# BACKUP
# Service Manual

# LASER TALON

## 1991

Volume-1
Engine, Chassis
& Body

## FOREWORD

This Service Manual has been prepared with the latest service information available at the time of publication. It is subdivided into various group categories and each section contains diagnosis, disassembly, repair, and installation procedures along with complete specifications and tightening references. Use of this manual will aid in properly performing any servicing necessary to maintain or restore the high levels of performance and reliability designed into these outstanding vehicles.

This BACKUP DSM manual is to be used ONLY as a BACKUP. Please DO NOT REDISTRIBUTE WHOLE SECTIONS. This BACKUP was sold to you under the fact that you do indeed OWN a GENUINE DSM MANUAL. It CANNOT BE considered a REPLACEMENT (Unless your original manual was lost or destroyed.)

Please See README.TXT or README.HTML for additional information

Thank you. Gimmiemymanual@hotmail.com

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NOTE: For Electrical, refer to Volume-2 "Electrical".

# HOW TO USE THIS MANUAL

N00BAAZ

## CONTENTS

The preceding page contains GROUP INDEX which lists the group title and group number.

## PAGE NUMBERS

All page numbers consist of two sets of digits separated by a dash. The digits preceding the dash identify the number of the group. The digits following the dash represent the consecutive page number within the group. The page numbers can be found on the top left or right of each page.

## TEXT

Unless otherwise specified, each service procedure covers all models. Procedures covering specific models are identified by the model codes, or similar designation (engine type, transaxle type, etc.). A description of these designations is covered in this unit under "VEHICLE IDENTIFICATION".

## TROUBLESHOOTING

Troubleshootings are classified into master troubleshooting and group troubleshooting and located as follows:

The master troubleshooting is prepared when the trouble symptom relates to two or more groups and given in MASTER TROUBLESHOOTING.

The group troubleshooting guide is prepared for causes of problems related to that individual group only; a troubleshooting guide is prepared for each appropriate group.

## SERVICE PROCEDURES

The service steps are arranged in numerical order and attentions to be paid in performing vehicle service are described in detail in SERVICE POINTS.

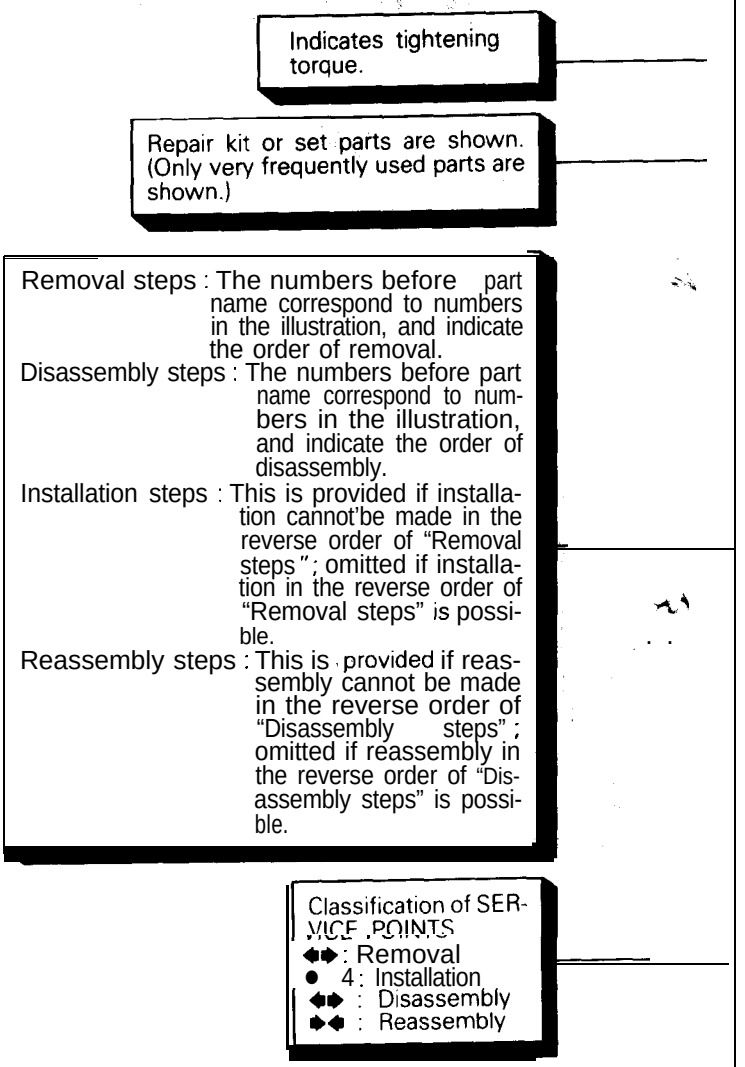
## DEFINITION OF TERMS

STANDARD VALUE

Indicates the value used as the standard for judging the quality of a part or assembly on inspection or the value to which the part or assembly is corrected and adjusted. It is given by tolerance.

LIMIT

Shows the standard for judging the quality of a part or assembly on inspection and means the maximum or minimum value within which the part or assembly must be kept functionally or in strength. It is a value established outside the range of standard value.




## MODEL INDICATIONS

The following abbreviations are used in this manual for classification of model types.

M/T: Indicates the manual transaxle, or models equipped with the manual transaxle.
A/T: Indicates the automatic transaxle, or models equipped with the automatic transaxle.
MPI: Indicates the multi-point injection, or engines equipped with the multi-point injection.
SOHC: Indicates an engine with the single overhead camshaft, or a model equipped with such an engine.
DOHC: Indicates an engine with the double overhead camshaft, or a model equipped with such an engine.
Turbo: Indicates an engine with turbocharger, or a model equipped with such an engine.
Non-Turbo: Indicates an engine without turbocharger, or a model equipped with such an engine.
FWD: Indicates the front wheel drive vehicles.
AWD: Indicates the all wheel drive vehicles.
ABS: Indicates the anti-lock braking system or models equipped with the anti-lock braking system.

Page number

Group title

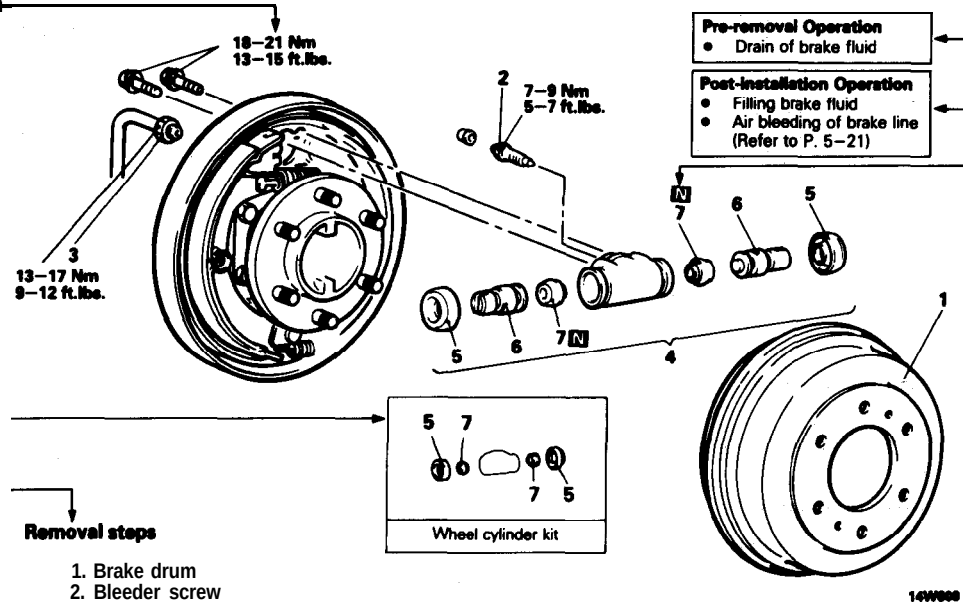
Section title

Indicates the incidental operation to be performed before removal or after installation

5-44 BRAKES–Rear Brake Wheel Cylinder

## REAR BRAKE WHEEL CYLINDER

### REMOVAL AND INSTALLATION




Pre-removal Operation
- Drain of brake fluid

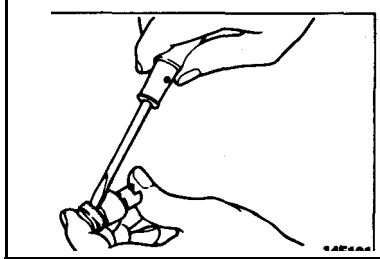
Post-installation Operation
- Filling brake fluid
- Air bleeding of brake line (Refer to P. 5–21)

Indicates non-reusable part.

**Removal steps**

1. Brake drum
2. Bleeder screw
3. Brake tube connection
- * 4. Wheel cylinder assembly
- e 5. Wheel cylinder boot
- + 6. Piston assembly
◆◆◆ 7. Piston cup

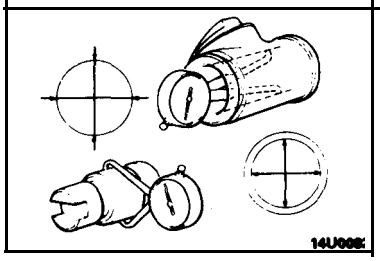
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".



### SERVICE POINTS REMOVAL

-7. REMOVAL OF PISTON CUP

Using a screwdriver, remove the piston cup from the piston.



### INSPECTION

Check the following points. and if there is any abnormality, replace the entire wheel cylinder assembly.

(1) Check piston and wheel cylinder walls for rust or damage.
(2) Check clearance between the cylinder and the piston.
Measure in two perpendicular directions to figure the clearance between the wheel cylinder inner diameter (max.value) and the piston outer diameter (min.value).

**Limit :** 0.15 mm (.0059 in.)

NOTE
If the difference is more than the limit, replace the piston and wheel cylinder as an assembly.

This number corresponds to the number in "Removal steps", "Disassembly steps", "Installation steps" or "Reassembly steps".

An explanation of procedures, notes, etc. regarding removal, installation, disassembly and reassembly.

## EXPLANATION OF THE TROUBLESHOOTING GUIDE

Indicates connector's terminal number.

Indicates the circuit diagram for checking (including the interface of the air conditioner control unit).

Indicates the connector number. Numbers are used in the operation descriptions only as necessary, and these numbers correspond to the numbers used in harness and component layout diagrams.

Provides the description of circuit operation for basic understanding.

Indicates the check to be made.

Provides hints (including judgement) when troubleshooting procedures are followed.

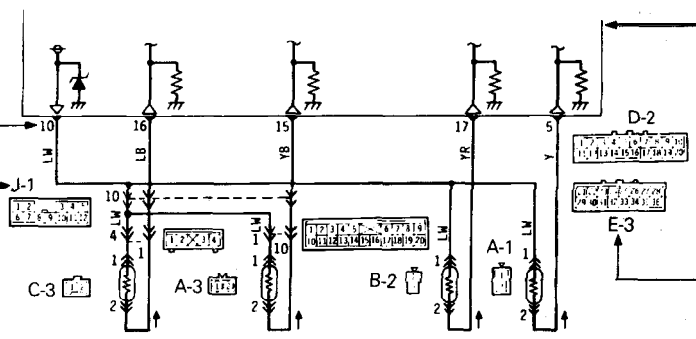
Indicates the diagnosis output code No. and the system conditions during output.

Indicates the terminals to be checked.

Indicates the conditions under which the check should be made.

Indicates the specification to be used for judgement of the check results.
If there is no particular mention of conditions in the "Conditions" column, the column shows the specification under normal conditions.

**3. Checking the passenger compartment-temperature sensor, outside-air sensor, air-thermostat sensor and refrigerant-temperature sensor circuits**




**Operation description**

A negative-characteristic thermistor is employed for each sensor in order to convert the ambient temperature of the sensor part to resistance
The sensor power-supply (25V) of the air-conditioner unit is applied to the terminals (16), (15), (17) (5) divided resistance resistance R

**Troubleshooting hints**

Diagnosis

No. 11: The passenger compartment-temperature sensor input signal is held to 25°C (77°F).
No. 12 The outside-air sensor input signal is held to 15°C (59°F)
No. 13 The air-thermostat sensor input signal is held to 4°C (39°F)

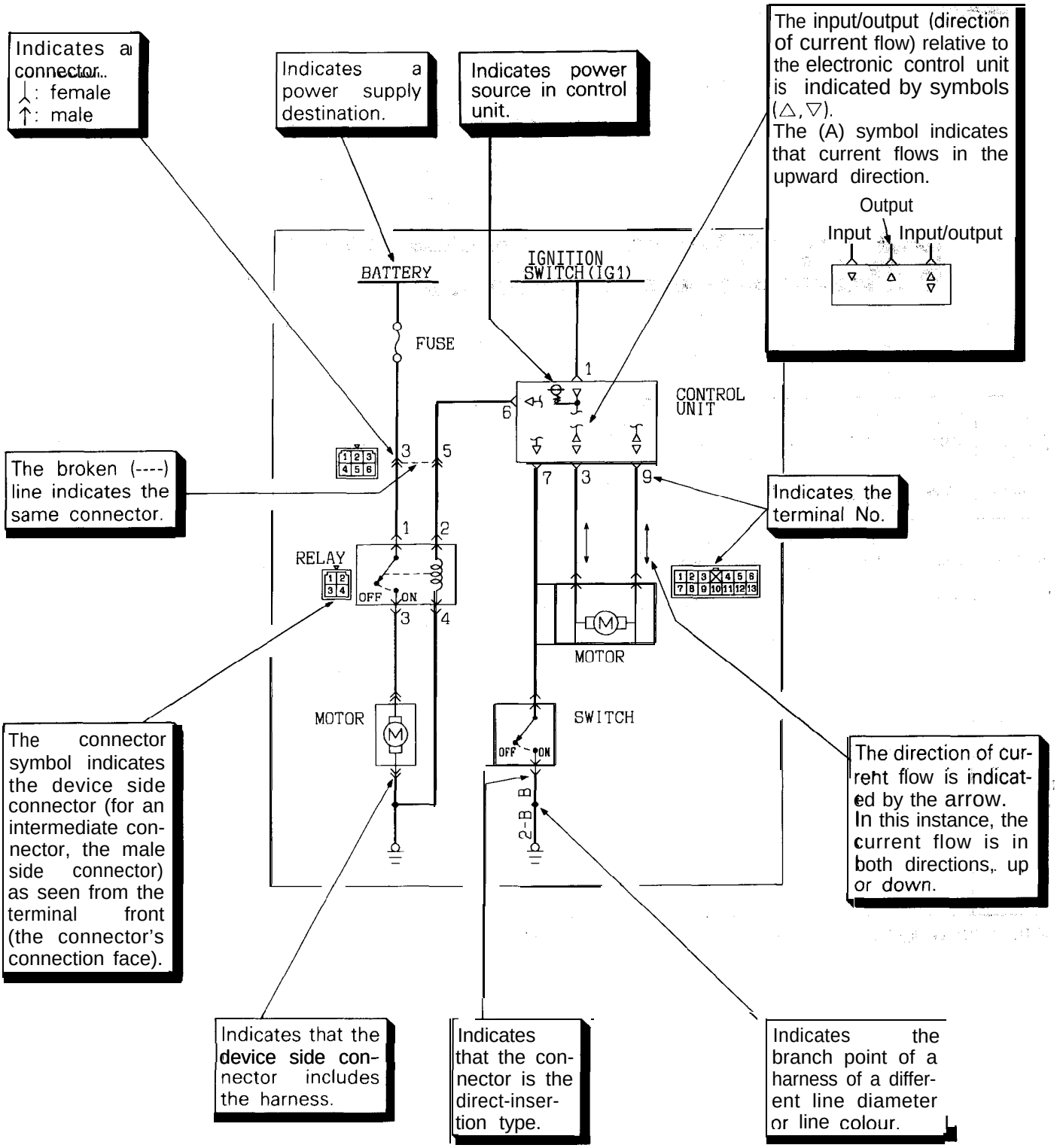
***Air conditioner control unit terminal voltage***

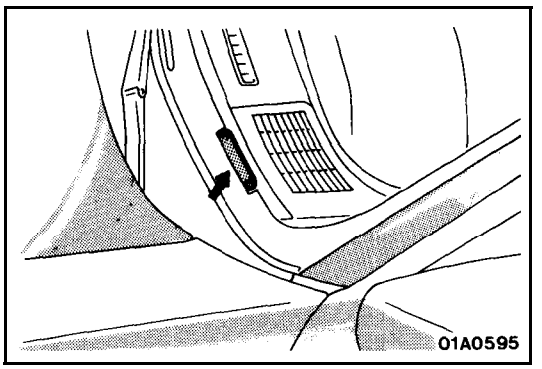
| Terminal No | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 5 | Outside-air sensor | Sensor part temperature 25°C (77°F): 4 kΩ | 1.0–1.6V |
| 10 | Sensor power supply | At all times | 2.45–2.55V |
| 15 | Refrigerant-temperature sensor | Sensor part temperature 25°C (77°F) when air conditioner is OFF: 80 Ω | 0.15V |
| 16 | Passenger compartment-temperature sensor | Sensor part temperature 25°C (77°F): 4 kΩ | 1.0–1.6V |
| 17 | Air-thermostat sensor | Sensor part temperature 25°C (77°F) when air conditioner is OFF: 4 kΩ | 1.0–1.6V |

## EXPLANATION OF CIRCUIT DIAGRAMS

The symbols used in circuit diagrams are used as described below.

NOTE
For detailed information concerning the reading of circuit diagrams, refer to GROUP 8–Wiring Harness.





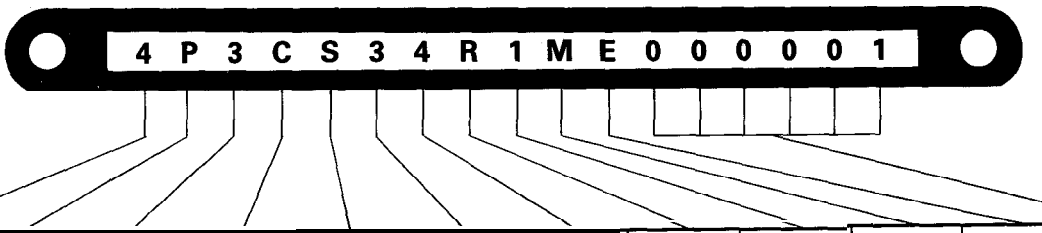

# VEHICLE IDENTIFICATION N00CA-

## VEHICLE IDENTIFICATION NUMBER LOCATION

The vehicle identification number (V.I.N.) is **located on a plate** attached to the left top side of the instrument **panel.**

## VEHICLE IDENTIFICATION CODE CHART PLATE N00CB-

All vehicle identification numbers contain **17** digits. The vehicle number is a code which tells country, make, vehicle type, etc.




| 1st Digit | 2nd Digit | 3rd Digit | 4th Digit | 5th Digit | 6th Digit | 7th Digit | 8th Digit | 9th Digit | 10th Digit | 11th Digit | 12th to 17th Digits |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Country | Make | Vehicle type | Others | Line | Price class | Body | Engine | *Check digits | Model year | Plant | Serial number |
| 4-<br>USA | E-<br>Eagle<br>P-<br>Plymouth | 3-<br>Passen-ger Car | B-<br>Manual Seat Belt<br>C-<br>Auto-matic Seat Belt | S-<br>Laser or Talon FWD<br>T-<br>Talon AWD | 3-<br>Medium<br>4-<br>High<br>5-<br>Premium<br>6-<br>Special | 4-<br>3 door Hatch-back | T-<br>1.8 liter (107 cu.in.) [SOHC-MPI]<br>R-<br>2.0 liters (122 cu.in.) [DOHC-MPI]<br>U-<br>2.0 liters (122 cu.in.) [DOHC-MPI-Turbo] | 1<br>2<br>3<br>·<br>·<br>·<br>·<br>9<br>x | M-<br>1991<br>Year | E-<br>DSM | 000001<br>to<br>999999 |

NOTE * "Check digit" means a single number or letter x used to verify the accuracy of transcription of vehicle identification number.

## VEHICLE IDENTIFICATION NUMBER LIST

N00CC-

### VEHICLES FOR FEDERAL

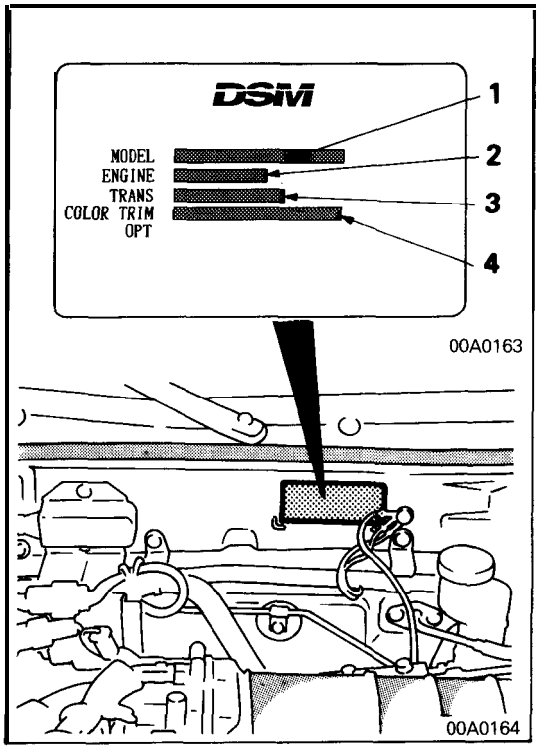
| V.I.N. (except sequence number) | Brand | Engine Displacement | Models Code |
|---|---|---|---|
| 4P3CS34T□ME | Plymouth Laser | 1.8 liter (107 cu.in.) [SOHC-MPI] | D21AMNJEL4P/RJEL4P |
| 4P3CS44T□ME | | | D21AMNHEL4P/RHEL4P |
| 4P3CS44R□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI] | D22AMNHML4P/RHML4P |
| 4P3CS44U□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI-Turbo] | D22AMNHFL4P/RHFL4P |
| 4E3CS44R□ME | Eagle Talon <FWD> | 2.0 liter (122 cu.in.) [DOHC-MPI] | D22AMNHML4E/RHML4E |
| 4E3CS54U□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI-Turbo] | D22AMNPFL4E/RPFL4E |
| 4E3CT64U□ME | Eagle Talon <AWD> | | D27AMNGFL4E/RGFL4E |

### VEHICLES FOR CALIFORNIA

| V.I.N. (except sequence number) | Brand | Engine Displacement | Models Code |
|---|---|---|---|
| 4P3CS34T□ME | Plymouth Laser | 1.8 liter (107 cu.in.) [SOHC-MPI] | D21AMNJEL9P/RJEL9P |
| 4P3CS44T□ME | | | D21AMNHEL9P/RHEL9P |
| 4P3CS44R□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI] | D22AMNHML9P/RHML9P |
| 4P3CS44U□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI-Turbo] | D22AMNHFL9P/RHFL9P |
| 4E3CS44R□ME | Eagle Talon <FWD> | 2.0 liter (122 cu.in.) [DOHC-MPI] | D22AMNHML9E/RHML9E |
| 4E3CS54U□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI-Turbo] | D22AMNPFL9E/RPFL9E |
| 4E3CT64U□ME | Eagle Talon <AWD> | | D27AMNGFL9E/RGFL9E |

### VEHICLES FOR CANADA

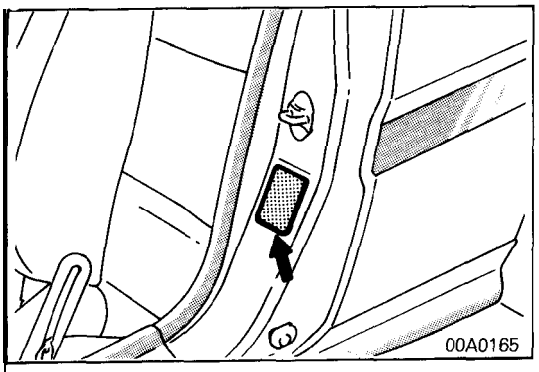
| V.I.N. (except sequence number) | Brand | Engine Displacement | Models Code |
|---|---|---|---|
| 4P3BS34T□ME | Plymouth Laser | 1.8 liter (107 cu.in.) [SOHC-MPI] | D21AMNJEL5P/RJEL5P |
| 4P3BS44T□ME | | | D21AMNHEL5P/RHEL5P |
| 4P3BS44R□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI] | D22AMNHML5P/RHML5P |
| 4P3BS44U□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI-Turbo] | D22AMNHFL5P/RHFL5P |
| 4E3BS44R□ME | Eagle Talon <FWD> | 2.0 liter (122 cu.in.) [DOHC-MPI] | D22AMNHML5E/RHML5E |
| 4E3BS54U□ME | | 2.0 liter (122 cu.in.) [DOHC-MPI-Turbo] | D22AMNPFL5E/RPFL5E |
| 4E3BT64U□ME | Eagle Talon <AWD> | | D27AMNGFL5E/RGFL5E |




## VEHICLE INFORMATION CODE PLATE N00CD--

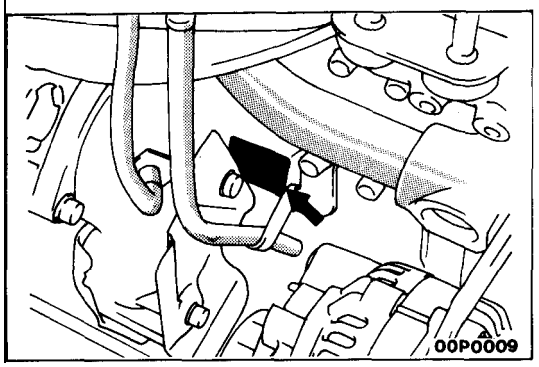
Vehicle information code plate is riveted onto the bulkhead in the engine compartment.
The plate shows model code, engine model, transaxle model, and body color code.

1. MODEL **D22AMN HML4P**
   - HML4P: Model series
   - D22AMN: Vehicle model
2. ENGINE **4G63**
   - 4G63: Engine model
3. TRANSAXLE **F5M33**
   - F5M33: Transaxle model
4. COLOR, TRIM OPT **B14**
   - B14: Monotone exterior color code




## VEHICLE SAFETY CERTIFICATION LABEL N00CF--

1. The vehicle safety certification label is attached to the face
2. This label indicates the month and year of manufacture, Gross Vehicle Weight Rating (G.V.W.R.), Gross Axle (G.A.W.R.) front and rear, and Vehicle Identification Number (V.I.N.).




## ENGINE MODEL STAMPING N00CG--

1. The engine model number is stamped at the front side on following:

| Engine model | Engine displacement |
|---|---|
| 4G37 | 1.8 liter (107 cu.in.) [SOHC-MPI] |
| 4G63 | 2.0 liter (122 cu.in.) [DOHC-MPI] or [DOHC-MPI-Turbo] |

2. The engine serial number is stamped near the engine model number, and the serial number cycles, as shown below.

| Engine serial number | Number cycling |
|---|---|
| AA0201 to YY9999 | AA0201 ------- →AA9999<br>AB0001 - - - - - - - →AY9999<br>BA0001 - - - - - - - →YY9999 |

**Theft protection label**

original parts




00A0212

For replacement parts




00A0213

## THEFT PROTECTION

N00CIAB

In order to protect against theft, a Vehicle Identification Number (VIN) is stamped in, or attached as a label to, the following major parts of the engine and transaxle, as well as main outer panels:

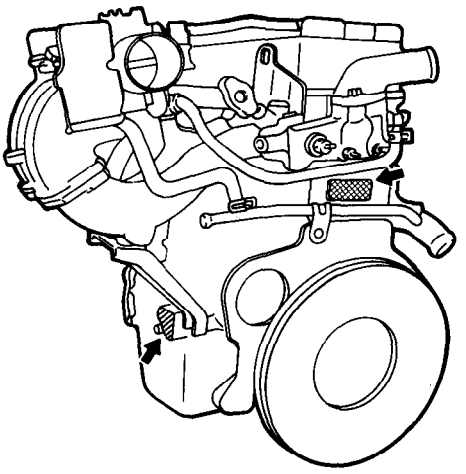
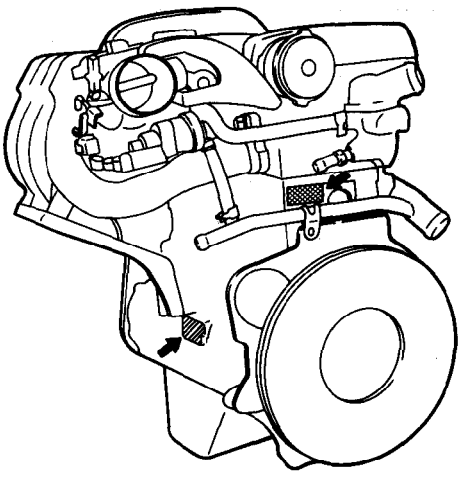
Engine cylinder block, Transaxle housing, Fender, Door, Quarter panel, Hood, Trunk lid, Bumpers

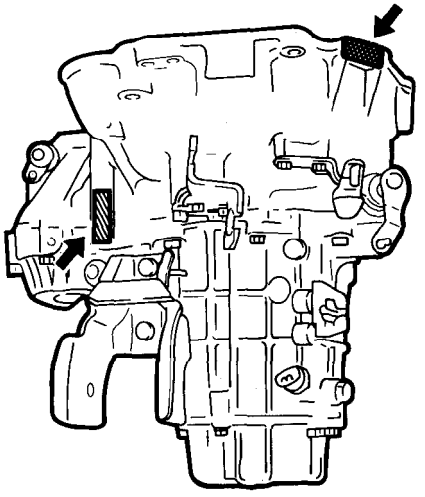
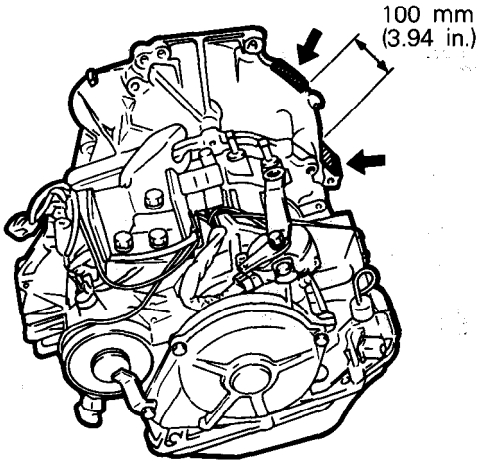
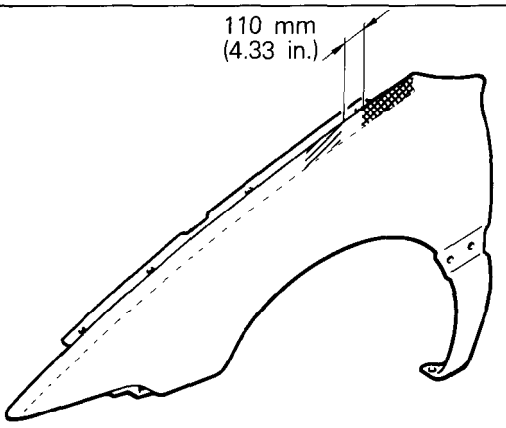
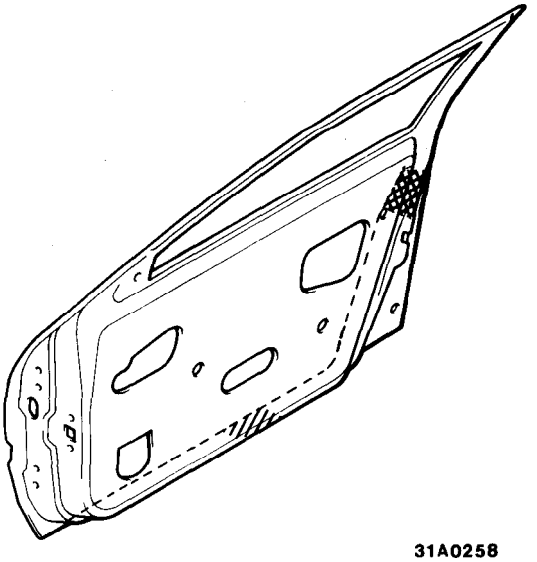
In addition, a theft-protection label is attached to replacement parts for the body outer panel main components, and the same data are stamped into replacement parts for the engine and the transaxle.

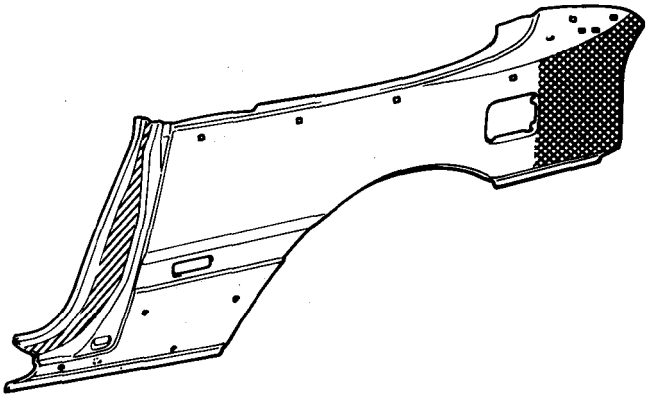
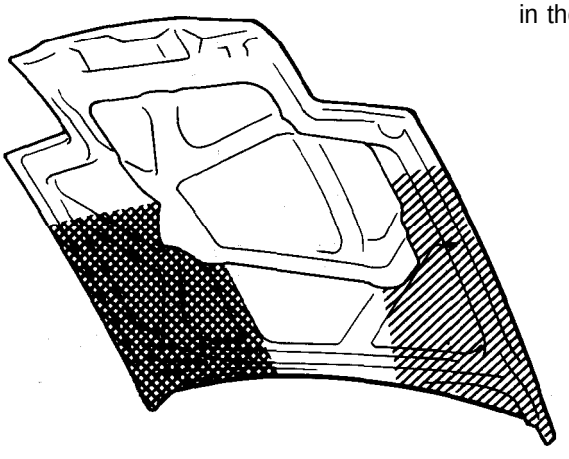
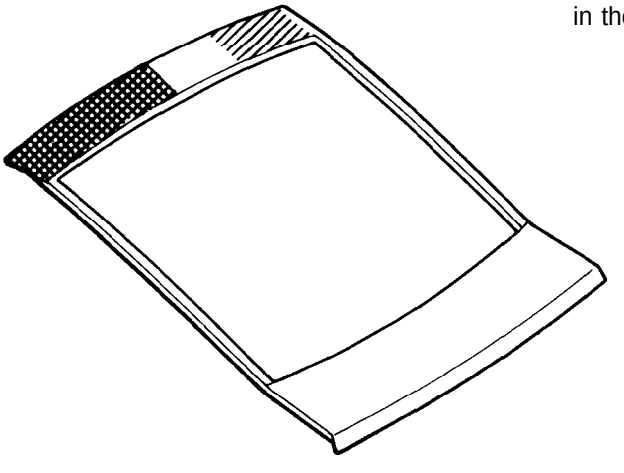
**Cautions regarding panel repairs**

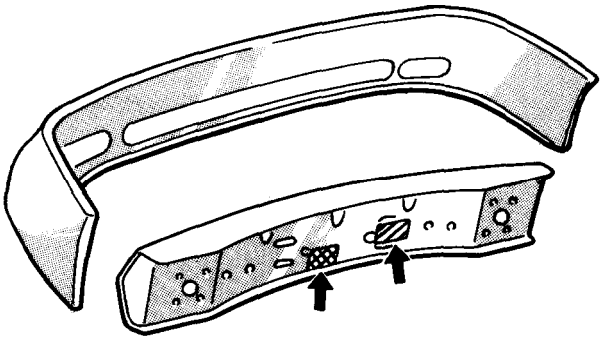
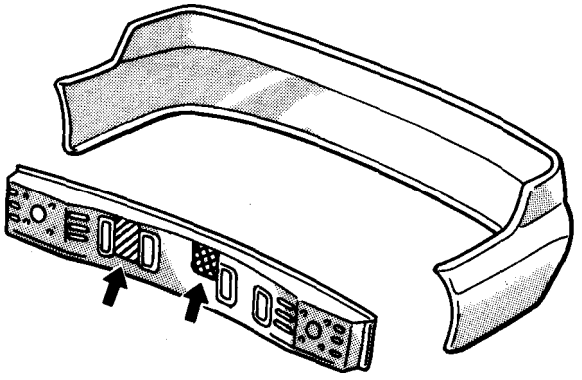
1. **When repainting original parts, do so after first masking the theft-protection label, and, after painting, be sure to peel off the masking tape.**
2. **The theft-protection label for replacement parts is covered by masking tape, so such parts can be painted as is. The masking tape should be removed after painting is finished.**
3. **The theft-protection label should not be removed from original parts or replacement parts.**

**LOCATIONS**

| Part | Target area ■ : for original equipment parts ▨ : for replacement parts |
|---|---|
| Engine | 1.8L Engine<br>  <br>00A0057<br>2.0L DOHC Engine<br>  <br>00A0055 |

| Part | Target area | ■ : for original equipment parts<br>▨ : for replacement parts |
|---|---|---|
| Transaxle | Manual transaxle<br>  <br>00A0061 | Automatic transaxle<br>  <br>00A0062 |
| Fender |  <br>The illustration indicates left hand side, outer.<br>Right hand side is symmetrically opposite.<br>31A0259 | |
| Door |  <br>31A0258<br>The illustration indicates right hand side, outer.<br>Left hand side is symmetrically opposite. | |

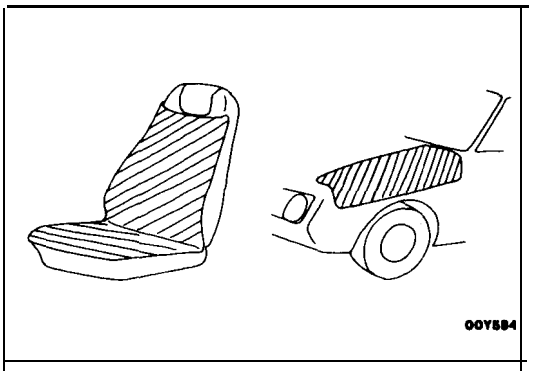
| Part | Target area : for original equipment parts : for replacement parts |
|---|---|
| Quarter panel | The label is attached at the inner side of the parts showr in the figure.<br>  <br>The illustration indicates left hand side, outer. Right hand side is symmetrically opposite.<br>31A0268 |
| Hood | The label is attached at the inner side of the parts shown in the figure.<br>  <br>31A0256 |
| Tailgate | The label is attached at the inner side of the parts shown in the figure.<br>  <br>31A0260 |

| Part | Target area<br>■: for original equipment parts<br>▨: for replacement parts |
|---|---|
| Front bumper |  <br>The label is attached at the inner side of the parts shown in the figure. 31A0332 |
| Rear bumper |  <br>The label is attached at the inner side of the parts shown in the figure. 31A0332 |

# PRECAUTIONS BEFORE SERVICE N00DAAH

## PROTECTING THE VEHICLE

If there is a likelihood of damaging painted or interior parts during service operations, protect them with suitable covers (such as seat covers, fender covers, etc.).



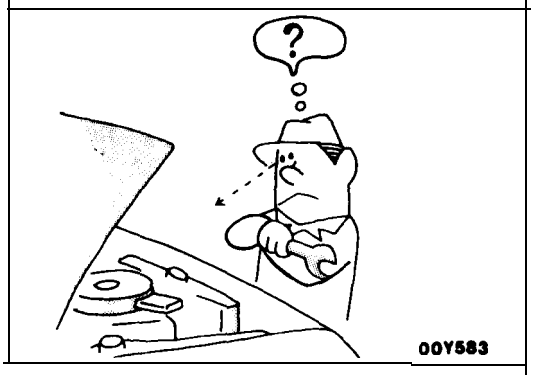

## REMOVAL AND DISASSEMBLY

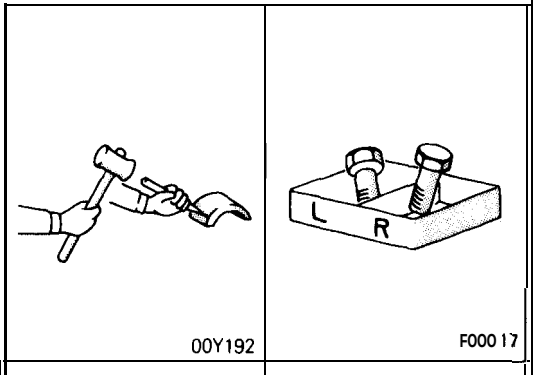
When checking a malfunction, find the cause of the problem. If it is determined that removal and/or disassembly is necessary, perform the work by following the procedures contained in this Service Manual.

If punch marks or mating marks are made to avoid error in assembly and to facilitate the assembly work, be sure'to make them in locations which will have no detrimental effect on performance and/or appearances.

If an area having many parts, similar parts, and/or parts which are symmetrical right and left is disassembled; be sure to arrange the parts so that they do not become mixed during the assembly process.

1. Arrange the parts removed in the proper order.
2. Determine which parts are to be reused and which are to be replaced.
3. If bolts, nuts, etc., are to be replaced, be sure to use only the exact size specified.



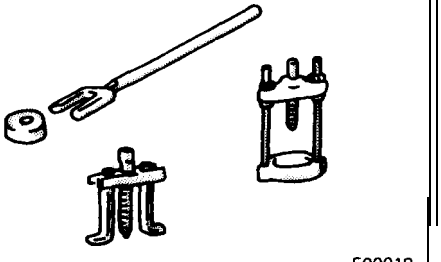







## SPECIAL TOOLS

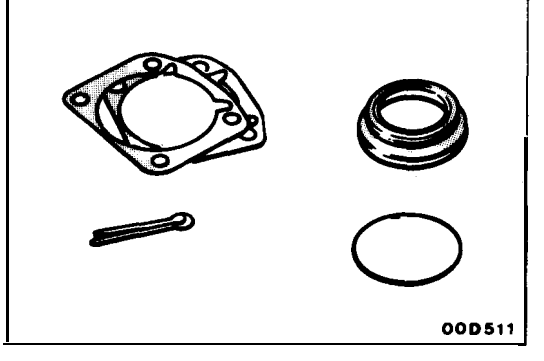
If other tools are substituted for the special tools to do service or repair work, there is the danger that vehicle parts might be damaged, or the technician might be injured; therefore, be sure to use the special tool whenever doing any work for which the use of one is specified.




## PARTS TO BE REPLACED

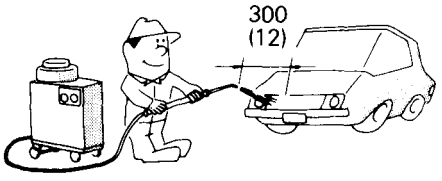
If any of the following parts are removed, they must be replaced with new parts.

1. Oil seals
2. Gaskets (except rocker cover gasket)
3. Packings
4. O-rings
5. Lock washers
6. Cotter pins
7. Self-locking nuts



## PARTS

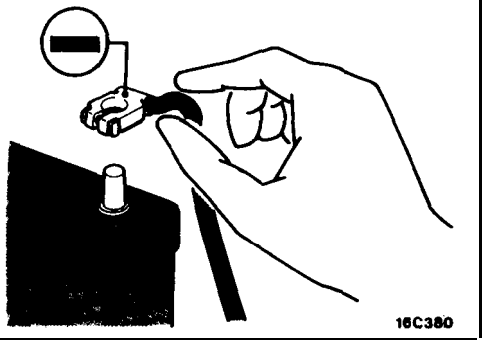
When replacing parts, use MOPAR genuine parts.




mm (in.) S00059

## VEHICLE WASHING

If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to maintain the spray nozzle at a distance of at least 300 mm (12 in.) from any plastic parts and all opening parts (doors, luggage compartment, etc.).




## SERVICING ELECTRICAL SYSTEM

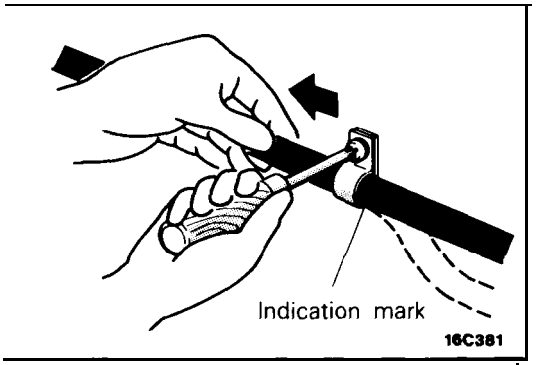
1. Note the following before proceeding with work on the electrical system.
   Note that the following must never be done:
   Unauthorized modifications of any electrical device or wiring, because such modifications might lead to a vehicle malfunction, over-capacity or short-circuit that could result in a fire in the vehicle.
2. When servicing the electrical system, disconnect the negative cable terminal from the batten/.

**Caution**

**1. Before connecting or disconnecting the negative cable, be sure to turn off the ignition switch and the lighting switch.**
**(If this is not done, there is the possibility of semiconductor parts being damaged.)**

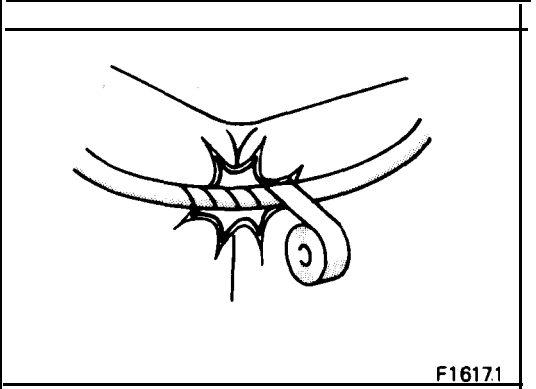
**2. For MPI-equipped models, after completion of the work steps [when the battery's negative (–) terminal is connected], warm up the engine and allow it to idle for approximately five minutes under the conditions described below, in order to stabilize engine control conditions, and then check to be sure that the idling is satisfactory.**

**Engine coolant temperature: 85–95°C (185–203°F)**
**Lights, electric fans, accessories: OFF**
**Transaxle: neutral position**
**(A/T models: "N" or "P")**
**Steering wheel: neutral (center) position**

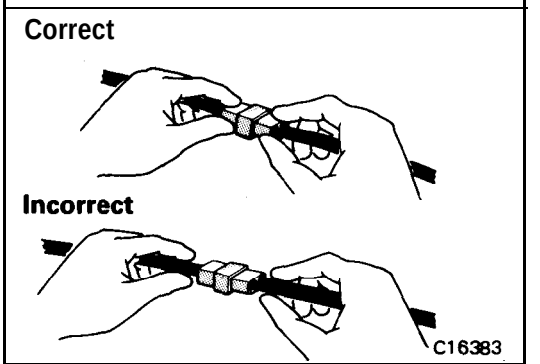



## WIRING HARNESSES

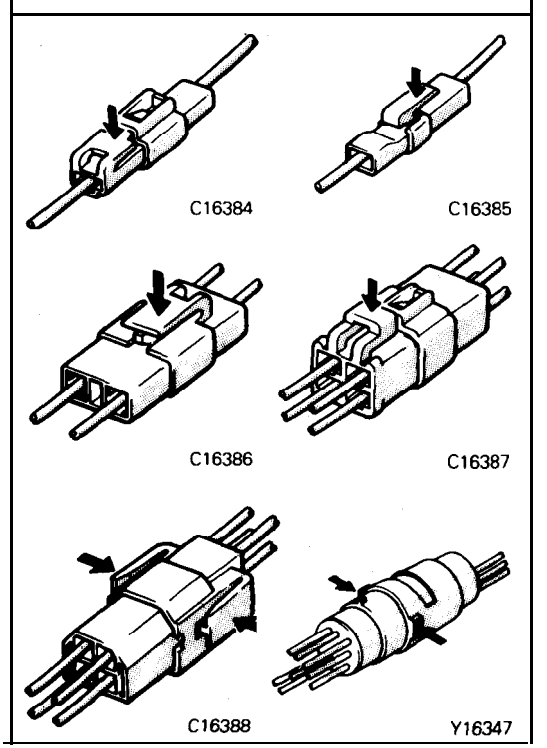
1. Secure the wiring harnesses by using clamps. However, for any harness which passes to the engine or other vibrating parts of the vehicle, allow some slack within a range that does not allow the engine vibrations to cause the harness to come into contact with any of the surrounding parts. Then secure the harness by using a clamp.
   In addition, if a mounting indication mark (yellow tape) is on a harness, secure the indication mark in the specified location.



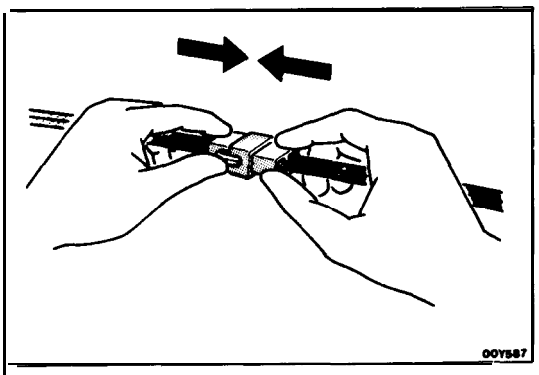

2. If any section of a wiring harness contacts the edge of a part, or a corner, wrap the section of the harness with tape or something similar in order to protect it from damage.



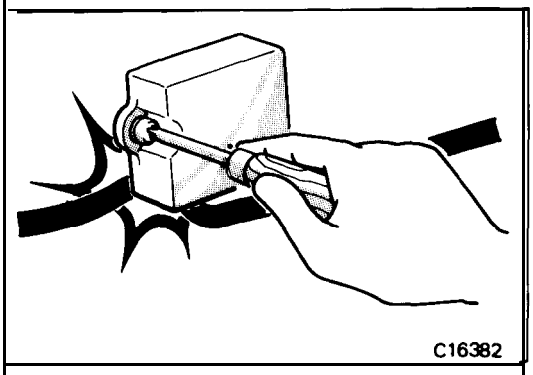

3. When disconnecting a connector, be sure to pull only the connector, not the harness.




4. Disconnect connectors which have catches by pressing in the direction indicated by the arrows in the illustration.

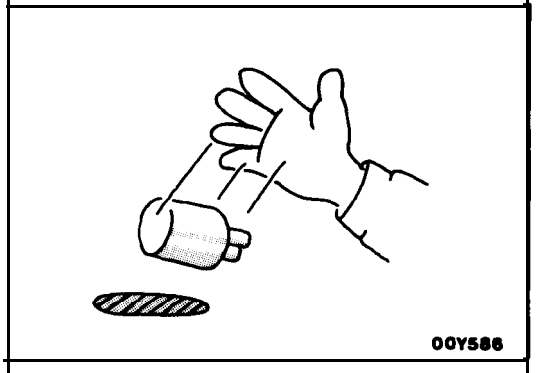



5. Connect connectors which have catches by inserting the connectors until they snap.

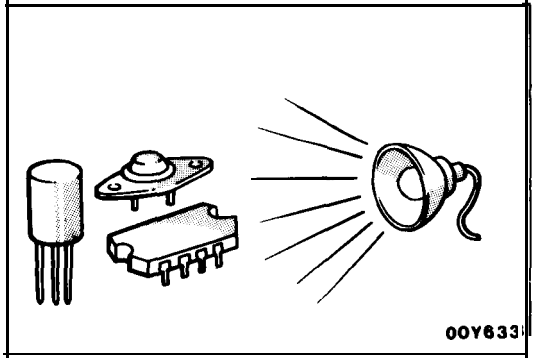



**ELECTRICAL COMPONENTS**

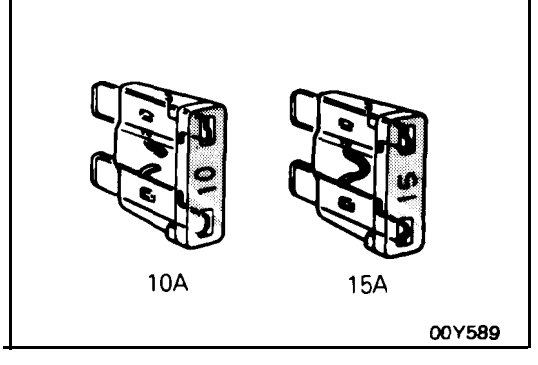
1. When installing any of the vehicle parts, be careful not to pinch or damage any of the wiring harnesses.




2. Sensors, relays, etc., are sensitive to strong impacts. Handle them with care so that they are not dropped or mishandled.




3. The electronic parts used for relays, etc., are sensitive to heat. If any service which causes a temperature of 80°C (176°F) or more is performed, remove the part or parts in question before carrying out the service.




**FUSES AND FUSIBLE LINKS**

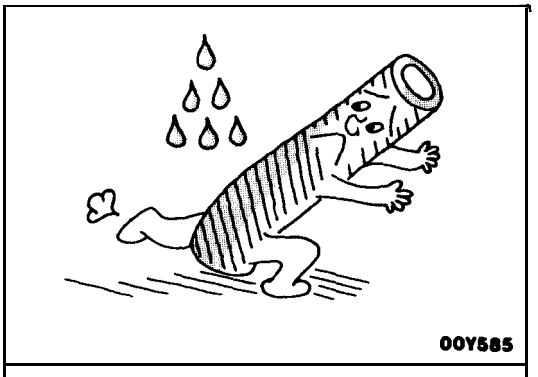
1. If a blown-out fuse is to be replaced, be sure to use only a fuse of the specified capacity. If a fuse of a capacity larger than that specified is used, parts may be damaged and the circuit may not be protected adequately.

**Caution**

1. **If a fuse is blown-out, be sure to eliminate the cause of the problem before installing a new fuse.**
2. **Check the condition of fuse holders. If rust or dirt is found, clean metal parts with a fine-grained sand-paper until proper metal-to-metal contact is made. Poor contact of any fuse holder will often lead to voltage drop or heating in the circuit and could result in improper circuit operation.**

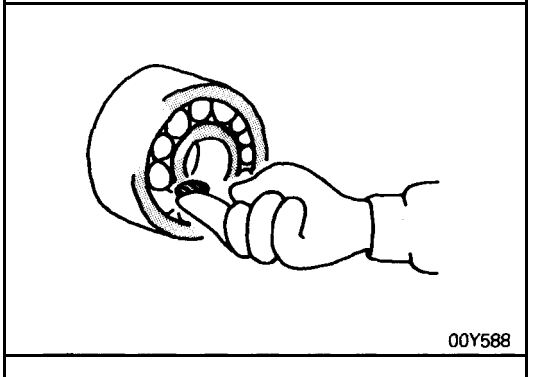
| Nominal size | SAE gage No. | Permissible current | |
|---|---|---|---|
| | | In engine compartment | Other areas |
| 0.3 $mm^2$ | AWG 22 | – | 5A |
| 0.5 $mm^2$ | AWG 20 | 7A | 13A |
| 0.85 $mm^2$ | AWG 18 | 9A | 17A |
| 1.25 $mm^2$ | AWG 16 | 12A | 22A |
| 2.0 $mm^2$ | AWG 14 | 16A | 30A |
| 3.0 $mm^2$ | AWG 12 | 21A | 40A |
| 5.0 $mm^2$ | AWG 10 | 31A | 54A |

2. If additional optional equipment is to be installed, in the vehicle, follow the procedure listed in the appropriate instruction manual; however, be sure to pay "careful attention to the following points:
   (1) In order to avoid overloading the wiring, take the electrical current load of the optional equipment into consideration, and determine the appropriate wire size:
   (2) Where possible, route the wiring through the existing harnesses.
   (3) If an ammeter or similar instrument is to be connected to a live-wire circuit, use tape to protect the wire, use a clamp to secure the wire, and make sure that there is no contact with any other parts.
   (4) Be sure to provide a fuse for the load circuit of the optional equipment.


00Y585

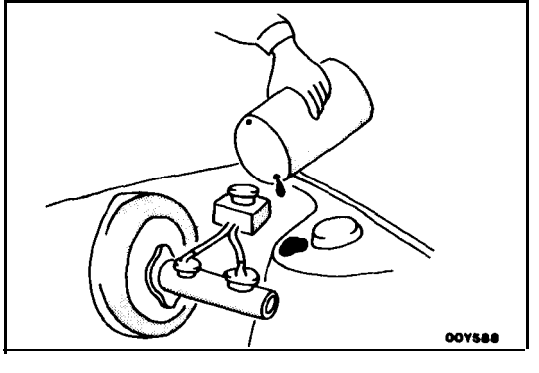
## TUBES AND OTHER RUBBER PARTS

Be careful to avoid spilling any gasoline, oil, etc., or rubber parts, they might be adversely affected.


00Y588

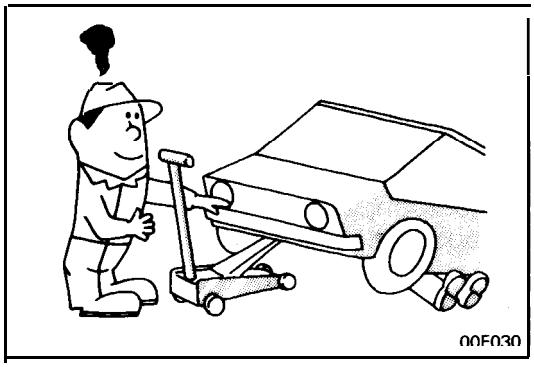
## LUBRICANTS

In accordance with the instructions in this Service Manual, apply the specified lubricants in the specified locations during assembly and installation.


00Y589

## BRAKE FLUID

Be careful to avoid spilling any brake fluid on painted surfaces, because the paint coat might be discolored or damaged.




## DOING SERVICE WORK IN GROUPS OF TWO OR MORE TECHNICIANS

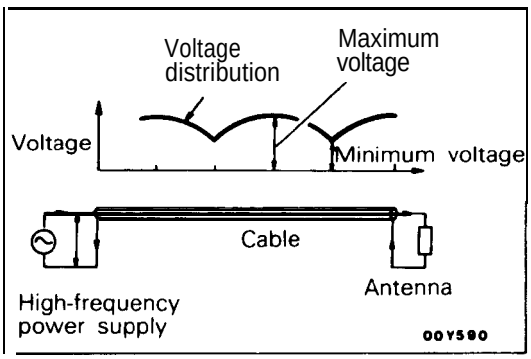
If the service work is to be done by two or more technicians working together, extra caution must be taken.

## NOTE ON INSTALLATION OF RADIO EQUIPMENT

N00EA--

The computers of the electronic control system has been designed so that external radio waves will not interfere with their operation.
However, if antenna or cable of amateur transceiver etc. is routed near the computers, it may affect the operation of the computers, even if the output of the transceiver is no more than 25W.
To protect each of the computers from interference by transmitter (hum, transceiver, etc.), the following should be observed.

1. Install the antenna on the roof or rear bumper.
2. Because radio waves are emitted from the coaxial cable of the antenna, keep it 200 mm (8 in.) away from the computers and the wiring harness. If the cable must cross the wiring harness, route it so that it runs at right angles to the wiring harness.
3. The antenna and the cable should be well matched, and the standing-wave ratio* should be kept low.
4. A transmitter having a large output should not be installed in the vehicle.
5. After installation of transmitter, run the engine at idle, emit radio waves from the transmitter and make sure that the engine is not affected.



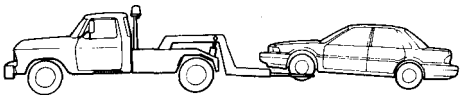

### "STANDING-WAVE RATIO

If an antenna and a cable having different impedances are connected, the input impedance Zi will vary in accordance with the length of the cable and the frequency of the transmitter, and the voltage distribution will also vary in accordance with the location.
The ratio between this maximum voltage and minimum voltage is called the standing-wave ratio. It can also be represented by the ratio between the impedances of the antenna and the cable.
The amount of radio waves emitted from the cable increases as the standing-wave ratio increases, and this increases the possibility of the electronic components being adversely affected.

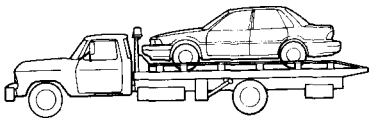
Sling type




Wheel lift type



Flat bed type

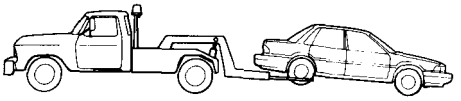


00A0049

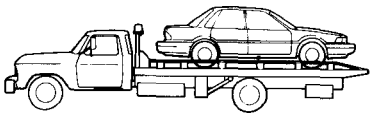
Sling type




Wheel lift type



Flat bed type



00A0048

# TOWING AND HOISTING

N00GA--

## WRECKER TOWING RECOMMENDATION <FWD>

### FRONT TOWING PICKUP

**Caution**
**This vehicle cannot be towed by a wrecker using sling-type equipment to prevent the bumper from deformation. If this vehicle is towed, use wheel lift or flat bed equipment.**

The vehicle may be towed on its rear wheels for extended distances provided the parking brake is released. It is recommended that vehicles be towed using the front pickup whenever possible.

### REAR TOWING PICKUP

**Caution**
**This vehicle cannot be towed by a wrecker using sling-type equipment to prevent the axle beam from deformation. If this vehicle is towed, use wheel lift or flat bed equipment.**

Manual transaxle vehicles may be towed on the front wheels, provided the transaxle is in neutral and the drive-line has not been damaged. The steering wheel must be clamped in the straight-ahead position with a steering wheel clamping device designed for towing service use.

**Caution**
**Do not use steering column lock to secure front wheel position for towing.**

Automatic transaxle vehicle may be towed on the front wheels at speeds not to exceed 50 km/h (30 mph) for a distances hot to exceed 30 km (18 miles).

**Caution**
**If these limits cannot be met, the front wheels must 'be placed on a tow dolly.**

### TOWING WHEN KEYS ARE NOT AVAILABLE

When a locked vehicle must be towed and keys are not available, the vehicle may be lifted and towed from the front,, provided the parking brake is released: If not released, the rear wheels should be placed on a tow dolly.

### SAFETY PRECAUTIONS

The following precautions should be taken when towing the vehicle.

1. DO NOT LIFT OR TOW THE VEHICLE BY ATTACHING TO OR WRAPPING AROUND THE BUMPER.
2. Any loose or protruding parts of damaged vehicle such as hoods, doors, fenders, trim, etc., should be secured prior to moving the vehicle.
3. Operator should refrain from going under a vehicle while it is lifted by the towing equipment, unless the vehicle in adequately supported by satefy stands.
4. Never allow passengers to ride in a towed vehicle.
5. State and local rules and regulations must be followed when towing a vehicle.

### <AWD>

Refer to the section “Special Handling Instructions for AWD Models”.

## HOISTING

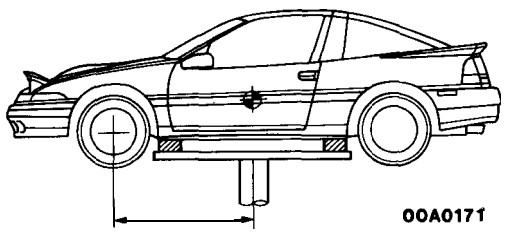
### POST TYPE

Special care should be taken when raising the vehicle on a frame contact type hoist. The hoist must be equipped with the proper adapters in order to support the vehicle at the proper locations.

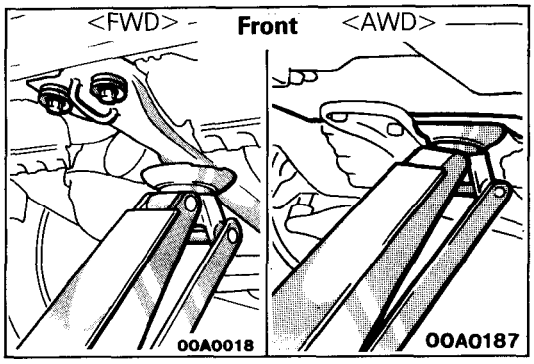
**Caution**

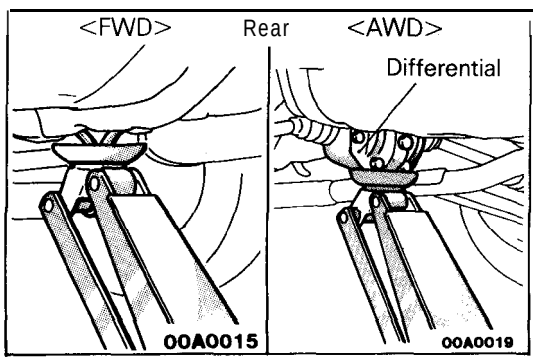
**When service procedures require removing rear suspension, fuel tank, spare tire and lift gate, place additional weight on rear end of vehicle or anchor vehicle to hoist to prevent tipping of center of gravity changes.**

Frame contact support location




<FWD>: 928mm (36.5 in.)
<AWD>: 998mm (39.3 in.)




### FLOOR JACK

The usual type of floor jack is used at the following locations.

Front:
- <FWD> Under the mid point of centermember
- <AWD> Under the mid point of crossmember

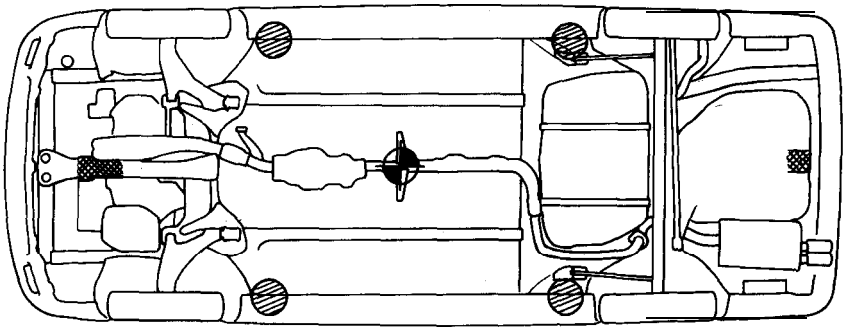
Rear:
- <FWD> Under the jack up bracket of rear floor pan
- <AWD> Under the rear differential

**Cautions**

1. **Never use a jack at the lateral rod or rear suspension assembly. <FWD>**
2. **In order to prevent scarring the centermember <FWD> or crossmember <AWD>, place a piece of cloth on the jack’s contact surface (to prevent corrosion caused by damage to the coating).**
3. **A floor jack must never be used on any part of the underbody.**
4. **Do not attempt to raise one entire side of the vehicle by placing a jack midway between front and rear wheels. This practice may result in permanent damage to the body.**

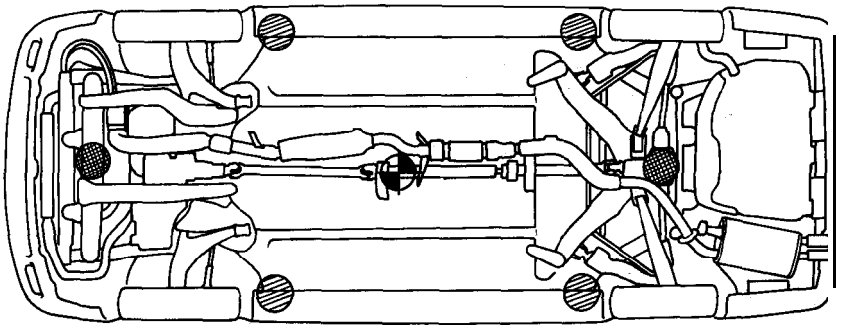
## LIFTING, JACKING SUPPORT LOCATION

<FWD>



10A0013

<AWD>



00A0021

Floor jack locations

Approximate center of gravity

Frame contact hoist, twin post hoist or scissors jack (emergency) locations

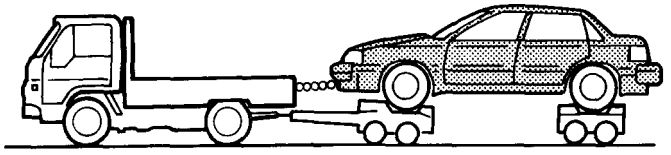
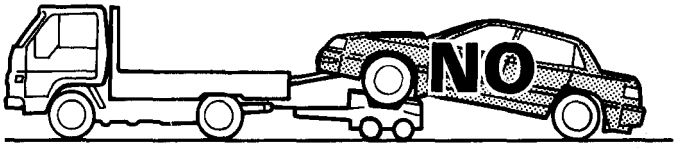
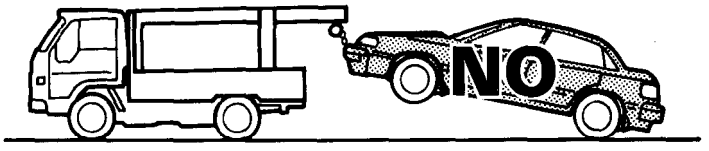
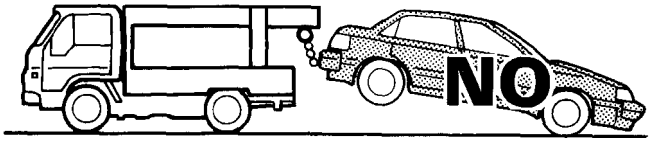
## EMERGENCY JACKING

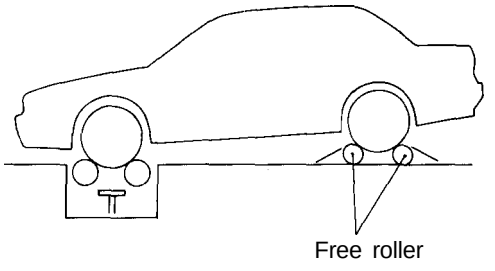
Jack receptacles are located at the body sills to accept the scissors jack supplied with the vehicle for emergency road service. Always block opposite wheels and jack on level surface.

# SPECIAL HANDLING INSTRUCTIONS FOR AWD MODELS

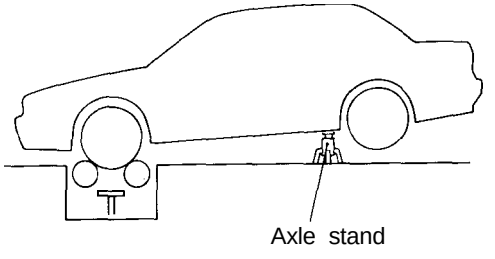
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## TOWING

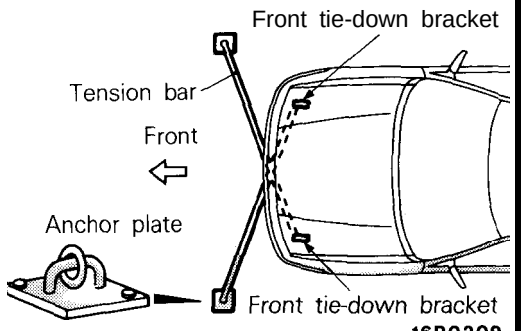
| Towing methods | Remarks |
|---|---|
| If a tow truck is used<br>Lifting method for 4 wheels-Good<br>  <br>00A0032 | • For AWD models, the basic principle is that all four wheels are to be raised before towing.<br>• The shift lever should be set to 1 st gear and the parking brake should be applied. <M/T><br>• The selector lever should be set to "P" position and the parking brake should be applied. <A/T> |
| Front wheels lifted-No good<br>  <br>00A0034 | • The vehicle must not be towed by placing only its front wheels or only the rear wheels on a rolling dolly, because to do so will result in deterioration of the viscous coupling and result in the viscous coupling causing the vehicle to jump forward suddenly. |
| Front wheels lifted—**No** good<br>  <br>11A0060 | • If only the front wheels or only the rear wheels are lifted for towing, the bumper will be damaged.<br>In addition, lifting of the rear wheels causes the oil to flow forward, and may result in heat damage to the rear bushing of the transfer, and so should never be done. |
| Rear wheels lifted-No good<br>  <br>00A0033 | |



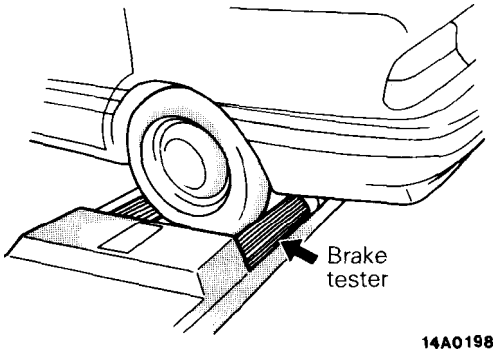
00P0038



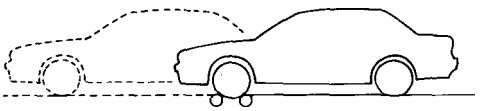
00P0037



16P0209



14A0198


00P0036

## SPEEDOMETER TEST

### IF A FREE ROLLER IS USED

1. Set the free roller on the floor (at the rear wheels) so that it is aligned with the vehicle's wheelbase and the rear tread.
2. Carefully move the vehicle onto the tester and free roller.
3. Set the speedometer tester in place.
4. Perform the speedometer test.
   For information concerning the measurement of speed and the allowable error, refer to GROUP 8–Meters and Gauges.

**Caution**
**Do not operate the clutch suddenly, or increase or reduce speed suddenly during the work.**

### IF THE REAR WHEELS ARE JACKED UP

1. Move the vehicle onto the speedometer tester.
2. Jack up the rear wheels, and place axle stands at the designated part of the side sill.
3. Perform the speedometer test.
   For information concerning the measurement of speed and the allowable error, refer to GROUP 8–Meters and Gauges.

**Caution**
**Do not operate the clutch suddenly, or increase or reduce speed suddenly during the work.**

### Front wheel side slip

To prevent the front wheels from moving from side to side, attach tension bars to the front tie-down brackets, and secure both ends at anchor plates.

### Accident prevention procedures

(1) Attach a chain or wire to the rear tie-down hole. (Refer to GROUP 8–Meters and Gauges.) Make sure the end of the wire or chain is secured firmly.
(2) Take all other necessary precautions.

## BRAKE TEST

In order to stabilize the viscous coupling's dragging force, the brake test should always be conducted after the speedometer test.

### FRONT WHEEL MEASUREMENTS

1. Place the front wheels on the brake tester.
2. Perform the brake test.

**Caution**
**The rear wheels should remain on the ground.**

3. If the brake dragging force exceeds the specified value, jack up the vehicle and manually rotate each wheel to check the rotation condition of each wheel.

NOTE
If the brake dragging force exceeds the specified value, the cause may be the effect of the viscous coupling's dragging force, so jack up the front wheels and check the rotation condition of the wheels in this state for no effect by the viscous coupling's dragging force.

### REAR WHEEL MEASUREMENTS

After placing the rear wheels on the brake tester, follow the same procedures as for the front wheel measurements.

**Braking force of AWD models with VCU**

| | | Braking force | |
|---|---|---|---|
| Each wheel | Left/right sum | At 90kg (198 lbs.) pedal depression force | 60% or more of front axle weight<br>Rear wheels: 330 kg (727 lbs.) or more |
| | Left/right difference | 8% or less of axle weight | |
| Total | | At 90kg (198 lbs.) pedal depression force | 830 kg (1,829 lbs.) or more* |

* About 20 kg (44 lbs.) of force by viscosity torque has been added.

or...

| | |
|---|---|
| Braking-stop distance | At primary velocity of 50 km/h (31 mph): Within 16.0m (52.5 ft.) |

## WHEEL BALANCE

### FRONT WHEEL MEASUREMENTS

1. Jack up the rear wheels, and place an axle stand at the designated part of the side sill.
2. Jack up the front wheels and set a pick-up stand and balancing machine in place.

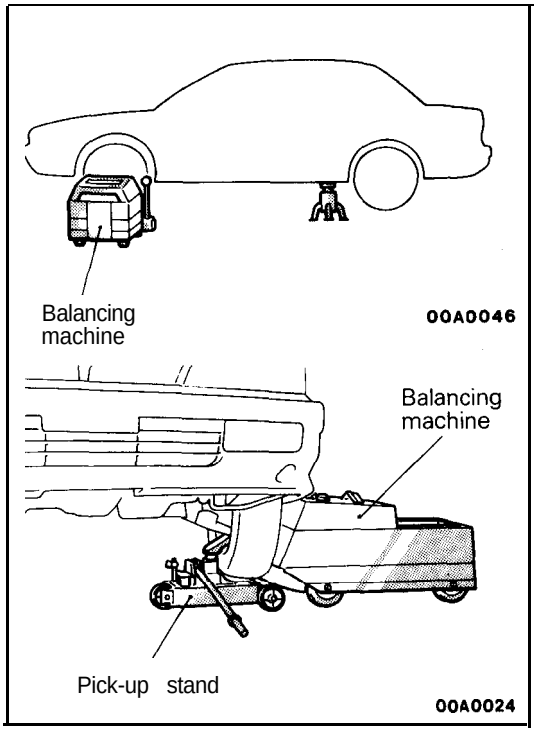
**Caution**
1. **Set so that the front and rear of the vehicle are at the same height.**
2. **Release the parking brake.**
3. **Rotate each wheel manually and check to be sure that there is no dragging.**

3. Use the engine to drive the tires, and then make the measurement.

**Caution**
1. **If an error is indicated in the state of engine drive, motor drive can be used concurrently.**
2. **Do not operate the clutch suddenly, or increase or reduce speed suddenly during the work.**

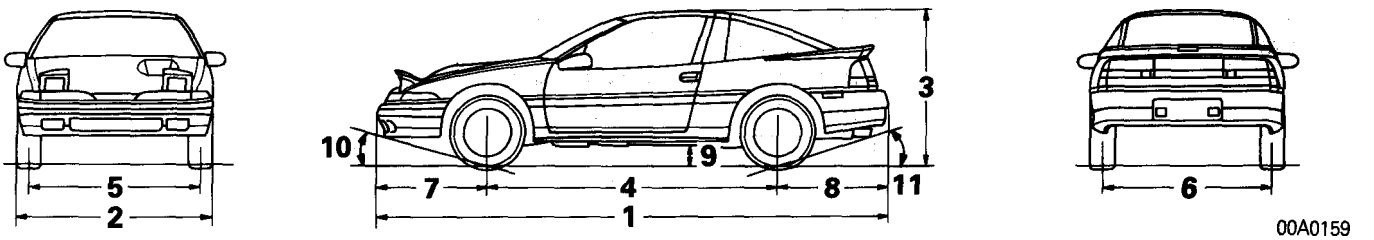
### REAR WHEEL MEASUREMENTS

1. Jack up the front wheels, and place an axle stand at the designated part of the side sill.
2. Jack up the rear wheels, and then, after setting a pick-up stand and balancing machine in place, follow the same procedure as for front wheel measurements.



# GENERAL DATA AND SPECIFICATIONS

N00HA--




00A0159

## GENERAL SPECIFICATIONS

**<PLYMOUTH>**

| Items | | | 1.8L Engine "Medium" | 1.8L Engine "High" | 2.0L DOHC Engine (Non-Turbo) | 2.0L DOHC Engine (Turbo) |
|---|---|---|---|---|---|---|
| Vehicle dimensions | | mm(in.) | | | | |
| Overall length | | 1 | 4,330 (170.5) | 4,330 (170.5) | 4,330 (170.5) | 4,330 (170.5) |
| Overall width | | 2 | 1,690 (66.5) | 1,690 (66.5) | 1,690 (66.5) | 1,690 (66.5) |
| Overall height | | 3 | 1,306 (51.4) | 1,306 (51.4) | 1,306 (51.4) | 1,306 (51.4) |
| Wheel base | | 4 | 2,470 (97.2) | 2,470 (97.2) | 2,470 (97.2) | 2,470 (97.2) |
| Tread | Front | 5 | 1,465 (57.7) | 1,465 (57.7) | 1,465 (57.7) | 1,465 (57.7) |
| | Rear | 6 | 1,450 (57.1) | 1,450 (57.1) | 1,450 (57.1) | 1,450 (57.1) |
| Overhang | Front | 7 | 950 (37.4) | 950 (37.4) | 950 (37.4) | 950 (37.4) |
| | Rear | 8 | 910 (35.8) | 910 (35.8) | 910 (35.8) | 910 (35.8) |
| Minimum running ground clearance | | 9 mm (in.) | 160 (6.3) | 160 (6.3) | 160 (6.3) | 160 (6.3) |
| Angle of approach degrees | | 10 | 15.3" | 15.3" | 15.3" | 15.3" |
| Angle of departure degrees | | 11 | 18.1" | 18.1" | 18.1" | 18.1" |
| Vehicle weight | | kg (lbs.) | | | | |
| Curb weights | | | | | | |
| M/T | | | 1,145 (2,524) | 1,165 (2,568) | 1,215 (2,679) | 1,245 (2,745) |
| A/T | | | 1,170 (2,579) | 1,190 (2,623) | 1,240 (2,734) | 1,280 (2,822) |
| Gross vehicle weight rating | | | 1,585 (3,494) | 1,585 (3,494) | 1,630 (3,594) | 1,670 (3,682) |
| Gross axle weight rating | | | | | | |
| Front | | | 900 (1,984) | 900 (1,984) | 930 (2,050) | 965 (2,127) |
| Rear | | | 685 (1,510) | 685 (1,510) | 700 (1,543) | 705 (1,554) |
| Seating capacity | | | 4 | 4 | 4 | 4 |
| Engine | | | | | | |
| Model No. | | | 4G37 | 4G37 | 4G63 | 4G63 |
| Transaxle | | | | | | |
| Model No. | | | | | | |
| Manual transaxle | | | F5M22 | F5M22 | F5M22 | F5M33 |
| Automatic transaxle | | | F4A22 | F4A22 | F4A22 | F4A33 |
| Clutch | | | | | | |
| Type | | | Dry-single disc & diaphragm spring | Dry-single disc & diaphragm spring | Dry-single disc & diaphragm spring | Dry-single disc & diaphragm spring |

| Items | | 1.8L Engine "Medium" | 1.8L Engine "Medium" | 2.0L DOHC Engine (Non-Tu rbo) | 2.0L DOHC Engine (Turbo) |
|---|---|---|---|---|---|
| Chassis | | | | | |
| Tire | | P185/70R14 | PI 85/70R14 | P205/55R16 89H or 205/55R16 89V or 205/55R16 88V | P205/55R16 89V or 205/55R16 88V |
| Front suspension | | | | | |
| Type | | Independent strut | Independent strut | Independent strut | Independent strut |
| Rear suspension | | | | | |
| Type | | 3-Link Torsion axle | 3-Link Torsion axle | 3-Link Torsion axle | 3-Link Torsion axle |
| Brake | | | | | |
| Type | Front | Disc | Disc | Disc | Disc |
| | Rear | Disc | Disc | Disc | Disc |
| Steering | | | | | |
| Gear type | | Rack and pinion | Rack and pinion | Rack and pinion | Rack and pinion |
| Gear ratio | | ∞ | ∞ | ∞ | CO |
| Fuel tank | | | | | |
| Capacity | liters (gals.) | 60 (16) | 60 (16) | 60 (16) | 60 (16) |

**<EAGLE>**

| Items | | | 2.0L DOHC Engine (Non-Turbo) | 2.0L DOHC Engine (FWD-Turbo) | 2.0L DOHC Engine (AWD-Turbo) |
|---|---|---|---|---|---|
| Vehicle dimensions | mm(in.) | | | | |
| Overall length | | 1 | 4,330 (1 70.5) | 4,350 (171.3) | 4,380 (1 72.4) |
| Overall width | | 2 | 1,690 (66.5) | 1,700 (66.9) | 1,700 (66.9) |
| Overall height | | 3 | 1,306 (51.4) | 1,306 (51.4) | 1,321 (52.0) |
| Wheel base | | 4 | 2,470 (97.2) | 2,470 (97.2) | 2,470 (97.2) |
| Tread | Front | 5 | 1,465 (57.7) | 1,465 (57.7) | 1,465 (57.7) |
| | Rear | 6 | 1,450 (57.1) | 1,450 (57.1) | 1,455 (57.3) |
| Overhang | Front | 7 | 950 (37.4) | 960 (37.8) | 960 (37.8) |
| | Rear | 8 | 910 (35.8) | 920 (36.2) | 950 (37.4) |
| Minimum running ground clearance | mm (in.) | 9 | 160 (6.3) | 160 (6.3) | 158 (6.2) |
| Angle of approach | degrees | 10 | 15.3 | 13.2" | 14.0" |
| Angle of departure | degrees | 11 | 18.1" | 18.1" | 17.6" |
| Vehicle weight | kg (lbs.) | | | | |
| Curb weights | | | | | |
| M/T | | | 1,230 (2,712) | 1,260 (2,778) | 1,405 (3,097) |
| A/T | | | 1,255 (2,767) | 1,295 (2,855) | 1,440 (3,175) |
| Gross vehicle weight rating | | | 1,630 (3,594) | 1,670 (3,682) | 1,81 0 (3,990) |
| Gross axle weight rating | | | | | |
| Front | | | 930 (2,050) | 965 (2,127) | 1,005 (2,216) |
| Rear | | | 700 (1,543) | 705 (1,554) | 805 (1,775) |
| Seating capacity | | | 4 | 4 | 4 |
| Engine | | | | | |
| Model No. | | | 4G63 | 4G63 | 4G63 |

| Items | | 2.0L DOHC Engine (Non-Turbo) | 2.0L DOHC Engine (FWD-Turbo) | 2.0L DOHC Engine (AWD-Turbo) |
|---|---|---|---|---|
| Transaxle | | | | |
| Model No. | | | | |
| Manual transaxle | | F5M22 | F5M33 | W5M33 |
| Automatic transaxle | | F4A22 | F4A33 | W4A33 |
| Clutch | | | | |
| Type | | Dry-single disc & diaphragm spring | Dry-single disc & diaphragm spring | Dry-single disc & diaphragm spring |
| Chassis | | | | |
| Tire | | P205/55R16 89H or 205/55R16 89V or 205/55R16 88V | P205/55R16 89V or 205/55R16 88V | P205/55R16 89V or 205/55R16 88V |
| Front suspension | | | | |
| Type | | Independent strut | Independent strut | Independent strut |
| Rear suspension | | | | |
| Type | | 3-Link Torsion axle | 3-Link Torsion axle | Double wishbone |
| Brake | | | | |
| Type | Front | Disc | Disc | Disc |
| | Rear | Disc | Disc | Disc |
| Steering | | | | |
| Gear type | | Rack and pinion | Rack and pinion | Rack and pinion |
| Gear ratio | | ∞ | ∞ | ∞ |
| Fuel tank | | | | |
| Capacity | liters (gals.) | 60 (16) | 60 (16) | 60 (16) |

## ENGINE SPECIFICATIONS

| Items | | 4G37 | 4G63 Non-Turbo | 4G63 Turbo |
|---|---|---|---|---|
| Type | | In-line SOHC | In-line DOHC | In-line DOHC |
| Number of cylinders | | 4 | 4 | 4 |
| Bore | mm (in.) | 80.6 (3.17) | 85.0 (3.35) | 85.0 (3.35) |
| Stroke | mm (in.) | 86.0 (3.39) | 88.0 (3.46) | 88.0 (3.46) |
| Piston displacement | $cm^3$ (cu.in.) | 1,755 (107) | 1,997 (122) | 1,997 (122) |
| Compression ratio | | 9.0 | 9.0 | 7.8 |
| Firina order | | 1–3–4–2 | 1–3–4–2 | 1–3–4–2 |

## TRANSAXLE SPECIFICATIONS

| Items | | F5M22 | F5M33 | W5M33 | F4A22 | F4A33 | W4A33 |
|---|---|---|---|---|---|---|---|
| Type | | 5-speed M/T | 5-speed M/T | 5-speed M/T | 4-speed A/T | 4-speed A/T | 4-speed A/T |
| Gear ratio | 1 st | 3.363 | 3.090 | 3.083 | 2.846 | 2.551 | 2.551 |
| | 2nd | 1.947 | 1.833 | 1.684 | 1.581 | 1.488 | 1.488 |
| | 3rd | 1.285 | 1.217 | 1.115 | 1.000 | 1.000 | 1.000 |
| | 4th | 0.939 | 0.888 | 0.833 | 0.685 | 0.685 | 0.685 |
| | 5th | 0.756 | 0.741 | 0.666 | — | — | — |
| | Reverse | 3.083 | 3.166 | 3.166 | 2.176 | 2.176 | 2.176 |
| Transaxle | | | | | | | |
| Primary reduction ratio | | 1.096 | 1.208 | 1.275 | 1.125 | 1.228 | 1.228 |
| Secondary reduction ratio | | 3.941 | 3.437 | 3.866 | 3.562 | 3.222 | 3.600 |
| Transfer | | | — | 1.090 | — | — | 1.090 |

# TIGHTENING TORQUE

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Each torque value in the table is a standard value for tightening under the following conditions.

(1) Bolts, nuts and washers are all mode of steel and plated with zinc.
(2) The threads and bearing surface of bolts and nuts are all in dry condition.

The values in the table are not applicable:

(1) If toothed washers are inserted.
(2) If plastic parts are fastened.
(3) If bolts are tightened to plastic or die-cast inserted nuts.
(4) If self-tapping screws or self-locking nuts are used.

**Standard bolt and nut tightening torque**

| Bolt nominal diameter (mm) | Pitch (mm) | Torque Nm (ft.lbs.) | | |
|---|---|---|---|---|
| | | Head mark ④ | Head mark ⑦ | Head mark ⑧ |
| M5 | 0.8 | 2–3 (1.4–2.2) | 4–6 (2.9–4.3) | 5–7 (3.6–5.1) |
| M6 | 1.0 | 4–6 (2.9–4.3) | 7–11 (5.1–8.0) | 8–12 (5.8–8.7) |
| M8 | 1.25 | 9–14 (6.5–10) | 17–26 (12–19) | 20–30 (14–22) |
| M10 | 1.25 | 19–28 (14–20) | 35–55 (25–40) | 45–60 (33–43) |
| M12 | 1.25 | 34–50 (25–36) | 70–95 (51–69) | 85–110 (61–80) |
| M14 | 1.5 | 60–85 (43–61) | 120–160 (87–116) | 130–180 (94–130) |
| M16 | 1.5 | 95–130 (69–94) | 180–240 (130–174) | 200–270 (145–195) |
| M18 | 1.5 | 140–190 (101–137) | 260–350 (188–253) | 300–400 (217–289) |
| M20 | 1.5 | 190–260 (137–188) | 360–480 (260–347) | 410–560 (297–405) |
| M22 | 1.5 | 260–350 (188–253) | 480–650 (347–470) | 560–750 (405–542) |
| M24 | 1.5 | 340–460 (246–333) | 630–860 (456–622) | 740–1,000 (535–723) |

**Flange bolt and nut tightening torque**

| Bolt nominal diameter (mm) | Pitch (mm) | Torque Nm (ft.lbs.) | | |
|---|---|---|---|---|
| | | Head mark ④ 4 | Head mark ⑦ 7 | Head mark ⑧ 8 |
| M6 | 1.0 | 4-6 (2.9–4.3) | 8–12 (5.8-8.7) | 9-14 (6.5–10) |
| M8 | 1.25 | 10–15 (7.2–11) | 19-28 (14–20) | 22-33 (16–24) |
| M10 | 1.25 | 21–31 (15-22) | 39–60 (28-43) | 50–65 (36-47) |
| M10 | 1.5 | 19-29 (14-21) | 36-54 (26–39) | 45-65 (33-47) |
| M12 | 1.25 | 38-55 (27–40) | 80– 110 (58–80) | 90–120 (65-87) |
| M12 | 1.75 | 34-52 (25-38) | 70–95 (51–69) | 85–110 (61–80) |

**Taper thread tightening torque**

| Thread size | Torque Nm (ft.lbs.) | |
|---|---|---|
| | Female thread material: Light alloy | Female thread material: Steel |
| NPTF 1/6 | 5-8 (3.6-5.8) | 8-12 (5.8-8.7) |
| PT 1/8 | 8– 12 (5.8-8.7) | 16–20 (12-14) |
| PT 1/4, NPTF 1/4 | 20–30 (14-22) | 35-45 (25-33) |
| PT 3/8 | 40–55 (29–40) | 60–75 (43-54) |

NOTE: NPTF is dry seat pipe thread, while PT is pipe thread.

# MASTER TROUBLESHOOTING

N00KAAH

## ENGINE OVERHEATS

| Symptom | Probable cause | Reference page |
|---|---|---|
| Engine overheats | Cooling system faulty | 7-5 |
| | Incorrect ignition timing | 8-169 |

## ENGINE WILL NOT CRANK OR CRANKS SLOWLY

| Symptom | Probable cause | Reference page |
|---|---|---|
| Engine will not crank or cranks slowly | Starting system faulty | 8-153 |

## ENGINE WILL NOT START OR HARD TO START (CRANKS OK)

| Symptom | Probable cause | Reference page |
|---|---|---|
| Engine will not start or hard to start (Cranks OK) | No fuel supply to injector | – |
| | Injection system problems | – |
| | Ignition system problems | 8–169 |
| | Vacuum leaks<br>• Purge control valve hose<br>• Vacuum hoses<br>• Intake manifold<br>• Air intake plenum<br>• Throttle body<br>• EGR valve | 11-5<br>25-4 |
| | Compression too low | 9–23 |

## ROUGH IDLE OR ENGINE STALL

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Rough idle or engine stalls | Vacuum leaks<br>• Purge control valve hose<br>• Vacuum hoses<br>• Intake manifold<br>• Air intake plenum<br>• Throttle body<br>• EGR valve | 11–5<br>25-4 |
| | Ignition system problems | 8-169 |
| | Idle speed set too low | Check idle speed control system |
| | Idle mixture too lean or too rich | – |
| | Fuel injection system problems | – |
| | Exhaust gas recirculation (EGR) system problems | 25–15 |
| | Engine overheats | 7-5 |
| | Compression too low | 9-23 |

## ENGINE HESITATES OR POOR ACCELERATION

| Symptom | Probable cause | Reference page |
|---|---|---|
| Engine hesitates or poor acceleration | Ignition system problem | 8-169 |
| | Vacuum leaks<br>• Purge control valve hose<br>• Vacuum hoses<br>• Intake manifold<br>• Air intake plenum<br>• Throttle body<br>• EGR valve | 11–5<br>25-4 |
| | Air cleaner clogged | – |
| | Fuel line clogged | – |
| | Fuel injection system problem | – |
| | Emission control system problem<br>• EGR system always on | 25-15 |
| | Engine overheats | 7-5 |
| | Compression too low | 9-23 |

## ENGINE DIESELING

| Symptom | Probable cause | Reference page |
|---|---|---|
| Engine dieseling (runs after ignition switch is turned off) | Incorrect ignition timing | 8-169 |

## EXCESSIVE OIL CONSUMPTION

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Excessive oil consumption | Oil leak | Repair as necessary. |
| | Positive crankcase ventilation line clogged. | 25-7 |
| | Valve stem seal worn or damaged. | 9–55, 114 |
| | Valve stem worn. | 9–55, 114 |
| | Piston ring worn or damaged. | 9–66, 128 |

## POOR FUEL MILEAGE

| Symptom | Probable cause | Reference page or remedy" |
|---|---|---|
| Poor fuel mileage | Fuel leak | Repair as necessary. |
| | Air cleaner clogged. | — |
| | Ignition system problems | 8-169 |
| | Fuel injection system problems. | — |
| | Compression too low. | 9-23 |
| | Tires improperly inflated. | 22-3 |
| | Clutch slips. | 6-4 |
| | Brakes drag. | 5-7 |

## NOISE

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Noise | Loose bolts and nuts. | Retighten as necessary. |
| | Engine noise | 9-23 |

## HARD STEERING

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Hard steering | Loose power steering oil pump belt | 19-12 |
| | Low fluid level | Replenish |
| | Air in power steering system | 19-13 |
| | Low tire pressure | 22-3 |
| | Excessive turning resistance of lower arm ball joint | 2-35 |
| | Excessively tightened of steering gear box rack support cover | 19–23, 30 |
| | Improper front wheel alignment | 2-8 |
| | Excessive turning resistance of tie-rod ball ioint | 19–8, 10 |
| | Sticky flow control valve | 19–41 |
| | Bent rack in steering gear box | 19–23, 30 |

## POOR RETURN OF STEERING WHEEL TO CENTER

| Symptom | Probable cause | Reference page |
|---|---|---|
| Poor return of steering wheel to center | Improper front wheel alignment | 2-8 |
| | Improper tire pressure | 22-3 |
| | Excessive tightened rack support cover | 19–23, 30 |
| | Damaged front wheel bearing | 2-12 |

## POOR RIDING

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Poor riding | Improper tire pressure | 22-3 |
| | Imbalanced wheels | Repair |
| | Improper front or rear wheel alignment | 2–8, 29<br>17–3, 20 |
| | Malfunctioning shock absorber | |
| | Broken or worn stabilizer | 2–29, 37, 42<br>17–8, 32, 35 |
| | Broken or worn coil spring | |
| | Loose suspension securing bolt(s) | Retighten |
| | Worn lower arm bushing | 2-33 |
| | Worn suspension arm bushing | 2-33 |

## ABNORMAL TIRE WEAR

| Symptom | Probable cause | Reference page |
|---|---|---|
| Abnormal tire wear | Improper front or rear wheel alignment | 2-8<br>17–3, 20 |
| | Improper tire pressure | 22-3 |
| | Imbalanced wheels | |
| | Loose wheel bearings | 17-3 |
| | Malfunctioning shock absorber | 2-29<br>17–8, 32 |

## ROAD WANDER

| Symptom | Probable cause | Reference page |
|---|---|---|
| Road wander | Improper front or rear wheel alignment | 2-8<br>17–3, 20 |
| | Excessive play of steering wheel | 19–7, 10 |
| | Poor turning resistance of lower arm ball joint | 2-35 |
| | Improper tire pressure | 22-3 |
| | Loose or worn lower arm bushing | 2-33 |
| | Loose or worn wheel bearings | |
| | Loose rack support cover in steering gear box | 19–23, 30 |

## VEHICLE PULLS TO ONE SIDE

| Symptom | Probable cause | Reference page |
|---|---|---|
| Vehicle pulls to one side | Improper front or rear wheel alignment | 2-8<br>17–3, 20 |
| | Imbalanced or worn tires | 22-3 |
| | Uneven tire pressure | |
| | Excessive turning resistance of lower arm ball joint | 2-35 |
| | Wheel bearing seizure | Replace |
| | Broken or weak coil spring | 2-29 |
| | Bent front axle drive shaft | 2–15, 3–13 |
| | Deformed lower arm | 2-35 |

## STEERING WHEEL SHIMMY

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Steering wheel shimmy | Improper front or rear wheel alignment | 2-8<br>17–3, 20 |
| | Improper tire pressure | 22-3 |
| | Imbalanced wheels | Replace |
| | Poor turning resistance of lower arm ball joint | 2-35 |
| | Excessive play of steering wheel | 19–7, 10 |
| | Broken or weak front stabilizer | 2-33 |
| | Worn lower arm bushing | 2-33 |
| | Malfunctioning shock absorber | 2-29<br>17–8, 32 |
| | Broken or weak coil spring | |
| | Wear, play, or seizure of wheel bearing | Replace |
| | Wear, play, or seizure of drive shaft ball joint | 2–15, 3–13 |

## BOTTOMING

| Symptom | Probable cause | Reference page or remedy |
|---|---|---|
| Bottoming | Overloaded vehicle | Correct |
| | Broken or weak coil spring | 2-29<br>17–8, 32 |
| | Malfunctioning shock absorber | |

## WHEEL BEARING TROUBLESHOOTING

| Trouble | Sympton | Probable cause |
|---|---|---|
| Pitting | Pitting occurs because of uneven rotation of race and bearing surfaces | Excessive bearing preload<br>Excessive load' |
| Flaking | The surface peels because of uneven rotation of the race and bearing surfaces | End of bearing life<br>Improper bearing assembly |
| Cracking | Chipping or cracking of cage or roller edges | Impact when bearing was installed (such as being hit with a hammer) |
| Flat spotting | When large load is applied, race and roller contact surfaces compress, forming indentations | Excessive bearing preload<br>Excessive load<br>Vibration when bearings are not used, such as during shipment on freight cars, transport trucks, etc. |
| Nicks | Instead of rolling along race surface, rollers slide, thus damaging surface | Insufficient grease<br>Excessive bearing preload<br>Excessive load<br>Faulty oil seal |
| Smearing | Damage or wear caused by minute particles adhering to surfaces results in rough movement and such high temperatures that parts of surface melt | Excessive variation of loads on bearings<br>Use of grease other than that specified<br>Insufficient grease |
| Rust, corrosion | Appears on various areas of the bearing | Use of grease other than that specified<br>Faulty oil seal<br>Presence of water or moisture |
| Wear | Wear of surface areas caused by friction | Insufficient grease<br>Foreign matter<br>Rust or corrosion due to moisture<br>Use of grease other than that specified<br>Faulty oil seal |
| Discoloration | Grease discoloration results from grease deterioration which causes particles of pigment contained in grease to adhere to surfaces<br>Heat discoloration will appear as a deep brown on purple | Use of grease other than that specified<br>Faulty oil seal<br>Excessive bearing preload<br>Excessive load |

# LUBRICATION AND MAINTENANCE

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N00OA--


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# GENERAL INFORMATION N00PA--

Maintenance and lubrication service recommendations have been compiled to provide maximum protection for the vehicle owner's investment against all reasonable types of driving conditions. Since these conditions vary with the individual vehicle owner's driving habits, the area in which the vehicle is operated and the type of driving to which the vehicle is subjected, it is necessary to prescribe lubrication and maintenance service on a time frequency as well as mileage interval basis.

Oils, lubricants and greases are classified and graded according to standards recommended by the Society of Automotive Engineers (SAE), the American Petroleum Institute (API) and the National Lubricating Grease Institute (NLGI).

## MAINTENANCE SCHEDULES

Information for service maintenance is provided under "SCHEDULED MAINTENANCE TABLE".

Three schedules are provided; one for "Required Maintenance", one for "General Maintenance" and one for "Severe Usage Service".

Item numbers in the "SCHEDULED MAINTENANCE TABLE" correspond to the item numbers in the "MAINTENANCE SERVICE" section.

## SEVERE SERVICE

Vehicles operating under severe service conditions will require more frequent service.

Component service information is included in appropriate units for vehicles operating under one or more of the following conditions:

1. Trailer towing or police, taxi, or commercial type operation
2. Operation of Vehicle
   (1) Short-trip operation at freezing temperature (engine not thoroughly warmed up)
   (2) More than 50% operation in heavy city traffic during hot weather above 32°C (90°F)
   (3) Extensive idling
   (4) Driving in sandy areas
   (5) Driving in salty areas
   (6) Driving in dusty conditions

## ENGINE OIL

The SAE grade number indicates the viscosity of engine oils, for example, SAE 30, which is a single grade oil. Engine oils are also identified by a dual number, for example, SAE 10W-30, which indicates a multigrade oil.

The API classification system defines oil performance in terms of engine usage. Only engine oil designed "For Service SG" or "For Service SG/CD", when available, should be used. These oils contain sufficient chemical additives to provide maximum engine protection. Both the SAE grade and the API designation can be found on the container.

**Caution**

**Test results submitted to EPA have shown that laboratory animals develop skin cancer after prolonged contact with used engine oil. Accordingly, the potential exists for humans to develop a number of skin disorders, including cancer, from such exposure to used engine oil. Care should be' taken, therefore, when changing engine oil, to minimize the amount and length of exposure time to used engine oil on your skin. Protective clothing and gloves, that cannot be penetrated by oil, should be worn. The skin should be thoroughly washed with soap and water, or use waterless hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.**

## GEAR LUBRICANTS

The SAE grade number also indicates the viscosity of Multi-Purpose Gear Lubricants.

The API classfication system defines gear lubricants in terms of usage. Typically gear lubricants conforming to API GL-4 or GL-5 with a viscosity of SAE 75W-85W are recommended for manual transaxle.

## LUBRICANTS – GREASES

Semi-solid lubricants, bear the NLGI designation and are further classified as grades 0, 1, 2, 3 etc.

Whenever "Chassis Lubricant" is specified, Multi-Purpose Grease, NLGI grade 2 should be used.

MOPAR Multi-Mileage Lubricant, Part Number 2525035 or equivalent, meets these requirement and is recommended.

## FUEL USAGE STATEMENT

Use gasolines having a minimum anti-knock index (Octane Value) of 87, (R+M)/2. This designation is comparable to a Research Octane Number of 91. Unleaded gasolines only must be used in vehicles equipped with catalyst emission control systems. All vehicles, so equipped, have labels located on the instrument panel and on the back of fuel filler lid that state, "UNLEADED GASOLINE ONLY". These vehicles also have fuel filler tubes especially designed to accept the smaller diameter unleaded gasoline dispensing nozzles only.

## MATERIALS ADDED TO FUEL

Indiscriminate use of fuel system cleaning agents should be avoided. Many of these materials intended for gum and varnish removal may contain highly active solvents or similar ingredients that can be harmful to gasket and diaphragm materials used in fuel system component parts.

# SCHEDULED MAINTENANCE TABLE

N00QA-

## SCHEDULED MAINTENANCE SERVICES FOR EMISSION CONTROL AND PROPER VEHICLE PERFORMANCE

Inspection and Services should be performed any time a malfunction is observed or suspected. Retain receipts for all vehicle emission services to protect your emission warranty.

| No. | Emission Control System Maintenance | Service Intervals | Kilometers in Thousands | 24 | 48 | 72 | 80 | 96 |
|---|---|---|---|---|---|---|---|---|
| | | | Mileage in Thousands | 15 | 30 | 45 | 50 | 60 |
| 1 | Check Fuel System (Tank, Line and Connections and Fuel Filler Cap) for Leaks Every 5 Years | or | | | | | X | |
| 2 | Check Fuel Every 2 Years for Leaks or Damage | or | | | X | | | X |
| 3 | Replace Air Cleaner Element | at | | | X | | | X |
| 4 | Replace Spark Plugs | at | | | X | | | X |

## GENERAL MAINTENANCE SERVICE FOR PROPER VEHICLE PERFORMANCE

| No. | General Maintenance | | Service Intervals | Kilometers in Thousands | 24 | 48 | 72 | 80 | 96 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Mileage in Thousands | 15 | 30 | 45 | 50 | 60 |
| 5 | Timing Belt (Including the Balancer Belt) | | Replace at | | | | | | X |
| 6 | Drive Belt (for Water Pump and Alternator) | | Inspect for tension at | | | X | | | X |
| 7 | Engine Oil | Non-Turbo | Change Every Year or | Every 12,000 km (7,500 miles) | | | | | |
| | | Turbo | Change Every 6 Months | Every 8,000 km (5,000 miles) | | | | | |
| 8 | Engine Oil Filter | Non-Turbo | Change Every Year or | | X | X | X | | X |
| | | Turbo | Change Every Year | Every 16,000 km (10,000 miles) | | | | | |
| 9 | Manual Transaxle Oil | | Inspect Oil Level at | | | X | | | X |
| 10 | Automatic Transaxle Fluid | | Inspect Fluid Level Every Year or | | X | X | X | | X |
| | | | Change Fluid at | | | X | | | X |
| 11 | Engine Coolant | | Replace Every 2 Years or | | | X | | | X |
| 12 | Disc Brake Pads | | Inspect for Wear Every Year or | | X | X | X | | X |
| 13 | Brake Hoses | | Check for Deterioration or Leaks Every Year | | X | X | X | | X |
| 14 | Ball Joint and Steering Linkage Seals | | inspect for Grease Leaks and Damage Every 2 Years or | | | X | | | X |
| 15 | Drive Shaft Boots | | Inspect for Grease Leaks and Damage Every Year or | X | | X | X | | X |
| 16 | Rear Axle <AWD> | With LSD | Change Oil | | | X | | | X |
| | | | Inspect Oil Level | | | X | | | X |
| 17 | Exhaust System (Connection Portion of Muffler, Pipings and Converter Heat Shields) | | Check and Service as Required Every 2 Years or | | | X | | | X |

NOTE
LSD: Limited-slip differential

## SCHEDULED MAINTENANCE UNDER SEVERE USAGE CONDITIONS

The maintenance items should be performed according to the following table:

| Maintenance Item | Service to be Performed | Mileage Intervals Kilometers in Thousands (Miles in Thousands) | | | | | | | | | Severe Usage Conditions | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 12 (7.5) | 24 (15) | 36 (22.5) | 48 (30) | 60 (37.5) | 72 (45) | (50) | 80 (52.5) | 84 (60) | | 26 | A | B | C | D | E | F | G |
| Air Cleaner Element | Replace | More Frequently | | | | | | | | | X | | | | | X | | |
| Spark Plugs | Replace | | X | | X | | X | | | X | | | | | xx | | | |
| Engine Oil | Change Every 3 Months or | Every 4,800 km (3,000 miles) | | | | | | | | | xxxx | | | | | | | X |
| Engine Oil Filter | Replace Every 6 Months or | Every 9,600 km (6,000 miles) | | | | | | | | | xxxx | | | | | | | X |
| Disc Brake Pads | Inspect for Wear | More Frequently | | | | | | | | | X | | | | | | X | |

Severe usage conditions
- A-Driving in dusty conditions
- B-Trailer towing or police, taxi, or commercial type operation
- C-Extensive idling
- D-Short trip operation at freezing temperatures (engine not thoroughly warmed up)
- E-Driving in sandy areas
- F-Driving in salty areas
- G-More than 50% operation in heavy city trafic during hot weather above 32°C (90°F)

# RECOMMENDED LUBRICANTS AND LUBRICANT CAPACITIES TABLE

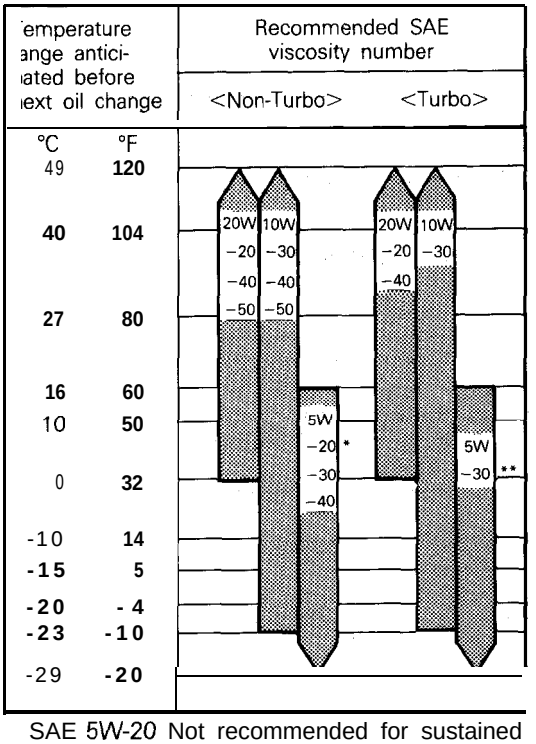
N00RA--

## RECOMMENDED LUBRICANTS

| Items | Recommended lubricants |
|---|---|
| Engine Oil | API classification SG or SG/CD (For further details, refer to SAE viscosity number) |
| Manual Transaxle | MOPAR Hypoid Gear Oil/API classification GL-4 or higher, SAE 75W–85W |
| Transfer | |
| Automatic Transaxle | MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176) or Dia ATF SP or Equivalent |
| Power Steering | MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid or "DEXRON" or "DEXRON II" |
| Rear Axle <AWD> | Refer to P.0-6. |
| Brake and Clutch | MOPAR Brake Fluid/Conforming to DOT 3 |
| Rear Wheel Bearings | MOPAR Front Wheel Bearing Grease, or MOPAR Multi-Mileage Lubricant/Multipurpose grease NLGI Grade 2EP |
| Hood Lock Latch,, Door Lock Strikers, Seat Adjusters, Liftgate Lock, Parking Brake Cable Mechanism | MOPAR Lubriplate/Multipurpose grease NLGI Grade 2 |
| Engine Coolant | MOPAR Antifreeze Permanent-Type Coolant/High quality ethylene-glycol antifreeze coolant |
| Door Hinges, Liftgate Hinges | Engine oil |

## LUBRICANT CAPACITIES TABLE

| Description | Metric measure | U.S. measure |
|---|---|---|
| Engine Oil | | |
| Crankcase (including oil filter) | | |
| <1.8L Engine> | 3.9 liters'. | 4.1 qts. |
| <2.0L DOHC Engine> | 4.4 liters | 4.6 qts. |
| Oil filter | 0.4 liter | ½ qt. |
| Oil cooler (Turbo) | 0.3 liter | ½ qt. |
| Cooling System (including heater and coolant reserve system) | | |
| <1.8L Engine> | 6.2 liters | 6.6 qts. |
| <2.0L DOHC Engine> | 7.2 liters | 7.6 qts. |
| Manual Transaxle | | |
| <Non-Turbo> | 1.8 liters | 1.9 qts. |
| <FWD-Turbo> | 2.2 liters | 2.3 qts. |
| <AWD-Turbo> | 2.3 liters | 2.4 qts. |
| Transfer | 0.6 liter | .63 qt. |
| Automatic Transaxle | | |
| <F4A22> | 6.1 liters | 6.4 qts. |
| <F4A33, W4A33> | 7.0 liters | 7.4 qts. |
| Rear Axle <AWD> | 0.7 liter | .74 qt. |
| Power Steering | 0.9 liter | .95 qt. |
| Fuel Tank | 60 liters | 15.9 gals. |




SAE 5W-20 Not recommended for sustained high speed vehicle operation.

**SAE 5W-30 may be used for operation in very cold weather areas where the lowest atmospheric temperature is below −23°C (−10°F).

## SELECTION OF LUBRICANTS

### ENGINE OIL

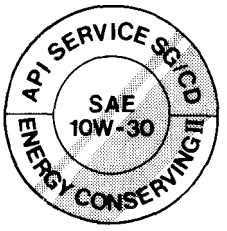
Engine oil should be used which conform to the requirements of the API classification "For Service SG" or "For Service SG/CD", and have the proper SAE grade number for the expected temperature range.

**Caution**

**Nondetergent or straight mineral oil must never be used.**

**Energy Conserving Oil**

In order to improve fuel economy and conserve energy new, lower friction engine oils have been developed. These oils are readily available and can be identified by such labels as "Energy Conserving", "Energy Saving", "Improved Fuel Economy", etc.



72A0044

### Oil Identification Symbol

A standard symbol appears on the top of oil containers and has three district areas for identifying various aspects of the oil. The top portion will indicate the quality of the oil. The center portion will show the SAE viscosity grade, such as SAE 10W-30. "Energy Conserving" shown in the lower portion, indicates that the oil has fuel-saving capabilities.

### REAR AXLE

| Lubricant | API classification GL-5 or higher |
|---|---|
| Anticipated temperature range | Viscosity range |
| Above −23°C (−10°F) | SAE 90<br>SAE 85W-90<br>SAE 80W-90 |
| −23°C to −34°C (−10°F to −30°F) | SAE 80W, SAE 80W-90 |
| Below −34°C (−30°F) | SAE 75W |

## SELECTION OF COOLANT

### COOLANT

**Relation between Antifreeze Concentration and Specific Gravity**

| Coolant temperature °C(°F) and specific gravity | | | | | Freezing temperature °C(°F) | Safe operating temperature °C(°F) | Coolant concentration (Specific volume) |
|---|---|---|---|---|---|---|---|
| 10 (50) | 20 (68) | 30 (86) | 40 (104) | 50 (122) | | | |
| 1.054 | 1.050 | 1.046 | 1.042 | 1.036 | −16 (3.2) | −11 (12.2) | 30% |
| 1.063 | 1.058 | 1.054 | 1.049 | 1.044 | −20 (−4) | −15 (5) | 35% |
| 1.071 | 1.067 | 1.062 | 1.057 | 1.052 | −25 (−13) | −20 (−4) | 40% |
| 1.079 | 1.074 | 1.069 | 1.064 | 1.058 | −30 (−22) | −25 (−13) | 45% |
| 1.087 | 1.082 | 1.076 | 1.070 | 1.064 | −36 (−32.8) | −31 (−23.8) | 50% |
| 1.095 | 1.090 | 1.084 | 1.077 | 1.070 | −42 (−44) | −37 (−35) | 55% |
| 1.103 | 1.098 | 1.092 | 1.084 | 1.076 | −50 (−58) | −45 (−49) | 60% |

Example

The safe operating temperature is −15°C (5°F) when the measured specific gravity is 1.058 at the coolant temperature of 20°C (68°F).

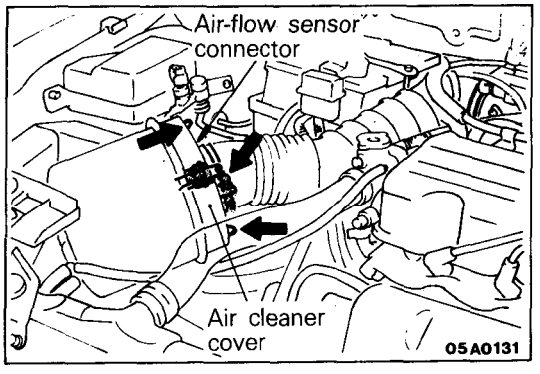
**Cautions**

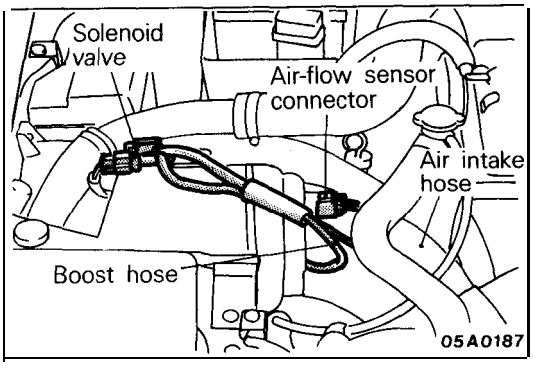
1. **If the concentration of the coolant is below 30%, the anti-corrosion property will be adversely affected. In addition, if the concentration is above 60%, both the anti-freeze and engine cooling properties will decrease, affecting the engine adversely. For these reasons, be sure to maintain the concentration level within the specified range.**
2. **Do not use a mixture of different brands of anti-freeze.**

# MAINTENANCE SERVICE

## 1. FUEL SYSTEM (Tank, Lines, Connections and Fuel Filler Cap) (Check for leaks)/2. FUEL HOSE (Check for leaks or damage) N00SAGBb

1. Check for damage or leakage in the fuel lines and connections and looseness of the fuel filler cap.
2. Inspect the surface of fuel hoses for heat and mechanical damage. Hard and brittle rubber, cracking, checking, tears, cuts, abrasions and excessive swelling indicate deterioration of the rubber.
3. If the fabric casing of the rubber hose is exposed by cracks and abrasions in the fuel system, the hoses should be changed.




## 3. AIR CLEANER ELEMENT (Replace) N00SAKBb

The air cleaner element will become dirty and loaded with dust during use, and the filtering effect will be substantially reduced. Replace it with a new one.

**<1.8L Engine, 2.0L DOHC Engine (Non-Turbo)>**

(1) Disconnect the air-flow sensor connector.
(2) Remove the air intake hose.
(3) Unclamp the air cleaner cover.
(4) Push the air intake hose backward, and remove the air cleaner cover.

**Caution**
**Care must be taken when removing the air cleaner cover, because the air-flow sensor is 'attached.**

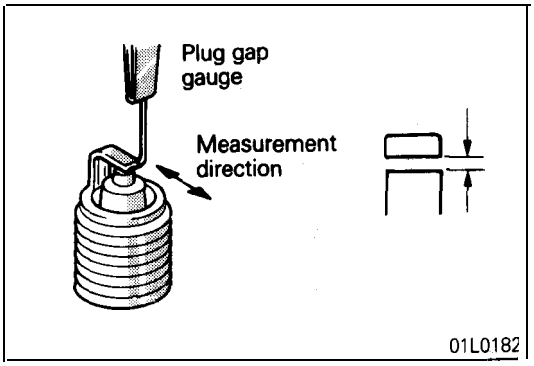
(5) Take out the air cleaner element.

**<2.0L DOHC Engine (Turbo)>**

(1) Disconnect the air-flow sensor connector.
(2) Disconnect the boost hose.
(3) Disconnect the solenoid valve with hoses.
(4) Disconnect the air intake hose.
(5) Remove the air cleaner retaining bolts.
(6) Remove the air cleaner assembly.
(7) Unclamp the air cleaner cover.

**Caution**
**Care must be taken when removing the air cleaner cover, because the air-flow sensor is attached.**

(8) Take out the air cleaner element.

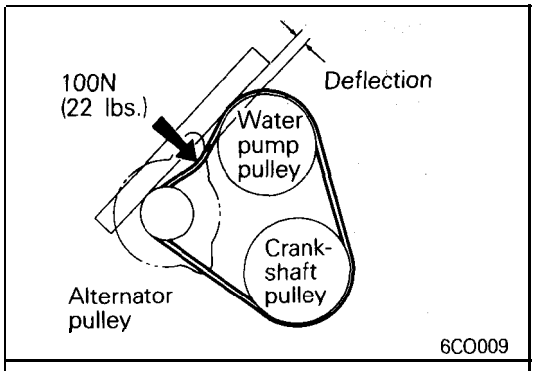


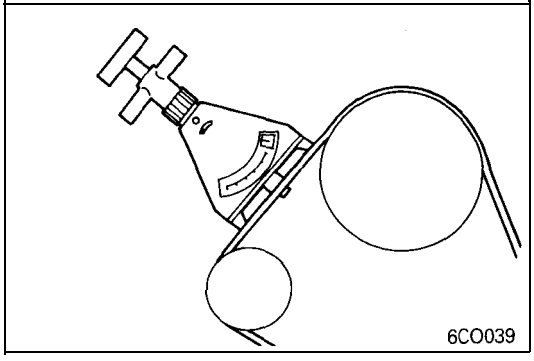

## 4. SPARK PLUGS (Replace) N00SAOFa

1. Spark plugs must spark properly to assure proper engine performance and reduce exhaust emission level.
   Therefore, they should be replaced periodically with new ones.
2. The new plugs should be checked for the proper gap.
   Spark plug gap
   **<Non-Turbo> 1.0–1.1 mm (.039–.043 in.)**
   **<Turbo> 0.7–0.8 mm (.028–.031 in.)**
3. Install the spark plug and tighten to 20–30 Nm (15-21 ft.lbs.).

## 5. TIMING BELT (Replace) N00SBACa

Replace the belt with a new one periodically to assure proper engine performance.
For removal and installation procedures, refer to GROUP 9–Timing Belt.



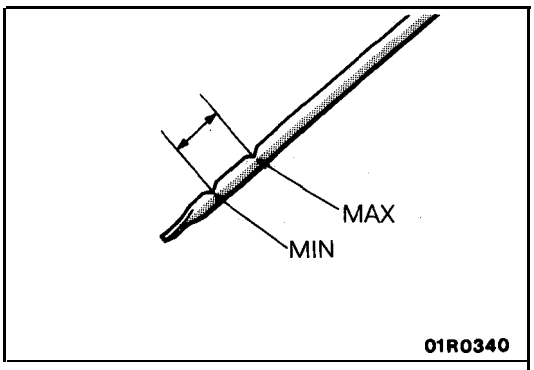

## 6. DRIVE BELT (For Water Pump and Alternator) (Inspect for tension) N00SBBN

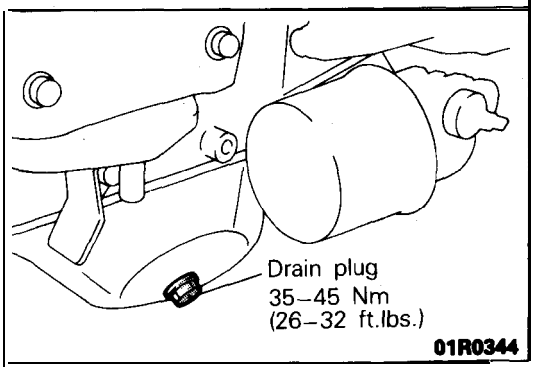
(1) Place straight edge as shown in the illustration.
(2) Measure the deflection with a force of 100 N (22 lbs.) applied to belt mid-point between water pump pulley and alternator pulley. If the standard value is not obtained, make adjustment.

**Standard value:**
**<1.8L Engine> 8.0–11.0 mm (.315–.433 in.)**
**<2.0L DOHC Engine> 9.0–11.5 mm (.354–.453 in.)**

(3) Use a tension gauge to check the belt tension. If the standard value is not obtained, make adjustment.
When tension gauge is used, the tension may be measured between any two pulleys.

**Standard value: 250–500 N (55–110 lbs.)**



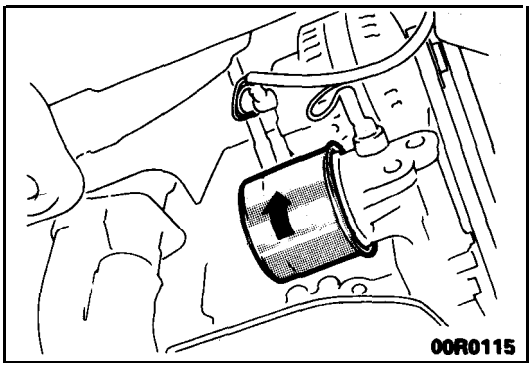

## 7. ENGINE OIL (Change) N00SAAF

Always use lubricants which conform to the requirements of the API classification "For Service SG" or "For Service SG/CD" when available, and have the proper SAE grade number for the expected temperature range.
Never use nondetergent or straight mineral oil.
(1) After warming up the engine, remove the oil filler cap.
(2) Remove the drain plug to allow the engine oil to drain.
(3) Replace the drain plug gasket with a new one and tighten the drain plug.
(4) Supply new engine oil through the oil filler.

**Engine oil total capacity:**

| | |
|---|---|
| **<1.8L Engine>** | **3.9 liters (4.1 qts.)** |
| **<2.0L DOHC-Non-Turbo>** | **4.4 liters (4.8 qts.)** |
| **<2.0L DOHC-Turbo>** | **4.7 liters (5.0 qts.)** |
| | **[including oil filter 0.4 liter (1/2 qt.)]** |

(5) Start and run the engine a few minutes.
(6) Stop the engine and check the engine oil level.




## 8. ENGINE OIL FILTER (Change) N00SABGa

The quality of replacement filters varies considerably. Only high quality filters should be used to assure most efficient service.
Genuine oil filters require that the filter is capable of withstanding a pressure of 256 psi are high quality filters and are recommended as follows:

**Oil Filter Part No.**
**Mitsubishi Genuine Parts: MD031805 or equivalent**

NOTE
Factory installed Mitsubishi Engine Oil Filter Part No. MD084693 or MD031805.

### ENGINE OIL FILTER SELECTION

This vehicle is equipped with a full-flow, throw-away oil filter.

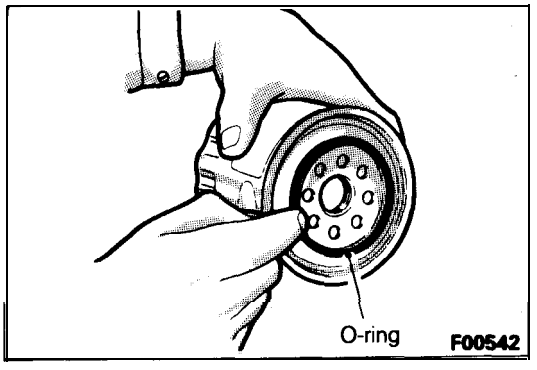
The same type of replacement filter is recommended as a replacement filter for this vehicle. It is possible, particularily in cold weather, that this vehicle may develop high oil pressure for a short duration. You should be sure that any replacement filter used on this vehicle is a high-quality filter and is capable of withstanding a pressure of 256 psi (manufacturer's specifications) to avoid filter and engine damage. The following is a high-quality filter and is strongly recommended for use on this vehicle : Mitsubishi Engine Oil Filter Part No. MD031805 or MD084693.

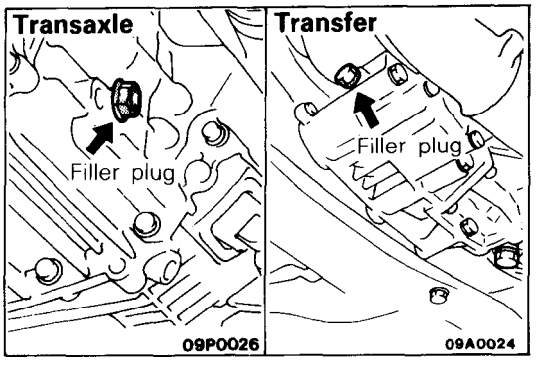
Any replacement oil filter should be installed in accordance with the oil filter manufacturer's installation instructions.

(1) Remove the engine oil filler cap.
(2) Remove the engine oil drain plug, and drain out the engine oil.
(3) Remove the engine oil filter by using the oil filter wrench.
(4) Clean the oil filter mounting surface of the oil filter bracket.
(5) Coat engine oil to the O-ring of new oil filter.
(6) Turn the oil filter by hand to install to the block.

NOTE
The oil filter tightening torque is 11–13 Nm (8–10 ft.lbs.).

(7) Supply engine oil.
(8) Start and run engine and check for engine oil leaks.
(9) After stopping engine, check oil level and replenish as necessary.



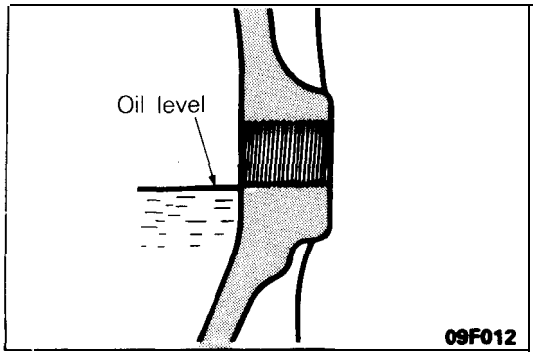




## 9. MANUAL TRANSAXLE (Inspect oil level)

N00SBCEb

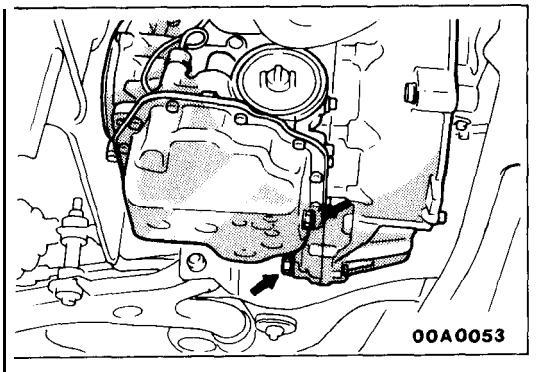
Inspect each component for evidence of leakage, and check the oil level by remaining the filler plug. If the oil is contaminated, it is necessary to replace it with new oil.

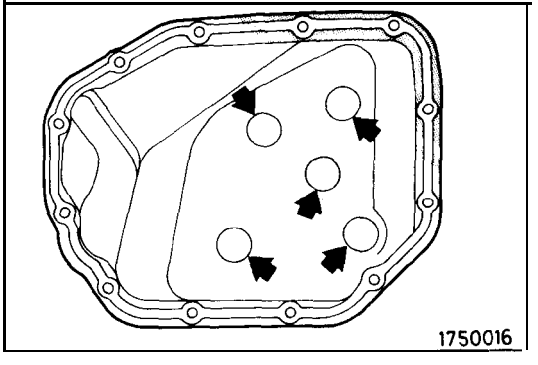
1. With the vehicle parked at a level place, remove the filler plug and check to be sure that the oil level is up to the lower edge of the filler plug hole.
2. Check to be sure that the transmission oil is not noticeably dirty, and that it has a suitable viscosity.



## 10.AUTOMATIC TRANSAXLE (Inspect fluid level) N00SBDAa

1. Drive until the fluid temperature reaches the usual temperature [70–80°C (160–180°F)].
2. Place vehicle on level floor.
3. Move selector lever sequentially to every position to fill torque converter and hydraulic circuit with fluid, then place lever in "N" Neutral position. This operation is necessary to be sure that fluid level check is accurate.
4. Before removing dipstick, wipe all dirt from area around dipstick. Then take out the dipstick and check the condition of the fluid.
   The transaxle should be overhauled under the following conditions.
   - If there is a "burning" odor.
   - If the fluid color has become noticeably blacker.
   - If there is a noticeably great amount of metal particles in the fluid.
5. Check to see if fluid level is in "HOT" range on dipstick. If fluid level is low, add ATF until level reaches "HOT" range.
   Low fluid level can cause a variety of conditions because it allows pump to take in air along with fluid. Air trapped in hydraulic circuit forms bubbles which make fluid spongy. Therefore, pressures will be erratic.
   Improper filling can also raise fluid level too high. When transaxle has too much fluid, gears churn up foam and cause same conditions which occur with low fluid level, resulting in accelerated deterioration of ATF.
   transmission fluid.
   In either case, air bubbles can cause overheating, fluid oxidation, which can interfere with normal valve, clutch, and servo operation. Foaming can also result in fluid escaping from transaxle vent where it may be mistaken for a leak.
6. Be sure to examine fluid on dipstick closely.

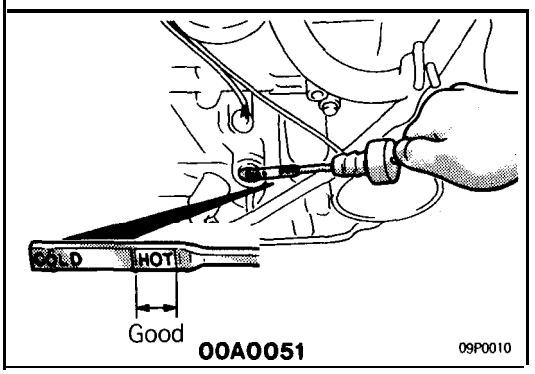



## 10.AUTOMATIC TRANSAXLE (Change fluid)

Drain the fluid and check whether there is any evidence of contamination.
Replenish with new fluid after the cause of any contamination has been corrected.

(1) Remove drain plugs to let fluid drain.
(2) Remove the oil pan.
(3) Check the oil filter for clogging and damage and replace if necessary.
(4) Clean the inside of oil pan and 5 magnets.
(5) Attach the five magnets to the concave part of the oil pan.
(6) Clean both gasket surfaces of transaxle case and oil pan.
(7) Install oil pan with new gasket and tighten oil pan bolts t o 10–12 Nm (7.5–8.5 ft.lbs.)
(8) Tighten drain plug with gasket to 30–35 Nm (22-25 ft.lbs.).




(9) Supply 4 liters (8.5 pints) of specified ATF into case through dipstick hole. [Total quantity of ATF required is 6.1 liters (12.9 pints).
Actually however, approx. 4.5 liters (9.5 pints) of fluid can be replaced because rest of fluid remains in torque converter.]

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176) or Dia ATF SP or Equivalent**

(10) Start engine and allow to idle for at least two minutes. Then, with parking brake on, move selector lever momentarily to each position, ending in "N" Neutral position.

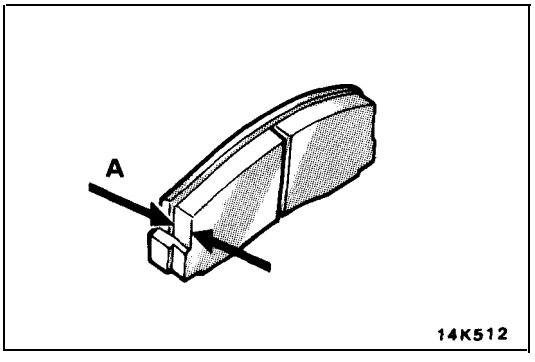
(11) Add sufficient ATF to bring fluid level to lower mark. Recheck fluid level after transaxle is at normal operating temperature.
Fluid level should be between upper and lower marks of "HOT" range. Insert dipstick fully to prevent dirt from entering transaxle.

## 11 .ENGINE COOLANT (Change) N00SBEAc

Check the cooling system parts, such as radiator, heater, and oil cooler hoses, thermostat and connections for leakage and damage.

**CHANGE COOLANT**

1. Remove the radiator cap.
2. Loosen the drain plug to drain the coolant.
3. Drain the coolant from the reserve tank.
4. After draining the coolant, tighten the drain plug securely.
5. Supply the coolant into the radiator until it is filled up to its filler neck.
6. Supply the coolant into the reserve tank.
7. After warming the engine until the thermostat opens, remove the radiator cap and check the coolant level.
8. Supply the coolant into the radiator until it is filled up to its filler neck, and install the radiator cap securely.
9. Fill the reserve tank with coolant up to the "FULL" line.




## 12.DISC BRAKE PADS (Inspect for wear) N00SBFAa

Check for fluid contamination and wear. Replace complete set of pads if defective.

**Caution**
**The pads for the right and left wheels should be replaced at the same time. Never "split" or intermix brake pad sets.**
**All four pads must be replace as a complete set.**

**Thickness of lining (A)**
**Limit : 2.0 mm (.08 in.)**

## 13. BRAKE HOSES (Check for deterioration or leaks) N00SBHAa

Inspection of brake hoses and tubing should be included in all brake service operations.

The hoses should be checked for:

1. Correct length, severe surface cracking, pulling, scuffing or worn spots. (If the fabric casing of the hoses is exposed by cracks of abrasion in the rubber hose cover, the hoses should be replaced. Eventual deterioration of hose may occur with possible bursting failure.)
2. Faulty installation, casing twisting or interference with wheel, tire of chassis.

## 14. BALL JOINT AND STEERING LINKAGE SEALS (Inspect for grease leaks and damage) N00SBJAb

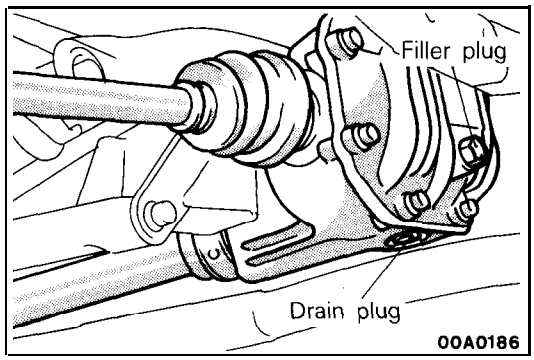
1. These components, which are permanently lubricated at the factory, do not require periodic lubrication. Damaged seals and boots should be replaced to prevent leakage or contamination of the grease.
2. Inspect the dust cover and boots for proper sealing, leakage and damage. Replace them if defective.

## 15. DRIVE SHAFT BOOTS (Inspect for grease leaks and damage) N00SBJAc

1. These components, which are permanently lubricated at the factory, do not require periodic lubrication. Damaged boots should be replaced to prevent leakage or contamination of the grease.
2. Inspect the boots for proper sealing, leakage and damage. Replace it if defective.

## 16. REAR AXLE (CONVENTIONAL DIFFERENTIAL) (Inspect oil level)-AWD N00SBPCa

Remove the filler plug and inspect the oil level at bottom of filler hole. If the oil level is slightly below the filler hole, it is in satisfactory condition.




## 16. REAR AXLE (LIMITED-SLIP DIFFERENTIAL) (Oil change)-AWD N00SBPCc

Before changing the rear axle oil, check to make sure that there is no oil leakage from the rear axle housing.
Remove the drain plug and drain out of the oil.
Put the oil plug back in place, and then pour new oil in through the filler hole.

## 17. EXHAUST SYSTEM (CONNECTION PORTION OF MUFFLER, PIPING AND CONVERTER HEAT SHIELDS) (Check and service as required) N00SBLAa

1. Check for holes and gas leaks due to damage, corrosion, etc.
2. Check the joints and connections for looseness and gas leaks.
3. Check the hanger rubber and brackets for damage.

**NOTES**

# FRONT SUSPENSION

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N02AA--


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# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N02CA--

<FWD>

| Items | Vehicles with 1.8L Engine | | Vehicles with 2.0L DOHC Engine <Non-Turbo> | | Vehicles with 2.0L DOHC Engine <Turbo> | |
|---|---|---|---|---|---|---|
| | M/T | A/T | M/T | A/T | M/T | A/T |
| Suspension system | McPherson strut with' coil spring and compression' rod type | | | | | |
| Coil spring | | | | | | |
| Wire dia. x O.D. x free length mm (in.) | 13.4x173.4x 326.5 (.53x 6.83x12.9) | 13.6x173.6x 334.5 (.54x 6.83x 13.2) | 13.7x173.7x 314 (.54x 6.84x 12.4) | 13.9x173.9x 321.5 (.55x 6.85x 12.7) | 13.9x173.9x 1 4 321.5 (.55x 6.85x 12.7) | . 1 x174.1x 329 (.55x 6.85x 12.9) |
| Coil spring identification color | Green x 1 | Green x 2 | Light blue x 1 | Light blue x 2 | Light blue x 2 | Orange x 1 |
| Spring constant N/mm (lbs./in.) | 22 (123) | 22 (123) | 24 (134) | 24 (134) | 24 (134) | 24 (134) |
| Shock absorber | | | | | | |
| Type | Hydraulic, cylindrical double acting type | | | | | |
| Maximum length mm (in.) | 483 (19.02) | | | | | |
| Compressed length mm (in.) | 330 (12.99) | | | | | |
| Stroke mm (in.) | 153 (6.02) | | | | | |
| Damping force [at 0.3 m/sec. (0.984 ft./sec.)] | | | | | | |
| Expansion N (lbs.) | 1,000 (220) | | | | | |
| Contraction N (lbs.) | 300 (66) | | | | | |
| Wheel bearing | | | | | | |
| Type | Double-row angular-contact ball bearing | | | | | |
| O.D. x I.D. mm (in.) | 80x40 (3.15x1.57) | | | | | |
| Drive shaft | | | | | | |
| Joint type | | | | | | |
| Outer | B.J.*1 | | | | | |
| Inner | T.J.*2 | | | | | |
| Drive shaft | | | | | | |
| Length mm (in.) | | | | | | |
| L.H. shaft | 708 (27.9) | | 706 (27.8) | | 706 (27.8) | 702 (27.6) |
| R.H. shaft | 368 (14.5) | | 366 (14.4) | | 366 (14.4) | 370 (14.5) |

NOTE
*1: B.J.: Birfield joint
*2: T.J.: Tripod joint

<AWD>

| Items | M/T | A/T |
|---|---|---|
| Suspension system | McPherson strut with coil spring and compression rod type | |
| Coil spring | | |
| Wire dia. x O.D. x free length mm (in.) | 14.0 x 174.0 x 326.5 (.55 x 6.85 x 12.9) | 14.2 x 174.2 x 333.5 (.56 x 6.86 x 13.1) |
| Coil spring identification color | Pink x 1 | Pink x 2 |
| Spring constant N/mm (lbs./in.) | 26 (146) | 26 (146) |
| Shock absorber | | |
| Type | Hydraulic, cylindrical double acting type | |
| Maximum length mm (in.) | 489 (19.25) | |
| Compressed length mm (in.) | 340 (13.39) | |
| Stroke mm (in.) | 149 (5.87) | |
| Damping force [at 0.3 m/sec. (0.984 ft./sec.)] | | |
| Expansion N (lbs.) | 1,000 (220) | |
| Contraction N (lbs.) | 300 (66) | |
| Wheel bearing | | |
| Type | Double-row angular-contact ball bearing | |
| O.D. x I.D. mm (in.) | 80 x 40 (3.15 x 1.57) | |
| Drive shaft | | |
| Joint type | | |
| Outer | B.J.*1 | |
| Inner | T.J.*2 | |
| Drive shaft | | |
| Length mm (in.) | | |
| L.H. shaft | 368 (14.5) | 365 (14.4) |
| R.H. shaft | 368 (14.5) | 371 (14.6) |

NOTE
*1: B.J.: Birfield joint
*2: T.J.: Tripod joint

## SERVICE SPECIFICATIONS

N02CB--

| Items | <FWD> | | <AWD> |
|---|---|---|---|
| | Vehicles with 1.8L Engine | Vehicles with 2.0L DOHC Engine | |
| Standard value | | | |
| Camber | 14′ ± 30′ | 5′ ± 30′ | 10′ ± 30′ |
| Caster | 2°20′ ± 30′ | 2°24′ ± 30′ | 2°18′ ± 30′ |
| Toe-in mm (in.) | 0 ± 3 (0 ± .12) | 0 ± 3 (0 ± .12) | 0 ± 3 (0 ± .12) |
| Protruding length of stabilizer bar mounting bolt mm (in.) | 16-18 (.63–.70) | – | – |
| Setting of T.J. boot length mm (in.) | | | |
| L.H. | 75 ± 3 (2.95 ± .12) | 80 ± 3 (3.15 ± .12) | 85 ± 3 (3.35 ± .12) |
| R.H. | 85 ± 3 (3.35 ± .12) | 80 ± 3 (3.15 ± .12) | 85 ± 3 (3.35 ± .12) |
| Lower arm ball joint starting torque N m (in.lbs.) | 3–10 (26-87) | 3– 10 (26-87) | 3–10 (26-87) |
| Stabilizer link ball joint starting torque N m (in.lbs.) | – | 1.7–3.2 (15-28) | 1.7–3.2 (15-28) |
| Crossmember bushings projection mm (in.) | | | |
| Bushing A | 7.2–10.2 (.28–.40) | 7.2–10.2 (.28–.40) | 7.2–10.2 (.28–.40) |
| Bushing B | 6.5-9.5 (.26–.37) | 6.5-9.5 (.26–.37) | 6.5-9.5 (.26–.37) |
| Limit | | | |
| Hub end play mm (in.) | 0.2 (.008) or less | | |
| Wheel bearing starting torque (Hub starting torque) Nm (in.lbs.) | 1.8 (16) or less | | |

## TORQUE SPECIFICATIONS

N02CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Drive shaft nut | 200–260 | 144-188 |
| Tie rod end ball joint | 24-34 | 17-25 |
| Knuckle to ball joint | 60–72 | 43-52 |
| Knuckle to strut assembly | 110–140 | 80–101 |
| Strut top end nut | 60–70 | 43-51 |
| Strut upper mounting nut | 40–50 | 29-39 |
| Caliper assembly mounting bolt | 80–100 | 58-72 |
| Center bearing bracket | 36-46 | 26-33 |
| Front speed sensor bracket | 9-14 | 7–10 |
| Front toothed rotor | 9-14 | 7–10 |
| Stabilizer bar bracket to crossmember | 30–42 | 22–30 |
| Stabilizer link | 35-45 | 25-33 |
| Lower arm clamp to crossmember (nut) | 35-47 | 25-34 |
| Lower arm clamp to crossmember (bolt) | 80–100 | 58-72 |
| Lower arm to crossmember | 100–120 | 72-87 |
| Stay to crossmember | 70–80 | 51–58 |
| Front exhaust pipe to exhaust manifold | | |
| Turbo | 40–60 | 29-43 |
| Non-Turbo | 30–40 | 22-29 |
| Front exhaust pipe clamp | 30–40 | 22-29 |
| Crossmember to body | 100–120 | 72-87 |
| Front roll stopper bracket to centermember | 40–50 | 29-36 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Rear roll stopper bracket to centermember | 40–50 | 29-36 |
| Centermember installation bolts (front) | 80–100 | 58-72 |
| Centermember installation bolts (rear) | 80–100 | 58-72 |
| Joint assembly and gear box connecting bolt | 15–20 | 11–14 |
| Steering gear box assembly to return tube | 12-18 | 9-13 |
| Steering gear box assembly to pressure hose | 12-18 | 9-13 |
| Steering gear box assembly to crossmember | 60–80 | 43-58 |
| Pressure hose bracket to crossmember | 9-14 | 7–10 |
| Transfer installation bolt | | |
| <M/T> | 55–60 | 40–43 |
| <A/T> | 60–80 | 43-58 |
| Gusset installation bolt | 70–80 | 51–58 |
| Left member installation bolt (front) | 80–100 | 58-72 |
| Left member installation bolt (rear) | 70–80 | 51-58 |
| No. 1 crossmember installation nut | 80–100 | 58-72 |
| Right member installation bolt (front) | 80–100 | 58-72 |
| Right member installation bolt (rear) | 70–80 | 51–58 |
| Front roll stopper to No. 1 crossmember | 40–50 | 29-36 |
| Front roll stopper installation nut | 50–65 | 36-47 |
| Front exhaust pipe to catalytic converter | 40–60 | 29-43 |
| Front exhaust pipe to hanger | 10–15 | 7-11 |

## LUBRICANTS

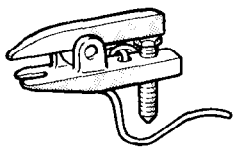
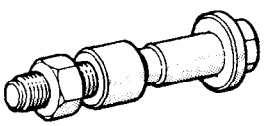
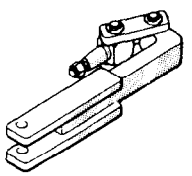
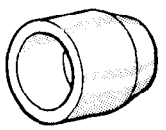
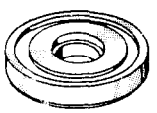
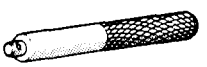
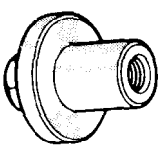
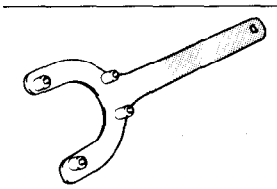
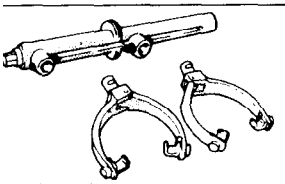
N02CD--

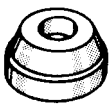
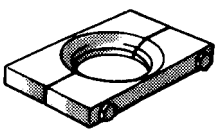
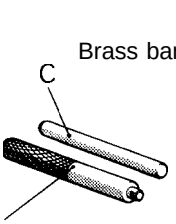
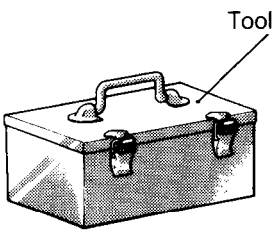
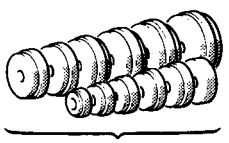
| Items | Specified lubricants | Quantity |
|---|---|---|
| Outer surface of wheel bearing outer race<br>Wheel bearing inner race<br>Oil seal lip<br>Strut insulator bearing<br>Lower arm ball joint<br>Stabilizer link | MOPAR Multi-mileage Lubricant<br>Part No. 2525035 or equivalent | As required |
| Inner dust cover | MOPAR Multi-mileage Lubricant<br>Part No. 2525035 or equivalent | 7–10 g (.25–.35 oz.) |
| Outer dust cover | MOPAR Multi-mileage Lubricant<br>Part No. 2525035 or equivalent | 4-6 g (.14–.21 oz.) |
| B.J. boot grease<br><FWD><br>Vehicles with 1.8L engine<br>Vehicles with 2.0L DOHC engine<br><AWD> | Repair kit grease | <br><br>95 g (3.4 oz.)<br>110 g (3.9 oz.)<br>95 g (3.4 oz.) |
| T.J. boot grease<br><FWD><br>Vehicles with 1.8L engine<br>Vehicles with 2.0L DOHC engine<br><AWD> | Repair kit grease | <br><br>105 g (3.7 oz.)<br>120 g (4.2 oz.)<br>105 g (3.7 oz.) |
| Spider assembly | Repair kit grease | As required |

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.

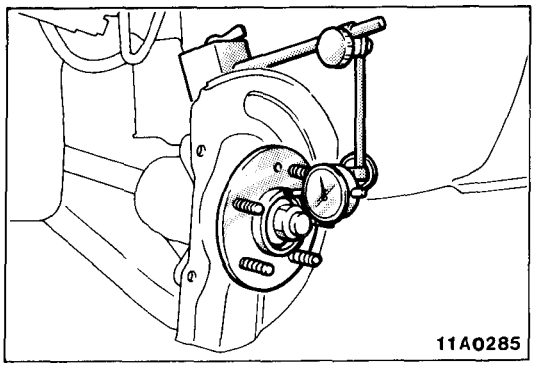
# SPECIAL TOOLS

N02DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB991113 | Steering linkage puller | Removal of the lower arm ball joint and tie rod |
|  | MB990998 | Front hub remover and installer | Removal or press-in the front hub |
|  | MB991056 or MB991001 | Knuckle arm bridge | Removal of the hub |
|  | C-3972-A | Oil seal installer | Press-fitting of the wheel bearing and oil seal |
|  | MB990985 | Oil seal installer | |
|  | C-4171 | Installer bar | |
|  | MB991004 | Wheel alignment gauge attachment | Measurement of the wheel alignment |
|  | MB991176 | Spring seat holder | Disassembly/reassembly of the strut assembly |
|  | MB991237<br>MB991238 | Spring compressor body<br>Arm set | Compression of the front coil spring |

| ›ol | Number | Name | I Use |
|---|---|---|---|
|  | MB990800 | Ball joint remover and installer | Installation of the dust cover |
|  | C-4628 | Bearing installer | Removal of wheel bearing |
|  | MB991 248 or MD998801 | Inner shaft remover | Removal of the inner shaft |
|   ar (one-touch type)    A Installer adapter | M 6990925 | Bearing and oil seal installer set | Removal and installation of the center bearing<br>Press-fitting of the dust seal |

| Tool number (MB990925) | O.D. mm (in.) | | Tool number (MB990925) | O.D. mm (in.) |
|---|---|---|---|---|
| MB990926 | 39 (1.54) | A | MB990933 | 63.5 (2.50) |
| MB990927 | 45 (1.77) | | MB990934 | 67.5 (2.66) |
| M 8990928 | 49.5 (1.95) | | MB990935 | 71.5 (2.81) |
| MB990929 | 51 (2.01) | | MB990936 | 75.5 (2.97) |
| MB990930 | 54 (2.13) | | MB990937 | 79 (3.11) |
| MB990931 | 57 (2.24) | B | MB990938 | – |
| M 8990932 | 61 (2.40) | C | MB990939 | – |



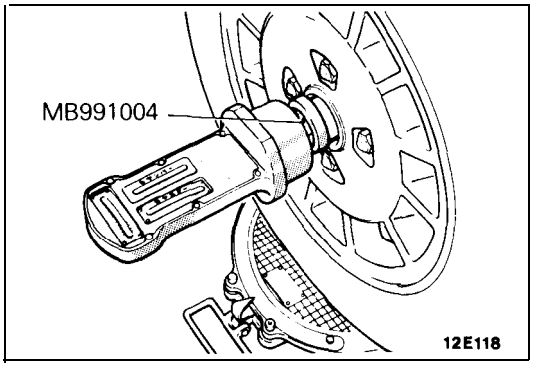

# SERVICE ADJUSTMENT PROCEDURES

## HUB END PLAY INSPECTION N02FAAB

1. Jack up the vehicle and remove the front wheels.
2. Remove the disc brake caliper and suspend it with a wire. (Refer to GROUP 5–Service Adjustment Procedures.)
3. Attach a dial indicator as shown in the illustration, and then measure the axial play while moving the hub back and forth.

   **Limit : 0.2 mm (.008 in.) or less**

   NOTE
   Secure the brake disc and hub by the wheel nut so that the brake disc won't come off the hub.
4. If axial play exceeds the limit, disassemble and check parts.




## FRONT WHEEL ALIGNMENT N02FBAQ

NOTE
The front suspension assembly must be free of worn, loose or damaged parts prior to measurement of front wheel alignments.
Measure wheel alignment by using the special tool.

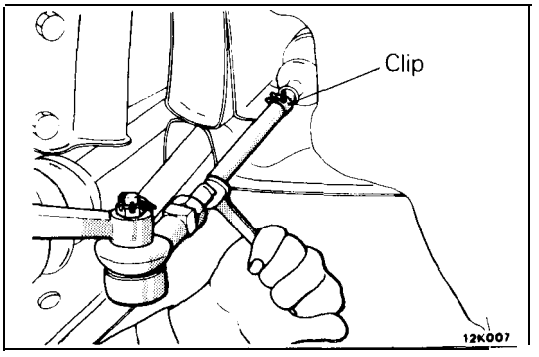
**CAMBER AND CASTER**

**Standard value :**

| | <1.8L> | <2.0L> | |
|---|---|---|---|
| | | FWD | A W D |
| Camber | 14′ ± 30′ | 5′ ± 30 | 10′ ± 30 |
| Caster | 2°20′ ± 30′ | 2°24′ ± 30′ | 2°18′ ± 30 |

Camber and caster are pre-set at the factory and cannot be adjusted.

NOTE
If camber and caster are not within specifications, replace bent or damaged parts.




**TOE-IN**

**Standard value : 0 ± 3 mm (0 ± .12 in.)**

1. Adjust the toe-in by undoing the clips and turning the left and right tie rod turnbuckles by the same amount (in opposite directions).
2. The toe will move out as the left turnbuckle is turned toward the front of the vehicle and the right turnbuckle is turned toward the rear of the vehicle.

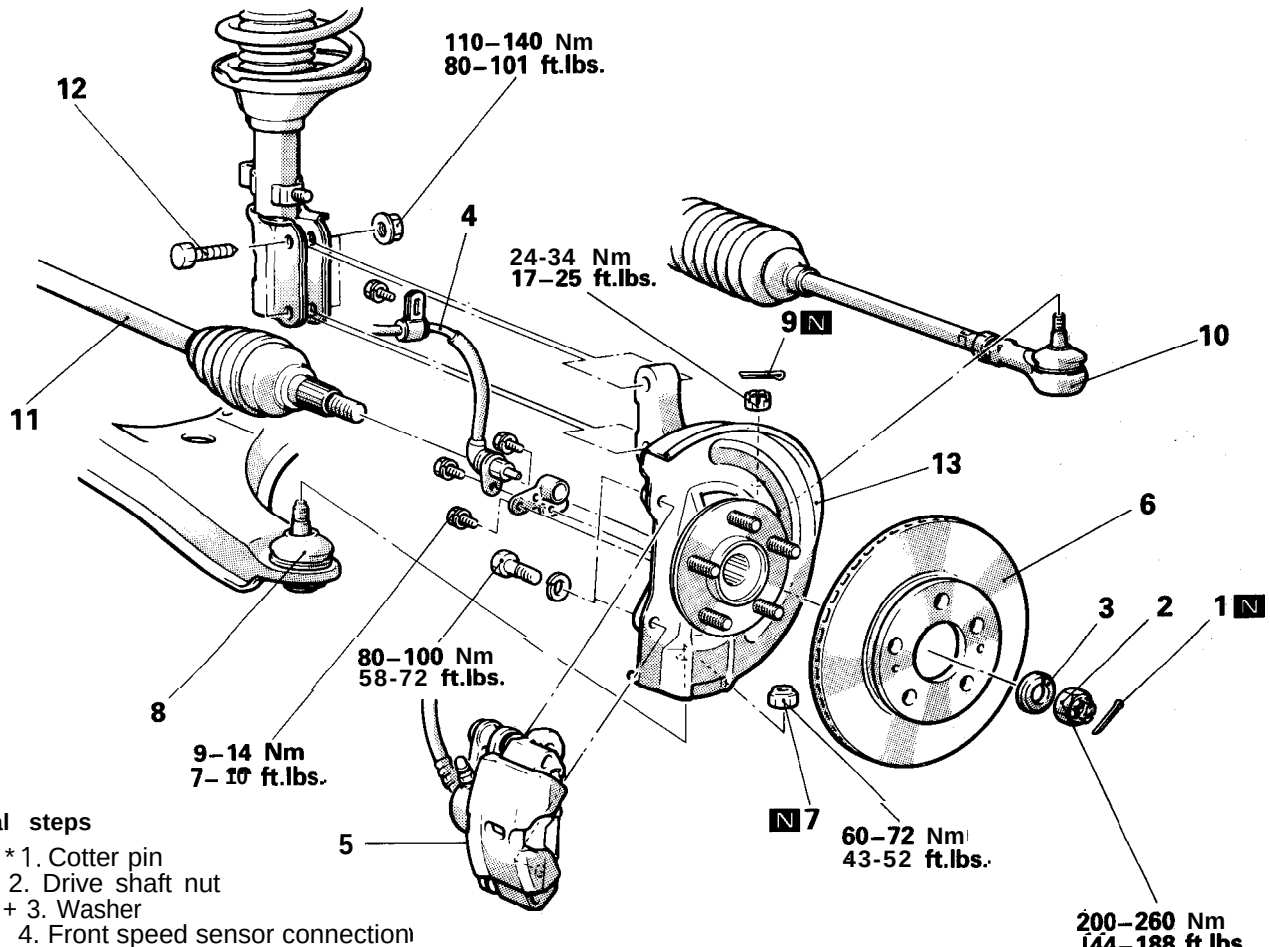
3. For each half turn of the left and right tie rods, the toe-in will be adjusted by 6 mm (.24 in.).
4. After making the adjustments, use a turning radius gauge to confirm that the steering wheel turning angle is within the standard value range. (Refer to GROUP 19–Service Adjustment Procedures.)

### WHEEL BEARING ADJUSTMENT N02FCAA

Bearing preload is pre-set to the specified value by design and therefore can not be adjusted.

## HUB AND KNUCKLE

### REMOVAL AND INSTALLATION N02IA--




**Removal steps**

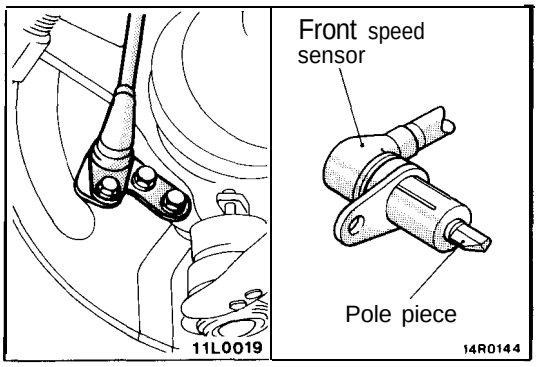
- ● *1. Cotter pin
- ◆◆ ▶◀ 2. Drive shaft nut
- ● + 3. Washer
- ◆◆ 4. Front speed sensor connection <Vehicles with ABS> (Refer to GROUP 5–Speed Sensor.)
- ◆◆ 5. Caliper assembly
- 6. Brake disc
- 7. Self locking nut
- ◆◆ ● + 8. Connection for lower arm ball joint
- 9. Cotter pin
- ◆◆ 10.
- ◆◆ 11. Drive shaft
- 12. Front strut mounting bolt
- 13. Hub and knuckle

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL N02IBAG

### 2. REMOVAL OF DRIVE SHAFT NUT

Loosen the drive shaft nut while the vehicle is on the floor with the brakes applied.



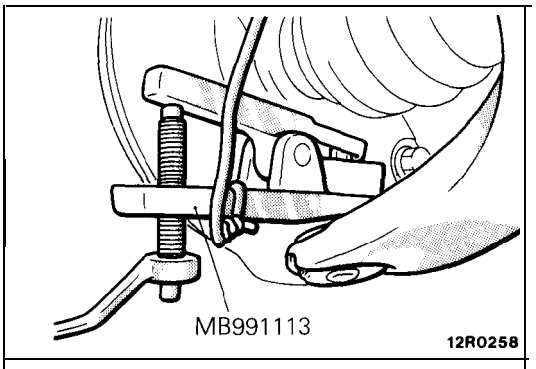

### 4. DISCONNECTION OF FRONT SPEED SENSOR

Remove the mounting bolts which hold the speed sensor bracket to the knuckle, and then remove the speed sensor.

**Caution**
**Be careful when handling the pole piece at the tip of the speed sensor and the toothed edge of the rotor so as not to damage them by striking against other parts.**

### 5. REMOVAL OF CALIPER ASSEMBLY

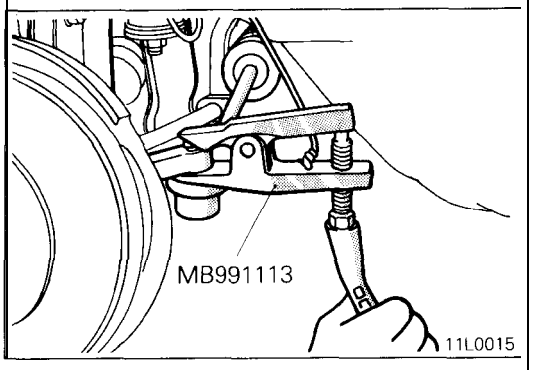
Remove the caliper assembly and suspend it with wires.




### 8. DISCONNECTION OF LOWER ARM BALL JOINT

Using the special tool, disconnect the lower arm ball joint from the knuckle.

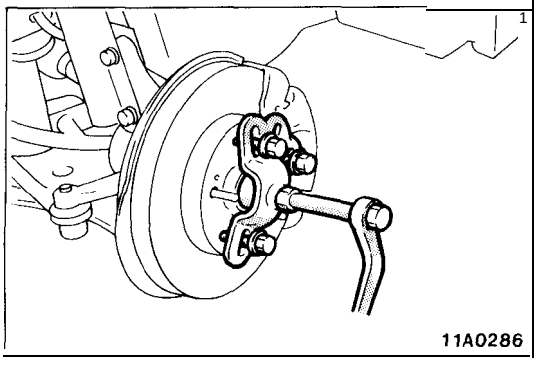
**Caution**
**1. Be sure to tie the cord of the special tool to the nearby part.**
**2. Loose the nut but do not remove it.**




### 10. DISCONNECTION OF TIE ROD END

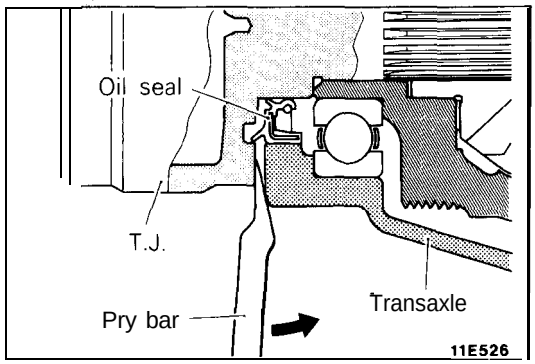
Using the special tool, disconnect the tie rod end from the knuckle.

**Caution**
**1. Be sure to tie the cord of the special tool to the nearby part.**
**2. Loose the nut but do not remove it.**




### 11. REMOVAL OF DRIVE SHAFT

(1) Using the suitable tool to push out the drive shaft from the front hub.




(2) <M/T, Non-Turbo A/T>
Insert a pry bar between the transaxle case and the drive shaft, and then pry the drive shaft from the transaxle.

**Caution**
**1. Do not pull on the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.**
**2. Do not insert the pry bar so deep as the damage the oil seal.**

<Turbo A/T>
Refer to P.2-23.

## INSPECTION N02ICAD

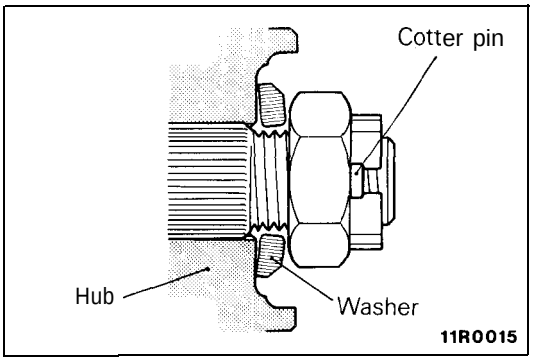
- Check the hub for cracks and spline for wear.
- Check the oil seal for damage.
- Check the knuckle for cracks.
- Check for defective bearing.

NOTE
If the meshing of the wheel bearing outer race and the knuckle, or of the wheel bearing inner race and the hub, is loose, replace the bearing or damaged parts.

## SERVICE POINTS OF INSTALLATION N02IDAD

### 8. INSTALLATION OF LOWER ARM BALL JOINT

Lower the vehicle to the ground and tighten the knuckle to the lower arm ball joint connecting bolt.

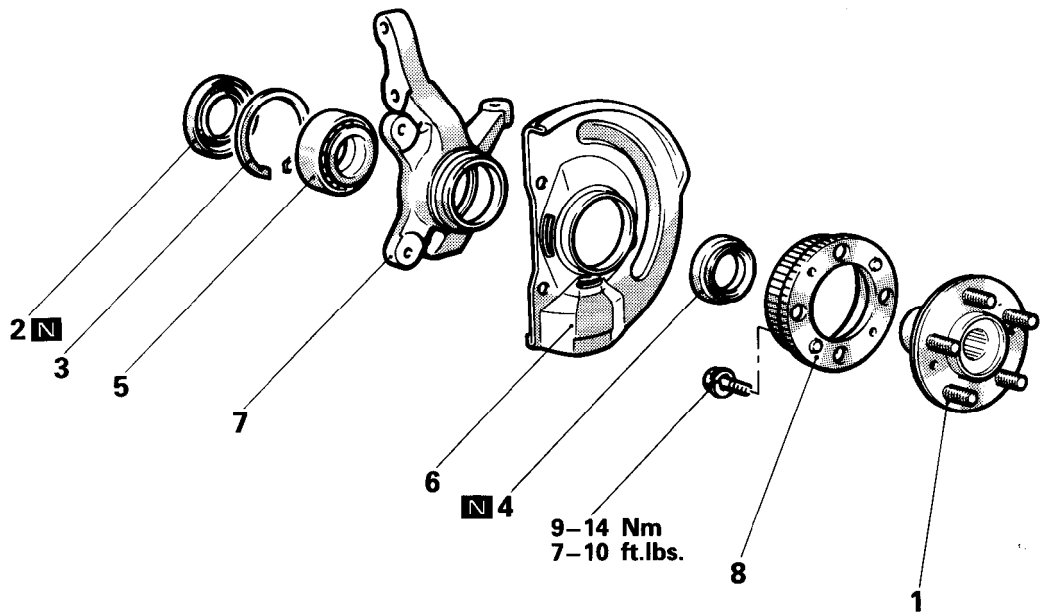



### 3. INSTALLATION OF WASHER/S. DRIVE SHAFT NUT/1. COTTER PIN

(1) Be sure to install the washer and wheel bearing nut in the specified direction.
(2) After installing the wheel, lower the vehicle to the ground and finally tighten the wheel bearing nut.
(3) If the position of the cotter pin holes does not match, tighten the nut up to 260 Nm (188 ft.lbs.) in maximum.
(4) Install the cotter pin in the first matching holes and bend it securely.

## DISASSEMBLY AND REASSEMBLY

N02IE--



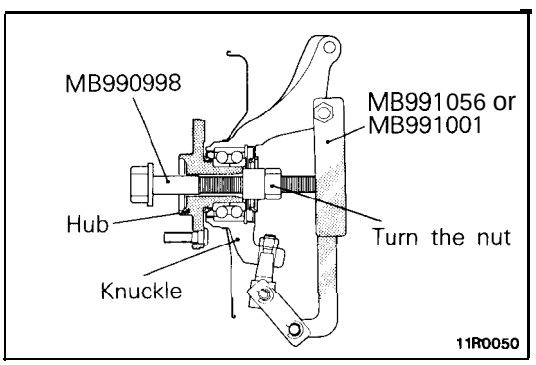

**Disassembly steps**

- ◆◆ 1. Front hub
- ◆◆ 2. Oil seal (drive shaft side)
- 3. Snap ring
- 4. Oil seal (hub side)
- ◆◆ 5. Wheel bearing
- 6. Dust shield
- 7. Knuckle
- 8. Front toothed rotor <ABS> (Refer to GROUP 5–Wheel Speed Sensor.)

**Reassembly steps**

- 8. Front toothed rotor <ABS> (Refer to GROUP 5–Wheel Speed Sensor.)
- 7. Knuckle
- 6. Dust shield
- ◆◆ 5. Wheel bearing
- ● + 4. Oil seal (hub side)
- 3. Snap ring
- ● + 1. Front hub
- ● ☒ Adjustment of wheel bearing starting torque
- ◆◆ 2. Oil seal (drive shaft side)

NOTE
(1) ◆◆: Refer to "Service Points of Disassembly".
(2) ● +: Refer to "Service Points of Reassembly".
(3) N: Non-reusable parts



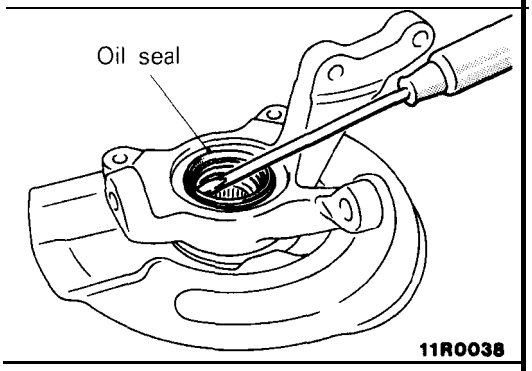

## SERVICE POINTS OF DISASSEMBLY

N02IFAO

### 1. REMOVAL OF FRONT HUB

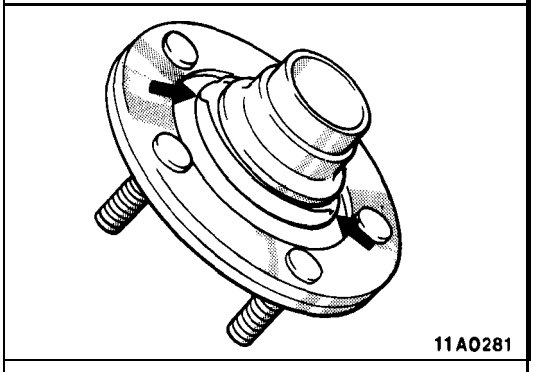
(1) Attach the special tools to the knuckle and front hub.
(2) Secure the knuckle in a vise.
(3) Tighten the nut of the special tool and remove the front hub from the knuckle.

**Caution**
**1. Be sure to use the special tools.**
**2. If the front hub and knuckle are disassembled by striking them with a hammer, the bearing will be damaged.**



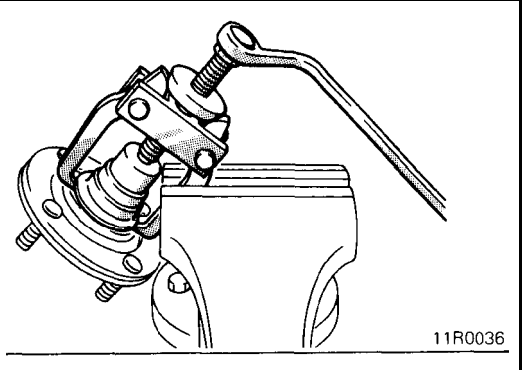

**2. REMOVAL OF OIL SEAL (DRIVE SHAFT SIDE)**

Remove the oil seal (drive shaft side) from the knuckle.




**5. REMOVAL OF WHEEL BEARING**

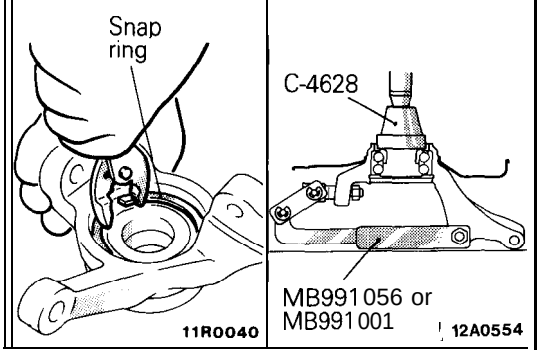
(1) Crush the oil seal in two places so that the tabs of the special tool will be caught on the wheel bearing inner race.




(2) Remove the wheel bearing inner race from the front hub by using the suitable puller.

NOTE

Be careful that the front hub will not fall down at the wheel bearing inner race (outer side) removed from the hub.



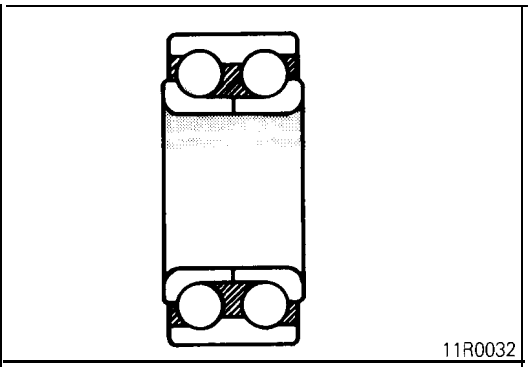

(3) Remove the snap ring from the knuckle.
(4) Remove the bearing by using the special tools.

**Caution**
**Removal is easier if the outer side inner race removed from the hub is placed on the bearing and the wheel bearing is then removed.**

## INSPECTION

N02IGABa

- Check the front hub and brake disc mounting surfaces for galling and contamination.
- Check the knuckle inner surface for galling and cracks.
- Check for defective bearing.

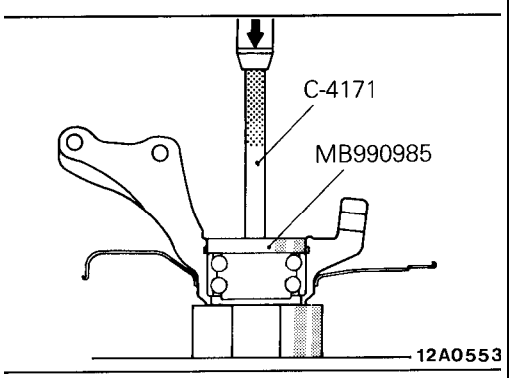

11R0032

## SERVICE POINTS OF REASSEMBLY N02IHAN

### 5. INSTALLATION OF WHEEL BEARING

(1) Fill the wheel bearing with multipurpose grease.
(2) Apply a thin coating of multipurpose grease to the knuckle and bearing contact surfaces.

**Grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

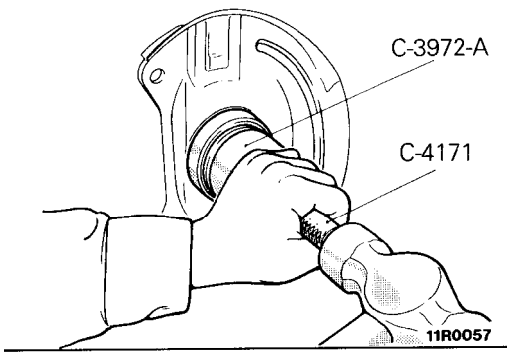



(3) With the wheel bearing inner race removed, press-in the bearing by using the special tools.
(4) Install the wheel bearing inner race to the wheel bearing.

### 4. INSTALLATION OF OIL SEAL (HUB SIDE)

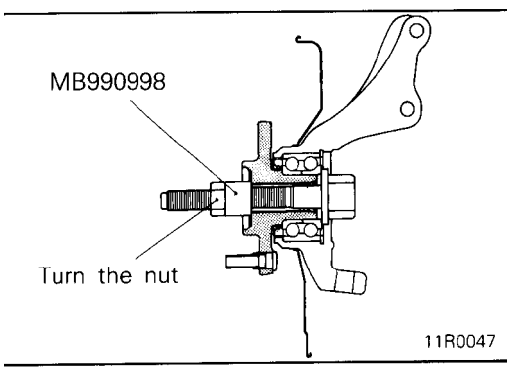
(1) Drive the oil seal (hub side) into the knuckle by using the special tools until it is flush with the knuckle end surface.
(2) Apply multipurpose grease to the lip of the oil seal and to the surfaces of the oil seal which contact the front hub.

**Grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**




### 1. INSTALLATION OF FRONT HUB

(1) Use the special tool to mount the front hub assembly onto the knuckle.
(2) Tighten the nut of the special tool to 200–260 Nm (144-188 ft.lbs.).
(3) Rotate the front hub assembly in order to seat the bearing.

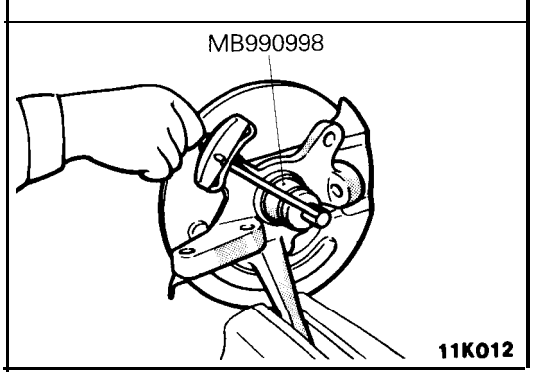


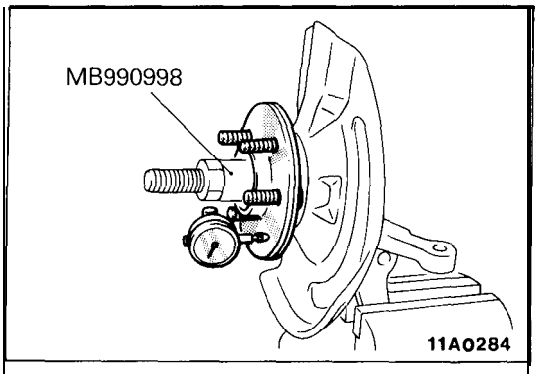

- **ADJUSTMENT OF WHEEL BEARING STARTING TORQUE**

(1) Measure the wheel bearing starting torque (hub starting torque) by using the special tools.

**Limit: 1.8 Nm (16 in.lbs.) or less**

NOTE
The starting torque must be within the limit and, in addition, the bearing must not feel rough when rotated.

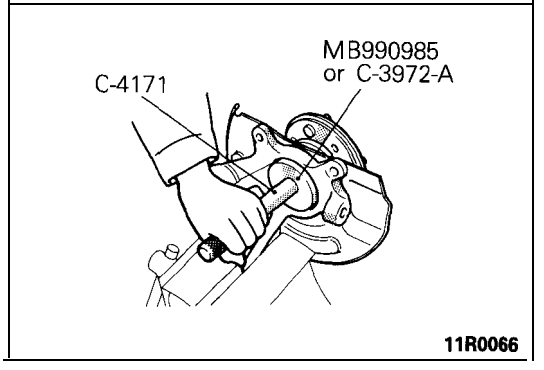





(2) Measure to determine whether the end play of the hub is within the specified limit or not.

**Limit: 0.2 mm (.008 in.) or less**

(3) If the starting torque and hub end play are not within the limit range while the nut is tightened to 200–260 Nm (144– 188 ft.lbs.), the bearing, hub and/or knuckle have probably not been installed correctly. Repeat the disassembly and assembly procedure.




**2. INSTALLATION OF OIL SEAL (DRIVE SHAFT SIDE)**

Drive the oil seal (drive shaft side) into the knuckle until it contacts the snap ring.

Apply multipurpose grease to the lip of the oil seal.

**Grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

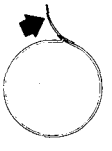
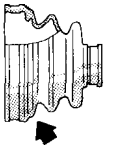
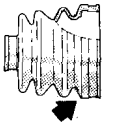
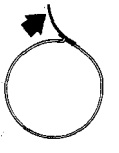
# DRIVE SHAFT <FWD> N02QA-A

The T.J.-B.J. type is used for FWD all models.

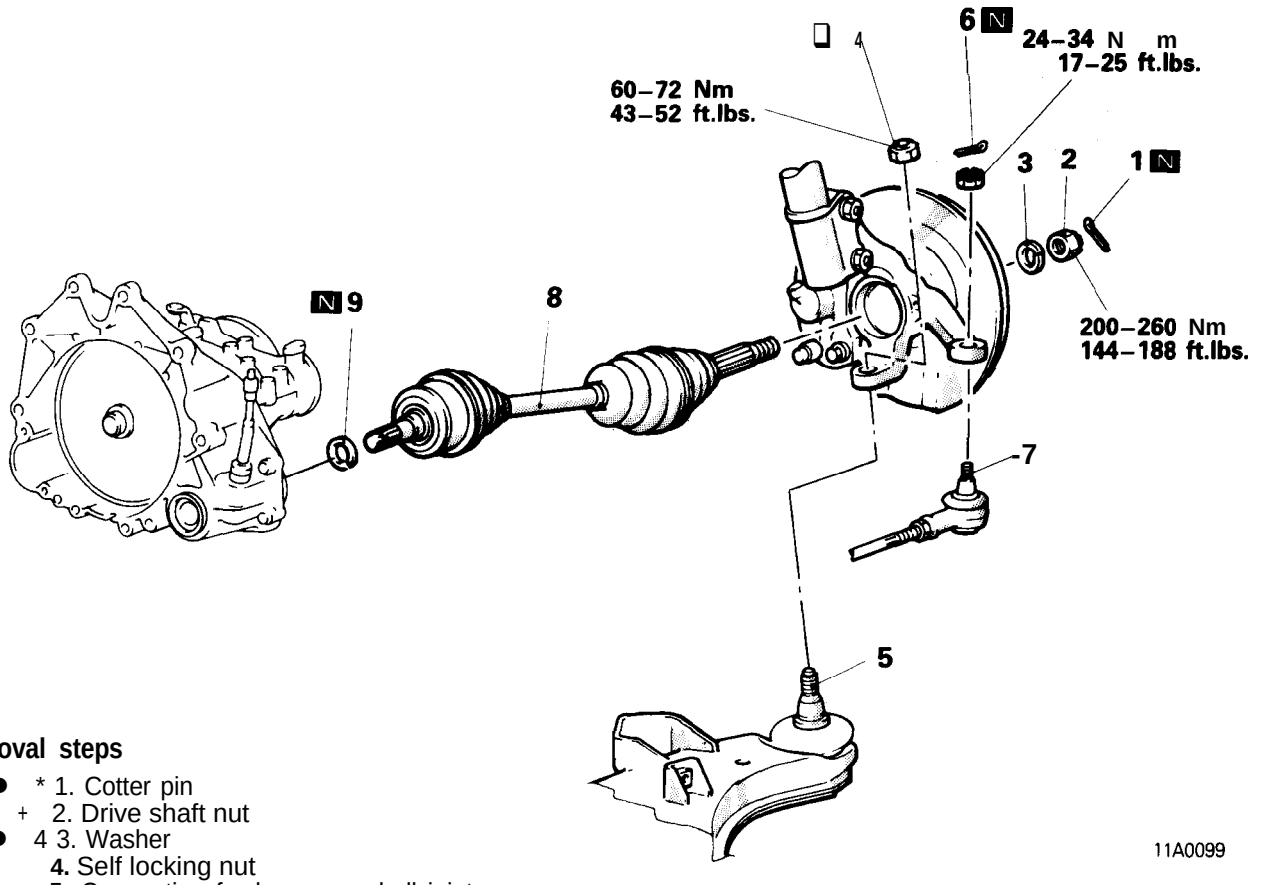
## PARTS DISTINCTION

Boots and boot bands can be distinguished by the indicated part number as below.

**T.J-B.J TYPE**

| | T.J. boot band | T.J. boot | Boot band (small) | B.J. boot | B.J. boot band |
|---|---|---|---|---|---|
| Part shapes and part identification number location | Identification location  11K033 |  Identification location 11R0156 | Identification location  11K033 |  Identification location 11K033 | Identification location  11K03 |
| 1800 | 20–110 | 17-261 #TJ87 | 20– 146 | 17–249#BJ87L | 20–1 1 3 |
| 2000 | 20–12 | 17–55#TJ92 | 20–111 | 17-31 #BJ92L | 20–75 |

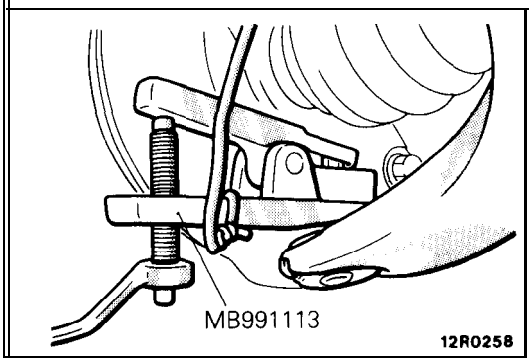
## REMOVAL AND INSTALLATION

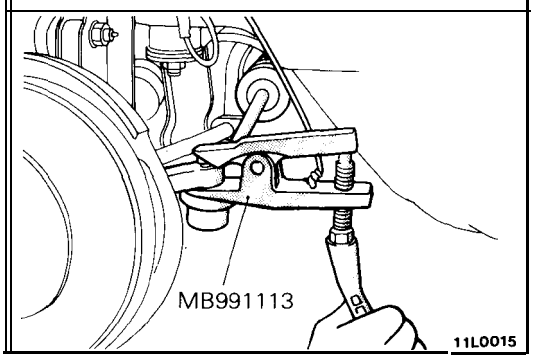



**Removal steps**

- ● * 1. Cotter pin
- ◆◆ ● + 2. Drive shaft nut
- ● 4 3. Washer
- **4.** Self locking nut
- ◆◆ ● + 5. Connection for lower arm ball joint
- 6. Cotter pin
- ◆◆ 7. Connection for tie rod end
- ● ☒ 8. Drive shaft
- 9. Circlip

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4 : Refer to "Service Points of Installation"
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF REMOVAL N02QBAL

### 2. REMOVAL OF DRIVE SHAFT NUT

Loosen the drive shaft nut while the vehicle is on the floor with the brakes applied.

### 5. DISCONNECTION OF LOWER ARM BALL JOINT

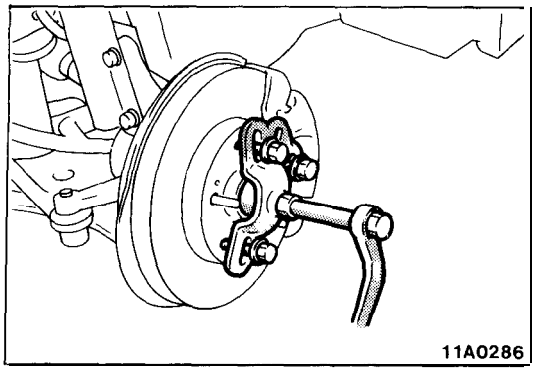
Using the special tool, disconnect the lower arm ball joint from the knuckle.

**Caution**
**1. Be sure to tie the cord of the special tool to the nearby part.**
**2. Loose the nut but do not remove it.**

### 7. DISCONNECTION OF TIE ROD END

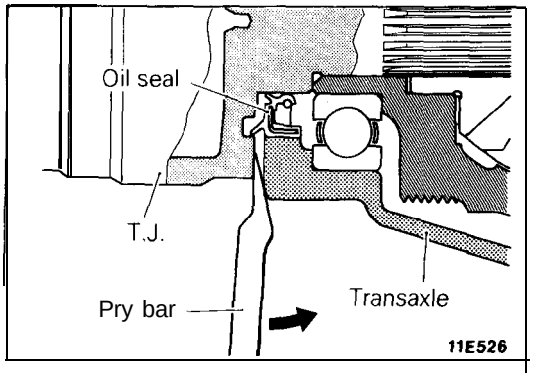
Using the special tool, disconnect the tie rod end from the knuckle.

**Caution**
**1. Be sure to tie the cord of the special tool to the nearby part.**
**2. Loose the nut but do not remove it.**


11A0286

## 8. REMOVAL OF DRIVE SHAFT

(1) Use the suitable tool to push out the drive shaft from the front hub.

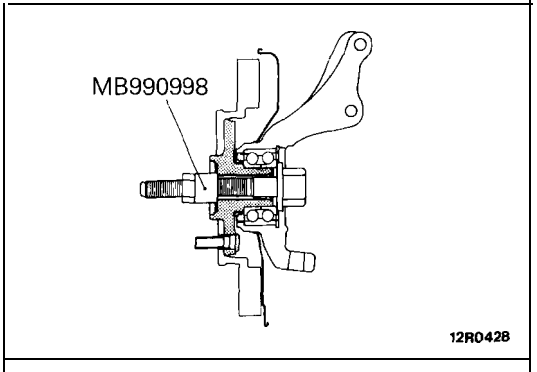


11E526

(2) <M/T, Non-Turbo A/T>
Insert a pry bar between the transaxle case and the drive shaft, and then pry the drive shaft from the transaxle.

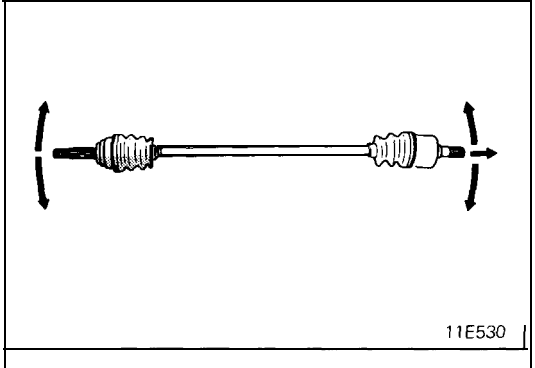
**Caution**
**1. Do not pull on the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.**
**2. Do not insert the pry bar so deep as the damage the oil seal.**

<Turbo A/T>
Refer to P.2-23.



12R0428

**Caution**
**Do not apply the vehicle weight to the wheel bearing while the drive shaft is disconnected. If the vehicle weight must unavoidably be applied (because of vehicle movement or some other reason), use the special tool to hold the wheel bearing, as shown in the figure.**


11E530

## INSPECTION N02QCAC

- Check the drive shaft boot for damage or deterioration.
- Check the ball joints for wear or operating condition.
- Check the spline part for wear or damage.

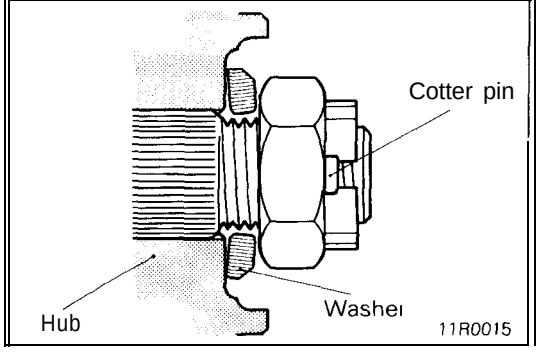
## SERVICE POINTS OF INSTALLATION N02QDAJ

### 5. INSTALLATION OF LOWER ARM BALL JOINT

Lower the vehicle to the ground and tighten the knuckle to the lower arm ball joint connecting nut.

### 3. INSTALLATION OF WASHER/2. DRIVE SHAFT NUT/I. COTTER PIN

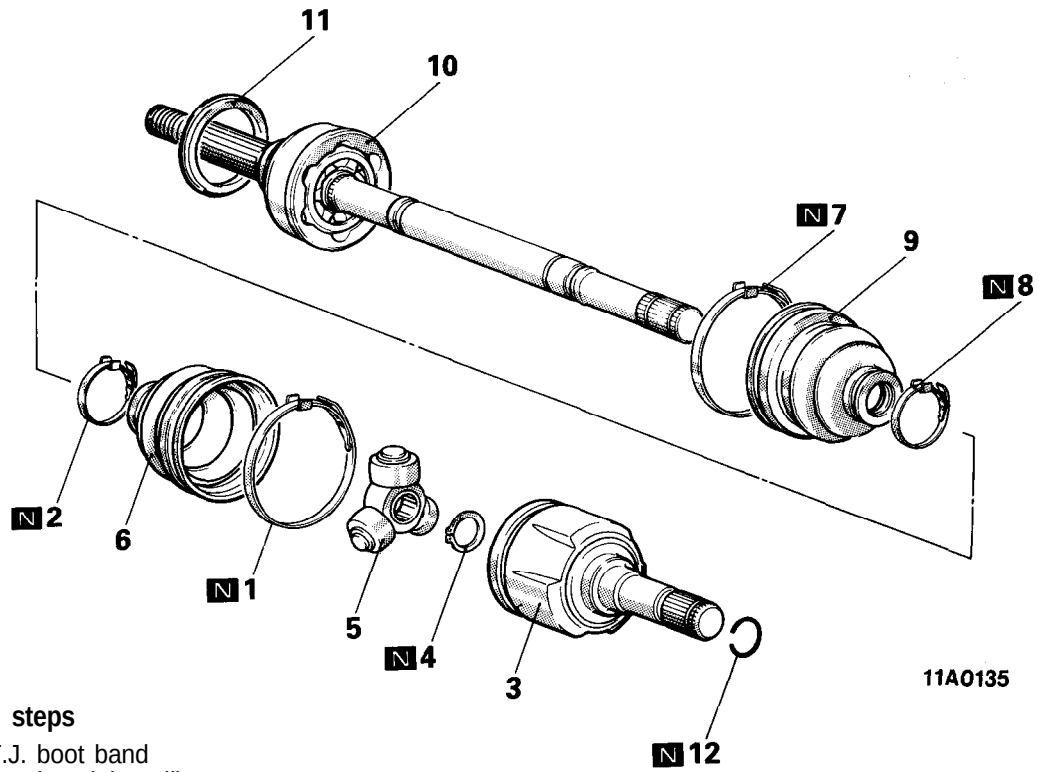
(1) Be sure to install the washer and wheel bearing nut in the specified direction.
(2) After installing the wheel, lower the vehicle to the ground and finally tighten the wheel bearing nut.
(3) If the position of the cotter pin holes does not match, tighten the nut up to 260 Nm (188 ft.lbs.) in maximum.
(4) Install the cotter pin in the first matching holes and bend it securely.



11R0015

## DISASSEMBLY AND REASSEMBLY

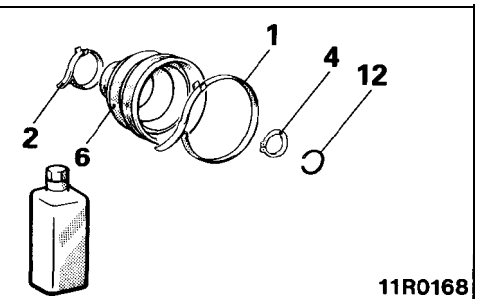
N02QE-A



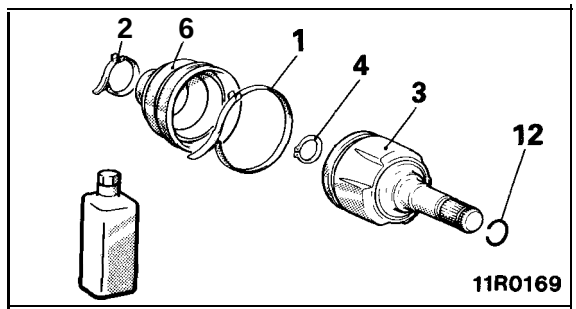

**Disassembly steps**

- ● + 1. T.J. boot band
- ◆◆ 2. Boot band (small)
- ◆◆ 3. T.J. case
- ◆◆ 4. Snap ring
- ◆◆ ● + 5. Spider assembly
- ◆◆ ◆◆ 6. T.J. boot
- 7. B.J. boot band
- 8. Boot band (small)
- ◆◆ ◆◆ 9. B.J. boot
- 10. B.J. assembly
- 11. Dust cover
- 12. Circlip

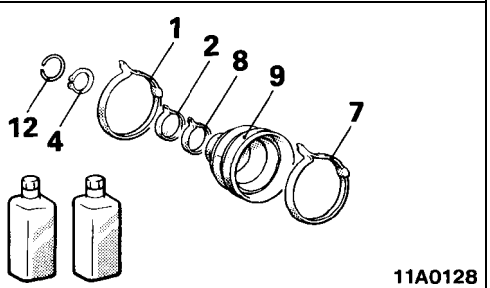
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ●: Refer to "Service Points of Reassembly".
(4) ❑: Non-reusable parts



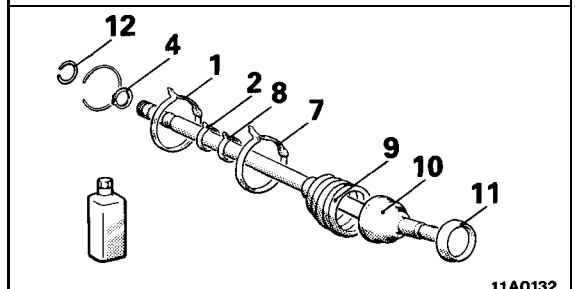

**T.J. Boot kit**



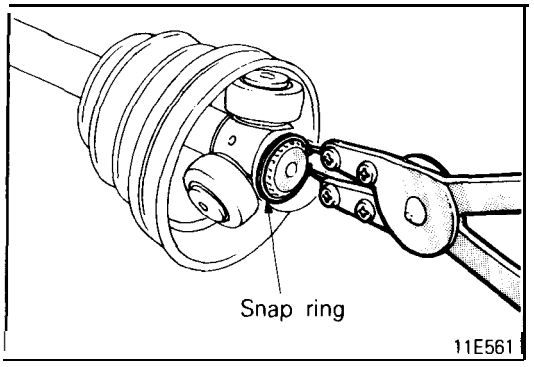

**T.J. Joint kit**




**B.J. Boot kit**




**B.J. Joint and shaft kit**

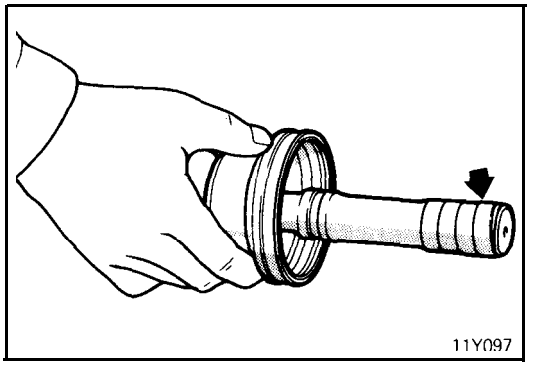



## SERVICE POINTS OF DISASSEMBLY N02QFDC

### 4. REMOVAL OF SNAP RING/S. SPIDER ASSEMBLY

(1) Remove the snap ring from the drive shaft with the snap ring pliers.
(2) Take out the spider assembly from the drive shaft.
(3) Clean the spider assembly.

**Caution**
**1. Do not disassemble the spider assembly.**
**2. If the T.J. of the drive shaft assembly is bent, the joint may be damaged. Use care in handling the drive shaft.**
**3. The drive shaft joint use special grease. Do not add another type of grease.**




### 6. REMOVAL OF T.J. BOOT/9. B.J. BOOT

(1) Wrap vinyl tape around the spline part on the T.J. side of the drive shaft so that the T.J. and B.J. boots are not damaged when they are removed.
(2) Withdraw the T.J. and B.J. boots from the drive shaft.

**Caution**
**Do not disassemble the B.J.**
**Distinguish between B.J. boot and T.J. boot parts.**

## INSPECTION N02QGDC

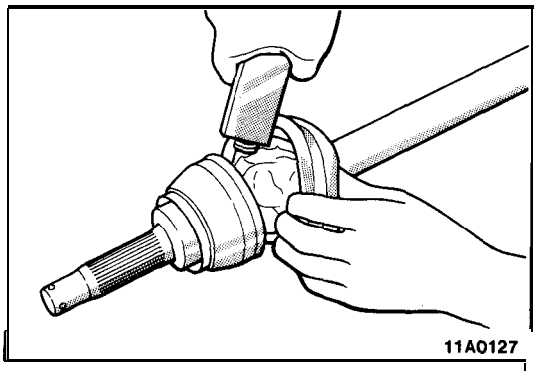
- Check the drive shaft for damage, bending or corrosion.
- Check the drive shaft spline part for wear or damage.
- Check for entry of water and/or foreign material into B.J.
- Check the spider assembly for roller rotation, wear or corrosion.
- Check the groove inside T.J. case for wear or corrosion.
- Check the boots for deterioration, damage or cracking.

## SERVICE POINTS OF REASSEMBLY N02QHDD

### 9. INSTALLATION OF B.J. BOOT/6. T.J. BOOT

(1) Wrap vinyl tape around the spline part on the drive shaft, and then install the B.J. boot and T.J. boot, in that order.

**Caution**
**Distinguish between B.J. boot and T.J. boot parts according to the section “Parts Distinction”, and be sure to assemble them correctly.**


11A0127

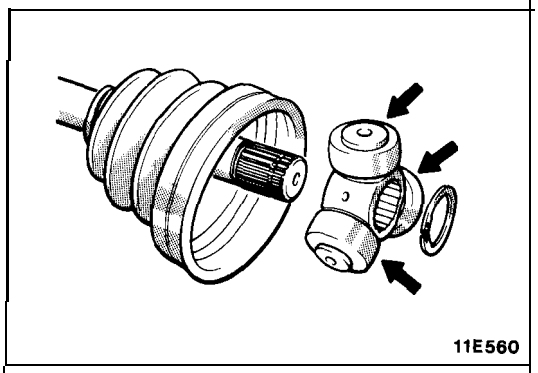
(2) Fill the inside of the B.J. and B.J. boot with the specified grease.

**Specified grease: Repair kit grease**
**95 g (3.4 oz.)*1, 110 g (3.9 oz.)*2**

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.
*1: <Vehicles with 1.8L engine>
*2: <Vehicles with 2.0L DOHC engine>

(3) Secure the boot bands.

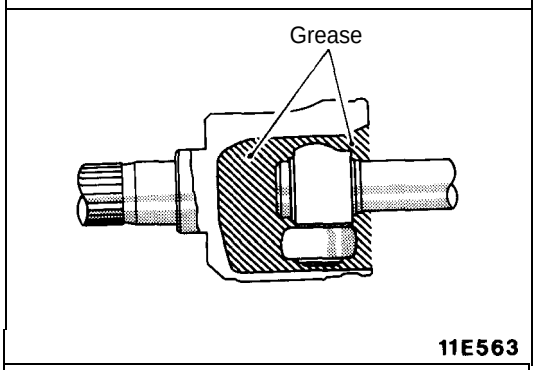
**Caution**
**The boot bands should be tightened with the drive shaft at a 0° joint angle.**


11E560

**5. APPLICATION OF GREASE TO SPIDER ASSEMBLY**

Apply the specified grease furnished in the repair kit to the spider assembly.

**Specified grease: Repair kit grease**



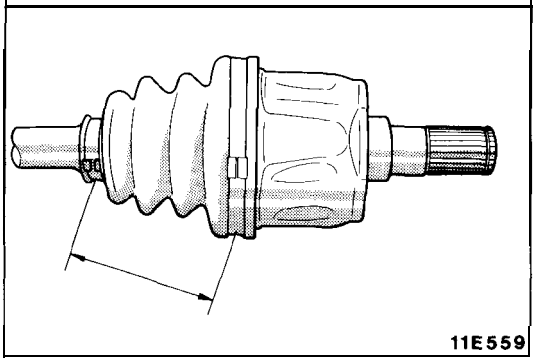
11E563

**3. APPLICATION OF GREASE TO T.J. CASE**

Fill the specified grease furnished in the repair kit to the T.J. case.

**Specified grease: Repair kit grease**
**105 g (3.7 oz.)*1, 120 g (4.2 oz.)*2**

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.
*1: <Vehicles with 1.8L engine>
*2: <Vehicles with 2.0L DOHC engine>


11E559

**2. INSTALLATION OF BOOT BAND (SMALL)/ 1. T.J. BOOT BAND**

Set the T.J. boot bands at the specified distance in order to adjust the amount of air inside the T.J. boot, and then tighten the T.J. boot band securely.

**Standard value:**

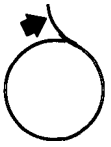
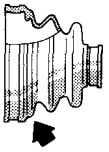
| | LH | RH |
|---|---|---|
| <1.8L> | 75±3 mm (2.95±.12 in.) | 85±3 mm (3.35±.12 in.) |
| <2.0L> | 80±3 mm (3.15±.12 in.) | 80±3 mm (3.15±.12 in.) |

# DRIVE SHAFT <AWD> N02QA-B

T.J.-B.J. type drive shaft is used. The left side drive shaft has an inner shaft and center bearing so that the left and right side drive shafts are same length.

## PARTS DISTINCTION

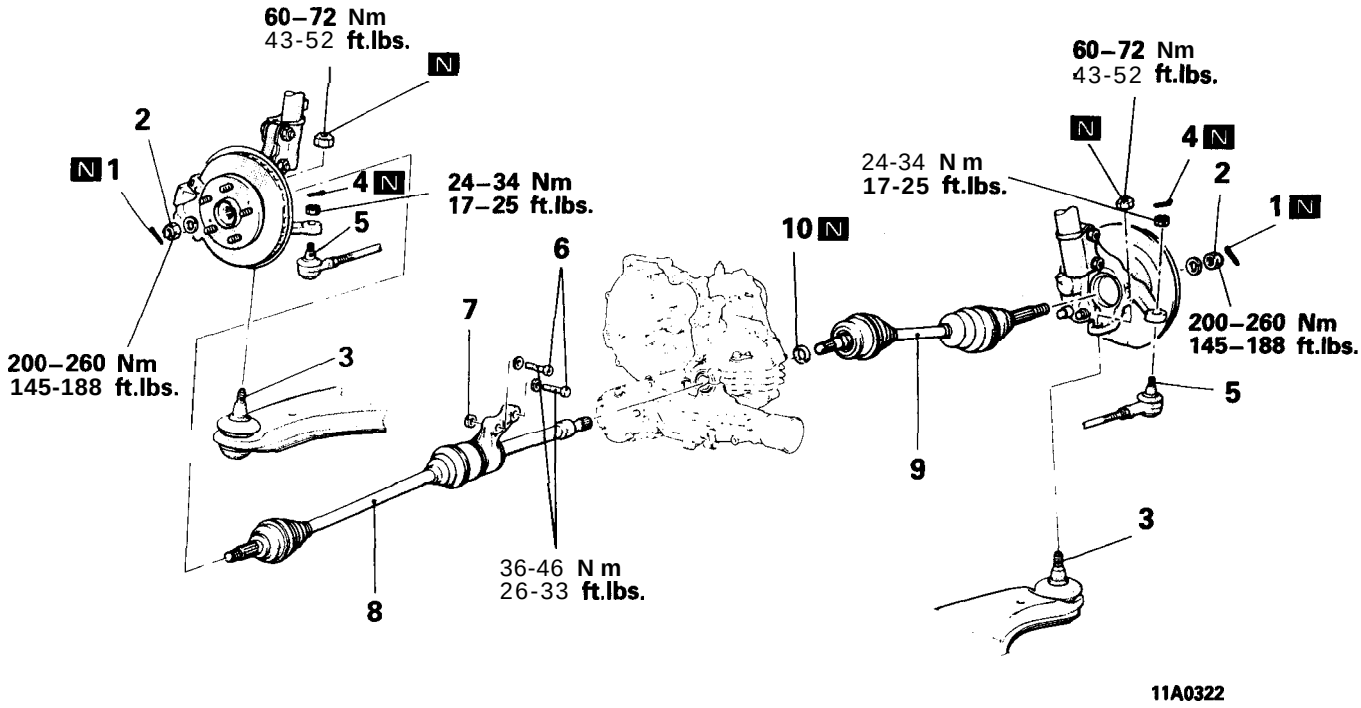
Boots and boot bands can be distinguished by the indicated part number as below.

| | T.J. boot band | T.J. boot | Boot band (small) | B.J. boot | B.J. boot band |
|---|---|---|---|---|---|
| Part shapes and part identification number location | Identification location  11K033 |  Identification location 11R0156 | Identification location  11K033 |  Identification location 11K033 | Identification location  11K033 |
| | 20–110 | 17-261 #TJ87 | 20–146 | 17–249#BJ87L | 20–1 1 3 |

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of the Under Cover

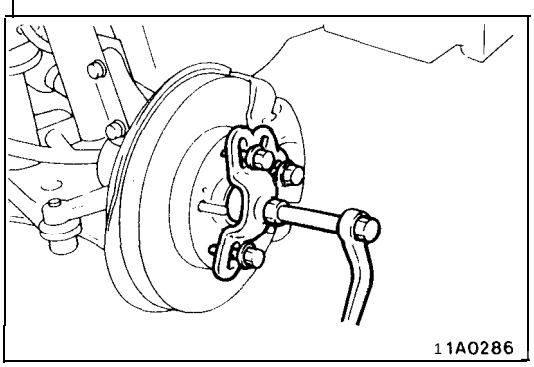
**Pre-installation Operation**
- installation of the Under Cover




**Removal steps**

1. Cotter pin
2. Drive shaft nut
3. Lower arm ball joint connection
4. Cotter pin
5. Tie rod end connection
6. Center bearing bracket installation bolt
7. Spacer (Vehicles without air conditioner)
8. Drive shaft and inner shaft assembly (L.H.)
9. Drive shaft (R.H.)
10. Circlip

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts



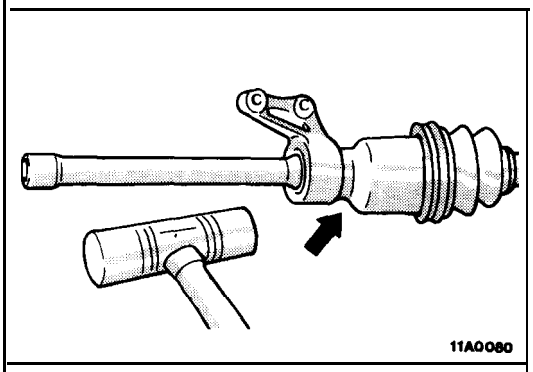

## SERVICE POINTS OF REMOVAL N02QBAT

**2. REMOVAL OF DRIVE SHAFT NUT/3. LOWER ARM BALL JOINT/5. TIE ROD END**

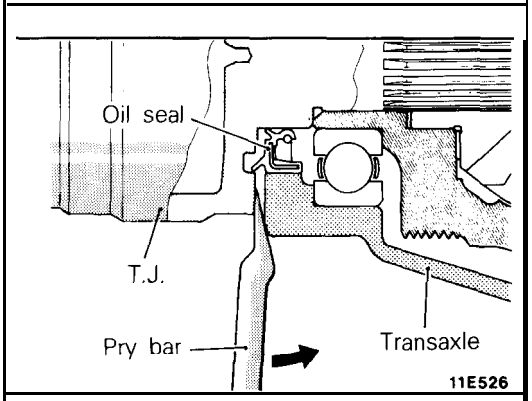
Refer to P.2-16.

**8. REMOVAL OF DRIVE SHAFT AND INNER SHAFT ASSEMBLY (L.H.)/9. DRIVE SHAFT (R.H.)**

(1) Use the suitable tools to push out the drive shaft and inner shaft assembly (L.H.) or the drive shaft (R.H.) from the front hub.


11A0080

(2) Remove the drive shaft and inner shaft assembly (L.H.) from the transaxle by lightly tapping the T.J. case with a plastic hammer, etc.



11E526

(3) The drive shaft (R.H.) is removed as described below.

<M/T>

Insert a pry bar between the transaxle case and the drive shaft, and then pry the drive shaft from the transaxle.

**Caution**

**1. Do not pull out the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.**

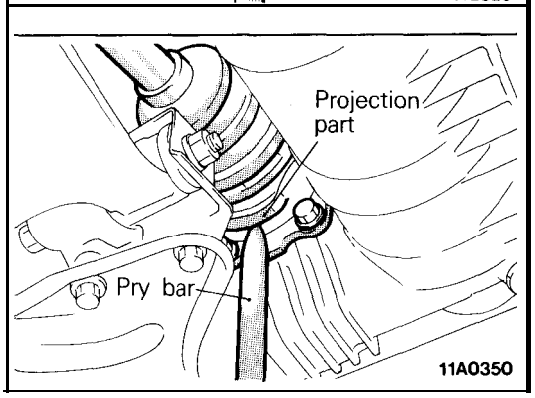
**2. Do not insert the pry bar so deep as to damage the oil seal.**

<A/T>

Insert a pry bar at the projection part and remove the drive shaft (R.H.) from the transaxle.

**Caution**

**Do not pull out the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.**



11A0350

## INSPECTION N02QCAE

- Check the drive shaft boot for damage or deterioration.
- Check the ball joints for wear or operating condition.
- Check the spline part for wear or damage.
- Check the operation of the center bearing.

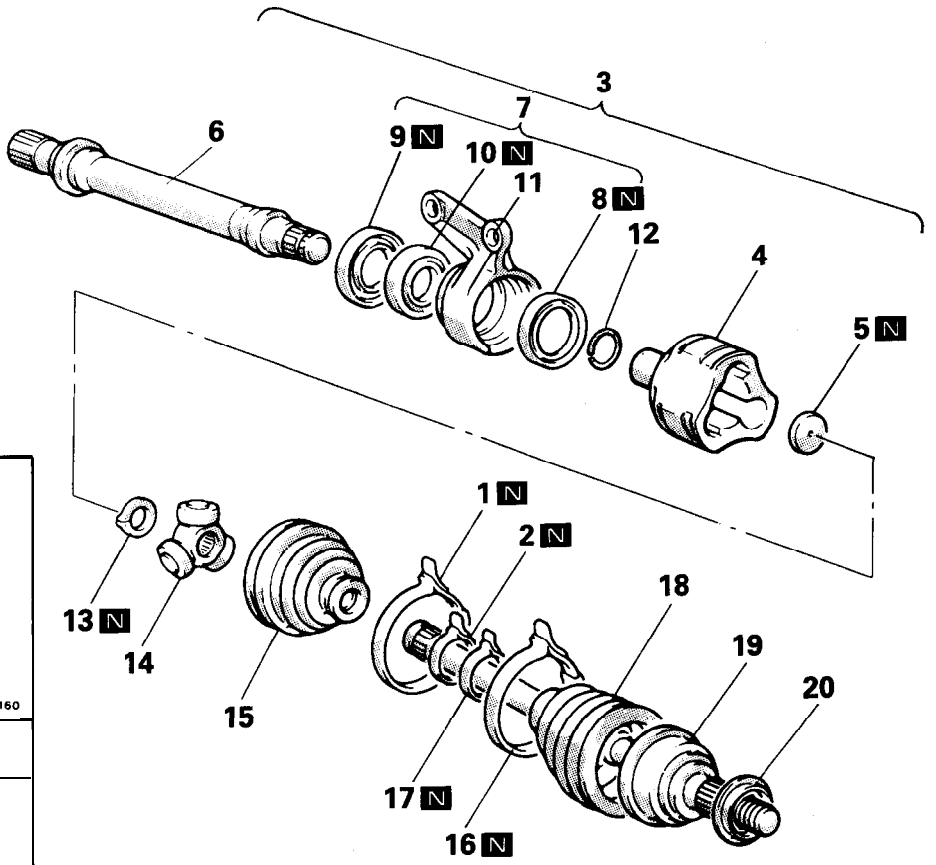
## SERVICE POINTS OF INSTALLATION N02QDAQ

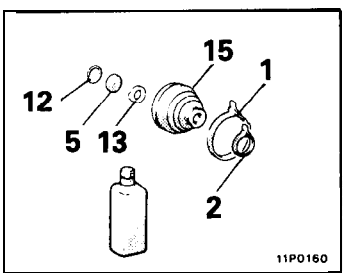
### 2. INSTALLATION OF DRIVE SHAFT NUT

Refer to P.2-17.

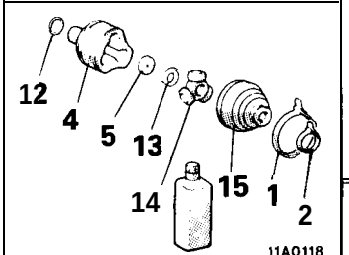
## DISASSEMBLY AND REASSEMBLY

N02QE-B

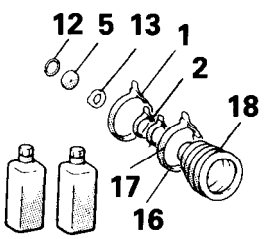


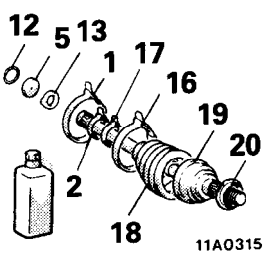

T.J. boot repair kit



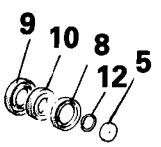

T.J. kit



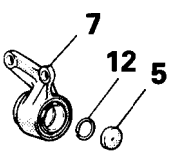

B.J. boot repair kit




B.J. kit




Bearing dust seal kit

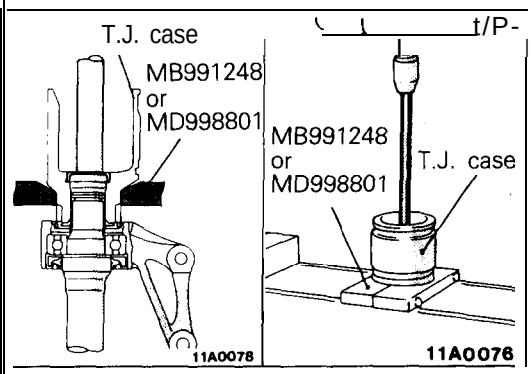



Bracket assembly kit

**Disassembly steps**

- ◆◆ 1. T.J. boot band
- ◆◆ 2. Boot band (small)
- ◆◆ 3. T.J. case and inner shaft assembly
- 4. T.J. case
- 5. Seal plate
- ◆◆ ◆◆ 6. Inner shaft
- 7. Bracket assembly
- ◆◆ 8. Outer dust seal
- ◆◆ 9. Inner dust seal
- ◆◆ ◆◆ 10. Center bearing
- 11. Center bearing bracket
- 12. Circlip
- ◆◆ 13. Snap ring
- ◆◆ ◆◆ 14. Spider assembly
- ◆◆ ● 4 15. T.J. boot
- 16. B.J. boot band
- 17. Boot band (small)
- ◆◆ ● 4 18. B.J. boot
- 19. B.J. assembly
- 20. Dust cover

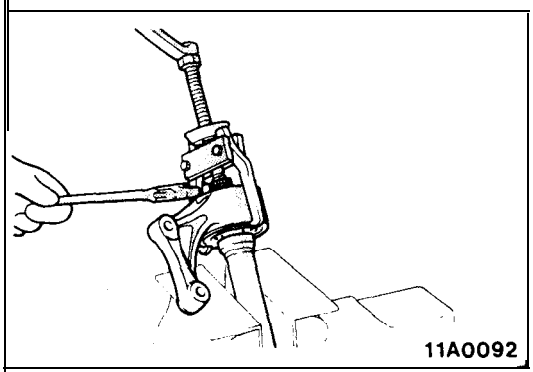
NOTE
(1) Reverse the disassembly procedures to reassembly.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



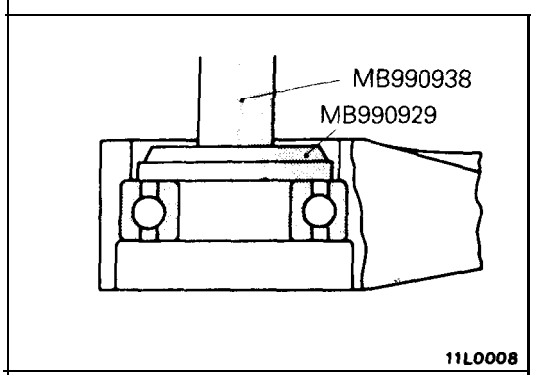

## SERVICE POINTS OF DISASSEMBLY N02QFED

### 6. REMOVAL OF INNER SHAFT

(1) Using the special tool, remove the inner shaft assembly, together with the seal plate, from the T.J. case.

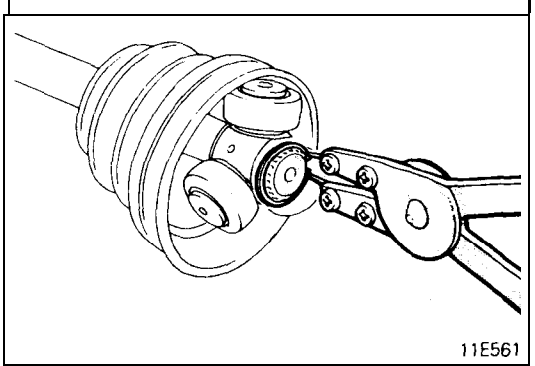



(2) Use the suitable puller to remove the inner shaft from the center bearing bracket.




### 10. REMOVAL OF CENTER BEARING

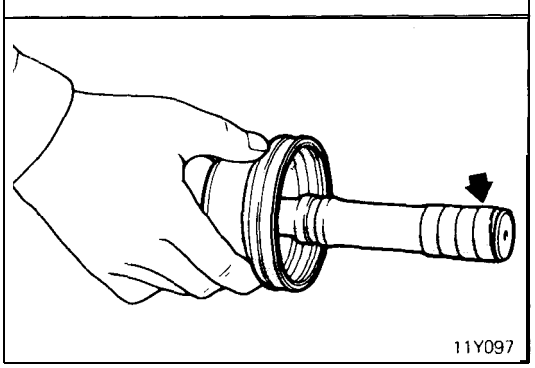
Use the special tools to remove the center bearing from the center bearing bracket.




### 13. REMOVAL OF SNAP RING / 14. SPIDER ASSEMBLY

(1) Remove the snap ring from the drive shaft with the snap ring pliers.
(2) Take out the spider assembly from the drive shaft.
(3) Clean the spider assembly.

**Caution**
**1. Do not disassemble the spider assembly.**
**2. If the T.J. of the drive shaft assembly is bent, the joint may be damaged. Use care in handling the drive shaft.**
**3. The drive shaft joint use special grease. Do not add another type of grease.**



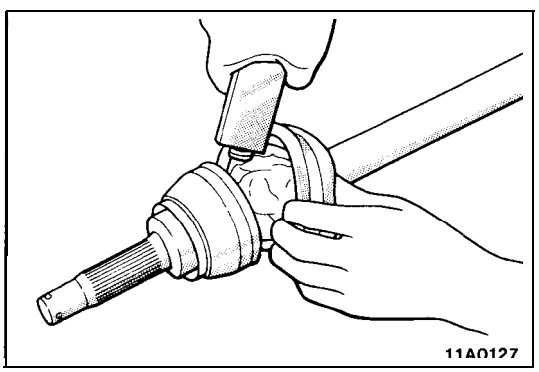

### 15. REMOVAL OF T.J. BOOT / 18. B.J. BOOT

(1) Wrap vinyl tape around the spline part on the T.J. side of the drive shaft so that the T.J. and B.J. boots are not damaged when they are removed.
(2) Withdraw the T.J. and B.J. boots from the drive shaft.

**Caution**
**Do not disassemble the B.J.**
**Distinguish between B.J. boot and T.J. boot parts.**

## INSPECTION N02QGEB

- Check the drive shaft for damage, bending or corrosion.
- Check the inner shaft for damage, bending or corrosion.
- Check the drive shaft spline part for wear or damage.
- Check the inner shaft spline for wear or damage.
- Check for entry of water and/or foreign material into B.J..
- Check the spider assembly for roller rotation, wear or corrosion.
- Check the groove inside T.J. case for wear of corrosion.
- Check the boots for deterioration, damage or cracking.
- Check the center bearing for seizure, discoloration or roughness of rolling surface.
- Check the dust cover for damage or deterioration.




## SERVICE POINTS OF REASSEMBLY N02QHEEa

### 18. INSTALLATION OF B.J. BOOT/15. T.J. BOOT

(1) Wrap vinyl tape around the spline part on the drive shaft, and then install the B.J. boot and T.J. boot, in that order.

**Caution**
**Distinguish between B.J. boot and T.J. boot parts according to the section "Parts Distinction", and be sure to assemble them correctly.**

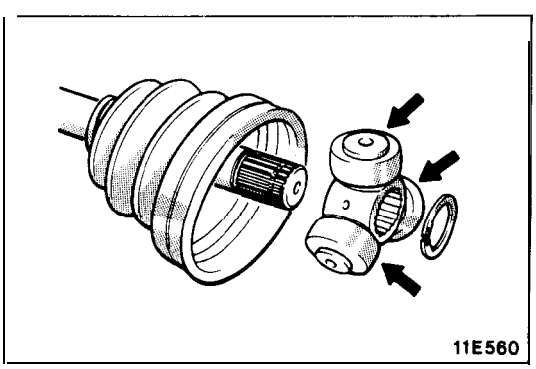
(2) Fill the inside of the B.J. and B.J. boot with the specified grease.

**Specified grease: Repair kit grease 95 g (3.4 oz.)**

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.

(3) Secure the boot bands.

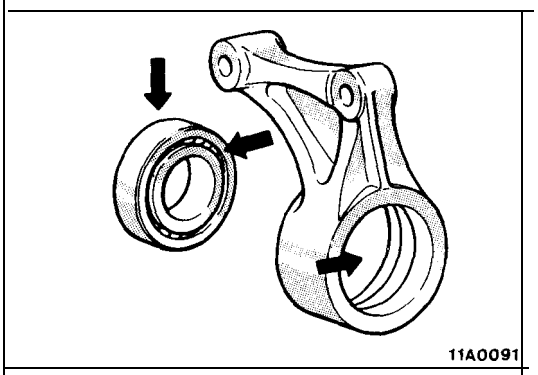
**Caution**
**The boot bands should be tightened with the drive shaft at a 0° break angle.**




### 14. APPLICATION OF GREASE TO SPIDER ASSEMBLY

Apply the specified grease furnished in the repair kit to the spider assembly.

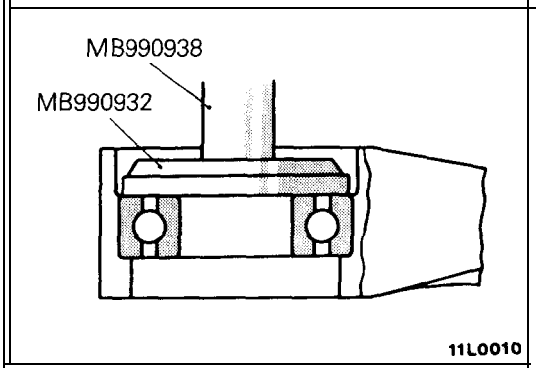
**Specified grease: Repair kit grease**



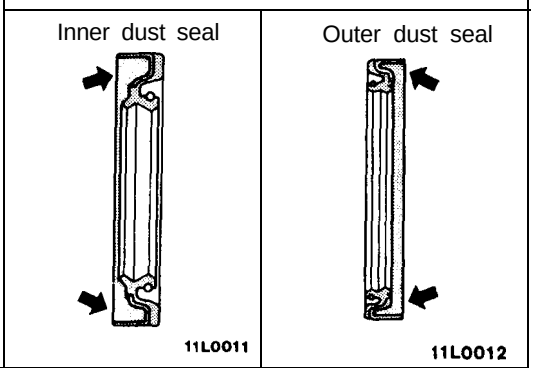

**10. INSTALLATION OF CENTER BEARING**

(1) Apply multipurpose grease to the center bearing and inside the center bearing bracket.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**



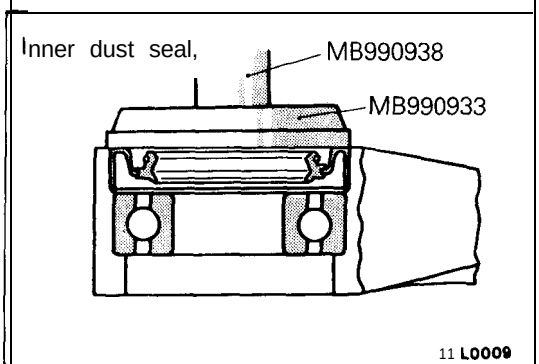

(2) Use the special tools to press-fit the center bearing into the center bearing bracket.




**9./8. INSTALLATION OF DUST SEALS**

(1) Apply multipurpose grease to the rear surfaces of all dust seals.

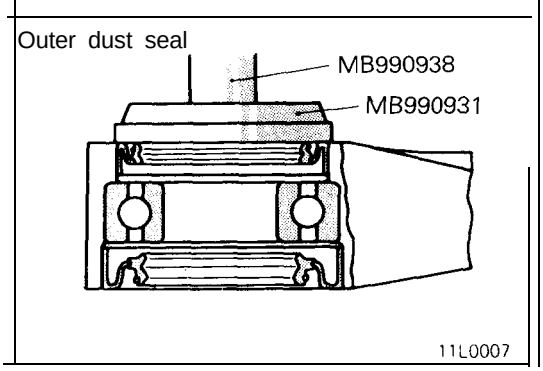
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**
**Inner dust seal 7–10 g (.25–.35 oz)**
**Outer dust seal 4 - 6 g (.14–.21 oz)**



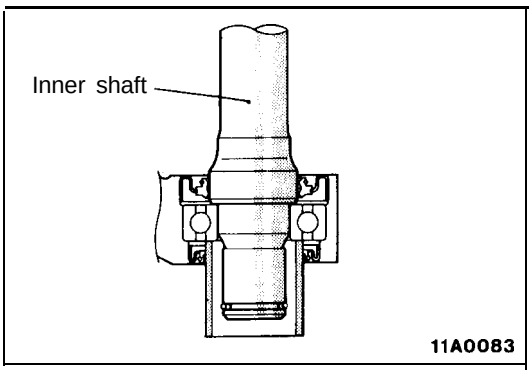

(2) Use the special tools to install the dust seal so that its surface runs even with that of the center bearing bracket.

(3) Apply multipurpose grease to the lip of each dust seal.

Grease: MOPAR **Multi-mileage** Lubricant
**Part No. 2525035 or equivalent**

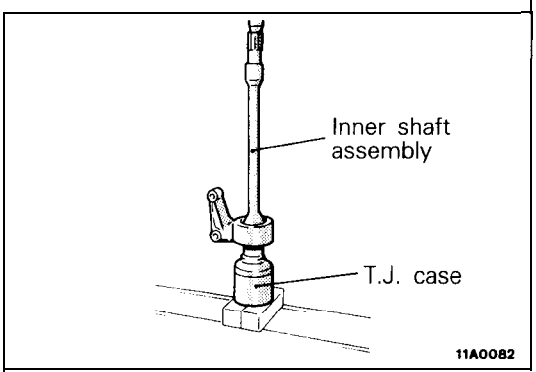



NOTE
When applying grease, make sure that it does not adhere to anything outside the lip.




**6. INSTALLATION OF INNER SHAFT**

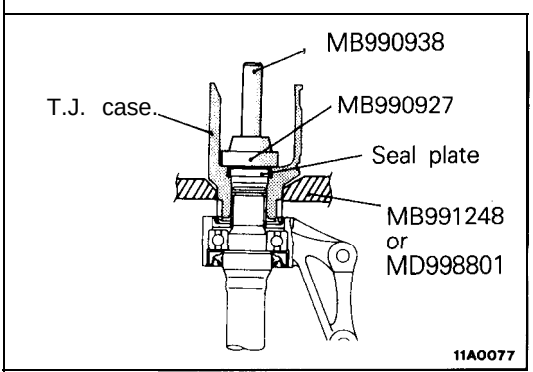
Use a pipe to hold the inner race of the center bearing and force the inner shaft into place.



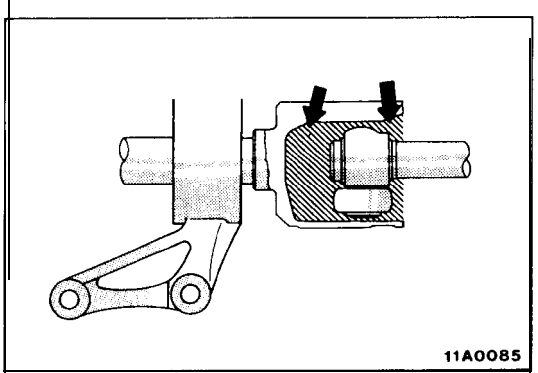

**3. INSTALLATION OF T.J. CASE AND INNER SHAFT ASSEMBLY**

(1) Apply multipurpose grease to the inner shaft spline, then press fit it into the T.J. case.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**




(2) Using the special tools, press the seal plate into the T.J. case.

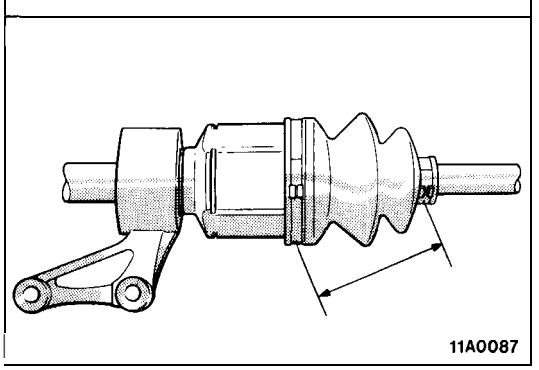



(3) Fill the specified grease furnished in the repair kit to the T.J. case.

**Specified grease: Repair kit grease 105 g (3.7 oz.)**

NOTE
The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.

**Caution**
**The drive shaft joint use special grease. Do not add another type of grease.**



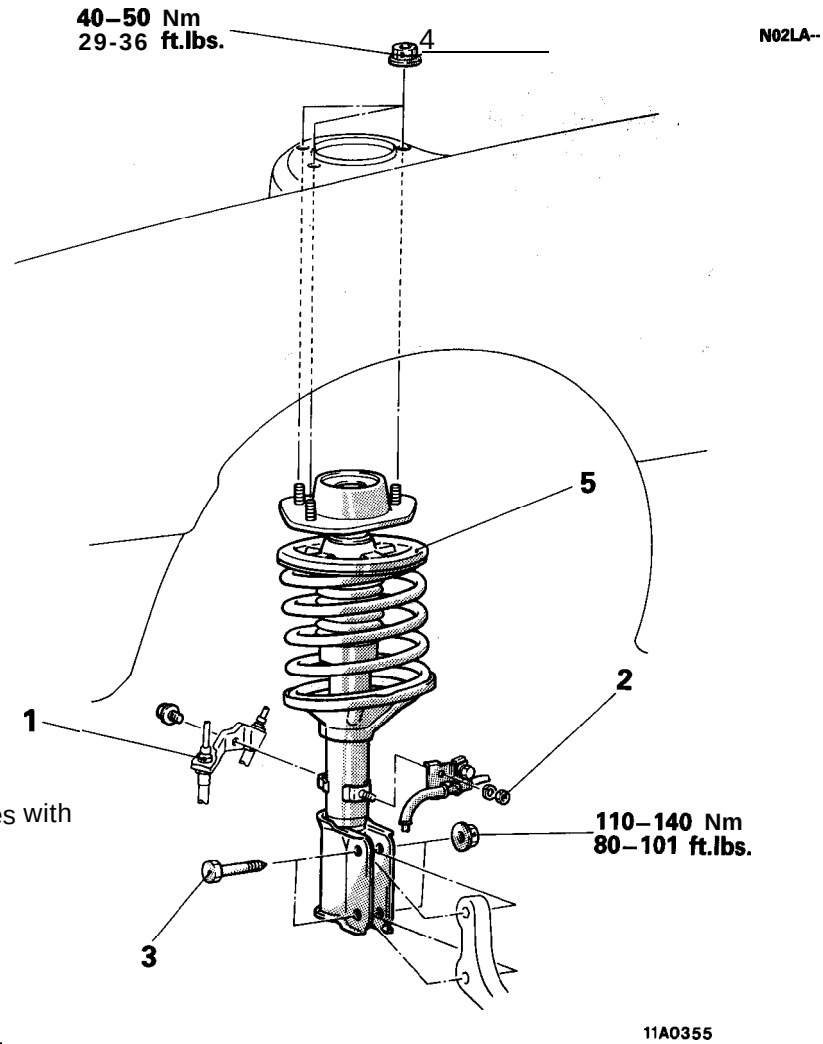

**2. INSTALLATION OF BOOT BAND (SMALL)/ 1. T.J. BOOT BAND**

Set the T.J. boot bands at the specified distance in order to adjust the amount of air inside the T.J. boot, and then tighten the T.J. boot band securely.

**Standard value: 85 ± 3 mm (3.35 ± .12 in.)**

# STRUT ASSEMBLY

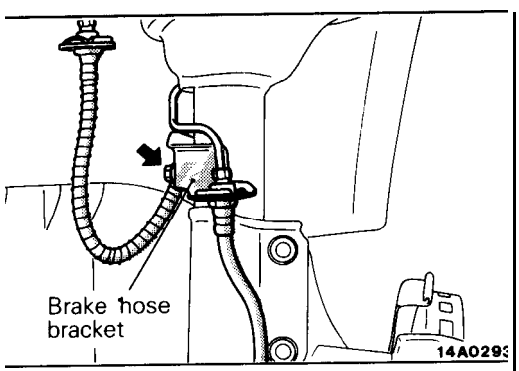
## REMOVAL AND INSTALLATION

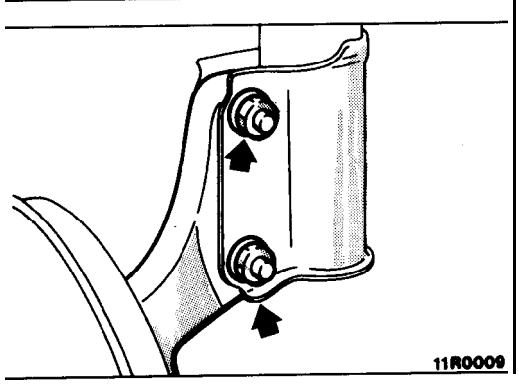



**Removal steps**

◆◆ 1. Brake hose and tube bracket
2. Front speed sensor cramp <Vehicles with A B S>
◆◆ 3. Strut lower mounting bolt
4. Strut upper mounting nut
◆◆ 5. Strut assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4: Refer to "Service Points of Installation".




## SERVICE POINTS OF REMOVAL N02LBAF

### 1. REMOVAL OF BRAKE HOSE AND TUBE BRACKET

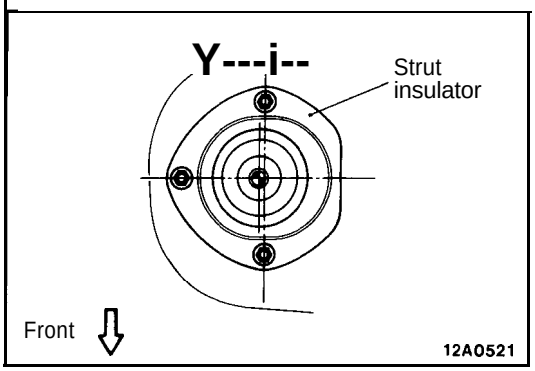
Do not pry the brake hose and tube clamp away when removing it.

### 3. REMOVAL OF STRUT LOWER MOUNTING BOLT

After the union between the strut and the knuckle has been removed, jack up the lower arm, attaching the brake hose, tube and drive shaft to the knuckle with wire so that they will not be pulled on.

## INSPECTION N02LCAB

- Check for oil leaks from the strut assembly.
- Check the strut assembly shock absorber for damage or deformation.



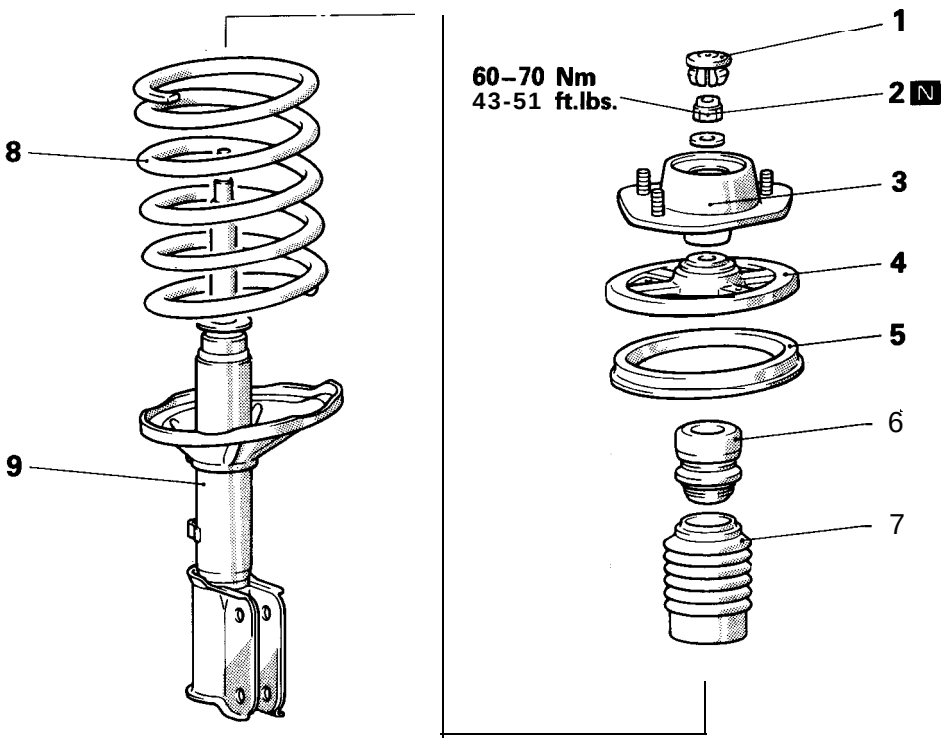

## SERVICE POINTS OF INSTALLATION N02LDAG

### 5. INSTALLATION OF STRUT ASSEMBLY

Install the strut assembly so that the strut insulator faces in the direction indicated in the illustration.

NOTE
Be sure to confirm that the direction is correct, because there will be a deviation of the wheel alignment if it is not.

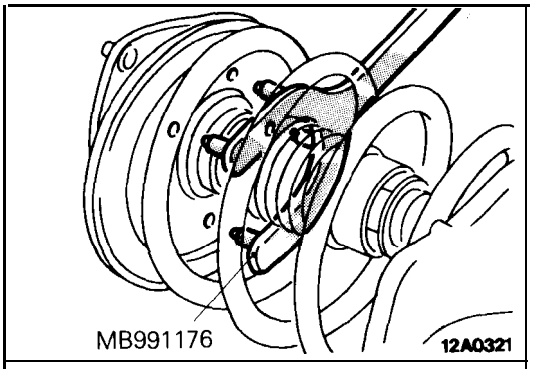
## DISASSEMBLY AND REASSEMBLY N02LE--

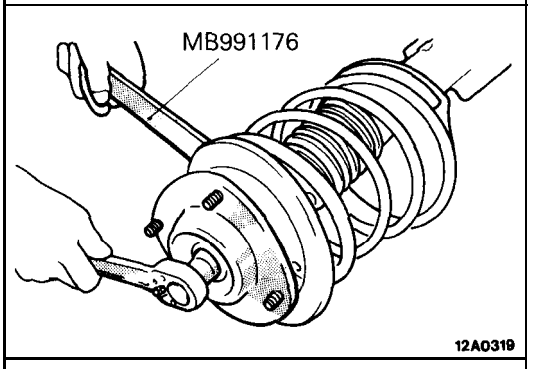


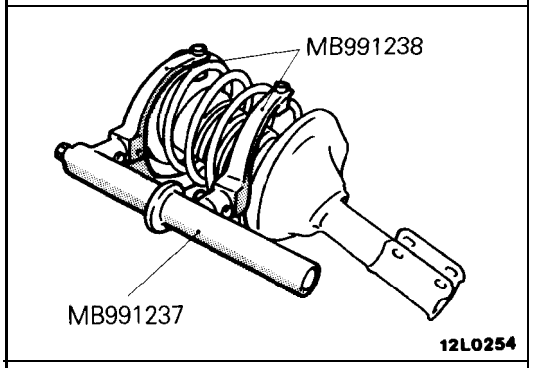

**Disassembly steps**

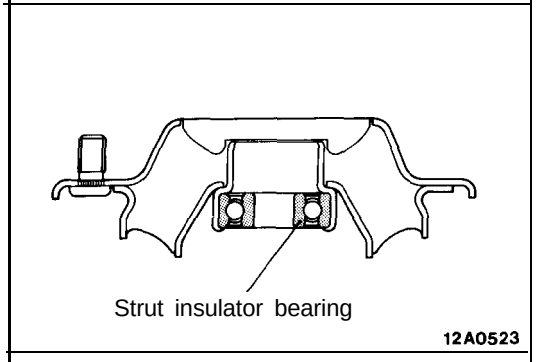
1. Dust cover
◆◆ ◆◆ 2. Self-locking nut
3. Strut insulator
● * 4. Spring seat, upper
5. Spring pad, upper
● + 6. Bump rubber
● + 7. Dust cover
8. Coil spring
9. Strut assembly

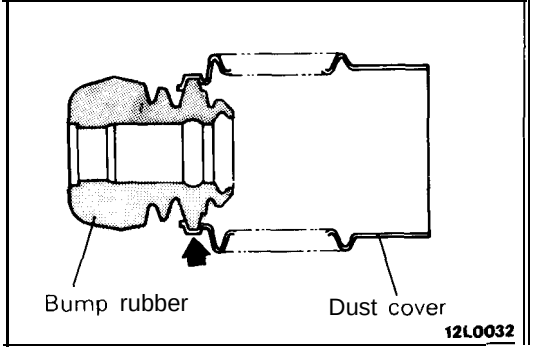
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly"
(3) ◆◆: Refer to "Service Points of Reassembly"
(4) N: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N02LFAI

### 2. REMOVAL OF SELF-LOCKING NUT

(1) Holding the spring upper seat with the special tool, loosen the self-locking nut.

**Caution**
**The self-locking nut should be loosened only, not removed.**

(2) Using the special tools, compress the coil spring, and then remove the self-locking nut.

NOTE
Install the special tools evenly, and so that the maximum length will be attained within the installation range.

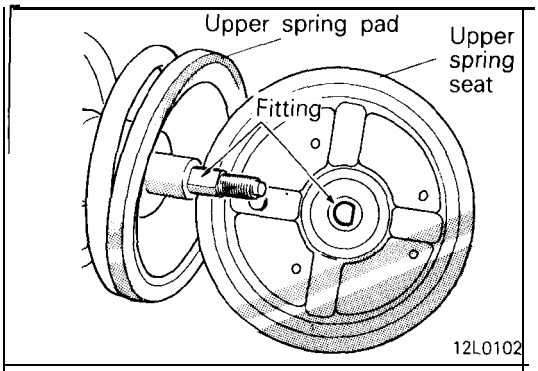
## INSPECTION N02LGAE

- Check the strut insulator bearing for wear or rust.
- Check the rubber parts for damage or deterioration.
- Check the spring for deformation, deterioration or damage.
- Check the shock absorber for deformation.

## SERVICE POINTS OF REASSEMBLY N02LHAK

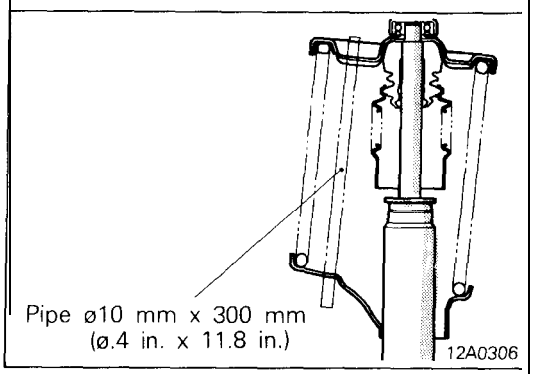
### 7. INSTALLATION OF DUST COVER/G. BUMP RUBBER

Join the dust cover and bump rubber.



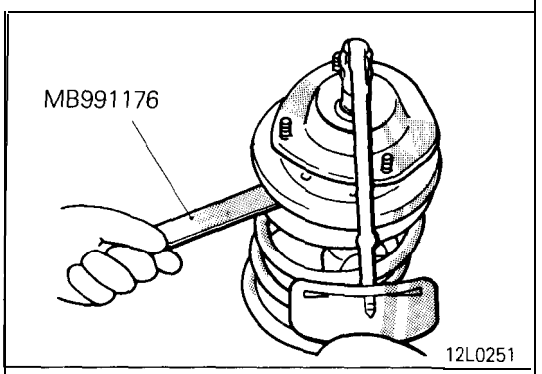

**4. INSTALLATION OF SPRING UPPER SEAT ASSEMBLY**

(1) Assemble the spring upper seat to the piston rod, fitting the notch in the rod to the shaped hole in spring seat.



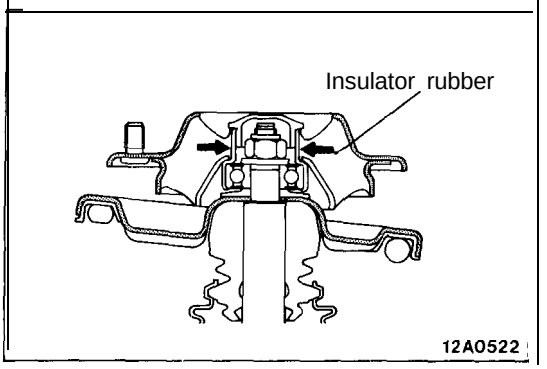

(2) Line up the holes in the strut assembly spring lower seat with the hole in the spring upper seat.

NOTE
The job is easily accomplished with a pipe [ø10 mm x 300 mm (0.4 in. x11.8 in.)].




**2. INSTALLATON OF SELF-LOCKING NUT**

(1) With the coil spring held compressed by the special tools (MB991 237 and MB991238), provisionally tighten the self-locking nut.
(2) Correctly align both ends of the coil spring with the grooves in the spring seat, and then loosen the special tools (MB991237 and MB991 238).
(3) Using the special tool, tighten the strut insulator at the specified torque.




(4) Apply multipurpose grease to the bearing part of the strut, insulator, and install the insulator cap.

**Grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

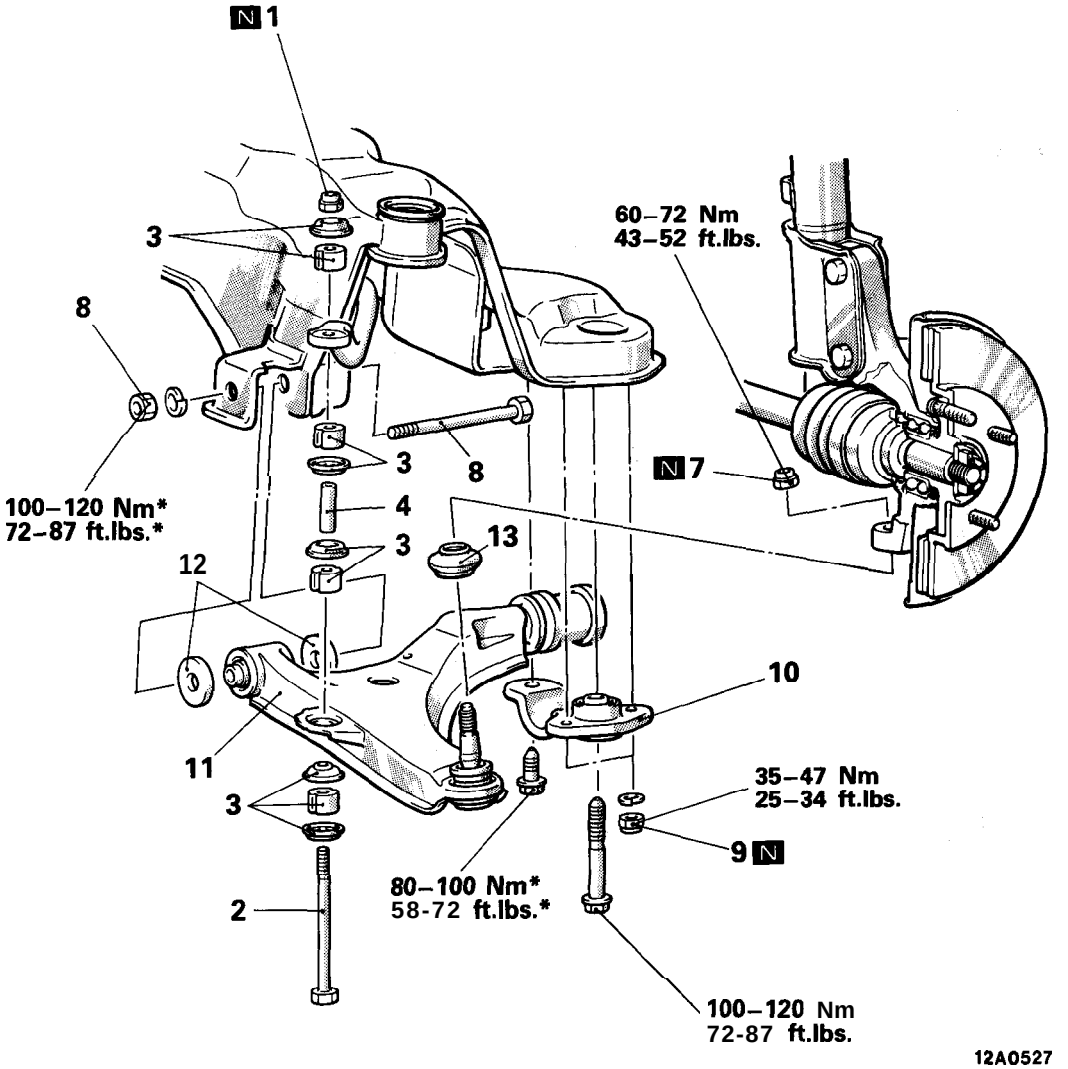
**Caution**
**When applying the grease, take care that grease does not adhere to the insulator's rubber part.**

# LOWER ARM

## REMOVAL AND INSTALLATION

N02NA--

**<Models equipped with the rubber bushing type of stabilizer>**



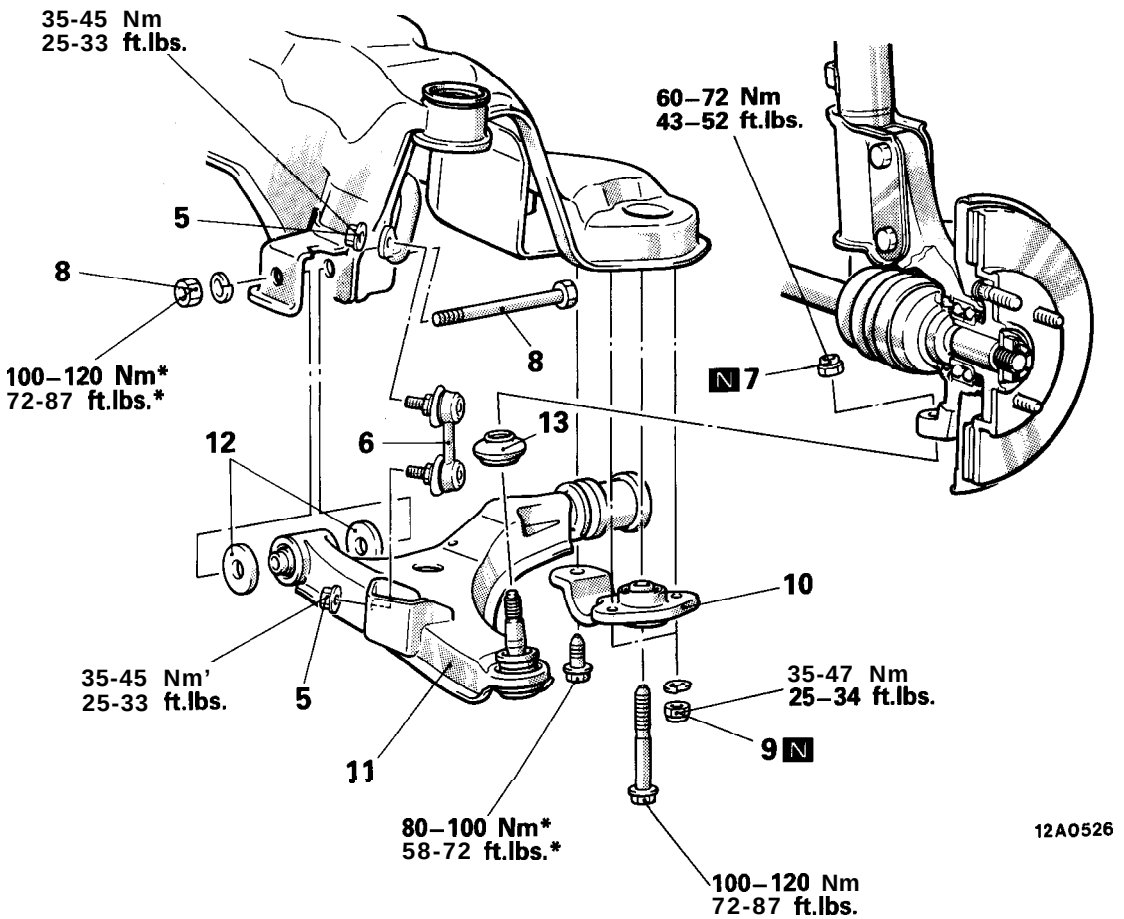

12A0527

**Removal step**

- ◆◆ 1. Stabilizer bar mounting nut
- 2. Stabilizer bar mounting bolt
- 3. Joint cups and bushing
- 4. Collar
- ◆◆ 7. Self-locking nut
- 8. Lower arm mounting nut and bolt
- 9. Self-locking nut
- 10. Clamp
- 11. Lower arm
- 12. Stopper
- 13. Ball joint dust cover

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) *: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

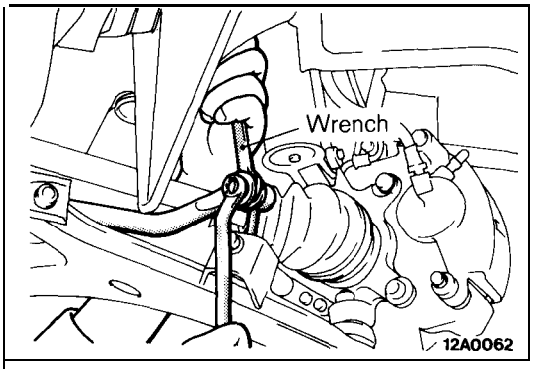
**<Models equipped with the pillow-ball type of stabilizer>**




**Removal step**

◆◆ ● 4 5. Stabilizer link mounting nut
6. Stabilizer link
● ☒ 7. Self-locking nut
8. Lower arm mounting nut and bolt
9. Self-locking nut
10. Clamp
11. Lower arm
12. Stopper
13. Ball joint dust cover

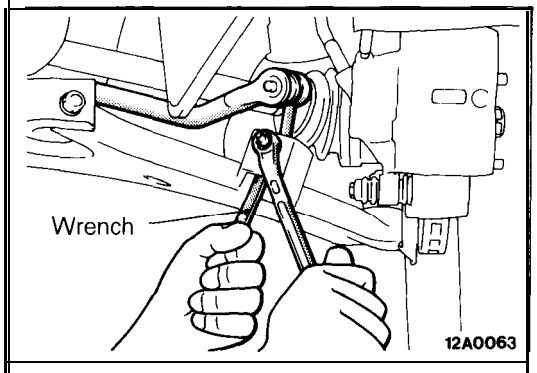
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.




## SERVICE POINTS OF REMOVAL N02NBAL

### 5. REMOVAL OF STABILIZER LINK MOUNTING NUTS

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, remove the mounting nuts.



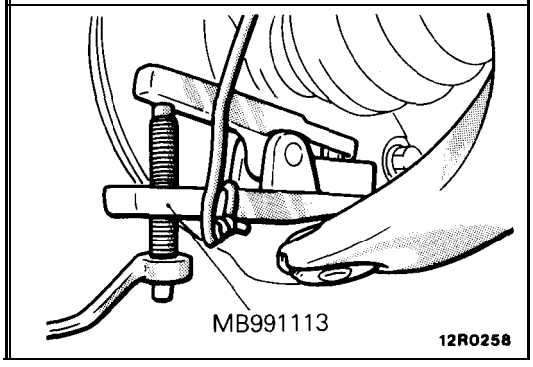

### 7. REMOVAL OF SELF-LOCKING NUT

Using the special tool, disconnect the lower arm ball joint from the knuckle.

**Caution**

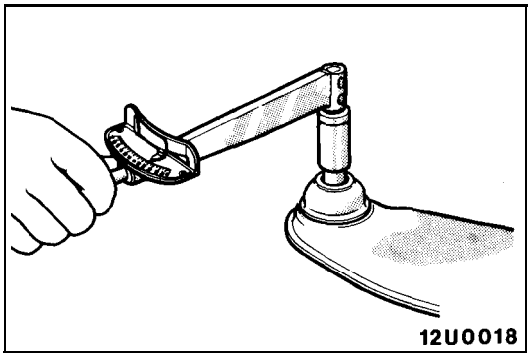
**1. Be sure to tie the cord of the special tool to the nearby part.**

**2. Loosen the nut but do not remove it.**




## INSPECTION N02NCAE

- Check the bushing for wear and deterioration.
- Check the lower arm for bend or breakage.
- Check the clamp for deterioration or damage.
- Check the ball joint dust cover for cracks.
- Check all bolts for condition and straightness.




### CHECKING OF BALL JOINT FOR STARTING TORQUE

(1) If a crack is noted in the dust cover, replace it, adding grease.

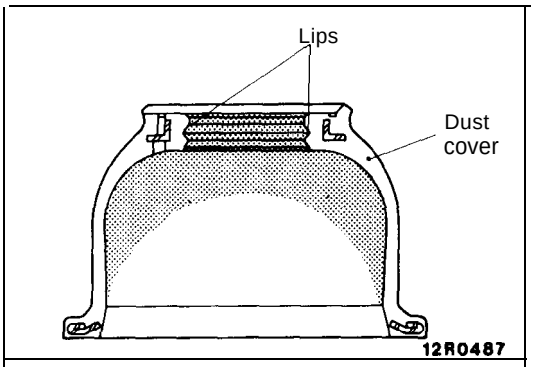
(2) Deflect side to side the ball joint stud several times.

(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

**Standard value: 3–10 Nm (26-87 in.lbs.)**

(4) If the starting torque exceeds the upper limit of standard value, replace the lower arm assembly.

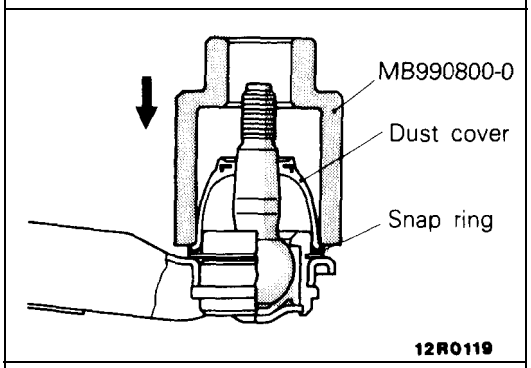
(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.




## BALL JOINT DUST COVER REPLACEMENT N02NEAF

(1) Remove the dust cover.
(2) Apply multipurpose grease to the lip and inside of the dust cover.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

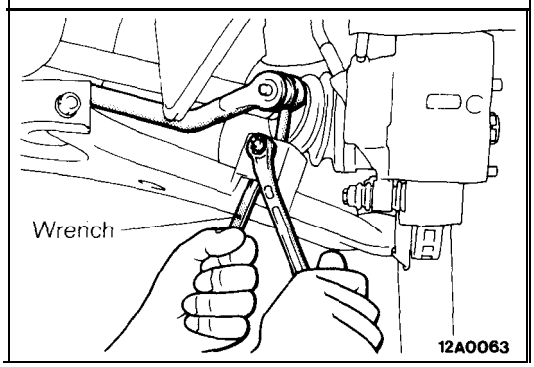


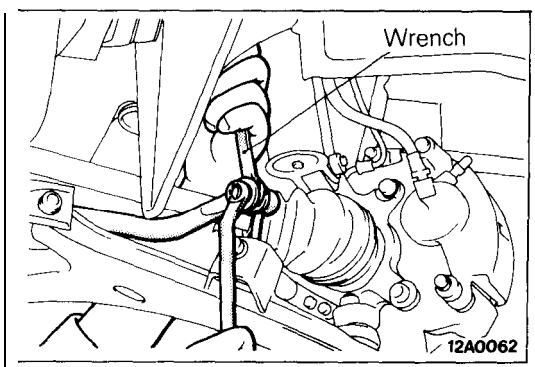

(3) Drive in the dust cover with special tool until it is fully seated.

## SERVICE POINTS OF INSTALLATION N02NFAL

### 5. INSTALLATION OF STABILIZER LINK MOUNTING NUTS

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, tighten the mounting nuts.



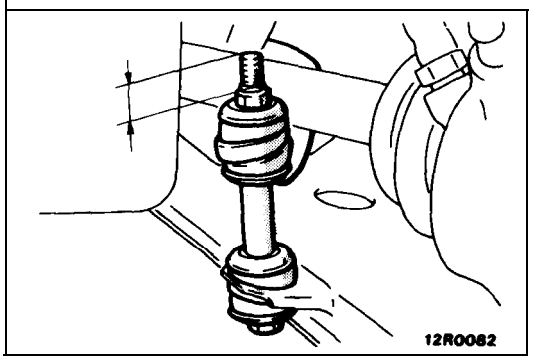




### 1. INSTALLATION OF STABILIZER BAR MOUNTING NUT

Tighten the nut on the stabilizer bar bolt to the specified distance.

**Standard value:**

| | |
|---|---|
| **Protruding length of stabilizer bar mounting bolt** | **16-18 mm (.63–.70 in.)** |

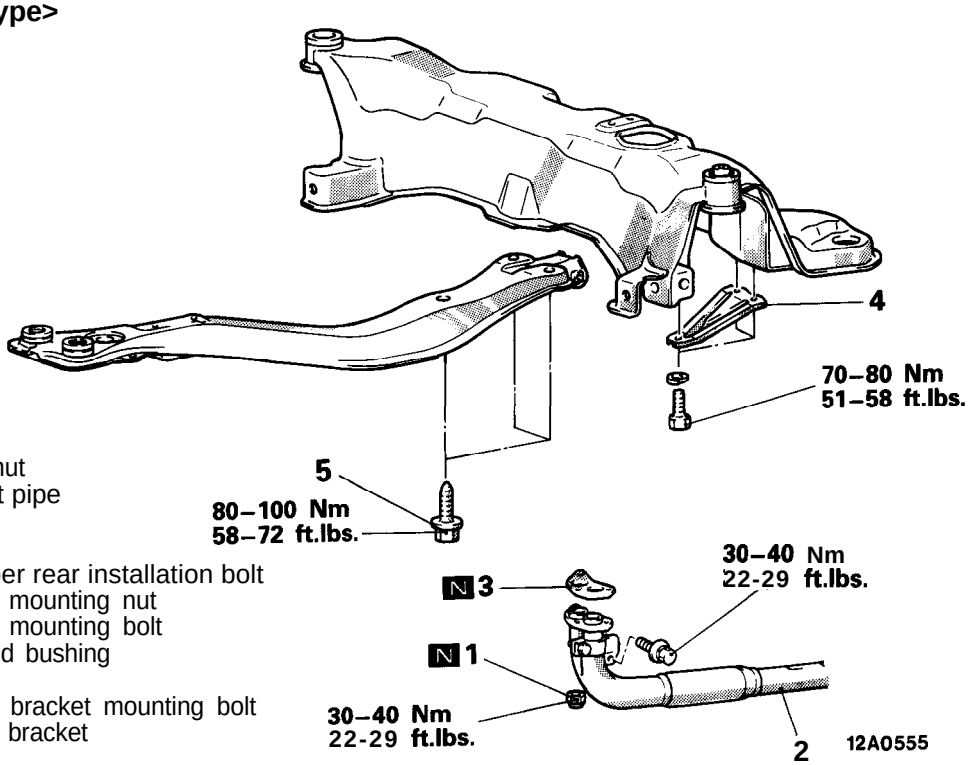


# STABILIZER BAR <FWD>

## REMOVAL AND INSTALLATION

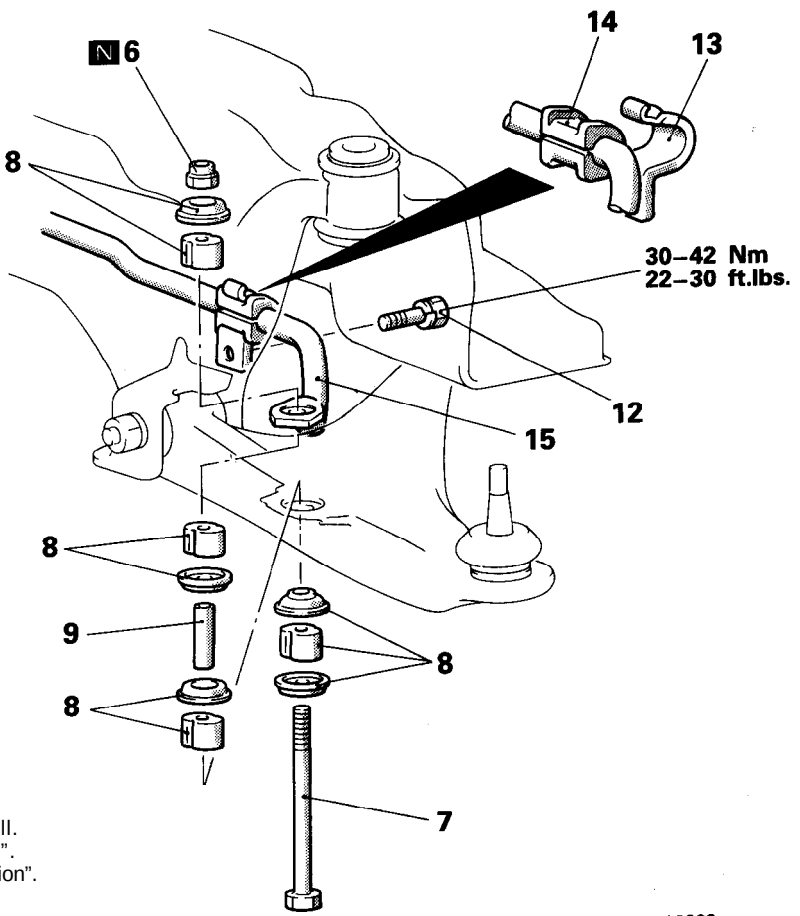
N02TA-A

**<Rubber bushing type>**



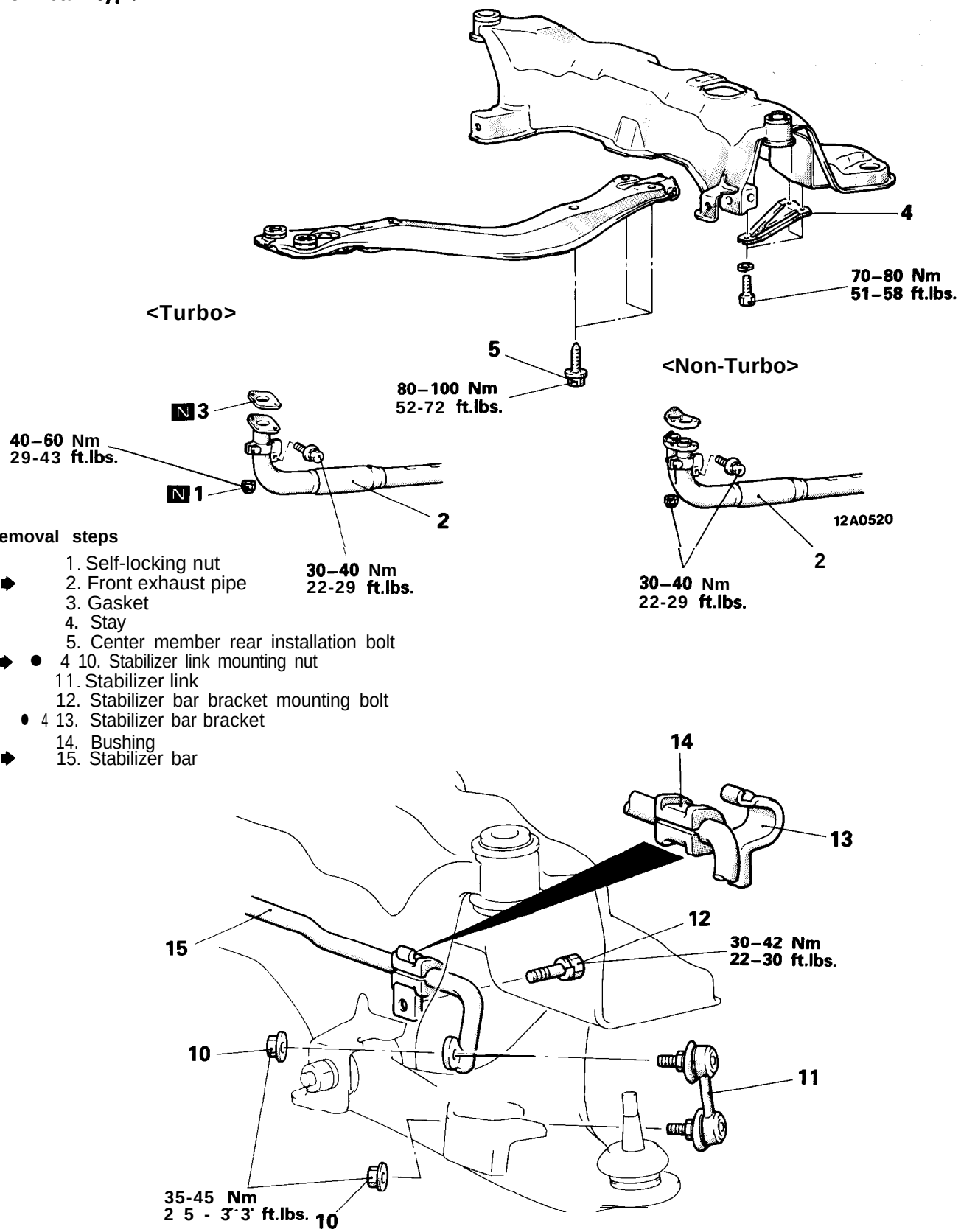

**Removal steps**

- 1. Self-locking nut
- ◆◆ 2. Front exhaust pipe
- 3. Gasket
- 4. Stay
- 5. Center member rear installation bolt
- ● 4 6. Stabilizer bar mounting nut
- 7. Stabilizer bar mounting bolt
- 8. Joint cups and bushing
- 9. Collar
- 12. Stabilizer bar bracket mounting bolt
- ●▯ 13. Stabilizer bar bracket
- 14. Bushing
- ◆◆ 15. Stabilizer bar




NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4: Refer to "Service Points of Installation".
(4) ❑ : Non-reusable parts

<Pillow-ball type>

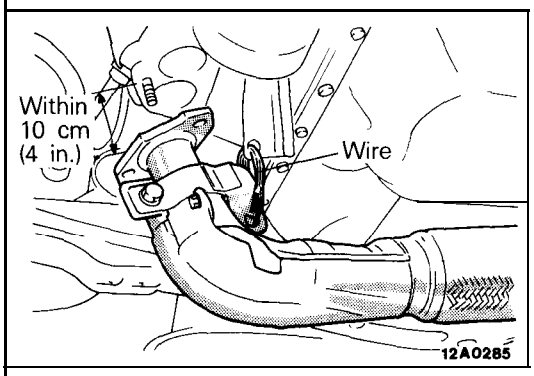



**Removal steps**

1. Self-locking nut
◆◆ 2. Front exhaust pipe
3. Gasket
4. Stay
5. Center member rear installation bolt
◆◆ ● 4 10. Stabilizer link mounting nut
11. Stabilizer link
12. Stabilizer bar bracket mounting bolt
● 4 13. Stabilizer bar bracket
14. Bushing
◆◆ 15. Stabilizer bar

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation"
(4) N: Non-reusable parts

12A0228

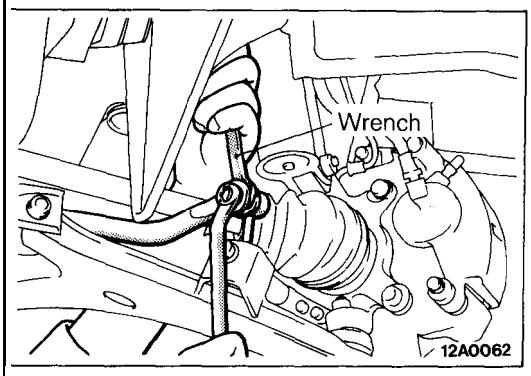



## SERVICE POINTS OF REMOVAL N02TBAFa

### 2. REMOVAL OF FRONT EXHAUST PIPE

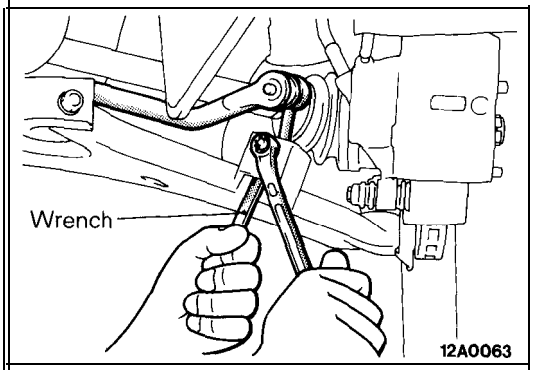
After disconnection of the front exhaust pipe assembly and the exhaust manifold, use wire, etc. to hang the front exhaust pipe down.

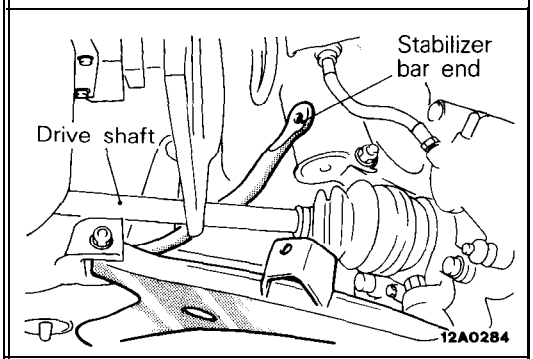
**Caution**
**There is danger of damage to the interior if the flexible joint is bent very much. Do not bend it more than shown in the figure.**




### 10. REMOVAL OF STABILIZER LINK MOUNTING NUT

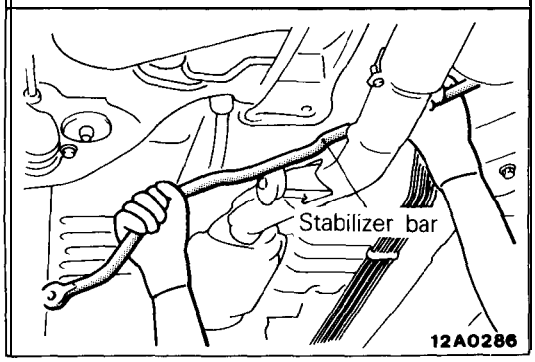
Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, remove the mounting nuts.




### 15. REMOVAL OF STABILIZER BAR

(1) Pull out both ends of the stabilizer bar to the rear of the drive shaft.




(2) Move the right stabilizer bar until the end of the stabilizer bar clears the lower arm.
(3) With the end that has cleared the lower arm, pull out the stabilizer bar diagonally.

## INSPECTION

N02TCAF

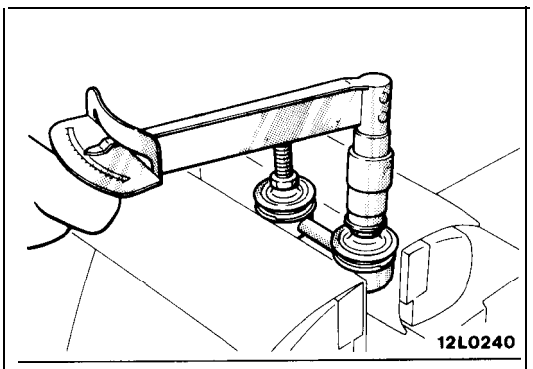
- Check the bushing for wear and deterioration.
- Check the stabilizer bar for deterioration or damage.
- Check the stabilizer link ball joint dust cover for cracks.
- Check all bolts for condition and straightness.

**CHECKING OF STABILIZER LINK BALL JOINT FOR STARTING TORQUE**

(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Deflect side to side the stabilizer link ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

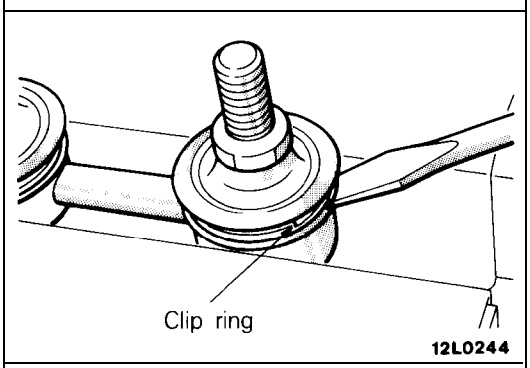
**Standard value: 1.7-3.2 Nm (15-28 in.lbs.)**

(4) If the starting torque exceeds the upper limit of standard value, replace the stabilizer link.
(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.



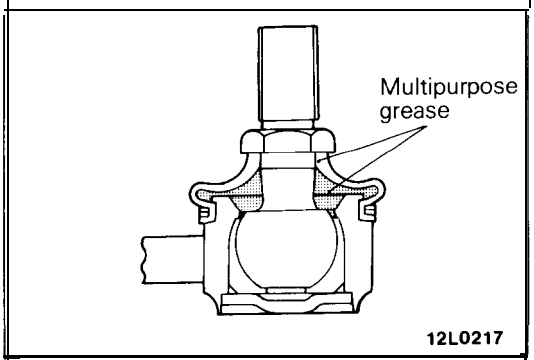

## BALL JOINT DUST COVER REPLACEMENT

(1) Remove the clip ring and the dust cover.

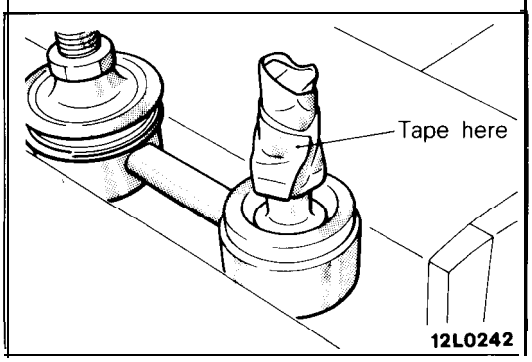


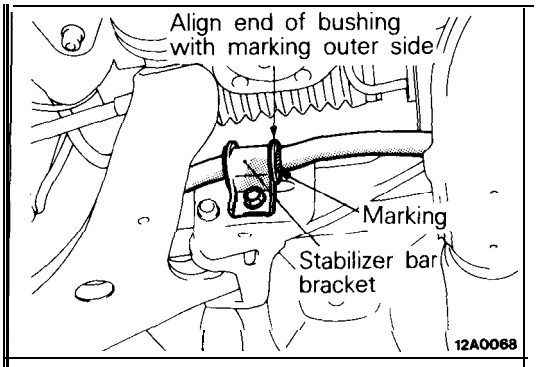

(2) Apply multipurpose grease to the lip and inside of the dust cover.

**Grease: MOPAR Multi-mileage Lubricant PART No. 2525035 or equivalent**




**(3)** Use vinyl tape to tape the stabilizer link where shown in the illustration, and then install the dust cover to the stabilizer link.
(4) Secure the dust cover by the clip link.

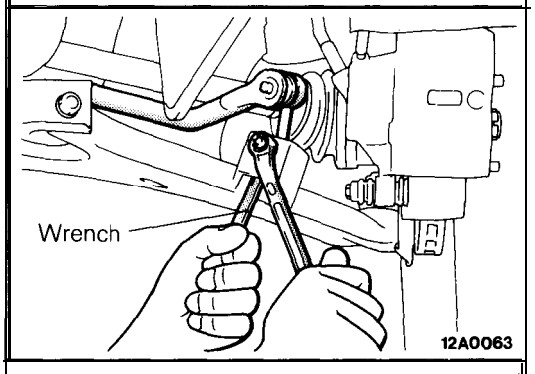





## SERVICE POINTS OF INSTALLATION N02TDAK

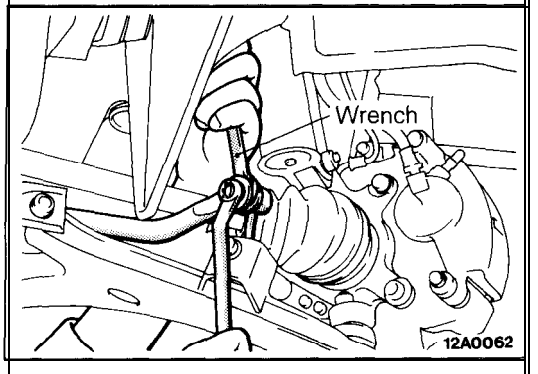
### 13. INSTALLATION OF STABILIZER BAR BRACKET

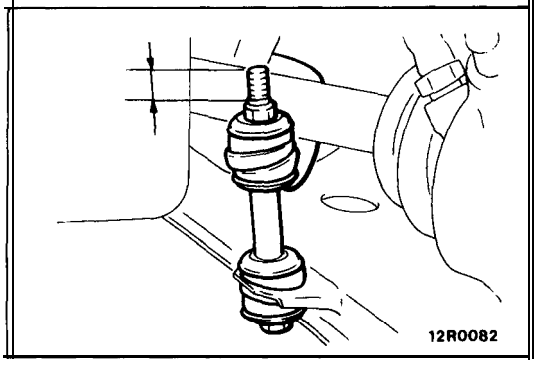
(1) Temporarily tighten the stabilizer bar bracket.
(2) Align the bushing end with the marked part of the stabilizer bar, and then fully tighten the stabilizer. bar bracket.




### 10. INSTALLATION OF STABILIZER LINK MOUNTING NUT

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, tighten the mounting nuts.




### 6. INSTALLATION OF STABILIZER BAR MOUNTING NUT

Tighten the nut on the stabilizer bar bolt to the specified distance.

**Standard value:**

| | |
|---|---|
| **Protruding** length of stabilizer bar mounting bolt | **16-18 mm (.63–.70 in.)** |

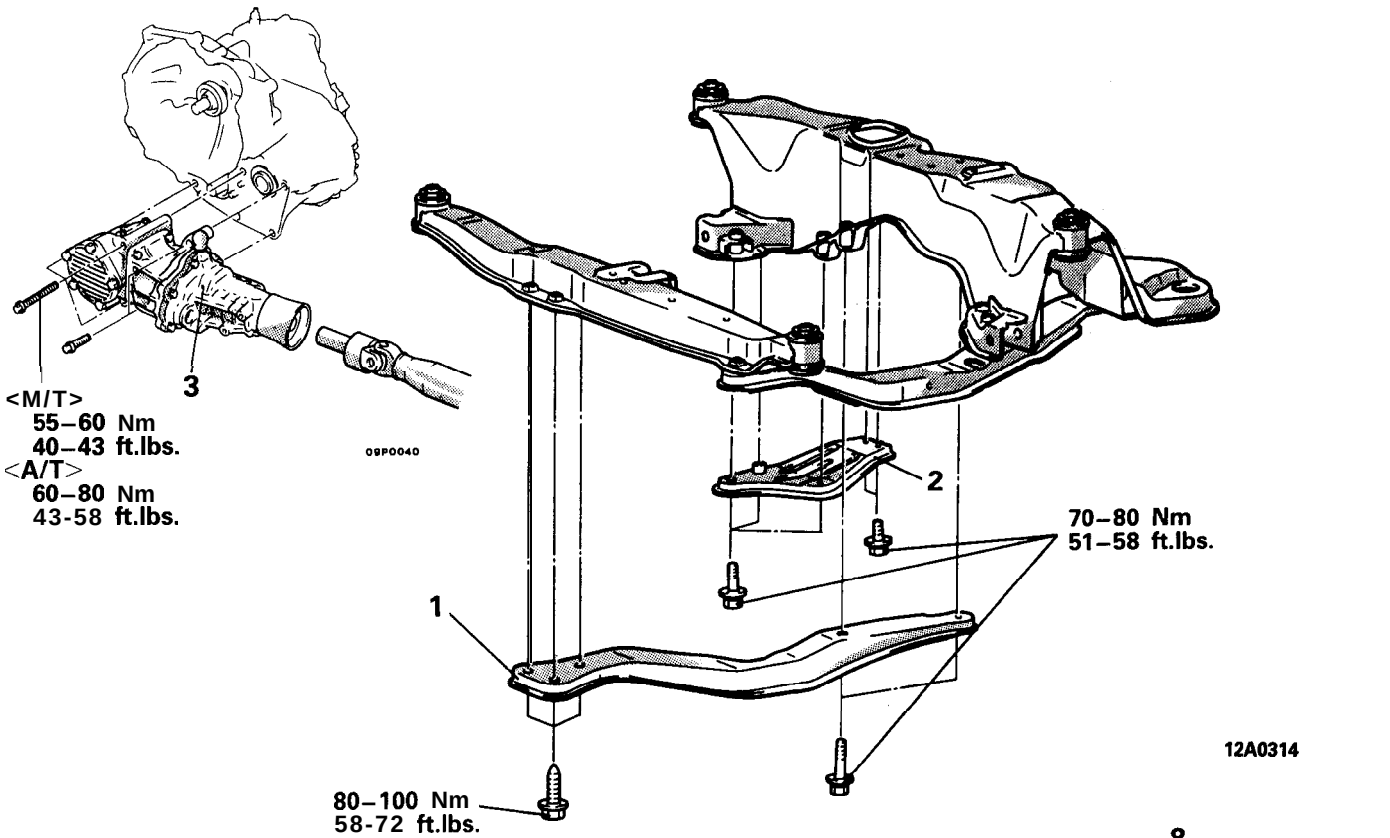
# STABILIZER BAR <AWD>

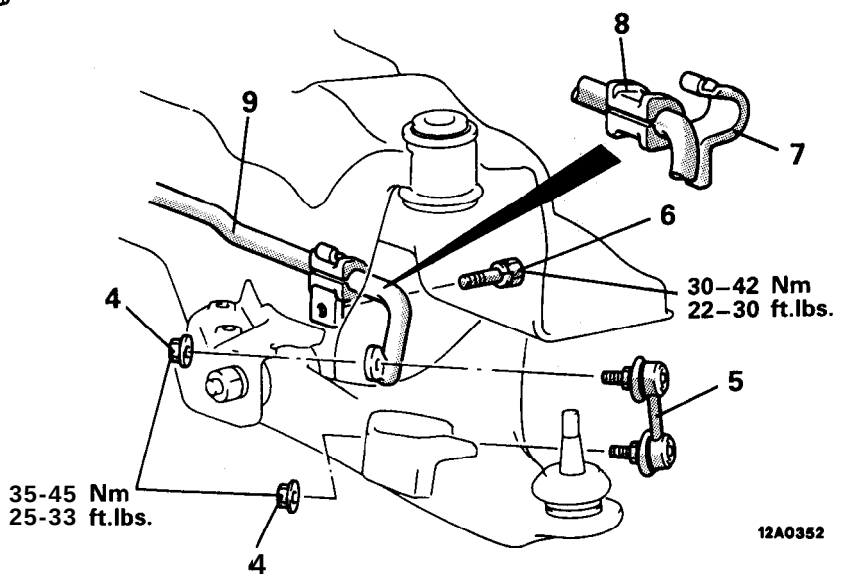
N02TA-B

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Front Exhaust Pipe (Refer to GROUP 11 -Exhaust Pipe and Main Muffler.)

**Post-installation Operation**
- Installation of Front Exhaust Pipe (Refer to GROUP 11 -Exhaust Pipe and Main Muffler.)

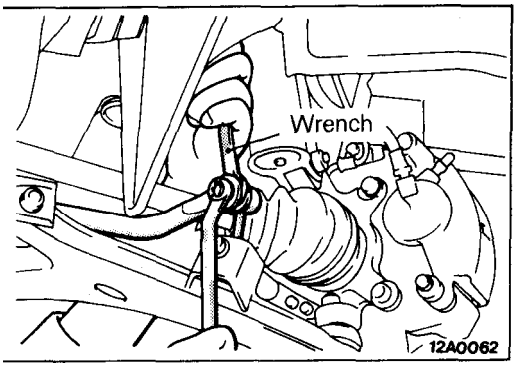


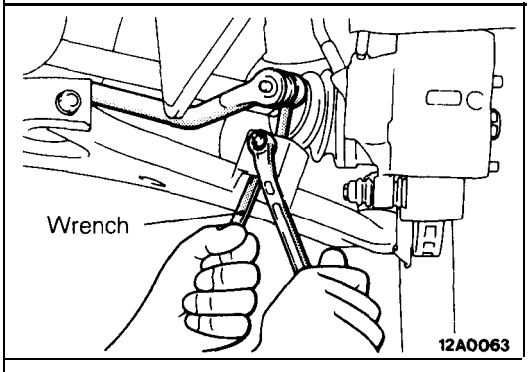



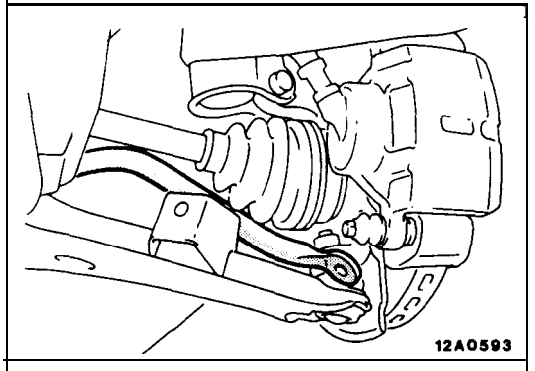

**Removal steps**

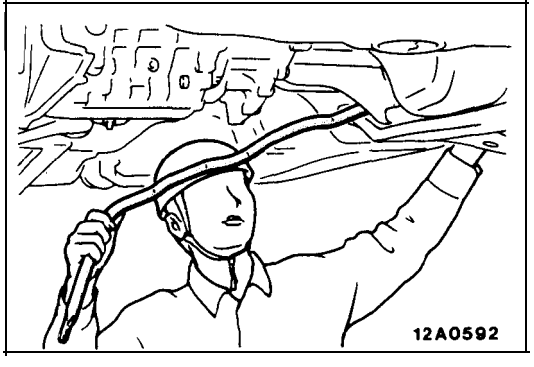
1. Left member
2. Gusset
3. Transfer
4. Stabilizer link installation nut
5. Stabilizer link
6. Stabilizer bar bracket installation bolt
7. Stabilizer bar bracket
8. Bushing
- Stabilizer bar

NOTE
(1) Reverse the removal procedures to reinstall.
(2) : Refer to "Service Points of Removal".
(3) 4 : Refer to "Service Points of Installation"




## SERVICE POINTS OF REMOVAL N02TBAG

### 4. REMOVAL OF STABILIZER LINK MOUNTING NUTS

Using a wrench or similar tool to secure the ball studs at both ends of the stabilizer link, remove the mounting nuts,

### 9. REMOVAL OF STABILIZER BAR

(1) Disconnect the coupling of the knuckle and lower arm at the right side.
(2) Pull out the left side stabilizer bar edge, pulling it out between the drive shaft and lower arm.

(3) Pull out the right side stabilizer bar edge, pulling it out from below the lower arm.

## INSPECTION N02TCAH

Refer to P.2-40.

## BALL JOINT DUST COVER REPLACEMENT N02TEAD

Refer to P.2-40.

## SERVICE POINTS OF INSTALLATION N02TDAN

### 7. INSTALLATION OF STABILIZER BAR BRACKET/ 4. STABILIZER LINK INSTALLATION NUT

Refer to P.2-41.

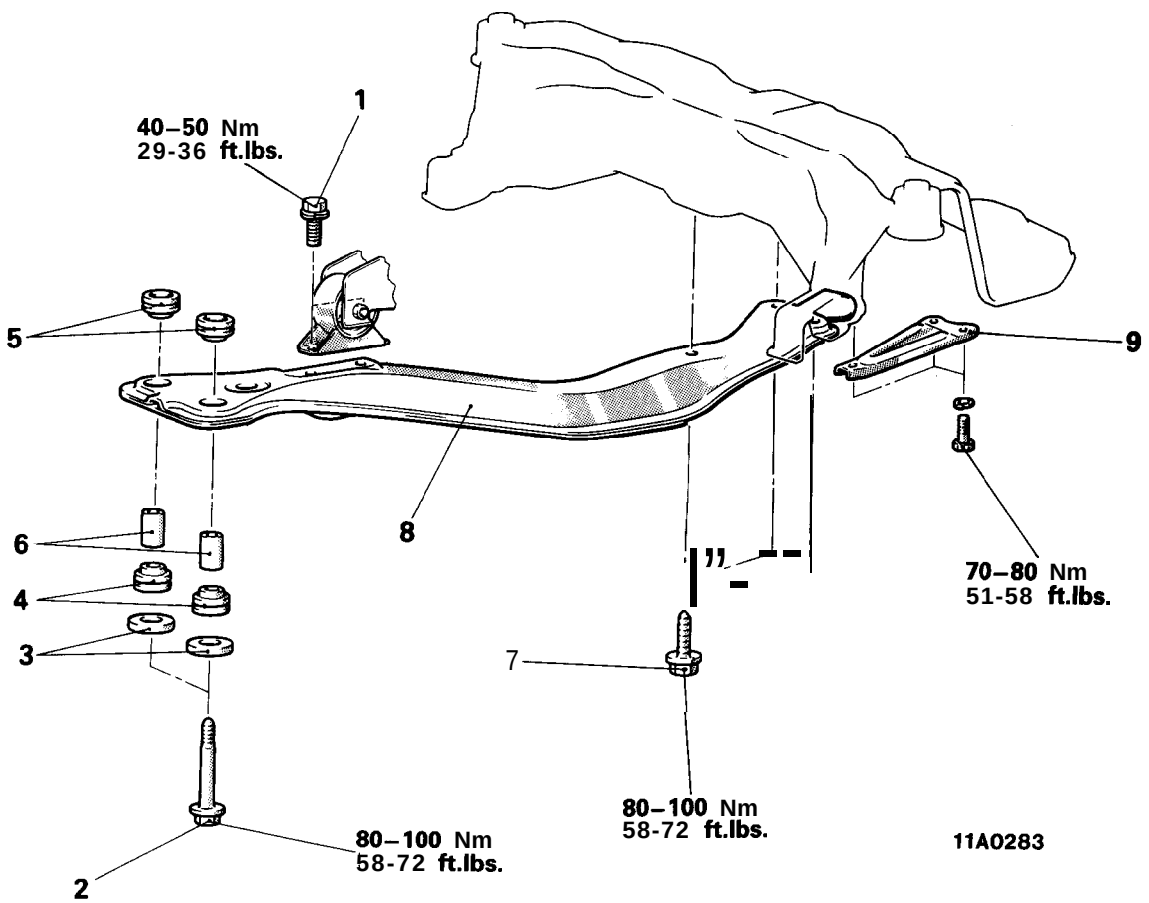
# CENTERMEMBER AND CROSSMEMBER <FWD>

## REMOVAL AND INSTALLATION

N02YA-A

**Pre-removal Operation**
- Disconnection of the Front Exhaust Pipe when removing the Crossmember (Refer to GROUP 1 l-Exhaust Pipe and Main Muffler.)
- Raise and Suspend the Engine to the Extent Force is not applied to the Engine Mount
- Draining of the Power-steering Fluid (Refer to GROUP 19–Service Adjustment Procedures.)

**Post-installation Operation**
*Lower the Engine
- coupling of the Front Exhaust Pipe (Refer to GROUP 11–Exhaust Pipe and Main Muffler.)
- Air bleeding of the Power-steering Fluid (Refer to GROUP 19–Service Adjustment Procedures.)
- Adjustment of the Front Wheel Alignment (Refer to GROUP 2–Service Adjustment Procedures.)

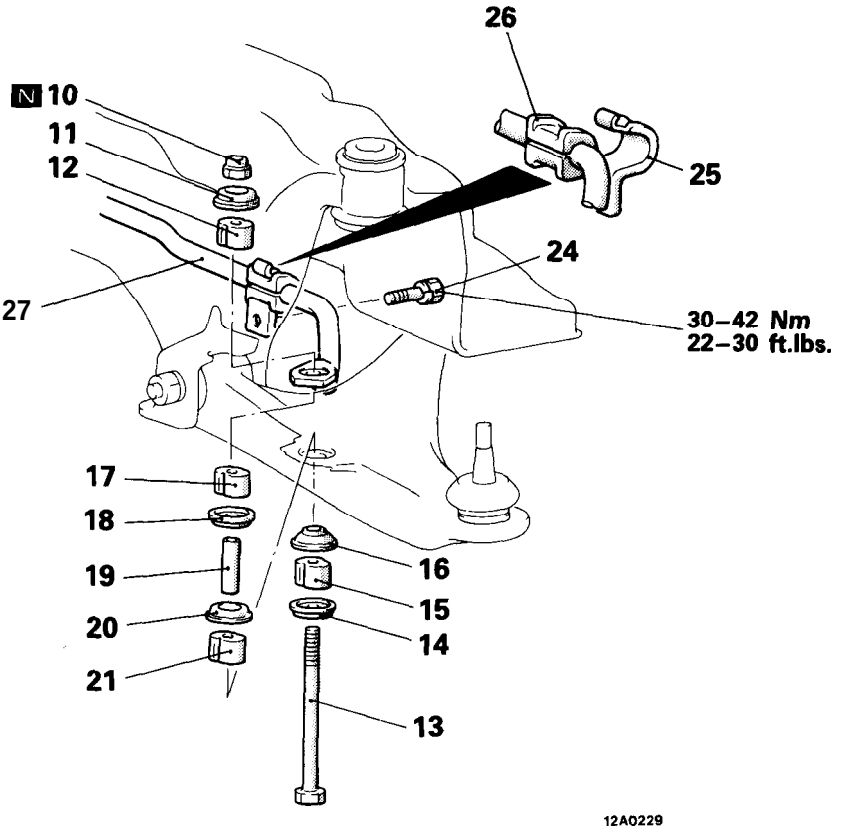



**Removal steps**

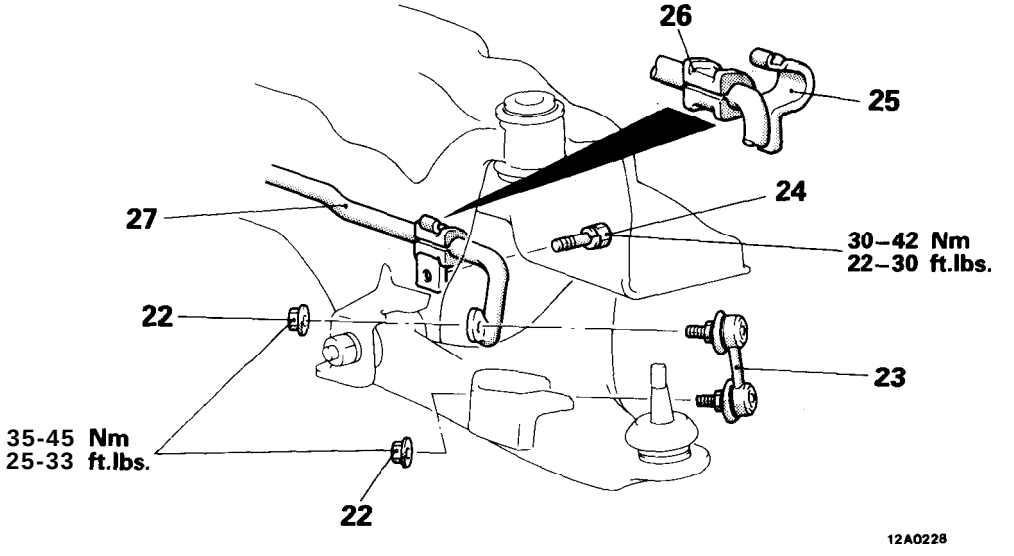
1. Front roll stopper bracket mounting bolt
2. Centermember installation bolts (front)
3. Stopper
4. Bushing
5. Bushing
6. Collar
7. Centermember installation bolts (rear)
8. Centermember
9. Stay

NOTE
Reverse the removal procedures to reinstall.

**<Rubber-bushing type stabilizer bar>**




**<Pillow-ball type stabilizer bar>**




◆◆ 10. Self locking nut
11. Joint cup
12. Stabilizer rubber
13. Stabilizer bar installation bolt
14. Joint cup
15. Stabilizer rubber
16. Joint cup
17. Stabilizer rubber
18. Joint cup
19. Collar
20. Joint cup
21. Stabilizer rubber

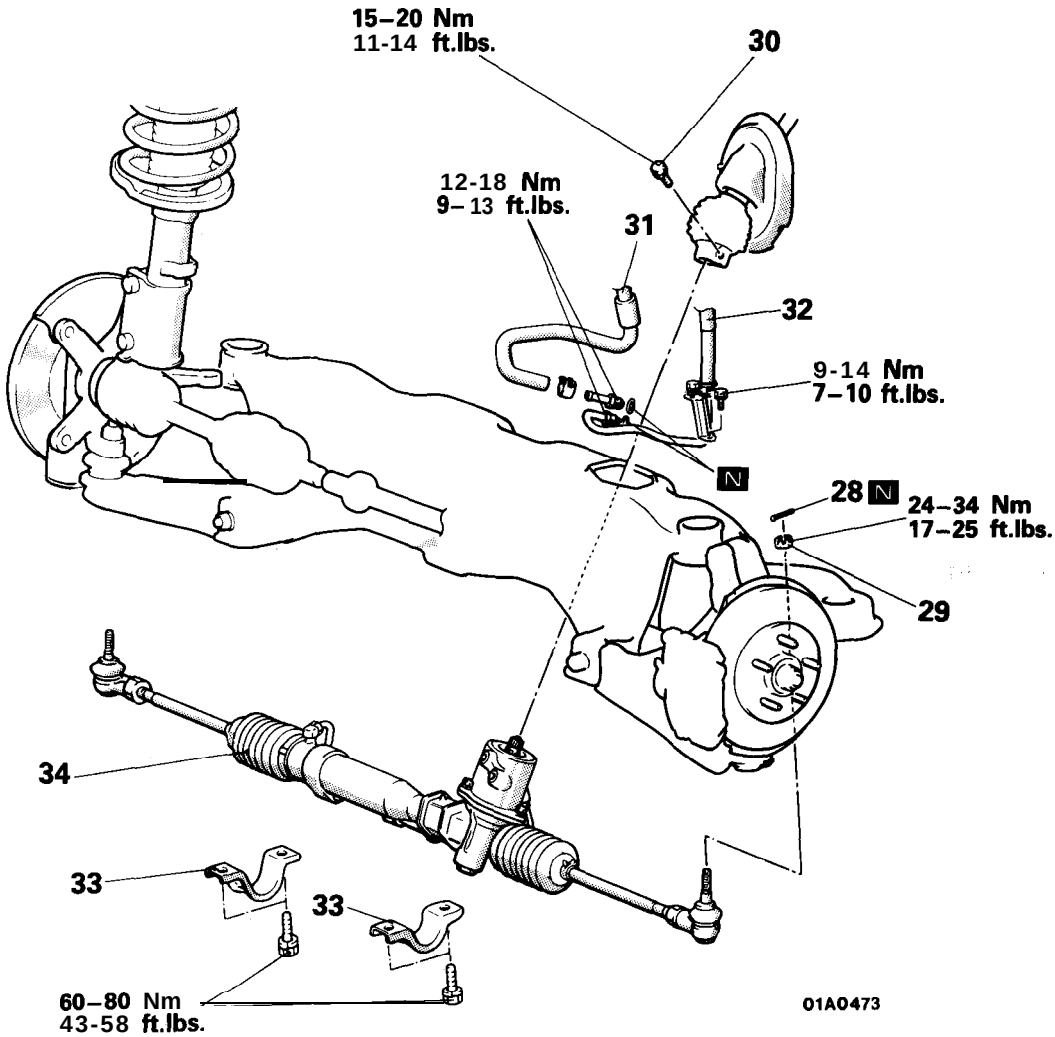
} Rubber-bushing type stabilizer bar

◆◆ ● 4 22. Nut
23. Stabilizer link

} Pillow-ball type stabilizer bar

24. Stabilizer bar bracket installation bolt
◆◆ 25. Stabilizer bar bracket
26. Bushing
◆◆ 27. Stabilizer bar

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

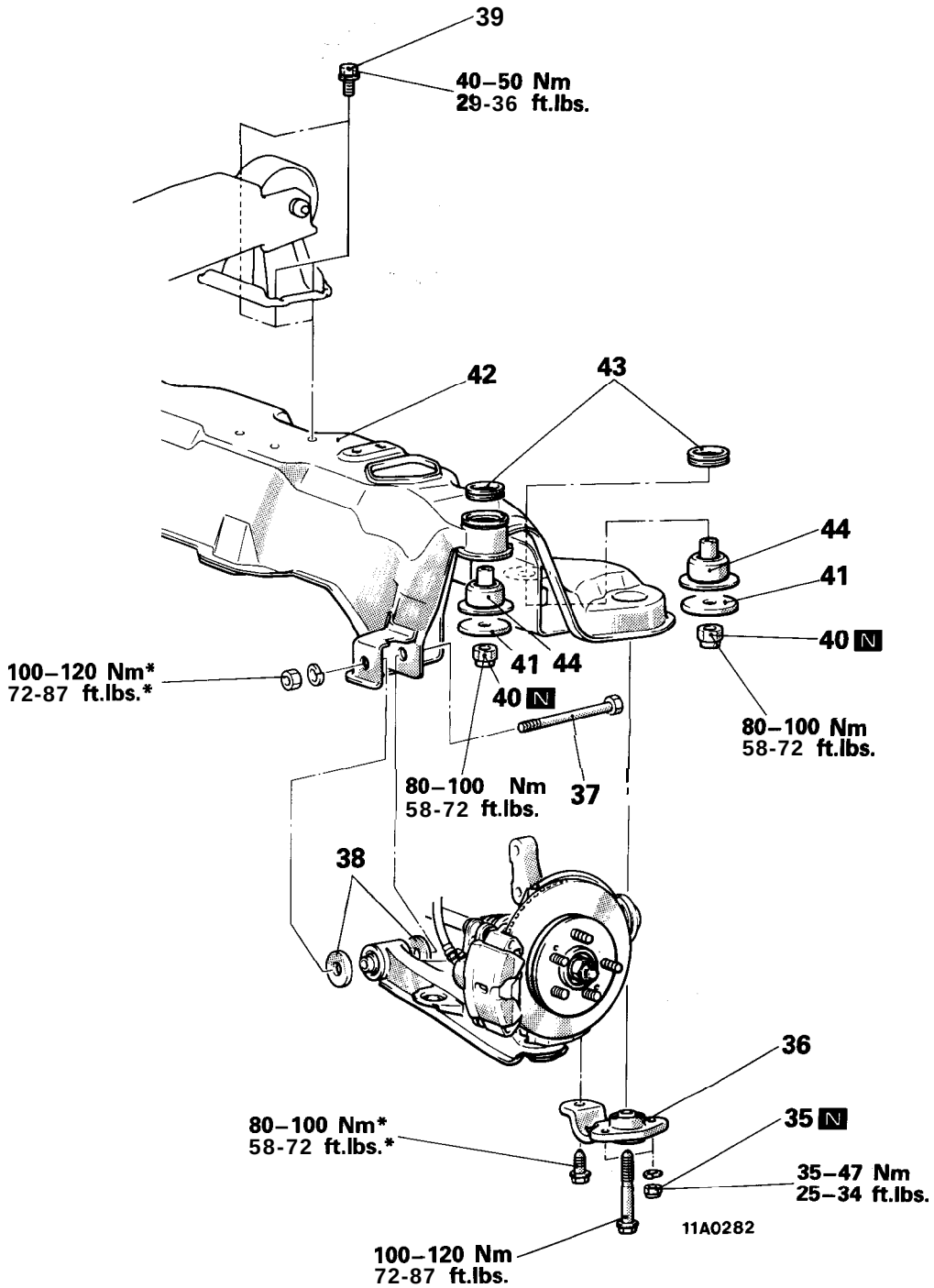



28. Cotter pin
29. Tie-rod end and connection nut
30. Joint assembly connection bolt
31. Return tube connection
32. Pressure hose connection
33. Mounting bracket

(Power steering)

◆▶ ● + 34. Steering gear box assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆▶: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




35. Self locking nut
36. Clamp
37. Lower arm mounting bolt
38. Stopper
39. Rear roll stopper bracket mounting bolt
40. Self locking nut
41. Lower plate
42. Crossmember
43. Stopper
44. Bushing

NOTE
(1) Reverse the removal procedures to reinstall.
(2) N : Non-reusable parts
(3) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

## SERVICE POINTS OF REMOVAL N02YBAEa

**22. REMOVAL OF NUT**

Refer to P.2-39.

**27. REMOVAL OF STABILIZER BAR**

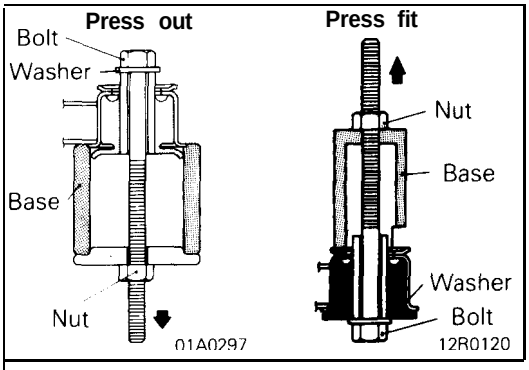
Refer to P.2-39.

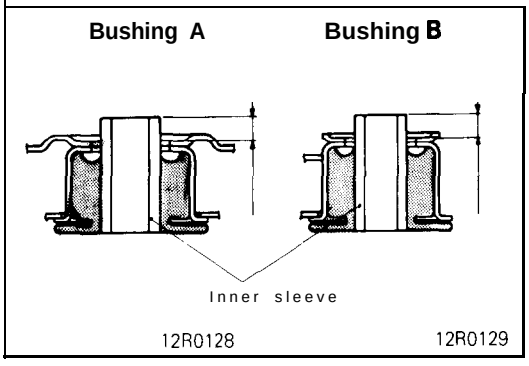
**34. REMOVAL OF STEERING GEAR BOX ASSEMBLY**

Refer to GROUP 19–Steering Gear Box.

## INSPECTION N02YCAA1

- Check the crossmember for cracks or deformation.
- Check the bushings for cracks or deterioration.
- Check the centermember for cracks or deformation.




## BUSHING REPLACEMENT N02YDAAa

(1) Remove and press in bushings A and B using the illustrated method.

(2) Press in bushings A and B so that the projecting amount of the inner sleeve agrees with the standard value.

**Standard value:**

| | |
|---|---|
| **Bushing A** | **7.2–10.2 mm (.28–.40 in.)** |
| **Bushing B** | **6.5-9.5 mm (.26–.37 in.)** |

**Caution**

**When pressing in, apply a solution of soap and water to the sliding part of the bushings, and then press them in without stopping one after the other.**

**If there is a pause during the pressing operation, the frictional resistance will prevent installation.**

## SERVICE POINTS OF INSTALLATION N02YEAEa

**34. INSTALLATION OF STEERING GEAR BOX ASSEMBLY**

Refer to GROUP 19–Steering Gear Box.

**25. INSTALLATION OF STABILIZER BAR**

Refer to P.2-41.

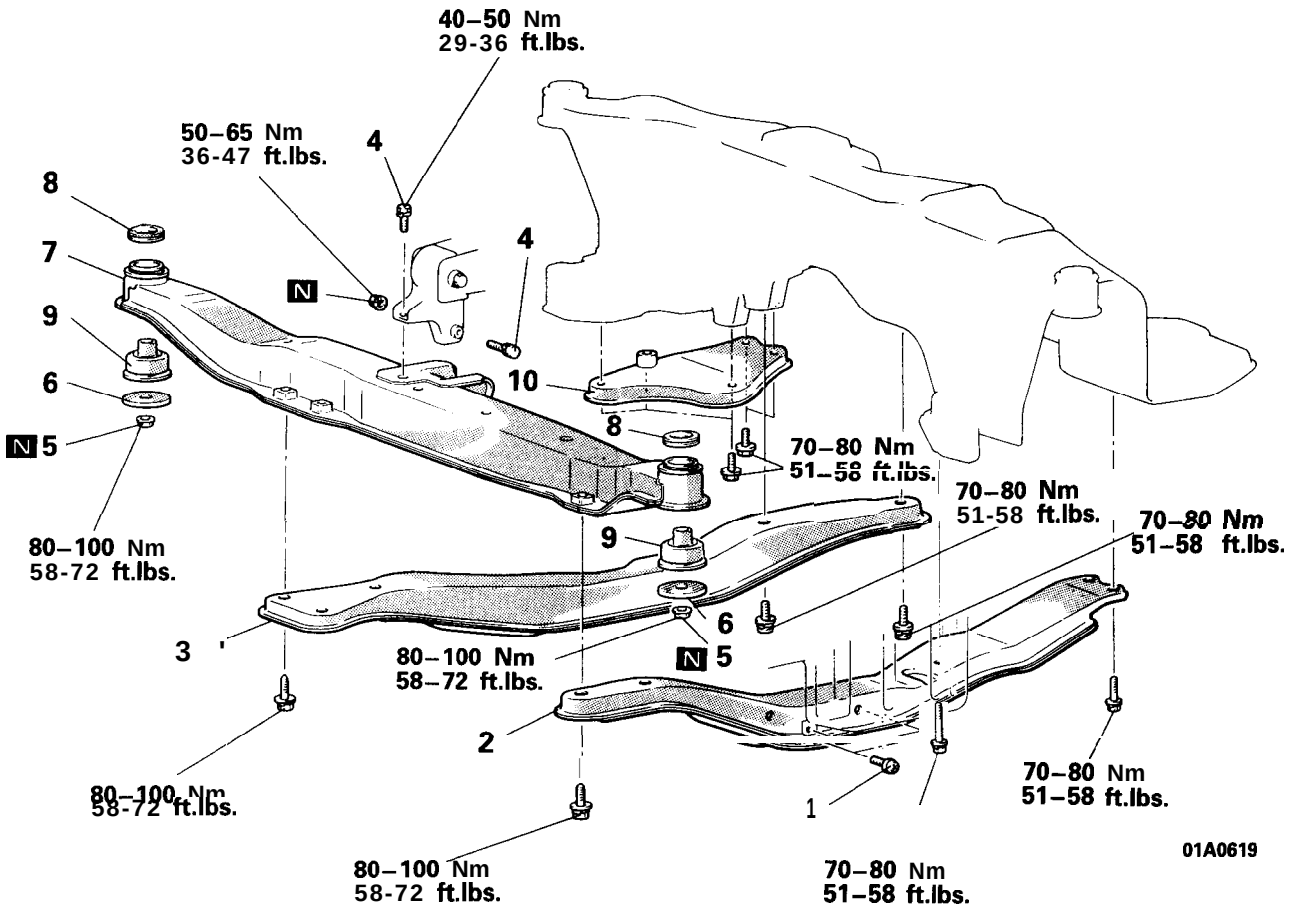
**10./22. INSTALLATION OF SELF LOCKING NUT/NUT**

Refer to P.2-41.

# CENTERMEMBER AND CROSSMEMBER <AWD>

## REMOVAL AND INSTALLATION

N02YA-B




**Removal steps**

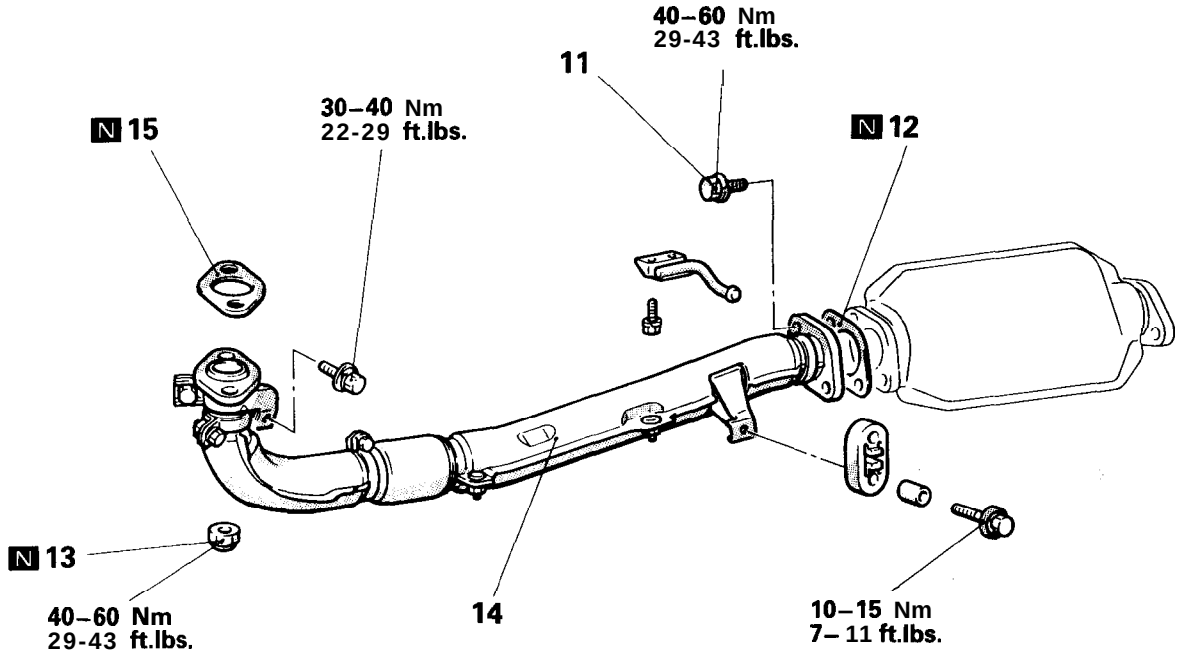
1. Cover installation screw
2. Left member
3. Right member
4. Front roll stopper installation bolt
5. No. 1 crossmember installation nut
6. Lower plate
7. No. 1 crossmember
8.
9. Bushing (B)
10. Gusset

**Pre-removal Operation**
- Draining of the Power-steering Fluid (Refer to GROUP 19–Service Adjustment Procedures.)

**Post-installation Operation**
- Air bleeding of the Power-steering Fluid (Refer to GROUP 19–Service
- Adjustment

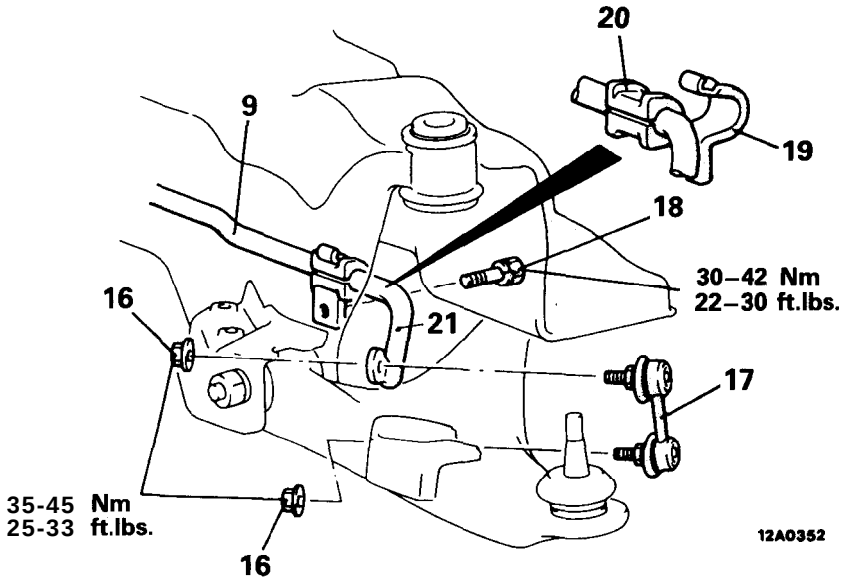
P.2-8.)

NOTE
(1)
(2) ❑ : Non-reusable parts




05A0169

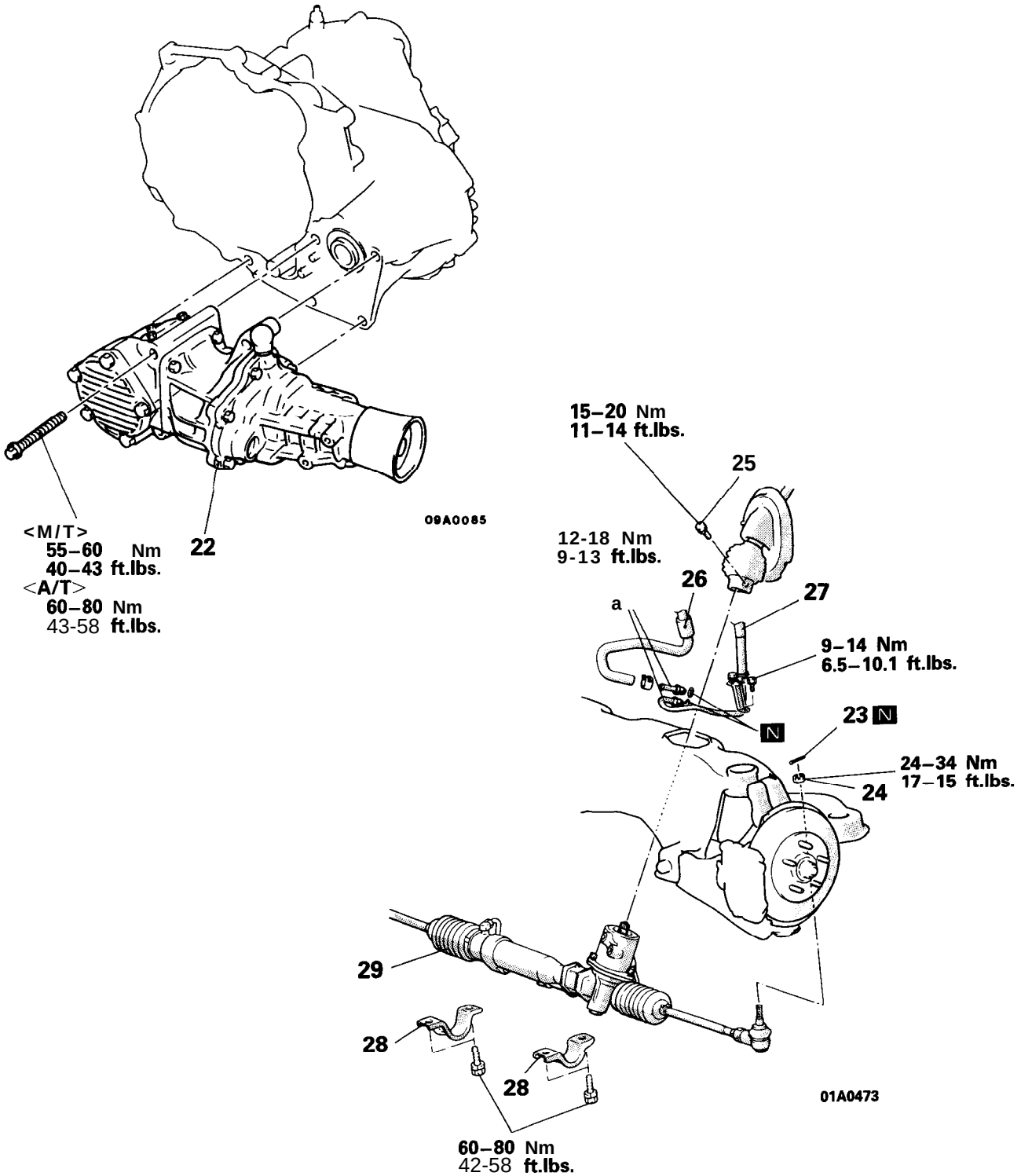
11. Front exhaust pipe rear installation bolts
12. Gasket
13. Self locking nut
14. Front exhaust pipe
15. Gasket




12A0352

◆■►◆ 16. Stabilizer link installation nut
17. Stabilizer link
18. Stabilizer bar bracket installation bolts
● 19. Stabilizer bar bracket
20. Bushing
◆■► 21. Stabilizer bar

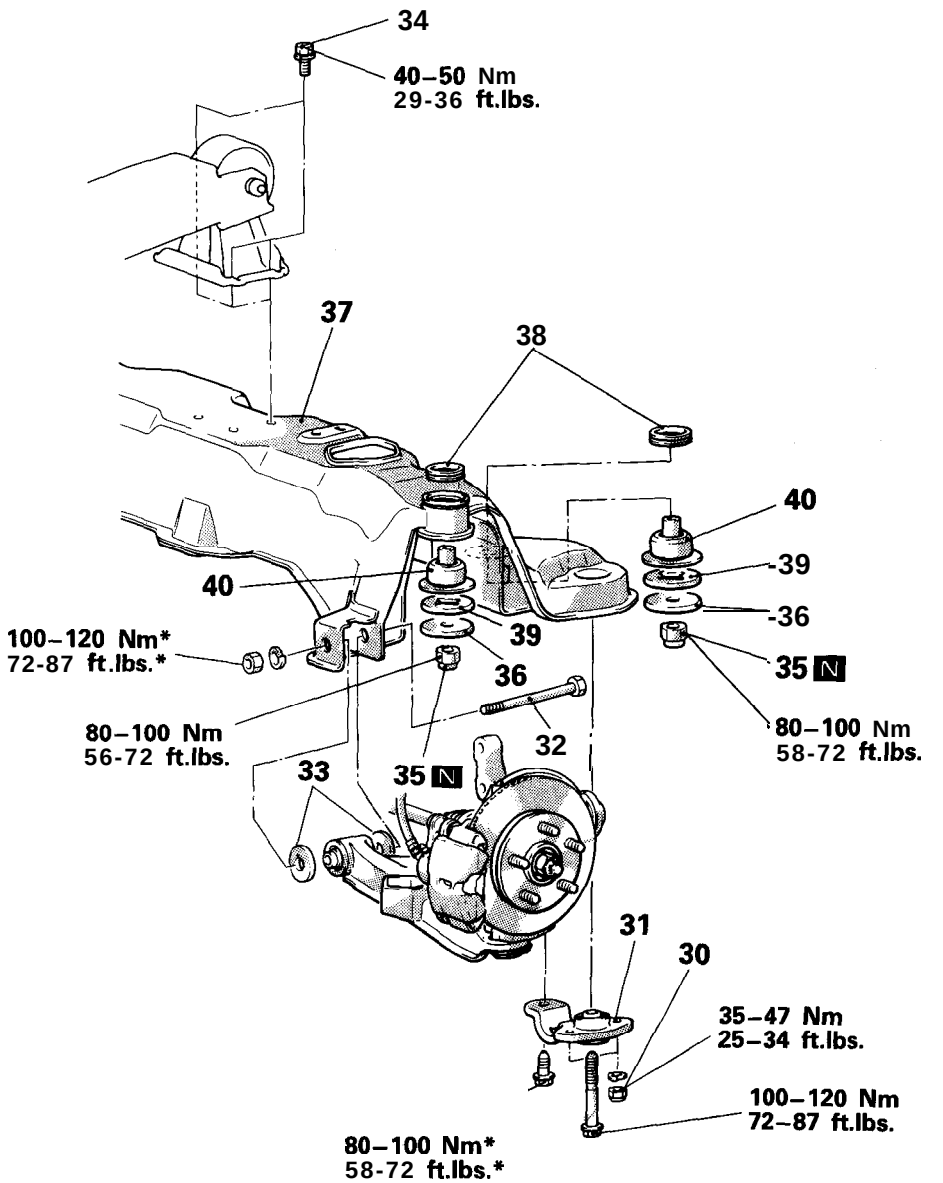
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆■►: Refer to "Service Points of Removal".
(3) ● 4 : Refer to "Service Points of Installation".
(4) N : Non-reusable parts




22. Transfer assembly
23. Cotter pin
24. Tie-rod end connection nut
25. Joint assembly connection bolt
26. Return tube connection
27. Pressure hose connection
28. Mounting bracket

◆◆ ● + 29. Steering gear box assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation"
(4) N: Non-reusable parts




01A0641

30. Self locking nut
31. Clamp
32. Lower arm mounting bolt
33. Stopper
34. Rear roll stopper bracket mounting bolt
35. Self locking nut
36. Lower plate
37. Crossmember
38. Stopper
39. Spacer
40. Bushing

NOTE
(1) Reverse the removal procedures to reinstall.
(2) N : Non-reusable parts
(3) * Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

## SERVICE POINTS OF REMOVAL N02YBAF

**16. REMOVAL OF STABILIZER LINK INSTALLATION NUT/ 21. STABILIZER BAR**

Refer to P.2-39.

**29. REMOVAL OF STEERING GEAR BOX ASSEMBLY**

Refer to GROUP 19–Steering Gear Box.

## INSPECTION N02YCAA2

- Check the crossmember for cracks or deformation.
- Check the bushings for cracks or deterioration.
- Check the centermember for cracks or deformation.

## BUSHING REPLACEMENT N02YDAB

Refer to P.2-48.

## SERVICE POINTS OF INSTALLATION N02YEAF

**29. INSTALLATION OF STEERING GEAR BOX ASSEMBLY**

Refer to GROUP 19–Steering Gear Box.

**19. INSTALLATION OF STABILIZER BAR BRACKET/ 16. STABILIZER LINK INSTALLATION NUT**

Refer to P.2-41.

**NOTES**

# REAR AXLE

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N03AA--


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  - Heat
  - Noise while turning
  - Oil leakage
- Differential (Limited Slip Differential)
  - Abnormal noise during driving or gear changing
  - Abnormal noise when cornering
  - Break down
  - Gear noise
  - Gear oil leakage
  - Seizure
  - The limited slip differential does not function
- Drive Shaft
  - Noise

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N03CA--

| Items | | | Vehicles with conventional differential | Vehicles with limited slip differential |
|---|---|---|---|---|
| Axle shaft | | | | |
| Type | | | Semi-floating type | Semi-floating type |
| Shaft dimensions | | | | |
| Outer bearing portion dia. | | mm (in.) | 35 (1.38) | 35 (1.38) |
| Inner bearing portion dia. | | mm (in.) | 28 (1.10) | 28 (1.10) |
| Center portion dia. | | mm (in.) | 34.5 (1.36) | 34.5 (1.36) |
| Overall length | | mm (in.) | 214.9 (8.46) | 214.9 (8.46) |
| Bearing | | | | |
| O.D. x I.D. | Outer | mm (in.) | 72 x 35 (2.83 x 1.38) | 72 x 35 (2.83 x 1.38) |
| | Inner | mm (in.) | 58 x 28 (2.28 x 1.10) | 58 x 28 (2.28 x 1.10) |
| Drive shaft | | | | |
| Joint type | Outer | | D.O.J. | D.O.J. |
| | Inner | | B.J. | B.J. |
| Length (joint to joint) x diameter | | mm (in.) | 397 x 24 (15.6 x.94) | 397 x 24 (15.6 x.94) |
| Differential | | | | |
| Reduction gear type | | | Hypoid gear | Hypoid gear |
| Reduction ratio | | | 3.545 <M/T>, 3.307 <A/T> | 3.545 <M/T>, 3.307 <A/T> |
| Differential gear type and configuration | | | | |
| Side gear | | | Straight bevel gear x 2 | Straight bevel gear x 2 |
| Pinion gear | | | Straight bevel gear x 2 | Straight bevel gear x 4 |
| Number of teeth | | | | |
| Drive gear | | | 39 <M/T>, 43 <A/T> | 39 <M/T>, 43 <A/T> |
| Drive pinion | | | 11<M/T>, 13 <A/T> | 11<M/T>, 13 <A/T> |
| Side gear | | | 14 | 16 |
| Pinion gear | | | 10 | 10 |

NOTE
D.O.J.: Double offset joint
B.J.: Birfield joint

## SERVICE SPECIFICATIONS

N03CB--

| Items | | Specifications |
|---|---|---|
| Standard value | | |
| Rear wheel bearing rotation sliding resistance | N (lbs.) [Nm (in.lbs.)] | 12 (2.6) [0.7 (6)] or less |
| Setting of D.O.J. boot length | mm (in.) | 76 ± 3 (3.00 ± .12) |
| Final drive gear backlash | mm (in.) | 0.1 1–0.16 (.004–.006) |
| Differential gear backlash | mm (in.) | |
| Conventional differential | | 0–0.076 (0–.003) |
| Limited slip differential | | 0.03–0.09 (.0012–.0035) |
| Drive pinion rotation starting torque | | |
| with oil seal | Nm (in.lbs.) | |
| New part | | 1.0–1.3 (9–11) |
| New part/reusable part | | 0.5–0.6 (4-5) |
| without oil seal | Nm (in.lbs.) | |
| New part | | 0.9–1.2 (8–10) |
| New part/reusable part | | 0.4–0.5 (3-4) |

# REAR AXLE – Specifications

| Items | | Specifications |
|---|---|---|
| Limit | | |
| Rear axle total backlash | mm (in.) | 5 (.2) |
| Drive gear runout | mm (in.) | 0.05 (.002) |
| Rear wheel bearing end play | mm (in.) | 0.8 (.031) |
| Differential gear backlash | mm (in.) | 0.2 (.008) |

## TORQUE SPECIFICATIONS

N03CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Drive shaft to companion flange | 55-65 | 40–47 |
| Axle shaft installation nut | 160–220 | 116–159 |
| Rear brake assembly installation bolts | 50–60 | 36-43 |
| Rear speed sensor brackets | 9-14 | 7–10 |
| Differential carrier to crossmember | 100–120 | 72-87 |
| Differential carrier to propeller shaft | 30–35 | 22-25 |
| Differential carrier to differential support member | 80–100 | 58-72 |
| Differential support member to bolt | 110–130 | 80–94 |
| Drain plug | 60–70 | 43-51 |
| Filler plug | 40–60 | 29-43 |
| Companion flange to drive pinion | 160–220 | 116-159 |
| Bearing cap installation bolt | 40–60 | 29-43 |
| Drive gear to differential case | 80–90 | 58-65 |
| Cover to gear carrier | 30–42 | 22–30 |

## LUBRICANTS

N03CD--

| Items | Specified lubricants | Quantity |
|---|---|---|
| Rear axle gear oil | MOPAR Hypoid Gear Oil API classification GL-5 or higher<br>Above −23°C (−10°F) SAE 90, 85W-90, 80W-90<br>From −34°C (−30°F) to −23°C (−10°F) SAE 80W, 80W-90<br>Below −34°C (−30°F) SAE 75W | 0.7 lit. (0.74 qts. |
| B.J. boot grease<br>D.O.J. boot grease | Repair kit grease | 90 g (3.2 oz.) |
| Seal lip of outer bearing<br>Trailing arm oil seal lip<br>Oil seal lip of side bearing<br>Washer of special tool (MB990836)<br>Oil seal lip of drive pinion<br>Differential companion flange washer | MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent | As required |

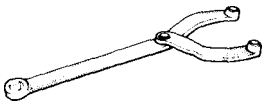
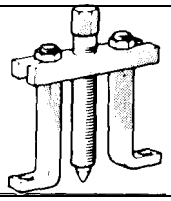
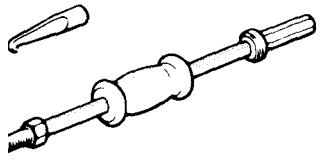
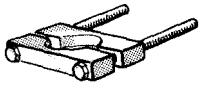
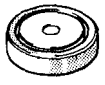
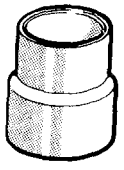
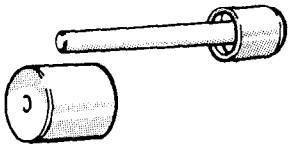
## SEALANTS AND ADHESIVES

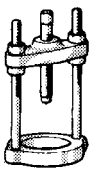
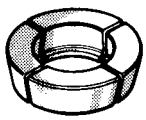
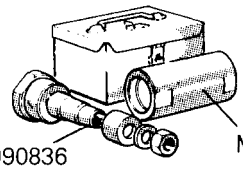
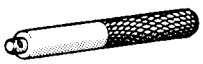
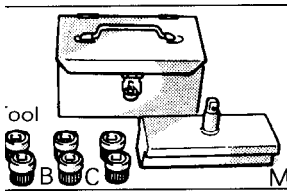
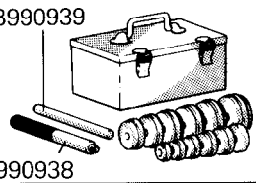
N03CE--

| Items | Specified sealants and adhesives |
|---|---|
| Vent plug<br>Differential cover | 3M ATD Part No. 8661, 8663 or equivalent |
| Drive gear threaded hole | MOPAR Part No. 4318031 or 4318032 or equivalent |

# SPECIAL TOOLS

N03DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB990767 | End yoke holder | Measurement of rotation torque of the limited slip differential<br>Stop axle shaft turning |
|  | CT-I 003 | Axle shaft puller | Press-fitting the drive pinion rear bearing outer race |
|  | C-673 | Sliding hammer set | Removal of the axle shaft |
|  | MB990560 | Bearing remover | Removal of the axle shaft dust cover, outer bearing and rear rotor<br>Press-in the outer wheel bearing and rear rotor |
|  | MB991115 | Oil seal installer | Press-fitting of drive shaft oil seal |
|  | MB990799 | Ball joint dust cover installer | Press-fitting the axle shaft dust cover |
|  | MB990641 | Lower arm bushing installer and remover A | Driving-out and press-fitting of differential support member bushing |
|  | MB990810 | Side bearing puller | Removal of the side bearing inner race |
|  | MB990811 | Side bearing cup | |

| ool | Number | Name | Use |
|---|---|---|---|
|  | C-293-PA | Taper roller bearing puller | Removal of the side bearing inner race<br>Removal of the drive pinion rear bearing inner race |
|  | C-293-45 | Bearing remover | |
|  <br>B990836 MB990392 | MB990835 | Pinion height gauge set | Measurement of the pinion height |
|  | MB990728 | Bearing installer | Press-fitting of the drive pinion rear bearing inner race<br>Press-fitting of the side bearing inner race |
|  | MB990031 | Drive pinion oil seal installer | Press-fitting of the drive pinion oil seal |
|  | C-4171 | Installer bar | Press-fitting of the drive pinion bearing outer race<br>Driving out and press-fitting of the trailing arm inner bearing.<br>Press-fitting differential oil seal. |
|  <br>'ool<br>B C MB990989 | MB990988 | Side gear holding tool set | Measurement of limited slip differential preload |
| MB990939<br>  <br>1B990938 | MB990925 | Bearing and oil seal installer set | Driving out and press-fitting of the trailing arm inner bearing<br>Press-fitting of the drive pinion bearing outer race |

# TROUBLESHOOTING

N03EA--

| Symptom | Probable cause | Remedy |
|---|---|---|
| AXLE SHAFT<br>Noise while wheels are rotating | Brake drag<br>Bent axle shaft<br>Worn or scarred axle shaft bearing | Replace |
| Grease leakage | Worn or damaged oil seal<br>Malfunction of bearing seal | Replace |
| DRIVE SHAFT<br>Noise | Wear, play or seizure of ball joint<br>Excessive drive shaft spline looseness | Replace |
| DIFFERENTIAL (CONVENTIONAL DIFFERENTIAL)<br>Constant noise | Improper final drive gear tooth contact adjustment<br>Loose, worn or damaged side bearing<br>Loose, worn or damaged drive pinion bearing | Correct or replace |
| | Worn drive gear, drive pinion<br>Worn side gear spacer or pinion shaft<br>Deformed drive gear or differential case<br>Damaged gear | Replace |
| | Foreign material | Eliminate the foreign material and check; replace the parts if necessary |
| | Insufficient oil | Replenish |
| Gear noise while driving | Poor gear engagement<br>Improper gear adjustment<br>Improper drive pinion preload adjustment | Correct or replace |
| | Damaged gear | Replace |
| | Foreign material | Eliminate the foreign material and check; replace the parts if necessary |
| | Insufficient oil | Replenish |
| Gear noise while coasting | Improper drive pinion preload adjustment<br>Damaged gear | Correct or replace<br>Replace |
| Bearing noise while driving or coasting | Cracked or damaged drive pinion rear bearing | Replace |
| Noise while turning | Loose side bearing<br>Damaged side gear, pinion gear or pinion shaft | Replace |
| Heat | Insufficient gear backlash<br>Excessive preload | Adjust |
| | Insufficient oil | Replenish |
| Oil leakage | Clogged vent plug | Clean or replace |
| | Cover insufficiently tightened<br>Seal malfunction | Retighten, apply sealant, or replace the gasket |
| | Worn or damaged oil seal | Replace |
| | Excessive oil | Adjust the oil level |
| DIFFERENTIAL (LIMITED SLIP DIFFERENTIAL)<br>Abnormal noise during driving or gear changing | Excessive final drive gear backlash<br>Insufficient drive pinion preload | Adjust |
| | Excessive differential gear backlash | Adjust or replace |
| | Worn spline of a side gear | Replace |
| | Loose companion flange self-locking nut | Retighten or replace |

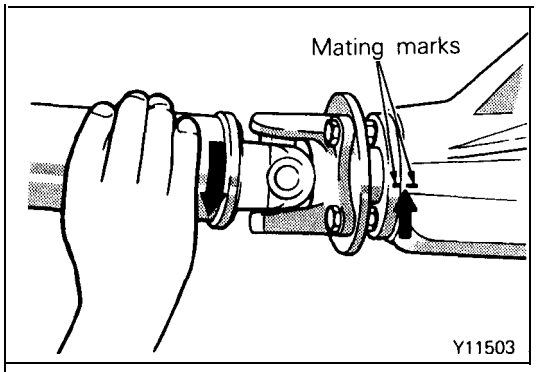
| Symptom | Probable cause | Remedy |
|---|---|---|
| NOTE<br>In addition to a malfunction of the differential carrier components, abnormal noise can also be caused by the universal joint of the propeller shaft, the axle shafts, the wheel bearings, etc. Before disassembling any parts, take all possibilities into consideration and confirm the source of the noise. | | |
| Abnormal noise when cornering | Damaged differential gears<br>Damaged pinion shaft | Replace |
| | Insufficient gear oil quantity | Replenish |
| Gear noise | Improper final drive gear tooth contact adjustment | Adjust or replace |
| | Incorrect final drive gear backlash<br>Improper drive pinion preload adjustment | Adjust |
| | Damaged, broken, and/or seized tooth surfaces of the drive gear and drive pinion<br>Damaged, broken, and/or seized drive pinion bearings<br>Damaged, broken, and/or seized side bearings<br>Damaged differential case<br>Inferior gear oil | Replace |
| | Insufficient gear oil quantity | Replenish |
| NOTE<br>Noise from the engine, muffler vibration, transaxle, propeller shaft, wheel bearings, tires, body, etc., is easily mistaken as being caused by malfunctions in the differential carrier components. Be extremely careful and attentive when performing the driving test, etc.<br>Test methods to confirm the source of the abnormal noise include: coasting acceleration, constant speed driving, raising the rear wheels on a jack, etc. Use the method most appropriate to the circumstances. | | |
| Gear oil leakage | Worn or damaged front oil seal, or an improperly installed oil seal<br>Damaged gasket | Replace |
| | Loose companion flange self-locking nut | Retighten or replace |
| | Loose filler or drain plug | Retighten or apply adhesive |
| | Clogged or damaged vent plug | Clean or replace |
| Seizure | Insufficient final drive gear backlash<br>Excessive drive pinion preload<br>Excessive side bearing preload<br>Insufficient differential gear backlash<br>Excessive clutch plate preload | Adjust |
| | Inferior gear oil | Replace |
| | Insufficient gear oil quantity | Replenish |
| VOTE<br>n the event of seizure, disassemble and replace the parts involved, and also be sure to check all components for any rregularities and repair or replace as necessary. | | |
| 3reak down | Incorrect final drive gear backlash<br>Insufficient drive pinion preload<br>Insufficient side bearing preload<br>Excessive differential gear backlash | Adjust |
| | Loose drive gear clamping bolts | Retighten |
| NOTE<br>n addition to disassembling and replacing the failed parts, be sure to check all components for irregularities and repair or replace as necessary. | | |
| The limited slip differential does not function (on snow, mud, ice, etc.) | The limited slip device is damaged | Disassemble, check the functioning, and replace the damaged parts |

# SERVICE ADJUSTMENT PROCEDURES

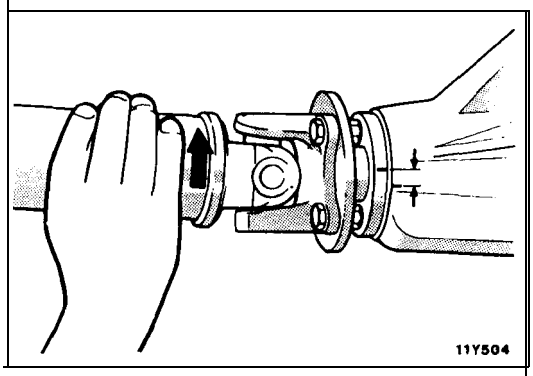
## REAR AXLE TOTAL BACKLASH CHECK N03FAAF

If the vehicle vibrates and produces a booming sound due to an imbalance of the driving system, measure the rear axle total backlash by the following procedures to see if the differential carrier assembly required removal.

(1) Place the gearshift lever in the neutral position, apply the parking brake and jack up the vehicle.




(2) Manually turn the propeller shaft clockwise as far as it will go and make mating marks on the companion flange dust cover and the differential carrier.




(3) Manually turn the propeller shaft counterclockwise as far as it will go and measure the movement of the mating marks.

**Limit: 5 mm (.2 in.)**

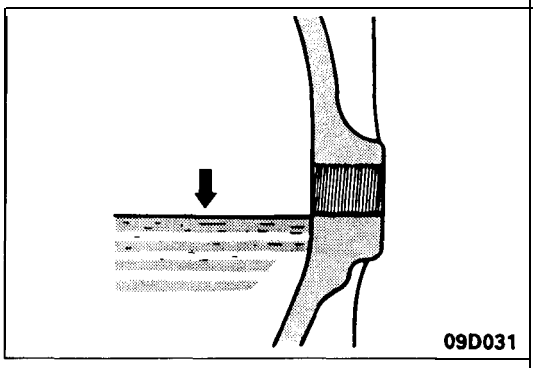
(4) If the backlash exceeds the limit, remove the differential carrier assembly and adjust the backlash. (Refer to P.3-20.)

## GEAR OIL LEVEL CHECK N03FCAA

1. Remove the filler plug, and check the oil level.
2. The oil level is sufficient if it reaches the filler plug hole.

**Specified gear oil:**
**MOPAR Hypoid Gear Oil API classification GL-5 or higher [0.7 liter (0.74 qts.)]**

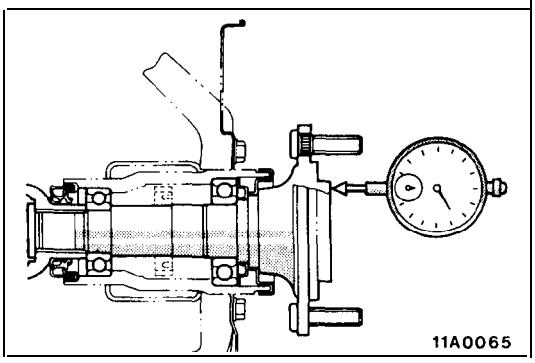
NOTE
Above −23°C (−10°F): SAE 90, 85W−90, 80W−90
From −34°C (−30°F) to −23°C (−10°F): SAE 80W, 80W−90
Below −34°C (−30°F): SAE 75W



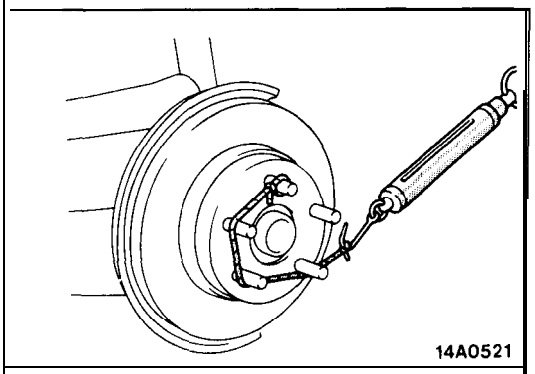

## REAR WHEEL BEARING END PLAY CHECK N03FBAE

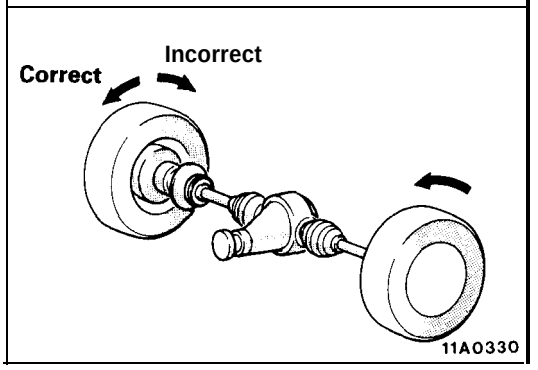
(1) Support the vehicle on axle stands positioned at the specified locations and remove the rear wheel.
(2) Separate the parking brake cable from the rear brake.
(3) Remove the caliper assembly and brake disc.
(4) Place a dial gauge as shown in the figure, and then measure the play when the axle shaft is moved in the axial direction.

**Limit: 0.8 mm (.031 in.)**




(5) If the play exceeds the limit, check the tightening torque of the companion flange of the axle shaft; if it is correct, replace the wheel bearing.




## REAR WHEEL BEARING ROTATION SLIDING RESISTANCE CHECK N03FJAA

(1) Remove the drive shaft from the companion flange.
(2) Remove the brake pad or caliper assembly.
(3) Attach a spring balance to the hub bolt, then, pulling the balance at a right angle to the hub bolt, measure the rotation sliding resistance (rotation starting torque) to see whether it is within the standard value.

**Standard value: 12 N (2.6 lbs.) [rotation starting torque 0.7 Nm (6 in lbs.)] or less**

(4) If the rotation starting torque exceeds the standard value, check the tightening torque of the axle shaft companion flange. If it is normal, replace the bearing.

## LIMITED-SLIP DIFFERENTIAL CHECK N03FIAA

(1) Block the front wheels and move the shift lever to neutral.
(2) Completely release the parking brake.
(3) Jack up the rear wheels and place a rigid rack at the specified part of the side sill.
(4) Disconnect the coupling of the differential and propeller shaft.
(5) When one wheel is slowly rotated, check whether or not the wheel on the other side turns in the same direction.
(6) If it turns in the opposite direction, replace the viscous unit.

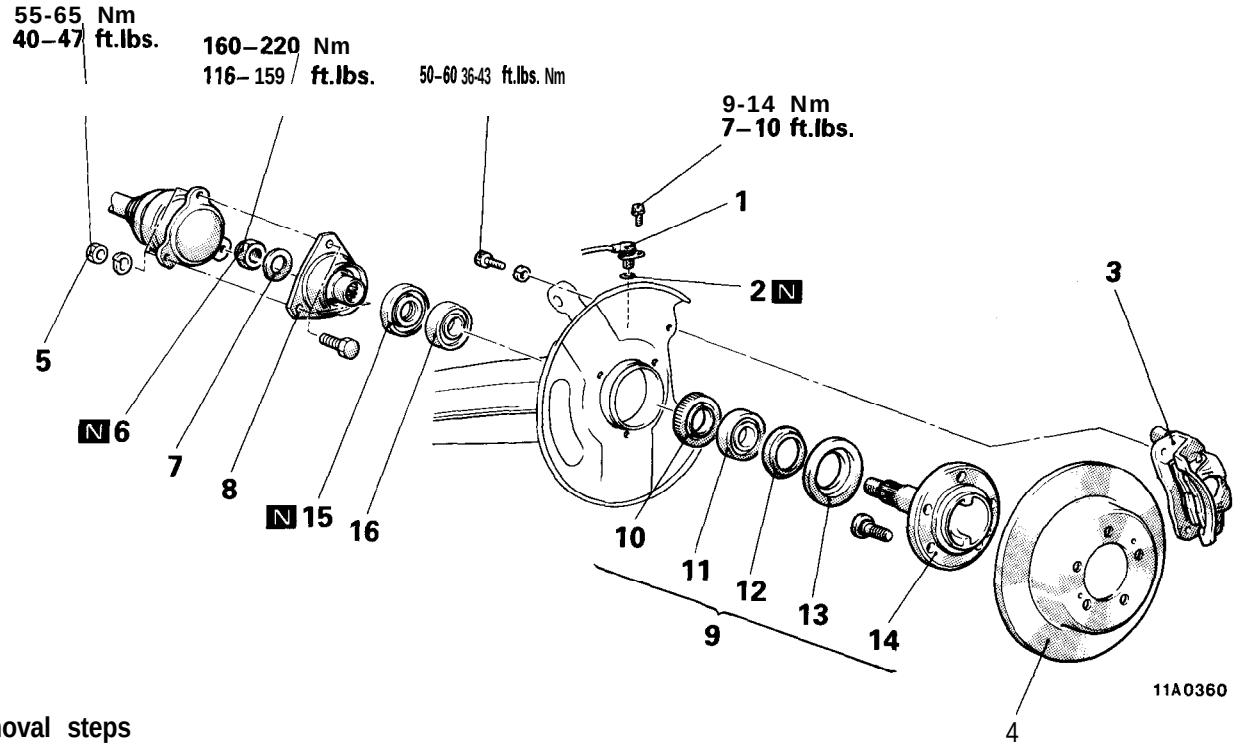
# AXLE SHAFT

## REMOVAL AND INSTALLATION

N03HA--

**Pre-removal Operation**
*Disconnecting of Parking Brake Cable End

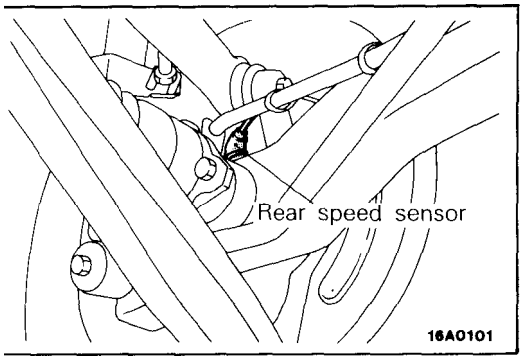
**Post-installation Operation**
- Connecting of Parking Brake Cable End
- Adjusting Parking Brake Lever Stroke (Refer to GROUP 5–Service Adjustment Procedures.)




**Removal steps**

◆◆ 1. Rear speed sensor <Vehicles with ABS>
2. O-ring
◆◆ 3. Brake caliper assembly
4. Brake disc
5. Drive shaft mounting nut
◆◆ ● + 6. Self-locking nut
7. Washer
8. Companion flange
◆◆ 9. Axle shaft assembly
◆◆ ◆◆ 10. Rear rotor <Vehicles with ABS>
◆◆ ◆◆ 11. Outer bearing
◆◆ ◆◆ 12. Dust cover
◆◆ 13. Dust cover
14. Axle shaft
◆◆ ◆◆ 15. Oil seal
◆◆ ● + 16. Inner bearing

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL

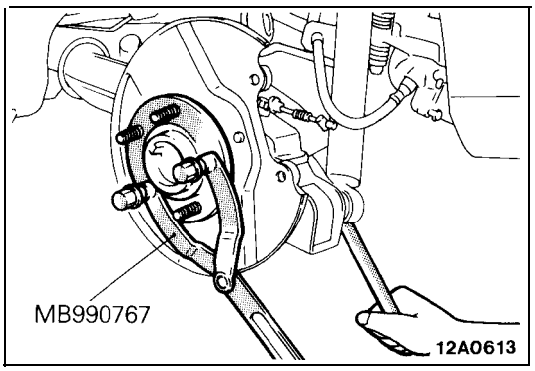
N03HBAP

### 1. REMOVAL OF REAR SPEED SENSOR <VEHICLES WITH ABS>

NOTE
Be cautious to ensure that the tip of the pole piece does not come in contact with other parts when removing the speed sensor.

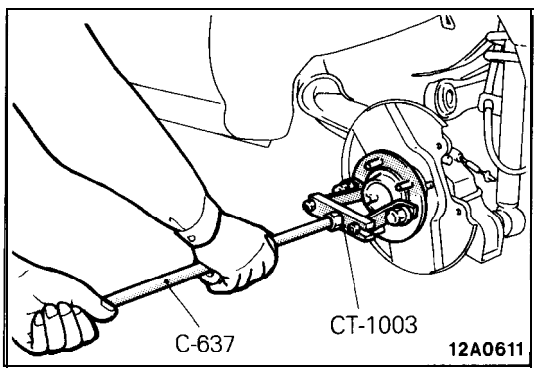
### 3. REMOVAL OF BRAKE CALIPER ASSEMBLY

Remove the brake caliper assembly and suspend it with a piece of wire.



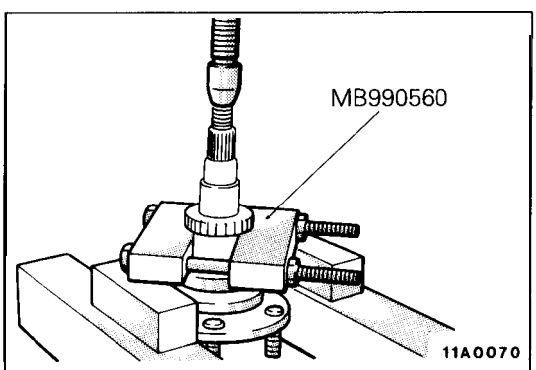

**6. REMOVAL OF SELF-LOCKING NUT**

With the special tool, secure the axle shaft and remove the companion flange self-locking nut.



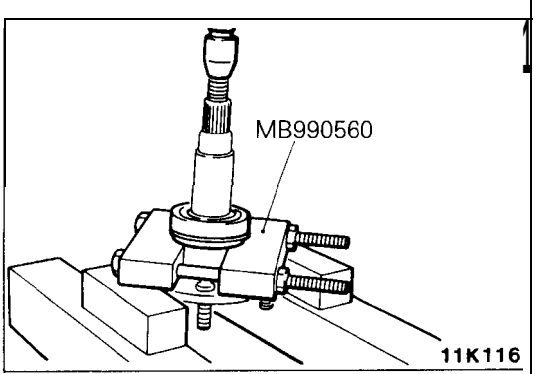

**9. REMOVAL OF AXLE SHAFT ASSEMBLY**

With the special tool, remove the axle shaft from the trailing arm.



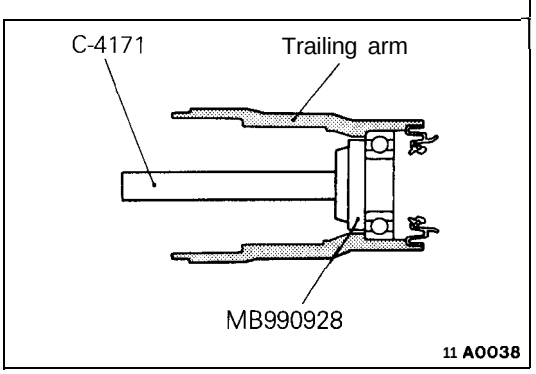

**10. REMOVAL OF REAR ROTOR <VEHICLES WITH ABS>**

Remove the rear rotor from the axle shaft.




**11. REMOVAL OF OUTER BEARING/12. DUST COVER**

With the special tool, remove the outer bearing and dust cover concurrently from the axle shaft.



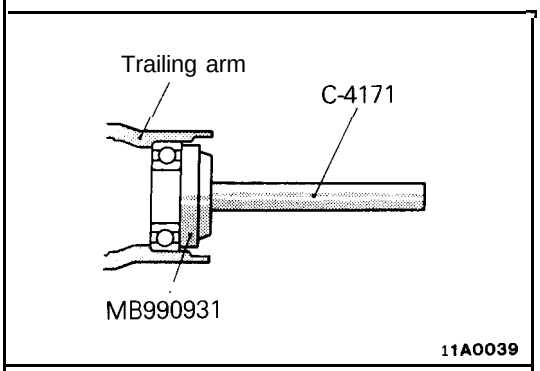

**15. REMOVAL OF OIL SEAL/16. INNER BEARING**

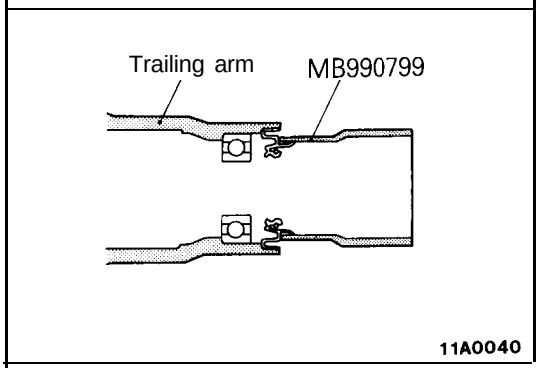
With the special tool, remove the inner bearing and oil seal from the trailing arm.

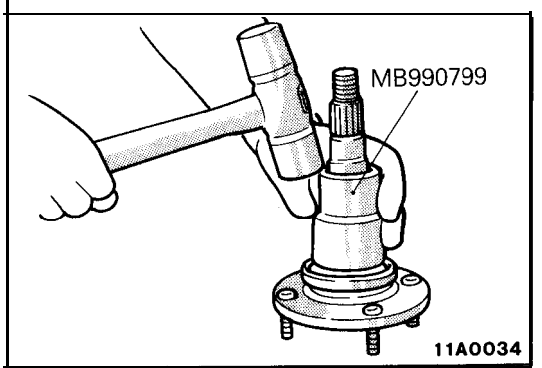
## INSPECTION

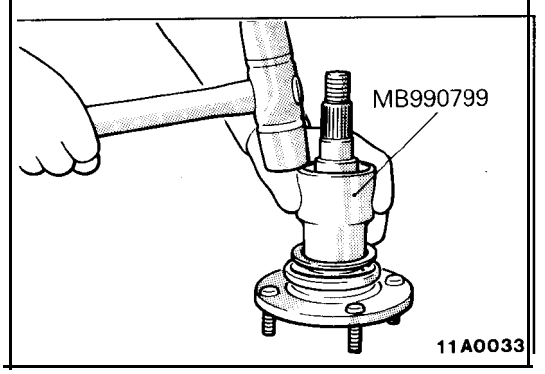
N03HCAF

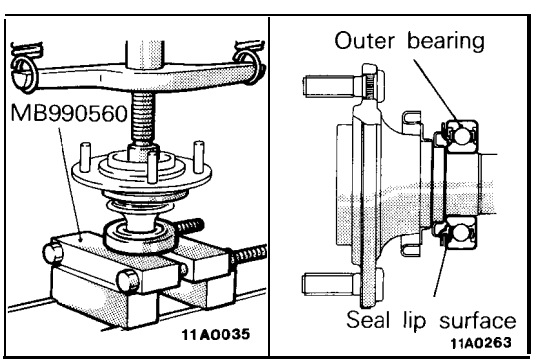
- Check the companion flange for wear or damage.
- Check the dust cover for deformation or damage.
- Check the wheel bearings for burning or discoloration.
- Check the wheel bearing for unsmooth rotation.
- Check the axle shaft for cracking, wear or damage.
- Check oil seal for cracking or damage.




## SERVICE POINTS OF INSTALLATION N03HDAR

### 16. INSTALLATION OF INNER BEARING

With the special tool, press fit the inner bearing onto the trailing arm.

### 15. INSTALLATION OF OIL SEAL

(1) With the special tool, press fit the oil seal onto the trailing arm with the depression in the oil seal facing upward, and until it contacts the shoulder on the inside of the inner arm.

NOTE
When tapping the oil seal in, use a plastic hammer to lightly tap the top and circumference of the special tool, press fitting gradually and evenly.

(2) Apply multipurpose grease to the oil seal lip.

**Specified grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**

### 13. INSTALLATION OF DUST COVER

Orienting the dust cover as shown in the illustration, and using the special tool, press fit the dust cover until it contacts the axle shaft shoulder.

NOTE
When tapping the oil seal in, use a plastic hammer to lightly tap the top and circumference of the special tool, press fitting gradually and evenly.

### 12. INSTALLATION OF DUST COVER

With the special tool, install the dust cover so that the depression is facing upward.

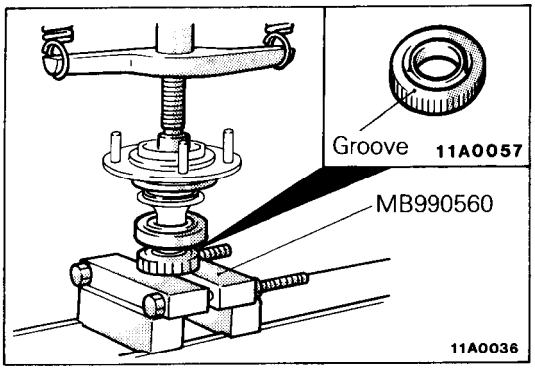
NOTE
When tapping the oil seal in, use a plastic hammer to lightly tap the top and circumference of the special tool, press fitting gradually and evenly.

### 11. INSTALLATION OF OUTER BEARING

(1) Apply multi-purpose grease around the entire circumference of the inner side of the outer bearing seal lip.

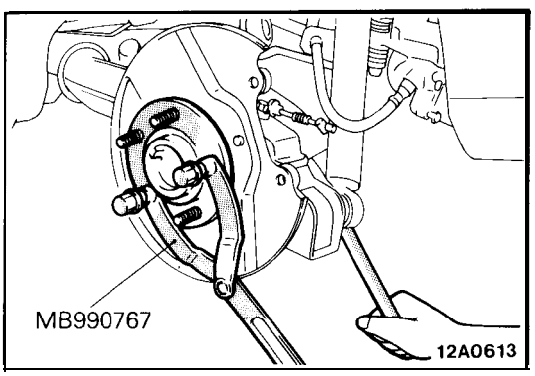
**Specified grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**

(2) With the special tool, press fit the outer bearing to the axle shaft so that the bearing seal lip surface is facing towards the axle shaft flange.




**10. INSTALLATION OF REAR ROTOR <VEHICLES WITH ABS>**

Press fit the rear rotor to the axle shaft with the rear rotor groove surface toward the axle shaft flange.




**6. INSTALLATION OF SELF LOCKING NUT**

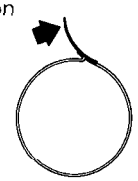
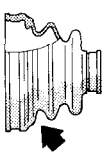
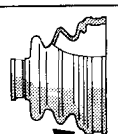
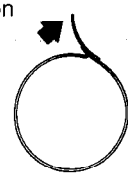
With the special tool, secure the axle shaft and tighten the companion flange self locking nut.

# DRIVE SHAFT

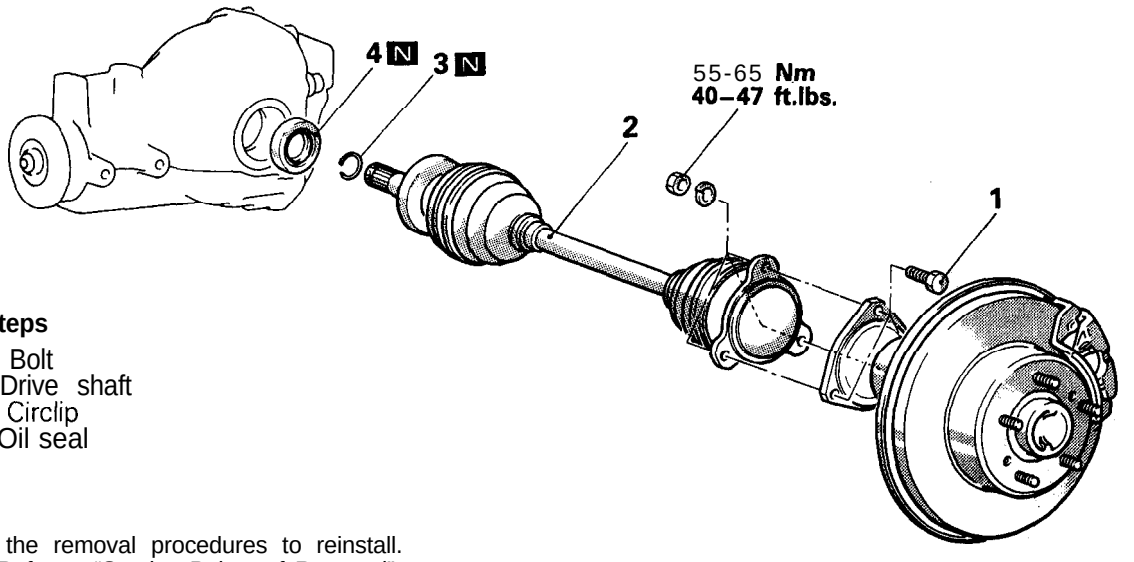
N03JA--

## PARTS DISTINCTION

-- Boots and boot bands can be distinguished by the indicated part number as below.

| | D.O.J. boot band | D.O.J. boot | Boot band (small) | B.J. boot | B.J. boot band |
|---|---|---|---|---|---|
| Part shapes and part identification number location | Identification location  |  Identification location 11R0156 | Identification location  |  Identification location 11A0356 | Identification location  11K033 |
| Part identification No. | 20–82 | 17–131 #BJ82 | 20–83 | 17–169 #BJ82 | 20–110 |

## REMOVAL AND INSTALLATION

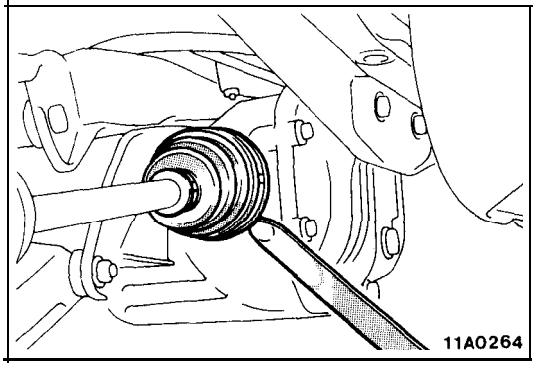



**Removal steps**

1. Bolt
◆◆ ● 4 2. Drive shaft
3. Circlip
● * 4. Oil seal

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) ❑ : Non-reusable parts

11A0324



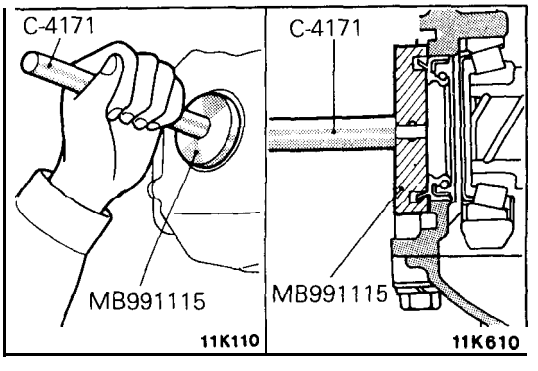

### SERVICE POINTS OF REMOVAL N03JBAD

**2. REMOVAL OF DRIVE SHAFT**

Using a tire lever, etc. remove the drive shaft from the differential carrier.

### INSPECTION N03JHAA

- Check the drive shaft boots for damage or deterioration.
- Check the ball joints (B.J. and D.O.J.) for excessive play or check operation.
- Check the drive shaft spline for wear or damage.

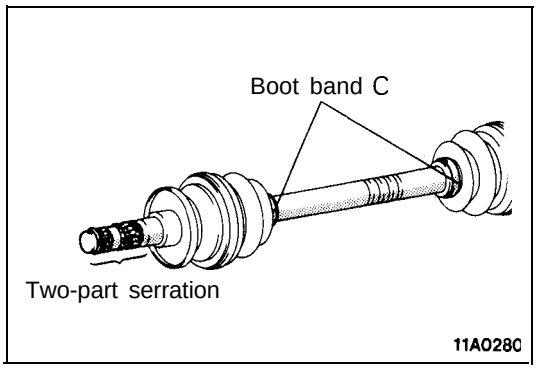



### SERVICE POINTS OF INSTALLATION N03JCAE

**4. INSTALLATION OF OIL SEAL**

(1) If the oil seal is to be replaced because of damage, drive it in by using the special tool.
(2) Apply the specified grease to the oil seal lip.

**Specified grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalant**




## 2. INSTALLATION OF DRIVE SHAFT

**Caution**

1. **Be cautious to ensure that the differential carrier oil seal is not damaged by the drive shaft spline.**
2. **The drive shafts for models equipped with the limited-slip differential are of different length and, in addition, the right drive shaft has a two-part serration; be very careful to install each one on the correct side.**

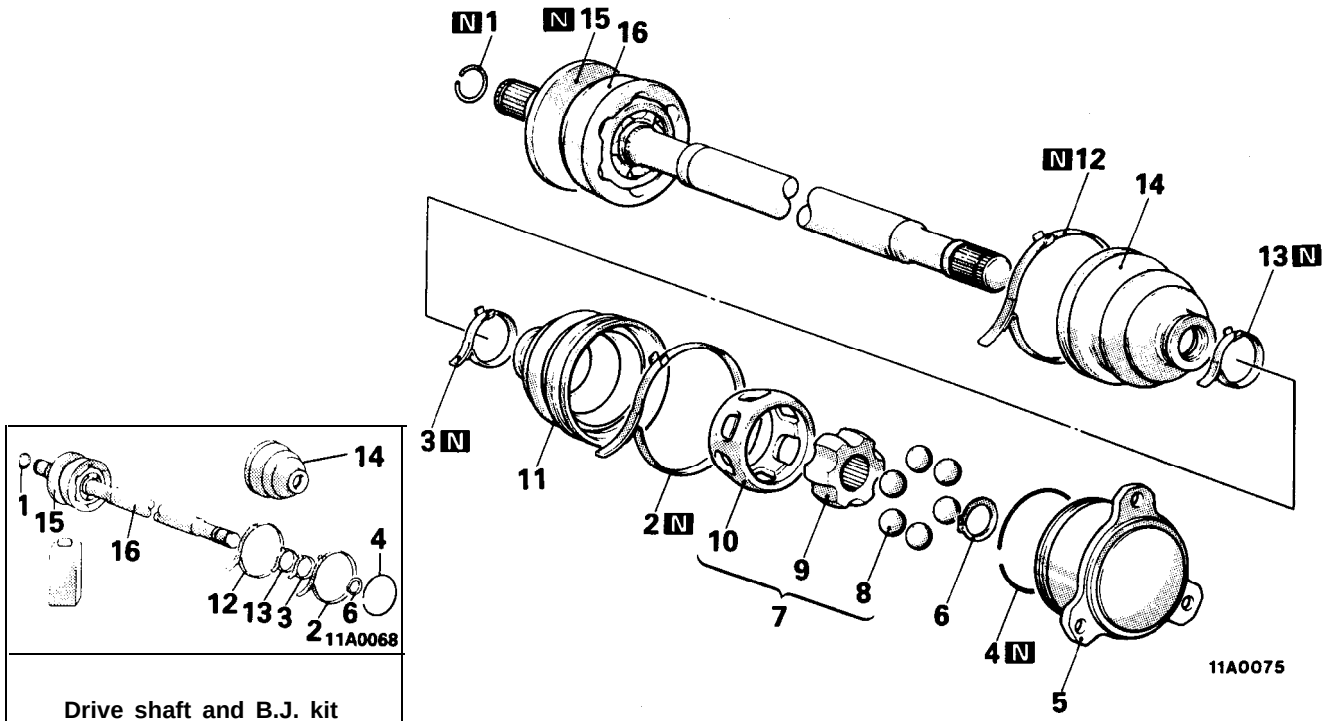
NOTE
The left and right drive shafts can also be distinguished from each other by the identification color of boot band C.

| Item | Drive shaft (left) | Drive shaft (right) |
|---|---|---|
| Boot band C identification color | Yellow | Blue |

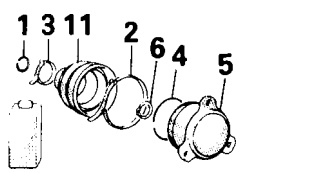
3. **Be sure to thoroughly remove any oil or grease, etc. from the threaded part of the bolt and nut used for installation to the companion flange, because any oil, grease, etc. on these parts might cause later loosening even though tightening is at the specified torque.**

## DISASSEMBLY AND REASSEMBLY

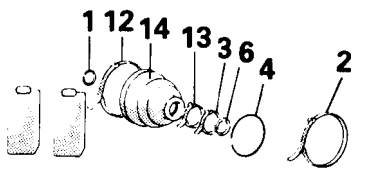
N03JD--



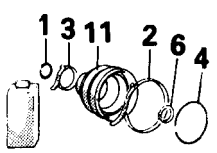

Drive shaft and B.J. kit




D.O.J. kit




B.J. boot repair kit




D.O.J. boot repair kit

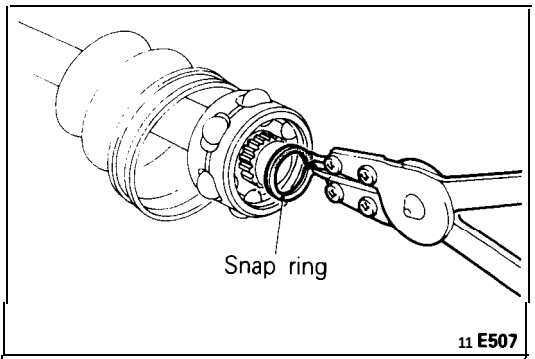
**Disassembly steps**

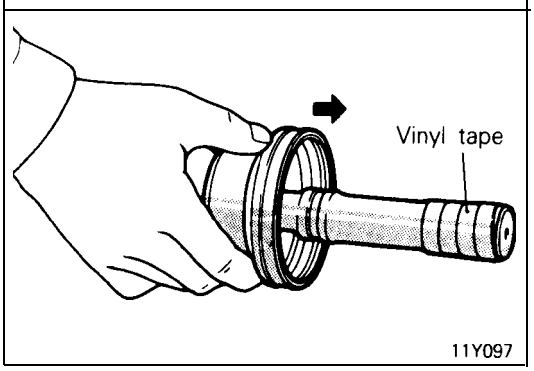
1. Circlip
2. Boot band(B)
3. Boot band (C)
4. Circrip
5. D.O.J. outer race
◆◆ 6. Snap ring
7. D.O.J. inner race, cage and ball assembly
◆◆ 8. Balls
◆◆ 9. D.O.J. inner race
◆◆ 10. D.O.J. cage
◆◆ 11. D.O.J. boot
12. Boot band (A)
13. Boot band (C)
◆◆ 14. B.J. boot
15. Dust cover
16. Drive shaft and B.J.

**Reassembly steps**

16. Drive shaft and B.J.
15. Dust cover
● + 14. B.J. boot
● + 12. Boot band (A)
● + 13. Boot band (C)
● + 3. Boot band (C)
● + 2. Boot band(B)
● + 11. D.O.J. boot
● + 7. D.O.J. inner race, cage and ball assembly
10. D.O.J. cage
9. D.O.J. inner race
8. Balls
6. Snap ring
◆◆ 5. D.O.J. outer race
4. Circlip
1. Circlip

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N03JEAC

**6. REMOVAL OF SNAP RING/8. BALLS/9. D.O.J. INNER RACE/IO. D.O.J. CAGE**

(1) Remove the snap ring with the snap ring pliers and then remove the D.O.J. inner race, the D.O.J. cage, and the balls as a unit.
(2) Clean the D.O.J. inner race, the D.O.J. cage, and the balls, without dismantling them.

**Caution**
**1. Be careful that balls do not drop out of the cage.**
**2. If the balls drop out, press them back into the D.O.J. cage with the D.O.J. inner race.**

**I I. REMOVAL OF D.O.J. BOOT/14. B.J. BOOT**

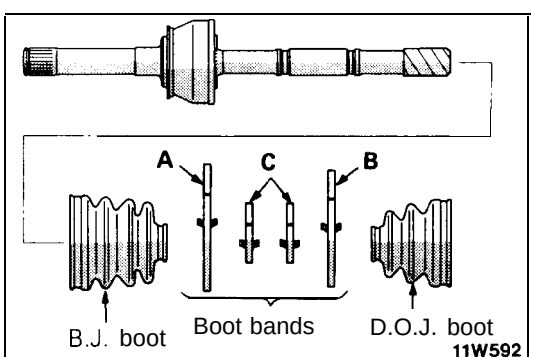
(1) Wipe the grease off of the spline portion.
(2) Remove the D.O.J. boot and B.J. boot.

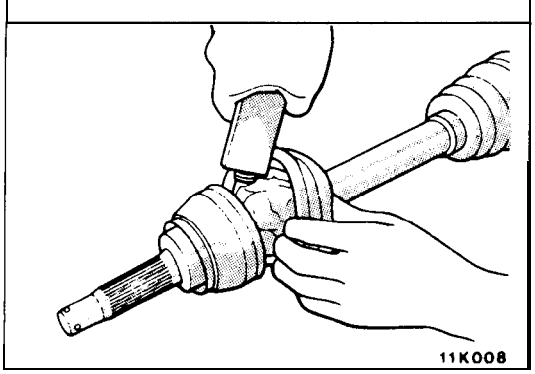
NOTE
If the boots are reused, wrap vinyl tape around the drive shaft spline so that the boots are not damaged when they are removed.

**Caution**
**Do not disassemble the B.J.**

## INSPECTION N03JFAC

- Check the drive shaft for damage, bending or corrosion.
- Check the drive shaft spline for wear or damage.
- Check the B.J. for entry of water and/or foreign material.
- Check the D.O.J. outer race for damage or corrosion.
- Check the D.O.J. cage, balls and D.O.J. inner race for damage, corrosion or wear.




## SERVICE POINTS OF REASSEMBLY N03JGAD

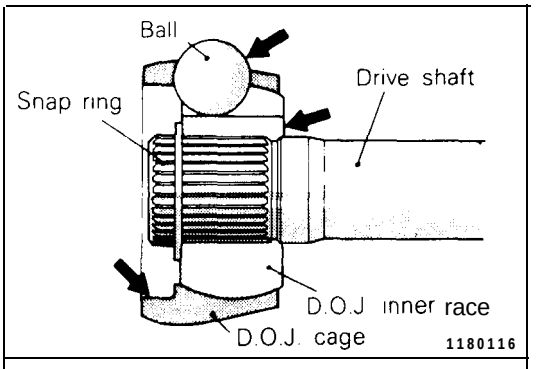
**14. INSTALLATION OF B.J. BOOT/12. BOOT BAND (A)/13. BOOT BAND (C)/3. BOOT BAND (C)/2. BOOT BAND (B)/11. D.O.J. BOOT**

(1) Wrap vinyl tape around the drive shaft spline.
(2) Insert the drive shaft in B.J. boot, boot band (A), (C), (C), (B), D.O.J. boot in that sequence.

(3) Fill the inside of the B.J. and B.J. boot with the specified grease.

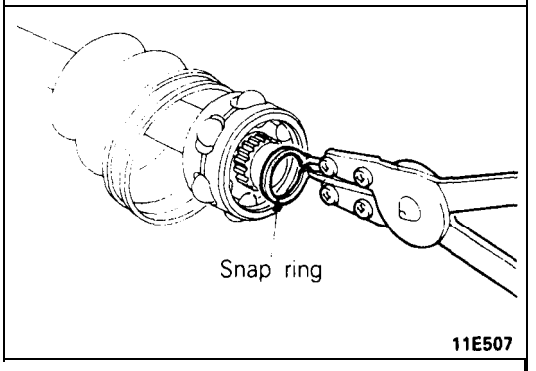
**Specified grease: Repair kit grease 90 g (3.2 oz.)**

**Caution**
**The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.**
**A special type of grease is used on the joint. Be cautious to ensure that not other grease is allowed to come in contact with the joint.**




(4) Secure the B.J. boot with boot bands (A) and (C) to the drive shaft and B.J.

**Caution**
**Ensure that the B.J. is at a zero angle with the drive shaft to ensure the boot contains the specified amount of air.**

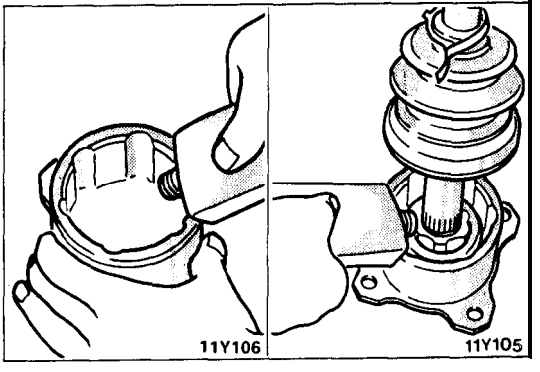



**7. INSTALLATION OF D.O.J. INNER RACE, CAGE AND BALL ASSEMBLY**

(1) Apply the specified grease to the D.O.J. cage, the balls and the D.O.J. inner race.

**Specified grease: Repair kit grease (As required)**

(2) Install the cage, balls and inner race to the drive shaft, then, using the snap ring pliers, fit the snap ring securely into the groove in the shaft.




**5. APPLICATION OF GREASE TO D.O.J. OUTER RACE**

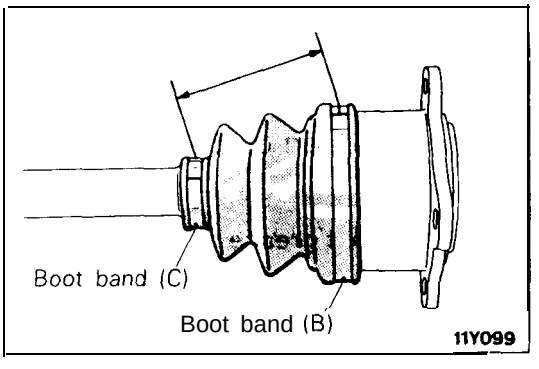
(1) Fill the specified grease to the D.O.J. outer race, fit the drive shaft into the D.O.J. outer race, and then fill more grease to the D.O.J. outer race.

**Specified grease: Repair kit grease 90 g (3.2 oz.)**

**Caution**
**The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.**
**A special type of grease is used on the joint. Be cautious to ensure that no other grease is allowed to come in contact with the joint.**

(2) Install the circlip to the D.O.J. outer race.
(3) Assemble the D.O.J. boot to the D.O.J. outer race, then secure the boot to the drive shaft with boot band (C).
(4) Place boot band (B) on the D.O.J. boot.

NOTE
Do not secure boot band (B)




(5) Set the D.O.J. boot bands at the specified distance in order to adjust the amount of air inside the D.O.J. boot, and then tighten the D.O.J. boot band (C) securely.

**Standard value: 76 ± 3 mm (3.00 ± .23 in.)**

(6) Release a part of the D.O.J. boot from the D.O.J. outer race to allow pressure to escape from the boot.
(7) Tighten boot band (B) and secure the D.O.J. boot.

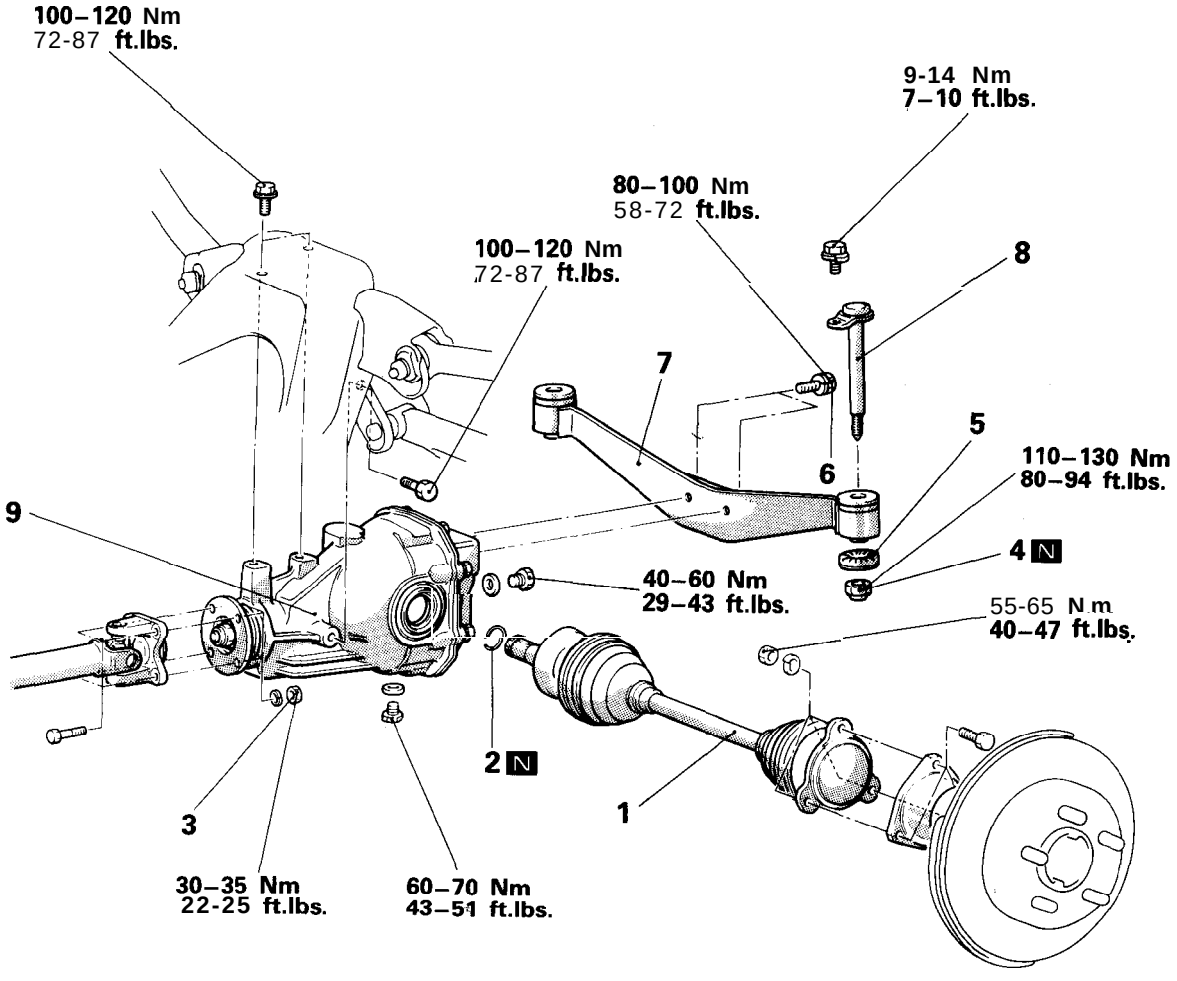
# DIFFERENTIAL CARRIER

## REMOVAL AND INSTALLATION

N03IA--

**Pre-removal Operation**
@Drainage of Differential Gear Oil (Refer to P.3-8.)
*Removal of Center Exhaust Pipe (Refer to GROUP 1 l-Exhaust Pipe and Main Muffler.)

**Post-installation Operation**
- Installation of Center Exhaust Pipe (Refer to GROUP 11–Exhaust Pipe and Main Muffler.)
- Filling Differential Gear Oil (Refer to P.3-8.)

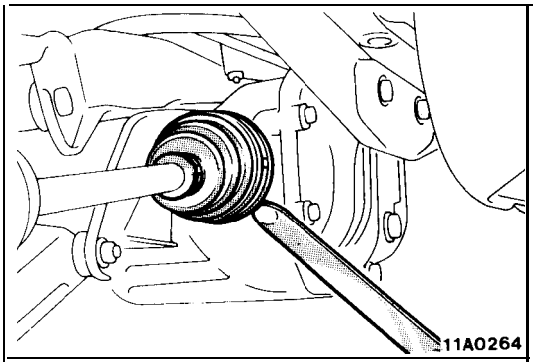



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**Removal steps**

◆◆ 1. Drive shaft
2. Circlip
◆◆▶◀ 3. Propeller shaft connection
4. Differential support member installation nut
5. Stopper (lower)
6. Differential support member installation bolts
7. Differential support member
8. Differential support member installation bolts
9. Differential carrier

NOTE
(1) Reverse the removal procedures to reinstall
(2) ◆◆: Refer to "Service Points of Removal".
(2) ▶◀: Refer to "Service Points of Installation".
(3) N: Non-reusable parts.

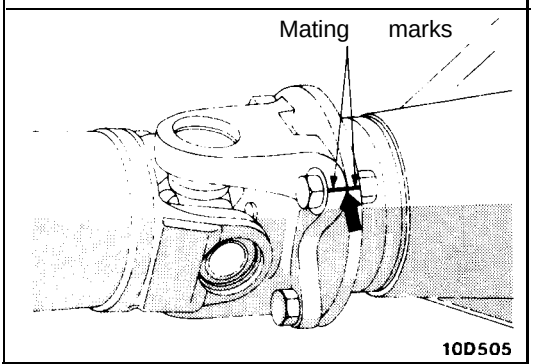



## SERVICE POINTS OF REMOVAL N03IBAL

### 1. REMOVAL OF DRIVE SHAFT

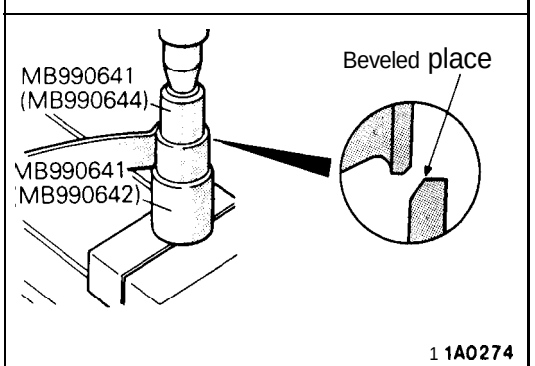
With a tyre lever, etc., remove the drive shaft from the differential carrier.

NOTE
Be cautious to ensure that the differential carrier oil seal is not damaged by the drive shaft spline.




### 3. DISCONNECTION OF PROPELLER SHAFT

(1) Place mating marks on the differential companion flange and flange yoke for reference during reassembly.
(2) Remove the differential carrier and propeller shaft connection.
(3) Support the propeller shaft with wire.




## DIFFERENTIAL SUPPORT MEMBER BUSHING REPLACEMENT N03IYAA

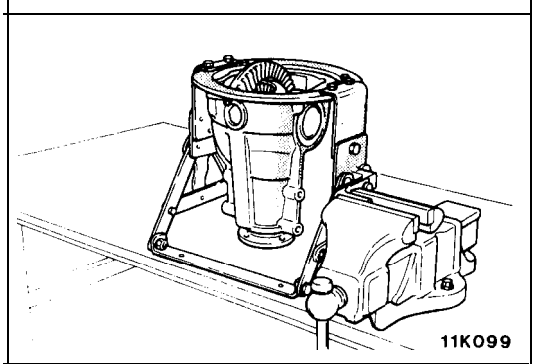
Use the special tool to pull out and press in the differential support member bushing.

NOTE
Press in the bushing from the beveled part of the differential support member; press in until the end surface of the bushing outer cylinder is flush with the support member.

## SERVICE POINTS OF INSTALLATION N03IDAK

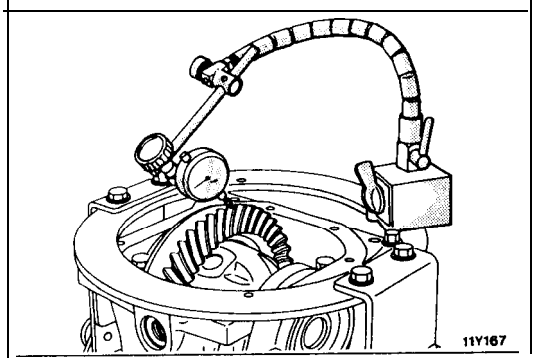
### 3. CONNECTION OF PROPELLER SHAFT

Align the mating marks on the flange yoke and the companion flange to install the propeller shaft.




## INSPECTION BEFORE DISASSEMBLY N03IEAI

Hold the working base in a vice, and attach the differential carrier to the working base.

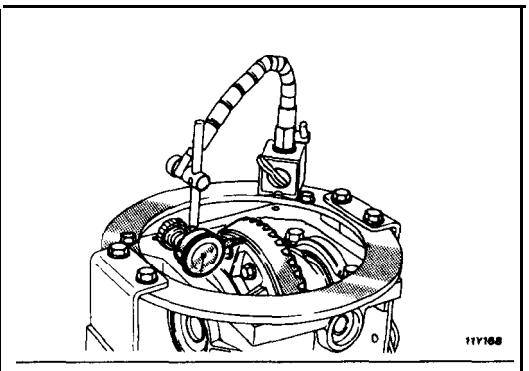



### FINAL DRIVE GEAR BACKLASH

With the drive pinion locked in place, measure the final drive gear backlash with a dial indicator on the drive gear.

NOTE
Measure at four points or more on the circumference of the drive gear.

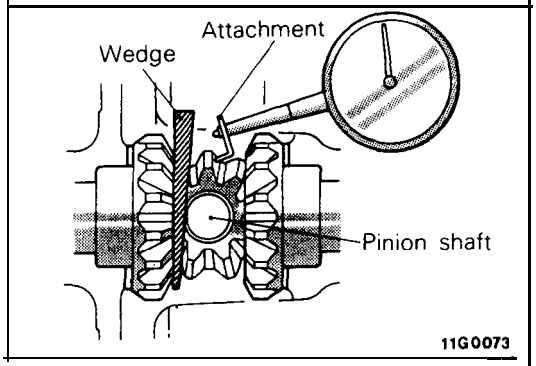
**Standard value: 0.11–0.16 mm (.004–.006 in.)**




### DRIVE GEAR RUNOUT

Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

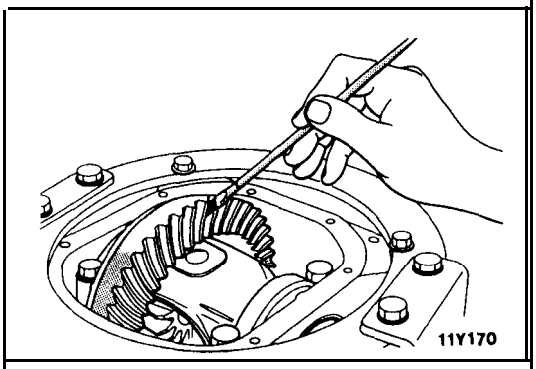
**Limit: 0.05 mm (.002 in.)**




### DIFFERENTIAL GEAR BACKLASH

While locking the side gear with the wedge, measure the differential gear backlash with a dial indicator on the pinion gear.

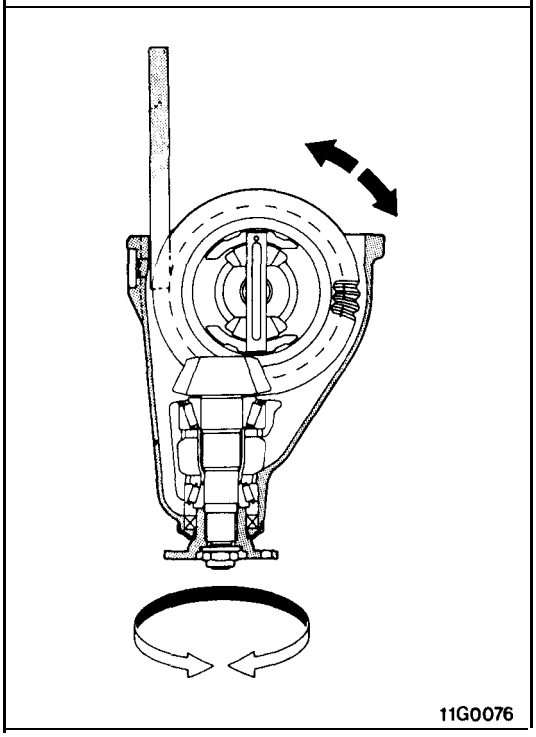
**Standard value:** **0–0.076 mm (0–.003 in.)**
**Limit:** 0.2 **mm (.008 in.)**




### FINAL DRIVE GEAR TOOTH CONTACT

Check the final drive gear tooth contact by following the steps below.

(1) Apply a thin, uniform coat of machine blue to both surfaces of the drive gear teeth.



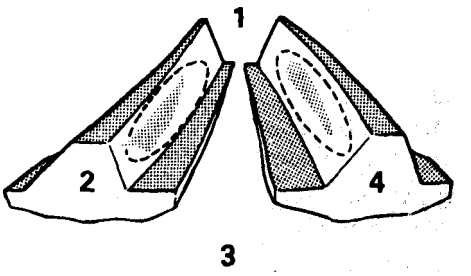

(2) Insert a brass rod between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear, so that the revolution torque [approximately 2.5–3.0 Nm (28-33 in.lbs.)] is applied to the drive pinion.

**Caution**
**If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.**

(3) Check the tooth contact condition of the drive gear and drive pinion.

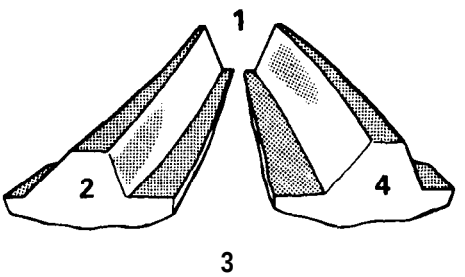
**Standard tooth contact pattern**

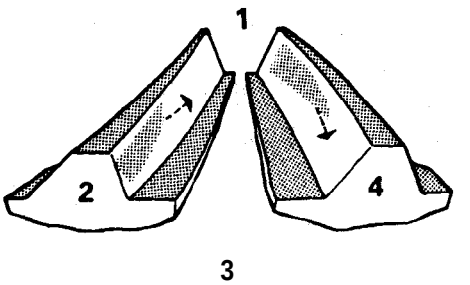
1 Narrow tooth side
2 Drive-side tooth surface (the side applying power during forward movement)
3 Wide tooth side
4 Coast-side tooth surface (the side applying power during reverse movement)




| Problem | Solution |
|---|---|

**Tooth contact pattern resulting from excessive pinion height**

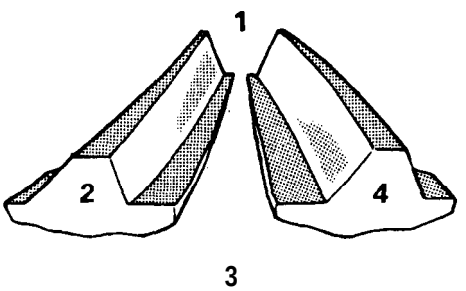


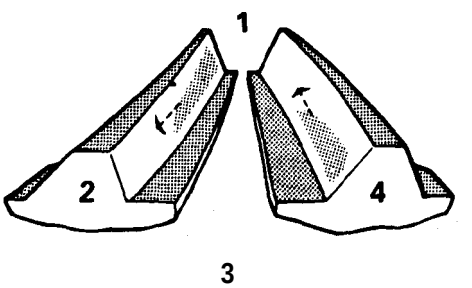




The drive pinion is positioned too far from the center of the drive gear.

Increase the thickness of the pinion height adjusting shim, and position the drive pinion closer to the center of the drive gear.
Also, for backlash adjustment, position the drive gear farther from the drive pinion.

**Tooth contact pattern resulting from insufficient pinion height**




The drive pinion is positioned too close to the center of the drive gear.

Decrease the thickness of the pinion height adjusting shim, and position the drive pinion farther from the center of the drive gear.
Also, for backlash adjustment, position the drive gear closer to the drive pinion.

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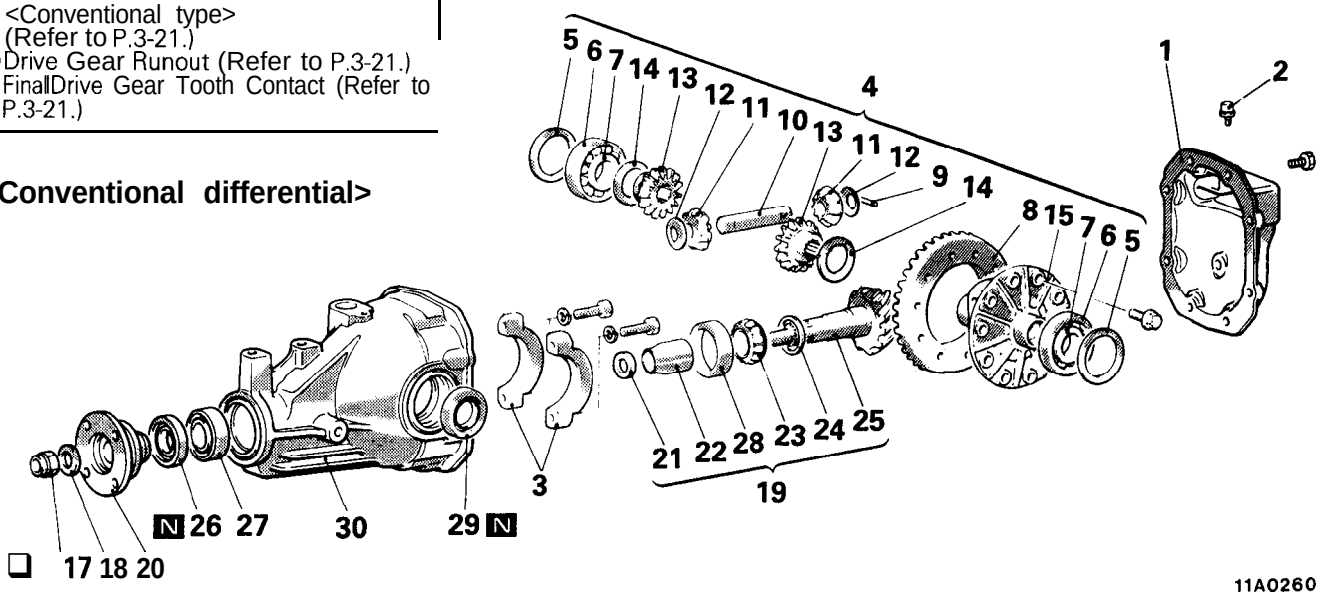
NOTE
(1) Tooth contact pattern is a method for judging the result of the adjustment of drive pinion height and final drive gear backlash. The adjustment of drive pinion hight and final drive gear backlash should be repeated until tooth contact patterns bear a similarity to the standard tooth contact pattern.
(2) When adjustment is not able to obtain a correct pattern, it may be judged that the drive gear and drive pinion have exceed their usage limits and both gears should be replaced as a set.

## DISASSEMBLY

N03IF--

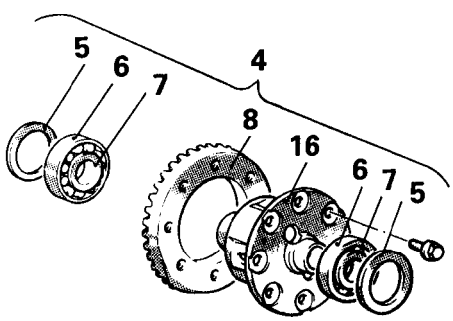
**Inspection Before Disassembly**
- Final Drive Gear Backlash (Refer to P.3-20.)
- *Differential Gear Backlash <Conventional type> (Refer to P.3-21.)
- Drive Gear Runout (Refer to P.3-21.)
- FinalDrive Gear Tooth Contact (Refer to P.3-21.)

**<Conventional differential>**




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**<Limited slip differential>**

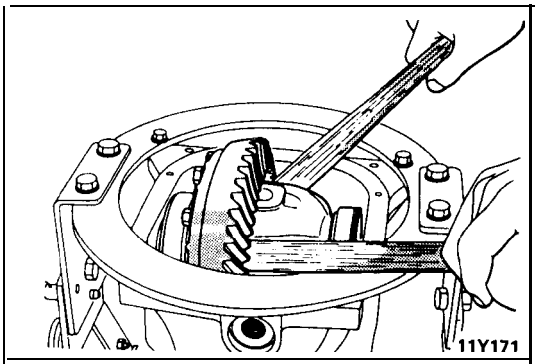


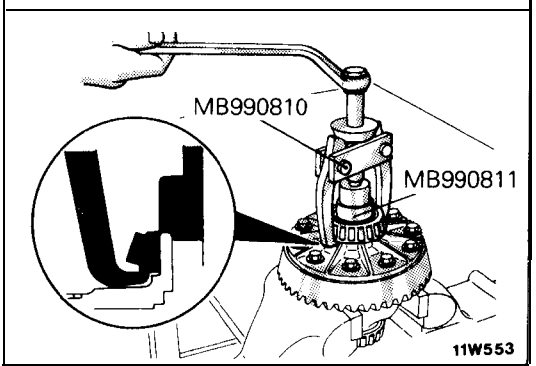

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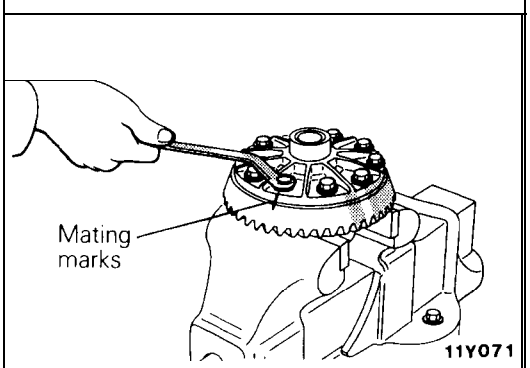
**Disassembly steps**

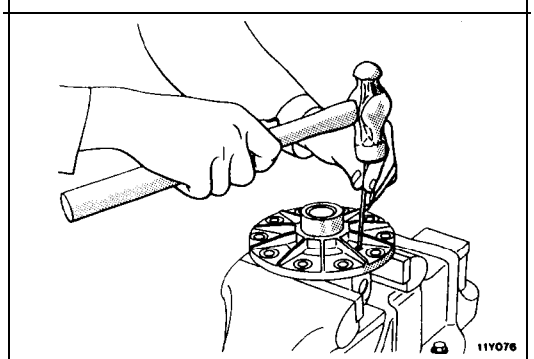
1. Differential cover
2. Vent plug
3. Bearing caps
4. ◆◆ Differential case assembly
5. Side bearing spacers
6. Side bearing outer race
7. ◆◆ Side bearing inner race
8. ◆◆ Drive gear
9. ● ☒ Lock pin
10. Pinion shaft
11. Pinion gears
12. Pinion washers
13. Side gears
14. Side gear spacers
15. Differential case
16. Limited slip differential case assembly
17. ◆◆ Self-locking nut
18. Washer
19. ◆◆ Drive pinion assembly
20. Companion flange
21. Drive pinion front shim (for preload adjustment)
22. Drive pinion spacer
23. ● ☒ Drive pinion rear bearing inner race
24. Drive pinion rear shim (for pinion height adjustment)
25. Drive pinion
26. ◆◆ Oil seal
27. ◆◆ Drive pinion front bearing
28. ◆◆ Drive pinion rear bearing outer race
29. Oil seal
30. Gear carrier

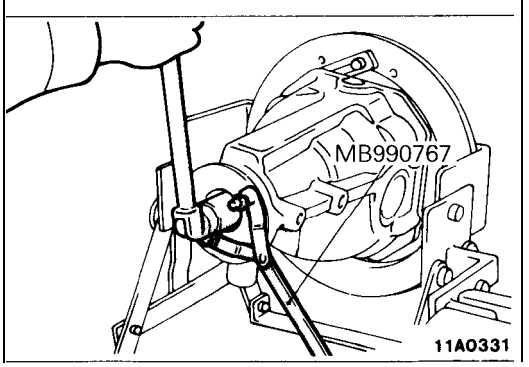
NOTE
(1) ◆◆: Refer to "Service Points of Disassembly".
(2) N: Non-reusable parts.




## SERVICE POINTS OF DISASSEMBLY N03IGBC

### 4. REMOVAL OF DIFFERENTIAL CASE ASSEMBLY

Prize out the differential case assembly using hammer shafts.

NOTE

When removing the differential case assembly, the removal should be accomplished slowly and carefully and caution paid to ensure that the side bearing outer race is not dropped.

Keep the right and left side bearings separate, so that they do not become mixed at the time of reassembly.

### 7. REMOVAL OF SIDE BEARING INNER RACES

Pull out the side bearing inner races by using the special tools.

### 8. REMOVAL OF DRIVE GEAR

(1) Make the mating marks to the differential case and the drive gear.

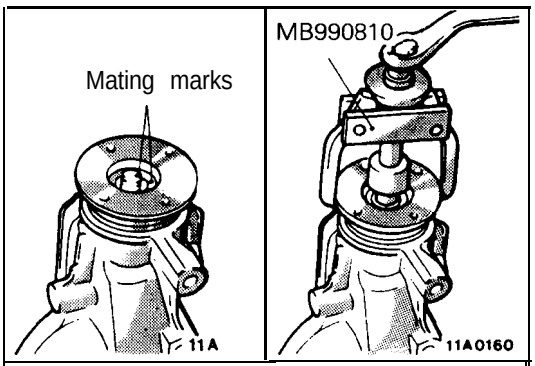
(2) Loosen the drive gear attaching bolts in diagonal sequence to remove the drive gear.

### 9. REMOVAL OF LOCK PIN

Drive out the lock pin with a punch and remove the pinion gears, pinion washers, side gears and side gear spacers.

### 17. REMOVAL OF SELF-LOCKING NUT

Use the special tools to hold the companion flange and remove the companion flange self-locking nut.

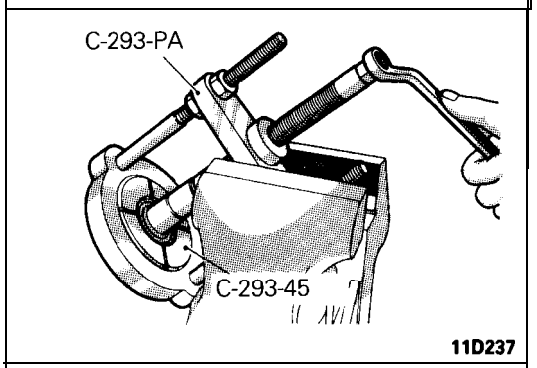



**19. REMOVAL OF DRIVE PINION**

(1) Make the mating marks to the drive pinion and companion flange.

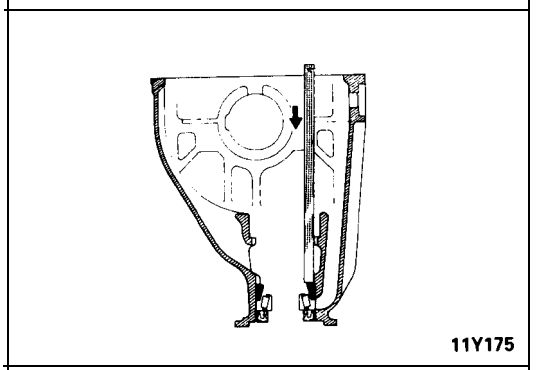
NOTE
Mating marks should not be made to the contact surfaces of companion flange and propeller shaft.

(2) Drive out the drive pinion together with the drive pinion spacer and drive pinion front shims.



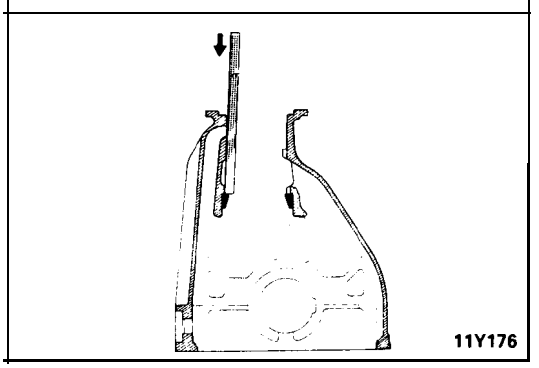

**23. REMOVAL OF DRIVE PINION REAR BEARING INNER RACE**

Pull out the drive pinion rear bearing inner race by using the special tools.




**26. REMOVAL OF OIL SEAL/27. DRIVE PINION FRONT BEARING**

Drive out the drive pinion front bearing from the gear carrier.




**28. REMOVAL OF DRIVE PINION REAR BEARING OUTER RACE**

Drive out the drive pinion rear bearing outer race from the gear carrier.

## INSPECTION

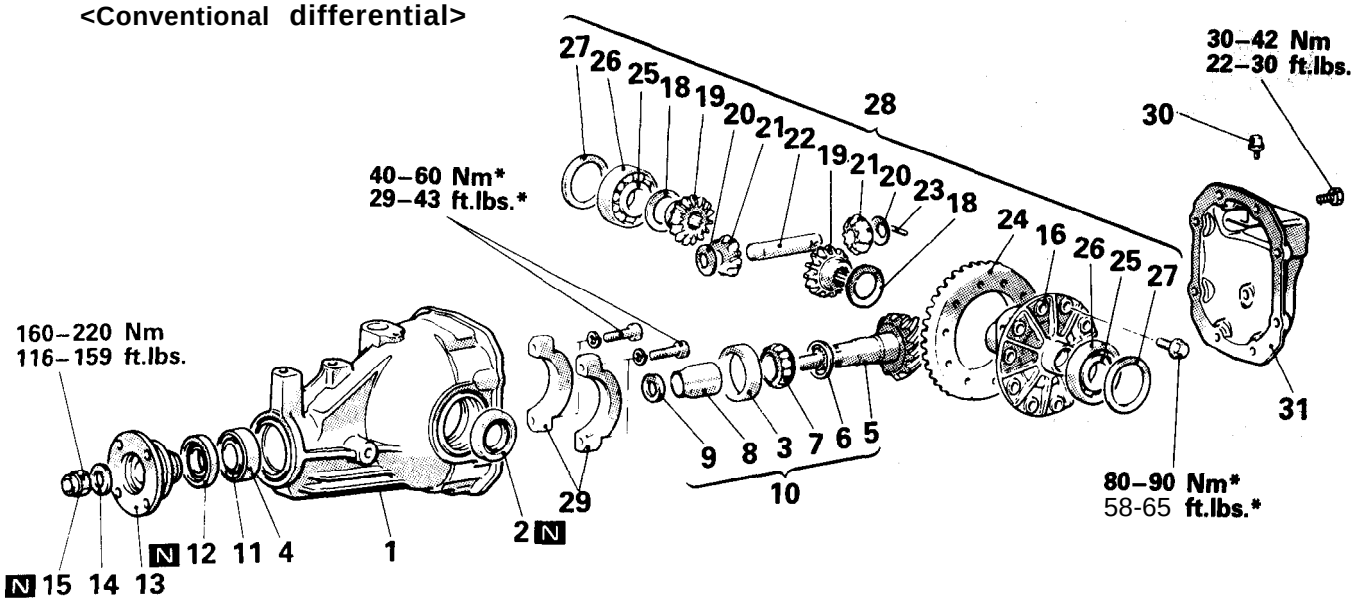
N03IHAD

- Check the companion flange for wear or damage.
- Check the oil seal for wear or deterioration.
- Check the bearings for wear or discoloration.
- Check the gear carrier for cracks.
- Check the drive pinion and drive gear for wear or cracks.
- Check the side gears, pinion gears and pinion shaft for wear or damage.
- Check the side gear spline for wear or damage.

## REASSEMBLY

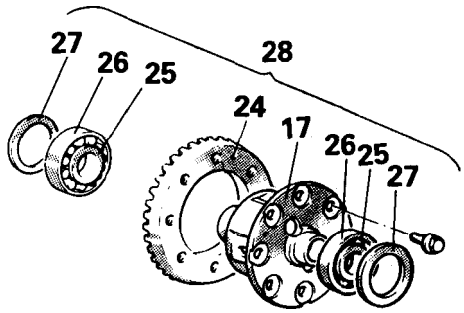
N03II--

<Conventional differential>



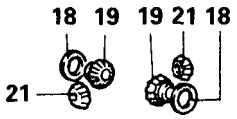

11A0260

<Limited slip differential>

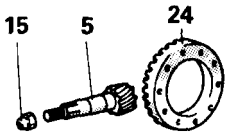



11A0290

<Conventional differential>




Differential gear set



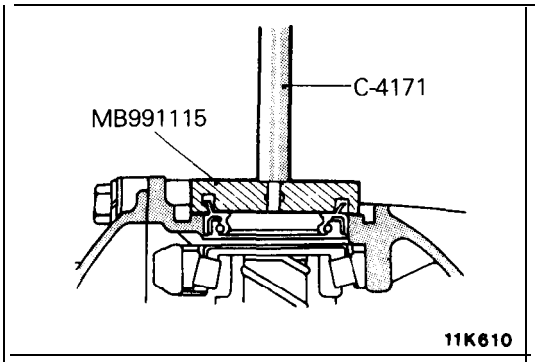

11 B0086

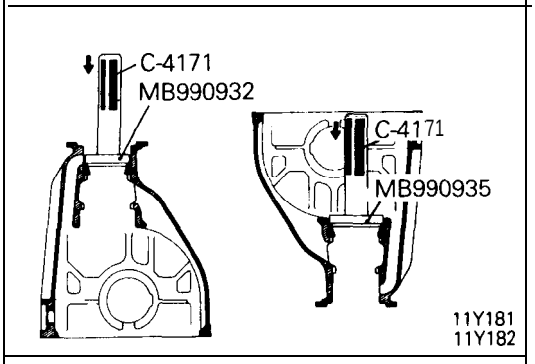
Final drive gear set

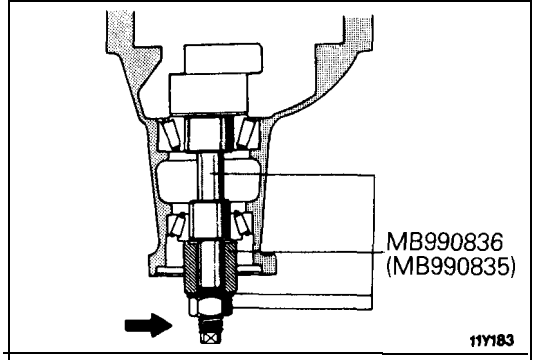
**Reassembly steps**

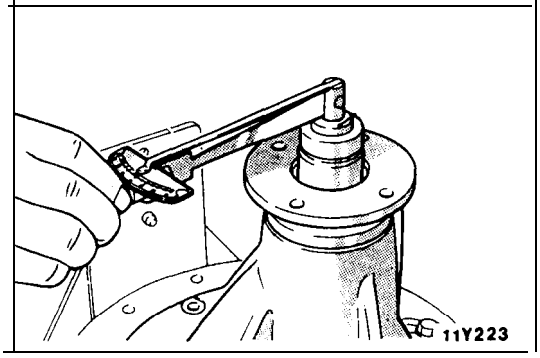
1. Gear carrier
- ● * 2. Oil seal
- ◆◆ 3. Drive pinion rear bearing outer race
- ◖ + 4. Drive pinion front bearing outer race
- ◖ ☒ Adjustment of pinion height
5. Drive pinion
6. Drive pinion rear shim (for pinion height adjustment)
7. Drive pinion rear bearing inner race
8. Drive pinion spacer
- ◖ ▯ Adjustment of drive pinion preload
9. Drive pinion front shim (for preload adjustment)
10. Drive pinion assembly
11. Drive pinion front bearing inner race
12. Oil seal
13. Companion flange
14. Washer
15. Self-locking nut
16. Differential case
17. Limited slip (viscous coupling) differential case
- ◖ ☒ Adjustment of differential gear backlash
18. Side gear spacers
19. Side gears
20. Pinion washers
21. Pinion gears
22. Pinion shaft
- ● * 23. Lock pin
- ● + 24. Drive gear
- ◆◆ 25. Side bearing inner race
26. Side bearing outer race
- ◖ ▯ Adjustment of final drive gear backlash
27. Side bearing spacers
28. Differential case assembly
29. Bearing caps
- ● 30. Vent plug
- ● 31. Differential cover

NOTE
(1) ◆◆: Refer to “Service Points of Reassembly”.
(2) N : Non-reusable parts.
(3) * : Tightening torque with oil applied.




## SERVICE POINTS OF REASSEMBLY N03IJBD

2. **PRESS FITTING OF OIL SEAL**

(1) With the special tool, press fit the oil seal until it is flush with the end of the gear carrier.

(2) Apply multipurpose grease to the oil seal lip.

**Specified grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**

**3. INSTALLATION OF DRIVE PINION REAR BEARING OUTER RACE/4. DRIVE PINION FRONT BEARING OUTER RACE**

Press-fit the drive pinion rear and front bearing outer races into the gear carrier by using the special tools.

**Caution**
**Be careful not to press in the outer race at an angle.**

- **ADJUSTMENT OF PINION HEIGHT**

Adjust the drive pinion height by the following procedures:

(1) Install special tools and drive pinion front and rear bearing inner races on the gear carrier in the sequence shown in the illustration.

NOTE
Apply a thin coat of multipurpose grease to the mating face of the washer of the special tool.

**Specified grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**

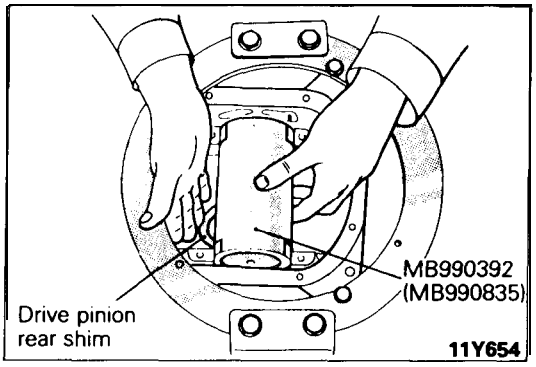
(2) Tighten the handle of the special tool until the standard value of drive pinion turning torque is obtained.

(3) Measure the drive pinion turning torque (without the oil seal).

**Standard value:**

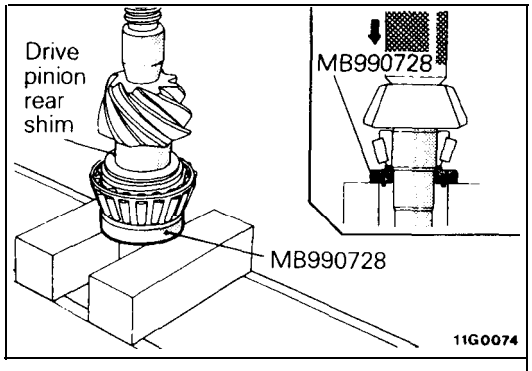
| Bearing classification | Bearing lubrication | Rotation torque (starting friction torque) Nm (in.lbs.) |
|---|---|---|
| New | None (with rust-prevention oil) | 0.9–1.2 (8–10) |
| New/reused | Oil application | 0.4–0.5 (3-4) |

NOTE
(1) Gradually tighten the nut of the special tool while checking the drive pinion turning torque.
(2) Because the special tool cannot be turned one turn, turn it several times within the range that it can be turned; then, after fitting to the bearing, measure the rotation torque.

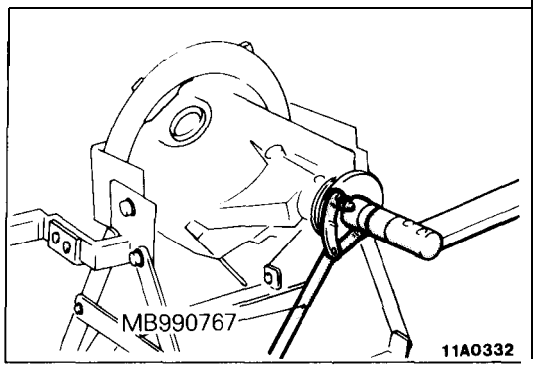



(4) Position the special tool in the side bearing seat of the gear carrier, and then select a drive pinion rear shim of a thickness which corresponds to the gap between the special tools.

NOTE
Clean the side bearing seat thoroughly. When positioning the special tool, be sure that the cut-out sections of the special tool are in the position shown in the illustration, and also confirm that the special tool is in close contact with the side bearing seat.
When selecting the drive pinion rear shims, keep the number of shims to a minimum.




(5) Fit the selected drive pinion rear shim(s) to the drive pinion, and press-fit the drive pinion rear bearing inner race by using the special tool.




**. ADJUSTMENT OF DRIVE PINION PRELOAD**

Adjust the drive pinion turning torque by using the following procedures:

(1) Fit the drive pinion front shim(s) between the drive pinion spacer and the drive pinion front bearing inner race.

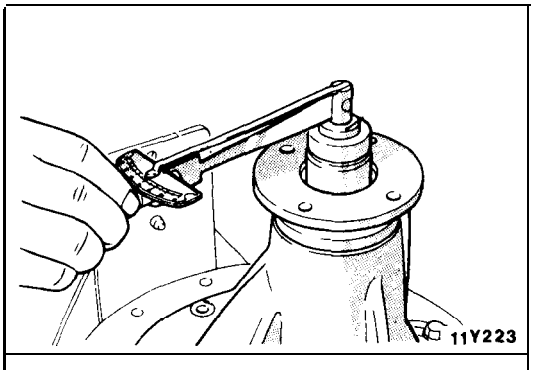
(2) Tighten the companion flange to the specified torque by using the special tools.

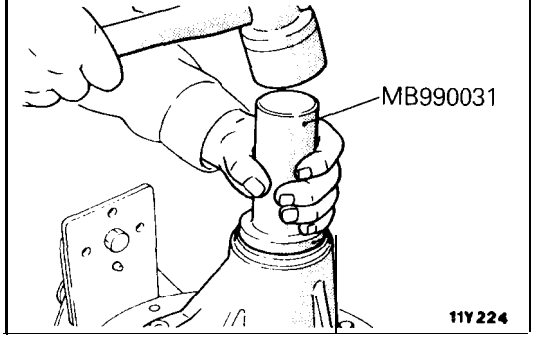
NOTE
Do not install the oil seal.

(3) Measure the drive pinion turning torque (without the oil seal) by using the special tools.

**Standard value:**

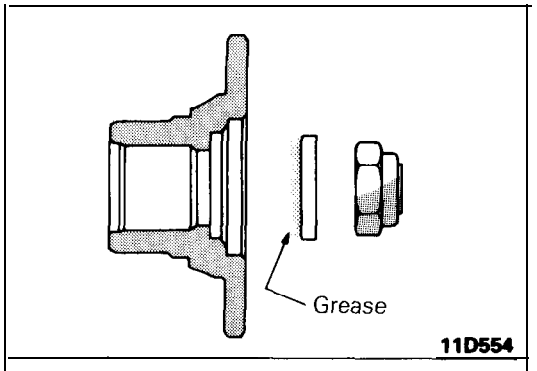
| Bearing classification | Bearing lubrication | Rotation torque (starting friction torque) Nm (in.lbs.) |
|---|---|---|
| New | None (with rust-prevention oil) | 0.9–1.2 (8–10) |
| New/reused | Oil application | 0.4–0.5 (3-4) |

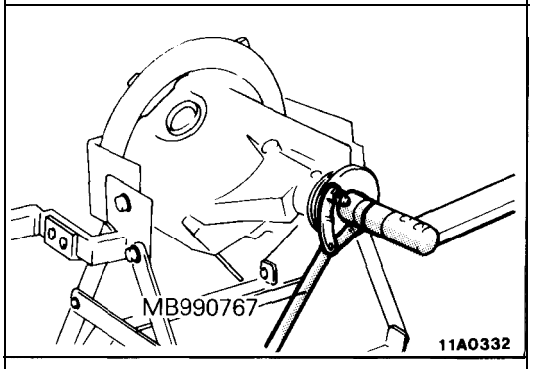


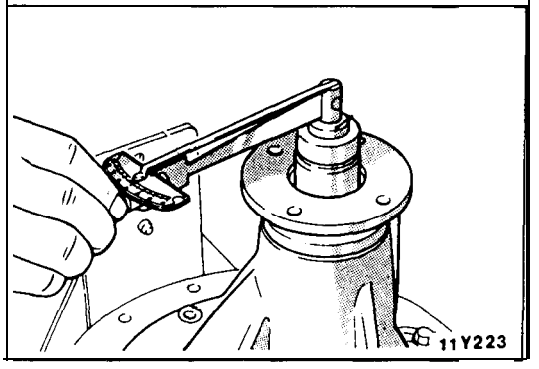




(4) If the drive pinion turning torque is not within the range of the standard value, adjust the turning torque by replacing the drive pinion front shim(s) or the drive pinion spacer.

NOTE
When selecting the drive pinion front shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the drive pinion spacers.




(5) Remove the companion flange and drive pinion once again.
Drive the oil seal into the gear carrier front lip by using the special tool.
Apply multipurpose grease to the oil seal lip.

**Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent**

(6) Apply a thin coat of multipurpose grease to the companion flange contacting surface of the washer before installing drive pinion assembly.

**Specified grease: MOPAR Multi-Mileage Lubricant Part No. 2525035 or equivalent**

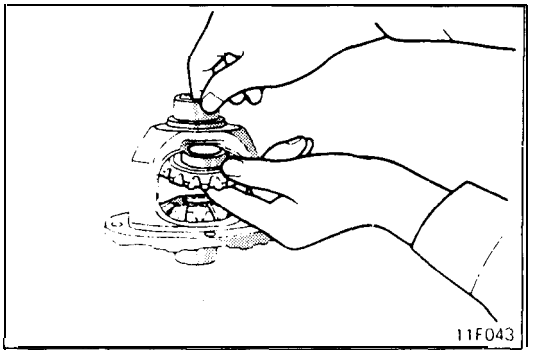
(7) Install the drive pinion assembly and companion flange with mating marks properly aligned, and tighten the companion flange self-locking nut to the specified torque by using the special tools.

(8) Measure the drive pinion turning torque (with oil seal) to verify that the drive pinion turning torque complies with the standard value.

**Standard value:**

| Bearing classification | Bearing lubrication | Rotation torque (starting friction torque) Nm (in.lbs.) |
|---|---|---|
| New | None (with rust-prevention oil) | 1.0–1.3 (9–11) |
| New/reused | Oil application | 0.5–0.6 (4–5) |

If there is a deviation from the standard value, check whether or not there is incorrect tightening torque of the companion flange tightening self-lock nut, or incorrect fitting of the oil seal.

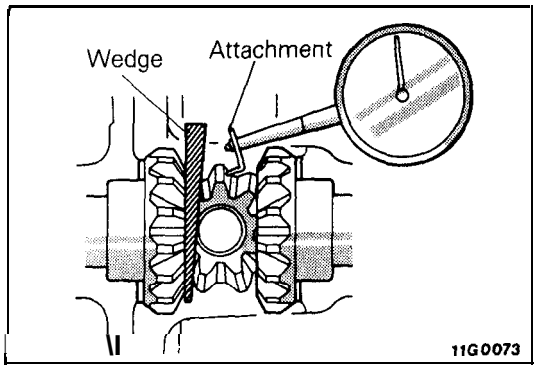



**. ADJUSTMENT OF DIFFERENTIAL GEAR BACKLASH**

Adjust the differential gear backlash by the following procedures:

(1) Assemble the side gears, side gear spacers, pinion gears, and pinion washers into the differential case.
(2) Temporarily install the pinion shaft.

NOTE
Do not drive in the lock pin yet.




(3) Adjust the differential gear backlash by the following procedures:

① While locking the side gear with the wedge, measure the differential gear backlash with a dial indicator on the pinion gear.

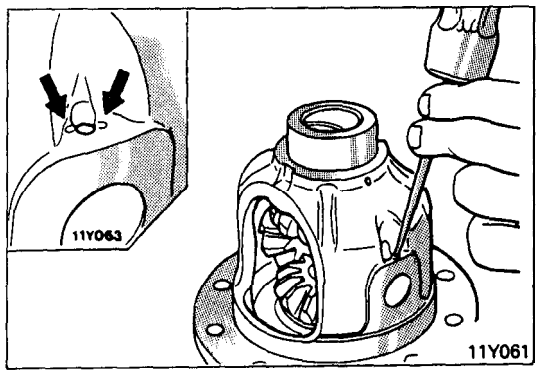
NOTE
The measurement should be made for both pinion gears individually.

**Standard value:** **0–0.076 mm (0–.003 in.)**
**Limit:** 0.2 **mm (.008 in.)**

② If the differential gear backlash exceeds the limit, adjust the backlash by installing thicker side gear spacers.

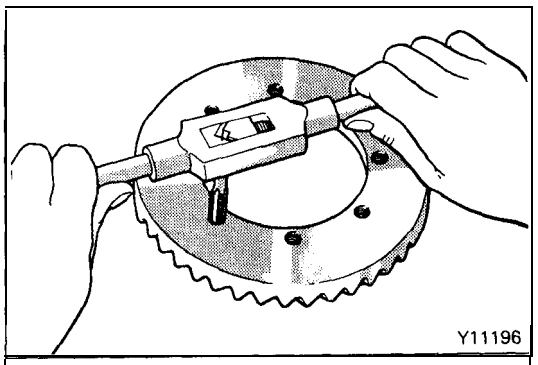
③ Measure the differential gear backlash once again, and confirm that it is within the limit.

NOTE
(1) After adjustment, check that the backlash is the less than the limit and differential gear rotates smoothly.
(2) When adjustment is impossible, replace the side gear and the pinion gear as a set.



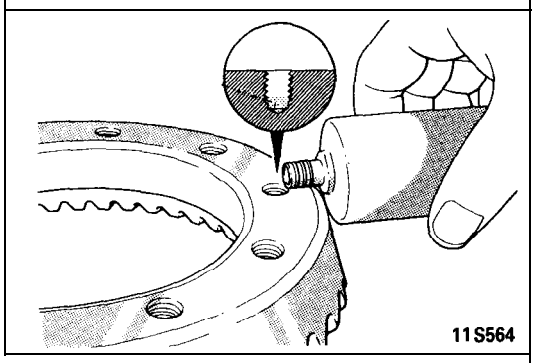

**23. INSTALLATION OF LOCK PIN**

(1) Align the pinion shaft lock pin hole with the differential case lock pin hole, and drive in the lock pin.
(2) Stake the lock pin with a punch at two points.




**24. INSTALLATION OF DRIVE GEAR**

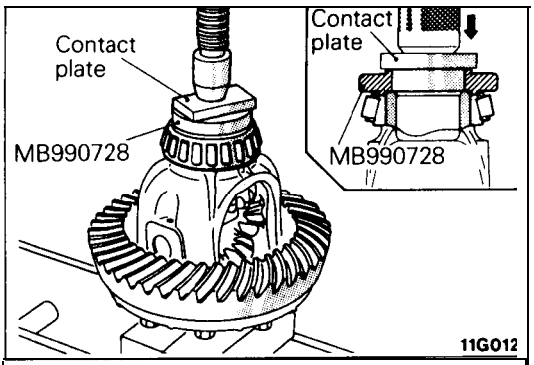
(1) Clean the drive gear attaching bolts.
(2) Use an M10 X 1.25 tap to remove the adhesive adhering to the threaded holes of the drive gear, and then clean the threaded holes by applying compressed air.




(3) Apply multipurpose adhesive to the threaded holes of the drive gear.

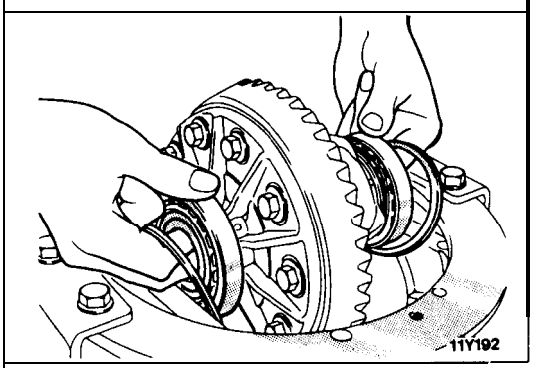
**Specified adhesive:** **MOPAR Part No. 4318031 or 4318032 or equivalent**

(4) Install the drive gear onto the differential case with the mating marks properly aligned. Tighten the bolts to the specified torque in a diagonal sequence.




**25. PRESS-FITTING OF SIDE BEARING INNER RACE**

Press-fit the side bearing inner races to the differential case by using the special tool.

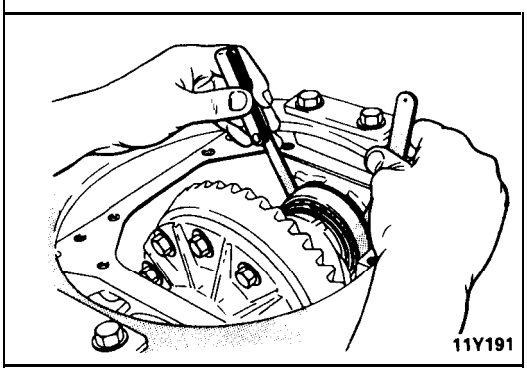



**. ADJUSTMENT OF FINAL DRIVE GEAR BACKLASH**

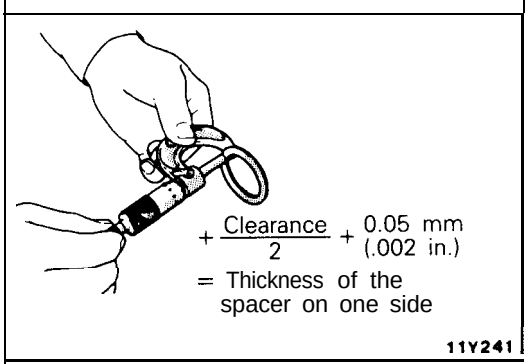
Adjust the final drive gear backlash by the following procedures:

(1) Install the side bearing spacers, which are thinner than those removed, to the side bearing outer races, and then mount the differential case assembly into the gear carrier.

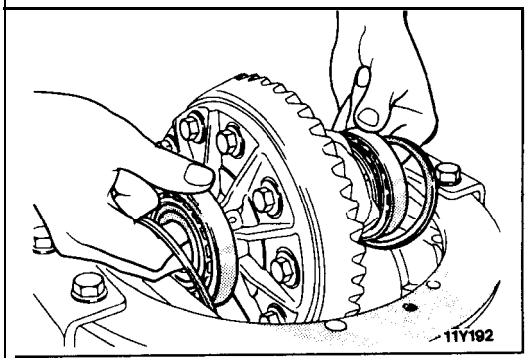
NOTE
Select side bearing spacers with the same thickness for both the drive pinion side and the drive gear side.



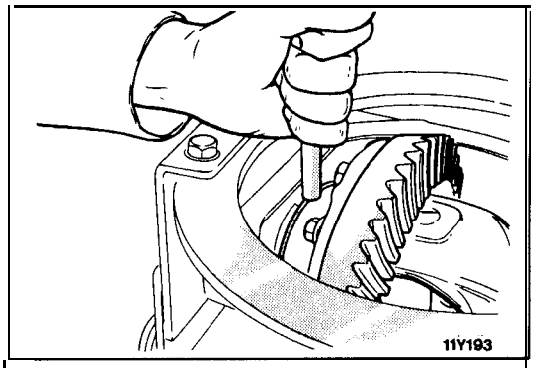

(2) Push the differential case to one side, and measure the clearance between the gear carrier and the side bearing.



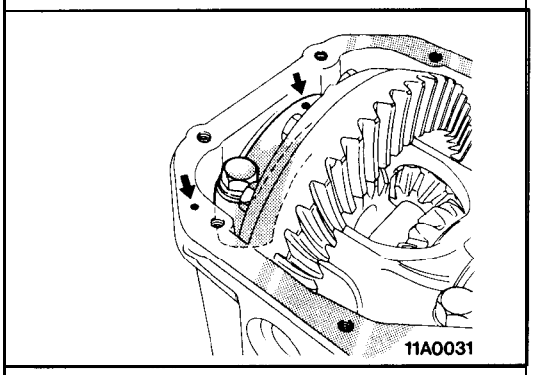

(3) Measure the thickness of the side bearing spacers on one side, select two pairs of spacers which correspond to that thickness plus one half of the clearance plus 0.05 mm (.002 in.), and then install one pair each to the drive pinion side and the drive gear side.



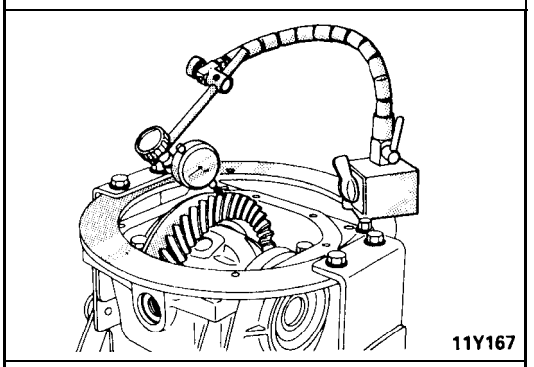

(4) Install the side bearing spacers and differential case assembly, as shown in the illustration, to the gear carrier.




(5) Tap the side bearing spacers with a brass bar to fit them to the side bearing outer race.



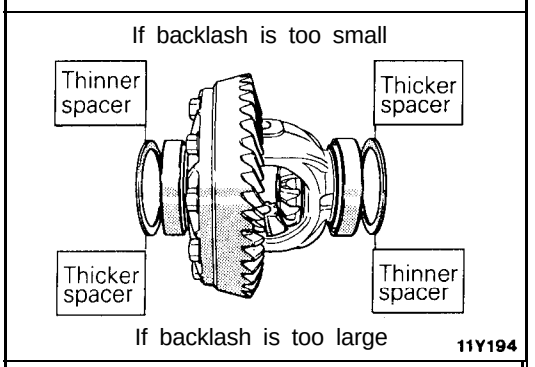

(6) Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap.




(7) With the drive pinion locked in place, measure the final drive gear backlash with a dial indicator on the drive gear.

NOTE
Measure at four points or more on the circumference of the drive gear.

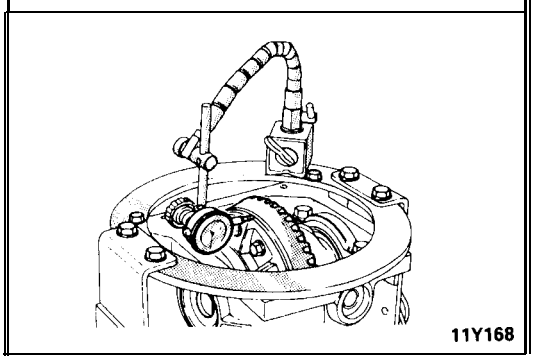
**Standard value: 0.11–0.16 mm (.004–.006 in.)**




(8) Change the side bearing spacers as illustrated, and then adjust the final drive gear backlash between the drive gear and the drive pinion.

NOTE
When increasing the number of side bearing spacers, use the same number for each, and as few as possible.

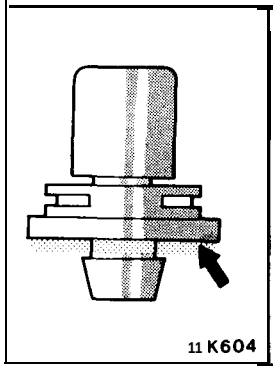
(9) Check the drive gear and drive pinion for tooth contact. If poor contact is evident, make adjustment. (Refer to P.3-22.)

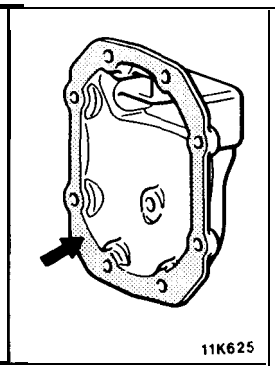



(IO) Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

**Limit: 0.05 mm (.002 in.)**

(11) If the drive gear runout exceeds the limit, reinstall by changing the phase of the drive gear and differential case, and remeasure.




**30. INSTALLATION OF VENT PLUG/31. DIFFERENTIAL COVER**

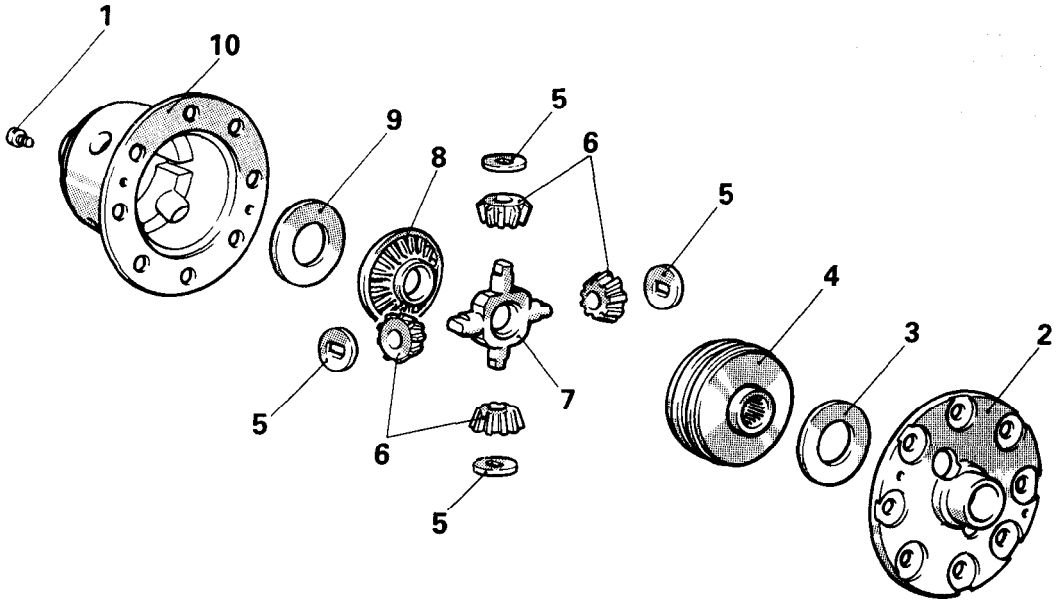
Apply specified sealant to the installation surface of vent plug and differential cover.

**Specified sealant: 3M ATD Part No.8661, 8663 or equivalent**

# DIFFERENTIAL CARRIER (LIMITED SLIP DIFFERENTIAL)

## DISASSEMBLY AND REASSEMBLY

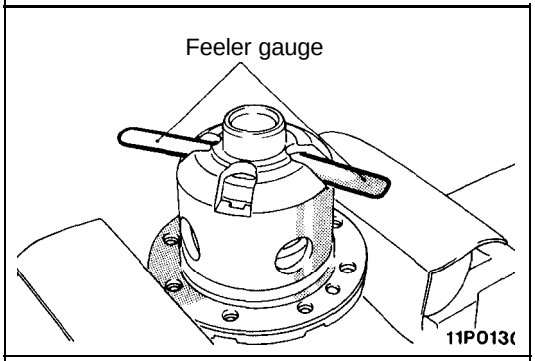
N03IK--

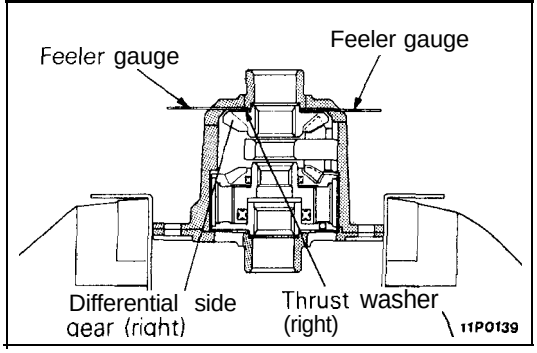



11P0127

**Disassembly steps**

1. Screw
● + 2. Differential case A
◆◆◆◆ 3. Thrust washer (L.H.)
4. Viscous unit
◆◆ 5. Pinion mate washer
◆◆ 6. Differential pinion mate
7. Differential pinion shaft
8. Differential side gear (R.H.)
◆◆ 9. Thrust washer (R.H.)
● +10. Differential case B




## INSPECTION BEFORE DISASSEMBLY

N03IEBA

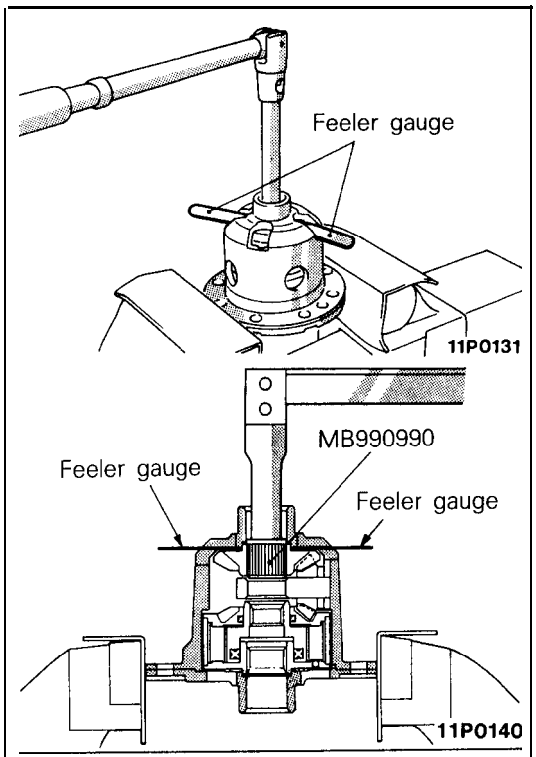
### 1. CHECKING THE DIFFERENTIAL GEAR BACKLASH

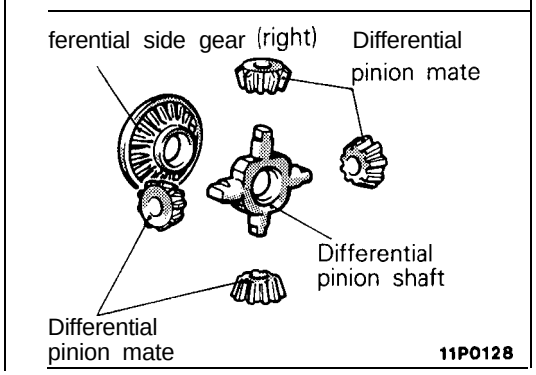
(1) Secure the differential case assembly in a vise so that the differential side gear (right) is facing upward.

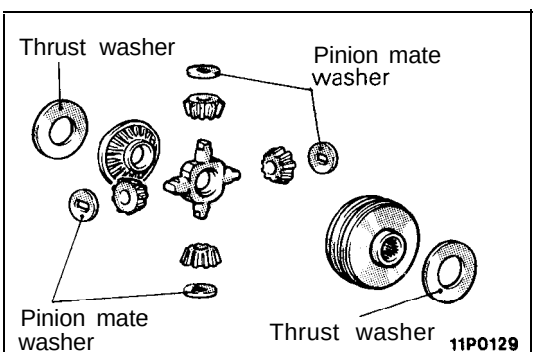
**Caution**
**When securing the vise, be sure not to hold the differential case assembly too tightly.**

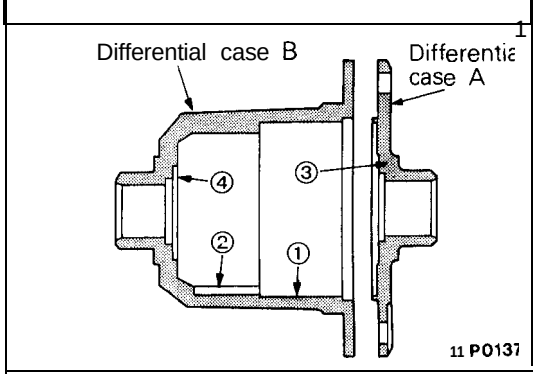
(2) Insert a 0.03 mm (.0012 in.) feeler gauge at two places (diagonally) between differential case B and the thrust washer (right).

**Caution**
**Do not insert a feeler gauge in the oil groove of differential case B.**




(3) Insert the special tool at the spline part of differential case B (right) and check to be sure the side gear (right) rotates.
(4) Then insert a 0.09 mm (.0035 in.) feeler gauge to replace a 0.03 mm (.0012 in.) gauge.
(5) Insert the special tool at the spline part of the differential side gear (right) and check to be sure the side gear (right) does not rotate.

**Differential gear backlash**
**Standard value (clearance in thrust direction of side gear):**
**0.03–0.09 mm (.0012–.0035 in.)**

NOTE
If the clearance in the thrust direction of the side gear is within the standard value range, the backlash of the differential gear is normal.

(6) If the clearance in the thrust direction of the side gear is not within the standard value range, remove differential case A and make the adjustment by adjusting the thickness of the thrust washer (left).

## SERVICE POINTS OF DISASSEMBLY N03ILBB

### 3. REMOVAL OF THE THRUST WASHER (LEFT)/ 9. THRUST WASHER (RIGHT)

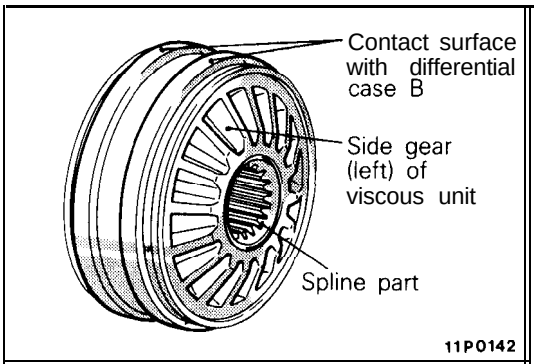
The thrust washers (left and right) are of different thickness, and so should be discriminated in some way for reference during installation.

## INSPECTION N03IMBB

(1) Check the gears and differential pinion shaft for unusual wear or damage.
(2) Check the spline part of the differential side gear (right) for stepped wear or damage.

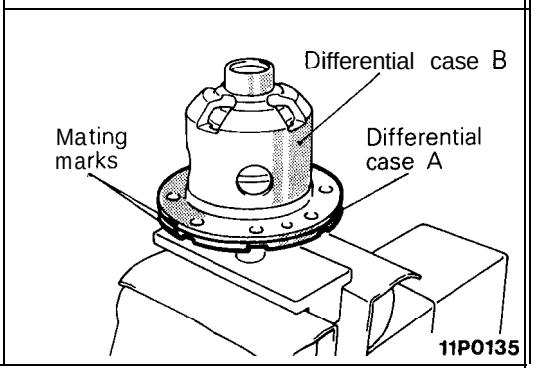
(3) Check the thrust washer and pinion mate washer for unusual wear of contact surfaces, heat damage or other damage.

(4) Check differential cases A and B for unusual wear of contact surfaces, heat damage or other damage.
①: Contact surface with the viscous unit
②: Contact surface with the pinion mate washer
③ and ④: Contact surfaces with thrust washer



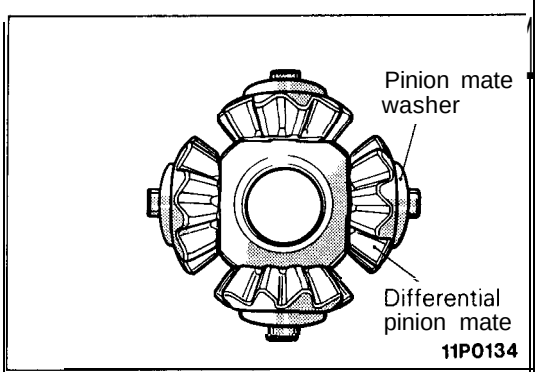

(5) Check the spline part of the viscous unit for stepped wear or damage, and check the contact surface with differential case B.
(6) Check the side gear (left) of the viscous unit for unusual wear or damage.

## SERVICE POINTS OF REASSEMBLY N03INBE




### 10. INSTALLATION OF THE DIFFERENTIAL CASE B/ 2. DIFFERENTIAL CASE A

Align the mating marks of differential cases B and A, and assemble the cases.




### 6. INSTALLATION OF THE DIFFERENTIAL PINION MATE/ 5. PINION MATE WASHER

With the washer in the position shown in the figure, install to the differential pinion shaft, and then install to differential case B.

### 3. SELECTION OF THE THRUST WASHER (LEFT)

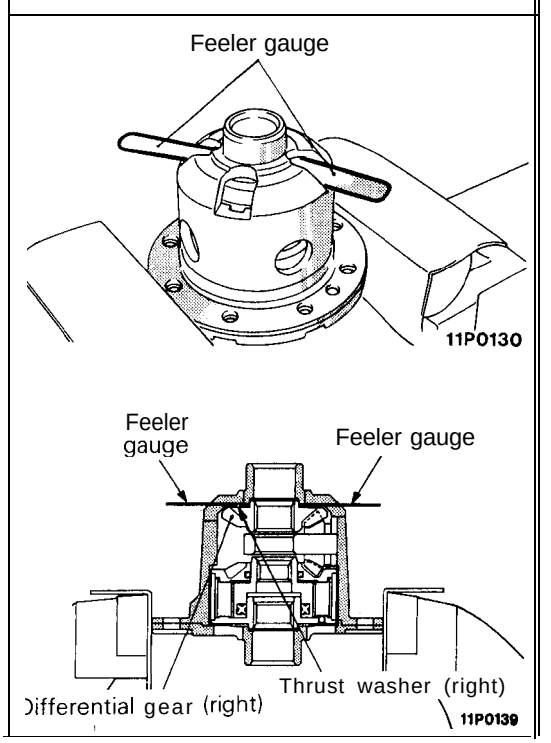
(1) If the differential side gear and pinion mate gear have been replaced, select the thrust washer (left) by following the steps below.

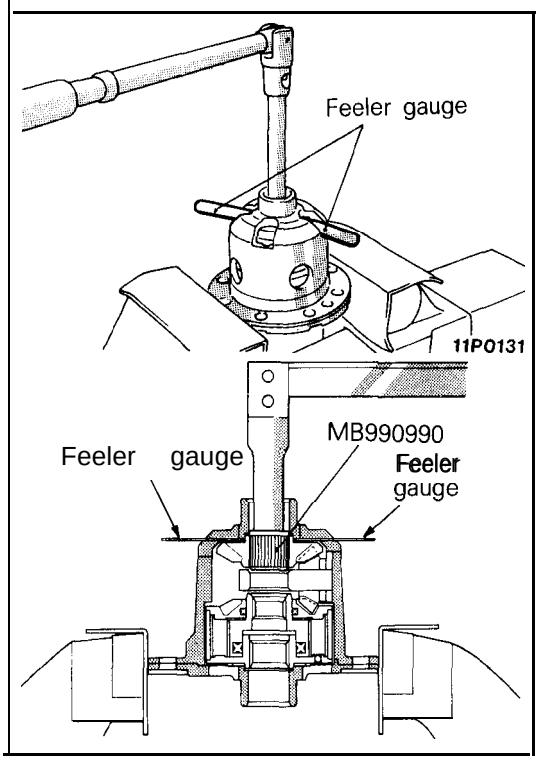
① Wash the differential side gear and pinion mate gear in unleaded gasoline to remove all oil, grease, etc.
② Install the previously used thrust washers (being careful the left and right ones are used at the correct side), together with the gears, viscous unit, pinion mate washer and pinion shaft, to differential cases A and B, and then, using screws, secure them temporarily.
③ Secure the differential case assembly in a vise so that the differential side gear (right) is facing upward.

**Caution**
**When securing in the vise, be sure not to hold the differential case assembly too tightly.**

④ Insert a 0.03 mm (.0012 in.) feeler gauge at two places (diagonally) between differential case B and the thrust washer (right).

**Caution**
**Do not insert a feeler gauge in the oil groove of differential case B.**






⑤ Insert the special tool at the spline part of differential side gear (right) and check to be sure the side gear (right) rotates.
⑥ Then insert a 0.09 mm (.0035 in.) feeler gauge to replace a 0.03 mm (.0012 in.) gauge.
⑦ Insert the special tool at the spline part of the differential side gear (right) and check to be sure the side gear (right) does not rotate.

**Differential gear backlash**
**Standard value (clearance in thrust direction of side gear):**
**0.03–0.09 mm (.0012–.0035 in.)**

NOTE
If the clearance in the thrust direction of the side gear is within the standard value range, the backlash of the differential side gear is normal.

⑧ If the clearance in the thrust direction of the side gear is not within the standard value range, remove differential case A and make the adjustment by adjusting the thickness of the thrust washer (left).

| Thrust washer (left) | |
|---|---|
| Part No. | Thickness mm (in.) |
| MB569243 | 0.8 (.031) |
| | 0.9 (.035) |
| | 1.0 (.039) |
| | 1.1 (.043) |
| | 1.15 (.045) |
| | 1.2 (.047) |
| | 1.25 (.049) |
| | 1.3 (.051) |
| | 1.35 (.053) |
| | 1.4 (.055) |
| | 1.5 (.059) |

| Thrust washer (right) (reference) | |
|---|---|
| Part No. | Thickness mm (in.) |
| MB569528 | 0.8 (.031) |

NOTE
Select one thrust washer (left) from the eleven types in the kit.

NOTES

# BRAKES

# SERVICE AND PARKING

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**CAUTION**

**When servicing brake assemblies or components, do not create dust by sanding, grinding or by cleaning brake parts with a dry brush or with compressed air. A WATER DAMPENED CLOTH SHOULD BE USED. Many brake components contain asbestos fibers which can become air-borne if dust is created during service operations. Breathing dust which contains asbestos fibers can cause serious bodily harm.**

# SPECIFICATIONS

## GENERAL SPECIFICATIONS <Non-Turbo>

N05CA--

| Items | | Vehicles without ABS | Vehicles with ABS |
|---|---|---|---|
| Master cylinder | | | |
| Type | | Tandem type (with level sensor) | Tandem type (with level sensor) |
| I.D. | mm (in.) | 22.2 (7/8) | 23.8 (15/16) |
| Brake booster | | | |
| Type | | Vacuum type | Vacuum type |
| Effective dia. of power cylinder | mm (in.) | 230 (9.0) | Front side: 180 (7.0)<br>Rear side: 205 (8.0) |
| Boosting ratio [Brake pedal depressing force] | | 5.0 [at 220 N (48 lbs.)] | 5.5 [at 220 N (48 lbs.)] |
| Proportioning valve | | | |
| Type | | Dual type | Dual type |
| Split point | kPa (psi) | 4,200 (597) | 4,200 (597) |
| Decompression ratio | | 0.3 | 0.3 |
| Front brakes | | | |
| Type | | Floating caliper, single-piston, ventilated disc (M-R44V) | Floating caliper, single-piston, ventilated disc (M-R44V) |
| Disc O.D. | mm (in.) | 256 (10.1) | 256 (10.1) |
| Disc thickness | mm (in.) | 24 (.94) | 24 (.94) |
| Pad thickness | mm (in.) | 16.0 (.63) | 16.0 (.63) |
| Wheel cylinder I.D. | mm (in.) | 53.9 (2 1/8) | 53.9 (2%) |
| Clearance adjustment | | Automatic | Automatic |
| Rear disc brakes | | | |
| Type | | Floating caliper, single-piston, ventilated disc (AD30P) | Floating caliper, single-piston, ventilated disc (AD30P) |
| Disc O.D. | mm (in.) | 265 (10.4) | 265 (10.4) |
| Disc thickness | mm (in.) | 10 (.39) | 10 (.39) |
| Pad thickness | mm (in.) | 14.5 (.57) | 14.5 (.57) |
| Wheel cylinder I.D. | mm (in.) | 30.1 (13/16) | 30.1 (13/16) |
| Clearance adjustment | | Automatic | Automatic |
| Rotor teeth | | | |
| Front wheel side | | – | 47 |
| Rear wheel side | | – | 47 |
| Speed sensor | | – | Magnet coil type |
| Parking brakes | | | |
| Type | | Mechanical brake acting on rear wheels | Mechanical brake acting on rear wheels |
| Brake lever type | | Lever type | Lever type |
| Cable arrangement | | V-type | V-type |

## <Turbo>

| Items | | FWD | AWD |
|---|---|---|---|
| Master cylinder | | | |
| Type | | Tandem type (with level sensor) | Tandem type (with level sensor) |
| I.D. | mm (in.) | 23.8 (15/16) | 25.4 (1) |
| Brake booster | | | |
| Type | | Vacuum type | Vacuum type |
| Effective dia. of power cylinder | mm (in.) | Front side: 180 (7.0) | Front side: 180 (7.0) |
| | | Rear side: 205 (8.0) | Rear side: 205 (8.0) |
| Boosting ratio [Brake pedal depressing force] | | 5.5 [at 220 N (48 lbs.)] | 5.5 [at 220 N (48 lbs.)] |
| Proportioning valve | | | |
| Type | | Dual type | Dual type |
| Split point | kPa (psi) | 4,200 (597) | 3,700 (526) |
| Decompression ratio | | 0.3 | 0.3 |
| Front brakes | | | |
| Type | | Floating caliper, single-piston, ventilated disc (M-R44V) | Floating caliper, single-piston, ventilated disc (M-R46V) |
| Disc O.D. | mm (in.) | 256 (10.1) | 256 (10.1) |
| Disc thickness | mm (in.) | 24 (.94) | 24 (.94) |
| Pad thickness | mm (in.) | 16.0 (.63) | 16.0 (.63) |
| Wheel cylinder I.D. | mm (in.) | 53.9 (2 1/8) | 60.3 (2 3/8) |
| Clearance adjustment | | Automatic | Automatic |
| Rear disc brakes | | | |
| Type | | Floating caliper, single-piston, ventilated disc (AD30P) | Floating caliper, single-piston, ventilated disc (AD35P) |
| Disc O.D. | mm (in.) | 265 (10.4) | 265 (10.4) |
| Disc thickness | mm (in.) | 10 (.39) | 10 (.39) |
| Pad thickness | mm (in.) | 14.5 (.57) | 14.5 (.57) |
| Wheel cylinder I.D. | mm (in.) | 30.1 (1 3/16) | 34.9 (1 3/8) |
| Clearance adjustment | | Automatic | Automatic |
| Rotor teeth* | | | |
| Front wheel side | | 47 | 47 |
| Rear wheel side | | 47 | 47 |
| Speed sensor* | | Magnet coil type | Magnet coil type |
| Parking brakes | | | |
| Type | | Mechanical brake acting on rear wheels | Mechanical brake acting on rear wheels |
| Brake lever type | | Lever type | Lever type |
| Cable arrangement | | V-type | V-type |

NOTE
The *symbol indicates vehicles with ABS.

## SERVICE SPECIFICATIONS

N05CB--

| Items | | Specifications |
|---|---|---|
| Standard value | | |
| Brake pedal height | mm (in.) | 176-181 (6.9-7.1) |
| Brake pedal free play | mm (in.) | 3-8 (.1–.3) |
| Brake pedal to floorboard clearance | mm (in.) | 80 (3.1) or more |
| Parking brake lever stroke | | 5-7 notches |
| Output pressure proportioning valve | MPa (psi) | |
| Split point | | |
| <FWD> | | 3.95-4.45 (561–633) |
| <AWD> | | 3.45-3.95 (491–561) |
| Output pressure [input pressure] | | |
| <FWD> | | 5.15–5.65 (732–804) [8.2 (1,163)] |
| <AWD> | | 4.65-5.15 (661-732) [7.7(1,095)] |
| Disc brake dragging force at hub bolt | N (lbs.) [Nm (ft.lbs.)] | 70 (15) or less [4 (3) or less] |
| Booster push rod to master cylinder piston clearance | mm (in.) | |
| 9 inch brake booster | | 0.8–1.0 (.031–.039) |
| 7 + 8 inch brake booster | | 0.5–0.7 (.020–.028) |
| Speed sensor's internal resistance | kΩ | 0.8–1.2* |
| Clearance between the speed pole piece and the toothed rotor | mm (in.) | 0.3–0.9 (.012–.035)* |
| Limit | | |
| Left/right proportioning valve out pressure difference | MPa (psi) | 0.4 (57) |
| Disc brake pad thickness | mm (in.) | 2.0 (.08) |
| Front disc thickness | mm (in.) | 22.4 (.882) |
| Rear disc thickness | mm (in.) | 8.4 (.331) |
| Disc runout | mm (in.) | 0.08 (.0031) |
| Hub end play | mm (in.) | 0.008 (.00031) |

NOTE
*: Vehicles with ABS

## TORQUE SPECIFICATIONS

N05CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Pedal support bracket installation bolts | 8-12 | 6-9 |
| Pedal support bracket installation nut | 10–15 | 7-11 |
| Pedal rod to pedal support bracket | 17-26 | 12-19 |
| Pedal rod to clutch pedal bracket | 17-26 | 12-19 |
| Clutch pedal bracket installation bolt | 8-12 | 6-9 |
| Turn-over spring mounting bolt | 17-26 | 12-19 |
| Stop lamp switch mounting nut | 10–15 | 7–11 |
| Clutch master cylinder installation nuts | 10–15 | 7-11 |
| Clutch pedal installation nut | 20–25 | 14-18 |
| Lever assembly (A) installation nut | 20–25 | 14-18 |
| Lever assembly (B) installation nut | 20–25 | 14-18 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Master cylinder to brake booster | 8-12 | 6-9 |
| Piston stopper bolt | 1.5–3.0 | 1–2 |
| Nipple installation screw | 1.5–3.0 | 1–2 |
| Brake booster installation nuts | 11–17 | 8-12 |
| Fitting | 15-18 | 11-13 |
| Flared brake line nuts | 13-17 | 9-12 |
| Brake hose bracket installation bolts | 17-26 | 12-19 |
| Front disc brake assembly installation bolts | 80–100 | 58-72 |
| Lock pin (front) | 64-86 | 46-62 |
| Guide pin (front) | 64-86 | 46-62 |
| Bleeder screw | 7-9 | 5-7 |
| Wheel bearing nut | 200–260 | 144-188 |
| Dust shield to axle beam | 9-14 | 7–10 |
| Rear disc brake assembly installation bolts | 50–60 | 36-43 |
| Drive shaft to companion flange | 55-65 | 39-47 |
| Companion flange to rear axle shaft | 160–200 | 116-159 |
| Brake hose to caliper body (rear) | 25-35 | 18–25 |
| Lock pin (rear) | 22-32 | 16-23 |
| Guide pin (rear) | 22-32 | 16–23 |
| Spindle lever to parking brake lever | 40–55 | 29–40 |
| Rear speed sensor installation bolt | 9-14 | 7–10 |
| Speed sensor bracket installation bolt | 9-14 | 7–10 |
| Rotor to front hub | 7-11 | 5-8 |
| Rotor to rear hub | 9-14 | 7–10 |

## LUBRICANTS

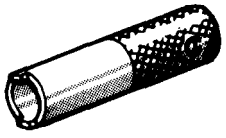
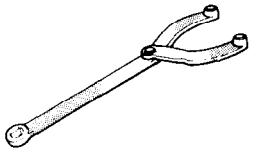
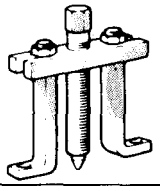
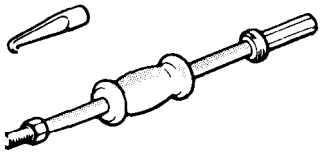
N05CD--

| Items | Specified lubricant |
|---|---|
| Brake fluid | MOPAR Brake Fluid/ Conforming to DOT3 |
| Brake pedal bushing inner surface<br>Clevis pin and washer<br>Parking brake lever sliding parts<br>Bushing inner surface | MOPAR Multi-mileage Lubricant<br>Part No. 2525035 or equivalent |

| Items | Specified lubricant |
|---|---|
| Brake piston seal<br>Brake piston boot inner surfaces<br>Brake lock pin boot inner surfaces<br>Guide pin boot inner surfaces<br>Guide pin and caliper support contact surface<br>Lock pin and caliper support contact surface<br>Spindle lever, lever boot, connecting link, O-ring and auto adjuster spindle | Repair kit grease (orange) |

## SPECIAL TOOLS

N05DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB990652 | Rear disc brake piston driver | Pressing of the rear disc brake pistons |
|  | MB990767 | End yoke holder | Holding of rear axle shaft |
|  | CT-1003 | Axle shaft puller | Removal of rear axle shaft |
|  | C-637 | Sliding hammer set | |

# TROUBLESHOOTING

N05EAAI

| Symptom | Probable cause | Remedy |
|---|---|---|
| Vehicle pulls to one side when brakes are applied | Grease or oil on pad or lining surface | Replace |
| | Inadequate contact of pad | Correct |
| | Auto adjuster malfunction | Adjust |
| Insufficient braking power | Low or deteriorated brake fluid | Add or refill |
| | Air in brake system | Bleed air |
| | Auto adjuster malfunction | Adjust |
| | Clogged brake line | Correct |
| | Inadequate contact of pad | |
| | Brake booster malfunction | |
| | Overheated brake rotor due to dragging of pad | |
| | Grease or oil on pad surface | Replace |
| | Proportioning valve malfunction | |
| Increased pedal stroke (Reduced pedal to floorboard clearance) | Air in brake system | Bleed air |
| | Worn pad | Replace |
| | Broken vacuum hose | |
| | Faulty master cylinder | |
| | Brake fluid leaks | Correct |
| | Auto adjuster malfunction | Adjust |
| | Excessive push rod to master cylinder clearance | |
| Brake drag | Insufficient push rod to master cylinder clearance | Adjust |
| | Incorrect parking brake adjustment | |
| | Worn brake pedal return spring | Replace |
| | Defective master cylinder piston return spring | |
| | Incomplete release of parking brake | Correct |
| | Clogged master cylinder return port | |
| Insufficient parking brake function | Worn brake pad | Replace |
| | Parking brake cable sticking | |
| | Stuck caliper piston | |
| | Grease or oil on pad surface | |
| | Auto adjuster malfunction | Adjust |
| | Excessive parking brake lever stroke | Adjust the parking brake lever stroke or check the parking brake cable routing |

| Symptom | Probable cause | Remedy |
|---|---|---|
| Scraping or grinding noise when brakes are applied | Worn brake pad | Replace |
| | Caliper to wheel interference | Correct or replace |
| | Cracked brake disc | |
| Squealing, groaning or chattering noise when brakes are applied | Disc brakes-missing or damaged brake pad anti-squeak shim | Replace |
| | Brake discs and pads worn or scored | Correct or replace |
| | Improper lining parts | |
| | Disc brake-burred or rusted calipers | Clean or deburr |
| | Dirty, greased, contaminated or glazed pad | Clean or replace |
| | Incorrect adjustment of brake pedal or booster push-rod | Adjust |
| Squealing noise when brakes are not applied | Disc brakes-rusted, stuck | Lubricate or replace |
| | Loose or extra parts in brakes | Retighten |
| | Improper positioning of pads in caliper | Correct |
| | Improper installation of support mounting to caliper body | |
| | Poor return of brake booster or master cylinder | Replace |
| | Incorrect adjustment of brake pedal or booster push-rod | Adjust |
| Groaning, clicking or rattling noise when brakes are not applied | Stones or foreign material trapped inside wheel covers | Remove stones, etc. |
| | Disc brakes-failure of shim | Replace |
| | Disc brakes-loose installation bolt | Retighten |
| | Loose wheel nuts | |
| | Incorrect adjustment of brake pedal or booster push-rod | Adjust |

# ANTI-LOCK BRAKING SYSTEM TROUBLESHOOTING

N05EBAE

## PARTICULAR CHARACTERISTICS OF THE ANTI-LOCK BRAKING SYSTEM

Models equipped with the anti-lock braking system (A.B.S.) may exhibit one or more of the following characteristics from time to time, but none of these is abnormal.

(1) A pulsing feeling in the brake pedal, or vibration of the body or the steering wheel, when the anti-lock braking system is activated by sudden braking or by braking on a slippery road surface. Actually, this phenomenon is an indication that the anti-lock braking system is functioning normally.

(2) When the vehicle speed reaches approximately 6 km/h (4 mph) after the engine is started and the vehicle starts off (for the first time), a whining motor noise may be heard from the engine compartment if the vehicle is traveling in a quiet place, but this noise is simply the result of a self-check being made of the anti-lock braking system operation.

## TROUBLESHOOTING METHODS

Problems related to the anti-lock braking system (A.B.S.) can be classified into two general categories: problems in the electrical system and those in the hydraulic system.

For problems in the electrical system, the self-diagnosis function is built into the electronic control unit (E.C.U.) causing the A.B.S. warning light to illuminate as a warning to the driver.

Problems in the hydraulic system (poor braking, etc.) can be located in the same way as for ordinary brakes. There is, however, the necessity to check to determine whether the problem is related to ordinary brake components or to the components related to the A.B.S.

## HOW TO USE THE TROUBLESHOOTING FLOW CHART

(1) Using the flow chart, check the ABS warning light light-up sequence and check the condition of braking operation.

(2) Following the check chart listed in the remedy column, perform the checks. There are [Explanation] and [Hint] in each check chart. Refer to them when troubleshooting.

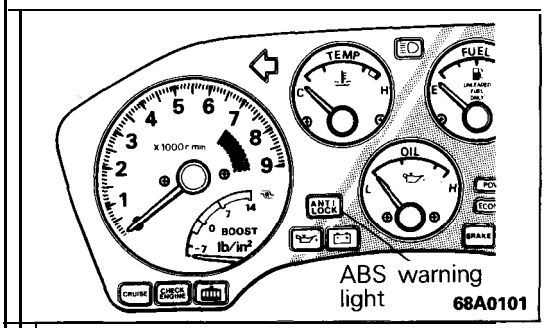
NOTE
ECU: Electronic control unit
HU: Hydraulic unit
MUT: Multi-use tester

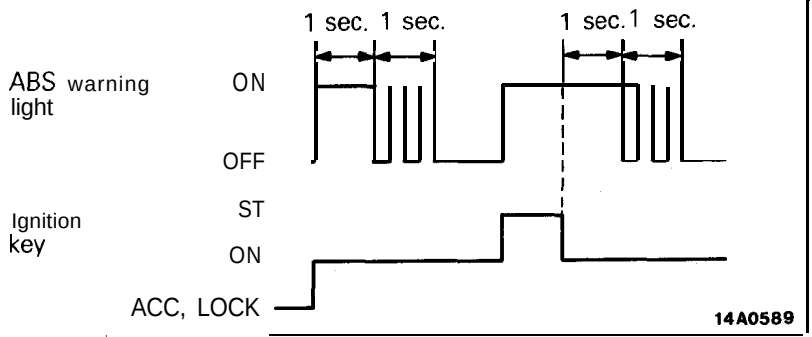
## TROUBLESHOOTING (ABS-FWD)

Confirm condition in the following way and diagnosis accordingly.

Does the ABS warning light illuminate as described below up to the time the engine starts?

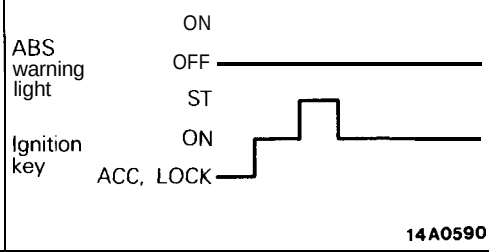
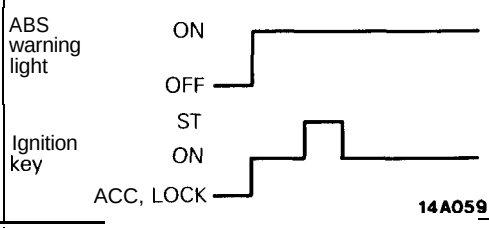
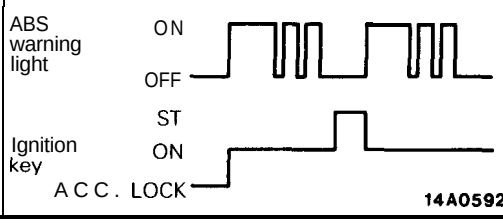
1) When the ignition key is turned to the "ON" position, the ABS warning light illuminates for approximately 1 second due to the ABS ECU (as a self check of the valve relays is performed), then it blinks twice and goes out and stays out.
2) With the ignition key in the "START" position, power to the ABS ECU is interrupted and the ABS warning light remains lit because the valve relay is OFF.
3) When the ignition key is turned from the "START" position to the "ON" position, the ABS warning light illuminates for approximately 1 second (during this time a recheck of the valve relays is performed), then it blinks twice and then goes out and stays out.

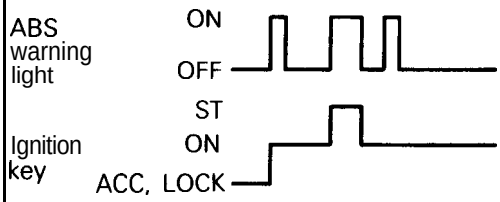



Yes → CONTINUE TO NEXT PAGE

No ↓

| No. | Trouble condition | Major causes | Remedy |
|---|---|---|---|
| 1 | ABS warning light does not light up at all.<br>  | • ABS warning light bulb is burnt out.<br>• Open in ABS warning light electrical circuit (check for blown fuse) | Check, using flow chart A (Refer to P.5-12.) |
| 2 | When the ignition key is turned to the "ON" position, it remains lighted.<br>  | • Fail safe is functioning due to ECU self diagnosis<br>• Short in ECU warning light drive circuit<br>• Malfunction of ECU | Check, using flow chart B (Refer to P.5-15.) |
| 3 | Does not illuminate when ignition key is in "START" position.<br>  | • Malfunction of valve relay<br>• Break in harness between ABS warning light and HU<br>• Break in harness between HU and body ground | Check, using flow chart C (Refer to P.5-17.) |

| No. | Trouble condition | Major causes | Remedy |
|---|---|---|---|
| 4 | After the ignition key is turned to the "ON" position, it blinks once and then illuminates when it is turned to the "START" position. When the key is returned to the "ON" position, the light blinks again. (Blinking with the ignition key in the "ON" position is synchronized with operation noise of the valve relay.)   | • Break in harness for ECU warning light drive circuit<br>• Malfunction of ECU | Check, using flow chart D. (Refer to P.5-18.) |

CONTINUED FROM PREVIOUS PAGE

Does the ABS warning light illuminate when starting to drive the car?

Yes → Trouble with the motor relay, solenoid valve [due to self test when driving above 6 km/h (4 mph)] or malfunction of wheel speed sensor → Check, following trouble source check charts E-I – E-6.

No

Is there one-sided braking, insufficient braking force or malfunction of ABS operation?

No → Normal

Yes

| Trouble condition | Major causes | Remedy |
|---|---|---|
| One-sided braking<br>Insufficient braking force | • Mechanical lock of HU solenoid valve<br>• Hydraulic line in HU is clogged. | Check HU operation and, if necessary, replace HU. If HU is normal, check structural parts for normal braking. (Refer to P.5-7.) |
| Decline in ABS function<br>(Wheels easily lock when there is sudden braking.) | • Malfunction in HU solenoid valve operation<br>• Hydraulic line in HU is clogged. | |
| ABS sometimes functions even when there is no sudden braking. (ABS operation vibration is transmitted.) | • Insufficient wheel speed sensor output voltage (sensor malfunction, too large a gap between sensor rotor, missing rotor teeth or temporarily broken wire in sensor harness)<br>• Malfunction of ABS ECU | Check wheel speed sensor (Refer to P.5-82.) and, if necessary, replace sensor, adjust gap or replace rotor. If tests indicate that there are no mechanical or electrical failures, replace the ECU. |

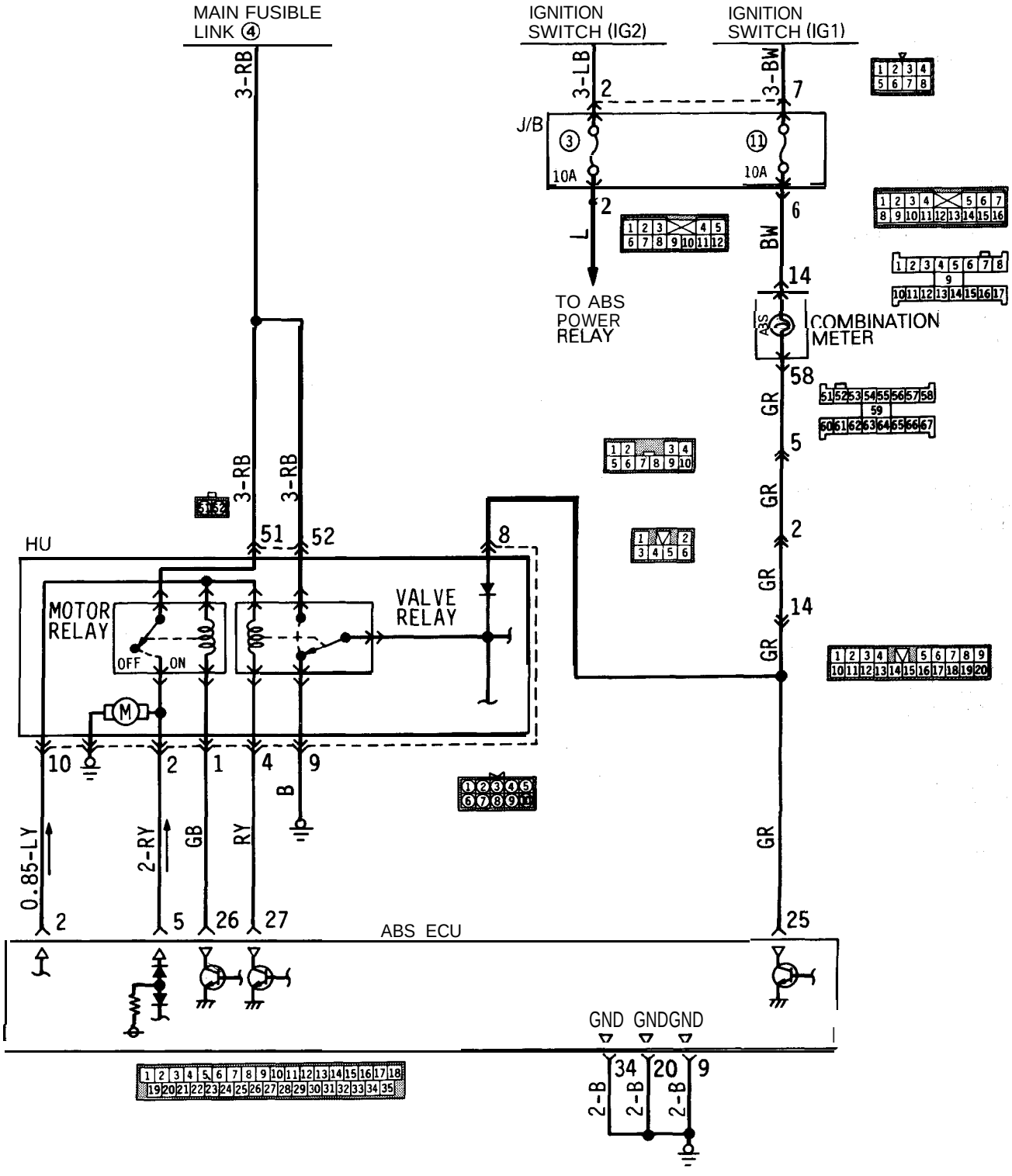
## A ABS warning light does not light at all.

**[Explanation]**

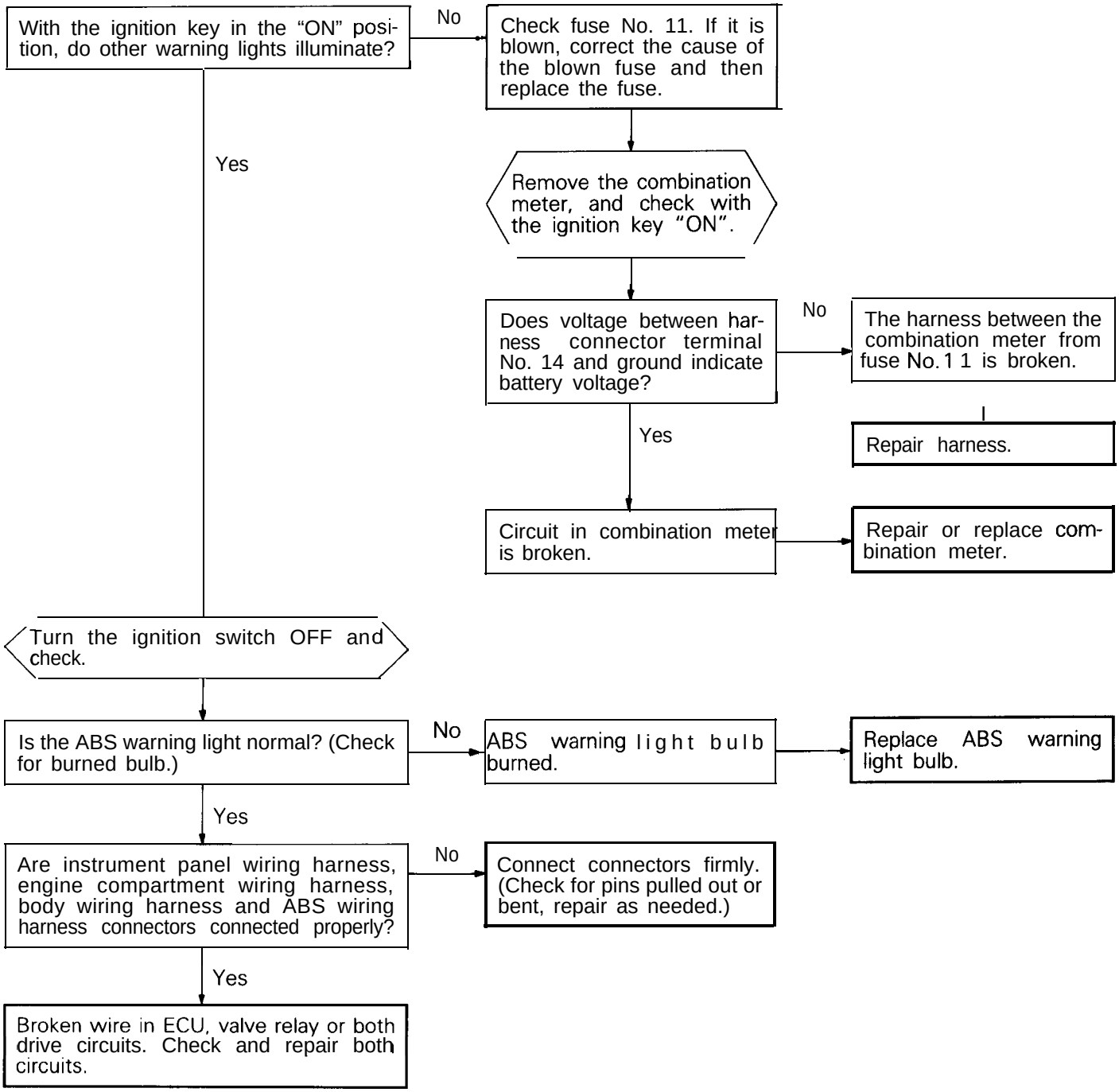
When it does not light up at all, there is a strong possibility that there is trouble with ABS warning light or with power to the light.

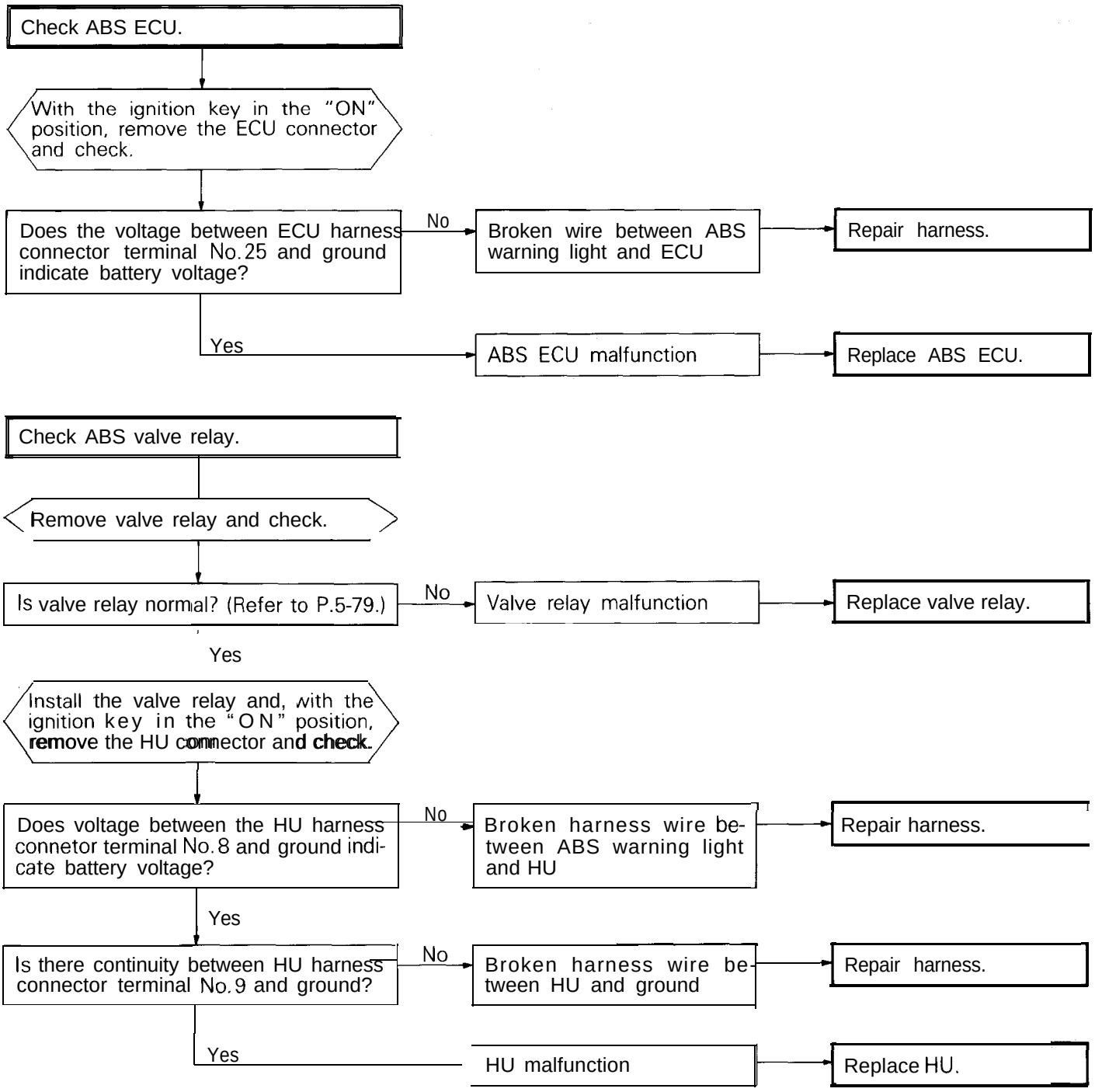
**[Hint]**

If other warning lights do not light up either, fuse is probably blown.




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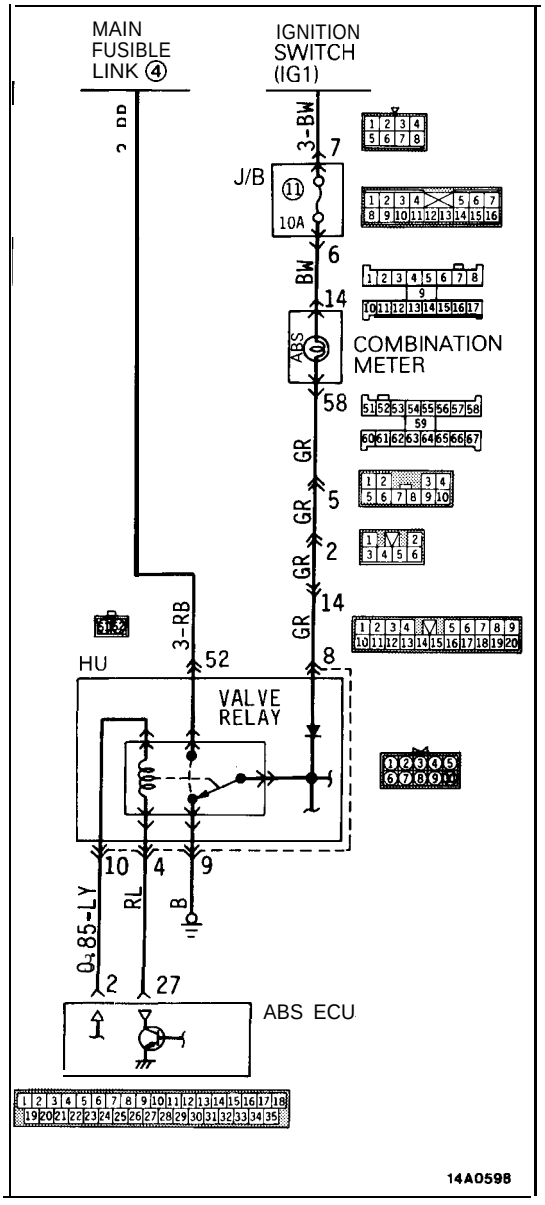

With the ignition key in the "ON" position, do other warning lights illuminate?
No
Check fuse No. 11. If it is blown, correct the cause of the blown fuse and then replace the fuse.
Yes
Remove the combination meter, and check with the ignition key "ON".
Does voltage between harness connector terminal No. 14 and ground indicate battery voltage?
No
The harness between the combination meter from fuse No. 11 is broken.
Repair harness.
Yes
Circuit in combination meter is broken.
Repair or replace combination meter.
Turn the ignition switch OFF and check.
Is the ABS warning light normal? (Check for burned bulb.)
No
ABS warning light bulb burned.
Replace ABS warning light bulb.
Yes
Are instrument panel wiring harness, engine compartment wiring harness, body wiring harness and ABS wiring harness connectors connected properly?
No
Connect connectors firmly. (Check for pins pulled out or bent, repair as needed.)
Yes
Broken wire in ECU, valve relay or both drive circuits. Check and repair both circuits.

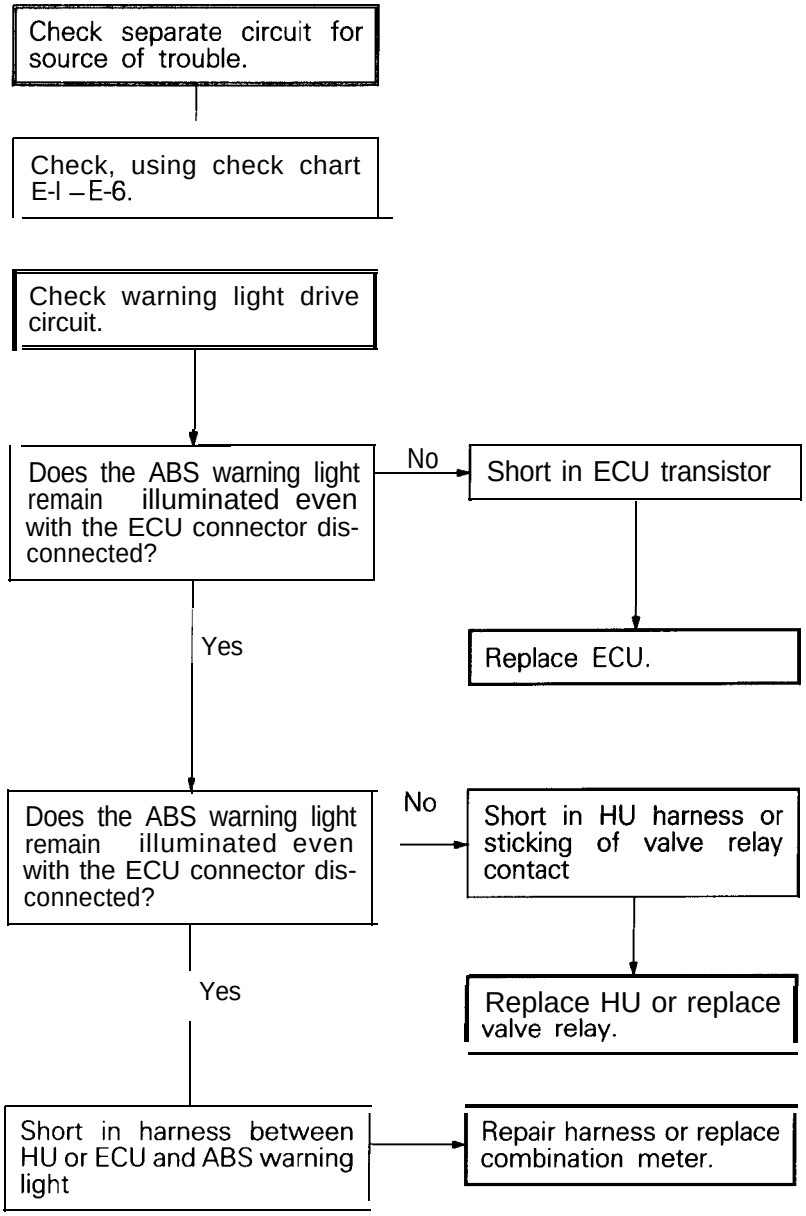

Check ABS ECU.
With the ignition key in the "ON" position, remove the ECU connector and check.
Does the voltage between ECU harness connector terminal No. 25 and ground indicate battery voltage?
No
Broken wire between ABS warning light and ECU
Repair harness.
Yes
ABS ECU malfunction
Replace ABS ECU.
Check ABS valve relay.
Remove valve relay and check.
Is valve relay normal? (Refer to P.5-79.)
No
Valve relay malfunction
Replace valve relay.
Yes
Install the valve relay and, with the ignition key in the "ON" position, remove the HU connector and check.
Does voltage between the HU harness connetor terminal No. 8 and ground indicate battery voltage?
No
Broken harness wire between ABS warning light and HU
Repair harness.
Yes
Is there continuity between HU harness connector terminal No. 9 and ground?
No
Broken harness wire between HU and ground
Repair harness.
Yes
HU malfunction
Replace HU.

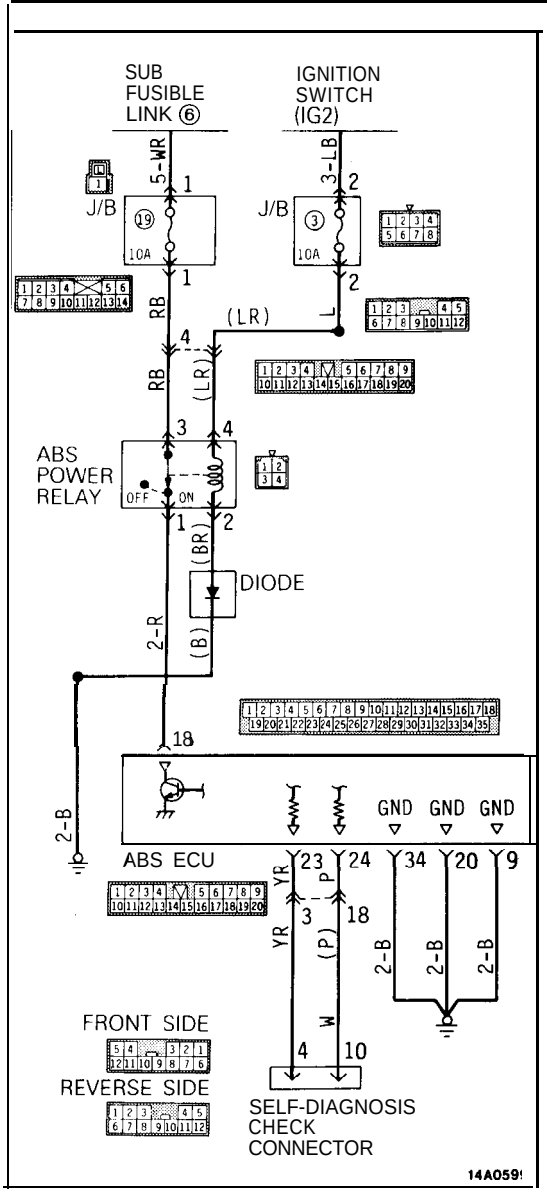
| B | **ABS warning light illuminated after the engine is started and remains on.** |
|---|---|

**[Explanation]**

This is the symptom when the ABS ECU does not power up due to broken ECU power circuit, etc., when the fail safe function operates and isolates the system or when the warning light drive circuit is short circuited.






Check of ECU power circuit.

Is fuse No.3 normal?
- No → Correct cause of blown fuse and replace fuse.
- Yes ↓

With the ignition key in the "ON" position, does the power relay make a 'click" noise?
- No → Is power relay normal? (Refer to P.5-52.)
  - Yes → Disconnect ECU connector and check harness connector.
  - No → Replace power relay.
- Yes ↓

Disconnect ECU connector and check harness connector. ↓

With the ignition key in the "ON" position, does voltage between ECU connector terminal No. 18 and ground indicate the battery voltage?
- No → Harness wire between power relay and ECU is broken. → Repair harness.
- Yes ↓

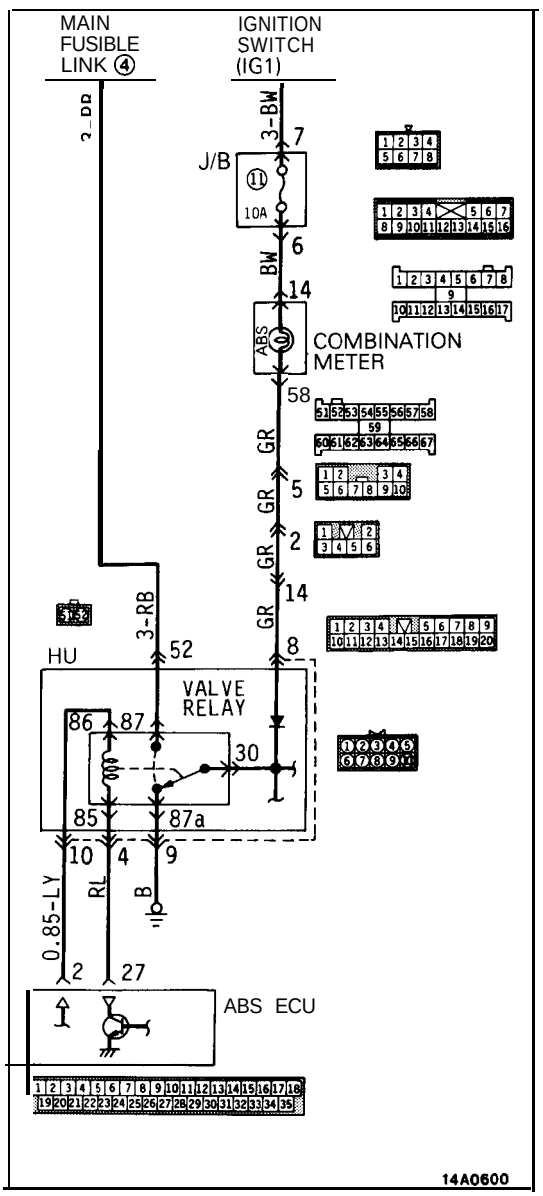
Is there continuity between body harness terminals No.9, No.20 and No.34, and ground?
- No → ECU ground line broken → Repair harness.
- Yes ↓

Malfunction of ABS ECU → Replace ABS ECU.

| C | ABS warning light does not illuminate when ignition key is in "START" position. |
|---|---|

**[Explanation]**

The ABS ECU uses the IG2 power source which is turned off in the "START" position. The ABS warning light uses the IG1 power source which is not turned off even in the "START" position. Consequently, in the "START" position, power is off and the ECU turns the valve relay OFF. If the warning light does not illuminate at this time, there is trouble in the warning light circuit on the valve relay side.




Remove the hydraulic unit (HU) connector and check.

With the ignition key in the "ON" position, does voltage between body connector terminal No. 8 and ground indicate the battery voltage?

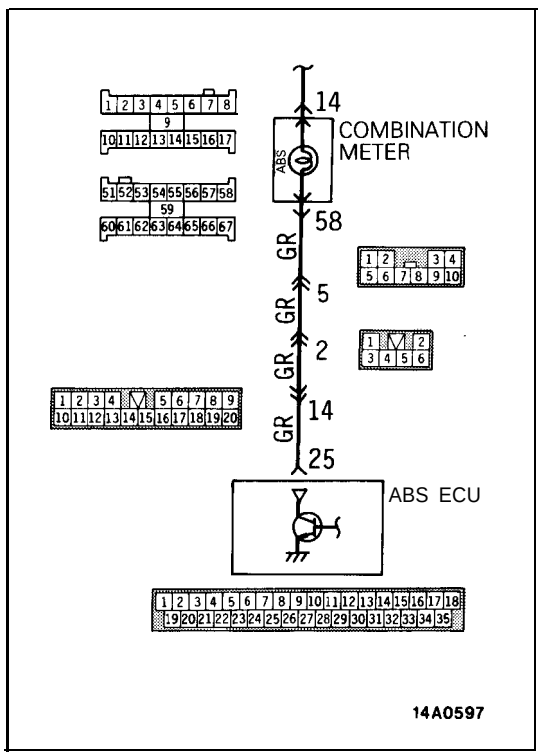
No → Harness wire between HU and warning light is broken.

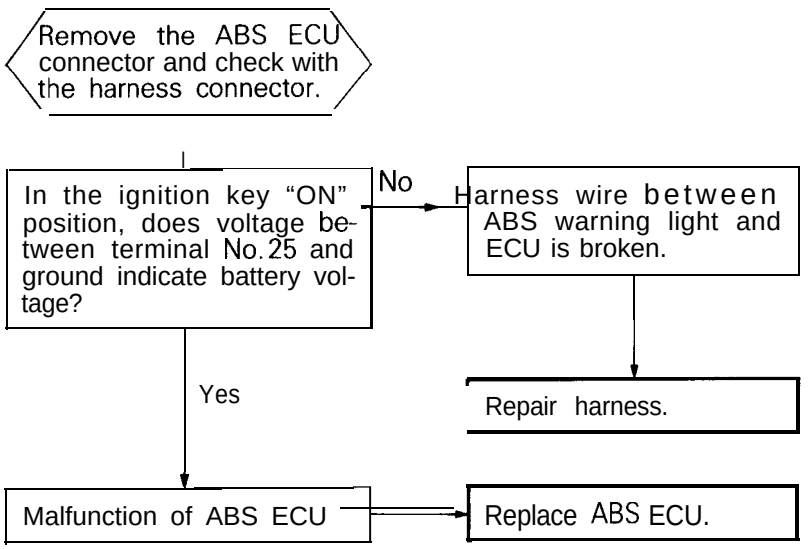
Yes

| D | **ABS warning light blinks once after the ignition key is turned to the "ON" position. It illuminates in the "START" position and blinks once again when turned to the "ON" position.** |
|---|---|

**[Explanation]**

When power flows, the ABS ECU turns on the warning light for approximately 1 sec. while it performs a valve relay test. If there is a break in the harness between the ECU and the warning light, the light illuminates only when the valve relay is off in the valve relay test, etc.



## E-I Input abnormality of wheel speed sensor

**[Explanation]**

The ABS ECU detects breaks in the wheel speed sensor wire. The warning light lights up if the wheel speed sensor signal is not input (or short circuited) or if its output is low when starting to drive or while driving.

**[Hint]**

In addition to a broken wire/short circuit in the wheel speed sensor, also check whether the sensor gap is too large, rotor teeth are missing, sensor harness wire is temporarily broken, or sensor harness and body connector are not properly inserted.

## E-2 Output abnormality of wheel speed sensor

**[Explanation]**

The warning light lights up when there is an abnormality (other than broken wire or short circuit) in the wheel speed sensor output signal while driving.

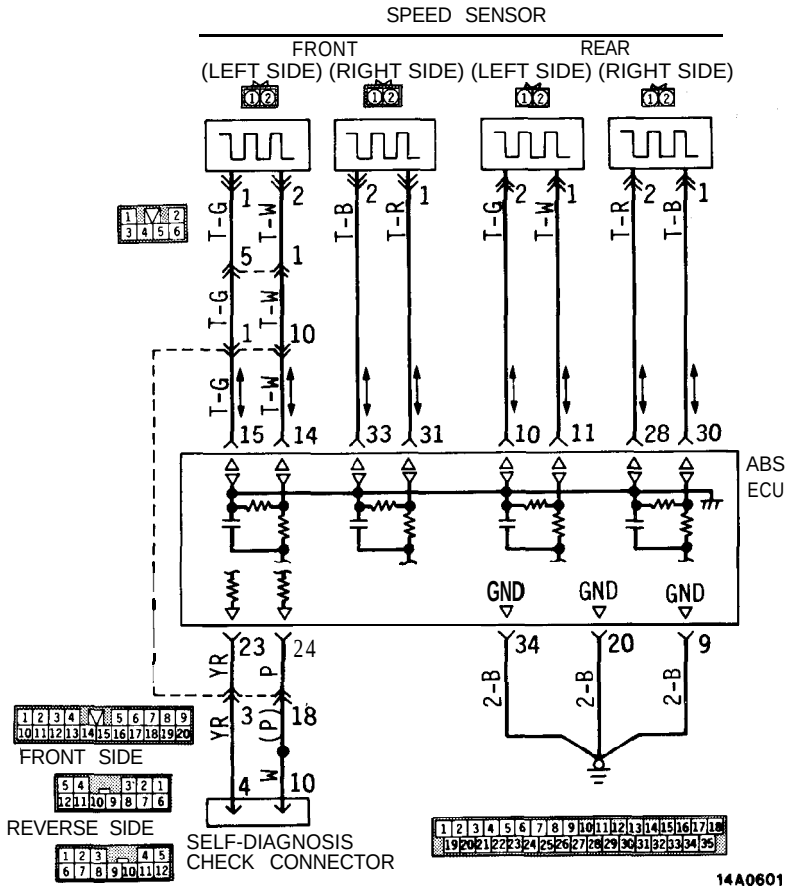
**[Hint]**

The following can be considered as the cause of the wheel speed sensor output abnormality.

- Distortion of rotor, teeth missing
- Low frequency noise interference when sensor harness wire is broken
- Noise interference in sensor signal
- When the sensor output signal is below the standard value or when amplitude modulation is over the standard value, using an oscilloscope to measure the wave shape of the wheel speed sensor output signal is very effective.
- Loose wheel bearing
- Temporarily broken wire in sensor harness
- Sensor harness and body connector are not properly inserted.

NOTE

If contact is poor, check the sensor cable by bending and lightly stretching it.



Check flow connected with wheel speed sensor

NOTE:
When checking with an oscilloscope, first measure voltage variations in the wheel speed sensor output. (Refer to P.5-51.)

Is the resistance value of the wheel speed sensor part, which the displayed trouble code indicates, normal?
Standard value: 0.8–1.2kΩ

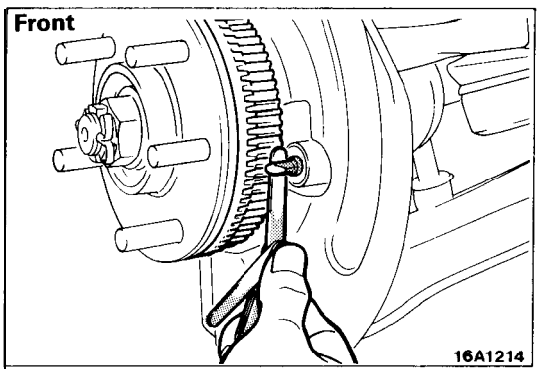
No → Malfunction of wheel speed sensor → Replace wheel speed sensor.

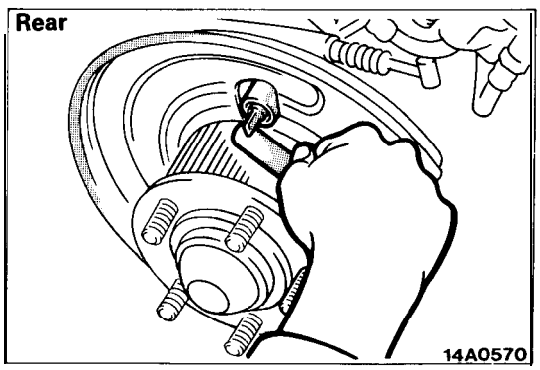
Yes

Is the resistance value with the ECU connector normal?

No → Harness wire for wheel speed sensor circuit is broken. → Repair harness.

Yes




Is the standard value for the gap between the wheel speed sensor and rotor, which the output trouble code indicates, within the range?

**Standard value:**
**Front 0.3–0.9 mm (.012–.035 in.)**
**Rear 0.3–0.9 mm (.012–.035 in.)**

No → Adjust the gap between the wheel speed sensor and rotor.

Yes

Is the wheel speed sensor rotor that the trouble code indicates. normal and with no missing or damaged teeth?

No → Replace rotor that has missing or damaged teeth.

Yes

Check the output of each wheel speed sensor with an oscilloscope, including the wave form. (Refer to measurement of wheel speed sensor output voltage variations on P.5-51.) Is the output voltage for each wheel speed sensor over the standard value and is the wave form normal?

No → Recheck if below the standard value or if the sensor has a poor wave form. Replace sensor or rotor.

Yes

Can the abnormality be found even if the sensor harness and connection between sensor harness and body harness are bent and stretched?

No → Repair harness.

Yes

Wheel speed sensor related things are normal.

## E-3 Abnormality of stop light switch circuit

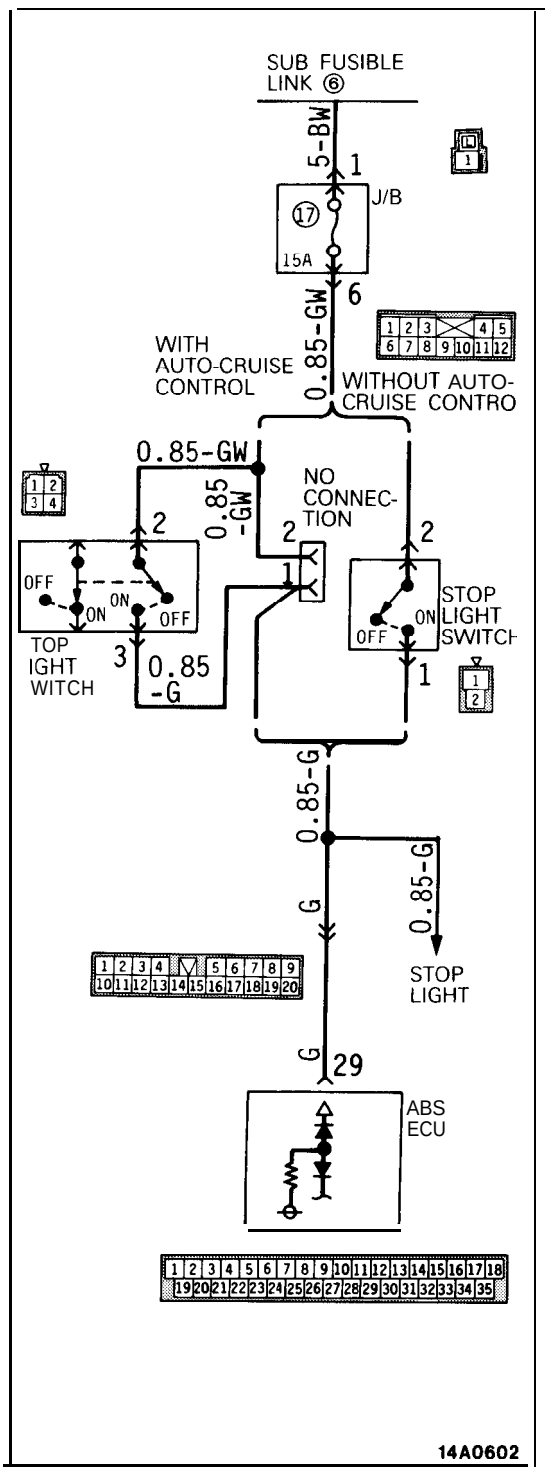
### [Explanation]

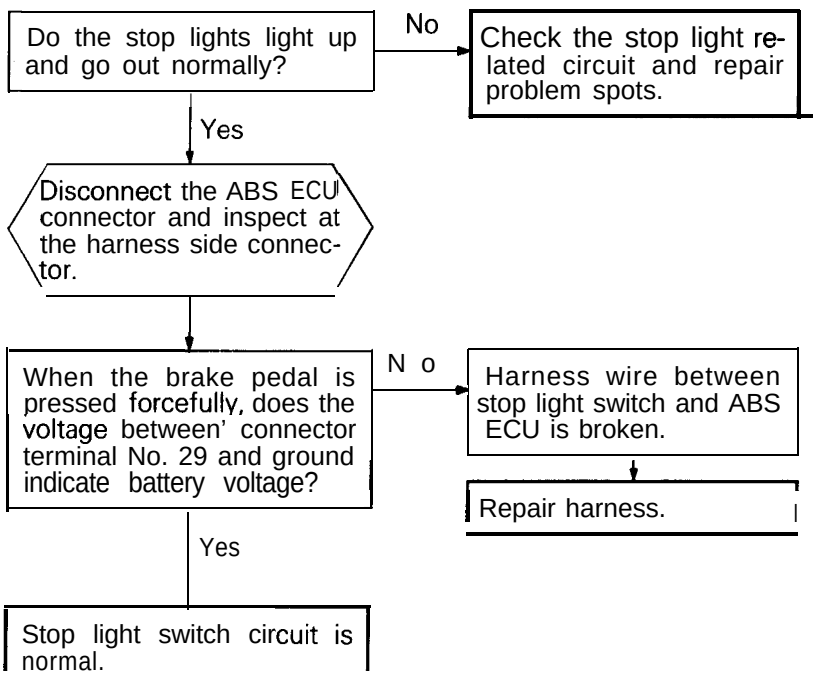
The ABS ECU turns on the warning light in the following cases.

- Stop light switch may remain on for more than 15 minutes without the ABS functions.
- The harness wire for the stop light switch may be open.

### [Hint]

If the stop light operates normal, the ABS harness wire for the stop light switch input circuit to the ECU is broken or there is a malfunction in the ABS ECU.

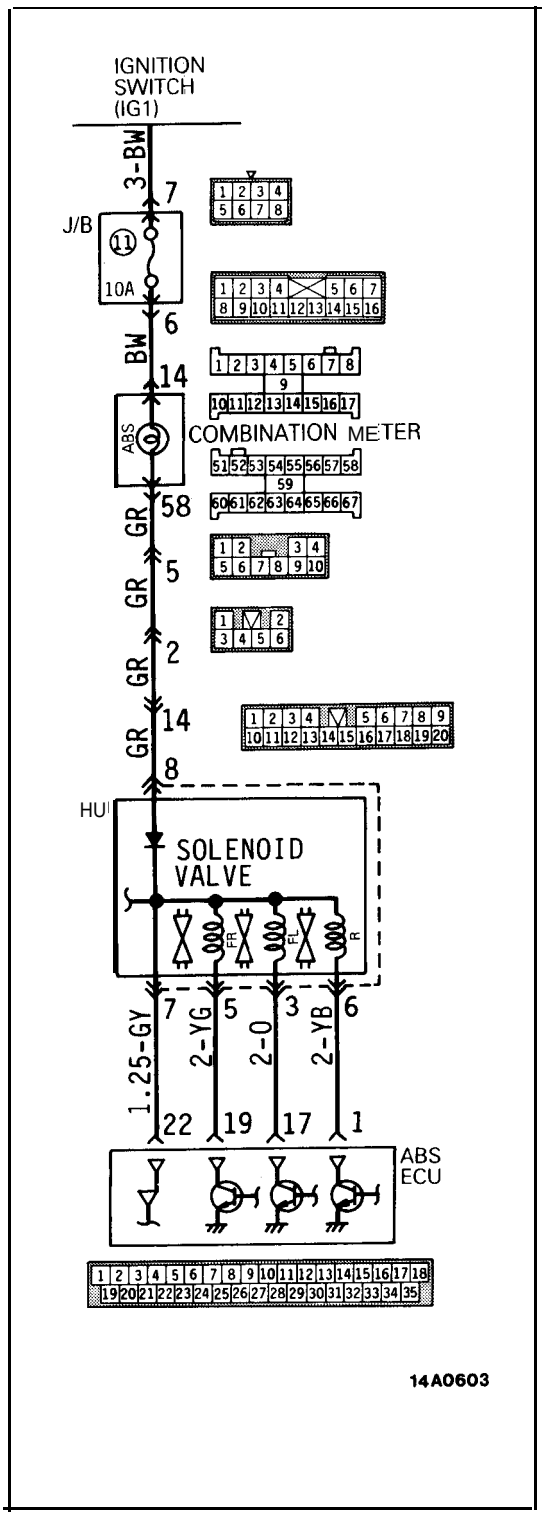


## E-4 Abnormality of solenoid valve drive circuit

**[Explanation]**

The ABS ECU normally monitors the solenoid valve drive circuit.
If no current flows in the solenoid even if the ECU turns the solenoid ON or if it continues to flow even when turned OFF, the ECU determines the solenoid coil wire is broken/short circuited or the harness is broken short circuited and then warning light lights up.




Remove HU 10P connector and check with the HU side connector.

↓

Is the resistance value for the solenoid valve, that the displayed trouble code indicates, within the range of the standard values?
**Standard value: 3.0–3.2 Ω**

No → Replace HU.

↓ Yes

Connect HU 10P connector, disconnect ECU connector and check.

↓

Is the solenoid valve resistance value, that the output trouble code displays, within the range of the standard values when measured at the ECU connector?
**Standard value: 3.0–3.2 Ω**

No → The harness wire for the solenoid valve circuit whose resistance value is outside the range of the standard value is broken or short circuited.

→ Repair ABS harness.

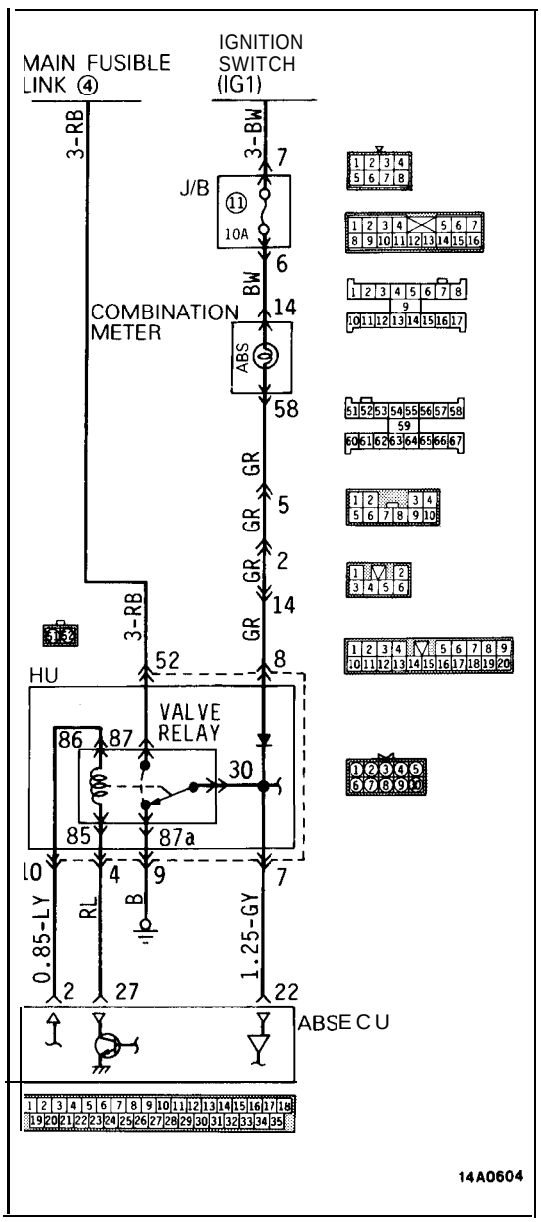
↓ Yes

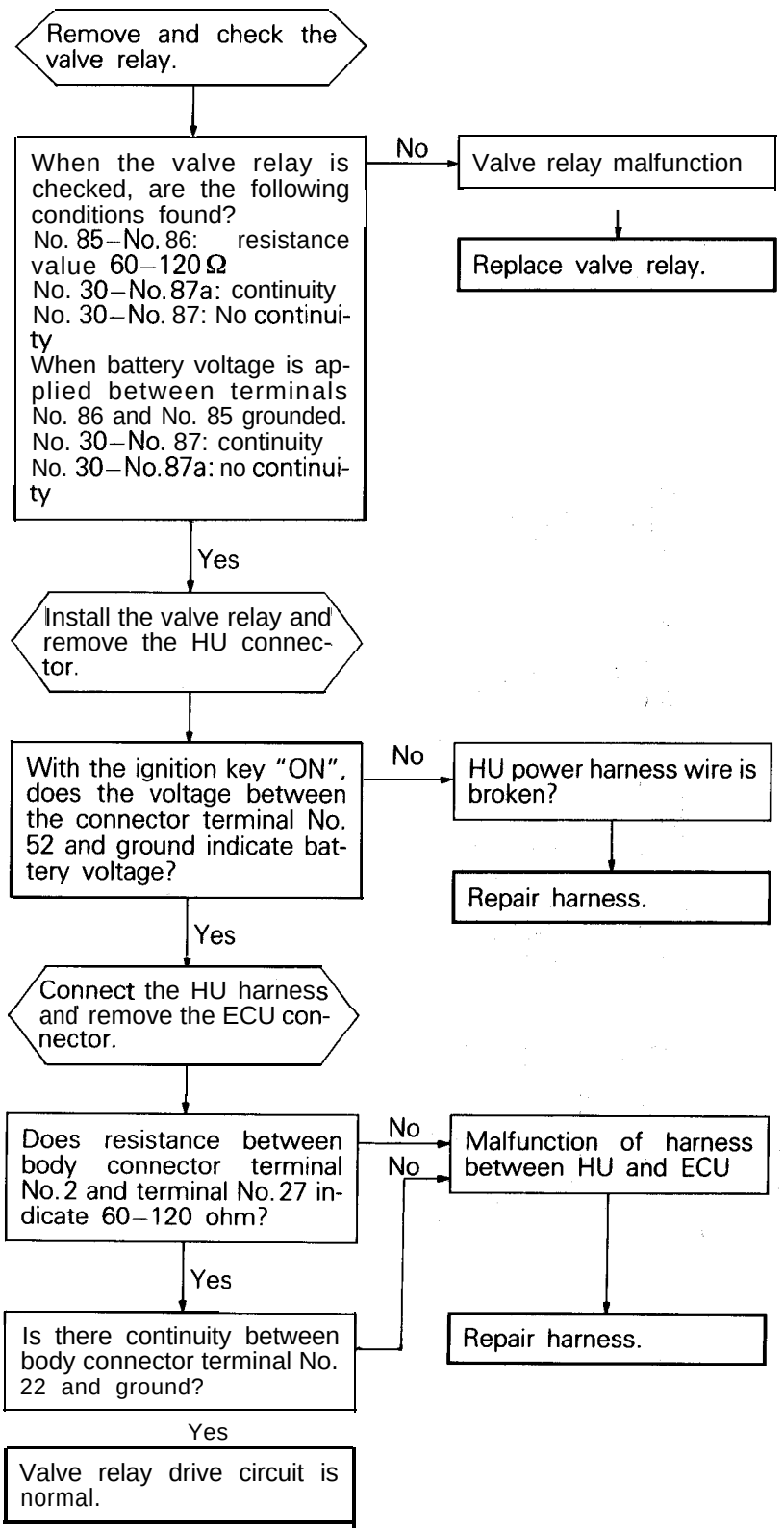
**Solenoid valve drive circuit is** normal.

## E-5 Abnormality of valve relay drive circuit

### [Explanation]

When the ignition switch is turned ON, the ABS ECU switches the valve relay OFF and ON for an initial check, compares the voltage of the signal to the valve relay and valve power monitor line voltage to check whether the valve relay operation is normal. In addition, normally it monitors whether or not there is power in the valve power monitor line since the valve relay is normally ON. Then, if the supply of power to the valve power monitor line is interrupted, the warning light illuminates.



## E-6 Abnormality of motor drive circuit

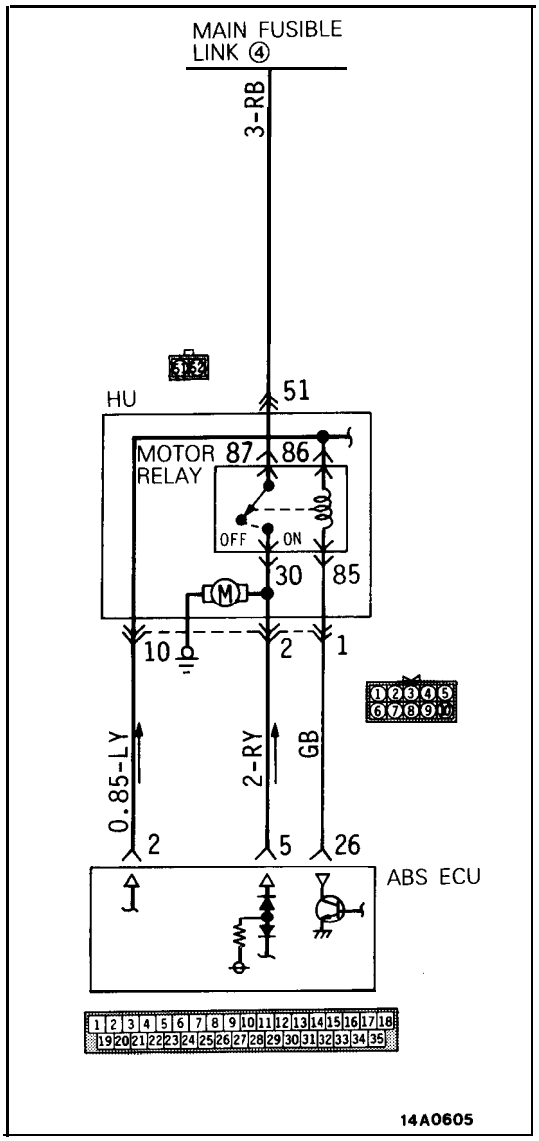
**[Explanation]**

The ABS ECU illuminates the warning light for the motor relay and motor in the following cases.

- When the motor relay does not function
- When there is trouble with the motor itself and it does not revolve
- When the motor ground line is disconnected and the motor does not revolve
- When the motor continues to revolve

**[Hint]**

If there is motor operation noise when wheel speed exceeds 6km/h (4mph) when starting up after the engine is started, there is a broken or short circuited motor monitor wire.




Does the motor make a noise when wheel speed exceeds 6 km/h (4 mph)?
- Yes → Broken wire or short circuit in motor monitor line → Repair the harness between HU and ECU.
- No → Remove the motor relay.

Remove the motor relay and check resistance values.
No. 85–No. 86: resistance value 30–60 Ω
No. 30–No. 87: no continuity
Battery voltage is applied on terminals No. 86 and No. 85 grounded.
No. 30–No. 87: continuity
- No → Motor relay malfunction → Replace motor relay.
- Yes ↓

Is pump motor ground connected normally?
- No → Connect ground wire.
- Yes ↓

Install motor relay and remove HU connector.

Does voltage between body connector terminal 51 and ground indicate battery voltage?
- No → Broken wire in pump motor power circuit → Repair the harness.
- Yes ↓

Connect the HU connector and remove the ECU connector.

Is resistance between body connector terminal No. 2 and No. 26 30–60 ohms?
- No → Malfunction of harness between HU and ECU → Repair harness.
- Yes ↓

Motor drive circuit is normal.

## TROUBLESHOOTING (ABS-AWD)

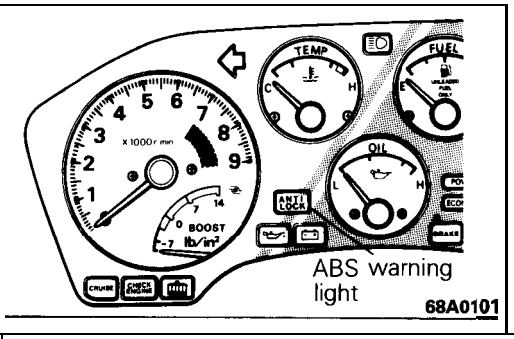
Confirm condition in the following way and diagnosis accordingly.

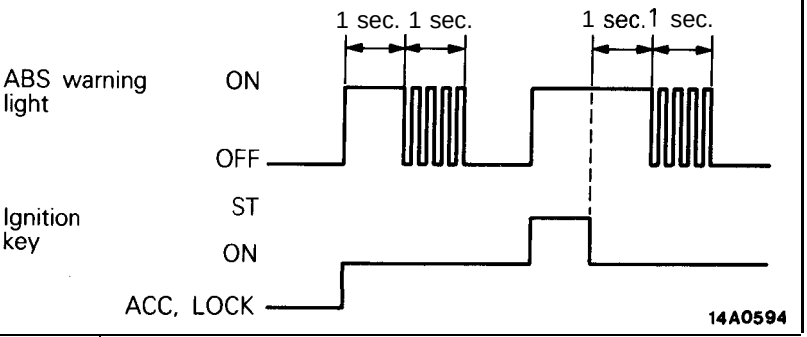
Does the ABS warning light illuminate as described below up to the time the engine starts?

(1) When the ignition key is turned to the "ON" position, the ABS warning light illuminates for approximately 1 second due to the ABS ECU (as a self check of the valve relays is performed), then it blinks four times and goes out and stays out.

(2) With the ignition key in the "START" position, power to the ABS ECU is interrupted and the ABS warning light remains lit because the valve relay is OFF.

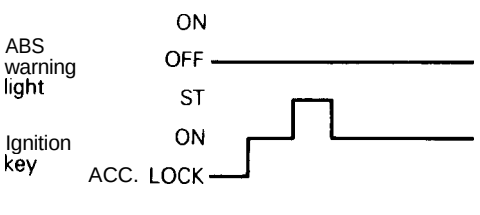
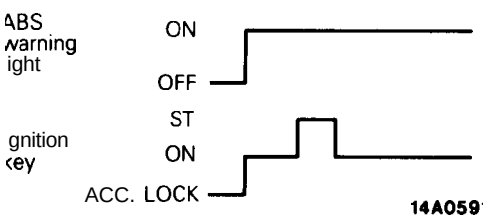
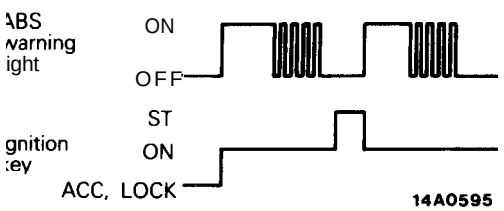
(3) When the ignition key is turned from the "START" position to the "ON" position, the ABS warning light illuminates for approximately 1 second (during this time a recheck of the valve relays is performed), then it blinks four times and then goes out and stays out.

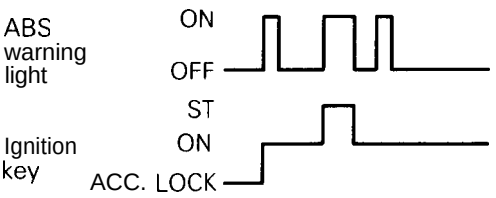



Yes → CONTINUE TO NEXT PAGE

No

| No. | Trouble condition | Major causes | Remedy |
|---|---|---|---|
| 1 | ABS warning light does not light up at all.<br>  | • ABS warning light bulb is burnt out.<br>• Open in ABS warning light electrical circuit (check for blown fuse) | Check, using flow chart A. (Refer to P.5-27.) |
| 2 | When the ignition key is turned to the "ON" position, it remains lighted.<br>  | • Fail safe is functioning due to ECU self diagnosis<br>• Short in ECU warning light drive circuit<br>• Malfunction of ECU | Check, using flow chart B. (Refer to P.5-30.) |
| 3 | Does not illuminate when ignition key is in "START" position.<br>  | • Malfunction of valve relay<br>• Break in harness between ABS warning light and HU<br>• Break in harness between HU and body ground | Check, using flow chart C. (Refer to P.5-32.) |

| No. | Trouble condition | Major causes | Remedy |
|---|---|---|---|
| 4 | After the ignition key is turned to the "ON" position, it blinks once and then illuminates when it is turned to the "START" position. When the key is returned to the "ON" position, the light blinks again. (Blinking with the ignition key in the "ON" position is synchronized with operation noise of the valve relay.)   | • Break in harness for ECU warning light drive circuit<br>• Malfunction of ECU | Check, using flow chart D. (Refer to P.5-33.) |

CONTINUED FROM PREVIOUS PAGE

Does the ABS warning light illuminate when starting to drive the car?

Yes → Trouble with the motor relay, solenoid valve [due to self test when driving above 6 km/h (4 mph)] or malfunction of wheel speed sensor → Check, following trouble source check charts E-l – E-7.

No

Is there one-sided braking, insufficient braking force or malfunction of ABS operation?

No → Normal

Yes

| Trouble condition | Major causes | Remedy |
|---|---|---|
| One-sided braking<br>Insufficient braking force | • Mechanical lock of HU solenoid valve<br>• Hydraulic line in HU is clogged. | Check HU operation and, if necessary, replace HU.<br>If HU is normal, check structural parts for normal braking. (Refer to P.5-2.) |
| Decline in ABS function<br>(Wheels easily lock when there is sudden braking.) | • Malfunction in HU solenoid valve operation<br>• Hydraulic line in HU is clogged. | |
| ABS sometimes functions even when there is no sudden braking. (ABS operation vibration is transmitted.) | • Insufficient wheel speed sensor output voltage (sensor malfunction, too large a gap between sensor rotor, missing rotor teeth or temporarily broken wire in sensor harness)<br>• Malfunction of ABS ECU | Check wheel speed sensor (Refer to P.5-82.) and, if necessary, replace sensor, adjust gap or replace rotor.<br>If tests indicate that there are no mechanical or electrical failures, replace the ECU. |

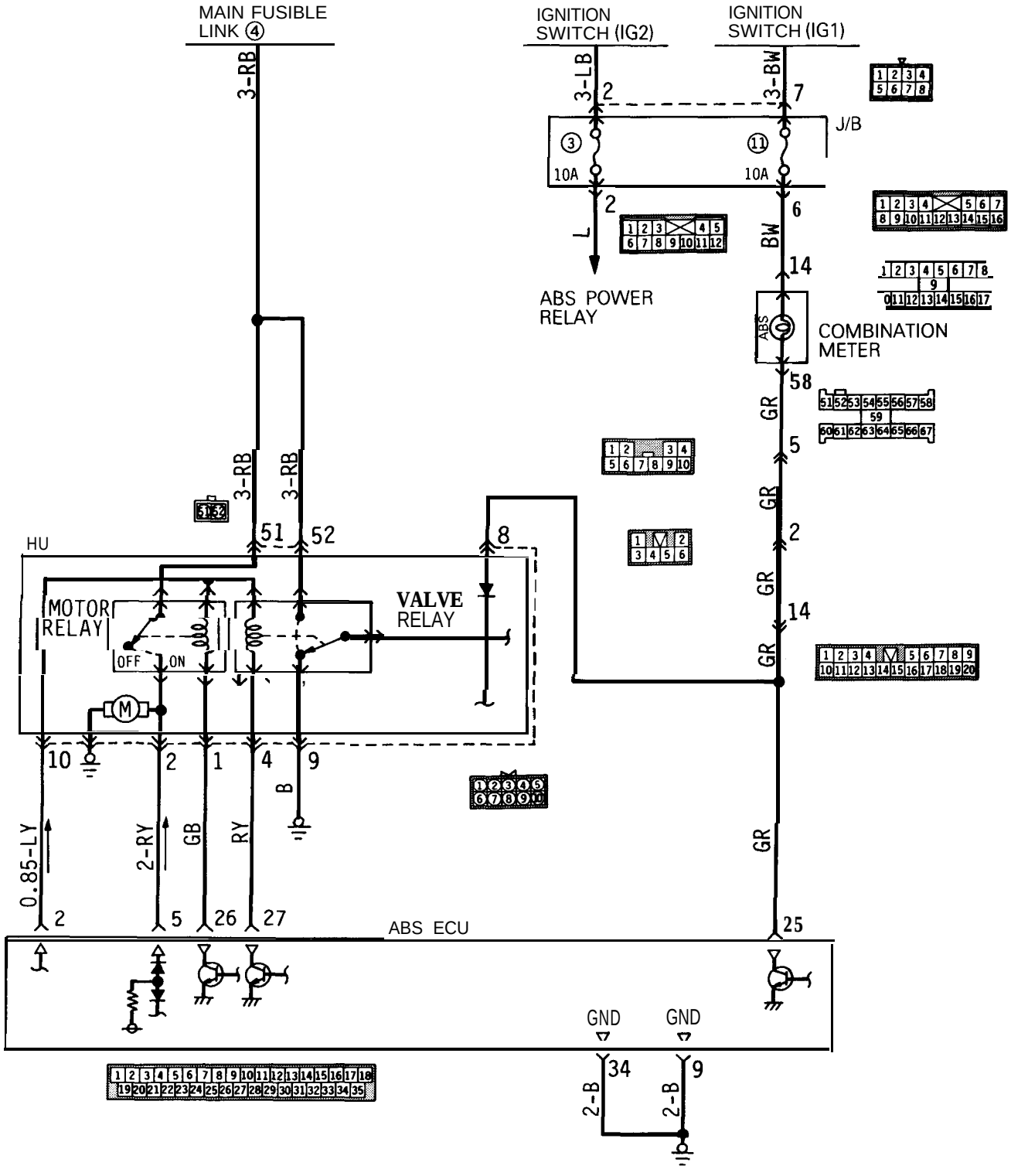
| A | ABS warning light does not light at all. |
|---|---|

**[Explanation]**

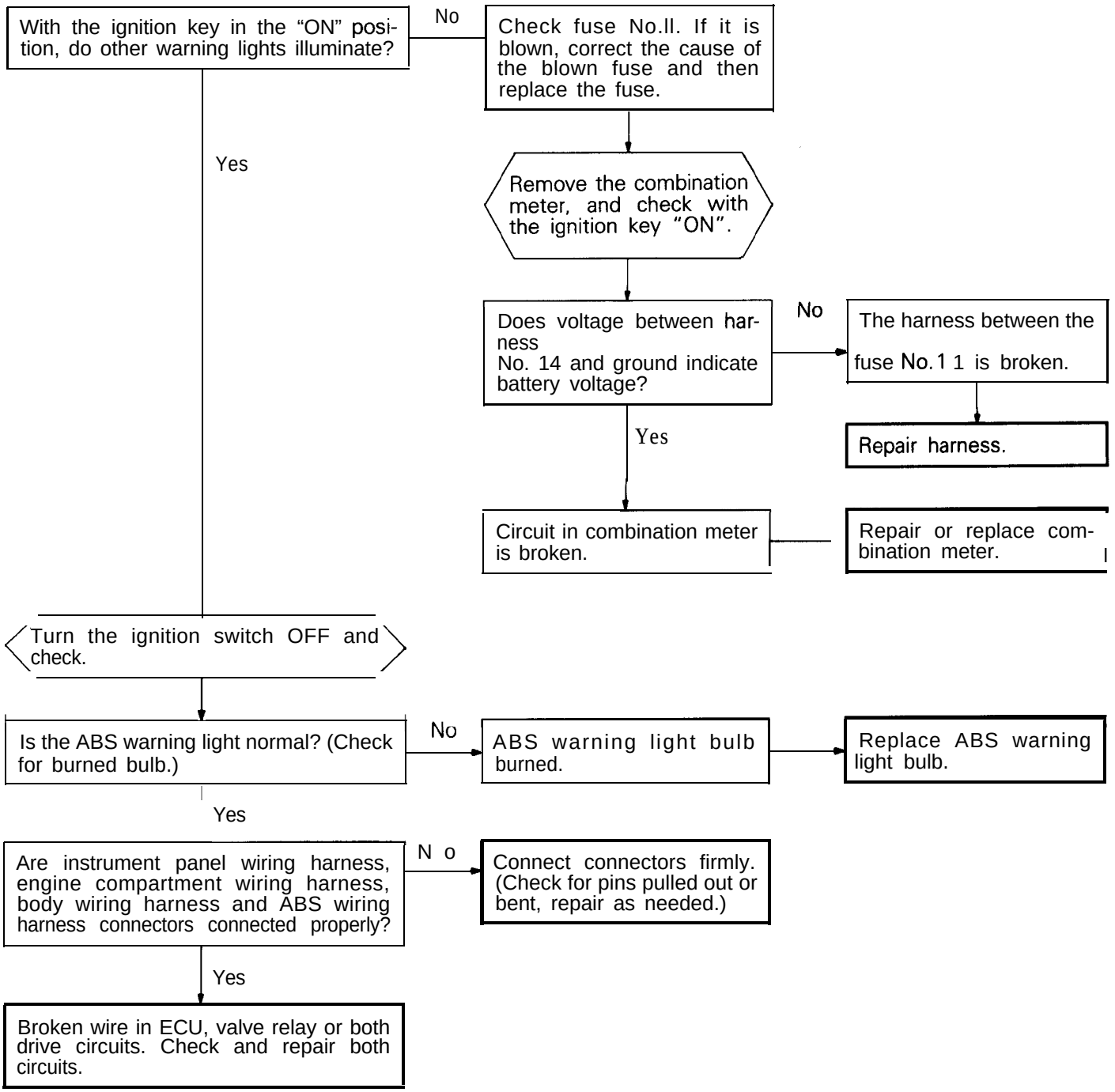
When it does not light up at all, there is a strong possibility that there is trouble with ABS warning light or with power to the light.

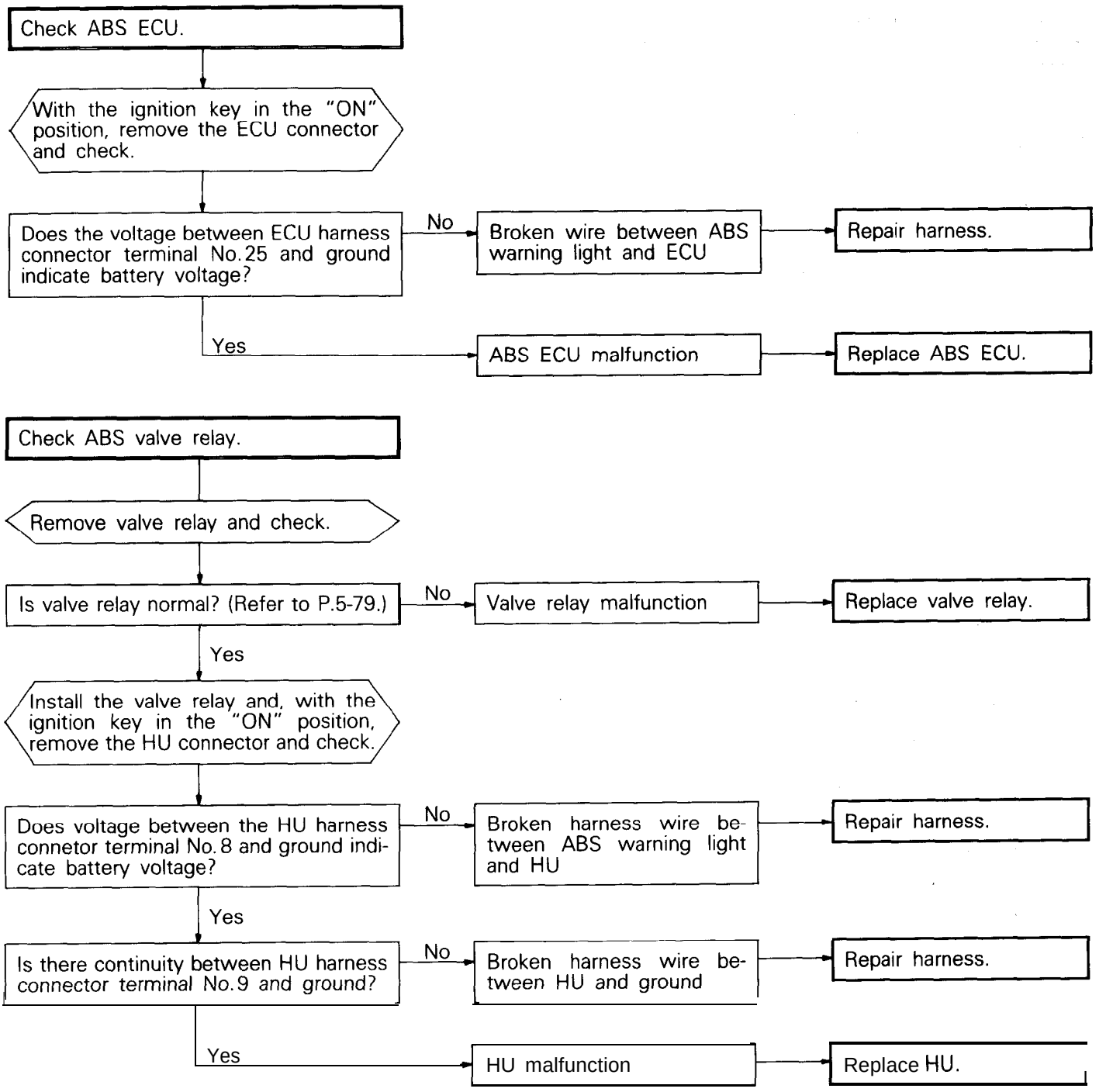
**[Hint]**

If other warning lights do not light up either, fuse is probably blown.




14A0606

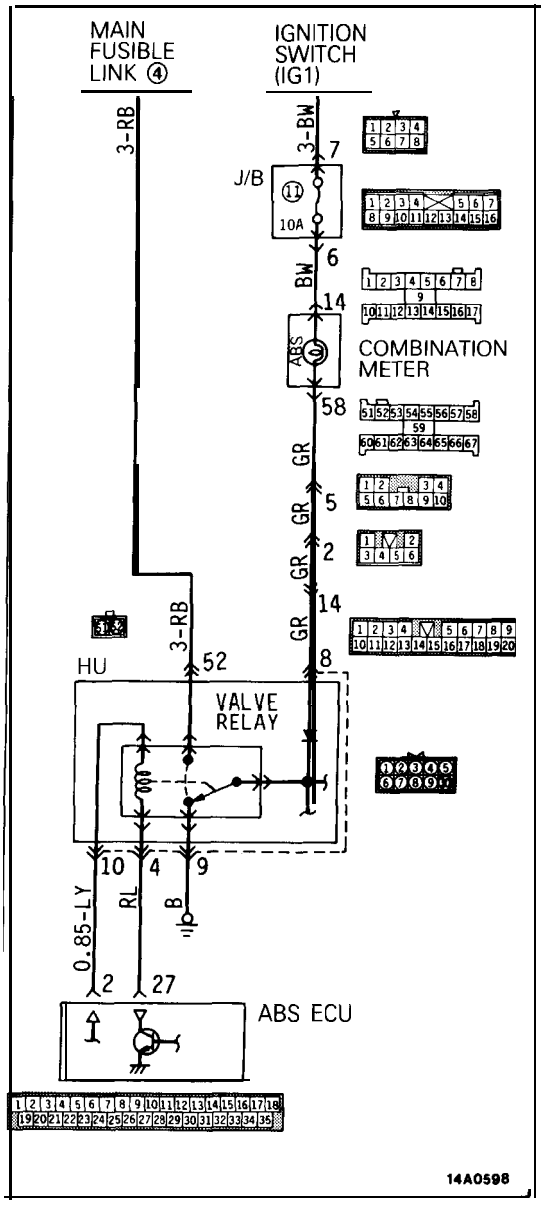

With the ignition key in the "ON" position, do other warning lights illuminate?
No
Check fuse No.11. If it is blown, correct the cause of the blown fuse and then replace the fuse.
Yes
Remove the combination meter, and check with the ignition key "ON".
Does voltage between harness No. 14 and ground indicate battery voltage?
No
The harness between the fuse No.11 is broken.
Repair harness.
Yes
Circuit in combination meter is broken.
Repair or replace combination meter.
Turn the ignition switch OFF and check.
Is the ABS warning light normal? (Check for burned bulb.)
No
ABS warning light bulb burned.
Replace ABS warning light bulb.
Yes
Are instrument panel wiring harness, engine compartment wiring harness, body wiring harness and ABS wiring harness connectors connected properly?
No
Connect connectors firmly. (Check for pins pulled out or bent, repair as needed.)
Yes
Broken wire in ECU, valve relay or both drive circuits. Check and repair both circuits.


Check ABS ECU.
With the ignition key in the "ON" position, remove the ECU connector and check.
Does the voltage between ECU harness connector terminal No.25 and ground indicate battery voltage?
No
Broken wire between ABS warning light and ECU
Repair harness.
Yes
ABS ECU malfunction
Replace ABS ECU.
Check ABS valve relay.
Remove valve relay and check.
Is valve relay normal? (Refer to P.5-79.)
No
Valve relay malfunction
Replace valve relay.
Yes
Install the valve relay and, with the ignition key in the "ON" position, remove the HU connector and check.
Does voltage between the HU harness connetor terminal No.8 and ground indicate battery voltage?
No
Broken harness wire between ABS warning light and HU
Repair harness.
Yes
Is there continuity between HU harness connector terminal No.9 and ground?
No
Broken harness wire between HU and ground
Repair harness.
Yes
HU malfunction
Replace HU.

## B ABS warning light illuminated after the engine is started and remains on.

**[Explanation]**

This is the symptom when the ABS ECU does not power up due to broken ECU power circuit, etc., when the fail safe function operates and isolates the system or when the warning light drive circuit is short circuited.




Check separate circuit for source of trouble.

Check, using check chart E-l – E-7.

Check warning light drive circuit.

Does the ABS warning light remain illuminated even with the ECU connector disconnected?

No → Short in ECU transistor → Replace ECU.

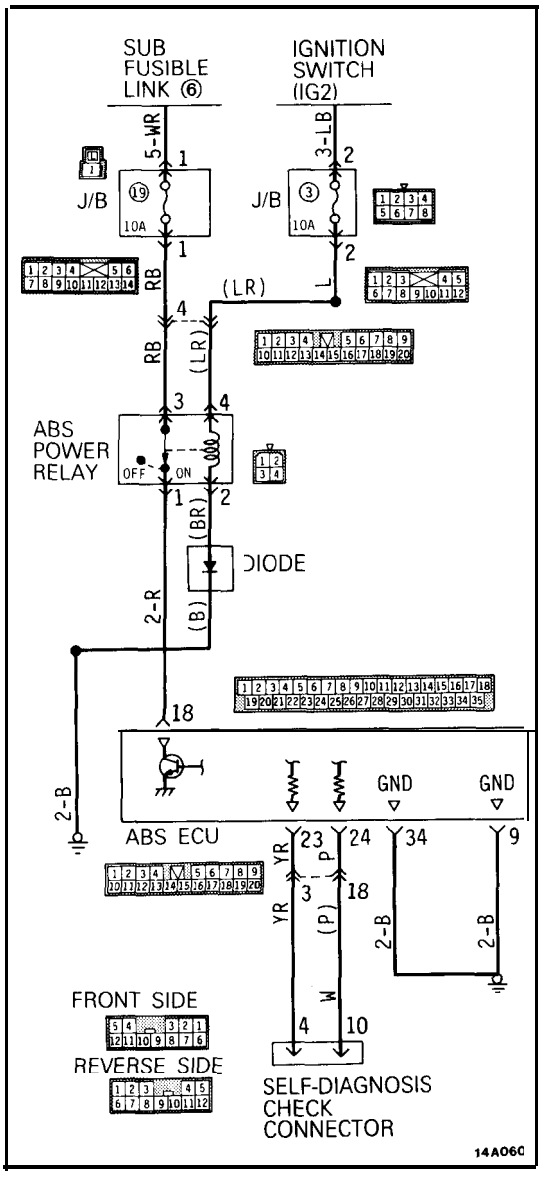
Yes

Does the ABS warning light remain illuminated even with the ECU connector disconnected?

No → Short in HU harness or sticking of valve relay contact → Replace HU or replace valve relay.

Yes

Short in harness between HU or ECU and ABS warning light → Repair harness or replace combination meter.




Check of ECU power circuit.

Is fuse No.3 normal?
- No → Correct cause of blown fuse and replace fuse.
- Yes ↓

With the ignition key in the "ON" position, does the power relay make a "click": noise?
- No → Is power relay normal? (Refer to P.5-52.)
  - Yes → Yes ↓
  - No → Replace power relay.
- Yes ↓

Disconnect ECU connector and check harness connector. ↓

With the ignition key in the "ON" position, does voltage between ECU connector terminal No. 18 and ground indicate the battery voltage?
- No → Harness wire between power relay and ECU is broken. → Repair harness.
- Yes ↓

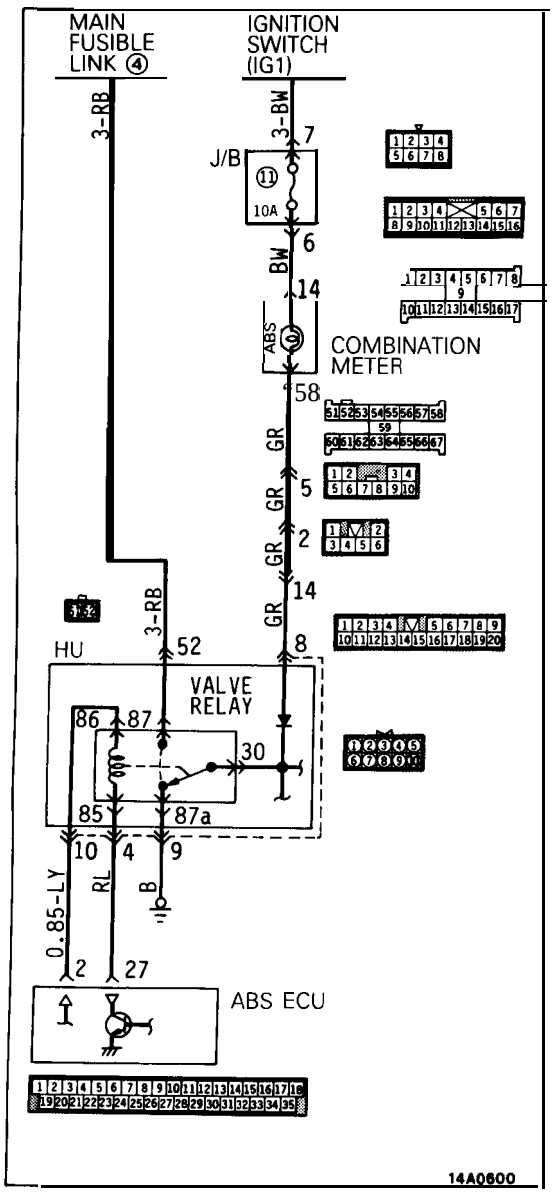
Is there continuity between body harness terminals No.9 and No.34, and ground?
- No → ECU ground line broken → Repair harness.
- Yes ↓

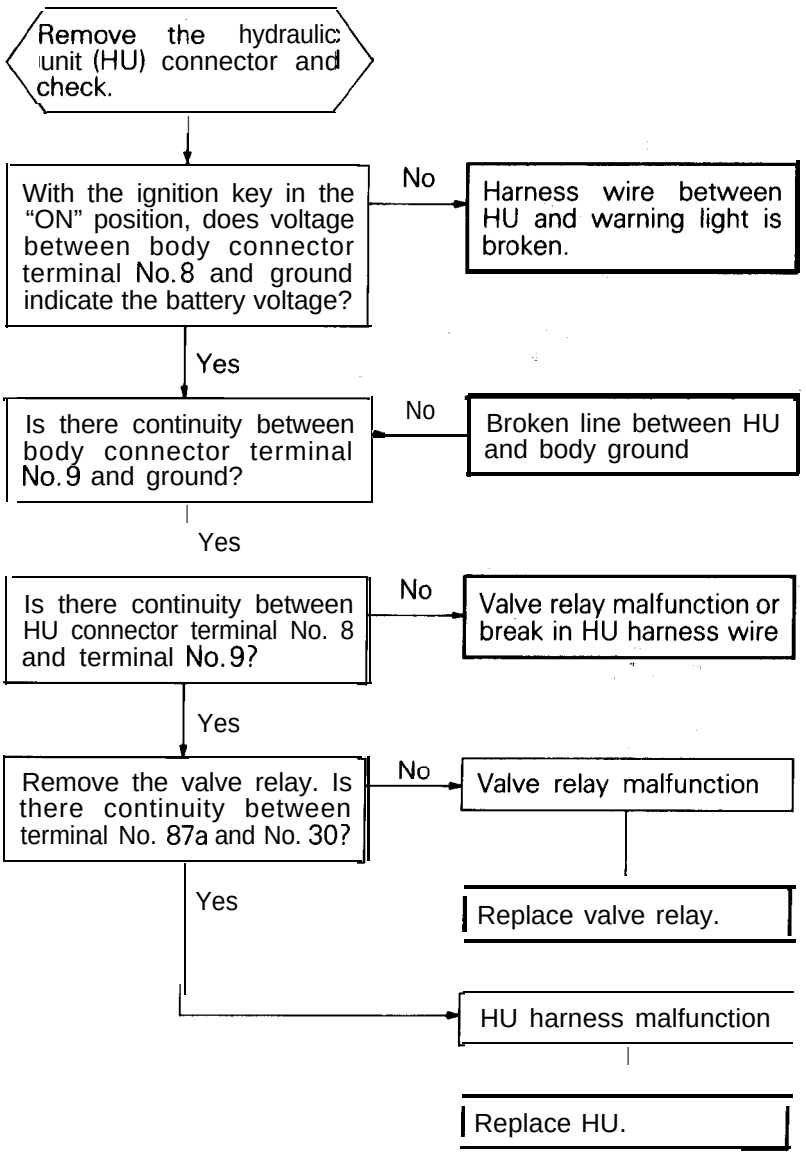
Malfunction of ABS ECU → Replace ABS ECU.

## C ABS warning light does not illuminate when ignition key is in "START" position.

**[Explanation]**

The ABS ECU uses the IG2 power source which is turned off in the "START" position. The ABS warning light uses the IG1 power source which is not turned off even in the "START" position. Consequently, in the "START" position, power is off and the ECU turns the valve relay OFF. If the warning light does not illuminate at this time, there is trouble in the warning light circuit on the valve relay side.

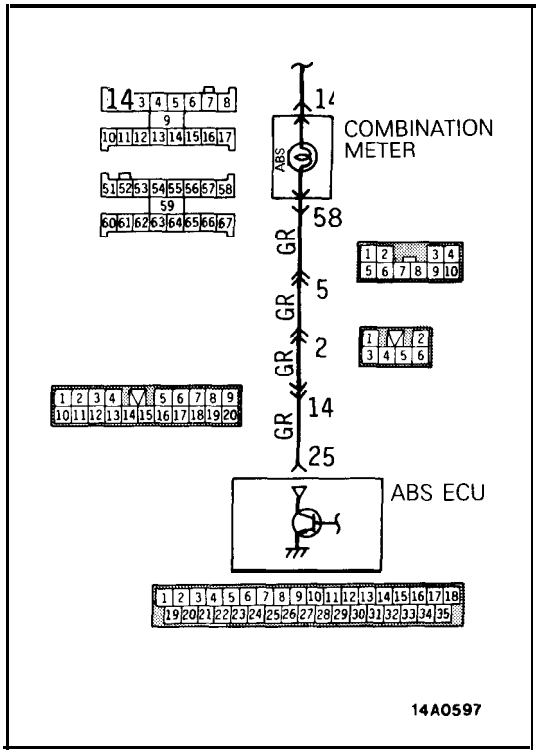


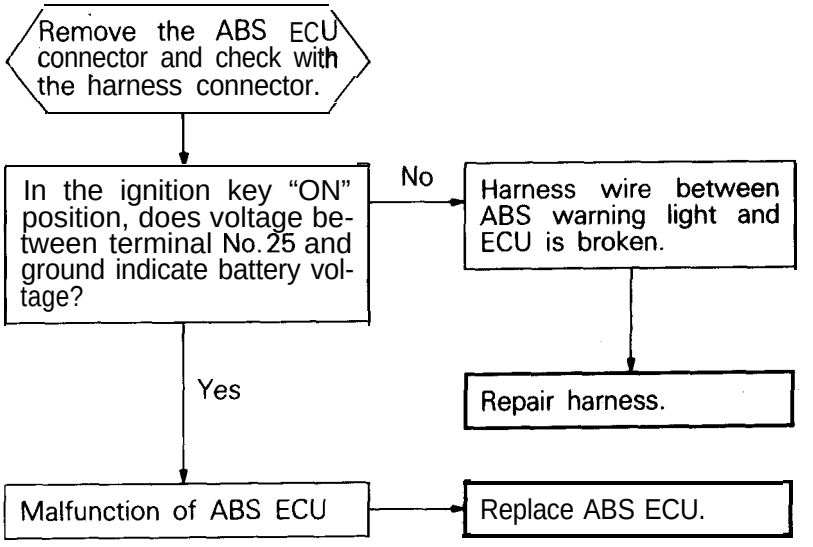



| D | ABS warning light blinks once after the ignition key is turned to the "ON" position. It illuminates in the "START" position and blinks once again when turned to the "ON" position. |
|---|---|

**[Explanation ]**

When power flows, the ABS ECU turns on the warning light for approximately 1 sec. while it performs a valve relay test. If there is a break in the harness between the ECU and the warning light, the light illuminates only when the valve relay is off in the valve relay test, etc.



## E-I Input abnormality of wheel speed sensor

**[Explanation]**

The ABS ECU detects breaks in the wheel speed sensor wire. The warning light lights up if the wheel speed sensor signal RL is not input (or short circuited) or if its output is low when starting to drive or while driving.

**[Hint]**

In addition to a broken wire/short circuit in the wheel speed sensor, also check whether the sensor gap is too large, rotor teeth are missing, sensor- harness wire is temporarily broken, or sensor harness and body connector are not properly inserted.

## E-2 Output abnormality of wheel speed sensor

**[Explanation]**

The warning light lights up when there is an abnormality (other than broken wire or short circuit) in the wheel speed sensor output signal while driving.

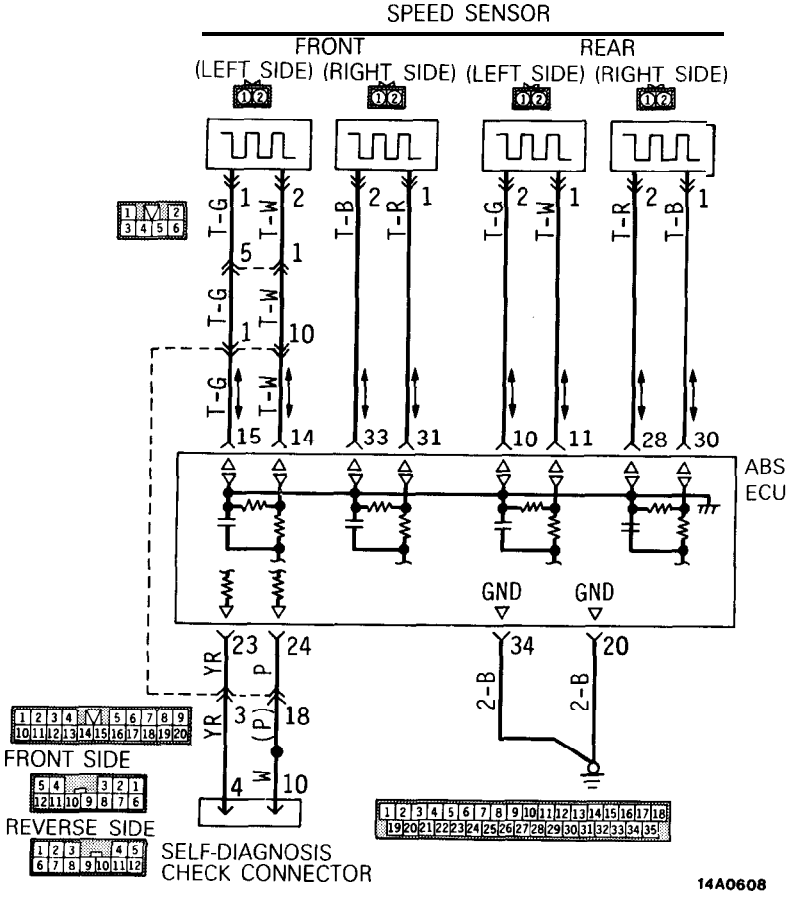
**[Hint]**

The following can be considered as the cause of the wheel speed sensor output abnormality.

- Distortion of rotor, teeth missing
- Low frequency noise interference when sensor harness wire is broken
- Noise interference in sensor signal
- When the sensor output signal is below the standard value or when amplitude modulation is over the standard value, using an oscilloscope to measure the wave shape of the wheel speed sensor output signal is very effective.
- Loose wheel bearing
- Temporarily broken wire in sensor harness
- Sensor harness and body connector are not properly inserted.

NOTE

If contact is poor, check the sensor cable by bending and lightly stretching it.



Check flow connected with wheel speed sensor

NOTE:
When checking with an oscilloscope, first measure voltage variations in the wheel speed sensor output. (Refer to P.5-51.)

Is the resistance value of the wheel speed sensor part, which the displayed trouble code indicates, normal?
Standard value: 0.8–1.2 kΩ

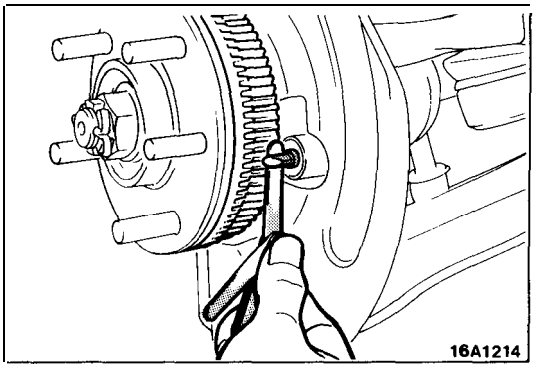
No → Malfunction of wheel speed sensor → Replace wheel speed sensor.

Yes ↓

Is the resistance value with the ECU connector normal?

No → Harness wire for wheel speed sensor circuit is broken. → Repair harness.

Yes ↓




Is the standard value tor the gap between the wheel speed sensor and rotor, which the output trouble code indicates, within the range?
**Standard value:**
**Front 0.3–0.9 mm (.012–.035 in.)**
**Rear No adjustment**

No → Adjust the gap between the wheel speed sensor and rotor.

Yes ↓

Is the wheel speed sensor rotor that the trouble code indicates, normal and with no missing or damaged teeth?

No → Replace rotor that has missing or damaged teeth.

Yes ↓

Check the output of each wheel speed sensor with an oscilloscope, including the wave form. (Refer to measurement of wheel speed sensor output voltage variations on P.5-51.) Is the output voltage for each wheel speed sensor over the standard value and is the wave form normal?

No → Recheck if below the standard value or if the sensor has a poor wave form. Replace sensor or rotor.

Yes ↓

Can the abnormality be found even if the sensor harness and connection between sensor harness and body harness are bent and stretched?

No → Repair harness.

Yes ↓

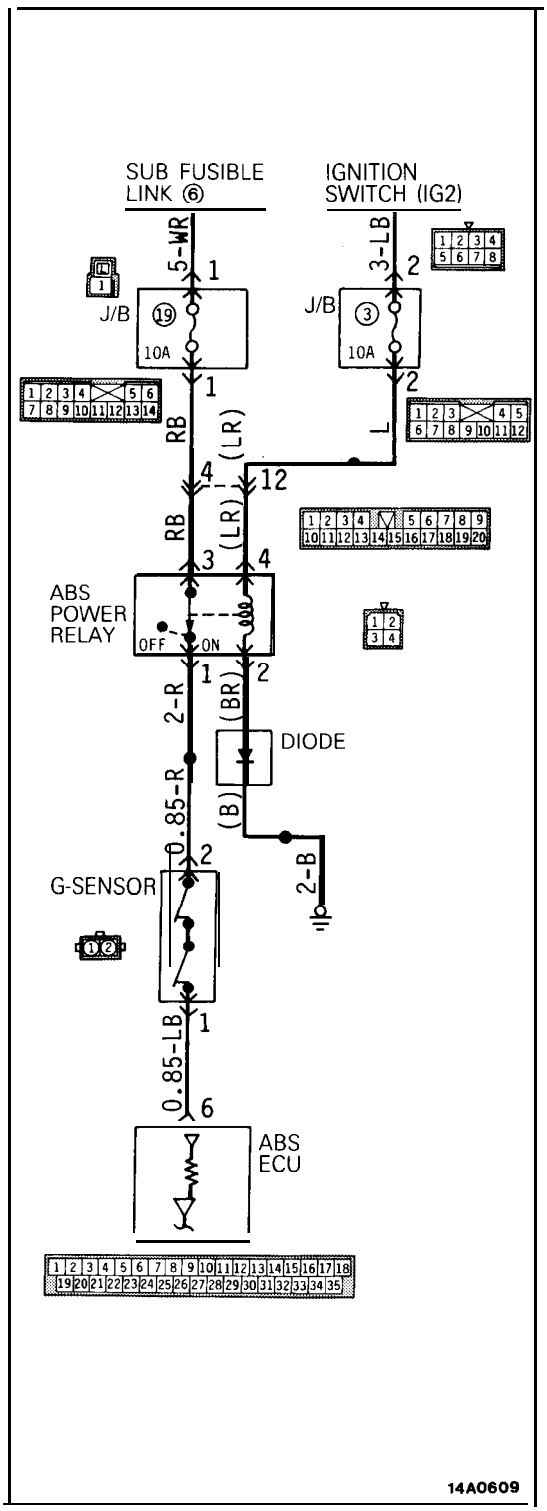
Wheel speed sensor related things are normal.

## E-3 Abnormality of G sensor circuit

**[Explanation]**

The ABS ECU turns on the warning light in the following cases.

- OFF trouble turning G sensor OFF (It is judged that the G sensor continues to be OFF for more than approximately 13 seconds except when the
- When there is a broken wire or short circuit in the harness for the G sensor system.




Is G sensor normal? (Refer to P.5-86.) — No → Replace G sensor.

Yes

Remove the ABS ECU connector and check at the harness connector.

With the ignition key "ON" does the voltage between terminal No.6 and ground indicate battery voltage? — No → The harness between the G sensor and the ABS ECU is broken. → Repair harness.

Yes

G sensor circuit is normal.

## E-4 Abnormality of stop light switch circuit

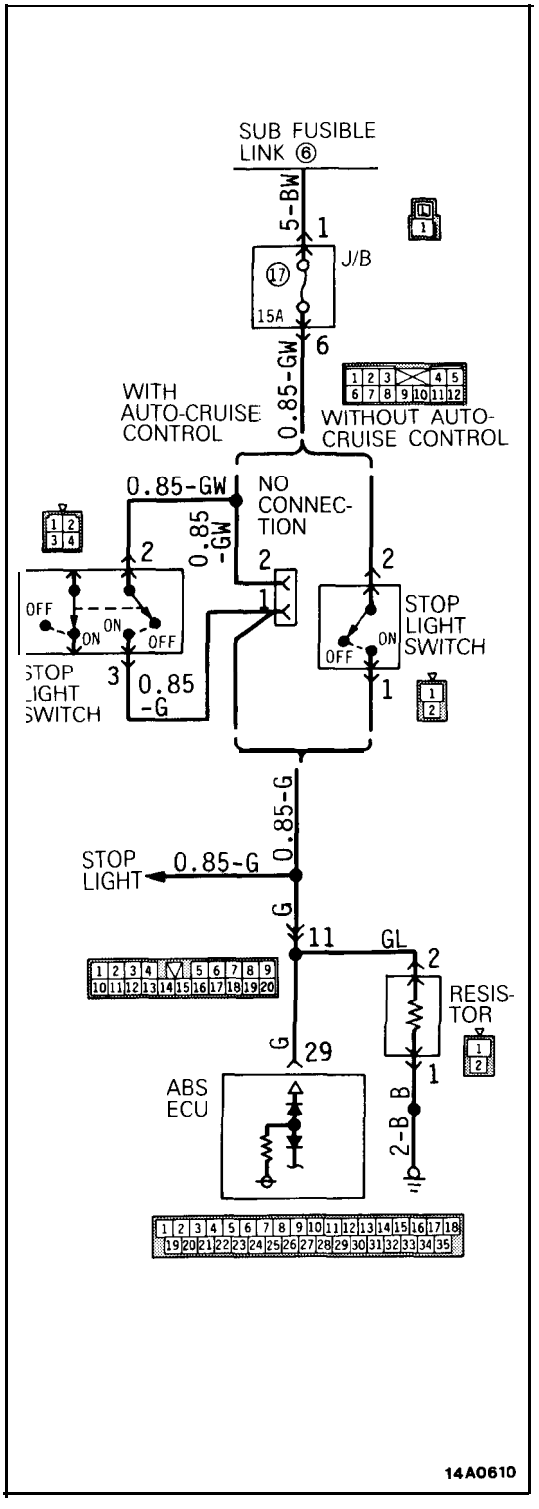
### [Explanation]

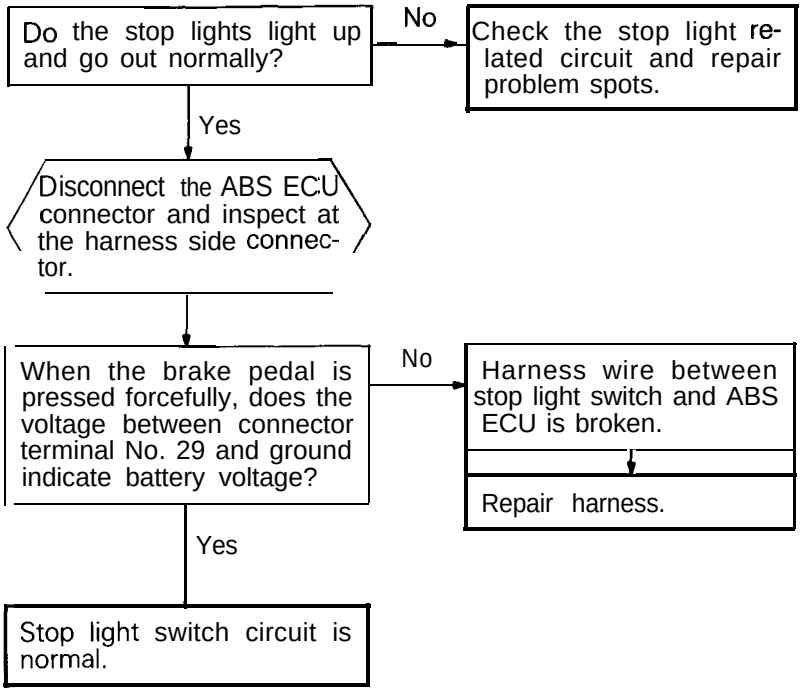
The ABS ECU turns on the warning light in the following cases.

- Stop light switch may remain on for more than 15 minutes without the ABS functions.
- The harness wire for the stop light switch may be open.

### [Hint]

If the stop light operates normal, the ABS harness wire for the stop light switch input circuit to the ECU is broken or there is a malfunction in the ABS ECU.

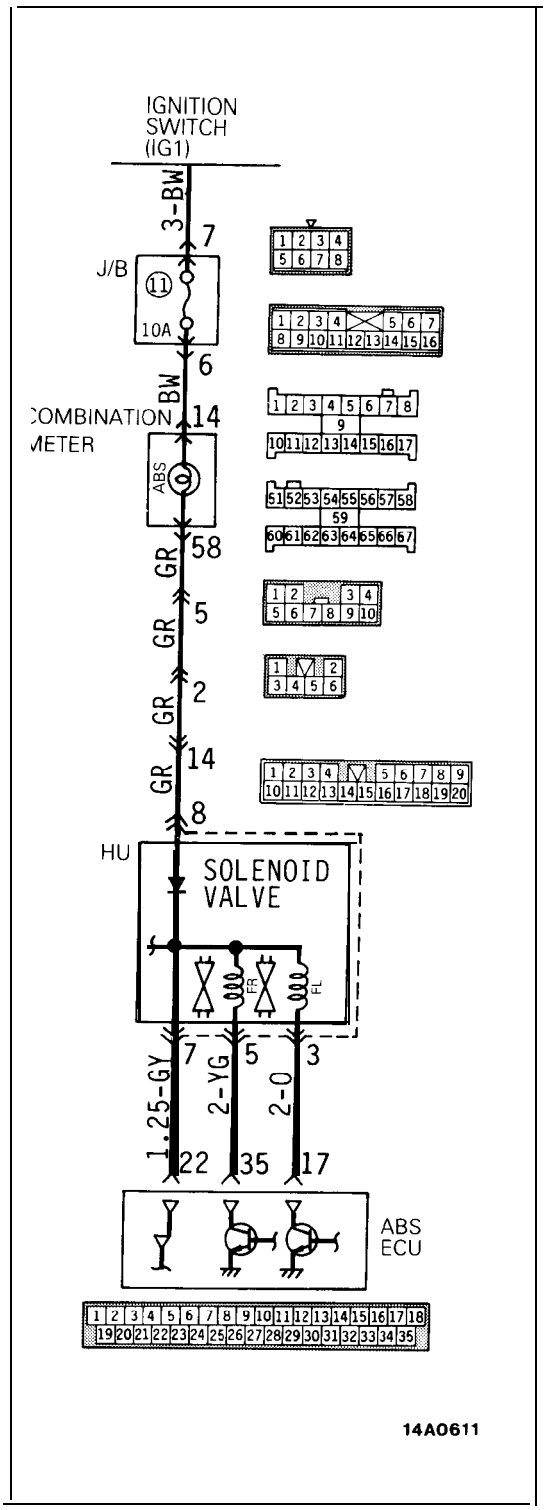


## E-5 Abnormality of solenoid valve drive circuit

**[Explanation]**

The ABS ECU normally monitors the solenoid valve drive circuit.
If no current flows in the solenoid even if the ECU turns the solenoid ON or if it continues to flow even when turned OFF, the ECU determines the solenoid coil wire is broken/short circuited or the harness is broken/short circuited and then the warning light lights up.




Remove HU 10P connector and check with the HU side connector.

Is the resistance value for the solenoid valve within the range of the standard values?
**Standard value: 3.0–3.2 Ω**

No → Replace HU.

Yes

Connect HU 10P connector, disconnect ECU connector and check.

Is the solenoid valve resistance value within the range of the standard values when measured at the ECU connector?
**Standard value: 3.0–3.2 Ω**

No → The harness wire for the solenoid valve circuit whose resistance value is outside the range of the standard value is broken or short circuited.

Repair ABS harness.

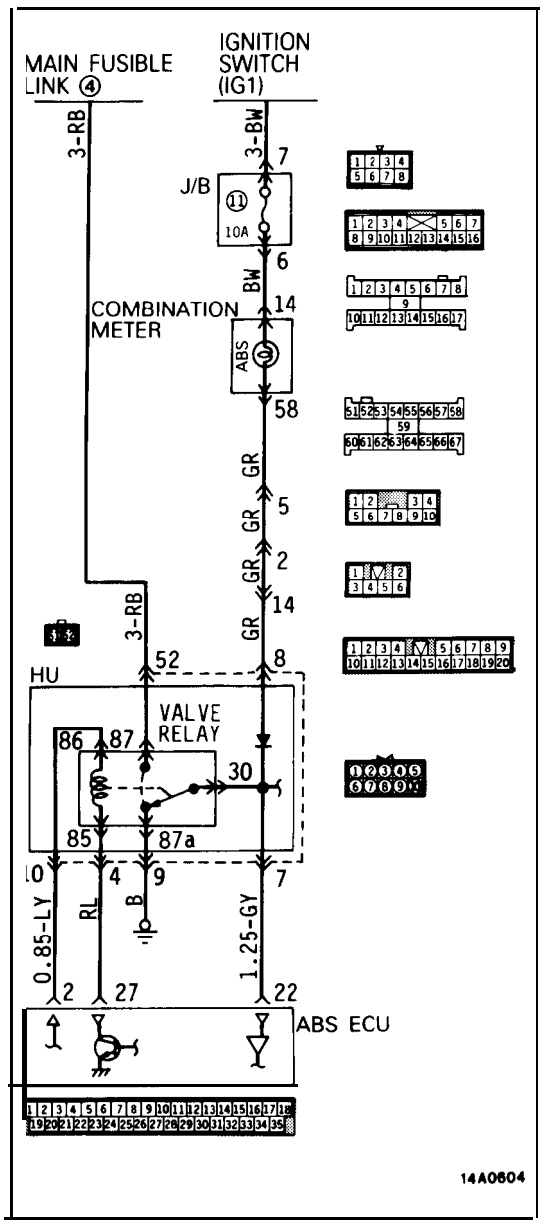
Yes

Solenoid valve drive circuit is normal.

## E-6 Abnormality of valve relay drive circuit

### [Explanation]

When the ignition switch is turned ON, the ABS ECU switches the valve relay OFF and ON for an initial check, compares the voltage of the signal to the valve relay and valve power monitor line voltage to check whether the valve relay operation is normal. In addition, normally it monitors whether or not there is power in the valve power monitor line since the valve relay is normally ON. Then, if the supply of power to the valve power monitor line is interrupted, the warning light illuminates.




Remove and check the valve relay.

When the valve relay is checked, are the following conditions found?
No. 85–No. 86: resistance value 60–120 Ω
No. 30–No. 87a: continuity
No. 30–No. 87: No continuity
When battery voltage is applied between terminals No. 86 and No. 85 grounded.
No. 30–No. 87: continuity
No. 30–No. 87a: no continuity

No → Valve relay malfunction → Replace valve relay.

Yes → Install the valve relay and remove the HU connector.

With the ignition key "ON", does the voltage between the connector terminal No. 52 and ground indicate battery voltage?

No → HU power harness wire is broken? → Repair harness.

Yes → Connect the HU harness and remove the ECU connector.

Does resistance between body connector terminal No. 2 and terminal No. 27 indicate 60–120 ohm?

No → Malfunction of harness between HU and ECU → Repair harness.

Yes → Is there continuity between body connector terminal No. 22 and ground?

No → Malfunction of harness between HU and ECU → Repair harness.

Yes → Valve relay drive circuit is normal.

## E-7 Abnormality of motor drive circuit

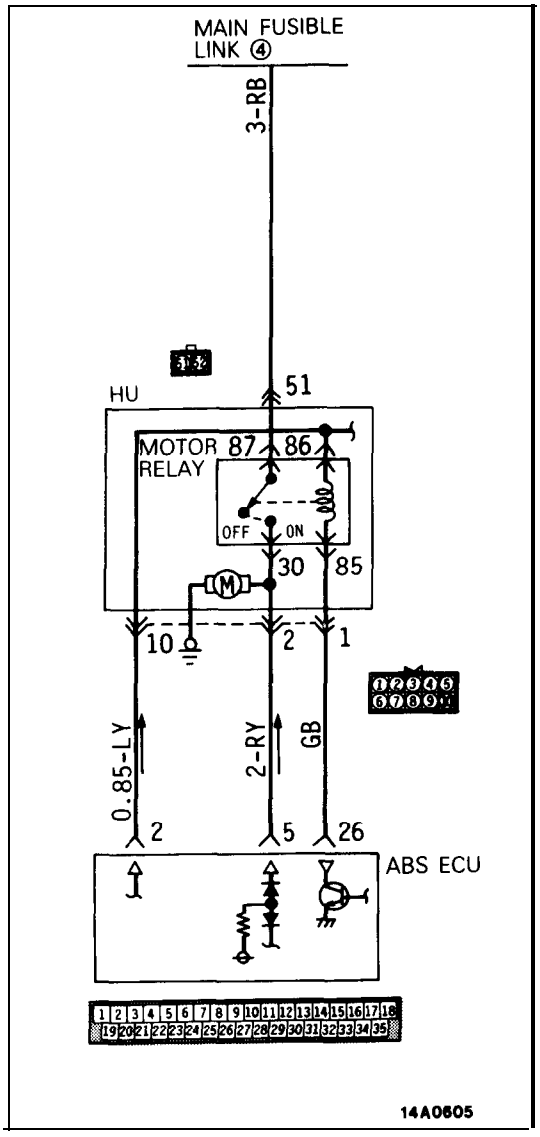
**[Explanation]**

The ABS ECU illuminates the warning light for the motor relay and motor in the following cases.

- When the motor relay does not function
- When there is trouble with the motor itself and it does not revolve
- When the motor ground line is disconnected and the motor does not revolve
- When the motor continues to revolve

**[Hint]**

If there is motor operation noise when wheel speed exceeds 6km/h (4mph) when starting up after the engine is started, there is a broken or short circuited motor monitor wire.




Does the motor make a noise when wheel speed exceeds 6 km/h (4 mph)?

Yes → Broken wire or short circuit in motor monitor line → Repair the harness between HU and ECU.

No → Remove the motor relay.

Remove the motor relay and check resistance values.
No. 85–No. 86: resistance value 30–60 Ω
No. 30–No. 87: no continuity
Battery voltage is applied on terminals No. 86 and No. 85 grounded
No. 30–No. 87: continuity

No → Motor relay malfunction → Replace motor relay.

Yes → Is pump motor ground connected normally?

No → Connect ground wire.

Yes → Install motor relay and remove HU connector.

Does voltage between body connector terminal 51 and ground indicate battery voltage?

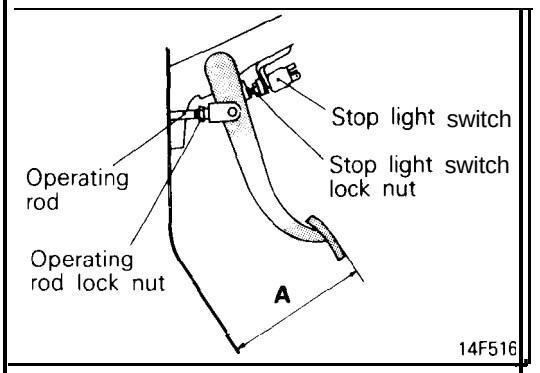
No → Broken wire in pump motor power circuit → Repair the harness.

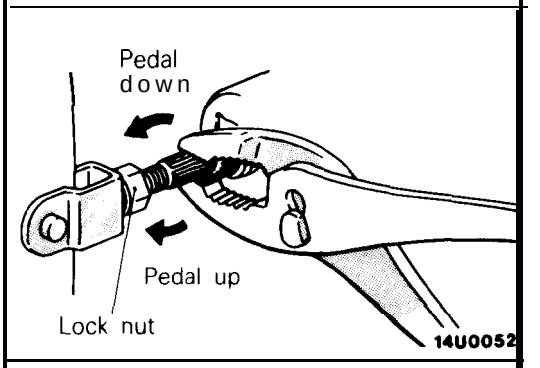
Yes → Connect the HU connector and remove the ECU connector.

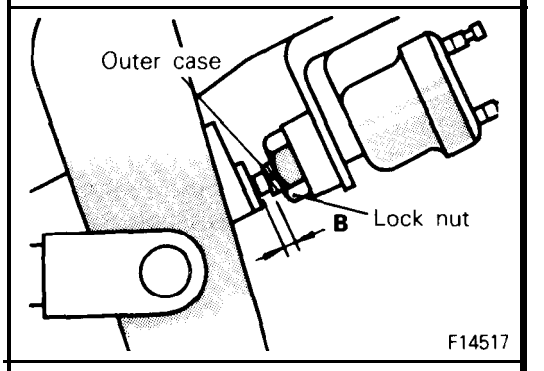
Is resistance between body connector terminal No. 2 and No. 26 30–60 ohms?

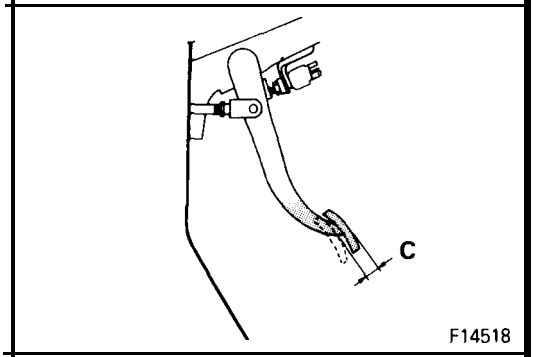
No → Malfunction of harness between HU and ECU → Repair harness.

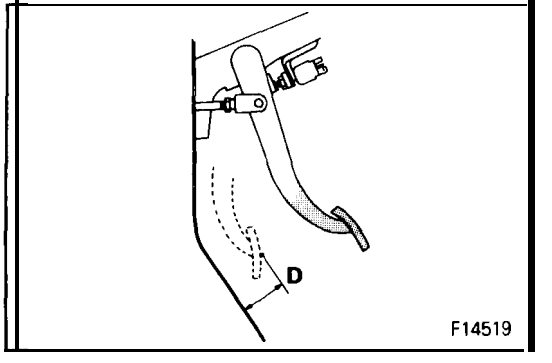
Yes → Motor drive circuit is normal.




# SERVICE ADJUSTMENT PROCEDURES

## BRAKE PEDAL INSPECTION AND ADJUSTMENT

N05FAAHa

1. Measure the brake pedal height as illustrated. If the brake pedal height is not within the standard value, adjust as follows.

   **Standard value (A): 176–181 mm (6.9–7.1 in.)**

   (1) Disconnect the stop light switch connector, loosen the lock nut, and move the stop light switch to a position where it does not contact the brake pedal arm.
   (2) Adjust the brake pedal height by turning the operating rod with pliers (with the operating rod lock nut loosened), until the correct brake pedal height is obtained.
   (3) After screwing in the stop light switch until it contacts the brake pedal stopper (just before the brake pedal is caused to move), return the stop light switch 1/2 to 1 turn and secure by tightening the lock nut.

   (4) Connect the connector of the stop light switch.
   (5) Check to be sure that the stop light is not illuminated with the brake pedal unpressed.

   **Reference value (B): 0.5–1.0 mm (.02–.04 in.)**

2. With the engine stopped, depress the brake pedal two or three times. After eliminating the vacuum in the power brake booster, press the pedal down by hand, and confirm that the amount of movement before resistance is met (the free play) is within the standard value range.

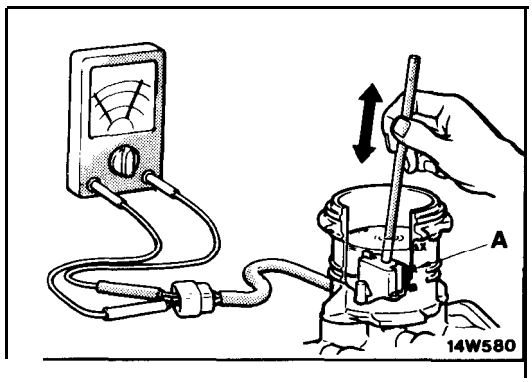
   **Standard value (C): 3-8 mm (.1–.3 in.)**

   If the free play is less than the standard value, confirm that the clearance between the stop light switch and brake pedal is within the standard value.
   If the free play exceeds the standard value, it is probably due to excessive play between the clevis pin and brake pedal arm. Check for excessive clearance and replace faulty parts as required.

3. Start the engine, depress the brake pedal with approximately 500 N (110 lbs.) of force, and measure the clearance between the brake pedal and the floorboard.

   **Standard value (D): 80 mm (3.1 in.) or more**

   If the clearance is less than the standard value, check for air trapped in the brake line and for brake fluid leaks. If necessary, check the brake system mechanism (excessive shoe clearance due to faulty auto adjuster) and repair faulty parts as required.




## BRAKE FLUID LEVEL SENSOR CHECK N05FBAB

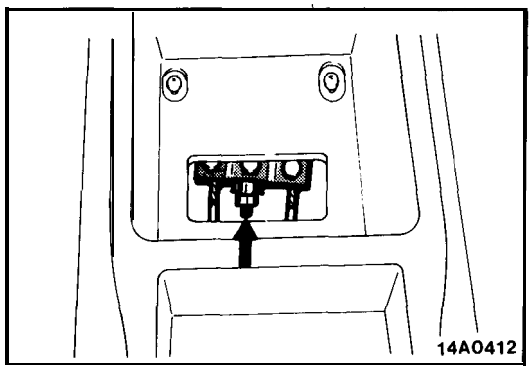
(1) Connect a circuit tester to the brake fluid level sensor.
(2) Move the float from top to bottom and check for continuity.
(3) The brake fluid level sensor is in good condition if there is no continuity when the float surface is above "A", and if there is continuity when the float surface is below "A".

## PARKING BRAKE LEVER STROKE CHECK N05FEAJ

1. Pull the parking brake lever with a force of approx. 200 N (45 lbs.), and count the number of notches.

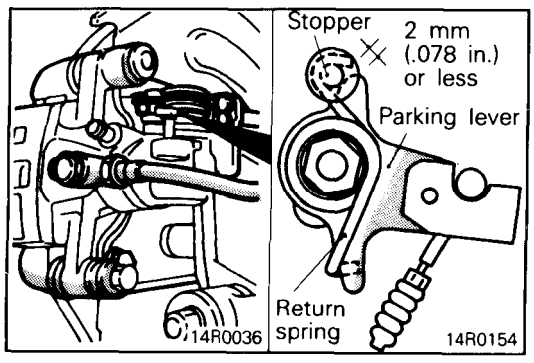
**Caution**
**The 200 N (45 lbs.) force of the parking brake lever must be strictly observed.**

**Standard value: 5-7 notches**




2. If the parking brake lever stroke is not the standard value, adjust as described below.
   (1) Remove the carpet in the floor console.
   (2) Loosen the adjusting nut to the end of the cable rod, thus freeing the parking brake cable.
   (3) With the engine idling, firmly depress the brake pedal five or six times and confirm that the pedal stroke stops changing.

   NOTE
   If the pedal stroke stops changing, it indicates that the automatic adjusting mechanism has functioned properly to adjust the clearance between the pads and the disc to the correct value.

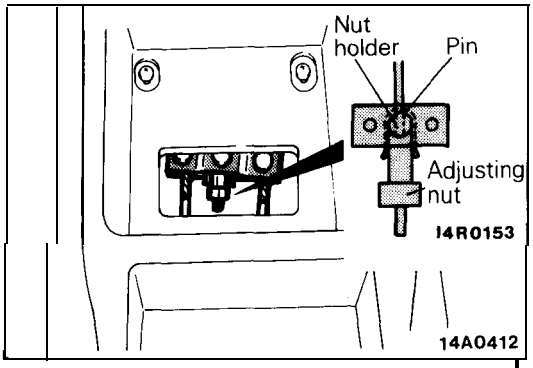



   (4) Check to be sure that the clearance between the stopper and the parking brake lever at the caliper side is as shown in the figure.

   NOTE
   If the clearance between the parking brake lever and the stopper exceeds 2 mm (.078 in.), the probable causes are brake cable sticking, improper wiring, or a malfunction of the automatic adjuster (within the rear brake caliper), so it is necessary to check the parking brake cable and to disassemble and check the rear brake caliper.

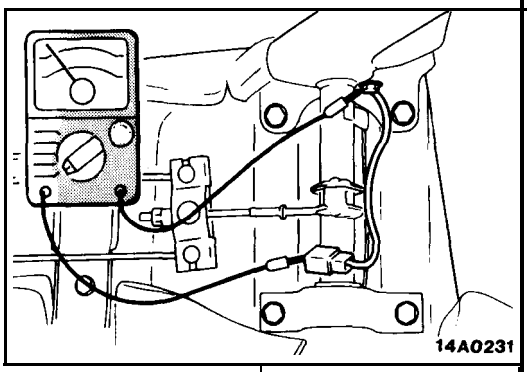
   (5) Turn the adjusting nut to adjust the parking brake lever stroke to within the standard value range.

**Caution**
**If the number of brake lever notches engaged is less than the standard value, the cable has been pulled excessively, and failure of the automatic adjuster mechanism will result. Be sure to adjust it to within the standard value.**



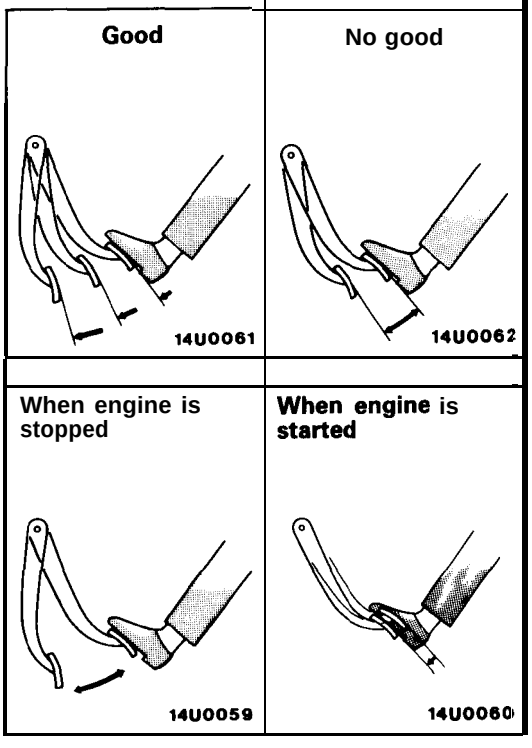

(6) After making the adjustment, check to be sure that there is no play between the adjusting nut and the pin. Also check to be sure that the adjusting nut is securely held at the nut holder.
(7) After adjusting the lever stroke, jack up the rear of the vehicle.
(8) With the parking brake lever in the released position, turn the rear wheel to confirm that the rear brakes are not dragging.

## PARKING BRAKE SWITCH CHECK N05FDAB



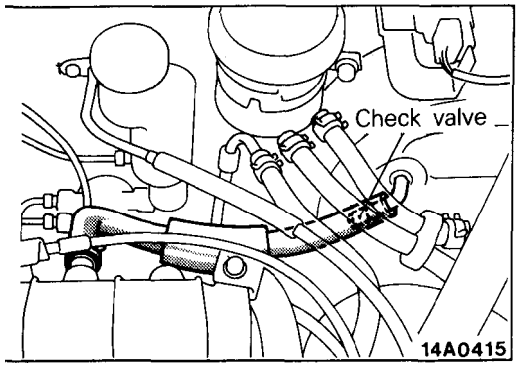

(1) Disconnect the connector of the parking brake switch, and connect an ohmmeter to the parking brake switch and the switch installation bolt.
(2) The parking brake switch is good if there is continuity when the parking brake lever is pulled and there is no continuity when it is returned.

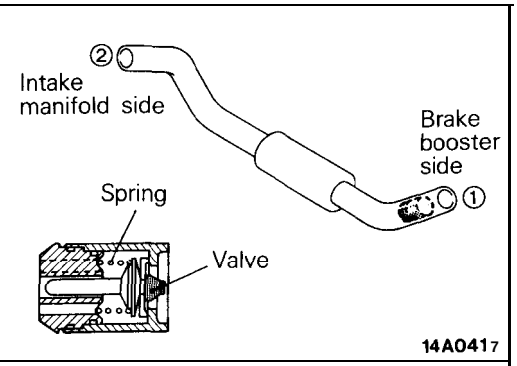
## BRAKE BOOSTER OPERATING INSPECTION N05FCAJ

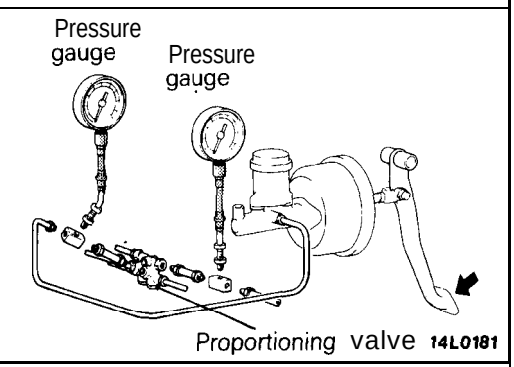


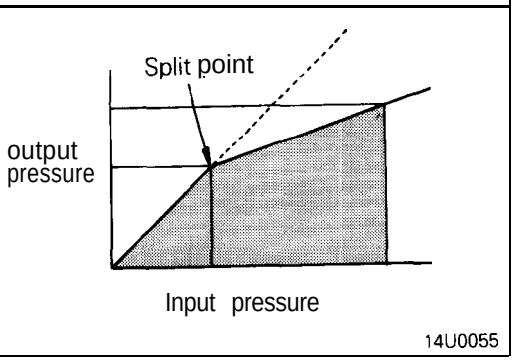

For simple checking of brake booster operation, carry out the following tests.
(1) Run the engine for one or two minutes, and then stop it.
(2) Step on the brake pedal several times with normal pressure.
If the pedal depressed fully the first time. but gradually becomes higher when depressed succeeding times, the booster is operating properly.
If the pedal height remains unchanged, the booster is faulty.
(3) With the engine stopped, step on the brake pedal several times with the same pressure to make sure that the pedal height will not change.
Then step on the brake pedal and start the engine.
If the pedal moves downward slightly, the booster is in good condition. If there is no change, the booster is faulty.
(4) With the engine running, step on the brake pedal and then stop the engine.
Hold the pedal depressed for 30 seconds. If the pedal height does not change, the booster is in good condition.
If the pedal rises, the booster is faulty.

If the above three tests are okay, the booster performance can be determined as good.
If one of the above three tests is not okay at last, the check valve, vacuum hose, or booster will be faulty.




## CHECK VALVE OPERATION CHECK N05FNAJ

When checking the check valve, keep the check valve fit in the vacuum hose.

1. Remove the vacuum hose.

**Caution**
**The check valve is press-fit inside the vacuum hose and do not remove the check valve from the vacuum hose.**

2. Check the operation of the check valve by using a vacuum pump.

| Vacuum pump connection | Accept/reject criteria |
|---|---|
| Connection at the brake booster side ① | A negative pressure (vacuum) is created and held. |
| Connection at the intake manifold side ② | A negative pressure (vacuum) is not created. |

**Caution**
**If the check valve is defective, replace it as an assembly unit together with the vacuum hose.**

## PROPORTIONING VALVE FUNCTION TEST N05FKAJ

1. Connect two pressure gauges, one each to the input side and output side of the proportioning valve, as shown.
2. Air bleed the brake line and the pressure gauge.
3. While gradually depressing the brake pedal, make the following measurements and check to be sure that the measured values are within the allowable range.
   (1) Output pressure begins to drop relative to input pressure (split point).
   **Standard value:**
   **<FWD> 3.95-4.45 MPa (561-633 psi)**
   **<AWD> 3.45-3.95 MPa (491-561 psi)**
   (2) Output fluid pressure when input fluid pressure are as follows.
   **Standard value:**
   **<FWD> 5.15-5.65 MPa (732–804 psi) [at 8.2 MPa (1,163 psi)]**
   **<AWD> 4.65-5.15 MPa (661–732 psi) [at 7.7 MPa (1,095 psi)],**
   (3) Output pressure difference between left and right brake lines
   **Limit: 0.4 MPa (57 psi)**
4. If the measured pressures are not within the permissible ranges, replace the proportioning valve.

## BLEEDING

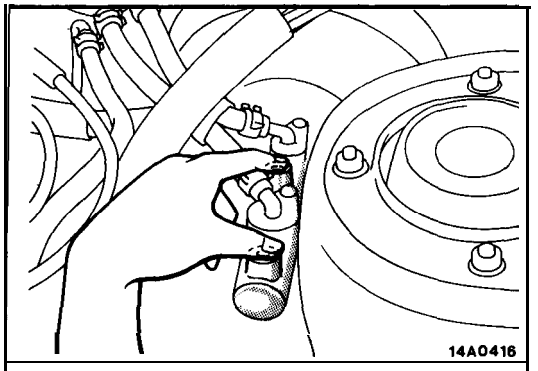
N05FYAN

When the master cylinder is empty of brake fluid, bleed air from the master cylinder by proceeding with procedures (1) thru (6). (Because this master cylinder is not equipped with a check valve.)

When brake fluid remains in the master cylinder, proceed with step (6).

(1) -Disconnect the brake tube from the master cylinder.

(2) Two persons should conduct the air bleeding, one person slowly depressing the brake pedal and holding the pedal depressed.




(3) In this condition, the other person should use a finger to close the outlet part of the master cylinder, and then the first person should release the brake pedal.

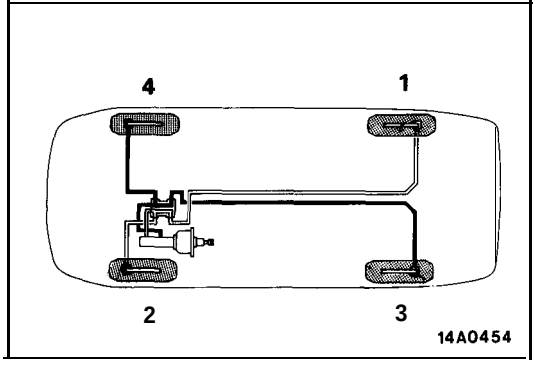
(4) Steps (2) and (3) should be repeated three or four times, and then the master cylinder should be filled with brake fluid to the specified level.

NOTE

The air is completely bled from the master cylinder by steps (1) to (4).

(5) Connect the brake tube to the master cylinder.

(6) Start the engine; then, in the sequence shown in the illustration, bleed the air from each wheel cylinder.




**Specified brake fluid: MOPAR Brake Fluid/ Conforming to DOT3**

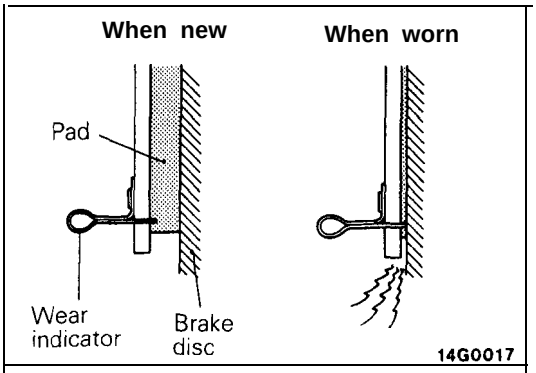
**Caution**

1. **Use the specified brake fluid. Avoid using a mixture of the specified brake fluid and other fluid.**
2. **If brake fluid is exposed to the air, it will absorb moisture; as water is absorbed from the atmosphere, the boiling point of the brake fluid will decrease and the braking performance will be seriously impaired. For this reason, use a hermetically sealed 1 lit. (1.06 qt.) or 0.5 lit. (0.52 qt.) brake fluid container.**
3. **Firmly close the cap of the brake fluid container after use.**
4. **For vehicles with the anti-lock braking system, be sure to install a filter to the master cylinder reservoir tank when supplying brake fluid.**

### ORDINARY AIR-BLEEDING PROCEDURES

(1) Depress the brake pedal several times until resistance is felt; then, with the pedal depressed, loosen the bleeder screw 1/3 to 1/2 turn and then tighten it before the fluid pressure is all gone.

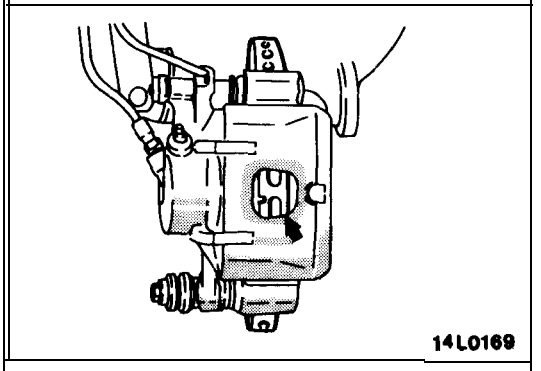
(2) Release the brake pedal. Repeat this procedure until there are no more air bubbles in the brake fluid.




## FRONT DISC BRAKE PAD CHECK AND REPLACEMENT

N05FQAF

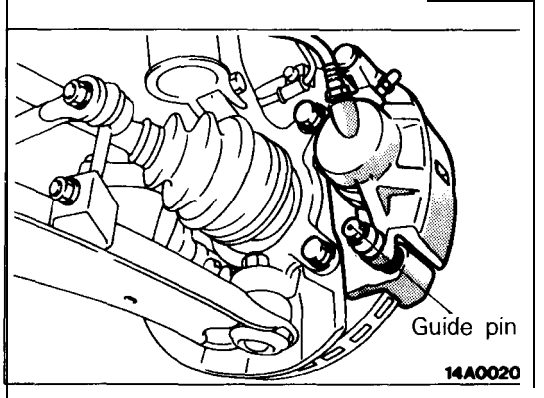
NOTE
The brake pads have wear indicators that contact the brake disc when the brake pad thickness becomes 2 mm (.08 in.), and emit a squealing sound to warn the driver.




1. Check brake pad thickness through caliper body check port.

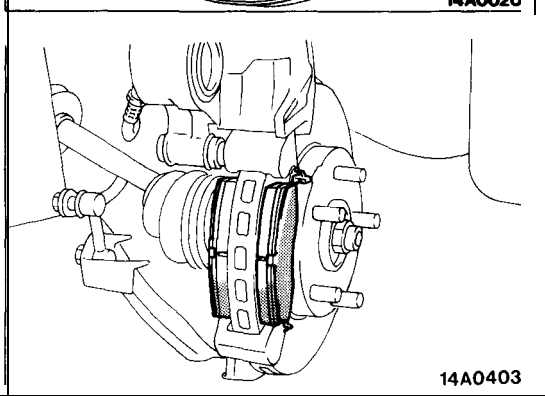
   **Limit: 2.0 mm (.08 in.)**

   **Caution**
   **1. When the limit is exceeded, replace the pads at both sides, and also the brake pads for the wheels on the opposite side at the same time.**
   **2. If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding condition of the piston, lock pin sleeve and guide pin sleeve.**

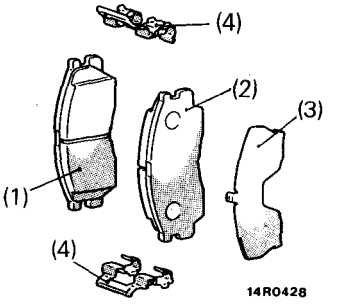



2. Remove lock or guide pin. Lift caliper assembly and retain with wires.

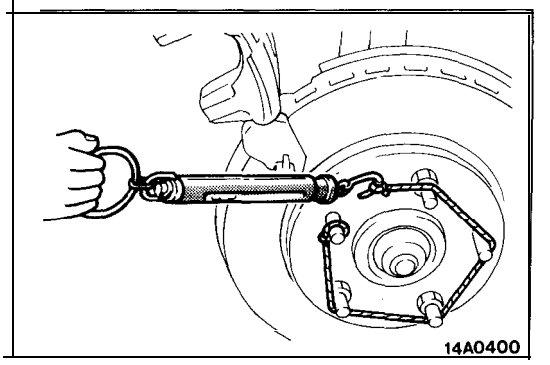
   **Caution**
   **Do not wipe off the special grease that is on the guide pin or allow it to contaminate the guide pin.**




3. Remove the following parts from caliper support.



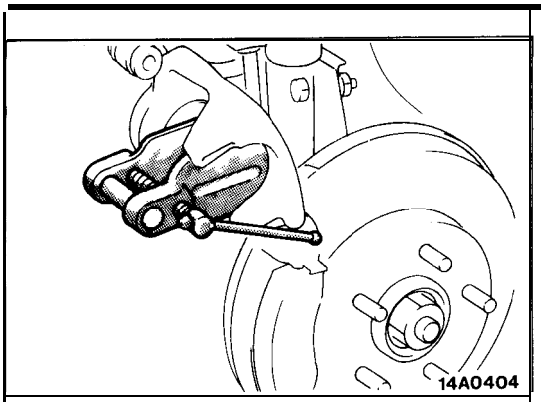

(1) Pad and wear indicator assembly
(2) Pad assembly
(3) Outer shim
(4) Pad clips



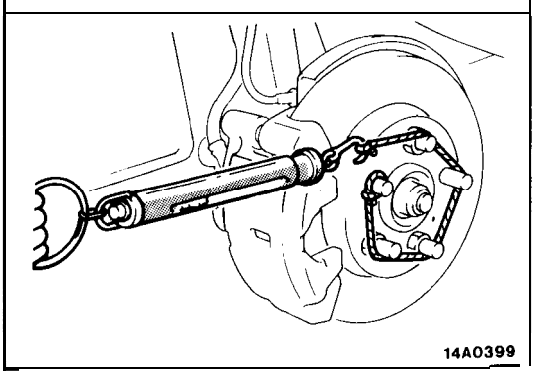

4. Measure hub torque with pad removed to measure brake drag torque after pad installation.

   NOTE
   Tighten the nuts in order to secure the disc to the hub.

5. Securely attach the pad clip to the caliper support.



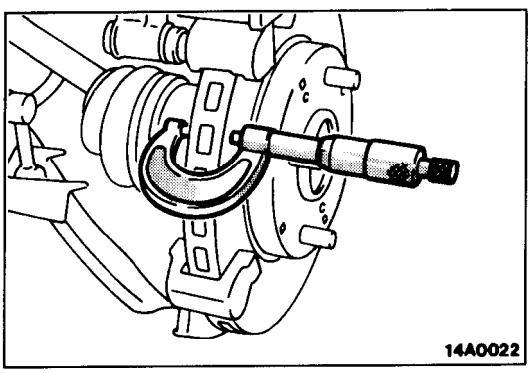

6. Clean piston and insert into cylinder with tool.
7. Be careful that the piston boot does not become caught, when lowering the caliper assembly and install the guide pin.




8. Check brake drag torque as follows.
   (1) Start engine and hold brake pedal down for 5 seconds.
   (2) Stop engine.
   (3) Turn brake disc forward 10 times.
   (4) Check brake drag torque with spring scale.

   If the difference between brake drag torque and hub torque exceeds the standard value, disassemble piston and clean the piston. Check for corrosion or worn piston seal, and check the sliding condition of the lock pin and guide pin.

   **Standard value: 70 N (15 lbs.) or less [4 Nm (3 ft.lbs.)] or less**

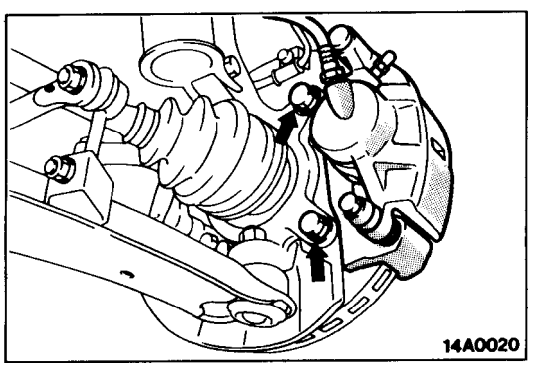



## FRONT BRAKE DISC THICKNESS CHECK N05FRAB

Remove dirt and rust from brake disc surface. Measure disc thickness at 4 locations or more.

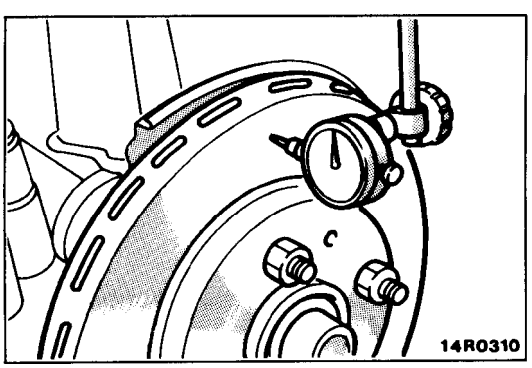
**Limit: 22.4 mm (.882 in.)**

Replace the discs and pad assembly for both sides left and right of the vehicle if they are worn beyond the specified limit.




## FRONT BRAKE DISC RUN-OUT CHECK N05FSAB

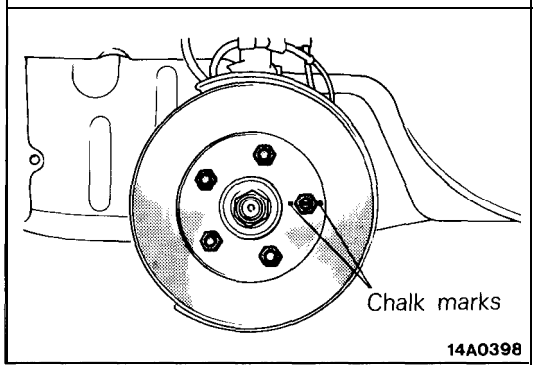
1. Remove the caliper support; then raise the caliper assembly upward and secure by using wire.




2. Place a dial gauge approximately 5 mm (.2 in.) from the outer circumference of the brake disc, and measure the run-out of the disc.

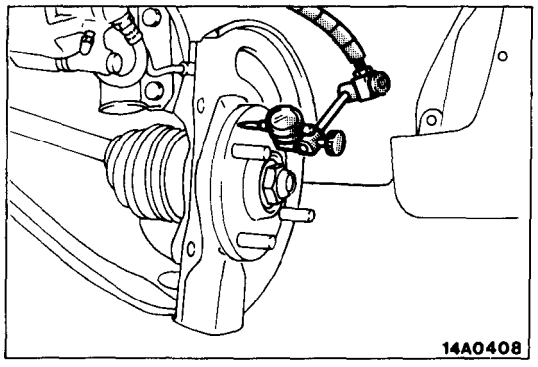
   **Limit: 0.08 mm (.0031 in.)**

   NOTE
   Tighten the nuts in order to secure the disc to the hub.




## FRONT BRAKE DISC RUN-OUT CORRECTION N05FTAB

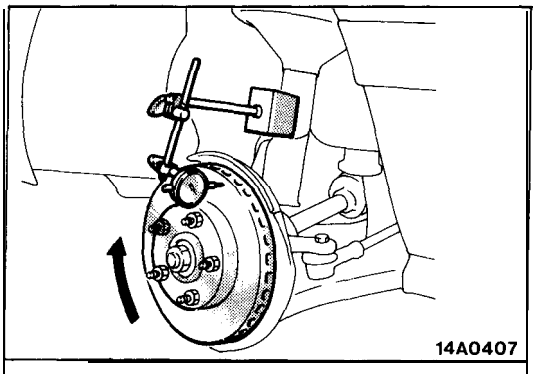
1. If the run-out of the brake disc is equivalent to or exceeds the limit specification, change the phase of the disc and hub, and then measure the run-out again.
   (1) Before removing the brake disc, chalk both sides of the wheel stud on the side at which run-out is greatest.




(2) Remove the brake disc, and then place a dial gauge as shown in the illustration; then move the hub in the axial direction and measure the play.

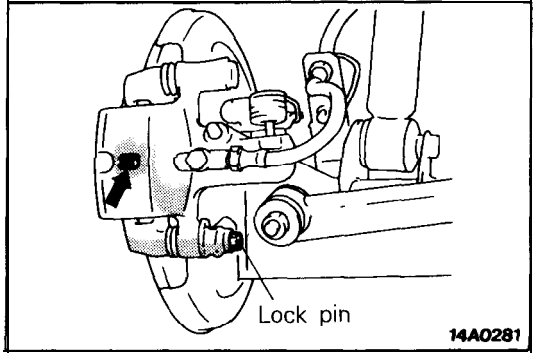
**Limit: 0.008 mm (.00031 in.)**

If the play is equivalent to or exceeds the limit, disassemble the hub knuckle and check each part.




(3) If the play does not exceed the limit specification, and then check the run-out of the brake disc once again. Mount the brake disc on the position dislocated from the chalk mark.

2. If the run-out cannot be corrected by changing the phase of the brake disc, replace the disc.




## REAR DISC BRAKE PAD CHECK AND REPLACEMENT N05FUAD

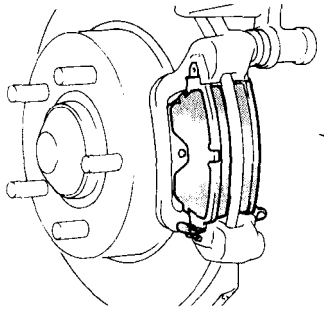
1. Check brake pad thickness through caliper body check port.

   **Limit: 2.0 mm (.08 in.)**

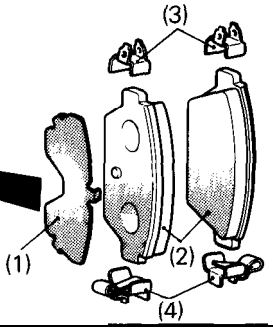
   **Caution**
   **1. When the limit is exceeded, replace the pads at both sides, and also the brake pads for the wheels on the opposite side at the same time.**
   **2. If there is a significant difference in the thicknesses of the pads on the left and right sides, check the sliding condition of the piston, lock pin sleeve and guide pin sleeve.**

2. Loosen the parking brake cable (from the vehicle interior), and disconnect the parking brake end installed to the rear brake assembly.
3. Remove lock pin. Lift caliper assembly and retain with wires.

   **Caution**
   **Do not wipe off the special grease that is on the lock pin or allow it to contaminate the lock pin.**

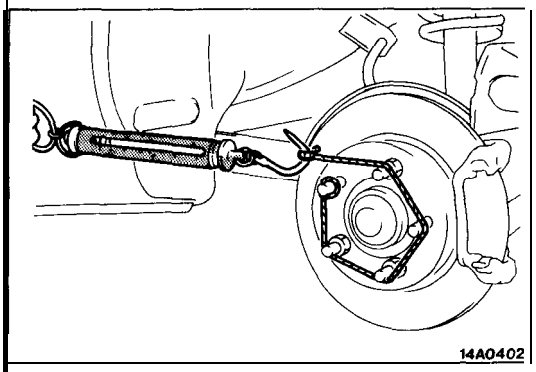

14A0405

4. Remove the following parts from caliper support.



14A0204

(1) Outer shim
(2) Pad assembly
(3) Pad clips C
(4) Pad clips B

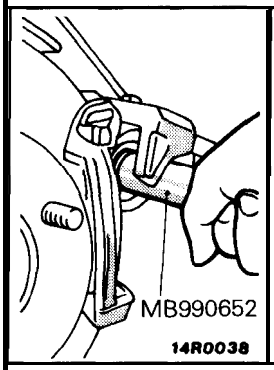

14A0402

5. Measure hub torque with pad removed to measure brake drag torque after pad installation.

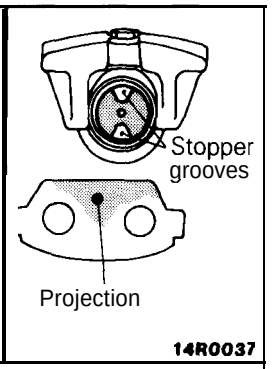
NOTE
To secure the disc to the hub, tighten the nuts.

6. Securely attach the pad clip to the caliper support.

**Caution**
**Do not deposit grease or other dirt on pad or brake disc friction surfaces.**

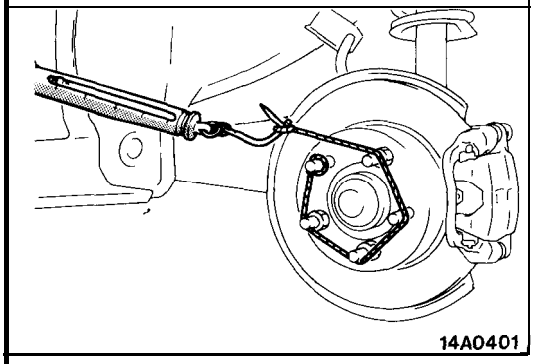


14R0038



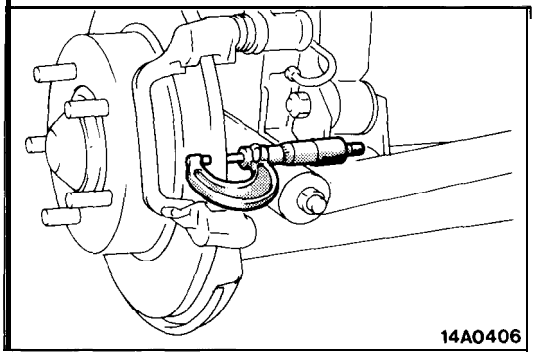
14R0037

7. Clean the piston; then use the special tool to thread the piston into the cylinder.
Be sure, at this time, that the stopper groove of the piston correctly fits to the projection on the pad's rear surface.
8. Be careful that the piston boot does not become caught, when lowering the caliper assembly and install the lock pin. With the engine running, forcefully depress the brake pedal five or six times, and then check whether or not the stroke of the parking brake lever is within the standard value. If there is a deviation from the standard value, adjust the stroke of the parking brake lever. (Refer to P.5–42.)


14A0401

9. Check brake drag torque as follows.
(1) Start engine and hold brake pedal down for 5 seconds.
(2) Stop engine.
(3) Turn brake disc forward 10 times.
(4) Check brake drag torque with spring scale.
If the difference between brake drag torque and hub torque exceeds the standard value, disassemble piston and clean piston. Check for corrosion or worn piston seal, and check the sliding condition of the lock pin sleeve and guide pin sleeve.

**Standard value: 70 N (15 lbs.) or less [4 Nm (3 ft.lbs)] or less**

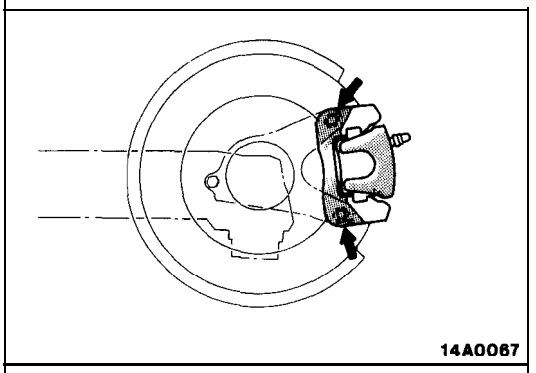

14A0406

## REAR BRAKE DISC THICKNESS CHECK N05FVAB

1. Remove dirt and rust from brake disc surface.
2. Measure disc thickness at 4 locations or more.

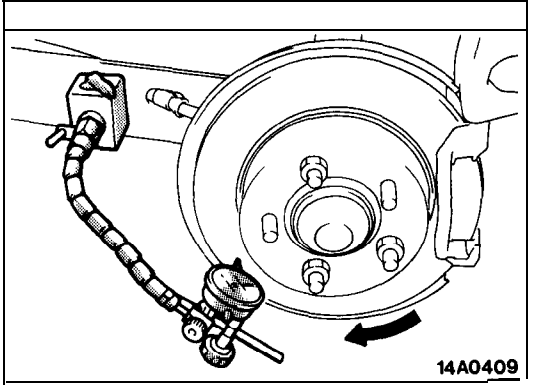
**Limit: 8.4 mm (.331 in.)**

Replace the discs and pad assembly for both sides left and right of the vehicle if they are worn beyond the specified limit.




## REAR BRAKE DISC RUN-OUT CHECK N05FWAB

1. Remove the caliper support, raise the caliper assembly, and secure it by using a wire, etc.




2. Place a dial gauge approximately 5 mm (.2 in.) from the outer circumference of the brake disc, and measure the run-out of the disc.

   **Limit: 0.08 mm (.0031 in.)**

   NOTE
   To secure the disc to the hub, tighten the nuts.

## REAR BRAKE DISC RUN-OUT CORRECTION N05FXAA

1. If the run-out of the brake disc is equivalent to or exceeds the limit specification, change the phase of the disc and hub, and then measure the run-out again.

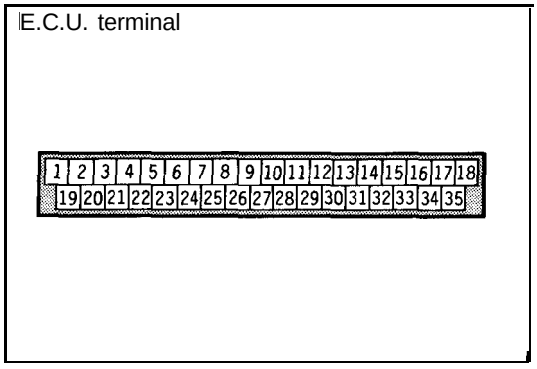
   NOTE
   The procedures for checking by changing the installation phase of the disc are the same as those for the front brake discs. (Refer to P.5–48.)

2. If the problem cannot be corrected by changing the phase of the brake disc, replace the disc.

## OBSERVATION OF WHEEL SPEED SENSOR OUTPUT VOLTAGE VARIATIONS <Vehicles with ABS> N05FOAO

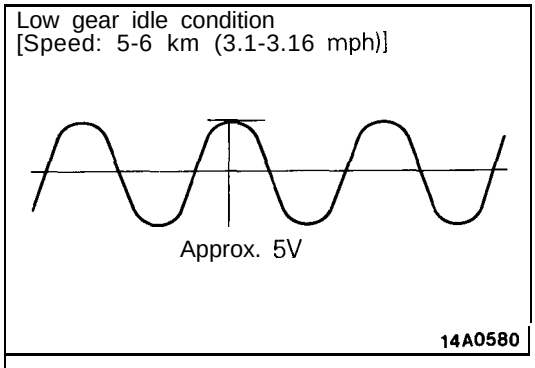
(1) Jack up the vehicle and release the parking brake.
(2) Disconnect the electronic control unit harness connector, and measure the speed sensor output voltage at the vehicle side harness connector.
(3) With an AWD model, put the shift lever in 1st (M/T) or L (A/T) position, rotate the wheels and observe the wave shape for each wheel. With an FWD model, put the shift lever in 1st (M/T) or L (A/T) position, rotate the wheels and observe the wave shape for the front wheels; for the rear wheels, rotate the wheels by hand and monitor the wave shape.

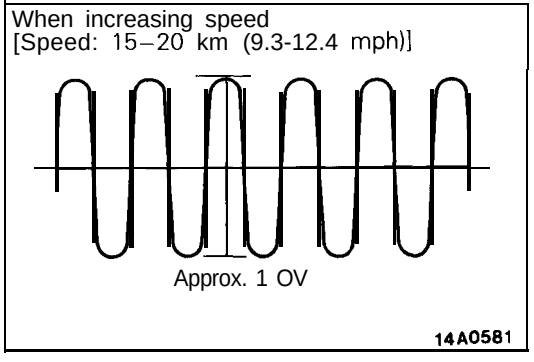
NOTE
It is also allright to actually drive the car.




| Speed sensor | E.C.U. terminal No. |
|---|---|
| Front left | 14-15 |
| Front right | 31-33 |
| Rear right | 28–30 |
| Rear left | 10–11 |

When wheel speed is slow, the output voltage is low and it gets higher as the speed increases.



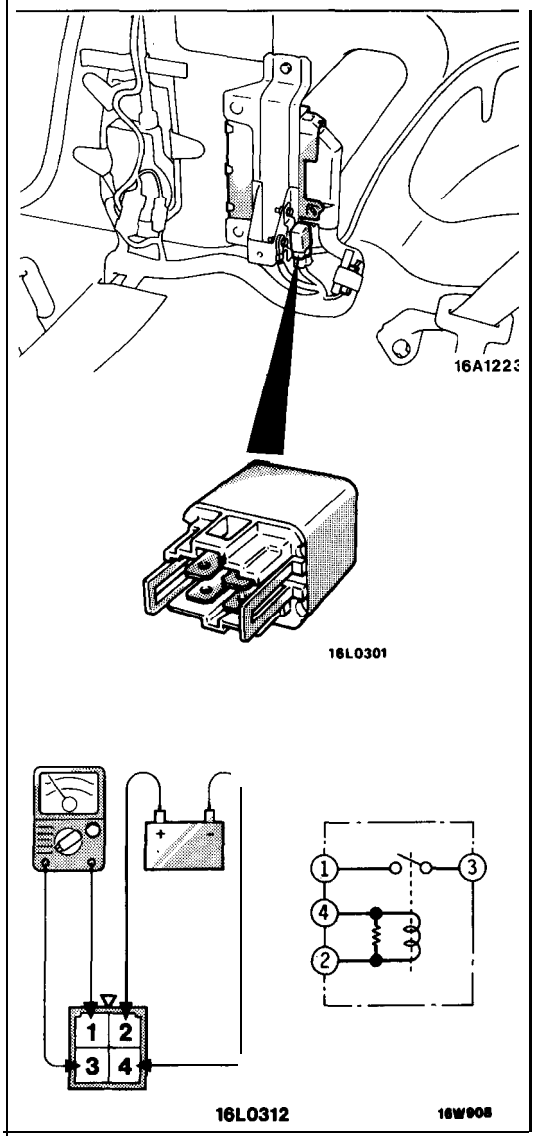




**Wave shape monitoring points**

IS THE OUTPUTVOLTAGE (AMPLITUDE) TOO LOW OR IS THERE NO OUTPUT VOLTAGE?
If it is too low, check each wheel speed sensor, With FWD rear wheels, check the sensor gap.

IS THERE VARIATION IN THE WAVE SHAPE AMPLITUDE?
If the flicker of the amplitude is large, consider shaking of the axle hub.

IS THERE NOISE IN THE WAVE SHAPE OR DISTORTION?
Broken or disconnected wire due to vibration or installation malfunction of the wheel speed sensor. Check rotor teeth meshing, breaks, etc.

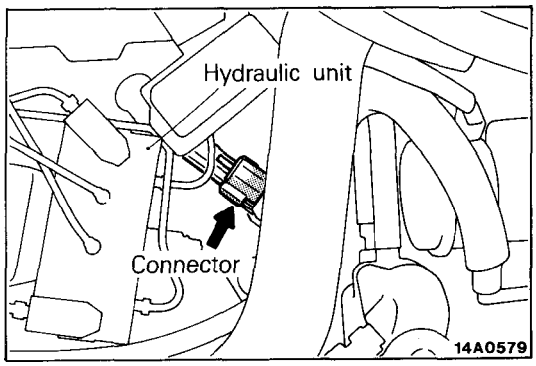



## ABS POWER RELAY CHECK N05FOAN

(1) Remove the ABS power relay from the ABS control unit bracket.

(2) Connect battery to terminal 2 and check continuity between terminals with terminal 4 grounded.

| | | |
|---|---|---|
| Power is supplied | 1–3 terminals | Continuity |
| Power is not supplied | 1–3 terminals | No continuity |
| | 2-4 terminals | Continuity |




## FLAT BATTERY REMEDY N05FOAF

When booster cables are used to start the engine when the battery is completely flat and then the vehicle is immediately driven without waiting for the battery to recharge itself to some extent, the engine may misfire, and driving might not be possible. This happens because ABS consumes a great amount of current for its self-check function; the remedy is to either allow the battery to recharge sufficiently, or to disconnect the connector for ABS circuit, thus disabling ABS.
The ABS warning light will illuminate when the connector (for ABS) is disconnected.
After the battery has sufficiently charged, connect the connector (for ABS) and restart the engine; then check to be sure the ABS warning light is not illuminated.

# BRAKE PEDAL

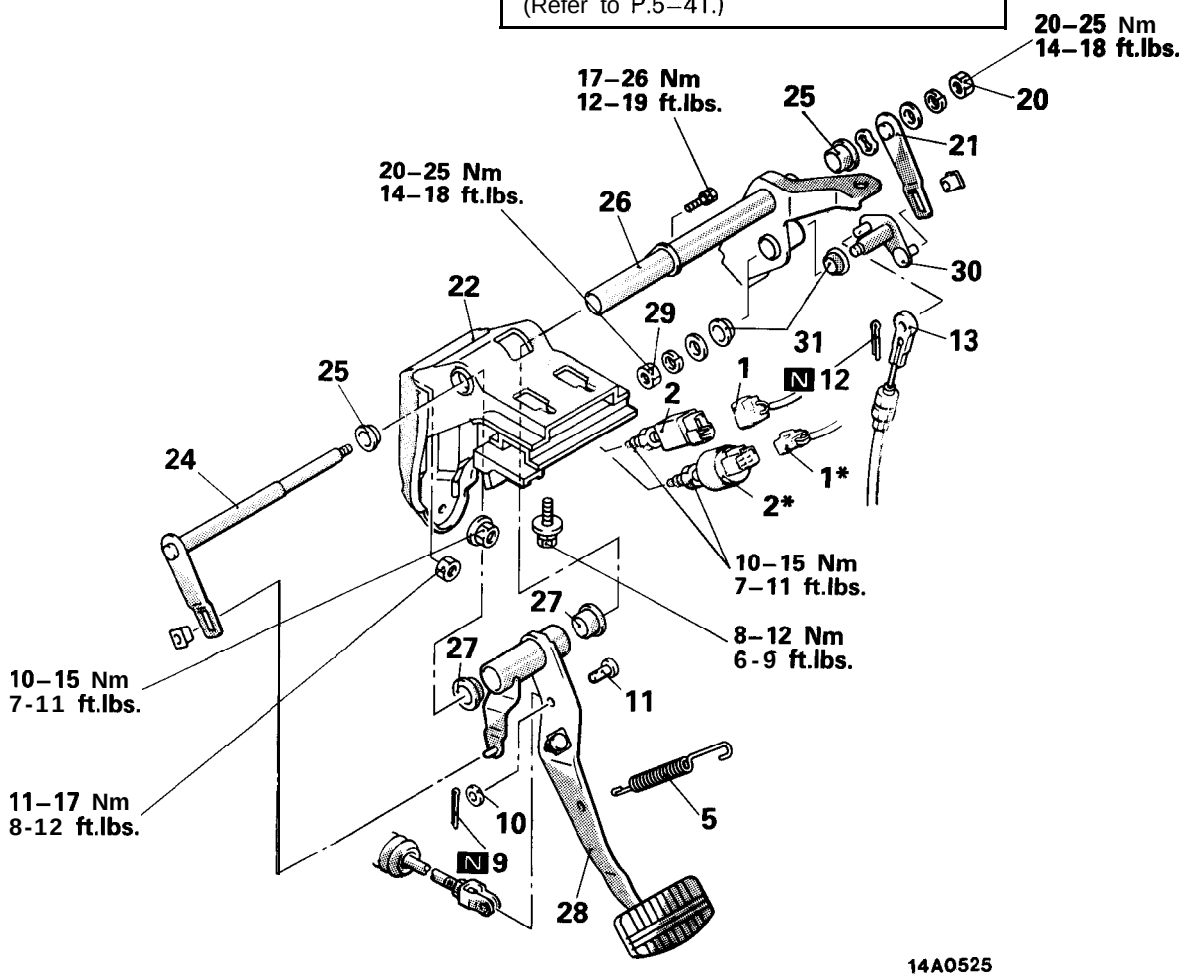
## REMOVAL AND INSTALLATION

N05GA--

**Pre-removal Operation**
- Removal of Knee Protector (Refer to GROUP 23–Instrument Panel.)
- Removal of Lap Cooler Duct and Shower Duct (L.H.) (Refer to GROUP 23–Instrument Panel.)
- Removal of Steering Column Assembly and Column Support <M/T> (Refer to GROUP 19–Steering Wheel and Shaft.)
- *Removal of Relay Box (Indoor)

**Post-installation Operation**
- installation of Relay Box (Indoor)
- Installation of Steering Column Assembly and Column Support (Refer to GROUP 19–Steering Wheel and Shaft.)
- @Installation of Lap Cooler Duct and Shower Duct (L.H.) (Refer to GROUP 23–Instrument Panel.)
- Installation of Knee Protector (Refer to GROUP 23–Instrument Panel.)
- Brake Pedal Adjustment (Refer to P.5–41.)

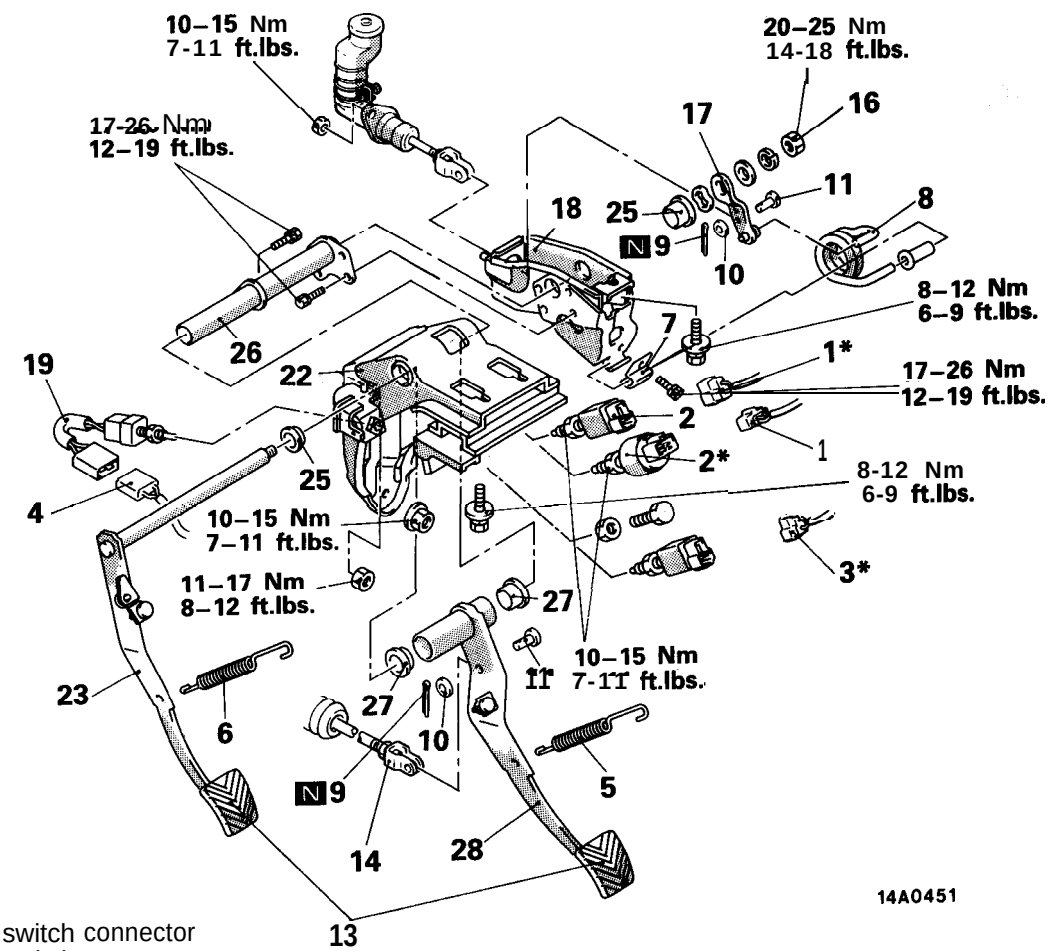
<A/T>




**Removal steps**
1. Stop light switch connector
2. Stop light switch
- + 5. Return spring
9. Cotter pin
10. Washer
11. Clevis pin
12. Cotter pin
13. Shift-lock cable connection
20. Lever assembly (A) mounting nut
21. Lever
22. Pedal support bracket
24. Lever assembly (A)
25. Bushing
- ⊠ 26. Pedal rod
27. Bushing
28. Brake pedal
29. Lever assembly(B) mounting nut
30. Lever assembly (B)
31. Bushing

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) * : Vehicles with auto-cruise control system

<M/T>

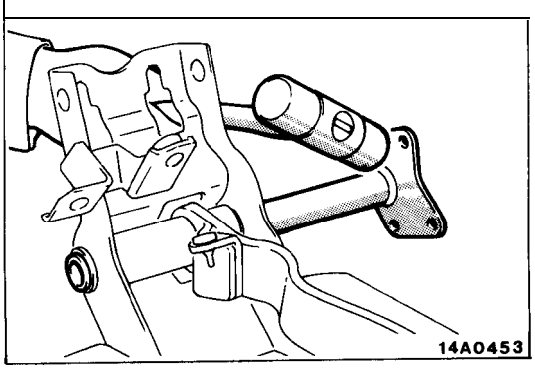



14A0451

**Removal steps**

1. Stop light switch connector
2. Stop light switch
3. Clutch switch connector and clutch switch
4. Inter lock switch connector
- ◆◆ 5. Return spring
- ◆◆ 6. Return spring <Non-Turbo>
7. Clip <Turbo>
- ◆◆ 8. Turn over spring <Turbo>
9. Cotter pin
- ◆◆ 10. Washer
- ◆◆ 11. Clevis pin
14. Brake booster push rod
15. Pedal and bracket assembly
16. Clutch pedal mounting nut
17. Lever assembly
18. Clutch pedal bracket
19. Inter lock switch
22. Pedal support bracket
23. Clutch pedal
- ◆◆ 25. Bushing
- ◆◆ 26. Pedal rod
- ◆◆ 27. Bushing
28. Brake pedal

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) * : Vehicles with auto-cruise control system



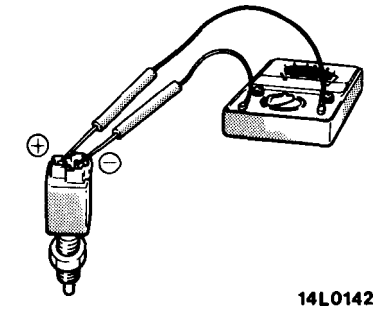
14A0453

## SERVICE POINTS OF REMOVAL

N05GBAHa

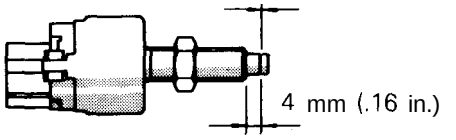
### 26. REMOVAL OF PEDAL ROD

Using a plastic hammer, remove the pedal rod from the pedal support bracket.



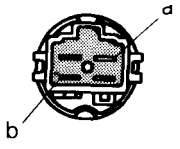

14L0142

No continuity Continuity




14L0171

<Vehicles with auto-cruise control system>



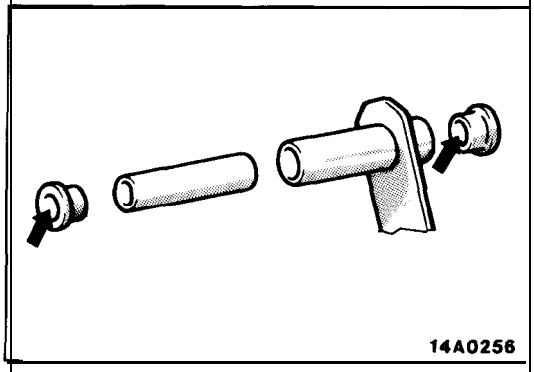

14L0170

## INSPECTION N05GCAJ

- Check the bushing for wear.
- Check the brake pedal for bend or twisting.
- Check the brake pedal return spring for 'damage.

### Stop light switch

Connect a circuit tester to the stop light switch, and check whether or not there is continuity when the plunger of the stop light switch is pushed in and when it is released.
The stop light switch is in good condition if there is no continuity when the plunger is pushed in to a depth of within 4 mm (.16 in.) from the outer case edge surface, and if there is continuity when it is released.
For vehicles with the auto-cruise control system, the check for continuity should be made at connectors "a" and "b" of the stop light switch.



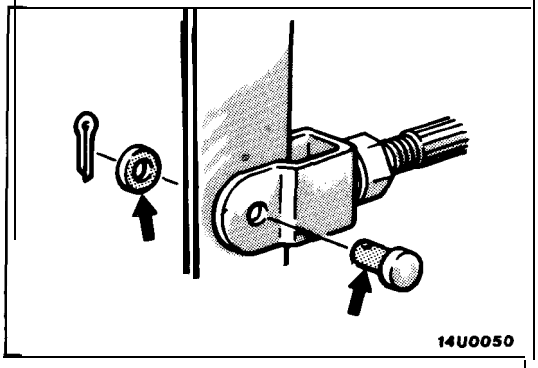
14A0256

## SERVICE POINTS OF INSTALLATION N05GDBAa

### 27./25. APPLICATION OF GREASE TO BUSHING

Apply a coating of the specified grease to the inner surface of the bushings.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**



14U0050

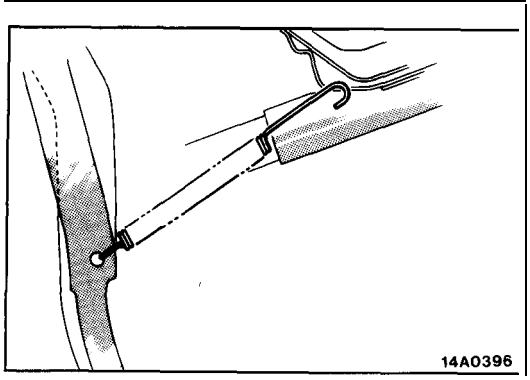
### 11. APPLICATION OF GREASE TO CLEVIS PIN/ 10. WASHER

After applying the specified grease to the clevis pin and washer, insert the clevis pin and bend the cotter pin tightly.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

### 8. INSTALLATION OF TURN OVER SPRING <TURBO>

Refer to GROUP 6–Clutch pedal.



14A0396

### 6./5. INSTALLATION OF RETURN SPRING

Install the return spring in the direction indicated in the illustration.

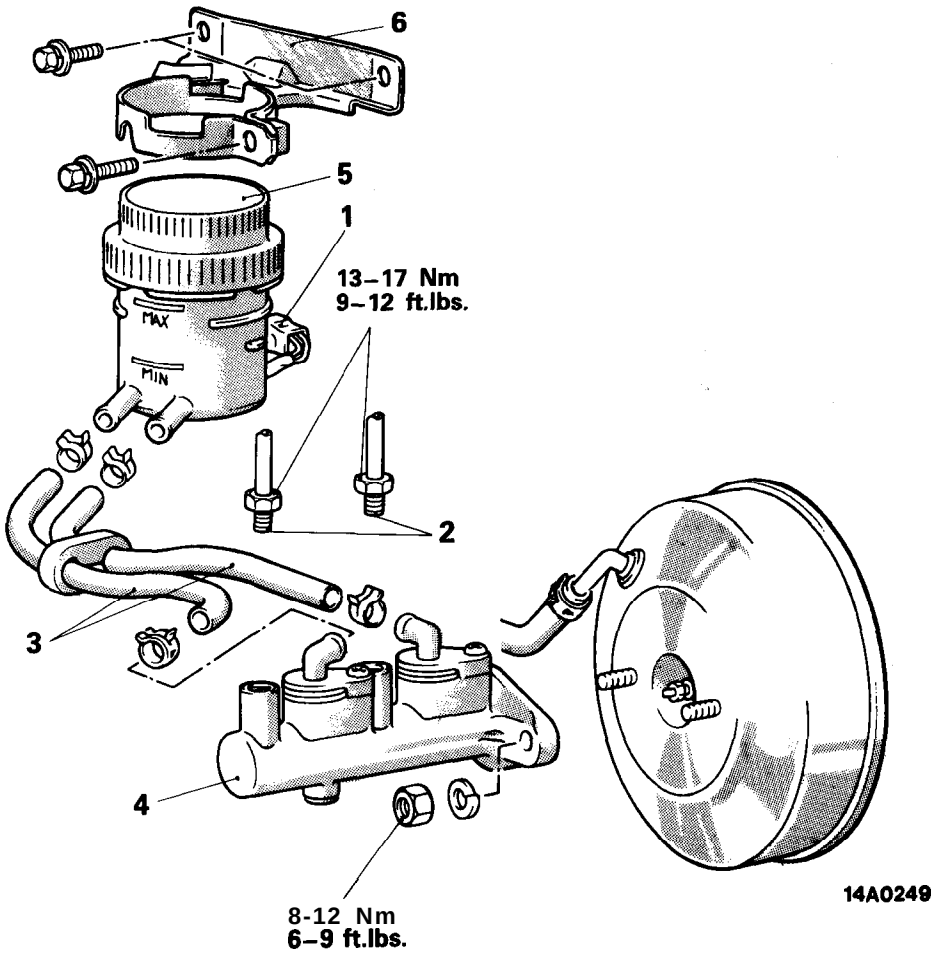
# MASTER CYLINDER

N05IA--

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining of Brake Fluid

**Post-installation Operation**
- supplying Brake Fluid
- Bleeding (Refer to P.5–45.)
- Adjustment of Brake Pedal (Refer to P.5–41.)

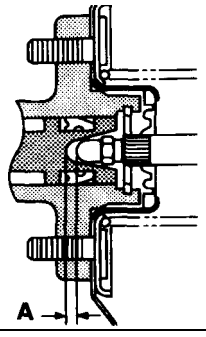



**Removal steps**

1. Fluid level sensor connector
2. Brake tubes
3. Reservoir hoses
4. Master cylinder
5. Reservoir
6. Bracket

● ▯ Adjustment of clearance between brake booster push rod and primary piston

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● : Refer to “Service Points of Installation”.

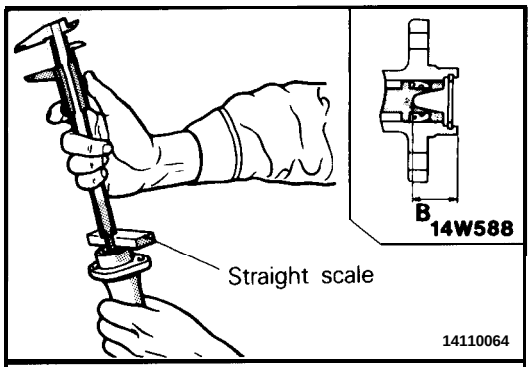



## SERVICE POINTS OF INSTALLATION

N05IDAOa

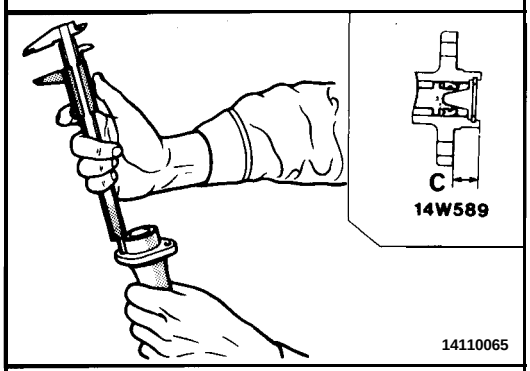
### . ADJUSTMENT OF CLEARANCE BETWEEN BRAKE BOOSTER PUSH ‘ROD AND PRIMARY PISTON

Adjust the clearance (A) between the brake booster push rod and primary piston as follows:

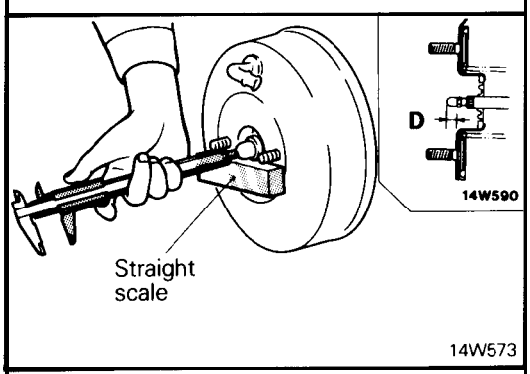



(1) Measure the dimension (B) between the master cylinder end face and piston.

NOTE
To obtain (B), first take measurement with a square placed on the master cylinder end face. Then, subtract the thickness of the square to arrive at (B).




(2) Obtain the dimension (C) between the brake booster mounting surface on the master cylinder and the end face.

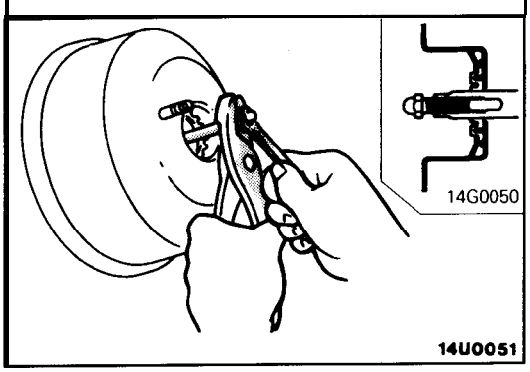



(3) Measure the dimension (D) between the master cylinder mounting surface on brake booster and the push rod end.

NOTE
To obtain (D), first take measurement with a square placed on the brake booster. Then, subtract the thickness of the square to arrive at (D).

(4). Using the measured values obtained in (1) through (3), obtain the clearance (A) between the brake booster push rod and primary piston.

**Standard value: [A (A = B-C-D)]**
**9 inch brake booster**
**0.8–1.0 mm (.031–.039 in.)**
**7 + 8 inch brake booster**
**0.5–0.7 mm (.020–.028 in.)**

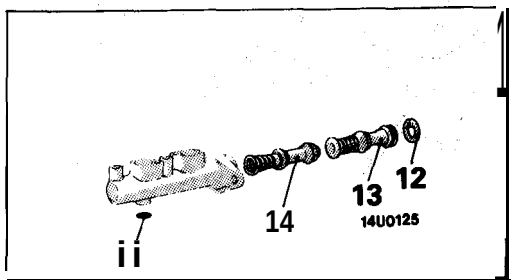



(5) If the clearance is not within the standard value range, adjust by changing the push rod length by turning the adjustable end of the push rod.

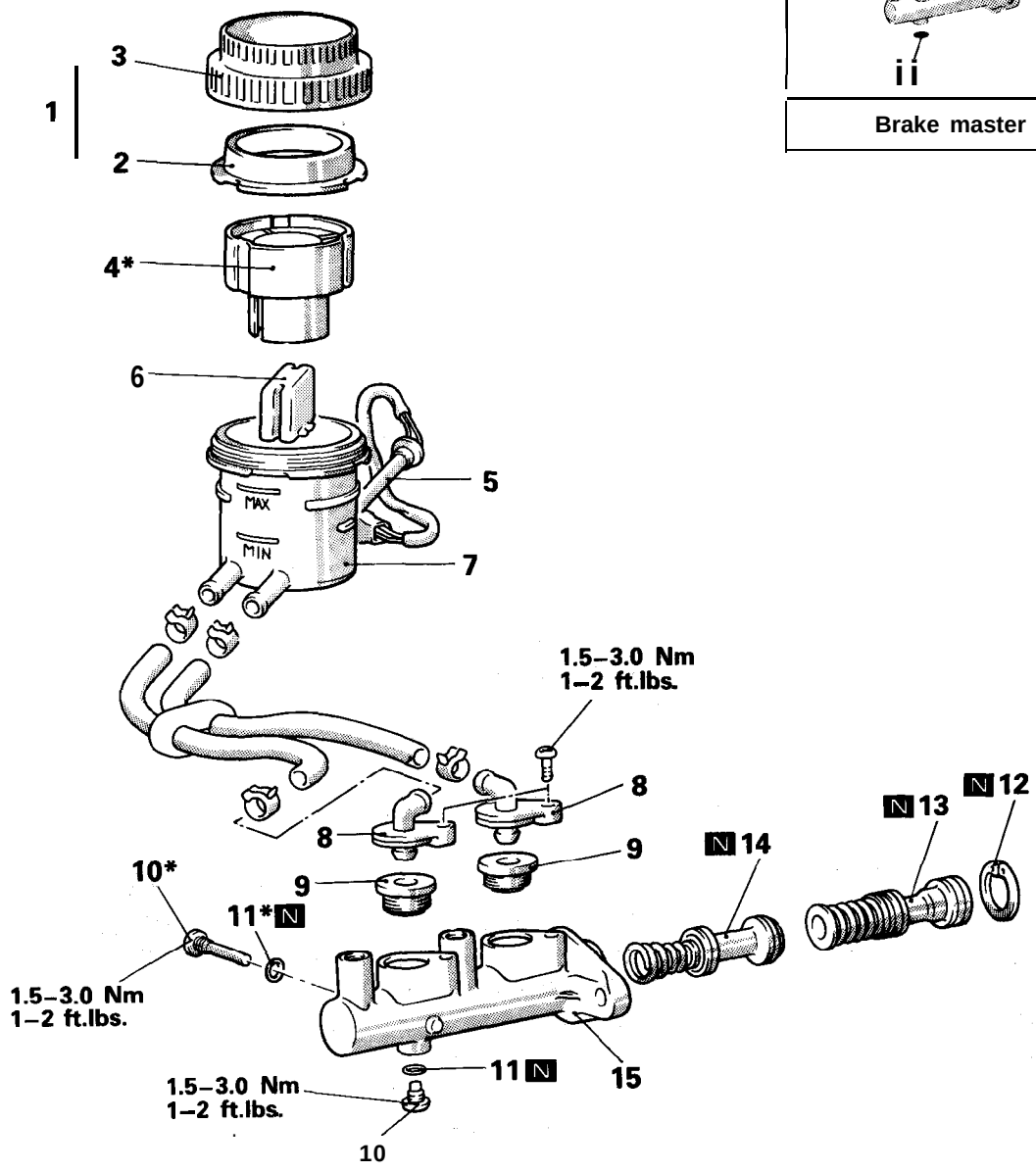
**Caution**
**Improper clearance may cause excessive brake drag.**

## DISASSEMBLY AND REASSEMBLY

N05HA--



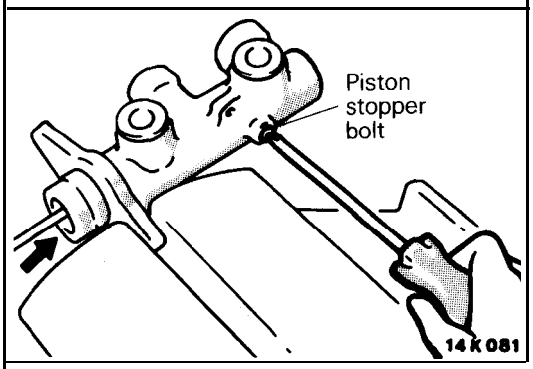

Brake master cylinder kit




**Disassembly steps**

1. Reservoir cap assembly
2. Diaphragm
3. Reservoir cap
4. Filter
5. Brake fluid level sensor
6. Float
7. Reservoir
8. Nipple
9. Reservoir seal
10. Piston stopper bolt
11. Gasket
12. Piston stopper ring
13. Primary piston assembly
14. Secondary piston assembly
15. Master cylinder body

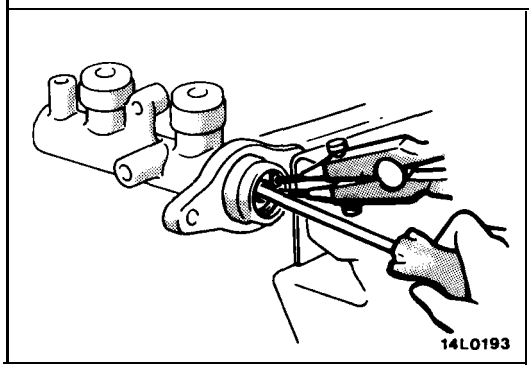
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly"
(3) ● : Refer to "Service Points of Reassembly"
(4) N : Non-reusable parts
(5) * : Vehicles with ABS




## SERVICE POINTS OF DISASSEMBLY N05HBAA

### 10. DISASSEMBLY OF PISTON STOPPER BOLT

Remove the piston stopper bolt, while depressing the piston.




### 12. DISASSEMBLY OF PISTON STOPPER RING

Remove the piston stopper ring, while depressing the piston.

### 13. DISASSEMBLY OF PRIMARY PISTON ASSEMBLY

**Caution**
**Do not disassemble the primary piston assembly.**

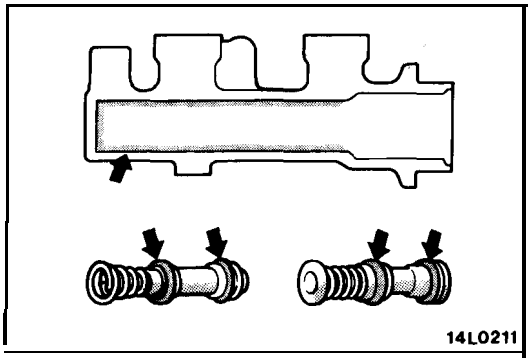
### 14. DISASSEMBLY OF SECONDARY PISTON ASSEMBLY

NOTE
If it is hard to remove the secondary piston from the cylinder, gradually apply compressed air from the outlet port on the secondary end of the master cylinder.

**Caution**
**Do not disassemble the secondary piston assembly.**

## INSPECTION N05HDAC

- Check the inner surface of master cylinder body for rust or pitting.
- Check the primary and secondary pistons for rust, scoring, wear, damage or wear.
- Check the diaphragm for cracks and wear.

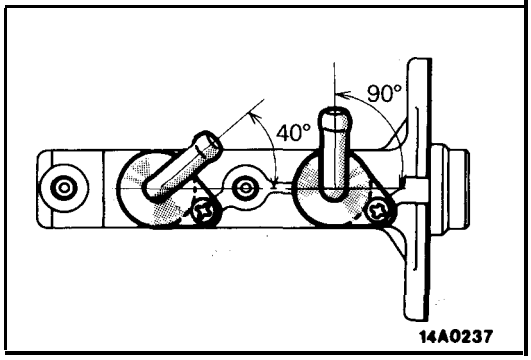



## SERVICE POINTS OF REASSEMBLY N05HCAI

### 15. APPLICATION OF FLUID TO MASTER CYLINDER BODY / 14. SECONDARY PISTON ASSEMBLY/ 13. PRIMARY PISTON ASSEMBLY

Apply the specified brake fluid sufficiently to the inner surface of the master cylinder body and to the entire surface of the secondary and primary pistons.

**Specified brake fluid: MOPAR Brake Fluid/ Conforming to DOT3**




### 8. INSTALLATION OF NIPPLES

Be sure that the primary side nipple and secondary side nipple are not mistaken one for the other when installed.

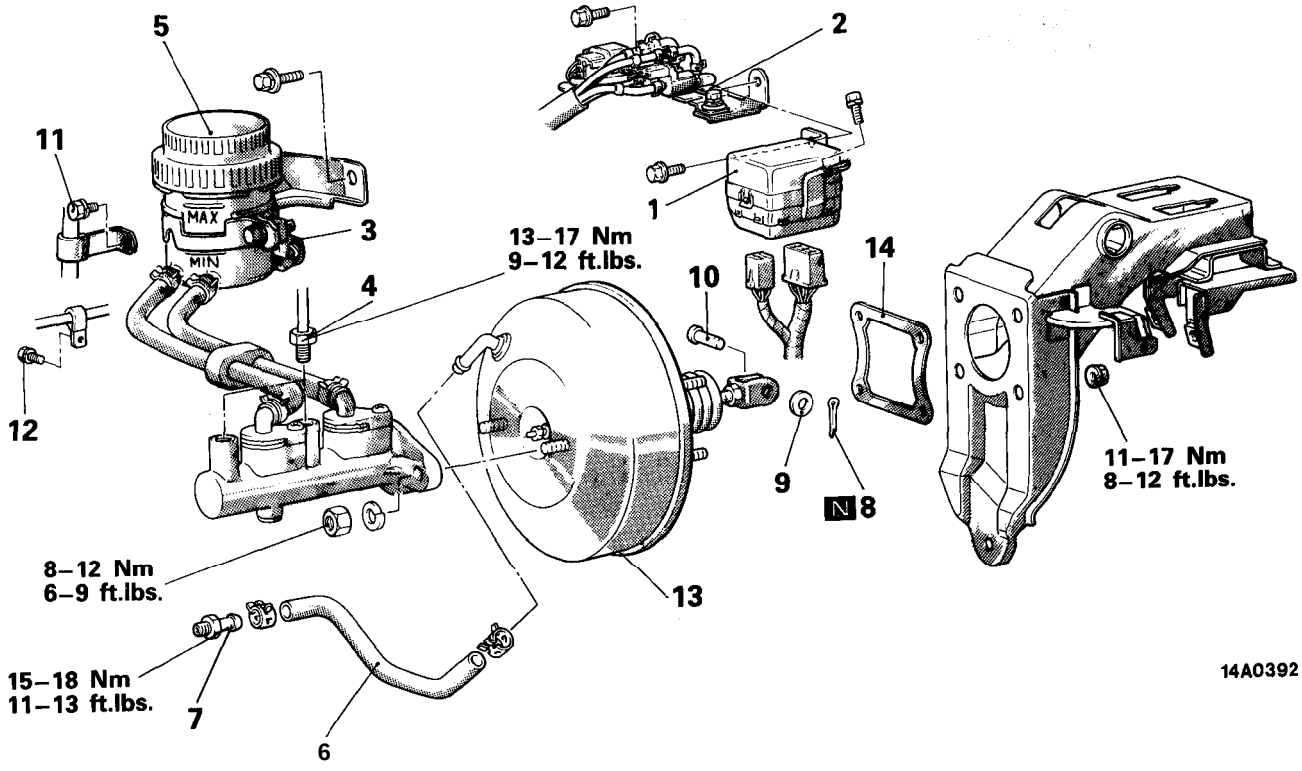
# BRAKE BOOSTER

N05JA--

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
● Drainino of Brake Fluid

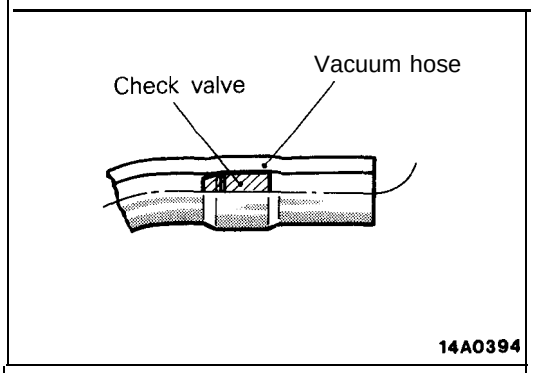
**Post-installation Operation**
●Supplying Brake Fluid
●Bleeding
(Refer to P.5–45.)
●Adjustment of Brake Pedal
(Refer to P.5–41.)




**Removal steps**

1. Relay box (for air conditioner)
2. Solenoid valve assembly
3. Brake fluid level sensor connector
4. Brake tube
5. Master cylinder, hose, reservoir assembly
◆1▶ ▶◀ 6. Vacuum hoses with check valve
▶◀ 7. Fitting
8. Cotter pin
▶◀ 9. Washer
▶◀ 10. Clevis pin
11. Fuel return tube installation bolt
12. Brake tube installation bolt
13. Brake booster
14. Sealer

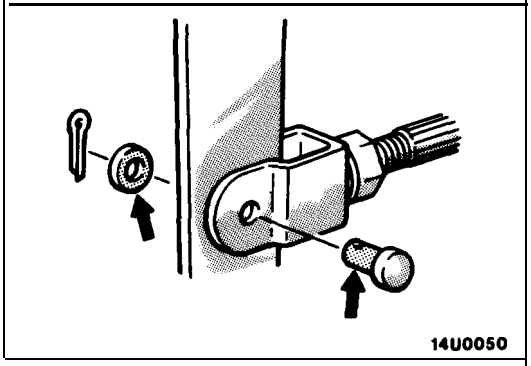
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆1▶: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N05JBAI

### 6. REMOVAL OF VACUUM HOSE WITH CHECK VALVE

NOTE
Since the check valve is fit to the vacuum hose, replace the check valve as an assembly unit together with the vacuum hose if the check valve is defective.

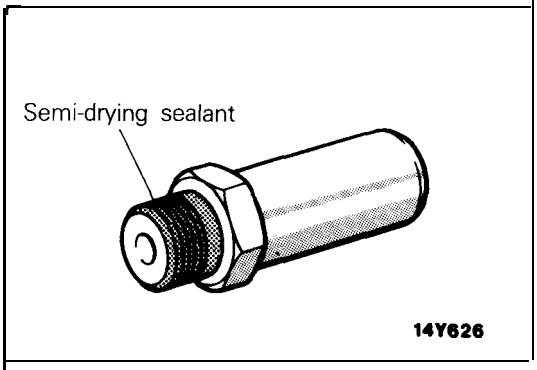



## SERVICE POINTS OF INSTALLATION N05JDAV

### 10. APPLICATION OF GREASE TO CLEVIS PIN/9. WASHER

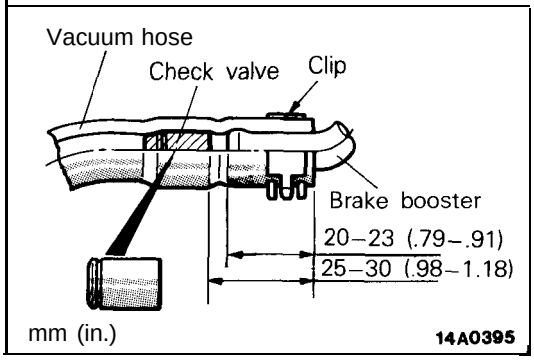
After applying the specified grease to the clevis pin and washer, insert the clevis pin and bend the cotter pin tightly.

**Grease: MOPAR Multi-mileage Lubricant**
**Part No. 2525035 or equivalent**




### 7. APPLICATION OF SEALANT TO FITTING

When installing the vacuum hose fitting, apply semi-drying sealant to its threaded portion.




### 6. INSTALLATION OF VACUUM HOSE WITH CHECK VALVE

(1) Attach the vacuum hose so that it may be inserted to a dimension illustrated.

**Caution**
**Prevent interference between the check valve and brake booster.**

(2) The vacuum hose at the engine should be securely connected until it contacts the hexagonal edge of the fitting, and then should be secured by the hose clip.

# BRAKE LINE

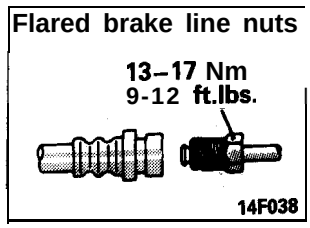
## REMOVAL AND INSTALLATION

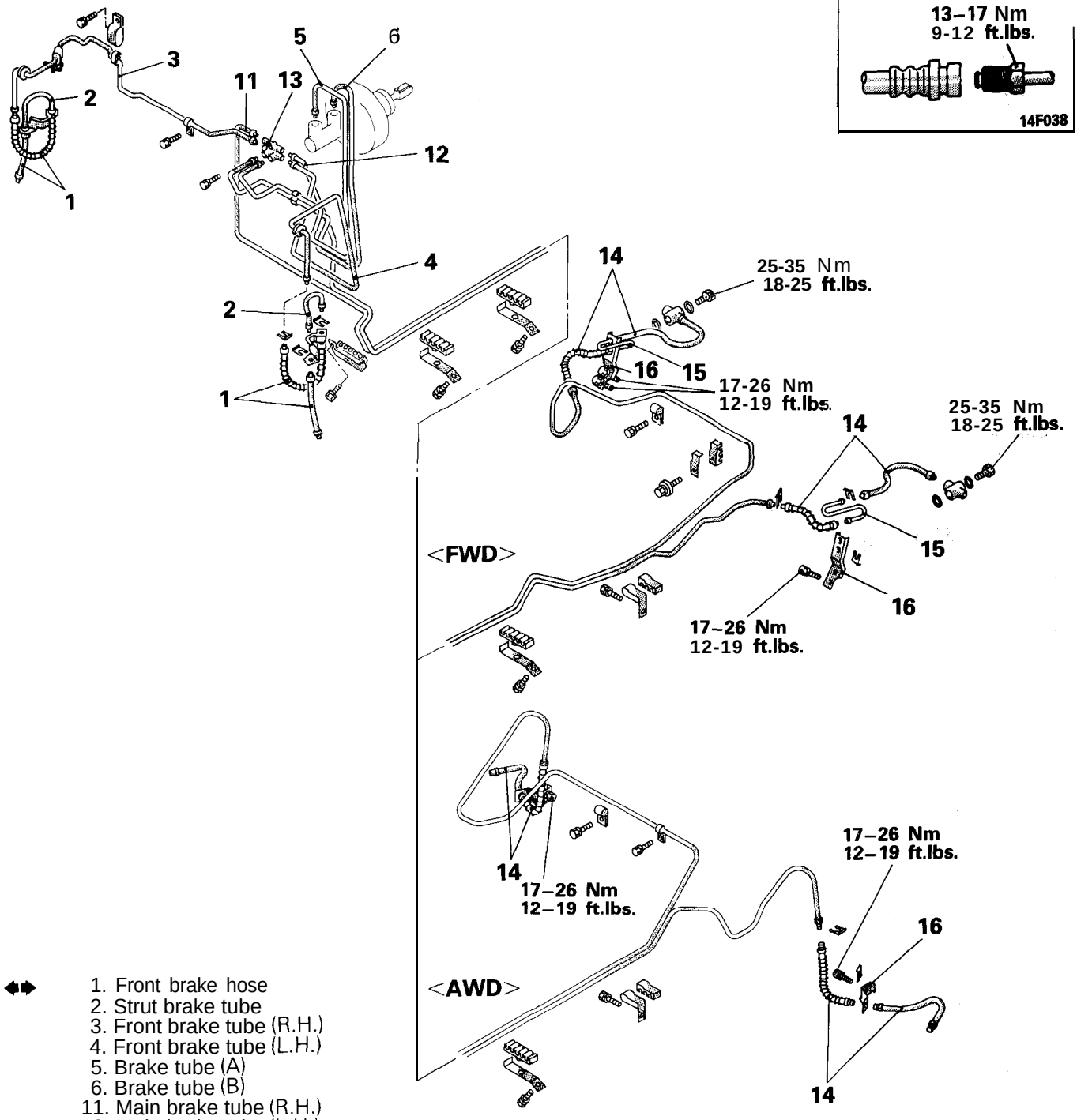
N05KA--

**Vehicles without ABS**

**Pre-removal Operation**
- Draining of Brake Fluid

**Post-installation Operation**
- Supplying Brake Fluid
- Bleeding (Refer to P.5-45.)



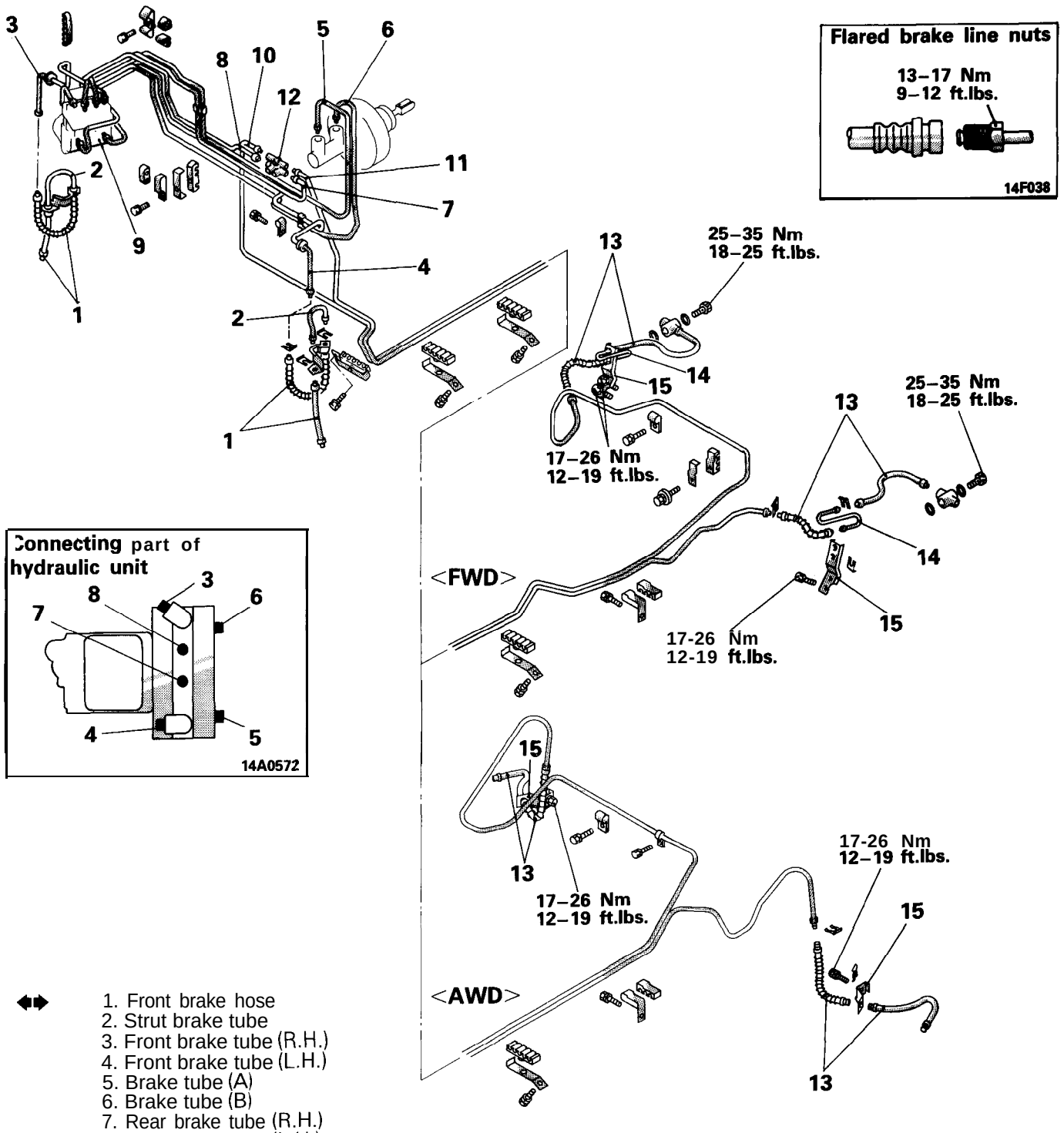

◆▶ 1. Front brake hose
2. Strut brake tube
3. Front brake tube (R.H.)
4. Front brake tube (L.H.)
5. Brake tube (A)
6. Brake tube (B)
11. Main brake tube (R.H.)
12. Main brake tube (L.H.)
◆▶ 13. Proportioning valve
◆▶ 14. Rear brake hose
15. Rear axle brake tube
16. Bracket

14A0583

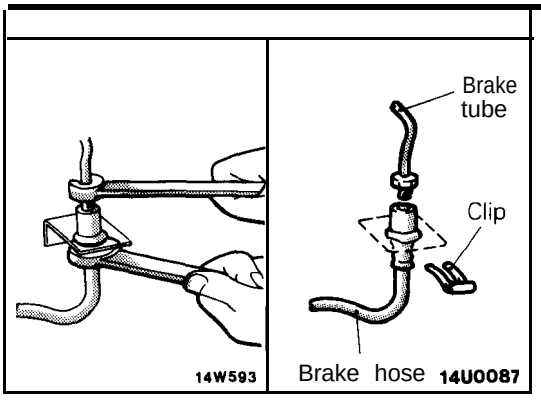
## Vehicles with ABS

**Pre-removal Operation**
- Draining of Brake Fluid

**Post-installation Operation**
- Supplying Brake Fluid
- Bleeding (Refer to P.5-45.)




1. Front brake hose
2. Strut brake tube
3. Front brake tube (R.H.)
4. Front brake tube (L.H.)
5. Brake tube (A)
6. Brake tube (B)
7. Rear brake tube (R.H.)
8. Rear brake tube (L.H.)
9. Hydraulic unit
10. Main brake tube (R.H.)
11. Main brake tube (L.H.)
12. Proportioning valve
13. Rear brake hose
14. Rear axle brake tube
15. Bracket




## SERVICE POINTS OF REMOVAL N05KBAMa

### 1. REMOVAL OF FRONT BRAKE HOSE/13. REAR BRAKE HOSE

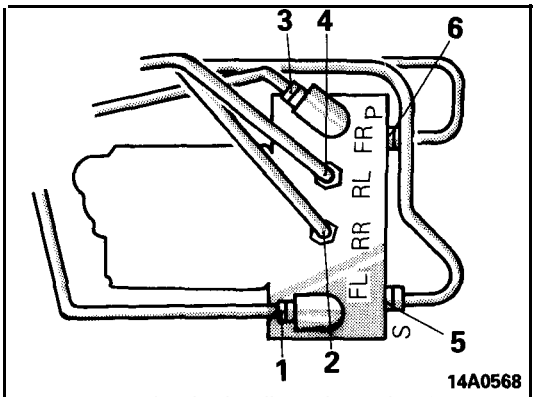
(1) Holding the lock nut on the brake hose side, loosen the flared brake line nut.
(2) Pull off the brake hose clip and remove the brake hose from the bracket.

### 12. REMOVAL OF PROPORTIONING VALVE

Do not disassemble the proportioning valve because its performance depends on the set load of the spring.

## INSPECTION N05KCAA

- Check the brake tubes for cracks, crimps and corrosion.
- Check the brake hoses for cracks, damage and leakage.
- Check the flared brake line nuts for damage and leakage.




1. From the hydraulic unit to the front brake (L.H.)
2. From the hydraulic unit to the proportioning valve (Rear, R.H.)
3. From the hydraulic unit to the front brake (R.H.)
4. From the hydraulic unit to the proportioning valve (Rear, L.H.)
5. From the master cylinder (for left front and right rear)
6. From the master cylinder (for right front and left rear)

## SERVICE POINTS OF INSTALLATION N05KDAJ

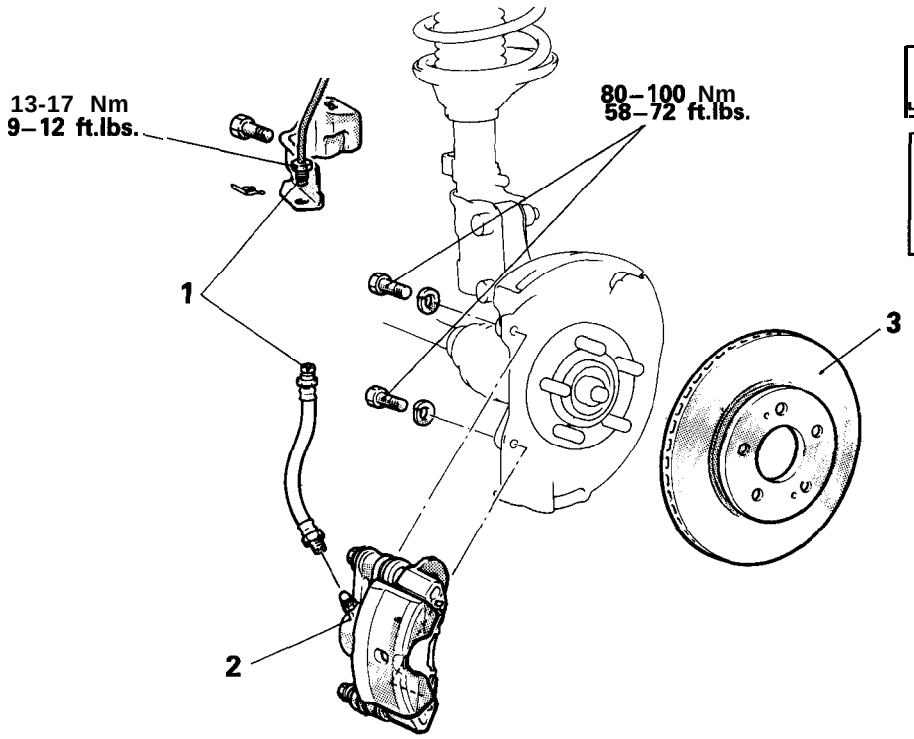
### 9. CONNECTION OF TUBE TO HYDRAULIC UNIT

Connect the tubes to the hydraulic unit as shown in the illustration.

# FRONT DISC BRAKE

## REMOVAL AND INSTALLATION

N05LA--




14A0420

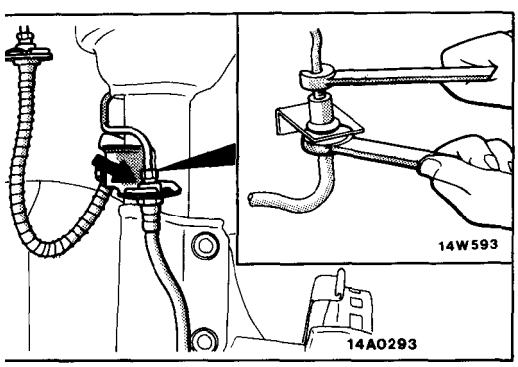
**Pre-removal Operation**
- Draining of Brake Fluid

**Post-installation Operation**
- Supplying Brake Fluid
- Bleeding
(Refer to P.5-45.)

**Removal steps**

◀▶▶◀ 1. Connection for the brake hose and the brake tube
● + 2. Front brake assembly
3. Brake disc

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀▶: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".




## SERVICE POINTS OF REMOVAL

N05LBAF

### 1. DISCONNECTION OF BRAKE HOSE

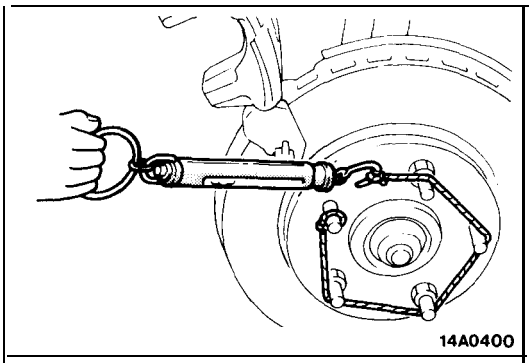
Holding the nut on the brake hose side. Loosen the flared brake line nut.

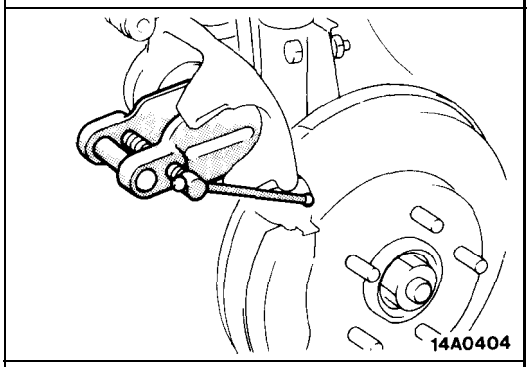
## INSPECTION

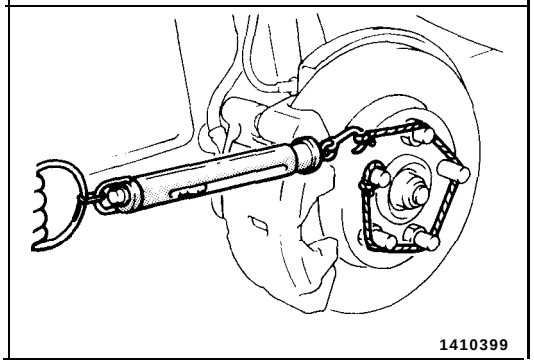
N05LCAD

### INSPECTION OF BRAKE DISC

- Check disc for wear. (Refer to P.5-47, Front Brake Disc Thickness Check.)
- Check disc for runout. (Refer to P.5-47, Front Brake Disc Run-out Check.)
- Check disc for damage


14A0400


14A0404


1410399

## SERVICE POINTS OF INSTALLATION N05LDAG

### 2. INSTALLATION OF FRONT BRAKE ASSEMBLY

(1) Measure hub torque with pad removed to measure brake drag torque after pad installation.

NOTE
Tighten the nuts in order to secure the disc to the hub.

(2) After installing the caliper support to the knuckle, expand the piston, and then install the caliper body.

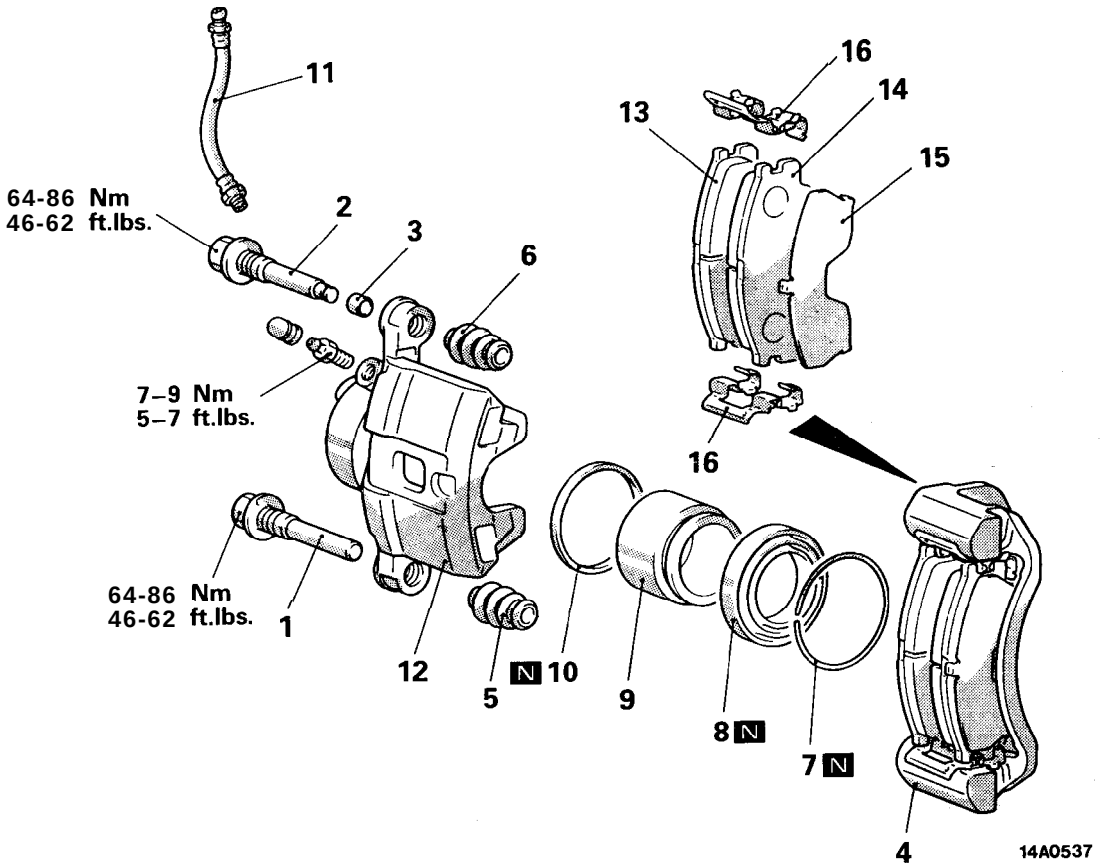
### 1. INSTALLATION OF BRAKE HOSE

Install brake hose without twisting or kinking.
Check brake drag torque as follows.
(1) Start engine and hold brake pedal down for 5 seconds.
(2) Stop engine.
(3) Turn brake disc forward 10 times.
(4) Check brake drag torque with spring scale.
If the difference between brake drag torque and hub torque exceeds the standard value, disassemble piston and clean the piston. Check for corrosion or worn piston seal.

**Standard value: 70 N (15 lbs.) or less**
**[4 Nm (3 ft.lbs.)] or less**

## DISASSEMBLY AND REASSEMBLY

N05LE-B




**Caliper assembly disassembly steps**

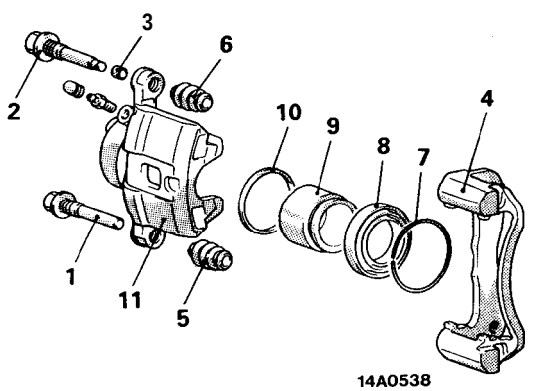
- + 1. Guide pin
- + 2. Lock pin
- + 3. Bushing
- 4. Caliper support (Pad, clip, shim)
- ◆◆ 5. Guide pin boot
- 6. Lock pin boot
- ◆◆ 7. Boot ring
- ◆◆ 8. Piston boot
- *** 9. Piston
- ◆◆ + 10. Piston seal
- 11. Brake hose
- + 12. Caliper body

**Pad assembly disassembly steps**

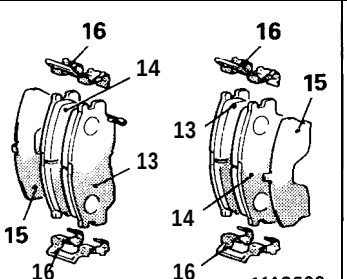
- + 1. Guide pin
- + 2. Lock pin
- * 3. Bushing
- 4. Caliper support (Pad, clip, shim)
- 13. Pad and wear indicator assembly
- 14. Pad assembly
- 15. Outer shim
- 16. Clip

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ●: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

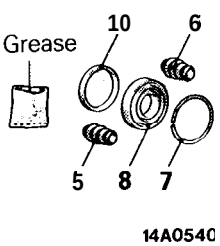
**Brake caliper kit**

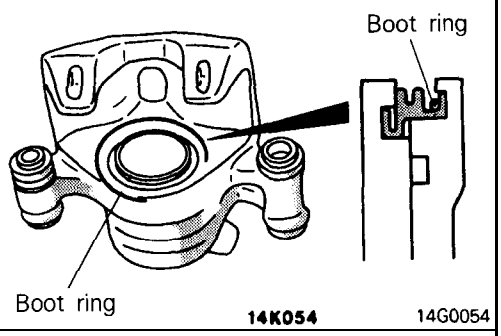



**Pad repair kit**




**Seal and boots repair kit**



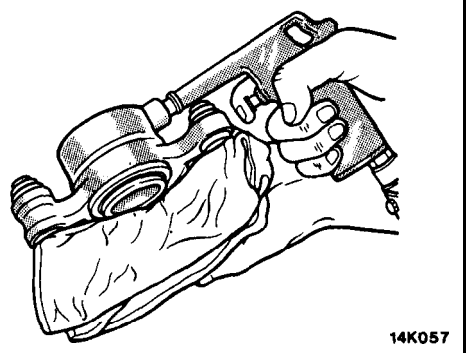



## SERVICE POINTS OF DISASSEMBLY N05LFAJ

When disassembling the front disc brakes, disassemble both sides (left and right) as a set.

### 7. REMOVAL OF BOOT RING

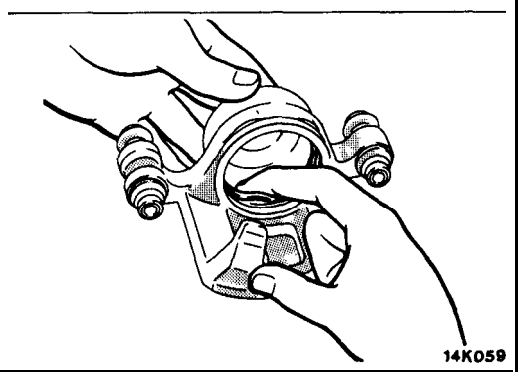
Remove boot ring with flat tip (–) screwdriver.




### 8. REMOVAL OF PISTON BOOT / 9. PISTON

Protect caliper body with cloth. Blow compressed air through brake hose to remove piston boot and piston.

**Caution**
**Blow compressed air gently.**




### 10. REMOVAL OF PISTON SEAL

(1) Remove piston seal with finger tip.

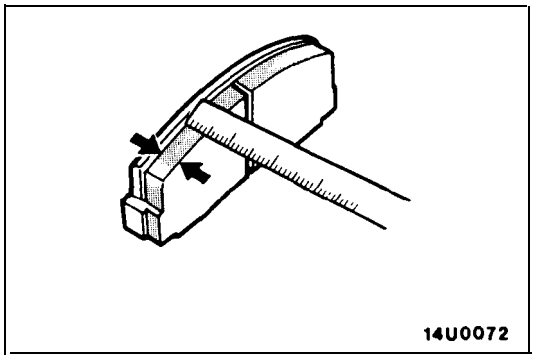
**Caution**
**Do not use flat tip (–) screwdriver or other tool to prevent damage to inner cylinder.**

(2) Clean piston surface and inner cylinder with trichloroethylene, alcohol or specified brake fluid.

**Specified brake fluid: MOPAR Brake Fluid/ Conforming to DOT3**

## INSPECTION N05LGAJ

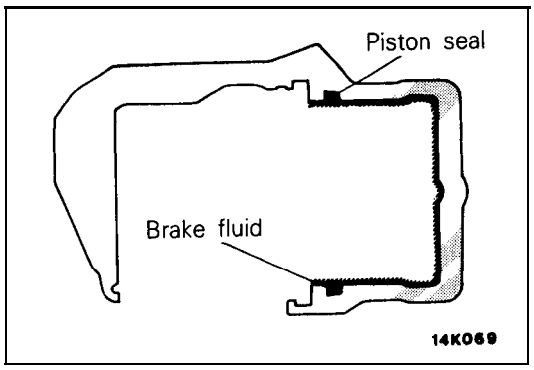
- Check cylinder for wear, damage or rust.
- Check piston surface for wear, damage or rust.
- Check caliper body guide pin or lock pin for wear.
- Check pad for damage or adhesion of grease, check backing metal for damage.




### PAD WEAR CHECK

Measure thickness at the thinnest and worn area of the pad. Replace pad assembly when pad thickness is less than the limit value.

**Limit value: 2.0 mm (.08 in.)**




## SERVICE POINTS OF REASSEMBLY N05LHAQ

### 12. APPLICATION OF BRAKE FLUID TO CALIPER BODY

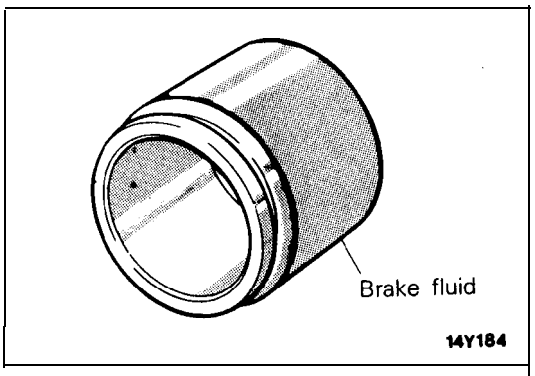
Apply specified brake fluid to inner cylinder.

**Specified brake fluid: MOPAR Brake Fluid/ Conforming to DOT3**

### 10. INSTALLATION OF PISTON SEAL

Install piston seal in cylinder groove.

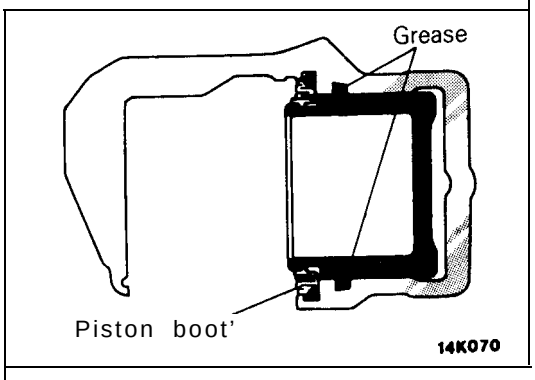
**Caution**
**Do not wipe special grease on piston seal.**




### 9. INSTALLATION OF PISTON

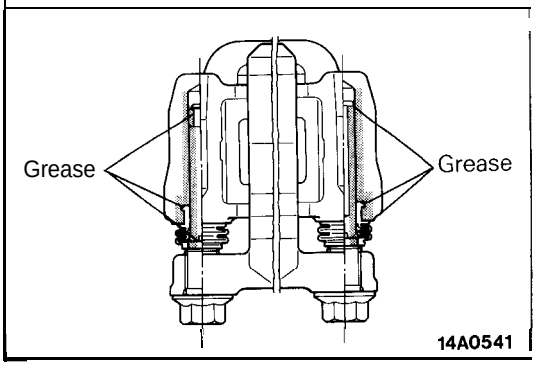
(1) Apply specified brake fluid to piston. Insert into cylinder without twisting.

**Specified brake fluid: MOPAR Brake Fluid/ Conforming to DOT3**




(2) Fill piston edge with specified grease. Install piston boots.

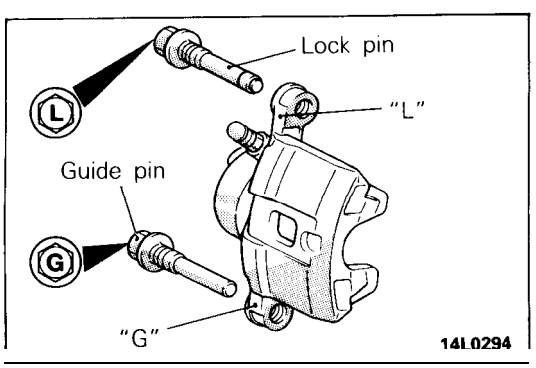
**Specified grease: Repair kit grease (orange)**




### 6. APPLICATION OF GREASE TO LOCK PIN BOOT/5. GUIDE PIN BOOT/3. BUSHING

Grease parts as illustrated with specified grease.

**Specified grease: Repair kit grease (orange)**




### 2. INSTALLATION OF LOCK PIN/I. GUIDE PIN

Install the guide pin and lock pin so the identification mark on the caliper body and head mark on the guide pin and lock pin are aligned.

# REAR DISC BRAKE

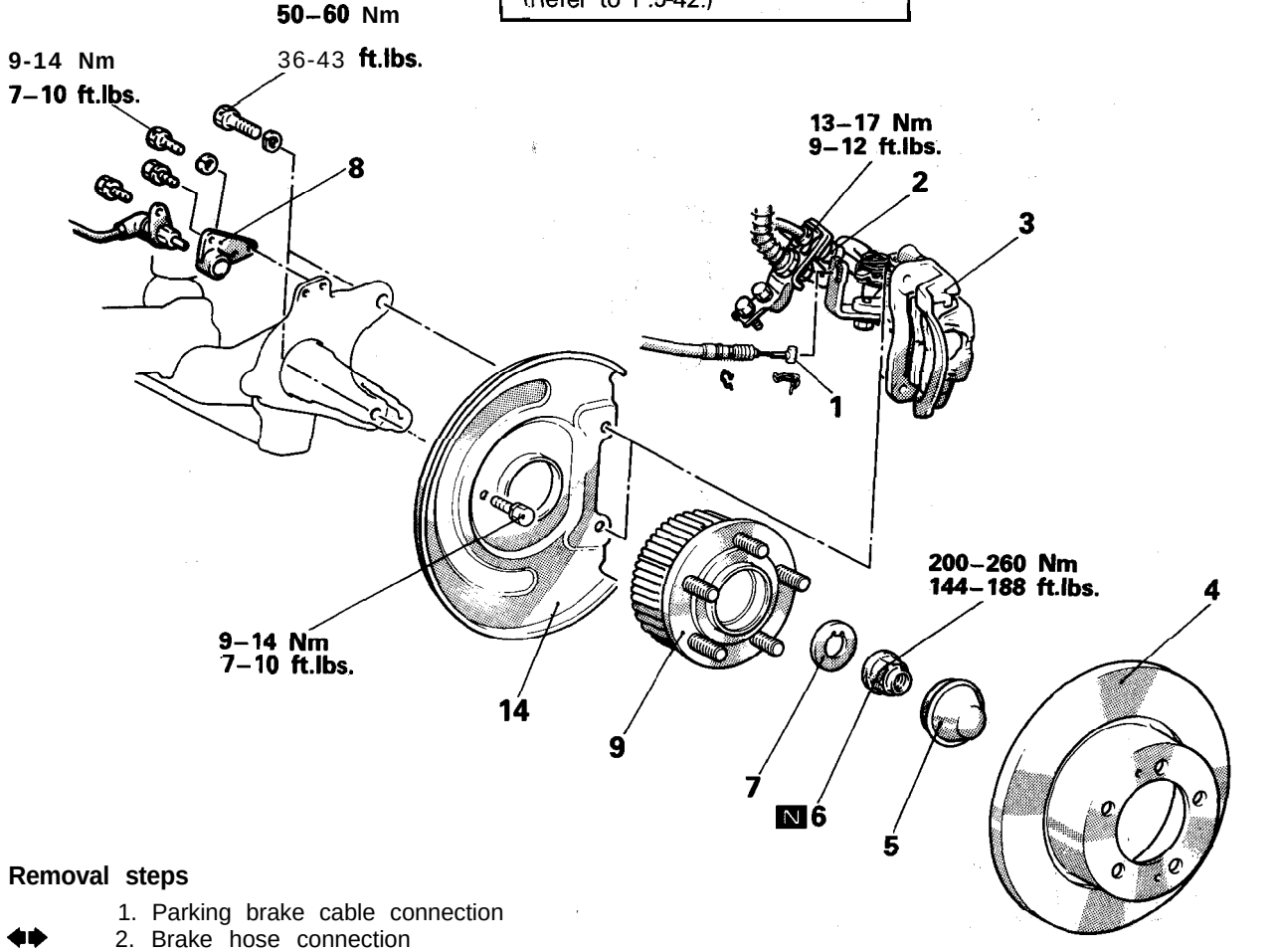
N05MA--

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
@Draining of Brake Fluid

**Post-installation Operation**
- Supplying Brake Fluid
- Bleeding
  (Refer to P.5-45.)
- Adjustment of Parking Brake Lever Stroke
  (Refer to P.5-42.)

<FWD>

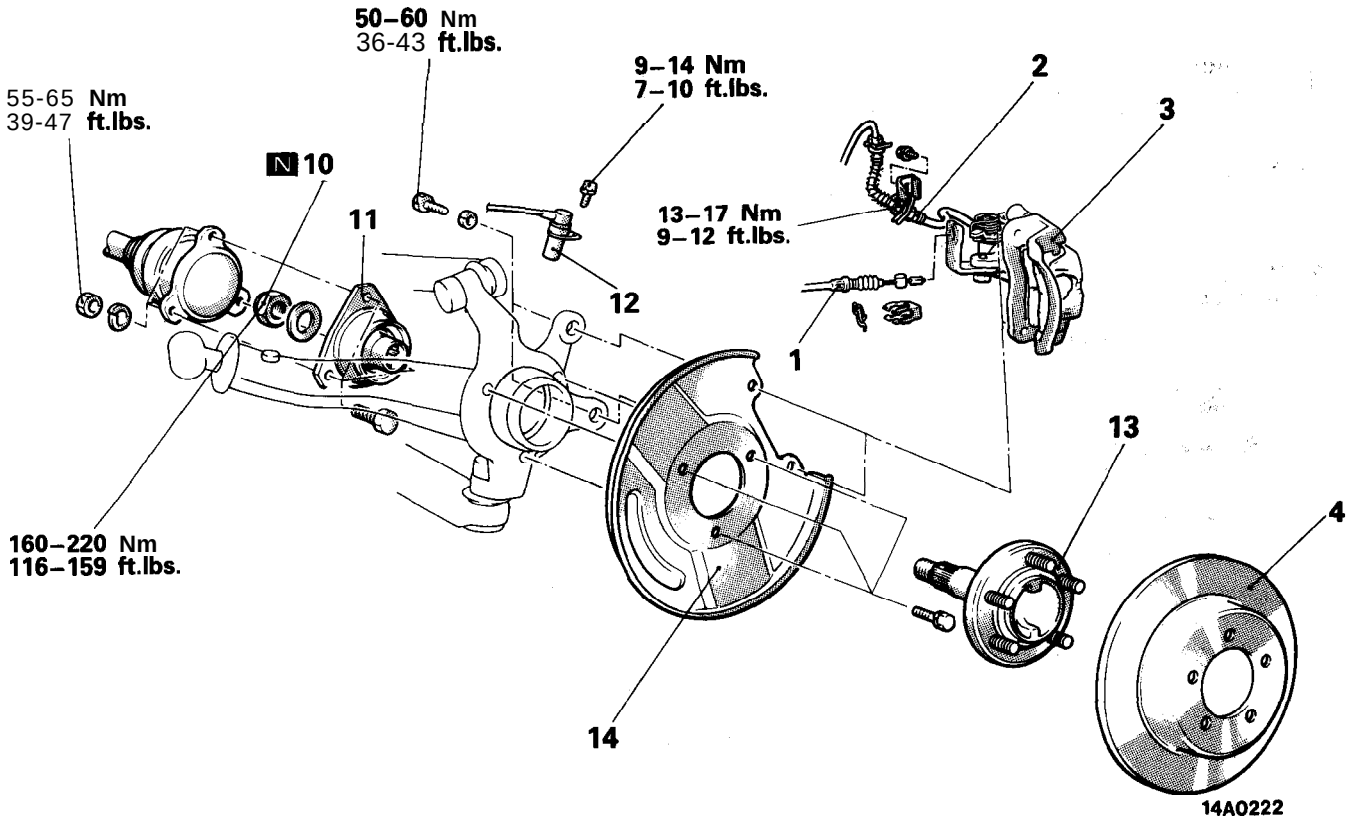



**Removal steps**

1. Parking brake cable connection
◆◆ 2. Brake hose connection
3. Rear brake assembly
4. Rear brake disc
5. Hub cap
◆◆ 6. Wheel bearing nut
7. Washer
8. Rear speed sensor bracket
   <Vehicles with ABS>
9. Rear hub assembly
14. Dust shield

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

<AWD>

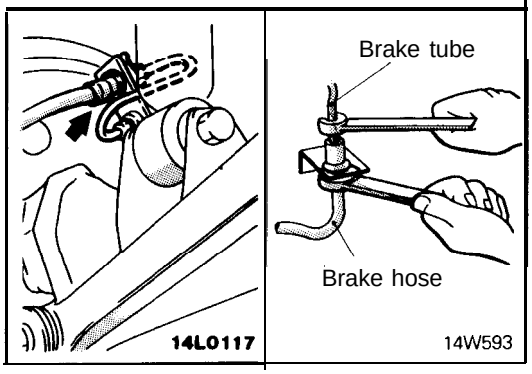



1. Parking brake cable connection
◆◆ 2. Brake hose connection
3. Rear brake assembly
4. Rear brake disc
◆◆ ● +10. Self locking nut
◆◆ 11. Companion flange
12. Rear speed sensor
<Vehicles with ABS>
◆◆ ● 13. Rear axle shaft

**Pre-removal Operation**
●Draining of Brake Fluid

**Post-installation Operation**
● supplying Brake Fluid
(Refer to P.5-45.)
● Adjustment of Parking Brake Lever Stroke
P.5-42.)

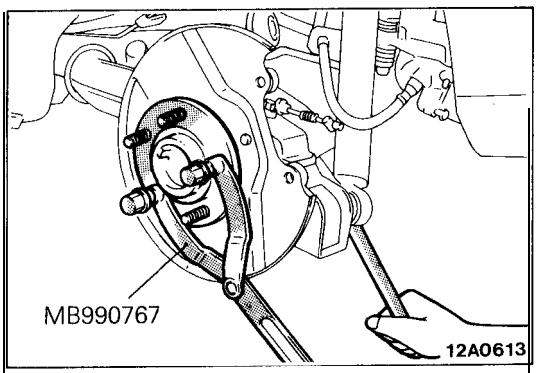
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: "Service
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N05MBAD

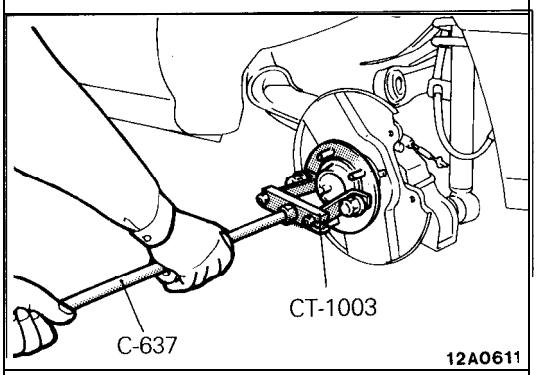
### 2. DISCONNECTION OF BRAKE HOSE

Holding the lock nut on the brake hose side, loosen the flared brake line nut.




### 10. REMOVAL OF SELF LOCKING NUT

Using the special tool, secure and hold the rear axle shaft, and remove the self locking nut.




### 13. REMOVAL OF REAR AXLE SHAFT

Using the special tool, remove the rear axle shaft.

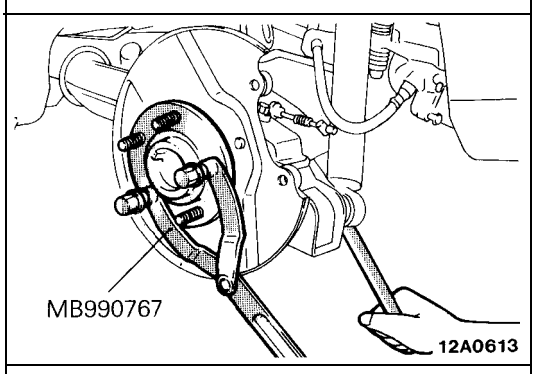
## INSPECTION N05MDABa

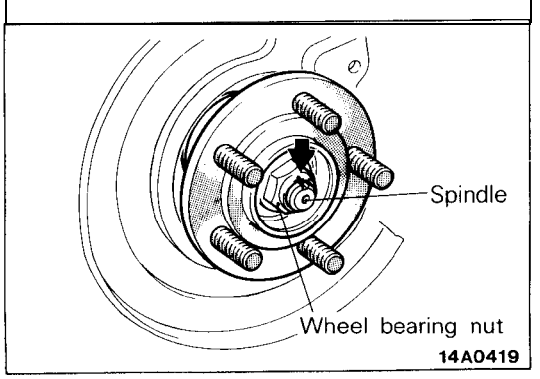
- Check disc for wear. (Refer to P.5-15, Rear Brake Disc Thickness Check.)
- Check disc for runout. (Refer to P.5-16, Rear Brake Disc Run-out Check.)
- Check disc for damage.

## SERVICE POINTS OF INSTALLATION N05MCAF

### 13. INSTALLATION OF REAR AXLE SHAFT/ 11. COMPANION FLANGE/10. SELF LOCKING NUT

(1) Provisionally install the rear axle shaft to the trailing arm.
(2) Install the companion flange to the rear axle shaft, and install the self locking nut.
(3) Then, using the special tool, secure and hold the rear axle shaft, and tighten the self locking nut.



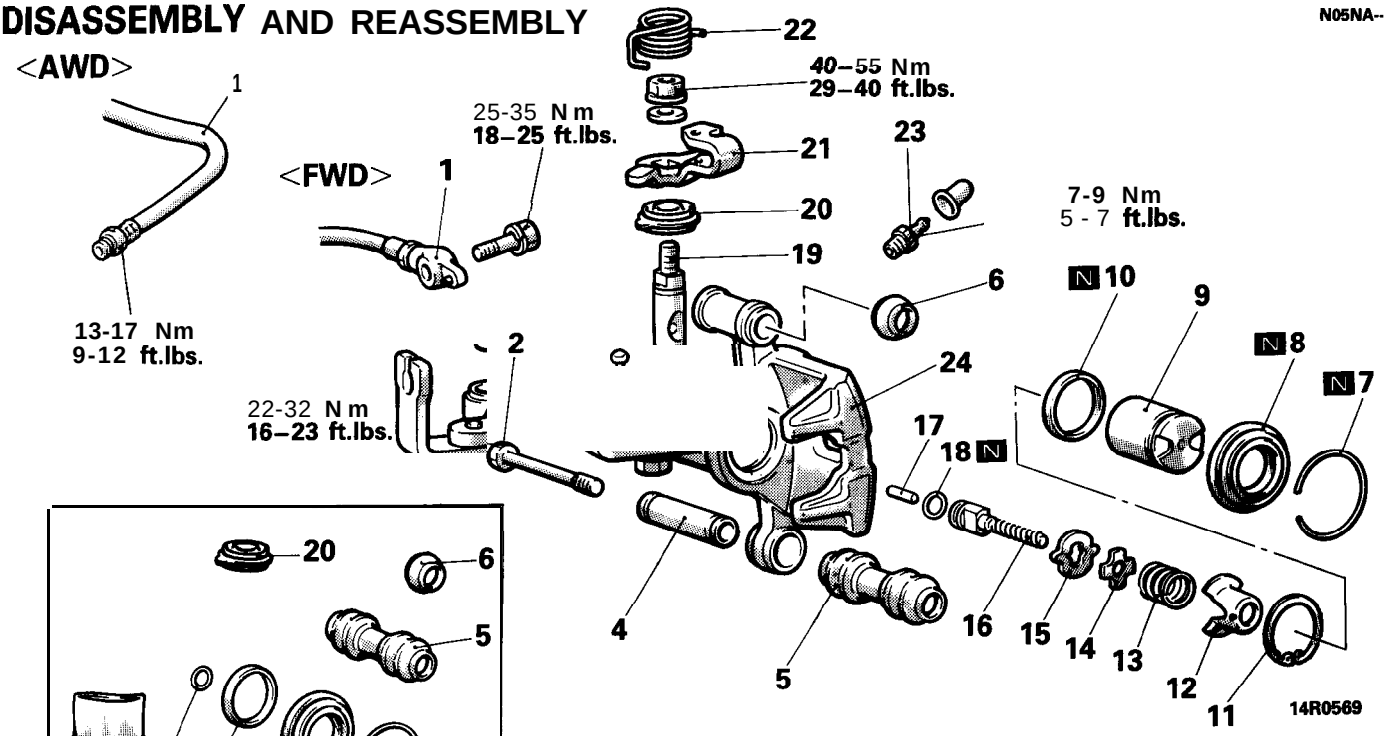



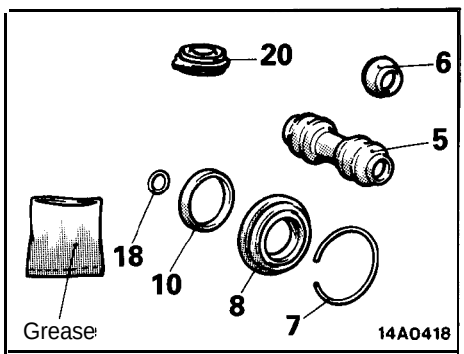

### 6. INSTALLATION OF WHEEL BEARING NUT

After tightening the wheel bearing nut, align with the indentation in the spindle, and then crimp.

## DISASSEMBLY AND REASSEMBLY

N05NA--



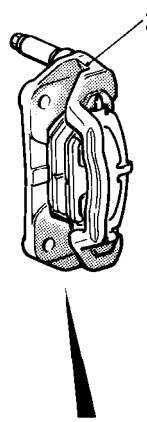

**Brake seal kit**

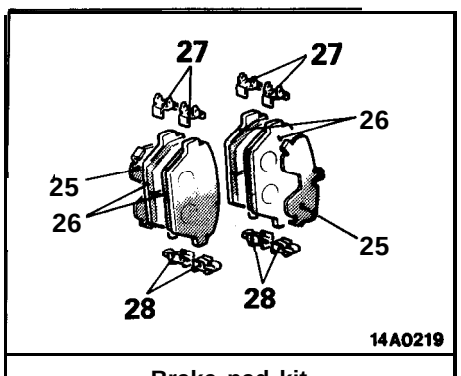
**Caliper assembly disassembly steps**

1. Connection for brake hose
2. Lock pin
- ◆◆ 4. Lock pin sleeve
- ◆◆ 5. Lock pin boot
- ● 6. Guide pin boot
7. Boot ring
- ● + 8. Piston boot
- ◆◆ ◆◆ 9. Piston assembly
- ◆◆ ● +10. Piston seal
- ● * ● +11. Snap ring
12. Spring case
13. Return spring
14. Stopper plate
15. Stopper
- ◆◆ 16. Auto-adjuster spindle
- ◆◆ 17. Connecting link
- ◆◆ 18. O-ring
- ● + 19. Spindle lever
- ● + 20. Lever boot
21. Parking brake lever
22. Return spring
23. Bleeder screw
24. Caliper body

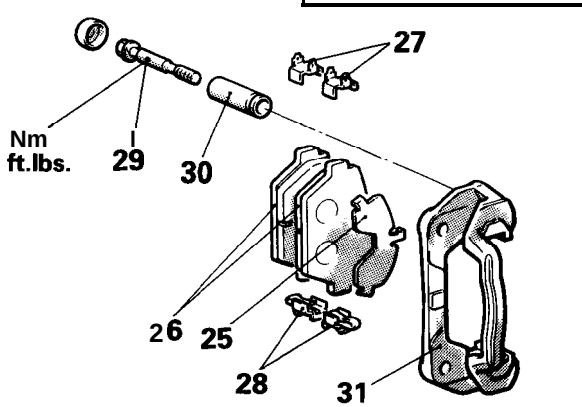
**Pad assembly disassembly steps**

1. Lock pin
- ◆◆ 3. Support mounting (pad, shim, clip)
25. Outer shim
26. Pad assembly
27. Pad clips C
28. Pad clips B
29. Guide pin
30. Guide pin sleeve
31. Support mounting

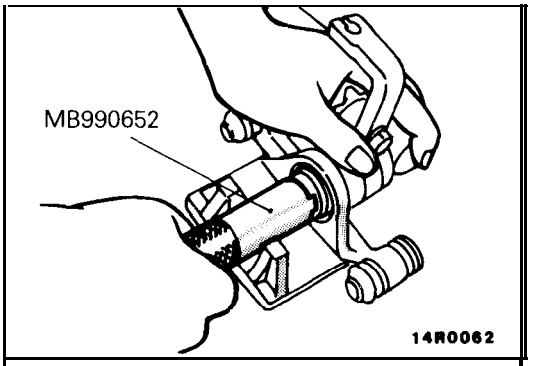


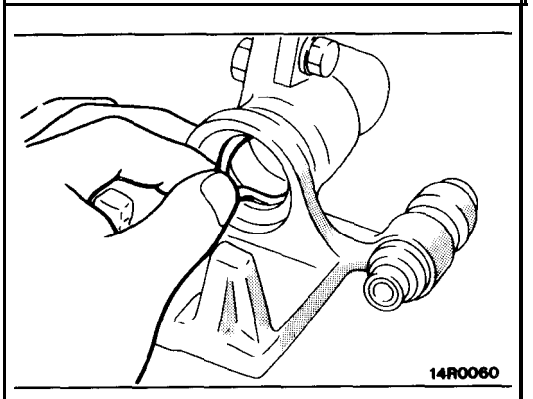



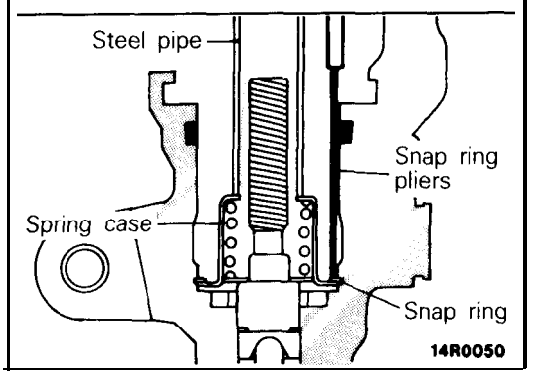

**Brake pad kit**




NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● I) : Refer to "Service Points of Disassembly".
(3) ◆◆ : Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N05NBAE

When disassembling the rear disc brakes, disassemble both sides (left and right) as a set.

### 3. REMOVAL OF SUPPORT MOUNTING

With the lock pin removed, pull the support mounting off from the caliper body.

### 9. DISASSEMBLY OF PISTON ASSEMBLY

Use the special tool to twist the piston out of the caliper body.

### 10. DISASSEMBLY OF PISTON SEAL

(1) Remove piston seal with finger tip.

**Caution**
**Do not use flat tip (–) screwdriver or other tool to prevent damage to inner cylinder.**

(2) Clean piston surface and inner cylinder with trichloroethylene, alcohol or specified brake fluid.

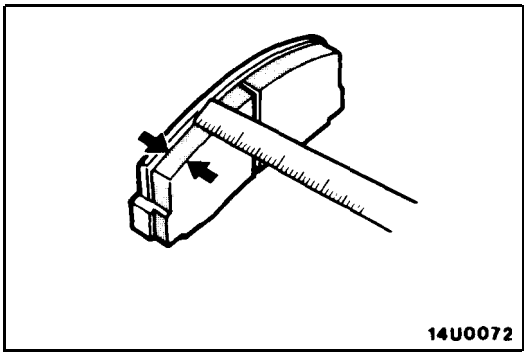
**Specified brake fluid: MOPAR Brake Fluid/ Conforming to DOT3**

### 11. DISASSEMBLY OF SNAP RING

While using a 19 mm (.75 in.) diameter steel pipe to press the spring case into the caliper body, use the snap ring pliers to remove the snap ring from the caliper body.

## INSPECTION N05NCAAa

- Check the connecting link and the spindle for wear or damage.
- 
- Check the spindle lever shaft for rust.
- 
- Check the piston for rust.
  Check the piston seal for wear or deterioration.
- piston

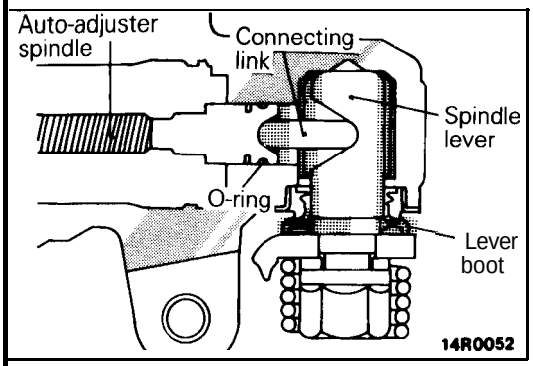



### PAD WEAR CHECK

(1) Measure the thickness of the pad at the thinnest place.

**(.08**

(2) If the pad assemblies are worn beyond the limit, replace them.

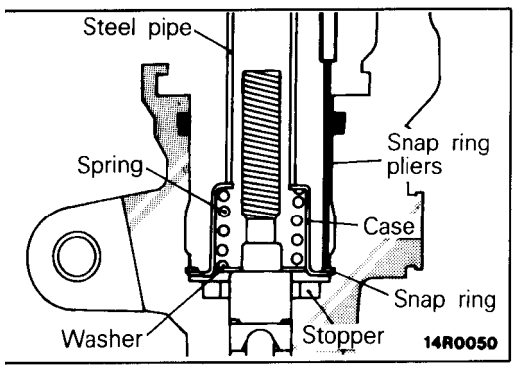



## SERVICE POINTS OF REASSEMBLY N05NDAF

### 20. APPLICATION OF GREASE TO LEVER BOOT/19. SPINDLE LEVER/ 18. O-RING/ 17. CONNECTING LINK/ 16. AUTO-ADJUSTER SPINDLE

Apply the specified grease to the lever boot, spindle lever, O-ring, connecting link, auto-adjuster spindle.

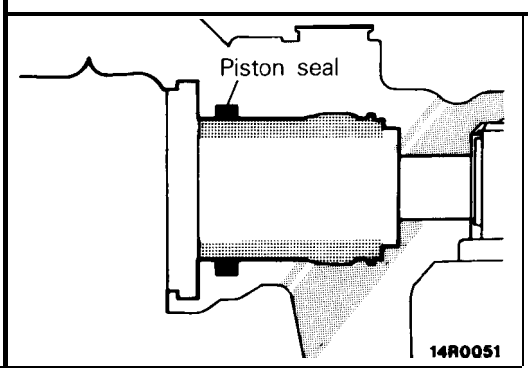
**Specified grease: Repair kit grease (Orange)**




### 11. REASSEMBLY OF SNAP RING

While using a 19 mm (.75 in.) diameter steel pipe to press in the spring case, use the snap ring pliers to attach the snap ring to the caliper body.

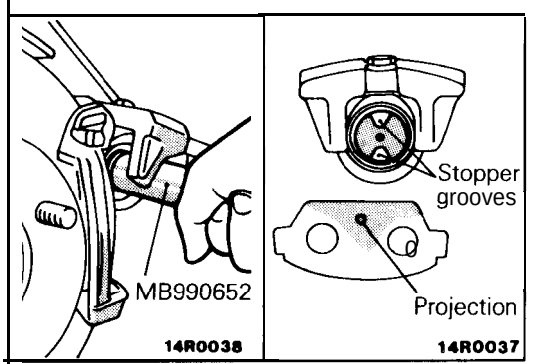
**Caution**
**Attach the snap ring to the caliper body with the opening facing the bleeder.**




### 10. APPLICATION OF GREASE TO PISTON SEAL

Apply the specified grease to the piston seal and the cylinder walls and then insert the piston seal into the cylinder.

**Specified grease: Repair kit grease (Orange)**

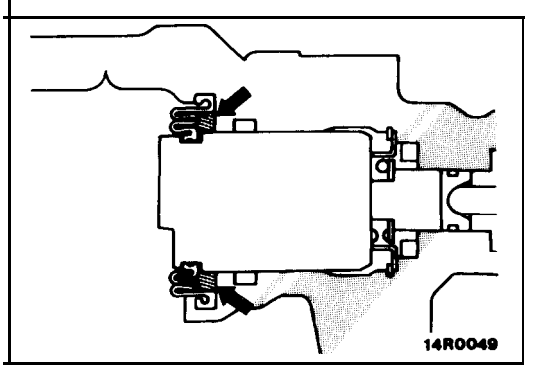



### 9. REASSEMBLY OF PISTON ASSEMBLY

(1) Push the piston into the caliper with special tool.

NOTE
Align the grooves as illustrated.

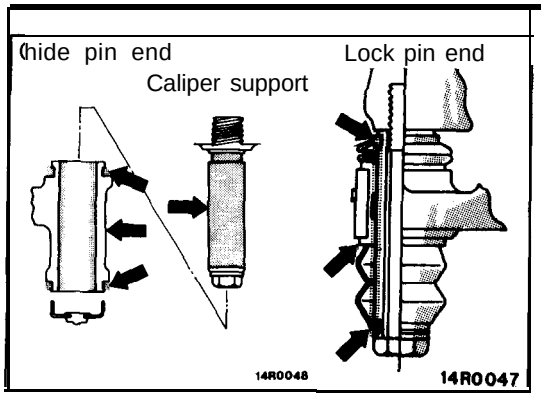
(2) The pins on the back side of the brake pad must be placed in the grooves in the position.




### 8. APPLICATION OF GREASE TO PISTON BOOT

Apply the specified grease to the piston boot mounting grooves in the caliper body and in the piston, and then install the piston boot.

**Specified grease: Repair kit grease (Orange)**




**6. APPLICATION OF GREASE TO GUIDE PIN BOOT/ 5. LOCK PIN BOOT/4. LOCK PIN SLEEVE**

Apply the specified grease to the following points:
(1) Guide pin boot inner surface (lip)
(2) Lock pin boot inner surface (lip)
(3) Lock pin sleeve (not on threads)

**Specified grease: Repair kit grease (orange)**

After assembling the rear disc brake assembly, install to the body, and then make the adjustment of the parking brake lever as described below.
(1) Free the parking brake cable.
(2) With the engine running, firmly depress the brake pedal five or six times.
(3) Check whether or not the stroke of the parking brake lever is within the standard value.

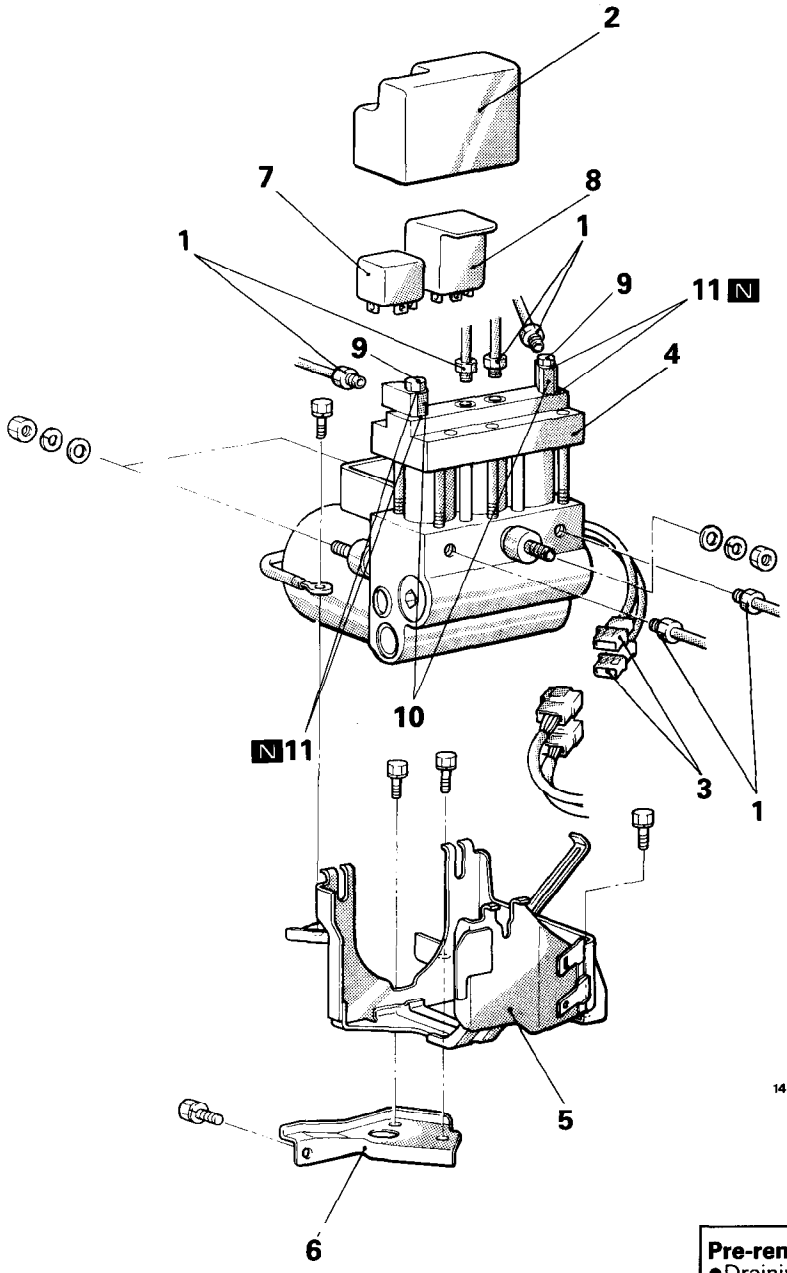
**Standard value: 5-7 notches**

(4) If there is a deviation from the standard value, adjust the stroke of the parking brake lever.
(Refer to P.5-42.)

# HYDRAULIC UNIT <VEHICLES WITH ABS>

## REMOVAL AND INSTALLATION

N05OXAE




**Flared brake line nuts**
13–17 Nm
9–12 ft.lbs.



14F038

**Pre-removal Operation**
- Draining of Brake Fluid
- Removal of Air Pipe B (Refer to GROUP 11–Intercooler.)

**Post-installation Operation**
@Supplying Brake Fluid
- Bleeding (Refer to P.5-45.)
- Installation of Air Pipe B (Refer to GROUP 11–Intercooler.)

**Removal steps**

◆◆ 1. Brake tube connection
2. Relay box cover
3. Hydraulic unit harness connection
◆◆ ● 4. Hydraulic unit
5. Hydraulic unit bracket assembly
6. Bracket
7. Valve relay
8. Motor relay
9. Connector bolt
10. Connector
11. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".

## SERVICE POINTS OF REMOVAL

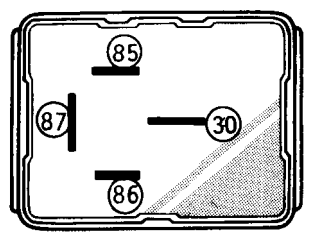
### 4. REMOVAL OF HYDRAULIC UNIT

Remove the installation nuts, and then take out the hydraulic unit upward.

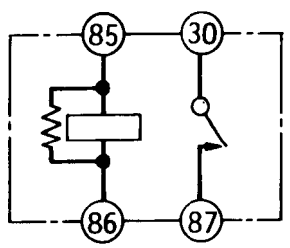
**Caution**

**1. The hydraulic unit is heavy, and so care should be taken when removing it.**
**2. The hydraulic unit is not to be disassembled; its nuts and bolts should absolutely not be loosened.**
**3. The hydraulic unit must not be dropped or otherwise subjected to impact shocks.**
**4. The hydraulic unit must not be turned upside down or laid on its side.**

Aotor relay




16R0670




16R1773

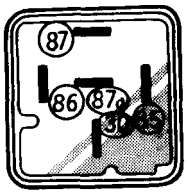
## INSPECTION

Check whether there is continuity between terminals when there is no current flow at each relay and when there is current flow.

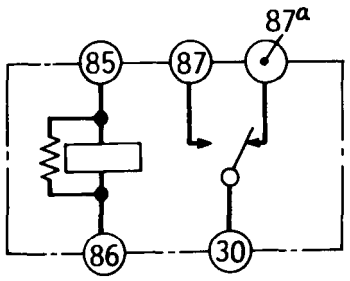
**MOTOR RELAY**

| | | |
|---|---|---|
| When no current flows | Between terminals ⑧⑤–⑧⑥ | 30–60 Ω |
| | Between terminals ③⓪–⑧⑦ | No continuity (∞Ω) |
| When current flows between terminal ⑧⑤–⑧⑥ | Between terminals ③⓪–⑧⑦ | Continuity (approx. 0 Ω) |

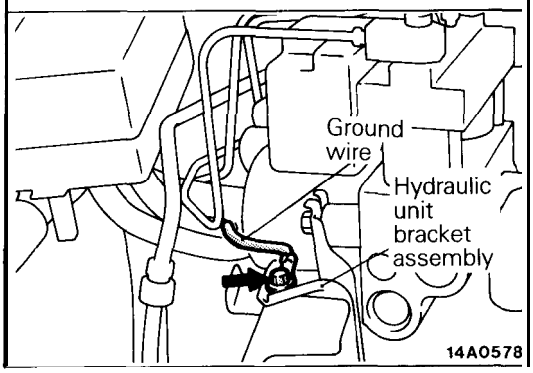
/alve relay




16R0670




16R1772




14A0578

/ALVE RELAY

| | | |
|---|---|---|
| When no current flows | Between terminals (85)–(86) | 60–120 Ω |
| | Between terminals (30)–(87a) | Continuity (approx. 0 Ω) |
| | Between terminals (30)–(87) | No continuity (∞Ω) |
| When current flows between terminal (85)–(86) | Between terminals (30)–(87a) | No continuity (∞Ω) |
| | Between terminals (30)–(87) | Continuity (approx. 0 Ω) |

## SERVICE POINTS OF INSTALLATION

### 4. INSTALLATION OF HYDRAULIC UNIT

Fasten the ground wire to hydraulic unit bracket assembly.

### 1. CONNECTION OF BRAKE TUBE

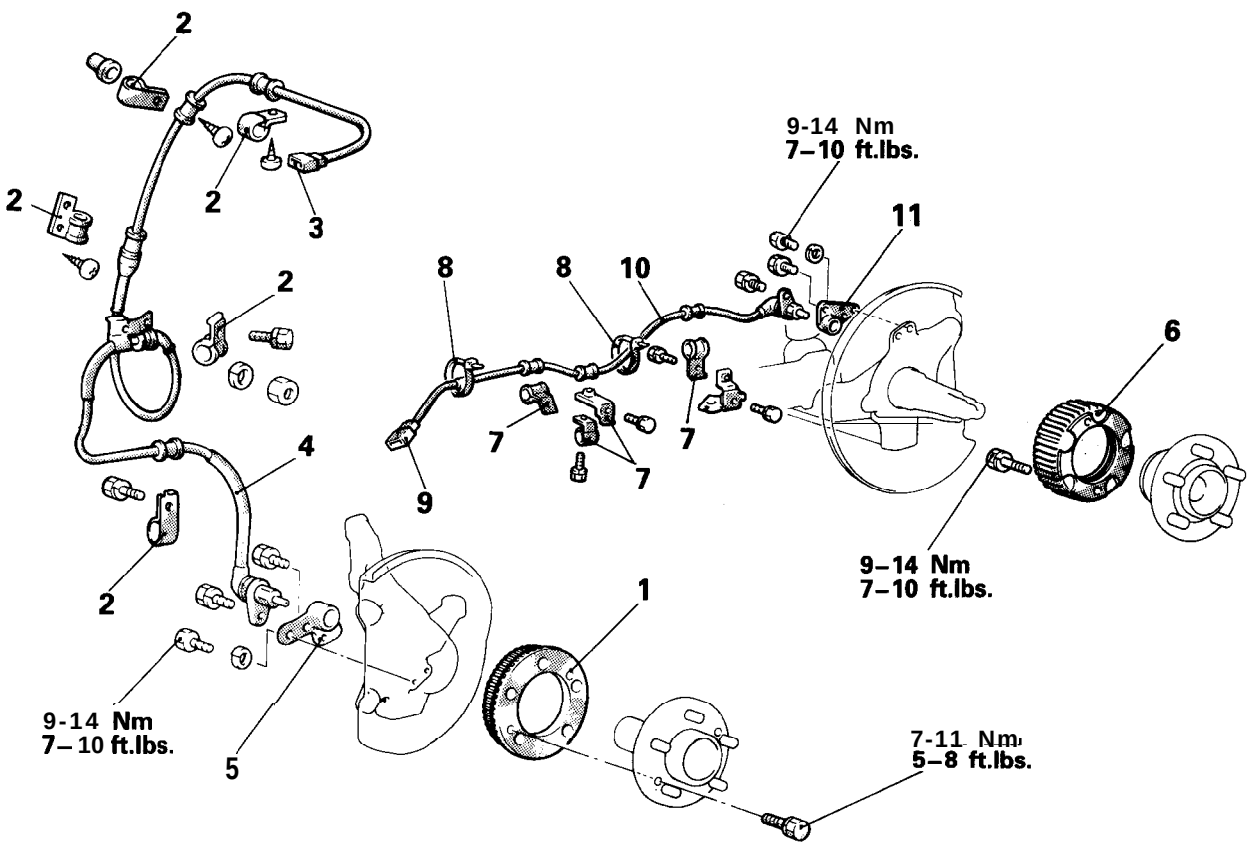
When connecting the tubes to the hydraulic unit, be sure they are connected correctly.
(Refer to P.5-64.)

# WHEEL SPEED SENSOR <VEHICLES WITH ABS>

N05OYAG

## REMOVAL AND INSTALLATION

<FWD>




14A0584

**Pre-removal Operation**
- Removal of the Splash Shield (Refer to GROUP 23–Fender.)

**Post-installation Operation**
- Installation of the Splash Shield (Refer to GROUP 23–Fender.)

**Front speed sensor removal steps**

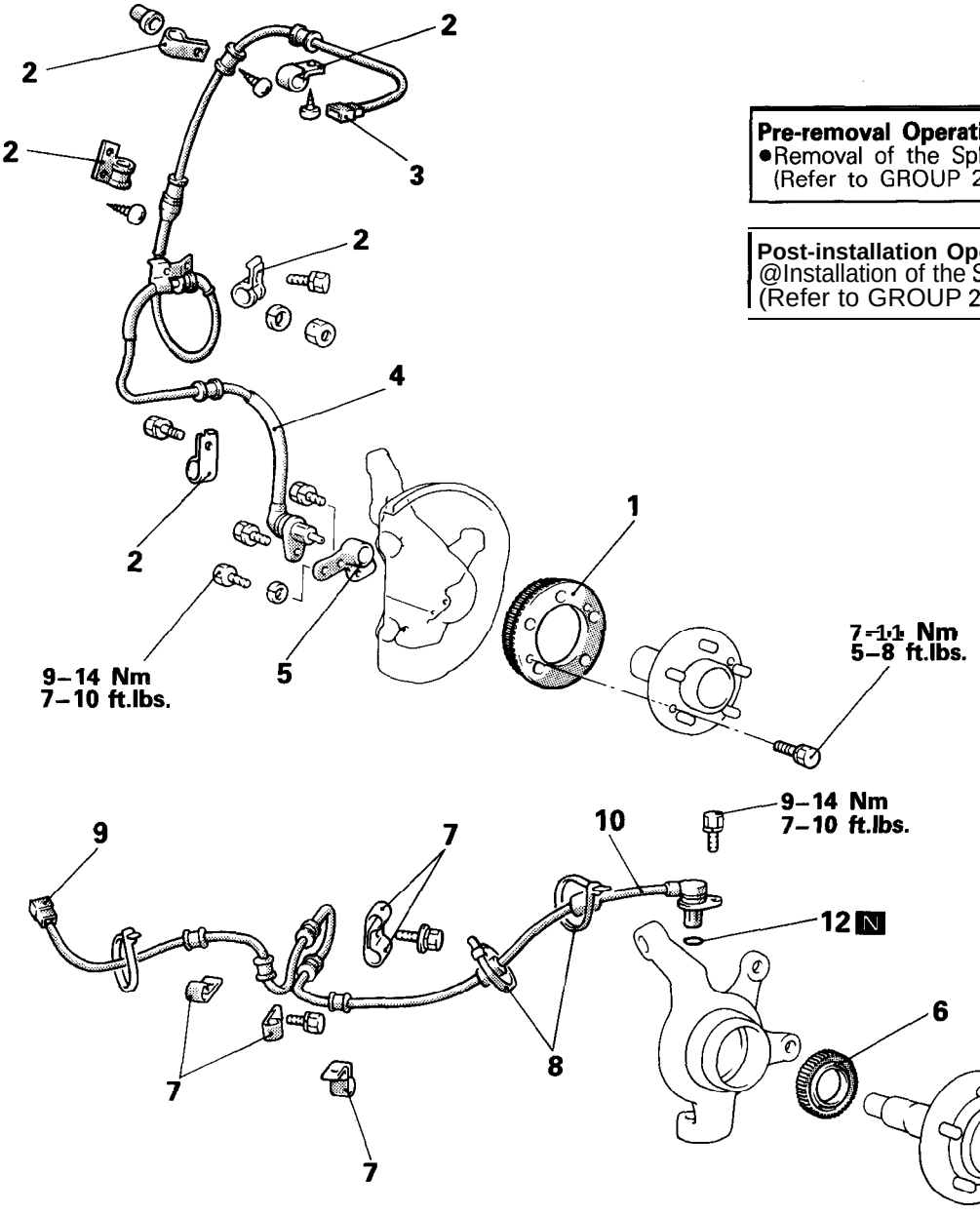
◆◆ 1. Front toothed rotor
2. Clip
3. Connection for front speed sensor
◆◆ ● + 4. Front speed sensor
● + 5. Front speed sensor bracket

**Rear speed sensor removal steps**

◆◆ 6. Rear toothed rotor
7. Clip
8. Cable band
9. Connection for rear speed sensor
◆◆ ◆◆ 10. Rear speed sensor
● +11. Rear speed sensor bracket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to “Service Points of Removal”.
(3) ● *: Refer to “Service Points of Installation”.

<AWD>




**Pre-removal Operation**
- Removal of the Splash Shield (Refer to GROUP 23–Fender.)

**Post-installation Operation**
@Installation of the Splash Shield (Refer to GROUP 23–Fender.)

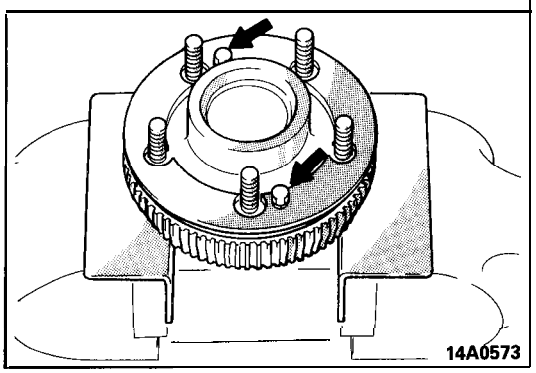
**Front speed sensor removal steps**

◆■▶ 1. Front toothed rotor
2. Clip
3. Front speed sensor connection
◆■▶◆ 4. Front speed sensor
● 5. Front speed sensor bracket

**Rear speed sensor removal steps**

6. Rear toothed rotor (Refer to GROUP 27–Rear Axle Hub.)
7. Clip
8. Cable band
9. Rear speed sensor connection
◆■▶◆ 10. Rear speed sensor
12. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆■▶: Refer to "Service Points of Removal".
(3) ▶◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

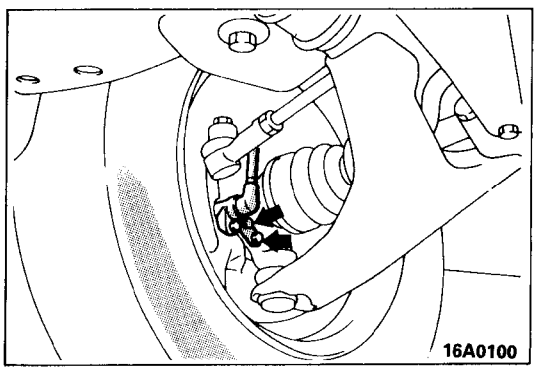



## SERVICE POINTS OF REMOVAL

### 1. REMOVAL OF THE FRONT TOOTHED ROTOR

Refer to GROUP Z-Hub and Knuckle.

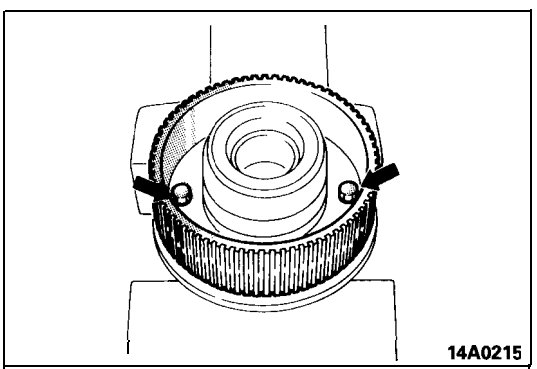
**Caution**
**Care must be taken not to scratch or scar the rotor's toothed surface, and not to drop it.**
**If the rotor's toothed surface is chipped or the rotor is deformed, it might not be able to accurately sense the wheel rotation speed and the system as a result might not perform normally.**




### 4. REMOVAL OF FRONT SPEED SENSOR

Remove the mounting bolts which hold the speed sensor bracket to the knuckle, and then remove the speed sensor.

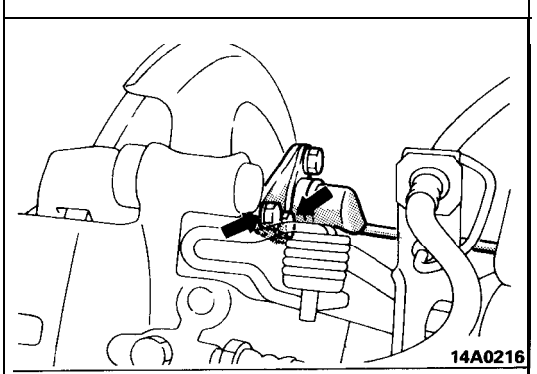
**Caution**
**Be careful when handling the pole piece at the tip of the speed sensor and the toothed edge of the rotor so as not to damage them by striking against other parts.**




### 6. REMOVAL OF REAR TOOTHED ROTOR

For FWD vehicles refer to GROUP 17–Rear Axle Hub, for AWD vehicles refer to GROUP 3–Axle Shaft.

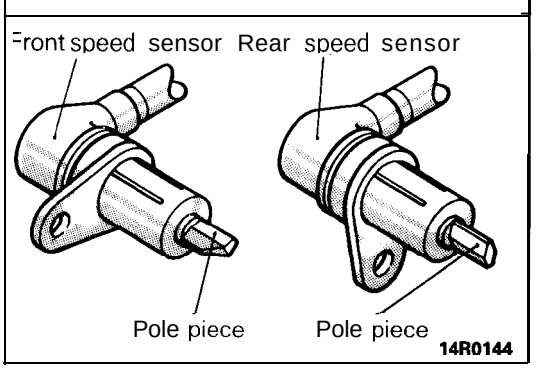
**Caution**
**Care must be taken not to scratch or scar the rotor's toothed surface, and not to drop it.**
**If the rotor's toothed surface is chipped or the rotor is deformed, it might not be able to accurately sense the wheel rotation speed and the system as a result might not perform normally.**




### 10. REMOVAL OF REAR SPEED SENSOR

Remove the speed sensor bracket and rear axle spindle installation nut, and then remove the speed sensor.

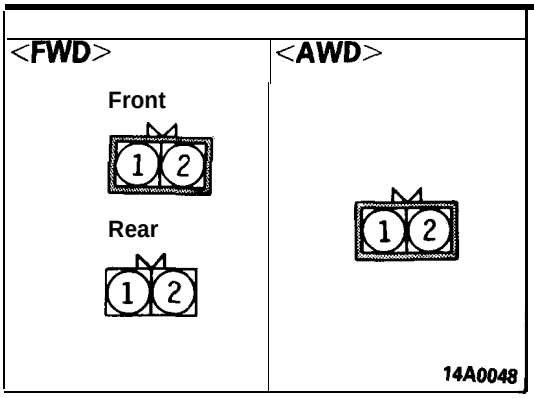
**Caution**
**Be careful when handling the pole piece at the tip of the speed sensor and the toothed edge of the rotor so as not to damage them by striking against other parts.**




## INSPECTION

### SPEED SENSOR CHECK

(1) Check whether any metallic foreign material has adhered to the pole piece at the speed sensor tip, and, is so, remove it. Also check whether the pole piece is damaged, and, if so, replace it with a new one.




NOTE
The pole piece can become magnetized because of the magnet built into the speed sensor, with the result that metallic foreign material easily adheres to it. Moreover, the pole piece may not be able to function to correctly sense the wheel rotation speed if it is damaged.

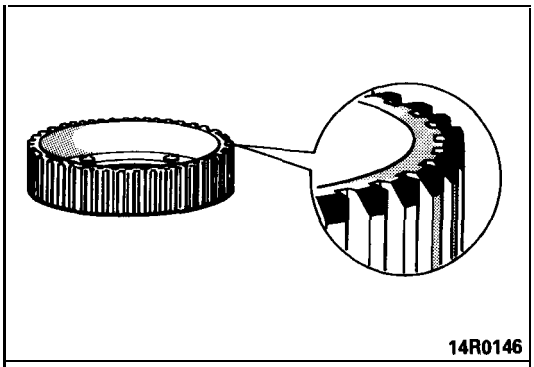
(2) Measure the resistance between the speed sensor terminals.

**Standard value: 0.8–1.2 kΩ**

If. the internal resistance of the speed sensor is not within the standard value, replace it with a new speed sensor.

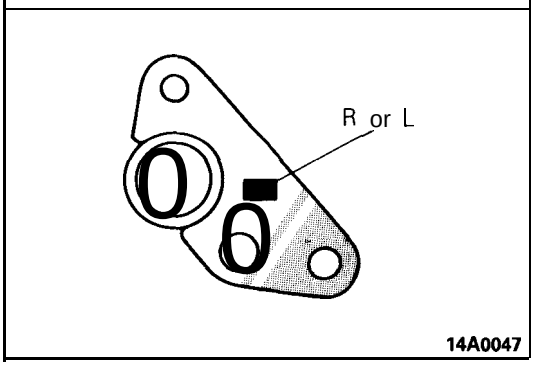
(3) Check the speed sensor cable for breakage, damage or disconnection; replace with a new one if a problem is found.

NOTE
When checking for cable damage, remove the cable clamp part from the body and then bend and pull the cable near the clamp to check whether or not temporary disconnection occurs.




**TOOTHED ROTOR CHECK**

Check whether rotor teeth are broken or deformed, and, if so, replace the rotor.



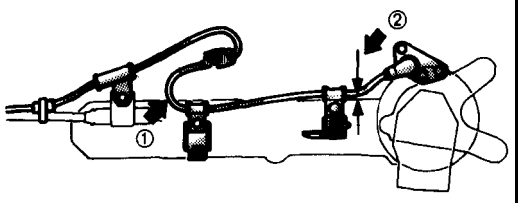

## SERVICE POINTS OF INSTALLATION

### 11. INSTALLATION OF REAR SPEED SENSOR BRACKET

Assemble the speed sensor and the speed sensor bracket.

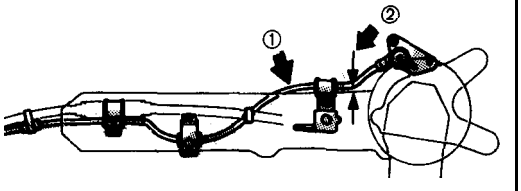
NOTE
The shape is different for the left and right speed sensor brackets. Each bracket has an identification symbol, so be sure to note these symbols and install correctly.
R: Indicates that the bracket is for the right wheel.
L: Indicates that the bracket is for the left wheel.

Left side view
Right side

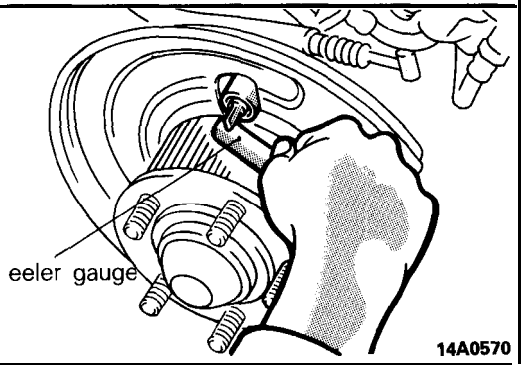



14A0045

Left side view
Left side




14A0046




14A0570

## 10. INSTALLATION OF REAR SPEED SENSOR <FWD>

(1) Temporarily install the speed sensor to the rear axle spindle.

**Caution**
**Be careful when handling the pole piece at the tip of the speed sensor and the toothed edge of the rotor so as not to damage them by striking against metal objects.**

(2) Note the following points when connecting the speed sensor cable, and secure the cable by the clip.
① Secure the clip so that the white-painted part (shaded in the illustration) of the speed sensor cable is not twisted.
② Be sure that there is space (where shown in the illustration) so that the trailing arm and speed sensor cable do not contact, and then secure by the clip.

**Caution**
**Because there is the possibility of damage to the cable during driving if the speed sensor cable and the trailing arm come into contact, or if the speed sensor cable is twisted, care must be taken regarding this point.**

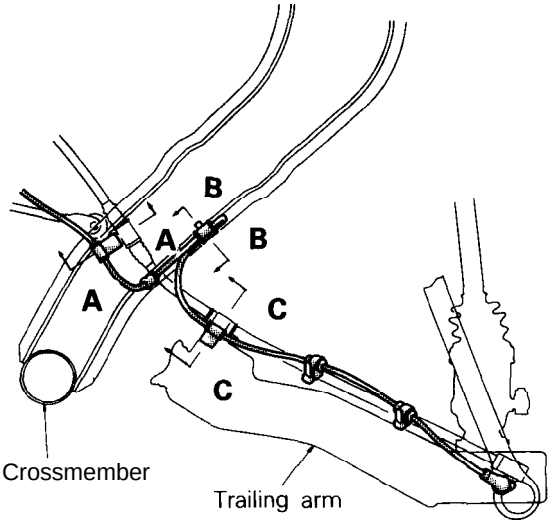
(3) Insert a feeler gauge into the space between the speed sensor's pole piece and the rotor's toothed surface, and then tighten the speed sensors at the position where the clearance is the standard value.

**Standard value: 0.3–0.9 mm (.012–.035 in.)**

NOTE
Check to be sure that there is no contact of the speed sensor's pole piece and the rotor's toothed surface when the rear hub assembly is slowly rotated one time. If there is contact, it is probable that the rotor or the rear hub is installed incorrectly, recheck installation.

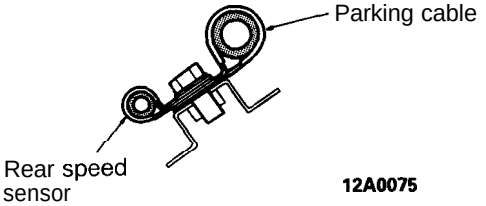
## 10. INSTALLATION OF REAR SPEED SENSOR <AWD>

Install the rear speed sensors as shown in the illustration.



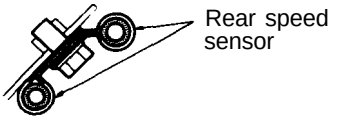

12A0074

Cross-section A-A



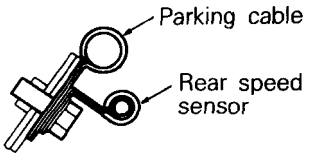

12A0075

Cross-section B-B

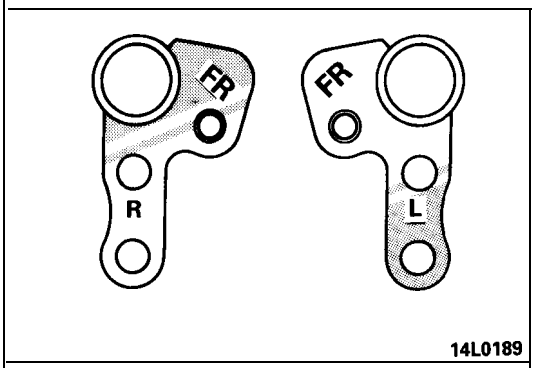



12A0076

Cross-section C-C




12A0077



14L0189

## 5. INSTALLATION OF FRONT SPEED SENSOR BRACKET

Assemble the speed sensor and the speed sensor bracket.

NOTE

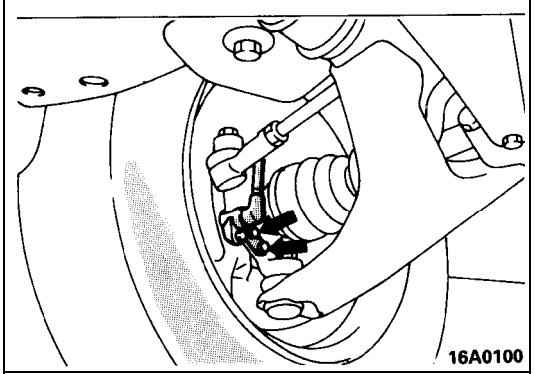
(1) The shape is different for the left and right speed sensor brackets. Each bracket has an identification symbol, so be sure to note these symbols and install correctly.
FR: Indicates that the bracket is for the front speed sensor.
R: Indicates that the bracket is for the right wheel.
L: Indicates that the bracket is for the left wheel.

(2) Check to be sure, when installing the speed sensor to the bracket, that the letters "FR" are visible.

## 4. INSTALLATION OF FRONT SPEED SENSOR

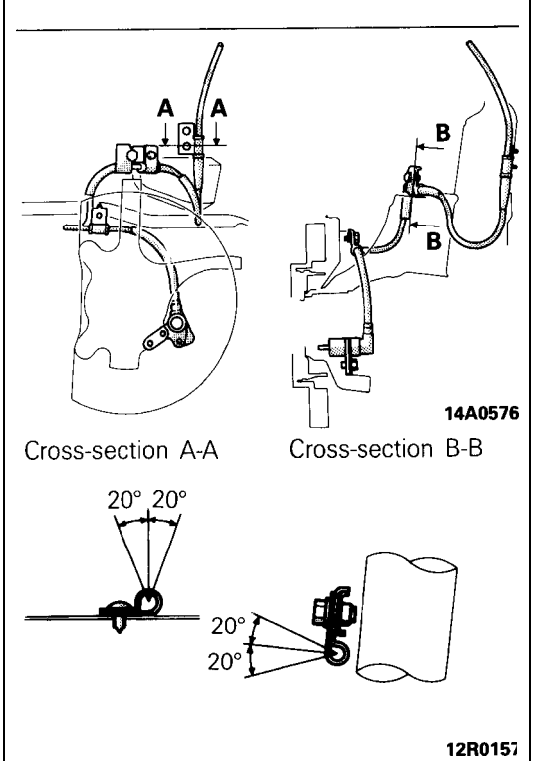
(1) Temporarily install the speed sensor to the knuckle.

**Caution**
**Be careful when handling the pole piece at the tip of the speed sensor and the toothed edge of the rotor so as not to damage them by striking against other parts.**


16A0100

(2) Note the following points when connecting the speed sensor cable, and secure the cable by the clip.
① Secure the cable by the clip so that the white-painted parts of the blackened parts (in the illustration) of the speed sensor cable are within the range of the angles indicated by cross-section A-A and cross-section B-B in the illustration.
② Check to be sure that the white-painted part (shaded in the illustration) of the speed sensor cable is not twisted.

**Caution**
**Because there is the possibility of damage to the cable during driving if the speed sensor cable is twisted, care must be taken regarding this point.**



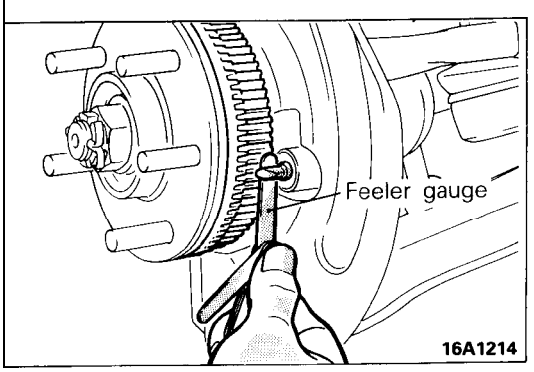
14A0576
Cross-section A-A
Cross-section B-B
12R0157

(3) Insert a feeler gauge into the space between the speed sensor's pole piece and the rotor's toothed surface, and then tighten the speed sensor at the position where the clearance is the standard value all around.

**Standard value: 0.3–0.9 mm (.012–.035 in.)**

NOTE

If the clearance between the speed sensor's pole piece and the rotor's toothed surface is not within the standard value range, it is probable that the rotor is incorrectly installed, recheck installation.



16A1214

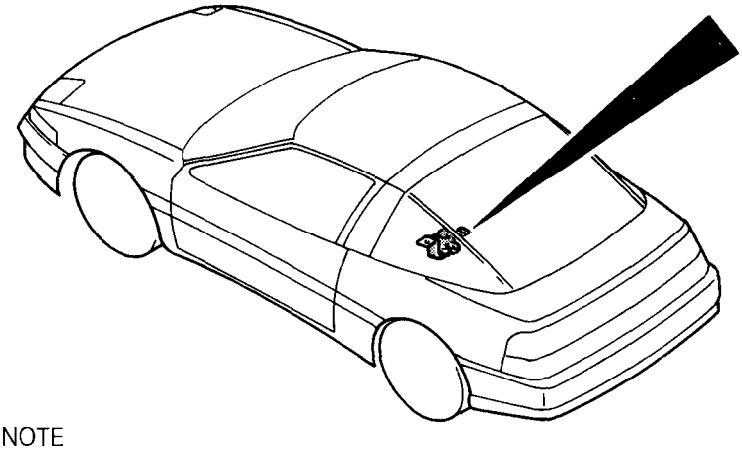
# G-SENSOR <AWD-ABS>

N050VAB

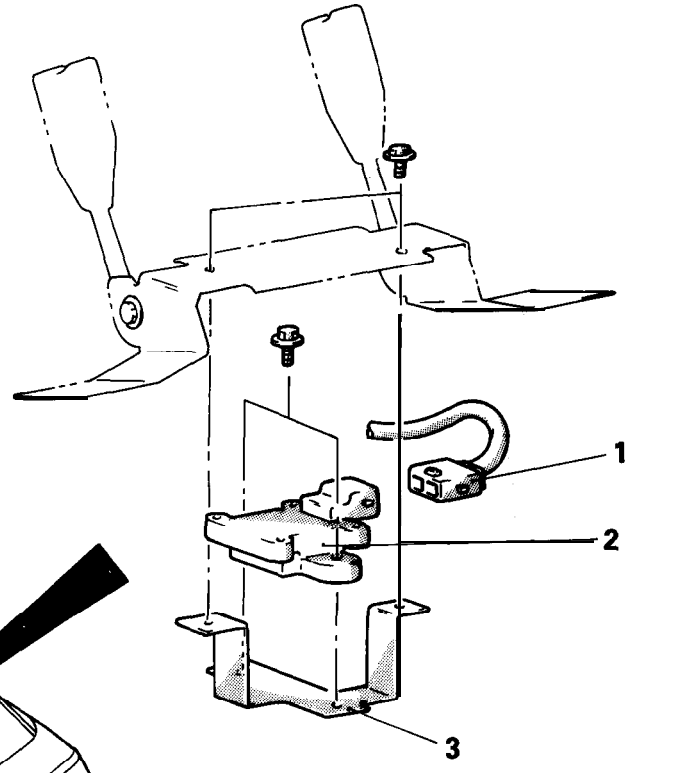
## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Rear Seat
  (Refer to GROUP 23–Seat.)

**Post-installation Operation**
- Installation of Rear Seat
  (Refer to GROUP 23–Seat.)

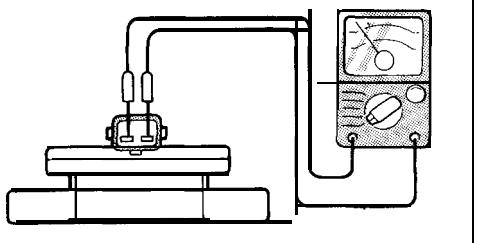


NOTE
Reverse the removal procedures to reinstall.

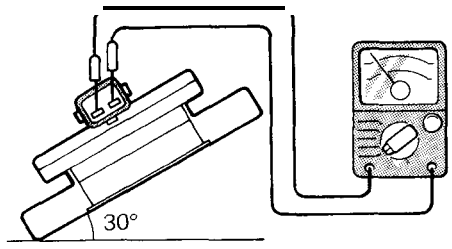



14A0565

**G-sensor removal steps**
1. Wiring harness connector
2. G-sensor
3. G-sensor bracket



14A0194

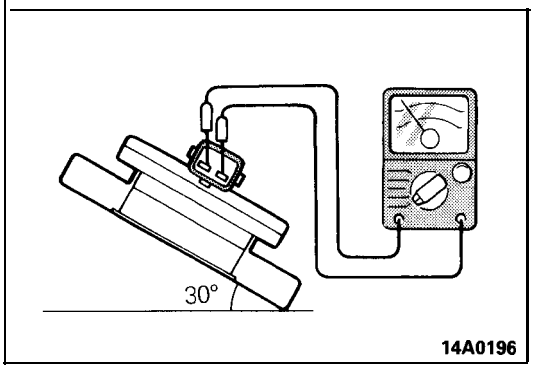



14A0195

## INSPECTION

(1) Place the sensor on a level surface, then check that there is conductance between the terminals.

(2) Slowly inclining the G-sensor in the direction of forward vehicle travel, check that there is no conductance above a sensor angle of 30 degrees.




(3) Slowly inclining the G-sensor in the direction of reverse vehicle travel, check that there is no conductance above a sensor angle of 30 degrees.

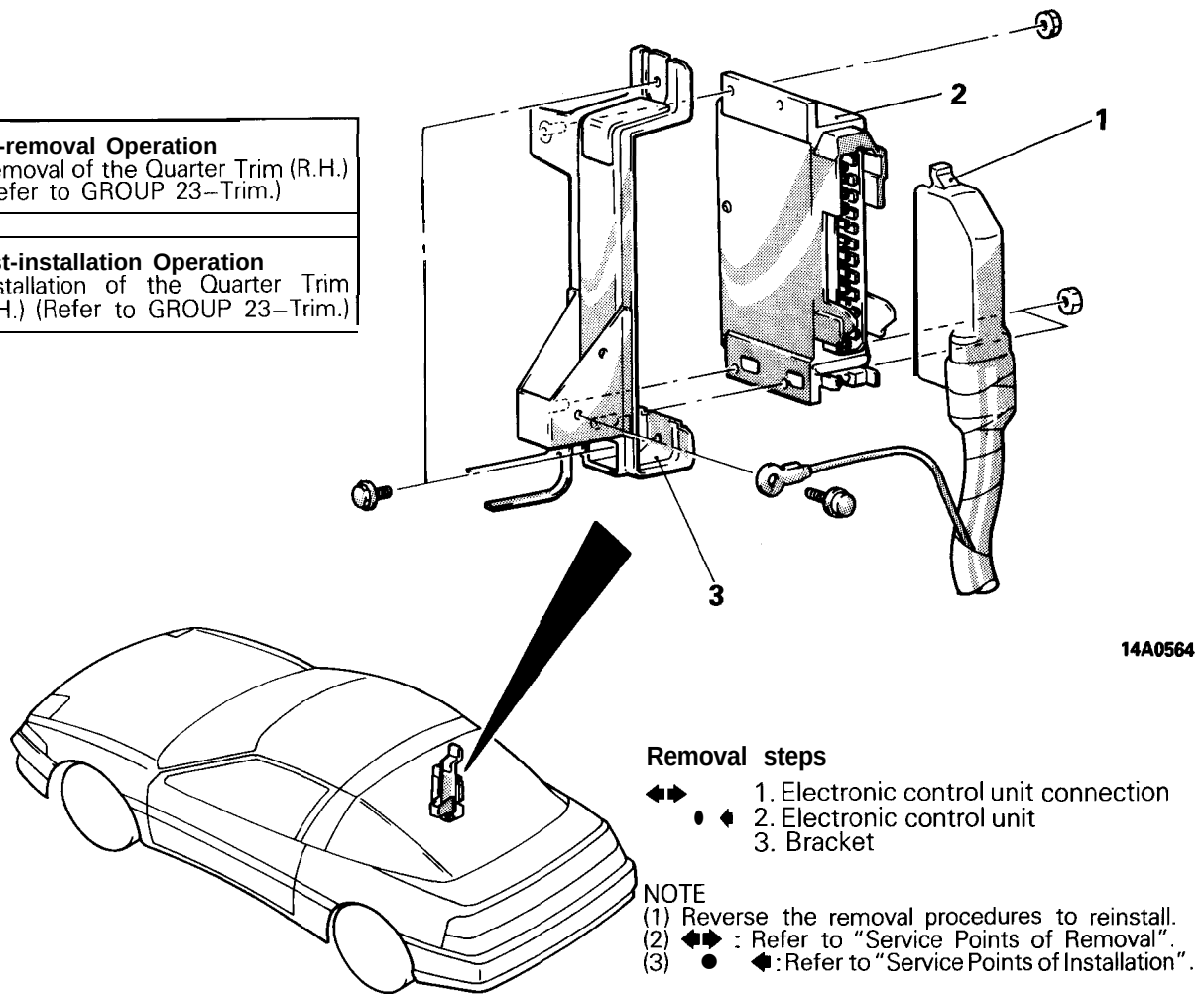
# ELECTRONIC CONTROL UNIT <VEHICLES WITH ABS>

N05OZAE

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of the Quarter Trim (R.H.) (Refer to GROUP 23–Trim.)

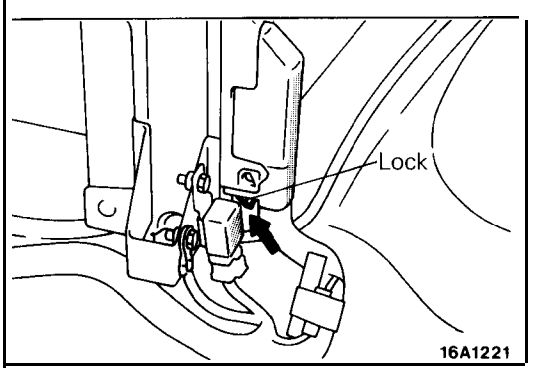
**Post-installation Operation**
- Installation of the Quarter Trim (R.H.) (Refer to GROUP 23–Trim.)




**Removal steps**

◆◆ 1. Electronic control unit connection
● ◆ 2. Electronic control unit
3. Bracket

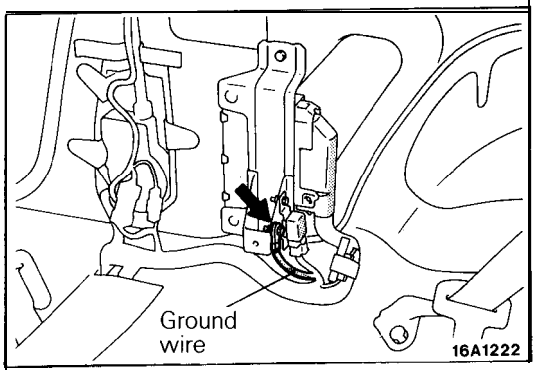
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● ◆ : Refer to "Service Points of Installation".




## SERVICE POINTS OF REMOVAL

### 1. DISCONNECTION OF ELECTRONIC CONTROL UNIT

Unlock the connector and take the connector out.




## SERVICE POINTS OF INSTALLATION

### 2. INSTALLATION OF ELECTRONIC CONTROL UNIT

When installing the electronic control unit to the bracket, fasten the connector's ground wire to the bracket.
After connecting the connector to the electronic control unit, secure the connector by the holding spring.

# PARKING BRAKES

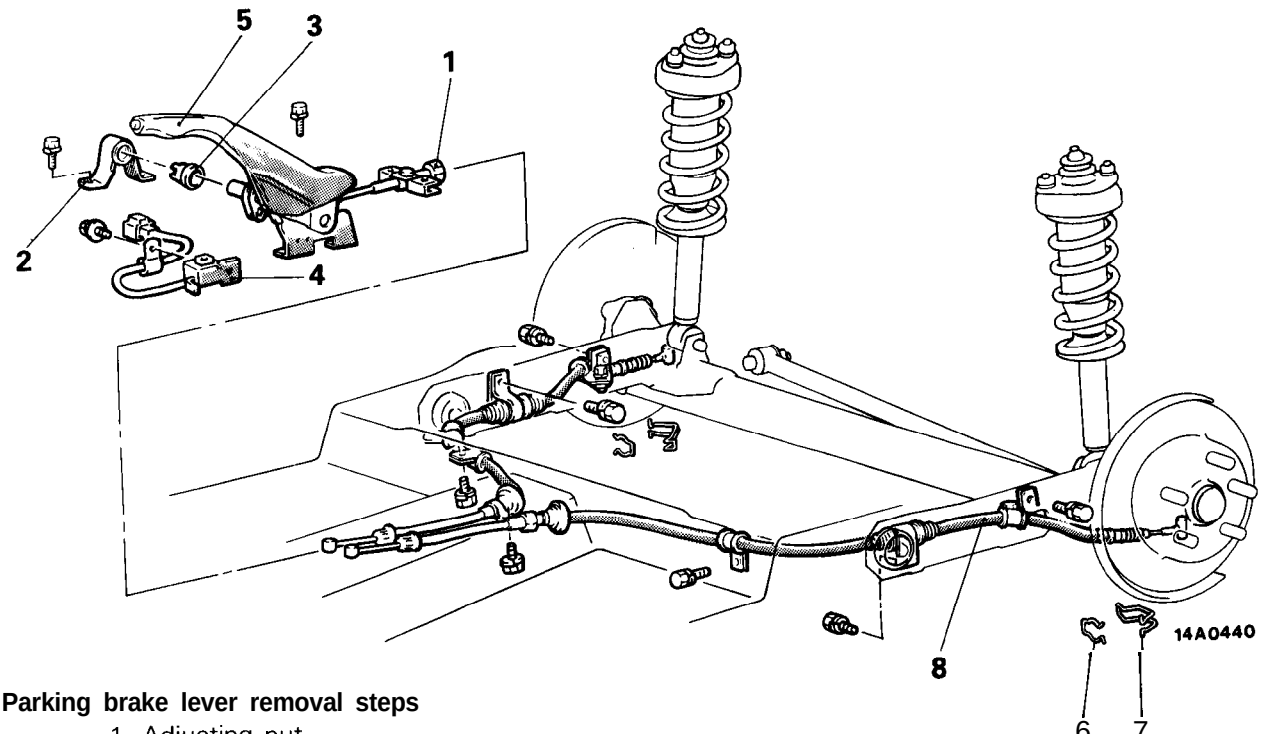
## REMOVAL AND INSTALLATION

N05YA--

**Pre-removal Operation**
- Removal of Floor Console
  (Refer to GROUP 23–Floor Console.)

**Post-installation Operation**
- Parking Brake Lever Stroke Adjustment
  (Refer to P.5–42.)
- Installation of Floor Console
  (Refer to GROUP 23–Floor Console.)

<FWD>

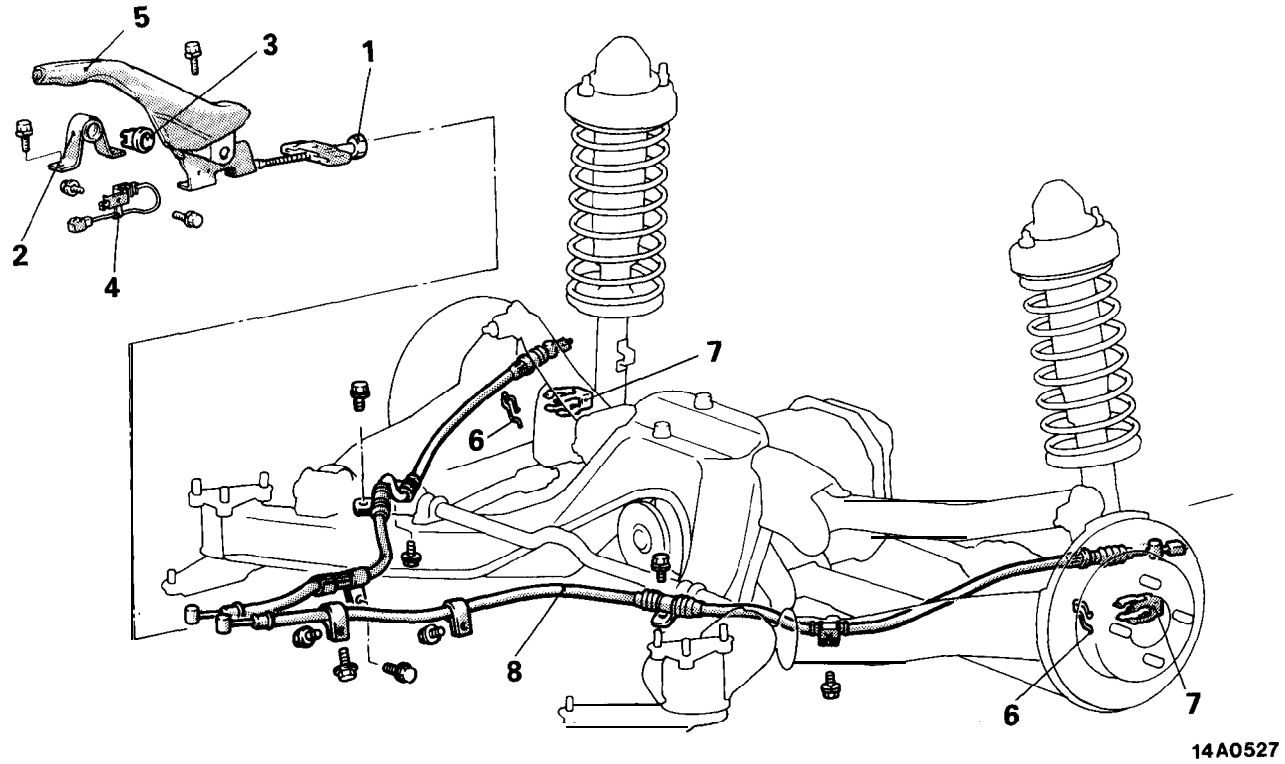



**Parking brake lever removal steps**
1. Adjusting nut
2. Parking brake stay
● ◀3. Bushing
4. Parking brake switch
▶◀ 5. Parking brake lever

**Parking brake cable removal steps**
1. Adjusting nut
◀▶ 6. Parking clip
◀▶ 7. Retainer spring
● ◀8. Parking brake cable

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀▶ : Refer to "Service Points of Removal".
(3) ▶◀ : Refer to "Service Points of Installation".

<AWD>



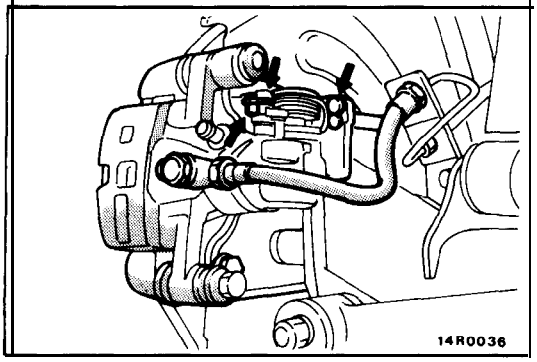

**Pre-removal Operation**
- Removal of Floor Console (Refer to GROUP 23–Floor Console)

**Post-installation Operation**
- Parking Brake Lever Stroke Adjustment (Refer to P.5–42.)
- Installation of Floor Console (Refer to GROUP 23–Floor Console.)

**Removal steps of the parking brake lever**
1. Adjusting nut
2. Parking brake stay
3. Bushing
4. Parking brake switch
5. Parking brake lever

**Removal steps of the parking brake cable**
1. Adjusting nut
6. Parking clip
7. Retainer spring
8. Parking brake cable

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● ◆ : Refer to "Service Points of Installation".



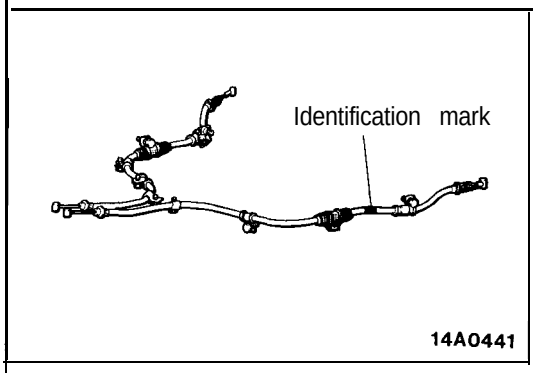

## SERVICE POINTS OF REMOVAL N05YBAJ

**6. REMOVAL** OF PARKING **CLIP/7.** RETAINER SPRING

Remove the parking clip and retainer spring and disconnect the parking brake cable from the rear brake assembly.

## INSPECTION N05YCAI

- Check the parking brake lever ratchet for wear.
- Check the parking brake lever for damage and operation.




## SERVICE POINTS OF INSTALLATION N05YDAKa

### 8. INSTALLATION OF PARKING BRAKE CABLE

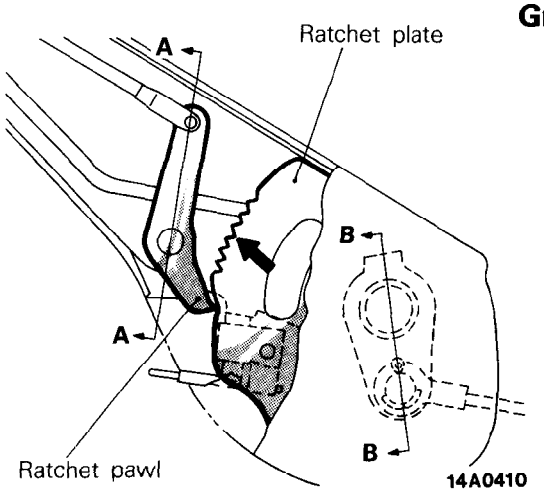
Check the parking brake cables for an identification mark and install as appropriate on the left and right sides.

| Item | | FWD | AWD |
|---|---|---|---|
| Identification mark | Left side | None | Yellow |
| | Right side | White | Orange |

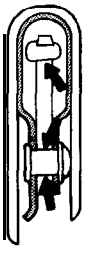
### 5. APPLICATION OF GREASE TO PARKING BRAKE LEVER

Apply a coating of the specified grease to each sliding parts of the ratchet plate or the ratchet pawl.

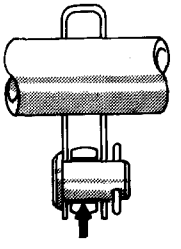
**Grease: MOPAR Multi-mileage Lubricant**
**Part No. 2525035 or equivalent**

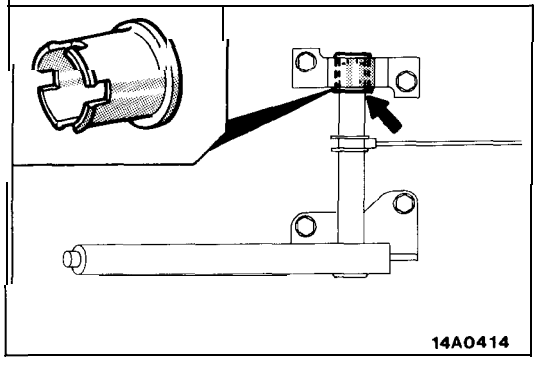



Cross-section A-A




Cross-section B-B




### 3. APPLICATION OF GREASE TO BUSHING

Apply a coating of the specified grease to the inner surface of the bushing.

**Grease: MOPAR Multi-mileage Lubricant**
**Part No. 2525035 or equivalent**

# CLUTCH

## CONTENTS

N06AA--


**CLUTCH CONTROL** ..... 9

**CLUTCH COVER AND DISC** ..... 16

**CLUTCH MASTER CYLINDER** ..... 11

**CLUTCH PEDAL** ..... 7

**CLUTCH RELEASE CYLINDER** ..... 13

**SERVICE ADJUSTMENT PROCEDURES** ..... 5

- Bleeding ..... 6
- Clutch Pedal Inspection and Adjustment . . . . 5

**SPECIAL TOOL** ..... 3

**SPECIFICATIONS** ..... 2

- General Specifications ..... 2
- Lubricants ..... 3
- Service Specifications ..... 2
- Torque Specifications ..... 3

**TROUBLESHOOTING** ..... 4

- Clutch chatters
- Clutch noise
- Clutch pedal feels “heavy”
- Clutch slips
- Gear shift malfunction


**CAUTION**
**When servicing clutch assemblies or components for vehicles with 1.8L engine, do NOT create dust by sanding or by cleaning clutch parts with a dry brush or with compressed air. (A water dampened cloth should be used). The clutch disc contains “Asbestos Fibers” which can become airborne if dust is created during service operations. Breathing dust containing “Asbestos Fibers” may cause serious bodily harm.**

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N06CA--

| Items | 1.8L Engine | 2.0L DOHC Engine <Non Turbo> | 2.0L DOHC Engine <Turbo> |
|---|---|---|---|
| Clutch operating method | Hydraulic type | Hydraulic type | Hydraulic type |
| Clutch disc* | | | |
| Type | Single dry disc type | Single dry disc type | Single dry disc type |
| Facing diameter | | | |
| O.D. x I.D. mm (in.) | 200 x130 (7.9 x 5.1) | 215 x140 (8.5 x 5.5) | 225 x150 (8.9 x 5.9) |
| Clutch cover assembly | | | |
| Type | Diaphragm spring strap drive type | Diaphragm spring strap drive type | Diaphragm spring strap drive type |
| Clutch release cylinder | | | |
| I.D. mm (in.) | 20.64 (13/16) | 20.64 (13/16) | 19.05 (3/4) |
| Clutch master cylinder | | | |
| I.D. mm (in.) | 15.87 (5/8) | 15.87 (5/8) | 15.87 (5/8) |

NOTE
*: Non-asbestos discs on vehicles with 2.0L DOHC Engine.

## SERVICE SPECIFICATIONS

N06CB--

| Items | Specifications |
|---|---|
| Standard value | |
| Clutch pedal height mm (in.) | 176.0–181.0 (6.93-7.13) |
| Clutch pedal clevis pin play mm (in.) | 1–3 (.04–.12) |
| Clutch pedal free play mm (in.) | 6-13 (.24–.51) |
| Distance between the clutch pedal and the firewall when the clutch is disengaged mm (in.) | 55 (2.2) or more |
| Limit | |
| Facing rivet sink mm (in.) | 0.3 (.012) |
| Diaphragm spring end height difference mm (in.) | 0.5 (.02) |

## TORQUE SPECIFICATIONS

N06CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Clutch pedal to clutch pedal support bracket | 20–25 | 14-18 |
| Clutch pedal support bracket | 8-12 | 6-9 |
| Clutch pedal support bracket to firewall | 10–15 | 7–11 |
| Stop light switch | 10–15 | 7-11 |
| Brake booster installation nut | 11-17 | 8-12 |
| Master cylinder to firewall | 10–15 | 7-11 |
| Pedal rod to clutch pedal support bracket | 17–26 | 12-19 |
| Clutch pedal bracket | 8–12 | 6-9 |
| Pedal rod to clutch pedal bracket | 17-26 | 12-19 |
| Clutch tube flare nut | 13-17 | 9-12 |
| Air cleaner bracket | 8-12 | 6-9 |
| Clutch tube clamp to body | 8–12 | 6-9 |
| Reservoir band | 5-7 | 4-5 |
| Clutch release cylinder | 15-22 | 11–16 |
| Clutch release cylinder to union bolt | 25 | 18 |
| Bleeder plug | 9-13 | 7-9 |
| Fulcrum | 35-42 | 25–30 |
| Clutch cover assembly | 15-22 | 11–16 |

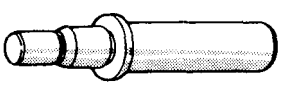
## LUBRICANTS

N06CD--

| Items | Specified lubricants |
|---|---|
| Contact surface of release bearing and fulcrum of clutch release fork<br>Inner surface of clutch release bearing<br>Inner surface of clutch disc spline<br>Contact portion of release fork to release cylinder push rod<br>Bushing, clevis pin, washer and bushing | MOPAR Multi-mileage Lubricant<br>Part No. 2525035 or equivalent |
| Inner surface of clutch release cylinder and outer circumference of piston and cup<br>Inner surface of clutch master cylinder and outer circumference of piston assembly | MOPAR Brake Fluid/Conforming to DOT3 |

## SPECIAL TOOL

N06DA--

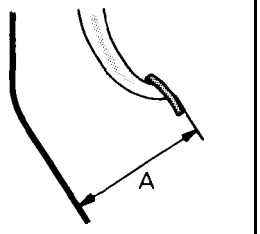
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998126 | Clutch disc center guide | Clutch disc center hole alignment |

# TROUBLESHOOTING

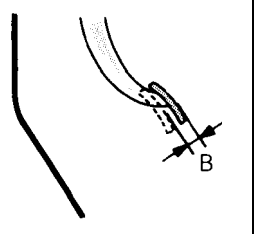
N06EAAJ

| Symptom | Probable cause | Remedy |
|---|---|---|
| Clutch slips | Insufficient clutch pedal play | Adjust |
| | Excessive wear of clutch disc facing | Replace |
| | Hardening of clutch disc facing, or adhesion of oil | Replace |
| | Clutch release fork catching | Repair or replace parts |
| | Weak or damaged diaphragm spring | Replace |
| | Clogging of hydraulic system | Repair or replace parts |
| Gear shift malfunction | Excessive clutch pedal play | Adjust |
| | Distorted clutch disc, excessive oscillation | Replace |
| | Clutch cover assembly worn | Replace |
| | Clutch disc spline worn or corroded | Replace |
| | Clutch disc facing peeling | Replace |
| | Clutch release bearing worn | Replace |
| | Damaged pressure plate or flywheel | Replace |
| | Leakage, air introduction or clogging of hydraulic system | Repair or replace parts |
| Clutch noise | Insufficient clutch pedal play | Adjust |
| | Improper installation of clutch cover assembly | Repair or replace parts |
| | Excessive wear of clutch disc facing | Replace |
| | Clutch release fork catching | Repair or replace parts |
| | Clutch release bearing worn | Replace |
| | Weak or damaged torsion spring | Replace |
| | Damaged pilot bushing | Replace |
| | Insufficient lubrication of bearing sleeve sliding surface | Repair |
| Clutch pedal feels “heavy” | Insufficient lubrication of clutch pedal | Repair |
| | Insufficient lubrication of clutch disc spline | Repair |
| | Clutch release fork catching | Repair or replace parts |
| | Insufficient lubrication of bearing sleeve sliding surface | Repair |
| Clutch chatters | Worn or damaged clutch disc facing | Replace |
| | Oil adhered to clutch disc facing | Replace |
| | Uneven height of diaphragm spring | Repair or replace parts |
| | Weak or damaged torsion spring | Replace |
| | Damaged pressure plate or flywheel | Replace |
| | Loose or damaged mounting | Replace or tighten mounting |

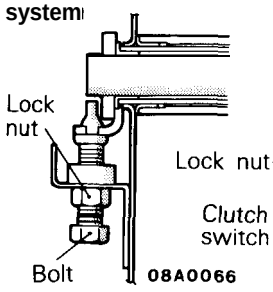
Clutch pedal height



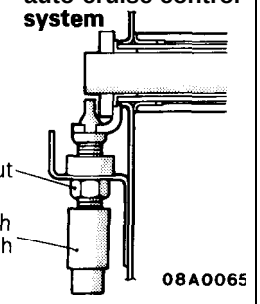

Clutch pedal clevis pin play




Vehicles without auto-cruise control system

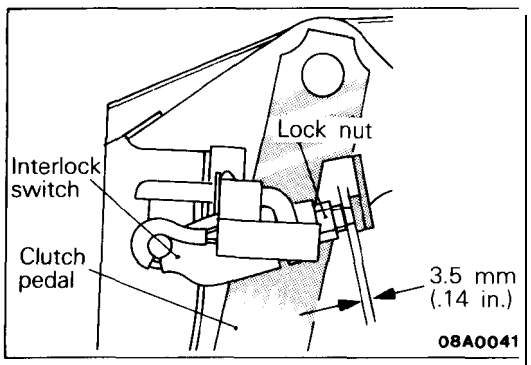



Vehicles with auto-cruise control system

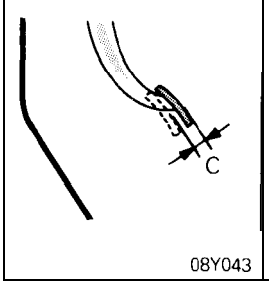




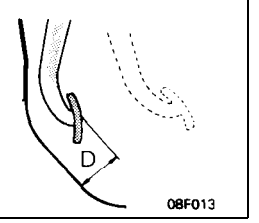





Clutch pedal free play




Distance between the clutch pedal and the firewall when the clutch is disengaged




# SERVICE ADJUSTMENT PROCEDURES

## CLUTCH PEDAL INSPECTION AND ADJUSTMENT

N06FAAK

1. Measure the clutch pedal height (from the face of the pedal pad to the firewall) and the clutch pedal clevis pin play (measured at the face of the pedal pad.)

   **Standard value (A): 176.0–181.0 mm (6.93–7.13 in.)**
   **Standard value (B): 1–3 mm (.04–.12 in.)**

2. If either the clutch pedal height or the clutch pedal clevis pin play are not within the standard value range, adjust as follows :
   (1) For vehicles without auto-cruise control system, turn and adjust the bolt so that the pedal height is the standard value, and then secure by tightening the lock nut.

   Vehicles with auto-cruise control system, disconnect the clutch switch connector and turn the switch for standard clutch pedal height. Then lock with the lock nut.

   NOTE
   When the pedal height is lower than the standard value, loosen the bolt or clutch switch, and then turn the push rod to make the adjustment. After making the adjustment, tighten the bolt or clutch switch to reach the pedal stopper, and then lock with the lock nut.

   (2) Turn the push rod to adjust the clutch pedal clevis pin play to agree with the standard value and then secure the push rod with the lock nut.

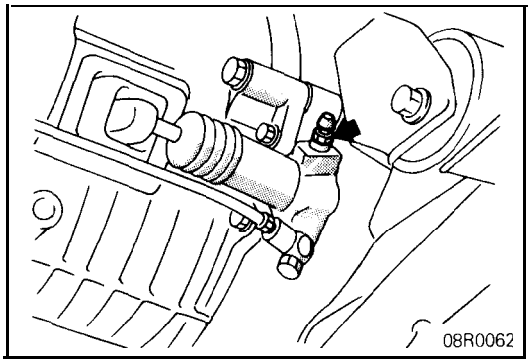
   **Caution**
   **When adjusting the pedal height or the clutch pedal clevis pin play, be careful not to push the push rod toward the master cylinder.**

3. Check to be sure that the interlock switch is as shown in the illustration when the clutch pedal is depressed its full stroke [151 mm (6.0 in.)]. If necessary, loosen the lock nut and adjust.

4. After completing the adjustments, confirm that the clutch pedal free play (measured at the face of the pedal pad) and the distance between the clutch pedal (the face of the pedal pad) and the firewall when the clutch is disengaged are within the standard value ranges.

   **Standard value (C): 6–13 mm (.24–.51 in.)**
   **Standard value (D): 55 mm (2.2 in.) or more**

5. If the clutch pedal free play and the distance between the clutch pedal and the firewall when the clutch is disengaged do not agree with the standard values, it is probably the result of either air in the hydraulic system or a faulty master cylinder or clutch. Bleed the air, or disassemble and inspect the master cylinder or clutch.




## BLEEDING N06FBAD

Whenever the clutch tube, the clutch hose, and/or the clutch master cylinder have been removed, or if the clutch pedal is spongy, bleed the system.

**Caution**

**Use the specified fluid. Avoid using a mixture of the specified fluid and other fluid.**

**Specified fluid: MOPAR Brake Fluid/Conforming to DOT3**

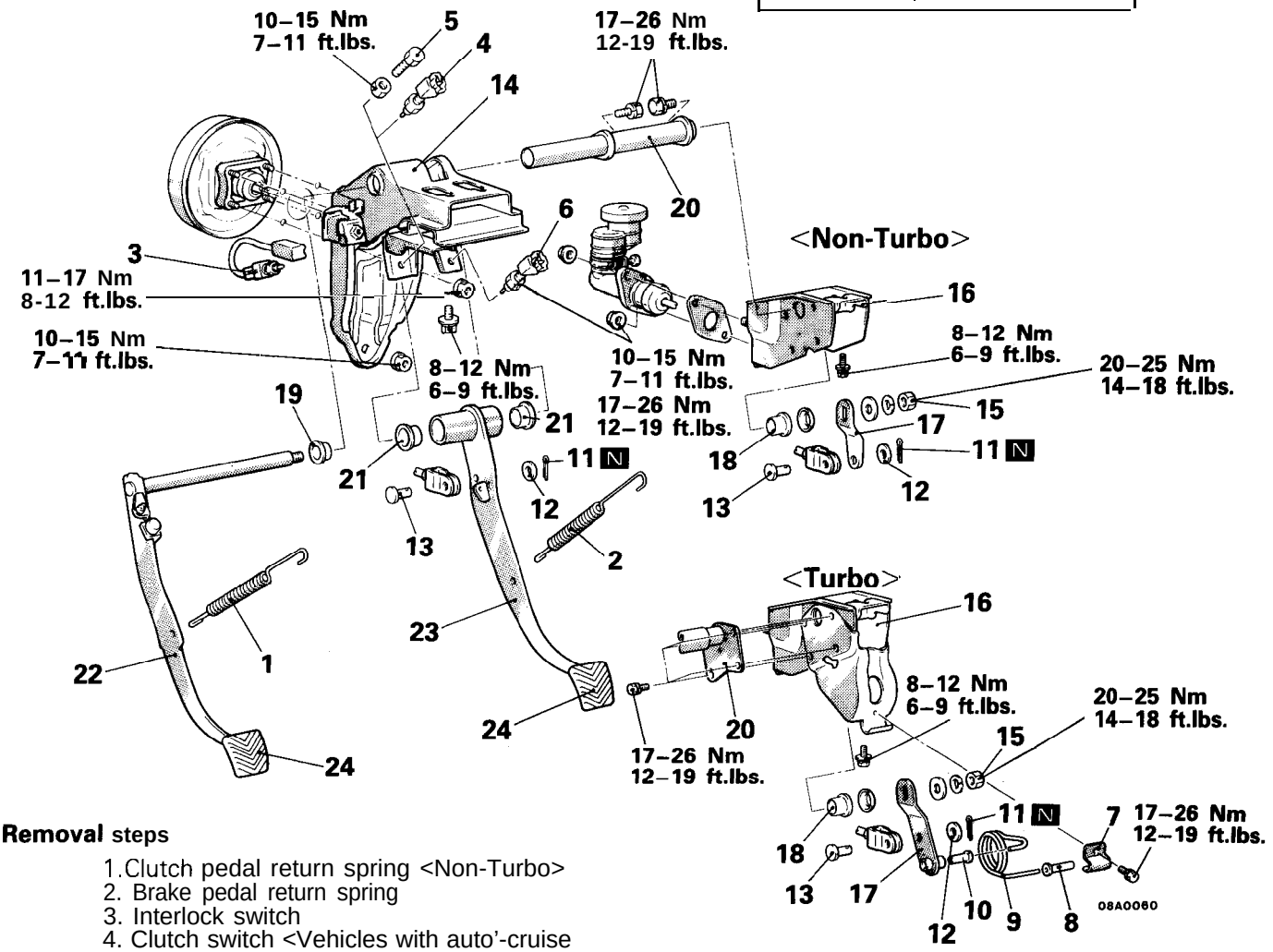
# CLUTCH PEDAL

## REMOVAL AND INSTALLATION

N06PA--

**Pre-removal Operation**
- Removal of the Lap Cooler Duct, Shower Duct (L.H.) and Knee Protector (Refer to GROUP 23–Instrument Panel.)
- Removal of the Steering Column Assembly (Refer to GROUP 19–Steering Wheel and Shaft.)
- Removal of the Relay Box (Indoor)

**Post-installation Operation**
- Installation of the Relay Box (Indoor)
- Installation of the Steering Column Assembly (Refer to GROUP 19–Steering Wheel and Shaft.)
- Installation of the Lap Cooler Duct, Shower Duct (L.H.) and Knee Protector (Refer to GROUP 23 Instrument Panel.)
- Adjustment of the Brake Pedal (Refer to GROUP 5–Service Adjustment Procedures.)
- Adjustment of the Clutch Pedal (Refer to P.6–5.)




**Removal steps**

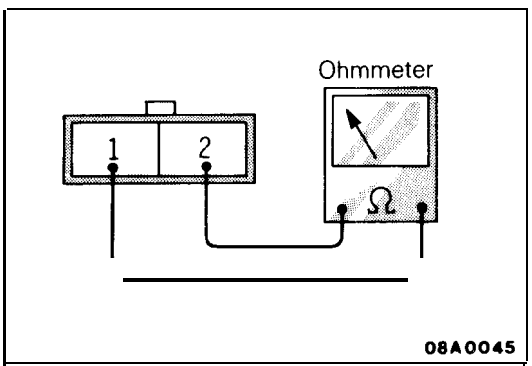
1. Clutch pedal return spring <Non-Turbo>
2. Brake pedal return spring
3. Interlock switch
4. Clutch switch <Vehicles with auto'-cruise control system>
5. Bolt <Vehicles without auto-cruise control system>
6. Stop light switch
7. Clip
- ● + 8. Bushing
9. Turn over spring
- ◆◆ 10. Bushing
11. Cotter pin
- ● + 12. Washer
- ● + 13. Clevis pin
14. Pedal support bracket assembly
15. Clutch pedal mounting nut
16. Clutch pedal bracket
17. Lever
- ● + 18. Clutch pedal bushing
- ◆◆ 19. Clutch pedal bushing
20. Pedal rod
- ◆◆ 21. Brake pedal bushings
22. Clutch pedal
23. Brake pedal
24. Pedal pad

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● ◆◆: Refer to "Service Points of Installation"
(3) N : Non-reusable parts

## INSPECTION

N06PCAG

- Check the pedal shaft and bushing for wear.
- Check the clutch pedal for bend or torsion.
- Check the return spring for damage or deterioration.
- Check the pedal pad for damage or wear.

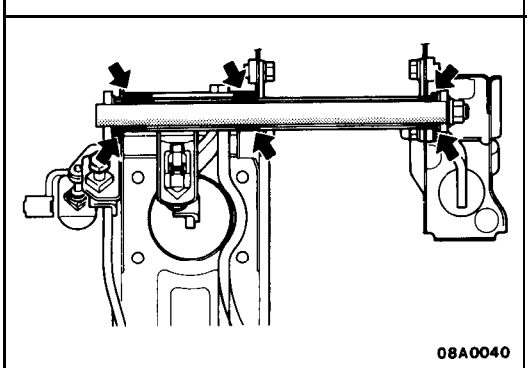



### • INTERLOCK SWITCH INSPECTION

(1) Disconnect the connector.
(2) Check to be sure that there is continuity between connector terminals 1 and 2 when the clutch pedal is depressed fully.

## SERVEICE POINTS OF INSTALLATION

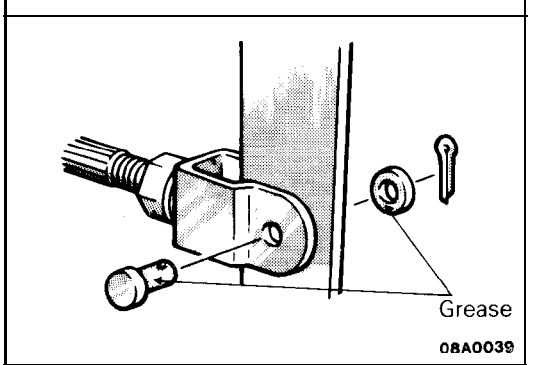
N06PDAU




### 21./19./18. APPLICATION OF GREASE TO BUSHING

Apply multipurpose grease to bushings.

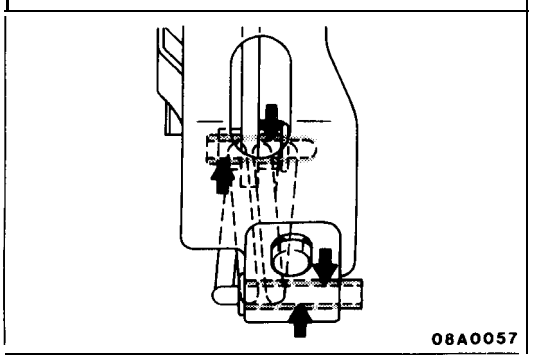
**Grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**




### 13. APPLICATION OF GREASE TO CLEVIS PIN/12. Washer

Apply multiporpose grease to the clevis pin and washer.

**Grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**




### 10./8. BUSH INSTALLATION <Turbo>

Apply multiporpose grease to the inside of the bushing.

**Grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**

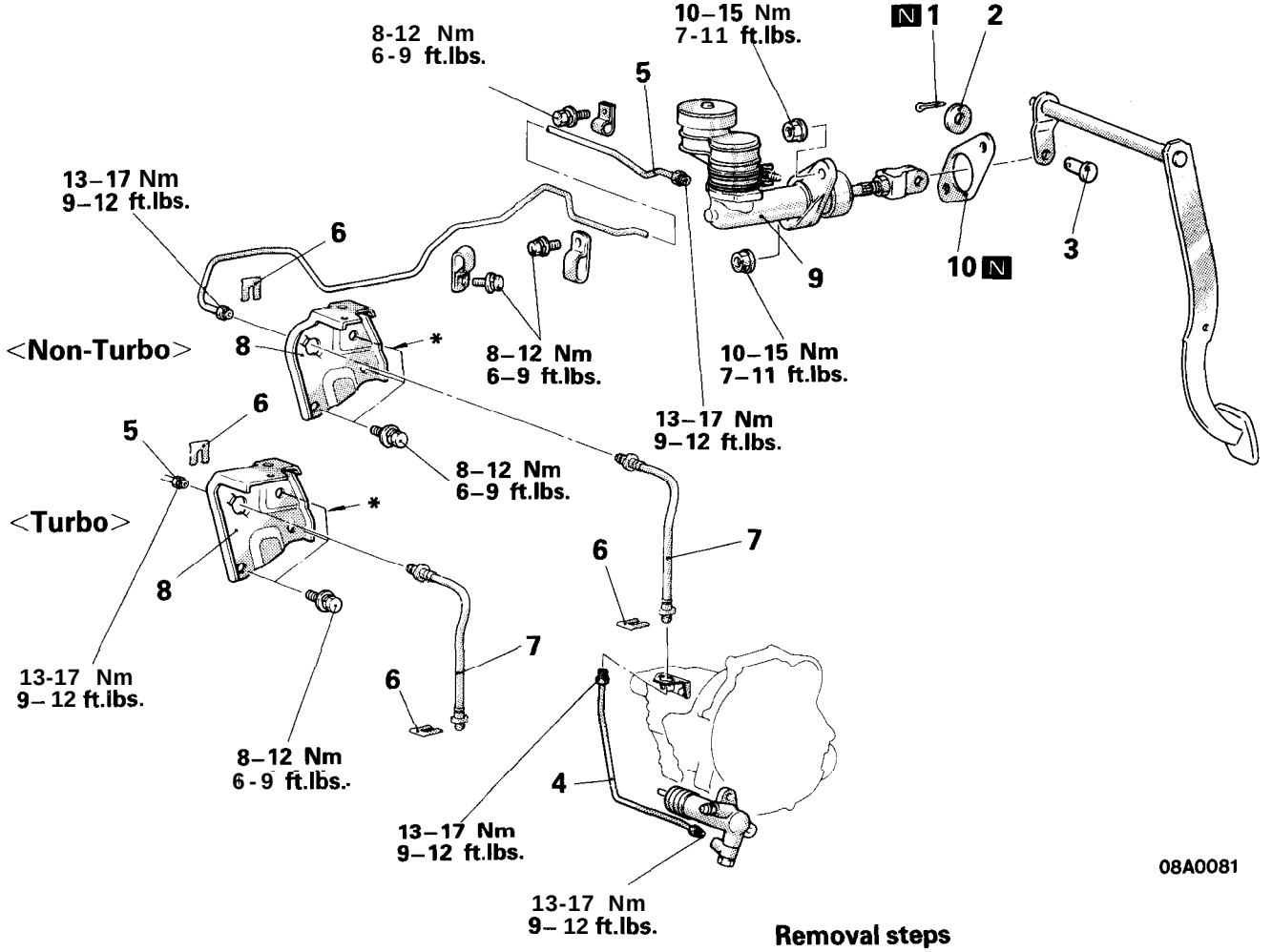
# CLUTCH CONTROL

## REMOVAL AND INSTALLATION

N06JA-

**Pre-removal Operation**
- Removal of the Air Cleaner (Refer to GROUP 11 – Air Cleaner.)
- Draining of the Clutch Fluid

**Post-installation Operation**
- Supplying of the Clutch Fluid
- Bleeding of the Clutch Line (Refer to P.6–6.)
- Adjustment of the Clutch Pedal (Refer to P.6–5.)
- Installation of the Air Cleaner (Refer to GROUP 11 – Air Cleaner.)

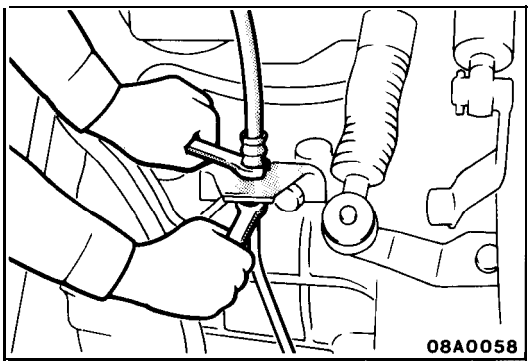


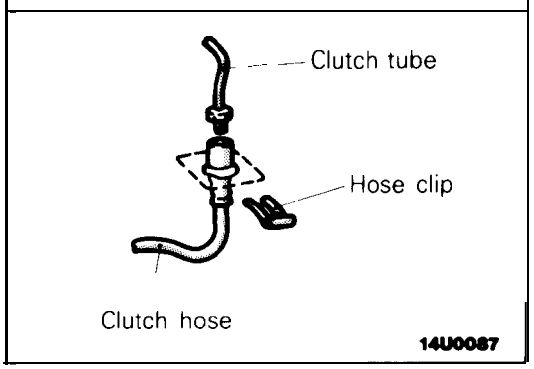

08A0081

**Removal steps**

1. Cotter pin
- ◀2. Washer
- ◀3. Clevis pin
- ◀4. Clutch tube
- ▶◀ 5. Clutch tube
- ◀▶ 6. Hose clips
- ◀▶ ▶◀ 7. Clutch hose
8. Air cleaner bracket
9. Clutch master cylinder
10. Sealer

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀▶ : Refer to "Service Points of Removal".
(3) ● ◀ : Refer to "Service Points of Installation".
(4) N : Non-reusable parts
(5) * : <Vehicles with ABS>




## SERVICE POINTS OF REMOVAL N06JBAD

### 6. DISCONNECTION OF HOSE CLIPS/7. CLUTCH HOSE

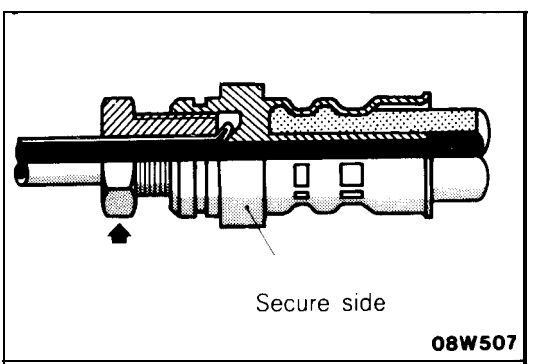
To disconnect clutch hose from the clutch tube, proceed as follows:

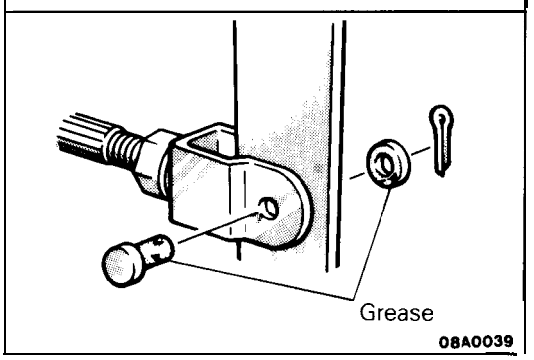
(1) Secure the nut on the clutch hose and loosen the flare nut on the clutch tube.

(2) Remove the clip from the clutch hose to remove clutch hose from bracket.

## INSPECTION N06JCAC

- Check the clutch hose or tube for cracks or clogging.




## SERVICE POINTS OF INSTALLATION N06JDAJ

### 7. INSTALLATION OF CLUTCH HOSE/5. CLUTCH TUBE/4. CLUTCH TUBE

Temporarily tighten the flare nut by hand, and then tighten it to the specified torque, being careful that the clutch hose does not become twisted.

### 3. APPLICATION OF GREASE TO CLEVIS PIN/2. WASHER

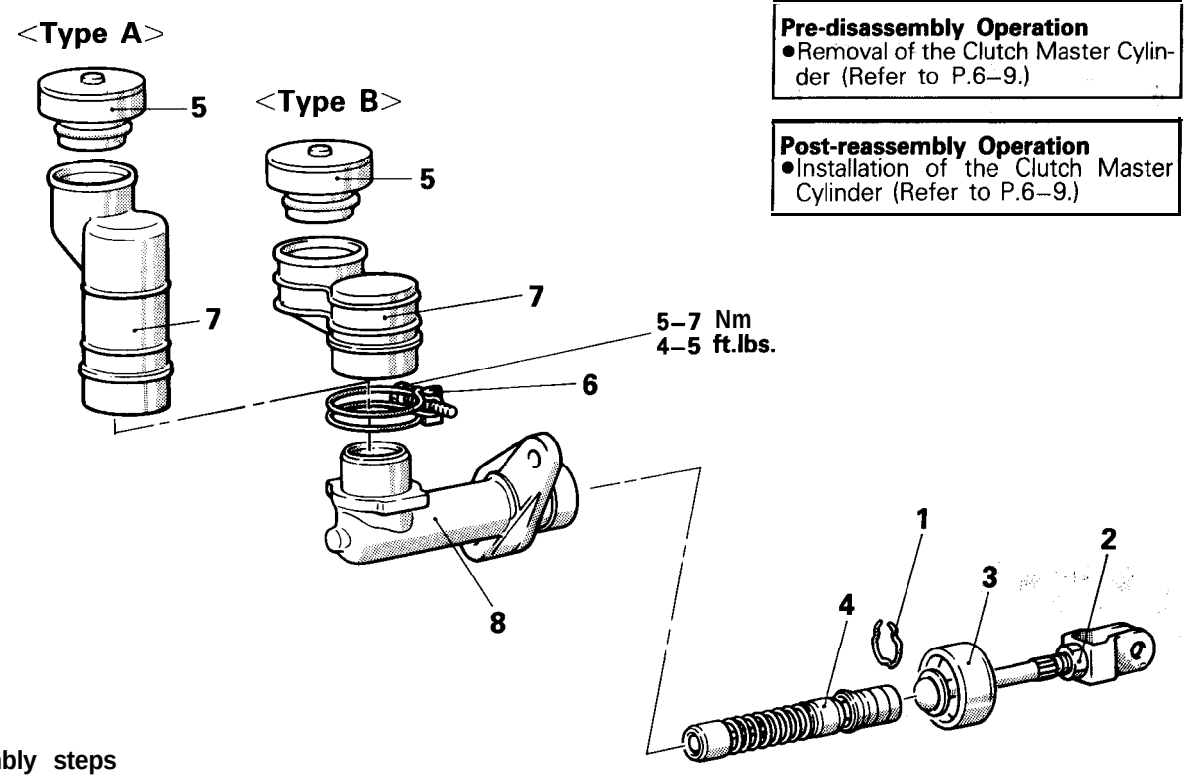
Apply multipurpose grease to the clevis pin and washer.

**Grease: MOPAR Multi-Mileage Lubricant Part No.2525035 or equivalent**

# CLUTCH MASTER CYLINDER

## DISASSEMBLY AND REASSEMBLY

N06NA--




**Pre-disassembly Operation**
- Removal of the Clutch Master Cylinder (Refer to P.6–9.)

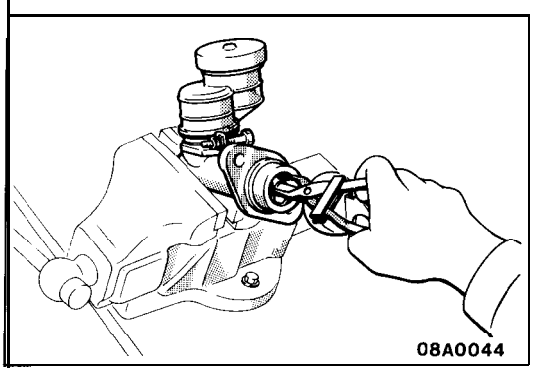
**Post-reassembly Operation**
- Installation of the Clutch Master Cylinder (Refer to P.6–9.)

**Disassembly steps**

1. Piston stop ring
- + 2. Push rod
3. Boot
◆◆▶◀ 4. Piston assembly
5. Reservoir cap
- + 6. Reservoir band
7. Reservoir
8. Master cylinder body

08A0055

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ▶◀ : Refer to "Service Points of Reassembly".
(4) <TYPE A> : Vehicles with auto-cruise control system
<TYPE B> : Vehicles without auto-cruise control system




N06NBAC

### 4. REMOVAL OF PISTON ASSEMBLY

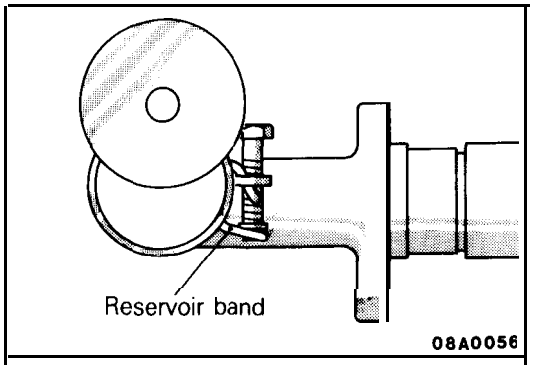
**Caution**

1. Do not **damage the master cylinder body and piston assembly.**
2. **Do not disassemble piston assembly.**

## INSPECTION

N06NCAC

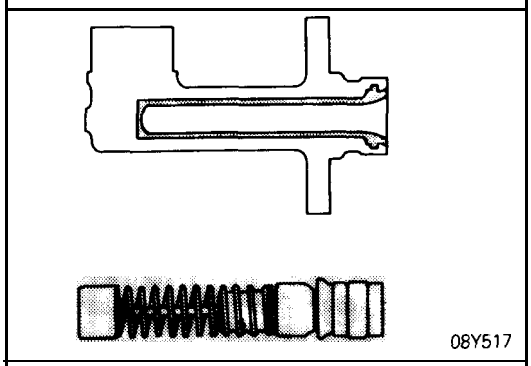
- Check the inside cylinder body for rust or scars.
- Check the piston cup for wear or deformation.
- Check the piston for rust or scars.
- Check the clutch tube connection part for clogging.




## SERVICE POINTS OF REASSEMBLY N06NDAN

### 6. INSTALLATION OF RESERVOIR BAND

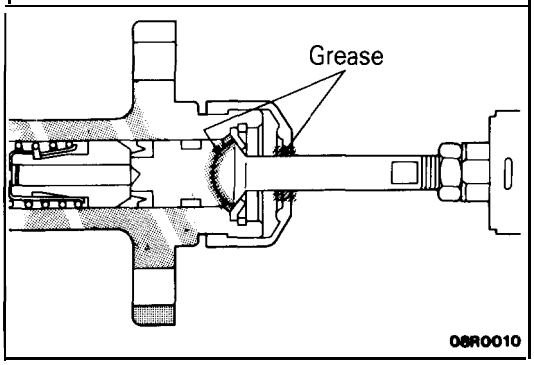
Tighten the resetver band at the illustrated position.




### 4. APPLICATION OF CLUTCH FLUID TO PISTON ASSEMBLY

Apply specified clutch fluid to the inner surface of the cylinder and to the entire periphery of the piston assembly.

**Specified fluid: MOPAR Brake Fluid/Conforming to DOT3**




### 2. APPLICATION OF GREASE TO PUSH ROD

Apply a suitable amount of rubber grease on the contact surfaces between the damper push rod and piston and between the push rod and boot.

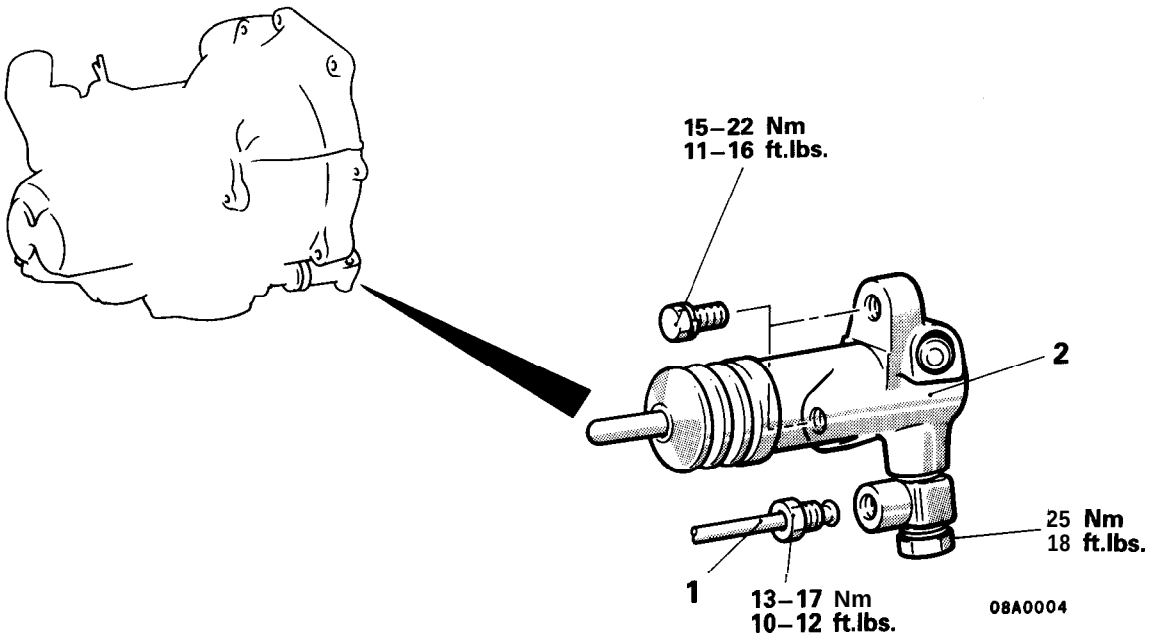
# CLUTCH RELEASE CYLINDER

## REMOVAL AND INSTALLATION

N06HA--

**Pre-removal Operation**
- Draining of the Clutch Fluid

**Post-installation Operation**
- Supplying of the Clutch Fluid
- Bleeding of the Clutch Line (Refer to P.6–6.)
- Adjustment of the Clutch Pedal (Refer to P.6–5.)



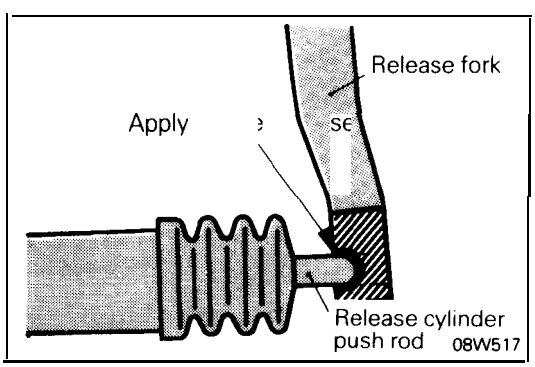

**Removal steps**
1. Connection of clutch tube
2. Clutch release cylinder

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● ◆: Refer to "Service Points of Installation"

## INSPECTION

N06HCAA

- Check the clutch release cylinder for fluid leakage.
- Check the clutch release cylinder boots for damage.




## SERVEICE POINTS OF INSTALLATION

N06HDAJ

### 2. APPLICATION OF GREASE TO CLUTCH RELEASE CYLINDER

Apply a coating of multipurpose grease at the contact part of the release cylinder push rod and the release fork.

**Grease: MOPAR Multi-Mileage Lubricant**
**Part No.2525035 or equivalent**

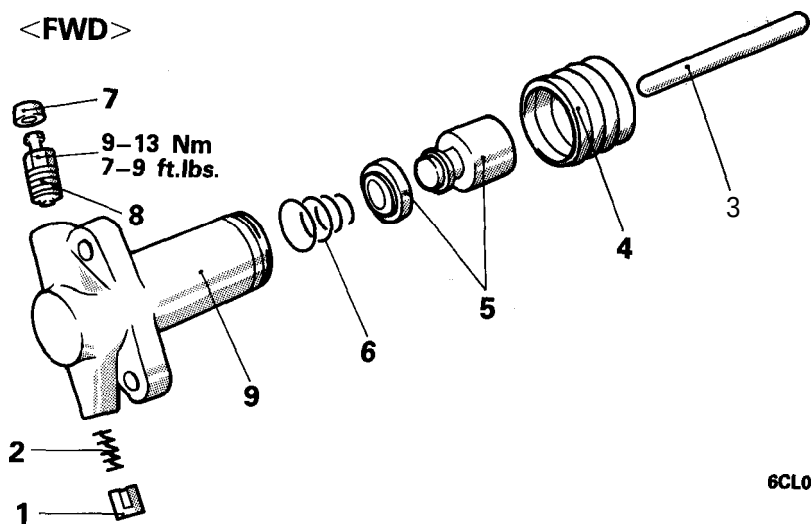
## DISASSEMBLY AND REASSEMBLY

N06LA--

**Pre-disassembly Operation**
- Removal of the Clutch Release Cylinder (Refer to P.6–13.)

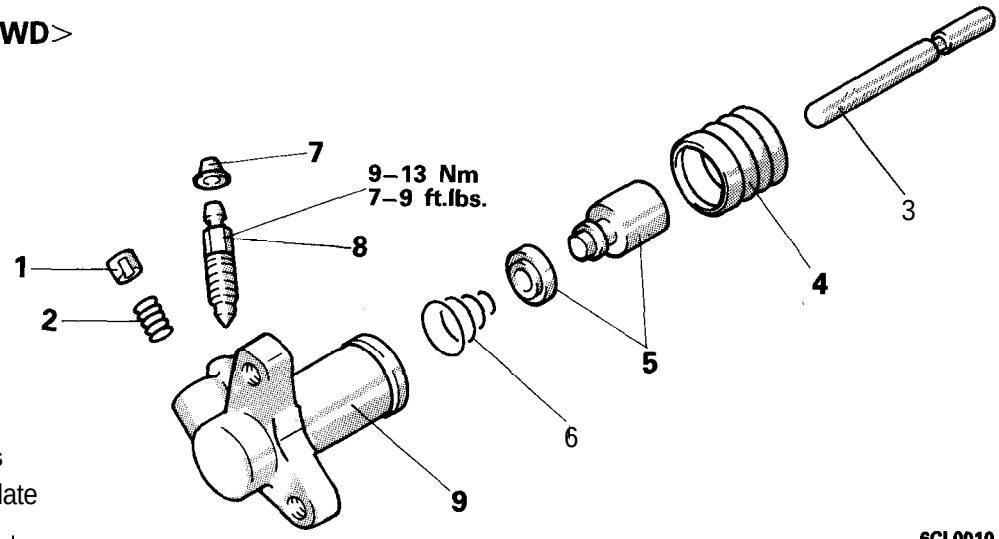
**Post-reassembly Operation**
- Installation of the Clutch Release Cylinder (Refer to P.6–13.)

<FWD>




6CL037

<AWD>

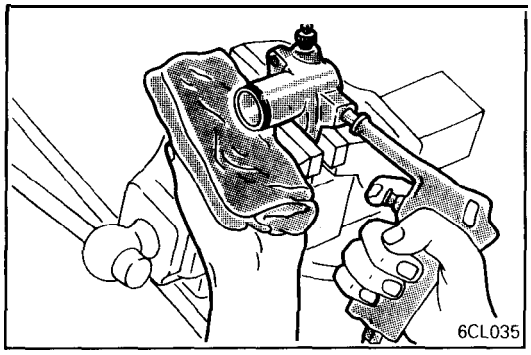



6CL0010

**Disassembly steps**

1. Valve plate
2. Spring
3. Push rod
4. Boots
- ◆◆ ● 5. Piston and cup
6. Conical spring
7. Cap
8. Bleeder plug
9. Release cylinder

NOTE
(1) Reverse the removal procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ◆◆ : Refer to "Service Points of Reassembly".



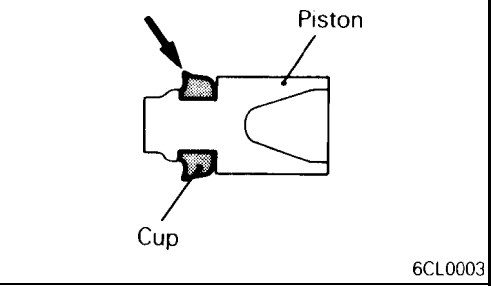

## SERVICE POINTS OF DISASSEMBLY

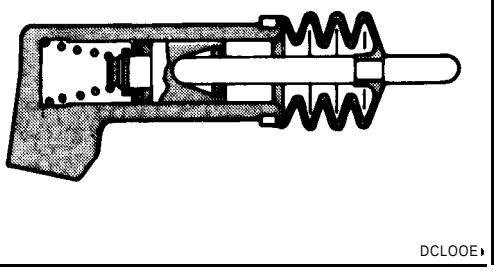
N06LBAE

### 5. DISASSEMBLY OF PISTON AND CUP

(1) Remove the corrosion from the piston-removal port of the release cylinder.
(2) Remove the piston from the release cylinder using compressed air.

**Caution**
1. **Cover with rags to prevent the piston from popping out.**
2. **Apply compressed air slowly to prevent brake fluid from splashing.**




## INSPECTION N06LCAD

(1) Check the inner surface of the release cylinder for scratches or irregular wear.
(2) Replace if the piston cup outer circumference is scratched or shows signs of fatigue, or if there is excessive wear of the lip where indicated in the figure.

## SERVICE POINTS OF REASSEMBLY N06LDAB

### 5. APPLICATION OF FLUID TO PISTON AND CUP

Apply specified brake fluid to the release cylinder inside and outer surface of the piston and piston cup and push the piston cup assembly in the cylinder.

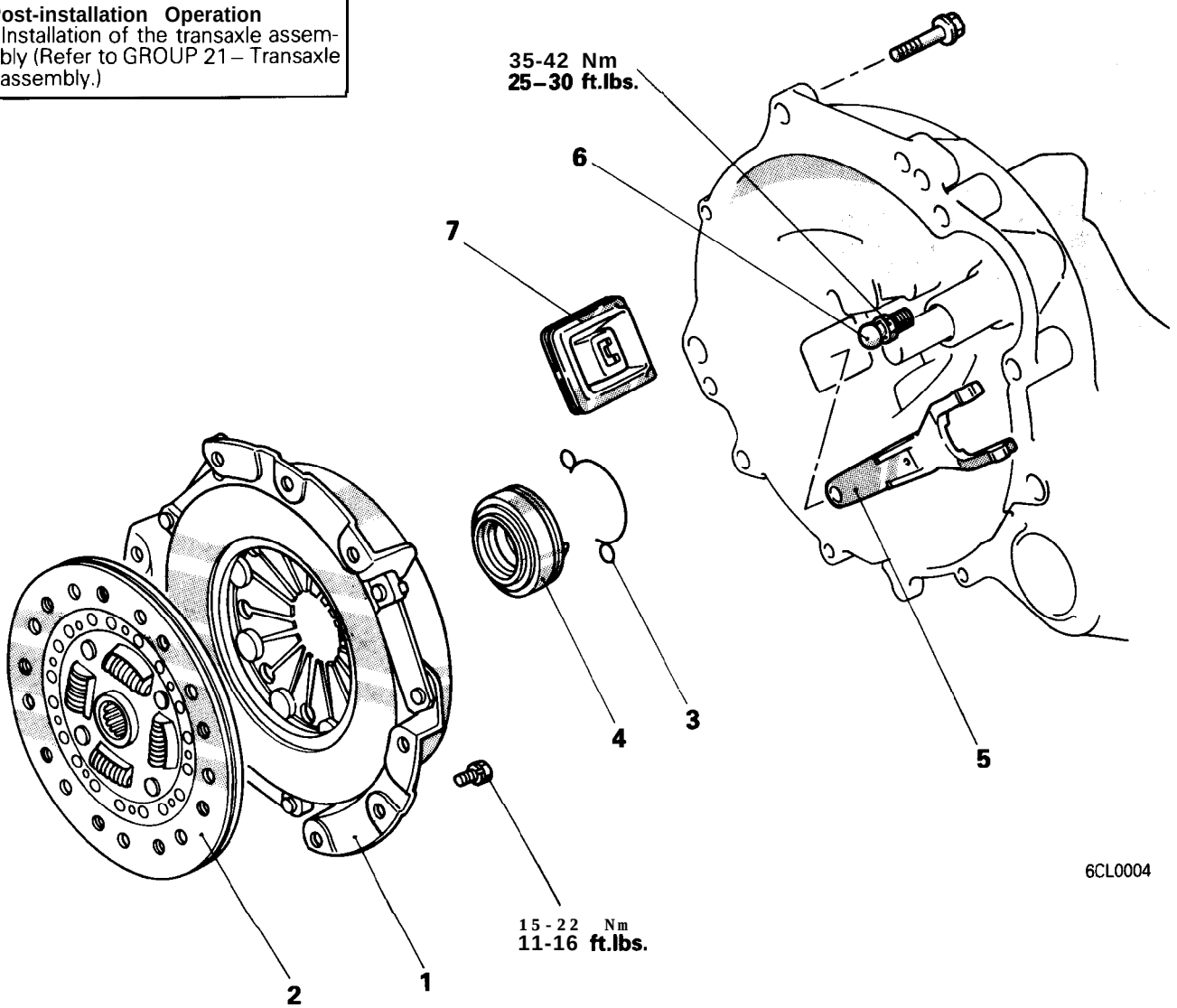
**Specified brake fluid: MOPAR Brake Fluid/Conforming to DOT3**

# CLUTCH COVER AND DISC

## REMOVAL AND INSTALLATION

N06GA--

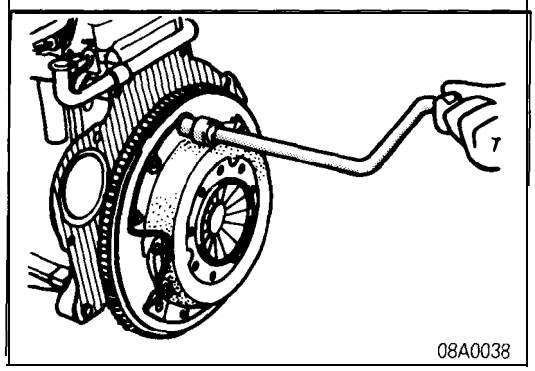
| |
|---|
| **Pre-removal Operation**<br>● Removal of the transaxle assembly (Refer to GROUP 21 – Transaxle assembly.) |
| **Post-installation Operation**<br>● Installation of the transaxle assembly (Refer to GROUP 21 – Transaxle assembly.) |




**Removal steps**

◆◆ ● 1. Clutch cover assembly
◆◆ ▶◀ 2. Clutch disc
3. Return clip
● + 4. Clutch release bearing
● * 5. Release fork
6. Fulcrum
7. Release fork boot

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ▶◀ : Refer to "Service Points of Installation"




## SERVICE POINTS OF REMOVAL N06GBAH

### 1. REMOVAL OF CLUTCH COVER ASSEMBLY/2. CLUTCH DISC

Diagonally loosen bolts which attach clutch cover to flywheel. Back off bolts in succession, one or two turns at a time, to avoid bending cover flange.

**Caution**
**DO NOT clean clutch disc or release bearing with cleaning solvent.**

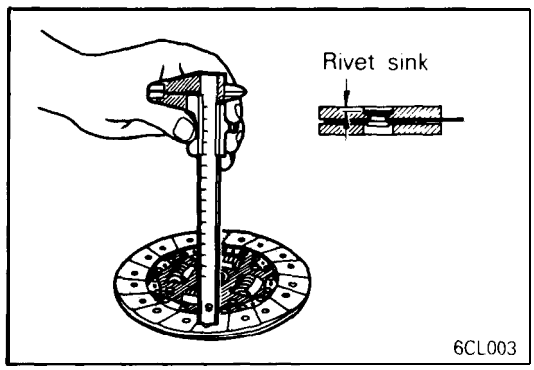
## INSPECTION N06GCAB

### CLUTCH COVER ASSEMBLY

- Check the diaphragm spring end for wear and uneven height.
  Replace if wear is evident or height difference exceeds the limit.

  **Limit : 0.5 mm (.02 in.)**

- Check the pressure plate surface for wear, cracks and color change.
- Check the strap plate rivets for looseness and replace the clutch cover assembly if loose.




### CLUTCH DISC

- Check the facing for loose rivets, uneven contact, deterioration due to seizure, adhesion of oil or grease and replace the clutch disc if defective.
- Measure the rivet sink and replace the clutch disc if it is out of specification.

  **Limit : 0.3 mm (.012 in.)**

- Check for torsion spring play and damage and if defective, replace the clutch disc.
- Combine the clutch disc with the input shaft and check sliding condition and check for play in the rotating direction. If it does not slide smoothly, check after cleaning and reassembling. If the play is excessive, replace the clutch disc and/or the input shaft.

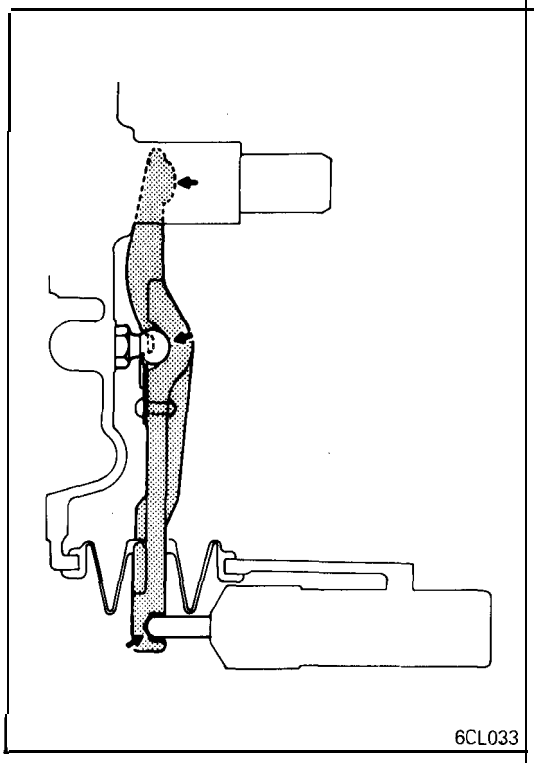
### CLUTCH RELEASE BEARING

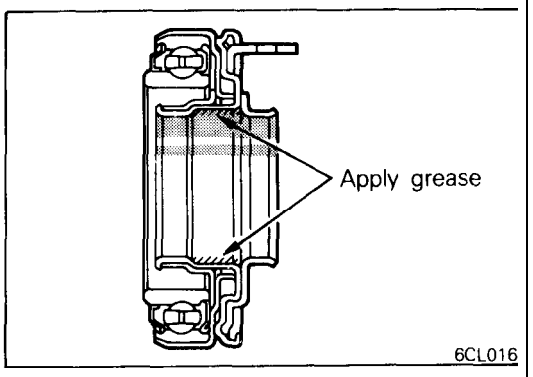
**Caution**
***The release bearing is packed with grease, so don't use cleaning oil, etc. to clean it.***

- Check for bearing heat damage, other damage, abnormal noise and/or improper rotation. Also check whether or not there is wear at the point of contact with the diaphragm spring.
- If there is abnormal wear at the pornt of contact with the release fork, replace the bearing.

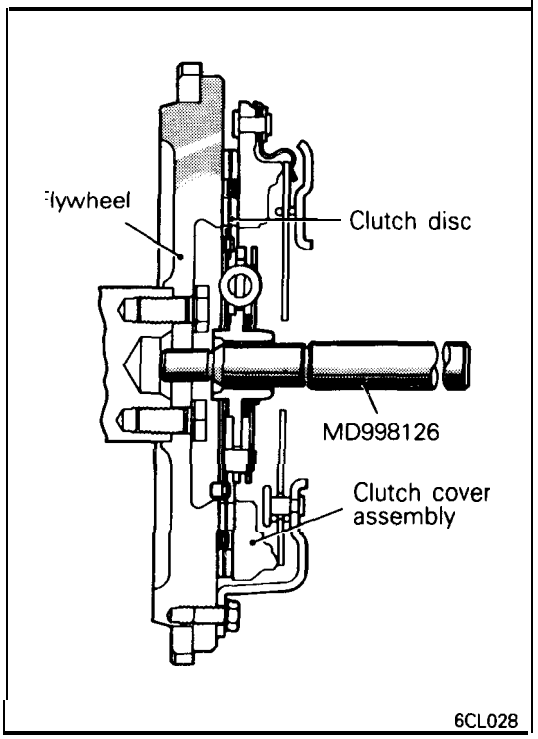
### RELEASE FORK

- If there is abnormal wear at the point of contact with the bearing, replace the release fork.


6CL033



6CL016



6CL028

## SERVICE POINTS OF INSTALLATION N06GDAT

### 5. APPLICATION OF GREASE TO RELEASE FORK

(1) Apply a coating of the specified grease to the point of contact with the fulcrum and the point of contact with the release bearing.

**Specified grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

**Caution**
**When installing the clutch, apply grease to each part, but be careful not to apply excessive grease; excessive grease will cause clutch slippage and shudder.**

(2) Apply a coating of the specified grease to the end of the release cylinder's push rod and to the push rod hole in the release fork.

**Specified grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

### 4. APPLICATION OF GREASE TO CLUTCH RELEASE BEARING

Pack the inner surface of the clutch release bearing and the groove with the specified grease.

**Specified grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

**Caution**
**For the release bearing of a resin sleeve, grease must not be applied to the sleeve part.**

### 2. APPLICATION OF GREASE TO CLUTCH DISC/ 1. CLUTCH COVER ASSEMBLY

(1) Apply a coating of the specified grease to the clutch disc spline, and then use a brush to rub it in.

**Specified grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

(2) Using the special tool (clutch disc center guide), position the clutch disc to the flywheel.
(3) Install the clutch cover assembly. Tighten the bolts a little at a time, working in a diagonal sequence, finally tightening them to the specified torque.

# COOLING

## CONTENTS

N07AA-


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**WATER PUMP <2.0L DOHC Engine> ..... 21**

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N07CA--

| Items | Specifications |
|---|---|
| Cooling method | Water-cooled, pressurized, forced circulation with electrical fan |
| Radiator | |
| Type | Pressurized corrugated fin type |
| Radiator fan motor | |
| Type | Direct current ferrite type |
| Water pump | |
| Type | Impeller of centrifugal type |
| Thermostat | |
| Type | Wax pellet type with jiggle valve |
| Identification mark | 88 (Stamped on flange) |
| Drive belt | |
| Type | V-ribbed belt |
| Engine coolant temperature gauge unit | |
| Type | Thermistor type |
| Engine coolant temperature sensor (Engine control) | |
| Type | Thermistor type |
| Engine coolant temperature switch (Air conditioner) | |
| Type | Thermistor type |

## SERVICE SPECIFICATIONS

N07CB--

| Items | Specifications |
|---|---|
| Standard value | |
| Range of coolant antifreeze concentration % | 30–60 |
| Thermostat | |
| Valve opening temperature of thermostat °C (°F) | 88 (190) |
| Full-opening temperature of thermostat °C (°F) | 100 (212) or more |
| Opening pressure of cap high pressure valve kPa (psi) | 75–105 (11-15) |
| Thermo sensor (on radiator) | |
| Operating temperature | |
| OFF → ON °C (°F) | 82-88 (180–190) |
| ON → OFF °C (°F) | 78 (172) or less |
| Engine coolant temperature gauge unit | |
| Resistance | |
| A t 70°C (158°F) Ω | 104 ± 13.5 |
| Engine coolant temperature sensor (Engine control) | |
| Resistance | |
| A t 20°C (68°F) kΩ | 2.45 ± 0.24 |
| A t 80°C (176°F) Ω | 296 ± 32 |
| Engine coolant temperature switch (Air conditioner) | |
| ON → OFF operating temperature °C (°F) | 112–118 (234-244) |
| Limit | |
| Opening pressure cap high pressure valve kPa (psi) | 65 (9.2) |

## TORQUE SPECIFICATIONS

N07CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Radiator upper insulator | 9-14 | 7–10 |
| Thermosensor to radiator | 3-4 | 2-3 |
| Automatic transaxle oil cooler hose cramp | 4-6 | 3-4 |
| Automatic transaxle oil cooler hose mounting bolt | 3-5 | 2-4 |
| Water outlet fitting bolts | 17–20 | 12-14 |
| Engine mount insulator nut (large) | 60–80 | 43-58 |
| Engine mount insulator nut (small) | 30–40 | 22-29 |
| Engine mount bracket to engine | 50–65 | 36-47 |
| Bracket between engine mount bracket and engine | 17-26 | 12-19 |
| Tension pulley bracket for air conditioner <1.8L Engine> | 18-22 | 13-15 |
| Water pump installation bolt | | |
| Bolt head mark "4T" | 12-15 | 9-11 |
| Bolt head mark "7T" | 20–27 | 14–20 |
| Water pump pulley bolt | 8–10 | 6-7 |
| Damper pulley, crankshaft pulley | | |
| <1.8L Engine> | 15-18 | 11-13 |
| <2.0L DOHC Engine> | 20–30 | 14-22 |
| Timing belt front upper cover installation bolt | 10–12 | 7-9 |
| Timing belt front lower cover installation bolt | 10–12 | 7-9 |
| Crankshaft sprocket installation bolt | 110–130 | 80–94 |
| Timing belt B tensioner | 15-22 | 11-16 |
| Tension pulley bracket for air conditioner <2.0L DOHC Engine> | 23-27 | 17–20 |
| Automatic tensioner installation bolt | 20–27 | 14–20 |
| Tensioner pulley installation bolt | 43-55 | 31–40 |
| Oil level gauge | 12-15 | 9-11 |
| Front exhaust pipe to exhaust manifold | | |
| <FWD> | 30–40 | 22-29 |
| <AWD> | 40–60 | 29-43 |
| Front exhaust pipe bracket | 30–40 | 22-29 |
| Exhaust manifold cover (A) | | |
| <1.8L Engine> | | |
| Flange bolt: 8 x 12 mm (.31x.47 in.) | 27-33 | 20–24 |
| Washer assembled bolt: 6 x 14 mm (.24 x .55 in.) | 8–10 | 6-7 |
| <2.0L DOHC Engine (Non-Turbo)> | 12-15 | 9-11 |
| Exhaust manifold cover (B) <Non-Turbo> | 12-15 | 9-11 |
| Heat protecter (A) <Turbo> | 12-15 | 9-11 |
| Heat protecter (B) <Turbo> | 12-15 | 9–11 |
| Exhaust manifold to cylinder head | | |
| <1.8L Engine> | 15–20 | 11-14 |
| <2.0L DOHC Engine> | 25–30 | 18-22 |
| Engine hanger to engine bracket | 12-15 | 9-11 |
| Water inlet pipe installation bolt | | |
| Transaxle side | 43-55 | 31–40 |
| Engine block side <1.8L Engine> | 10–12 | 7-9 |
| <2.0L DOHC Engine> | 12-15 | 9-11 |
| Power steering oil pump to oil pump bracket | 35-45 | 25-33 |
| Power steering oil pump bracket to engine | 25-33 | 18-24 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Exhaust manifold to turbocharger | 55-65 | 40–47 |
| Oil return pipe | 8–10 | 6-7 |
| Water pipe (A) to turbocharger | 35–50 | 25-36 |
| Water pipe (A) mounting bolt | 10–12 | 7-9 |
| Water pipe (B) to turbocharger | 35–50 | 25-36 |
| Water pipe (B) to water inlet pipe | 40–50 | 29-36 |
| Water pipe to engine | | |
| Mounting bolt (M8) | 12-15 | 9-11 |
| Mounting bolt (M6) | 10–12 | 7-9 |
| Water pipe to turbocharger | 8–10 | 6-7 |
| Eye bolt (oil pipe) | 14-19 | 10–14 |
| Exhaust pipe support bracket | 30–42 | 22–30 |
| Exhaust pipe support bracket to front exhaust pipe | 30–40 | 22-29 |
| Engine coolant temperature gauge unit | 10–12 | 7-9 |
| Engine coolant temperature sensor (Engine control) | 20–40 | 14-29 |
| Engine coolant temperature switch (Air conditioner) | 30–40 | 22-29 |

## LUBRICANT

N07CD--

| Item | Specified lubricant | Quantity |
|---|---|---|
| Engine coolant | High quality ethylene glycol antifreeze coolant | <1.8L Engine><br>6.2 liters<br>6.5 qts.<br><2.0L DOHC Engine><br>7.2 liters<br>7.6 qts. |

## SEALANT

N07CE--

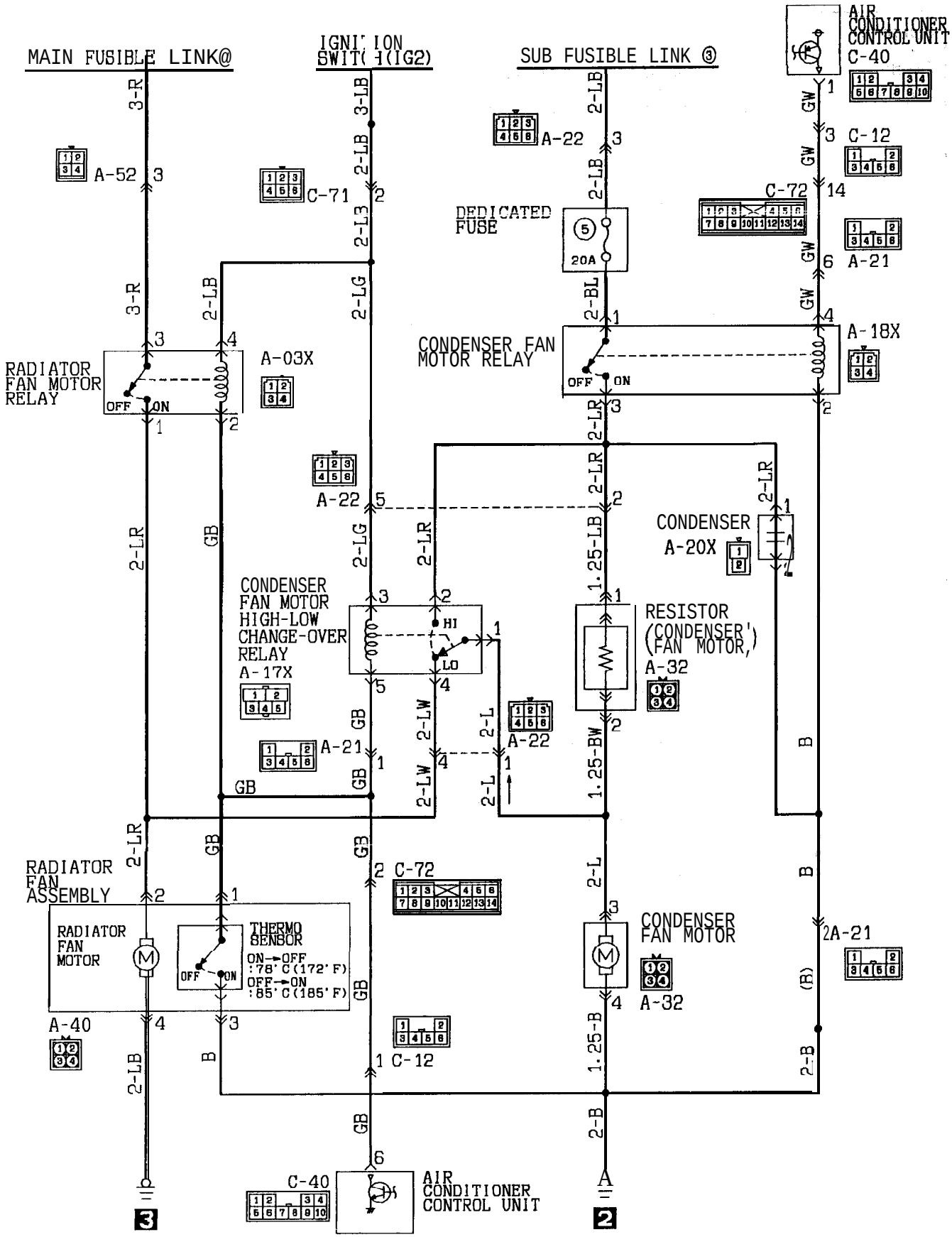
| Item | Specified adhesive |
|---|---|
| Engine coolant temperature gauge unit<br>-Engine coolant temperature sensor (Engine control)<br>Engine coolant temperature switch (Air conditioner) | MOPAR Part No.4318034 or equivalent |

# TROUBLESHOOTING

N07EAAK

| Symptom | Probable cause | Remedy |
|---|---|---|
| Overheat | Insufficient engine coolant | Replenish |
| | Too high an anti-freeze concentration | Correct anti-freeze concentration |
| | Loose or broken drive belt | Replace |
| | Inoperative electric cooling fan | |
| | Faulty thermosensor | Replace |
| | Faulty electrical motor | Replace |
| | Faulty radiator fan relay | Replace |
| | Damaged or blocked (insufficiently ventilated) radiator fins | Correct |
| | Water leaks | |
| | Damaged radiator core joint | Replace |
| | Corroded or cracked hoses (radiator hose, heater hose, etc.) | Replace |
| | Loose bolt or leaking gasket in water outlet fitting (thermostat) | Correct or replace |
| | Loose water pump mounting bolt or leaking gasket | Correct or replace |
| | Faulty cap valve or setting of spring | Replace |
| | Loose intake manifold bolts or leaking from gasket | Retorque bolts or replace gasket |
| | Cracked intake manifold | Replace |
| | Faulty automatic transaxle oil cooler operation | |
| | Blocked or collapsed hose and pipe | Replace |
| | Loose hose and pipe connection | Correct |
| | Faulty thermostat operation | Replace |
| | Faulty water pump operation | Replace |
| | Water passage clogged with slime or rust deposit or foreign substance | Clean |
| Jo rise in temperature | Faulty thermostat | Replace |

## CIRCUIT DIAGRAM




KX35-AC-U0602-NC

OPERATION

**1. When the output of the air conditioner control unit is "LO" (0V) (when the compressor magnet clutch is deenergized)**

- When the ignition switch is at "ON" , and if engine coolant temperature rises to 85°C (185°F), the thermosensor contacts close, causing current to flow through the radiator fan motor relay (coil), thermosensor and ground, causing the radiator fan motor relay contacts to close.
- Current flows through the radiator fan motor relay contacts, radiator fan motor and ground, causing the radiator fan motor to rotate.

**2. When the output of the air conditioner control unit is "HI" (approx. 12V) (when the compressor magnet clutch is energized)**

- If the thermo sensor is "ON" when the engine coolant temperature exceeds 85°C (185°F), the condenser fan motor control relay is also "ON", thus the condenser fan as well as the radiator fan start rotating at a high speed.

TROUBLESHOOTING HINTS

**1. Neither the radiator fan nor condenser fan rotate at all.**

- Check sub fusible link No.3.

**2. Only the condenser fan does not operate.**

- Check dedicated fuse No.5.

**3. The radiator fan and condenser fan do not operate in the low speed mode, but operate otherwise.**

(1)The A/C compressor magnet clutch does not enter the "ON" state.

- Check whether the output of the air conditioner control unit is available.

NOTE
For troubleshooting of the air conditioner control unit, refer to GROUP 24.

(2)The A/C compressor magnet clutch enters the "ON" state.

- Check the resistor.

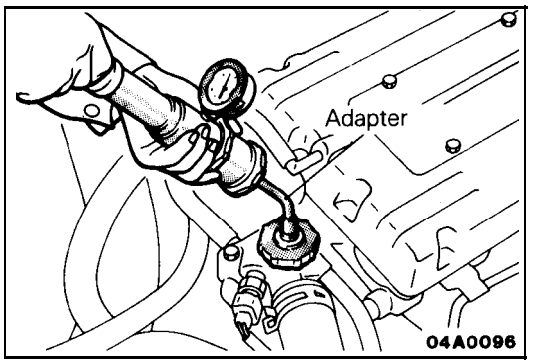
**Conditions under which the Air Conditioner Control Unit Outputs a "HI" Signal**

| | | |
|---|---|---|
| Ignition switch ($IG_2$) | ON | Remarks<br>• If any of the switches and sensors is OFF, the air conditioner control unit will output a "LO" signal (OV). |
| Blower switch | ON | |
| Air conditioner switch | ON | |
| Compressor magnet clutch | ON | |

**Fan Operating Mode**

| Switch conditions | | Fan rotating condition | |
|---|---|---|---|
| Air conditioner switch | Thermo sensor | Cooling (radiator) fan | Condenser fan |
| LO (0V) | OFF | OFF | OFF |
| LO (0V) | ON | HIGH | OFF |
| HI (12V) | OFF | LOW | LOW |
| HI (12V) | ON | HIGH | HIGH |

NOTE
The thermo sensor is ON when the temperature reaches 85°C(185°F) or more.



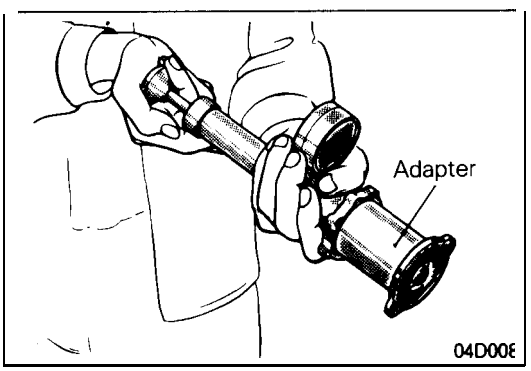

# SERVICE ADJUSTMENT PROCEDURES

## ENGINE COOLANT LEAK CHECK N07FAAE

1. Loosen cap.
2. Confirm that the engine coolant level is up to the filler neck.
3. Install a adapter to the water outlet fitting and apply 160 kPa (23 psi) pressure. Hold pressure for two minutes, while checking for leakage from the radiator, hose or connections

**Caution**
**Be sure to completely clean away moisture from the places checked.**
**When the tester is removed, be careful not to spill any engine coolant from it.**
**Be careful, when installing and removing the tester and when testing, not to deform the water outlet fitting.**

4. If there is leakage, repair or replace the appropriate part.




## CAP PRESSURE TEST N07FBAG

1. Use a special tool to attach the cap to the tester.
2. Increase the pressure until the indicator of the gauge stops moving.

**Limit: 65 kPa (9.2 psi)**
**Standard value: 75–105 kPa (11–15 psi)**

3. Replace the cap if the reading does not remain at or above the limit.

NOTE
Be sure that the cap is clean before testing, since rust or other foreign material on the cap seal will cause an improper indication.

## ENGINE COOLANT REPLACEMENT N07FCAC

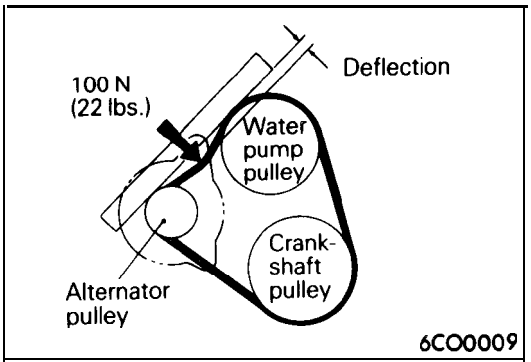
Refer to GROUP O-Cooling System.

## ENGINE COOLANT CONCENTRATION TEST N07FDAG

Refer to GROUP O-Selection of Engine Coolant.

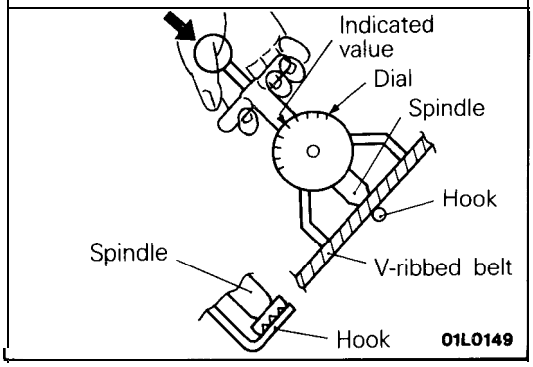
## ALTERNATOR/WATER PUMP DRIVE BELT TENSION INSPECTION N07FEAG

**Caution**
**If the belt slips or squeaks, check the belt tension and also check the belt for wear, damage and breakage and check the pulleys for damage.**




(1) Place straight edge as shown in the illustration.
(2) Measure the deflection with a force of 100 N (22 lbs.) applied to belt mid-point between water pump pulley and alternator pulley. If the standard value is not obtained, make adjustment.

**Standard value:**
**<1.8L Engine> 8.0–11.0 mm (.315–.433 in.)**
**<2.0L DOHC Engine> 9.0–11.5 mm (.354–.453 in.)**

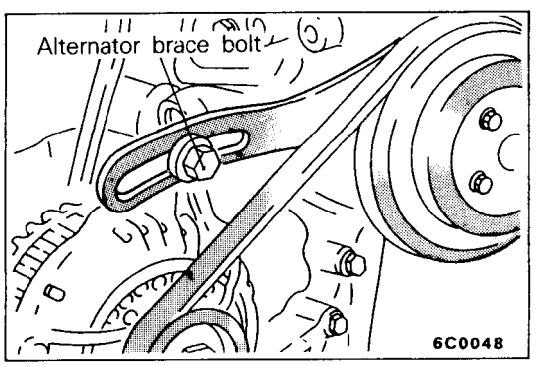



(3) Use a tension gauge to check the belt tension. If the standard value is not obtained, make adjustment.
When tension gauge is used, the tension may be measured between any two pulleys.

**Standard value: 250–500 N (55–110 lbs.)**

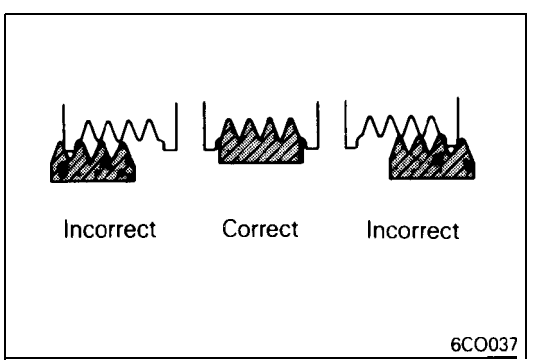
## ALTERNATOR/WATER PUMP DRIVE BELT TENSION ADJUSTMENT N07FFAI

**Caution**
**Excessive belt tension will cause damage to alternator and water pump pulley bearings, while on the other hand, loose belt tension will produces slip.**
**Therefore, be sure to adjust the belt tension to proper value.**

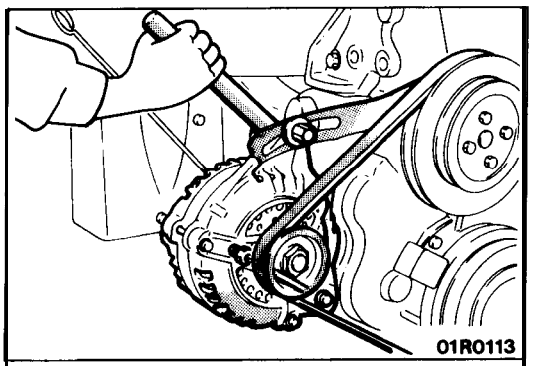



**<1.8L Engine>**

(1) Loosen the nut on the alternator support bolt.
(2) Loosen the alternator brace bolt.



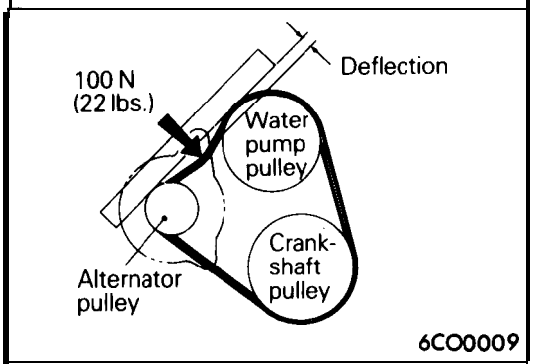

(3) Make sure that the belt is properly installed in pulley groove.

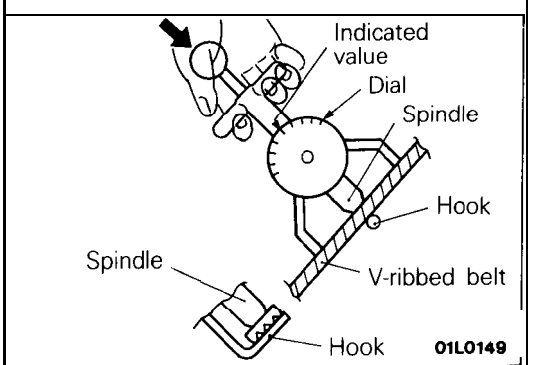



(4) Move the alternator to adjust so that the amount of deflection is the standard value.

**Standard value:**

| | |
|---|---|
| **New belt** | **6.5–8.0 mm (.256–.315 in.)** |
| **Used belt** | **9.5 mm (.374 in.)** |



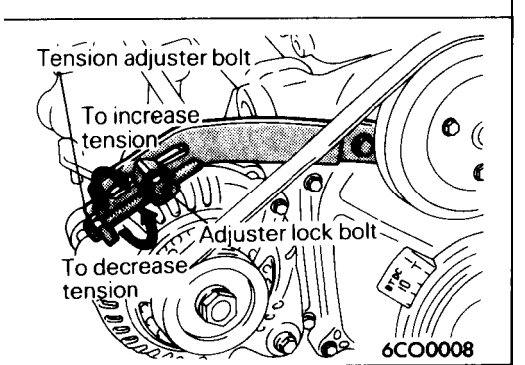

(5) On using tension gauge, move the alternator to adjust deflection to standard value.

**Standard value:**

| | |
|---|---|
| **New belt** | **600 ± 100 N (132 ± 22 lbs.)** |
| **Used belt** | **400 N (88 lbs.)** |

(6) After completion of adjustment, tighten alternator brace bolt and alternator brace bolt nut to the specified torque.

(7) If new belt has been installed, run engine for more than 5 minutes.
Then follow "V-RIBBED BELT DEFLECTION CHECK" procedure to make sure that the belt has proper deflection.



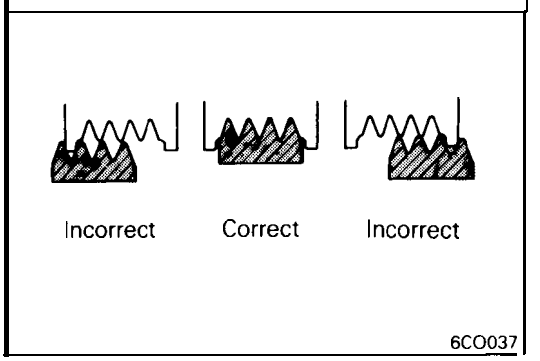

**<2.0L DOHC Engine>**

(1) Loosen the alternator pivot nut.

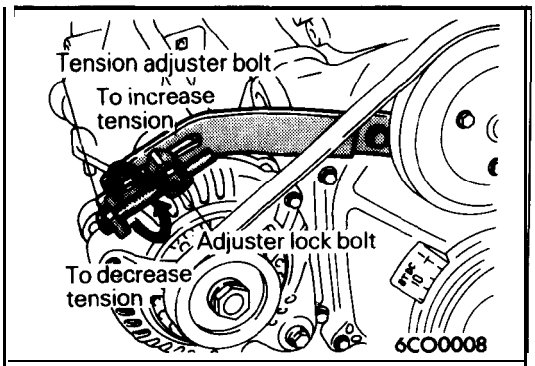
(2) Loosen the belt tension adjuster lock bolt.

(3) Release tension by rotating the adjuster bolt counterclockwise.

(4) Remove and install the alternator and water pump drive belt.



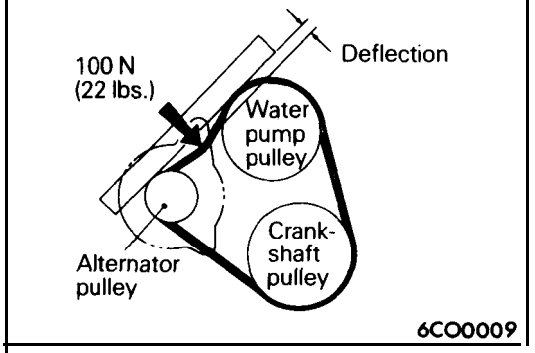

(5) Make sure the V-ribbed type drive belt is properly installed in pulley grooves.

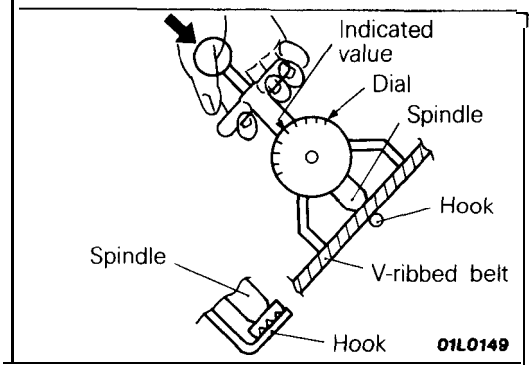



(6) Adjust belt deflection by tightening adjust bolt.
Turn adjuster bolt clockwise to increase the belt tension and turn adjuster bolt counterclockwise to decrease the belt tension.

**Standard value:**

| | |
|---|---|
| **New belt** | **7.5–9.0 mm (.295–.354 in.)** |
| **Used belt** | **10.0 mm (.394 in.)** |




(7) On using tension gauge, move the alternator to adjust deflection to standard value.

**Standard value:**

| | |
|---|---|
| **New belt** | **600 ± 100 N (132 ± 22 lbs.)** |
| **Used belt** | 400 **N** (88 **lbs.**) |

(8) Tighten in order, first, adjuster lock bolt then alternator pivot nut to the specified torque.

(9) If new belt has been installed, run engine for more than 5 minutes. Then follow “DRIVE BELT TENSION INSPECTION” procedure to make sure that the belt has proper tension and readjust if necessary.

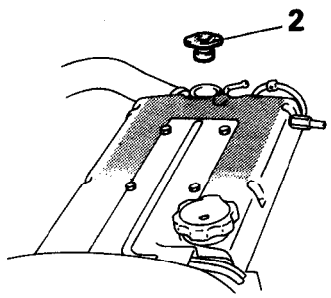
# RADIATOR

## REMOVAL AND INSTALLATION

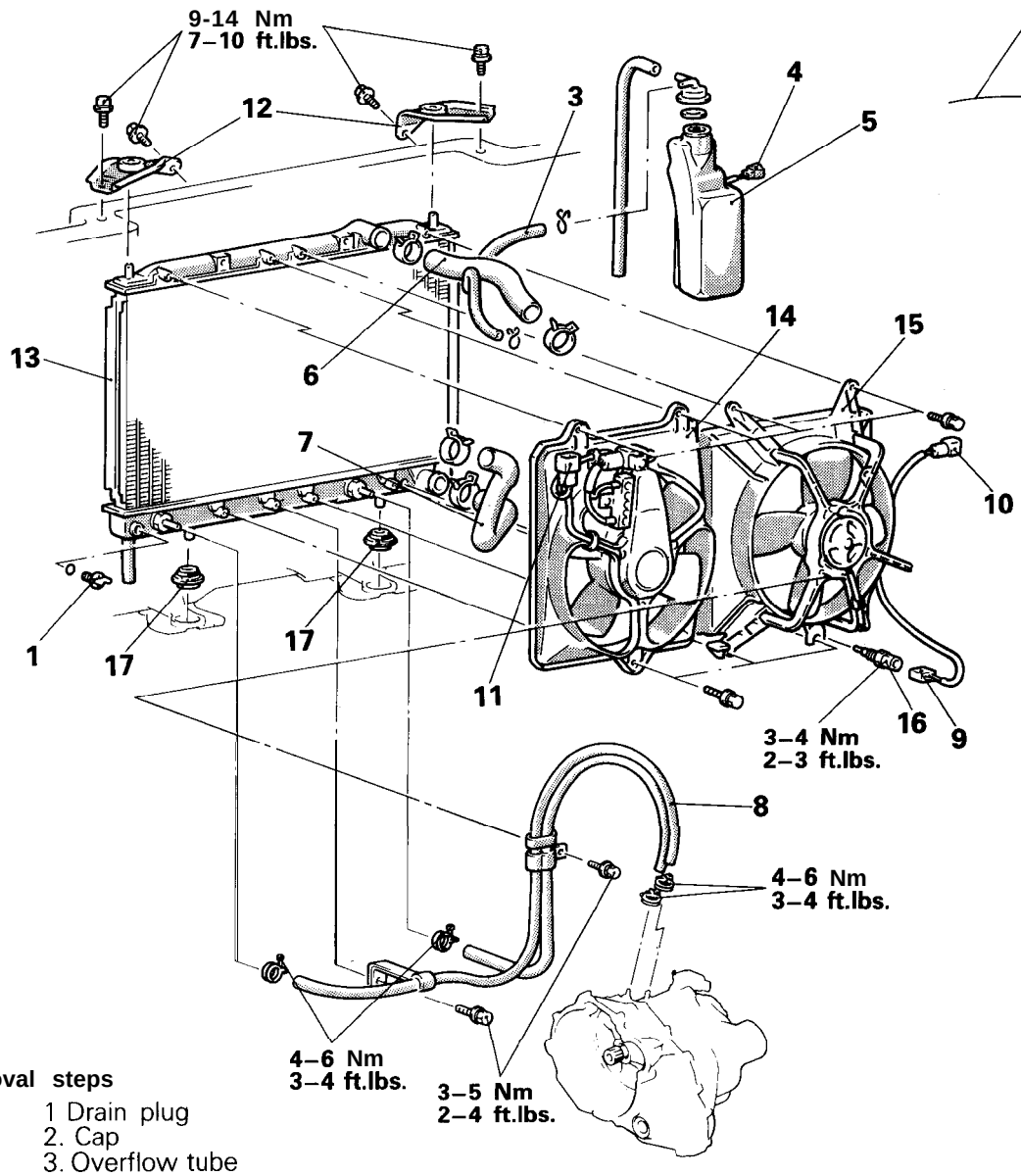
N07QA--

**Pre-removal Operation**
- Draining of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)
- Removal of Air Cleaner Bracket (Refer to GROUP 11 –Air Cleaner.) <Turbo>

**Post-installation Operation**
- Installation of Air Cleaner Bracket (Refer to GROUP 11–Air Cleaner.) <Turbo>
- Refilling of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)
- Checking Automatic Transaxle Fluid Level and Refilling If Necessary




04A0097

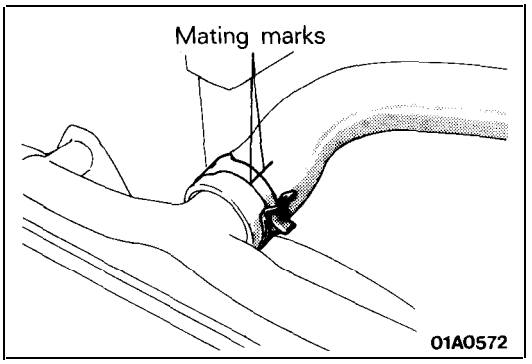



07A0049

**Removal steps**

1 Drain plug
2. Cap
3. Overflow tube
4. Water level switch connector
5. Reserve tank
◆◆ ● ◆ 6. Radiator upper hose
◆◆ ◆◆ 7. Radiator lower hose
◆◆ 8. Automatic transaxle oil cooler hoses <Vehicles with Non-Turbo (A/T)>
9. Thermo sensor connector
10. Radiator fan motor connector
11. Condenser fan motor connector <Vehicles with air conditioner>
12. Upper insulator
13. Radiator assembly
14. Condenser fan motor assembly <Vehicles with air conditioner>
15. Radiator fan motor assembly
16. Thermosensor
17. Lower insulator

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● ◆ : Refer to "Service Points of Installation"




## SERVICE POINTS OF REMOVAL N07QBAH

### 6. REMOVAL OF RADIATOR UPPER HOSE/7. RADIATOR LOWER HOSE

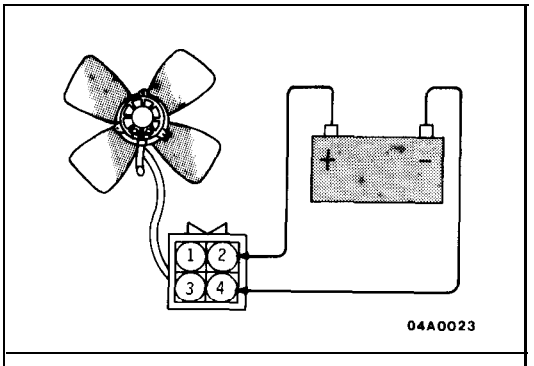
After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.

### 8. DISCONNECTION OF AUTOMATIC TRANSAXLE OIL COOLER HOSES

Use a plug or otherwise cover the hose and nipple part of the radiator so that dust, dirt, foreign materials, etc. do not enter after the hose has been disconnected from the radiator.

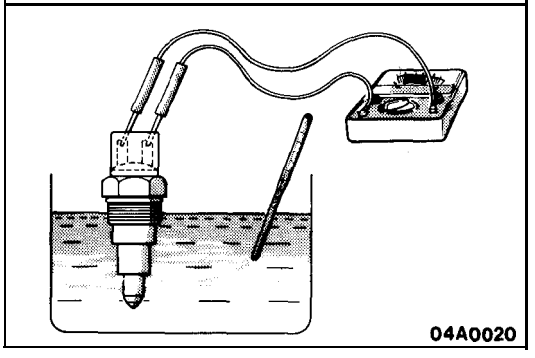
## INSPECTION N07QCAM

- Check for foreign material between radiator fins.
- Check the radiator fins for bent, or damage.
- Check the radiator for corrosion, damage rust or scale.
- Check the radiator hoses for cracks, damage or deterioration.
- Check the reserve tank for damage.
- Check the automatic transaxle oil cooler hoses for cracking, damage or deterioration.




### RADIATOR FAN MOTOR INSPECTION

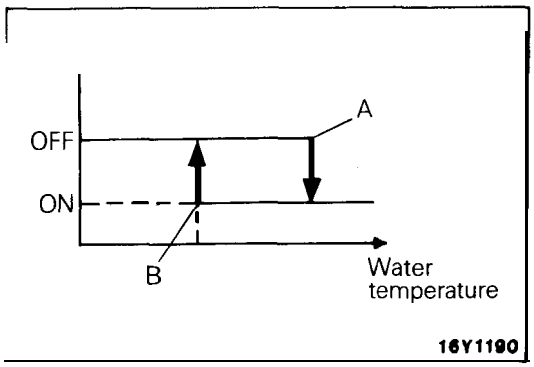
(1) Check to be sure that the radiator fan rotates when batten/ voltage is applied between terminals (as shown in the figure).
(2) Check to see that abnormal noises are not produced, while motor is turning.



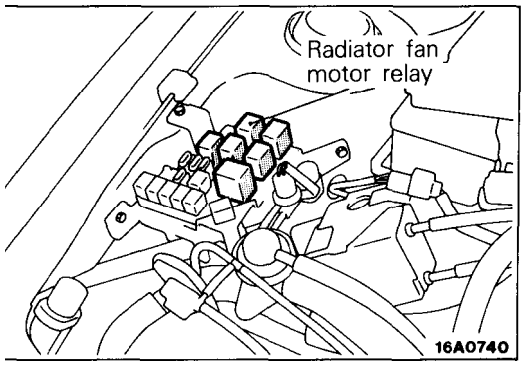

### THERMO SENSOR INSPECTION

Check for continuity with the thermo sensor in hot water.

NOTE
Immerse thermo sensor in hot water up to mounting thread to check for continuity.

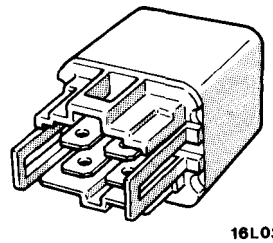


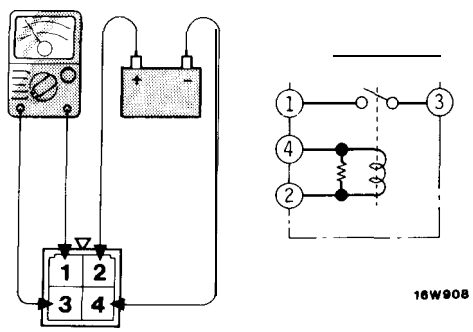

**Standard value:**
**Continuity at 82–88°C (180–190°F) ..... at A point**
**No continuity at 78°C (172°F) or less ..... at B point**




## RADIATOR FAN MOTOR RELAY INSPECTION

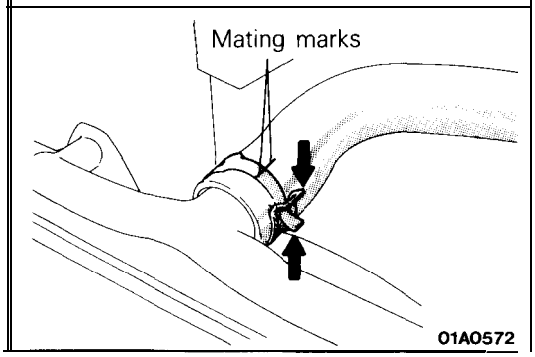
(1) Remove radiator fan motor relay from the relay box located at the right side in the engine compartment.




(2) Check for continuity between the terminals when the battery power-supply is applied to terminal ②, and terminal ④ is grounded.

| | | |
|---|---|---|
| When current flows | Between terminals 1–3 | Continuity |
| When no current flows | Between terminals 1–3 | No continuity |
| | Between terminals 2–4 | Continuity |




## SERVICE POINTS OF INSTALLATION N07QDAF

### 7. INSTALLATION OF RADIATOR LOWER HOSE/ 6. RADIATOR UPPER HOSE

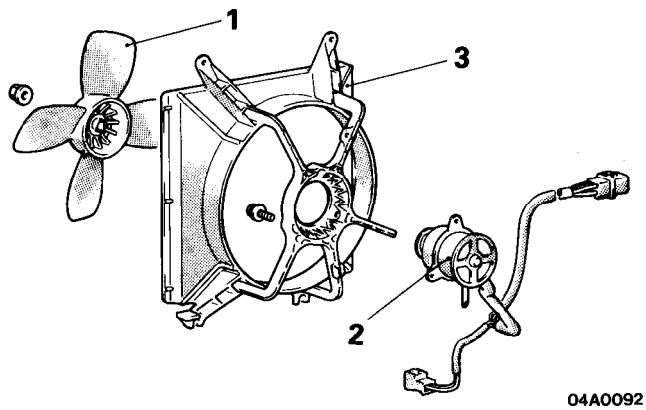
Align the mating marks on the radiator hose and hose clamp and then connect them; then, applying force in the direction indicated by the arrow in the illustration, seat the clamp to the trace marks of the previous connection.

**Caution**
**Be sure to install the hose clamps at the trace marks of the previous connection.**

# RADIATOR FAN MOTOR ASSEMBLY

N07TA--

## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

1. Fan
2. Radiator fan motor
3. Shroud

NOTE
Reverse the disassembly procedures to reassemble.

# THERMOSTAT

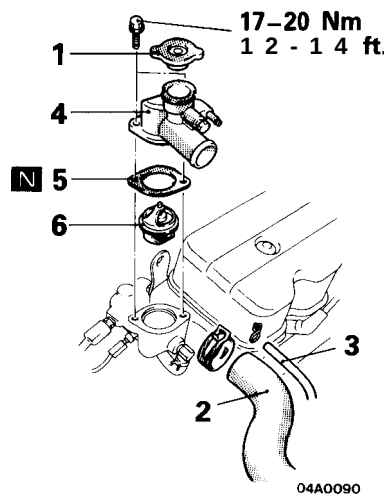
## REMOVAL AND INSTALLATION

N07GB--

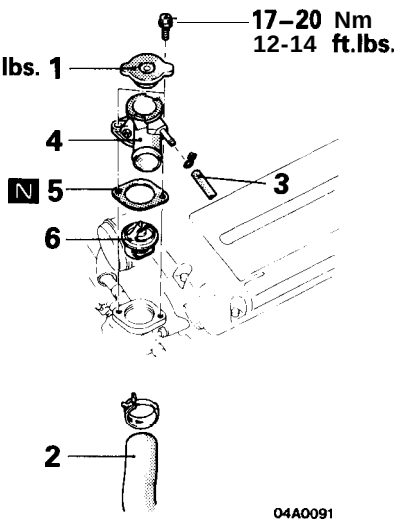
**Pre-removal Operation**
- Draining of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- Supplying of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

**<1.8L Engine>**



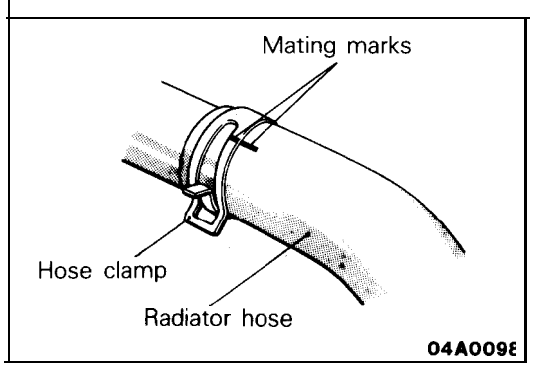

**<2.0L DOHC Engine>**




**Removal steps**

1. Cap
◆◆ ● 4 2. Connection for radiator upper hose
3. Connection for overflow tube
4. Water outlet fitting
5. Gasket
● + 6. Thermostat

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● ◆ : Refer to "Service Points of Installation".
(4) N : Non-reusable parts

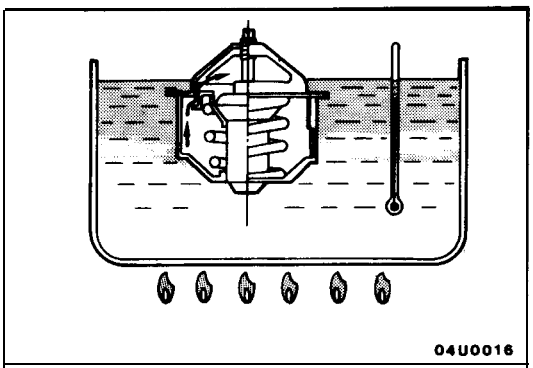



## SERVICE POINTS OF REMOVAL

N07GCAA

### 2. DISCONNECTION OF RADIATOR UPPER HOSE

After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.


04U0016

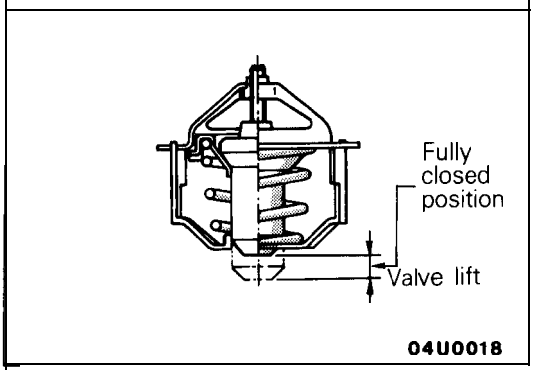
## INSPECTION N07GDAJ

- Check that valve closes tightly at room temperature.
- Check for defects or damage.
- Check for rust or encrustation on valve. Remove if any.
- Immerse thermostat in container of water. Stir to raise water temperature and check that thermostat opening valve temperature and the temperature with valve fully open [valve lift-over 8 mm (.31 in.)] are at the standard value.

**Standard value:**

| | |
|---|---|
| **Opening valve temperature** | **88°C (190°F)** |
| **Full-open temperature** | **100°C (212°F)** |

NOTE
Measure valve height when fully closed. Calculate lift by measuring the height when fully open.



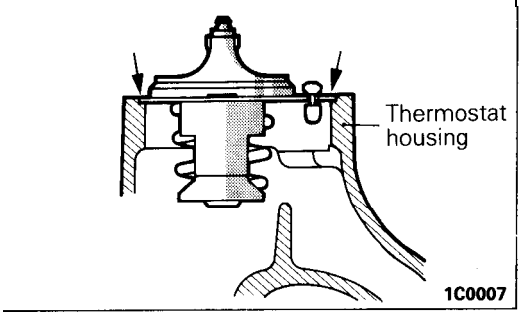
04U0018

## SERVICE POINTS OF INSTALLATION N07GEAG

### 6. INSTALLATION OF THERMOSTAT

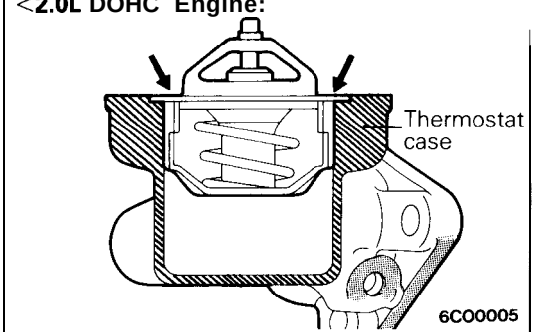
Install the thermostat so that the flange fits perfectly to the recessed seat of the thermostat or thermostat housing.

<1.8L Engine>

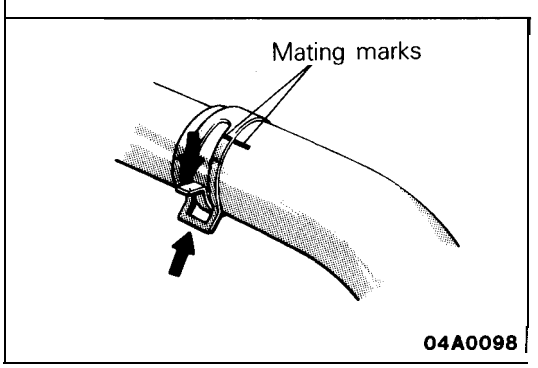


1C0007

<2.0L DOHC Engine:



6CO0005



04A0098

### 2. CONNECTION OF RADIATOR UPPER HOSE

Align the mating marks on the radiator hose and hose clamp and then connect them; then, applying force in the direction indicated by the arrow in the illustration, seat the clamp to the trace marks of the previous connection.

**Caution**
**Be sure to install the hose clamps at the trace marks of the previous connection.**

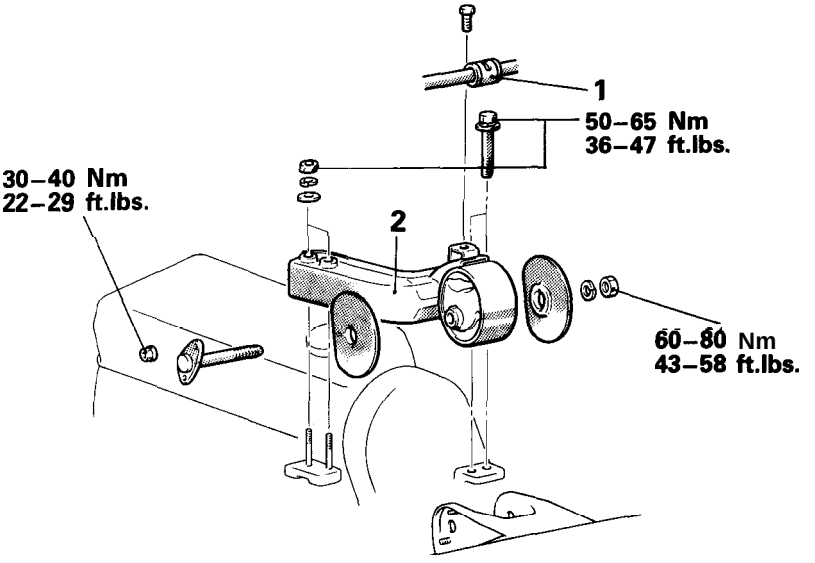
# WATER PUMP <1.8L Engine>

## REMOVAL AND INSTALLATION

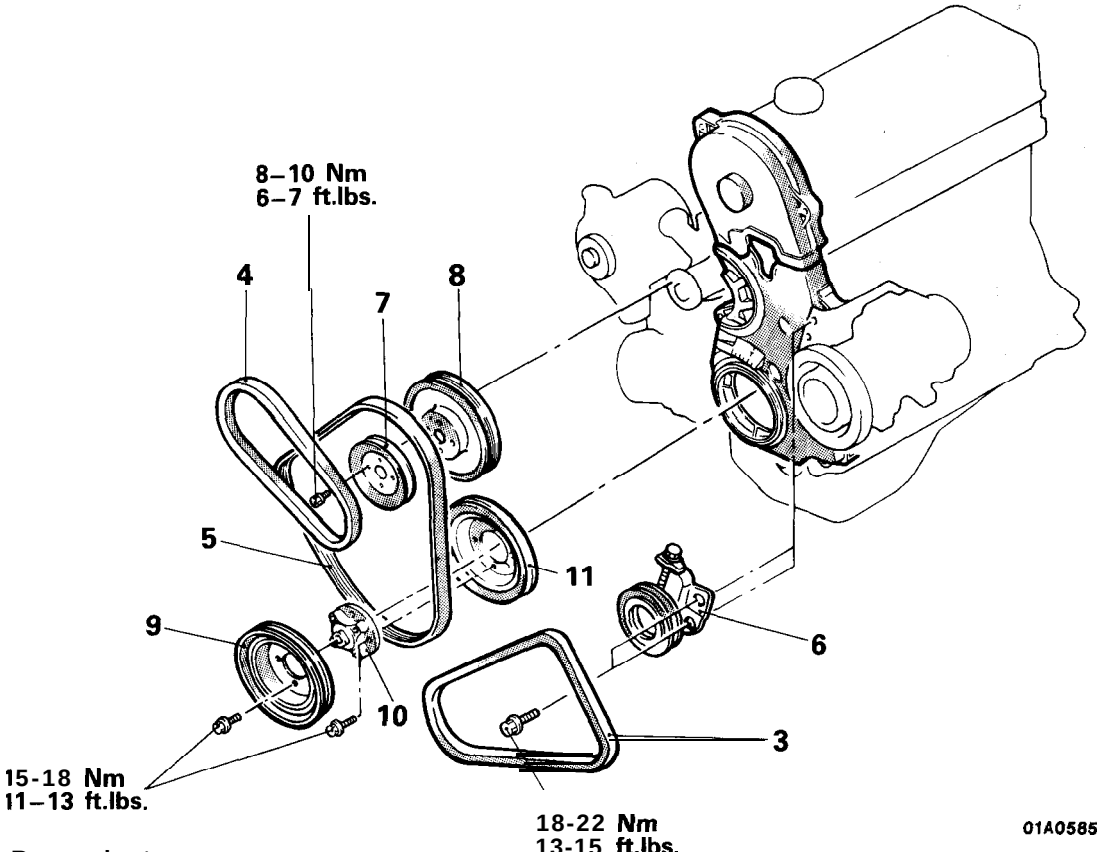
N07MB-A

**Pre-removal Operation**
- Removal of the Under Cover
- Draining of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- Installation of the Under Cover
- Supplying of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)
- Engine Adjustment (Refer to GROUP 9–Engine Adjustment.)




01A0558

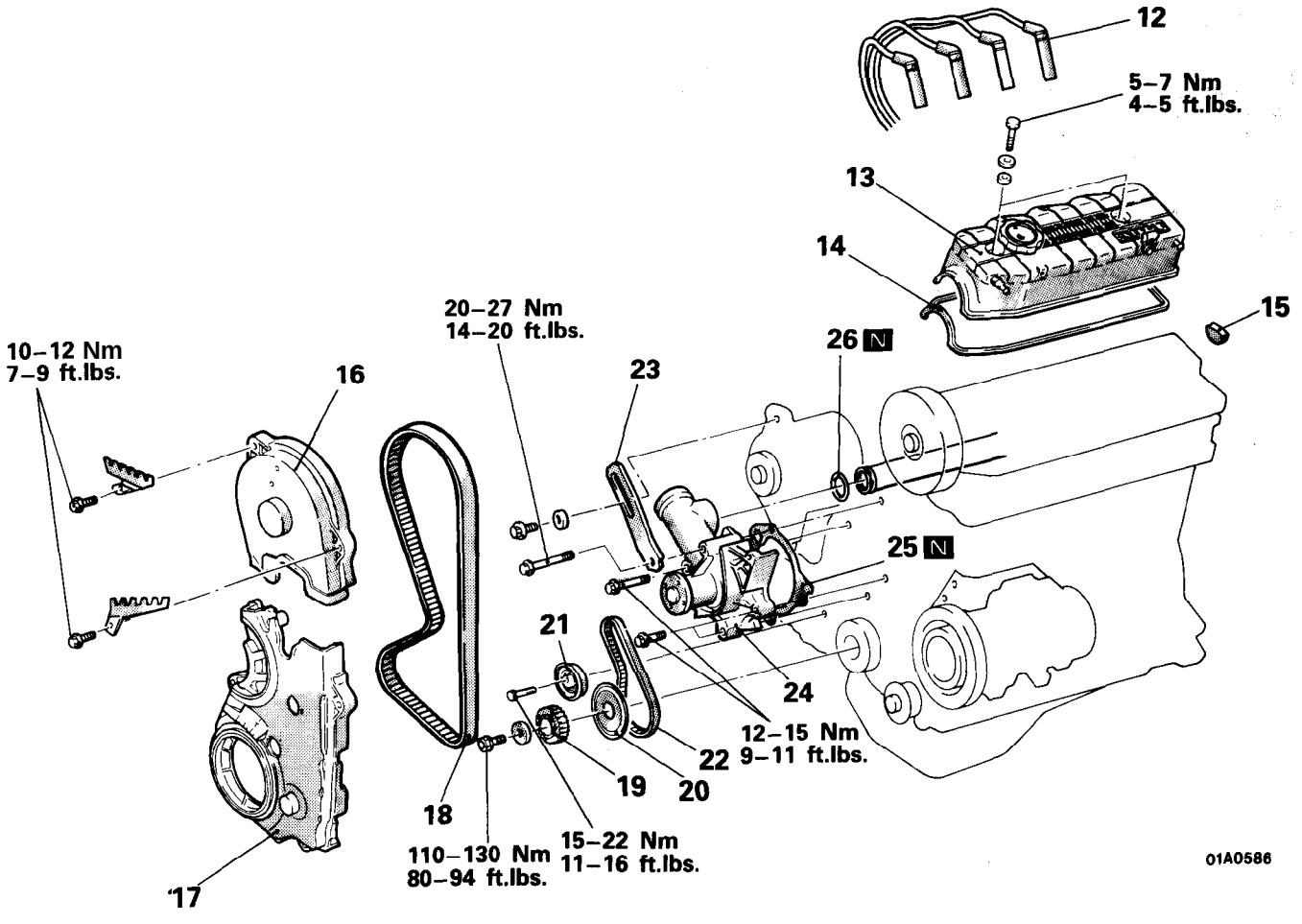



01A0585

**Removal steps**

1. Clamp part of hoses (Power steering)
◆◆ 2. Engine mount bracket
◆ ◆ 3. Drive belt (Air conditioner)
◆◆ 4. Drive belt (Power steering)
◆◆ ● ◆ 5. Drive belt
6. Tension pulley bracket
7. Water pump pulley (Power steering)
8. Water pump pulley
9. Damper pulley
10. Adapter
11. Crank shaft pulley.

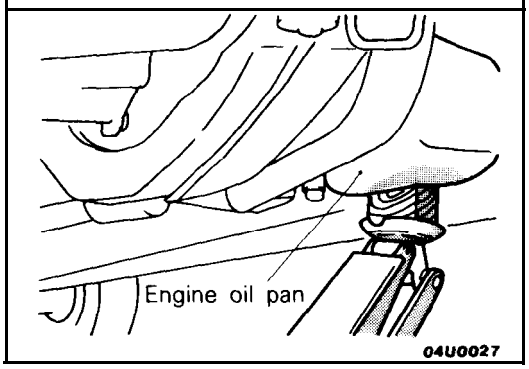
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ Refer to "Service Points of Removal".
(3) ◆◆ : Refer to "Service Points of Installation".




**Removal steps**

12. Spark plug cable
◆◆ ● 4 13. Rocker cover
14. Rocker cover gasket
● ◆15. Semi-circular packing
◆◆ ◆◆16. Timing belt front upper cover
● 17. Timing belt front lower cover
◆◆ ● 18. Timing belt
19. Crankshaft sprocket
● 20. Flange
21. Timing belt B tensioner
● ◆◆◆22. Timing belt B
23. Alternator brace
● ◆24. Water pump
25. Water pump gasket
● ◆26. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● ◆: Refer to "Service Points of Installation".
(4) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL N07MCAG

### 2. REMOVAL OF ENGINE MOUNT BRACKET

(1) Place a wooden block at the oil pan part of the engine, and then jack up the vehicle.

**Caution**
**Jack up carefully, so as not to apply a load to each part.**

(2) Remove the engine mount bracket.

### 5. REMOVAL OF DRIVE BELT

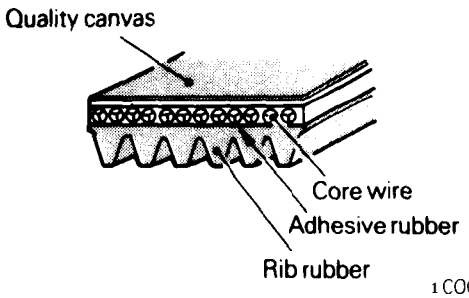
Before removing the V-ribbed belt, loosen the water pump pulley installation bolt.

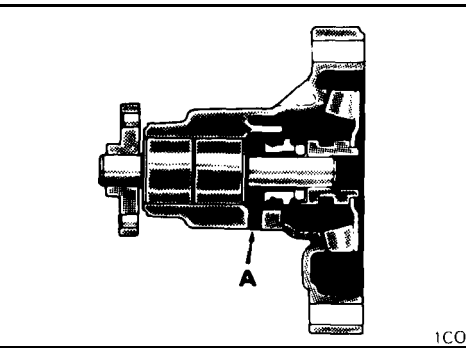
### 13. REMOVAL OF ROCKER COVER/16. TIMING BELT FRONT UPPER COVER/ 18. TIMING BELT

For information concerning the removal of the rocker cover, the timing belt front upper cover, and the timing belt, refer to GROUP 9–Timing Belt.

### 22. REMOVAL OF TIMING BELT B

For information concerning the removal of the timing belt B, refer to GROUP 9–Timing Belt B.




## INSPECTION N07MDAL

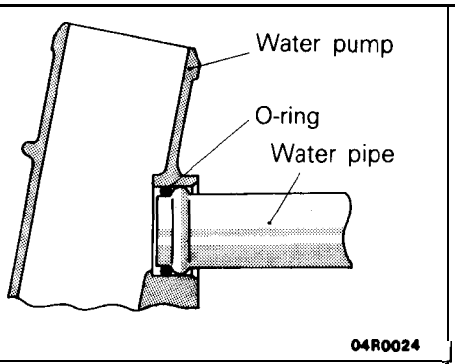
### V-RIBBED BELT

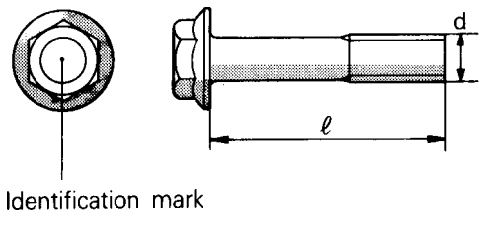
Check following items and replace if faulty.

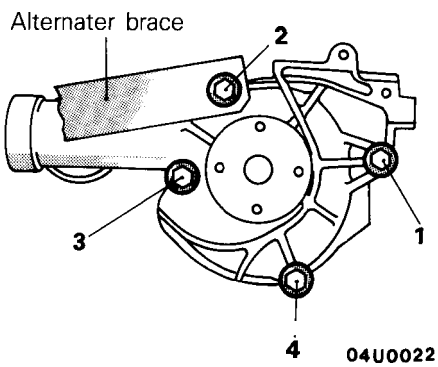
- Check belt surface for damage, peeling or cracks.
- Check belt surface for oil or grease.
- Check belt rubber for wear or brittleness.
- Check the pulleys for cracks or damage.

### WATER PUMP

- Check each part for cracks, damage or wear, and replace the water pump assembly if necessary.
- Check the bearing for damage, abnormal noise and sluggish rotation, and replace the water pump assembly if necessary.
- Check the seal unit for leaks, and replace the water pump assembly if necessary.
- Check for water leakage. If water leaks from hole “A”, seal unit is leaking. Replace as an assembly.




## SERVICE POINTS OF INSTALLATION N07MEAQa

### 26. INSTALLATION OF O-RING

Insert the O-ring to the water inlet pipe, and coat the outer circumference of the O-ring with water.
By coating with water, the insertion to the water pump will become easier.

**Caution**

1. **Care must be taken not to permit engine oil or other greases to adhere to the O-ring.**
2. **When inserting the pipe, check to be sure that there is no sand, dirt, etc. on its inner surface.**

### 24. INSTALLATION OF WATER PUMP

(1) Clean both gasket surfaces of water pump body and cylinder block.
(2) Install new water pump gasket and water pump assembly and tighten the bolts.

| No. | Identification mark | Bolt diameter (d) x length (ℓ) mm (in.) | Torque Nm (ft.lbs.) |
|---|---|---|---|
| 1 | 4 | 8 x 28 (.31x 1.1) | 12–15 (9–10) |
| 2 | 7 | 8 x 70 (.31 x 2.76) | 20–27 (15–19) |
| 3 | 4 | 8 x 55 (.31 x 2.17) | 12-15 (9–10) |
| 4 | 4 | 8 x 28 (.31 x 1.1) | |

### 22. INSTALLATION OF TIMING BELT B/20. FLANGE

For information concerning the installation of the timing belt B and the flange, refer to GROUP 9–Timing Belt B.

### 18. INSTALLATION OF TIMING BELT/17. TIMING BELT FRONT LOWER COVER/16. TIMING BELT FRONT UPPER COVER/ 15. SEMI-CIRCULAR PACKING/13. ROCKER COVER

For information concerning the installation of the timing belt, the timing belt front lower cover, the timing belt front upper cover, the semi-circular packing, and the rocker cover, refer to GROUP 9–Timing Belt.

### 5. DRIVE BELT TENSION ADJUSTMENT

Refer to P.7-9.

### 4. DRIVE BELT TENSION ADJUSTMENT <POWER STEERING>

Refer to GROUP 19–Service Adjustment Procedures.

### 3. DRIVE BELT TENSION ADJUSTMENT <AIR CONDITIONER>

Refer to GROUP 24–Service Adjustment Procedures,

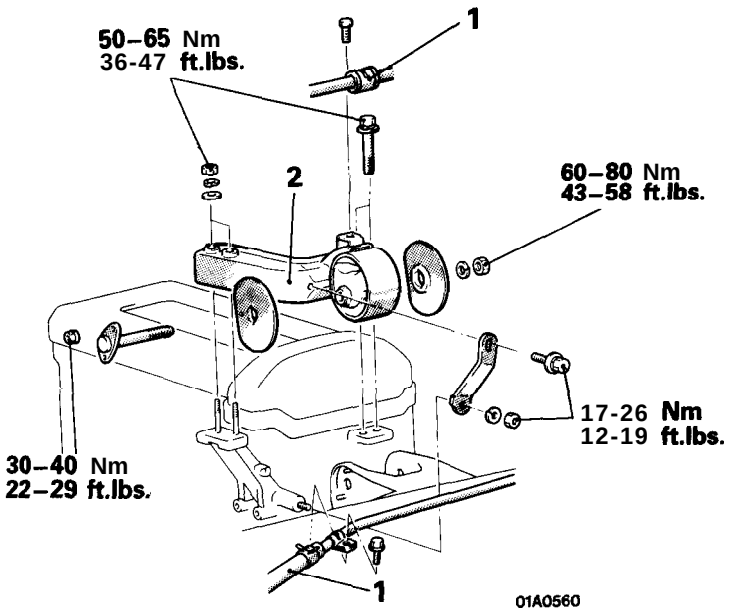
# WATER PUMP <2.0L DOHC Engine>

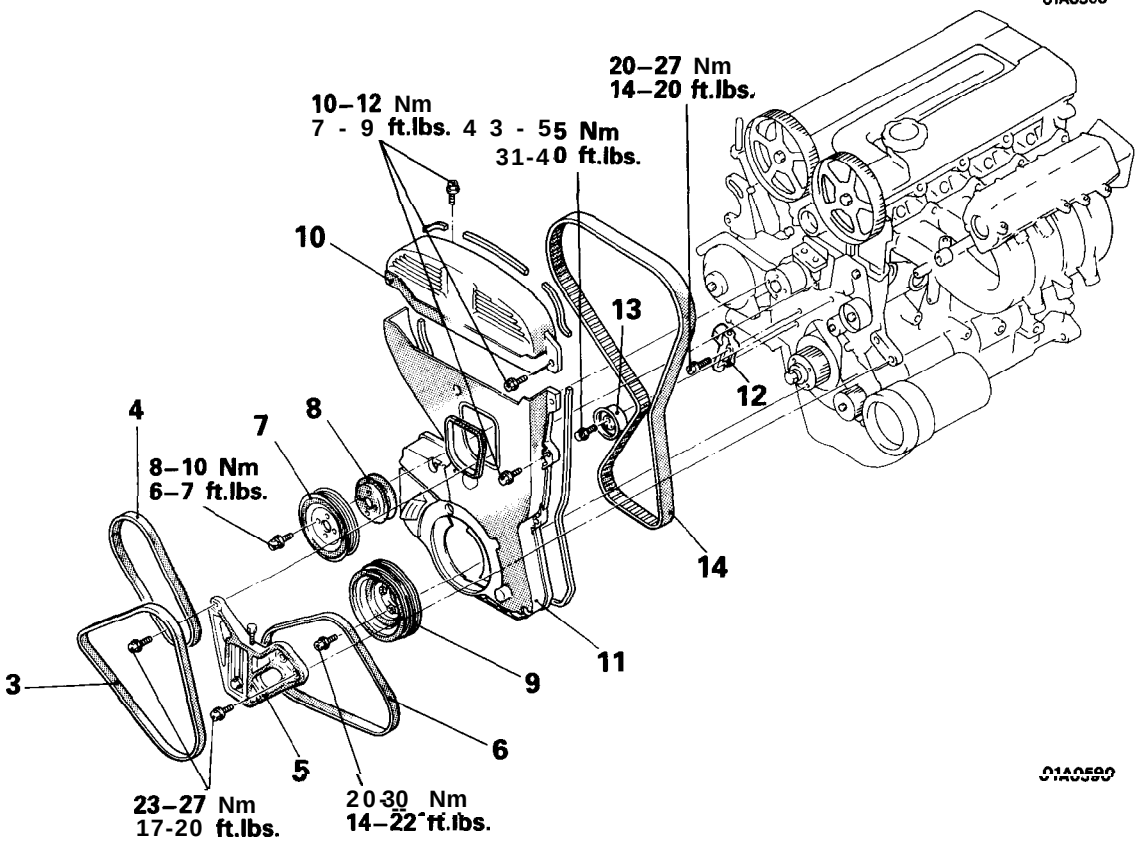
## --- REMOVAL AND INSTALLATION

N07MB-B

**Pre-removal Operation**
- Removal of the Under Cover
- Draining of the Engine Coolant
(Refer to GROUP 0–Maintenance Service.)

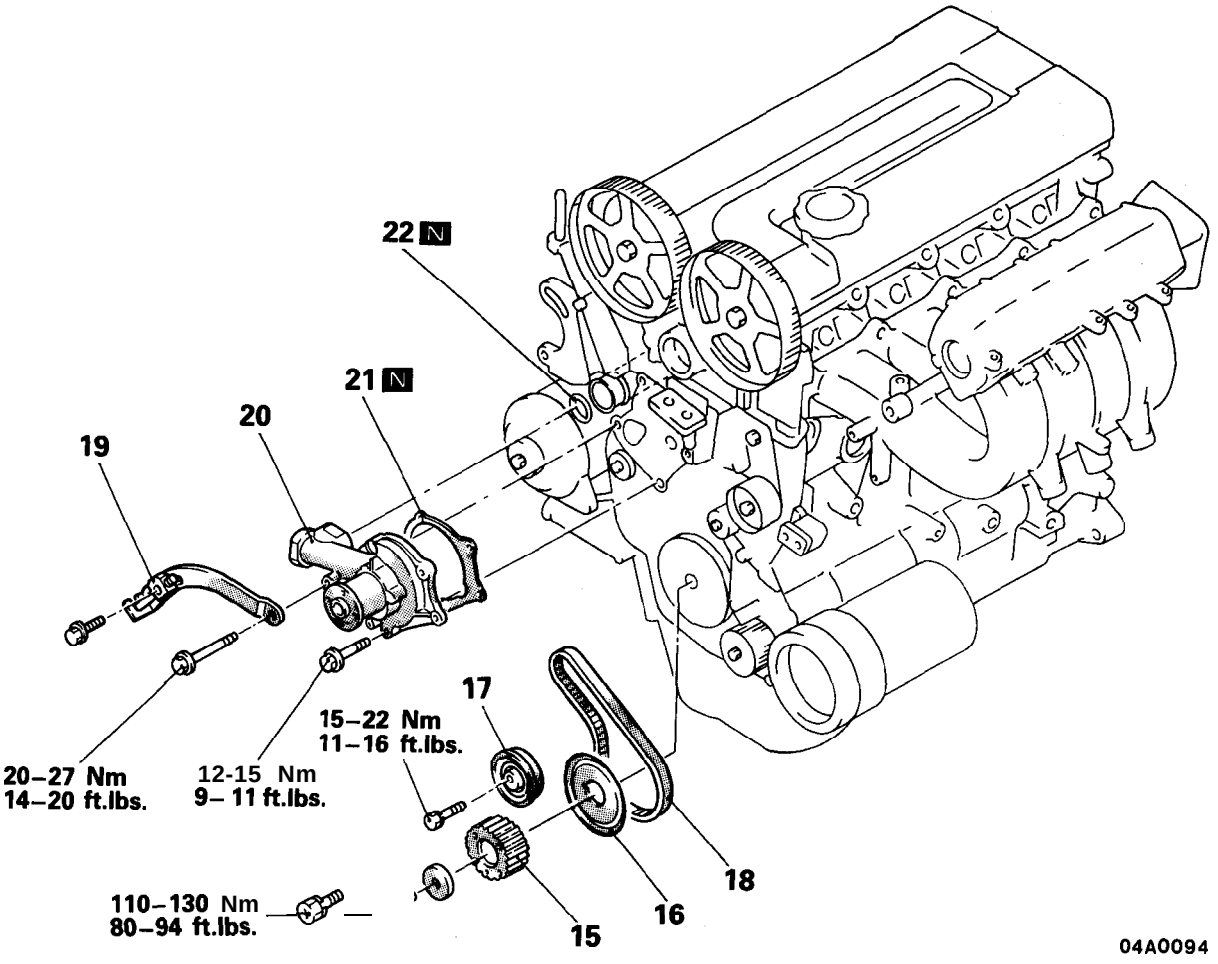
**Post-installation Operation**
- Installation of the Under Cover
- Supplying of the Engine Coolant
(Refer to GROUP O-Maintenance Service.)
- Engine Adjustment
(Refer to GROUP 9–Engine Adjustment.)



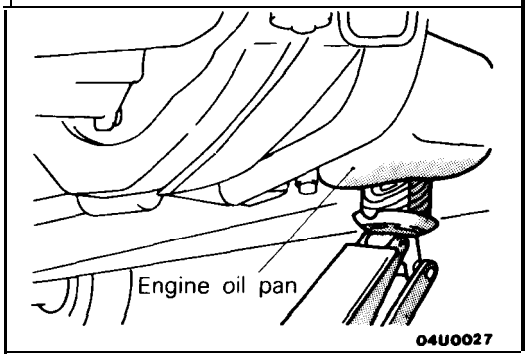

**Removal steps**
1. Clamp part of hoses (Power steering)
◆◆ 2. Engine mount bracket
● + 3. Drive belt
◆◆ 4. Drive belt (Power steering)
5. Tension pulley bracket
◆◆ 6. Drive belt (Air conditioner)
7. Water pump pulley
8. Water pump pulley (Power steering)
9. Crankshaft pulley
● + 10. Timing belt upper cover
◆◆ 11. Timing belt lower cover
◆◆ ● + 12. Automatic tensioner
13. Tensioner pulley
◆◆ ● + 14. Timing belt

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● ◆ : Refer to "Service Points of Installation"




15. Crankshaft sprocket
● ◀16. Flange
17. Timing belt B tensioner
◀▶ ● ◀18. Timing belt B
19. Alternator brace
● ◀20. Water pump
21. Water pump gasket
▶◀ 22. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀▶ : Refer to "Service Points of Removal".
(3) ▶◀ : Refer to "Service Points of Installation".
(4) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL

N07MCAH

### 2. REMOVAL OF ENGINE MOUNT BRACKET

(1) Place a wooden block at the oil pan part of the engine, and then jack up the vehicle.

**Caution**
**Jack up carefully, so as not to apply a load to each part.**

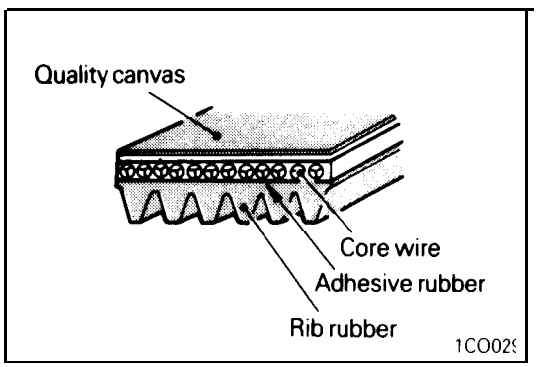
(2) Remove the engine mount bracket.

### 12. REMOVAL OF AUTOMATIC TENSIONER/14. TIMING BELT

For information concerning removal of the automatic tensioner and the timing belt, refer to GROUP 9–Timing Belt.

### 18. REMOVAL OF TIMING BELT B

For information concerning the removal of timing belt B, refer to GROUP 9–Timing Belt B.



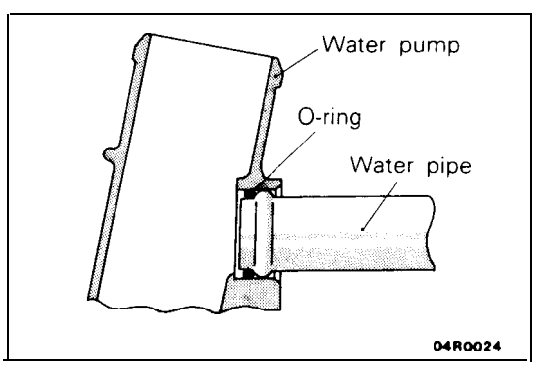

## INSPECTION N07MDAJ

### V-RIBBED BELT

Check following items and replace if faulty.
- Check belt surface for damage, peeling or cracks.
- Check belt surface for oil or grease.
- Check belt rubber for wear or brittleness.
- Check the pulleys for cracks or damage.

### WATER PUMP

- Check each part for cracks, damage or wear, and replace the water pump assembly if necessary.
- Check the bearing for damage, abnormal noise and sluggish rotation, and replace the water pump assembly if necessary.
- Check the seal unit for leaks, and replace the water pump assembly if necessary.
- Check for water leakage.

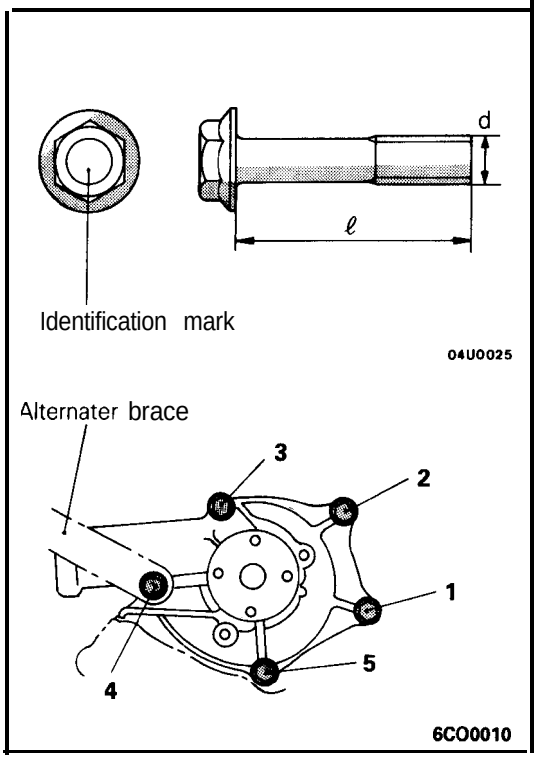



## SERVICE POINTS OF INSTALLATION N07MEAN

### 22. INSTALLATION OF O-RING

Insert the O-ring to the water inlet pipe, and coat the outer circumference of the O-ring with water.
By coating with water, the insertion to the water pump will become easier.

**Caution**
**1. Care must be taken not to permit engine oil or other greases to adhere to the O-ring.**
**2. When inserting the pipe, check to be sure that there is no sand, dirt, etc. on its inner surface.**




## 20. INSTALLATION OF WATER PUMP

(1) Clean both gasket surfaces of water pump body and cylinder block.
(2) Install new water pump gasket and water pump assembly and tighten the bolts.

| No. | Identification mark | Bolt diameter (d) x length (ℓ) mm (in.) | Torque Nm (ft.lbs.) |
|---|---|---|---|
| 1 | 4 | 8 x 14 (.31 x .55) | 12-15 (9–10) |
| 2 | 4 | 8 x 22 (.31 x .87) | |
| 3 | 4 | 8 x 30 (.31 x 1.18) | |
| 4 | 7 | 8 x 65 (.31 x 2.56) | 20–27 (15–19) |
| 5 | 4 | 8 x 28 (.31 x 1.10) | 12-15 (9–10) |

## 18. INSTALLATION OF TIMING BELT B/16. FLANGE

For information concerning the installation of the timing belt B and the flange, refer to GROUP 9–Timing Belt B.

## 14. INSTALLATION OF TIMING BELT/12. AUTOMATIC TENSIONNER/ 11. TIMING BELT LOWER COVER/ 10. TIMING BELT UPPER COVER

For information concerning installation of the timing belt, the automatic tensioner, the timing belt lower cover, and the timing belt upper cover, refer to GROUP 9–Timing Belt.

## 6. DRIVE BELT TENSION ADJUSTMENT <AIR CONDITIONER>

Refer to GROUP 24–Service Adjustment Procedures.

## 4. DRIVE BELT TENSION ADJUSTMENT <POWER STEERING>

Refer to GROUP 1 9–Service Adjustment Procedures.

## 3. DRIVE BELT TENSION ADJUSTMENT

Refer to P.7-9.

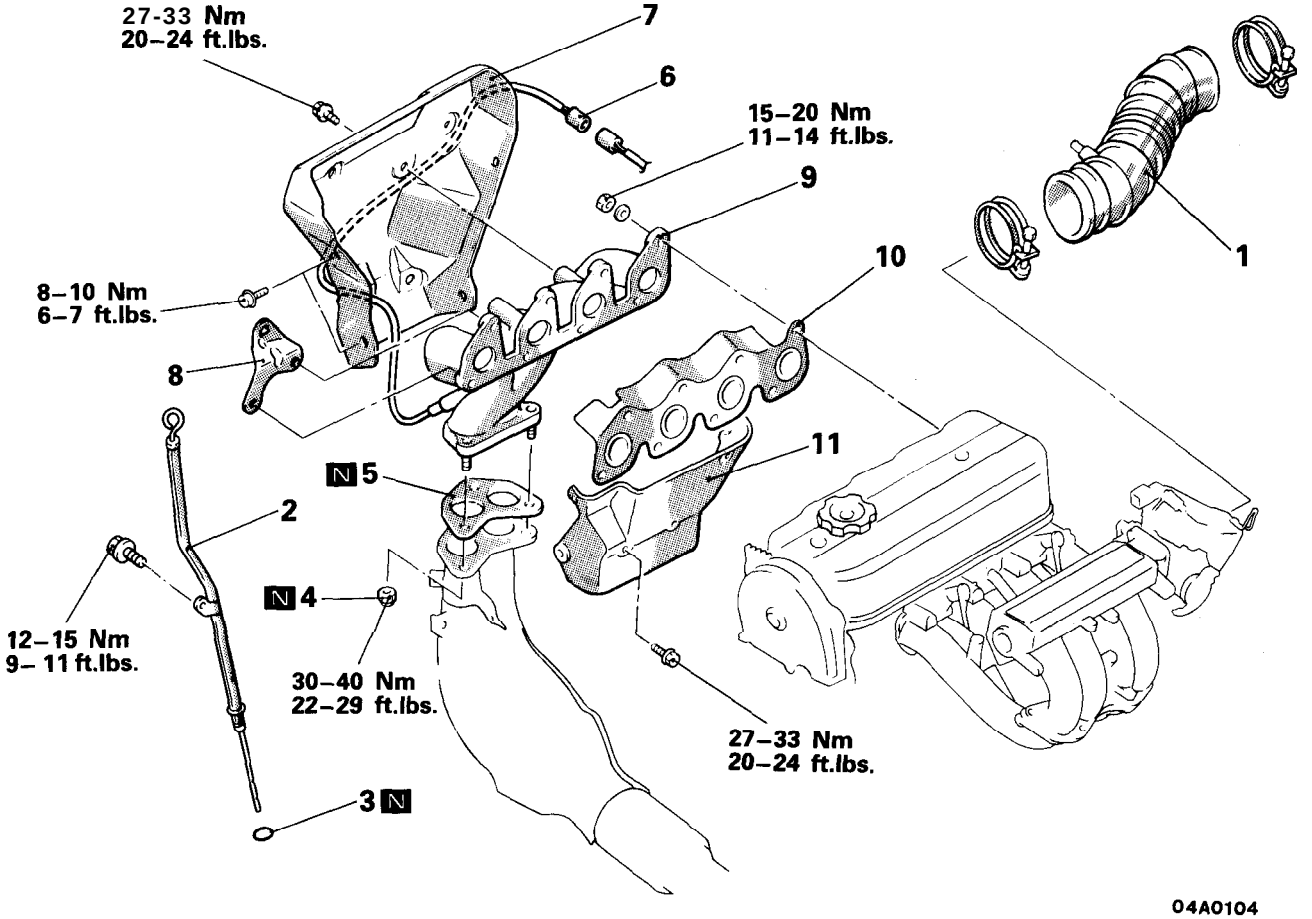
# WATER HOSE AND WATER PIPE <1.8L Engine>

## REMOVAL AND INSTALLATION

N07IA-A

**Pre-removal Operation**
- Draining of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

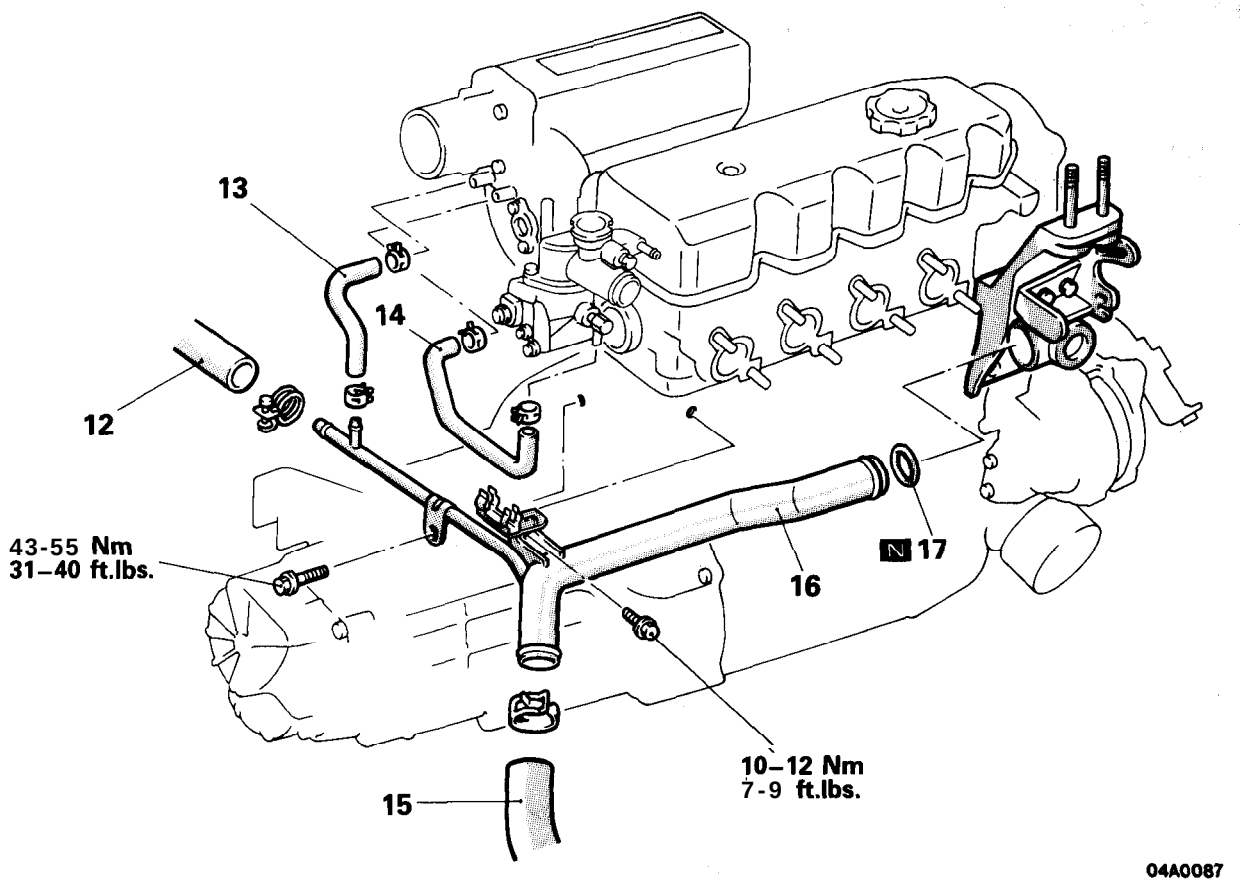
**Post-installation Operation**
- Supplying of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)




**Removal steps**

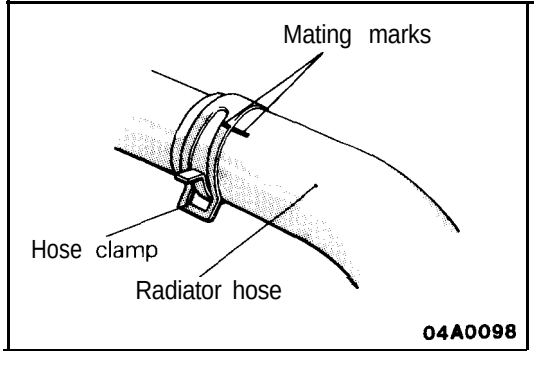
1 Air intake hose
2. Engine oil level gauge guide
3. O-ring
4. Self locking nut
5. Gasket
6. Oxygen sensor harness connector
7. Exhaust manifold cover (A)
8. Engine hanger
9. Exhaust manifold
10. Exhaust manifold gasket
11. Exhaust manifold cover(B)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) N : Non-reusable parts




12. Connection for heater hose
13. Water by-pass hose
14. Water hose
◆◆▶◆ 15. Connection for radiator lower hose
● + 16. Water inlet pipe
● * 17. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation"
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF REMOVAL N07IBAC1

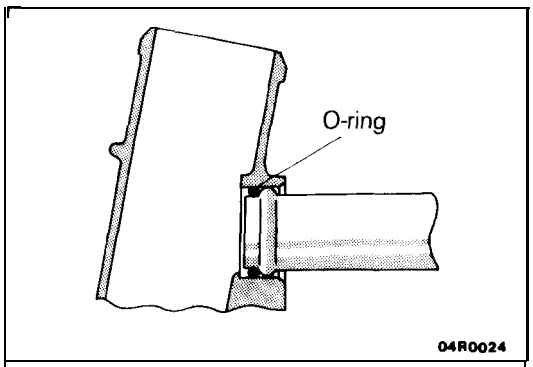
### 15. DISCONNECTION OF RADIATOR LOWER HOSE

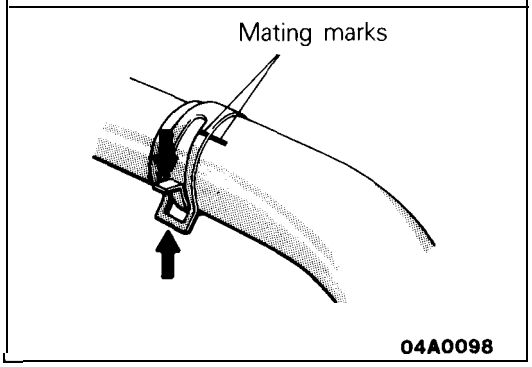
After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.

## INSPECTION N07ICAAa1

### WATER PIPE AND HOSE INSPECTION

Check the water pipe and hose for cracks, damage, clog and replace them if necessary.




## SERVICE POINTS OF INSTALLATION N071DAJ1

### 17. INSTALLATION OF O-RING / 16. WATER INLET PIPE

Insert the O-ring to the water inlet pipe, and coat the outer circumference of the O-ring with water.
By coating with water, the insertion to the water pump will become easier.

**Caution**
**Care must be taken not to permit engine oil or other greases to adhere to the O-ring.**

### 15. CONNECTION OF RADIATOR LOWER HOSE

Align the mating marks on the radiator hose and hose clamp and then connect them; then, applying force in the direction indicated by the arrow in the illustration, seat the clamp to the trace marks of the previous connection.

**Caution**
**Be sure to install the hose clamps at the trace marks of the previous connection.**

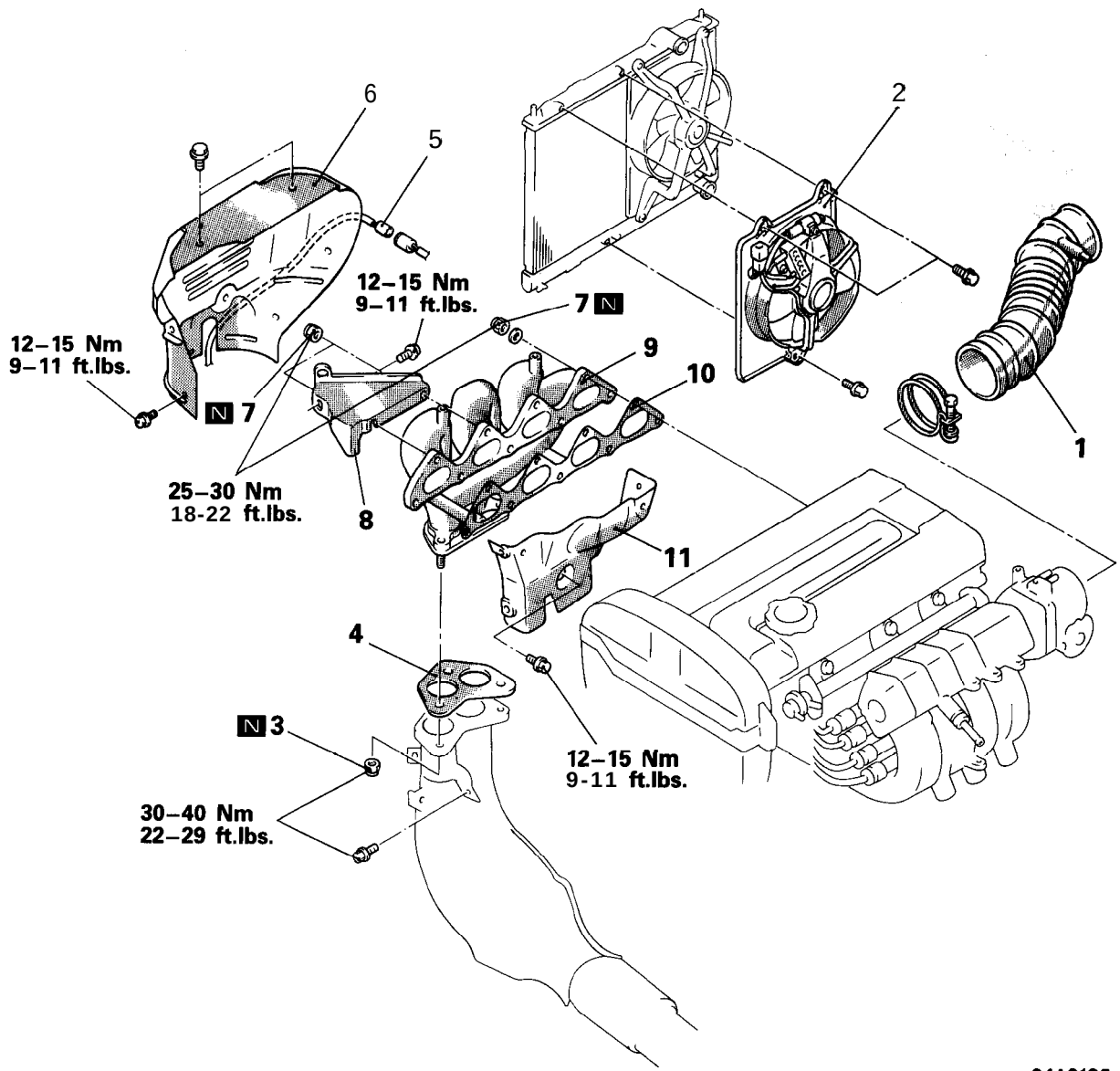
# <2.0L DOHC Engine (Non-Turbo)>

## REMOVAL AND INSTALLATION

N07IA-B

**Pre-removal Operation**
- Draining of the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- Supplying of the Engine Coolant (Refer to GROUP O-Maintenance Service.)

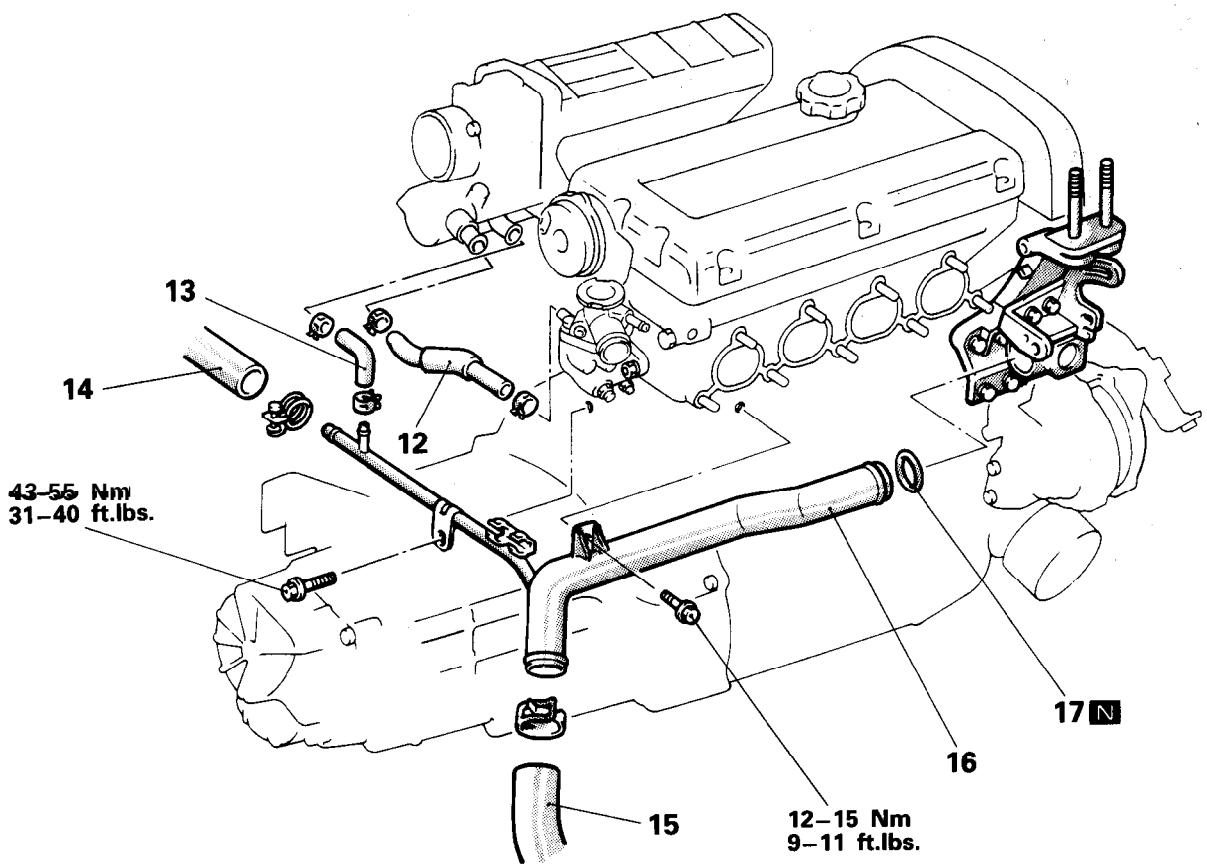



04A0105

**Removal steps**

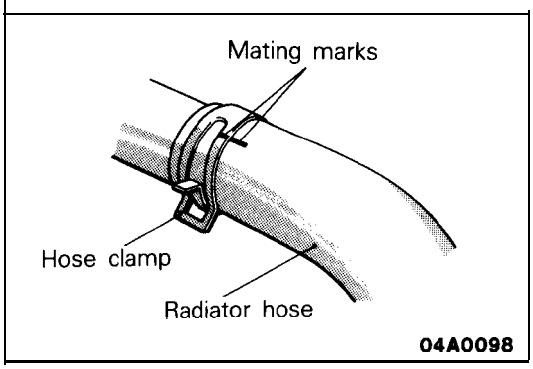
1 Air intake hose
2. Condenser fan motor assembly <Vehicles with air conditioner>
3. Self-locking nut
4. Gasket
5. Oxygen sensor harness connector
6. Exhaust manifold cover (A)
7. Self-locking nut
8. Engine hanger
9. Exhaust manifold
10. Exhaust manifold gasket
11. Exhaust manifold cover(B)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) N : Non-reusable parts




12. Water hose
13. Water by-pass hose
14. Connection for heater hose
◆◆ ● 15. Connection for radiator lower hose
● 16. Water inlet pipe
● * 17. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4 : Refer to "Service Points of Installation"
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF REMOVAL

N07IBAC2

### 15. DISCONNECTION OF RADIATOR LOWER HOSE

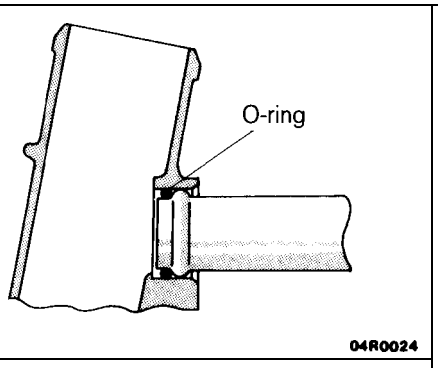
After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.

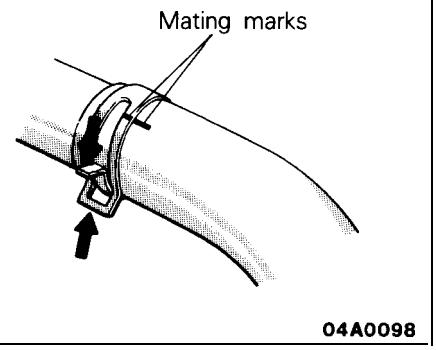
## INSPECTION

N07ICAAa2

### WATER PIPE AND HOSE INSPECTION

Check the water pipe and hose for cracks, damage, clog and replace them if necessary.




## SERVICE POINTS OF INSTALLATION N071DAJ2

### 17. INSTALLATION OF O-RING/ 16. WATER INLET PIPE

Insert the O-ring to the water inlet pipe, and coat the outer circumference of the O-ring with water.
By coating with water, the insertion to the water pump will become easier.

**Caution**
**Care must be taken not to permit engine oil or other greases to adhere to the O-ring**

### 15. CONNECTION OF RADIATOR LOWER HOSE

Align the mating marks on the radiator hose and hose clamp and then connect them; then, applying force in the direction indicated by the arrow in the illustration, seat the clamp to the trace marks of the previous connection.

**Caution**
**Be sure to install the hose clamps at the trace marks of the previous connection.**

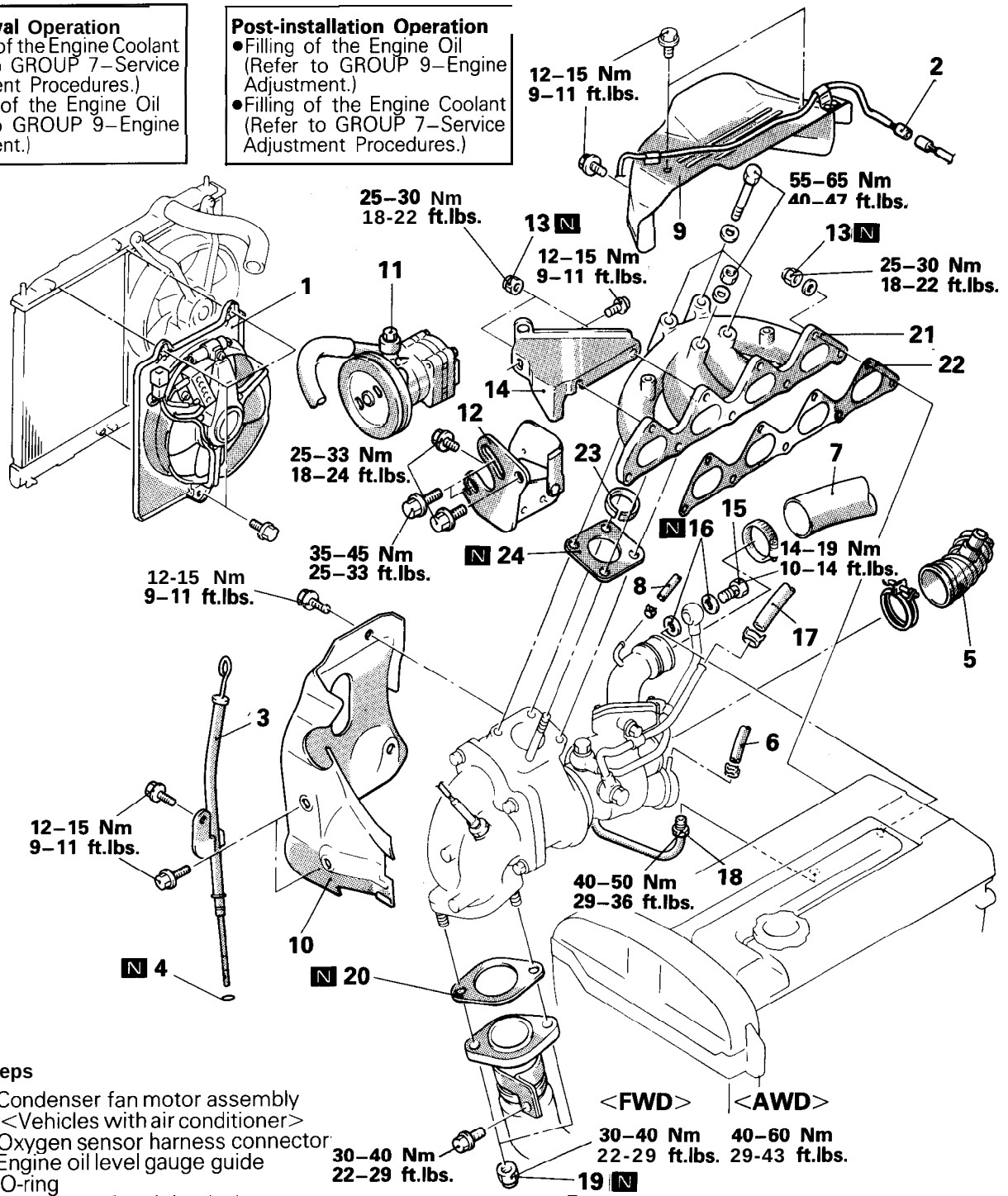
# WATER HOSE AND WATER PIPE <2.0L DOHC Engine (Turbo)>

## REMOVAL AND INSTALLATION

N07IA-C

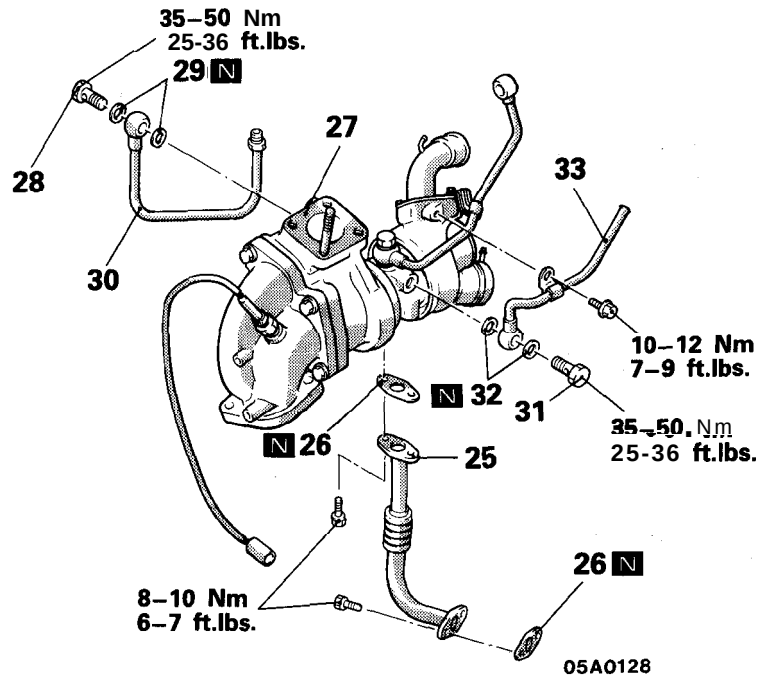
**Pre-removal Operation**
- Draining of the Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)
- Draining of the Engine Oil (Refer to GROUP 9–Engine Adjustment.)

**Post-installation Operation**
- Filling of the Engine Oil (Refer to GROUP 9–Engine Adjustment.)
- Filling of the Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)

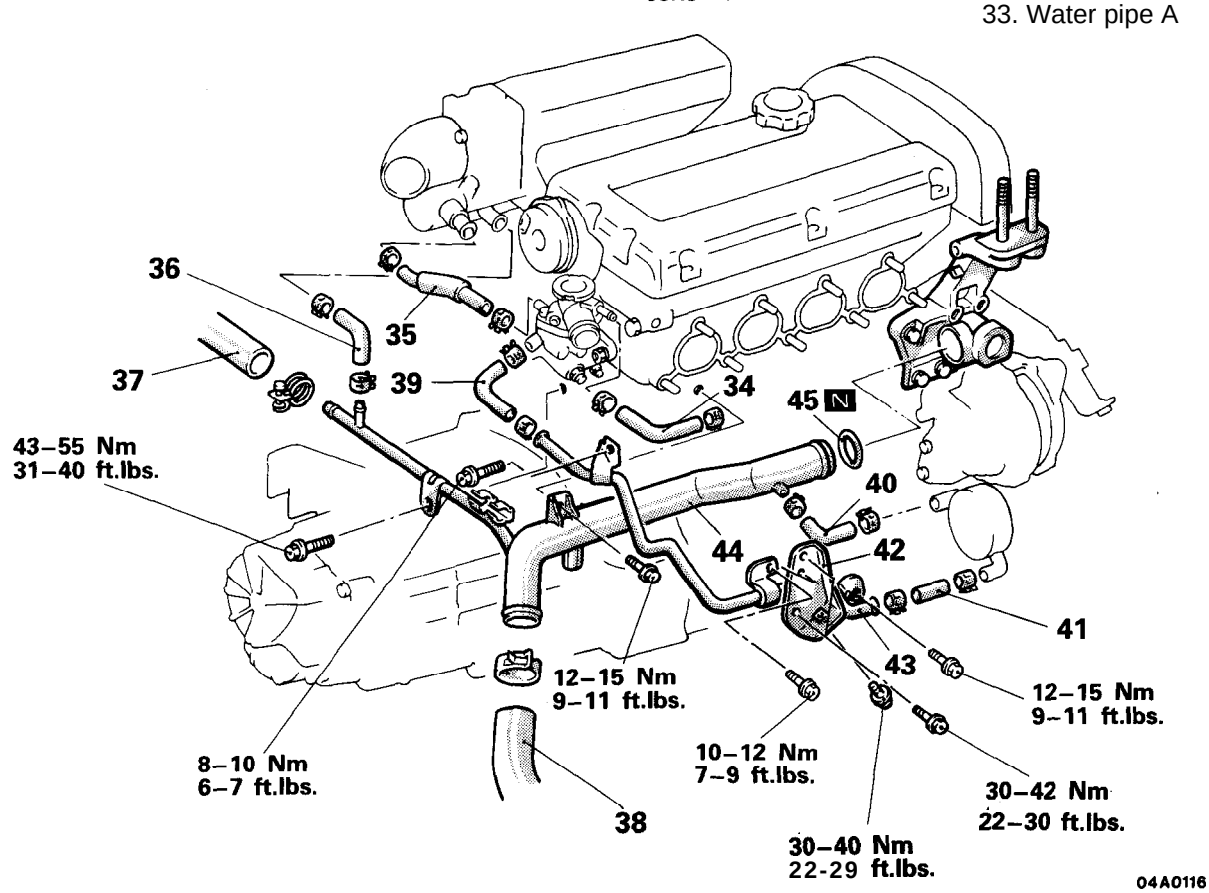



**Removal steps**

1. Condenser fan motor assembly <Vehicles with air conditioner>
2. Oxygen sensor harness connector
3. Engine oil level gauge guide
4. O-ring
5. Connection for air intake hose
6. Connection for vacuum hose
7. Connection for air hose A
8. Connection for vacuum hose
9. Heat protector A
10. Heat protector B
11. Power steering oil pump
12. Oil pump bracket
13. Self-locking nut
14. Engine hanger
15. Eye bolt
16. Gasket
17. Connection for water hose
18. Connection for water pipe B
19. Self-locking nut
20. Gasket
21. Exhaust manifold
22. Exhaust manifold gasket
23. Ring
24. Gasket

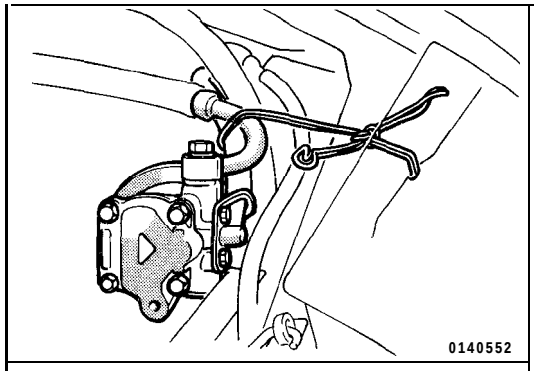


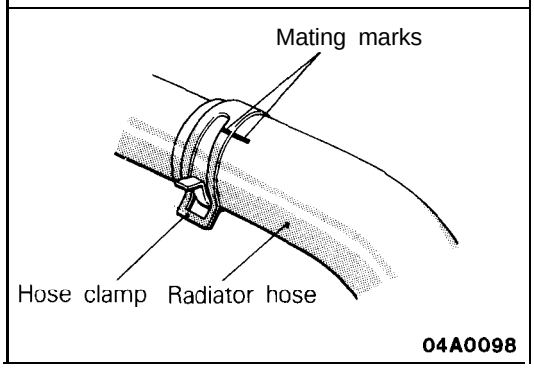

25. Oil return pipe
26. Gasket
◆◆ ● 27. Turbocharger
28. Eye bolt
29. Gasket
30. Water pipe B
31. Eye bolt
32. Gasket
33. Water pipe A




◆◆ 34. Water hose (to turbocharger)
35. Water hose
36. Water by-pass hose
37. Connection for heater hose
◆◆ ● 38. Connection for radiator lower hose
39. Water hose
40. Water hose
41. Water hose
42. Exhaust pipe support bracket
43. Water pipe
● * 44. Water inlet pipe
● * 45. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● : Refer to "Service Points of Installation"
(4) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL N07IBAC3

**11. DISCONNECTION OF POWER STEERING OIL PUMP**

Disconnect the oil pump with hoses from the bracket.

NOTE
The removed power steering oil pump should be fastened (by using rope, etc.) in a position that will not interfere with the removal/installation of the engine assembly.

**27. REMOVAL OF TURBOCHARGER ASSEMBLY**

Remove the turbocharger assembly with the exhaust fitting, water pipe A, water pipe B and the oil pipe attached to it.

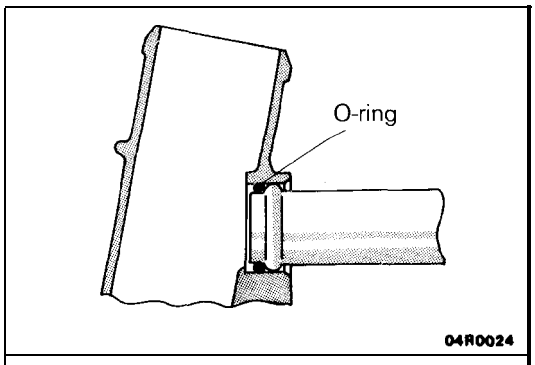
**38. DISCONNECTION OF RADIATOR LOWER HOSE**

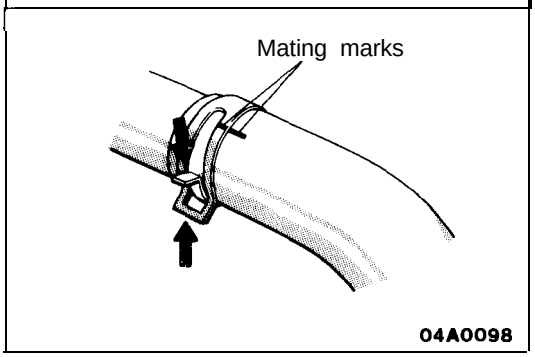
After making mating marks on the radiator hose and the hose clamp, disconnect the radiator hose.

## INSPECTION N07ICAAa3

**WATER PIPE AND HOSE INSPECTION**

Check the water pipe and hose for cracks, damage, clog and replace them if necessary.




## SERVICE POINTS OF INSTALLATION N07IDAJ3

**45. INSTALLATION OF O-RING / 44. WATER INLET PIPE**

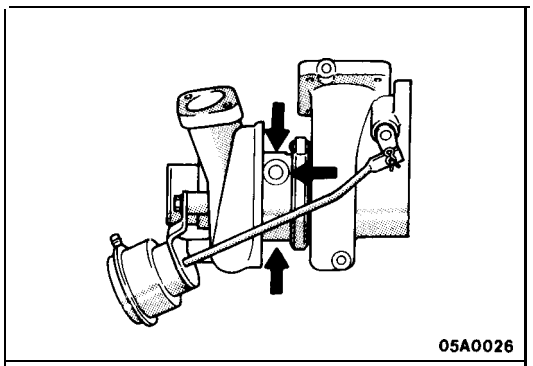
Insert the O-ring to the water inlet pipe, and coat the outer circumference of the O-ring with water.
By coating with water, the insertion to the water pump will become easier.

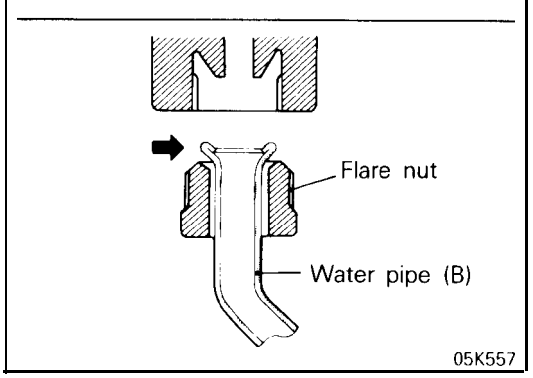
**Caution**
**Care must be taken not to permit engine oil or other greases to adhere to the O-ring.**

**38. CONNECTION OF RADIATOR LOWER HOSE**

Align the mating marks on the radiator hose and hose clamp and then connect them; then, applying force in the direction indicated by the arrow in the illustration, seat the clamp to the trace marks of the previous connection.

**Caution**
**Be sure to install the hose clamps at the trace marks of the previous connection.**




### 34. INSTALLATION OF WATER HOSE

Install the water hose with the longer straight area positioned on the turbo side.

### 27. INSTALLATION OF TURBOCHAGER ASSEMBLY

Clean the alignment surfaces shown in the illustration.

**Caution**
**When cleaning, care must be taken so that a piece of the gasket does not enter the oil passage hole.**

### 18. INSTALLATION OF WATER PIPE (B)

Before installing to the water inlet pipe, apply machine oil to the inner surface of the pipe flare.

# ENGINE COOLANT TEMPERATURE GAUGE UNIT, ENGINE COOLANT TEMPERATURE SENSOR AND ENGINE COOLANT TEMPERATURE SWITCH

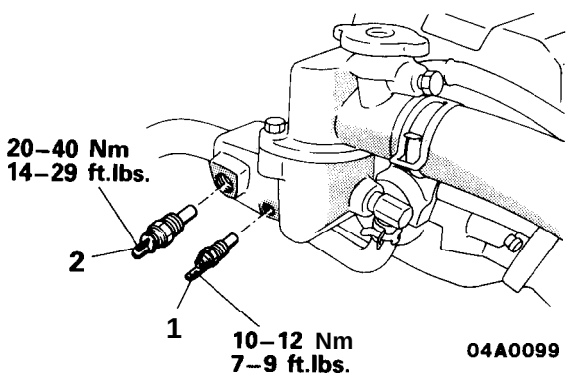
## REMOVAL AND INSTALLATION

N07OB--

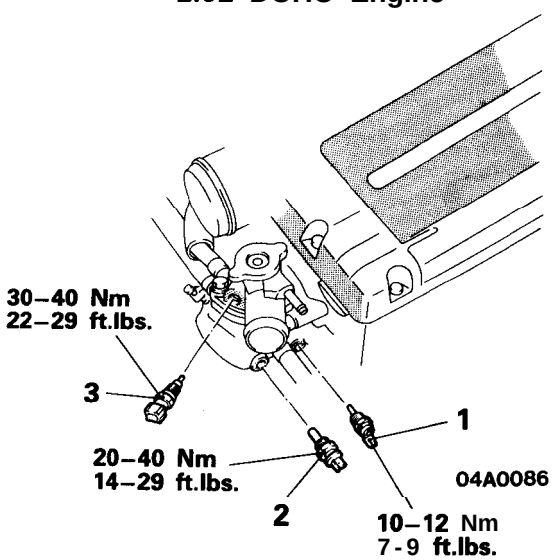
**Pre-removal Operation**
*Draining of the Engine Coolant (Refer to GROUP O-Maintenance Service.)

**Post-installation Operation**
@Supplying of the Engine Coolant (Refer to GROUP O-Maintenance Service.)

<1.8L Engine>



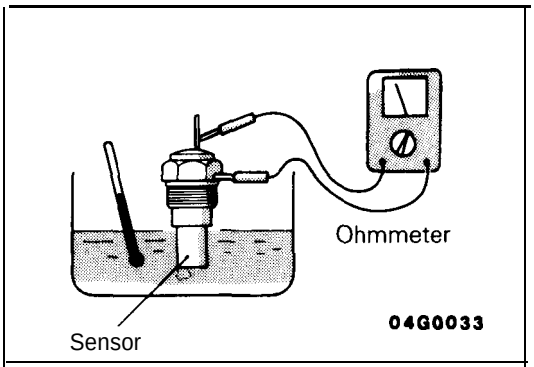

<2.0L DOHC Engine>




### Removal

● + 1. Engine coolant temperature gauge unit
◆◆ 2. Engine coolant temperature sensor (Engine control)
◆◆ 3. Engine coolant temperature switch (Air conditioner)

NOTE
● a : Refer to “Service Points of Installation”.

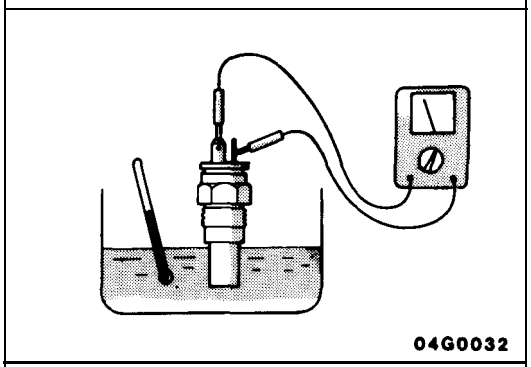



## INSPECTION N07ODAG

### ENGINE COOLANT TEMPERATURE GAUGE UNIT

Raise the water temperature and measure the resistance if within the standard value.

**Standard value: 104 ± 13.5 Ω [at 70°C (158°F)]**

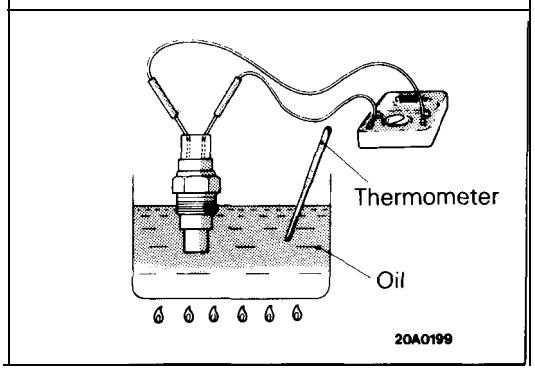



### ENGINE COOLANT TEMPERATURE SENSOR (Engine control)

Raise the water temperature and measure the resistance if within the standard value.

**Standard value:**

| | |
|---|---|
| **At 20°C (68°F)** | **2.45 ± 0.24 kΩ** |
| **At 80°C (176°F)** | **296 ± 32 Ω** |

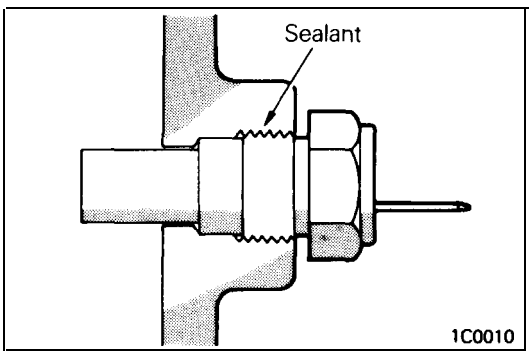



### ENGINE COOLANT TEMPERATURE SWITCH (Air conditioner)

(1) Immerse the engine coolant temperature switch in oil and then heat (by using a gas stove flame or similar method) so as to increase the oil temperature.
(2) Check to be sure that the engine coolant temperature switch is switched OFF when the oil temperature reaches the standard value.

**Standard value: 112–118°C (234–244°F)**

**Caution**
**The oil used above should be engine oil and should be stirred well while being heated; do not heat more than necessary.**




## SERVICE POINTS OF INSTALLATION N07OEAU

**3. ENGINE COOLANT TEMPERATURE SWITCH/2. ENGINE COOLANT TEMPERATURE SENSOR/I. ENGINE COOLANT TEMPERATURE GAUGE UNIT**

Apply sealant to threaded portion and tighten.

**Specified sealant: MOPAR Part No.4318034 or equivalent**

NOTES

# ENGINE

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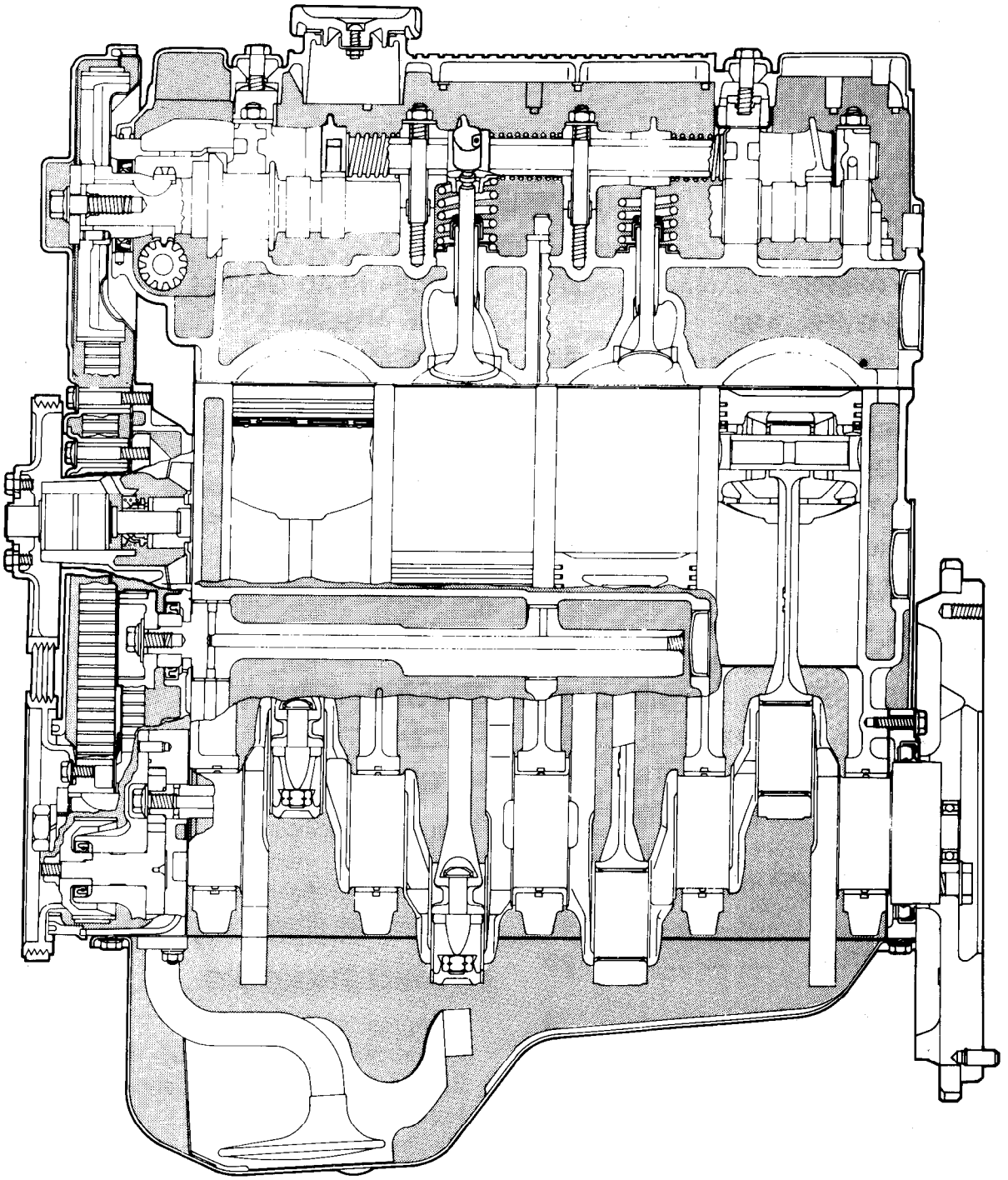
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Connecting Rod Noise/Main Bearing Noise
Excessive Engine Rolling and Vibration
Noisy Valves
Oil Pressure Drop
Oil Pressure Too High
Timing Belt Noise

# GENERAL INFORMATION

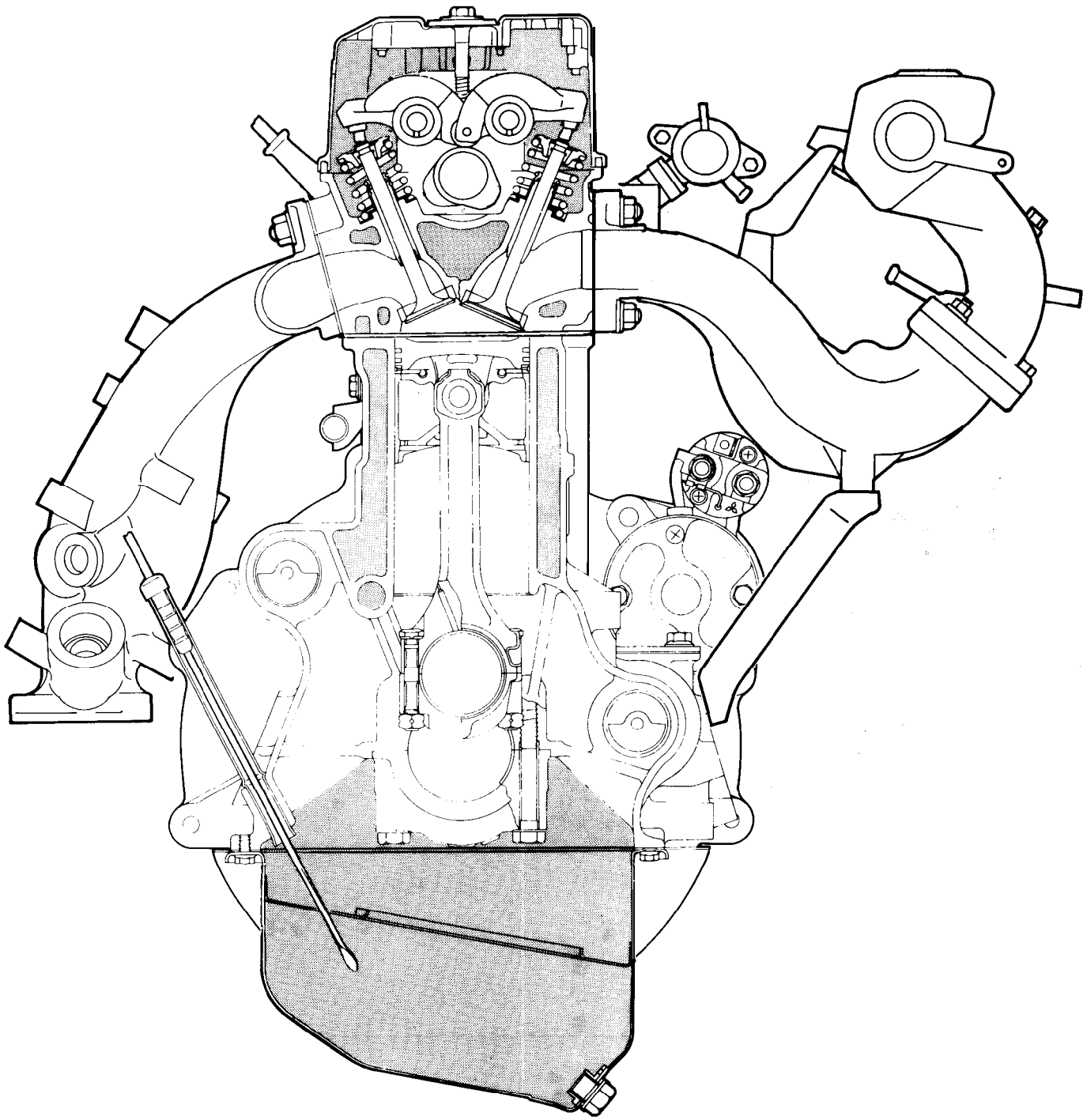
## SECTIONAL VIEW <1.8L Engine>

N09BAFC



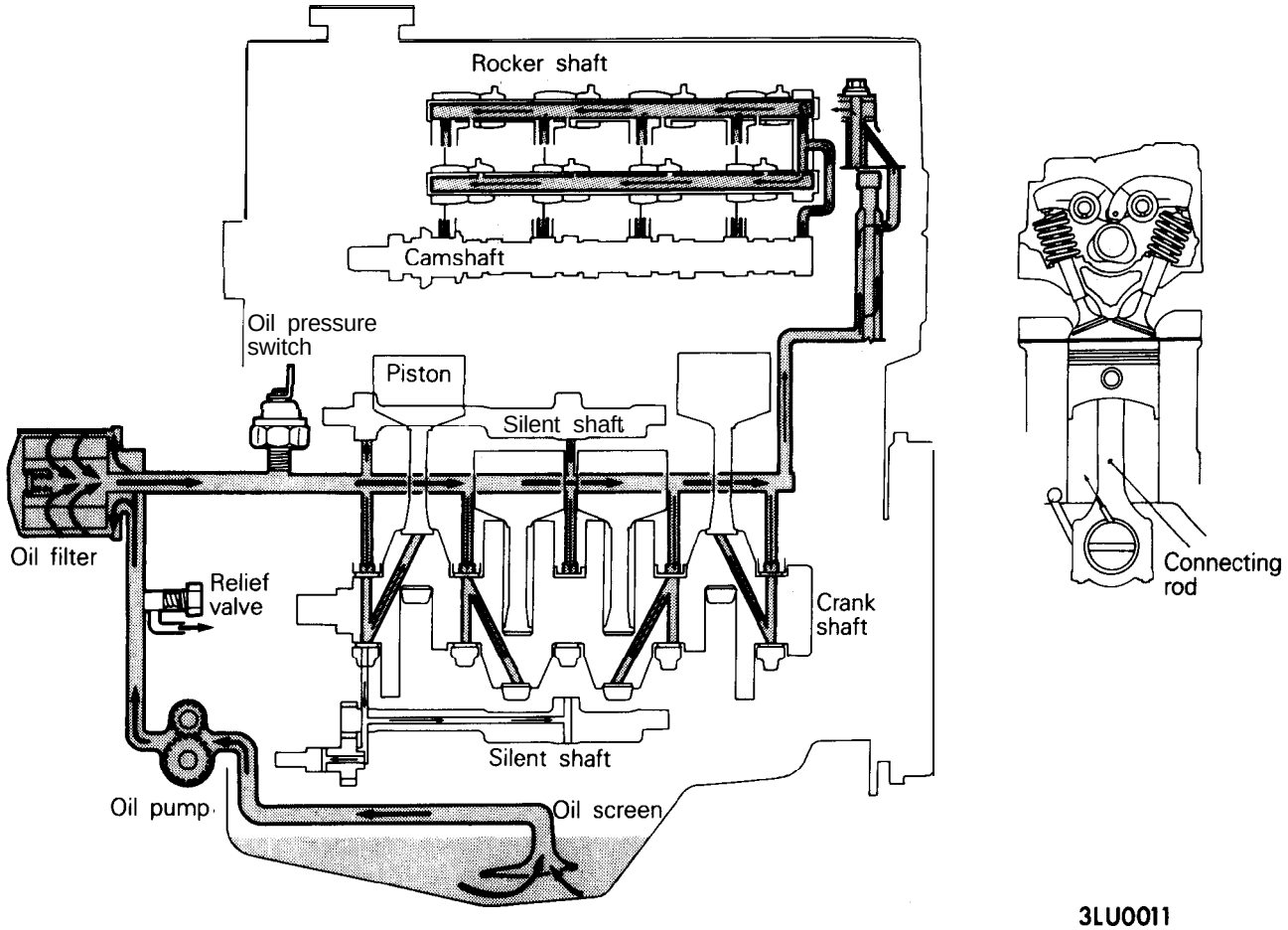
3EN0086

## SECTIONAL VIEW <1.8L Engine>

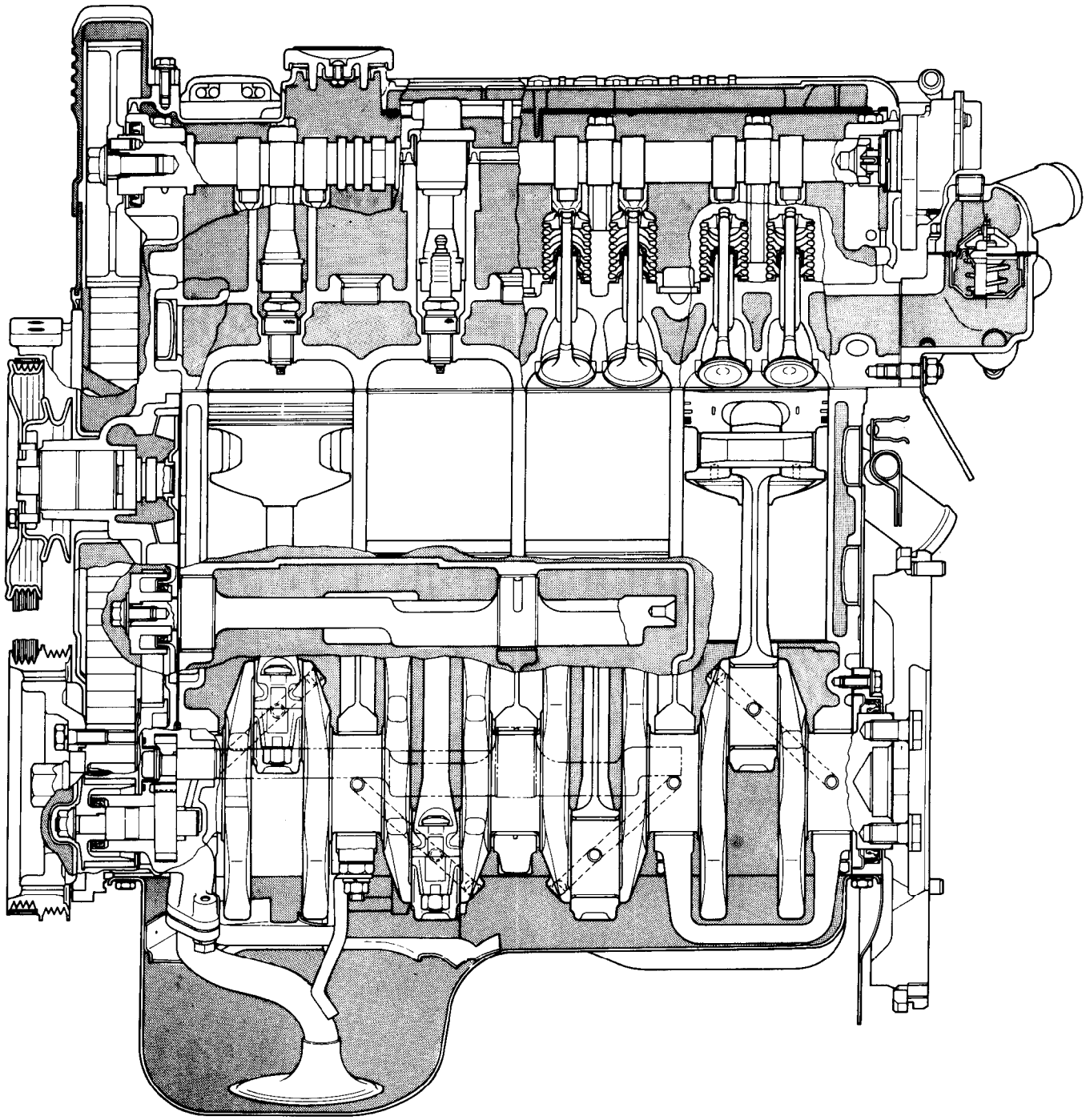


3EN0087

## LUBRICATION SYSTEM <1.8L Engine>



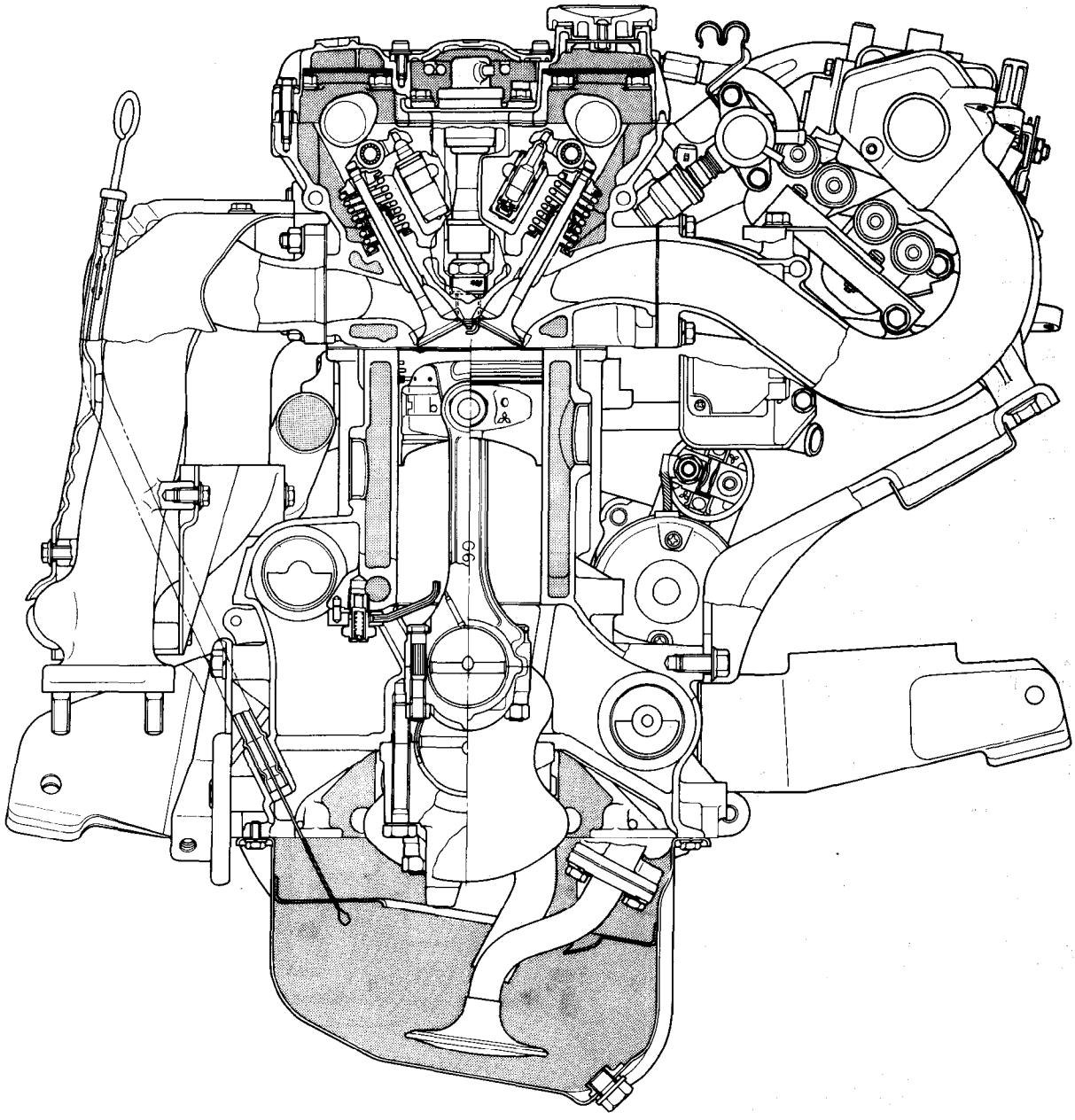
## SECTIONAL VIEW <2.0L DOHC Engine>



6EN0245

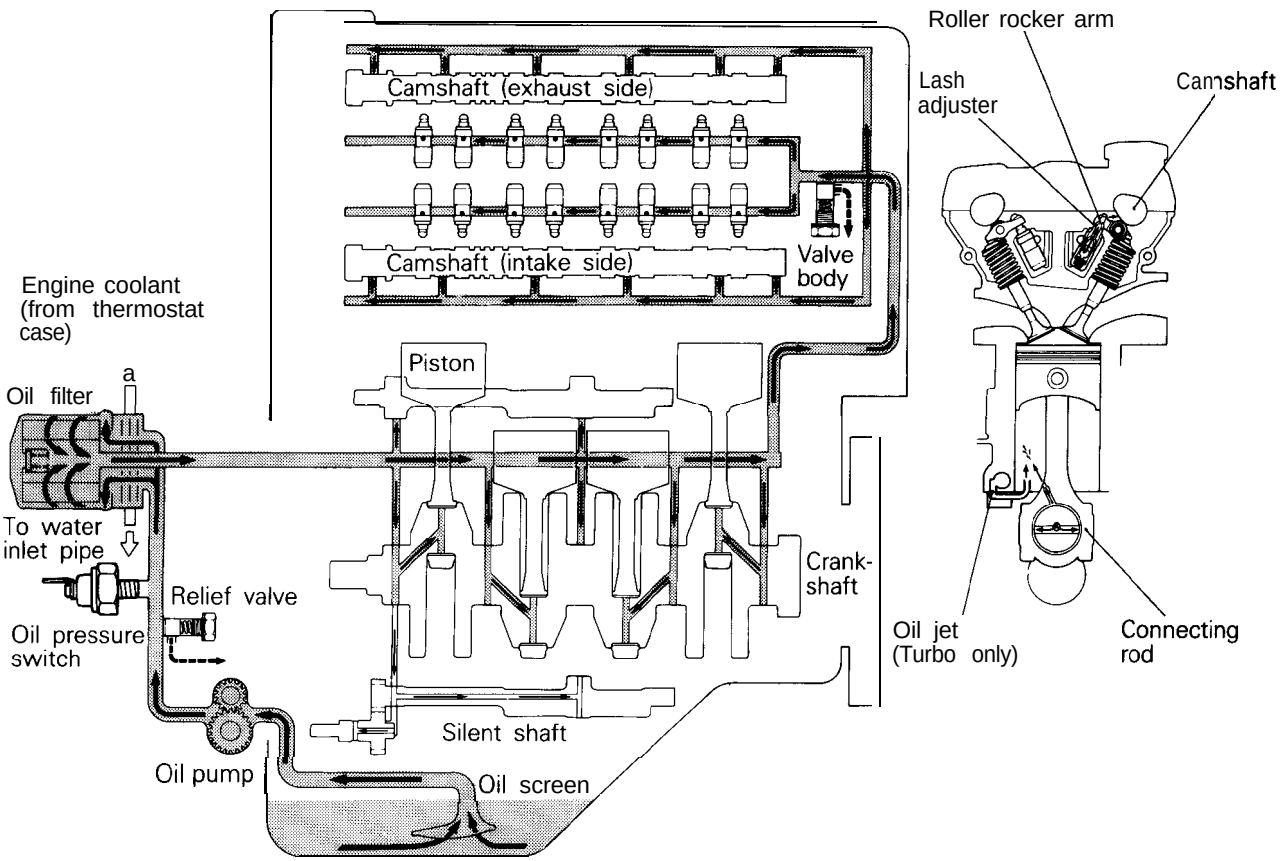
## SECTIONAL VIEW <2.0L DOHC Engine>

N09BAFC



6EN0244

## LUBRICATION SYSTEM <2.0L DOHC Engine>



# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N09CA--

| Items | Specifications | |
|---|---|---|
| | 1.8L Engine | 2.0L Engine |
| Type | In-line Single Over Head Camshaft | In-line Double Over Head Camshaft |
| Number of cylinders | 4 | 4 |
| Bore mm (in.) | 80.6 (3.17) | 85 (3.35) |
| Stroke mm (in.) | 86 (3.39) | 88 (3.46) |
| Compression ratio | 9.0 | 9.0 (Non-Turbo)<br>7.8 (Turbo) |
| Firing order | 1–3–4–2 | 1–3–4–2 |
| Silent shaft | Equipped | Equipped |
| Valve timing | | |
| Intake valve | | |
| Opens (BTDC) | 20° | 26° (Non-Turbo)<br>21° (Turbo) |
| Closes (ATDC) | 52° | 46° (Non-Turbo)<br>51° (Turbo) |
| Exhaust valve | | |
| Opens (BBDC) | 55° | 55° |
| Closes (ATDC) | 17° | 9° |
| Lubrication | Pressure feed-full flow filtration | Pressure feed-full flow filtration |

## SERVICE SPECIFICATIONS

N09CB--

### <1.8L Engine>

| Items | Standard Value | Limit |
|---|---|---|
| Engine adjustments | | |
| Engine compression pressure kPa (psi) | – | Min. 920 (131) |
| Engine compression pressure difference between each cylinder kPa (psi) | – | Max. 100 (14) |
| Intake manifold vacuum at idle mmHg (in.Hg) | 510 (20) | |
| Timing belt "B" tension mm (in.) | 5 - 7 (.20–.28) | |
| Cylinder head | | |
| Overall height mm (in.) | 88.5 (3.484) | -0.2 (–.008)*<br>*Limit must be -0.2 (–.008) combined with amount of grinding of cylinder block gasket surface. |
| Flatness of gasket surface mm (in.) | Less than 0.05 (.0019) | 0.2 (.008) |
| Flatness of manifold mounting surface mm (in.) | Less than 0.15 (.0059) | 0.3 (.012) |

| Items | Standard Value | Limit |
|---|---|---|
| Valve stem to valve guide clearance mm (in.) | | |
| Intake | 0.03–0.06 (.0012–.0024) | 0.10 (.004) |
| Exhaust | 0.05–0.09 (.0020–.0035) | 0.15 (.006) |
| Valve guide | | |
| Length mm (in.) | | |
| Intake | 44 (1.73) | |
| Exhaust | 48 (1.89) | |
| Service size mm (in.) | 0.05 (.002), 0.25 (.010), 0.50 (.020) oversize | |
| Valve seat | | |
| Width of seat contact mm (in.) | 0.9–1.3 (.0354–.0512) | |
| Seat angle | 44°–44.5 | |
| Valve spring | | |
| Free length mm (in.) | 49.2 (1.937) | 48.2 (1.898) |
| Load N (lbs.) | 274.6 (62) at installed height | |
| Out of squarness | Less than 2" | 4" |
| Cylinder block | | |
| Cylinder bore mm (in.) | 80.6 (3.173) | |
| Out-of-roundness and taper of cylinder bore mm (in.) | Less than 0.01 (.0004) | |
| Cylinder block height mm (in.) | 285.2 (11.228) | |
| Flatness of gasket surface mm (in.) | Less than 0.05 (.0020) | 0.1 (.0039) |
| Right silent shaft | | |
| Front journal diameter mm (in.) | 38.959-38.975 (1.5338– 1.5344) | |
| Rear journal diameter mm (in.) | 35.951-35.967 (1.4154–1.4160) | |
| Oil clearance mm (in.) | | |
| Front journal | 0.030–0.061 (.0012–.0024) | |
| Rear journal | 0.050–0.091 (.0020–.0036) | |
| Left silent shaft | | |
| Front journal diameter mm (in.) | 18.467–18.480 (.7270–.7276) | |
| Rear journal diameter mm (in.) | 35.951–35.967 (1.4154–1.4160) | |
| Oil clearance mm (in.) | | |
| Front journal | 0.020–0.054 (.0008–.0021) | |
| Rear journal | 0.050–0.091 (.0020–.0036) | |
| Piston | | |
| O.D. mm (in.) | 80.6 (3.173) | |
| Clearance (Piston to cylinder) mm (in.) | 0.01–0.03 (.0004–.0012) | |

| Items | Standard Value | Limit |
|---|---|---|
| Oversize rework dimension of valve seat hole mm (in.) | | |
| Intake 0.3 (.012) O.S. | 43.300–43.325 (1.7047–1.7057) | |
| 0.6 (.024) O.S. | 43.600–43.625 (1.7165–1.7175) | |
| Exhaust 0.3 (.012) O.S. | 37.300–37.325 (1.4685–1.9695) | |
| 0.6 (.024) O.S. | 37.600–37.625 (1.4803–1.4813) | |
| Oversize rework of valve guide hole (both intake and exhaust) mm (in.) | | |
| 0.05 (.002) O.S. | 13.050– 13.068 (.5138–.5145) | |
| 0.25 (.010) O.S. | 13.250– 13.268 (.5217–.5224) | |
| 0.50 (.020) O.S. | 13.500–13.518 (.5315–.5322) | |
| **Camshaft** | | |
| Cam height mm (in.) | | |
| Intake | 35.91 (1.4138) | 35.41 (1.3941) |
| Exhaust | 35.91 (1.4138) | 35.41 (1.3941) |
| Journal O.D. mm (in.) | 33.935–33.950 (1.3360–1.3366) | |
| Bearing oil clearance mm (in.) | 0.05–0.09 (.0020–.0035) | |
| End play mm (in.) | 0.1–0.2 (.004–.008) | |
| **Rocker arm** | | |
| I.D. mm (in.) | 18.910– 18.928 (.7445–.7452) | |
| Clearance (Rocker arm to shaft) mm (in.) | 0.01–0.04 (.0004–.0016) | 0.1 (.004) |
| **Rocker arm shaft** | | |
| O.D. mm (in.) | 18.885–18.898 (.7435–.7440) | |
| **Rocker arm shaft spring** | | |
| Free length m m (in.) | | |
| Intake | 53.3 (2.098) | |
| Exhaust | 53.3 (2.098) | |
| **Valve** | | |
| Valve length mm (in.) | | |
| Intake | 109.8 (4.323) | |
| Exhaust | 108.7 (4.280) | |
| Stem O.D. mm (in.) | 8 (.31) | |
| Face angle | 45°–45.5° | |
| Thickness of valve head (Margin) mm (in.) | | |
| Intake | 1.0 (.039) | 0.7 (.028) |
| Exhaust | 0.7 (.028) | 0.5 (.020) |

| ems | Standard Value | Limit |
|---|---|---|
| Ring groove width mm (in.) | | |
| No. 1 | 1.52– 1.54 (.0598–.0606) | |
| No. 2 | 1.51–1.53 (.0594–.0602) | |
| Oil | 4.015–4.045 (.1581–.1593) | |
| Service size mm (in.) | 0.25 (.010), 0.50 (.020), 0.75 (.030), 1.00 (.039) oversize | |
| ston ring | | |
| Side clearance mm (in.) | | |
| No. 1 | 0.045–0.085 (.0018–.0033) | 0.12 (.005) |
| No. 2 | 0.02–0.06 (.0008–.0024) | 0.1 (.004) |
| End gap mm (in.) | | |
| No. 1 | 0.30–0.45 (.0118–.0177) | 0.8 (.031) |
| No. 2 | 0.20–0.35 (.0079–0.138) | 0.8 (.031) |
| Oil ring side rail mm (in.) | 0.20–0.70 (.0079–.0276) | 1.0 (.039) |
| Service size mm (in.) | 0.25 (.010), 0.50 (.020), 0.75 (.030), 1.00 (.039) oversize | |
| onnecting rod | | |
| Bend mm (in.) | 0.05 or less per 100 (.0020 or less per 3.937) | |
| Twist mm (in.) | 0.1 or less per 100 (.0039 or less per 3.937) | |
| Connecting rod big end to crankshaft side clearance mm (in.) | 0.10–0.25 (.0039–.0098) | 0.4 (.016) |
| Piston pin press-in load N (lbs.) | 5,000– 15,500 (1,100–3,300) | |
| onnecting rod bearing | | |
| Oil clearance mm (in.) | 0.02–0.05 (.0008–.0020) | 0.1 (.004) |
| Service size mm (in.) | 0.25 (.010), 0.50 (.020), 0.75 (.030) undersize | |
| ankshaft main bearing | | |
| Oil clearance mm (in.) | 0.02–0.05 (.0008–.0020) | |
| Service size mm (in.) | 0.25 (.010), 0.50 (.020), 0.75 (.030) undersize | |
| ankshaft | | |
| Pin O.D. mm (in.) | 45 (1.77) | |
| Journal O.D. mm (in.) | 57 (2.24) | |
| Out-of-roundness of journal and pin mm (in.) | Less than 0.015 (.0006) | |
| Taper of journal and pin mm (in.) | Less than 0.005 (.0002) | |
| tnd play mm (in.) | 0.05–0.18 (.0020–.0070) | 0.4 (.016) |

| ems | Standard Value | Limit |
|---|---|---|
| Undersize rework dimension of pin mm (in.) | | |
| 0.25 (.010) U.S. | 44.735–44.750 (1.7612–1.7618) | |
| 0.50 (.020) U.S. | 44.485–44.500 (1.7514–1.7520) | |
| 0.75 (.030) U.S. | 44.235–44.250 (1.7415-1.7421) | |
| Undersize rework dimension of journal mm (in.) | | |
| 0.25 (.010) U.S. | 56.735–56.750 (2.2337-2.2342) | |
| 0.50 (.020) U.S. | 56.485–56.500 (2.2238-2.2244) | |
| 0.75 (.030) U.S. | 56.235–56.250 (2.2140–2.2146) | |
| ywheel | | |
| Runout mm (in.) | | Less than 0.13 (.0051) |
| l pressure at curb idle speed kPa (psi) onditions: oil temperature is 75 to 90°C 67 to 194°F)] | 80 (11.4) or more | |
| l pump | | |
| Tip clearance mm (in.) | | |
| Drive gear | 0.06–0.12 (.0024–.0047) | 0.20 (.0079) |
| Driven gear | 0.04–0. 12 (.0016–.0047) | 0.18 (.0071) |
| Side clearance mm (in.) | | |
| Drive gear | 0.10–0.16 (.0039–.0063) | 0.20 (.0079) |
| Driven gear | 0.02–0.05 (.0008–.0020) | 0.15 (.0059) |
| Relief spring | | |
| Free length mm (in.) | 43.8 (1.724) | |
| Load [37N at 8.2 lbs.] mm (in.) | 40.1 (1.5787) | |
| ive belt | | |
| For alternator | | |
| Deflection mm (in.) | | |
| Inspection | 9.0– 11.5 (.354–.453) | |
| New belt | 7.5–9.0 (.295–.354) | |
| Used belt | 10 (.394) | |
| Tension N (lbs.) | | |
| Inspection | 250–500 (55– 110) | |
| New belt | 500–700 (110–154) | |
| Used belt | 400 (88) | |
| For air conditioner compressor | | |
| Deflection mm (in.) | | |
| Inspection | Approx. 8 (.315) | |
| New belt | 5.0–5.5 (.197–.217) | |
| Used belt | 6.0–7.0 (.236–.276) | |

| Items | Standard Value | Limit |
|---|---|---|
| Tension N (lbs.) | | |
| Inspection | 250–500 (55–110) | |
| New belt | 470–570 (104– 126) | |
| Used belt | 320–400 (71–88) | |
| For power steering pump | | |
| Deflection mm (in.) | | |
| Inspection | 6.0–9.0 (.236–.354) | |
| Timing belt tension mm (in.) | 14 (.55) | |

NOTE
O.D.: Outer Diameter
I.D.: Inner Diameter
OS.: Oversize Diameter
U.S.: Undersize Diameter

<2.0L DOHC Engine>

| Items | Standard Value | Limit |
|---|---|---|
| Engine adjustments | | |
| Engine compression pressure kPa (psi) | – | Min. 960 (137) |
| (Turbo) | – | Min. 800 (114) |
| Engine compression pressure difference between each cylinder kPa (psi) | – | Max. 100 (14) |
| Intake manifold vacuum at idle mm Hg (in.Hg) | | |
| <Non-Turbo> | 490 (19.3) | |
| <Turbo> | 480 (18.9) | |
| Timing belt "B" tension mm (in.) | 5 - 7 (.20–.28) | |
| Cylinder head | | |
| Overall height mm (in.) | 132.0 (5.197) | - 0.2 (–.008)* *Limit must be -0.2 (–.008) combined with amount of grinding of cylinder block gasket surface. |
| Flatness of gasket surface mm (in.) | less than 0.05 (.0020) | 0.2 (.008) |
| Flatness of manifold mounting surface mm (in.) | Less than 0.15 (.0059) | 0.3 (.012) |
| Oversize rework dimension of valve seat hole mm (in.) | | |
| Intake 0.3 (.012) O.S. | 35.300–35.325 (1.3898–1.3907) | |
| 0.6 (0.24) O.S. | 35.600–35.625 (1.4016–1.4026) | |
| Exhaust 0.3 (.012) OS. | 33.300–33.325 (1.3110–1.3120) | |
| 0.6 (.024) O.S | 33.600–33.625 (1.3228– 1.3238) | |

| Items | Standard Value | Limit |
|---|---|---|
| Oversize rework of valve guide hole (both intake and exhaust) mm (in.) | | |
| 0.05 (.002) O.S. | 12.050–12.068 (.4744–.4751) | |
| 0.25 (.010) O.S. | 12.250–12.268 (.4823–.4830) | |
| 0.50 (.020) O.S. | 12.500–12.518 (.4921–.4928) | |
| Camshaft | | |
| Cam height mm (in.) | | |
| Intake | | |
| <Non-Turbo, Turbo-M/T> | 35.493 (1.3974) | 34.993 (1.3777) |
| <Turbo-A/T> | 35.200 (1.3858) | 34.700 (1.3661) |
| Exhaust | | |
| <Non-Turbo, Turbo-A/T> | 35.200 (1.3858) | 34.700 (1.3661) |
| <Turbo-M/T> | 35.493 (1.3974) | 34.993 (1.3777) |
| Journal O.D. mm (in.) | 25.951–25.970 (1.0217–1.0224) | |
| Bearing oil clearance mm (in.) | 0.05–0.09 (.0020–.0035) | |
| End play mm (in.) | 0.1–0.2 (.004–.008) | |
| Valve | | |
| Valve length mm (in.) | | |
| Intake | 109.5 (4.311) | |
| Exhaust | 109.7 (4.319) | |
| Stem O.D. mm (in.) | | |
| Intake | 6.565–6.580 (.2585–.2591) | |
| Exhaust | 6.530–6.550 (.2571–.2579) | |
| Face angle | 45°–45.5° | |
| Thickness of valve head (Margin) mm (in.) | | |
| Intake | 1.0 (.040) | 0.7 (.028) |
| Exhaust | 1.5 (.059) | 1.0 (.040) |
| Valve stem to valve guide clearance mm (in.) | | |
| Intake | 0.02–0.047 (.0008–.0019) | 0.10 (.004) |
| Exhaust | 0.05–0.085 (.0020–.0033) | 0.15 (.006) |
| Valve guide | | |
| Length mm (in.) | | |
| Intake | 45.5 (1.791) | |
| Exhaust | 50.5 (1.988) | |
| Service size mm (in.) | 0.05 (.002), 0.25 (.010), 0.50 (.020) oversize | |
| Valve seat | | |
| Width of seat contact mm (in.) | 0.9–1.3 (.035–.051) | |
| Seat angle | 44°–44.5° | |
| Service size mm (in.) | 0.3 (.012), 0.6 (.024) oversize | |

| Items | Standard Value | Limit |
|---|---|---|
| **Valve spring** | | |
| Free length mm (in.) | 48.3 (1.902) | 47.3 (1.862) |
| Load N (lbs.) | 300 (66) at installed height | |
| Out of squarness | Less than 1.5" | 4" |
| **Cylinder block** | | |
| Cylinder bore mm (in.) | 85.00 (3.3465) | |
| Out-of-roundness and taper of cylinder bore mm (in.) | Less than 0.01 (.0004) | |
| Flatness of gasket surface mm (in.) | Less than 0.05 (.0020) | 0.1 (.0040) |
| **Right silent shaft** | | |
| Front journal diameter mm (in.) | 41.959–41.975 (1.6519-1.6526) | |
| Rear journal diameter mm (in.) | 40.951–40.967 (1.6122-1.6129) | |
| Oil clearance mm (in.) | | |
| Front journal | 0.020–0.061 (.0008–.0024) | |
| Rear journal | 0.050–0.091 (.0020–.0036) | |
| **Left silent shaft** | | |
| Front journal diameter mm (in.) | 18.467– 18.480 (.7270–.7276) | |
| Rear journal diameter mm (in.) | 40.959–40.975 (1.6126–1.6132) | |
| Oil clearance mm (in.) | | |
| Front journal | 0.020–0.054 (.0008–.0021) | |
| Rear journal | 0.042–0.083 (.0017–.0033) | |
| **Piston** | | |
| O.D. mm (in.) | 85.00 (3.3465) | |
| Clearance (Piston to cylinder) mm (in.) (Non-Turbo) | 0.02–0.04 (.0008–.0016) | |
| (Turbo) | 0.03–0.05 (.0012–.0020) | |
| Ring groove width mm (in.) | | |
| No. 1 | 1.22–1.24 (.0480–.0488) | |
| No. 2 | 1.52– 1.54 (.0598–.0606) | |
| Oil | 3.01–3.03 (.1185–.1193) | |
| Service size mm (in.) | 0.25 (.010), 0.50 (.020), 0.75 (.030), 1.00 (.039) oversize | |
| **Piston ring** | | |
| Side clearance mm (in.) | | |
| No. 1, No. 2 | 0.03–0.07 (.0012–.0028) | 0.1 (.004) |
| End gap mm (in.) | | |
| No. 1 | 0.25–0.45 (.0098–.0177) | 0.8 (.031) |
| No. 2 | 0.35–0.50 (.0138–.0197) | 0.8 (.031) |
| Oil ring side rail mm (in.) | 0.20–0.70 (.0079–.0276) | 1.0 (.040) |
| Service size mm (in.) | 0.25 (.010), 0.50 (.020), 0.75 (.030), 1.00 (.039) oversize | |

| Items | Standard Value | Limit |
|---|---|---|
| Connecting rod | | |
| Bend mm (in.) | 0.05 or less per 100 (.0020 or less per 3.937) | |
| Twist mm (in.) | 0.1 or less per 100 (.0040 or less per 3.937) | |
| Connecting rod big end to crankshaft side clearance mm (in.) | 0.10–0.25 (.0040–.0098) | 0.4 (.0157) |
| Piston pin press-in load N (lbs.) | 75,000– 175,000 (1,653–3,858) | |
| Connecting rod bearing | | |
| Oil clearance mm (in.) | 0.02–0.05 (.0008–.0020) | 0.1 (.004) |
| Crankshaft main bearing | | |
| Oil clearance mm (in.) | 0.02–0.05 (.0008–.0020) | 0.1 (.004) |
| Crankshaft | | |
| Pin O.D. mm (in.) | 44.980–44.995 (1.7709–1.7715) | |
| Journal O.D. mm (in.) | 56.980–56.995 (2.2433–2.2439) | |
| Out-of-roundness of journal and pin mm (in.) | Less than 0.015 (.0006) | |
| Taper of journal and pin mm (in.) | Less than 0.005 (.0002) | |
| End play mm (in.) | 0.05–0.18 (.0020–.0070) | 0.25 (.0098) |
| Flywheel | | |
| Runout mm (in.) | | Less than 0.13 (.0051) |
| Oil pressure at curb idle speed kPa (psi) [Conditions: oil temperature is 75 to 90°C (167 to 194°F)] | 80 (11.4) or more | |
| Oil pump | | |
| Tip clearance mm (in.) | | |
| Drive gear | 0.16–0.21 (.0063–.0083) | 0.25 (.0098) |
| Driven gear | 0.13–0.18 (.0051–.0071) | 0.25 (.0098) |
| Side clearance mm (in.) | | |
| Drive gear | 0.08–0.14 (.0031–.0055) | 0.25 (.0098) |
| Driven gear | 0.06–0.12 (.0024–.0047) | 0.25 (.0098) |
| Relief spring | | |
| Free length mm (in.) | 46.6 (1.835) | |
| Load [61N at 13.4 lbs.] mm (in.) | 40.1 (1.579) | |

| Items | Standard Value | Limit |
|---|---|---|
| Drive belt | | |
| For alternator | | |
| Deflection mm (in.) | | |
| Inspection | 9.0– 11.5 (.354–.453) | |
| New belt | 7.5–9.0 (.295–.354) | |
| Used belt | 10 (.394) | |
| Tension N (lbs.) | | |
| Inspection | 250–500(55–110) | |
| New belt | 500–700 (110–154) | |
| Used belt | 400 (88) | |
| For air conditioner compressor | | |
| Deflection mm (in.) | | |
| Inspection | Approx. 8 (.315) | |
| New belt | 5.0–5.5 (.197–.217) | |
| Used belt | 6.0–7.0 (.236–.276) | |
| Tension N (lbs.) | | |
| Inspection | 250–500(55– 110) | |
| New belt | 470–570 (104–126) | |
| Used belt | 320–400 (71–88) | |
| For power steering pump | | |
| Deflection mm (in.) | | |
| Inspection | 6.0–9.0 (.236–.354) | |
| Timing belt | | |
| Amount of projection of auto tensioner rod mm (in.) | 12 (.47) | |
| Timing belt "B" tension mm (in.) | 5 - 7 (.20–.28) | |
| Amount of projection of auto tensioner rod mm (in.) (distance between the tensioner arm and auto tensioner body) | 3.8-4.5 (.15–.18) | |
| Auto tensioner rod retraction rpm | 2.5-3 | |

NOTE
O.D.: Outer Diameter
I.D.: Inner Diameter
O.S.: Oversize Diameter
U.S.: Undersize Diameter

## TORQUE SPECIFICATIONS

N09CC-

| Items | Nm | ft.lbs. |
|---|---|---|
| Engine mount insulator nut (large) | 60–80 | 43-58 |
| (small) | 30–40 | 22-29 |
| Engine mount bracket nut or bolt | 50–65 | 36-47 |
| Transaxle mount insulator nut | 60–80 | 43-58 |
| Transaxle mount to body | 40–50 | 29-36 |
| Front roll stopper insulator nut | 50–65 | 36-47 |
| Front roll stopper bracket to centermember | 40–50 | 29-36 |
| Rear roll stopper insulator nut | 40–50 | 29-36 |
| Rear roll stopper bracket to centermember | 40–50 | 29-36 |
| Accelerator cable adjusting bolts | 4-6 | 3-4 |
| Fuel high pressure hose to delivery pipe | 4-6 | 3-4 |
| Ground cable to air intake manifold | 4-6 | 3-4 |
| Control wiring harness to air intake plenum | 4-6 | 3-4 |
| Power steering oil pump to bracket | 35-45 | 25-33 |
| Air conditioner compressor to bracket | 23-27 | 17–20 |
| Exhaust pipe clamp bolt | 30–40 | 22-29 |
| Exhaust pipe to rubber hanger | 10–15 | 7–11 |
| Oil pan drain plug | 35-45 | 25-33 |
| Oil pan (bolts) | 6-8 | 4-6 |
| (nuts) | 5-7 | 3.5-5 |
| Water pump pulley | 8–10 | 6-7 |
| Tensioner pulley bracket (air conditioner compressor) | 23-27 | 17–20 |
| Timing belt front cover | 10–12 | 7-9 |
| Crankshaft sprocket | 110–130 | 80–94 |
| Camshaft sprocket | 80–100 | 58-72 |
| Timing belt "B" tensioner bolt | 15–22 | 11-16 |
| Left engine support bracket | 30–42 | 22–30 |
| Oil pressure switch | 8-12 | 6-9 |
| Oil pressure gauge unit | 8-12 | 6-9 |
| Oil filter bracket | 15-22 | 11-16 |
| Oil pump cover | 15-18 | 11-13 |
| Relief plug | 40–50 | 29-36 |
| Flywheel or drive plate | 130–140 | 94–101 |
| Exhaust pipe support bracket | 30–42 | 22–30 |
| Front roll stopper bracket | 55-75 | 40–54 |
| Rear roll stopper bracket | 110–130 | 80–94 |
| Front engine support bracket | 50–70 | 36-51 |
| <1.8L Engine> | | |
| Oil screen | 18–25 | 13-18 |
| Rocker cover | 5-7 | 4-5 |
| Camshaft bearing cap bolt (6 x 20) | 20–27 | 14–20 |
| (8 x 65) | 19-21 | 14-15 |
| Exhaust pipe to exhaust manifold | 30–40 | 22-29 |
| Intake manifold stay bolt | 18–25 | 13-18 |
| Cylinder head bolt | 70–75 | 51–54 |
| Crankshaft pulley | 15-18 | 11-13 |
| Crankshaft damper pulley | 15-18 | 11-13 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Oil pump sprocket | 34–40 | 26-29 |
| Silent shaft sprocket | 34–40 | 25-29 |
| Timing belt tensioner nut or bolt | 22–30 | 16-22 |
| Timing belt rear cover (upper) | 10–12 | 7-9 |
| (lower) | 12-15 | 9-11 |
| Oil pump driven gear | 34–40 | 25-29 |
| Front case | 15-18 | 11–13 |
| Connecting rod bearing cap | 32-35 | 24-25 |
| Crankshaft bearing cap | 50–55 | 37-39 |
| <2.0L DOHC Engine> | | |
| Engine mount bracket to bracket nut or bolt | 17-26 | 12-19 |
| Engine cooler pipe to engine front case | 40–45 | 29-33 |
| Exhaust pipe to exhaust manifold (Turbo) | 40–60 | 29-43 |
| Oil return pipe to oil pan (Turbo) | 8–10 | 6-7 |
| Oil screen nut or bolt | 15–22 | 11–16 |
| Centermember installation bolt | 80–100 | 58-72 |
| Oil pipe to engine (Turbo) | 14-19 | 10–14 |
| Rocker cover | 2.5-3.5 | 2-3 |
| Center cover | 2.5-3.5 | 2-3 |
| Heat protector to exhaust manifold | 12-15 | 9–11 |
| Exhaust manifold to turbocharger (Turbo) | 55-65 | 40–47 |
| Intake manifold stay bolt | 25–30 | 18-22 |
| Cylinder head bolt | 90–100 | 65-72 |
| Crankshaft pulley | 20–30 | 14-22 |
| Oil pump sprocket | 50–60 | 36-43 |
| Silent shaft sprocket | 43-49 | 31–35 |
| Auto tensioner | 20–27 | 14–20 |
| Timing belt tensioner pulley | 43-55 | 31–40 |
| Timing belt idle pulley | 34-42 | 25–30 |
| Timing belt rear cover | 10–12 | 7-9 |
| Oil pump driven gear | 34–40 | 25-29 |
| Front case | 20–22 | 14-16 |
| Engine oil cooler mounting nut | 8–12 | 6-9 |
| Eye bolt (Engine oil cooler side) | 30–35 | 22-25 |
| Engine oil hose mounting bolt | 3-5 | 2-4 |
| Engine oil feed hose assembly to Feed/Return tube assembly | 40–50 | 29–36 |
| Engine oil return hose assembly to Feed/Return tube assembly | 40–50 | 29-36 |
| Feed/Return tube assembly to oil filter bracket | 3-5 | 2-4 |
| Eye bolt (Oil filter bracket side) | 40–45 | 29-33 |
| Crankshaft angle sensor | 10–13 | 7-9 |
| Throttle body stay | 15–22 | 11–16 |

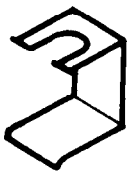
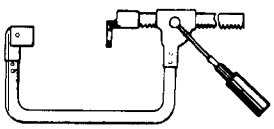
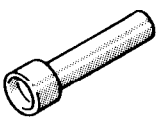
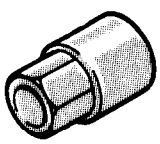
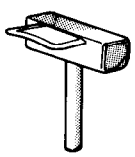
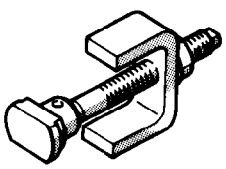
## SEALANTS AND ADHESIVES

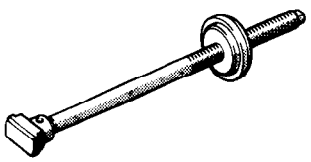
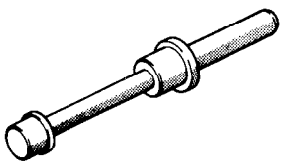
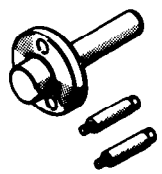
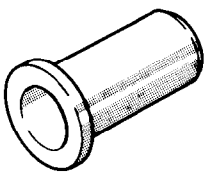
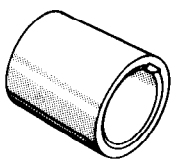
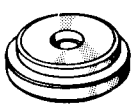
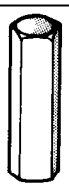
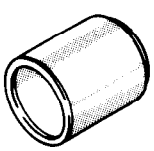
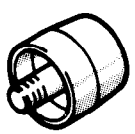
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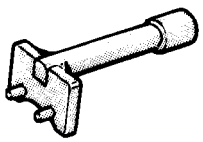
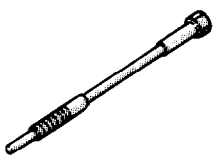
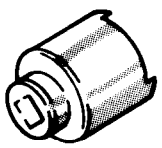
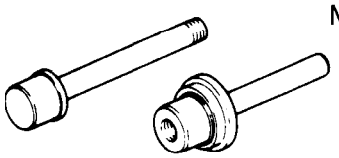
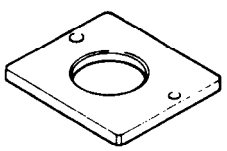
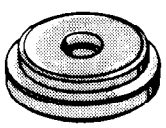
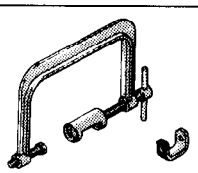
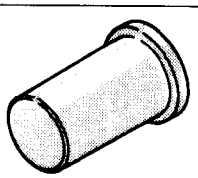
| Items | Specified sealant | |
|---|---|---|
| Semi-circular Rocker cover <2.0L | MOPAR Part No. 4318034 | |
| | No. 4318034 | No. 1141E |
| Oil pan | No. MD997110 | |

# SPECIAL TOOLS

N09DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | TW-10B | Cylinder head bolt wrench | Tightening and removal of cylinder head bolts <1.8L Engine> |
|  | MD998443 | Lash adjuster holder | Supporting of the lash adjuster to prevent it from falling when rocker shaft assembly is removed or installed <1.8L Engine> |
|  | MD998364 | **Camshaft oil seal** installer | **Installation of camshaft oil seal** <1.8L Engine> |
|  | C-3422-B | Valve spring **compressor** | Installation and removal of valve and allied parts Use with C-3422-B1 <1.8L Engine> |
|  | C-3422-B1 | Adapter | Use with C-3422-B <1.8L Engine> |
|  | MD998728 <1.8L Engine> MD998737 <2.0L DOHC Engine> | Valve stem seal installer | Installation of valve stem seal |
|  | MD998054 | Oil pressure switch wrench | **Removal and installation of oil pressure switch** |
|  | MD998727 | Oil pan removal | Removal of oil pan |
|  | MD998282 <1.8L Engine> MD998371 <2.0L DOHC Engine> | Silent shaft bearing puller (for engine with silent shafts) | Removal of silent shaft front bearing |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998283 <1.8L Engine> MD998372 <2.0L **DOHC** Engine> | Silent shaft bearing puller (engine with silent shafts) | **Removal of silent shaft rear bearing** |
|  | MD998286 | Silent shaft bearing **installer (for engine with silent shafts)** | Installation of silent shaft rear bearing <1.8L Engine> |
|  | MD998280 | Silent shaft bearing installer (for engine with silent shafts) | Installation of silent shaft front bearing <1.8L Engine> |
|  | MD998304 <1.8L Engine> | Crankshaft front oil seal installer | Installation of crankshaft front oil seal |
|  | MD998285 | **Crankshaft front oil** seal guide | **Installation of crankshaft front oil seal** |
|  | MD998011 <1.8L **Engine>** MD998376 <2.0L DOHC Engine> | Crankshaft rear oil **seal installer** | Removal and installation of crankshaft rear oil seal |
|  | MD998051 | Cylinder head bolt wrench | Tightening of cylinder head to block <2.0L DOHC Engine> |
|  | MD998306 | Camshaft oil seal installer | Installation of camshaft oil seal Use with MD998307 <2.0L DOHC Engine> |
|  | MD998307 | Camshaft oil seal guide | Installation of oil seal Use with MD998306 <2.0L DOHC Engine> |

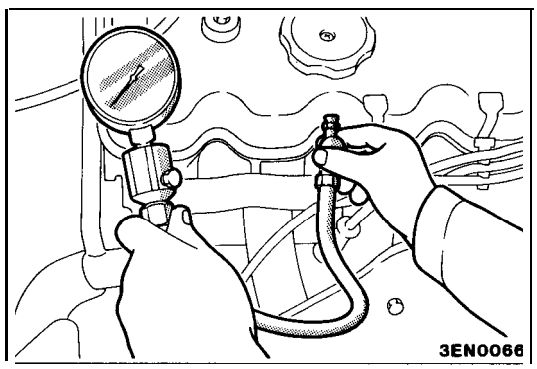
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998752 | Socket wrench | Installation of auto tensioner <2.0L DOHC Engine> |
|  | MD998738 | Set screw | Removal and installation of auto tensioner <2.0L DOHC Engine> |
|  | MD998162 | **Plug cap wrench** | **Removal and installation of front case cap plug <2.0L DOHC Engine>** |
|  | MD998373 | Front and rear silent shaft bearings installer | Installation of silent shaft **Use with** MD998374 **<2.0L DOHC Engine>** |
|  | MD998374 | Silent shaft bearing puller and installer guide plate | Removal and installation of rear bearing Use with MD998372 and MD998373 **<2.0L DOHC Engine>** |
|  | MD998376 | Crankshaft rear oil seal installer | Installation of oil seal <2.0L DOHC Engine> |
|  | MD998735 | Compressor, valve spring | **Removal and installation of valve and related** parts <2.0L DOHC Engine> |
|  | MD998375 | Crankshaft front oil seal installer | Installation of oil seal |

| Symptom | Probable cause | Remedy |
|---|---|---|
| Compression too low | Cylinder head gasket blown | Replace gasket |
| | Piston ring worn or damage | Replace rings |
| | Piston or cylinder worn | Repair or replace piston and/or cylinder block |
| | Valve seat worn or damage | Repair or replace valve and/or seat ring |
| Oil pressure drop | Engine oil level too low | Check engine oil level |
| | Oil pressure switch faulty | Replace oil pressure switch |
| | Oil filter clogged | Install new filter |
| | Oil pump gears or cover worn | Replace gears and/or cover |
| | Thin or diluted engine oil | Change engine oil to correct viscosity |
| | Oil relief valve stuck (opened) | Repair relief valve |
| | Excessive bearing clearance | Replace bearings |
| Oil pressure too high | Oil relief valve stuck (closed) | Repair relief valve |
| Noisy valves | Incorrect lash adjuster | Bleed air or replace lash adjuster |
| | Thin or diluted engine oil (low oil pressure) | Change engine oil |
| | Valve stem or valve guide worn or damage | Replace valve and/or guide |
| Connecting rod noise/ main bearing noise | Insufficient oil supply | Check engine oil level |
| | Low oil pressure | Refer to "Oil pressure drop" |
| | Thin or diluted engine oil | Change engine oil |
| | Excessive bearing clearance | Replace bearings |
| Timing belt noise | Incorrect belt tension | Adjust belt tension |
| Excessive engine rolling and vibration | Loose engine roll stopper (Front, Rear)<br>Loose transaxle mount bracket<br>Loose engine mount bracket<br>Loose center member | Retighten |
| | Broken transaxle mount insulator<br>Broken engine mount insulator<br>Broken engine roll stopper insulator | Replace |

# ENGINE <1.8L Engine>

## SERVICE ADJUSTMENT PROCEDURES

### CHECKING COMPRESSION PRESSURE N09FFAI




(1) Before checking compression, ensure that engine oil, the starter motor, and battery are all in good condition.
(2) Start the engine and wait until engine coolant temperature has risen to 85–95°C (185–205°F).
(3) Stop the engine and pull the spark plug cables.
(4) Remove the spark plugs.
(5) Crank the engine to remove any foreign objects in the cylinders.

**Caution**
**Cover the spark plug holes with shop towel, etc., in order to keep expelled foreign objects from flying out, and keep away from the holes. When measuring compression with water, oil, or fuel having entered the cylinder through a crack, etc., these will come flying out of the spark plug hole hot and fast, so be sure to take the proper precautions.**

(6) Set the compression gauge to the spark plug hole.
(7) Holding the throttle valve full open, crank the engine and measure compression.

**Limit: Min. 920 kPa (130 psi) [250–400 rpm]**

(8) Perform 6 and 7 above for all the cylinders, ensuring that compression pressure differential for each of the cylinders is within the specified limit.

**Differential limit: Max. 100 kPa (14 psi)**

(9) If a cylinder's compression or pressure differential exceeds the limit, add a small amount of oil through the spark plug hole and repeat steps (6)–(8).
① If the addition of oil brings compression up, it is possible that there is poor contact between the piston ring and cylinder wall.
② If not compression does not come up, valve seizure, poor valve seating, or a compression leak from the gasket are all possible.

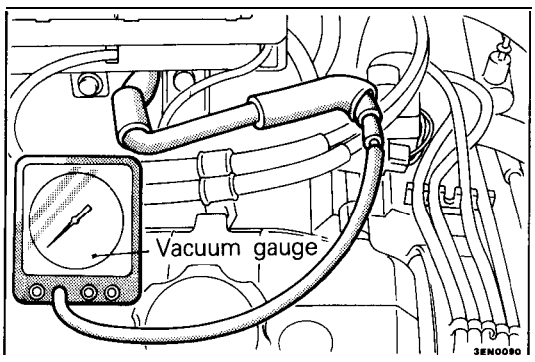
## MANIFOLD VACUUM INSPECTION N09FNACa

(1) Before inspection and adjustment, put the vehicle into the following state.
- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric, cooling fan, and accessories: OFF
- Transaxle: Neutral (N or P for vehicles with an automatic transaxle)
- Steering wheel: Neutral position

(2) Check that the idling revolution speed is normal.
(3) Remove the PCV hose from the PCV valve and attach a vacuum gauge.
(4) Check that the negative pressure at the intake manifold during idle revolution is normal.

**Standard value: 510 mmHg (20 in.Hg)**

(5) If outside the standard value, isolate the cause by referring to the following table and repair the fault.



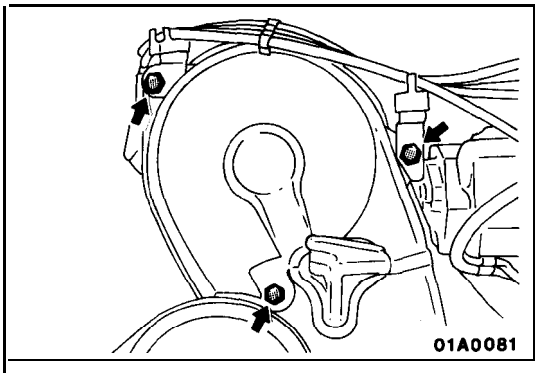

| Symptom | Cause | Remedy |
|---|---|---|
| • **The vacuum gauge reading is less than standard value, but the pointer is stable.** | • **Ignition timing is retarded.** | • **Adjust the ignition timing.** |
| • **The vacuum gauge pointer swings** slowly. | • **Air mixture concentration too rich.** | • Check ECI-MULTI system. |
| • **The vacuum gauge pointer drops irregularly.** | • **Air mixture concentration too lean.** | • Check ECI-MULTI system. |
| • **The vacuum gauge pointer drops intermittently to 30 to** 160 mmHg **(1.2 to 6.3** in.Hg). | • **Incomplete close contact of** intake exhaust valve seat. | • **Check and repair the valve.** |
| • **The vacuum gauge pointer drops suddenly from the normal reading to 250** mmHg (9.8 in.Hg), **then returns to** normal. | • **Broken cylinder head gasket** | • **Replace cylinder head gasket.** |

## TIMING BELT TENSION ADJUSTMENT N09FGBC

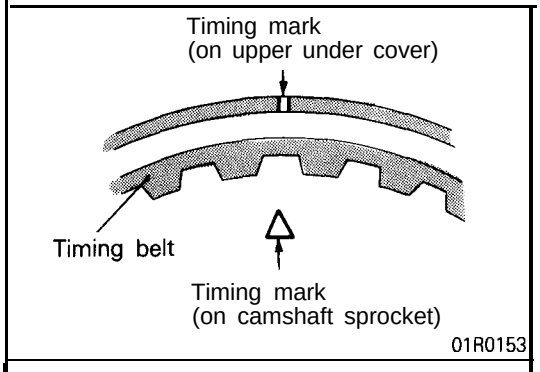
There are two access holes provided in the timing belt front lower cover. The two access holes can be used to readjust the tension of the timing belt, by following the procedures described below, without the necessity of removing the timing belt front lower cover. Note, however, that timing belt "B", which drives the right silent shaft, cannot be adjusted unless the cover is removed.

(1) Turn the steering wheel all the way to the left.
(2) Remove the left side undercover panel.

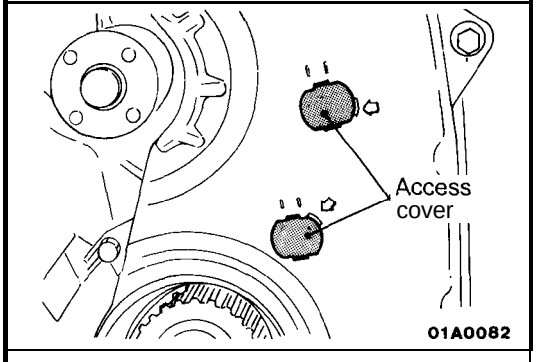
NOTE
This work is done so that the crankshaft can be turned.




(3) Place a piece of wood against the engine oil pan and jack up.
(4) Remove the engine mounting bracket.
(5) Remove the timging belt front upper cover.
(6) Remove the four spark plugs.
(7) Turn the crankshaft clockwise and check the timing belt condition.

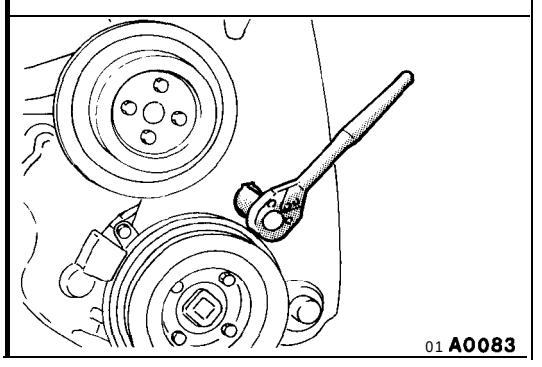


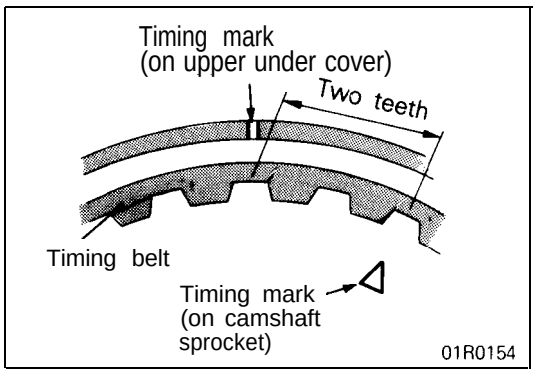

(8) Turn the crankshaft clockwise and align the timing marks.



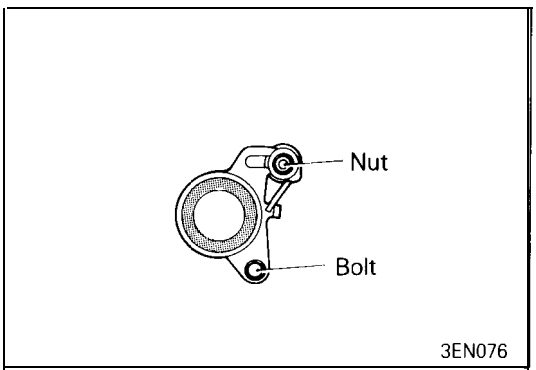

(9) Remove the air conditioner drive belt and the alternator drive belt.
(10) Remove the access cover (two places). There are easily removed by inserting a screwdriver into the slots indicated by the raised arrows in the timing belt cover and twisting.
(11) Insert a socket wrench [a 14 mm (.55 in.) box wrench] through the hole in the access cover and loosen the timing belt tension bolt and nut.

**Caution**
**The timing belt tension bolt and nut need only be loosened 180°–200°. Any further loosening might result in their falling off inside the timing belt cover.**



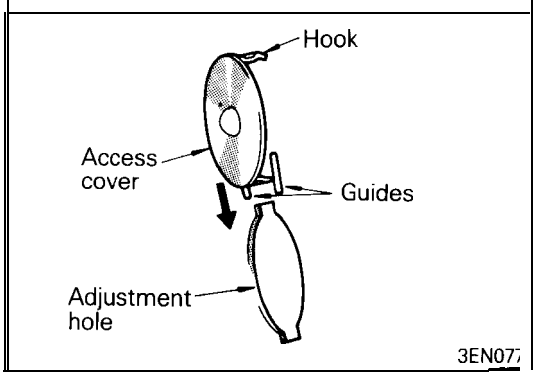



(12)Turn the crankshaft clockwise by two teeth of the camshaft sprocket.




(13)First tighten the timing belt tensioner installation bolt (on the lower side), and then tighten the tensioner spacer (upper side).

**Caution**
**Be sure to tighten the bolt (lower side) first. If the tensioner spacer of pivot side is tightened first, the tensioner will rotate with it and belt tension may become loose.**




(14)Install the access cover. The access cover may be easily installed by passing the hooks between the guides and sliding it in.
(15)Install the air conditioner drive belt and alternator drive belt and adjust the slack.
(16)Install the timing belt front upper cover.
(17)Install the engine mounting bracket.
(18)Install the spark plugs.
(19)Install the left side undercover panel.

## LASH ADJUSTERS CHECK

N09FEABa0

If an abnormal noise is heard from the lash adjusters check as follows.
(1) After warming up the engine, stop it.
(2) While installed to the cylinder head, press the part of rocker

feel very hard if the lash adjuster condition is normal.
(3) If, when pressed, it easily descends all the way downward,

(4) If there is a spongy feeling when pressed, air is probably

cause is probably an insufficient amount of engine oil, or damage to the oil screen and/or screen gasket.

(adding oil or repair), warm up the engine and drive at low speed for a short time. Then, after stopping the engine and

this procedure a few times to bleed out the air from the oil.

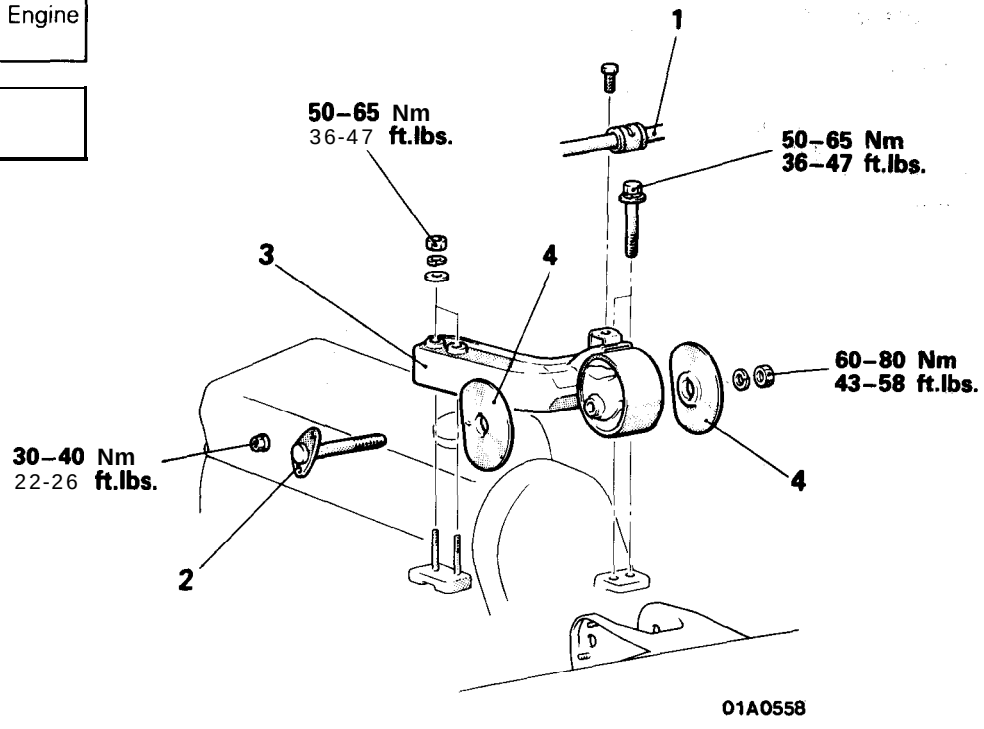
# ENGINE MOUNTING

N09GA-A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Raise and Suspend the Engine to the Extent Force is not applied to the Engine Mount

**Post-installation Operation**
- Lower the Engine




**Removal steps**

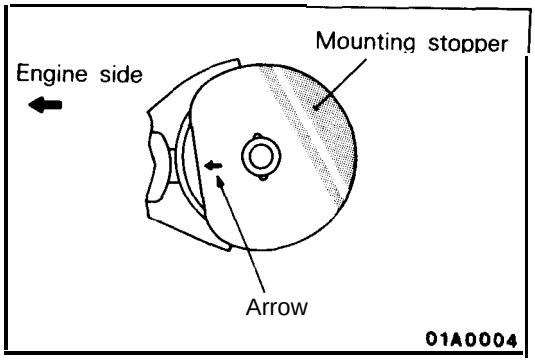
1. Pressure hose (power steering)
2. Engine mount bracket and body connection bolt
3. Engine mount bracket
- ◆◆ 4. Mounting stopper

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation"

## INSPECTION

N09GCAH0

- Check each insulator for cracks or damage.
- Check each bracket for deformation or damage.




## SERVICE POINTS OF INSTALLATION

N09GDAK0

### 4. INSTALLATION OF MOUNTING STOPPER

Install the mounting stopper of the engine mount bracket so that the arrow faces the center part of the engine.

# TRANSAXLE MOUNTING

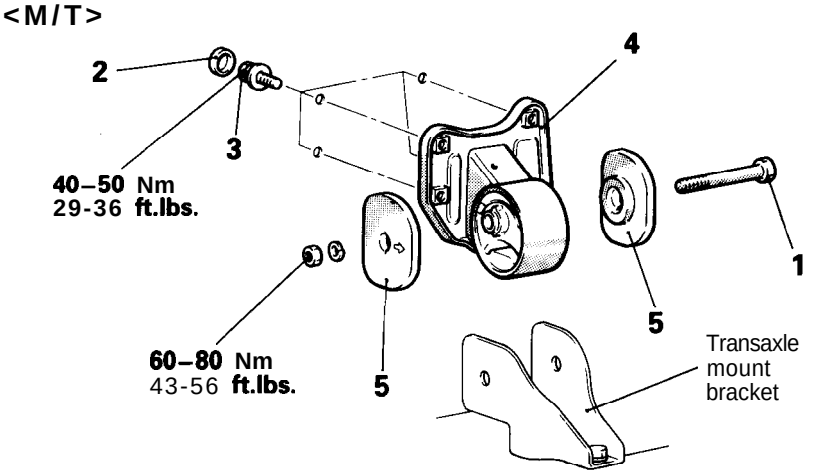
N09GE-A

## REMOVAL AND INSTALLATION

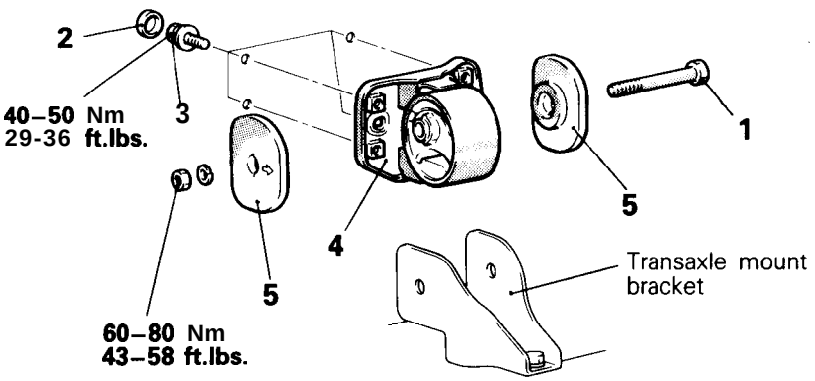
**Pre-removal Operation**
- Raise and Suspend the Transaxle to the Extent Force is not applied to the Transaxle Mount
- Removal of the Air Cleaner (Refer to GROUP 11–Air Cleaner.)

**Post-installation Operation**
- Lower the Transaxle
- installation of the Air Cleaner (Refer to GROUP 11–Air Cleaner.)

<M/T>




<A/T>




**Removal steps**

1. Transaxle mount bracket and transaxle connection bolt
2. Caps
3. Transaxle mount bracket installation bolts
4. Transaxle mount bracket
5. Mounting stopper

NOTE
Reverse the removal procedures to reinstall.

## INSPECTION

N09GCAH1

- Check each insulator for cracks or damage.
- Check each bracket for deformation or damage.

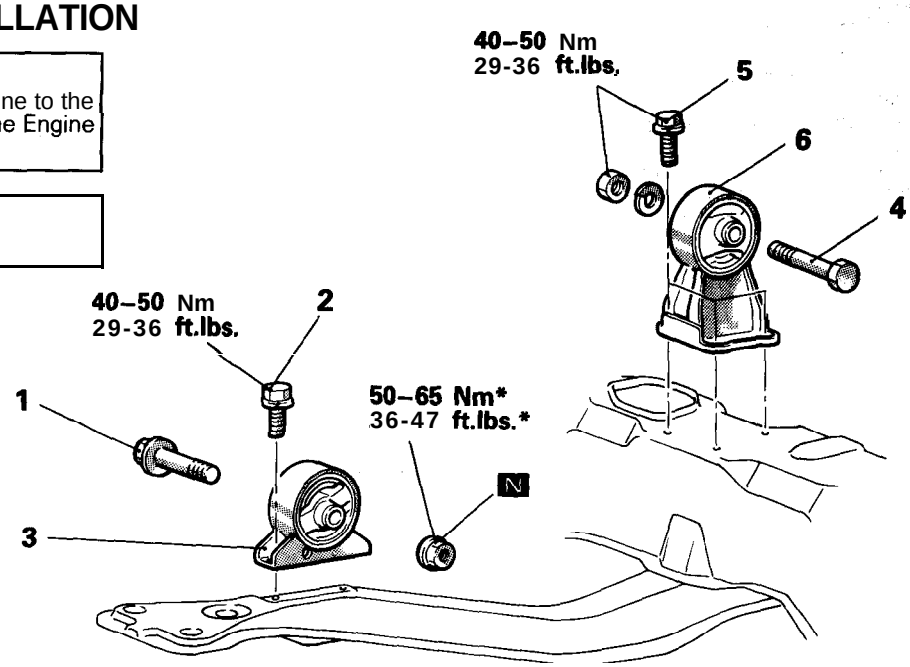
# ENGINE ROLL STOPPER

N09GF-A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Raise and Suspend the Engine to the Extent Force is not applied to the Engine Mount

**Post-installation Operation**
- Lower the Engine



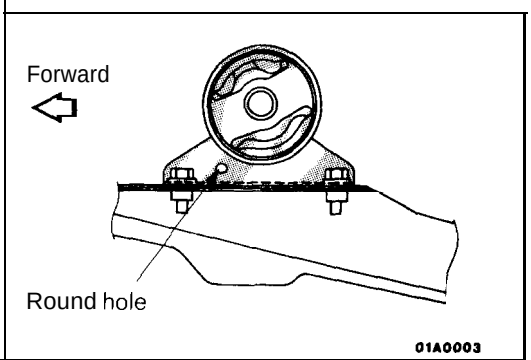

**Front roll stopper bracket removal steps**

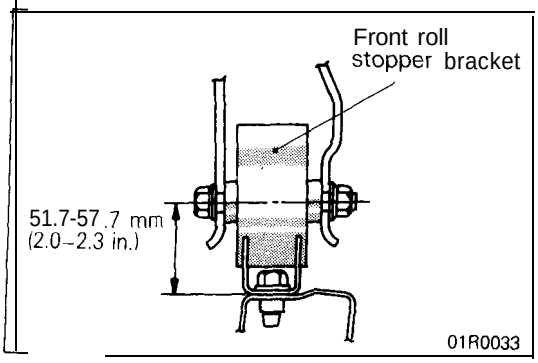
1. **Front roll stopper bracket and engine connection bolt**
2. **Front roll stopper bracket installation bolts**
- ◆ 3. **Front roll stopper bracket**

**Rear roll stopper bracket removal steps**

4. **Rear roll stopper bracket and engine connection bolt**
5. Rear roll stopper bracket installation bolts
6. **Rear roll stopper bracket**

**NOTE**
(1) **Reverse the removal procedures to reinstall.,,**
(2) ◆◆: Refer to Service Points of Installation
(3) N Non-reusable parts
(4) For tightening locations indicated by the * symbol, first **tighten temporarily, and then make the final tightening with the entire weight of the engine applied to the** vehicle body.




## INSPECTION

N09GCAH2

- Check each insulator for cracks or damage.
- Check each bracket for deformation or damage.

## SERVICE POINTS OF INSTALLATION

N09GJAB1

**3. INSTALLATION OF FRONT ROLL STOPPER BRACKET**

(1) Install the front roll stopper bracket so that the part where the round hole is made is facing the forward of the vehicle.

(2) After temporarily tightening the front roll stopper bracket, tighten so that, in the unladen vehicle condition, the distance from the center hole of the insulator to the lower edge of the bracket is the specified distance.

# ENGINE ASSEMBLY

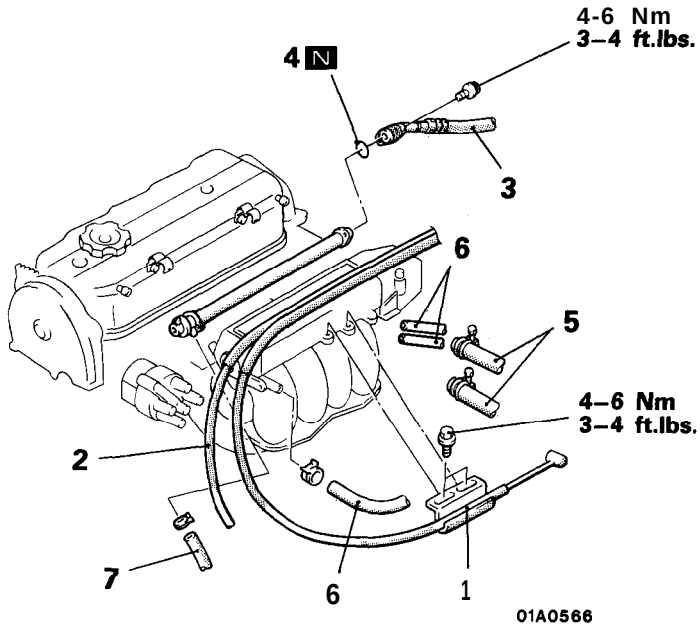
N09SA-A

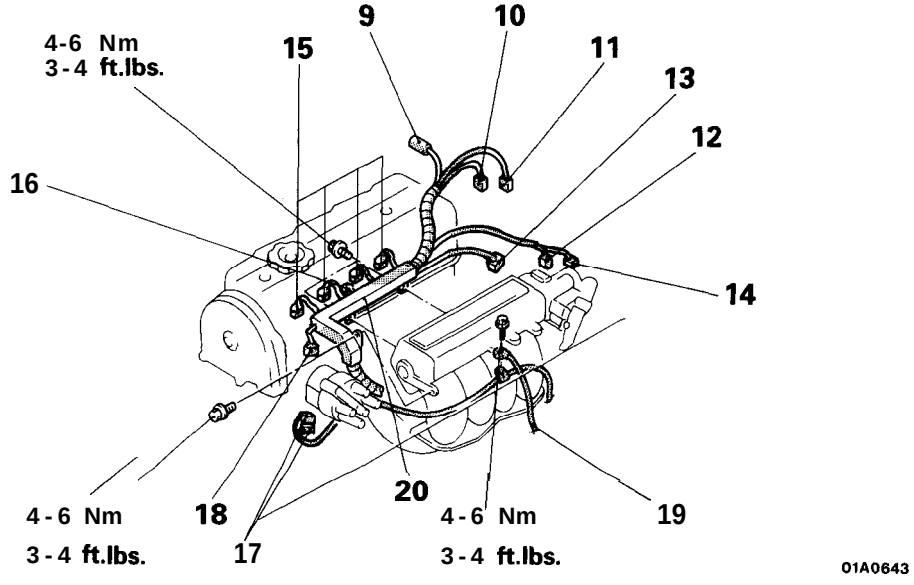
## . REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Eliminating Fuel Pressure in Fuel Line (Refer to GROUP 14–Service Adjustment Procedures.)
- Removal of Engine Hood
- Draining of Engine Coolant (Refer to GROUP O-Maintenance Service.)
- Removal of the Transaxle Assembly (Refer to GROUP 21 -Transaxle Assembly.)

*Removal of the Radiator (Refer to GROUP 7–Radiator.)

**Post-installation Operation**
- Installation of the Radiator (Refer to GROUP 7–Radiator.)
- Installation of the Transaxle Assembly (Refer to GROUP 21 -Transaxle Assembly.)
- Refilling of Engine Coolant (Refer to GROUP O-Maintenance Service.)
- Installation of Engine Hood

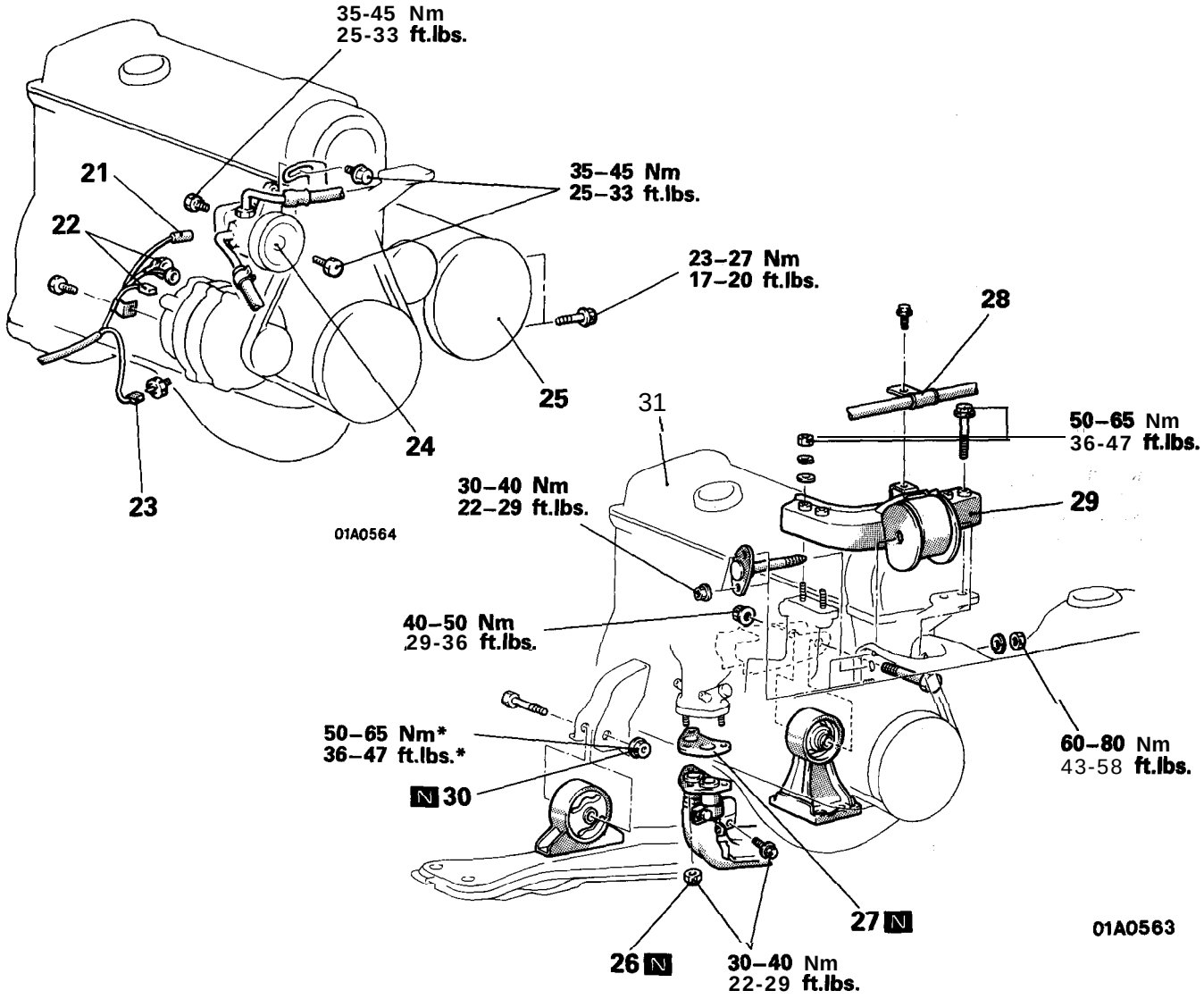



**Removal steps**

- ● + 1. Connection for accelerator cable or throttle cable
  2. Connection for accelerator cable (Auto-cruise control)
  3. Connection for fuel high pressure hose
  4. O-ring
  5. Connection for heater hoses
  6. Connection for vacuum hoses
  7. Connection for fuel return hose
  8. Connection for brake booster vacuum hose
  9. Connection for oxygen sensor
  10. Connection for engine coolant temperature gauge unit
  11. Connection for engine coolant temperature sensor
  12. Connection for ISC
  13. Connection for TPS
  14. Connection for MPS
  15. Connection for fuel injectors
  16. Connection for EGR temperature sensor
  17. Connection for distributor
  18. Connection for CRC filter
  19. Connection for ground cable
  20. Control wiring harness

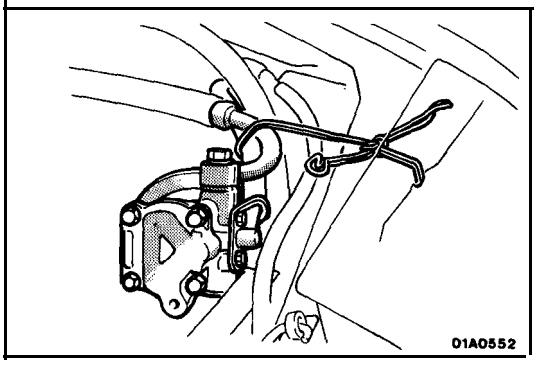
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● +: Refer to "Service Points of Installation".
(3) N: Non-reusable parts




**Removal steps**

- **21.** Connection **for power steering oil pump** switch
- 22. **Connection for alternator**
- 23. **Connection for oil pressure switch**
- ◆◆ ● + 24. **Power steering oil pump**
- ◆◆ ● 4 25. **Air conditioner compressor**
- 26. Self-locking **nuts**
- 27. Gasket
- 28. **Clamp of pressure hose (Power** steering)
- ◆◆ 29. **Engine mount bracket**
- **30. Self-locking nut**
- ◆◆▶◀ **31. Engine assembly**

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● ***: Refer to "Service Points of** Removal".
(3) ● ***: Refer to "Service Points of Installation".**
(4) N **: Non-reusable parts**
(5) **For** tightening **locations indicated by the * symbol, first tighten temporarily, and** then make the final tightening **with the entire weight of the engine applied to the** vehicle body.



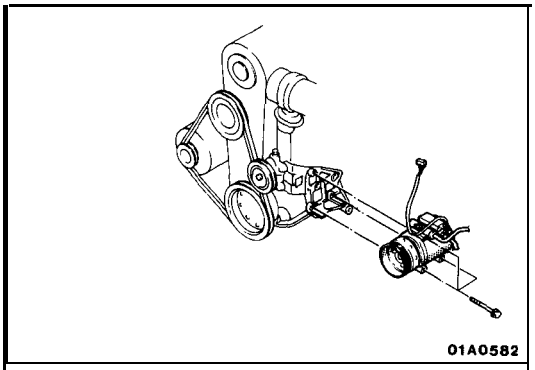

## SERVICE POINTS OF REMOVAL

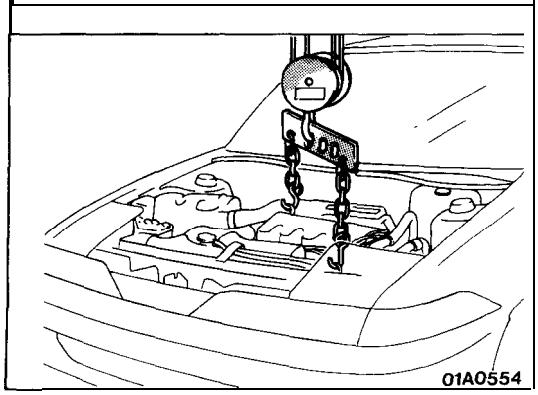
N09SBBC

### 24. REMOVAL OF POWER STEERING OIL PUMP

**Remove the oil pump** (with the hose attached).

NOTE
Suspend the removed oil pump (by using wire or similar material) at a place where no damage will be caused during removal/installation of the engine assembly.




**25. REMOVAL OF AIR CONDITIONER COMPRESSOR**

Disconnect the connection of the air conditioner compressor, and then remove the compressor (with the hose attached) from the compressor bracket.

NOTE
Suspend the removed air conditioner compressor (by using wire or similar material) at a place where no damage will be caused during removal/installation of the engine assembly.

**29. REMOVAL OF ENGINE MOUNT BRACKET**

(1) Attach wire or similar material to the engine hook, and then suspend (to the extent that there is no slackness of the wire) by using a chain block or similar arrangement.
(2) Remove the engine mount bracket.

**31. REMOVAL OF ENGINE ASSEMBLY**

(1) Check to be sure that all cables, hoses, harness connectors, etc. are disconnected from the engine.
(2) Lift the chain block slowly to remove the engine assembly upward from the engine compartment.

## SERVICE POINTS OF INSTALLATION N09SDAT

**31. INSTALLATION OF ENGINE ASSEMBLY**

install the engine assembly. When doing so, check carefully to **be sure that all pipes and hoses are connected, and** that none are twisted, damaged, etc.

**25. INSTALLATION OF AIR CONDITIONER COMPRESSOR**

Refer to GROUP 24–Service Adjustment Procedures.

**24. INSTALLATION OF POWER STEERING OIL PUMP**

Refer to GROUP 19–Service Adjustment Procedures.

**1. ADJUSTMENT OF ACCELERATOR CABLE OR THROTTLE CABLE**

Refer to GROUP 14–Service Adjustment Procedures.

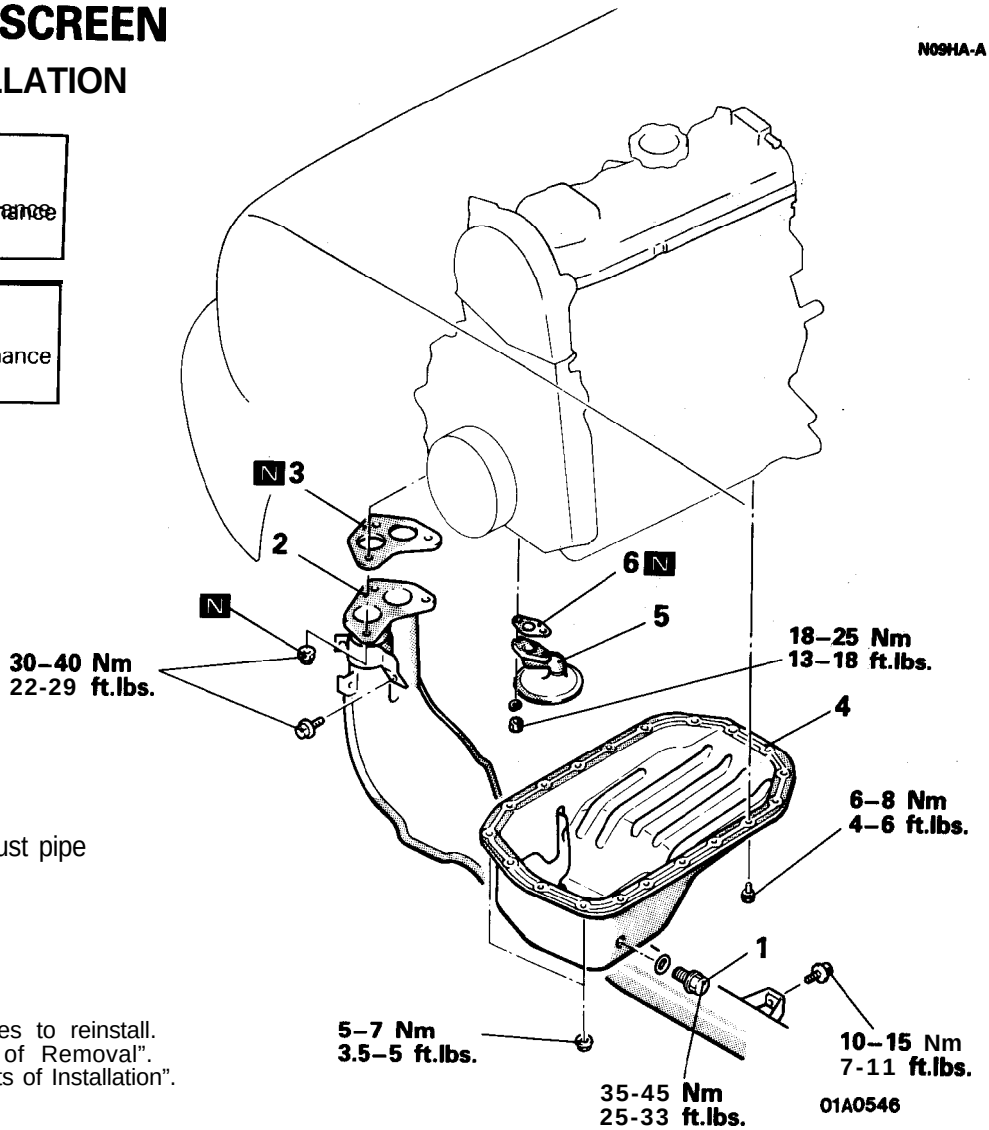
# OIL PAN AND OIL SCREEN

## REMOVAL AND INSTALLATION

N09HA-A

**Pre-removal Operation**
- Draining of Engine Oil (Refer to GROUP 0-Maintenance Service.)

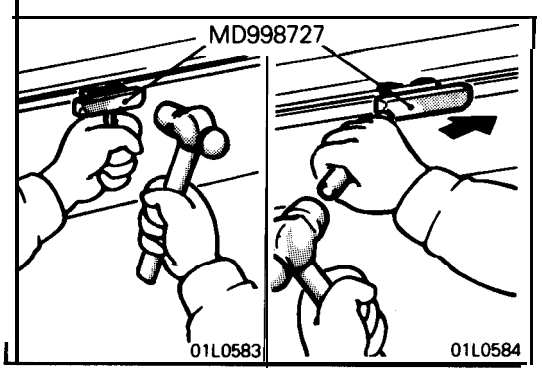
**Post-installation Operation**
- Refilling of Engine Oil (Refer to GROUP 0–Maintenance Service.)




**Removal steps**

1. Drain plug
2. Connection for exhaust pipe
3. Gasket
- ◆▶ ● + 4. Oil pan
5. Oil screen
6. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆▶: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL

N09HBAFa0

### 4. REMOVAL OF OIL PAN

(1) Remove the oil pan mounting bolts.
(2) Tap the special tool in between the cylinder block **and the** oil pan.

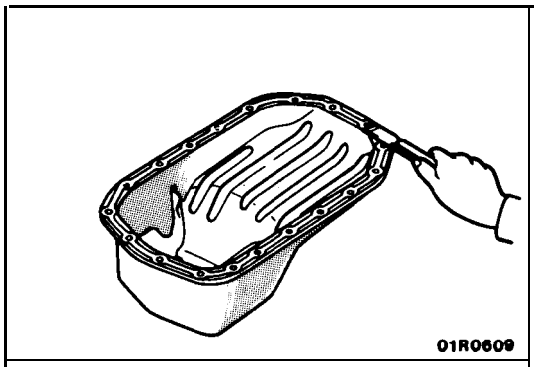
**Caution**
**Do not use a screwdriver, a chisel or a similar tool when removing the oil pan.**

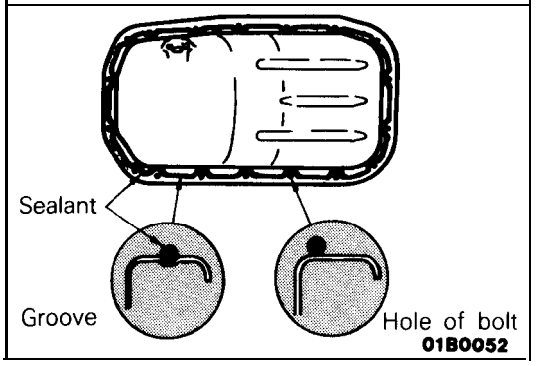
(3) Remove the oil pan by placing a brass bar at the corner of the special tool and then tapping with a hammer.

## INSPECTION

N09HCAC0

- Check the oil pan for damage and cracks. Replace if faulty.
- Check the oil screen for clogging; damage and cracks. Replace if faulty.


01R0609



01B0052

## SERVICE POINTS OF INSTALLATION N09HDAS

### 4. INSTALLATION OF OIL PAN

(1) Use a wire brush or other tool to scrape clean all gasket surfaces of the cylinder block and oil pan so that all loose material is removed.
(2) Gasket surfaces must be free of oil and dirt.

(3) Apply the specified sealant around the gasket surface of oil pan as specified in illustration.

**Specified sealant: MITSUBISHI GENUINE PART No. MD997110 or equivalent**

NOTE
The sealant should be applied in a continuous bead approximately 4 mm (.16 in.) in diameter.

(4) Assemble oil pan to cylinder block within 15 minutes after applying the sealant.

**Caution**
**After installing the oil pan, wait at least 30 minutes before starting the engine.**

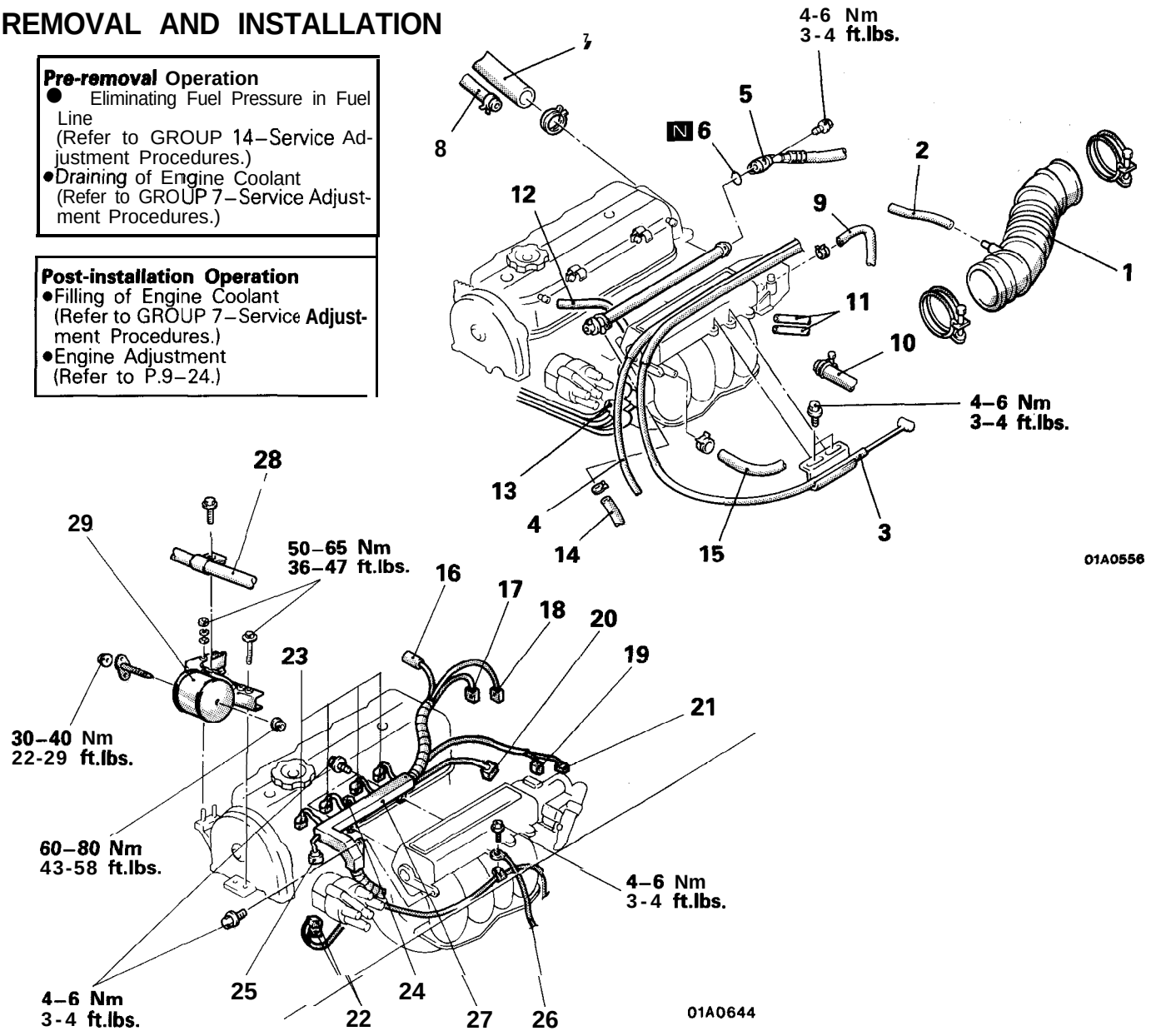
# CYLINDER HEAD GASKET

N09JA-A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Eliminating Fuel Pressure in Fuel Line (Refer to GROUP 14–Service Adjustment Procedures.)
- Draining of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)

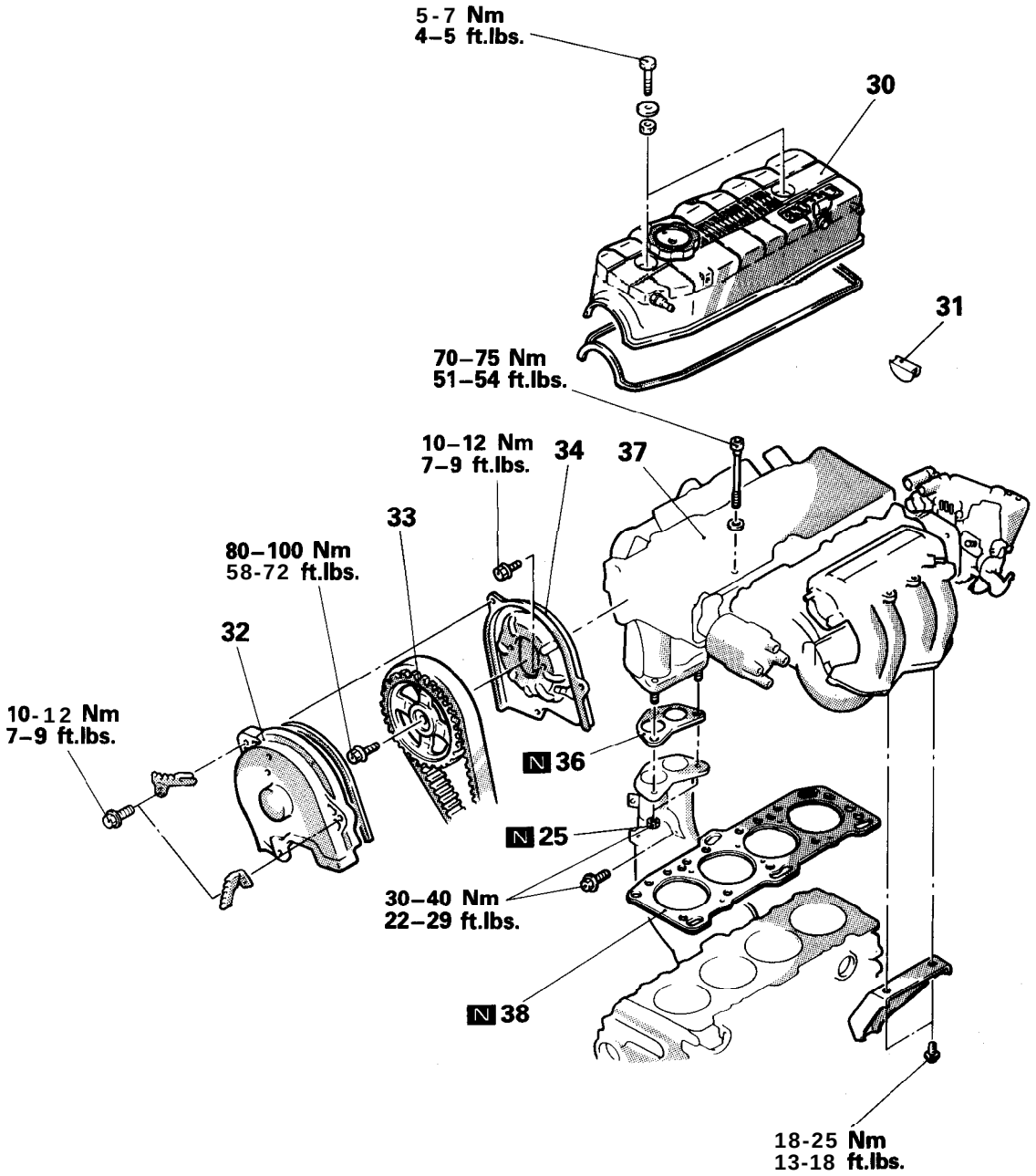
**Post-installation Operation**
- Filling of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)
- Engine Adjustment (Refer to P.9–24.)




**Removal steps**

- **1. Air intake hose**
- **2. Connection for breather hose**
- ◆◆ **3. Connection for accelerator cable or throttle cable**
- **4. Connection for accelerator cable (Auto-cruise control)**
- ● **5. Connection for fuel high pressure hose**
- **6. O-ring**
- ◆◆ ◆◆ **7. Connection for radiator upper hose**
- **8. Connection for water hose**
- **9. Connection for water by-pass hose**
- **10. Connection for heater hose**
- **11. Connection for vacuum hose**
- **12. Connection for PCV hose**
- **13. Connection for spark plug cable**
- **14. Connection for fuel return hose**
- 15. Connection for brake booster vacuum hose
- **16. Connection for oxygen sensor**
- 17. Connection for engine coolant temperature gauge unit
- **18. Connection for engine coolant** temperature sensor
- **19. Connection for** ISC
- **20. Connection for TPS**
- **21. Connection for MPS**
- **22. Connection for distributor**
- **23. Connection for injector**
- **24. Connection for EGR temperature sensor (California vehicles only)**
- **25. Connection for CRC filter**
- **26. Connection for ground** cable
- **27. Control wiring harness**
- **28. Clamp for pressure hose (Power steering)**
- ◆◆ 29. Engine mounting bracket

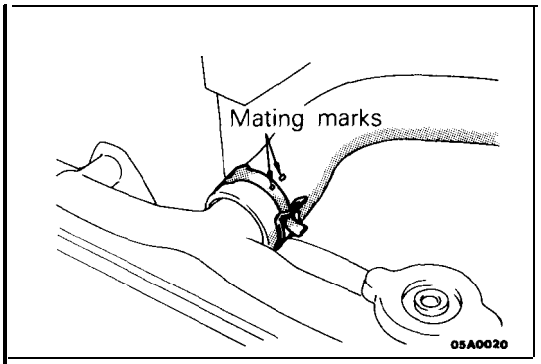
**NOTE**
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




01A0092

**30.** Rocker cover
◆◆ 31. Semi-circular packing
32. Timing belt front upper cover
◆◆ 33. Camshaft sprocket
34. Timing belt rear upper cover
35. Self-locking nuts
36. Gasket
◆◆ ● + 37. Cylinder head assembly
● + 38. Cylinder head gasket

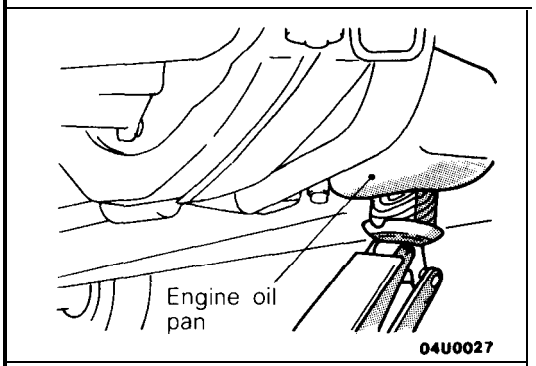
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4 : Refer to "Service Points of Installation".
(4) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL N09JBAO

### 7. REMOVAL OF RADIATOR UPPER HOSE

Make mating marks on the radiator hose and hose clamp, and then disconnect the radiator hose.

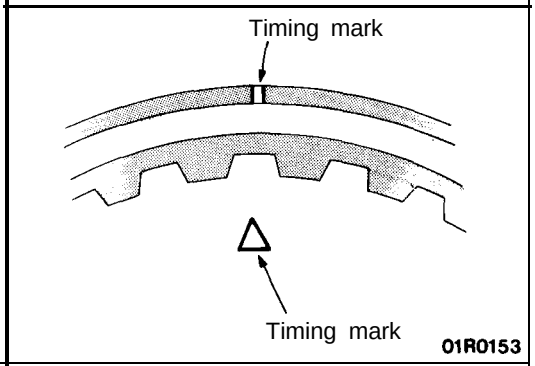



### 29. REMOVAL OF ENGINE MOUNTING BRACKET

(1) Jack up the vehicle after placing a wooden block between the jack and the engine's oil pan.

**Caution**
**Jack up carefully, so as not to apply an excessive load to the various parts.**

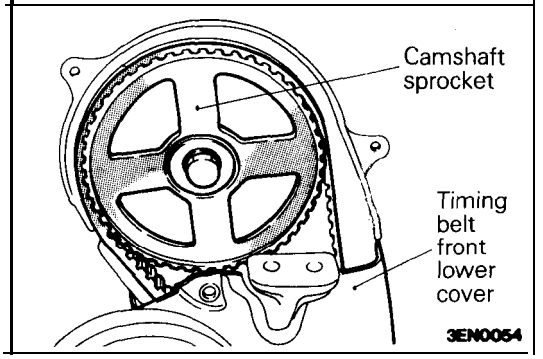
(2) Remove the engine mount bracket.




### 33. REMOVAL OF CAMSHAFT SPROCKET

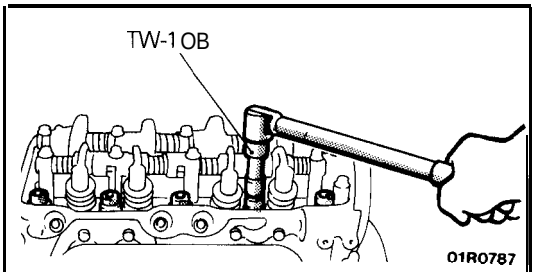
(1) Turn the crankshaft clockwise and align the timing mark.

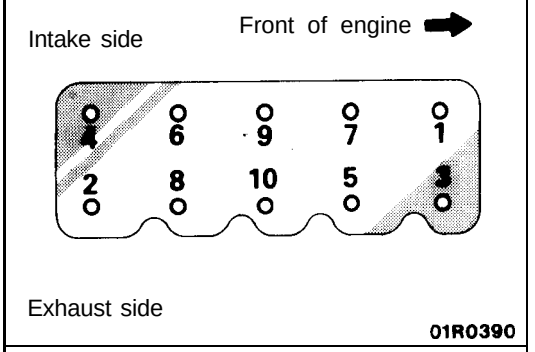
**Caution**
**The crankshaft must always be rotated in the clockwise only.**




(2) Remove the camshaft sprocket (with the timing belt attached), and place on the timing belt front lower cover.

**Caution**
**After removing the camshaft sprocket, be sure not to rotate the crankshaft.**

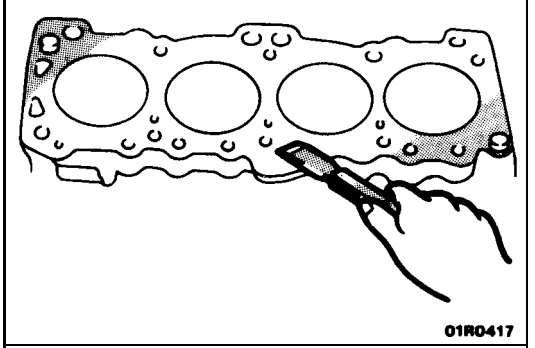



**37. REMOVAL OF CYLINDER HEAD ASSEMBLY**

(1) Using the special tool, remove cylinder head bolts in sequence shown in figure.
(2) Remove the cylinder head assembly.

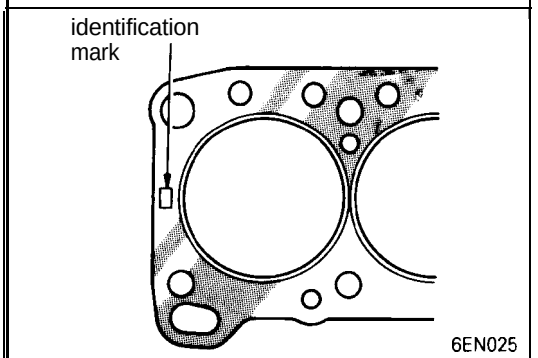
## SERVICE POINTS OF INSTALLATION N09JDDHa




**38. INSTALLATION OF CYLINDER HEAD GASKET**

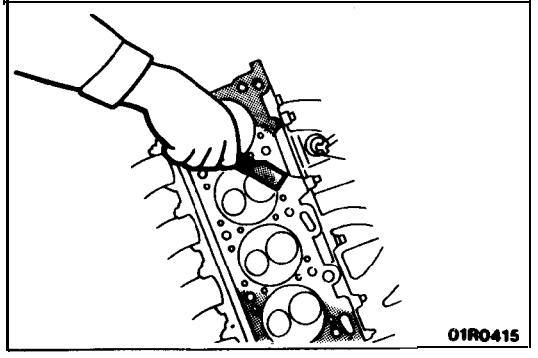
(1) Use a scraper to remove the cylinder head gasket from the cylinder block.

**Caution**
**Take care that no foreign material gets into the cylinder, or into coolant or oil passages.**




(2) Clean the cylinder block and head surfaces that are in contact with the gasket.
(3) Lay the cylinder head gasket on cylider block with the identification mark at front top.

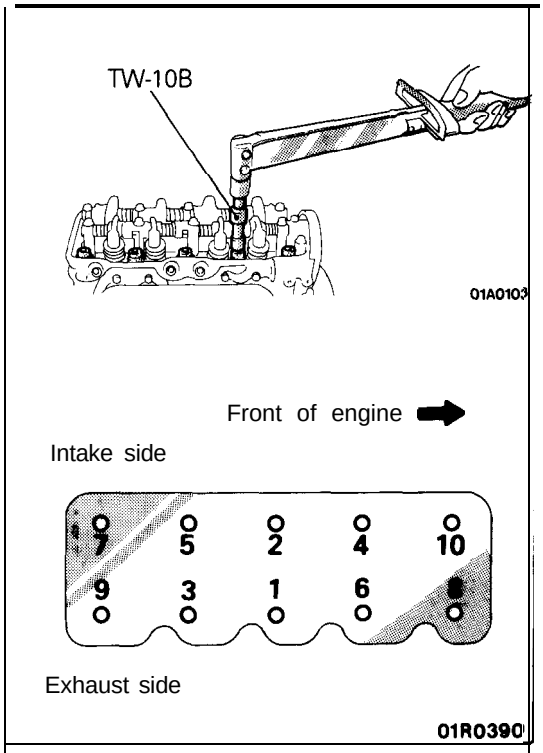
**Caution**
**Do not apply sealant to cylinder head gasket.**



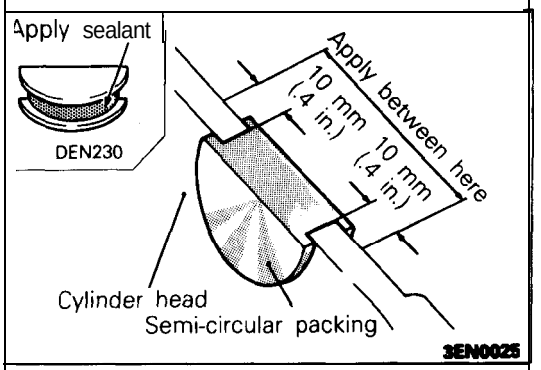

**37. INSTALLATION OF CYLINDER HEAD ASSEMBLY**

(1) Use a scraper to remove the cylinder head gasket from the cylinder head assembly.

**Caution**
**Take care that no foreign material gets into the coolant or oil passages.**



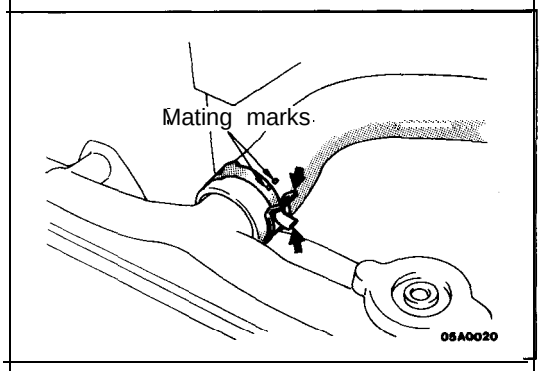

(2) Using the special tool, tighten the bolts in the order shown in two or three steps.




**31. APPLICATION OF SEALANT TO SEMI-CIRCULAR PACKING**

Apply a coating of the specified sealant to the semi-circular packing and the cylinder head top surfaces.

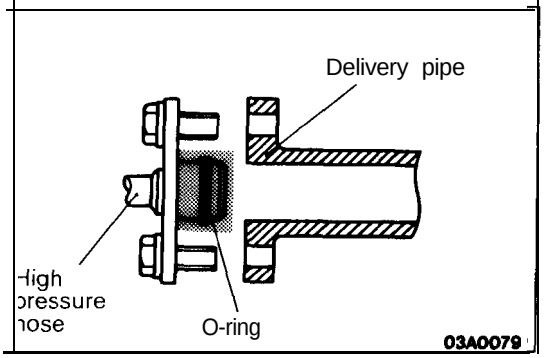
**Specified sealant: MOPAR Part No. 4318034 or equivalent**




7. **INSTALLATION OF RADIATOR UPPER HOSE**

Align the mating marks (of the radiator hose and hose clamp), and then, while applying force in the direction of the arrow in the illustration, set the hose clamp to the trace marks (on the hose) remaining from the prior connection.

**Caution**
**Be sure to install the hose clamp at the trace marks (on the hose) remaining from the prior connection.**




**5. CONNECTION OF FUEL HIGH PRESSURE HOSE**

When connecting the fuel high-pressure hose to the delivery pipe, apply a coating of gasoline to the hose union, and insert so that the O-ring is not damaged.

**3. INSTALLATION OF ACCELERATOR CABLE OR THROTTLE CABLE CONNECTION**

Refer to GROUP 14–Service Adjustment Procedures.

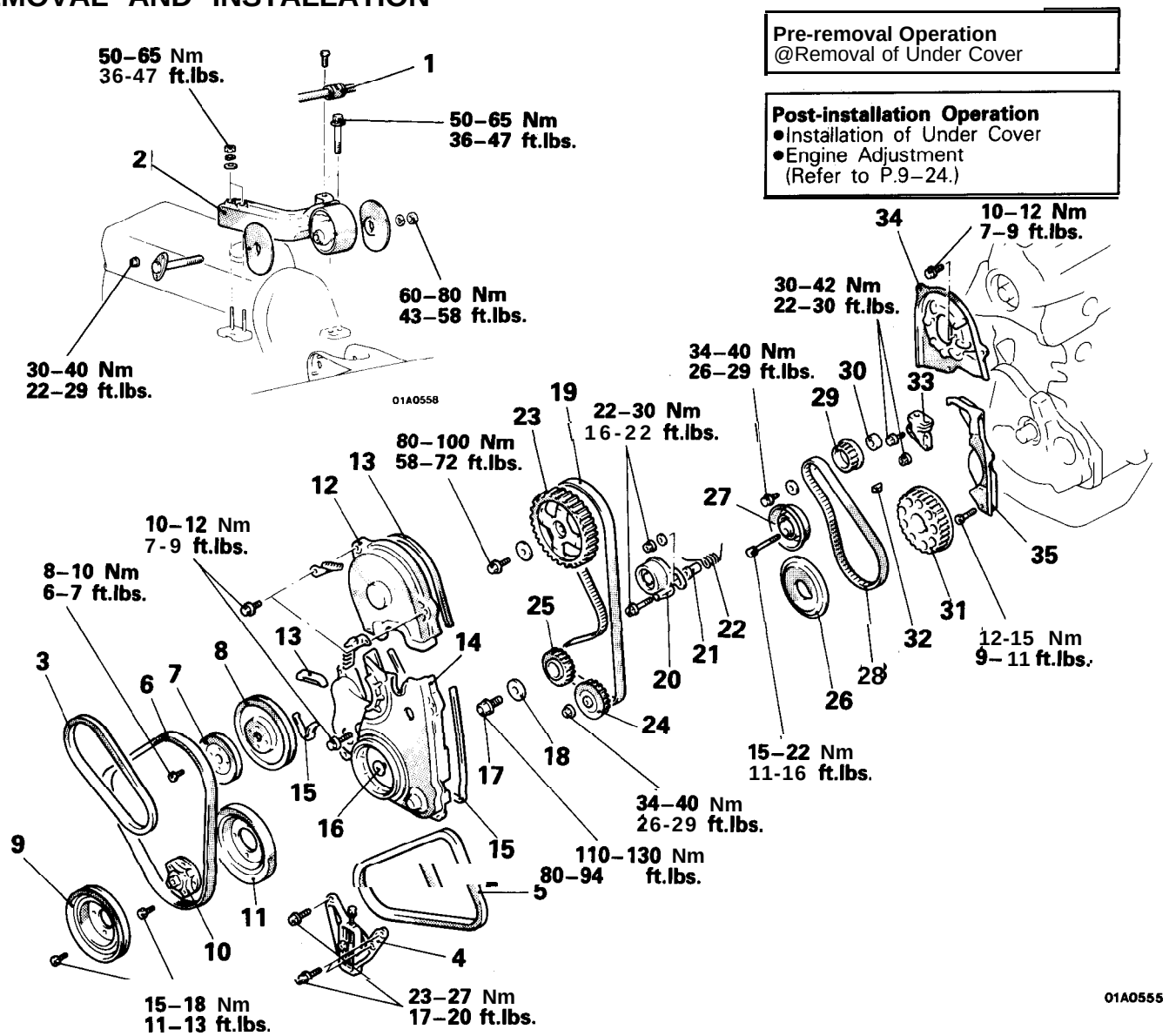
# TIMING BELT

N09KA-A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
@Removal of Under Cover

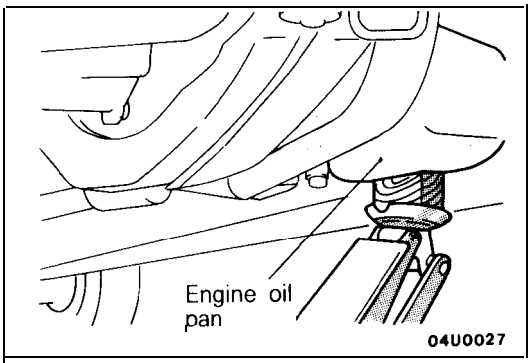
**Post-installation Operation**
- Installation of Under Cover
- Engine Adjustment (Refer to P.9–24.)




**Removal steps**

- **1. Clamp for pressure hose (power steering)**
- ◆◆ **2. Engine mount bracket**
- ◆◆ **3. Drive belt (power steering)**
- **4. Tensioner pulley bracket**
- ◆◆ **5. Drive belt (air conditioner)**
- ● **+ 6. Drive belt (alternator)**
- **7. Water pump pulley (power steering)**
- 8. Water pump pulley
- 9. Damper pulley
- 10. Adapter
- 11. Crankshaft pulley
- ◆◆ 12. Timing belt front upper cover
- **13. Gasket**
- ● **14. Timing belt front lower cover**
- **15. Gasket**
- 16. Access cover
- **17. Crankshaft sprocket bolt**
- 18. Special washer
- ◆◆ Adjustment of timing belt tensioner
- ● ***◆◆ 19. Timing belt**
- ● 4 20. Timing belt tensioner
- ◆◆ **21. Tensioner spacer**
- ● **22. Tensioner spring**
- **23. Camshaft sprocket**
- ◆◆ **24. Oil pump sprocket**
- **25. Crankshaft sprocket**
- ● **26. Flange**
- **27. Timing belt tensioner "B"**
- ◆◆ ● **28. Timing belt "B"**
- Adjustment of timing belt **"B"** tension
- **29. Right silent shaft sprocket**
- ● ***30. Spacer**
- ◆◆ 31. **Crankshaft sprocket "B"**
- **32. Key**
- 33. Left engine support bracket
- **34. Timing belt rear upper cover**
- 35. Timing belt rear lower cover

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4 : Refer to "Service Points of Installation".



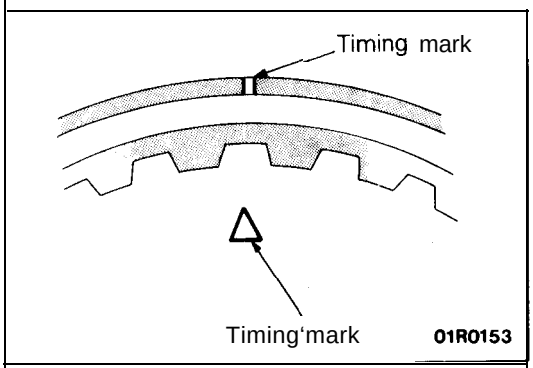

## SERVICE POINTS OF REMOVAL N09KBBCa

### 2. REMOVAL OF ENGINE MOUNT BRACKET

(1) Jack up the vehicle after placing a wooden block between the jack and the engine's oil pan.

**Caution**
**Jack up carefully so as not to apply an excessive load to the various parts.**

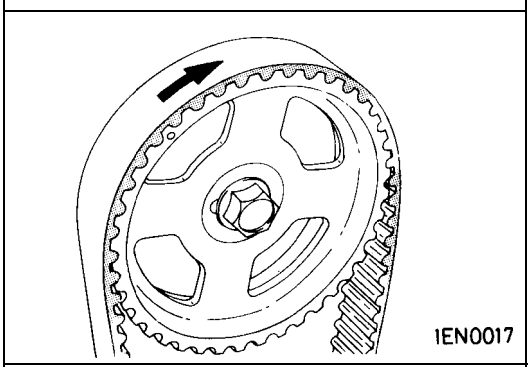
(2) Remove the engine mount bracket.



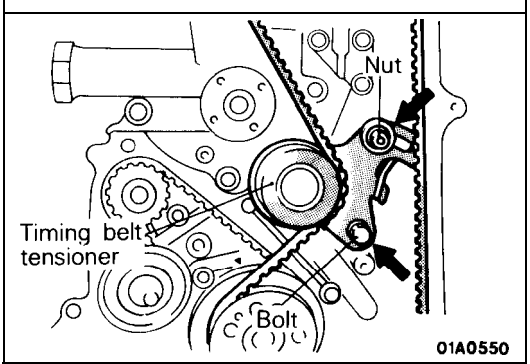

### 19. REMOVAL OF TIMING BELT

(1) Turn the crankshaft clockwise and align the timing marks.

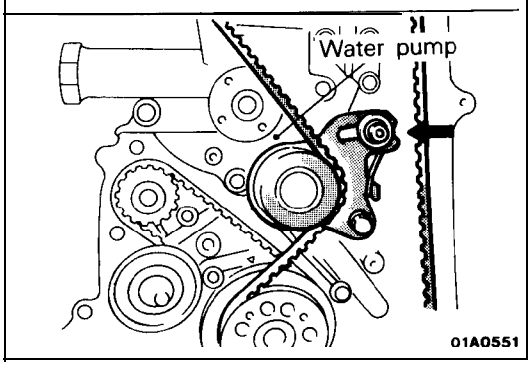
**Caution**
**The crankshaft must always be turned clockwise.**




(2) Make a mark on the back of the timing belt indicating the direction of rotation so it may be reassembled in the same direction if it is to be reused.



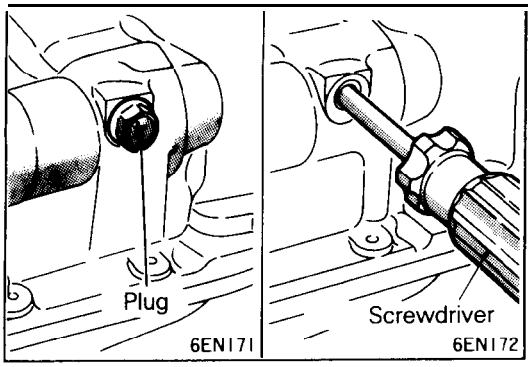

(3) Loosen the bolt and tension spacer of the timing belt tensioner.




(4) Move the timing belt tensioner to the water pump side and loosely tighten the bolt so that the tensioner doesn't return; then remove the timing belt.

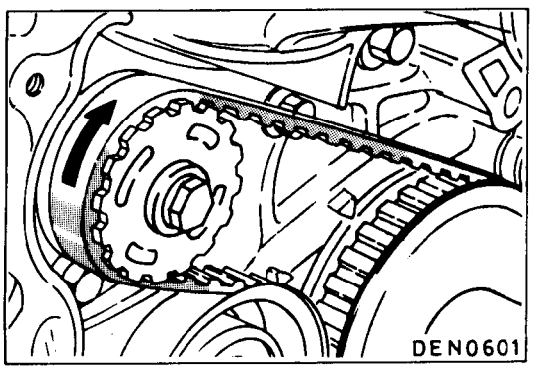
NOTE
If the timing belt is to be re-used, use chalk to mark (on its flat side) an arrow indicating the clockwise direction.

**Caution**
1. **As water or oil on the belt can seriously reduce its usable life, ensure that the timing belt, sprocket, and tensioner stay clean and dry while removed, and never wash them. Parts that have become too dirty should be replaced.**
2. **When any of the parts are oily, check to see whether there are any oil leaks in any of the oil seals or the camshaft oil seal on the front of the engine.**




### 24. REMOVAL OF OIL PUMP SPROCKET

(1) Remove the plug on the side of the cylinder block.
(2) Insert a Phillips screwdriver [shank diameter 8 mm (.31 in.)] to block the left silent shaft.
(3) Remove the oil pump sprocket nut.
(4) Remove the oil pump sprocket.




### 28. REMOVAL OF TIMING BELT "B"

Make a mark on the back of the timing belt indicating the direction of rotation so it may be reassembled in the same direction if it is to be reused.

**Caution**
**Water or oil on the belt shorten its life drastically, so the removed timing belt, sprocket, and tensioner must be free from oil and water. These parts should not be washed. Replace parts if seriously contaminated.**
**If there is oil or water on each part check the front case oil seals, camshaft oil seal and water pump for leaks.**

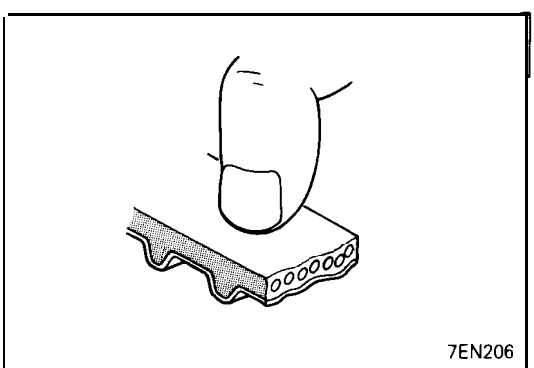
## INSPECTION

NOSKCAD

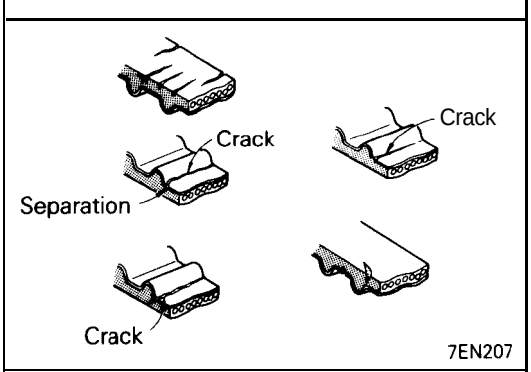
### TIMING BELTS

The timing belts must be checked closely. Should the following defects be evident, replace the belt with a new one.

(1) Hardened back surface rubber
Glossy, non-elastic, and so hard that no mark is produced even when scratched by a fingernail.

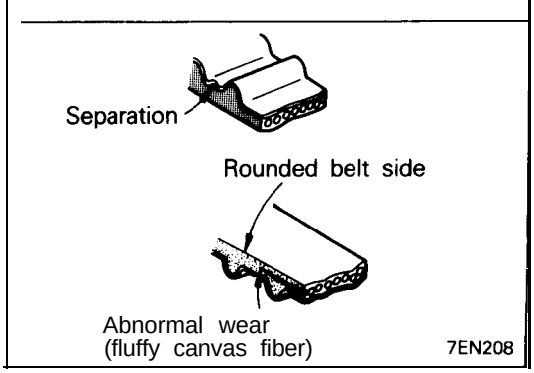


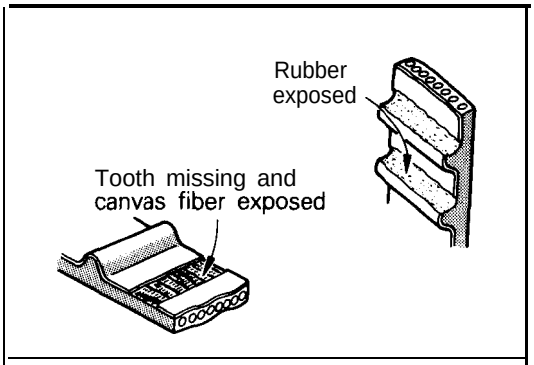

(2) Cracked back surface rubber.
(3) Cracked or separated canvas.
(4) Cracked tooth bottom.
(5) Cracked side.



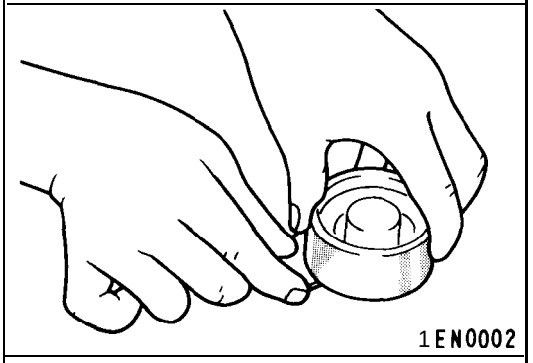

(6) Abnormal wear on side.

NOTE
Normal belt should have clear-cut sides as if cut by a sharp knife.






(7) Abnormal wear on teeth.
Initial stage:
Canvas on load side tooth flank worn (Fluffy **canvas** fibers, rubber gone and color changed to white, **and** unclear canvas texture)
Final stage:
Canvas on load side tooth flank worn down **and rubber** exposed (tooth width reduced)
(8) Missing tooth.



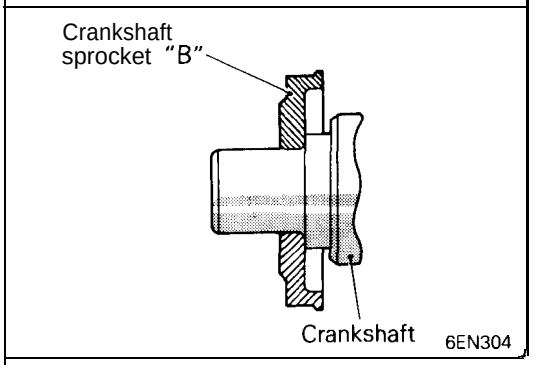

TENSIONER PULLEY

Turn the pulleys to check for possible binding, excessive play, and unusual noise. Replace the pulley if any of these defects is evident.

## SERVICE POINTS OF INSTALLATION N09KDCH

### 31. INSTALLATION OF CRANKSHAFT SPROCKET "B"

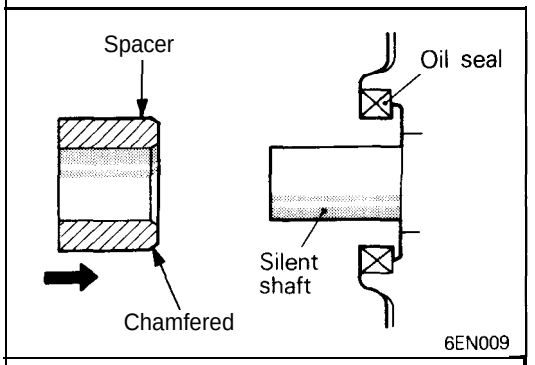
Install the crankshaft sprocket "B" as shown while paying attention to its direction.




### 30. INSTALLATION OF SPACER

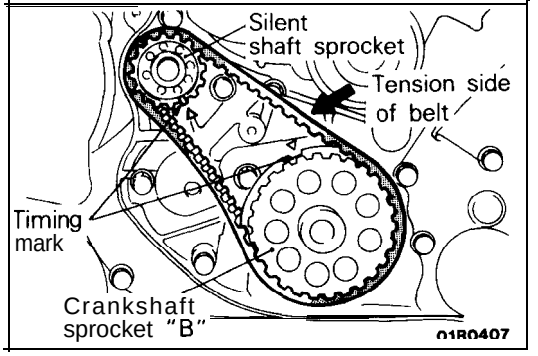
(1) Apply a thin coat of engine oil to the outer circumference of the spacer.
(2) Install the spacer with the chamfered end facing the oil seal.

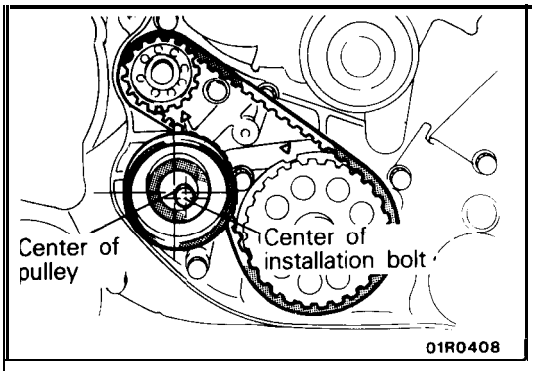
NOTE
If the spacer is installed adversely, the oil seal may be damaged, resulting in the oil leaks.




### 28. INSTALLATION OF TIMING BELT "B"

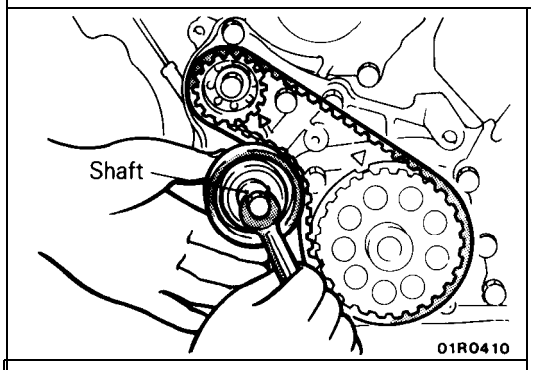
(1) Ensure that crankshaft sprocket "B" timing mark and the silent shaft sprocket timing mark are aligned.
(2) Fit timing belt "B" over crankshaft sprocket "B" and the silent shaft sprocket. Ensure that there is no slack in the belt.





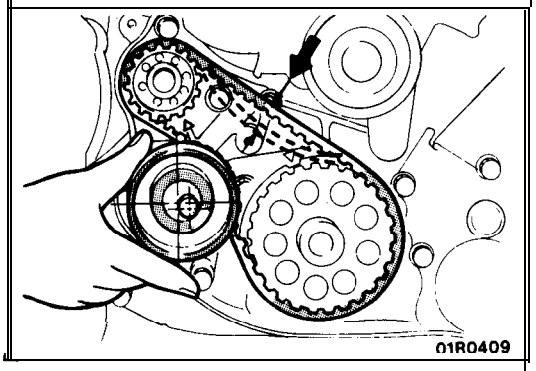

. ADJUSTMENT OF TIMING BELT "B" TENSION

(1) Temporarily fix the timing belt "B" tensioner such that the center of the tensioner pulley is to the left and above the center of the installation bolt, and temporarily attach the tensioner pulley so that the flange is toward the front of the engine.



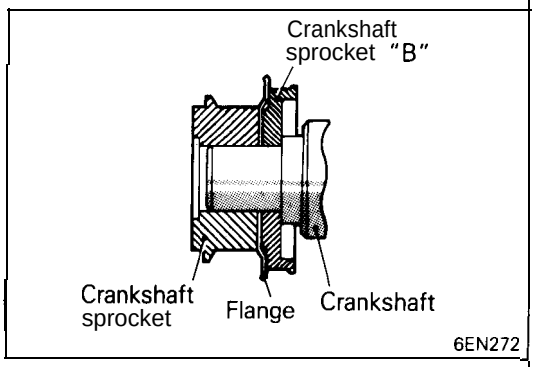

(2) Holding the timing belt "B" tensioner up with your finger in the direction of the arrow, place pressure on the timing belt so that the tension side of the belt is taut. Now tighten the bolt to fix the tensioner.

Caution
When tightening the bolt, ensure that the tensioner pulley shaft does not rotate with the bolt. Allowing it to rotate with the bolt can cause excessive tension on the belt.



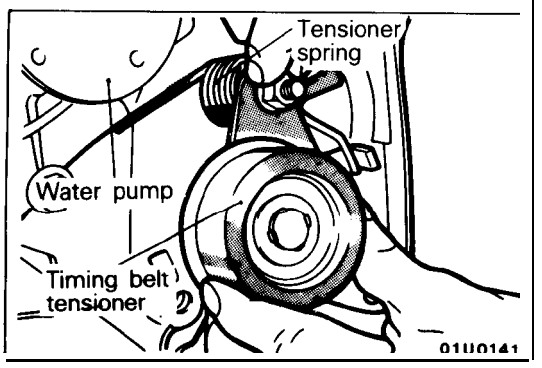

(3) To ensure that the tension is correct, depress the belt (point A) with a finger. If not, adjust.

Standard value: 5-7 mm **(.20–.28** in.)



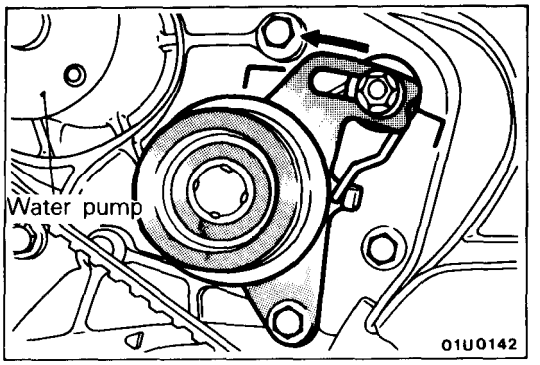

26. INSTALLATION OF FLANGE

Install the flange in correct direction as shown.

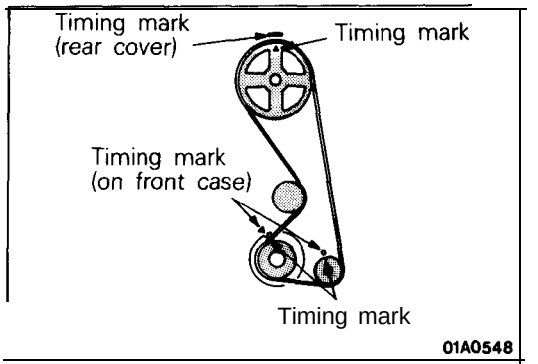



22. INSTALLATION OF TENSIONER **SPRING/21.** TENSIONER **SPACER/20.** TIMING BELT TENSIONER

(1) Install the tensioner spring, tensioner spacer and timing belt tensioner.
(2) Place the upper end of the tensioner spring against the water pump body.

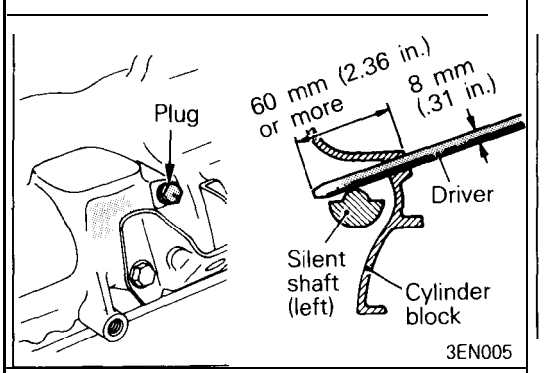



(3) Move tensioner fully toward water pump and temporarily secure tensioner.

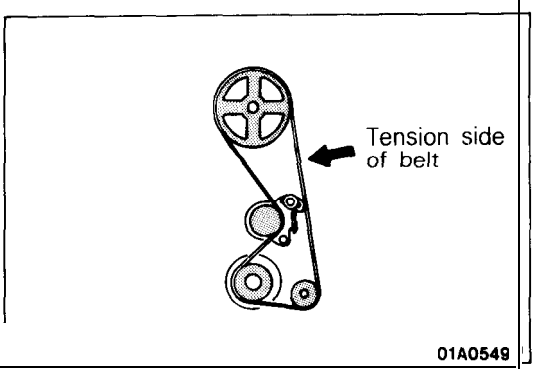



19. INSTALLATION OF TIMING BELT

(1) Ensure that the timing marks of the camshaft sprocket, the crankshaft sprocket, and the oil pump sprocket are all aligned.

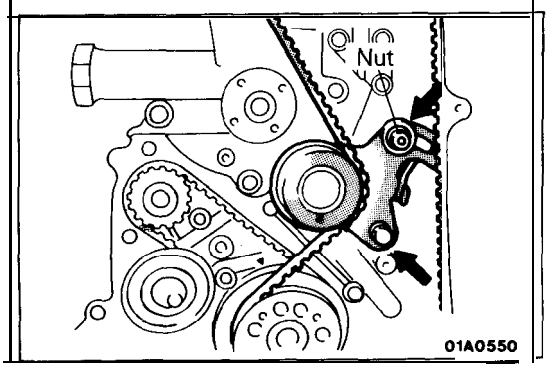



(2) When aligning the timing mark of the oil pump sprocket, remove the plug of the cylinder block; then insert the shaft of a cross-tip (+) screwdriver with a shaft diameter of 8 mm (.31 in.) into the plug hole and check to be sure that the screwdriver's shaft can be inserted at least 60 mm (2.36 in.). Do not remove the screwdriver until the timing belt is completely attached. If the screwdriver's shaft can be inserted only to a depth of about 20 to 25 mm (.79 to .98 in.) because it contacts the silent shaft, turn the sprocket by one rotation and align the timing mark once again; then check again to be sure that the screwdriver's shaft can be inserted at least 60 mm (2.36 in.).



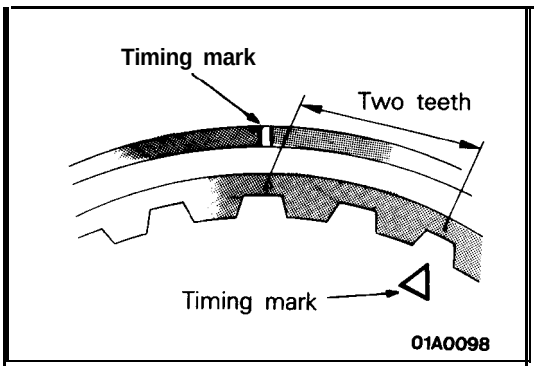

(3) Install timing belt. While making sure that tension side of belt is not slackened, install timing belt onto crankshaft sprocket, oil pump sprocket and camshaft sprocket in that order.

Caution
If the timing belt is reused, install so that the arrow marked on it at the time of removal is pointing in the clockwise direction.



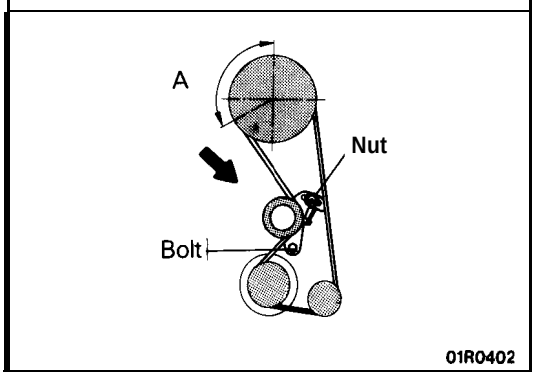

ADJUSTMENT OF TIMING BELT TENSION

(1) Loosen tensioner mounting nut. By so doing, tensioner will be moved by spring and will apply tension to belt.
(2) Recheck to be sure that each sprocket's timing mark is correct.




(3) Turn the crankshaft clockwise by two teeth of the camshaft sprocket.

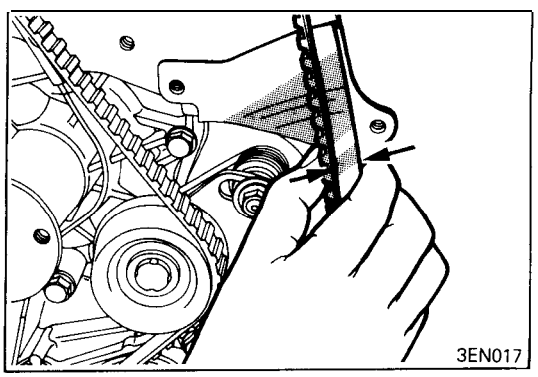
Caution
As the purpose of this procedure is to apply the proper amount of tension on the timing belt, be sure not to rotate the crankshaft counterclockwise or place pressure on the belt to check the amount of tension.




(4) Apply force on tensioner toward turning direction, (in the direction of the arrow) such that no portion of the belt raises out in portion A, place the belt on the camshaft sprocket such that the belt sprocket teeth are fully engaged.

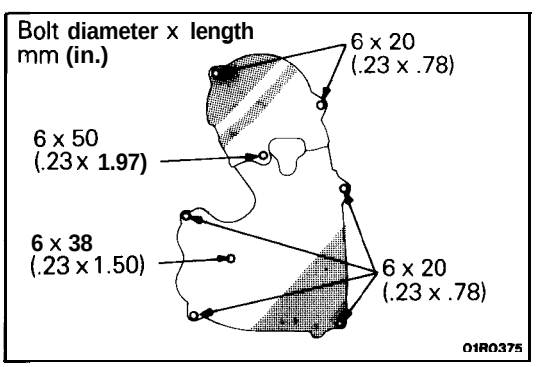
(5) Tighten the tensioner installation bolt and tensioner spacer in that order.

Caution
If the tensioner spacer is tightened first, the tensioner will rotate with it and belt tension be thrown out of adjustment. Always tighten the bolt first.




(6) Check to see that the clearance between the outside of the belt and the cover are within the standard value by grasping the tension side (between the camshaft sprocket and oil pump sprocket) of the centre part of the timing belt between the thumb and index finger.

Standard value: 12 mm (.40 in.)




14. INSTALLATION OF TIMING BELT FRONT LOWER COVER/12. TIMING BELT FRONT UPPER COVER

Note that the timing belt lower and upper cover attaching **bolts differ in size from one place to another.**

6. TENSION ADJUSTMENT OF THE ALTERNATOR DRIVE BELT

Refer to GROUP 14–Service Adjustment Procedures.

5. TENSION ADJUSTMENT OF THE AIR CONDITIONER COMPRESSOR DRIVE BELT

Refer to GROUP 24– Service Adjustment Procedures.

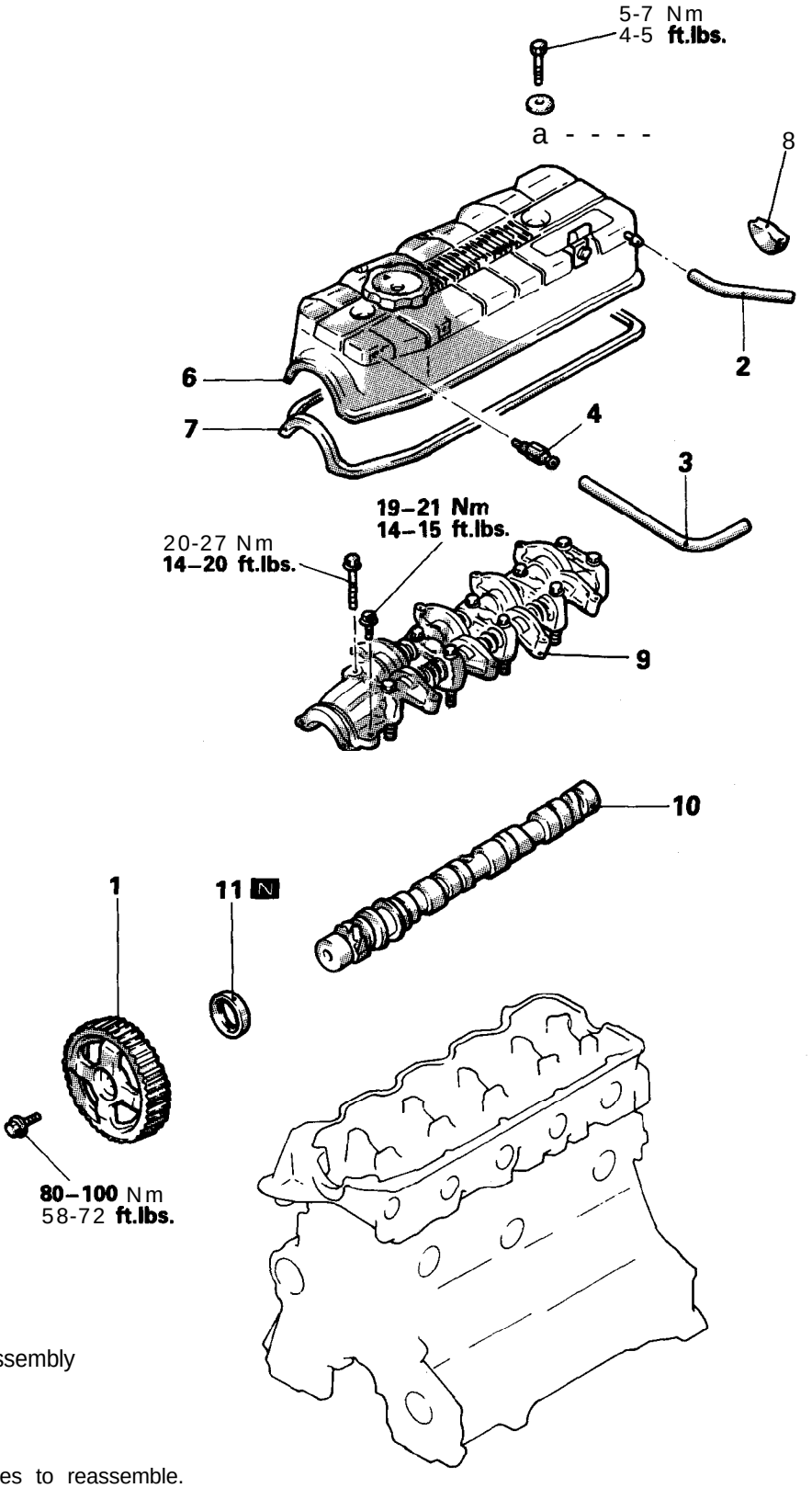
3. DEFLECTION ADJUSTMENT OF POWER STEERING OIL PUMP DRIVE BELT

Refer to GROUP 19–Service Adjustment Procedures.

# ROCKER ARMS, ROCKER ARM SHAFTS AND CAMSHAFT

N09LE-A

## DISASSEMBLY AND REASSEMBLY

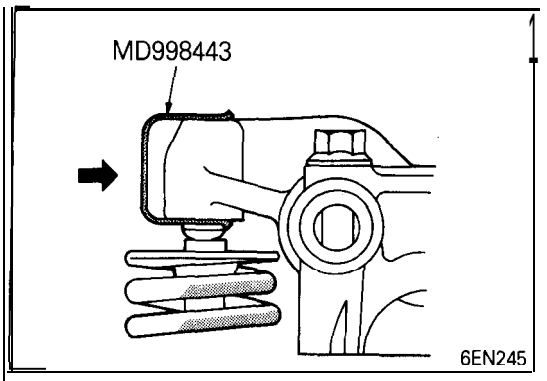


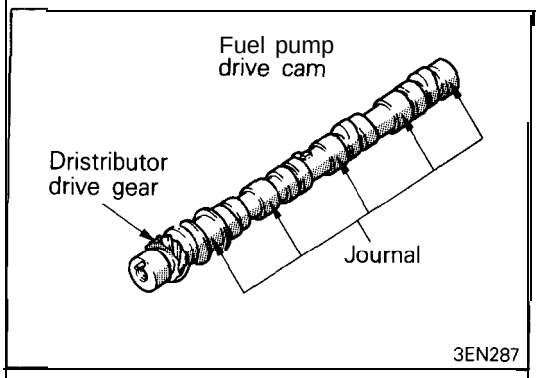

Disassembly steps

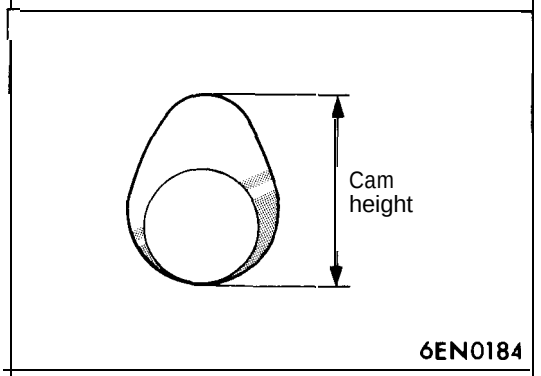
1. Camshaft sprocket
2. Breather hose
3. P.C.V. hose
4. P.C.V. valve
5. Oil seal
6. Rocker cover
7. Gasket
● + 8. Semi-circular packing
◆◆▶◆ 9. Rocker arm and shaft assembly
10. Camshaft
● * 11. Oil seal

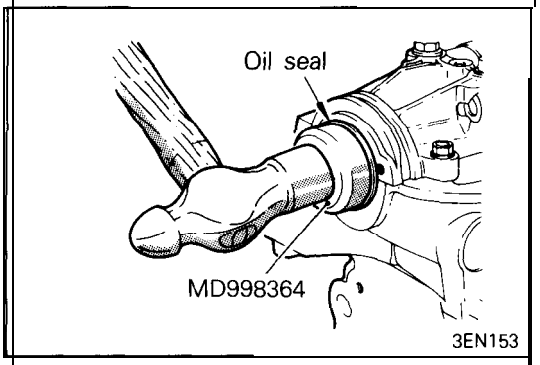
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◆: Refer to "Service Points of Reassembly".
(4) ❑ : Non-reusable parts

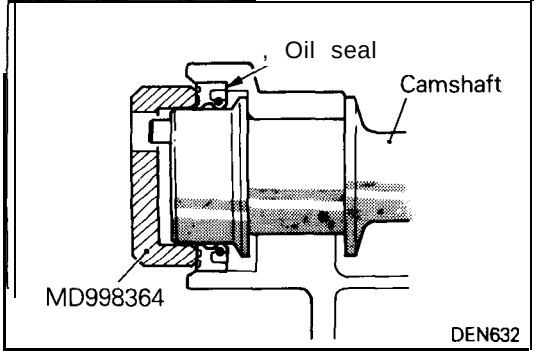
3EN0079




## SERVICE POINTS OF DISASSEMBLY N09LFAAa

### 9. REMOVAL OF ROCKER ARM AND SHAFT ASSEMBLY

**Before removing the rocker arm and shaft assembly, use** the special tool to ensure that the lash adjuster doesn't fall out.

Caution
Put the rocker arms and lash adjusters in order in cylinder No. separated places with clear distinction between the intake and exhaust ones to prevent confusion.

## INSPECTION N09LCDDa

CAMSHAFT

(1) Visually check the camshaft journal surfaces and replace if damage or seizure is evident.
If the journal is seized, check the cylinder head for possible damage. Check also for clogged oil holes in the cylinder head.

(2) Check cams for excessive wear and damage and replace if defects are evident. Measure the cam height and replace if the limit is not reached.

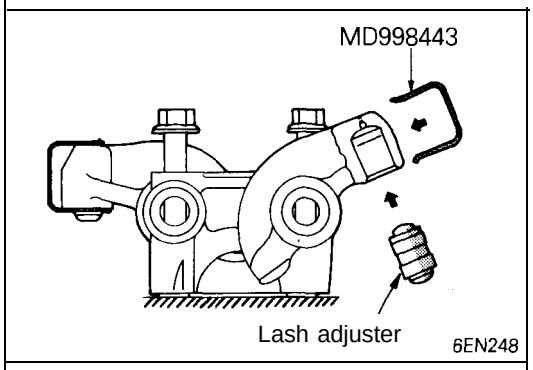
Standard value: 35.91 mm (1.4138 in.)

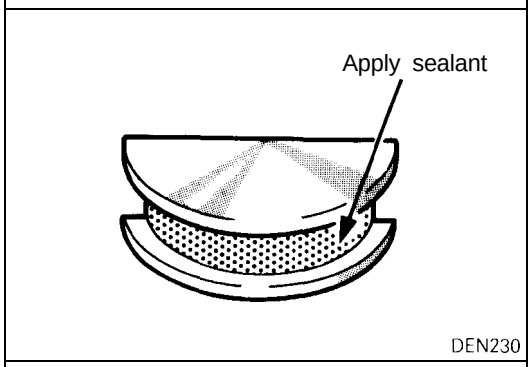
Limit: 35.41 mm (1.3941 in.)

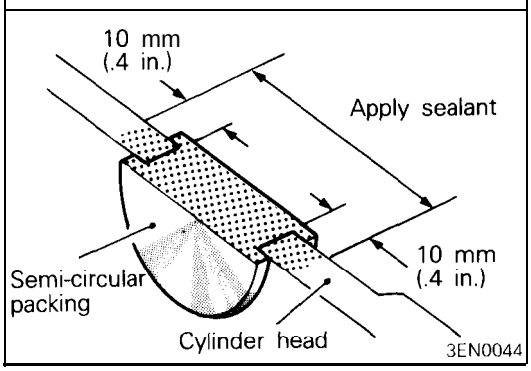
## SERVICE POINTS OF **INSTALLATION** N09LGACa

### 11. INSTALLATION OF OIL SEAL

(1) Apply engine oil to oil seal lip.
(2) Using **the special tool, drive the camshaft oil seal into** the cylinder head.




**9.** INSTALLATION OF ROCKER ARM AND SHAFT ASSEMBLY

(1) Insert the lash adjuster from below as illustrated, being careful not to spill the diesel oil inside it. Then use the special tool to prevent adjuster from falling while installing it.
(2) Place the rocker arm and shaft assembly on the cylinder head and tighten the bearing cap bolt.
(3) Remove the special tool.

8. APPLICATION OF SEALANT TO SEMI-CIRCULAR PACKING

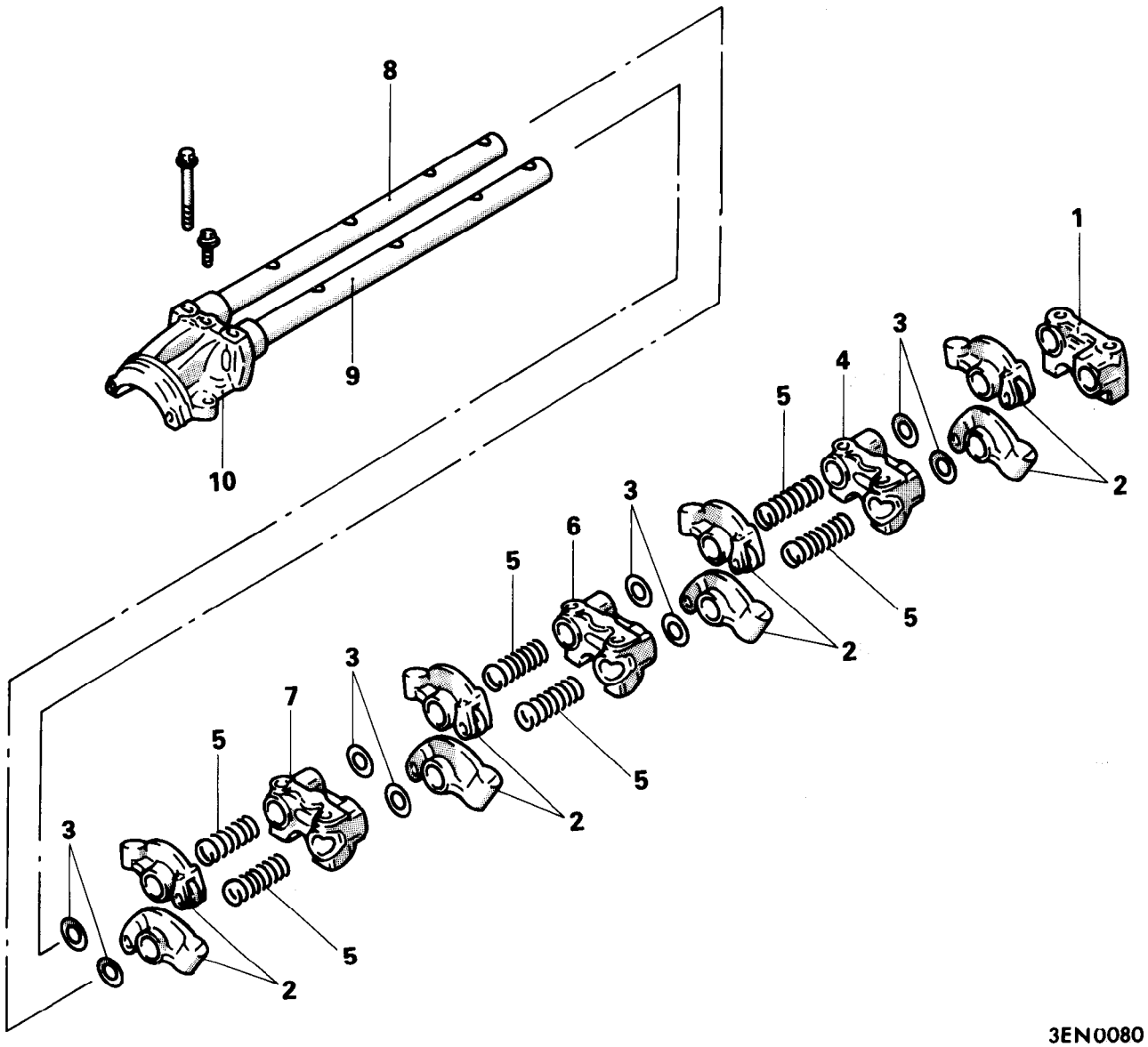
Apply sealant on the periphery of the semi-circular packing.

**Specified sealant: MOPAR Part No.4318034 or equivalent**

# ROCKER ARMS AND ROCKER SHAFTS

## DISASSEMBLY AND REASSEMBLY

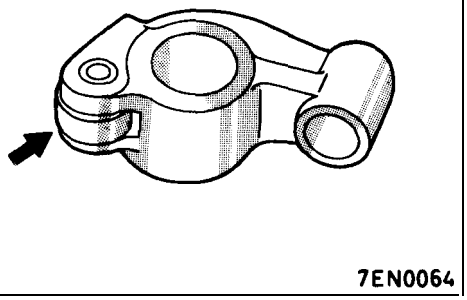
N09NE-A

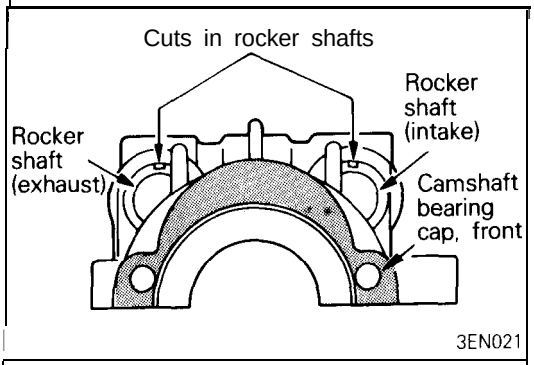



Disassembly steps

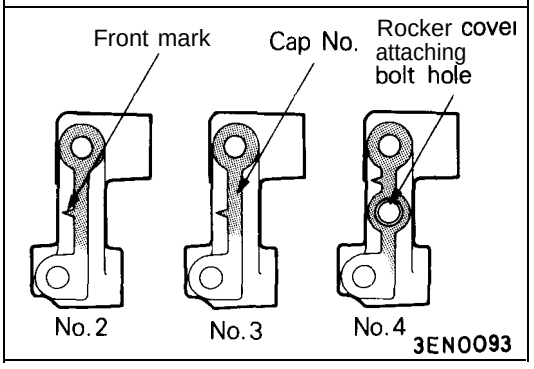
1. Rear camshaft bearing cap
2. Rocker arm
● 3. Wave washer
➡◀ 4. Camshaft bearing cap No. 4
5. Rocker shaft spring
⬮ + 6. Camshaft bearing cap No. 3
➡◀ 7. Camshaft bearing cap No. 2
⬮ + 8. Right rocker shaft
● 9. Left rocker shaft
10. Front bearing cap

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● : Refer to "Service Points of Reassembly".


7EN0064



3EN021



3EN0093

## SERVICE POINTS OF DISASSEMBLY N09LFEA

NOTE
Before disassembly, mark the rocker arm for indentification.

## INSPECTION N09NGAG

ROCKER ARM

(1) Visually check the roller and replace if dent, damage, or seizure is evident.
(2) Check roller for smooth rotation. Replace if it is binds or there is an excessive play.
(3) Check the inside diameter and replace the rocker arm if damage or seizure is observed.

## SERVICE POINTS OF REASSEMBLY N09NHBC

**9./8.** INSTALLATION OF ROCKER ARM SHAFTS

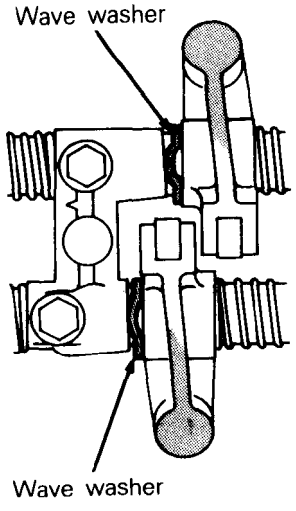
Insert the rocker shafts into the holes in front bearing cap and temporarily install the bolts to hold the shafts in place. When the rocker arm shafts are inserted, make sure that the shaft front end cuts are facing up as shown.

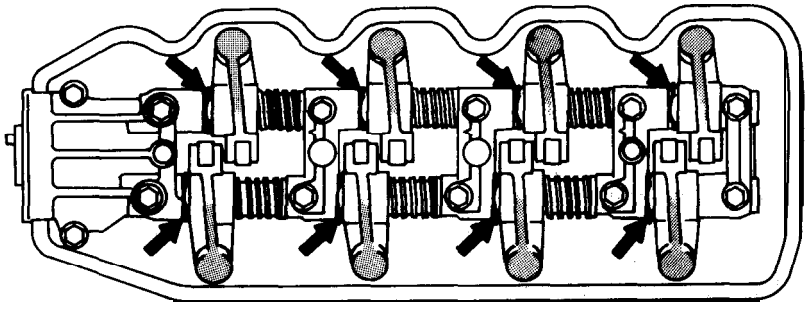
**7./6./4.** INSTALLATION OF BEARING CAPS

The No. 2, No.3 and No.4 caps look alike in shape. Install correct one at correct position. They can be identified by the front mark, cap number and rocker cover attaching bolt hole as illustrated.

3. INSTALLATION OF WAVE WASHER

Install the wave washer in correct direction as shown.

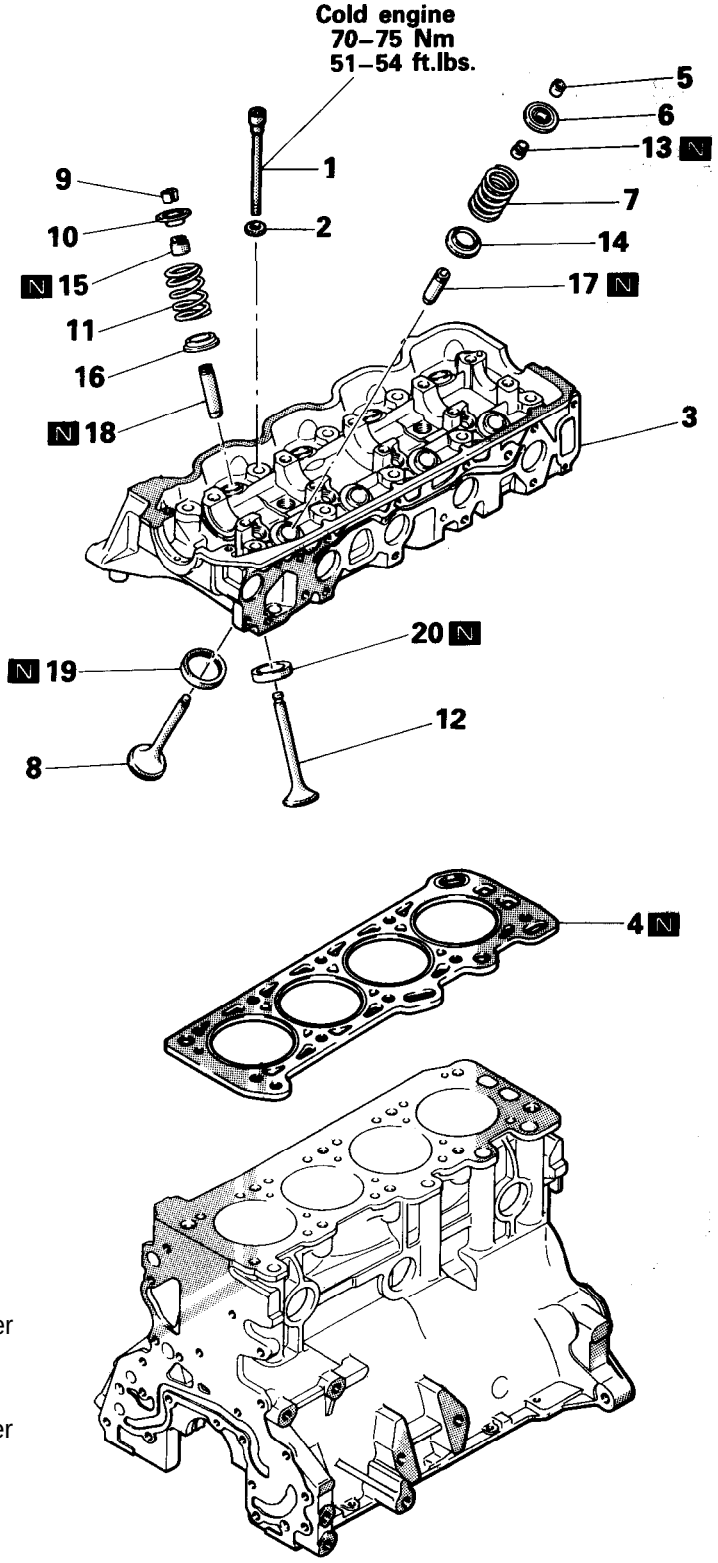




3EN0081

# CYLINDER HEAD AND VALVE

## DISASSEMBLY AND REASSEMBLY

N09PE-A

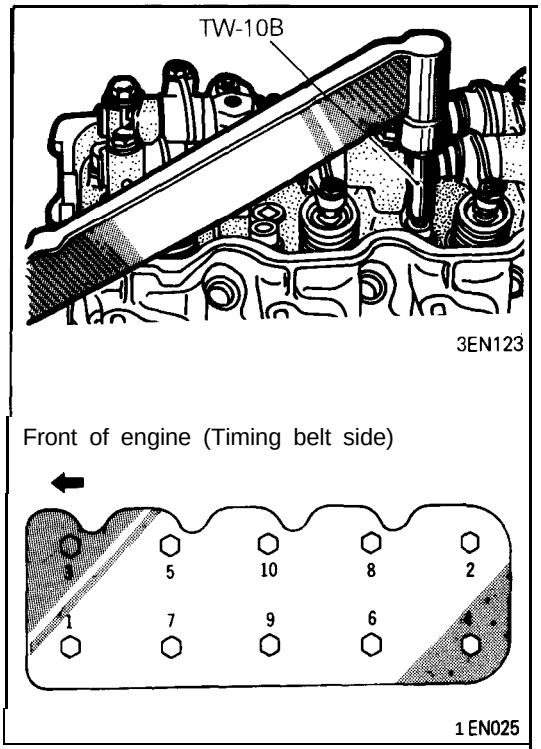



3EN289

Disassembly steps

- ◆◆ ▶◀ 1. Cylinder head bolts
- 2. Washer
- 3. Cylinder head
- 4. Gasket
- ◆◆ ● + 5. Retainer lock
- 6. Valve spring retainer
- ● + 7. Valve spring
- ▶◀ 8. Intake valve
- ◆◆ ▶◀ 9. Retainer lock
- 10. Valve spring retainer
- ● a11. Valve spring
- ● + 12. Exhaust valve
- ◆◆ ● 4 13. Valve stem seal
- ● 4 14. Valve spring seat
- ◆◆ ● * 15. Valve stem seal
- ● + 16. Valve spring seat
- 17. Intake valve guide
- 18. Exhaust valve guide
- 19. Intake valve seat
- 20. Exhaust valve seat

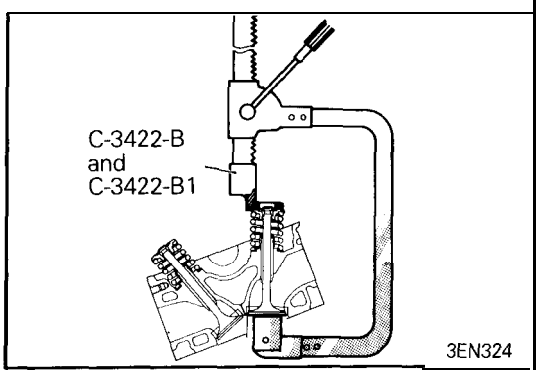
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N09PFAP

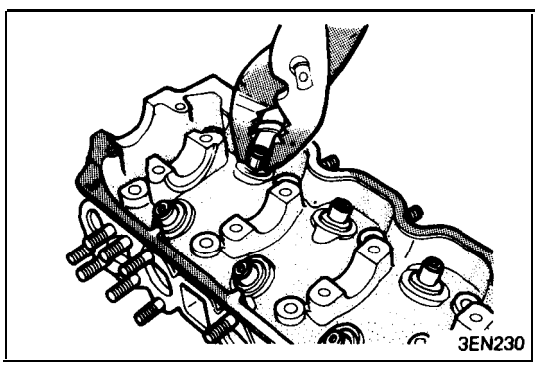
### 1. REMOVAL OF CYLINDER HEAD BOLTS

Loosen the bolts in the order shown.
Loosen them little by little and uniformly.



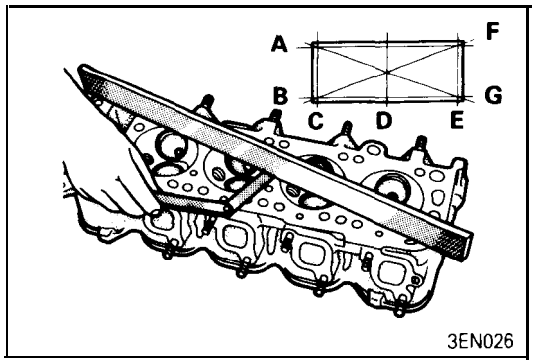

### 5./9. REMOVAL OF RETAINER LOCKS

(1) Using the special tool, remove the retainer locks.
(2) Keep the removed retainer locks valve by valve so that they can be reinstalled in their original positions.




### 13./15. REMOVAL OF VALVE STEM SEAL

Remove the stem seals with pliers. Do not reuse the valve stem seal.




## INSPECTION

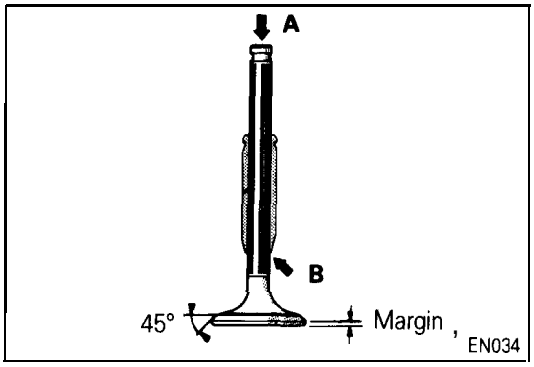
### CYLINDER HEAD N09OCAM

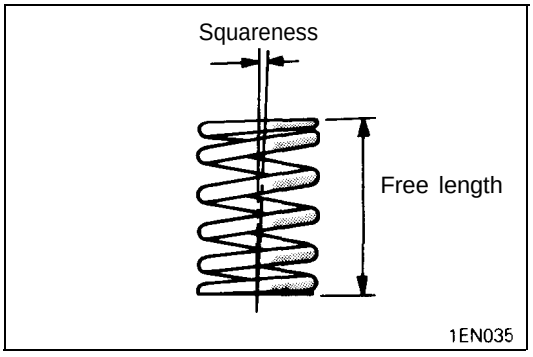
- Check the cylinder head for cracks, damage and engine coolant leakage.
- Remove the scale, sealing compound and carbon deposits completely. After cleaning oil passages, apply compressed air to make certain that the passages are clear.
- Check the cylinder head gasket surface for flatness by using a straight edge in the direction of A, B, . . . as shown. If the flatness exceeds the limit in any direction, either resurface or replace the cylinder head.

Flatness of cylinder head gasket surface:

| | |
|---|---|
| Standard dimension | Less than 0.05 mm (.0020 in.) |
| Limit | 0.2 mm (.008 in.) |
| Overall height: | 88.5 mm (3.484 in.) |
| Limit | 88.3 mm (3.478 in.) |

Caution
If cylinder block gasket surface has already been ground, thickness of the removed stock should be included in the grinding limit of -0.2 mm (–.008 in.).




### VALVES N09PGAAa

(1) Check each valve for wear, damage and deformation of head and stem at B. Correct or replace excessively worn, damaged or deformed valves.
(2) If stem tip A is pitted, correct with an oil stone or other means. The correction must be limited to a minimum. Also reface the valve.
(3) Replace the valve if the margin has decreased to less than the limit.

Margin:

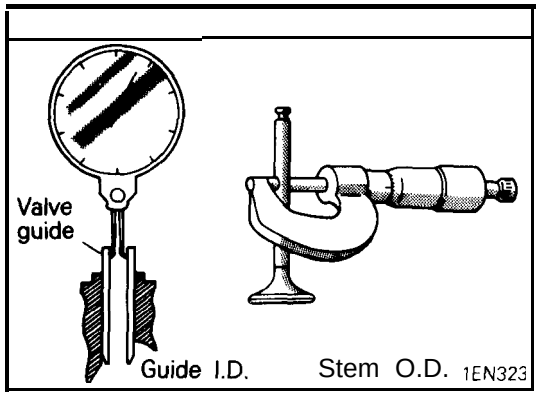
| | |
|---|---|
| Standard dimension | |
| Intake | 1.0 mm (.039 in.) |
| Exhaust | 0.7 mm (.028 in.) |
| Limit | |
| Intake | 0.7 mm (.028 in.) |
| Exhaust | 0.5 mm (.020 in.) |

### VALVE SPRINGS N09PGBAa

(1) Check the valve spring for free length and load. If they exceed the limits, replace the spring.
(2) Using a square, check the squareness of each spring. If the spring is out of square beyond the limit, replace.

Valve spring:

| | |
|---|---|
| Standard dimension | |
| Free length | 49.2 mm (1.937 in.) |
| Load | 274.6 N (62 lbs.) at installed height |
| Installed height | 37.3 mm (1.469 in.) |
| Out of square | Less than 2° |
| Limit | |
| Free length | 48.2 mm (1.888 in.) |
| Installed height | 38.3 mm (1.516 in.) |
| Out of square | 4° |




## VALVE GUIDES

N09PGCA

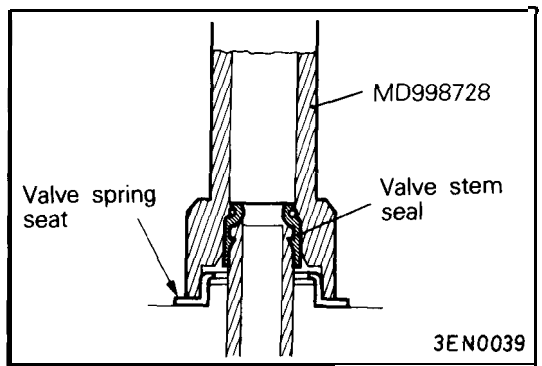
Check the valve stem-to-guide clearance. If the clearance exceeds the limit, replace the valve guide with a next higher oversize guide.

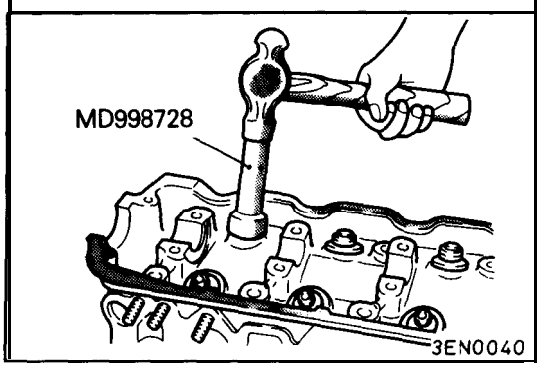
Valve stem-to-guide clearance:

| | |
|---|---|
| Standard dimension | |
| Intake | **0.03–0.06** mm **(.0012–.0024** in.) |
| Exhaust | **0.05–0.09** mm **(.0020–.0035** in.) |
| Limit | |
| Intake | 0.10 mm **(.004** in.) |
| Exhaust | 0.15 mm **(.006** in.) |

Valve Guide Oversizes

| Size mm (in.) | Size mark | Valve guide fitting hole diameter mm (in.) |
|---|---|---|
| 0.05 (.002) O.S. | 5 | 13.05–13.068 (.5138–.5145) |
| 0.25 (.010) OS. | 25 | 13.25–13.268 (.5216–.5244) |
| 0.50 (.020) O.S. | 50 | 15.5-13.518 (.5315–.5323) |




## SERVICE POINTS OF REASSEMBLY

N09PKBD

**15./** 13. INSTALLATION OF VALVE **STEM SEAL/16./14.** VALVE SPRING SEAT

Install the spring seat, then using the special tool, install the stem seal by lightly tapping the tool. Seal is installed in specified position using the special tool.

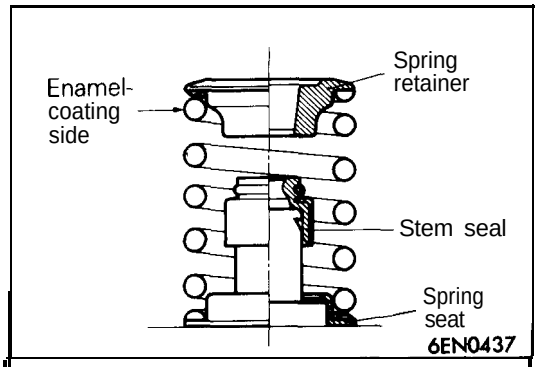
Caution

**1.** Incorrect installation of the seal without using the special tool will result in poor sealing and cause oil leakage down valve guide.

2. Do not reuse stem seal.

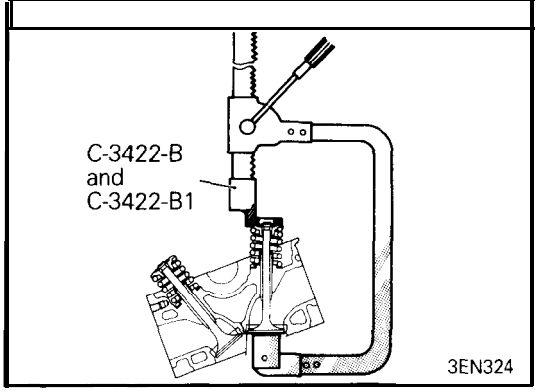
**12./8.** INSTALLATION OF EXHAUST, INTAKE VALVE

Apply engine oil to each valve. Insert valves into the valve guides. Avoid inserting the valve into the seal with force. After insertion, check to see if the valve moves smoothly.




**11./7.** INSTALLATION OF **VALVE** SPRING

Install the valve spring with its enamel coated end toward the valve spring retainer.

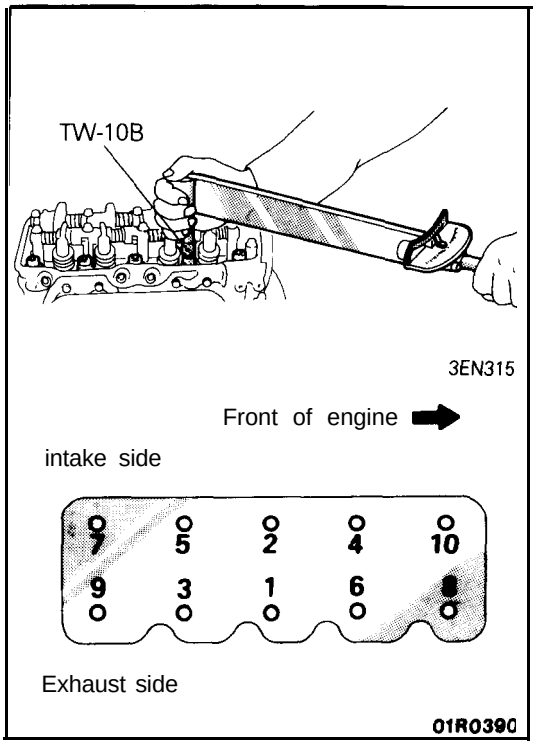



**9./5.** INSTALLATION OF RETAINER LOCK

(1) Using the special tool, compress the spring, and then install the retainer lock.

Caution
When compressing the spring, check to see that the valve stem seal is not pressed to the bottom of the retainer.

(2) Make certain that retainer locks are positively installed.

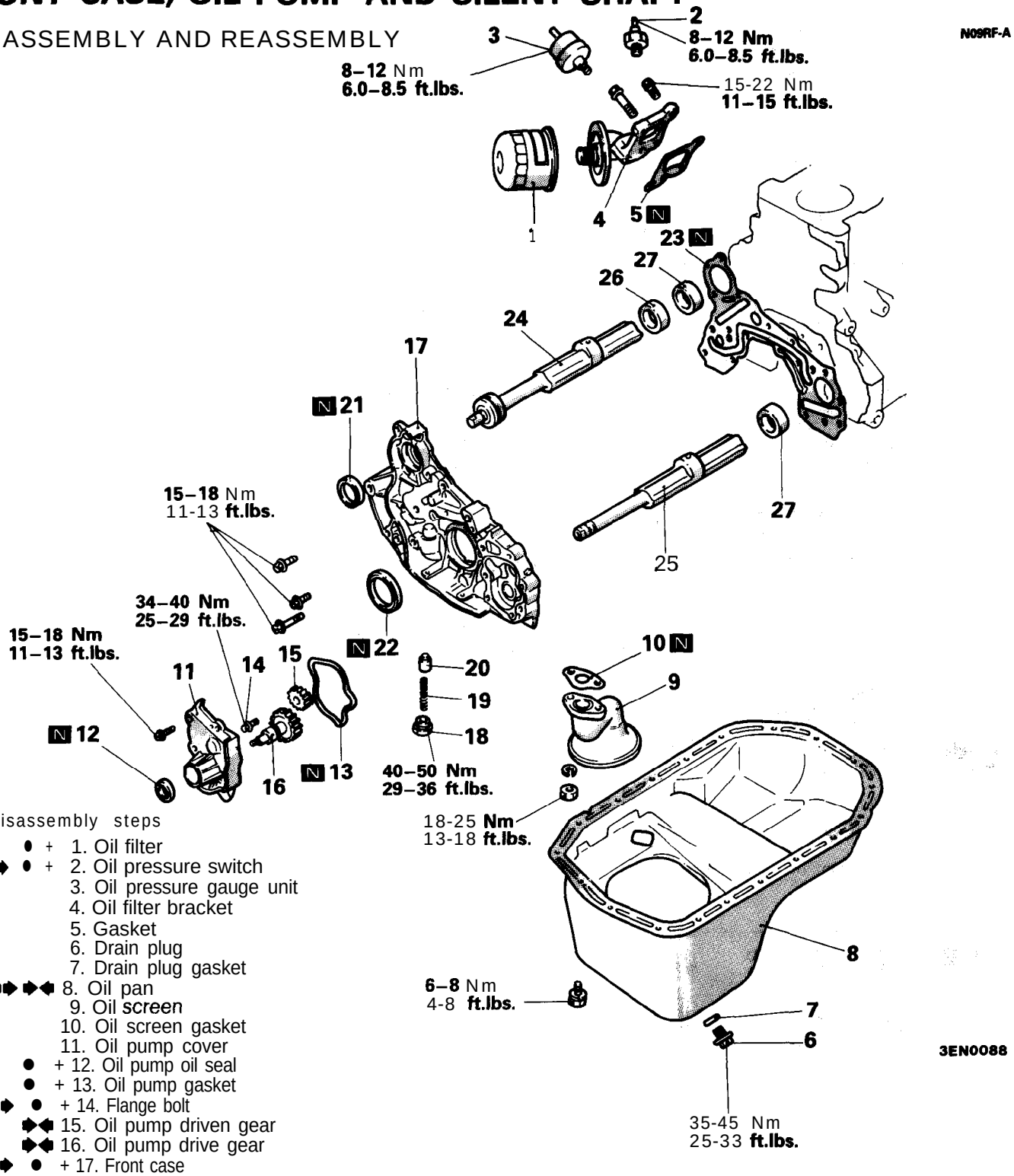



1. INSTALLATION OF CYLINDER HEAD BOLTS

Using the special tool, tighten in the order shown in two or three steps, gradually tighten. Finally tighten to the specified torque.

# FRONT CASE, OIL PUMP AND SILENT SHAFT

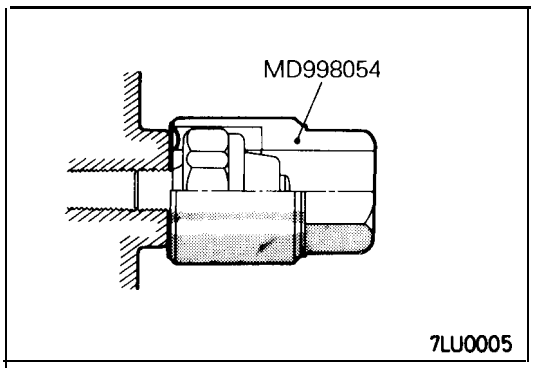
## DISASSEMBLY AND REASSEMBLY




Disassembly steps

- ● + 1. Oil filter
- ◆● + 2. Oil pressure switch
- 3. Oil pressure gauge unit
- 4. Oil filter bracket
- 5. Gasket
- 6. Drain plug
- 7. Drain plug gasket
- ◆●◆ 8. Oil pan
- 9. Oil screen
- 10. Oil screen gasket
- 11. Oil pump cover
- ● + 12. Oil pump oil seal
- ● + 13. Oil pump gasket
- ◆● + 14. Flange bolt
- ◆◆ 15. Oil pump driven gear
- ◆◆ 16. Oil pump drive gear
- ◆● + 17. Front case
- 18. Plug
- 19. Relief spring
- 20. Relief plunger
- ● + 21. Silent shaft oil seal
- ● + 22. Crankshaft front oil seal
- 23. Front case gasket
- 24. Silent shaft, right
- 25. Silent shaft, left
- ◆● + 26. Silent shaft front bearing
- ◆● + 27. Silent shaft rear bearing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆●: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

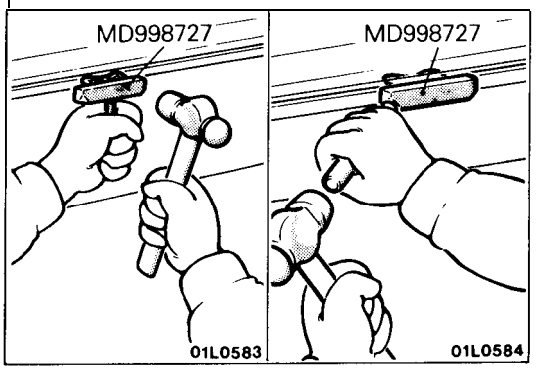



## SERVICE POINTS OF DISASSEMBLY N09RGAE

### 2. REMOVAL OF PRESSURE SWITCH

(1) Disconnect the oil pressure switch terminal.
(2) Using the special tool, remove the oil pressure switch.

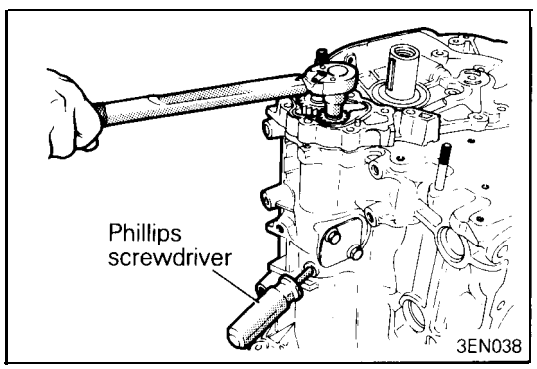
Caution
Sealant is coated on the threaded part, so be careful not to damage when removing.




### 8. REMOVAL OF OIL PAN

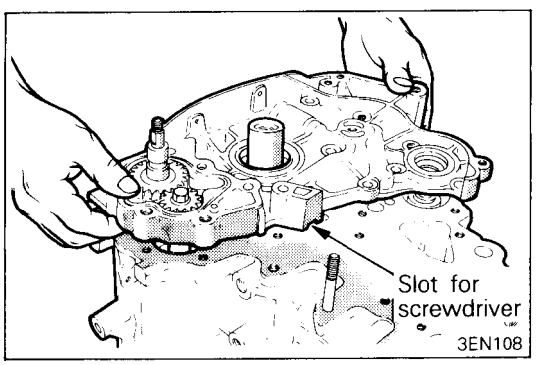
(1) Remove the all oil pan bolts.
(2) Drive in the special tool between the cylinder block and oil pan.

NOTE
Never use a screwdriver or chisel, instead of the special tool, as a deformed oil pan flange will result, resulting in oil leakage.



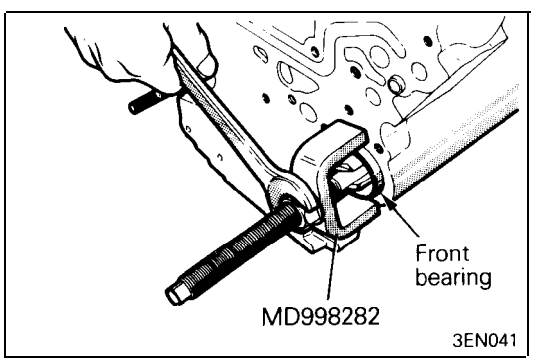

### 14. REMOVAL OF FLANGE BOLT

When loosening the oil pump driven gear flange bolt, first insert a Phillips screwdriver [shank diameter 8 mm (.32 in.)] into the plug hole on the left side of cylinder block to block the silent shaft.



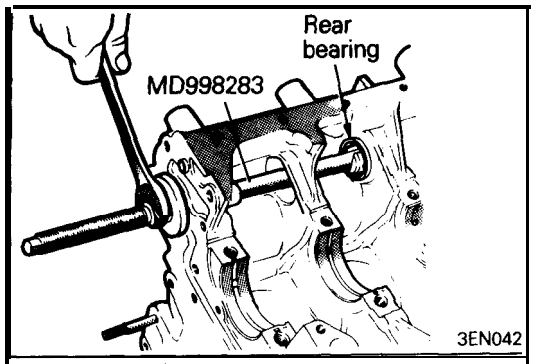

### 17. REMOVAL OF FRONT CASE

The front case may be sticking to the cylinder block. In such a case, insert a screwdriver into the slot shown in the **illustration and pry up. Never attempt to pry at any other** positions where flange is thinner. Also avoid applying impact to the front case for removal.



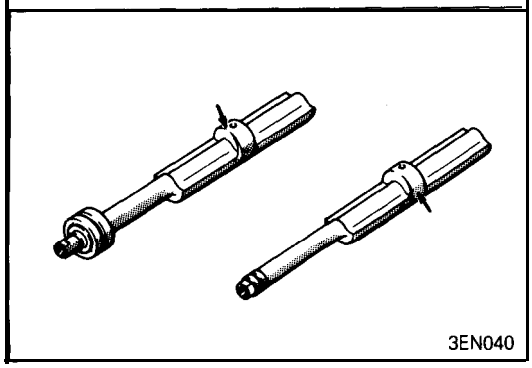

### 26. REMOVAL OF SILENT SHAFT FRONT BEARINGS

Using the special tool, remove the front bearing from cylinder block.




### 27. REMOVAL OF SILENT SHAFT REAR BEARING

Using the special tool, remove the rear bearing from cylinder block.




## INSPECTION

### SILENT SHAFT N09RCIE1

(1) Check oil holes for clogging.
(2) Check journal for seizure, damage, and contact with bearing. If there is anything wrong with the journal, replace silent shaft, bearing or front case assembly.
(3) Check the silent shaft oil clearance. If the clearance is excessively due to wear, replace the silent shaft bearing silent shaft or front case assembly.

**Standard value:**

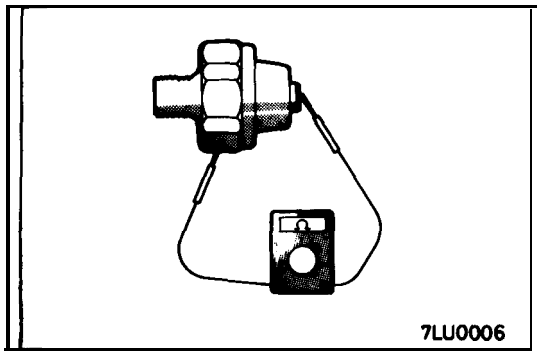
| | |
|---|---|
| **Front** | |
| **Right** | **0.030–0.060 mm (.0012–.0024 in.)** |
| **Left** | **0.020–0.054 mm (.0008–.0021 in.)** |
| **Rear** | |
| **Right** | **0.050–0.091 m m (.0020–.0036 in.)** |
| **Left** | **0.050–0.091 mm (.0020–.0036 in.)** |

### FRONT CASE N09RCJC0

(1) Check oil holes for clogging and clean if necessary.
(2) Check left silent shaft front bearing section for wear, damage and seizure. If there is anything wrong with the section, replace the front case.
(3) Check the front case for cracks and other damage. Replace cracked or damaged front case.

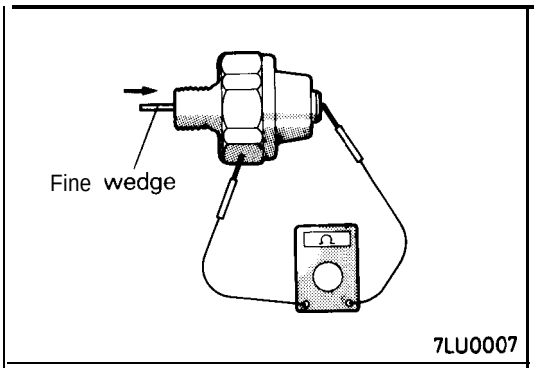
### OIL SEAL N09RCMA0

(1) Check the oil seal lip for wear and damage. Replace oil seal if necessary.
**(2) Check the oil seal lip for deterioration. Replace oil seal if necessary.**




### OIL PRESSURE SWITCH N09RCLA0

(1) Connect a tester (ohm range) between the terminal and the body and check for conductivity. If there is no conductivity, replace the switch.



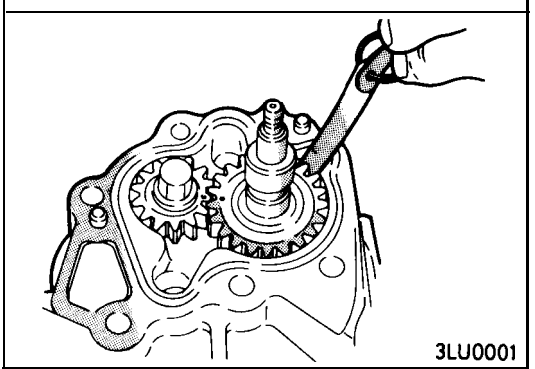

(2) Next insert a very fine wedge through the oil hole, pushing it slightly. There should be no conductivity (resistance should be infinite). If there is conductivity even when wedge is pushed, replace the switch.
(3) Or, if there is no conductivity when a 50 kPa (71 psi) pressure is placed through the oil hole, the switch is operating properly. Check at this time to see that there is no air pressure leakage. If there is air pressure leakage, the diaphragm is broken, and the switch should be replaced.

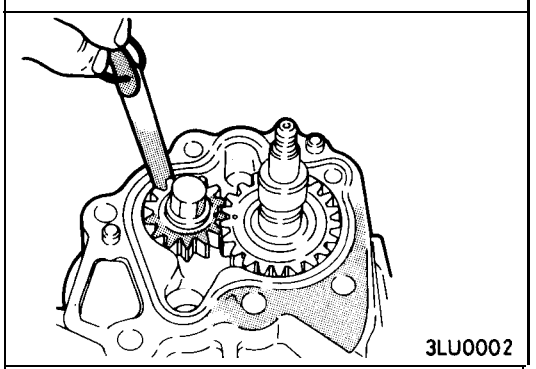
## OIL PUMP

N09RCGH

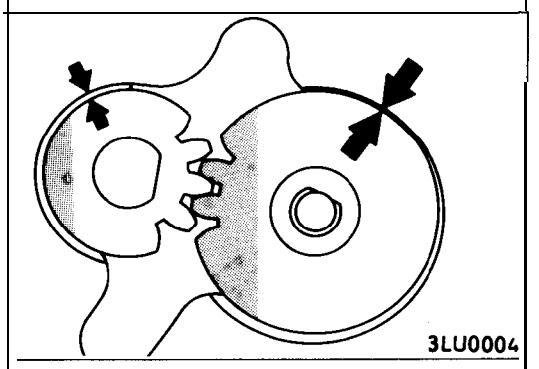
(1) Install the oil pump gears in the front case and check the tip clearance of each gear using a thickness gauge.

| | |
|---|---|
| Standard value: | |
| Drive gear | **0.06–0.12** mm **(.0024–.0047** in.) |
| Driven gear | **0.04–0.12** mm **(.0039–.0079** in.) |
| Limit: | |
| Drive gear | 0.20 mm **(.079** in.) |
| Driven gear | 0.18 mm **(.071** in.) |



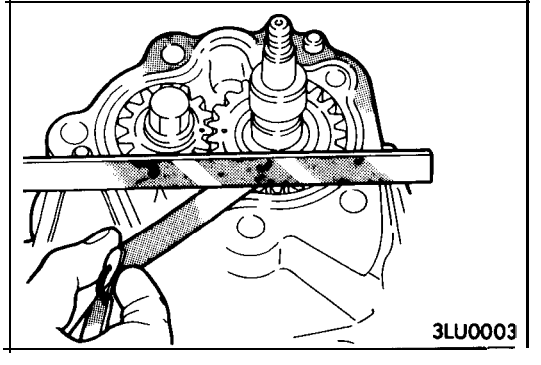




NOTE
Check the tip clearance of each gear at position indicated by an arrow.




(2) Check the side clearance of each gear.

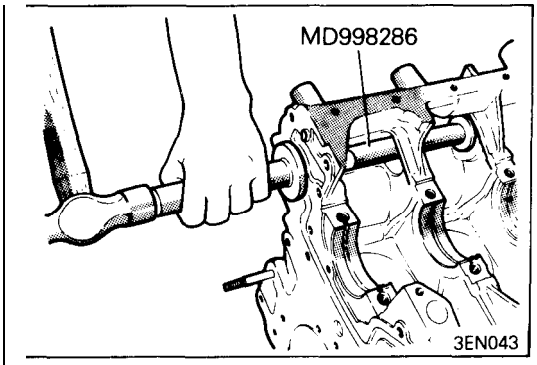
| | |
|---|---|
| Standard value: | |
| Drive gear | **0.10–0.16** mm **(.0039–.0063** in.) |
| Driven gear | **0.02–0.05** mm **(.0008–.0020** in.) |
| Limit: | |
| Drive gear | 0.20 mm **(.008** in.) |
| Driven gear | 0.15 mm **(.006** in.) |




(3) Check for ridge wear on the surface of the oil pump cover that are in contact with the pump gear side.

OIL RELIEF PLUNGER

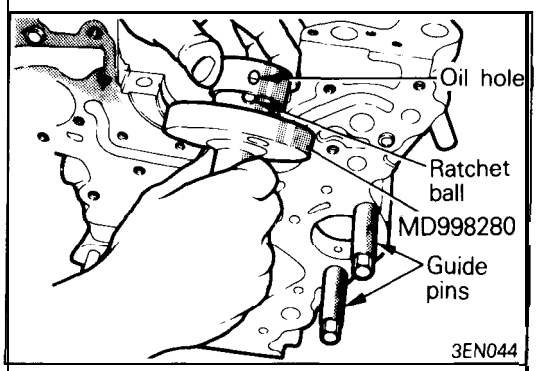
(1) Check that the relief plunger slides smoothly.
(2) Check the relief spring for breakage.




## SERVICE POINTS OF REASSEMBLY N09RHAF

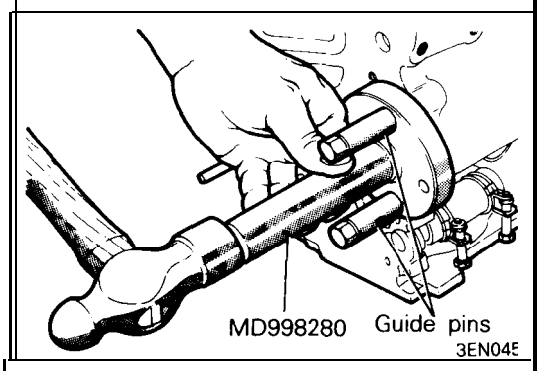
27. INSTALLATION OF SILENT SHAFT REAR BEARING

(1) Apply engine oil to the rear bearing outer circumference and bearing hole in cylinder block.
(2) Using the special tool and a hammer, drive the rear bearing into cylinder block.

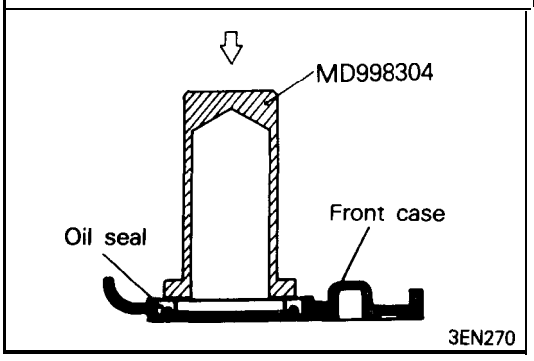



26. INSTALLATION OF SILENT SHAFT FRONT BEARING

(1) Install two guide pins included in the special tool set to the threaded holes in cylinder block.
(2) Set the front bearing on the special tool so that the ratchet ball of special tool fits in the oil hole in bearing.
(3) Apply engine oil to the bearing outer circumference and bearing hole in cylinder block.

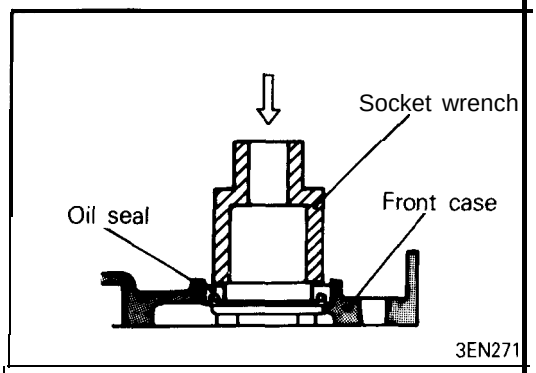



(4) Set the special tool on guide pins and drive the bearing into cylinder block.



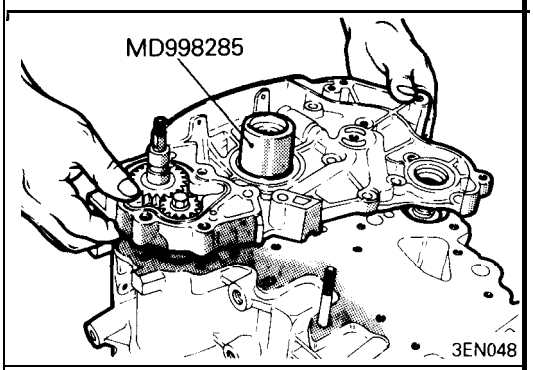

22. INSTALLATION OF CRANKSHAFT OIL SEAL

Using the special tool, install the crankshaft oil seal into front case.



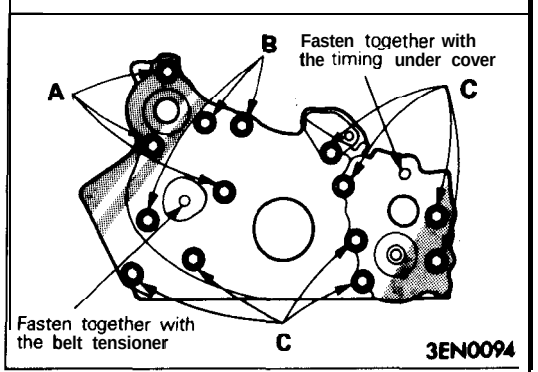

21. **INSTALLATION** OF SILENT SHAFT OIL SEAL

Using a socket wrench, press-in the silent shaft oil seal into front case.



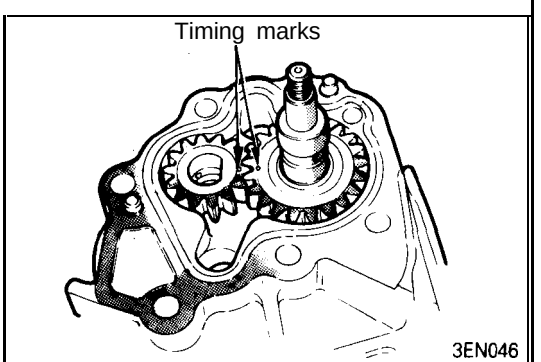

17. INSTALLATION OF FRONT CASE

(1) Set the special tool on the front end of crankshaft and apply engine oil to the outer circumference of the special tool.



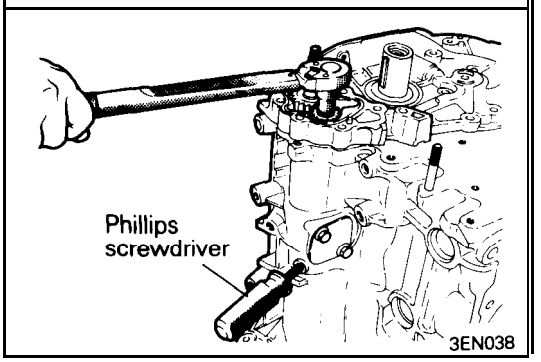

(2) Install the front case using three different sizes of bolts as shown.

| Code | Bolt size (diameter x length) mm (in.) | Head mark |
|---|---|---|
| A | 8 x 20 (.32 x .79) | "4" |
| B | 8 x 25 (.32 x .98) | "4" |
| C | 8 x 40 (.32 x 1.57) | "4" |



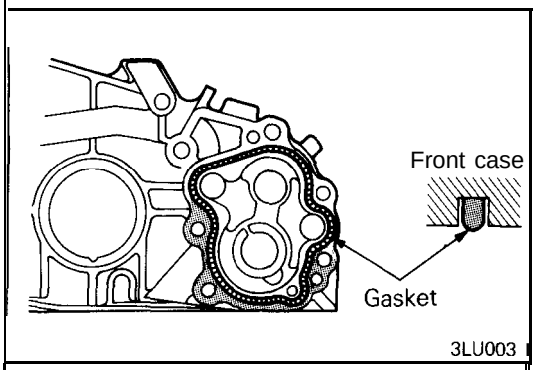

16. / 15. INSTALLATION OF OIL PUMP GEARS

(1) Align the timing mark on the drive gear with that on driven gear and install them into front case.
(2) Apply amplely engine oil to the gears.



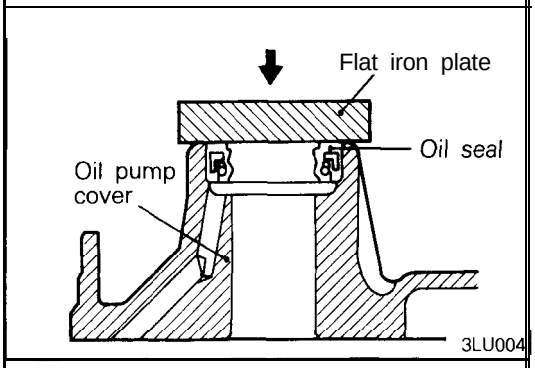

14. INSTALLATION OF FLANGE BOLT

Insert a Phillips screwdriver [shank diameter 8 mm (.32 in.)] into the plug hole on the left side of cylinder block to block the silent shaft, then tighten the flange bolt.



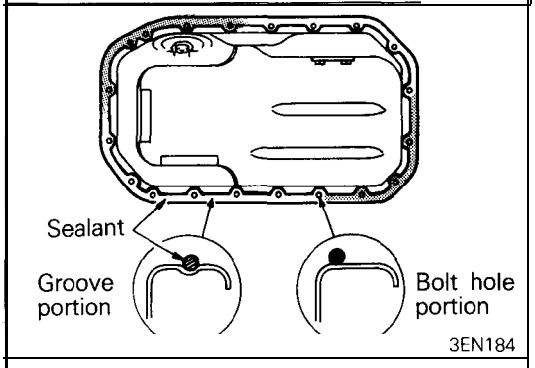

13. **INSTALLATION** OF OIL PUMP COVER GASKET

Install a new oil pump cover gasket in the groove of the front case.
When installing the gasket, face the round side to the oil pump cover.




12. INSTALLATION OF OIL PUMP OIL SEAL

Install the oil seal into the oil pump cover, making sure that its lip is in correct direction.

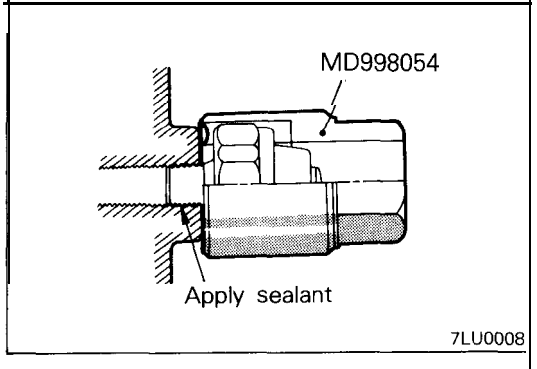



8. APPLICATION OF SEALANT TO OIL PAN

(1) Clean both mating surfaces of oil pan and cylinder block.
(2) Apply sealant into groove of oil pan flange, keeping clear of holes as shown. The width of sealant bead as sqeezed out of tube should be about 4 mm (.16 in.).

Caution
After application of sealant, do not exceed **15** minutes before installing the oil pan.

Specified sealant: MITSUBISHI GENUINE PART No. **MD997110** or equivalent

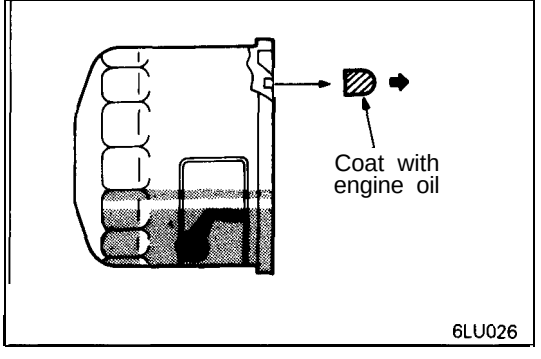



2. INSTALLATION OF OIL PRESSURE **SWITCH**

Coat the threads of switch with sealant and install the switch using the special tool.

Specified sealant: MOPAR Part **No.4318034** or equivalent

Caution
1. Keep the end of threaded portion clear of sealant.
2. Avoid an **overtightening.**




1. APPLICATION OF ENGINE OIL TO OIL FILTER

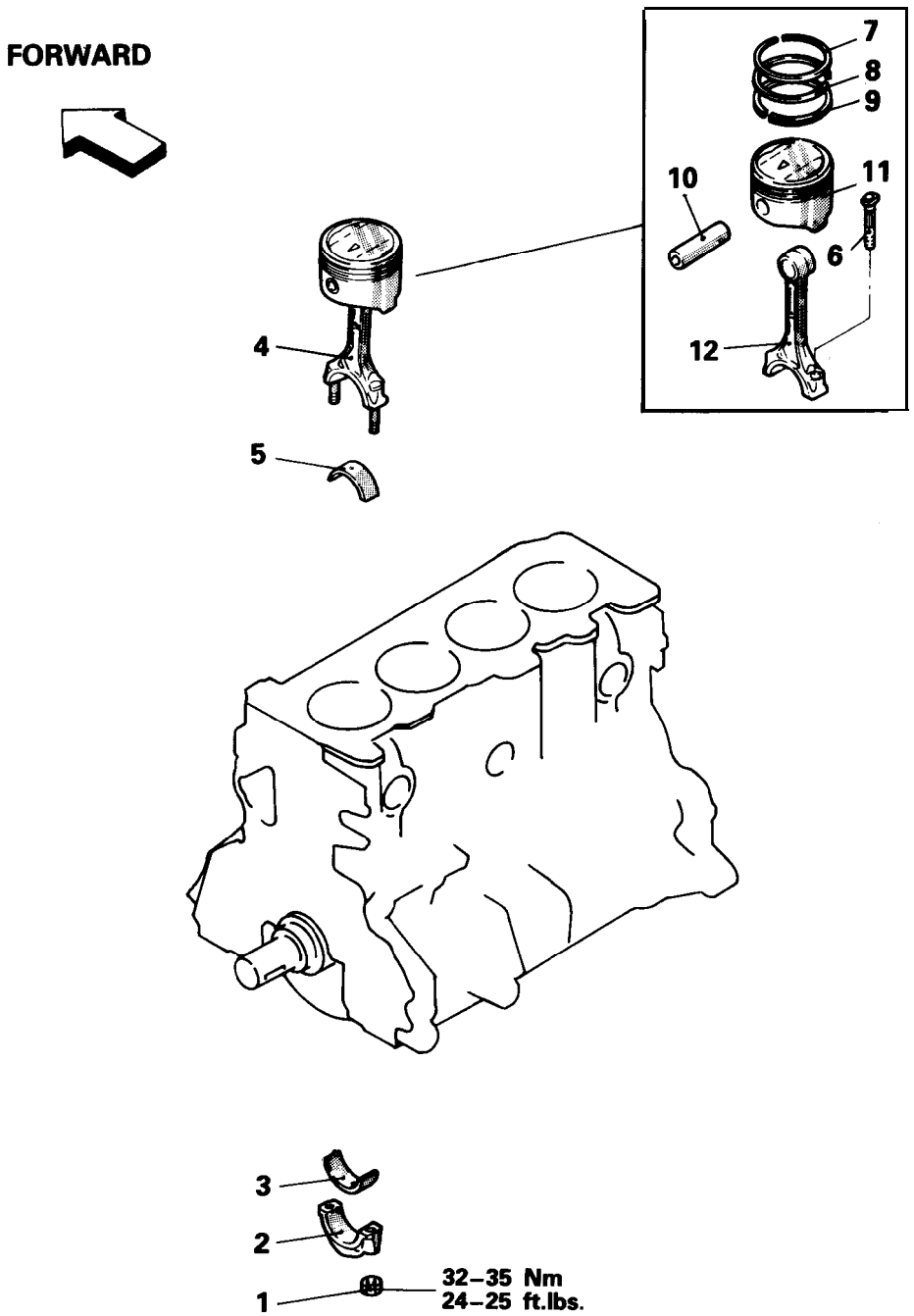
Apply a thin coat of engine oil to the packing surface.

Caution
Do not apply oil too much.

# PISTON AND CONNECTING ROD

N09TE-A

## DISASSEMBLY AND REASSEMBLY

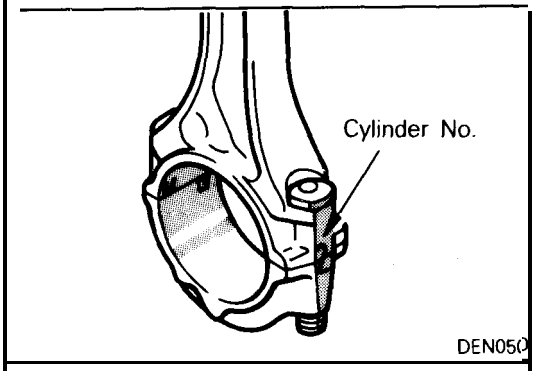


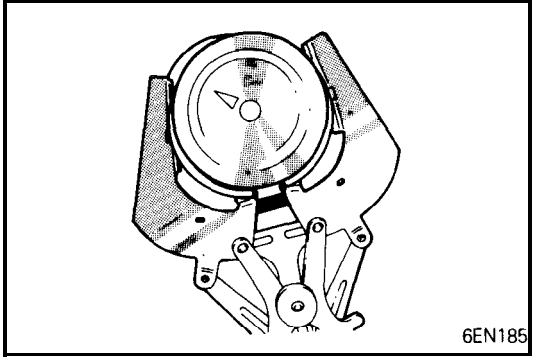

Disassembly steps

- ⬮ Inspection of connecting rod big end side clearance
- 1. Nut
- ◆◆ 2. Connecting rod cap
- 3. Connecting rod bearing
- ⬮ * 4. Piston and connecting rod assembly
- 5. Connecting rod bearing
- 6. Bolt
- ◆◆ 7. No. 1 piston ring
- ◆◆ ⬮ + 8. No. 2 piston ring
- ● * 9. Oil ring
- 10. Piston pin
- 11. Piston
- 12. Connecting rod

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".

3EN275




## SERVICE POINTS OF DISASSEMBLY N09TFEA

### 2. REMOVAL OF CONNECTING ROD CAP

Put cylinder number on the side of the connecting rod big end for identification in reassembly.

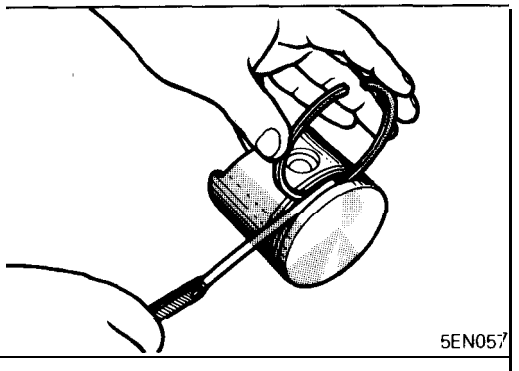
### 7. REMOVAL OF NO. 1 PISTON RING /8. NO.2 PISTON RING

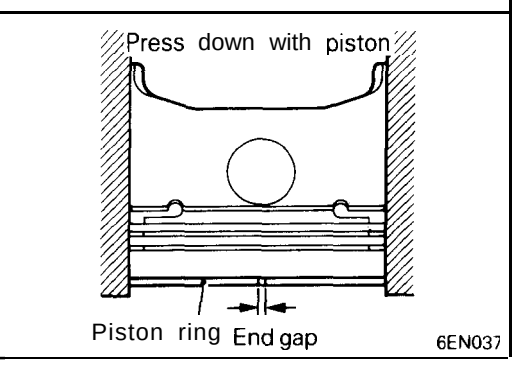
Remove the piston rings with a piston expander.

## INSPECTION N09TCAA

### PISTON AND PISTON PIN

(1) Replace the piston if it has marks of streaks or seizure on the outside thrust surface in particular. Also replace if it has cracks on the outside.
(2) If the piston pin can be inserted into the piston pin hole snugly with a thumb, it is reusable. If it is inserted with no resistance or there is a play, replace the piston and pin as a set.




### PISTON RINGS N09TCBAa

(1) Measure the piston ring side clearance. If the measurement exceeds the limit, insert a new ring in ring groove to measure the side clearance. If the clearance still exceeds **the limit, replace the piston and rings together. If it is within the limit replace the piston rings only.**

Piston ring side clearance:

| | |
|---|---|
| No. 1 | **0.045–0.085** mm **(.0018–.0033 in.)** |
| **No.2** | **0.02–0.06** mm **(.0008–.0024 in.)** |

Limit:

| | |
|---|---|
| No. 1 | 0.12 mm **(.005** in.) |
| **No.2** | 0.1 mm **(.004** in.) |

(2) To measure the piston ring end gap, insert a piston ring into cylinder bore. Correctly position the ring at right angles to the cylinder wall by gently pressing it down with a piston. Draw the piston up and out, then measure the gap with a feeler gauge. If the gap exceeds the limit, replace the piston ring.

Piston ring end gap:
Standard dimension
No. 1 0.30–0.45 mm (.0118–.0177 in.)
No.2 0.20–0.35 mm (.0079–.0138 in.)
Limit 0.8 mm (.031 in.)
Oil ring side rail:
Standard dimension 0.2–0.7 mm (.008–.028 in.)
Limit 1.0 mm (.039 in.)

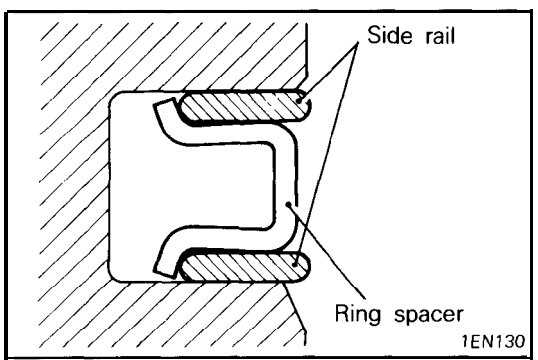
When replacing the ring only without correcting the cylinder bore, check the gap with the ring positioned at a lower part of cylinder that is less worn.
When replacing a ring, be sure to use a ring of the same size.

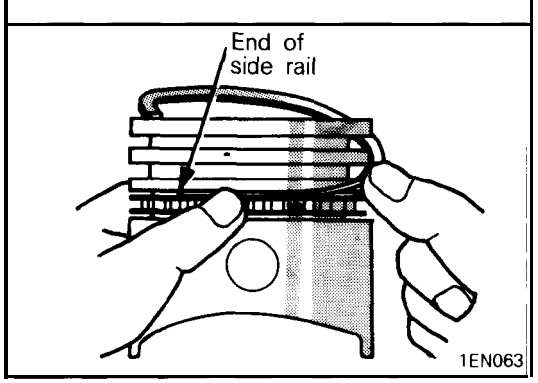
Piston ring service size and mark:
STD None
0.25 mm (.010 in.) O.S. 25
0.50 mm (.020 in.) O.S. 50
0.75 mm (.030 in.) O.S. 75
1.00 mm (.039 in.) O.S. 100

## CONNECTION RODS N09TCCA

(1) Replace the connecting rod if it has damage on thrust faces at either end. Also replace the connecting rod that has ridge wear or severely rough surface on the inside diameter of the small end.
When using a new connecting rod, the cylinder number should be stamped in two places, on the cap and on the rod.
(2) Using a connecting rod aligner, check the rod for bend and twist. If the measured value is close to the limit, correct the rod using a press. Any connecting rod that has been severely bent or distorted should be replaced.

Bend of connecting rod:
0.05/100 mm (.0020/3.937 in.) or less
Twist of connecting rod:
0.1/100 mm (.004/3.937 in.) or less



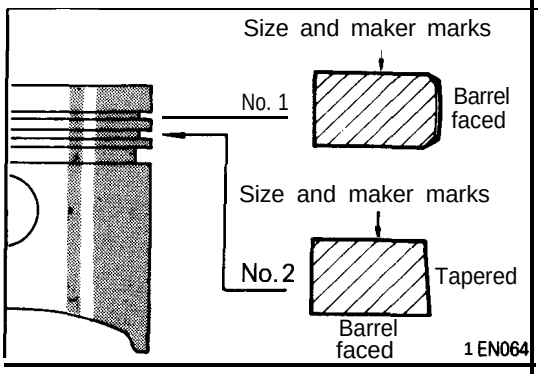

## SERVICE POINTS OF REASSEMBLY N09TGEA

### 9. INSTALLATION OF OIL RING

(1) **First, install the oil ring spacer in the piston ring groove.**
Next, install the upper side rail and then the lower side rail. Both upper and lower side rails may be installed with their either side facing up.

(2) To install the side rail, first place one end in the gap between the groove and the spacer.
While holding the end firmly, press the portion to be inserted with finger as illustrated until the side rail is in position.

Caution
Do not use piston ring expander to install the side rail.

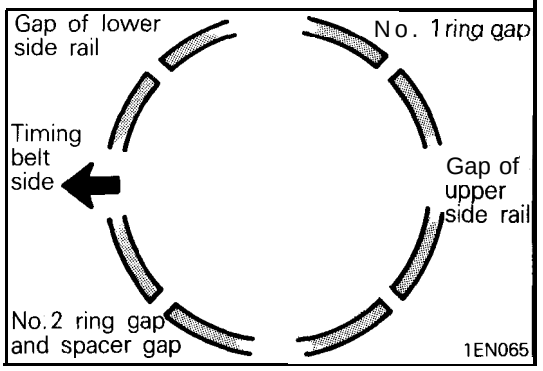



8. INSTALLATION OF **NO.2** PISTON **RING/7.** NO. **1** PISTON **RING**

Install the No. 2 piston ring and then the No. 1 piston ring with a piston ring expander.

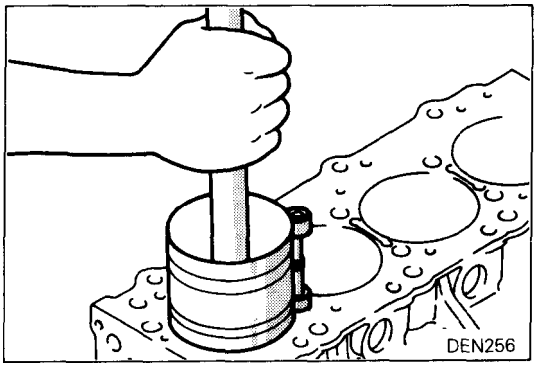
**Caution**

1. The No. 1 and **No.2** piston rings have a different cross section. Be sure to install them in correct positions.
2. Install the No. 1 and **No.2** piston rings with the size mark and maker mark on ring surface toward the piston top.



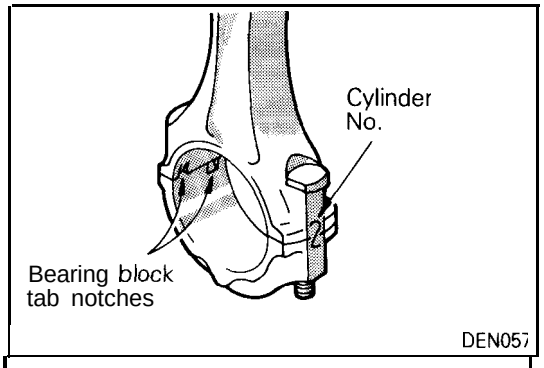

4. INSTALLATION OF PISTON AND **CONNECTING** ROD **ASSEMBLY**

(1) Liberally coat engine oil on the circumference of the piston, piston ring, and oil ring.
(2) Arrange the piston ring and oil ring gaps (side rail and spacer) as shown in the figure.
(3) Rotate crankshaft so that crank pin is on center of cylinder bore.



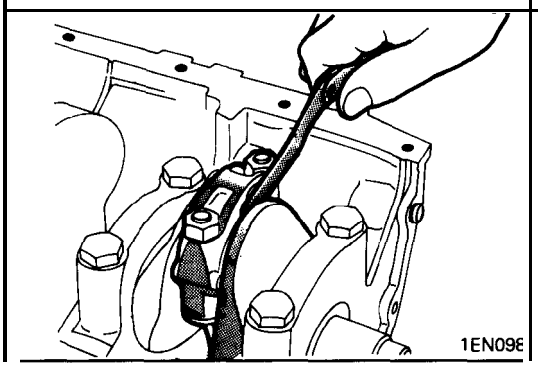

(4) Use suitable thread protectors on connecting rod bolts before inserting piston and connecting rod assembly into cylinder block. Care must be taken not to nick crank pin.
(5) Using a suitable piston ring compressor tool, install piston and connecting rod assembly into cylinder block.

Caution
Insert the front mark (arrow) on the top of the piston so it faces the engine front (timing belt side).




2. INSTALLATION OF CONNECTING ROD CAP

Lining up the marks put at the time of disassembly, install the connecting rod cap on the connecting rod.
If the connecting rod is new without such marks, position the bearing block tab notches in rod and cap on the same side as illustrated.



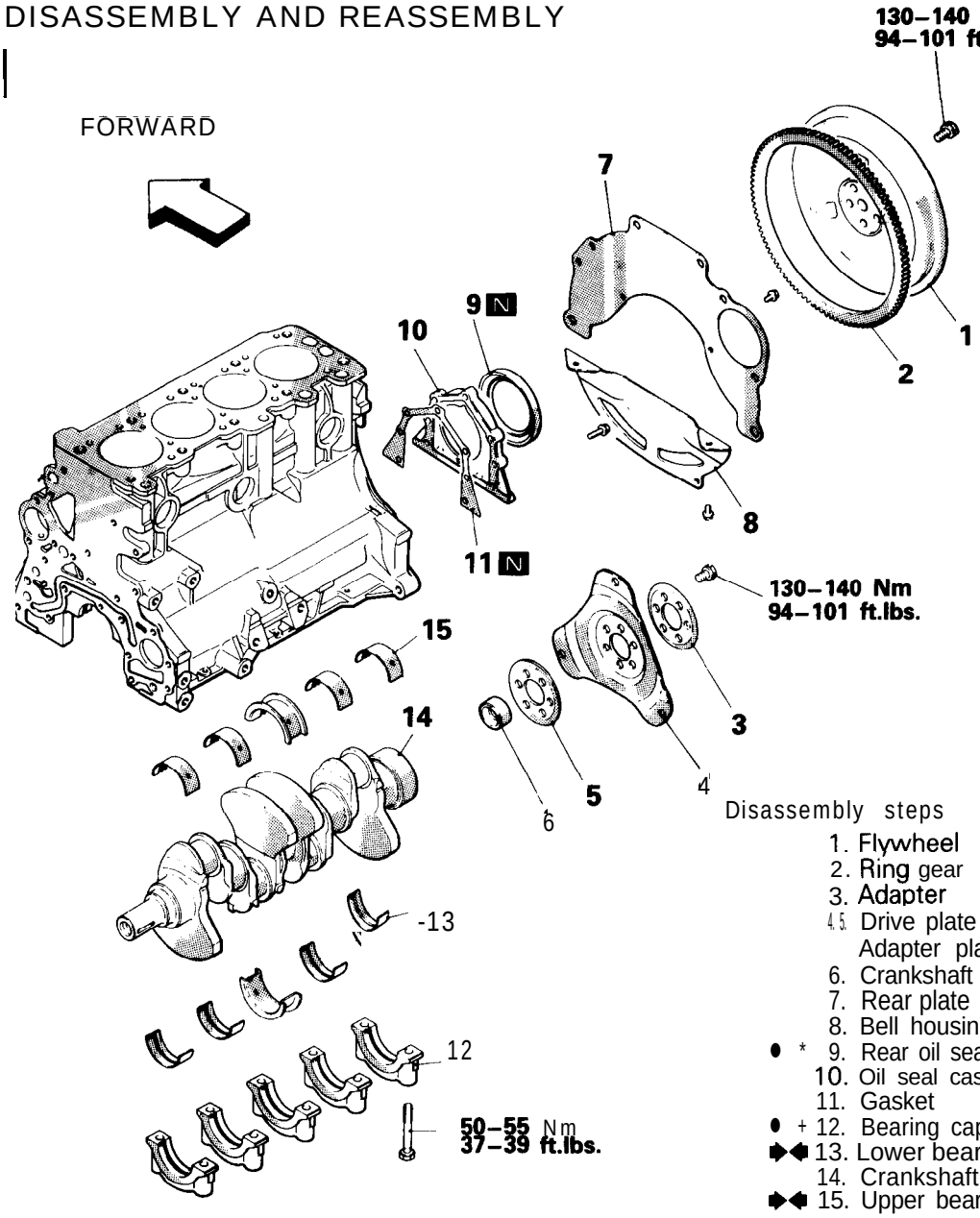

. CHECKING CONNECTING ROD BIG END SIDE CLEARANCE

Connecting rod big end side clearance:
**0.1–0.25** mm **(.0039–.0098** in.)
Limit: 0.4 mm **(.016** in.)

# CRANKSHAFT, FLYWHEEL AND DRIVE PLATE

## DISASSEMBLY AND REASSEMBLY

N09UE-A




3EN320

Disassembly steps

1. Flywheel
2. Ring gear

} Vehicles with a manual transaxle

3. Adapter
4. Drive plate
   Adapter plate
5. Crankshaft bushing

} Vehicles with an automatic transaxle

6. Crankshaft bushing
7. Rear plate
8. Bell housing cover
● * 9. Rear oil seal
10. Oil seal case
11. Gasket
● + 12. Bearing cap
◆◆ 13. Lower bearing
14. Crankshaft
◆◆ 15. Upper bearing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● + : Refer to "Service Points of Reassembly".
(3) N : Non-reusable parts

## INSPECTION

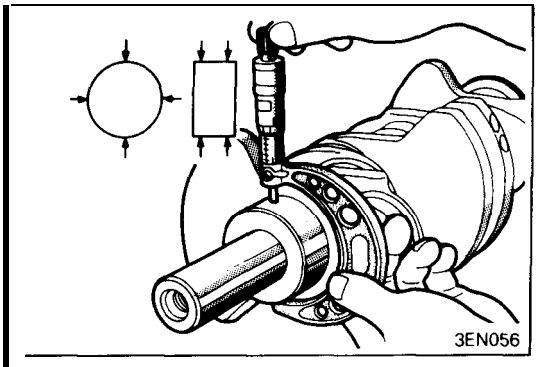
N09UHAC

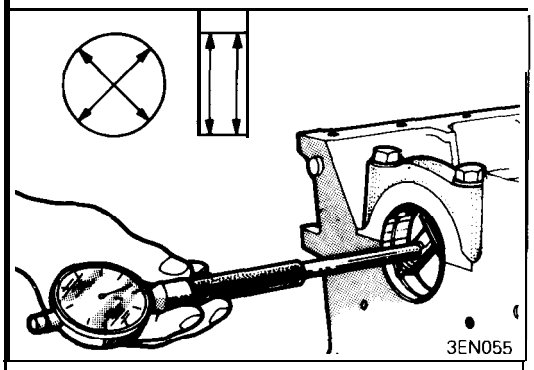
### CRANKSHAFT

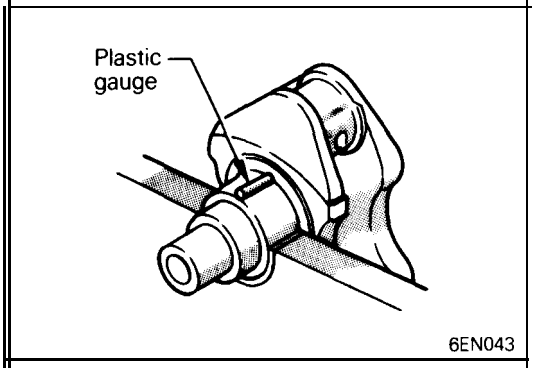
(1) Check the crankshaft journals and pins for damage, uneven wear and cracks. Also check oil holes for clogging. Correct or replace any faulty part.
(2) Inspect out-of-round and taper of crankshaft journal and pin.

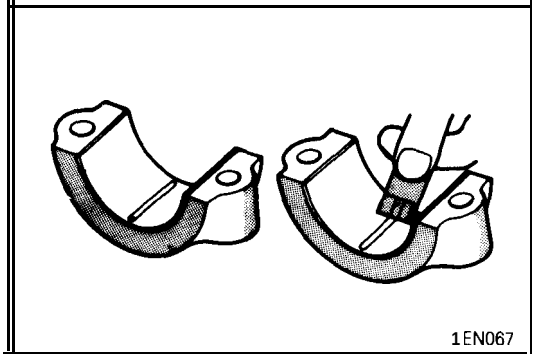
Standard dimension:

| | |
|---|---|
| Crankshaft journal O.D. | 57 mm (2.24 in.) |
| Crank pin O.D. | 45 mm (1.77 in.) |
| Crankshaft journal pin out-of-round and taper | Less than 0.015 mm (.0006 in.) |




MAIN BEARINGS AND CONNECTING ROD **BEARINGS**

Visually inspect each bearing for peeling, melt, seizure and improper contact. Replace the faulty bearings.

OIL CLEARANCE MEASUREMENT

To check the oil clearance, measure the outside diameter of crankshaft journal and crank pin and the inside diameter of bearing. The clearance can be obtained by calculating the difference between the measured outside and inside diameters.

Oil clearance:

Crankshaft main bearing
**0.02–0.05** mm **(.0008–.0019** in.)

Connecting rod bearing
**0.02–0.05** mm **(.0008–.0019** in.)

Limit:

| | |
|---|---|
| Crankshaft main bearing | 0.1 mm **(.004** in.) |
| Connecting rod bearing | 0.1 mm **(.004** in.) |

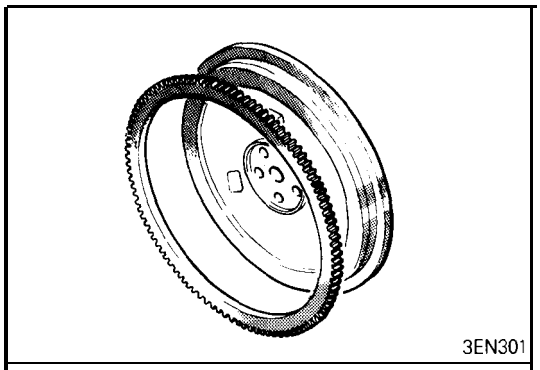
PLASTIC-GAUGE METHOD

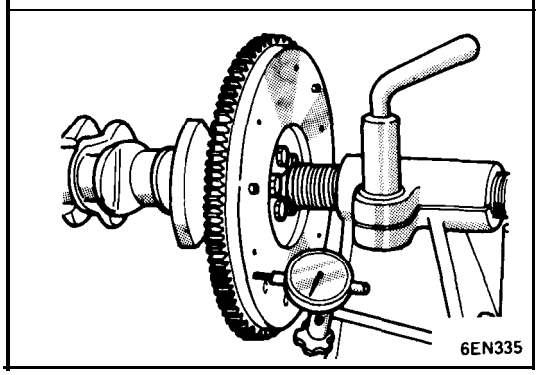
Plastic-Gauge may be used to measure the clearance.

(1) Remove oil and grease and any other dirt from bearings and journals.
(2) Cut Plastic-Gauge to the same length as the width of the bearing and place it in parallel with the journal, off oil holes.
(3) Install the crankshaft, bearings and caps and tighten them to the specified torques. During this operation, do NOT turn the crankshaft. Remove the caps. Measure the width of the Plastic-Gauge at the widest part by using a scale printed on the Plastic-Gauge sleeve.
If the clearance exceeds the limit, the bearing should be replaced or an undersize bearing used.
When installing a new crankshaft, be sure to use standard size bearings.
Should the standard clearance not be obtained even after bearing replacement, the journal should be ground to undersize and a bearing of the same size should be installed.

OIL SEAL

Check front and rear oil seals for damage or worn lips. Replace any seat that is faulty.


3EN301


6EN335

RING GEAR (Engine with a manual **transaxle)**

Check the ring gear for worn, damaged or broken teeth. Replace the ring gear if teeth are faulty, and also check the starter motor pinion.

Ring Gear Replacement Procedure

(1) Strike outer circumference of ring gear at several points.

Caution
The ring gear cannot be removed if it is heated.

(2) Install the ring gear on flywheel after heating the ring gear to 260–280°C (500–536°F) for shrink fit.

FLYWHEEL (Engine with a manual transaxle)

(1) Visually check the clutch disc friction surface of flywheel for ridge wear, streaks and seizure. Replace as necessary.
(2) If the flywheel runout exceeds the limit, replace it.

Limit: 0.13 mm **(.0051** in.)

DRIVE PLATE (Engine with an automatic transaxle)

Replace if deformed, damaged or cracked.

## SERVICE POINTS OF REASSEMBLY N09UDAA

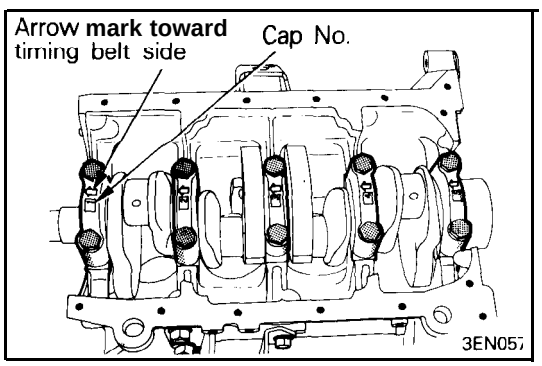
15. INSTALLATION OF UPPER BEARING

When reusing the main bearings, install them in their original positions by referring to location marking made at the time of removal.
Be sure that oil holes in bearings align with those in cylinder block.

13. INSTALLATION OF LOWER BEARING

Make sure that a bearing without oil groove is used as lower bearing.

12. INSTALLATION OF BEARING CAP

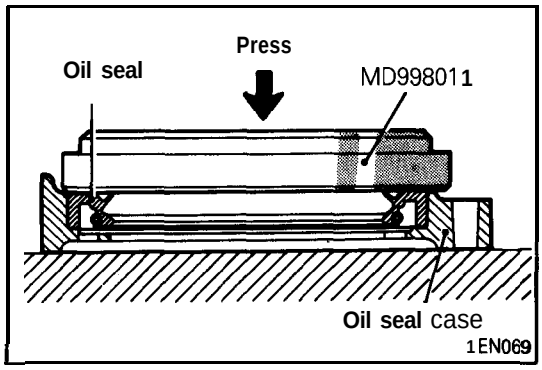


3EN057

(1) Install the bearing caps with their arrow mark directed toward the timing belt side of engine. Cap numbers must be in correct order.
(2) **Tighten cap bolts in the sequence** of center, No.2, No.4, front and rear cap bolts.
(3) Cap bolts should be tightened evenly in 2 to 3 steps before they are finally tightened.

(4) Make certain that the crankshaft turns freely and has a proper end play by checking the clearance between center main bearing thrust flange and connecting rod big end bearing.

Crankshaft end play:
**0.05–0.18** mm **(.0020–.0071** in.)
Limit: 0.25 mm **(.0098** in.)



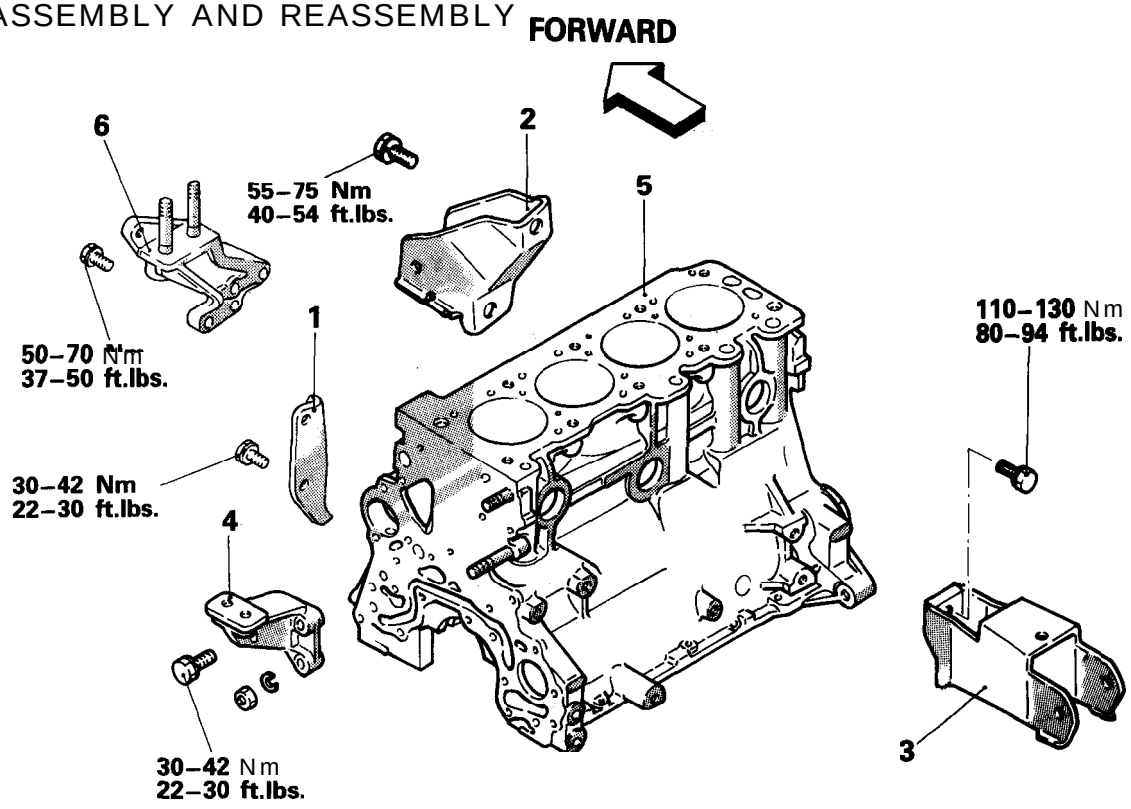

### 9. INSTALLATION OF REAR OIL SEAL

Install oil seal in the crankshaft rear oil seal case. Using the special tool, press fit the oil seal all the way in without tilting it.

## CYLINDER BLOCK

### DISASSEMBLY AND REASSEMBLY

N09VF-A



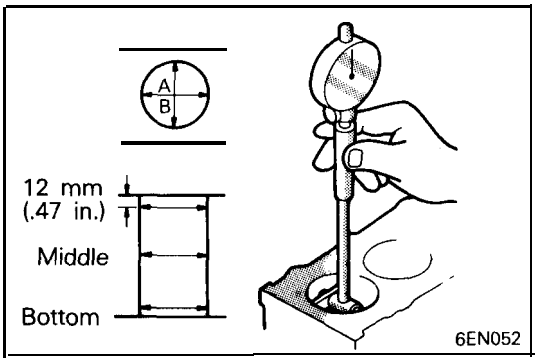

1. **Exhaust pipe support bracket**
2. **Front roll stopper** bracket
3. Rear roll stopper bracket
4. Left engine support bracket
5. Cylinder block
6. Engine mount bracket

3EN0092

### INSPECTION

N09VCAJ

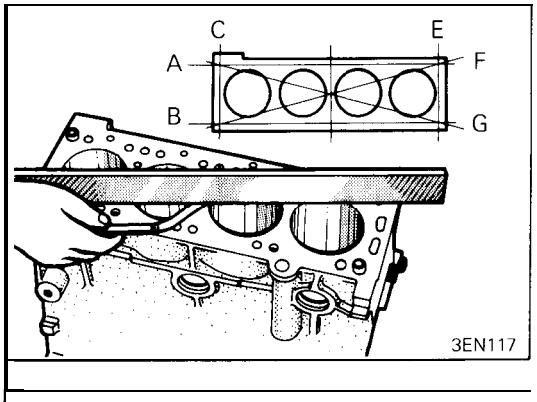
- Visually check the cylinder block for scores, rust and corrosion. Also check for cracks or any other faults by using the magnaflux method. Correct or replace the block if faulty.
- Measure the cylinder bore with a cylinder gauge at three levels and in two directions A and B as shown. If out-of-round or taper is more than specified or if the cylinder walls are badly scuffed or scored, the cylinder block should be rebored and honed, and new oversize pistons and rings fitted.
  Measuring points are as shown.
  Cylinder bore: 80.8 mm (3.173 in.)
  Out-of-round and taper: 0.01 mm (.0004 in.)

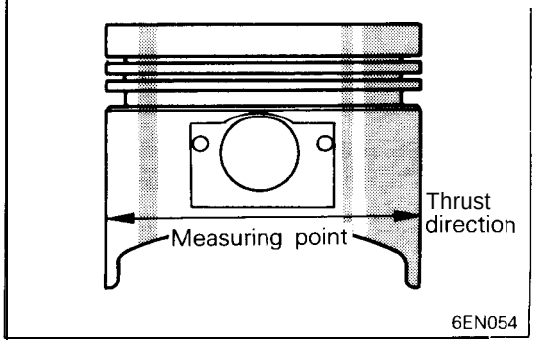


- If cylinder top ridge is worn in stages, smooth out with a ridge reamer.
- Oversize pistons are available in four sizes.

  Piston oversizes and marks:
  0.25 mm (.010 in.) OS. 0.25
  0.50 mm (.020 in.) O.S. 0.50
  0.75 mm (.030 in.) O.S. 0.75
  1 .00 mm (.039 in.) O.S. 1.00
- To rebore the cylinder to an oversize, keep the specified clearance between the oversize piston and the bore, and make sure that all pistons used are of the same oversize. The standard measurement of the piston outside diameter is taken at a level 2 mm (.0787 in.) above the bottom of the piston skirt and across the thrust faces.

  Piston-to-cylinder wall clearance:
  **0.01–0.03** mm **(.0004–.0012** in.)




- Check for damage and cracks.
- Check top surface for flatness. If excessive distortion is evident, grind minimum stock within the limit or replace.

  Flatness of gasket surface:
  Standard Less than 0.05 mm **(.0020** in.)
  Limit 0.1 mm **(.004** in.)
  Overall height: 285.2 mm (11.228 in.)
  Limit 285 mm **(11.220** in.)

  Caution
  If cylinder head gasket surface has already been ground, the thickness of the removed stock should be included in the grinding limit of -0.2 mm **(–.008** in.).

## CYLINDER **REBORING** N09VEBA

(1) Determine the oversize pistons to be used with reference to the cylinder with the largest bore.
(2) Measure the piston O.D. at the measuring point.

  NOTE
  There are four piston oversizes available: 0.25 mm (.010 in.), 0.50 mm (.020 in.), 0.75 mm (.030 in.) and 1.00 mm (.039 in.).

(3) Based on the measured piston O.D., calculate the boring dimension as follows:
  Boring dimension = [Piston O.D.] + [Piston-to-cylinder clearance 0.03 to 0.05 mm (.0012 to .0020 in.)] – [Honing allowance 0.02 mm (.0008 in.)]
(4) Bore each cylinder to the calculated boring dimension.

  Caution
  To prevent distortion caused by temperature rise during boring, work in the order of **No.2** to **No.4** to No. 1 to **No.3** cylinders.

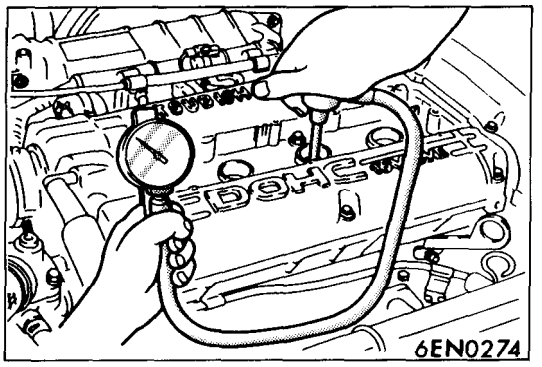
(5) Hone to final finish dimension [Piston O.D.] + [Piston-to-cylinder clearance].
(6) Check piston to cylinder clearance.

  Standard value: **0.01–0.03** mm **(.0004–.0012** in.)

# ENGINE <2.0L DOHC Engine>

## SERVICE ADJUSTMENT PROCEDURES

### CHECKING COMPRESSION PRESSURE N09FFAH




(1) Before checking compression, ensure that engine oil, the starter motor, and battery are all in good condition.
(2) Start the engine and wait until engine coolant temperature has risen to 85–95°C (185–205°F).
(3) Stop the engine and pull the spark plug cables.
(4) Remove the spark plugs.
(5) Crank the engine to remove any foreign objects in the cylinders.

Caution
Cover the spark plug holes with shop towel, etc., in order to keep expelled foreign objects from flying out, and keep away from the holes. When measuring compression with water, oil, or fuel having entered the cylinder through a crack, etc., these will come flying out of the spark plug hole hot and fast, so be sure to take the proper precautions.

(6) Set the compression gauge to the spark plug hole.
(7) Holding the throttle valve full open, crank the engine and measure compression.

Limit:
<Non-Turbo>: Min. 960 **kPa** (137 psi) **[250–400 rpm]**
<Turbo>: Min. 800 **kPa** (114 psi) **[250–400 rpm]**

(8) Perform 6 and 7 above for all the cylinders, ensuring that compression pressure differential for each of the cylinders is within the specified limit.

Differential limit: Max. **100 kPa** (14 psi)

(9) If a cylinder's compression or pressure differential exceeds the limit, add a small amount of oil through the spark plug hole and repeat steps (6)–(8).
① If the addition of oil brings compression up, it is possible that there is poor contact between the piston ring and cylinder wall.
② If not compression does not come up, valve seizure, poor valve seating, or a compression leak from the gasket are all possible.

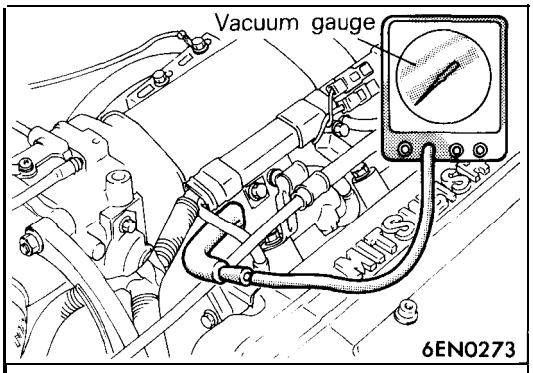
## MANIFOLD VACUUM INSPECTION N09FNAO

(1) Before inspection and adjustment, put the vehicle into the following state.
- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric, cooling fan, and accessories: **OFF**
- Transaxle: Neutral (N or P for vehicles with an automatic transaxle)
- Steering wheel: Neutral position

(2) Check that the idling revolution speed is normal.
(3) Remove the PCV hose from the PCV valve and attach a vacuum gauge.
(4) Check that the negative pressure at the intake manifold during idle revolution is normal.

Standard value:
<Non-Turbo>: 490 **mmHg** (19.3 **in.Hg)**
<Turbo>: 480 ***mmHg*** (18.9 ***in.Hg)***

(5) If outside the standard value, isolate the cause by referring to the following table and repair the fault.




| ymptom | Cause | Remedy |
|---|---|---|
| The vacuum gauge reading is less than standard value, but the pointer is stable. | • Ignition timing is retarded. | • Adjust the ignition timing. |
| The vacuum gauge pointer swings slowly. | • Air mixture concentration too rich. | • Check ECI-MULTI system. |
| The vacuum gauge pointer drops irregularly. | • Air mixture concentration too lean. | • Check ECI-MULTI system. |
| The vacuum gauge pointer drops intermittently to 30 to 160 mmHg (1.2 to 6.3 in.Hg). | • Incomplete close contact of intake and exhaust valve seat. | • Check and repair the valve. |
| The vacuum gauge pointer drops suddenly from the normal reading to 250 mmHg (9.8 in.Hg), then returns to normal. | • Broken cylinder head gasket | • Replace cylinder head gasket. |

## LASH ADJUSTERS CHECK

N09FEABa1

If an abnormal noise is heard from the lash adjusters check as follows.

(1) After warming up the engine, stop it.
(2) While installed to the cylinder head, press the part of rocker arm that contacts the lash adjuster. The part pressed will feel very hard if the lash adjuster condition is normal.
(3) If, when pressed, it easily descends all the way downward, replace the lash adjuster.
(4) If there is a spongy feeling when pressed, air is probably mixed in, and so the cause should be investigated. The cause is probably an insufficient amount of engine oil, or damage to the oil screen and/or screen gasket.
(5) After finding the cause and taking the appropriate step (adding oil or repair), warm up the engine and drive at low speed for a short time. Then, after stopping the engine and waiting a few minutes, drive again at low speed. Repeat this procedure a few times to bleed out the air from the oil.

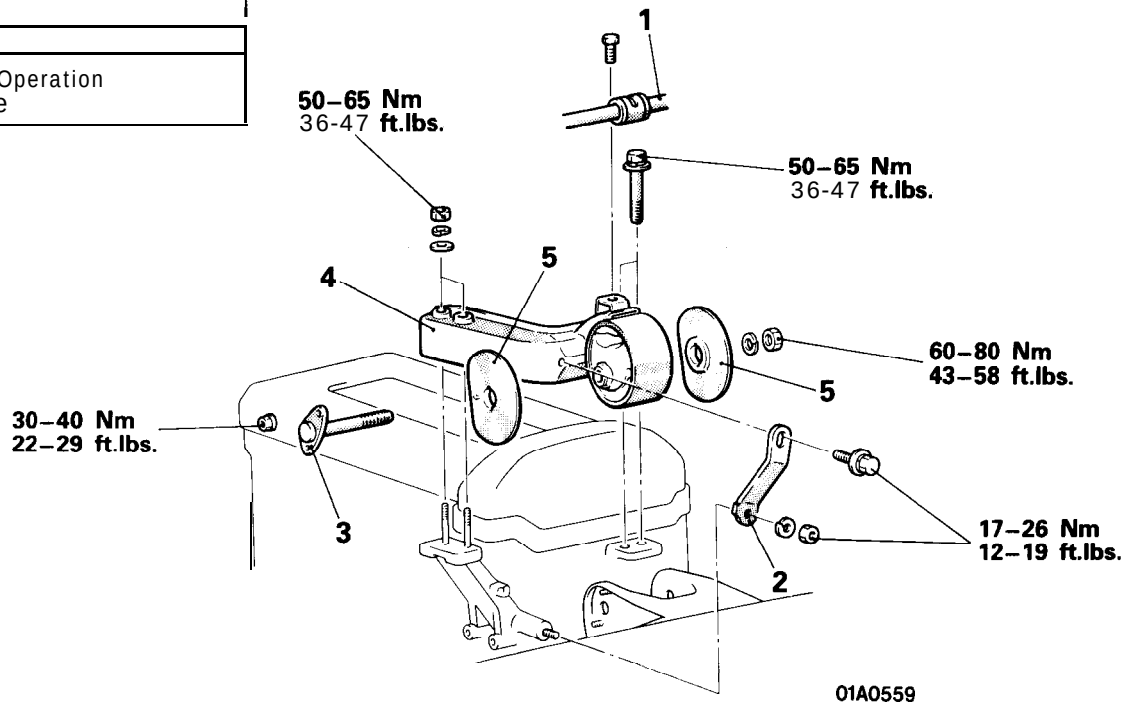
# ENGINE MOUNTING

N09GA-B

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Raise and Suspend the Engine to the Extent Force is not applied to the Engine Mount

Post-installation Operation
- Lower the Engine



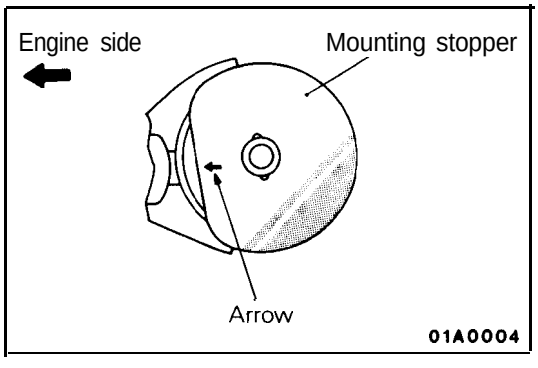

Removal steps
1. Pressure hose (power steering)
2. Bracket
3. Engine mount bracket and body connection bolt
4. Engine mount bracket
- + 5. Mounting stopper

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".

## INSPECTION

N09GCAH3

- Check each insulator for cracks or damage.
- Check each bracket for deformation or damage.




## SERVICE POINTS OF INSTALLATION

N09GDAK1

5. INSTALLATION OF MOUNTING STOPPER

Install the mounting stopper of the engine mount bracket so that the arrow faces the center part of the engine.

# TRANSAXLE MOUNTING

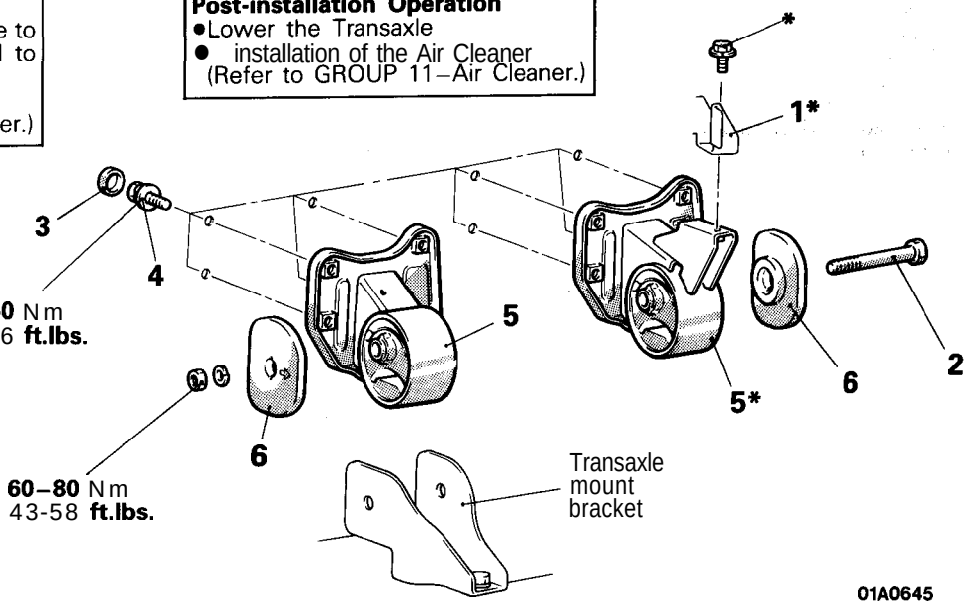
N09GE-B

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Raise and Suspend the Transaxle to the Extent Force is not applied to the Transaxle Mount
- Removal of the Air Cleaner (Refer to GROUP 11–Air Cleaner.)

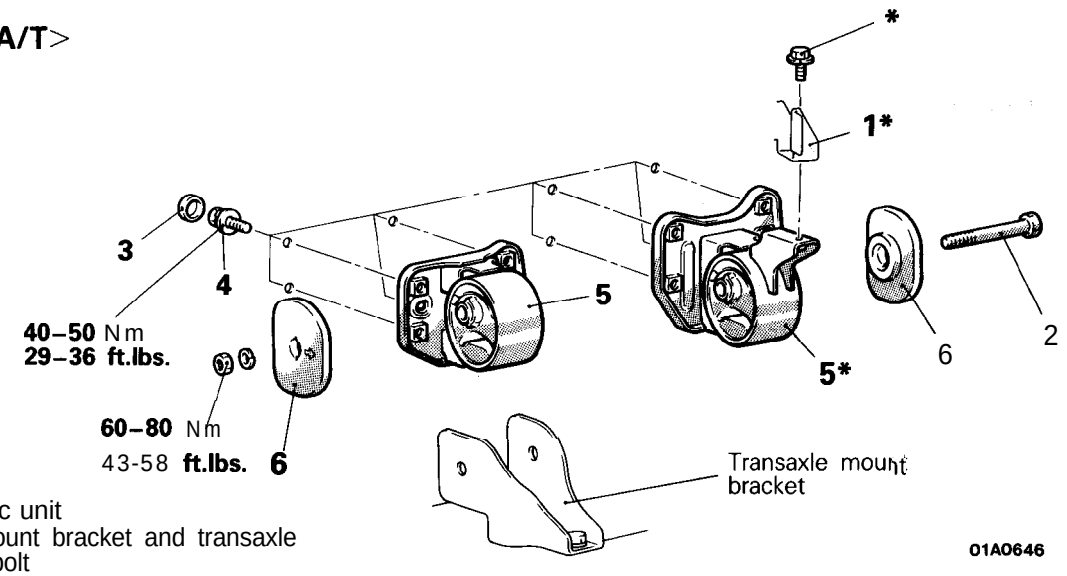
**Post-installation Operation**
- Lower the Transaxle
- installation of the Air Cleaner (Refer to GROUP 11–Air Cleaner.)

<M/T>




01A0645

<A/T>




01A0646

Removal steps

◆◆ 1. ABS hydraulic unit
2. Transaxle mount bracket and transaxle connection bolt
3. Caps
4. Transaxle mount bracket installation bolts
5. Transaxle mount bracket
6. Mounting stopper

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) *: <Vehicles with ABS>

## SERVICE POINTS OF REMOVAL

N09GEAA

### 1. REMOVAL OF ABS HYDRAULIC UNIT

Refer to GROUP 5–Hydraulic Unit.

## INSPECTION

N09GCAH4

- Check each insulator for cracks or damage.
- Check each bracket for deformation or damage.

# ENGINE ROLL STOPPER

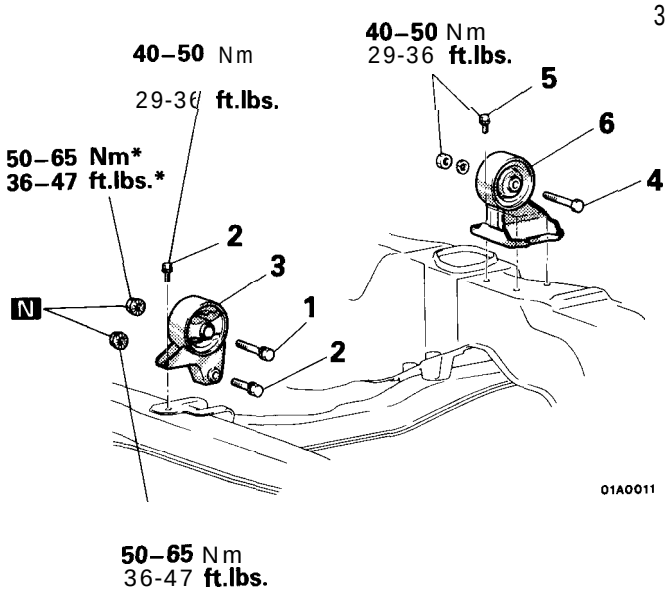
N09GF-B

## REMOVAL AND INSTALLATION

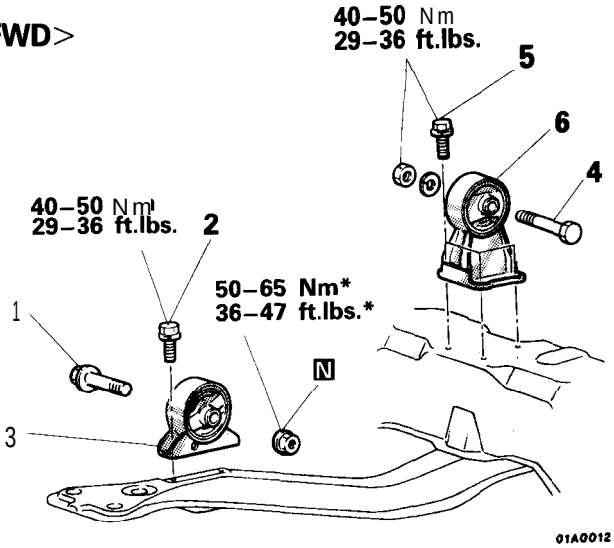
**Pre-removal Operation**
- Raise and Suspend the Engine to the Extent Force is not applied to the Engine Mount

Post-installation Operation
- Lower the Engine

<AWD>




<FWD>




Front roll stopper bracket removal steps
1. Front roll stopper bracket and engine connection bolt
2. Front roll stopper bracket installation bolts
3. Front roll stopper bracket

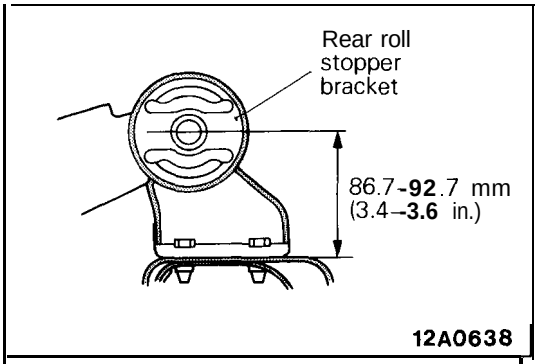
Rear roll stopper bracket removal steps
4. Rear roll stopper bracket and engine connection bolt
5. Rear roll stopper bracket installation bolts
6. Rear roll stopper bracket

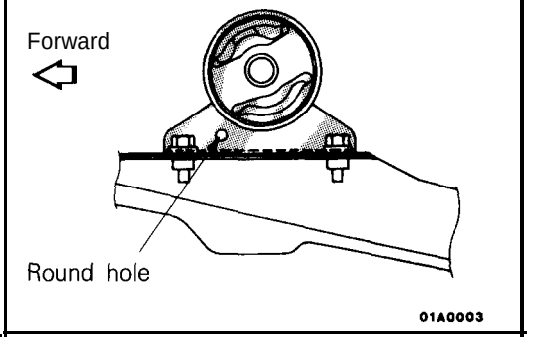
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● + : Refer to “Service Points of Installation”.
(3) ❑ : Non-reusable parts
(4) For tightening locations indicated by the * symbol, first tighten temporarily, and then make the final tightenrng with the entire weight of the engine applied to the vehicle body.

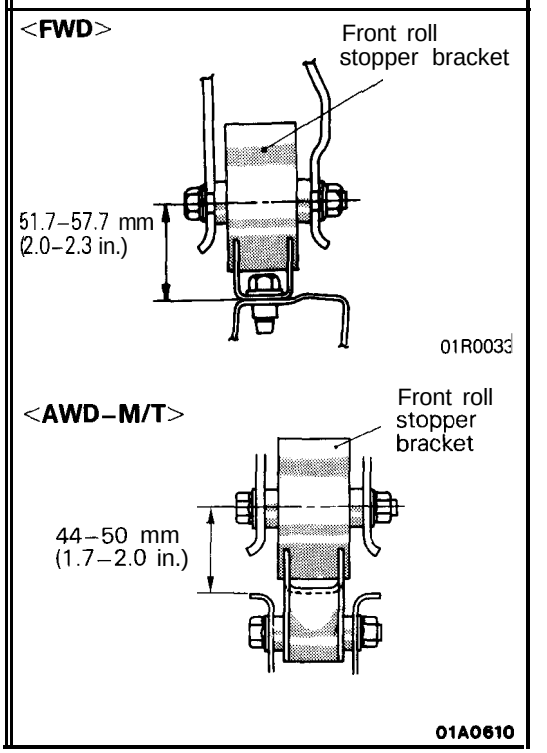
## INSPECTION

N09GCAH5

- Check each insulator for cracks or damage.
- Check each bracket for deformation or damage.




## SERVICE POINTS OF INSTALLATION N09GJAB2

6. INSTALLATION OF REAR ROLL STOPPER BRACKET <Vehicles with AWD–A/T>

After temporarily tightening the rear roll stopper bracket, tighten so that, in the unladen vehicle condition, the distance from the center hole of the insulator to the lower edge of the bracket is the specified distance.

3. INSTALLATION OF FRONT ROLL STOPPER BRACKET

(1) Install the front roll stopper bracket so that the part where the round hole is made is facing the front of the vehicle.

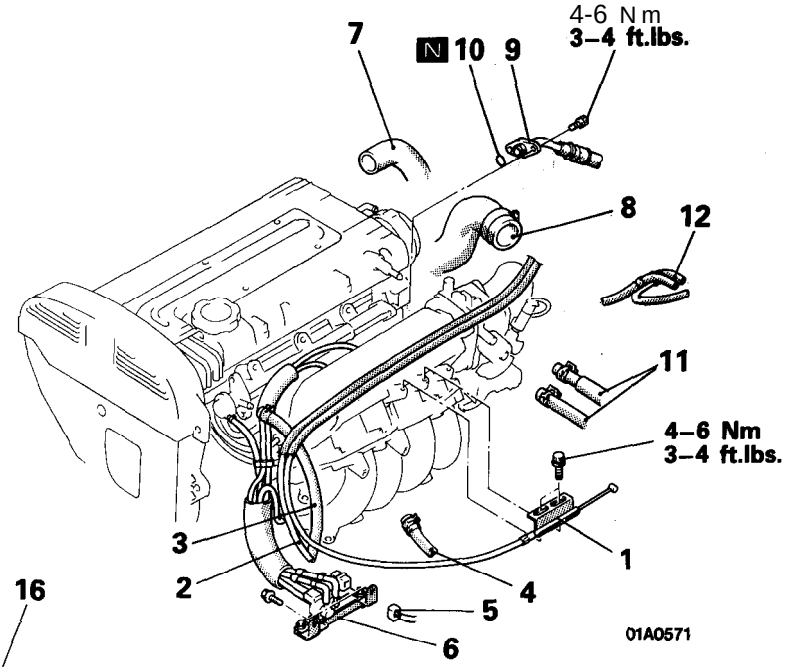
(2) After temporarily tightening the front roll stopper bracket, tighten so that, in the unladen vehicle condition, the distance from the center hole of the insulator to the lower edge of the bracket is the specified distance.

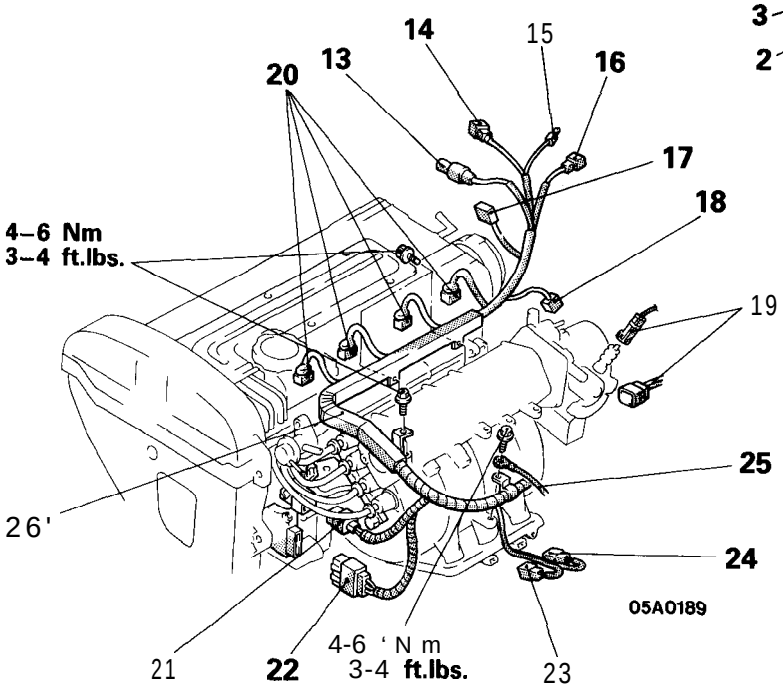
# ENGINE ASSEMBLY

N09SA-B

## REMOVAL AND INSTALLATION

Pre-removal Operation
- Eliminating Fuel Pressure in Fuel Line (Refer to GROUP 14–Service Adjustment Procedures.)
- *Removal of Engine Hood
- Draining of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)
- *Removal of the Transaxle Assembly (Refer to GROUP 21 -Transaxle Assembly.)
- *Removal of the Radiator (Refer to GROUP 7–Radiator.)
- *Removal of Under Cover Left



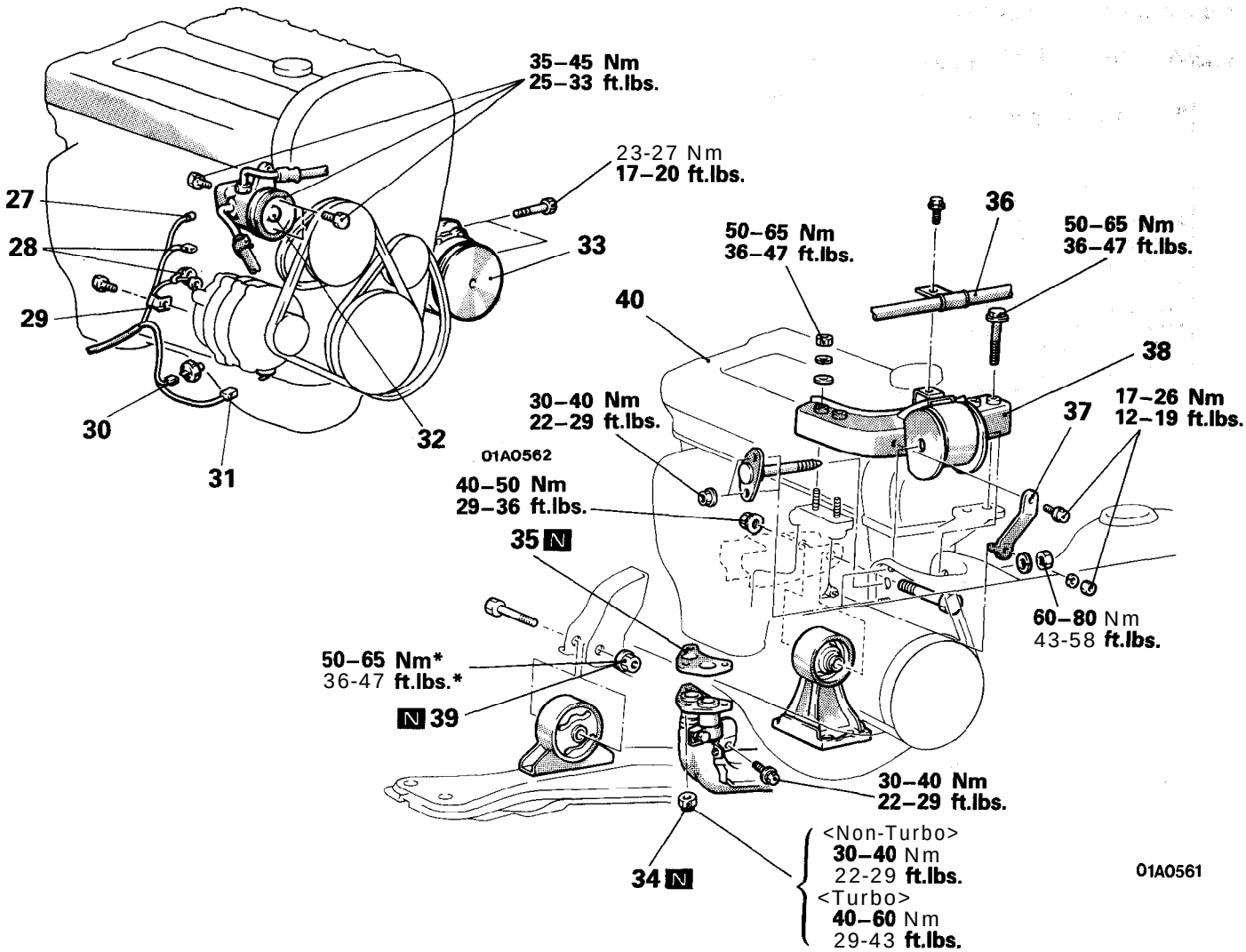




Post-installation Operation
- Installation of Under Cover Left
- Installation of the Radiator (Refer to GROUP 7–Radiator.)
- *Installation of the Transaxle Assembly (Refer to GROUP 21 -Transaxle Assembly.)
- Refilling of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)
- Installation of Engine Hood

Removal steps

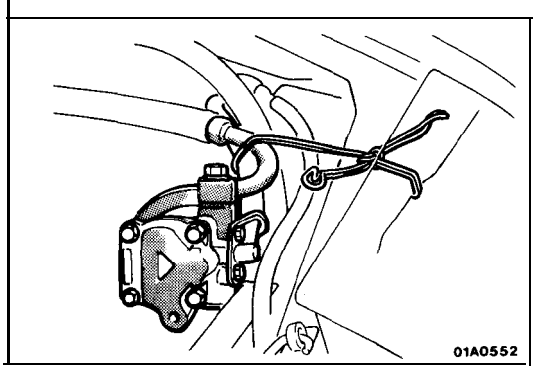
◆◆ 1. Connection for accelerator cable or throttle cable
2. Connection for accelerator cable (Auto-cruise control)
3. Connection for fuel return hose
4. Connection for brake booster vacuum hose
5. Connection for solenoid valve (Turbo)
6. Solenoid valve bracket (Turbo)
7. Connection for air hose A (Turbo)
8. Connection for air hose C (Turbo)
9. Connection for fuel high pressure hose
10. O-ring
11. Connection for heater hoses
12. Connection for vacuum hoses
13. Connection for oxygen sensor
14. Connection for engine coolant temperature sensor
15. Connection for engine coolant temperature gauge unit
16. Connection for engine coolant temperature switch (Air conditioner)
17. Connection for crank angle sensor
18. Connection for TPS
19. Connection for ISC and idle switch
20. Connection for fuel injectors
2 1. Connection for ignition coil
22. Connection for power transistor
23. Connection for knock sensor (Turbo)
24. Connection for EGR temperature sensor (California vehicles only)
25. Connection for ground cable
26. Control wiring harness

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".
(3) N: Non-reusable parts




27. Connection for oil pressure switch (Power steering)
28. Connection for alternator
29. Alternator wiring harness clamp
30. Connection for oil pressure switch
31. Connection for oil pressure gauge unit
● +● *32. Power steering oil pump
◆◆▶◀ 33. Air conditioner compressor
34. Self-locking nuts
35. Gasket
36. Pressure hose (Power steering)
37. Bracket
◆◆ 38. Engine mount bracket
39. Self-locking nut
◆◆ ● + 40. Engine assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ▶◀: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) For tightening locations indicated by the * symbol, first tighten temporarily, and then make the final tightening with the entire weight of the engine applied to the vehicle bodv.

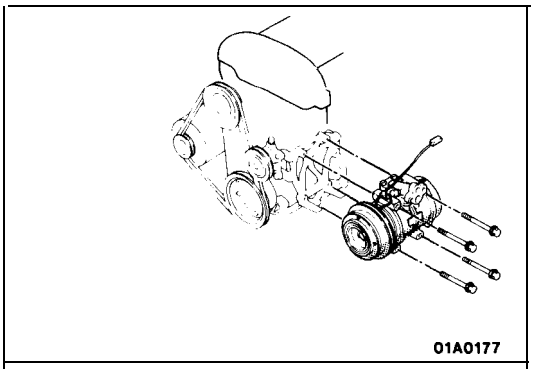


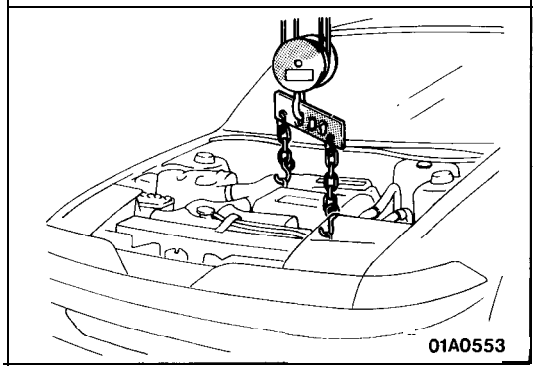

## SERVICE POINTS OF REMOVAL N09SBDFa

### 32. DISCONNECTION OF POWER STEERING OIL PUMP

Disconnect the oil pump with hoses from the bracket.

NOTE
The removed power steering oil pump should be fastened (by using rope, etc.) in a position that will not interfere with the removal/installation of the engine assembly.




33. DISCONNECTION OF AIR CONDITIONER COMPRESSOR

**Disconnect air conditioner compressor connector and remove it with** hoses from the compressor bracket.

NOTE

The removed air conditioner compressor should be fastened (by using rope, etc.) in a position that will not interfere with the removal/installation of the engine assembly.

38. DISCONNECTION OF ENGINE MOUNT BRACKET

Before removing the engine mount bracket installation bolt, use a chain block or similar arrangement to suspend the engine assembly (to the extent that there is no looseness of the chain).

40. DISCONNECTION OF ENGINE ASSEMBLY

After checking that the cables, hoses, harness connectors, **etc. are all removed, slowly raise the chain block to lift the** engine assembly upward out of the engine compartment.

## SERVICE POINTS OF INSTALLATION N09SDAU

40. INSTALLATION OF ENGINE ASSEMBLY

When mounting the engine, check to be sure that the cables, hoses, harness connectors, etc. are all in the correct position.

33. INSTALLATION OF AIR CONDITIONER COMPRESSOR

Refer to GROUP 24–Service Adjustment Procedures.

32. INSTALLATION OF POWER STEERING OIL PUMP

Refer to GROUP 1 9–Service Adjustment Procedures.

1. ADJUSTMENT OF ACCELERATOR CABLE

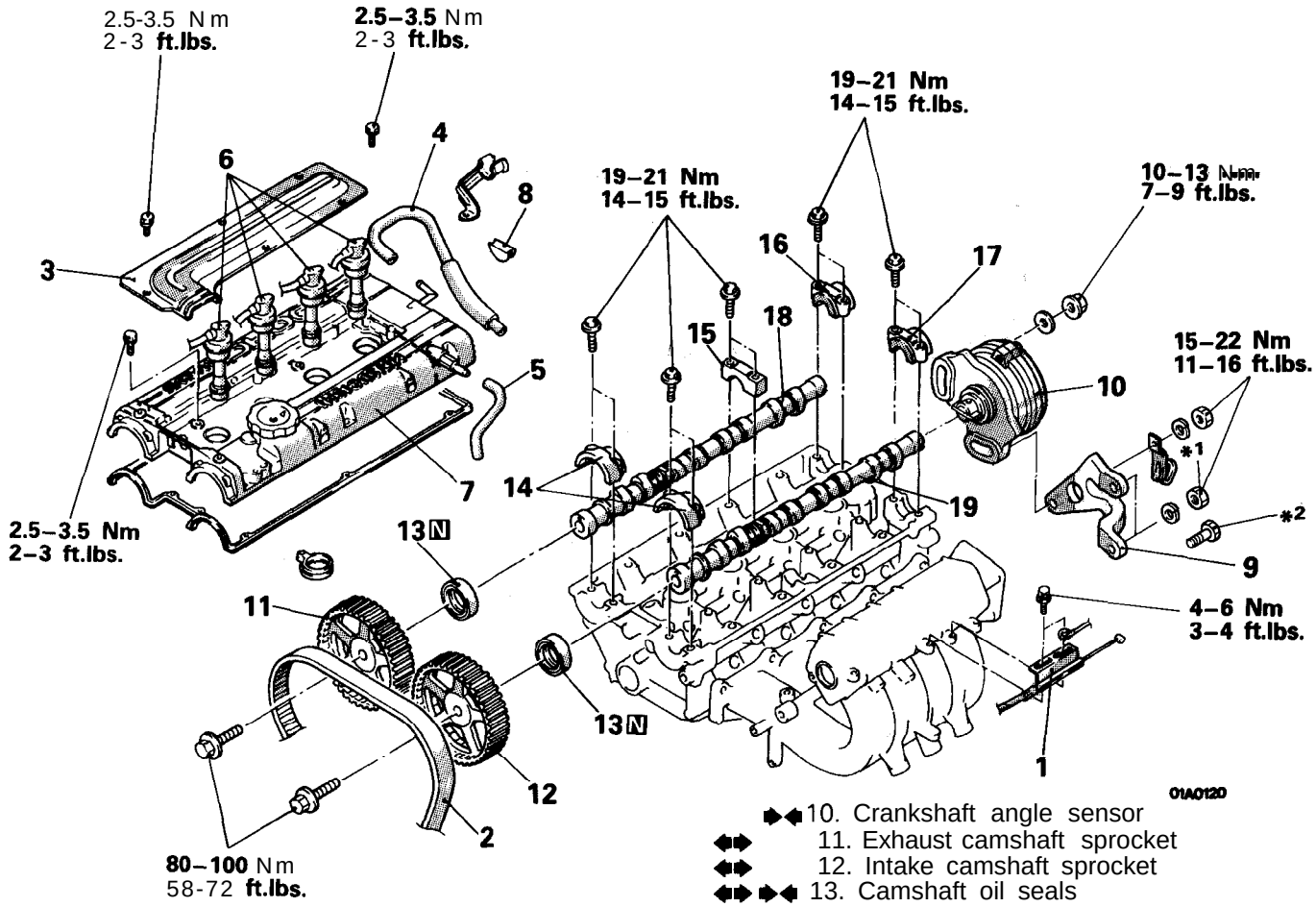
Refer to GROUP 14–Service Adjustment Procedures.

# CAMSHAFTS AND CAMSHAFT OIL SEALS

## REMOVAL AND INSTALLATION

N09ZA-B

**Post-installation Operation**
- Engine Adjustment
(Refer to P.9-74.)




Removal steps
- ● + 1. Connection for accelerator cable or throttle cable
- ◆◆ ● b 2. Timing belt
- 3. Center cover
- 4. Connection for breather hose
- 5. Connection for PCV hose
- 6. Connection for spark plug cables
- ● + 7. Rocker cover
- ◆◆ 8. Semi-circular packing
- 9. I hrottle body stay
- ◆◆ 10. Crankshaft angle sensor
- ◆◆ 11. Exhaust camshaft sprocket
- ◆◆ 12. Intake camshaft sprocket
- ◆◆ ◆◆ 13. Camshaft oil seals
- ◆◆ ◆◆ 14. front camshaft bearing caps
- ◆◆ ◆◆ 15. Camshaft bearing caps
- ◆◆ ◆◆ 16. Rear camshaft bearing cap (R.H.)
- ◆◆ ◆◆ 17. Rear camshaft bearing cap (L.H.)
- ◆◆ 18. Exhaust camshaft
- ◆◆ 19. intake camshaft

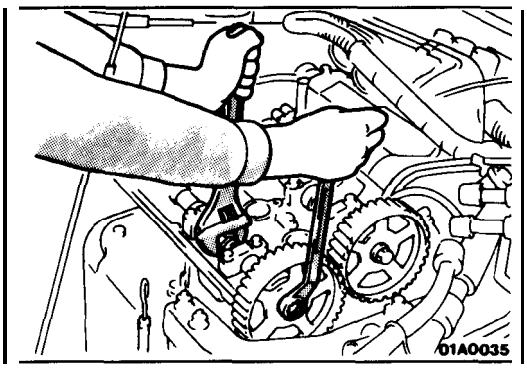
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● a: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) *1: <Non-Turbo>
(6) *2: <Turbo>

### SERVICE POINTS OF REMOVAL

N09ZBAB

**2. REMOVAL OF** TIMING BELT

Refer to P.9-98.




**11.** REMOVAL OF EXHAUST CAMSHAFT SPROCKET/
12. INTAKE CAMSHAFT SPROCKET

(1) Using a wrench at the hexagonal part of the camshaft (to prevent the crankshaft from turning), loosen the cramshaft sprocket bolt.
(2) Remove the camshaft sprokets.

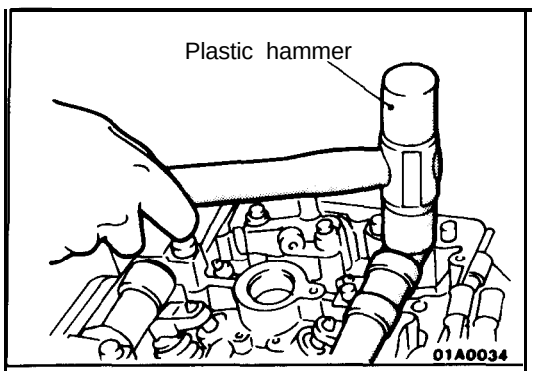
13. REMOVAL OF CAMSHAFT OIL SEALS

Remove the oil seals using a screwdriver or similar tool.

Caution
Take care not to damage front camshaft bearing cap and camshaft.

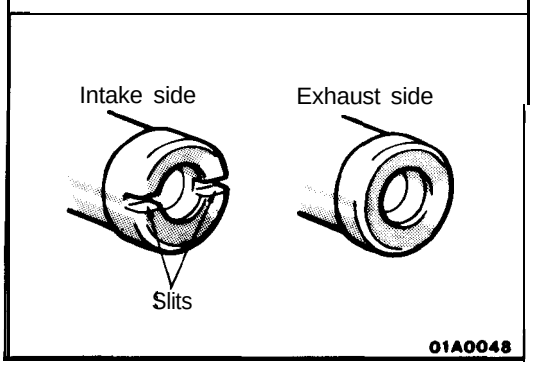
**14./15./16./17.** REMOVAL OF CAMSHAFT **BEARING** CAPS

(1) Loosen the bearing cap installation bolts in two or three steps.




(2) Remove the bearing cap.

NOTE
If the bearing cap is difficult to remove, use a plastic hammer to gently tap the rear part of the camshaft, and then remove.

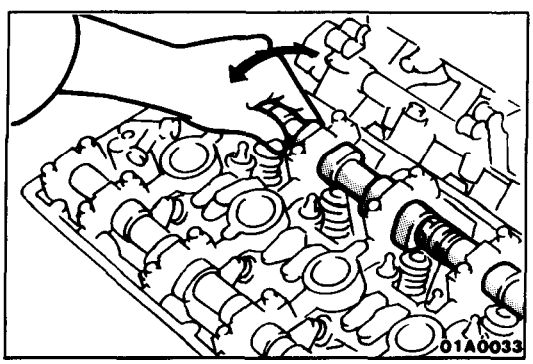



## SERVICE POINTS OF INSTALLATION N09ZDAB

lg. INSTALLATION OF INTAKE **CAMSHAFT/18.** EXHAUST CAMSHAFT

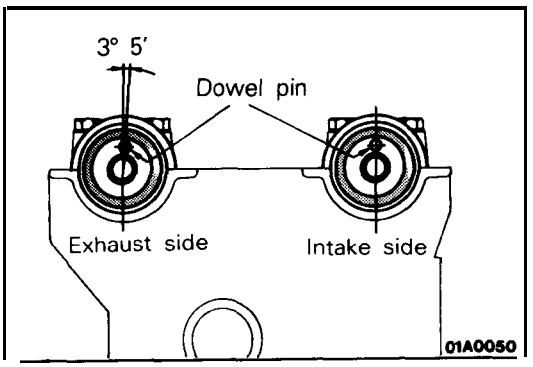
**(1) Install the camshafts on the cylinder head.**

Caution
Be sure not to mistake the intake side and the exhaust side. There are slits for crank angle sensor drive in the rear end of the intake camshaft.




NOTE
Install new camshafts using the following procedure.

(1) Remove the rocker arms.
(2) Lay the camshafts on the cylinder head and install the bearing caps.
(3) Check that the camshaft can be easily turned by hand.
(4) After checking, remove the bearing caps and the camshafts, and install the rocker arms.

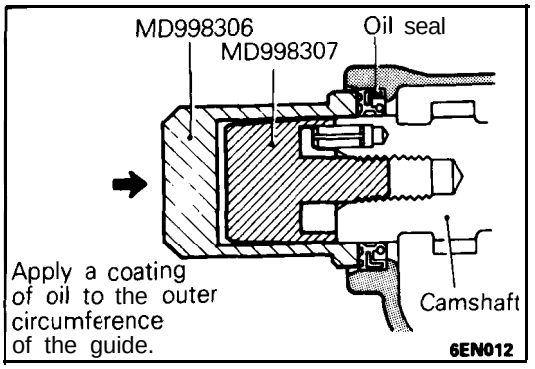



(2) The camshaft's dowel pins should be at the positions shown in the figure.

**17./16./15./14.** INSTALLATION OF CAMSHAFT BEARING CAPS

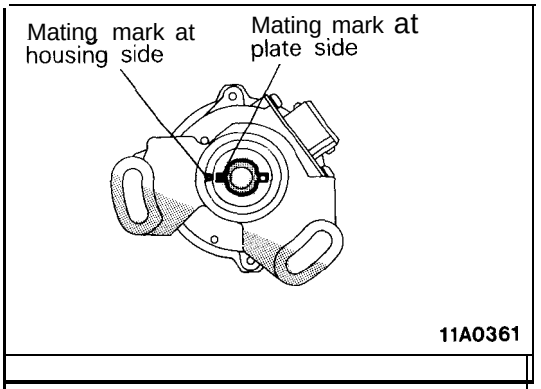
Tighten the bearing cap installation bolts to the specified torque in two or three steps.

Caution
Tighten uniformly, otherwise the rocker **arms** will not be straight.




13. INSTALLATION OF CAMSHAFT OIL SEALS

Using the special tool, press in the oil seal as shown in the figure.

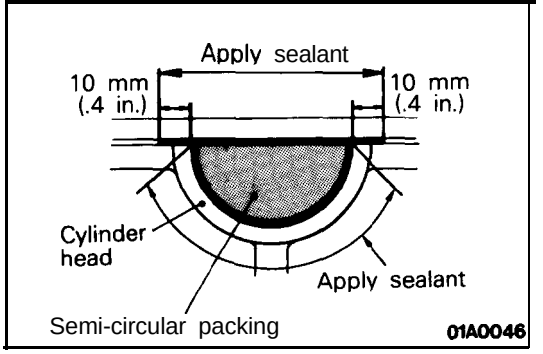



10. INSTALLATION OF THE CRANKSHAFT ANGLE SENSOR

(1) Align the mating mark (punch mark) on the housing of the crank angle sensor with the mating mark (notch) in the plate.
(2) Install the crank angle sensor to **the** engine.

Caution
When tightening the nut of the crankshaft angle sensor, make sure that the crank angle sensor does not turn.

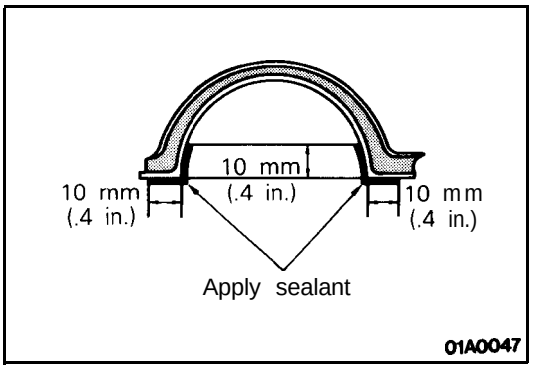
(3) Check that the ignition timing is set at the standard value. (Refer to GROUP 8–Ignition System.)




8. INSTALLATION OF SEMI-CIRCULAR PACKING

Install the semi-circular packing to the cylinder head, and apply a coating of the specified sealant where shown in the figure.

Specified sealant: MOPAR Part **No.4318034**
or equivalent




7. INSTALLATION OF ROCKER COVER

Apply a coating of the specified sealant where shown in the figure, and then install the rocker cover to the cylinder head assembly.

Specified sealant: MOPAR Part **No.4318034** or equivalent

2. INSTALLATION AND ADJUSTMENT OF TIMING BELT

Refer to P.9-104.

1. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 14–Service adjustment procedures.

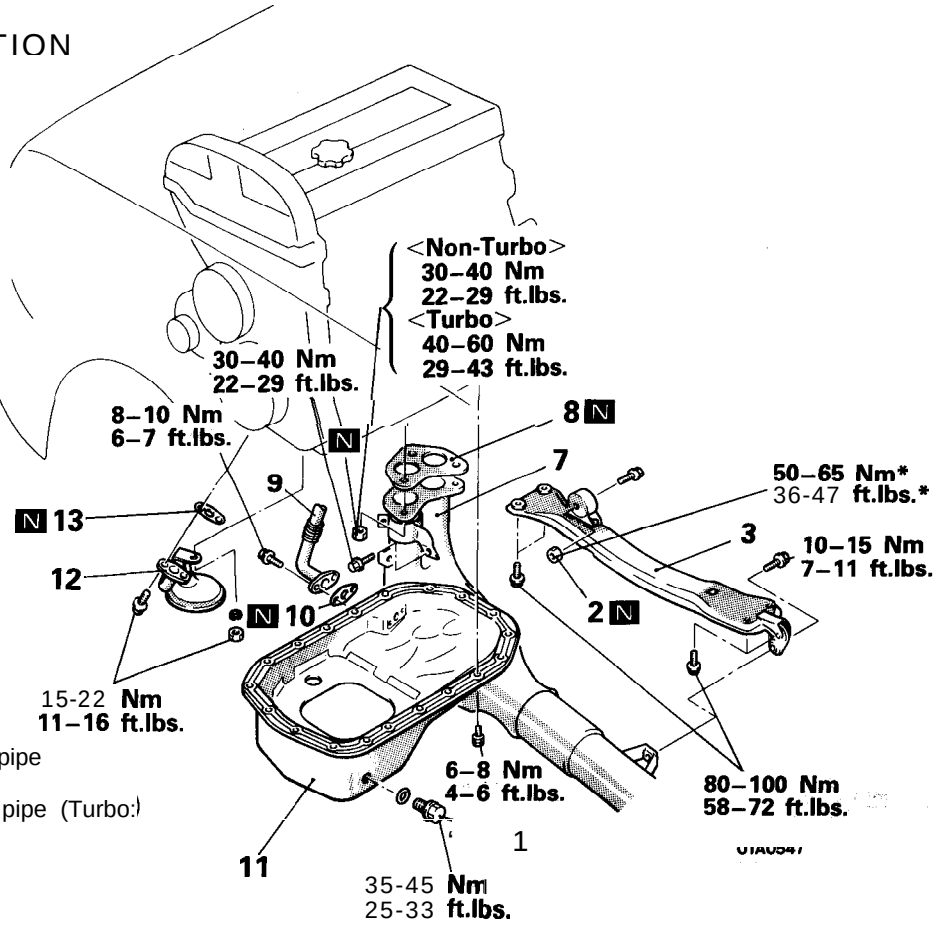
# OIL PAN AND OIL SCREEN

N09HA-B

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining of Engine Oil (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- Refilling of Engine Oil (Refer to GROUP 0–Maintenance Service.)




Removal steps

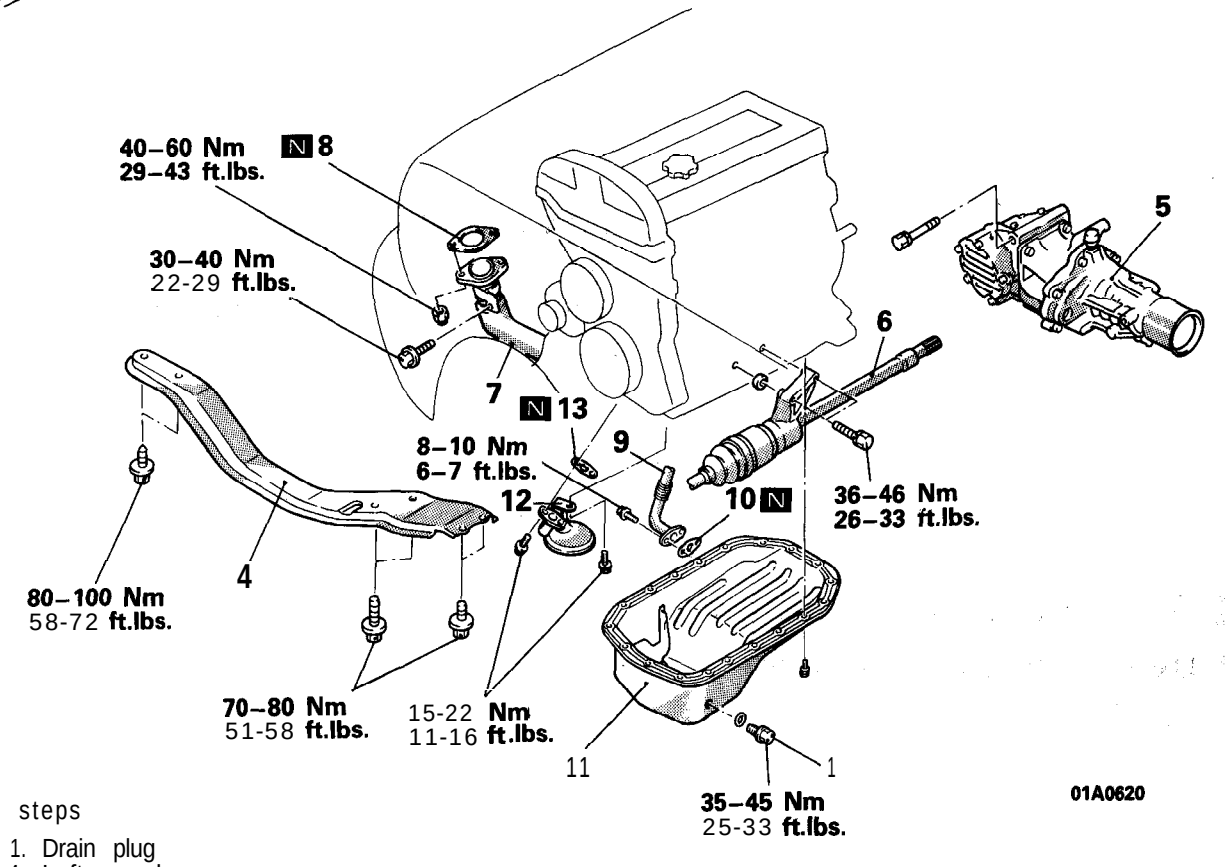
1. Drain plug
2. Self locking nut
3. Centermember
7. Connection for exhaust pipe
8. Gasket
9. Connection for oil return pipe (Turbo)
10. Gasket (Turbo)
- ● *● *11. Oil pan
12. Oil screen
13. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● e : Refer to "Service Points of Removal".
(3) ● + : Refer to "Service Points of Installation".
(4) N : Non-reusable parts
(5) For tightening locations indicated by the * symbol, first tighten temporarily, and then make the final tightening with the entire weight of the engine applied to the vehicle body.

**Pre-removal Operation**
- Draining of Engine Oil (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- Refilling of Engine Oil (Refer to GROUP 0–Maintenance Service.)

<AWD>

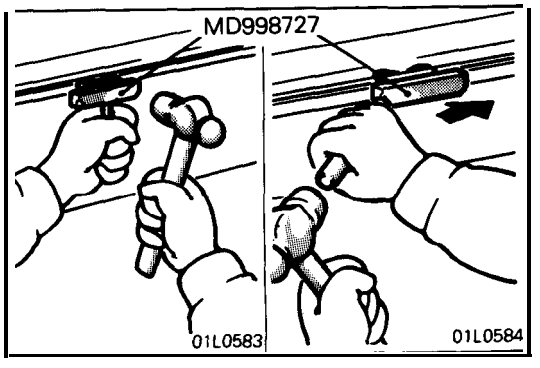



Removal steps
1. Drain plug
4. Left member
5. Transfer assembly
6. Drive shaft
7. Exhaust pipe connection
8. Gasket
9. Oil return pipe connection
10. Gasket
11. Oil pan
12. Oil screen
13. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL

N09HBAFa1




5. REMOVAL OF TRANSFER ASSEMBLY

Refer to GROUP 21–Transfer.

11. REMOVAL OF OIL PAN

(1) Remove the oil pan mounting bolts.
(2) Tap the special tool in between the cylinder block and the oil pan.

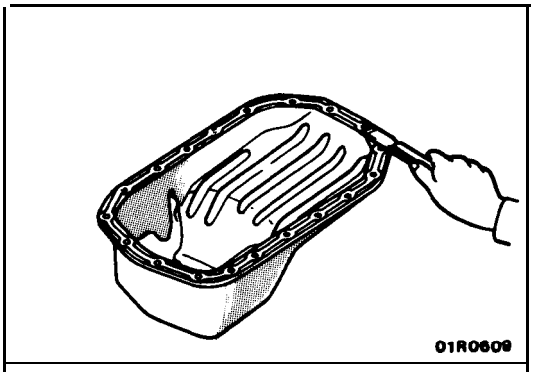
Caution
Do not use a screwdriver, a chisel or a similar tool when removing the oil pan.

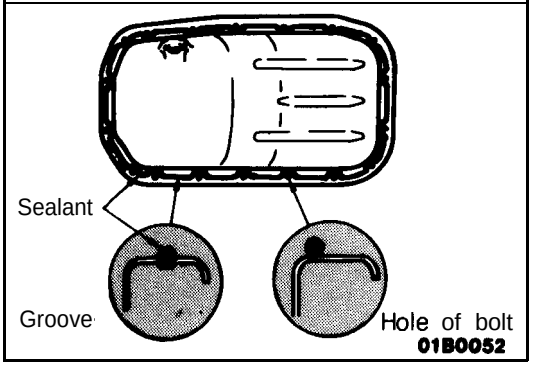
(3) Remove the oil pan by placing a brass bar at the correct of the special tool and then tapping with a hammer.

## INSPECTION

N09HCAC1

- Check the oil pan for damage and cracks. Replace if faulty.
- Check the oil screen for clogging; damage and cracks. Replace if faulty.




## SERVICE POINTS OF INSTALLATION

N09HDASa

11. INSTALLATION OF OIL PAN

(1) Use a wire brush or other tool to scrape clean all gasket surfaces of the cylinder block and oil pan so that all loose material is removed.

(2) Gasket surfaces must be free of oil and dirt.

(3) Apply the specified sealant around the gasket surface of the oil pan as specified in illustration.

Specified sealant: MITSUBISHI GENUINE PART No. **MD997110** or equivalent

NOTE

The sealant should be applied in a continuous head approximately 4 mm (.16 in.) in diameter.

(4) Assemble oil pan to cylinder block within 15 minutes after applying the sealant.

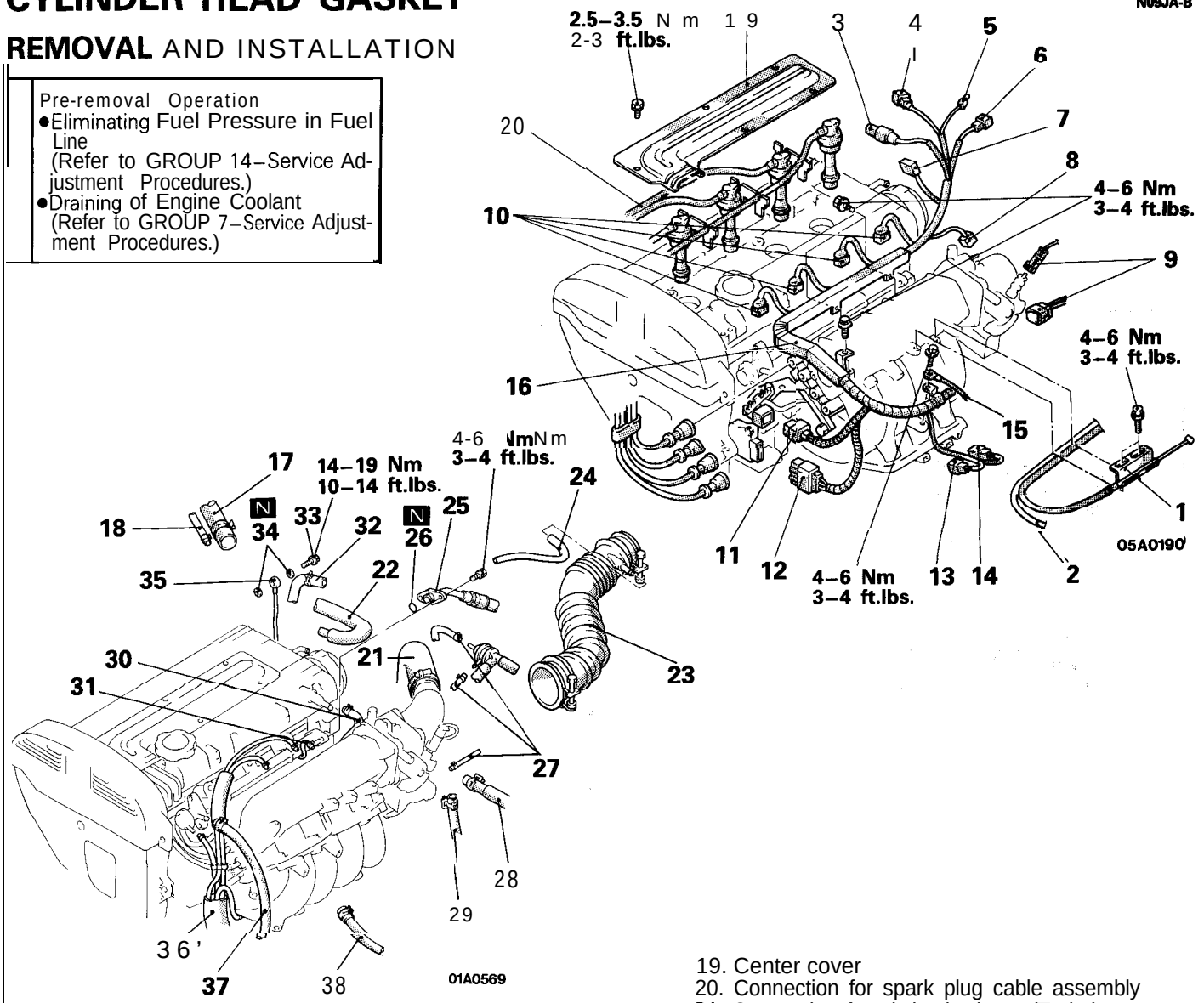
Caution

After installing the oil pan, wait at least 30 minutes before starting the engine.

# CYLINDER HEAD GASKET

## REMOVAL AND INSTALLATION

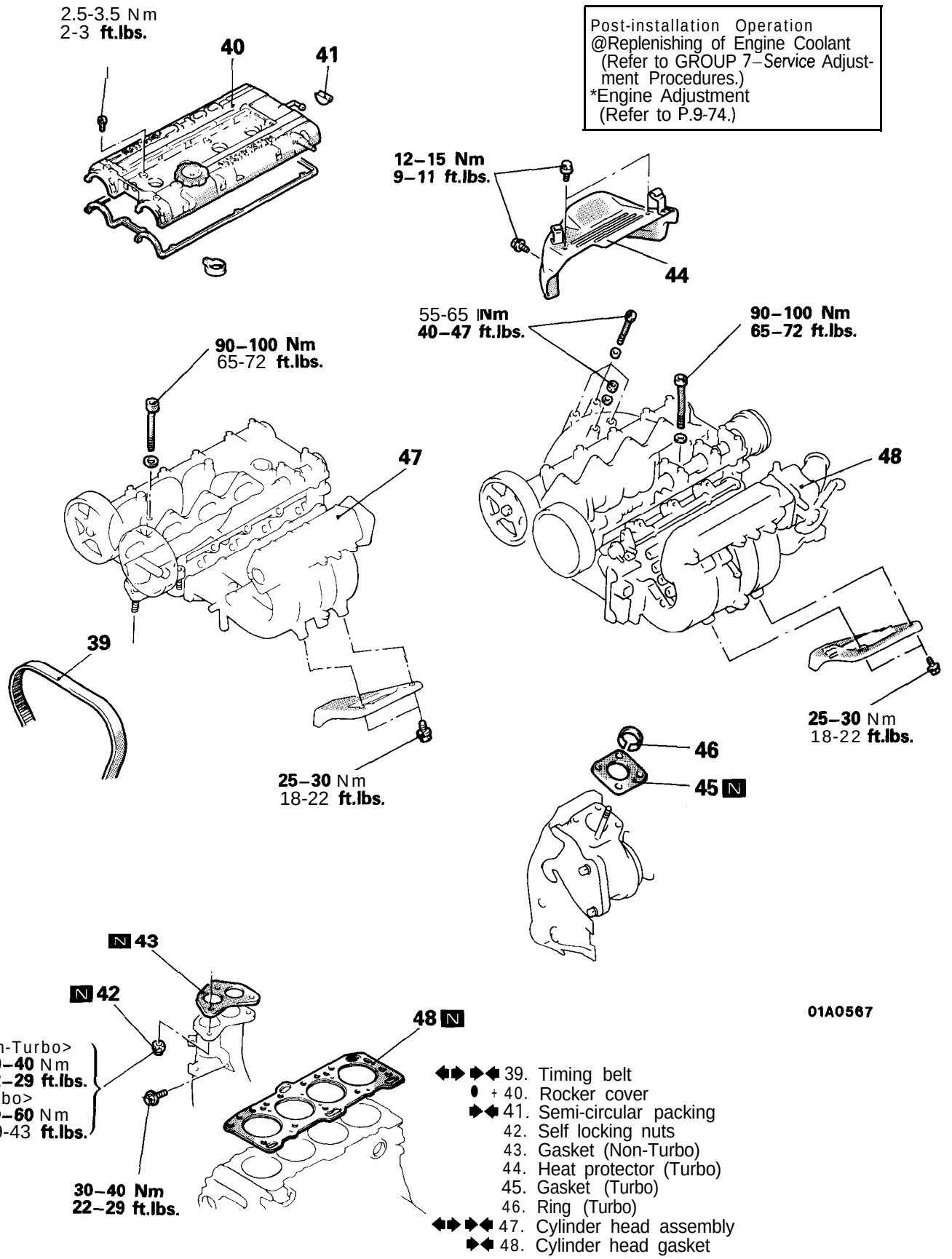
Pre-removal Operation
- Eliminating Fuel Pressure in Fuel Line (Refer to GROUP 14–Service Adjustment Procedures.)
- Draining of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)




Removal steps

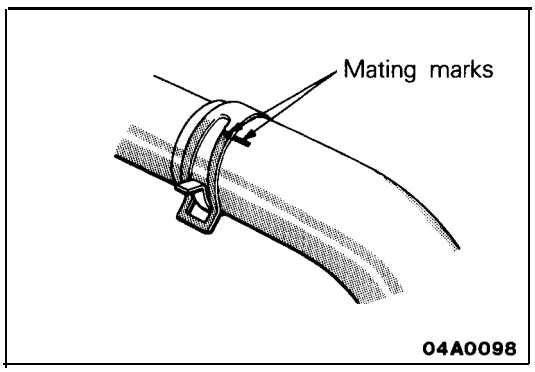
- 1. Connection for accelerator cable or throttle cable
- 2. Connection for accelerator cable (Auto-cruise control)
- 3. Connection for oxygen sensor
- temperature sensor
- 5. Connection for engine coolant temperature gauge unit
- 6. Connection for engine coolant
- 7. Connection for crank angle sensor
- 8. Connection for TPS
- ISC and idle switch
- 10. Connection for fuel injector
- 12. Connection for power transistor
- 13. Connection for knock sensor (Turbo)
- 14. Connection for EGR temperature sensor (California vehicles only)
- 15. Connection for ground cable
- ◆◆ ● + 17. Connection for radiator upper hose
- 19. Center cover
- 20. Connection for spark plug cable assembly
- 21. Connection for air intake hose (Turbo)
- 22. Connection for breather hose (Turbo)
- 23. Air intake hose
- 24. Connection for breather hose
- ◆◆ ● 25. Connection for fuel high pressure hose
- 26. O-ring
- 27. Connection for vacuum hoses
- 28. Connection for heater hose
- 29. Connection for water by-pass hose
- 30. Connection for PCV hose
- 31. Connection for vacuum hose (Turbo)
- 32. Connection for water hose (Turbo)
- 33. Eye-bolt (Turbo)
- 34. Gasket (Turbo)
- 35. Connection for oil pipe (Turbo)
- 36. Connection for vacuum hoses (Turbo)
- 37. Connection for fuel return hose
- 38. Connection for brake booster vacuum hose

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




◆◆ ▶◀ 39. Timing belt
● + 40. Rocker cover
▶◀ 41. Semi-circular packing
42. Self locking nuts
43. Gasket (Non-Turbo)
44. Heat protector (Turbo)
45. Gasket (Turbo)
46. Ring (Turbo)
◆◆ ▶◀ 47. Cylinder head assembly
▶◀ 48. Cylinder head gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ▶◀: Refer to "Service Points of installation"
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N09JBAP

17. REMOVAL OF RADIATOR UPPER HOSE

Make mating marks on the radiator hose and hose clamp, and then disconnect the radiator hose.

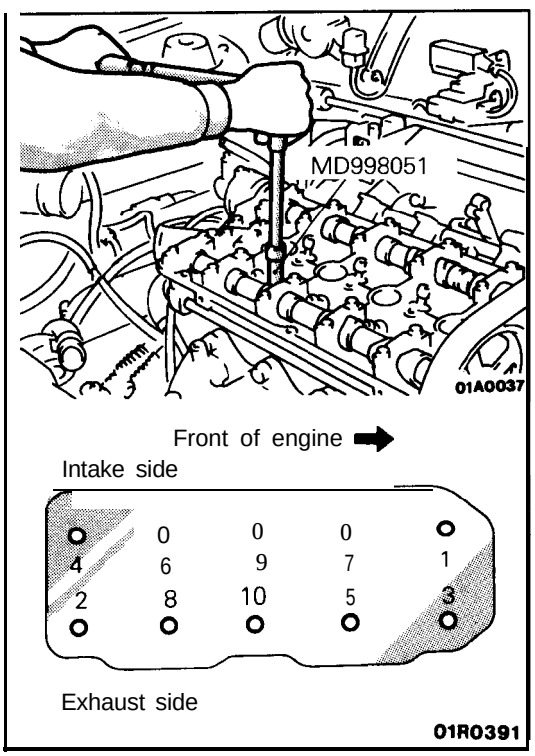
25. DISCONNECTION OF HIGH PRESSURE FUEL HOSE

Caution
Cover the hose connection with rags to prevent splash of fuel that could be caused by some residual **pressure** in the fuel pipe line.

For information concerning the bleeding of the residual pressure, refer to GROUP 14–Service Adjustment Procedures.

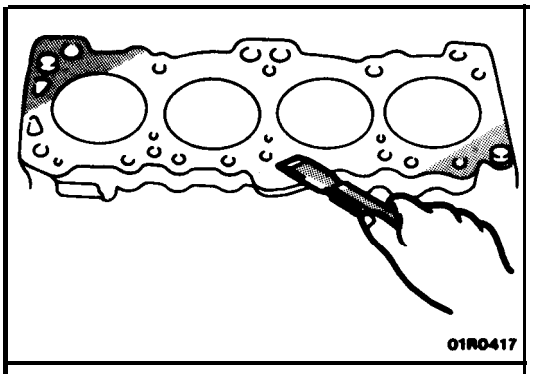
39. REMOVAL OF TIMING BELT

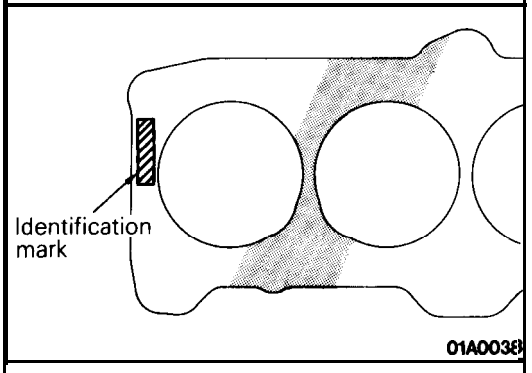
Refer to P.9-98.



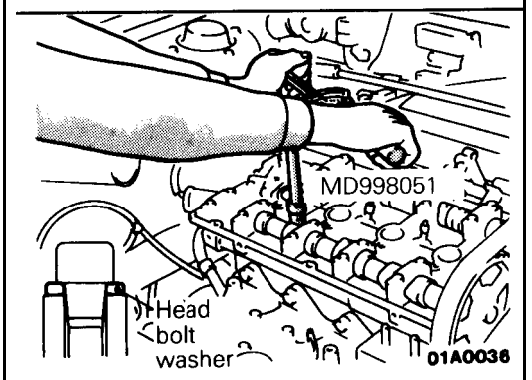

47. REMOVAL OF CYLINDER HEAD ASSEMBLY

Using the special tool, loosen the bolts in the order shown in the figure (in 2 or 3 cycles) and remove. Then remove the cylinder head assembly.

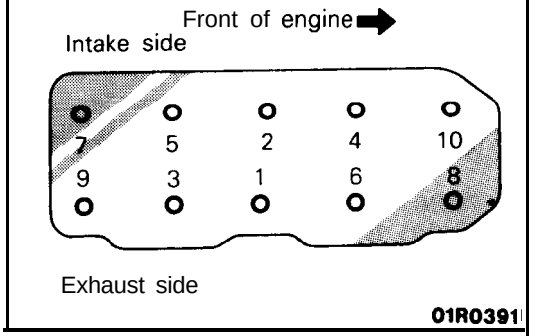

01R0417



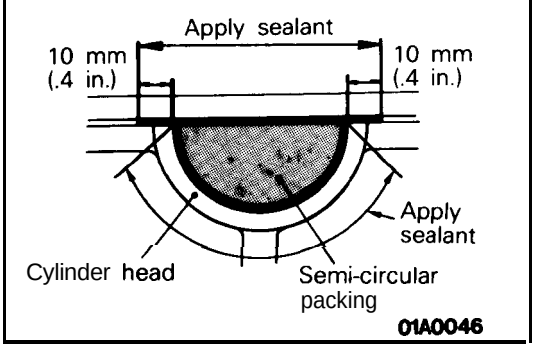
01A0038



01A0036



01R0391



01A0046

## SERVICE POINTS OF INSTALLATION N09JDDIa

48. INSTALLATION OF CYLINDER HEAD GASKET

(1) Use a scraper to clean the gasket surface of the cylinder block.

Caution
Take care that no foreign material gets into the cylinder, or into coolant passages or oil passages.

(2) Make sure that the gasket has the proper identification mark for the engine.
(3) Lay the cylinder head gasket on the cylinder block with the identification mark at the front top.

47. INSTALLATION OF CYLINDER HEAD ASSEMBLY

(1) Use a scraper to clean the gasket surface of the cylinder head assembly.

Caution
Take care that no foreign material gets into the coolant passages or oil passages.

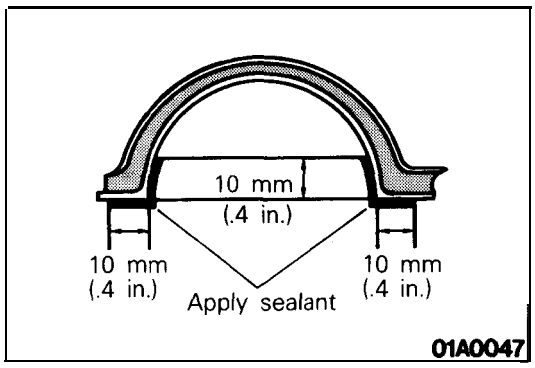
(2) Using the special tool and a torque wrench, tighten the bolts to the specified torque in the order shown in the figure. (in two or three cycles)

Caution
Install the head bolt washers as shown in the diagram.

41. APPLICATION OF SEALANT TO SEMI-CIRCULAR PACKING

Apply a coating of the specified sealant to the semi-circular packing and the cylinder head to top surfaces.

Specified sealant: MOPAR Part **No.4318034** or equivalent



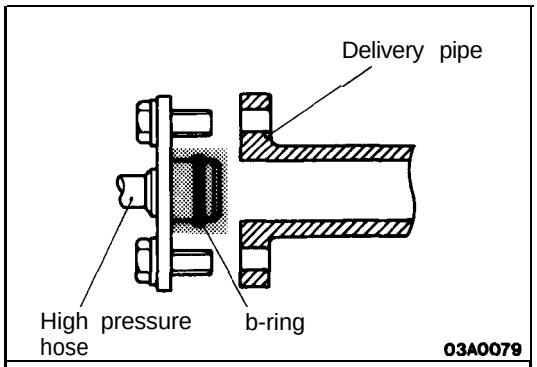

40. INSTALLATION OF ROCKER COVER

Apply a coating of the specified sealant where shown in the figure, and then install the rocker cover to the cylinder head assembly.

Specified sealant: MOPAR Part No. 4318034 or equivalent

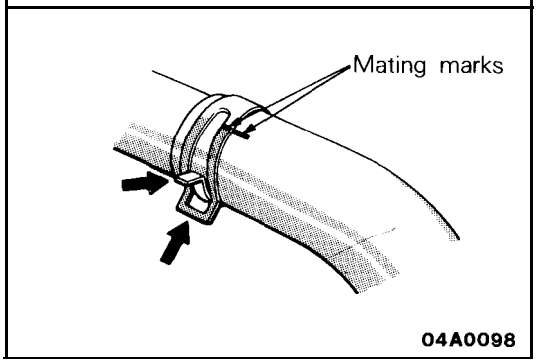
39. INSTALLATION AND ADJUSTMENT OF TIMING BELT

Refer to P.9-104.




25. CONNECTION OF FUEL HIGH PRESSURE HOSE

When connecting the fuel high-pressure hose to the delivery pipe, apply a coating of gasoline to the hose union, and insert so that the O-ring is not damaged.




17. INSTALLATION OF RADIATOR UPPER HOSE

Align the mating marks (of the radiator hose and hose clamp), and then, while applying force in the direction of the arrow in the illustration, set the hose clamp to the trace marks (on the hose) remaining from the prior connection.

Caution

Be sure to install the hose clamp at the trace marks (on the hose) remaining from the prior connection.

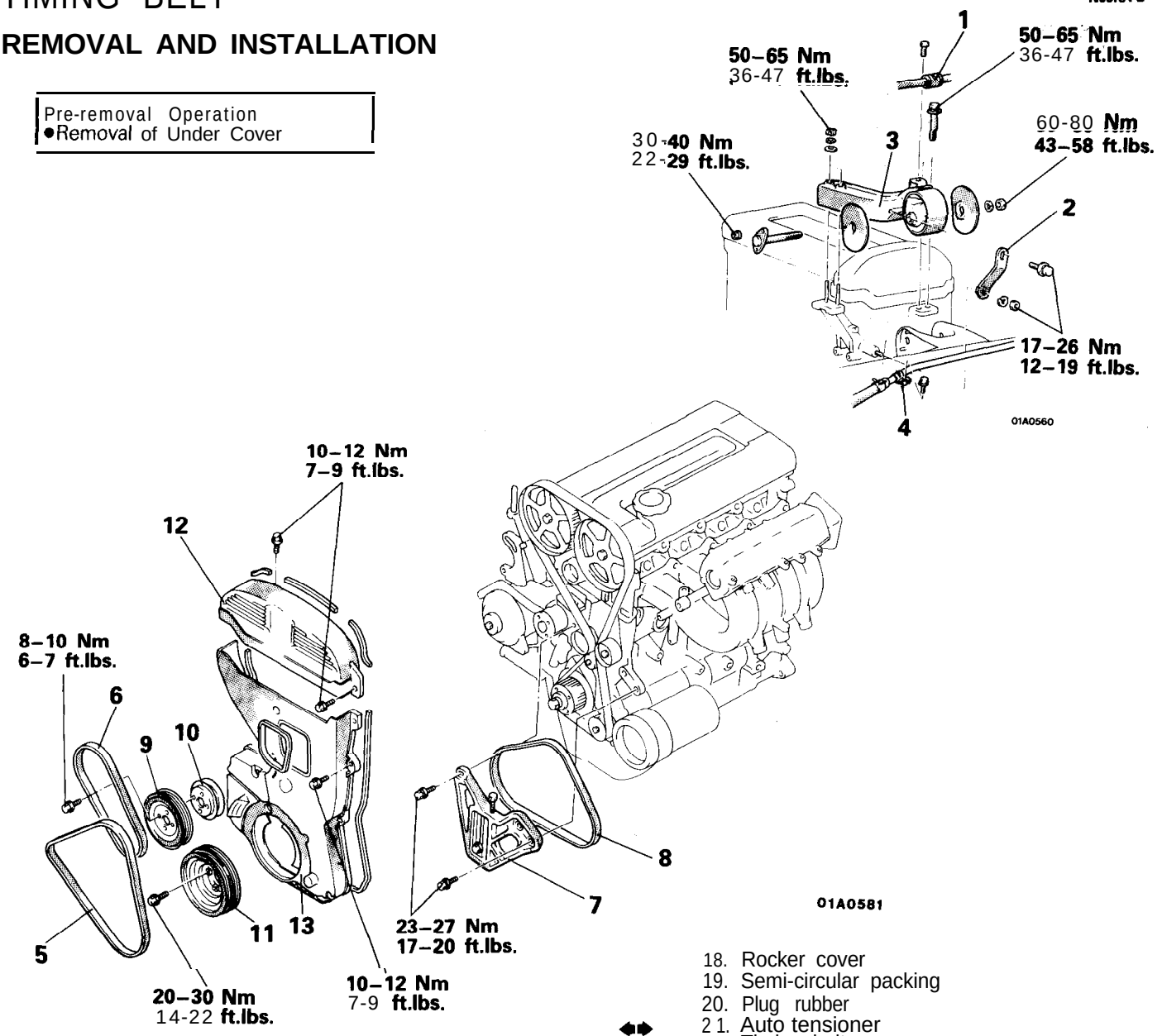
1. ADJUSTMENT OF ACCELERATOR CABLE

Refer to GROUP 14–Service Adjustment Procedures.

# TIMING BELT

## REMOVAL AND INSTALLATION

N09KA-B

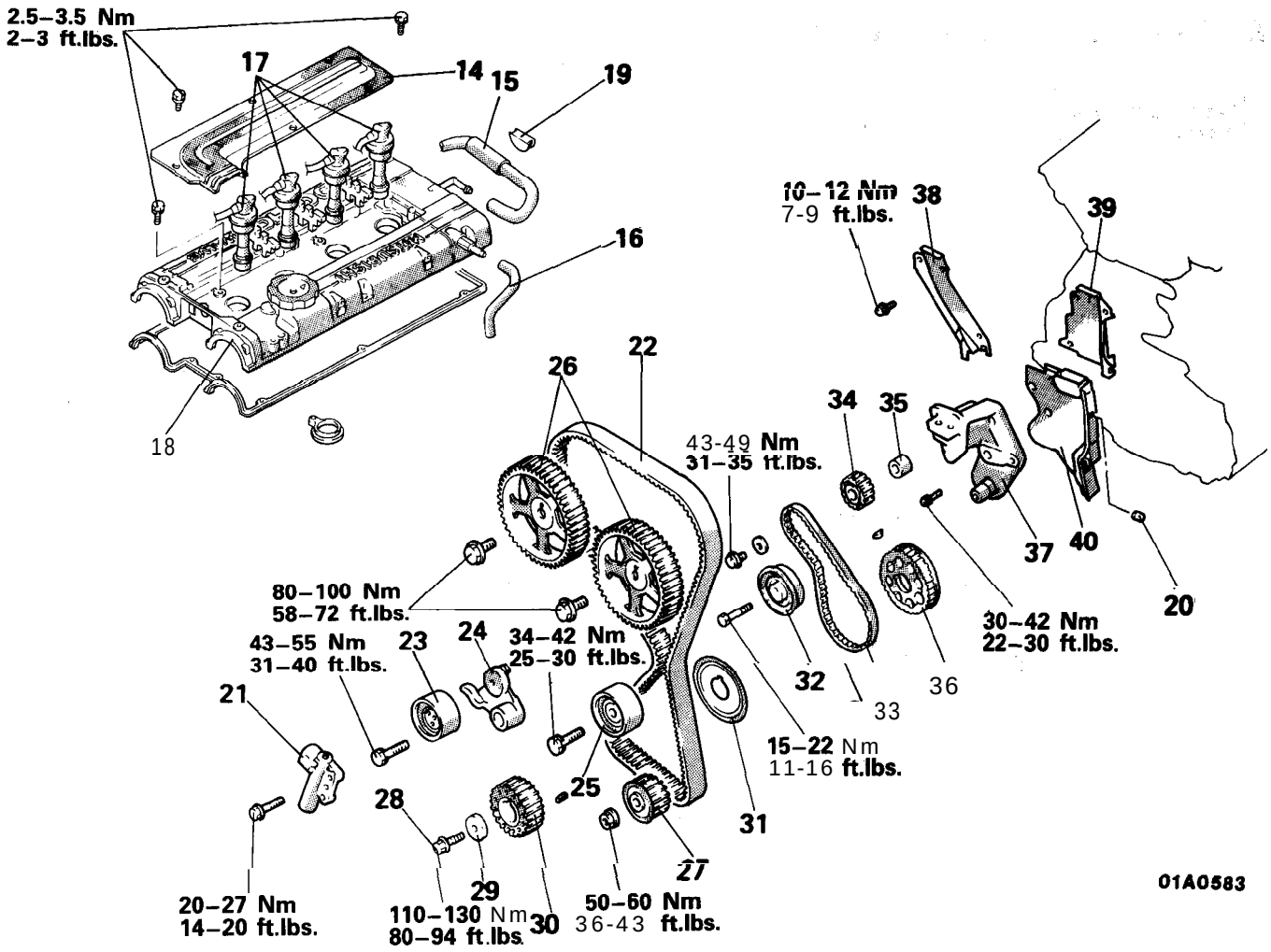



| Pre-removal Operation |
|---|
| •Removal of Under Cover |

Removal steps

1. Clamp for pressure hose (power steering)
2. Bracket
- ▪ ☒ 3. Engine mount bracket
4. Clamp of return pipe (power steering)
- ◆◆ 5. Drive belt (alternator)
6. Drive belt (power steering)
7. Tensioner pulley bracket
8. Drive belt (air conditioner)
9. Water pump pulley
10. Water pump pulley (power steering)
11. Crankshaft pulley
12. Timing belt front upper cover
13. Timing belt front lower cover
14. Center cover
15. Breather hose
16. PCV hose
17. Connection for spark plug cables
18. Rocker cover
19. Semi-circular packing
20. Plug rubber
- ◆◆ 21. Auto tensioner
- ◆◆ 22. Timing belt
23. Tensioner pulley
24. Tensioner arm
25. Idle pullev
- ◆◆ 26. Camshaft sprocket
- ◆◆ 27. Oil pump sprocket
28. Crankshaft sprocket bolt
29. Special washer
30. Crankshaft sprocket
31. Flange
32. Tensioner "B"
- ◆◆ 33. Timing belt "B"
34. Silent shaft sprocket
35. Spacer
36. Crankshaft sprocket "B"
37. Left engine support bracket
38. Timing belt rear right cover
39. Timing belt rear left cover (upper)
40. Timing belt rear left cover (lower)

NOTE
◆◆: Refer to "Service Points of Installation".

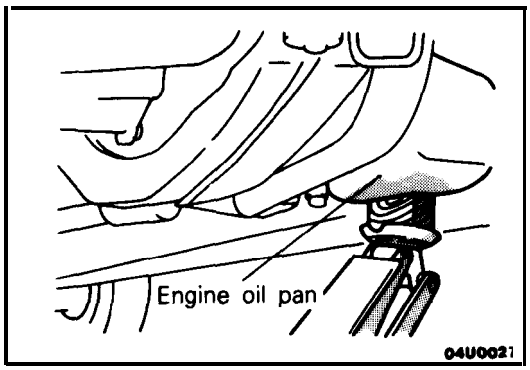



Installation steps

40. Timing belt rear left cover (lower)
39. Timing belt rear left cover (upper)
38. Timing belt rear right cover
37. Left engine support bracket
◆◆ 36. Crankshaft sprocket "B"
● + 35. Spacer
34. Silent shaft sprocket
● + 33. Timing belt "B"
◖ Adjustment of timing belt "B" tension
32. Tensioner "B"
● + 31. Flange
◆◆ 30. Crankshaft sprocket
29. Special washer
28. Crankshaft sprocket bolt
● + 27. Oil pump sprocket
● + 26. Camshaft sprocket
25. Idle pulley
◆◆ 21. Auto tensioner
24. Tensioner arm
● 23. Tensioner pulley
● + 22. Timing belt
◖ Adjustment of timing belt tension
20. Plug rubber
● + 19. Semi-circular packing
● 4 18. Rocker cover
17. Connection for spark plug cables
16. PCV hose
15. Breather hose
14. Center cover
● + 13. Timing belt front lower cover
◆◆ 12. Timing belt front upper cover
11. Crankshaft pulley
10. Water pump pulley (power steering)
9. Water pump pulley
◖ + 8. Drive belt (air conditioner)
7. Tensioner pulley bracket
◆◆ 6. Drive belt (power steering)
◖ + 5. Drive belt (alternator)
4. Return pipe clamp bolt (power steering)
3. Engine mount bracket
2. Bracket
1. Clamp for pressure hose (power steering)

**Post-installation Operation**
- Installation of Under Cover
- Engine Adjustment
(Refer to P.9-74.)

NOTE
◆◆: Refer to "Service Points of Installation".




## SERVICE POINTS OF REMOVAL

N09KBDGa

### 3. REMOVAL OF ENGINE MOUNT BRACKET

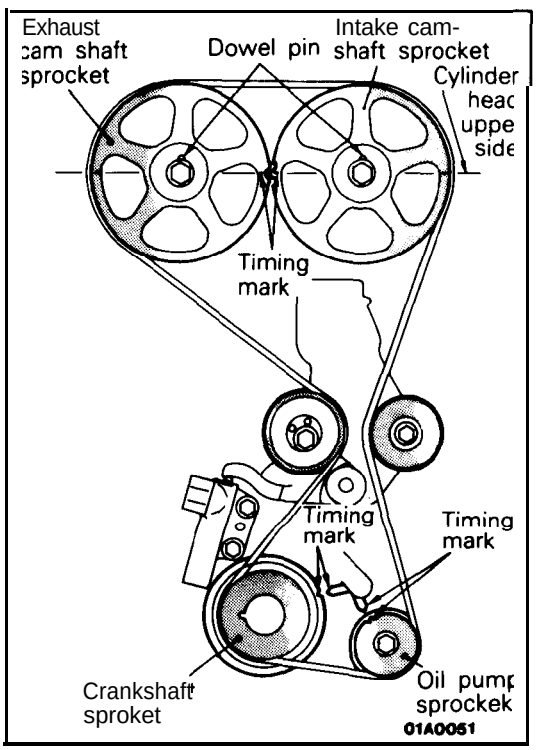
(1) With a wooden block placed against the oil pan part of the engine, jack up the vehicle.

**Caution**
**Jack up gently, so as not to apply a load to the various parts.**

(2) Remove the engine mount bracket,

### 5. REMOVAL OF DRIVE BELT (ALTERNATOR)

Before removing the drive belt, loosen the water pump pulley mounting bolts.

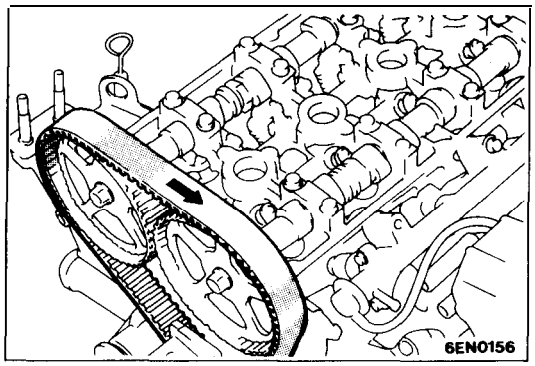



### 21. REMOVAL OF AUTO TENSIONER

(1) Turn the crankshaft clockwise and align the timing marks so as to bring the No. 1 cylinder to compression top-dead-centre position.
At this time the timing marks of the camshaft sprocket and the upper surface of the cylinder head should coincide, and the dowel pin of the camshaft sprocket should be at the upper side.

**Caution**
**The crankshaft must always be rotated clockwise.**

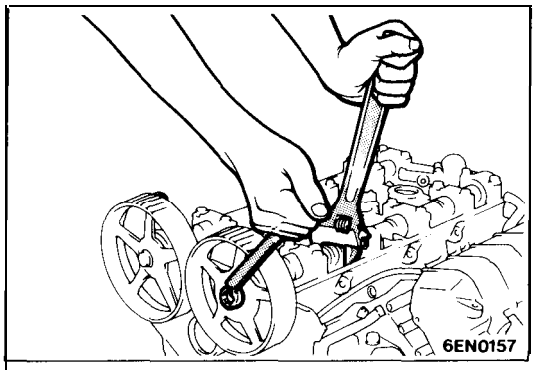
(2) Remove the auto tensioner.




**22. REMOVAL OF TIMING BELT**

Make a mark on the back of the timing belt indicating the direction of rotation so it may be reassembled in the same direction if it is to be reused.

**Caution**
**Water or oil on the belt shorten its life drastically, so the removed timing belt, sprocket, and tensioner must be free from oil and water. These parts should not be washed. Replace parts if seriously contaminated.**
**If there is oil or water on each part check the front case oil seals, camshaft oil seal and water pump for leaks.**

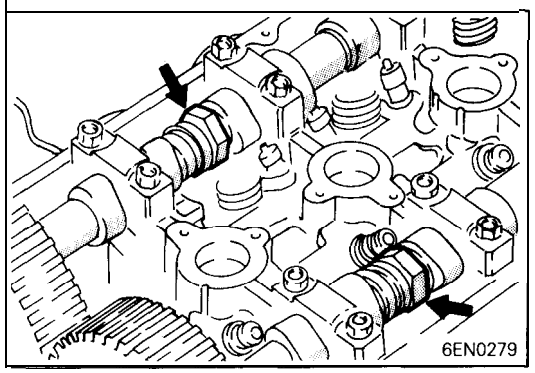


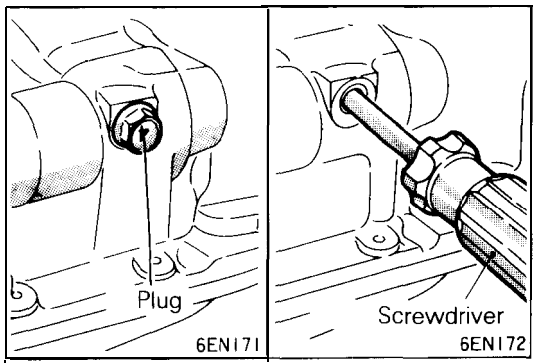

**26. REMOVAL OF CAMSHAFT SPROCKETS**

(1) Using a wrench, hold the camshaft at its hexagon (between the No. 2 and No. 3 journals) and remove the camshaft sprocket bolt.

**Caution**
**Locking the camshaft sprocket with a tool damages the sprocket.**

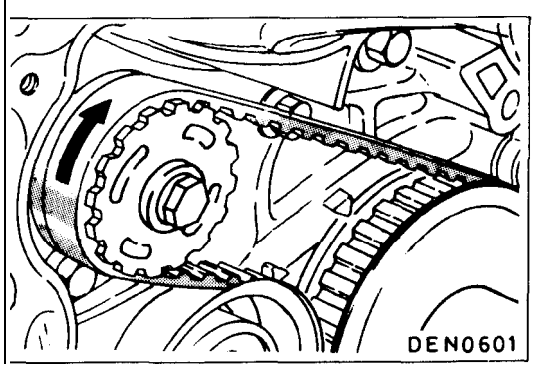
(2) Remove the camshaft sprockets.




**27. REMOVAL OF OIL PUMP SPROCKET**

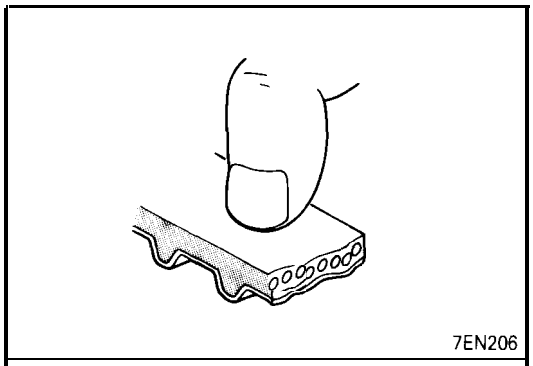
(1) Remove the plug on the side of the cylinder block.
(2) Insert a Phillips screwdriver [shank diameter 8 mm (.31 in.)] to block the left silent shaft.
(3) Remove the oil pump sprocket nut.
(4) Remove the oil pump sprocket.




**33. REMOVAL OF TIMING BELT "B"**

Make a mark on the back of the timing belt indicating the direction of rotation so it may be reassembled in the same direction if it is to be reused.

**Caution**
**Water or oil on the belt shorten its life drastically, so the removed timing belt, sprocket, and tensioner must be free from oil and water. These parts should not be washed. Replace parts if seriously contaminated.**
**If there is oil or water on each part check the front case oil seals, camshaft oil seal and water pump for leaks.**


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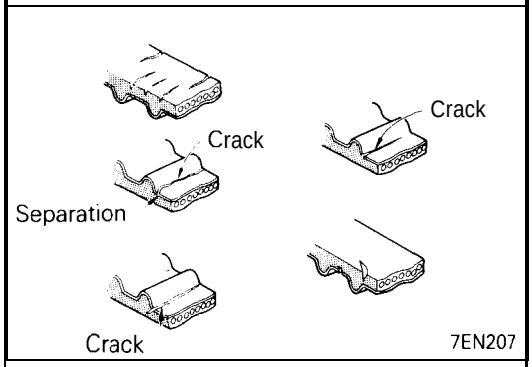
## INSPECTION

N09KCAC

### TIMING BELTS

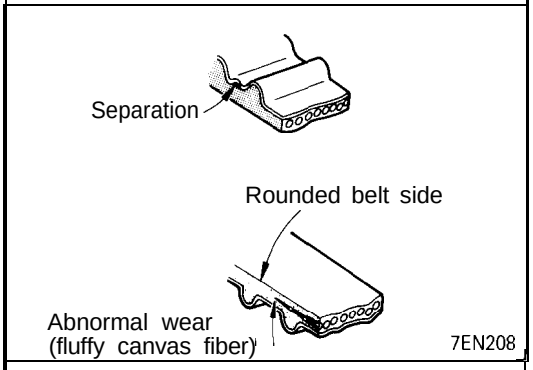
The timing belts must be checked closely. Should the following defects be evident, replace the belt with a new one.

(1) Hardened back surface rubber
Glossy, non-elastic, and so hard that no mark is produced even when scratched by a fingernail.



7EN207

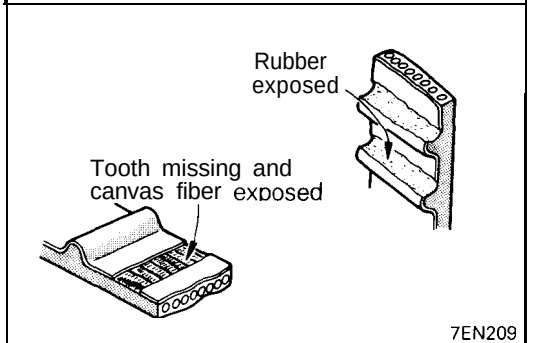
(2) Cracked back surface rubber.
(3) Cracked or separated canvas.
(4) Cracked tooth bottom.
(5) Cracked side.



7EN208

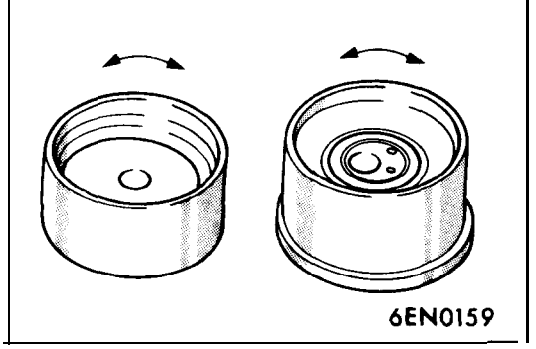
(6) Abnormal wear on side.

NOTE
Normal belt should have clear-cut sides as if cut by a sharp knife.



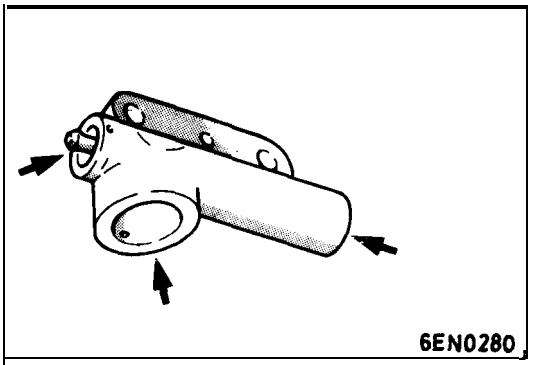
7EN209

(7) Abnormal wear on teeth.
Initial stage:
Canvas on load side tooth flank worn (Fluffy canvas fibers, rubber gone and color changed to white, and unclear canvas texture)
Final stage:
Canvas on load side tooth flank worn down and rubber exposed (tooth width reduced)
(8) Missing tooth.


6EN0159

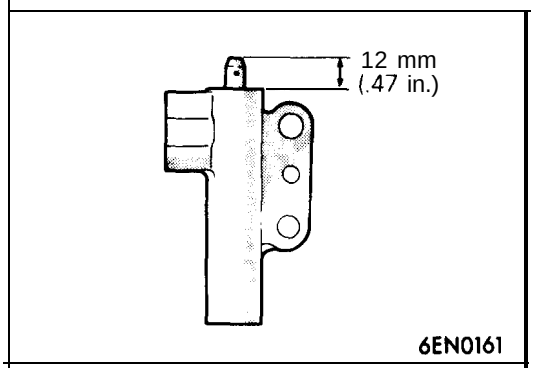
### TENSIONER PULLEY AND IDLER PULLEY

(1) Turn the pulleys to check for possible binding, excessive play, and unusual noise. Replace the pulley if any of these defects is evident.
(2) Replace if there is a grease leak.


6EN0280

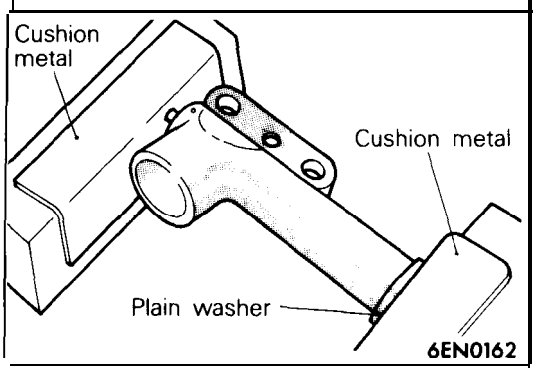
**AUTO TENSIONER**

(1) Check the auto tensioner for possible leaks and replace as necessary.
(2) Check the rod end for wear or damage and replace as necessary.



6EN0161

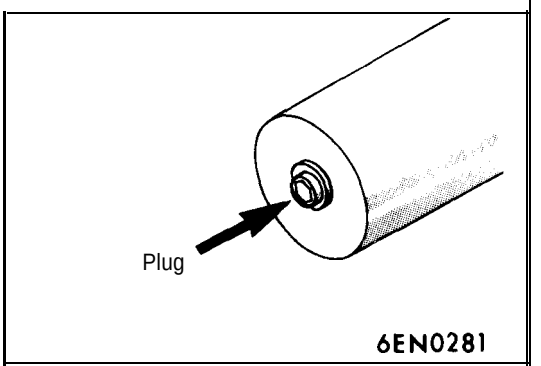
(3) Measure the rod protrusion. If it is out of specification, replace the auto tensioner.
**Standard value: 12 mm (.47 in.)**



6EN0162

(4) Using a vise with soft jaws push in the auto tensioner rod. If the rod can be easily retracted, replace the auto tensioner. You should feel a fair amount of resistance when pushing the rod in.

**Caution**
**1. Clamp the auto tensioner in the vise so it maintains a level position.**

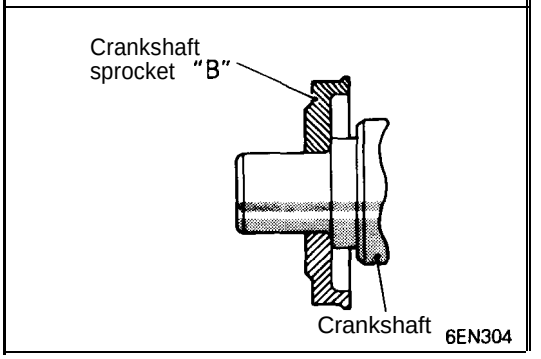


6EN0281

**2. If the plug at the bottom of the auto tensioner protrudes, surround it with a plain washer as illustrated to prevent the plug from being in direct contact with the vise.**

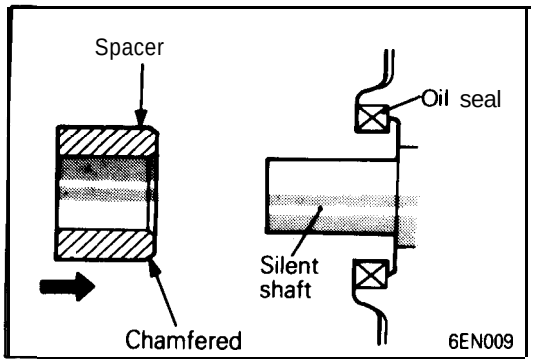
## SERVICE POINTS OF INSTALLATION N09KDCM

### 36. INSTALLATION OF CRANKSHAFT SPROCKET "B"



6EN304

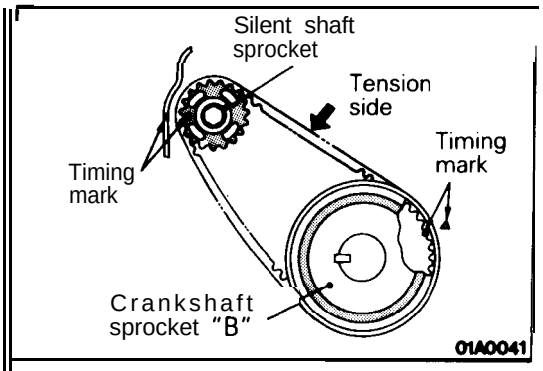
Install the crankshaft sprocket "B" as shown while paying attention to its direction.




**35. INSTALLATION OF SPACER**

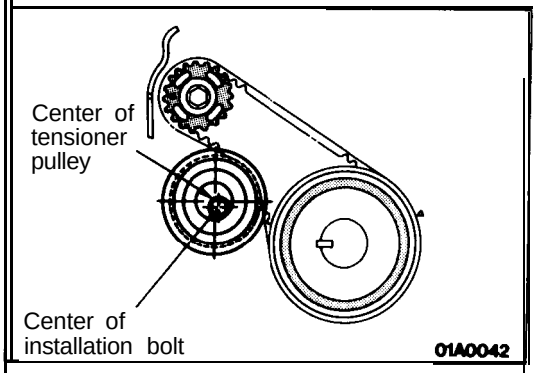
(1) Apply a thin coat of engine oil to the outer circumference of the spacer.
(2) Install the spacer with the chamfered end facing the oil seal.

NOTE
If the spacer is installed adversely, the oil seal may be damaged, resulting in the oil leaks.



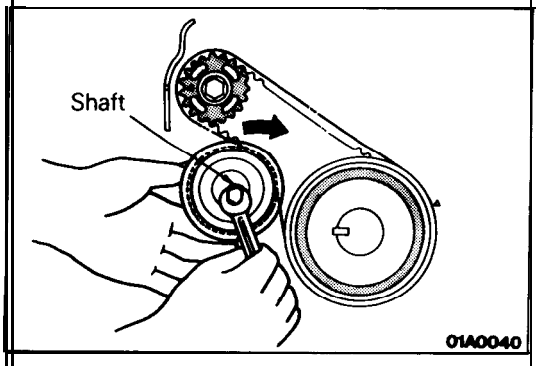

**33. INSTALLATION OF TIMING BELT "B"**

(1) Ensure that crankshaft sprocket "B" timing mark and the silent shaft sprocket timing mark are aligned.
(2) Fit timing belt "B" over crankshaft sprocket "B" and the silent shaft sprocket. Ensure that there is no slack in the belt.



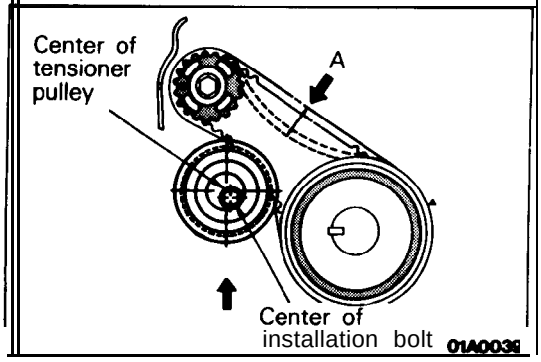

**. ADJUSTMENT OF TIMING BELT "B" TENSION**

(1) Temporarily fix the timing belt "B" tensioner such that the center of the tensioner pulley is to the left and above the center of the installation bolt, and temporarily attach the tensioner pulley so that the flange is toward the front of the engine.



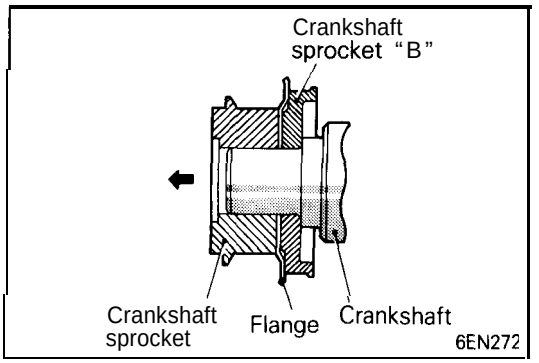

(2) Holding the timing belt "B" tensioner up with your finger in the direction of the arrow, place pressure on the timing belt so that the tension side of the belt is taut. Now tighten the bolt to fix the tensioner.

**Caution**
**When tightening the bolt, ensure that the tensioner pulley shaft does not rotate with the bolt. Allowing it to rotate with the bolt can cause excessive tension on the belt.**




(3) To ensure that the tension is correct, depress the belt (point A) with a finger. If not, adjust.

**Standard value: 5-7 mm (.20–.28 in.)**




**31. INSTALLATION OF FLANGE**

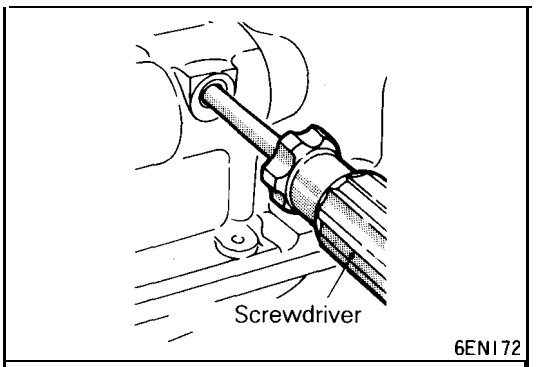
Install the flange in correct direction as shown.

**Caution**
**Pay special attention to the direction of the flange. If it is installed in the wrong direction, a broken timing belt could result.**

**30. INSTALLATION OF CRANKSHAFT SPROCKET**

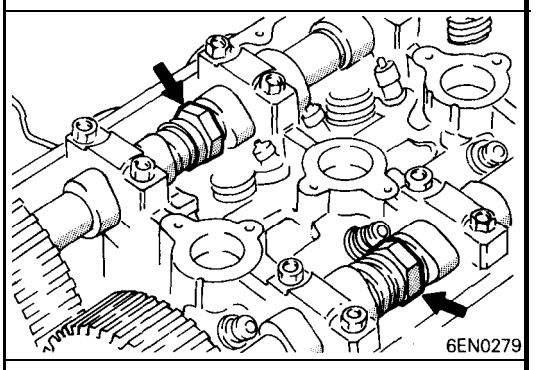
Install the crankshaft sprocket in the correct direction as shown.

**Caution**
**Pay special attention to the direction of the flange. If it is installed in the wrong direction, a broken timing belt could result.**




**27. INSTALLATION OF OIL PUMP SPROCKET**

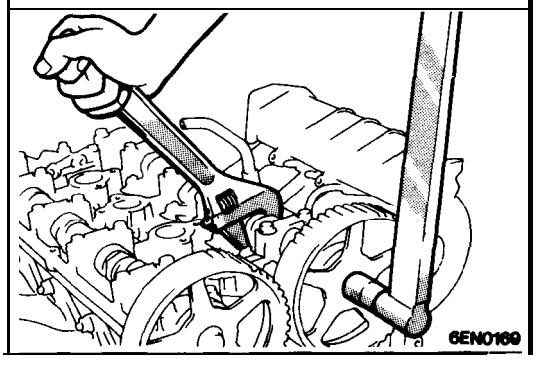
(1) Insert a Phillips screwdriver [shank diameter 8 mm (.31 in.) shaft] through the plug hole on the left side of cylinder block to block the left silent shaft.
(2) Install the oil pump sprocket.
(3) Tighten the nut to the specified torque.

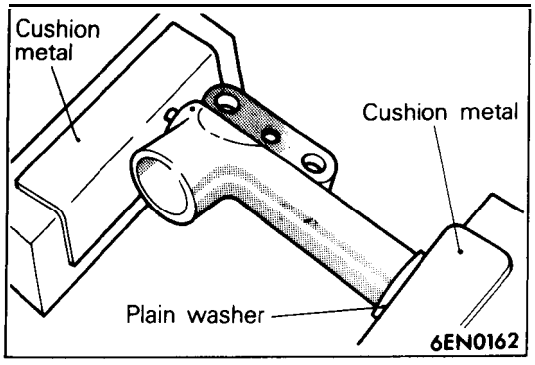



**26. INSTALLATION OF CAMSHAFT SPROCKETS**

Using a wrench, hold the camshaft at its hexagon (between the No. 2 and No. 3 journals) and tighten the bolt to specification.

**Caution**
**Locking the camshaft sprocket with a tool damages the sprocket.**

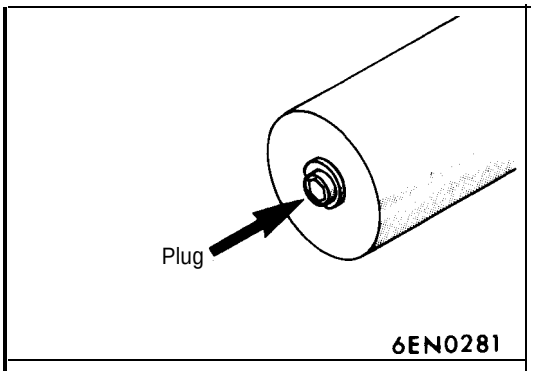




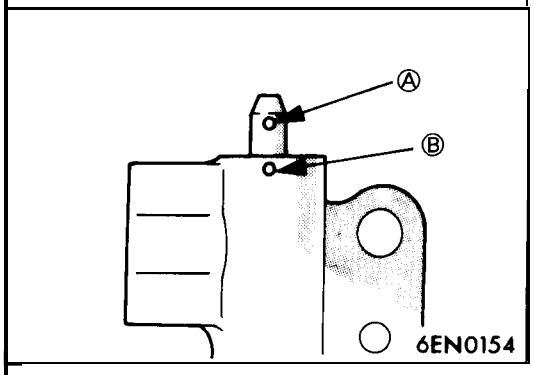

**21. INSTALLATION OF AUTO TENSIONER**

(1) If the auto tensioner rod is in its fully extended position, reset it as follows.

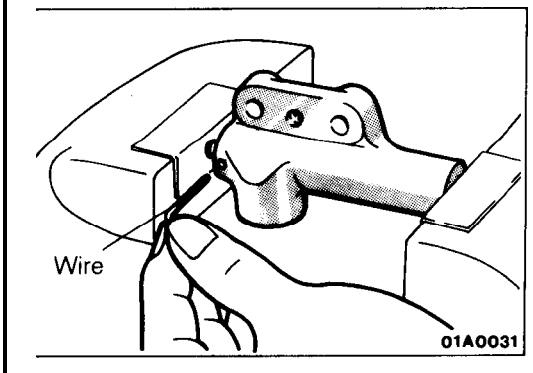
① Keep the auto tensioner level and, in that position, clamp it in the vise with soft jaws.




If the plug at the bottom of the auto tensioner protrudes, surround it with a plain washer as illustrated to prevent the plug from being in direct contact with the vise.




② Push in the rod little by little with the vise until the set hole Ⓐ in the rod is aligned with that Ⓑ in the cylinder.

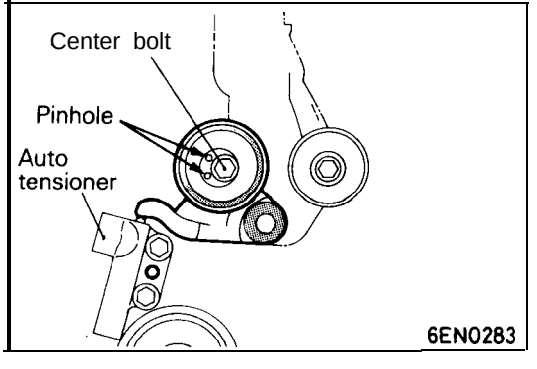



③ Insert a wire [1.4 mm (.055 in.) in diameter] into the set holes.

④ Unclamp the auto tensioner from the vise.

(2) Install the auto tensioner.

**Caution**
**Leave the wire installed in the auto tensioner.**

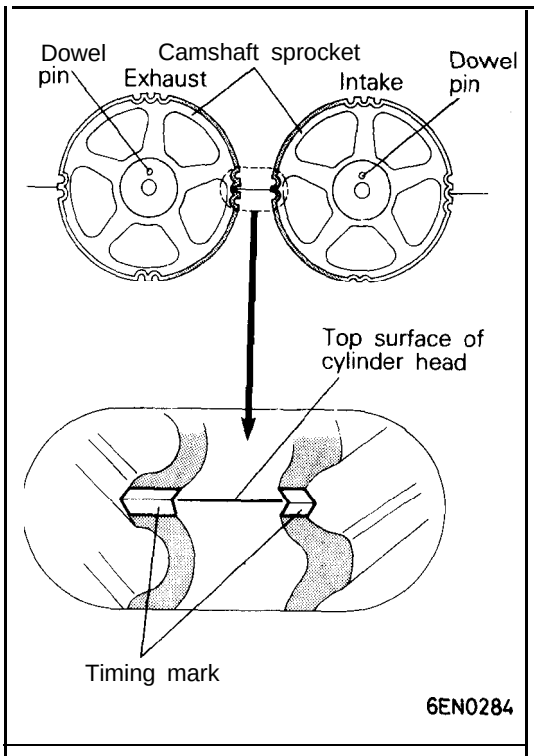


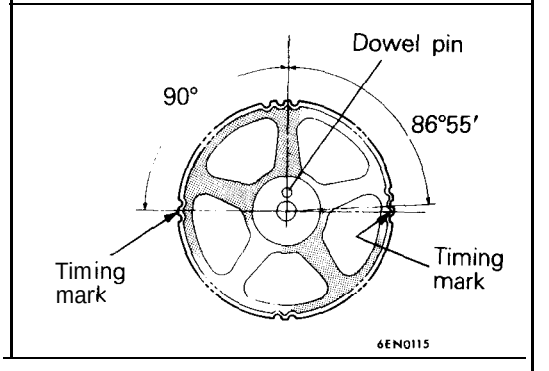

**23. INSTALLATION OF TENSIONER PULLEY**

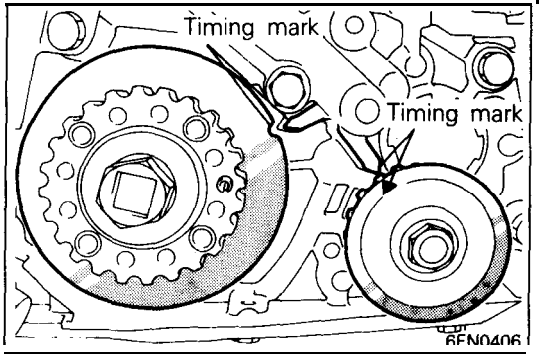
(1) Install the tensioner pulley onto the tensioner arm.

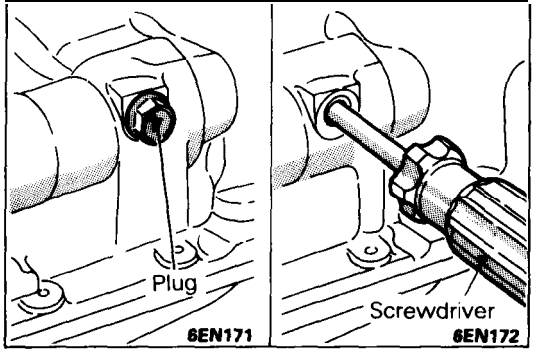
(2) Locate the pinhole in the tensioner pulley shaft to the left of the center bolt. Then, tighten the center bolt finger-tight.

**Caution**
**Leave the wire installed in the auto tensioner.**




## 22. INSTALLATION OF TIMING BELT

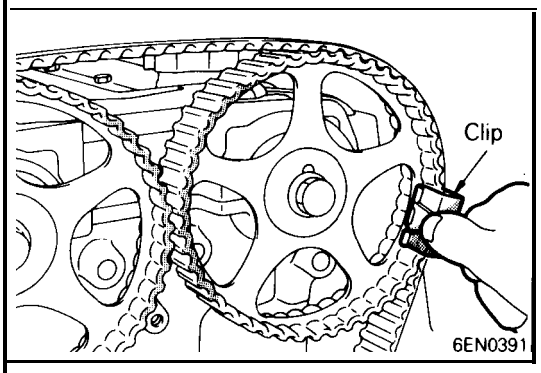
(1) Turn the two sprockets so that their dowel pins are located on top. Then, align the timing marks facing each other with the top surface of the cylinder head. When, you let go of the exhaust camshaft sprocket, it will rotate one tooth in the counterclockwise direction. This should be taken into account when installing the timing belt on the sprockets.

NOTE
The same camshaft sprocket is used for the intake and exhaust camshafts and is provided with two timing marks. When the sprocket is mounted on the exhaust camshaft, use the timing mark on the right with the dowel pin hole on top. For the intake camshaft sprocket, use the one on the left with the dowel pin hole on top.

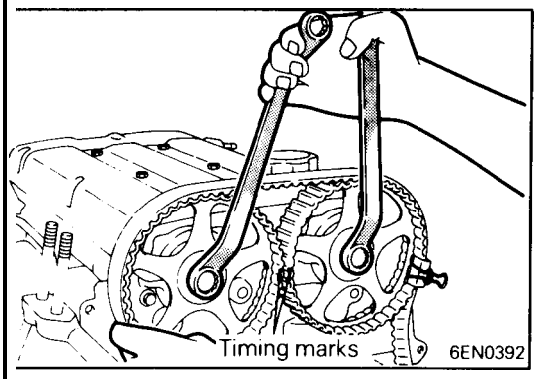
(2) Align the crankshaft sprocket timing mark.
(3) Align the oil pump sprocket timing mark.

(4) Remove the plug on the cylinder block and insert a Phillips screwdriver [shank diameter 8 mm (.31 in.)] through the hole.
If it can be inserted as deep as 60 mm (2.4 in.) or more, the timing marks are correctly aligned. If the inserted depth is only 20–25 mm (.8–1.0 in.), turn the oil pump sprocket one turn and realign timing marks. Then check to ensure that the screwdriver can be inserted 60 mm (2.4 in.) or more. Keep the screwdriver inserted until the installation of the timing belt is finished.

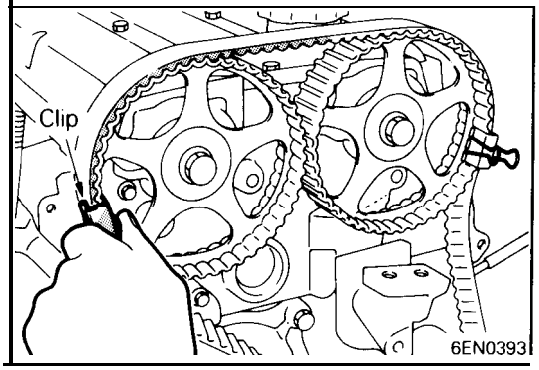
NOTE
Step (4) is performed to ensure that the oil pump sprocket is correctly positioned with reference to the silent shafts.



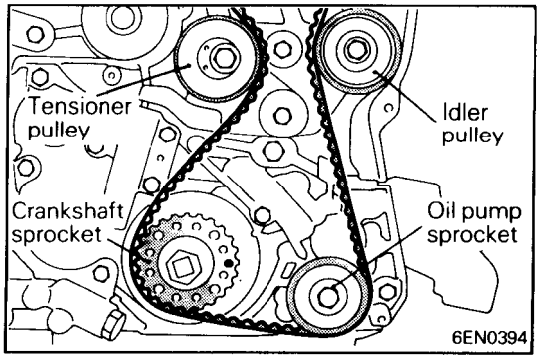

(5) Thread the timing belt over the intake side camshaft sprocket and fix it an indicated position by a clip.



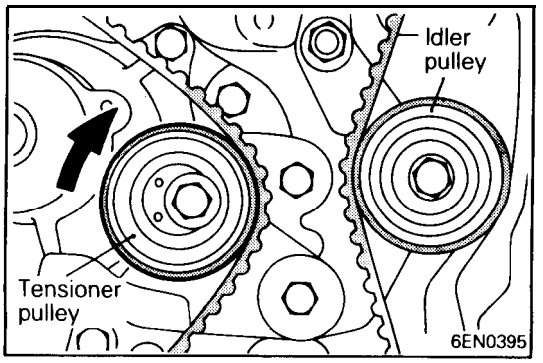

(6) Thread the timing belt over the exhaust side sprocket, aligning the timing marks with the cylinder head top surface using two wrenches.



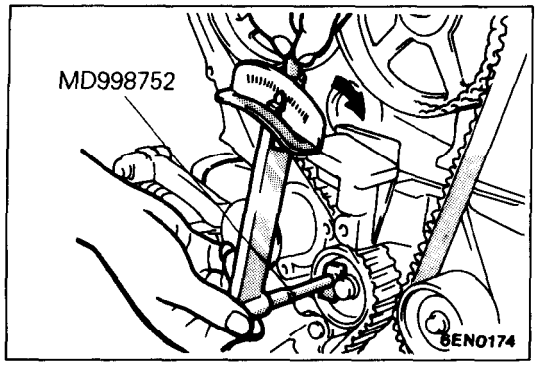

(7) Fix the belt at indicated position by a clip.

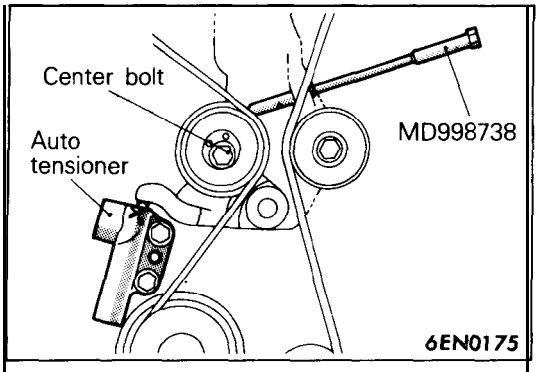


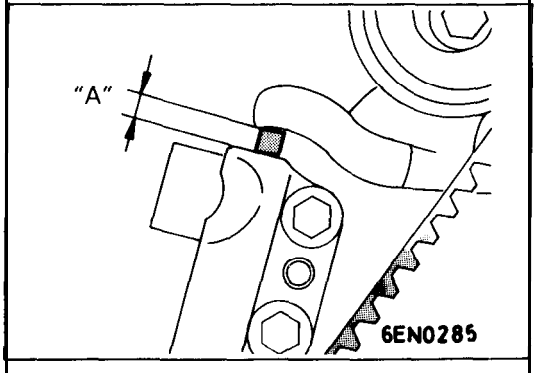

(8) Thread the timing belt over the idler pulley, the oil pump sprocket, the crankshaft sprocket and the tension pulley in the order shown.
(9) Remove the two clips.

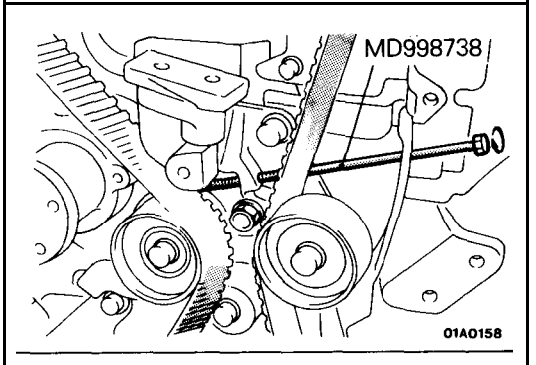


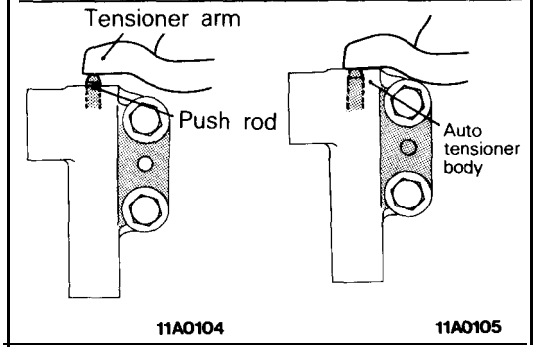

(10) Lift up the tensioner pulley in the direction of arrow and tighten the center bolt.
(11) Check to see that all timing marks are lined up.
(12) Remove the screwdriver inserted in step (4) and fit the plug.
(13) Give the crankshaft a quarter counterclockwise turn. Then, turn it clockwise until the timing marks are lined up again.




**. ADJUSTMENT OF TIMING BELT TENSION**

(1) After turning the crankshaft 1/4 turn counterclockwise, turn it clockwise to move the No. 1 cylinder to top dead center.

(2) Loosen the center bolt, and then, as shown in the illustration, attach the special tool and a torque wrench and apply a torque of 2.6-2.8 Nm (1.88–2.03 ft.lbs.). If the body interferes with the special tool and the torque wrench, use a jack to slightly raise the engine assembly.

NOTE
Use a torque wrench that is capable of measurement within a range of 0–3 Nm (0–2.2 ft.lbs.).

(3) Holding the tensioner pulley with the special tool and torque wrench, tighten the center bolt to specification.

(4) Screw the special tool into the engine left support bracket until its end makes contact with the tensioner arm. At that point, screw the special tool in some more and then remove the set wire attached to the auto tensioner.

(5) Remove the special tool.

(6) Rotate the crankshaft two complete turns clockwise and leave it as is for about 15 minutes. Then, measure the auto tensioner protrusion "A" (distance between the tensioner arm and auto tensioner body) to ensure that it is up to specification.

**Standard value: 3.8–4.5 mm (.15–.18 in.)**

If it is out of specification, repeat steps (6) through (1) until the specified value is obtained.

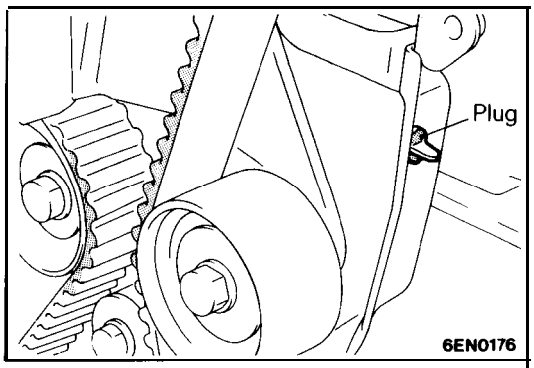
(7) If the clearance between the tensioner arm and the auto tensioner body cannot be measured (when the engine is being mounted, etc.), the following procedures can be used to substitute for the ordinary method of measurement.

① Screw in the special tool until it contacts the tensioner arm.

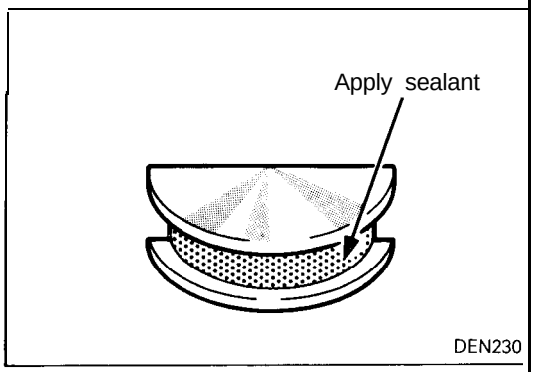
② From that point of contact, further screw in the special tool, screwing it in until the push rod of the auto tensioner body is caused to move backward and the tensioner arm contacts the auto tensioner body.

Check to be sure that the amount that the special tool has been screwed in (when the push rod moves backward) is the standard value.

**Standard value: 2.5-3 turns**



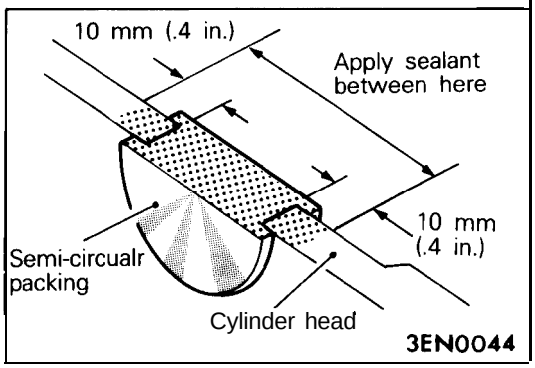

(8) Install the rubber plug to the timing belt rear cover.




**19. APPLICATION OF SEALANT ON SEMI-CIRCULAR PACKING**

Apply sealant on the periphery of the semi-circular packing.

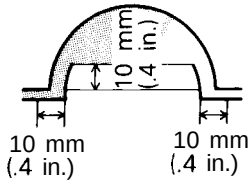
**Specified sealant: MOPAR Part No.4318034 or equivalent**

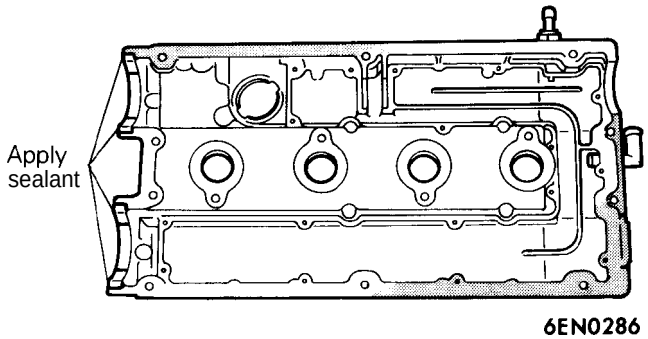


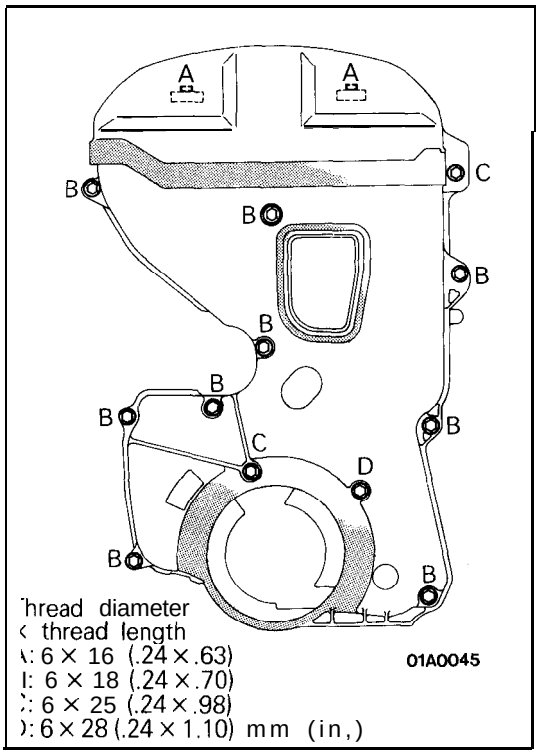

**18. APPLICATION OF SEALANT ON ROCKER COVER**

Apply sealant to the areas indicated in the illustration.

**Specified sealant: MOPAR Part No.4318034 or equivalent**






'hread diameter
‹ thread length
ı: 6 × 16 (.24 × .63)
I: 6 × 18 (.24 × .70)
:: 6 × 25 (.24 × .98)
): 6 × 28 (.24 × 1.10) mm (in.)

**13. INSTALLATION OF TIMING BELT LOWER COVER/ 12. TIMING BELT UPPER COVER**

The dimensions of the installation bolts for the timing covers differ according to the installation location, so be sure not to install the bolts in the incorrect locations.

**8. TENSION ADJUSTMENT OF THE AIR CONDITIONER COMPRESSOR DRIVE BELT**

Refer to GROUP 24–Service Adjustment Procedures.

**6. DEFLECTION ADJUSTMENT OF POWER STEERING OIL PUMP DRIVE BELT**

Refer to GROUP 1 9–Service Adjustment Procedures.

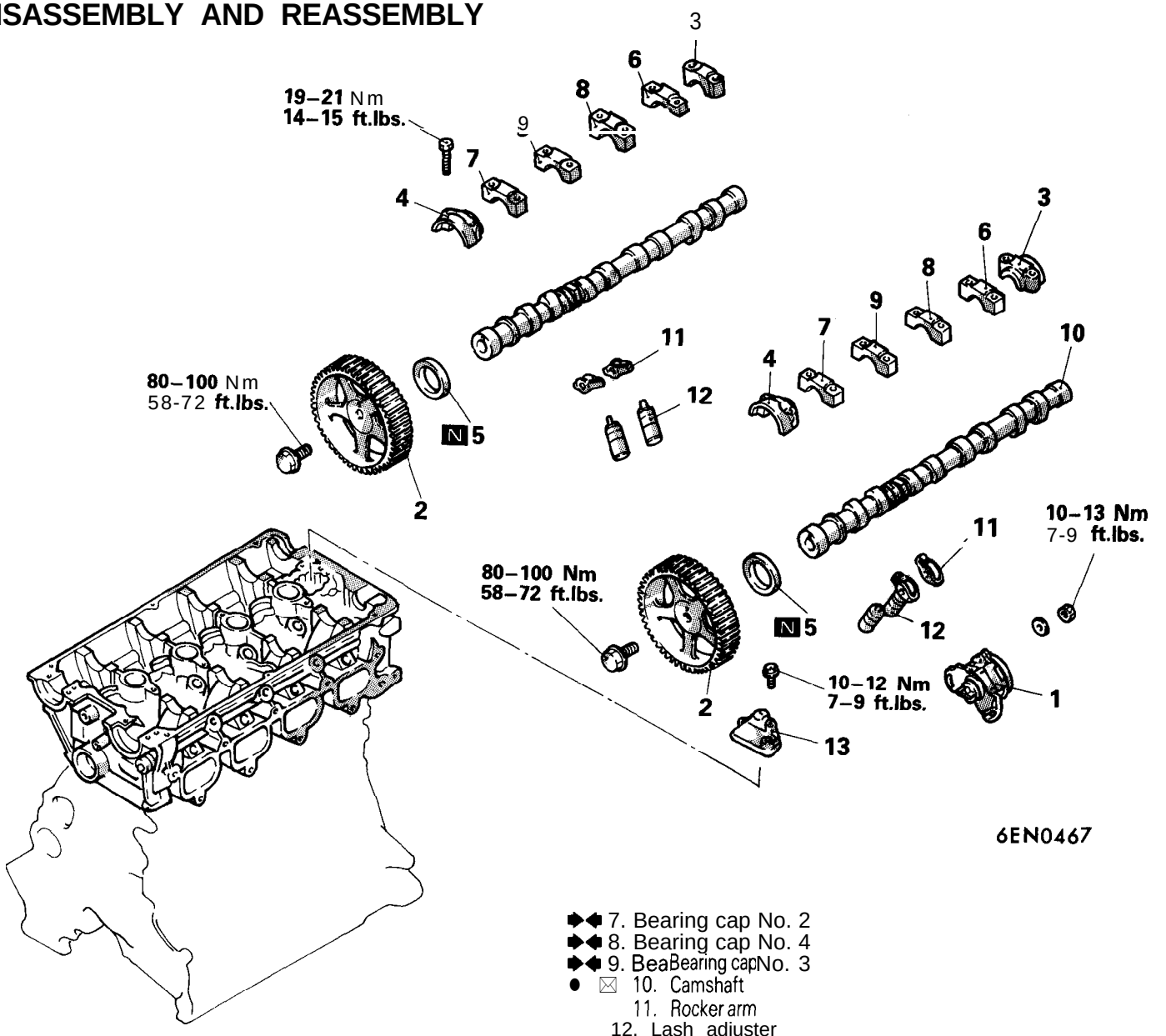
**5. TENSION ADJUSTMENT OF THE ALTERNATOR DRIVE BELT**

Refer to GROUP 7–Maintenance Service.

# CAMSHAFT AND ROCKER ARM

N09LE-B

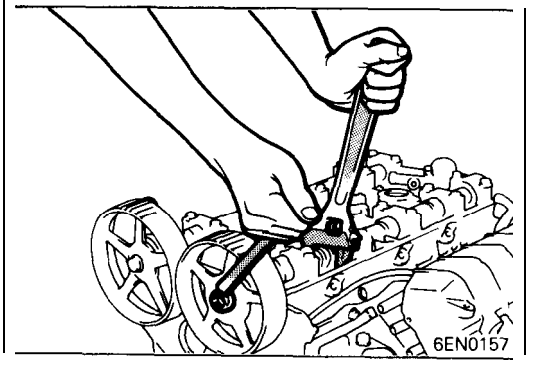
## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

- ◆◆ 1. Crank angle sensor
- ◆◆ ● + 2. Camshaft sprocket
- ● + 3. Bearing cap rear
- ◆◆ 4. Bearing cap front
- ● 4 5. Camshaft oil seal
- ● * 6. Bearing cap No. 5
- ◆◆ 7. Bearing cap No. 2
- ◆◆ 8. Bearing cap No. 4
- ◆◆ 9. BeaBearing capNo. 3
- ● ☒ 10. Camshaft
- 11. Rocker arm
- 12. Lash adjuster
- 13. Oil delivery body

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● a: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY

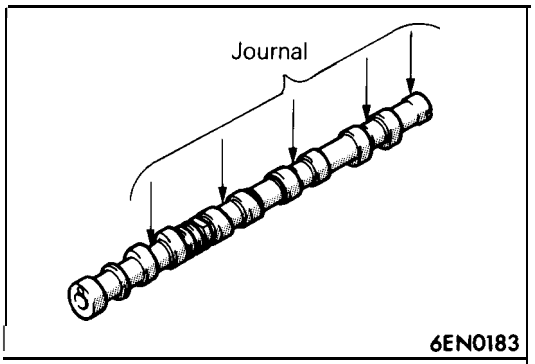
N09LBDD

### 2. REMOVAL OF CAMSHAFT SPROCKET

(1) Using a wrench, hold the camshaft at its hexagon (between the No.2 and No.3 journals) and remove the camshaft sprocket bolt.

**Caution**
**Locking the camshaft sprocket with a tool damages the sprocket.**

(2) Remove the camshaft sprockets.

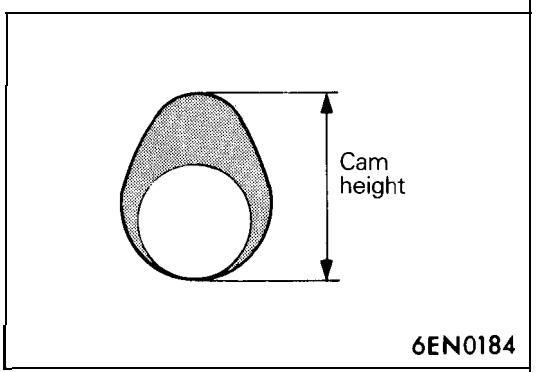



## INSPECTION

N09LCDC

### CAMSHAFT

(1) Visually check the camshaft journal surfaces and replace if damage or seizure is evident.
If the journal is seized, check the cylinder head for possible damage. Check also for clogged oil holes in the cylinder head.



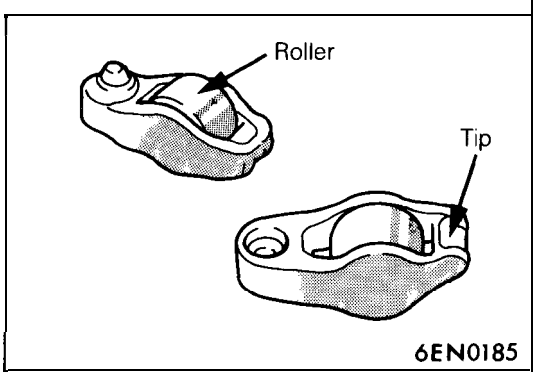

(2) Check cams for excessive wear and damage and replace if defects are evident. Measure the cam height and replace if the limit is not reached.

**Standard value:**

| | |
|---|---|
| **Intake** | |
| **<Non-Turbo, Turbo-M/T>** | **35.493mm (1.3974 in.)** |
| **<Turbo-A/T>** | **35.200mm (1.3858 in.)** |
| **Exhaust** | |
| **<Non-Turbo, Turbo-A/T>** | **35.200mm (1.3858 in.)** |
| **<Turbo-M/T>** | **35.493mm (1.3974 in.)** |

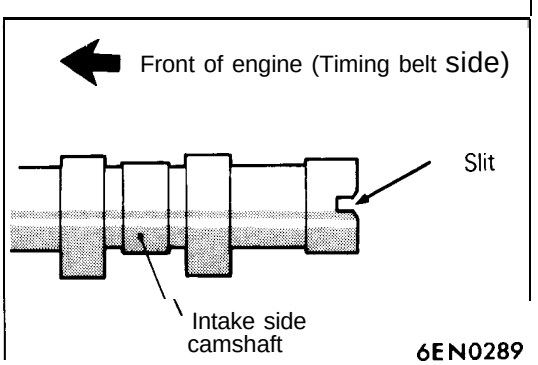
**Limit:**

| | |
|---|---|
| **Intake** | |
| **<Non-Turbo, Turbo-M/T>** | **34.993mm (1.3777 in.)** |
| **<Turbo-A/T>** | **34.700mm (1.3661 in.)** |
| **Exhaust** | |
| **<Non-Turbo, Turbo-A/T>** | **34.700mm (1.3661 in.)** |
| **<Turbo-M/T>** | **35.993mm (1.3777 in.)** |




### ROCKER ARM

(1) Visually check the roller and replace if dent, damage, or seizure is evident.
(2) Check the roller for smooth rotation. Replace if it binds or there is an excessive play.
(3) Check the valve contact surface for possible damage or seizure and replace as necessary.

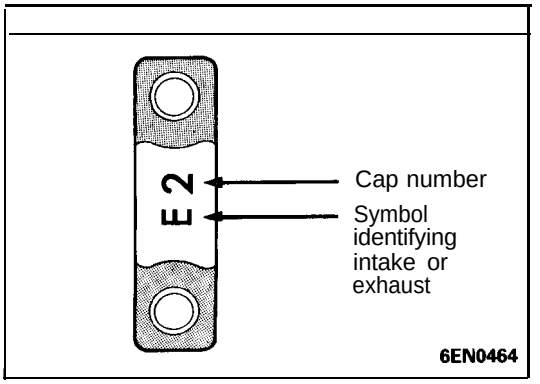



## SERVICE POINTS OF REASSEMBLY

N09LGAB

### 10. INSTALLATION OF CAMSHAFT

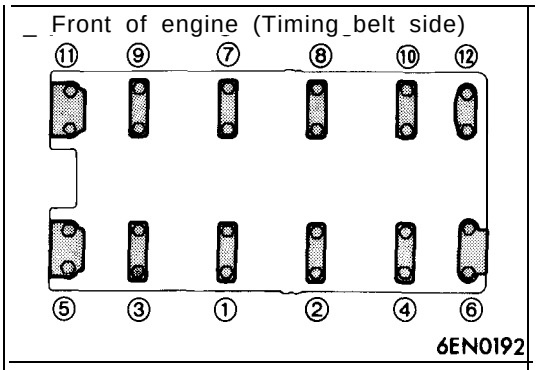
(1) Apply engine oil to journals and cams of the camshafts.
(2) Install the camshafts on the cylinder head.
Use care not to confuse the intake camshaft with the exhaust one. The intake camshaft has a slit on its rear end for driving the crank angle sensor.
(3) Make also sure that the dowel pins on the camshaft sprocket end are located on the top.



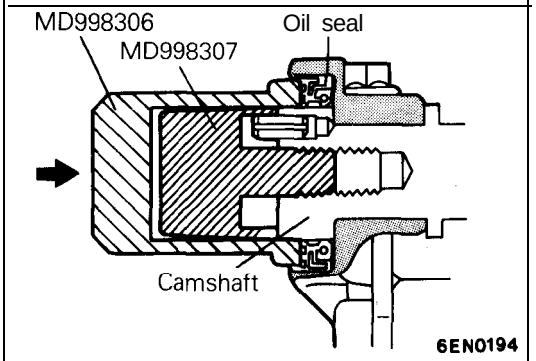

### 9./8./7./6./4./3. INSTALLATION OF BEARING CAPS

(1) Bearing cap Nos. 2 to 5 are of the same shape. At installation, check with the markings on the caps of cap number and intake/exhaust identification symbol. Only "I" or "E" is stamped on No. 1 bearing cap.

I: For Intake camshaft side
E: For Exhaust camshaft side

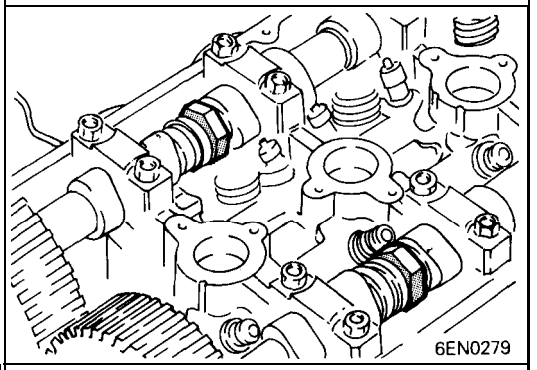



(2) Tighten the bearing caps in the order shown two to three times by torquing progressively.
Tighten to specification in the final sequence.
(3) Check to be sure that the rocker arm is correctly placed on the lash adjuster and valve stem end.




**5. INSTALLATION OF CAMSHAFT OIL SEAL**

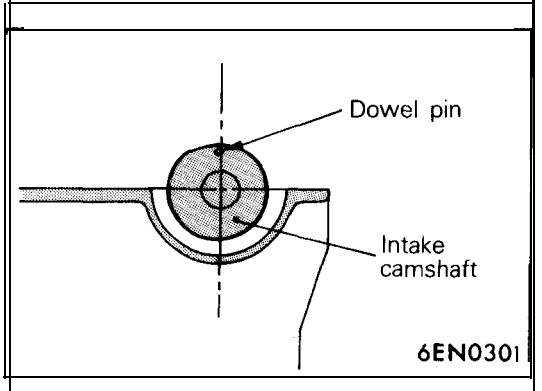
(1) Install the special tool, Guide, on the camshaft.
(2) Apply oil to the oil seal and insert the seal along the Guide until it contacts the cylinder head.
(3) Using the special tool, Installer, press-fit the oil seal into the cylinder head.




**2. INSTALLATION OF CAMSHAFT SPROCKET**

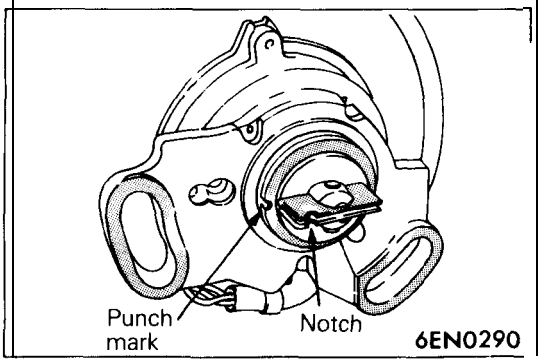
Using a wrench hold the camshaft at its hexagon (between the No.2 and No.3 journals) and tighten the bolt to specification.

**Caution**
**Locking the camshaft sprocket with a tool damages the sprocket.**




**1. INSTALLATION OF CRANK ANGLE SENSOR**

(1) Locate the dowel pin on the sprocket side of the intake camshaft at top.




(2) Align the punch mark on the crank angle sensor housing with the notch in plate.

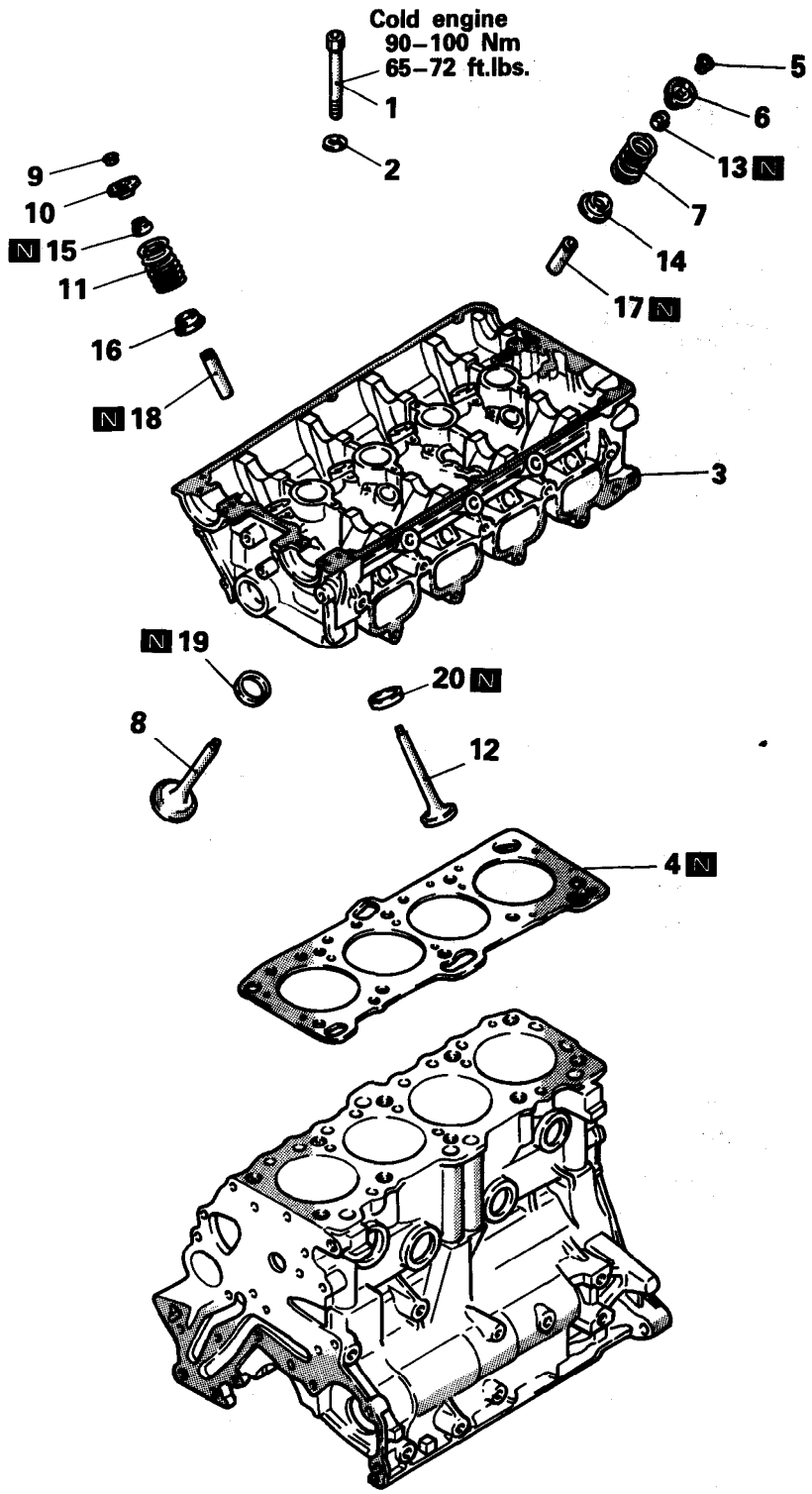
NOTE
The crank angle sensor can be installed even when the punch mark is positioned opposite the notch; however, the position results in incorrect fuel injection and ignition timings.

(3) Install the crank angle sensor on the cylinder head.

# CYLINDER HEAD AND VALVE

## DISASSEMBLY AND REASSEMBLY

N09PE-B

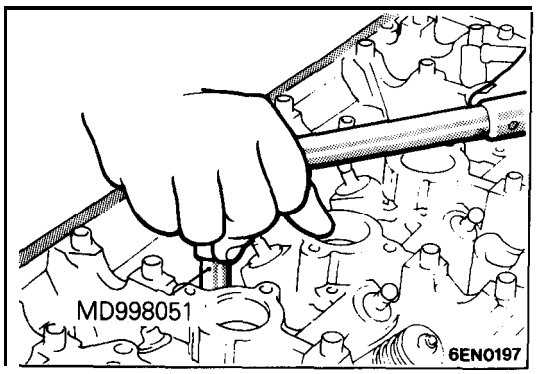



6E N0196

Disassembly steps

- ◆◆ ▶◆ 1.Cylinder head bolt
- 2.Washer
- 3.Cylinder head
- 4.Gasket
- ▶◆ 5.Retainer lock
- 6.Valve spring retainer
- 7.Valve spring
- ◆◆ 8.Intake valve
- ▶◆ 9.Retainer lock
- 10.Valve spring retainer
- 11.Valve spring
- ◆◆ 12.Exhaust valve
- ◆◆ ▶◆ 13.Valve stem seal
- 14.Valve spring seat
- ◆◆ ▶◆ 15.Valve stem seal
- 16.Valve spring seat
- 17.Intake valve guide
- 18.Exhaust valve guide
- 19.Intake valve seat
- 20.Exhaust valve seat

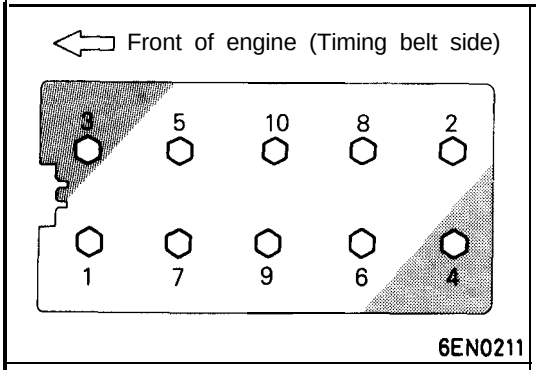
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



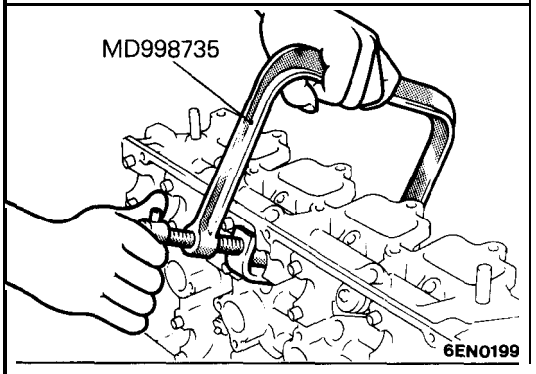

## SERVICE POINTS OF DISASSEMBLY N09PFAG

### 1. REMOVAL OF CYLINDER HEAD BOLTS

(1) Using the special tool, remove the cylinder head bolts in sequence shown in figure.

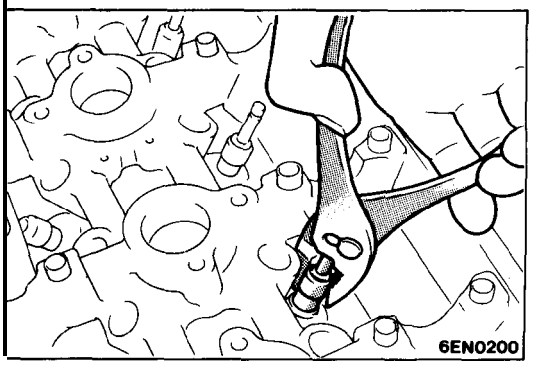



(2) Loosen the cylinder head bolts in the order shown. Loosen bolts evenly little by little, taking several steps.




### 8. REMOVAL OF INTAKE VALVE/12. EXHAUST VALVE

(1) Using the valve spring compressor, compress the spring and remove the retainer lock.
(2) Remove the spring retainer, valve spring, spring seat, and valve.
(3) Keep removed parts in order according to the cylinder number and intake/exhaust.




### 13./15. REMOVAL OF VALVE STEM SEALS

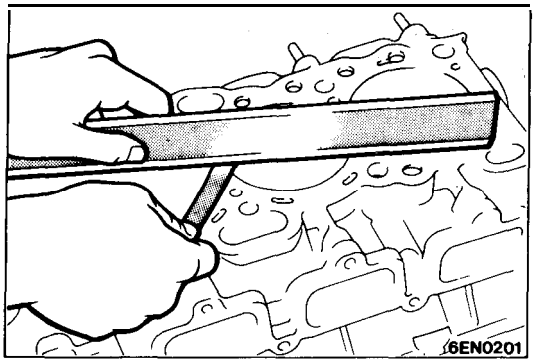
To remove the valve stem seal, use pliers.

**Caution**
**Do not reuse** the stem seals.

## INSPECTION N09OCAH

### CYLINDER HEAD

(1) Before cleaning the cylinder head, be sure to check for possible coolant or gas leak, damage, and cracks.
(2) Completely remove oil, scale, sealant, and carbon deposits. After the oil passages have been flushed, blow air into the passages to ensure that they are not plugged.




(3) Using a straight edge and feeler gauge, check the cylinder head bottom surface for flatness. If it warps excessively correct by grinding within the allowable limit.

Bottom surface distortion

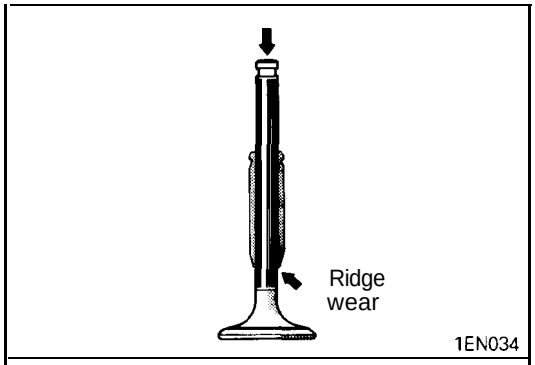
**Standard value:** **Within 0.05 mm (.0020 in.)**

**Limit:** **'0.2 mm (.008 in.)**

**Grinding limit:** **0.2 mm (.008 in.)**

**Cylinder head height (when new):**
**132.0 mm (5.197 in.)**

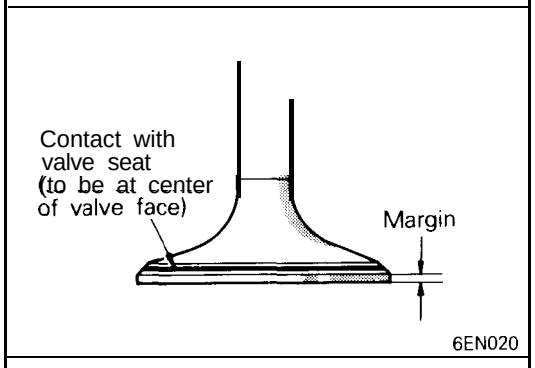
**Caution**
**The total thickness of the stock allowed to be removed from the cylinder head and mating cylinder block is 0.2 mm (.008 in.) at maximum.**




## VALVE

N09PGAE

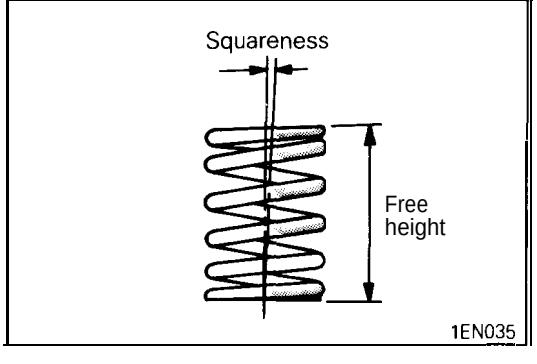
(1) Check the valve stem for wear (ridge wear).
(2) Check the valve stem end face for wear and dents.




(3) Check the valve seat for proper contact with the valve set. If it is not concentric, correct the valve seat.
(4) If the margin is out of the limit, replace the valve.

**Standard value:**
**Intake** **1.0 mm (.040 in.)**
**Exhaust** **1.5 mm (.059 in.)**

**Limit:**
**Intake** **0.7 mm (.028 in.)**
**Exhaust** **1.0 mm (.040 in.)**




## VALVE SPRING

N09PGBC

(1) Measure the free height of the spring and replace if it is out of the limit.

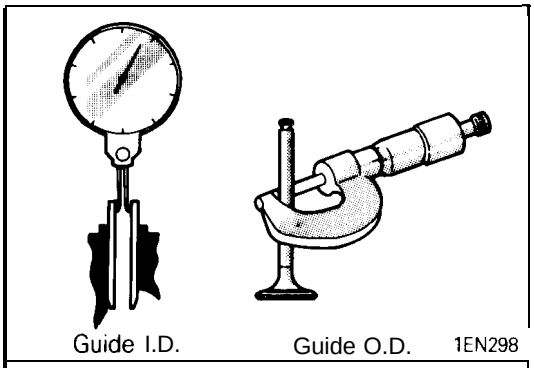
**Standard value: 48.3 mm (1.902 in.)**

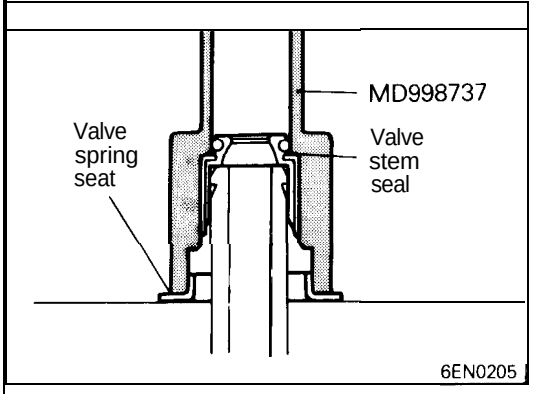
**Limit: 47.3 mm (1.862 in.)**

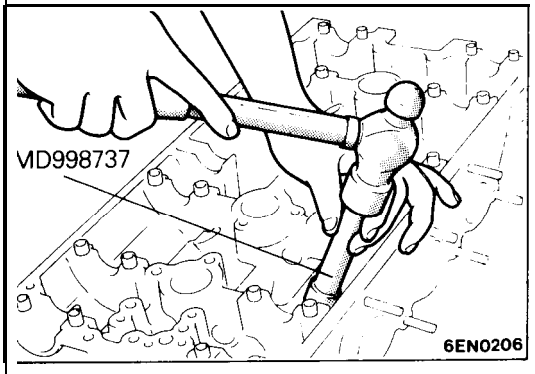
(2) Check the spring for squareness and replace if the limit is exceeded.

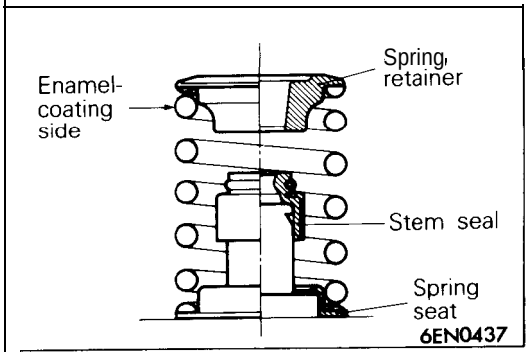
**Standard value: Less than 1.5°**

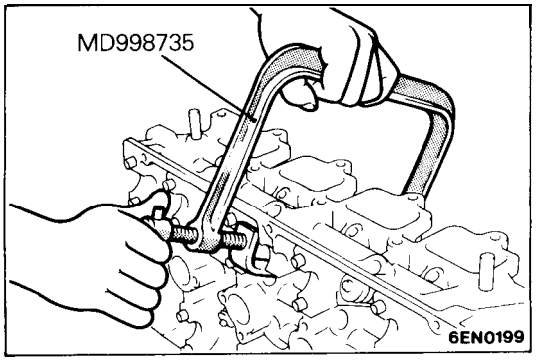
**Limit: 4°**




### VALVE GUIDE

NOSPGCC

Measure the clearance between the valve guide and valve stem and, if the clearance exceeds the limit, replace the valve guide or valve, or both.

**Standard value:**

| | |
|---|---|
| **Intake** | **0.02–0.047 mm (.0008–.0019 in.)** |
| **Exhaust** | **0.05–0.085 mm (.002–.0033 in.)** |

**Limit:**

| | |
|---|---|
| **Intake** | **0.10 mm (.0040 in.)** |
| **Exhaust** | **0.15 mm (.0059 in.)** |

## SERVICE POINTS OF REASSEMBLY

N09PKDEa

### 15. / 13. INSTALLATION OF VALVE STEM SEAL

(1) Install the valve spring seat.
(2) Using the special tool, install a new stem seal to the valve guide.

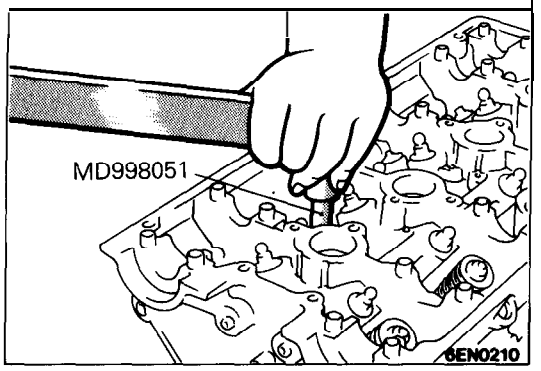
**Caution**
**1. Do not reuse the valve stem seal.**
**2. Use the special tool to install the valve stem seal. Improper installation can be a cause of leakage of oil down into the cylinder.**

### 9. /5. INSTALLATION OF RETAINER LOCK

(1) Install the valve spring so that its end with identification color is positioned on the rocker arm end.

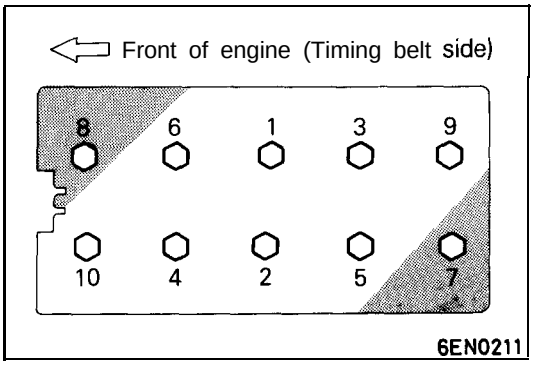
(2) Using the valve spring compressor, compress the valve spring and insert the retainer lock into position.

**Caution**
**If the valve spring is compressed excessively, the lower end of the retainer contacts the 'stem seal, damaging the stem seal.**




**1. INSTALLATION OF CYLINDER HEAD BOLTS**

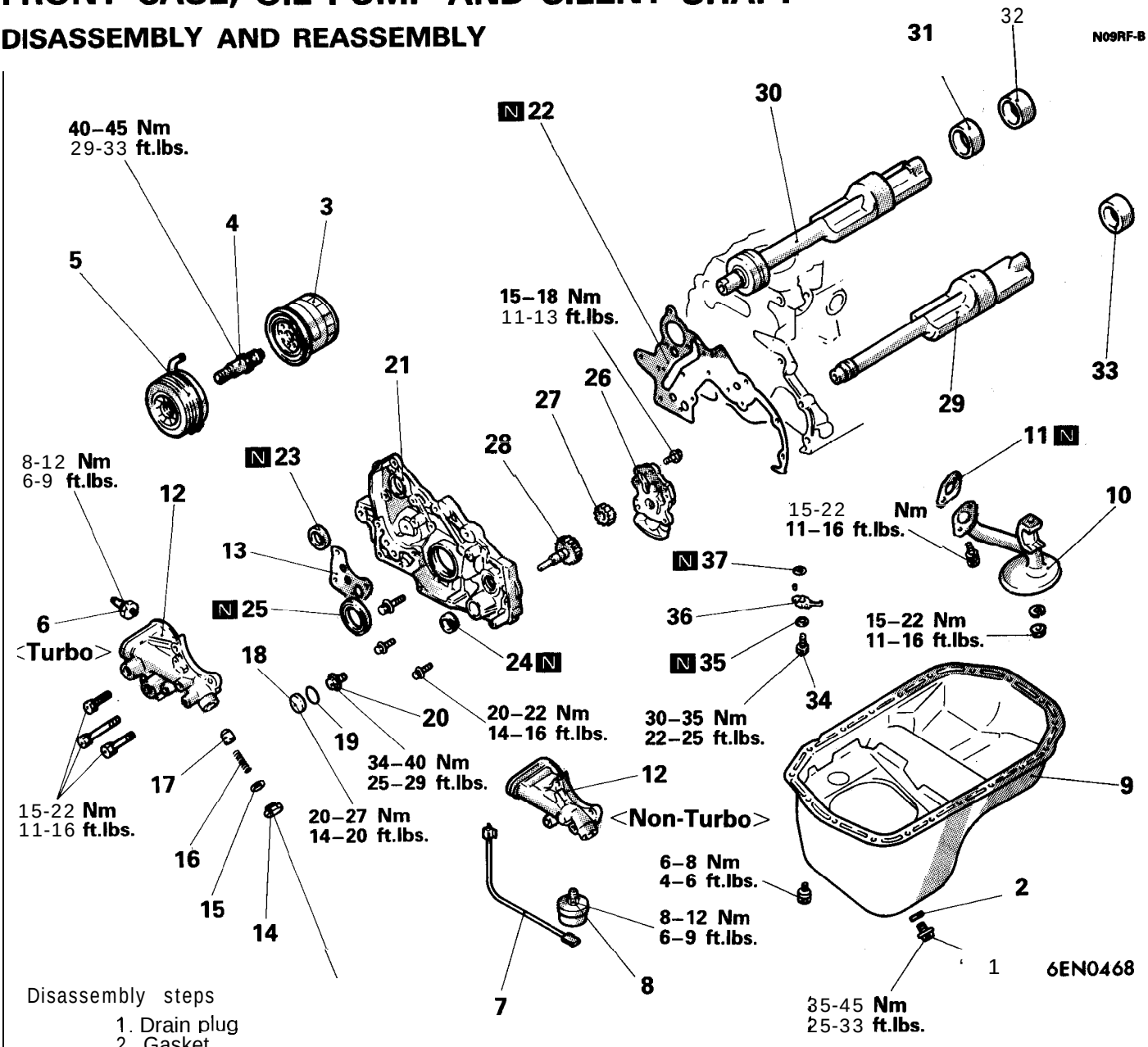
(1) Using the special tool, tighten the cylinder head bolts.




(2) Tighten the cylinder head bolts in the sequence shown. Each bolt should be tightened in two to three steps, torquing progressively. Tighten to specified torque in the final sequence.

# FRONT CASE, OIL PUMP AND SILENT SHAFT

## DISASSEMBLY AND REASSEMBLY

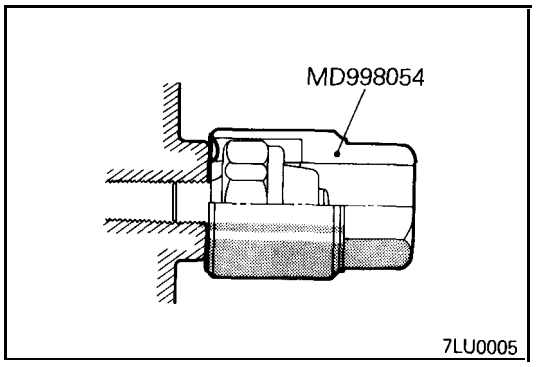



Disassembly steps

1. Drain plug
2. Gasket
- + 3. Oil filter
4. Oil cooler bolt (Turbo)
◆◆ 5. Oil cooler (Turbo)
◆◆ ◆◆ 6. Oil pressure switch
7. Harness assembly
8. Oil pressure gauge unit
◆◆ ◆◆ 9. Oil pan
10. Oil screen
11. Gasket
12. Oil filter bracket
13. Gasket
14. Relief plug
15. Gasket
16. Relief spring
17. Relief plunger
- I) ◆◆ 18. Plug cap
19. O-ring
◆◆ ◆◆ 20. Driven gear bolt
◆◆ 21. Front case
22. Gasket

- 4 23. Oil seal
- + 24. Silent shaft oil seal
- + 25. Crankshaft front oil seal
26. Oil pump cover
- * 27. Oil pump driven gear
◆◆ 28. Oil pump drive gear
29. Left silent shaft
30. Right silent shaft
◆◆ ◆◆ 31. Silent shaft front bearings
◆◆ ◆◆ 32. Right silent shaft rear bearing
◆◆ ◆◆ 33. Left silent shaft rear bearing
34. Check valve (Turbo)
35. Gasket (Turbo)
- + 36. Oil jet (Turbo)
37. Gasket (Turbo)

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to “Service Points of Disassembly”.
(3) ◆◆: Refer to “Service Points of Reassembly”.
(4) N: Non-reusable parts



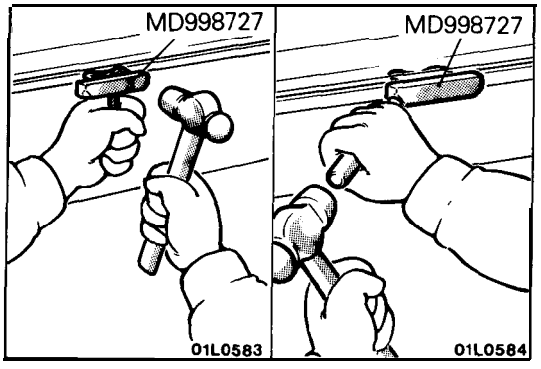

## SERVICE POINTS OF DISASSEMBLY

N09RGAAa

### 6. REMOVAL OF OIL PRESSURE SWITCH

(1) Remove the oil pressure switch terminals.
(2) Using the special tool, remove the oil pressure switch.

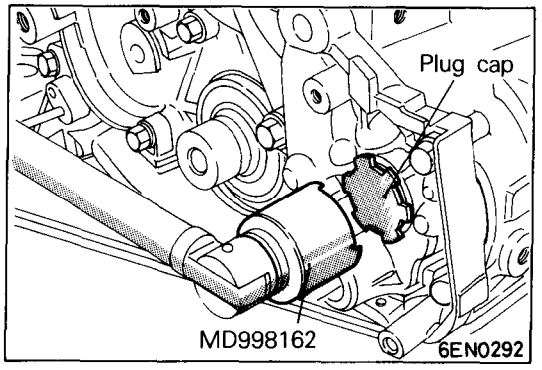
**Caution**
**Since sealant is coated on the thread area, be careful not to break it.**




### 9. REMOVAL OF OIL PAN

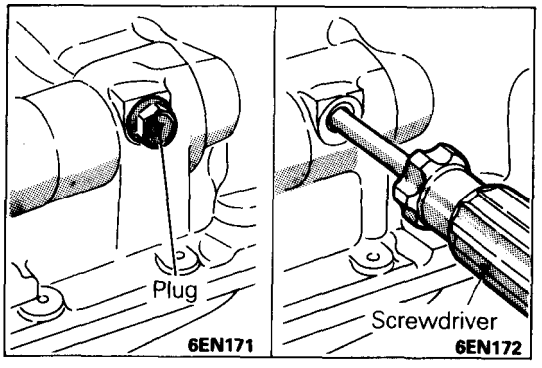
(1) Remove the all oil pan bolts.
(2) Drive in the special tool between the cylinder block and oil pan.

NOTE
Never use a screwdriver or chisel, instead of the special tool, as a deformed oil pan flange will result, resulting in oil leakage.



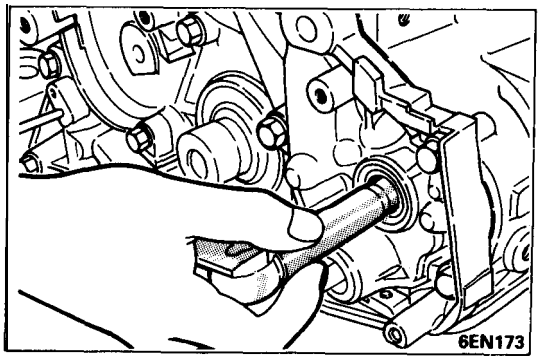

### 18. REMOVAL OF PLUG CAP

Using the special tool, remove the plug cap.

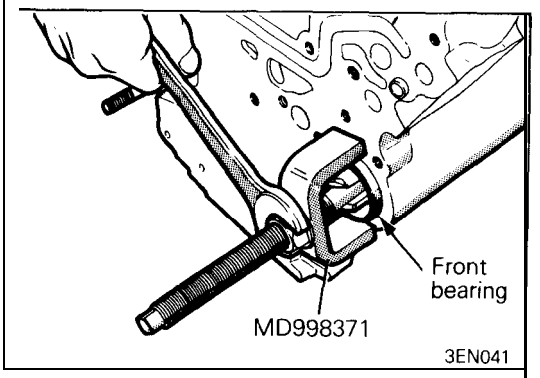



### 20. REMOVAL OF DRIVEN GEAR BOLT

(1) Remove the plug on the side of cylinder block.
(2) Insert a Phillips screwdriver [shank diameter 8 mm (.32 in.)] into the plug hold to block the silent shaft.



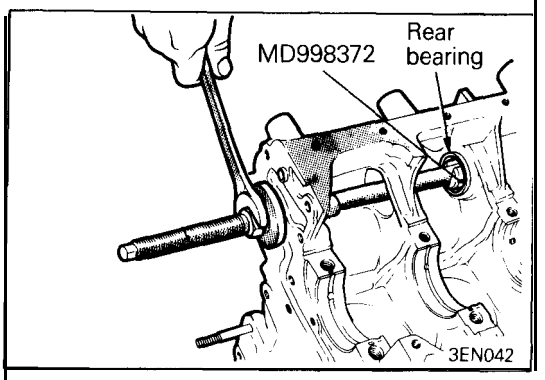

(3) Remove the driven gear bolt that secures the oil pump driven gear to the silent shaft.




**31. REMOVAL OF SILENT SHAFT FRONT BEARINGS**

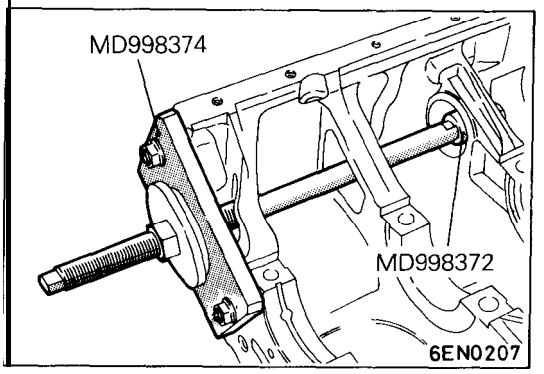
Using the special tool, remove the right silent shaft front bearing from the cylinder block.

NOTE
Be sure to remove the front bearing first.
If it has not been removed, the Rear Bearing Puller cannot be used.




**32. REMOVAL OF RIGHT SILENT SHAFT REAR BEARING**

Using the special tool, remove the right silent shaft rear bearing from the cylinder block.




**33. REMOVAL OF LEFT SILENT SHAFT REAR BEARING**

Using the special tool, remove the left silent shaft rear bearing from the cylinder block.

## INSPECTION

### FRONT CASE

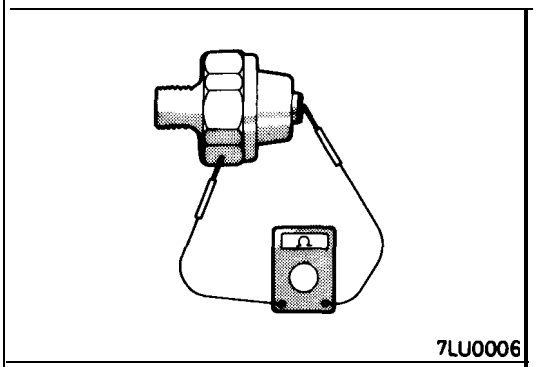
N09RCJC1

(1) Check oil holes for clogging and clean if necessary.
(2) Check silent shaft front bearing section for wear, damage and seizure. If there is anything wrong with the section, replace the front case.
(3) Check the front case for cracks and other damage. Replace cracked or damaged front case.

### OIL SEAL

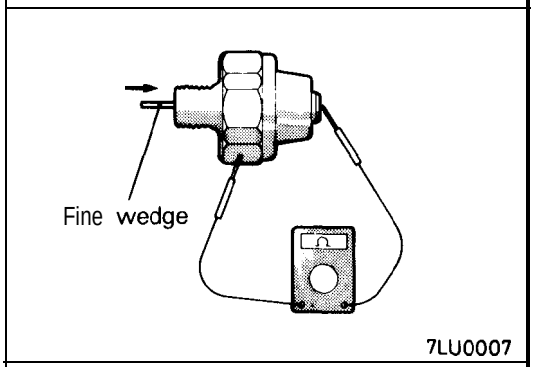
N09RCMA1

(1) Check the oil seal lip for wear and damage. Replace oil seal if necessary.
(2) Check the oil seal lip for deterioration. Replace oil seal if necessary.


7LU0006

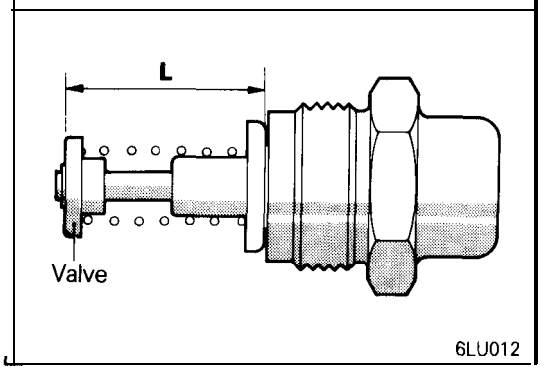
### OIL PRESSURE SWITCH N09RCLA1

(1) Connect a tester (ohm range) between the terminal and the body and check for conductivity. If there is no conductivity, replace the switch.



7LU0007

(2) Next insert a very fine wedge through the oil hole, pushing it slightly. There should be no conductivity (resistance should be infinite). If there is conductivity even when wedge is pushed, replace the switch.
(3) Or, if there is no conductivity when a 50 kPa (71 psi) pressure is placed through the oil hole, the switch is operating properly. Check at this time to see that there is no air pressure leakage. If there is air pressure leakage, the diaphragm is broken, and the switch should be replaced.



6LU012

### OIL COOLER BYPASS VALVE (Turbo) N09RCNA

(1) Make sure that the valve moves smoothly.
(2) Ensure that the dimension L measures the standard value under normal temperature and humidity.

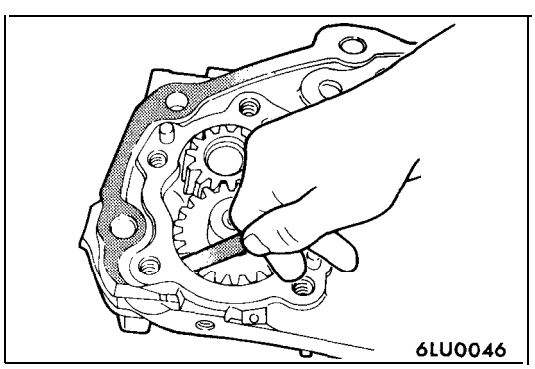
**Dimension L: 34.5 mm (1.358 in.)**

(3) The dimension must be the standard value when measured after the valve has been dipped in 100°C (212°F) oil.

**Dimension L: 40 mm (1.57 in.) or more**

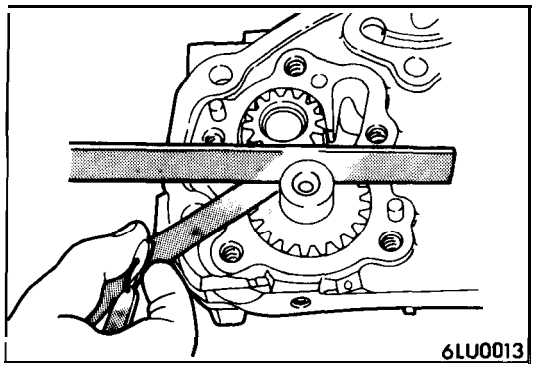
### OIL PUMP N09RCGG

(1) Assemble the oil pump gear to the front case and rotate it to ensure smooth rotation with no looseness.
(2) Ensure that there is no ridge wear on the contact surface between the front case and the gear surface of the oil pump cover.


6LU0046

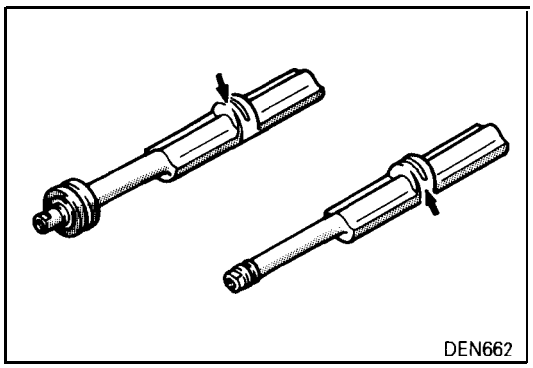
(3) With the drive and driven gears installed into the front case.

| | |
|---|---|
| **Standard value:** | |
| **Drive gear** | **0.16–0.21 mm (.0063–.0083 in.)** |
| **Driven gear** | **0.13–0.18 mm (.0051–.0071 in.)** |
| **Limit:** | |
| **Drive gear** | **0.25 mm (.0098 in.)** |
| **Driven gear** | **0.25 mm (.0098 in.)** |




(4) Check the side clearance.

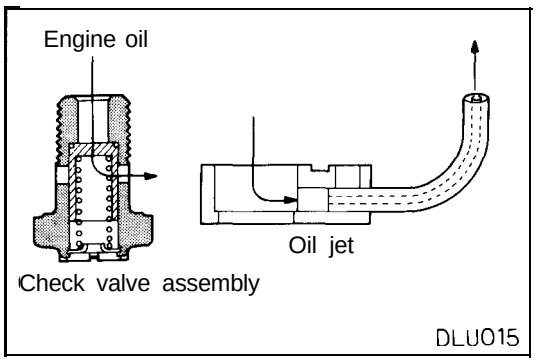
| | |
|---|---|
| **Standard value:** | |
| **Drive gear** | **0.08–0.14 mm (.0031–.0055 in.)** |
| **Driven gear** | **0.06–0.12 mm (.0024–.0047 in.)** |
| **Limit:** | |
| **Drive gear** | **0.25 mm (.0098 in.)** |
| **Driven gear** | **0.25 mm (.0098 in.)** |




**SILENT SHAFT** N09RCIE2

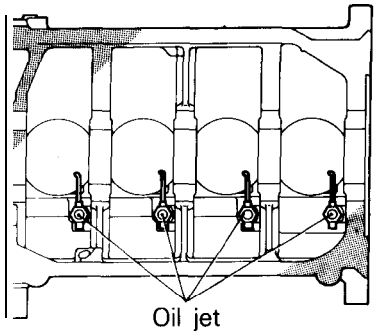
(1) Check oil holes for clogging.
(2) Check journal for seizure, damage, and contact with bearing. If there is anything wrong with the journal, replace silent shaft, bearing or front case assembly.
(3) Check the silent shaft oil clearance. If the clearance is excessively due to wear, replace the silent shaft bearing, silent shaft or front case assembly.

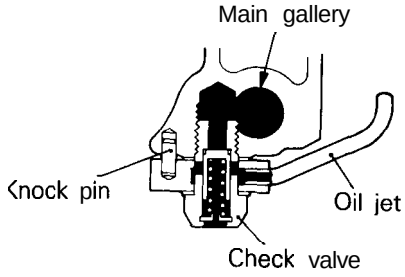
| | |
|---|---|
| **Standard value:** | |
| **Front** | |
| **Right** | **0.020–0.061 mm (.0008–.0024 in.)** |
| **Left** | **0.050–0.091 mm (.0002–.0036 in.)** |
| **Rear** | |
| **Right** | **0.020–0.054 mm (.0008–.0021 in.)** |
| **Left** | **0.042–0.083 mm (.0017–.0033 in.)** |




**OIL JET, CHECK VALVE** N09RCOA

(1) Check the oil jet and check valve for clogging.
(2) Check the oil jet for damage and deformation.



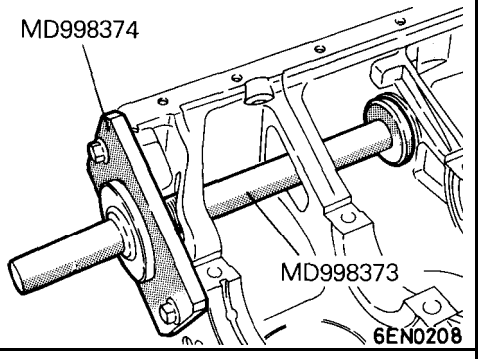




6LU014

## SERVICE POINTS OF REASSEMBLY N09RHAG

### 36. INSTALLATION OF OIL JET

When installing the oil jet, make sure that the nozzle is in correct direction, that is, toward the piston.

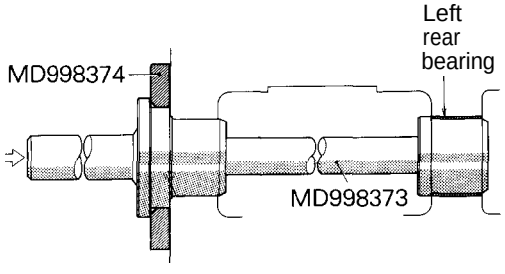



6EN0208

### 33. INSTALLATION OF LEFT SILENT SHAFT REAR BEARING

(1) Install the special (GUIDE PLATE) tool to the cylinder block.

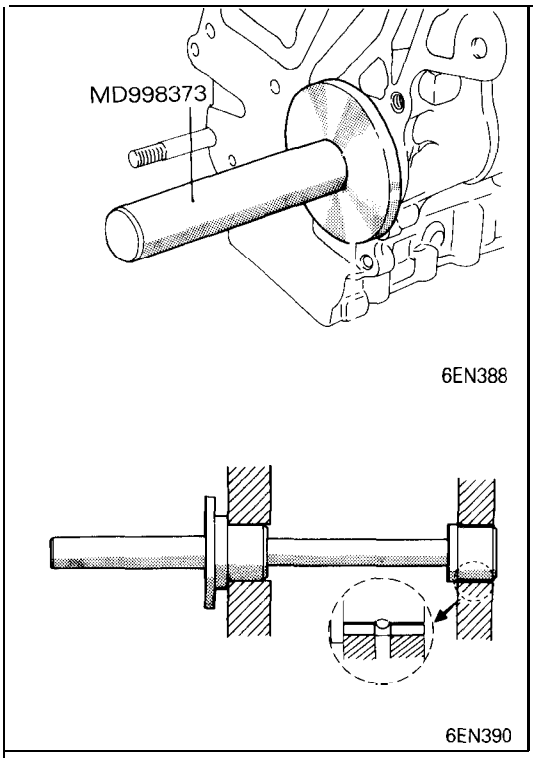
(2) Apply engine oil to the rear bearing outer circumference and bearing hole in cylinder block.




6EN323

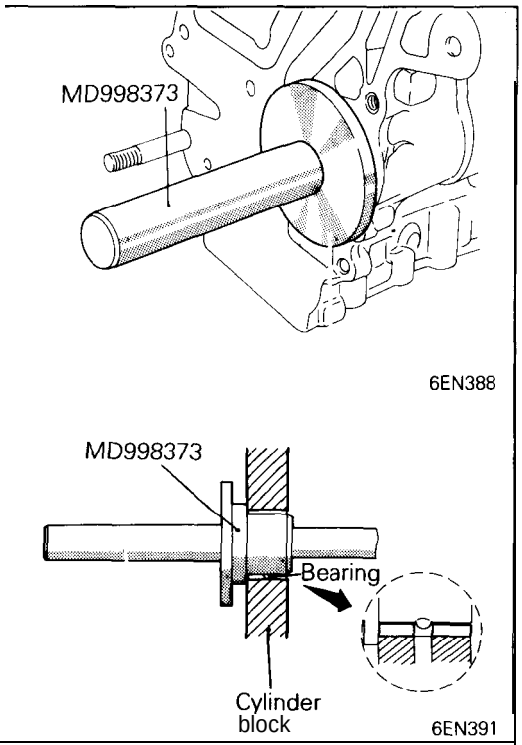
(3) Using the special tool, install the rear bearing.

NOTE
The left rear bearing has no oil holes.




**32. INSTALLATION OF RIGHT SILENT SHAFT REAR BEARING**

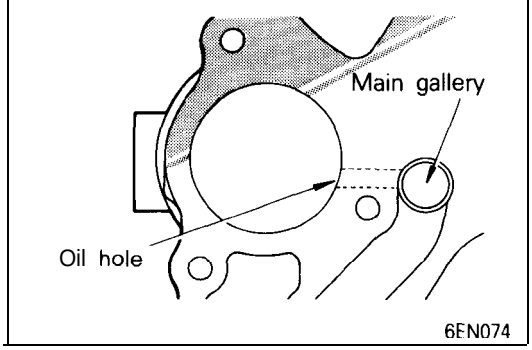
(1) Apply engine oil to outer surface of bearing.
(2) Using special tools, install right rear bearing. Make sure that oil hole of bearing is aligned with oil hole of cylinder block.

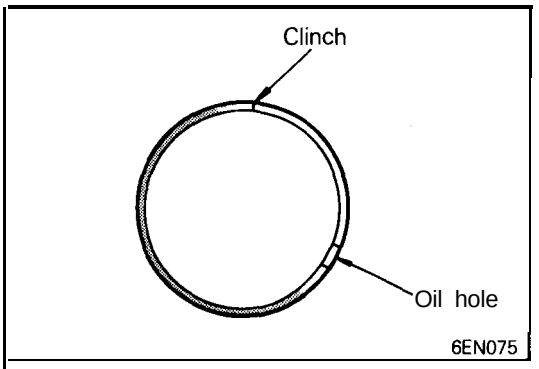



**31. INSTALLATION OF SILENT SHAFT FRONT BEARINGS**

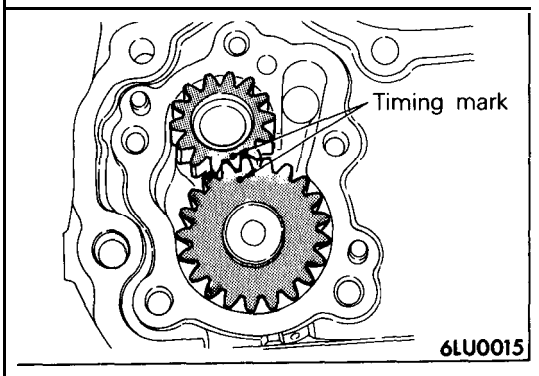
(1) Using special tools, install front bearing.

(2) Make sure that oil hole of bearing is aligned with oil hole of cylinder block.



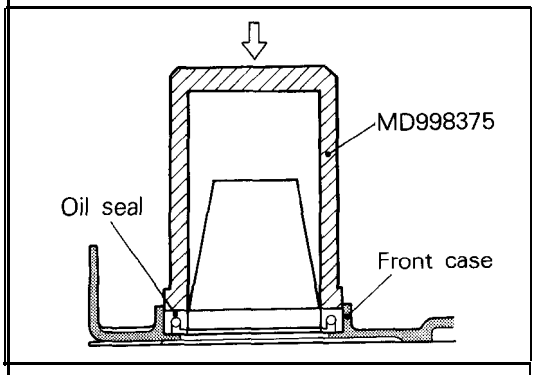



(3) Furthermore, make sure that clinch of bearing is in upper most position.



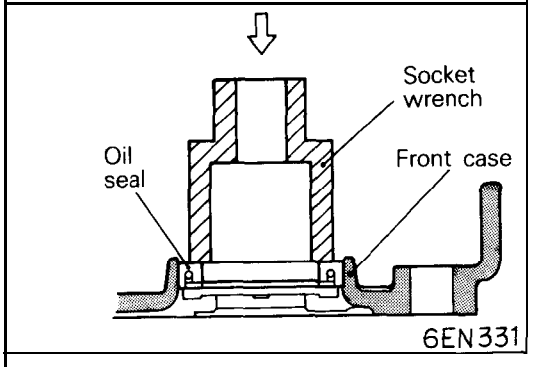

**28. INSTALLATION OF DRIVE GEAR/27. DRIVEN GEAR**

Coat the gear with plenty of engine oil, and align the two timing marks.



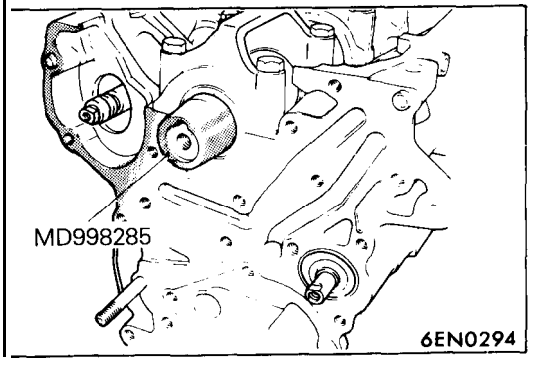

**25. INSTALLATION OF CRANKSHAFT FRONT OIL SEAL**

Using the special tool, install the crankshaft front oil seal into front case.



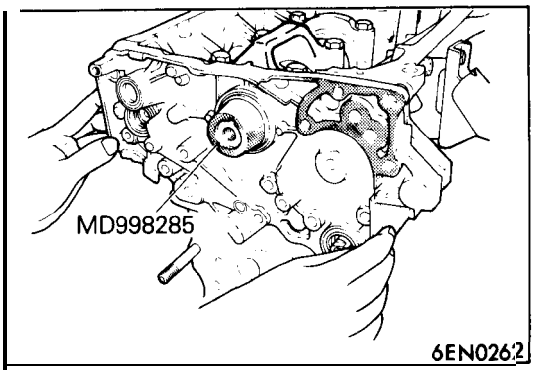

**24./23. INSTALLATION OF OIL SEAL**

Using a socket wrench, press-in the oil seal into front case.

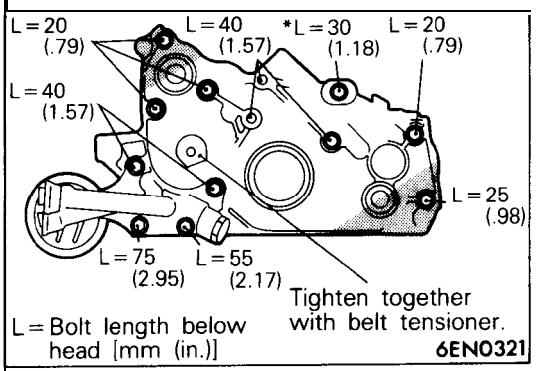



21. **INSTALLATION OF FRONT CASE**

(1) Set the special tool on the front end of the crankshaft and apply a thin coat of engine oil to the outer circumference of the special tool to install the front case.

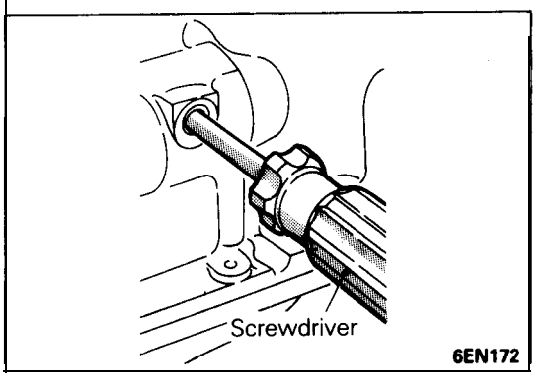



(2) Install the front case assembly through a new front case gasket and temporarily tighten the flange bolts (other than those for tightening the filter bracket).



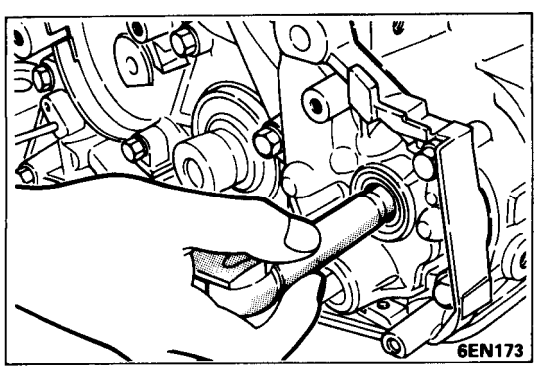

(3) Mount the oil filter bracket with oil filter bracket gasket. Then, install the four bolts with washers.
(4) Tighten the bolts to specification.

NOTE
Bolts indicated by the * symbol should be tightened at a torque of 27-34 Nm (20–25 ft.lbs.).

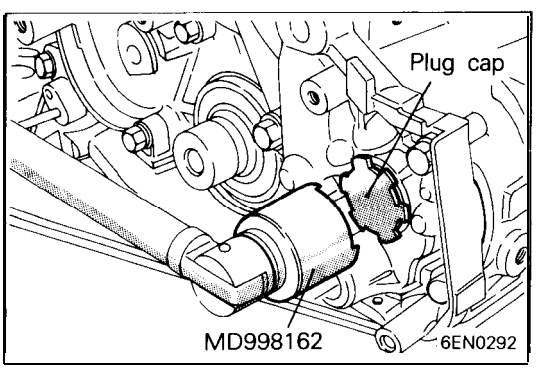



**20. INSTALLATION OF DRIVEN GEAR BOLT**

(1) Insert a Phillips screwdriver into a hole in the left side of the cylinder block to lock the silent shaft.

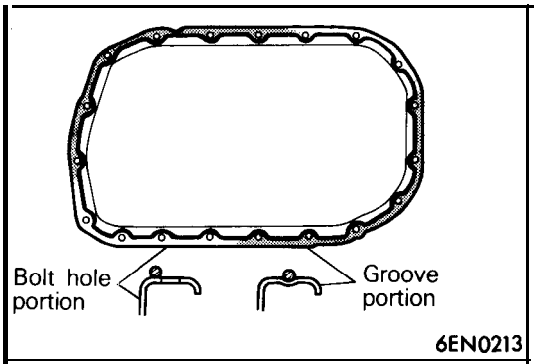


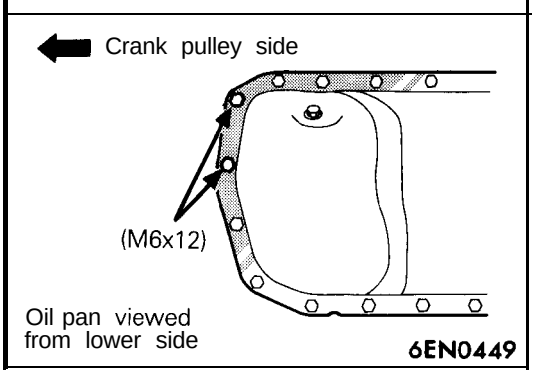

(2) Secure the oil pump driven gear onto the left silent shaft by tightening the driven gear bolt to specified torque.




**18. INSTALLATION OF PLUG CAP**

(1) Install a new O-ring to the groove of front case.
(2) Using the special tool, install the plug cap and tighten to specified torque.




**9. INSTALLATION OF OIL PAN**

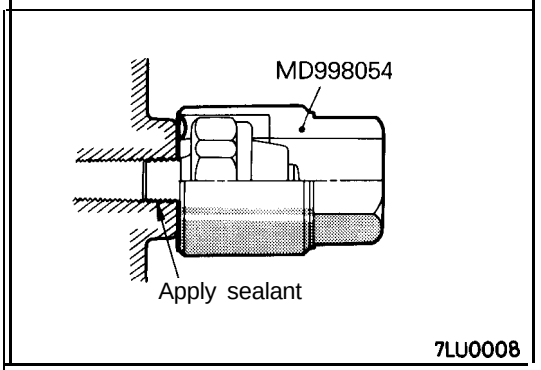
(1) Clean both mating surfaces of oil pan and cylinder block.

(2) Apply a 4 mm (.16 in.) wide bead of sealant to the entire circumference of the oil pan flange.

**Specified sealant:**
**MITSUBISHI GENUINE PART No. MD997110 or equivalent**

(3) The oil pan should be installed in 15 minutes after the application of sealant.

(4) Note the difference in bolt lengths at the location shown.



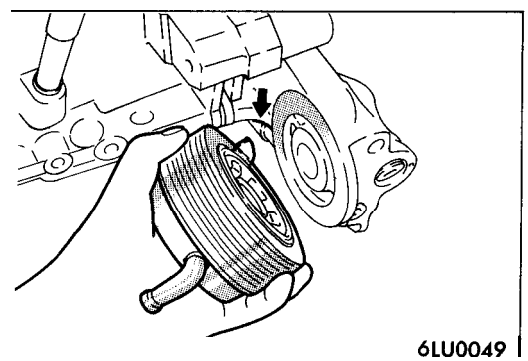

**8. INSTALLATION OF OIL PRESSURE SWITCH**

(1) Coat sealant on the thread area, and using the special tool, install the pressure switch.

**Specified sealant: MOPAR Part No. 4318034 or equivalent**

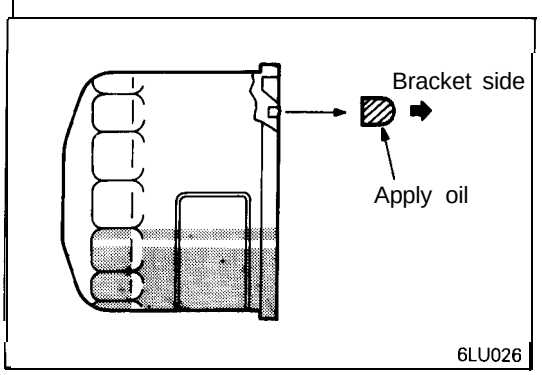
**Caution**
**1. Do not let sealant ooze out of the top of the thread area.**
**2. Do not overtighten the pressure switch.**

(2) Install the oil pressure switch terminals.




**5. INSTALLATION OF OIL COOLER**

First insert the oil cooler projecting stopper in the oil filter bracket groove and then tighten the oil cooler bolts.




**3. INSTALLATION OF OIL FILTER**

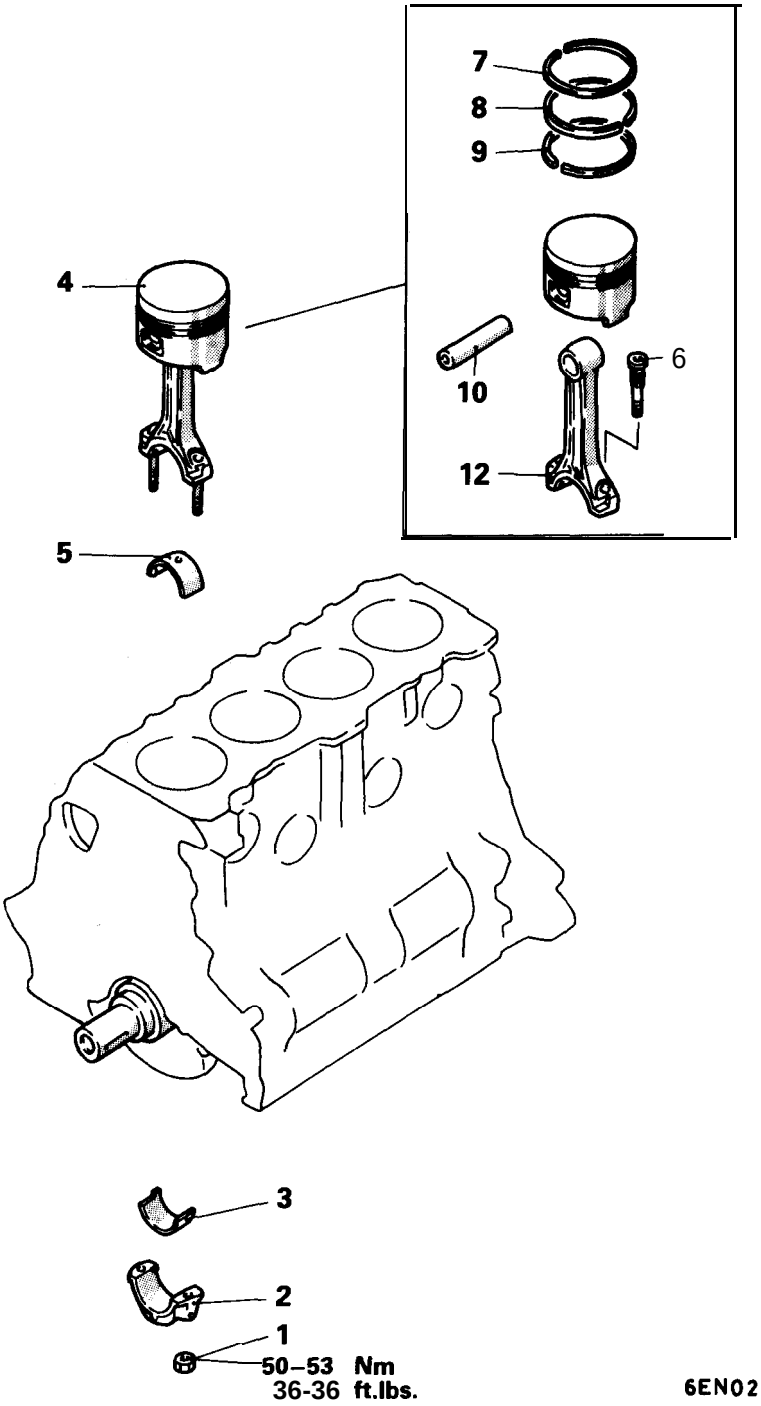
Wipe clean the mounting surface on the filter bracket. Then, apply a thin coat of engine oil to filter O-ring and tighten the oil filter by hand.

**Caution**
**Never use a wrench to tighten the oil filter.**

# PISTON AND CONNECTING ROD

N09TE-B

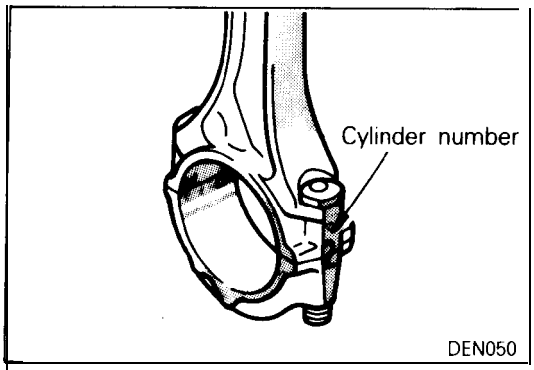
## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

1. Nut
◆◆ ● + 2. Connecting rod cap
3. Connecting rod bearing
◆◆ 4. Piston and connecting rod assembly
5. Connecting rod bearing
6. Bolt
◆◆ ◆◆ 7. Piston ring No. 1
◆◆ ◆◆ 8. Piston ring No.2
● * 9. Oil ring
10. Piston pin
11. Piston
12. Connecting rod

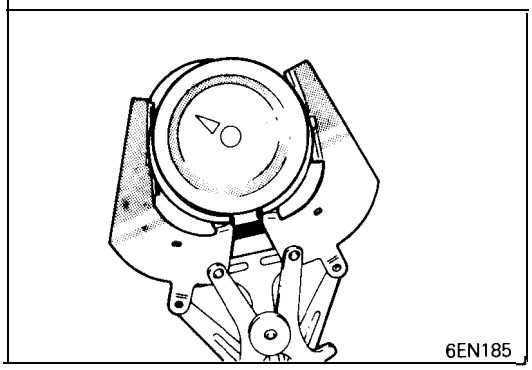
NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ● e : Refer to “Service Points of Disassembly”.
(3) ◆◆: Refer to “Service Points of Reassembly”.




## SERVICE POINTS OF DISASSEMBLY N09TFAC

### 2. REMOVAL OF CONNECTING ROD CAP

Mark the large end of the connecting rod with the cylinder number for use during reassembly.




### 7. REMOVAL OF NO. 1 PISTON RING /8. NO.2 PISTON RING

Remove the piston rings with a piston expander.

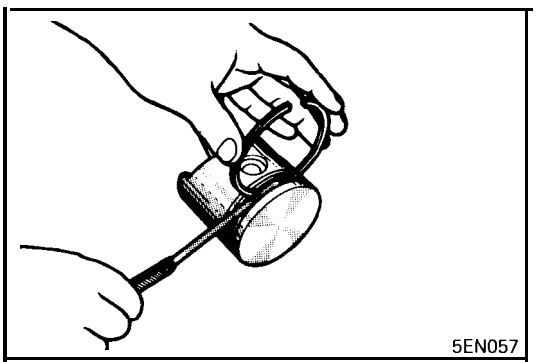
## INSPECTION

### PISTON N09TCAF

Replace the piston if scratches or seizure is evident on its surfaces (especially the thrust surface). Replace the piston if it is cracked.

### PISTON PIN

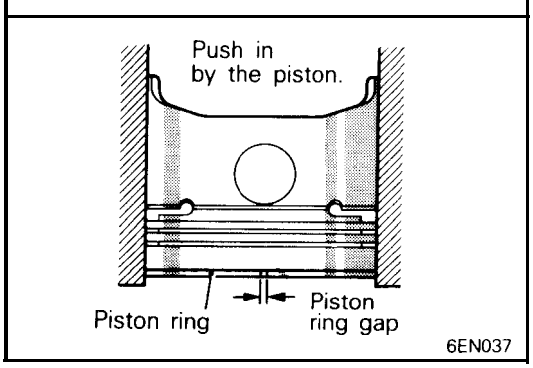
(1) Insert the piston pin into the piston pin hole with a thumb. You should feel a slight resistance. Replace the piston pin if it can be easily inserted or there is an excessive play.
(2) The piston and piston pin must be replaced as an assembly.




### PISTON RING N09TCBF

(1) Check the piston ring for damage, excessive wear, and breakage and replace if defects are evident. If the piston has been replaced with a new one, the piston rings must also be replaced with new ones.
(2) Check the clearance between the piston ring and ring groove. If the limit is exceeded, replace the ring or piston, or both.

**Standard value: 0.03–0.07 mm (.0012–.0028 in.)**
**Limit: 0.1 mm (.004 in.)**




(3) Install the piston ring into the cylinder bore. Force it down with a piston, its crown being in contact with the ring, to correctly position it at right angles to the cylinder wall. Then, measure the end gap with a feeler gauge.
If the ring gap is excessive, replace the piston ring.

**Standard value:**

| | |
|---|---|
| No. 1 | 0.25–0.40 mm (.0098–.0157 in.) |
| No.2 | 0.20–0.35 mm (.0079–.0138 in.) |
| Oil | 0.20–0.70 mm (.0079–.0276 in.) |

**Limit:**

| | |
|---|---|
| No. 1, No.2 | 0.8 mm (.031 in.) |
| Oil | 1.0 mm (.039 in.) |

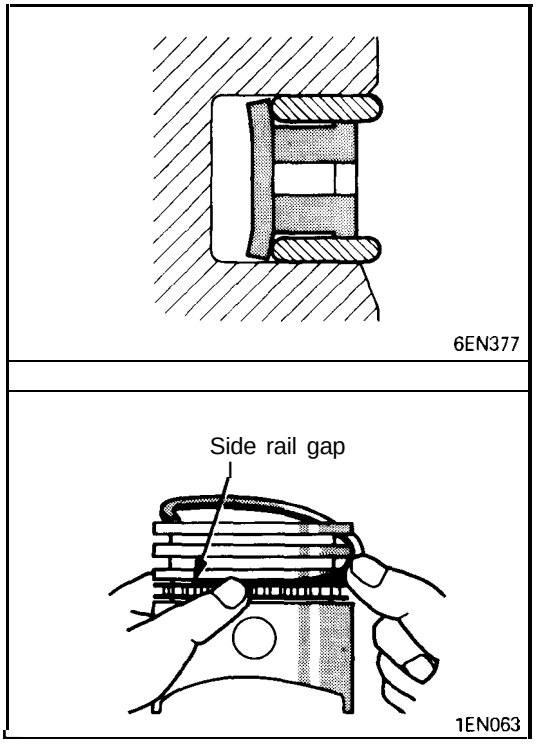
### CONNECTING ROD BEARING N09TCDD

(1) Visually check the bearing surface for uneven contact, streaks, scratches, and seizure. Replace if defects are evident. If streaks and seizure are excessive, check also the crankshaft. If damage is present on the crankshaft, replace crankshaft or regrind to undersize for reuse.
(2) Measure the connecting rod bearing I.D. and crankshaft pin O.D. if the oil clearance exceeds the limit, replace bearing, and crankshaft if necessary. Or, regrind the crankshaft to an undersize and replace bearing with an undersize one.

**Standard value: 0.02–0.05 mm (.0008–.0020 in.)**

**Limit: 0.1 mm (.004 in.)**

NOTE
For oil clearance measuring method using the plastic gauge, refer to the section CRANKSHAFT.




## SERVICE POINTS OF REASSEMBLY N09TGACa

### 9. INSTALLATION OF OIL RING

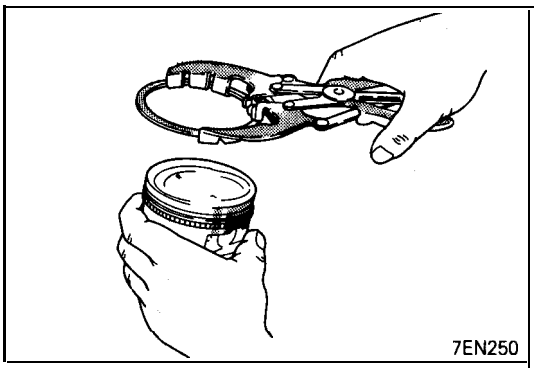
(1) Fit the oil ring spacer into the piston ring groove.

NOTE
The side rails and spacer may be installed in either direction.

(2) Install the upper side rail.
To install the side rail, first fit one end of the rail into the piston groove, then press the remaining portion into position by finger. See illustration.
Use of ring expander to expand the side rail end gap can break the side rail, unlike other piston rings.

NOTE
Do not use piston ring expander when installing side rail.

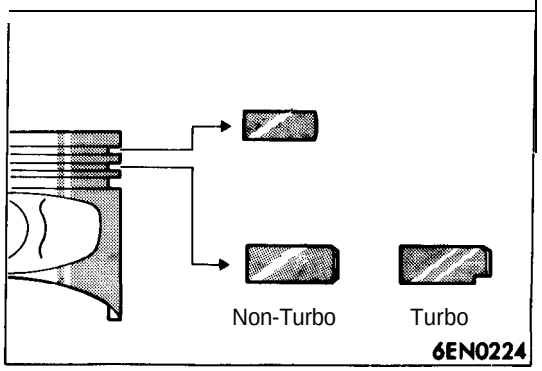
(3) Install the lower side rail in the same procedure as described in step (2).
(4) Make sure that the side rails move smoothly in either direction.

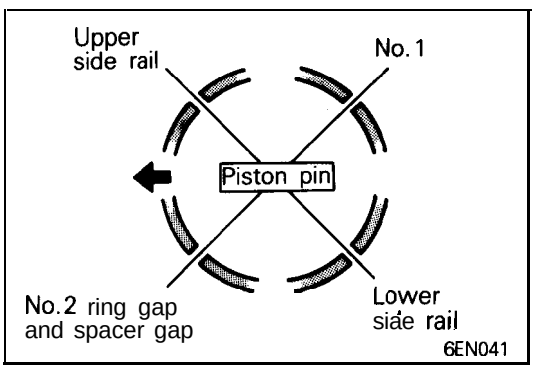



### 8. INSTALLATION OF PISTON RING NO.2/7. PISTON RING NO.1

Using a piston ring expander, fit the No.2 and then No. 1 piston ring into position.

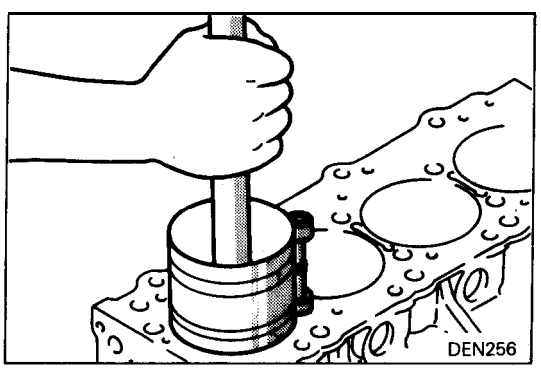
NOTE
1. Note the difference in shape between No. 1 and No. 2 piston rings.
2. Install piston rings No. 1 and No. 2 with their side having marks facing up (on the piston crown side).



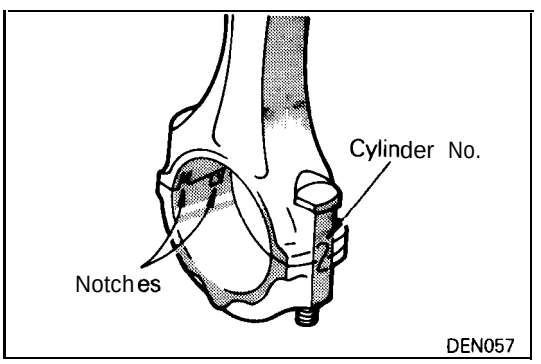

### 4. INSTALLATION OF PISTON AND CONNECTING ROD

(1) Liberally coat engine oil on the circumference of the piston, piston ring, and oil ring.
(2) Arrange the piston ring and oil ring gaps (side rail and spacer) as shown in the figure.
(3) Rotate crankshaft so that crank pin is on center of cylinder bore.



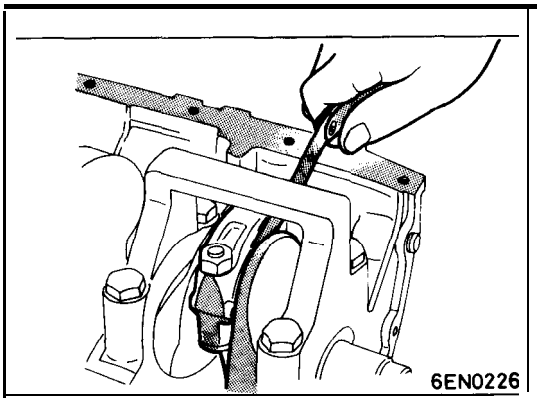

(4) Use suitable thread protectors on connecting rod bolts before inserting piston and connecting rod assembly into cylinder block. Care must be taken not to nick crank pin.
(5) Using a suitable piston ring compressor tool, install piston and connecting rod assembly into cylinder block.

**Caution**
**Insert the front mark (arrow) on the top of the piston so it faces the engine front (timing belt side).**




### 2. INSTALLATION OF CONNECTING ROD CAP

(1) Mate the correct bearing cap with the correct connecting rod by checking with the alignment marks marked during disassembly. If a new connecting rod is used which has no alignment mark, position the notches for locking the bearing on the same side.



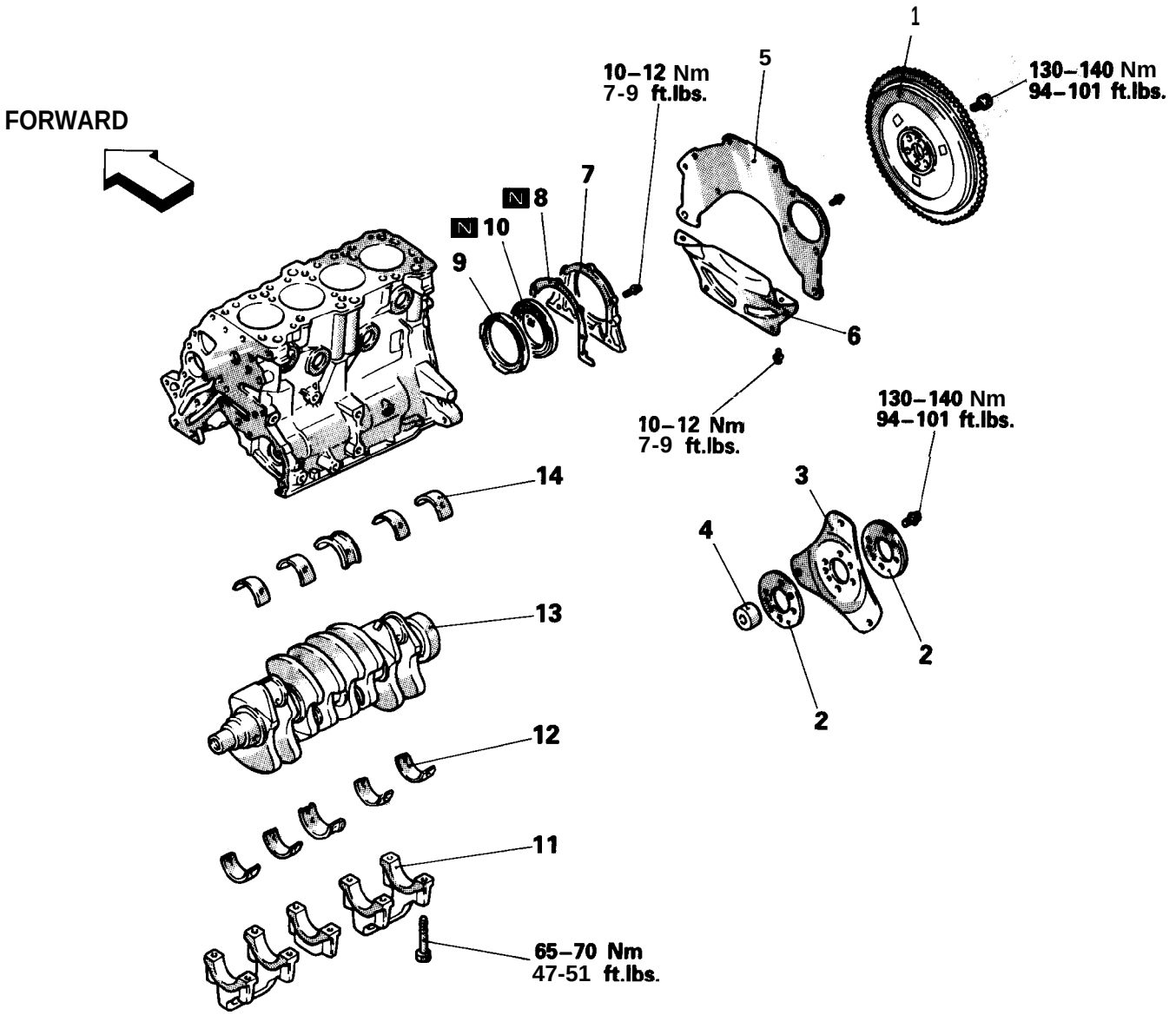

(2) Check if the thrust clearance in the connecting rod big end is correct.

**Standard value: 0.10–0.25 mm (.0040–.0098 in.)**
**Limit: 0.4 mm (.0157in.)**

# CRANKSHAFT, FLYWHEEL AND DRIVE PLATE

## DISASSEMBLY AND REASSEMBLY

N09UE-B




**Disassembly steps**

1. Flywheel (Manual transaxle)
2. Adapter plate } Automatic transaxle
3. Drive plate } Automatic transaxle
4. Crankshaft bushing } Automatic transaxle
5. Rear plate
6. Bell housing cover
7. Oil seal case
8. Gasket
- \+ 9. Oil separator
- a 10. Oil seal
- +11. Bearing cap
- + 12. Lower bearing
13. Crankshaft
- + 14. Upper bearing

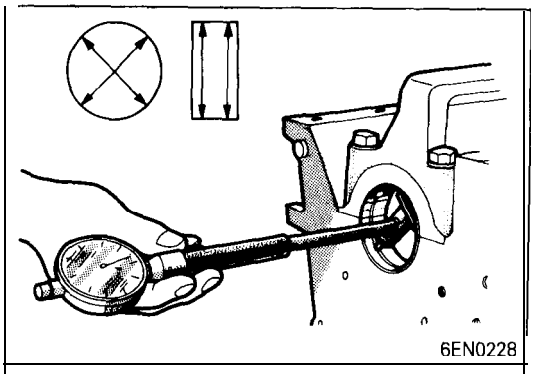
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Reassembly".
(3) N: Non-reusable parts

## INSPECTION

N09UHAD

### CRANKSHAFT

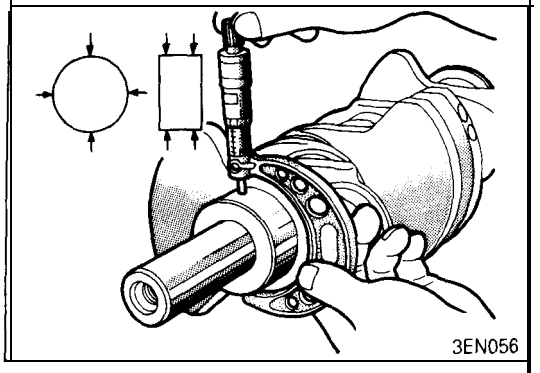
**(1) Check the crankshaft journals and pins for streaks and** seizure. Replace if necessary.


6EN0228

(2) Measure the journal O.D. and main bearing I.D. to obtain **the clearance between the two (oil clearance). If the** clearance exceeds the limit, replace the main bearing and, if necessary, the crankshaft.

**Standard value: 0.02–0.05 mm (.0008–.0020 in.)**
**Limit: 0.1 mm (.0040 in.)**

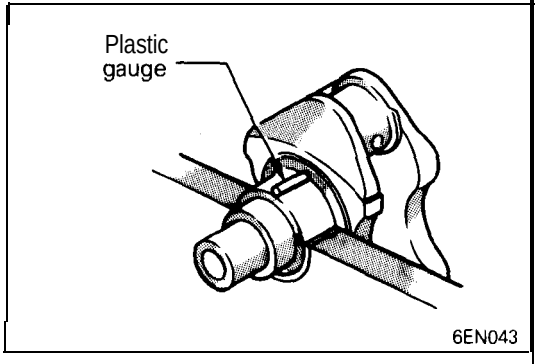
**Caution**
**A special surface treatment has been applied to crankshaft. Do not machine it to undersize.**


3EN056

### CRANKSHAFT OIL CLEARANCE (PLASTIC GAUGE METHOD)

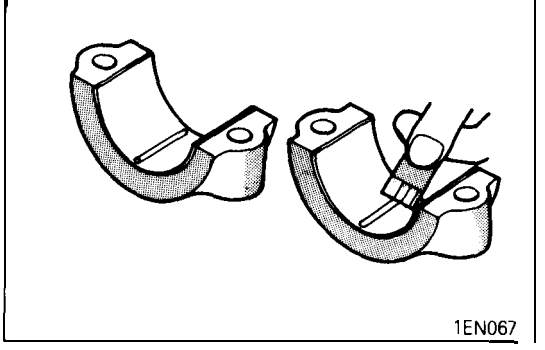
The crankshaft oil clearance can be measured easily by using a plastic gauge, as follows:

(1) Remove oil and grease and any other foreign matters from crankshaft journal and bearing inner surface.
(2) Install the crankshaft.
(3) Cut the plastic gauge to the same length as the width of bearing and place it on journal in parallel with its axis.



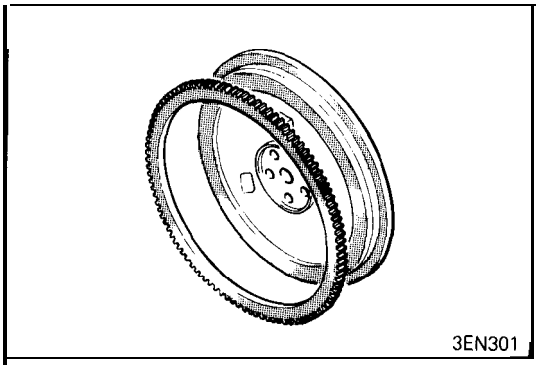
6EN043

(4) Gently place the crankshaft bearing cap over it and tighten the bolts to the specified torque.
(5) Remove the bolts and gently remove the crankshaft bearing cap.
(6) Measure the width of the smashed plastic gauge at its widest section by using a scale printed on the plastic gauge bag.


1EN067

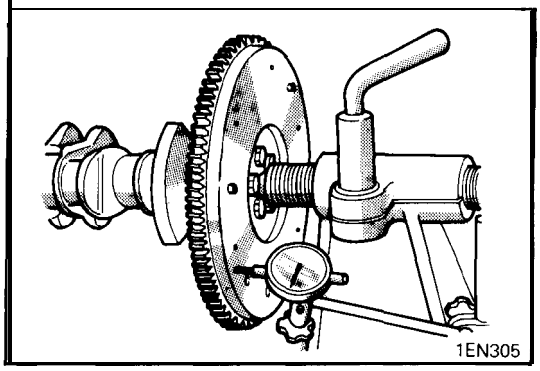
**CRANKSHAFT REAR OIL SEAL**

(1) Check oil seal lip for wear and damage.
(2) Check rubber for deterioration or hardening.
(3) Check oil seal case for cracks and damage.


3EN301

**RING GEAR (Engine with a manual transaxle)**

Check teeth of ring gear for wear and damage. If necessary, replace the ring gear.
If the ring gear teeth are worn or damaged, also check the starter motor pinion.
To remove the ring gear, strike the ring gear at several points on its outer circumference. The ring gear cannot be removed if it is heated.
To install the ring gear, heat the ring gear to 300°C (572°F) for shrink fit.


1EN305

**FLYWHEEL (Engine with a manual transaxle)**

(1) Check the clutch disc friction surface for ridge wear, streaks, and seizure. If necessary, replace flywheel.
(2) If the runout of flywheel exceeds the limit, replace.

**Limit: 0.13 mm (.0051 in.)**

**DRIVE PLATE (Engine with an automatic transaxle)**

Replace deformed, damaged, or cracked drive plates.

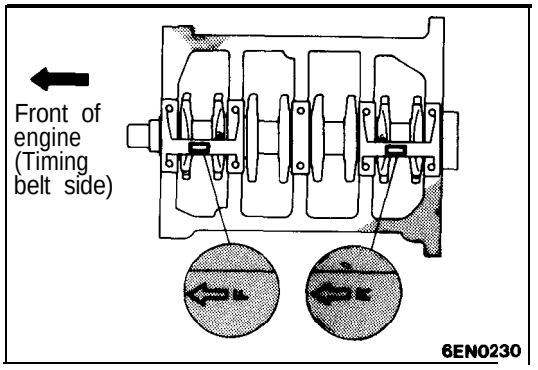
## SERVICE POINTS OF REASSEMBLY N09UGAB

**14. INSTALLATION OF CRANKSHAFT BEARING (UPPER)**

Install the upper crankshaft bearing to the cylinder block. There is an oil groove in the upper crankshaft bearing. There is no difference between upper and lower bearings for the center (with flange).

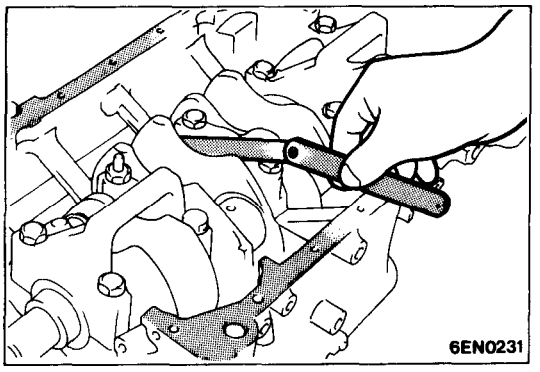
**12. INSTALLATION OF CRANKSHAFT BEARING (LOWER)**

Install the lower crankshaft bearing (with no oil groove; there is no difference for center) to each bearing cap and apply engine oil to bearing surfaces.



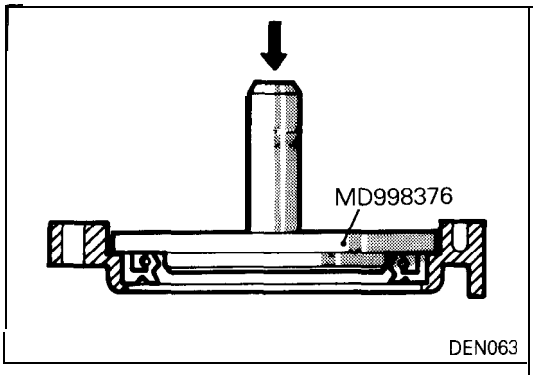

**11. INSTALLATION OF BEARING CAP**

(1) Verify the correct identification mark and the direction of the arrow for installation.



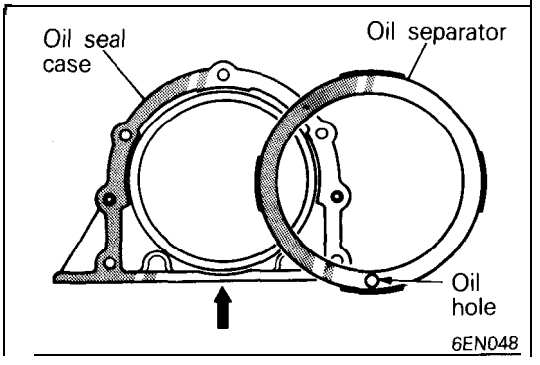

(2) After installing the bearing caps, make sure that the crankshaft turns smoothly and the end play is correct. If the end play exceeds the limit, replace crankshaft bearings.

**Standard value: 0.05–0.18 mm (.0020–.0071 in.)**
**Limit: 0.25 mm (.0098 in.)**




**10. INSTALLATION OF OIL SEAL**

Using the special tool, press-fit the oil seal into the crankshaft rear oil case. Use a new oil seal.



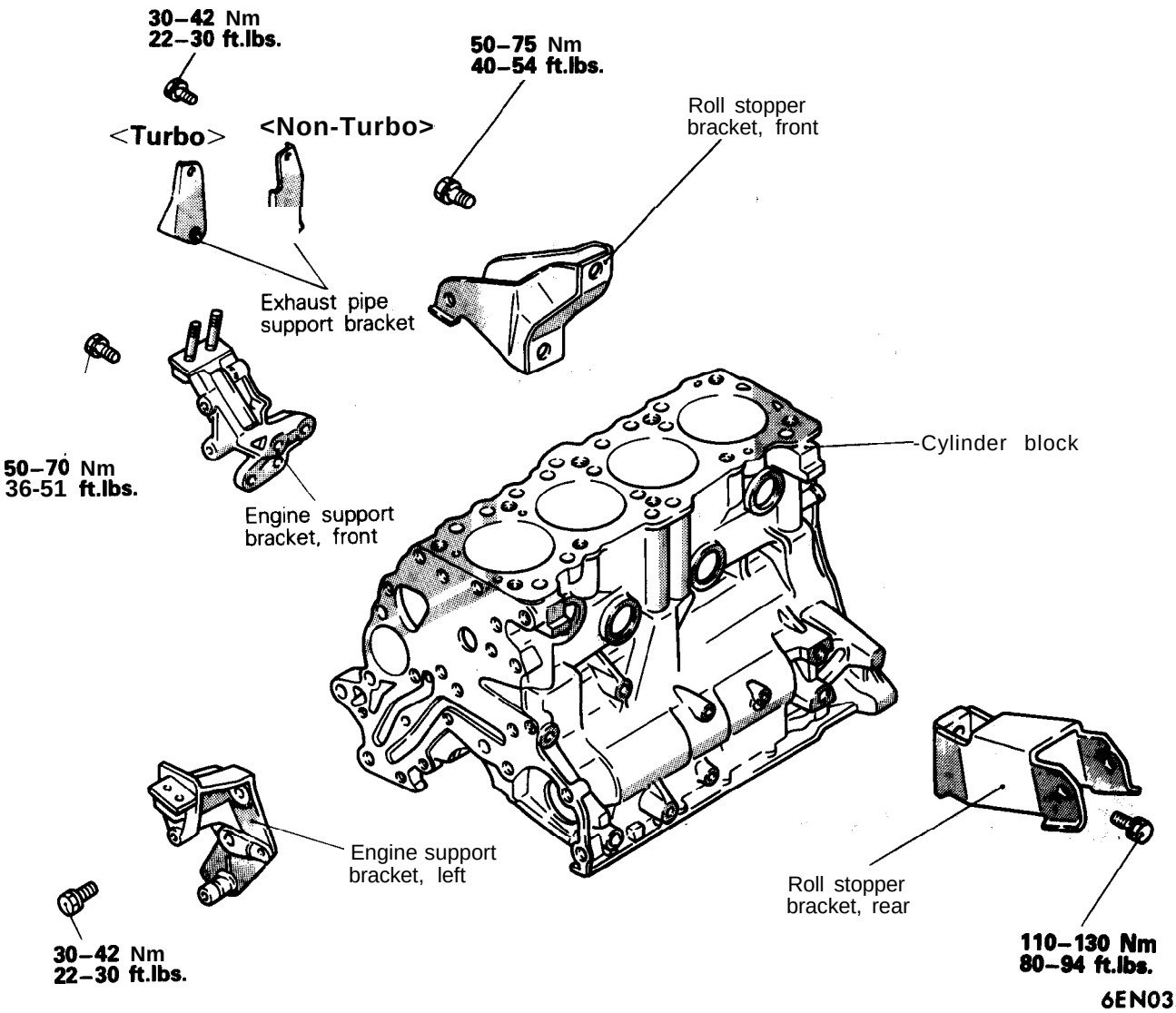

**9. INSTALLATION OF OIL SEPARATOR**

Force the oil separator into the oil seal case so that the oil hole in the separator is directed downward (arrow in illustration).

# CYLINDER BLOCK

## DISASSEMBLY AND REASSEMBLY

N09VF-B




## INSPECTION

N09VCAH

NOTE

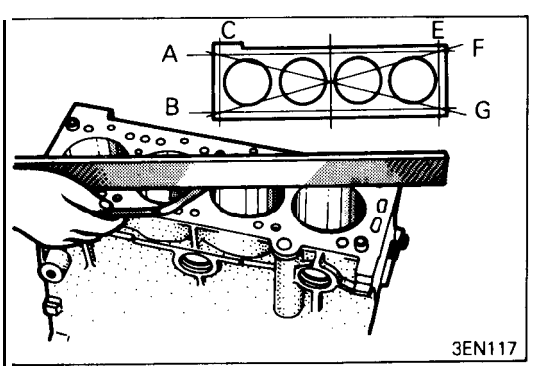
1. Clean parts to remove dust, oil, carbon deposits, and scale before starting the inspection and 'repair procedure.
2. Check cylinder block for water leaks and damage before cleaning.
3. Remove deposits from oil holes and make sure that they are not clogged.
4. Keep parts neatly arranged according to a matched pair.

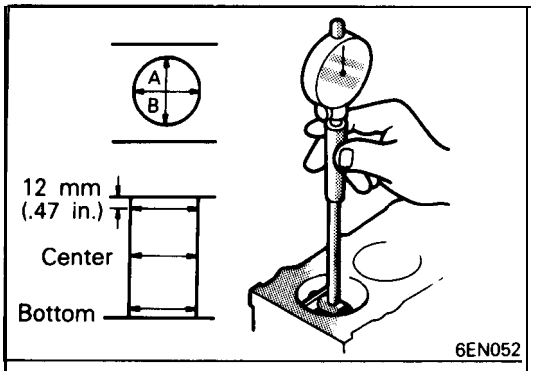
**CYLINDER BLOCK**

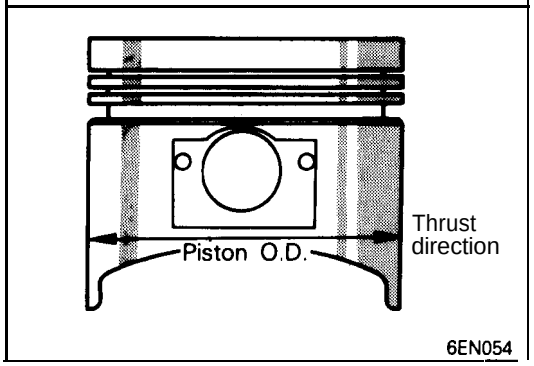
(1) Visually check for scratches, rust, and corrosion.
Use also a flaw detecting agent for the check. If defects are evident, correct, or replace.

(2) Using a straightedge and feeler gauge, check the block top surface for warpage. Make sure that the surface is free from gasket chips and other foreign matter.

**Standard value: 0.05 mm (.0020 in.) or less**
**Limit: 0.1 mm (.0040 in.)**






(3) If the distortion is excessive, correct within the allowable limit or replace.

**Grinding limit: 0.2 mm (.008 in.)**
**The total thickness of the stock allowed to be removed from cylinder block and mating cylinder head is 0.2 mm (.008 in.) at maximum.**
**Cylinder block height (when new): 284 mm (11.18 in.)**

(4) Check cylinder walls for scratches and seizure. If **defects** are evident, correct (bored to oversize) or replace.

(5) Using cylinder gauge, measure the cylinder bore and cylindricity. If worn badly, correct cylinder to an oversize and replace piston and piston rings. Measure at the points shown in illustration.

**Standard value:**
**Cylinder I.D.: 85.00–85.03 mm (3.3485-3.3476 in.)**
**Out-of-roundness and taper of cylinder bore:**
**0.01 mm (.0004 in.) or less**

## CYLINDER **REBORING** N09VEDCa

(1) Oversize pistons to be used should be determined on the basis of the largest bore cylinder.

**Piston size identification**

| Size | Identification mark |
|---|---|
| **0.25** mm (.01 in.) O.S. | **0.25** |
| **0.50** mm (.02 in.) O.S. | **0.50** |
| **0.75** mm (.03 in.) O.S. | **0.75** |
| 1.00 mm (.04 in.) O.S. | 1.00 |

NOTE
Size mark is stamped on piston top.

(2) Measure outside diameter of piston to be used. Measure it in thrust direction as shown.

(3) Based on measure piston O.D. calculate boring finish dimension.

**Boring finish dimension = Piston O.D. + (clearance between piston O.D. and cylinder) – 0.02 mm (.0008 in.) (honing margin)**

(4) Bore all cylinders to calculated boring finish dimension.

Caution
**To prevent distortion that may result from temperature rise during honing, bore cylinders, working from No.2 to No.4 to No. 1 to No. 3.**

(5) Hone to final finish dimension (piston O.D. + clearance between piston O.D. and cylinder).

(6) Check clearance between piston and cylinder.

**Clearance between piston and cylinder:**
**<Non-Turbo>: 0.02–0.04 mm (.0008–.0016 in.)**
**<Turbo>: 0.03–0.05 mm (.0012–.0020 in.)**

NOTE
When boring cylinders, finish all of four cylinders to same oversize. Do not bore only one cylinder to an oversize.

**NOTES**

# INTAKE AND EXHAUST

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N11AA--


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# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N11CA--

| Items | Specifications |
|---|---|
| Air cleaner | |
| Element | Unwoven cloth type |
| Exhaust system | |
| Front exhaust pipe <Non-Turbo> | Dual type |
| Front exhaust pipe <Turbo> | Single type |
| Muffler | Expansion resonance type |
| Coupling | Flat coupling |
| Suspension system | Rubber hangers and O-rings |
| Turbocharger | |
| Type | Exhaust gas turbine type |
| Identification No. | |
| <M/T> | TD05H-14B-6 |
| <A/T> | TD04-13G-5 |
| Supercharging pressure control | Waste gate actuator and valve |
| Intercooler | |
| Type | Air cooled type |

## SERVICE SPECIFICATIONS

N11CB--

| Items | Standard | Limit |
|---|---|---|
| Intake and exhaust manifolds | | |
| Distorsion of cylinder head contacting surface mm (in.) | Less than 0.15 (.0059) | 0.3 (.012) |
| Supercharging pressure solenoid valve terminal resistance [at 20°C (68°F)] Ω | 36-44 | |
| Turbocharger | | |
| Supercharging pressure kPa (psi) | | |
| <M/T> | 41–75 (6.0–10.8) | |
| <A/T> | 37-68 (5.4–9.9) | |
| Waste gate valve opening pressure kPa (psi) | | |
| <M/T> | Approx. 76.7 (11 .1) | |
| <A/T> | Approx. 72.0 (10.4) | |

## TORQUE SPECIFICATIONS

N11CC--

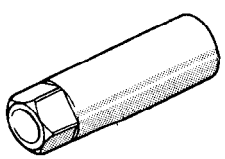
| Items | Nm | ft.lbs. |
|---|---|---|
| Air cleaner | | |
| Air cleaner to body | 8–10 | 6-7 |
| Resonator | 10–13 | 7-9 |
| Air cleaner bracket | 12-15 | 9-11 |
| Intercooler | | |
| Intercooler to body | 12-15 | 9-11 |
| Air by-pass valve | 15-22 | 11-16 |
| Air pipe B | 12-15 | 9-11 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Intake manifold <1.8L Engine> | | |
| Accelerator cable to air intake plenum | 4 - 6 | 3 - 4 |
| Fuel high pressure hose to delivery pipe | 4 - 6 | 3 - 4 |
| Delivery pipe to intake manifold | 10–13 | 7 - 9 |
| Intake manifold stay | 18-25 | 13–18 |
| Engine hanger | 15–20 | 11–14 |
| Intake manifold to engine | 15–20 | 11–14 |
| Throttle body | 15–22 | 11–16 |
| Air intake plenum stay | 15–20 | 11-14 |
| Air intake plenum to intake manifold | 15–20 | 11-14 |
| Water outlet fitting | 17–20 | 12-14 |
| EGR valve | 10–15 | 7–11 |
| EGR temperature sensor <Vehicles for California> | 10–12 | 7 - 9 |
| Ground cable to air intake plenum | 10–12 | 7 - 9 |
| Control harness protector to air intake plenum | 4 - 6 | 3 - 4 |
| Cover | 10–13 | 7 - 9 |
| Intake manifold <2.0L DOHC Engine> | | |
| Accelerator cable to intake manifold | 4 - 6 | 3 - 4 |
| Throttle body stay | 15-22 | 11-16 |
| Fuel high pressure hose to delivery pipe | 4 - 6 | 3 - 4 |
| Delivery pipe to engine | 10–13 | 7 - 9 |
| Intake manifold stay | 25–30 | 18-22 |
| Intake manifold to engine | | |
| Mounting bolt (M8) | 15–20 | 11-14 |
| Mounting nut and bolt (M10) | 30–42 | 22–30 |
| Ignition coil | 20–27 | 14–20 |
| Power transistor unit | 10–12 | 7 - 9 |
| Throttle body | 15-22 | 11–16 |
| EGR valve | 15–22 | 11–16 |
| EGR temperature sensor <Vehicles for California> | 10–12 | 7 - 9 |
| Control harness protector to intake manifold | 4 - 6 | 3 - 4 |
| Control harness clamp bolt | 10–12 | 7 - 9 |
| ixhaust manifold <1.8L Engine> | | |
| Front exhaust pipe to exhaust manifold | 30–40 | 22-29 |
| Front exhaust pipe to engine | 30–40 | 22-29 |
| Exhaust manifold cover (A) to exhaust manifold | 27-33 | 20–24 |
| Exhaust manifold cover (B) to exhaust manifold | 20–28 | 14–20 |
| Exhaust manifold cover (A) to exhaust manifold cover (B) | 8–10 | 6 - 7 |
| Exhaust manifold to engine | 15–20 | 11–14 |
| Oxygen sensor | 40–50 | 29-36 |
| Engine oil level gauge guide mounting bolt | 12-15 | 9–11 |
| ixhaust manifold <2.0L DOHC Engine (Non-Turbo)> | | |
| Front exhaust pipe to exhaust manifold | 30–40 | 22-29 |
| Front exhaust pipe to engine | 30–40 | 22-29 |
| Heat protector (A), (B) | 12-15 | 9–11 |
| Exhaust manifold to engine | 25–30 | 18-22 |
| Oxygen sensor | 40–50 | 29-36 |
| Engine hanger to engine | 12-15 | 9–11 |
| ixhaust manifold and turbocharger <2.0L DOHC Engine (Turbo)> | | |
| Front exhaust pipe to exhaust fitting | 40–60 | 29-43 |
| Front exhaust pipe to engine | 30–40 | 22-29 |
| Heat protector (A), (B) | 12-15 | 9-11 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Engine oil level gauge guide mounting bolt | 12-15 | 9–11 |
| Engine hanger to engine | 12-15 | 9-11 |
| Exhaust manifold to engine | 25–30 | 18–22 |
| Exhaust manifold to turbocharger | 55-65 | 40–47 |
| Oil pipe to engine | 14-19 | 10–14 |
| Water pipe (B) to water inlet pipe | 40–50 | 29-36 |
| Waste gate actuator | 10–13 | 7-9 |
| Oxygen sensor | 40–50 | 29-36 |
| Water pipe (B) to turbocharger | 35–50 | 25-36 |
| Air outlet fitting | 9-14 | 7–10 |
| Oil pipe to turbocharger | 28-34 | 20–25 |
| Water pipe (A) to turbocharger | 35–50 | 25-36 |
| Water pipe (A) mounting bolt | 10–12 | 7-9 |
| Exhaust fitting | 55-65 | 40–47 |
| Oil return pipe | 8–10 | 6-7 |
| Exhaust pipe and main muffler | | |
| Front exhaust pipe to exhaust manifold <Non-Turbo> | 30–40 | 22-29 |
| Front exhaust pipe to exhaust fitting <Turbo> | 40–60 | 29-43 |
| Front exhaust pipe clamp | 30–40 | 22-29 |
| Rubber hanger | 10–15 | 7-11 |
| Front exhaust pipe to catalytic converter | 40–60 | 29-43 |
| Catalytic converter to center exhaust pipe | 30–40 | 22-29 |
| Hanger bracket to body | 10–15 | 7-11 |
| Hook to center exhaust pipe | 10–15 | 7-11 |
| Center exhaust pipe to main muffler | 30–40 | 22-29 |
| Moulding to main muffler | 4-6 | 3-4 |

## SPECIAL TOOL

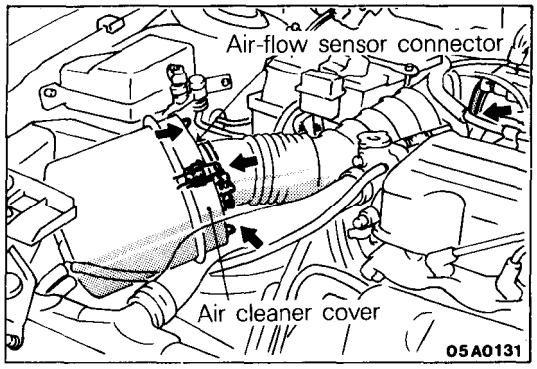
N11DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998703 | Oxygen sensor wrench | Removal/Installation of oxygen sensor <Non-Turbo> |
| | MD998748 | Oxygen sensor wrench | Removal/Installation of oxygen sensor <Turbo> |

## TROUBLESHOOTING

N11EAAB

| Symptom | Probable cause | Remedy |
|---|---|---|
| Exhaust gas leakage | Loose joints | Retighten |
| | Broken pipe or muffler | Repair or replace |
| Abnormal noise | Broken separator in muffler<br>Broken rubber hangers | Replace |
| | Interference of pipe or muffler with vehicle body | Correct |
| | Broken pipe or muffler | Repair or replace |




# SERVICE ADJUSTMENT PROCEDURES

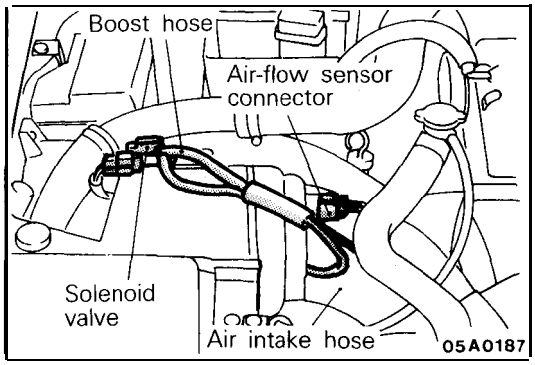
## AIR CLEANER ELEMENT INSPECTION AND REPLACEMENT N11GBAF

**<1.8L Engine, 2.0L DOHC Engine (Non-Turbo)>**

(1) Disconnect the air-flow sensor connector.
(2) Remove the air intake hose.
(3) Unclamp the air cleaner cover.
(4) Push the air intake hose backward, and remove the air cleaner cover.

**Caution**
**Care must be taken when removing the air cleaner cover, because the air-flow sensor is attached.**

(5) Take out the air cleaner element.
(6) Check the air cleaner element for dirt or clogging.
(7) Replace the air cleaner element if the dirt or clogging is serious.
(8) Insert the element into the air cleaner body and install the air cleaner cover.
(9) Install the air intake hose.
(10) Connect the air intake hose and the air-flow sensor connector.

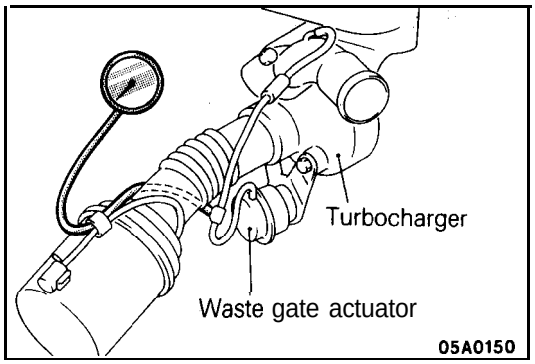



**<2.0L DOHC Engine (Turbo)>**

(1) Disconnect the air-flow sensor connector.
(2) Disconnect the boost hose.
(3) Disconnect the solenoid valve with hoses.
(4) Disconnect the air intake hose.
(5) Remove the air cleaner retaining bolts.
(6) Remove the air cleaner assembly.
(7) Unclamp the air cleaner cover.

**Caution**
**Care must be taken when removing the air cleaner cover, because the air-flow sensor is attached.**

(8) Take out the air cleaner element.
(9) Check the air cleaner element for dirt or clogging.
(10) Replace the air cleaner element if the dirt or clogging is serious.
(11) Insert the element into the air cleaner body.
(12) Clamp the air cleaner cover.
(13) Install and tighten the air cleaner retaining bolts to the specified torque.
(14) Connect the air intake hose and the solenoid valve.
(15) Connect the vaccum hose and the air-flow sensor connector.




## TURBOCHARGER SUPERCHARGING PRESSURE INSPECTION

N11GAAB

**Caution**
**Perform running inspection with two passengers in the vehicle and where full throttle acceleration can be safely made.**
**The pressure gauge reading is taken by a front seat passenger.**

(1) Disconnect the supercharging pressure control hose at the solenoid valve (fixed to the air cleaner) and plug the nipple. Attach the pressure gauge to the hose.
(2) Drive the vehicle with full throttle and accelerate the engine to a speed of more than 3,500 rpm at 2nd gear. Measure the supercharging pressure when the pointer is stabilized.

**Standard value:**
**M/T 41-75 kPa (6.0–10.8 psi)**
**A/T 37-68 kPa (5.4-9.9 psi)**

**Caution**
**If the supercharging pressure deviates from the standard value, check the following items for possible causes.**

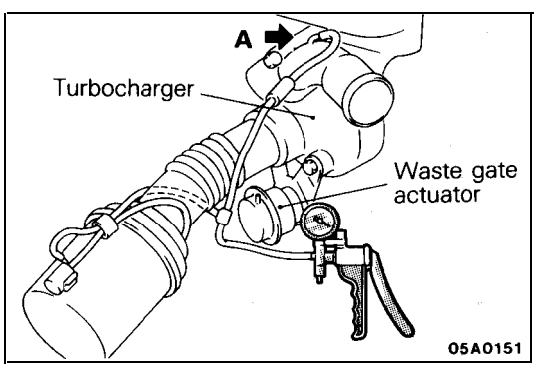
**When pressure is high:**
**Waste gate actuator malfunction**

**When pressure is low:**
**Waste gate actuator malfunction**
**Supercharging pressure leaks**
**Faulty turbocharger**

## SUPERCHARGING PRESSURE CONTROL SYSTEM INSPECTION

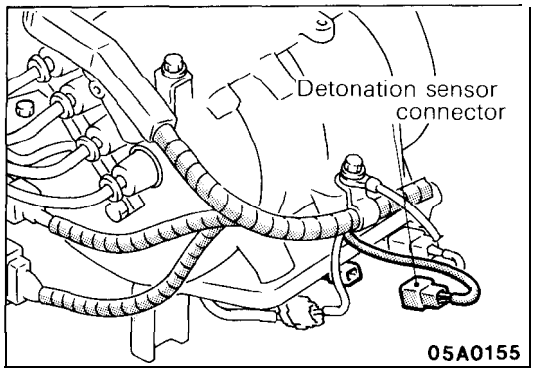
N11GFAA

(1) After the self-diagnosis content of ECI-MULTI system is completely read, turn off the ignition switch.
(2) Disconnect the vacuum hose (white-striped) from the waste gate actuator, and connect the hand vacuum pump to the vacuum hose.
(3) Disconnect the vacuum hose (black) from the intake port (A in the figure) of the boost which controls the waste gate actuator, and insert the blind plug into the nipple from which the vacuum hose was disconnected.
(4) Keep the (–) terminal of the battery disconnected for 10 seconds or longer, and then reconnect the terminal.
(5) Apply the negative pressure in the following state, and check the air tightness.




| Engine state | Hose (black) | Normal state |
|---|---|---|
| Stop | Opened | Negative pressure leaks. |
| | Closed by finger | Negative pressure is maintained. |
| Idling | | Negative pressure leaks. |

NOTE
If negative pressure is not normal, it can be assumed that there is a malfunction in the waste gate solenoid valve or vacuum hose.




(6) With the vacuum hose (black) closed when idling, apply negative pressure and inspect the condition of the negative pressure.

| Engine state | Detonation sensor connector | Normal state |
|---|---|---|
| Idling | Connection | Negative pressure leaks. |
| | Disconnection | Negative pressure is maintained. |

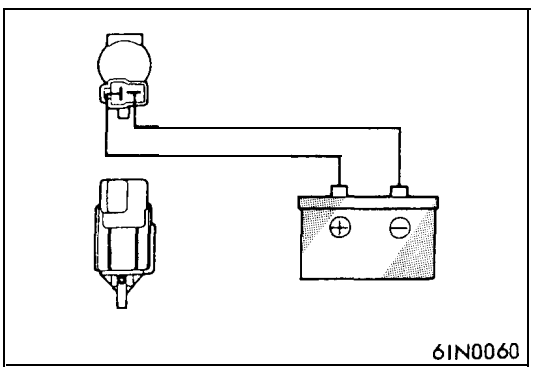
NOTE
If negative pressure is not normal, it can be assumed that there is a malfunction in the knock sensor circuit.

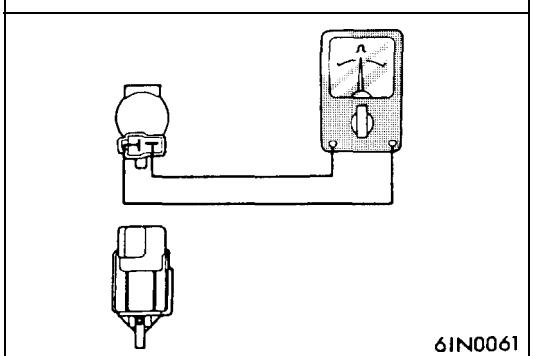
(7) Turn off the ignition switch, and connect the connector of the detonation sensor.

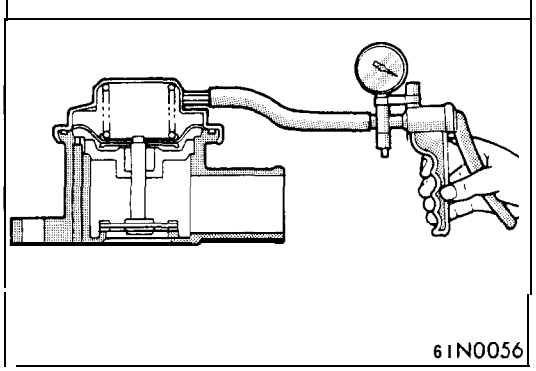
(8) Disconnect the (−) terminal of the battery for 10 seconds or more.

NOTE
This erases the diagnosis memory of the detonation sensor trouble by disconnecting the detonation sensor connector.

## SUPERCHARGING PRESSURE RELIEF SOLENOID VALVE INSPECTION N11GGAA




(1) Operation check

Using a hand vaccum pump, apply a negative pressure to the solenoid valve nipple on which the white vacuum hose is connected, and check air-tightness when the voltage is applied to the solenoid valve terminal and when it is released from the terminal.

| Battery voltage | Other nipple of solenoid valve | Normal state |
|---|---|---|
| When applied | Opened | Negative pressure leaks. |
| | Closed by finger | Negative pressure is maintained. |
| When released | Opened | Negative pressure is maintained. |

(2) Continuity check of coil

Measure the solenoid valve terminal resistance.

**Standard value: 36-44 Ω [at 20°C (68°F)]**

## AIR BYPASS VALVE INSPECTION N11GHAA

(1) Remove the air bypass valve.

(2) Connect the hand vacuum pump to the nipple of the air bypass valve.

(3) Apply a negative pressure of approx. 53.3 kPa (7.7 psi), and check operation of the valve. Also check that air tightness is maintained.

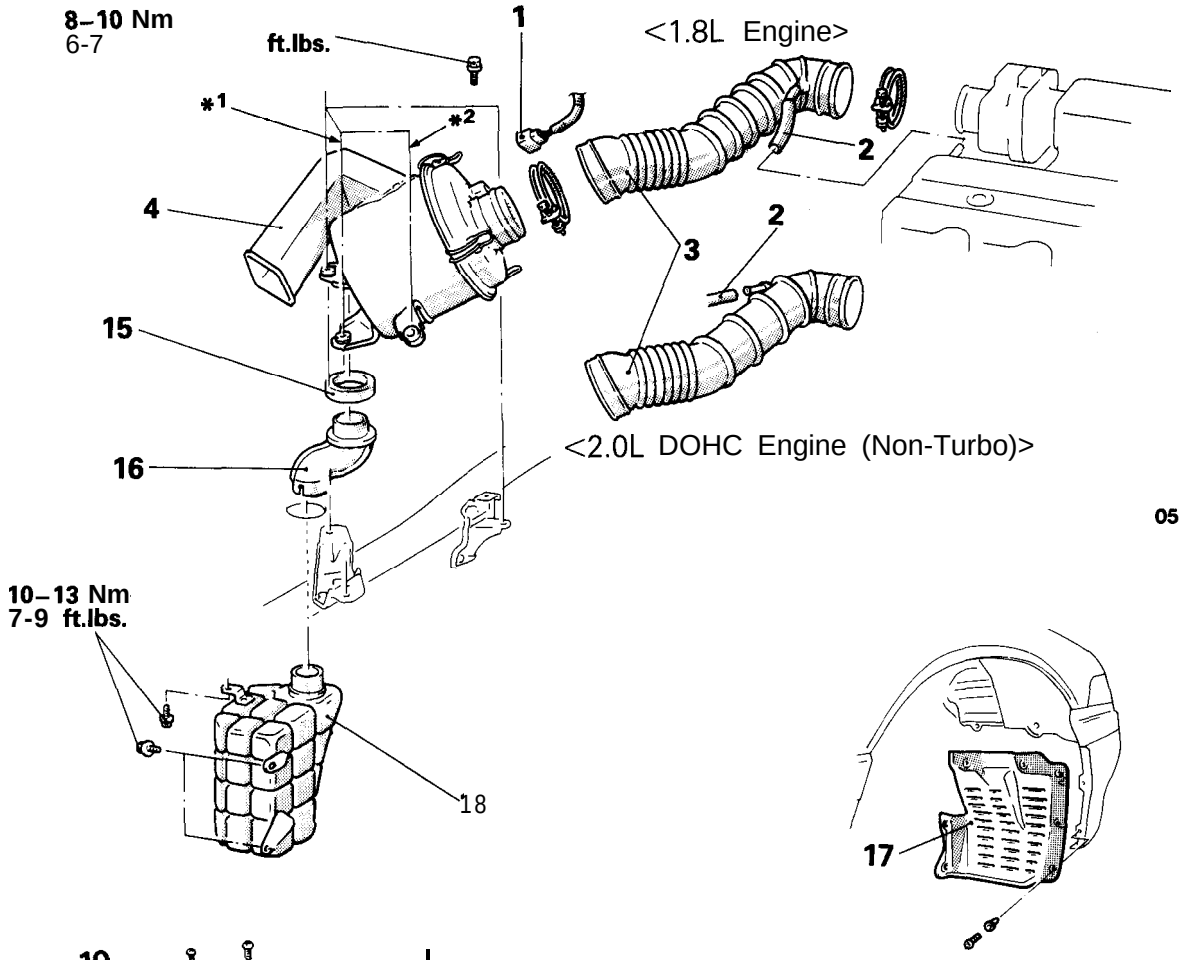
| Negative pressure | Valve operation |
|---|---|
| About 53.3 kPa (7.7 psi) | It starts opening. |

# AIR CLEANER

## REMOVAL AND INSTALLATION

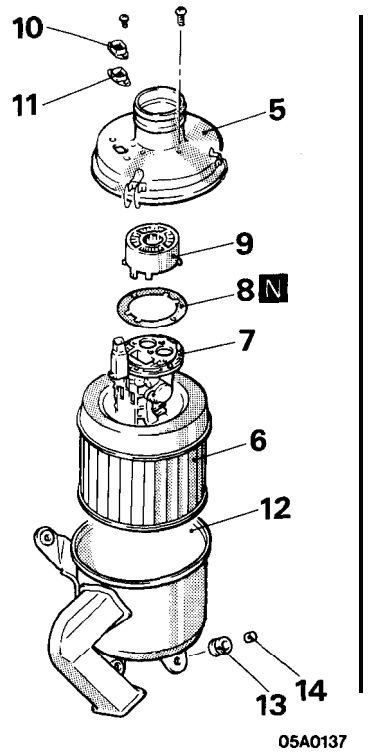
N11FA--

**<1.8L Engine, 2.0L DOHC Engine (Non-Turbo)>**




05A0179

05A0140




05A0137

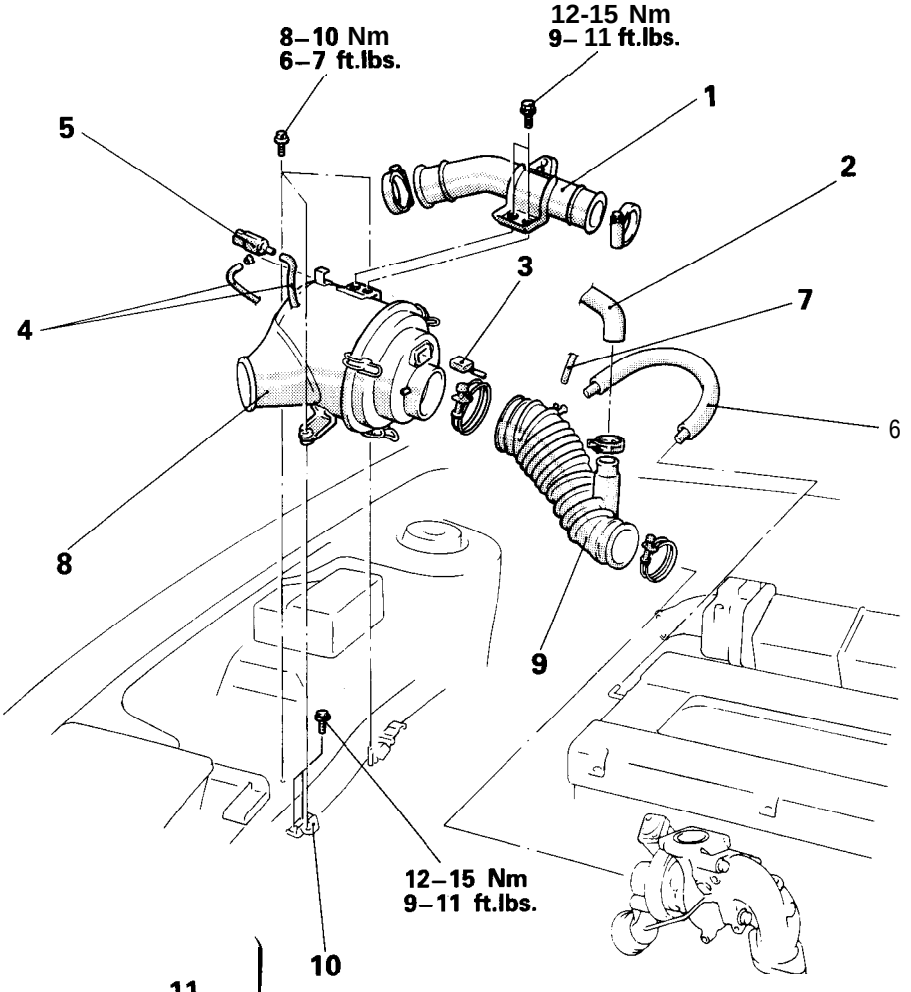
**Removal steps**

1. Connection for air flow sensor connector
2. Breather hose
3. Air intake hose
4. Air cleaner
5. Air cleaner cover
6. Air cleaner element
7. Air flow sensor assembly
8. Air flow sensor gasket
9. Noise reduction filter
10. Cover
11. Grommet
12. Air cleaner body
13. Insulator
14. Collar
15. Packing
16. Tuning pipe
17. Splash shield extension
18. Resonator

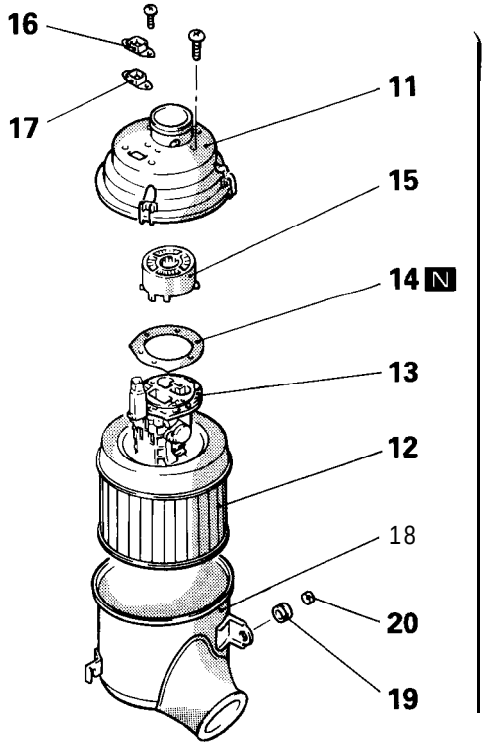
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ❑ : Non-reusable parts
(3) *1: <1.8L engine>
(4) *2: <2.0L DOHC engine (Non-Turbo)>

## REMOVAL AND INSTALLATION

**<2.0L DOHC Engine (Turbo)>**




05A0182




05A0167

**Removal steps**

1. Air pipe B
2. By-pass air hose
3. Connection for air flow sensor connector
4. Vacuum hose
5. Waste gate solenoid valve
6. Breather hose
7. Purge hose
8. Air cleaner
9. Air intake hose
10. Air cleaner bracket
11. Air cleaner cover
12. Air cleaner element
13. Air flow sensor assembly
14. Air flow sensor gasket
15. Noise reduction filter
16. Cover
17. Grommet
18. Air cleaner body
19. Insulator
20. Collar

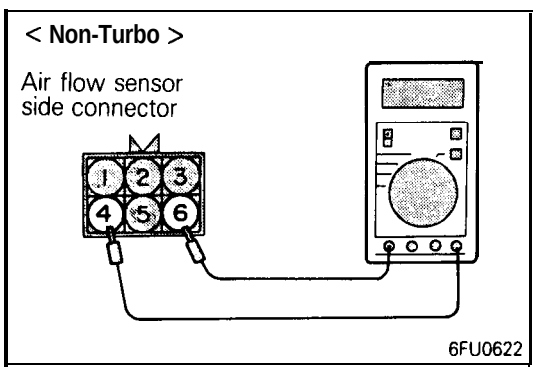
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ❑ : Non-reusable parts

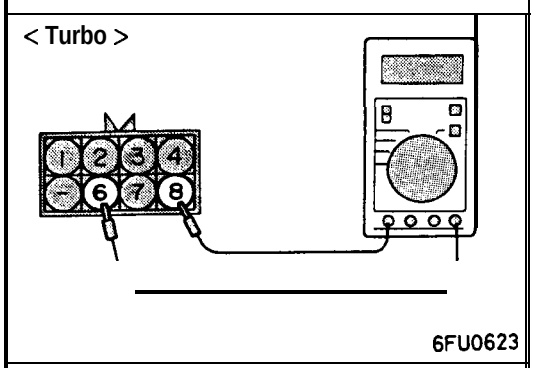
## INSPECTION N11FCAB

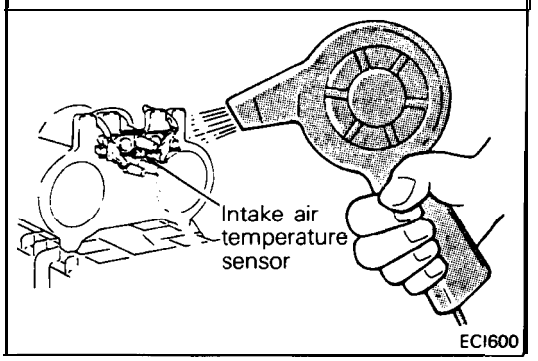
- Check the air cleaner body, cover or packing for deformation, corrosion or damage.
- Check the air duct for damage.
- Check the air cleaner element for clogging, contamination or damage.
  If element is slightly clogged, remove dust by blowing air from inside of element.

### AIR-FLOW SENSOR CHECK

For inspection of air-flow sensor, refer to GROUP 14—Air-Flow Sensor Check.




## INTAKE AIR TEMPERATURE SENSOR N14QHABa

(1) Disconnect the air flow sensor connectors.
(2) Measure resistance between terminals ④ and ⑥ <Non-Turbo>.
(3) Measure resistance between terminals ⑥ and ⑧ <Turbo>.

| Temperature°C (°F) | Resistance kΩ |
|---|---|
| 0 (32) | 6.0 |
| 20 (68) | 2.7 |
| 80 (176) | 0.4 |

(4) Measure resistance while heating the sensor using a hair drier.

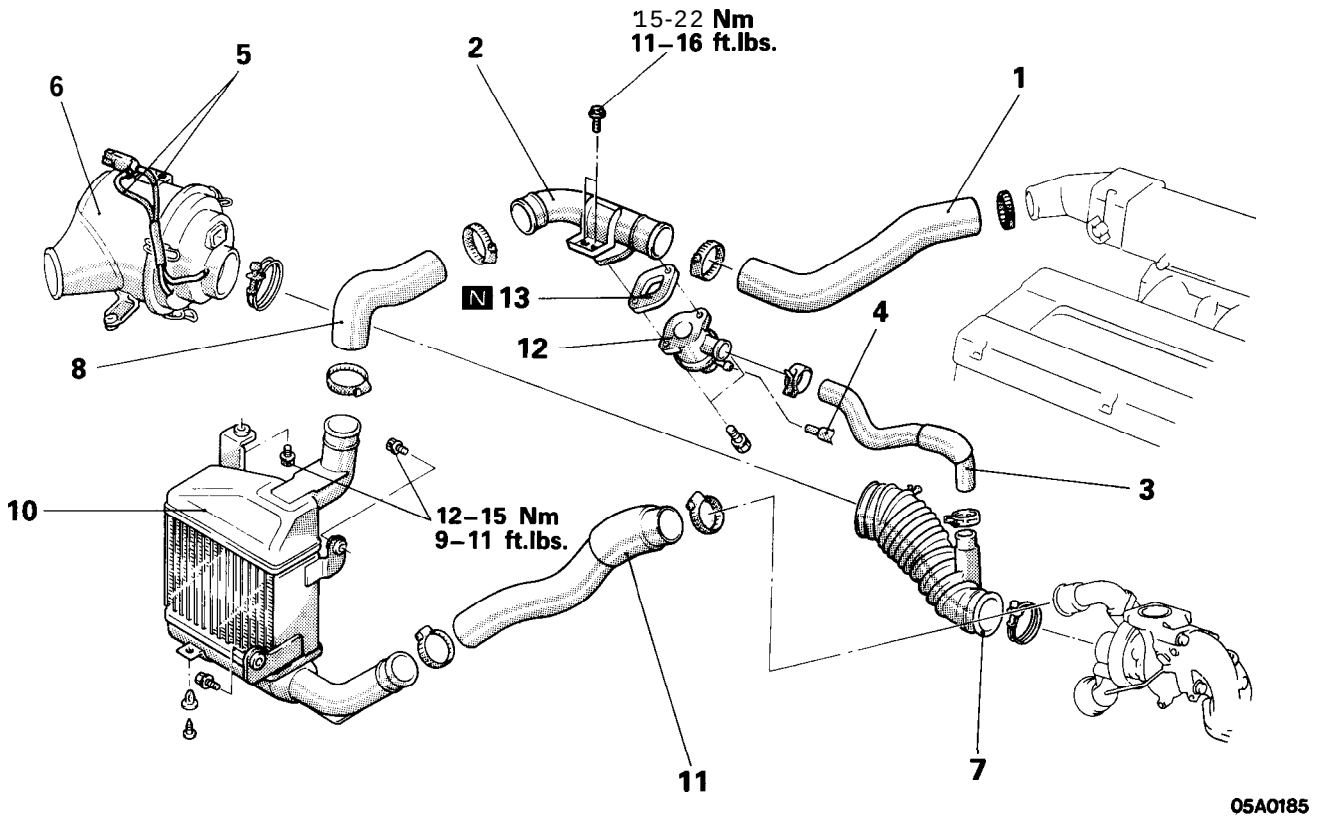
| Temperature°C (°F) | Resistance kΩ |
|---|---|
| Higher | Smaller |

(5) If the value deviates from the standard value or the resistance remains unchanged, replace the air flow sensor assembly.

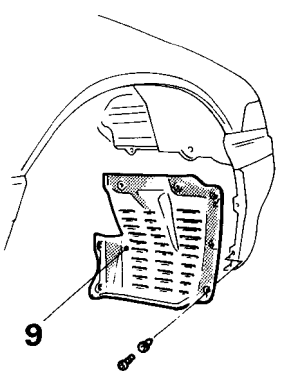
# INTERCOOLER

## REMOVAL AND INSTALLATION

N11TA--




05A0185




05A0140

**Removal steps**

1. Air hose C
2. Air pipe B
3. Air by-pass hose
4. Vacuum hose
5. Vacuum hose
- ⊠ 6. Air cleaner
7. Air intake hose
8. Air hose B
9. Splash shield extension
- ◆10. Intercooler
11. Air hose A
12. Air by-pass valve
13. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● ◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation"
(4) ❑ : Non-reusable parts

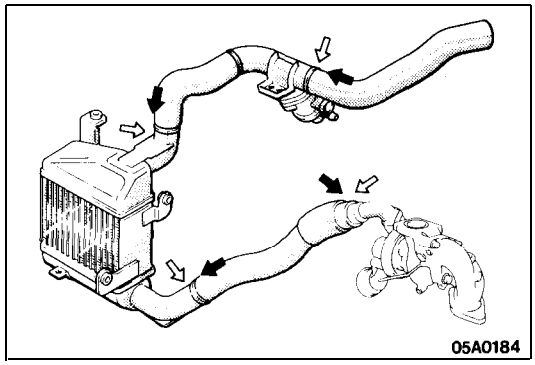
## SERVICE POINTS OF REMOVAL N11TBABa

### 6. REMOVAL OF AIR CLEANER

Refer to P.11-9.

## INSPECTION N11TCAA

- Check the intercooler fins for bending, damage, or foreign matter.
- Check the intercooler hoses for cracking, damage, or wear.




## SERVICE POINTS OF INSTALLATION N11TDAB

### 10. INSTALLATION OF INTERCOOLER

Connect the air hoses and air pipes by aligning the paint marks on the hoses with the projections and indentations on the pipes.

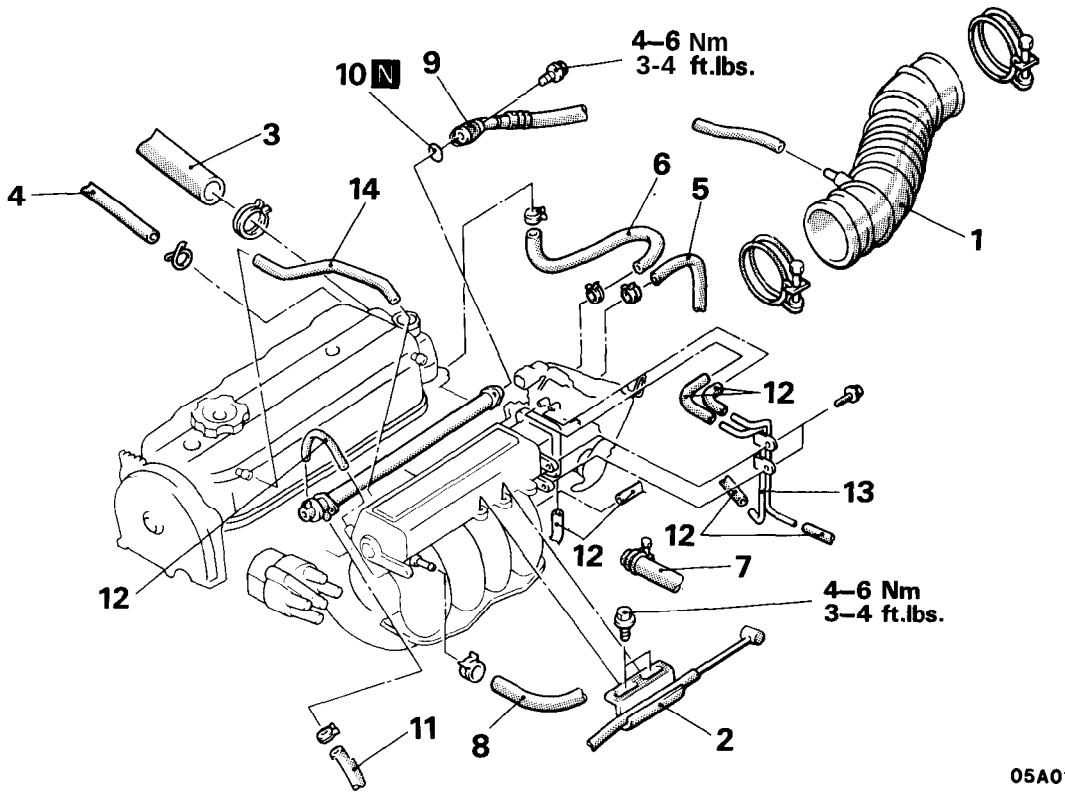
**Caution**
**Be careful not to allow any foreign matter to get into the hoses, pipes, or the intercooler itself.**

NOTE
⇦ : Projection or indentation (pipe)
⬅ : Paint mark (hose)

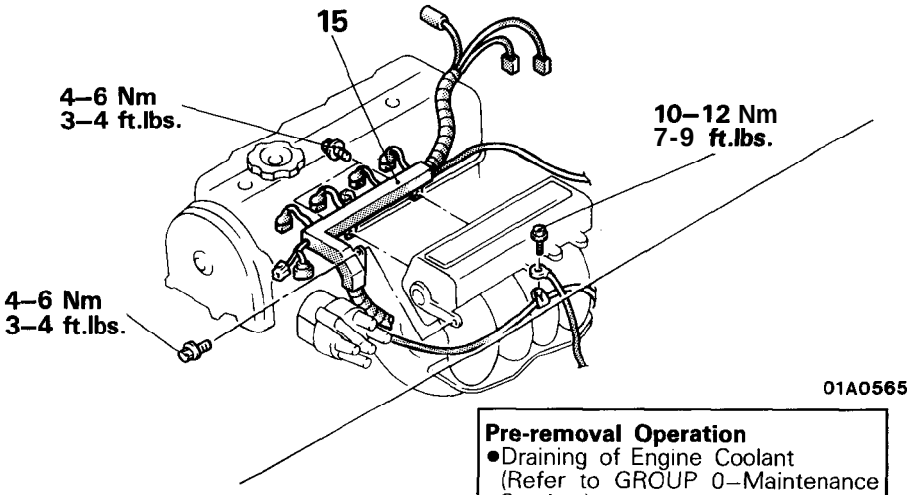
# INTAKE MANIFOLD < 1.8L Engine >

## REMOVAL AND INSTALLATION

N11MA-A




05A0132




01A0565

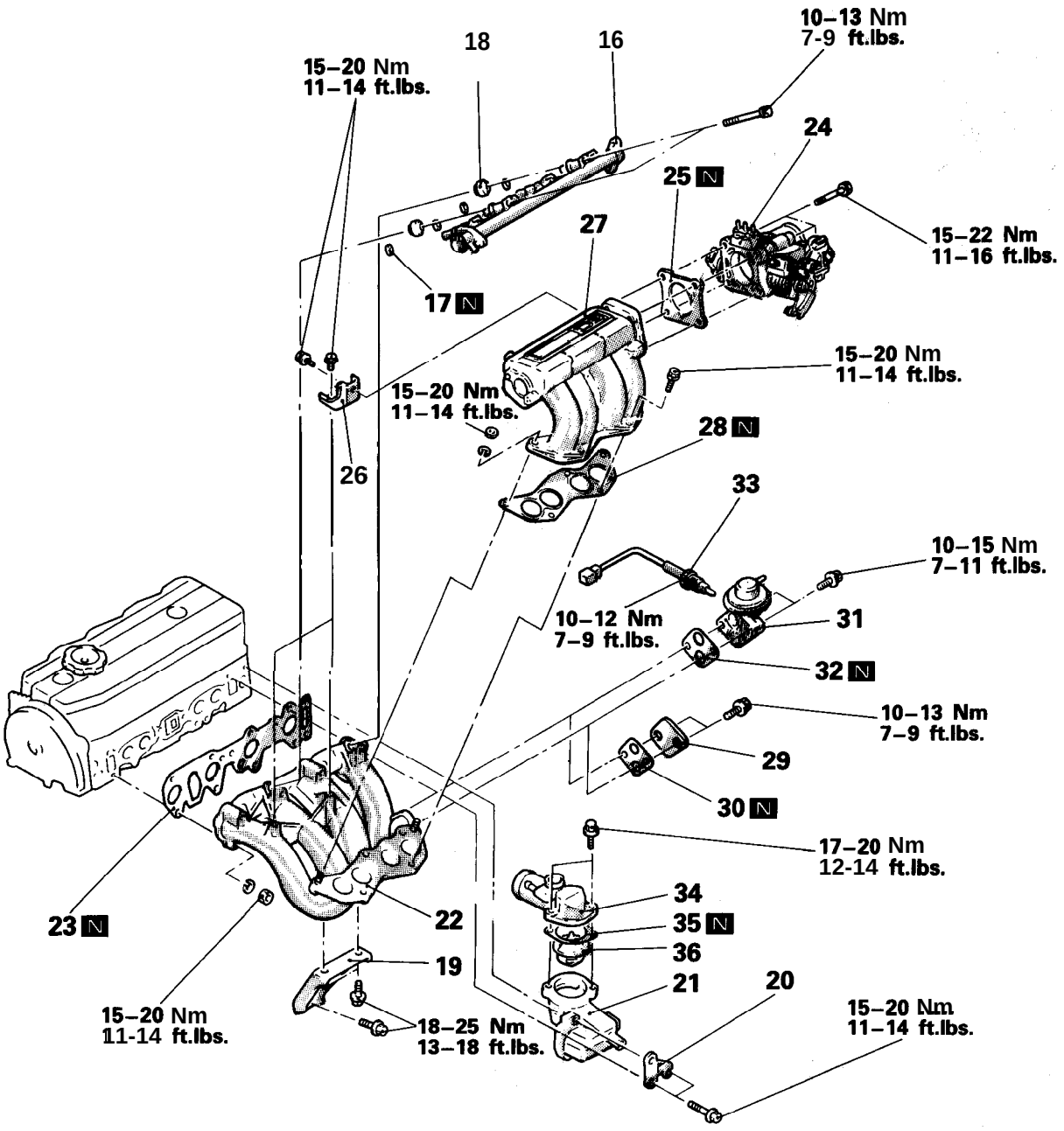
**Pre-removal Operation**
- Draining of Engine Coolant (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- *Filling of Engine Coolant (Refer to GROUP O-Maintenance Service.)
- Adjustment of Accelerator Cable (Refer to GROUP 14–Service Adjustment Procedures.)
- Inspection of Fuel Pressure (Refer to GROUP 14–Service Adjustment Procedures.)

**Removal steps**

1. Air intake hose
2. Connection for accelerator cable
◆◆ ● ◆ 3. Connection for radiator upper hose
4. Connection for overflow tube
5. Connection for water by-pass hose
6. Water hose
7. Connection for heater hose
8. Connection for brake booster vacuum hose
◆◆ 9. Connection for fuel high pressure hose
10. O-ring
11. Connection for fuel return hose
12. Connection for vacuum hoses
13. Vacuum pipe
14. PCV hose
15. Connection for control harness

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) ❑ : Non-reusable parts

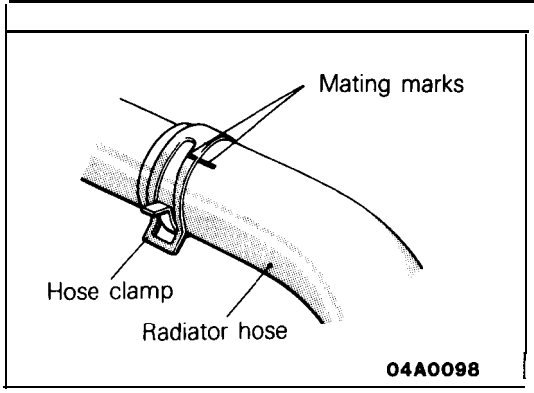



05A0180

**Removal steps**

◆◆ ● ◆16. Delivery pipe, fuel injector and pressure regulator
17. Insulator
18. Insulator
19. Intake manifold stay
20. Engine hanger
21. Thermostat housing
22. Intake manifold
23. Intake manifold gasket
24. Throttle body assembly
25. Gasket
26. Air intake plenum stay
27. Air intake plenum
28. Air intake plenum gasket
●◆ 29. Cover <Vehicles for Federal and Canada>
30. Gasket <Vehicles for Federal>
31. EGR valve <Vehicles for California>
32. EGR gasket <Vehicles for California>
33. EGR temperature sensor <Vehicles for California>
34. Water outlet fitting
35. Gasket
36. Thermostat

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation"
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF REMOVAL N11MBAI

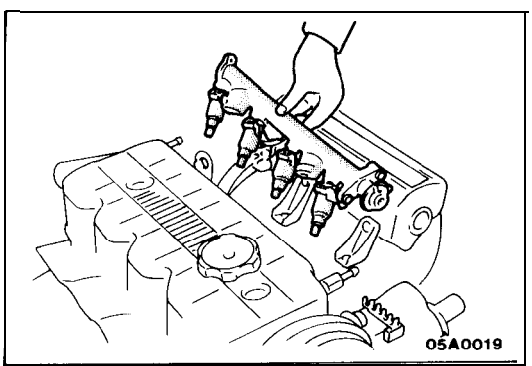
### 3. DISCONNECTION OF RADIATOR UPPER HOSE

Make mating marks on the radiator hose and the hose clamp, and then remove the radiator hose.

### 9. DISCONNECTION OF FUEL HIGH PRESSURE HOSE

Relieve pressure in the fuel pipe line to prevent fuel outflow.
(Refer to GROUP 14 – Service Adjustment Procedures.)

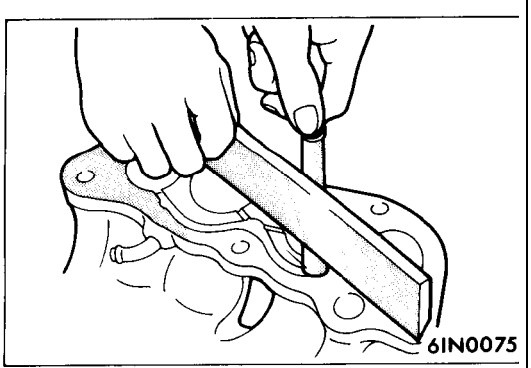
**Caution**
**Cover fuel pipe line with rag after relieving pressure as certain pressure may still remain.**




### 16. REMOVAL OF DELIVERY PIPE, FUEL INJECTOR AND PRESSURE REGULATOR

Remove delivery pipe with fuel injector and pressure regulator.

**Caution**
**Do not drop injector when removing delivery pipe.**



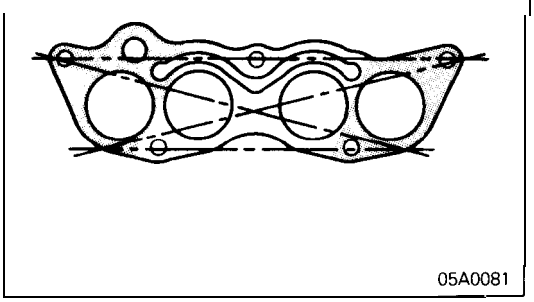

## INSPECTION N11MCAI

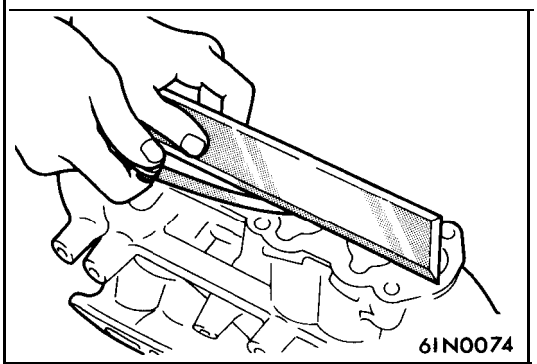
Check the following points; replace the part if a problem is found.

AIR INTAKE PLENUM

(1) Check air intake plenum for defect or cracks. Replace if defective or cracked.
(2) Check load (negative pressure) of drain port. Check cooling water and jet air passages for clogging. Clean if required.
(3) Check deflection of installation surface with straight edge and feeler gauge.

**Standard value: 0.15 mm (.006 in.) or less**
**Limit: 0.3 mm (.012 in.)**

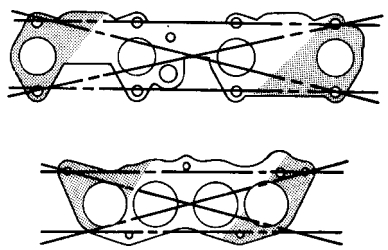





**INTAKE MANIFOLD**

(1) Check for damage or cracking of any part.
(2) Check load (negative pressure) of drain port. Check cooling water and jet air passages for clogging. Clean if required.
(3) Check deflection of installation surface with straight edge and feeler gauge.

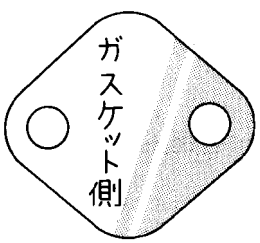
**Standard value: 0.15 mm (.006 in.) or less**
**Limit: 0.3 mm (.012 in.)**




## SERVICE POINTS OF INSTALLATION N11MDAXa

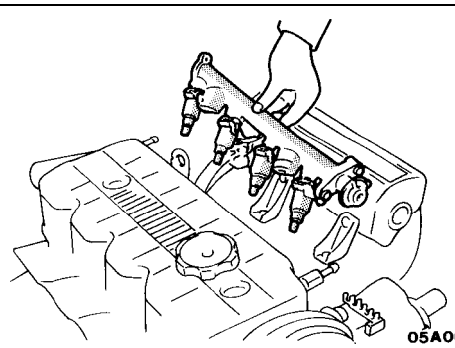
### 29. INSTALLATION OF COVER

Install the cover so that the side of the cover imprinted "ガスケット側" (gasket side) is at the gasket side.




### 16. INSTALLATION OF DELIVERY PIPE, FUEL INJECTOR AND PRESSURE REGULATOR

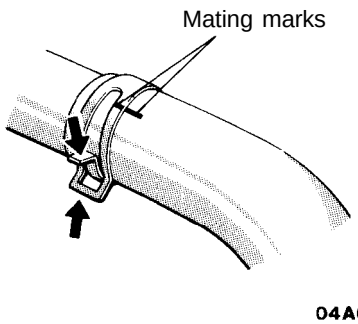
**Caution**
**Be careful not to drop the injector when the delivery pipe is installed.**




### 3. CONNECTION OF RADIATOR UPPER HOSE

Align the mating marks on the radiator hose and the hose clamp and install; then apply pressure where shown by the arrows in the illustration so that the clamp is correctly seated at the clamp's previous trace indentations.

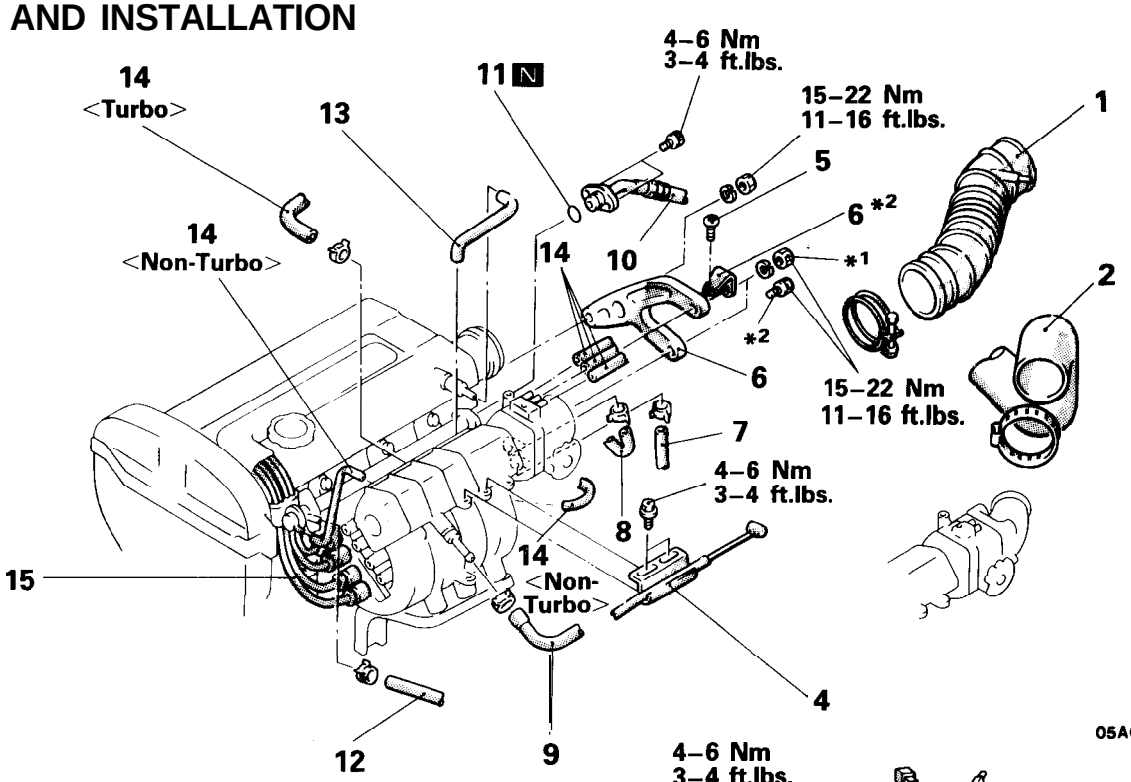
**Caution**
**Be absolutely sure that the hose clamp is correctly seated to its previous trace indentations.**



# INTAKE MANIFOLD <2.0L DOHC Engine>

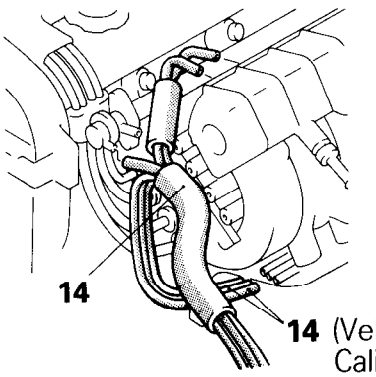
## REMOVAL AND INSTALLATION

N11MA-B

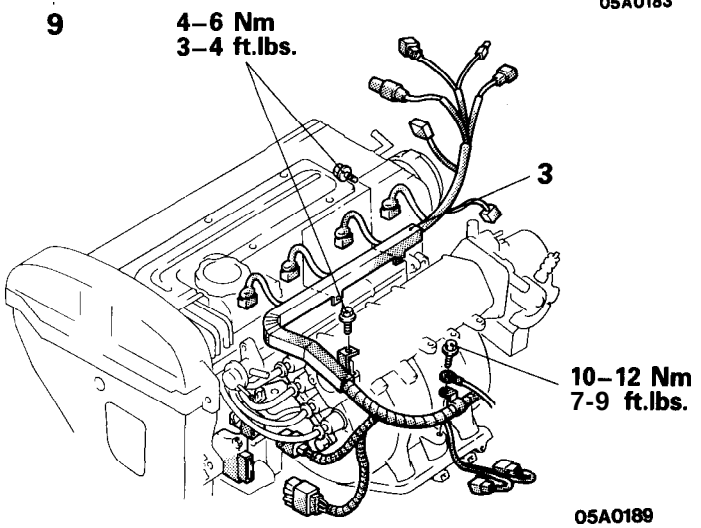



05A0183

<Turbo>




05A0139




05A0189

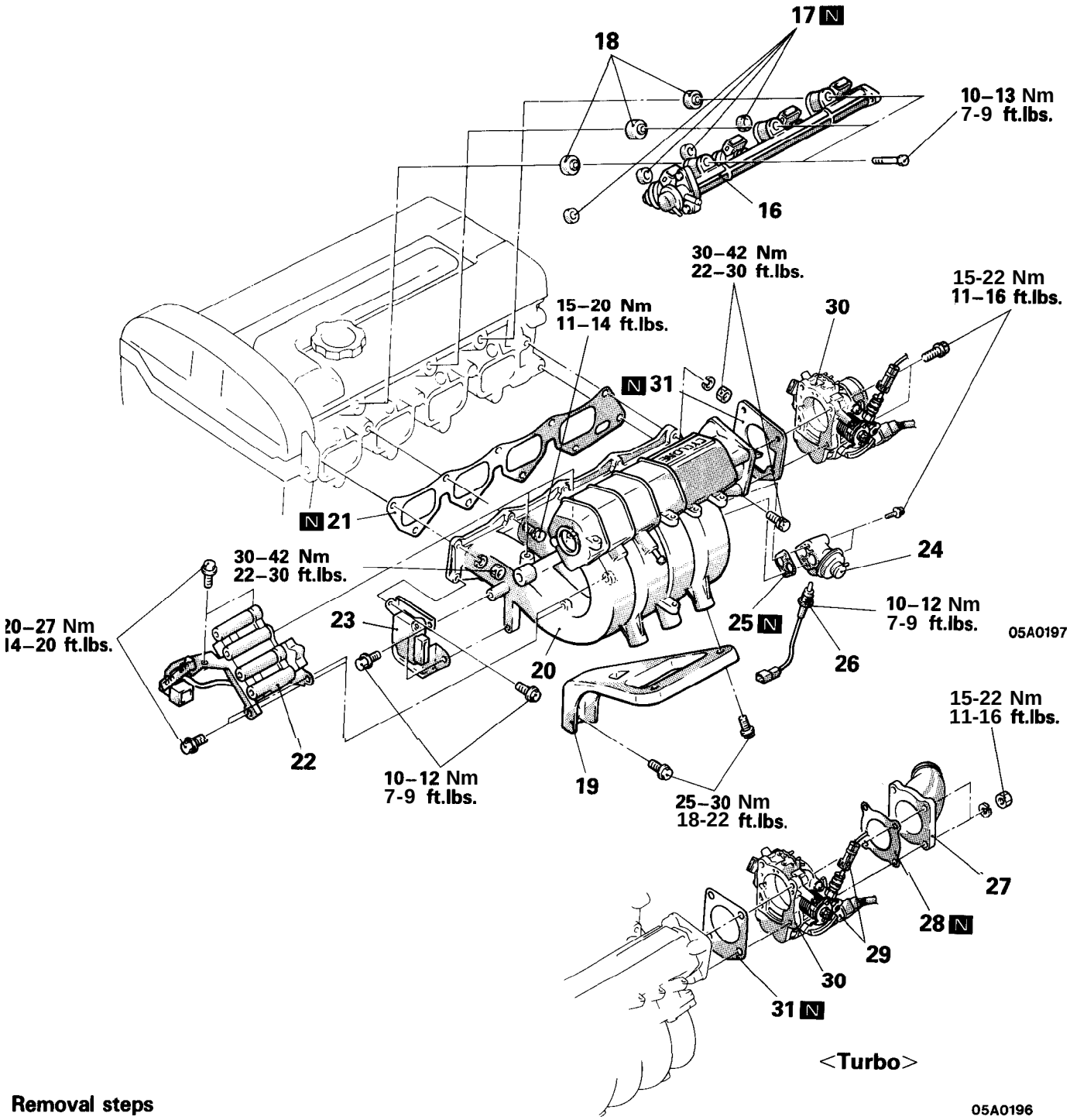
**Pre-removal Operation**
- Draining of Engine Coolant
  (Refer to GROUP 0–Maintenance Service.)

**Post-installation Operation**
- *Filling of Engine Coolant
  (Refer to GROUP 0–Maintenance Service.)
- @Adjustment of Accelerator Cable
  (Refer to GROUP 14–Service Adjustment Procedures.)
- Inspection of Fuel Pressure
  (Refer to GROUP 14–Service Adjustment Procedures.)

**Removal steps**

1. Air intake hose <Non-Turbo>
2. Air hose C <Turbo>
3. Connection for control harness
4. Connection for accelerator cable
5. Ground plate installation screw
6. Throttle body stay and ground plate
7. Connection for water by-pass hose
8. Connection for water hose
9. Connection for brake booster vacuum hose
- ◆◆ 10. Connection for fuel high pressure hose
11. O-ring
12. Connection for fuel return hose
13. Connection for PCV hose
14. Connection for vacuum hoses
15. Connection for spark plug cable

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ❑ : Non-reusable parts
(4) *1: <Non-Turbo>
(5) *2: <Turbo>




**Removal steps**

◆◆ ● ◆16. Delivery pipe, fuel injector and pressure regulator
17. Insulator
18. Insulator
19. Intake manifold stay
20. Intake manifold
21. Intake manifold gasket
22. Ignition coil
23. Power transistor unit
24. EGR valve
25. Gasket
26. EGR temperature sensor <Vehicles for California>
27. Air fitting <Turbo>
28. Gasket <Turbo>
29. Connection for control harness
30. Throttle body
31. Gasket

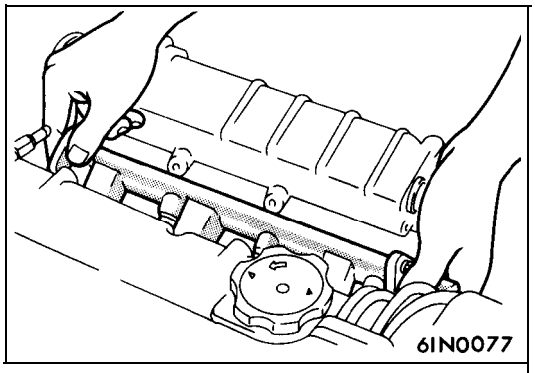
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● ◆: Refer to "Service Points of Removal".
(3) ● ◆: Refer to "Service Points of Installation".
(4) N : Non-reusable parts

## SERVICE POINTS OF REMOVAL N11MBAJ

**10. DISCONNECTION OF FUEL HIGH PRESSURE HOSE**

Relieve pressure in the fuel pipe line to prevent fuel outflow. (Refer to GROUP 14 – Service Adjustment Procedures)

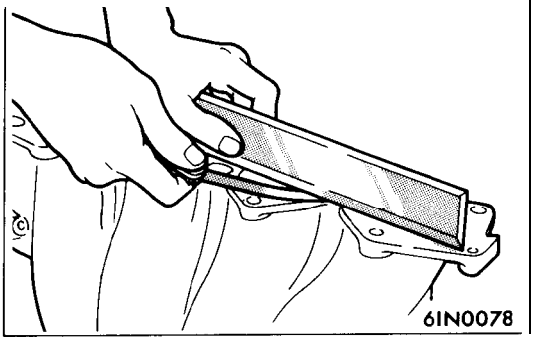
**Caution**
**Cover fuel pipe line with rag after relieving pressure as certain pressure may still remain.**




**16. REMOVAL OF DELIVERY PIPE, FUEL INJECTOR AND PRESSURE REGULATOR**

Remove delivery pipe with fuel injector and pressure regulator on.

**Caution**
**Do not drop injector when removing delivery pipe.**



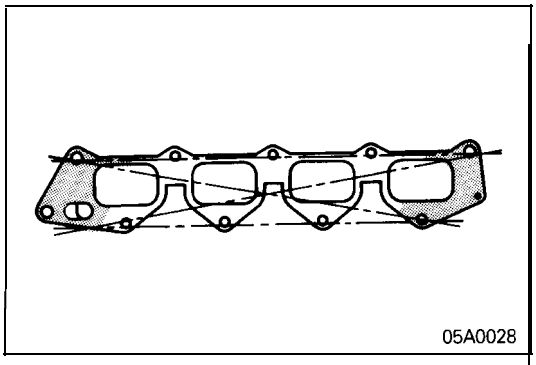

## INSPECTION N11MCAJ

Check the following points; replace the part if a problem is found.

**INTAKE MANIFOLD**

1. Check for damage or cracking of any part.
2. Check for obstruction of the negative pressure (vacuum) outlet port, and for obstruction of the water passage or gas passage.
3. Using a straight edge and a thickness gage, check for distortion of the cylinder head installation surface.

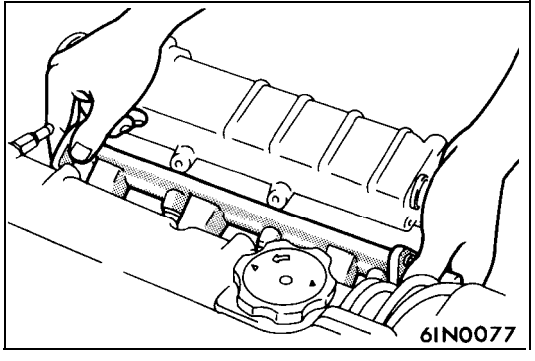
**Standard value: 0.15 mm (.006 in.) or less**
**Limit: 0.3 mm (.012 in.)**




## SERVICE POINTS OF INSTALLATION N11MDAVa

**16. INSTALLATION OF DELIVERY PIPE, FUEL INJECTOR AND PRESSURE REGULATOR**

**Caution**
**Be careful not to drop the injector when the delivery pipe is installed.**

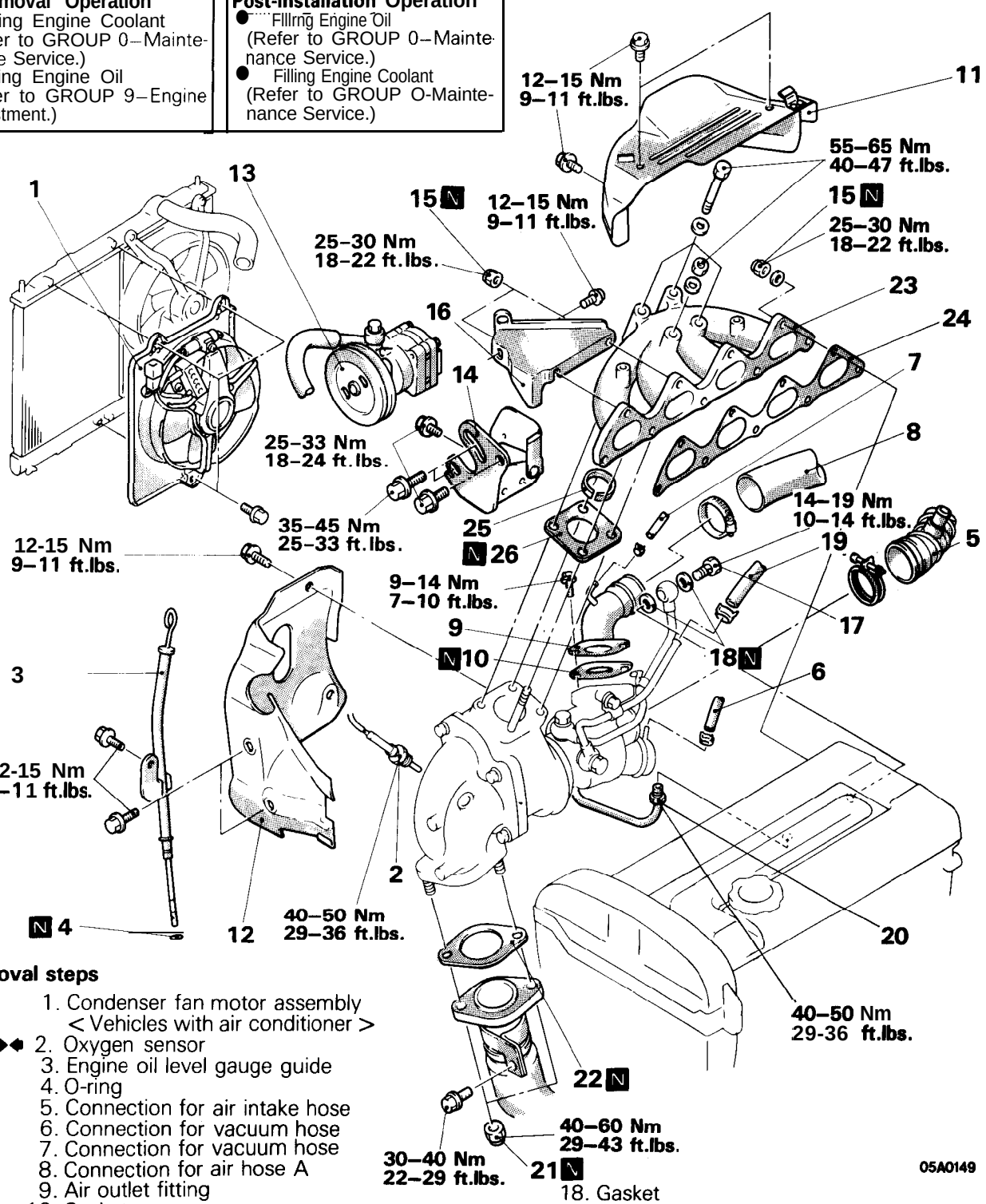


# TURBOCHARGER

## REMOVAL AND INSTALLATION

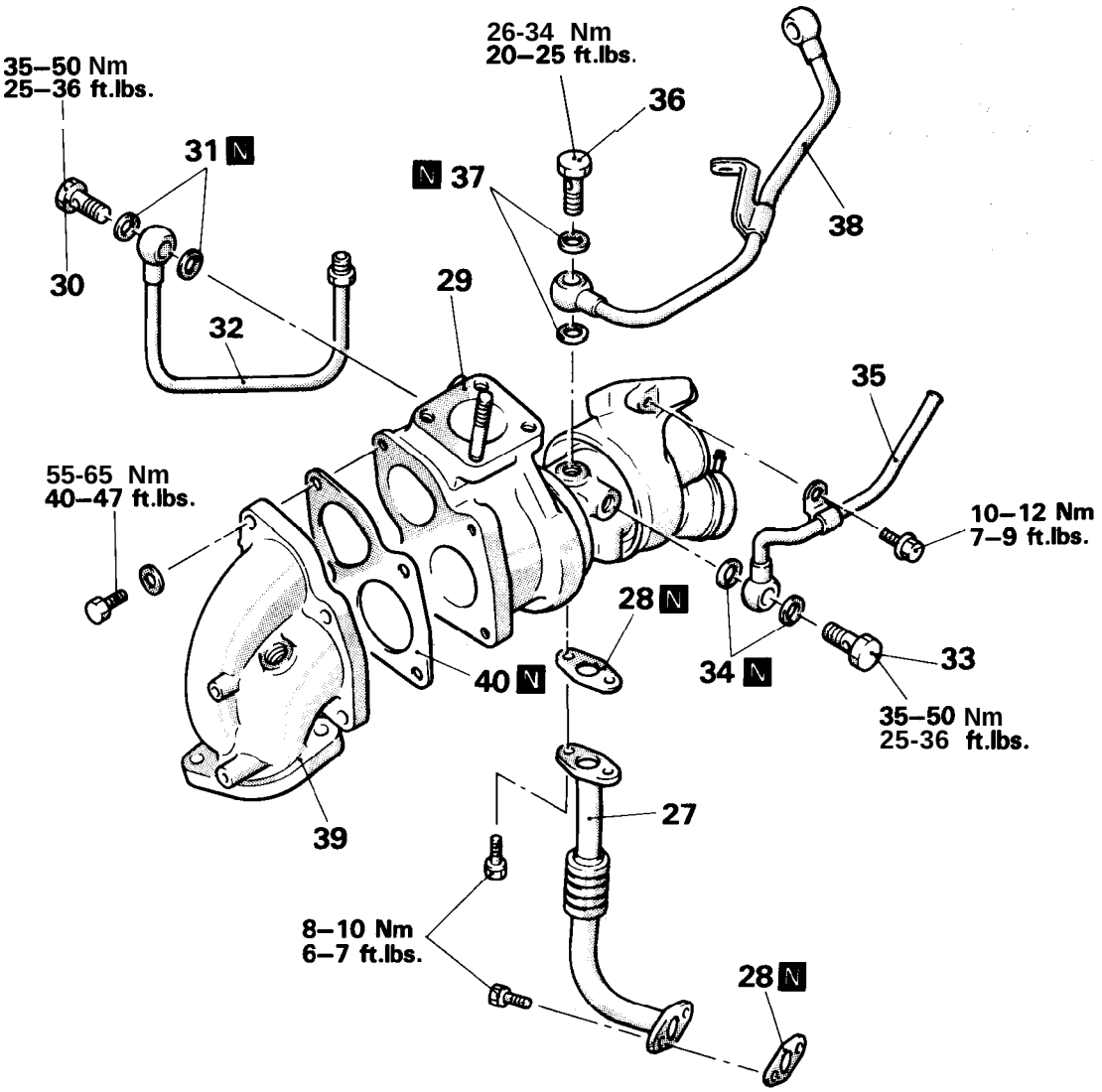
N11LA--

| Pre-removal Operation | Post-installation Operation |
|---|---|
| *Draining Engine Coolant (Refer to GROUP 0–Maintenance Service.) | ● Filling Engine Oil (Refer to GROUP 0–Maintenance Service.) |
| *Draining Engine Oil (Refer to GROUP 9–Engine Adjustment.) | ● Filling Engine Coolant (Refer to GROUP O-Maintenance Service.) |



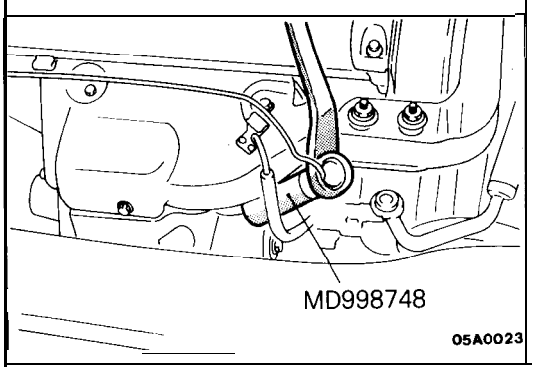

**Removal steps**

1. Condenser fan motor assembly <Vehicles with air conditioner>
◆● ●◆ 2. Oxygen sensor
3. Engine oil level gauge guide
4. O-ring
5. Connection for air intake hose
6. Connection for vacuum hose
7. Connection for vacuum hose
8. Connection for air hose A
9. Air outlet fitting
10. Gasket
11. Heat protector A
12. Heat protector B
◆● 13. Power steering oil pump
14. Oil pump bracket
15. Self-locking nut
16. Engine hanger
17. Eye bolt
18. Gasket
19. Connection for water hose
● ◆ 20. Connection for water pipe B
21. Self-locking nut
22. Gasket
23. Exhaust manifold
24. Exhaust manifold gasket
25. Ring
26. Gasket




27. Oil return pipe
28. Gasket
● ◆ ● ◆29. Turbocharger
30. Eye bolt
31. Gasket
32. Water pipe B
**33.** Eye bolt
34. Gasket
35. Water pipe A
36. Eye bolt
37. Gasket
◆◆ ● c **38.** Oil pipe
39. Exhaust fitting
40. Gasket

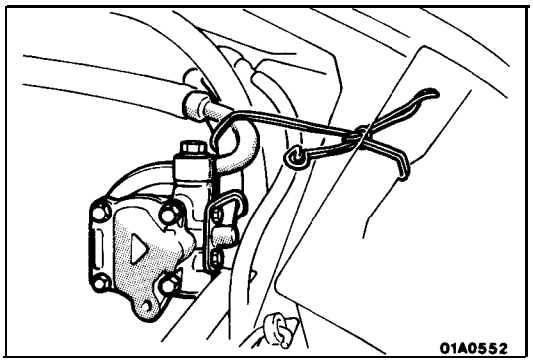
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF REMOVAL N11LBAD

### 2. REMOVAL OF OXYGEN SENSOR

Disconnect the connector of the oxygen sensor, and install the special tool to the oxygen sensor.
Then, using an offset (box-end) wrench, remove the oxygen sensor.




**13. DISCONNECTION OF POWER STEERING OIL PUMP**

Disconnect the oil pump with hoses from the bracket.

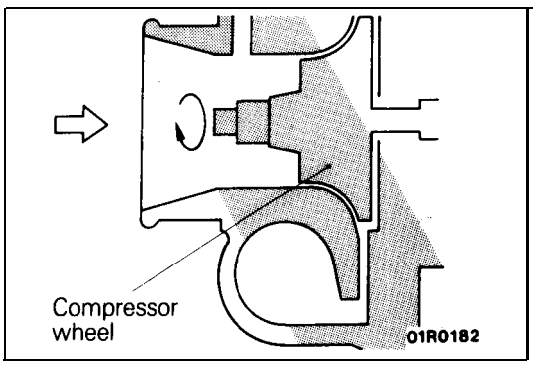
NOTE
The removed power steering oil pump should be fastened (by using rope, etc.) in a position that will not interfere with the removal/installation of the turbocharger assembly.

**29. REMOVAL OF TURBOCHARGER ASSEMBLY**

Remove the turbocharger assembly with the exhaust fitting, water pipe A, water pipe B and the oil pipe attached to it.

**38. REMOVAL OF OIL PIPE**

**Caution**
**After disconnecting the oil pipe, take care that foreign material does not enter the oil passage hole of the turbocharger assembly.**




## INSPECTION N11LCAC

**TURBOCHARGER ASSEMBLY CHECK**

- Visually check the turbine wheel and the compressor wheel for cracking or other damage.
- Check whether the turbine wheel and the compressor wheel can be easily turned by hand.
- Check for oil leakage from the turbocharger assembly.
- Check whether or not the waste gate valve remains open.

If any problem is found, replace the part after disassembly.

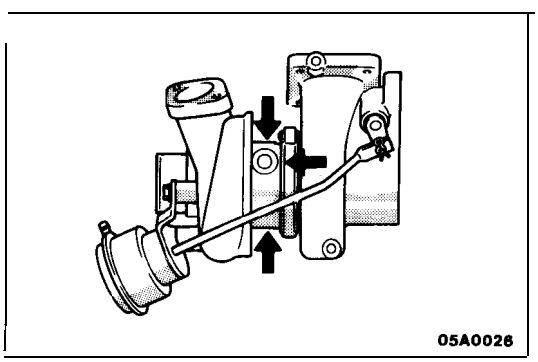
**OIL PIPE AND OIL-RETURN PIPE CHECK**

Check the oil pipe and oil-return pipe for clogging, bending, or other damage.
If there is clogging, clean it.

## SERVICE POINTS OF INSTALLATION N11LDAC

**38. INSTALLATION OF OIL PIPE**

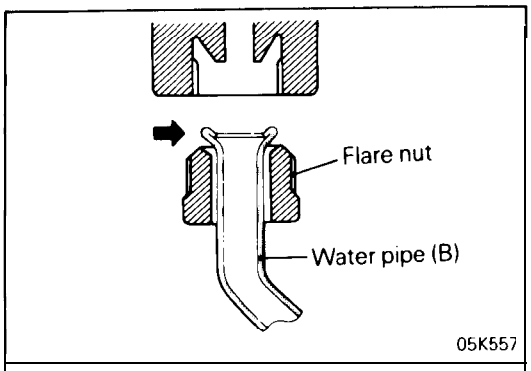
Supply clean engine oil through the oil pipe installation hole of the turbocharger assembly.




**29. INSTALLATION OF TURBOCHARGER ASSEMBLY**

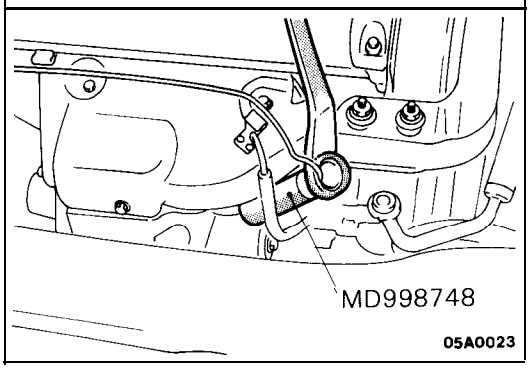
Clean the alignment surfaces shown in the illustration.

**Caution**
**When cleaning, care must be taken so that a piece of the gasket does not enter the oil passage hole.**




### 20. INSTALLATION OF WATER PIPE (B)

Before installing to the water inlet pipe, apply machine oil to the inner surface of the pipe flare.

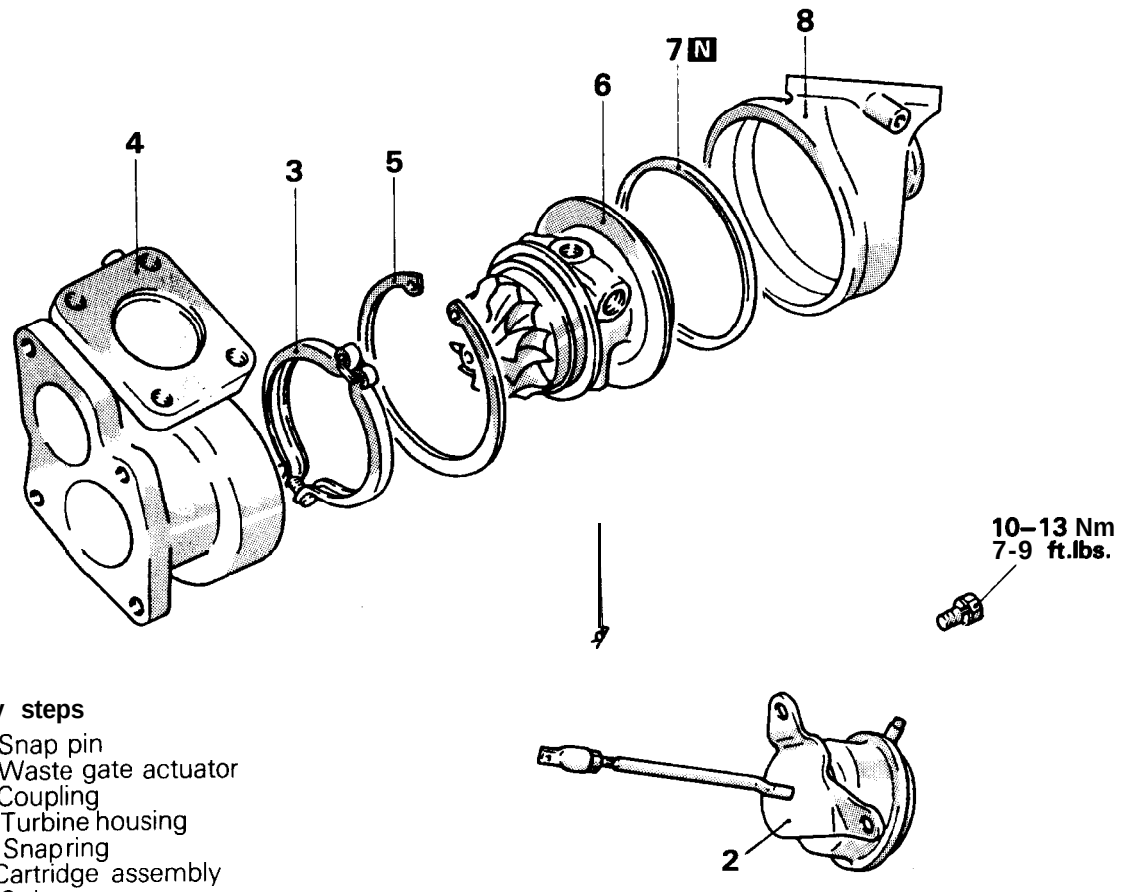



### 2. INSTALLATION OF OXYGEN SENSOR

Use the special tool to install the oxygen sensor.

## DISASSEMBLY AND REASSEMBLY

N11LE--

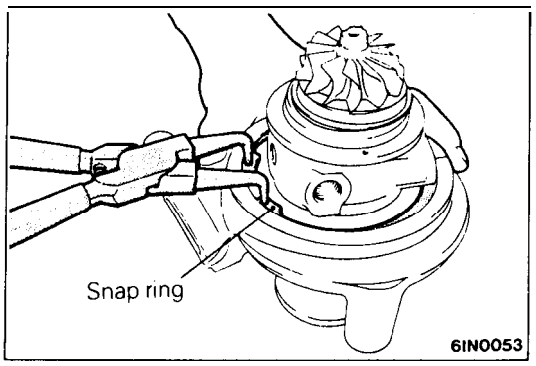



**Disassembly steps**

1. Snap pin
2. Waste gate actuator
3. Coupling
- ● 4. Turbine housing
- ◆◆ ● ◆◆ 5. Snap ring
- ◆◆ ◆◆ 6. Cartridge assembly
- ● ◆◆ 7. O-ring
8. Compressor cover

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) ☐: Non-reusable parts

61N0084

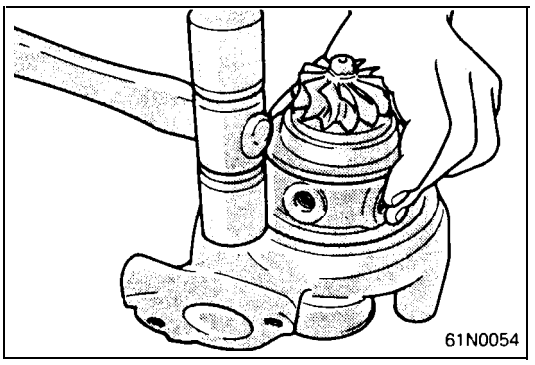



## SERVICE POINTS OF DISASSEMBLY N11LFAB

### 5. REMOVAL OF SNAP RING

Place the compressor cover assembly on the floor with its end surface down and remove the snap ring with pliers.

**Caution**
**During removal, hold with a finger the snap ring which can spring out.**




### 6. REMOVAL OF CARTRIDGE ASSEMBLY

Remove the cartridge assembly by tapping the compressor cover with a soft hammer.

**Caution**
**Some resistance will be experienced in the removal due to the O-ring on the cartridge assembly.**

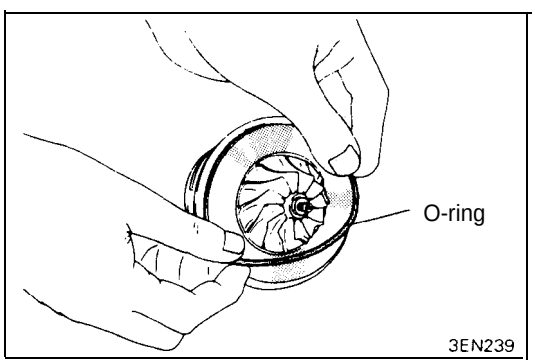
## INSPECTION N11LGAA

### TURBOCHARGER

1. Inspect the cast-iron turbine housing for damage, cracks, or evidence of contact between the turbine blades and the housing.
2. Manually open and close the waste gate valve to make sure it operates freely.
3. Inspect the turbine and compressor wheels for wear, damage, bent or broken blades.
4. Inspect the oil passage in the cartridge for signs of deposits or blockage.
5. Clean the inlet section of the compressor cover with a rag. Inspect it for signs of contact with the compressor turbine. If worn, replace it.

### WASTE GATE ACTUATOR

1. Leak-test the waste gate valve actuator with a hand vacuum pump.
   Replace the actuator if it does not hold vacuum.
2. Check the rod to see that it is not bent or binding.

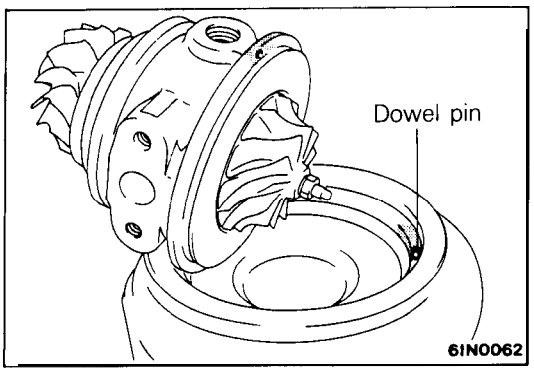



## SERVICE POINTS OF REASSEMBLY N11LHAB

### 7. INSTALLATION OF O-RING

Coat the inner surface of a new O-ring with a thin film of engine oil, and set it in the groove of the cartridge assembly.

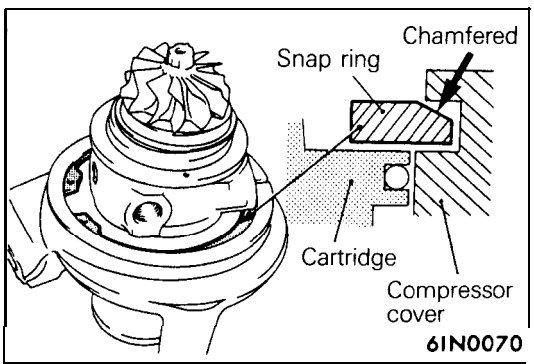
**Caution**
**Be careful not to damage the O-ring while installing it as oil leakage could result.**




### 6. INSTALLATION OF CARTRIDGE ASSEMBLY

(1) Coat the outer circumference of the cartridge assembly O-ring with a thin film of engine oil.
(2) Install the cartridge assembly on the compressor cover by aligning the dowel pin.

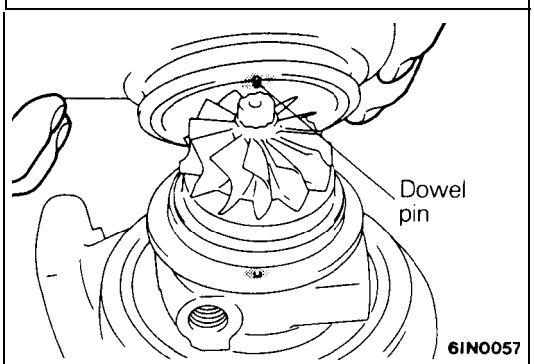
**Caution**
**When installing the cartridge assembly on the compressor cover, be careful not to damage the compressor wheel blades.**




### 5. INSTALLATION OF SNAP RING

Place the cartridge assembly with the compressor cover faced down and install the snap ring.

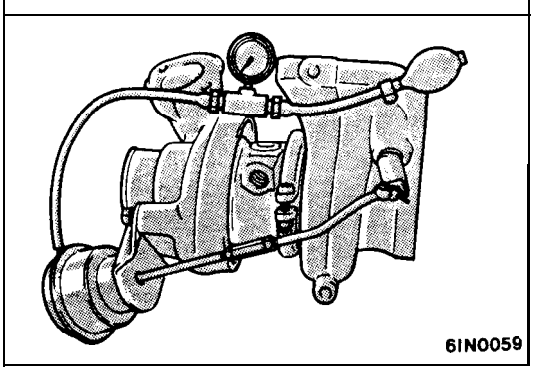
**Caution**
**Install the snap ring with the tapered side of its outside diameter up.**




### 4. INSTALLATION OF TURBINE HOUSING

Install the compressor cover and cartridge assembly on the turbine housing with the dowel pin in alignment.

**Caution**
**1. Be careful not to damage the blades of the turbine wheel.**
**2. Be careful to install the turbine housing in the correct direction.**




## TEST OF WASTE GATE ACTUATOR OPERATION

N11LIAA

Using a tester, apply a pressure to the actuator and make sure that the rod moves.

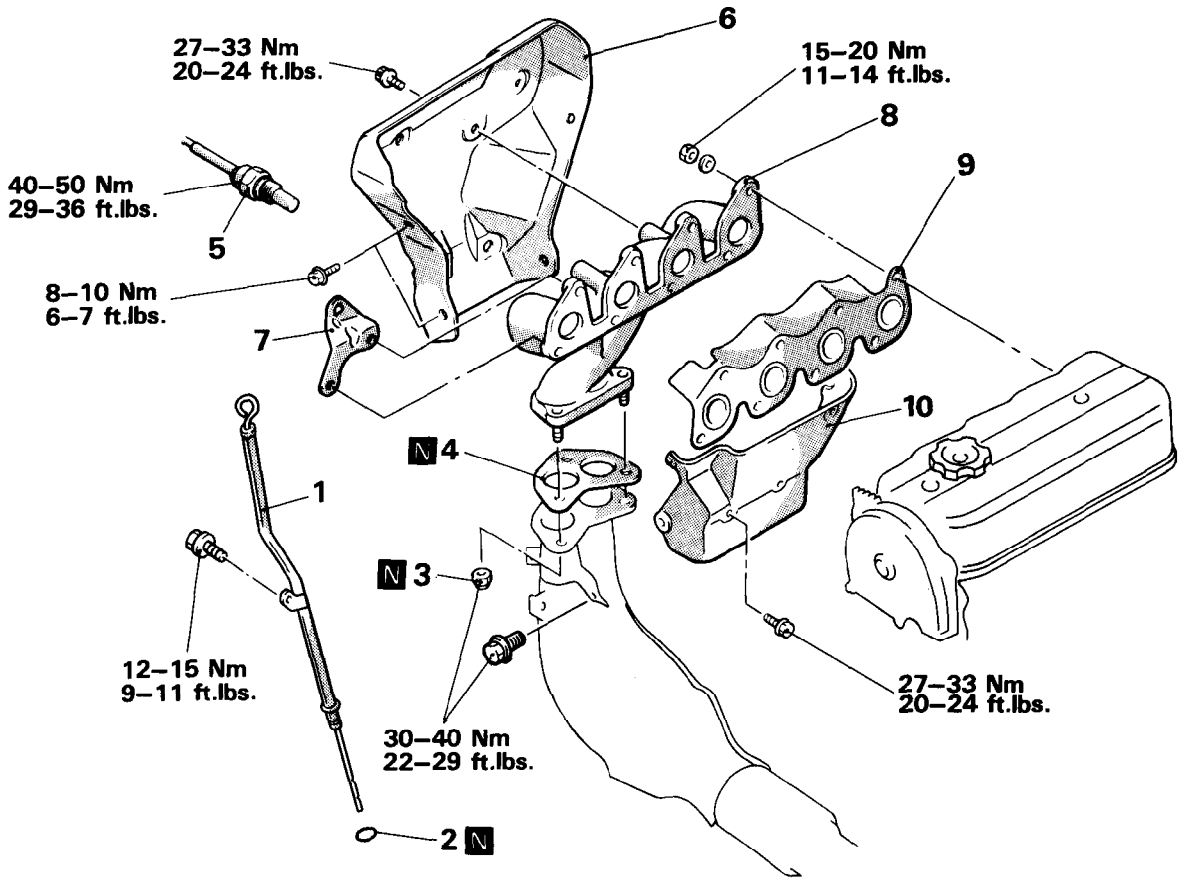
**Standard value:**
**M/T 76.7 kPa (11.1 psi)**
**A/T 72.0 kPa (10.4 psi)**

**Caution**
**Do not apply a pressure of more than 85.3 kPa (12.4 psi) to the actuator. Otherwise, diaphragm may be damaged.**
**Never attempt to adjust the waste gate valve.**

# EXHAUST MANIFOLD <1.8L Engine>

## REMOVAL AND INSTALLATION

N11NA-A

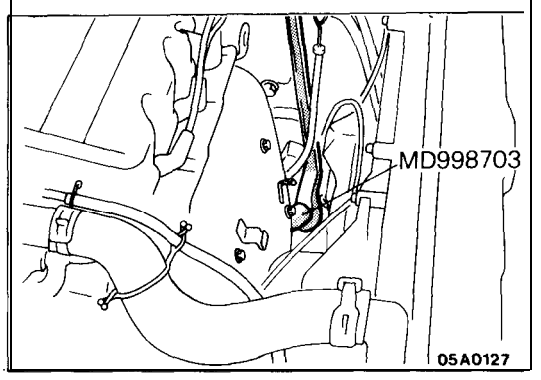



05A0135

**Removal steps'**

1. Engine oil level gauge guide
2. O-ring
3. Self locking nut
4. Gasket
5. Oxygen sensor
6. Exhaust manifold cover (A)
7. Engine hanger
8. Exhaust manifold
9. Exhaust manifold gasket
10. Exhaust manifold cover (B)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ❑ : Non-reusable parts




## SERVICE POINTS OF REMOVAL

N11NBAG

### 5. REMOVAL OF OXYGEN SENSOR

Disconnect the connector of the oxygen sensor, and install the special tool to the oxygen sensor.
Then, using an offset (box-end) wrench, remove the oxygen sensor.

## INSPECTION

N11NCAL0

Check the following points; replace the part if a problem is found.

### EXHAUST MANIFOLD

Check for damage or cracking of any part.

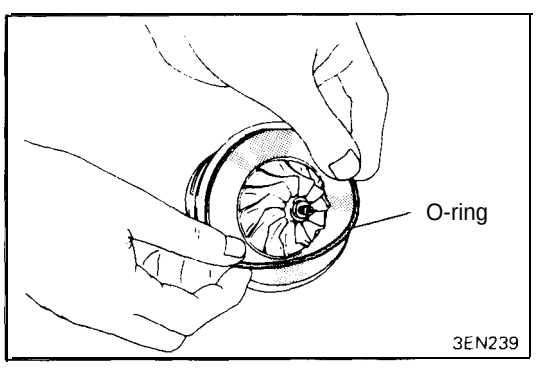
### EXHAUST MANIFOLD GASKET

Check for flaking or damage of the gasket.

or blockage.
5. Clean the inlet section of the compressor cover with a rag. Inspect it for signs of contact with the compressor turbine. If worn, replace it.

### WASTE GATE ACTUATOR

1. Leak-test the waste gate valve actuator with a hand vacuum pump.
   Replace the actuator if it does not hold vacuum.
2. Check the rod to see that it is not bent or binding.




## SERVICE POINTS OF REASSEMBLY

N11LHAB

### 7. INSTALLATION OF O-RING

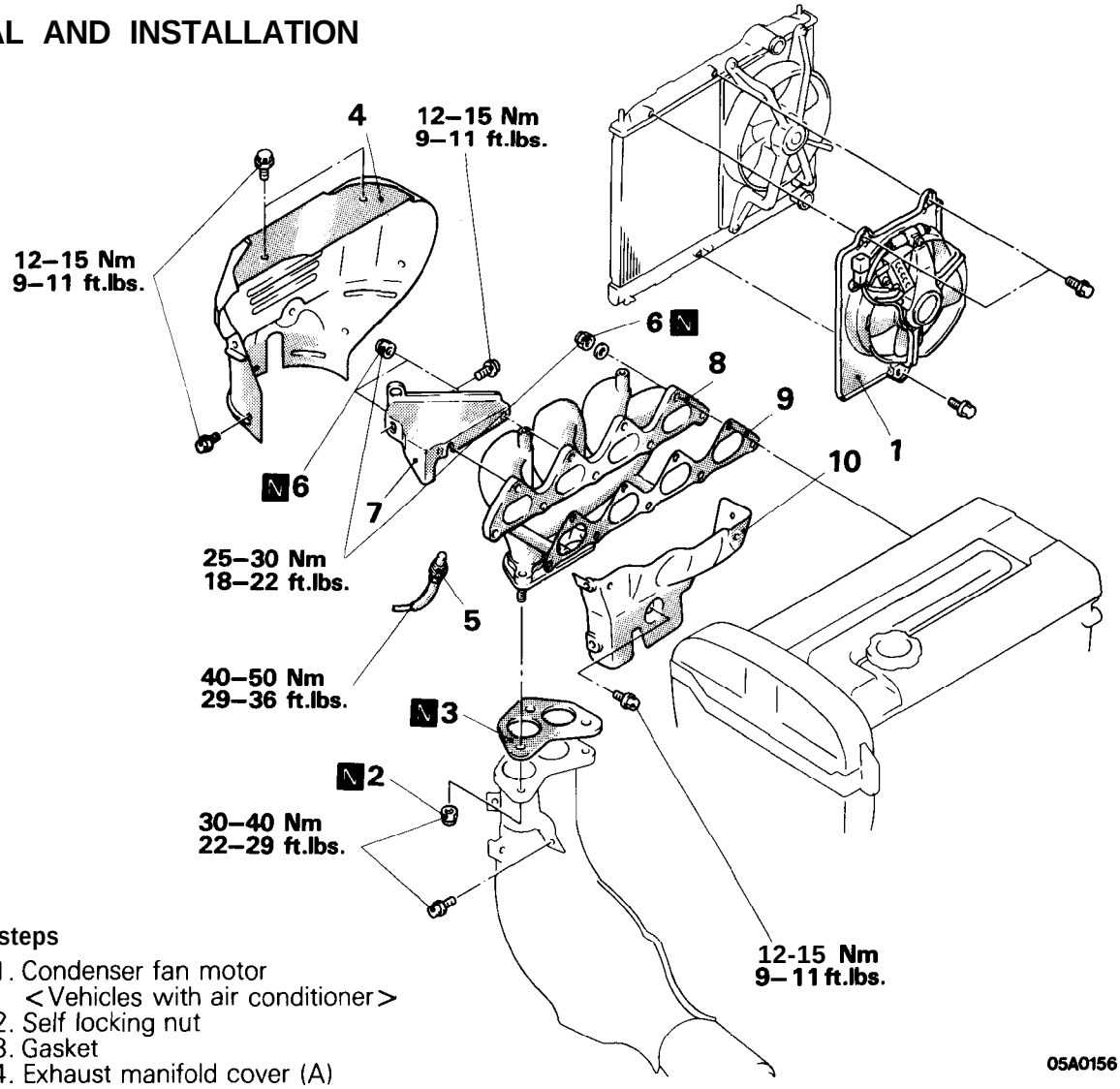
Coat the inner surface of a new O-ring with a thin film of engine oil, and set it in the groove of the cartridge assembly.

**Caution**
**Be careful not to damage the O-ring while installing it as oil leakage could result.**

# EXHAUST MANIFOLD <2.0L DOHC Engine (Non-Turbo)>

## REMOVAL AND INSTALLATION

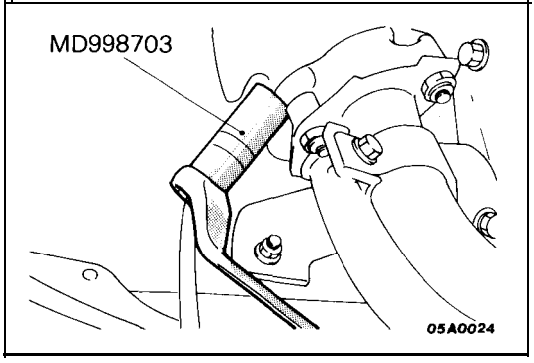
N11NA-B




**Removal** steps

1. Condenser fan motor <Vehicles with air conditioner>
2. Self locking nut
3. Gasket
4. Exhaust manifold cover (A)
* * 5. Oxygen sensor
6. Self locking nut
7. Engine hanger
8. Exhaust manifold
9. Exhaust manifold gasket
10. Exhaust manifold cover (B)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀■▶: Refer to "Service Points of Removal"
(3) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL

N11NBAH

### 5. REMOVAL OF OXYGEN SENSOR

Disconnect the connector of the oxygen sensor, and install the special tool to the oxygen sensor.
Then, using an offset (box-end) wrench, remove the oxygen sensor.

## INSPECTION

N11NCAL1

Check the following points; replace the part if a problem is found.

### EXHAUST MANIFOLD

Check for damage or cracking of any part.

### EXHAUST MANIFOLD GASKET

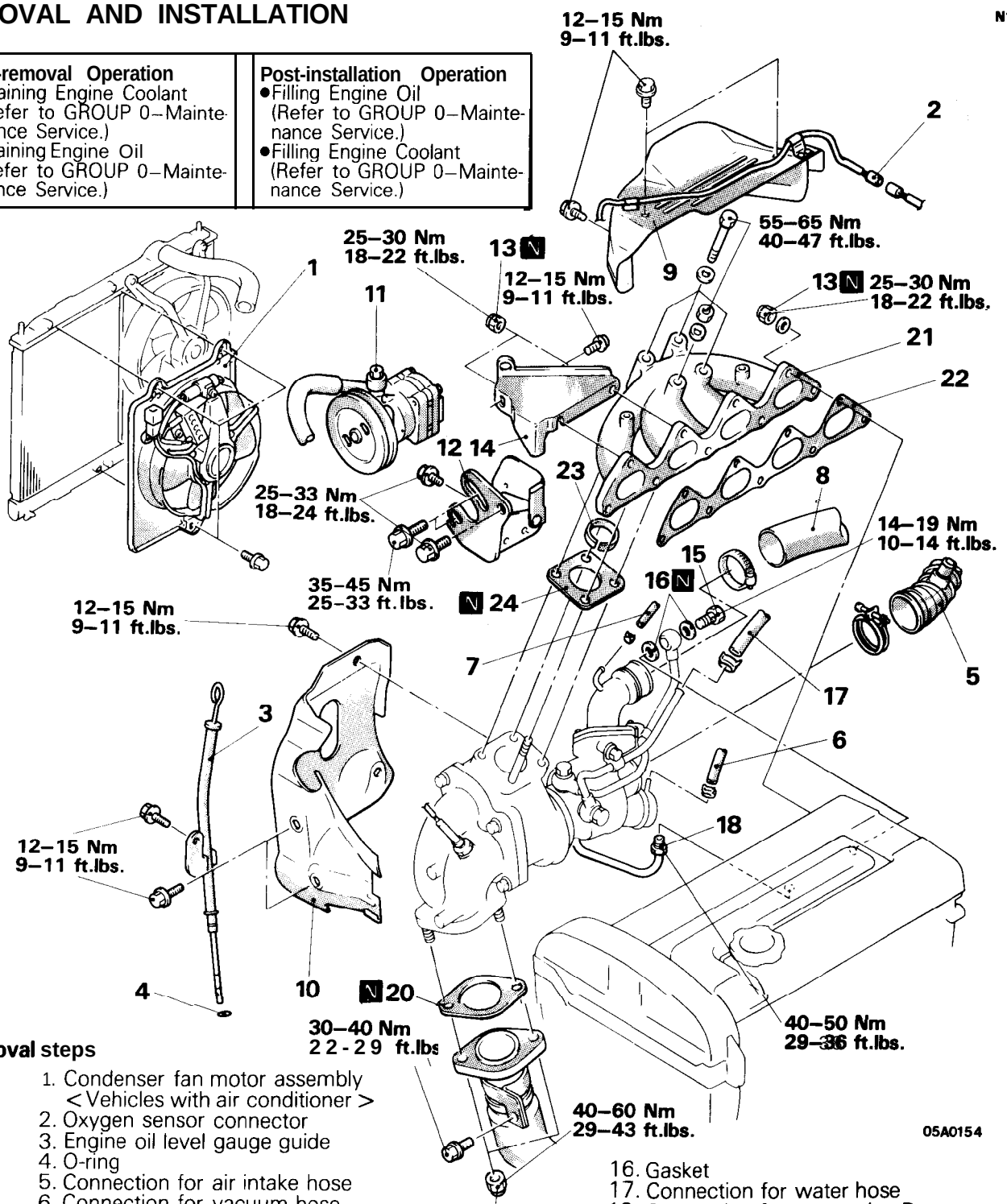
Check for flaking or damage of the gasket.

# EXHAUST MANIFOLD <2.0L DOHC Engine (Turbo)>

## REMOVAL AND INSTALLATION

N11NA-C

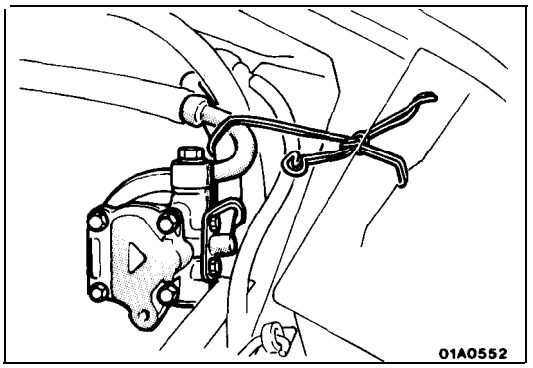
| Pre-removal Operation | Post-installation Operation |
|---|---|
| •Draining Engine Coolant (Refer to GROUP 0–Maintenance Service.) | •Filling Engine Oil (Refer to GROUP 0–Maintenance Service.) |
| •Draining Engine Oil (Refer to GROUP 0–Maintenance Service.) | •Filling Engine Coolant (Refer to GROUP 0–Maintenance Service.) |




**Removal steps**

1. Condenser fan motor assembly <Vehicles with air conditioner>
2. Oxygen sensor connector
3. Engine oil level gauge guide
4. O-ring
5. Connection for air intake hose
6. Connection for vacuum hose
7. Connection for vacuum hose
8. Connection for air hose A
9. Heat protector A
10. Heat protector B
◆◆ 11. Power steering oil pump
12. Oil pump bracket
13. Self-locking nut
14. Engine hanger
15. Eye bolt
16. Gasket
17. Connection for water hose
◆◆ 18. Connection for water pipe B
19. Self-locking nut
20. Gasket
21. Exhaust manifold
22. Exhaust manifold gasket
23. Ring
24. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation"
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N11NBAI

**11. DISCONNECTION OF POWER STEERING OIL PUMP**

Disconnect the oil pump with hoses from the bracket.

NOTE

The removed power steering oil pump should be fastened (by using rope, etc.) in a position that will not interfere with the removal/installation of the exhaust manifold.

## INSPECTION N11NCAL1

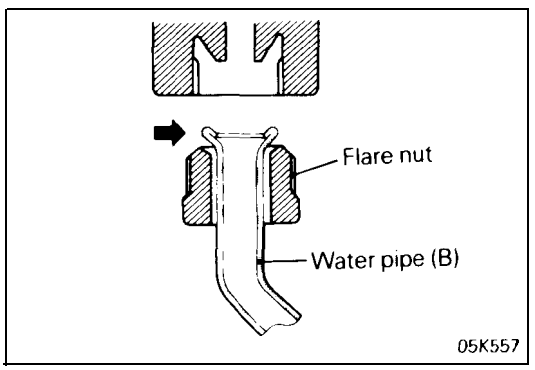
Check the following points; replace the part if a problem is found.

**EXHAUST MANIFOLD**

Check for damage or cracking of any part.

**EXHAUST MANIFOLD GASKET**

Check for flaking or damage of the gasket.




## SERVICE POINTS OF INSTALLATION N11NDAG

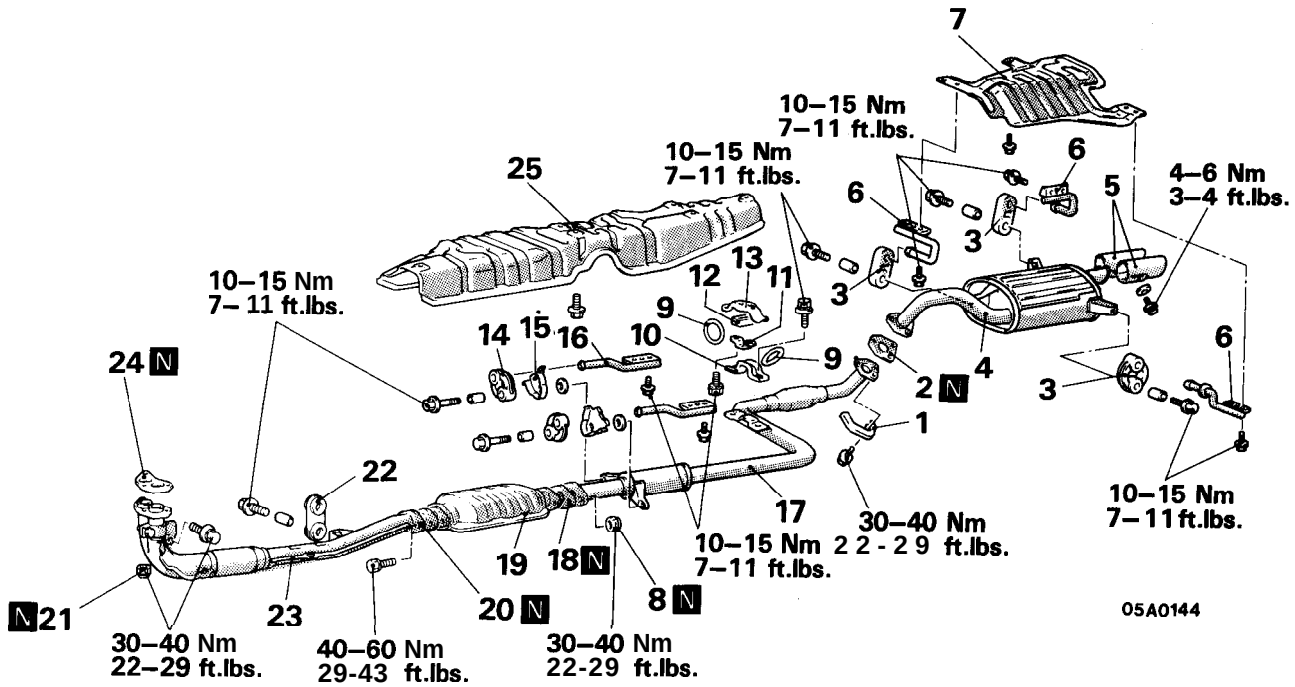
**18. INSTALLATION OF WATER PIPE (B)**

Before installing to the water inlet pipe, apply machine oil to the inner surface of the pipe flare.

# EXHAUST PIPE AND MAIN MUFFLER <1.8L Engine, 2.0L DOHC Engine (Non-Turbo)>

## REMOVAL AND INSTALLATION

N11RA-A




**Removal steps**

1. Protector
2. Gasket
3. Hanger
4. Main muffler
5. Moulding <2.0L DOHC engine (Non-Turbo)>
6. Hanger bracket
7. Rear heat protector panel
8. Self locking nut
9. O-ring
10. Hook
11. Bracket
12. Stopper
13. Hanger bracket
14. Hanger
15. Protector
16. Hanger bracket
17. Center exhaust pipe
18. Gasket
19. Catalytic converter
20. Gasket
21. Self locking nut
22. Hanger
23. Front exhaust pipe
24. Gasket
25. Front floor heat protector panel

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ❑ : Non-reusable parts

## INSPECTION

N11RCAH0

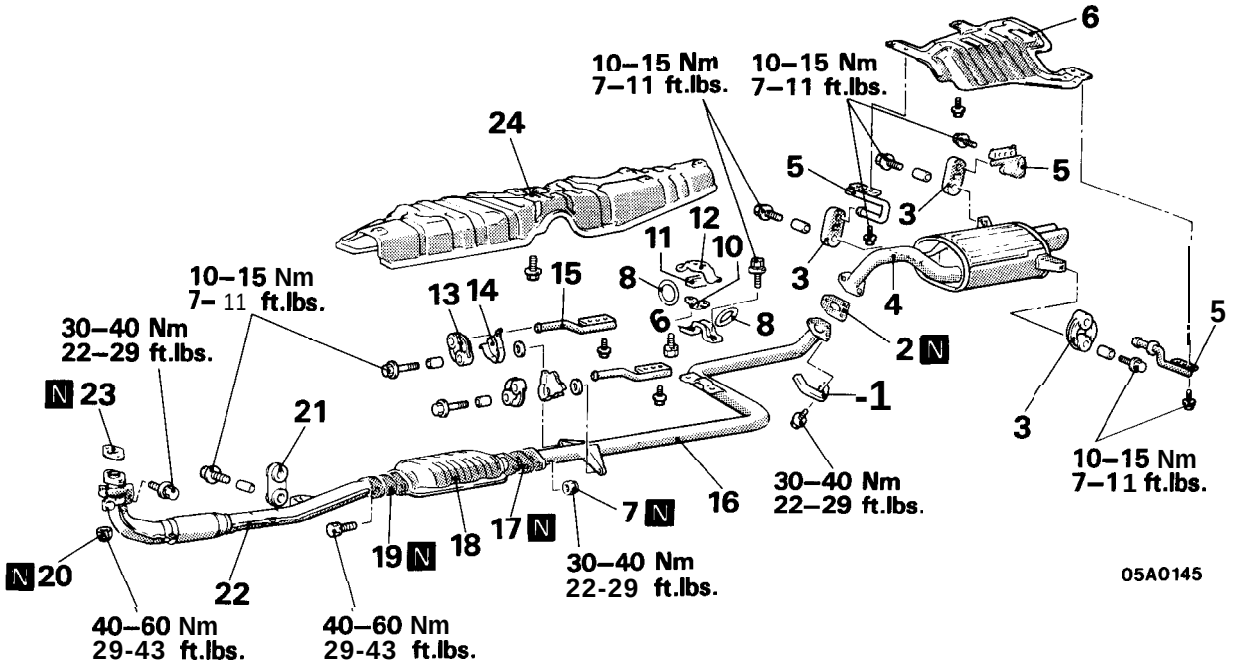
- Check the mufflers and pipes for corrosion or damage.
- Check the rubber hangers and rubber O-rings for deterioration or damage.
- Check for gas leakage from mufflers and pipes.

# EXHAUST PIPE AND MAIN MUFFLER <2.0L DOHC Engine (Turbo)>

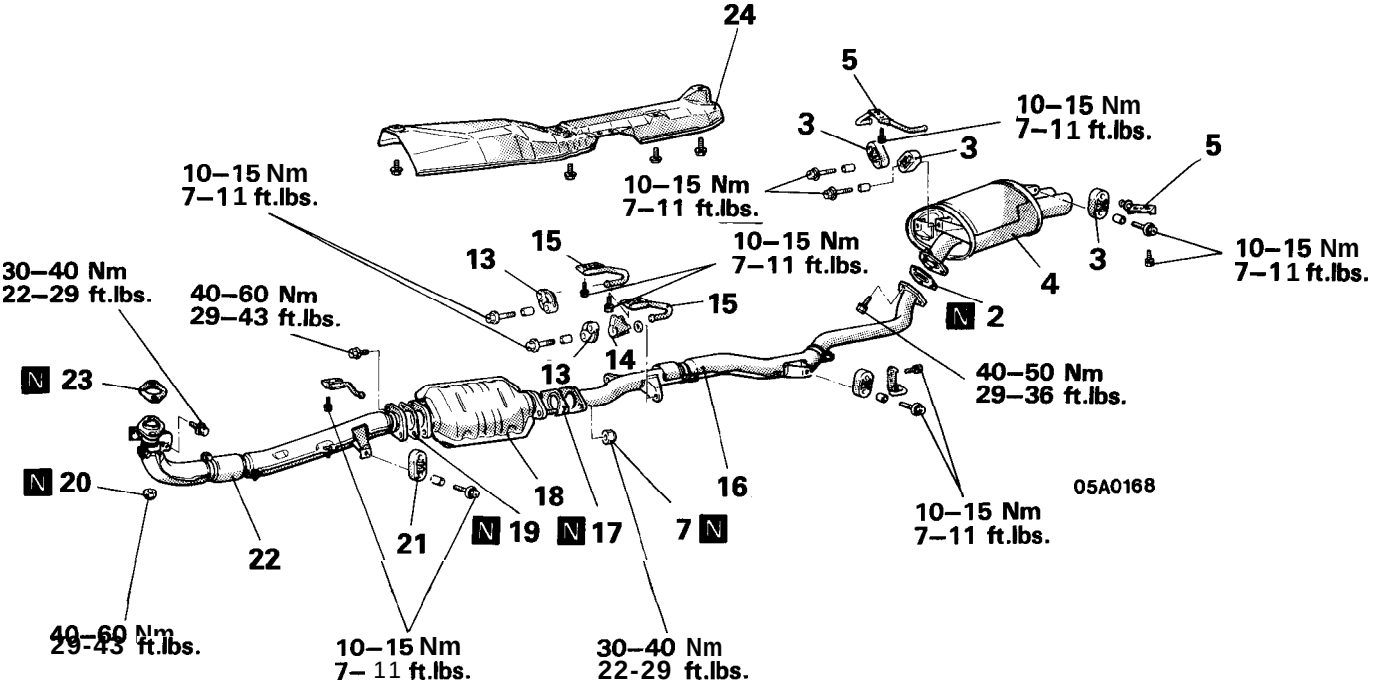
## REMOVAL AND INSTALLATION

N11RA-B

<FWD>




<AWD>



**Removal steps**

1. Protector
2. Gasket
3. Hanger
4. Main muffler
5. Hanger bracket
6. Rear heat protector panel
7. Self locking nut
8. O-ring
9. Hook
10. Bracket
11. Stopper
12. Hanger bracket
13. Hanger
14. Protector
15. Hanger bracket
16. Center exhaust pipe
17. Gasket
18. Catalytic converter
19. Gasket
20. Self locking nut
21. Hanger
22. Front exhaust pipe
23. Gasket
24. Front floor heat protector panel

NOTE
(1) Reverse the removal procedures to reinstall
(2) ❑ : Non-reusable parts

## INSPECTION

N11RCAH1

- Check the mufflers and pipes for corrosion or damage.
- Check the rubber hangers and rubber O-rings for deterioration or damage.
- Check for gas leakage from mufflers and pipes.

# FUEL SYSTEM

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N14AA--


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# FUEL SYSTEM

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

N14CA--

**<1.8L Engine>**

| Items | | Specifications |
|---|---|---|
| Fuel | | |
| Tank capacity | liter (gal.) | 60 (15.9) |
| Return system | | Equipped |
| Filter | | High pressure type |
| Fuel pump | | |
| Type | | Electrical, in-tank type |
| Driven by | | Electric motor |
| Throttle body | | |
| Throttle bore | mm (in.) | 50 (1.97) |
| Throttle position sensor | | Variable resistor type |
| Idle speed control servo | | Electric motor |
| Idle position switch | | Contact type, within idle speed control servo |
| Motor position sensor | | Variable resistor type |
| Engine control unit | | |
| Identification model No. | | |
| For Federal and Canada | | E2T33674 |
| For California | | E2T33673 |
| Sensors | | |
| Air flow sensor | | Karman vortex type |
| Barometric pressure sensor | | Semiconductor diffusion type |
| Intake air temperature sensor | | Thermistor type |
| Engine coolant temperature sensor | | Thermistor type |
| Oxygen sensor | | Zirconia type |
| Vehicle speed sensor | | Reed switch type |
| Inhibitor switch | | Contact switch type |
| No. 1 cylinder top dead center sensor | | Photo interrupter type |
| Crank angle sensor | | Photo interrupter type |
| EGR temperature sensor <California> | | Thermistor type |
| Actuators | | |
| Control relay type | | Contact switch type |
| Injector type and number | | Electromagnetic, 4 |
| Injector identification mark | | N210H |
| Purge control solenoid valve | | ON/OFF type solenoid valve |
| EGR control solenoid valve <California> | | Duty cycle type solenoid valve |
| Fuel pressure regulator | | |
| Regulated pressure | kPa (psi) | 335 (47.6) |

## <2.0L DOHC Engine>

| Items | Specifications |
|---|---|
| Fuel | |
| Tank capacity liter (gal.) | 60 (15.9) |
| Return system | Equipped |
| Filter | High pressure type |
| Fuel pump | |
| Type | Electrical, in-tank type |
| Driven by | Electric motor |
| Throttle body | |
| Throttle bore mm (in.) | 60 (2.36) |
| Throttle position sensor | Variable resistor type |
| Idle speed control servo | Stepper motor type<br>The stepper motor type by-pass air control system with the Fast Idle Air Valve (FIAV) |
| Idle position switch | Contact switch type |
| Engine control unit | |
| Identification model No. | |
| For Federal <Non-Turbo> | E2T36572 |
| <Turbo-FWD-M/T> | E2T36574 |
| <Turbo-FWD-A/T> | E2T36576 |
| <Turbo-AWD-M/T> | E2T36578 |
| <Turbo-AWD-A/T> | E2T36582 |
| For California <Non-Turbo> | E2T36571 |
| <Turbo-FWD-M/T> | E2T36573 |
| <Turbo-FWD-A/T> | E2T36575 |
| <Turbo-AWD-M/T> | E2T36577 |
| <Turbo-AWD-A/T> | E2T36581 |
| Sensors | |
| Air flow sensor | Karman vortex type |
| Barometric pressure sensor | Semiconductor diffusion-type |
| Intake air temperature sensor | Thermistor type |
| Engine coolant temperature sensor | Thermistor type |
| Oxygen sensor | Zirconia type |
| Vehicle-speed sensor | Reed switch type |
| Detonation sensor <Turbo> | Piezoelectric device type |
| Top dead center sensor | Photo interrupter type |
| Crank angle sensor | Photo interrupter type |
| EGR temperature sensor <California> | Thermistor type |
| Power steering oil pressure switch | Contact switch type |
| Actuators | |
| Control relay | Contact switch type |
| Resistor identification model No. | E8T05873 |
| Injector type and number | Electromagnetic, 4 |
| Injector identification mark <Non-turbo> | N240H |
| <Turbo-M/T> | B450L |
| <Turbo-A/T> | B390L |
| Purge control solenoid valve | ON/OFF type solenoid valve |
| EGR control solenoid valve <California> | Duty cycle type solenoid valve |
| Fuel pressure control solenoid valve <Turbo> | ON/OFF type solenoid valve |
| Waste gate solenoid valve <Turbo> | ON/OFF type solenoid valve |

| Items | Specifications |
|---|---|
| Fuel pressure regulator | |
| Regulated pressure kPa (psi) <Non-Turbo> | 335 (47.6) |
| <Turbo-M/T> | 255 (36.3) |
| <Turbo-A/T> | 300 (42.7) |

## SERVICE SPECIFICATIONS

### <1.8L Engine>

N14CB--

| Items | Specifications |
|---|---|
| Basic ignition timing | 5°BTDC at curb idle |
| Curb idle speed rpm | 700±100 |
| Idle speed when air conditioner is on rpm | 850 at neutral position |
| | 650 at D range <A/T> |
| Basic idle speed rpm | 700±50 |
| Throttle position sensor adjusting voltage V | 0.48–0.52 at curb idle |
| Throttle position sensor resistance kΩ | 3.5–6.5 |
| Motor position sensor resistance kΩ | 4–6 |
| Idle speed control servo motor coil resistance Ω | 5–35 [at 20°C (68°F)] |
| Intake air temperature sensor resistance kΩ | 2.7 [at 20°C (68°F)] |
| Engine coolant temperature sensor resistance kΩ | |
| 20°C (68°F) | 2.5 |
| 80°C (176°F) | 0.3 |
| Fuel pressure kPa (psi) | |
| Vacuum hose disconnection | 330–350 (47–50) at curb idle |
| Vacuum hose connection | Approx. 270 (38) at curb idle |
| Injector coil resistance Ω | 13–16 [at 20°C (68°F)] |

### <2.0L DOHC Engine>

| Items | Specifications |
|---|---|
| Basic ignition timing | 5°± 2°BTDC at curb idle |
| Curb idle speed rpm | 750±100 |
| Idle speed when air conditioner is on rpm | |
| <M/T> | 850 at neutral position |
| <A/T> | 650 at D range |
| Basic idle speed rpm | 750±50 |
| Throttle position sensor adjustment voltage V | 0.48–0.52 at curb idle |
| Throttle position sensor resistance kΩ | 3.5–6.5 |
| Idle speed control servo (stepper motor) coil resistance Ω | 28–33 [at 20°C (68°F)] |
| Intake air temperature sensor resistance kΩ | 2.7 [at 20°C (68°F)] |
| Engine coolant temperature sensor resistance kΩ | |
| 20°C (68°F) | 2.5 |
| 80°C (176°F) | 0.3 |
| Fuel pressure kPa (psi) | |
| Vacuum hose disconnection <Non-Turbo> | 330–350 (47–50) at curb idle |
| <Turbo-M/T> | 250–270 (36–38) at curb idle |
| <Turbo-A/T> | 290–320 (41–46) at curb idle |
| Vacuum hose connection <Non-Turbo> | Approx. 270 (38) at curb idle |
| <Turbo-M/T> | Approx. 190 (27) at curb idle |
| <Turbo-A/T> | Approx. 230 (33) at curb idle |

| Items | Specifications |
|---|---|
| Injector coil resistance Ω <Non-Turbo><br><Turbo> | 13–16 [at 20°C (68°F)]<br>2–3 [at 20°C (68°F)] |

## TORQUE SPECIFICATIONS

N14CC-A

| Items | Nm | ft.lbs. |
|---|---|---|
| Center cover | 2.5–3.5 | 2–3 |
| Oxygen sensor | 40–50 | 30–36 |
| Engine coolant temperature sensor | 20–40 | 15–29 |
| Throttle position sensor attaching screws | 1.5–2.5 | 1.1–1.8 |
| Idle speed control servo attaching screws <2.0L DOHC Engine> | 2.5–4.5 | 1.8–3.3 |
| Delivery pipe mounting bolts | 10–13 | 7–9 |
| High-pressure fuel hose to delivery pipe | 4–6 | 3–4 |
| Fuel pressure regulator to delivery pipe | | |
| <1.8L Engine> | 7–11 | 5–8 |
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| Accelerator cable clamp | 10–13 | 7–9 |
| Throttle body mounting bolts and nuts | 15–22 | 11–16 |
| Throttle body stay mounting nut <Turbo> | 15–22 | 11–16 |
| Accelerator cable adjusting bolts | 4–6 | 3–4 |
| Lateral rod attaching bolt | 80–100 | 57–72 |
| Self-locking nut | 21–31 | 15–22 |
| Fuel tank drain plug | 15–20 | 11–14 |
| Electrical fuel pump | | |
| Screws | 2–3 | 1.4–2.2 |
| Bolt (at lower side) | 9–14 | 6.5–10 |
| Fuel gauge unit mounting screws | 2–3 | 1.4–2.2 |
| High pressure hose to electrical fuel pump | 30–40 | 22–29 |
| High pressure hose to fuel main pipe | 30–40 | 22–29 |
| Battery tray to battery | 2–3 | 1.5–2 |
| Battery tray mounting bolt | 9–14 | 7–14 |
| Fuel main pipe to fuel filter | 30–40 | 22–29 |
| Eye bolt | 25–35 | 18–25 |
| Fuel filter mounting bolts | 9–14 | 7–10 |
| Fuel pipes clip attaching bolt | 9–14 | 7–10 |
| Vapor pipe assembly mounting bolt | 9–14 | 7–10 |
| Canister holder mounting bolt | 9–14 | 7–10 |

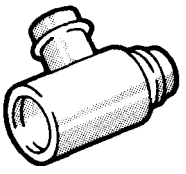
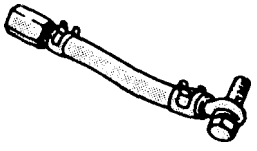
## SEALANT AND ADHESIVE

N14CE-A

| Items | Specified sealant |
|---|---|
| Engine coolant temperature sensor threaded portion | MOPAR Part No. 4318034 or equivalent |
| Fuel tank hole cover <AWD> | MOPAR Rope Caulk Sealer 3/16 × 80″ roll Part No. 4026044 or equivalent |

## SPECIAL TOOLS

N14DA-B

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998742 | Hose adapter | • Measurement of fuel pressure (to be used together with MD998709) |
|  | MD998709 | Adapter hose | • Measurement of fuel pressure (to be used together with MD998742) |

## TROUBLESHOOTING

N14EBBH

When checking and correcting engine troubles, it is important to start with inspection of the basic systems.
In case you have such troubles as (1) engine start failure, (2) rough idling or (3) poor acceleration, therefore, you should first check the following basic systems:

(1) Power supply
- Battery
- Fusible link
- Fuse

(2) Body ground
(3) Fuel supply
- Fuel line
- Fuel filter
- Fuel pump

(4) Ignition system
- Spark plugs
- High tension cable
- Distributor <1.8L Engine>
- Crank angle sensor <2.0L DOHC Engine>
- Ignition coil

(5) Emission control system
- Crankcase ventilation system
- Exhaust gas recirculation system
- Vacuum leak

(6) Others
- Ignition timing
- Idle speed

Troubles with the MPI system are often caused by poor contact of harness connector. It is, therefore, important to check harness connector contact.

| Symptom | Probable cause | Remedy |
|---|---|---|
| Engine will not start or start too hard (Cranks OK) | Trouble in the MPI system | Check for output of self-diagnosis code.<br>Read the code with a voltmeter. |
| | Malfunction of the fuel pump drive control system | Check the fuel pump drive control system and the fuel pump. |
| | Malfunction of the ignition timing control system | Check the ignition timing. |
| | Malfunction of the power transistor | Check the power transistor as a single unit. |
| | Power is not supplied to the engine control unit. | Check the power supply circuit. |
| | Malfunction of the control relay | Replace. |
| | Malfunction of the injector | Check the injector drive circuit.<br>Check the injector as a single unit. |
| | The fuel pressure is not proper. | Check the fuel pressure. |
| | Vacuum hose disconnected or damaged | Repair or replace. |
| | Malfunction of the engine control unit | Replace. |
| | Wire breakage or short circuit occurs in the harness, or the connector is improperly connected. | Repair or replace. |
| Rough idle or engine stumbles | Trouble in the MPI system | Check for output of self-diagnosis code.<br>Read the code with a voltmeter. |
| | Malfunction of the sensor<br>• Intake air temperature sensor<br>• Engine coolant temperature sensor<br>• Barometric pressure sensor<br>• Ignition switch<br>• Idle position switch<br>• Throttle position sensor<br>• No. 1 cylinder TDC sensor, crank angle sensor <1.8L Engine><br>• TDC sensor, crank angle sensor <2.0L DOHC Engine><br>• Power steering oil pressure switch<br>• Air conditioner switch<br>• Inhibitor switch <A/T><br>• Motor position sensor <1.8L Engine><br>• Air flow sensor<br>• Oxygen sensor | Check the sensor-related circuit.<br>Check the sensor as a single unit |
| | Malfunction of the engine control system<br>• Stepper motor <2.0L DOHC Engine><br>• Injector<br>• Power transistor | Check the actuator-related circuit.<br>Check the actuator as a single unit. |

| Symptom | Probable cause | Remedy |
|---|---|---|
| Rough idle or engine stable | Malfunction of the vehicle speed reed switch | Check the vehicle speed reed switch. |
| | The fuel pressure is not proper. | Check the fuel pressure. |
| | Vacuum hose disconnected or damaged. | Repair or replace. |
| | Malfunction of the engine control unit. | Replace. |
| | Wire breakage or short circuit occurs in the harness, or the connector is improperly connected. | Repair or replace. |
| Engine hesitates or poor acceleration | Trouble in the MPI system | Check for output of self-diagnosis code.<br>Read the code with a voltmeter. |
| | Malfunction of the sensor<br>• Intake air temperature sensor<br>• Engine coolant temperature sensor<br>• Barometric pressure sensor<br>• Ignition switch<br>• Idle position switch<br>• Throttle position sensor<br>• No. 1 cylinder TDC sensor, crank angle sensor <1.8L Engine><br>• TDC sensor, crank angle sensor <2.0L DOHC Engine><br>• Power steering oil pressure switch<br>• Air conditioner switch<br>• Inhibitor switch <A/T><br>• Motor position sensor <1.8L Engine><br>• Air flow sensor<br>• Oxygen sensor | Check the sensor-related circuit.<br>Check the sensor as a single unit. |
| | Malfunction of the engine control system<br>• Stepper motor <2.0L DOHC Engine><br>• Injector<br>• Power transistor | Check the actuator-related circuit.<br>Check the actuator as a single unit. |
| | Malfunction of the air conditioner power relay control system | Check the system, and the components if the system is found defective. |
| | The fuel pressure is not proper. | Check the fuel pressure. |
| | Vacuum hose disconnected or damaged. | Repair or replace. |
| | Malfunction of the engine control unit. | Replace. |
| | Wire breakage or short circuit occurs in the harness, or the connector is improperly connected. | Repair or replace. |

| Symptom | Probable cause | Remedy |
|---|---|---|
| Poor fuel mileage | Trouble in the MPI system | Check for output of self-diagnosis code.<br>Read the code with a voltmeter. |
| | Malfunction of the sensor<br>• Intake air temperature sensor<br>• Engine coolant temperature sensor<br>• Barometric pressure sensor<br>• Ignition switch<br>• Idle position switch<br>• Throttle position sensor<br>• No. 1 cylinder TDC sensor, crank angle sensor <1.8L Engine><br>• TDC sensor, crank angle sensor <2.0L DOHC Engine><br>• Power steering oil pressure switch<br>• Air conditioner switch<br>• Inhibitor switch <A/T><br>• Motor position sensor <1.8L Engine><br>• Air flow sensor<br>• Oxygen sensor | Check the sensor-related circuit.<br>Check the sensor as a single unit. |
| | Malfunction of the engine control system<br>• Stepper motor <2.0L DOHC Engine><br>• Injector<br>• Power transistor | Check the actuator-related circuit.<br>Check the actuator as a single unit. |
| | The fuel pressure is not proper. | Check the fuel pressure. |

## CONTROL FUNCTIONS

N14EE--

### <1.8L Engine>

| Functional elements \ Function | | Air-fuel mixture control | Ignition timing control | Idle speed control | Air conditioner power relay control | Fuel pump drive control | Purge control | EGR control |
|---|---|---|---|---|---|---|---|---|
| In-put | Power supply (Ignition switch coupled) | X | X | X | X | X | X | X |
| | Power supply (battery backup) | X | X | X | X | X | X | X |
| | Air flow sensor | X | X | | | | X | X |
| | Barometric pressure sensor | X | X | | | | X | |
| | Intake air temperature sensor | X | X | | | | X | |
| | Engine coolant temperature sensor | X | X | X | | | X | X |
| | Throttle position sensor | X | X | X | X* | | | |
| | Idle position switch | X | X | X | | | | |
| | Motor position sensor | | | X | | | | |
| | No. 1 cylinder TDC sensor | X | | | | | | |
| | Crank angle sensor | X | X | X | X | X | X | X |
| | Oxygen sensor | X | | | | | | |
| | Vehicle speed sensor | | X | X | | | | |
| | Air conditioner switch | | | X | X* | | X | |
| | Inhibitor switch <A/T> | | X | X | X* | | | |
| | Ignition switch ST terminal (start signal) | X | X | X | | | | |
| | Power steering oil pressure switch | | | X | | | | |
| Out-put | Injector | X | | | | | | |
| | Idle speed control servo | | | X | | | | |
| | Power transistor | | X | | | | | |
| | Air conditioner power relay | | | | X | | | |
| | Control relay | | | | | X | | |
| | Purge control solenoid valve | | | | | | X | |
| | EGR control solenoid valve <California> | | | | | | | X |

NOTE
*: <A/T>

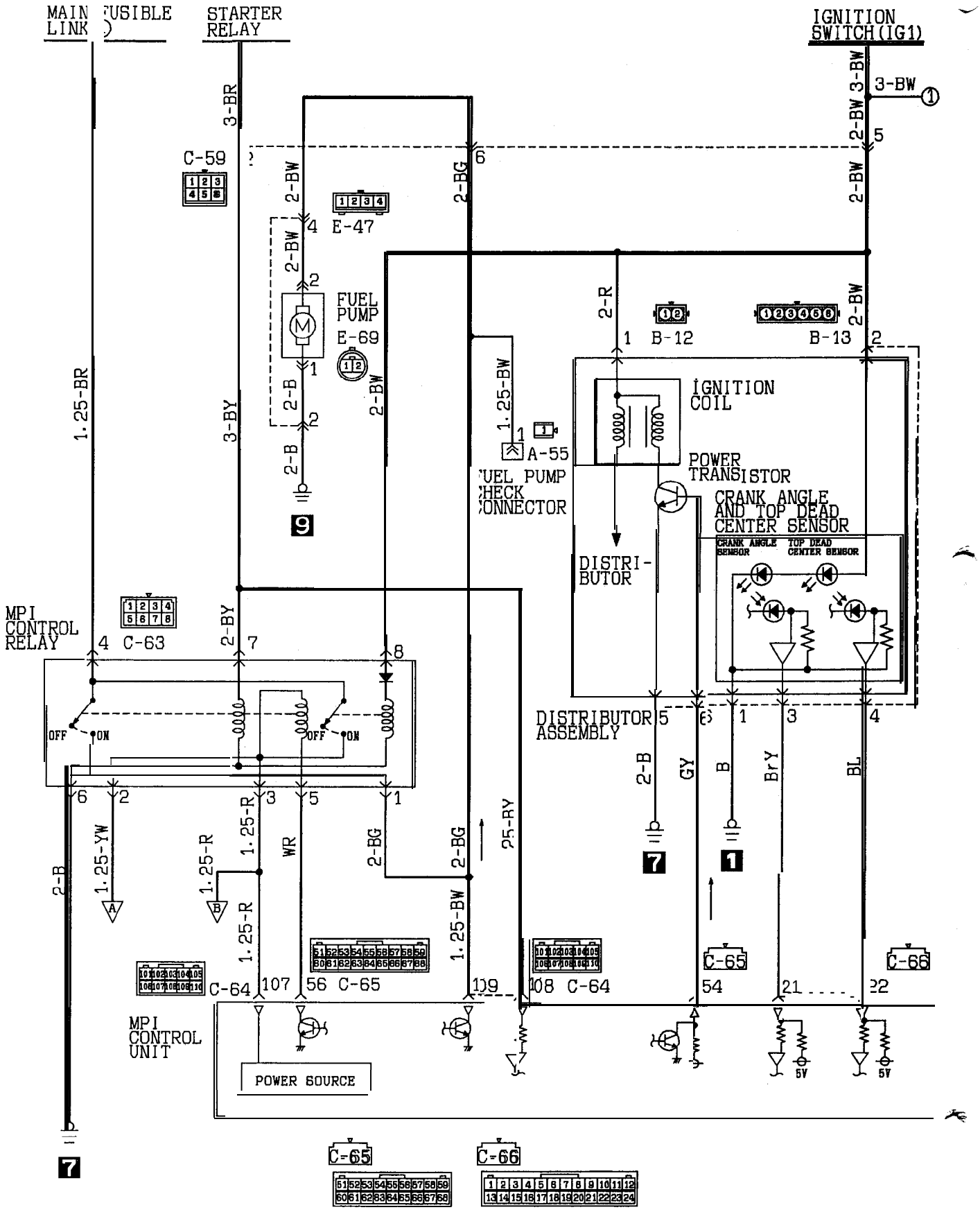
## <2.0L DOHC Engine>

| Functional elements \ Function | | Air-fuel mixture control | Ignition timing control | Idle speed control | Air conditioner power relay control | Fuel pump drive control | Fuel pressure control | Purge air control | EGR control |
|---|---|---|---|---|---|---|---|---|---|
| In-put | Power supply (ignition switch coupled) | X | X | X | X | X | X | X | X |
| | Power supply (battery backup) | X | X | X | X | X | X | X | X |
| | Air flow sensor | X | X | X | | | | X | X |
| | Barometric pressure sensor | X | X | | | | | X | |
| | Intake air temperature sensor | X | X | X | | | X | X | |
| | Engine coolant temperature sensor | X | X | X | | | X | X | X |
| | Throttle position sensor | X | | X | X* | | | | |
| | Idle position switch | X | X | X | | | | | |
| | Top dead center sensor | X | X | | | | | | |
| | Crank angle sensor | X | X | X | X | X | | X | X |
| | Oxygen sensor | X | | | | | | | |
| | Vehicle speed sensor | | X | X | | | | | |
| | Air conditioner switch | | | X | X* | | | X | |
| | Power steeringoil pressure switch | | | X | | | | | |
| | Detonation sensor <Turbo> | | X | | | | | | |
| | Ignition switch | X | X | X | | | | | |
| | Ignition switch ST terminal | X | X | X | | | | | |
| | Inhibitor switch <A/T> | | X | X | X* | | | | |
| )ut-ut | Injector | X | | | | | | | |
| | Resistor <Turbo> | X | | | | | | | |
| | Idle speed control servo | | | X | | | | | |
| | Power transistor | | X | | | | | | |
| | Air conditioner power relay | | | | X | | | | |
| | Control relay | | | | | X | | | |
| | Fuel pressure control valve <Turbo> | | | | | | X | | |
| | Purge control solenoid valve | | | | | | | X | |
| | EGR control solenoid valve <California> | | | | | | | | X |

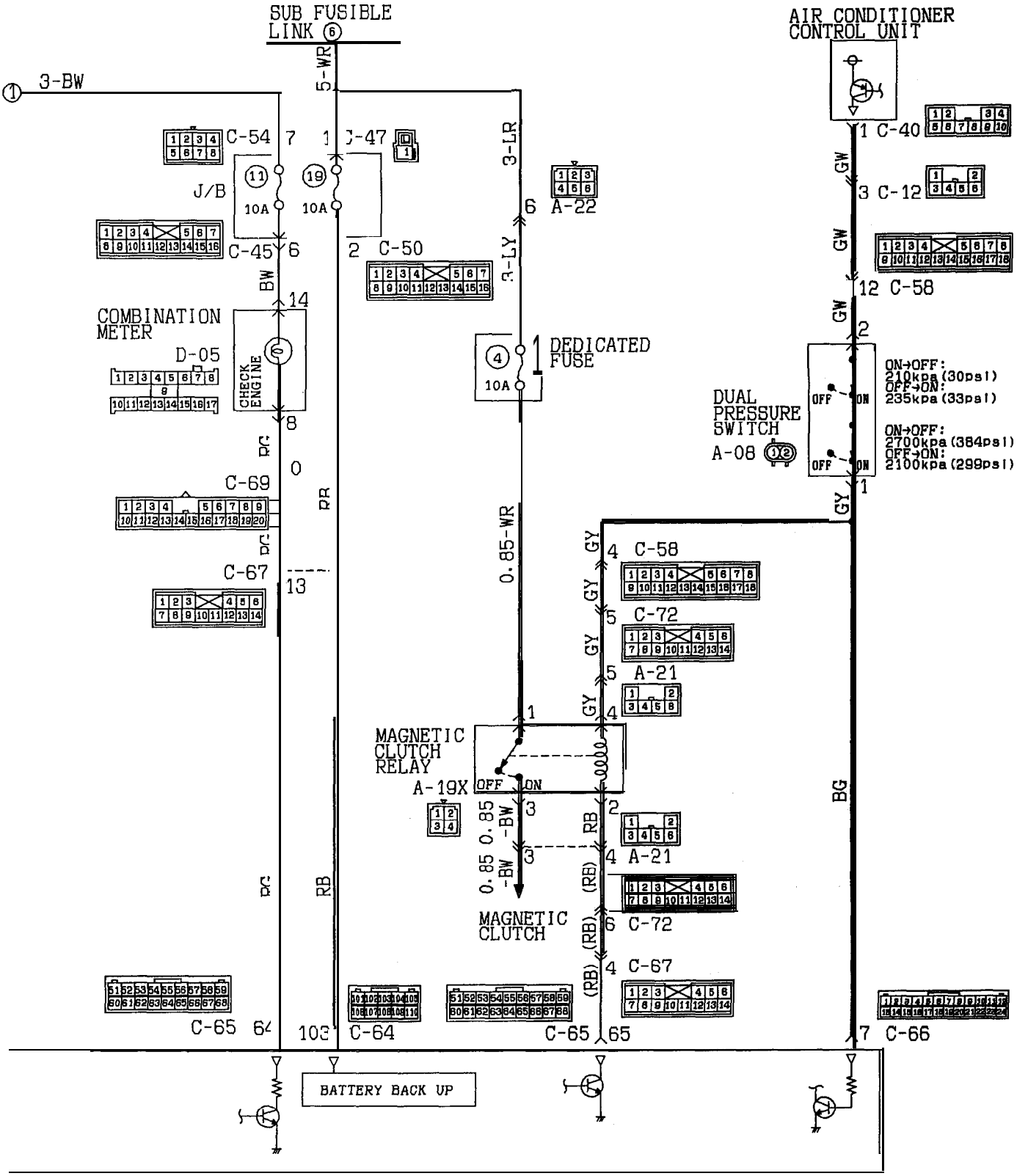
NOTE
*: <A/T>

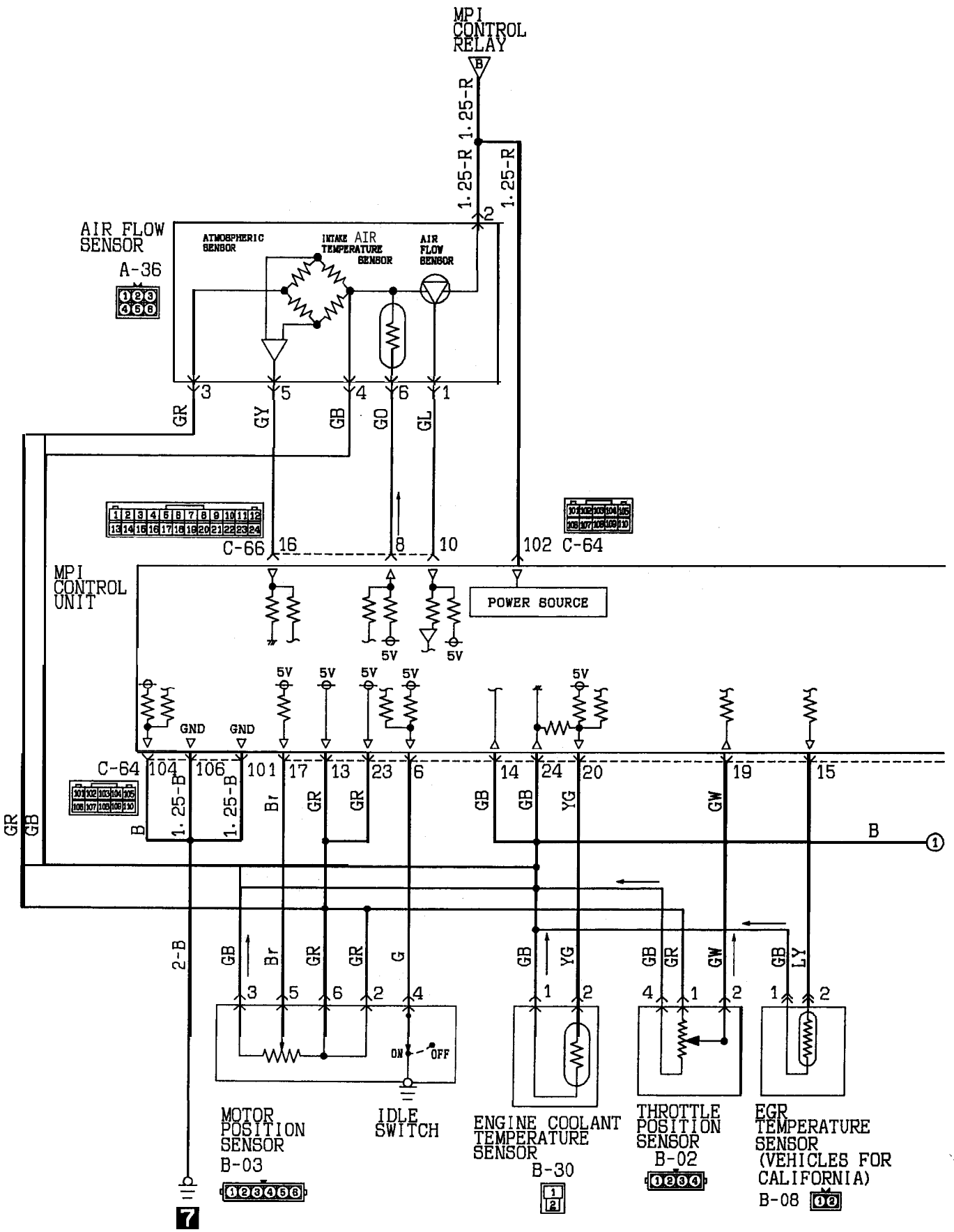
## MPI CIRCUIT

### 1.8L Engine <M/T>

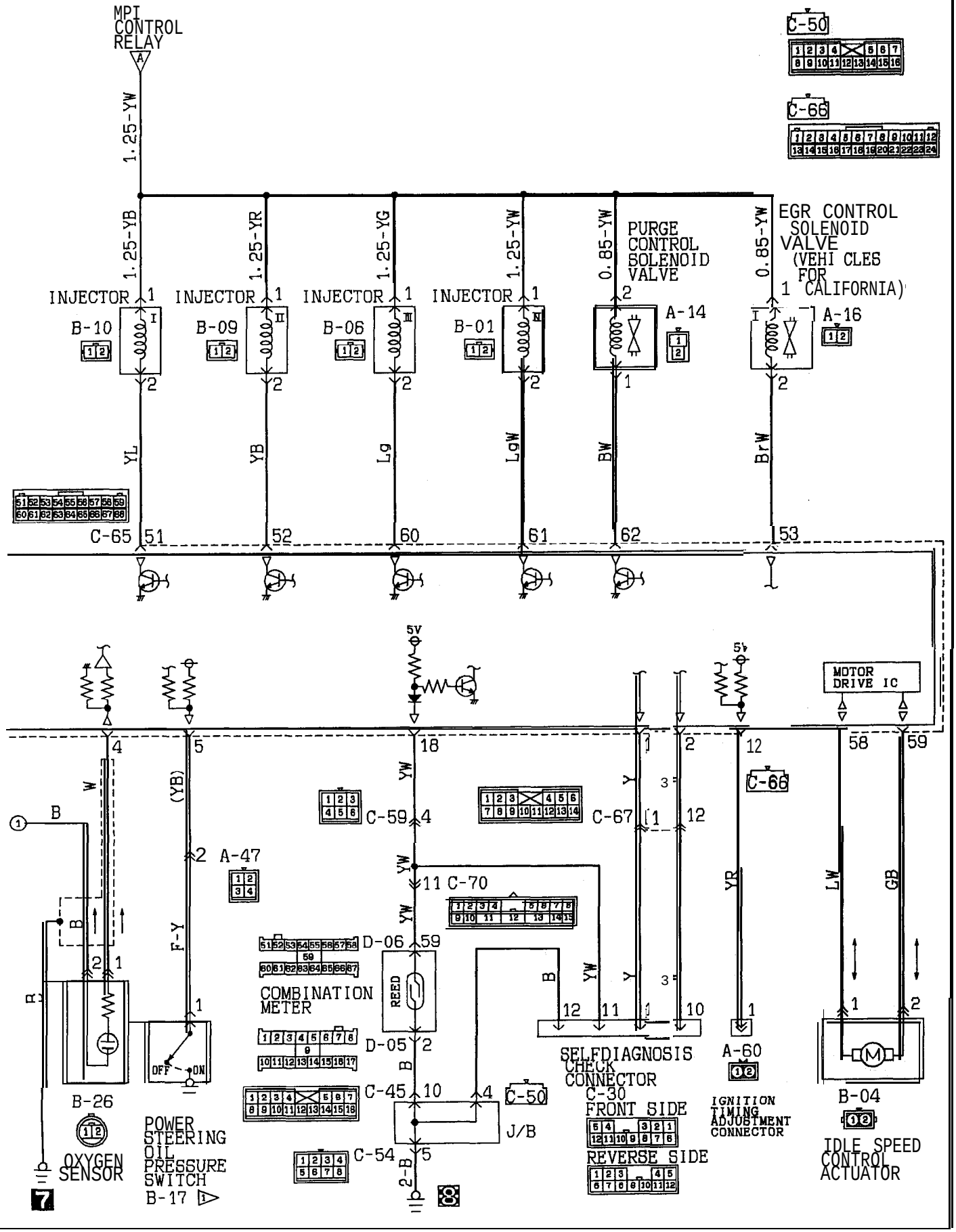



KX35-AC-U0514-NC

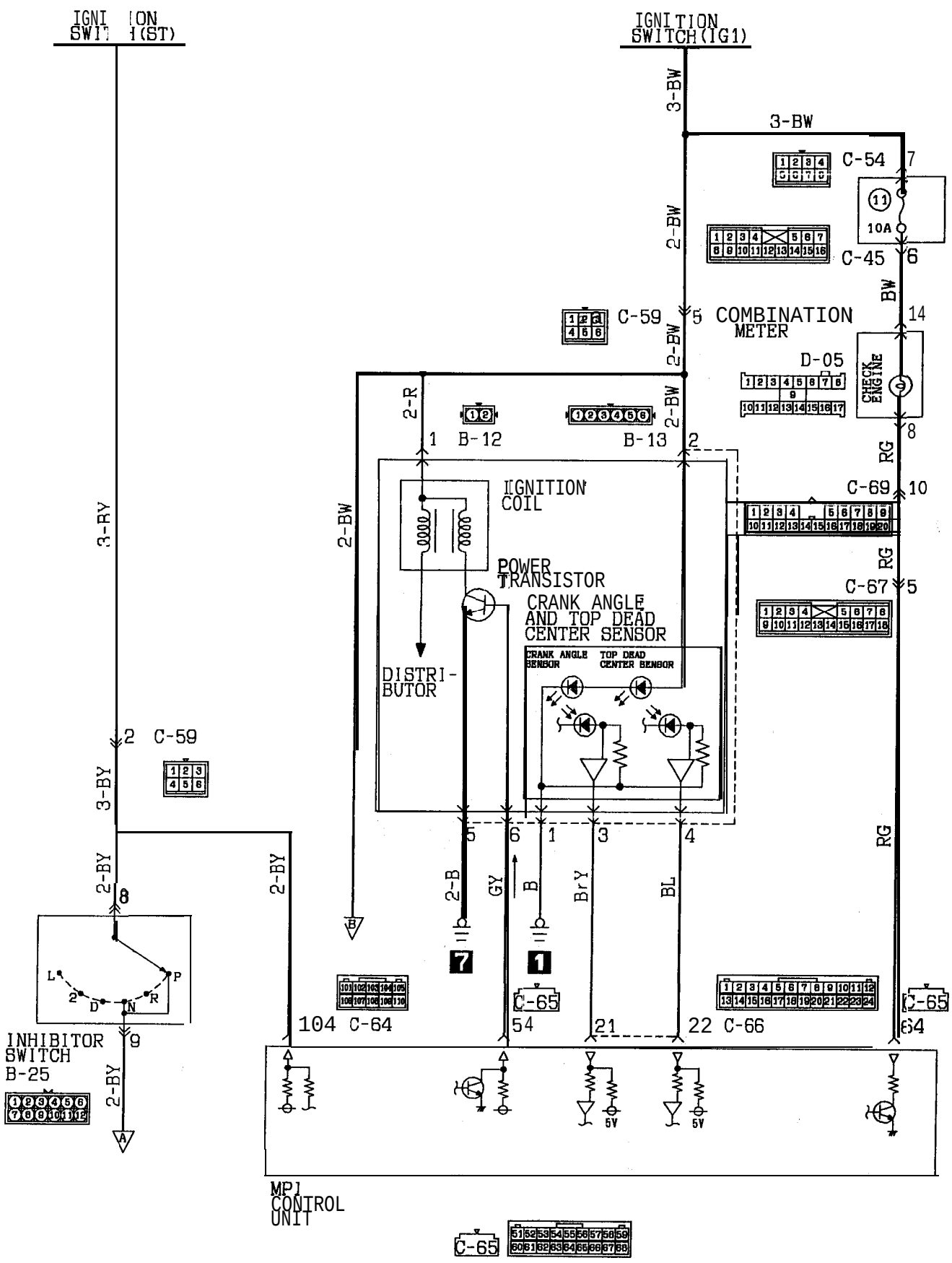

SUB FUSIBLE LINK ⑥
AIR CONDITIONER CONTROL UNIT
3-BW
5-WR
C-54
C-47
J/B
10A
10A
C-45
C-50
3-LR
A-22
3-LY
C-40
GW
C-12
C-58
COMBINATION METER
D-05
CHECK ENGINE
BW
DEDICATED FUSE
10A
DUAL PRESSURE SWITCH
A-08
ON→OFF: 210kpa (30psi)
OFF→ON: 235kpa (33psi)
ON→OFF: 2700kpa (384psi)
OFF→ON: 2100kpa (299psi)
GY
C-69
C-67
0.85-WR
C-58
C-72
A-21
MAGNETIC CLUTCH RELAY
A-19X
OFF
ON
0.85-BW
RB
MAGNETIC CLUTCH
(RB)
BG
C-65
C-64
C-65
C-66
BATTERY BACK UP



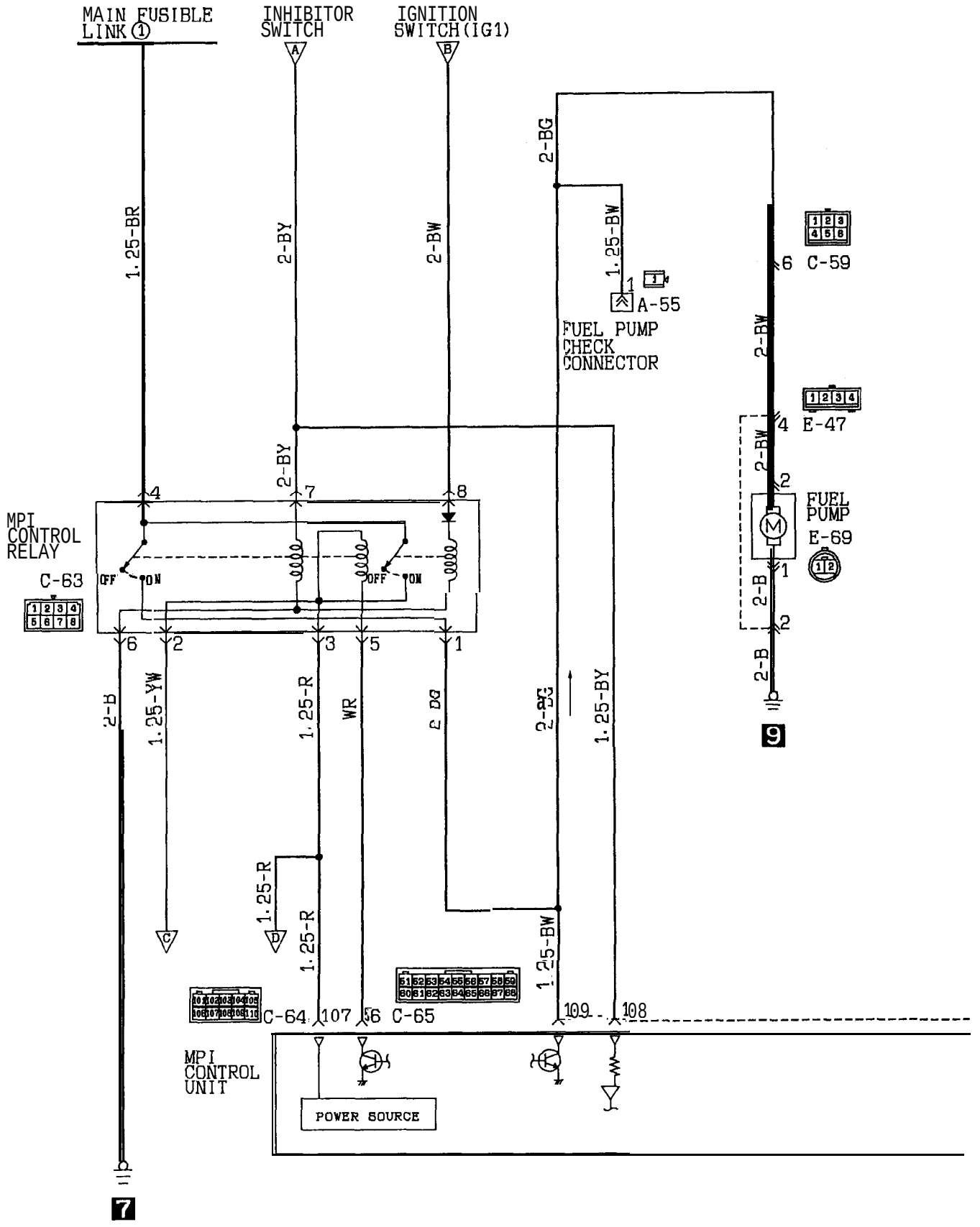

KX35-AC-U0514A-NC

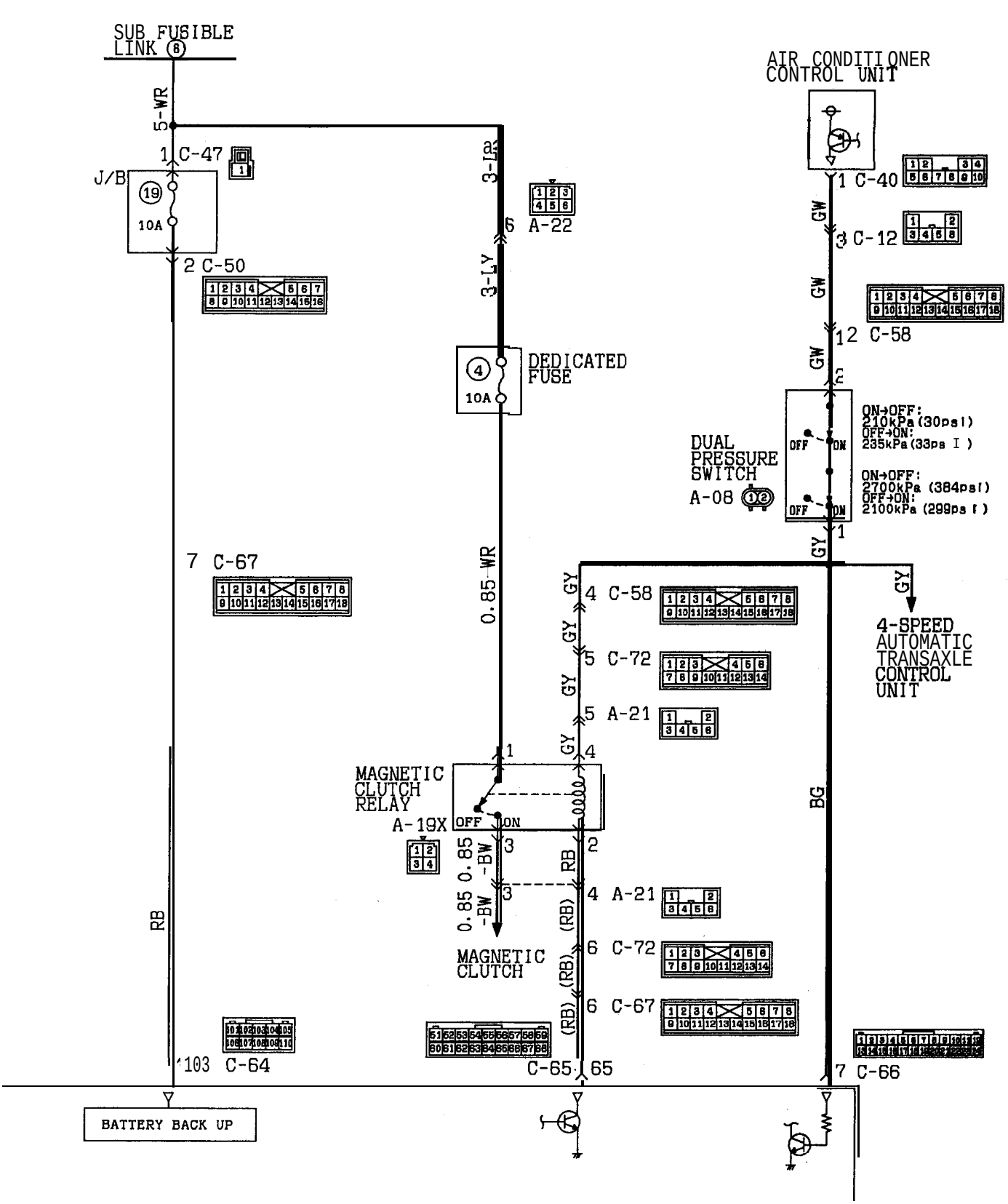

MPI CONTROL RELAY
1.25-YW
C-50
C-66
1.25-YB
1.25-YR
1.25-YG
1.25-YW
0.85-YW
0.85-YW
PURGE CONTROL SOLENOID VALVE
EGR CONTROL SOLENOID VALVE (VEHICLES FOR CALIFORNIA)
INJECTOR 1
INJECTOR 2
INJECTOR 3
INJECTOR 4
B-10
B-09
B-06
B-01
A-14
A-16
YL
YB
Lg
LgW
BW
BrW
C-65 51 52 60 61 62 53
5V
MOTOR DRIVE IC
4 5 18 1 2 12 58 59
W
(YB)
YW
Y
YR
LW
GB
B
F-Y
R
C-59 4
C-67 1 12
A-47 2
11 C-70
D-06 59
D-05 2
COMBINATION METER
REED
C-45 10
4 C-50
J/B
C-54 5
2-B
B-26
OXYGEN SENSOR
POWER STEERING OIL PRESSURE SWITCH
B-17
SELFDIAGNOSIS CHECK CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
A-60
IGNITION TIMING ADJUSTMENT CONNECTOR
B-04
IDLE SPEED CONTROL ACTUATOR
OFF
ON
7
8

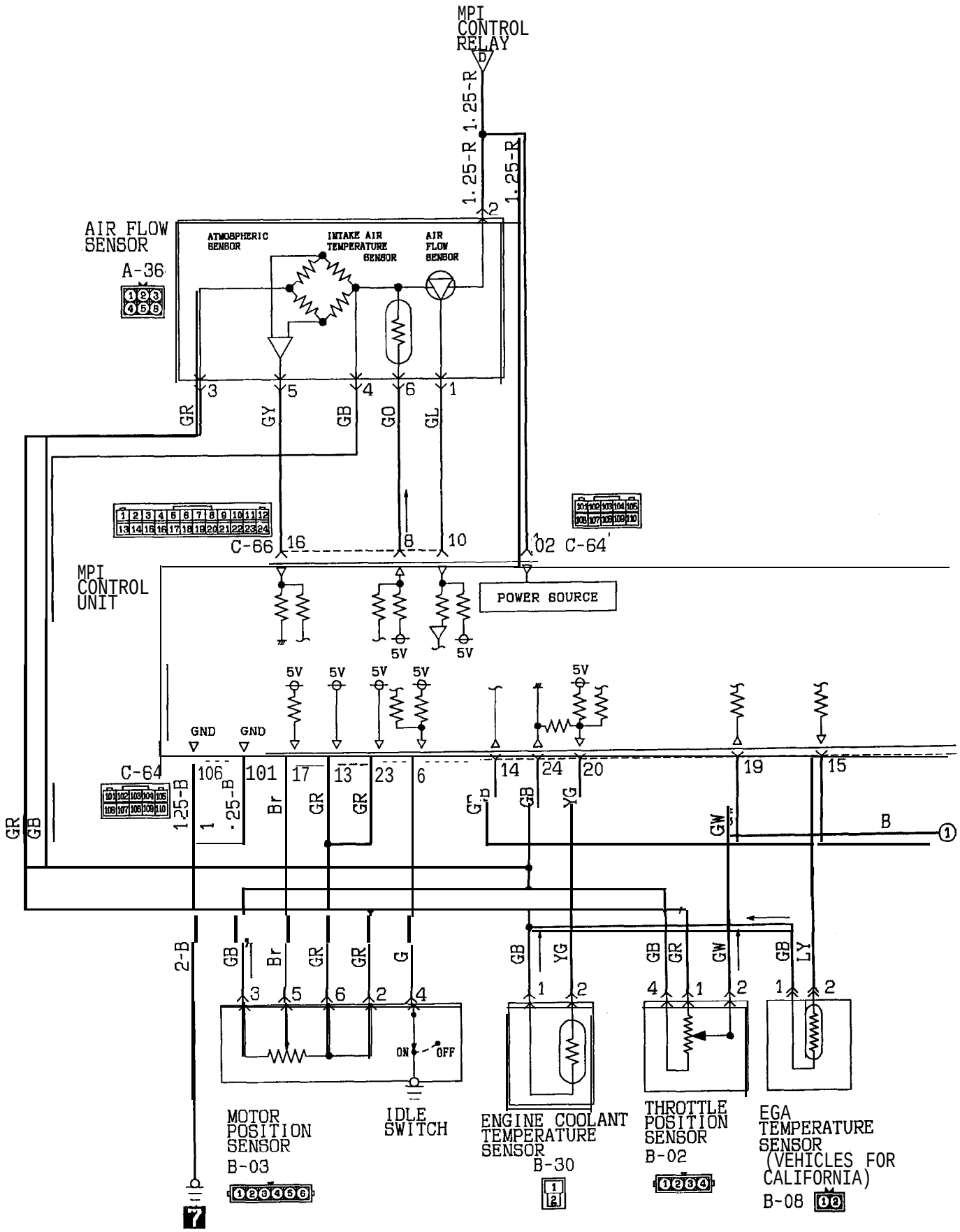
## 1.8L Engine <A/T>



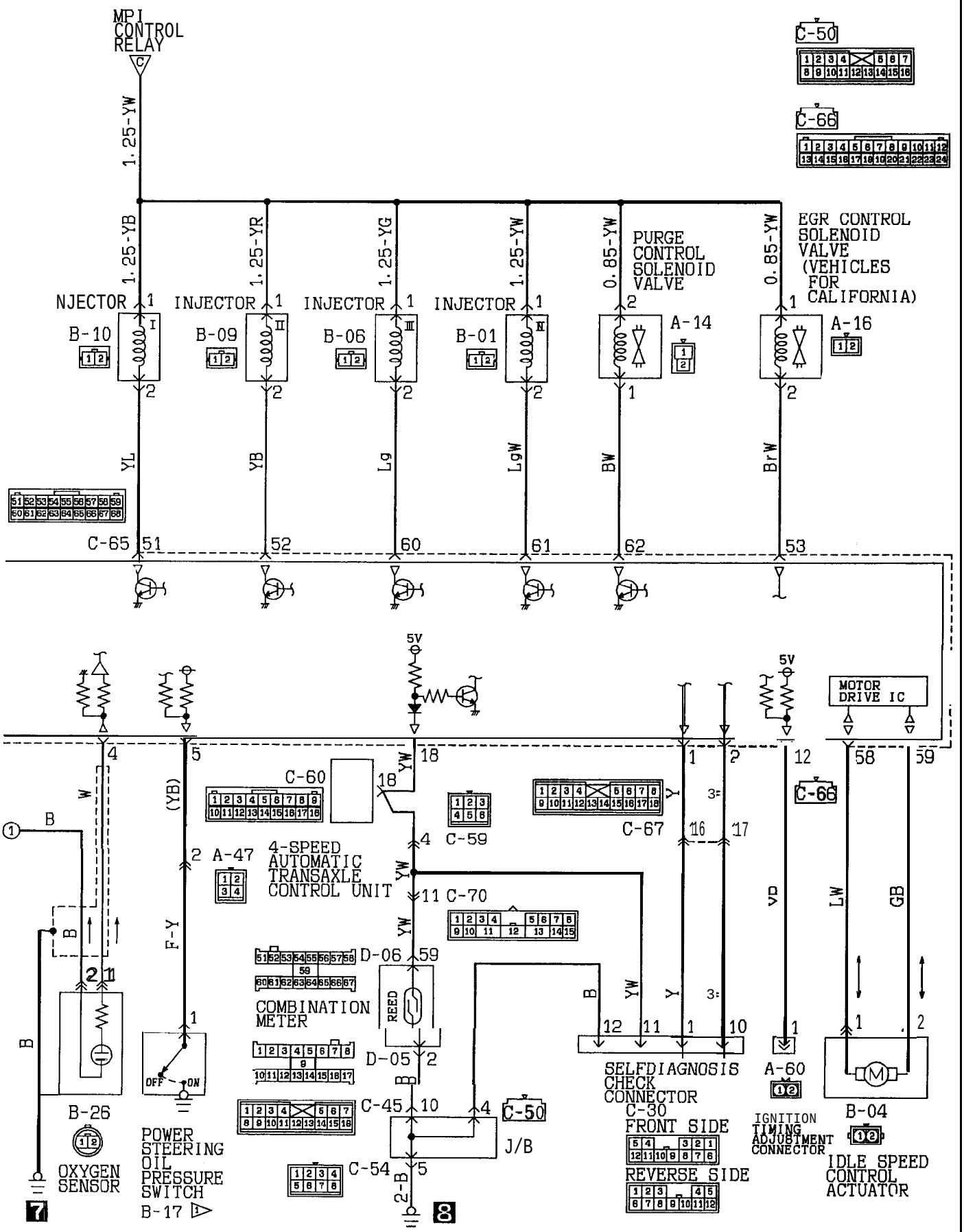

KX35-AC-U0515-NC


MAIN FUSIBLE LINK ①
INHIBITOR SWITCH
IGNITION SWITCH(IG1)
1.25-BR
2-BY
2-BW
2-BG
1.25-BW
A-55
FUEL PUMP CHECK CONNECTOR
C-59
E-47
FUEL PUMP
E-69
MPI CONTROL RELAY
C-63
OFF
ON
1.25-YW
1.25-R
WR
2-B
1.25-BY
C-64
C-65
MPI CONTROL UNIT
POWER SOURCE
9
7

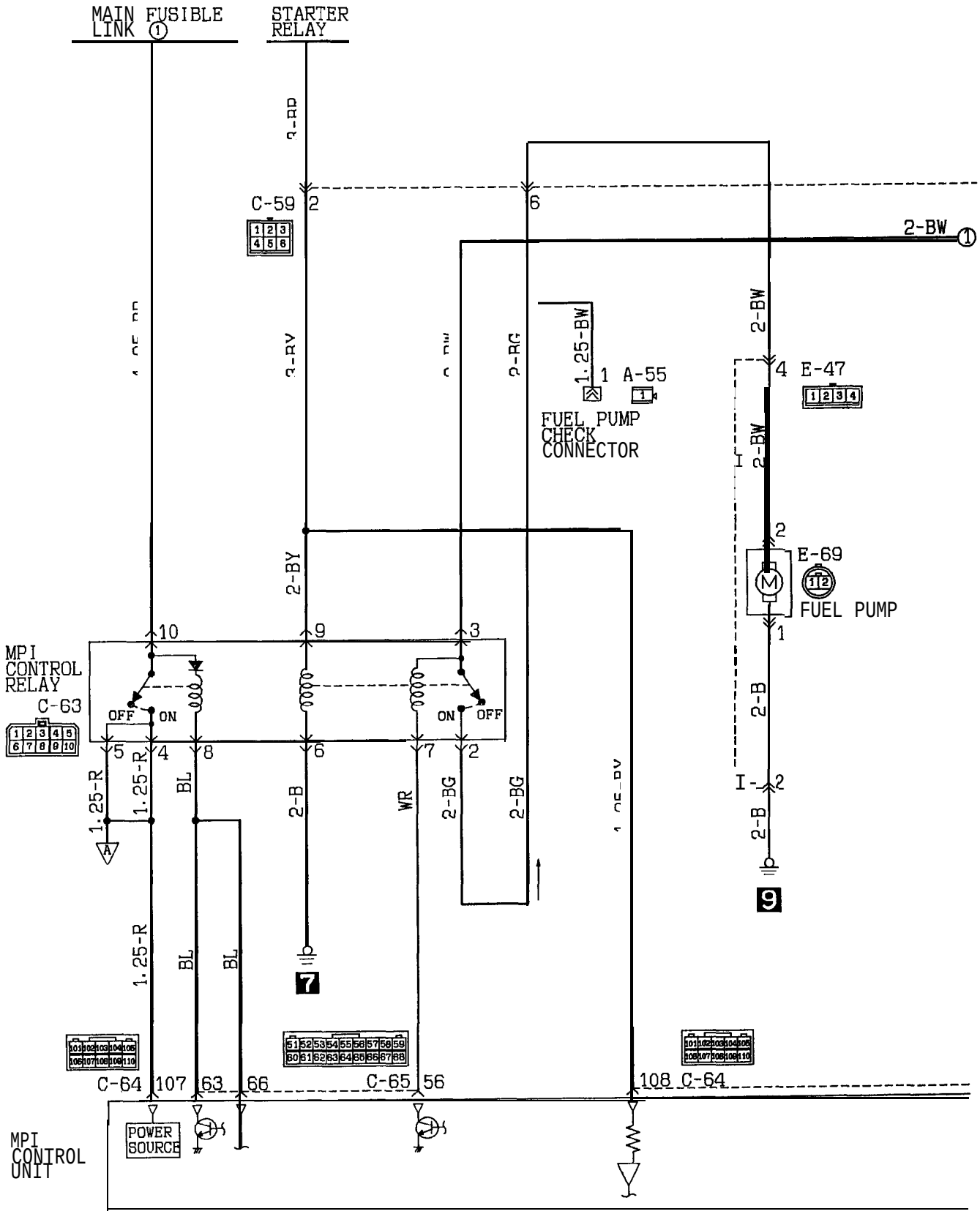

SUB FUSIBLE LINK (8)
5-WR
1 C-47
J/B
(19)
10A
2 C-50
3-LR
6 A-22
3-LY
(4)
10A
DEDICATED FUSE
0.85-WR
7 C-67
RB
MAGNETIC CLUTCH RELAY
A-19X
OFF ON
0.85-BW
0.85-BW
MAGNETIC CLUTCH
(RB)
(RB)
(RB)
4 A-21
6 C-72
6 C-67
C-65 65
103 C-64
BATTERY BACK UP
AIR CONDITIONER CONTROL UNIT
1 C-40
GW
3 C-12
GW
12 C-58
GW
2
DUAL PRESSURE SWITCH
A-08
ON→OFF:
210kPa (30psi)
OFF→ON:
235kPa (33psi)
ON→OFF:
2700kPa (384psi)
OFF→ON:
2100kPa (299psi)
GY
4 C-58
GY
5 C-72
GY
5 A-21
GY
4
BG
4-SPEED AUTOMATIC TRANSAXLE CONTROL UNIT
GY
7 C-66

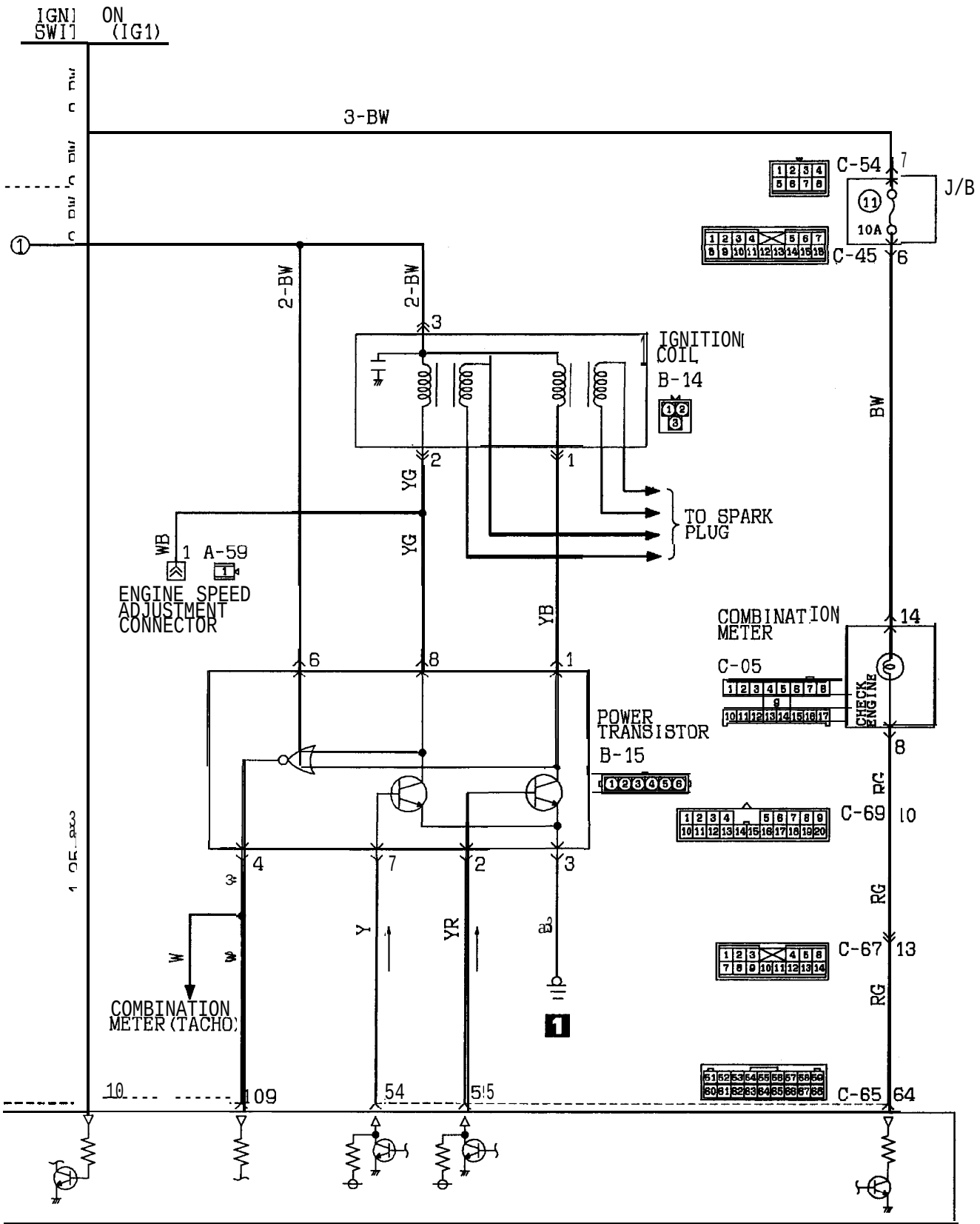


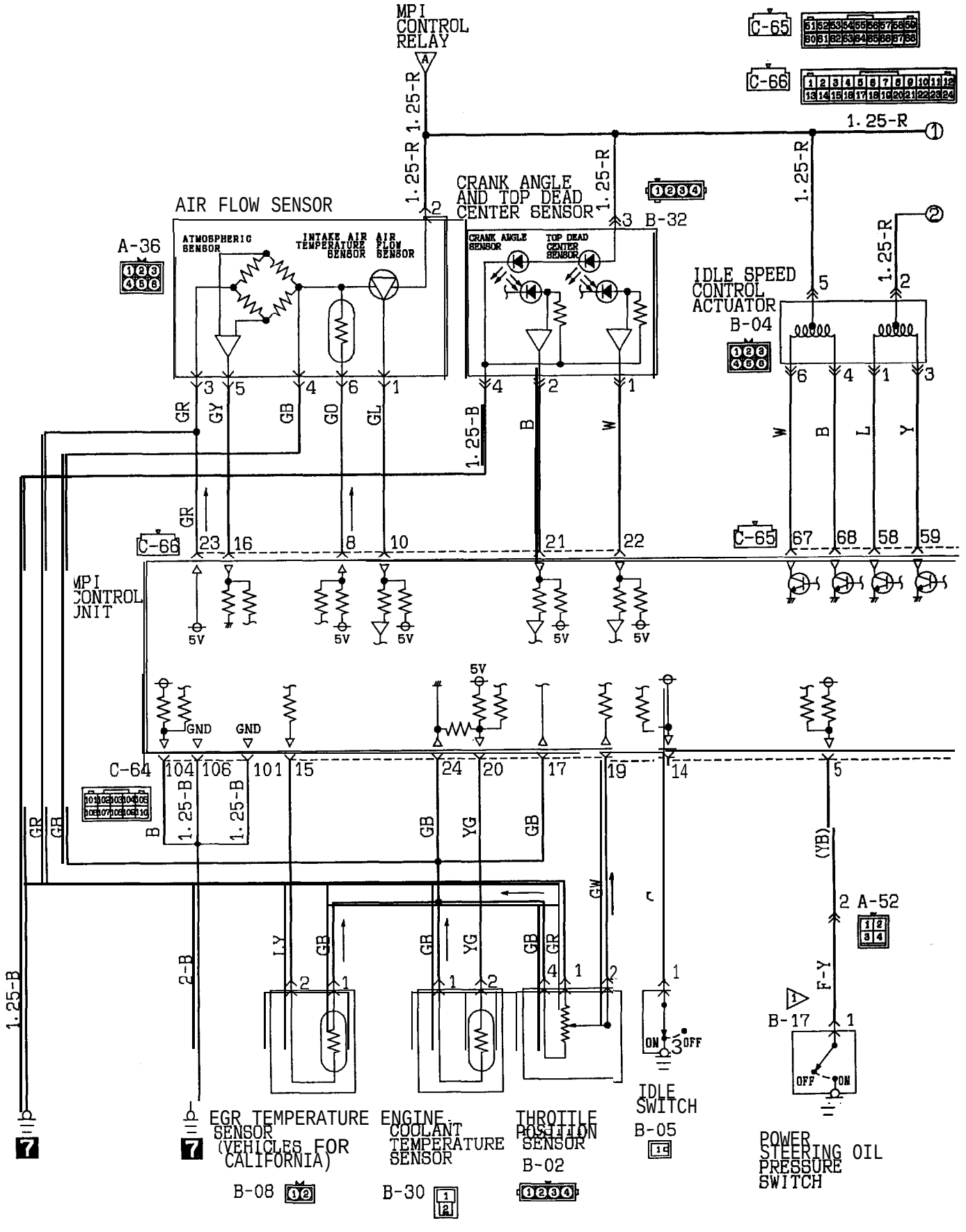

KX35-AC-U0515B-NC

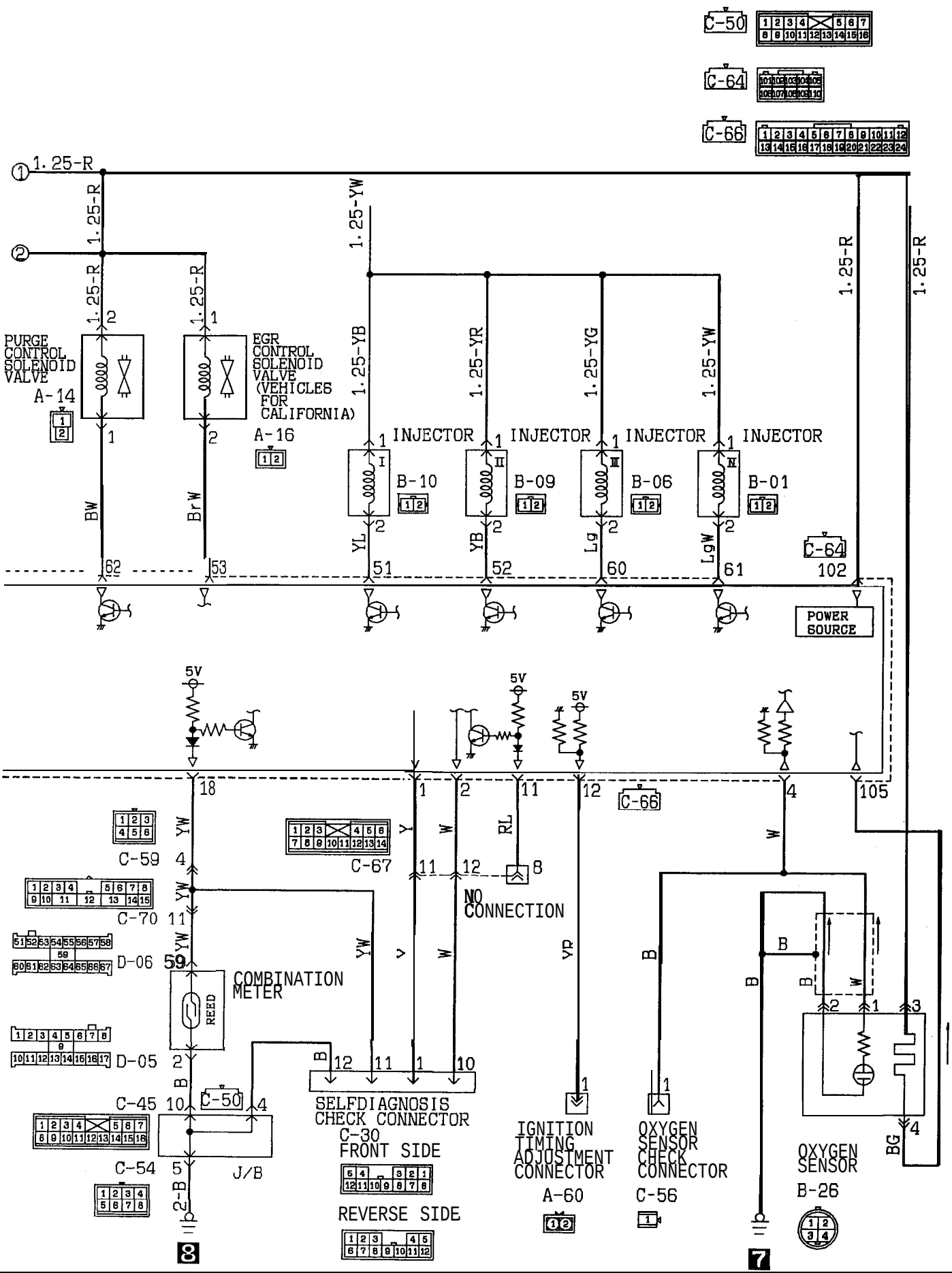

MPI CONTROL RELAY
1.25-YW
C-50
C-66
1.25-YB
1.25-YR
1.25-YG
1.25-YW
0.85-YW
PURGE CONTROL SOLENOID VALVE
0.85-YW
EGR CONTROL SOLENOID VALVE (VEHICLES FOR CALIFORNIA)
INJECTOR #1
INJECTOR #2
INJECTOR #3
INJECTOR #4
B-10
B-09
B-06
B-01
A-14
A-16
YL
YB
Lg
LgW
BW
BrW
C-65
51
52
60
61
62
53
5V
MOTOR DRIVE IC
C-60
C-59
C-67
C-66
4-SPEED AUTOMATIC TRANSAXLE CONTROL UNIT
A-47
C-70
D-06
D-05
COMBINATION METER
REED
SELFDIAGNOSIS CHECK CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
A-60
IGNITION TIMING ADJUSTMENT CONNECTOR
B-04
IDLE SPEED CONTROL ACTUATOR
B-26
OXYGEN SENSOR
POWER STEERING OIL PRESSURE SWITCH
B-17
C-45
C-54
J/B
OFF
ON

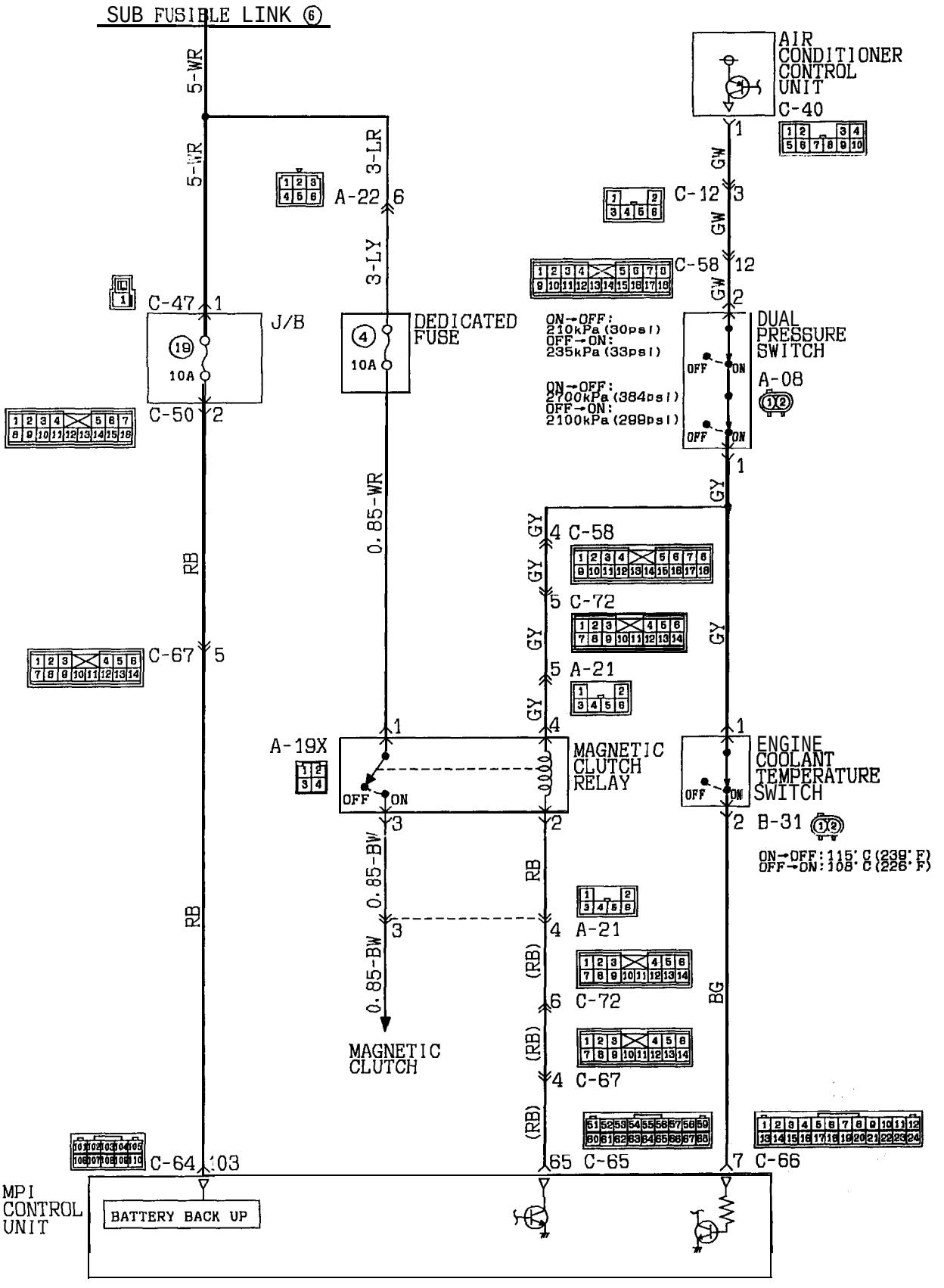
## 2.0L DOHC Engine (Non-Turbo) <M/T>




IGNI SWI ON (IG1)
3-BW
C-54
J/B
10A
C-45
2-BW
2-BW
IGNITION COIL
B-14
BW
YG
YG
TO SPARK PLUG
WB
A-59
ENGINE SPEED ADJUSTMENT CONNECTOR
YB
COMBINATION METER
C-05
CHECK ENGINE
POWER TRANSISTOR
B-15
C-69
RG
RG
RG
C-67
W
Y
YR
COMBINATION METER (TACHO)
C-65
109
54
55
64

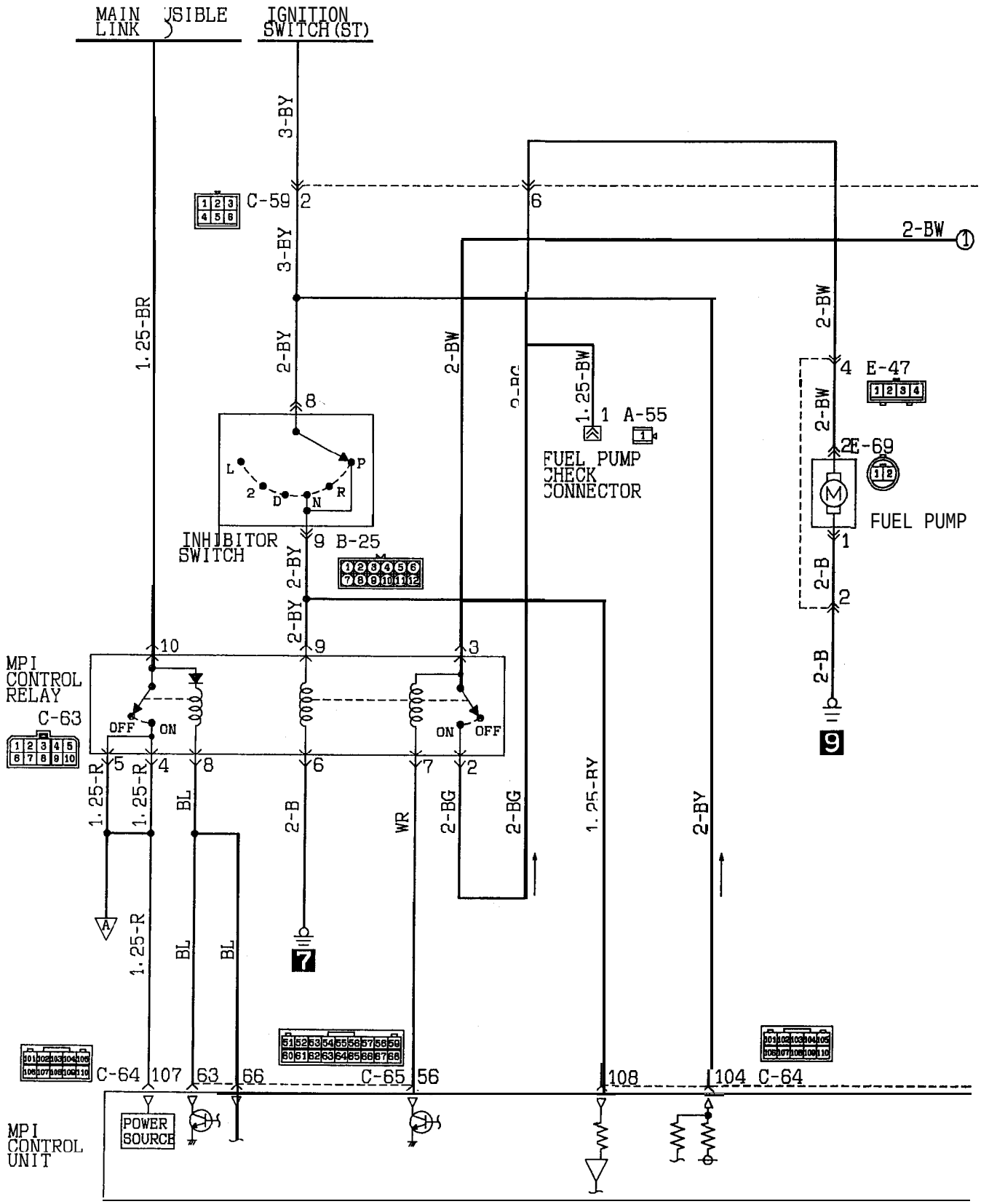

MPI CONTROL RELAY
C-65
C-66
1.25-R
AIR FLOW SENSOR
ATMOSPHERIC SENSOR
INTAKE AIR TEMPERATURE SENSOR
AIR FLOW SENSOR
A-36
CRANK ANGLE AND TOP DEAD CENTER SENSOR
CRANK ANGLE SENSOR
TOP DEAD CENTER SENSOR
B-32
IDLE SPEED CONTROL ACTUATOR
B-04
GR
GY
GB
GO
GL
B
W
L
Y
MPI CONTROL UNIT
5V
GND
C-64
104
106
101
15
24
20
17
19
14
5
1.25-B
2-B
LY
YG
GW
(YB)
F-Y
2 A-52
B-17
ON
OFF
IDLE SWITCH
B-05
POWER STEERING OIL PRESSURE SWITCH
EGR TEMPERATURE SENSOR (VEHICLES FOR CALIFORNIA)
B-08
ENGINE COOLANT TEMPERATURE SENSOR
B-30
THROTTLE POSITION SENSOR
B-02


C-50
C-64
C-66
1.25-R
1.25-YW
1.25-YB
1.25-YR
1.25-YG
PURGE CONTROL SOLENOID VALVE
A-14
EGR CONTROL SOLENOID VALVE (VEHICLES FOR CALIFORNIA)
A-16
INJECTOR
B-10
B-09
B-06
B-01
BW
BrW
YL
YB
Lg
LgW
62
53
51
52
60
61
102
POWER SOURCE
5V
C-59
C-70
D-06
C-67
NO CONNECTION
COMBINATION METER
REED
D-05
C-45
C-50
J/B
SELFDIAGNOSIS CHECK CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
IGNITION TIMING ADJUSTMENT CONNECTOR
A-60
OXYGEN SENSOR CHECK CONNECTOR
C-56
OXYGEN SENSOR
B-26
BG
8
7

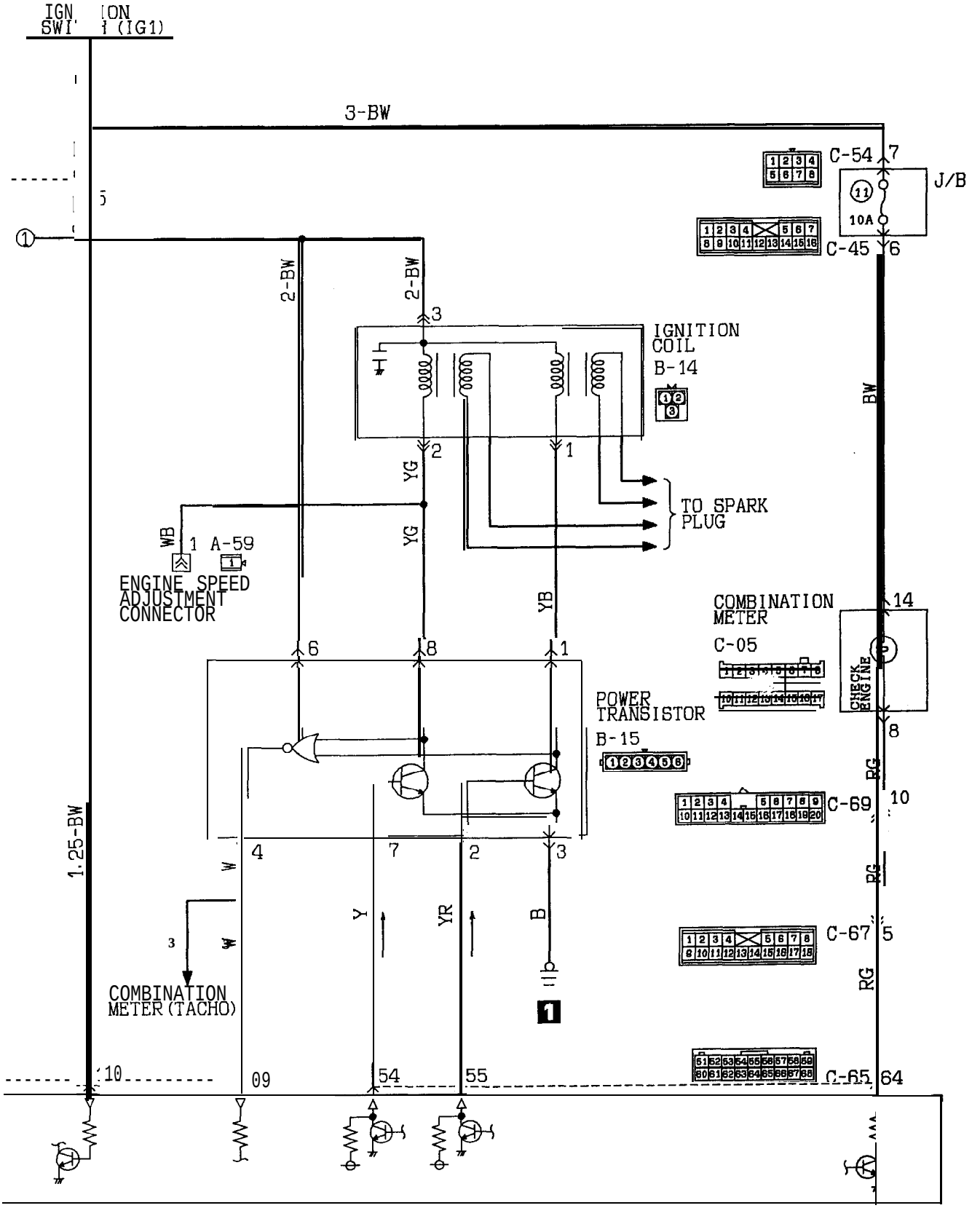


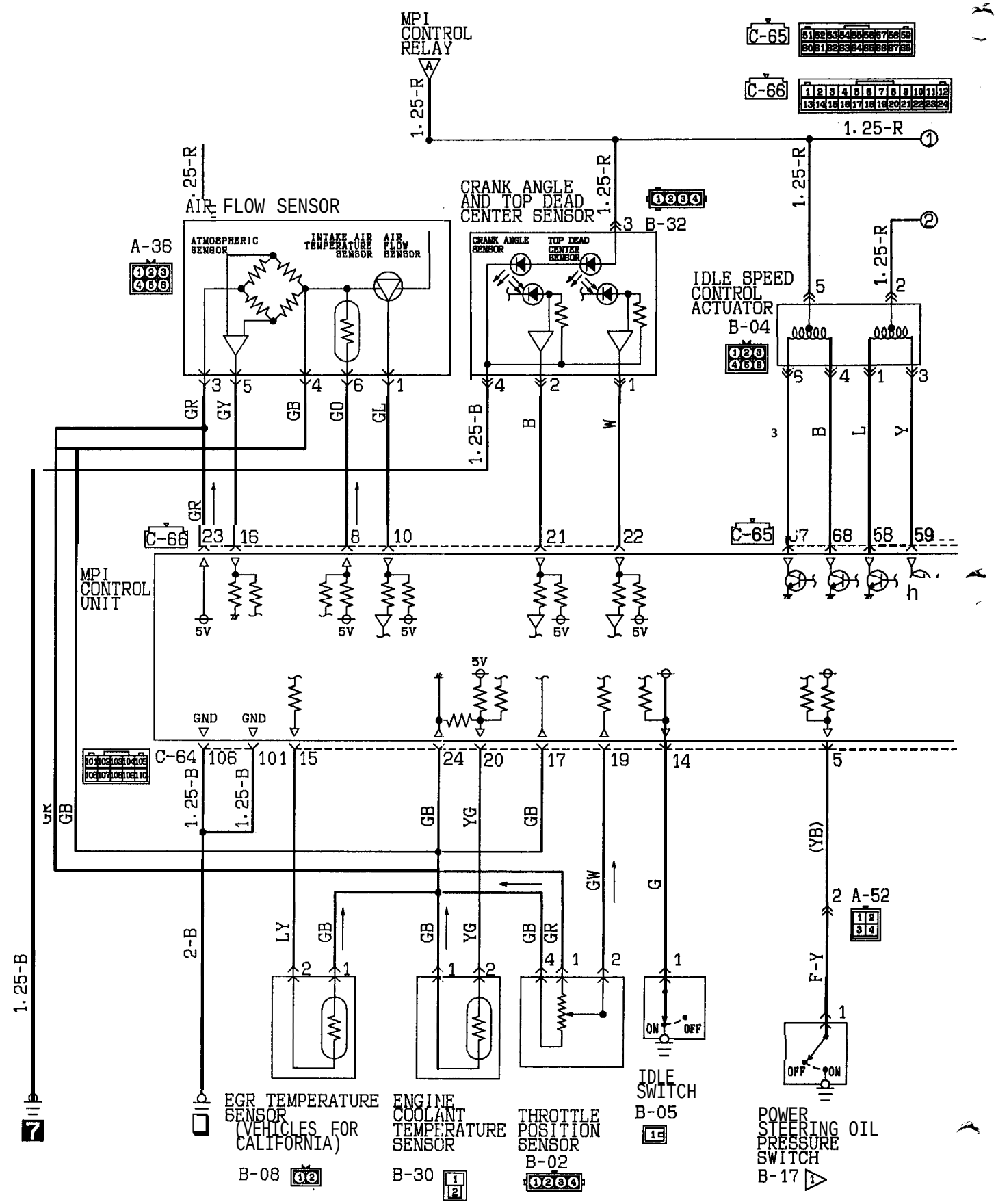

KX35-AC-U0516B-NC

## 2.0L DOHC Engine (Non-Turbo) <A/T>

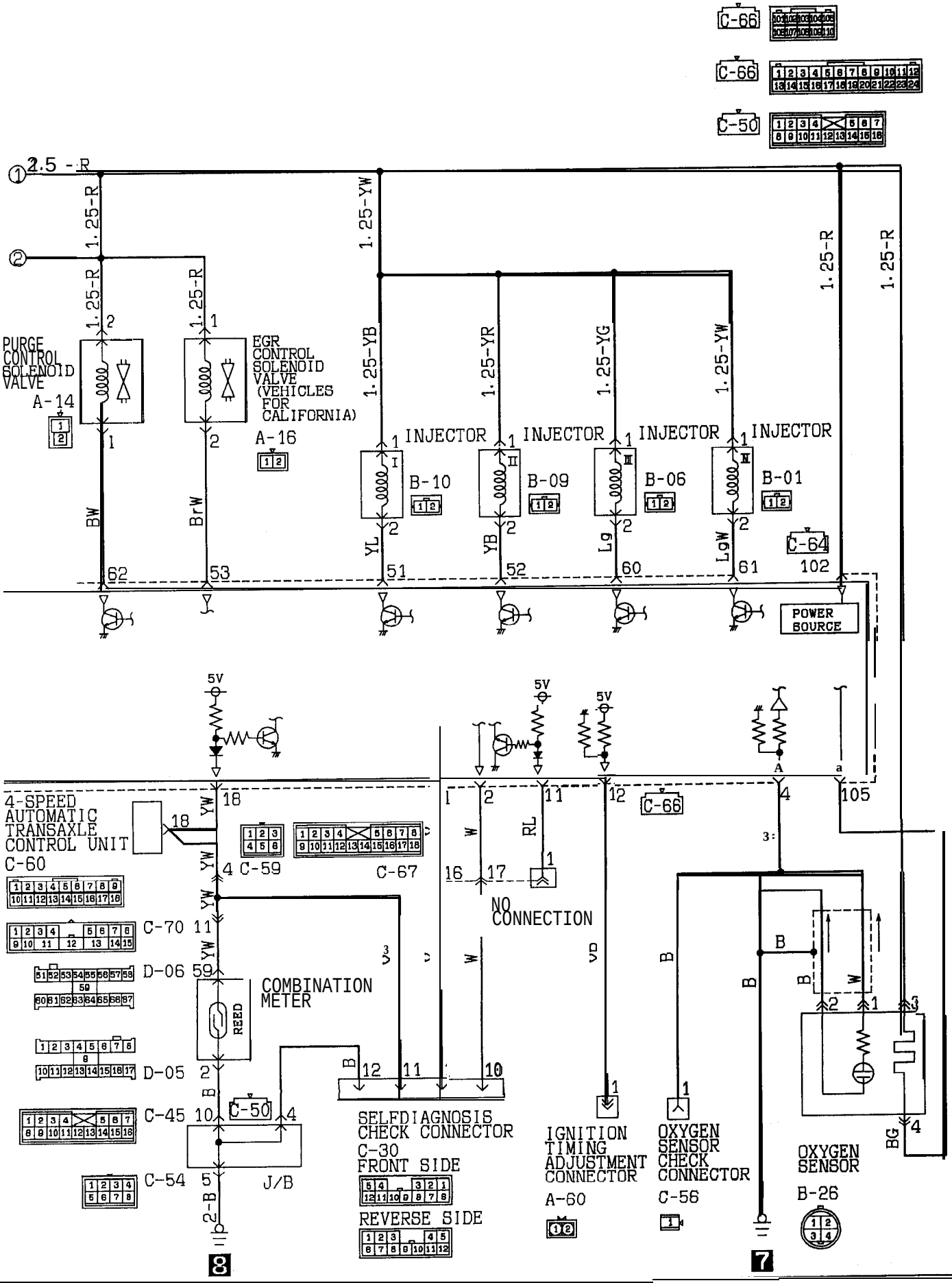


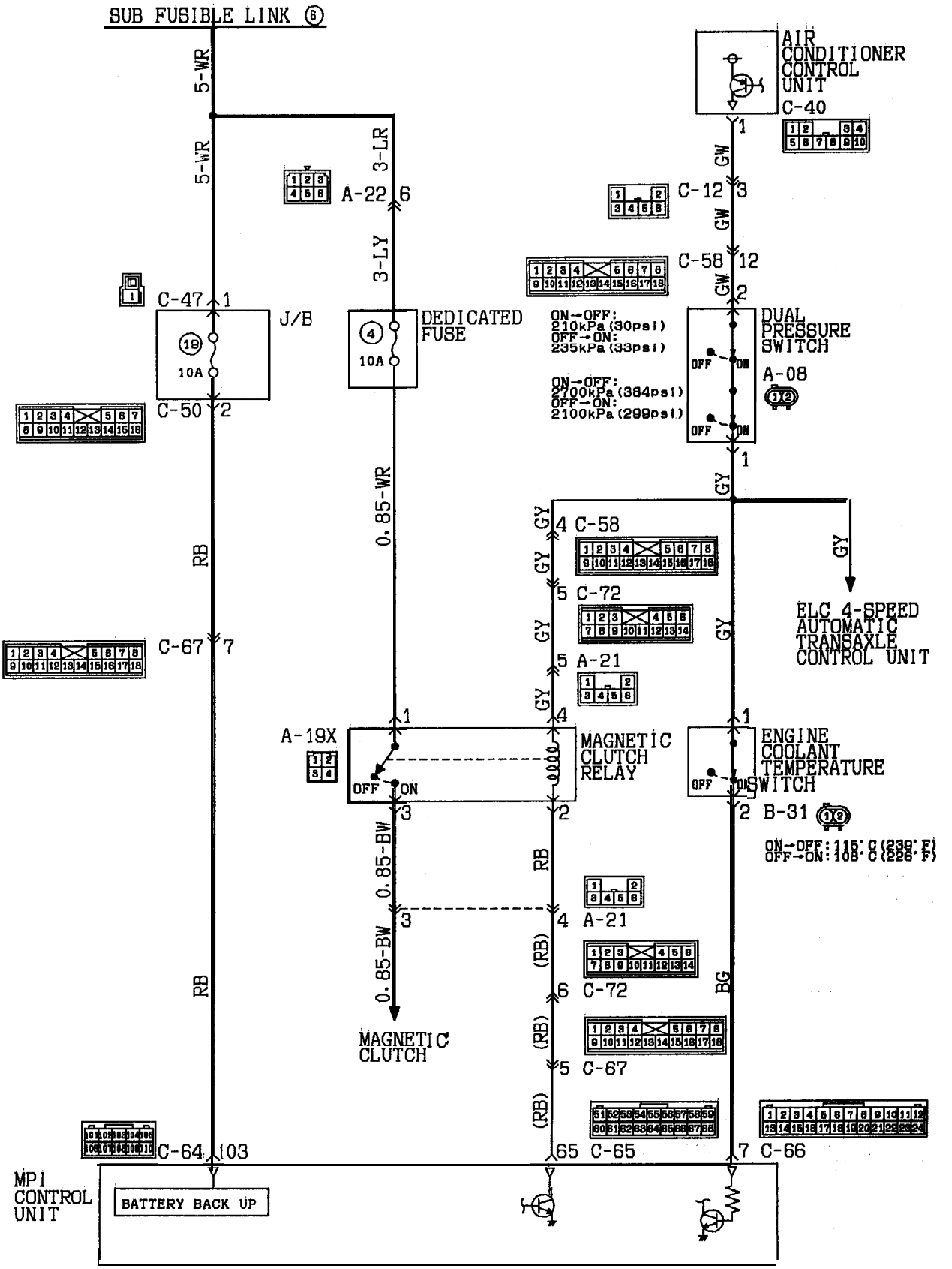

KX35-AC-U0517-NC


IGN ION
SWI 1 (IG1)
3-BW
C-54
7
J/B
11
10A
C-45
6
2-BW
2-BW
3
IGNITION
COIL
B-14
BW
2
1
YG
TO SPARK
PLUG
WB
1 A-59
ENGINE SPEED
ADJUSTMENT
CONNECTOR
YG
YB
COMBINATION
METER
C-05
14
CHECK
ENGINE
6
8
1
POWER
TRANSISTOR
B-15
8
RG
C-69
10
1.25-BW
4
7
2
3
W
Y
YR
B
RG
3
W
C-67
5
RG
COMBINATION
METER (TACHO)
1
10
09
54
55
C-65
64

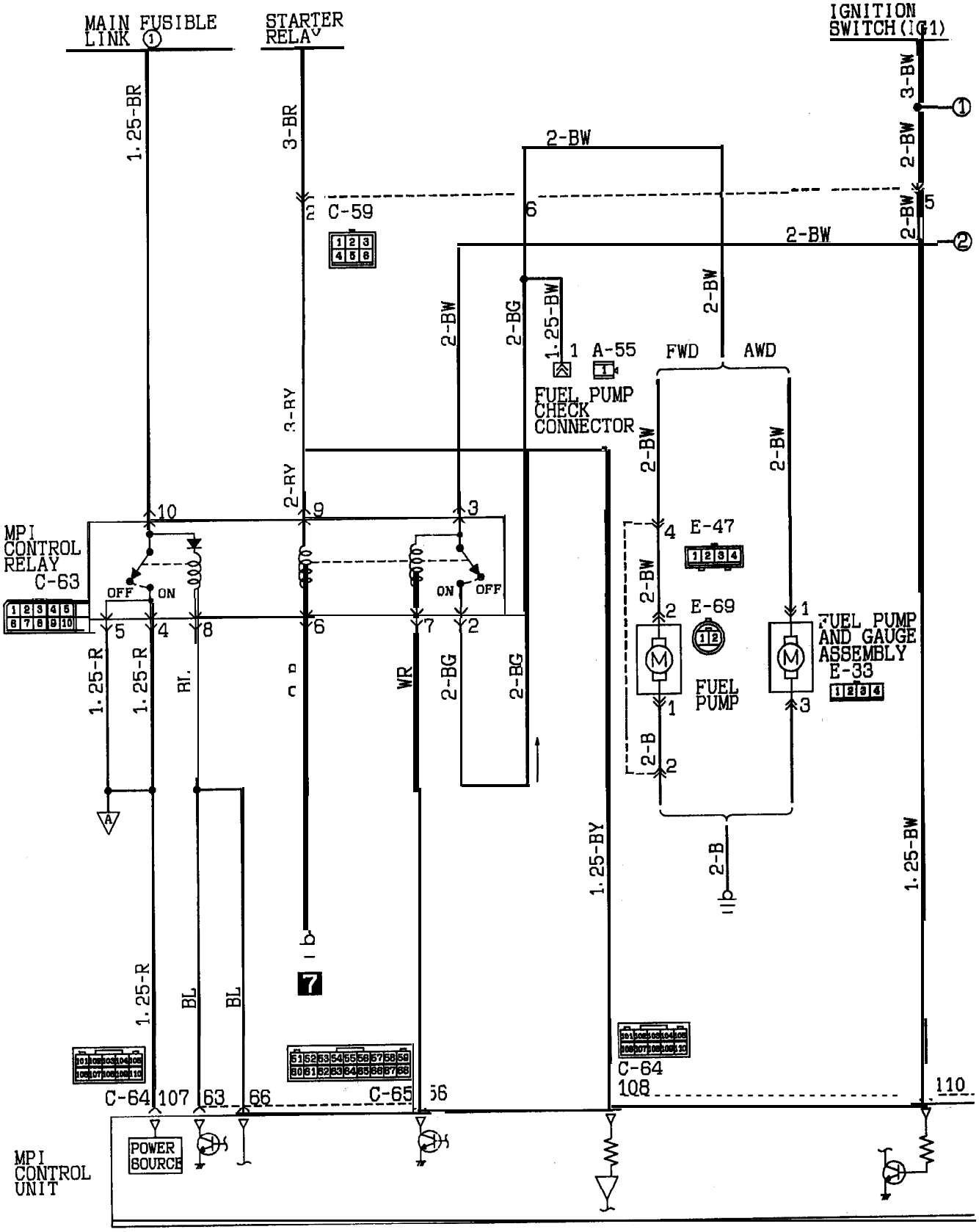


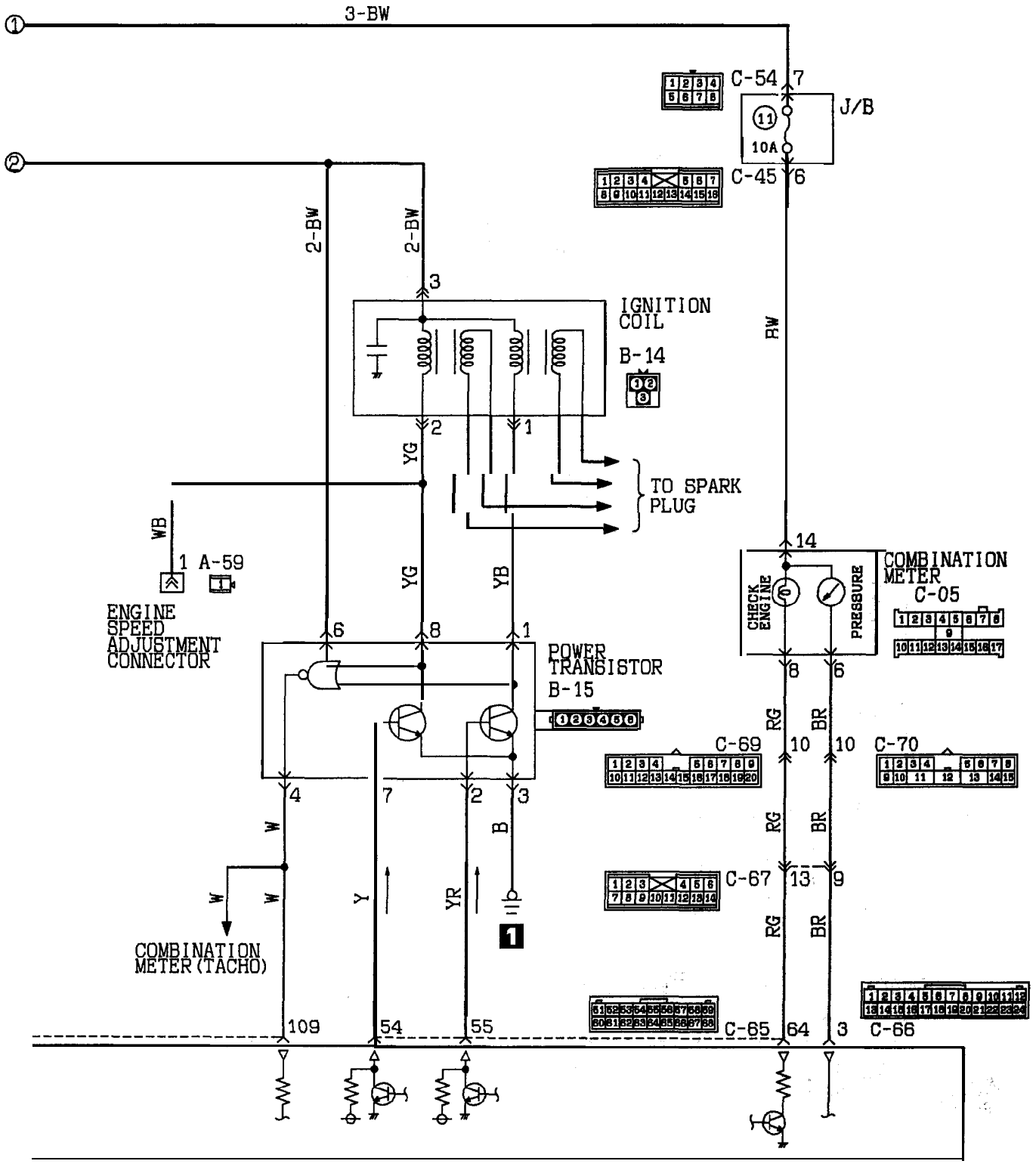

KX35-AC-U0517A-NC

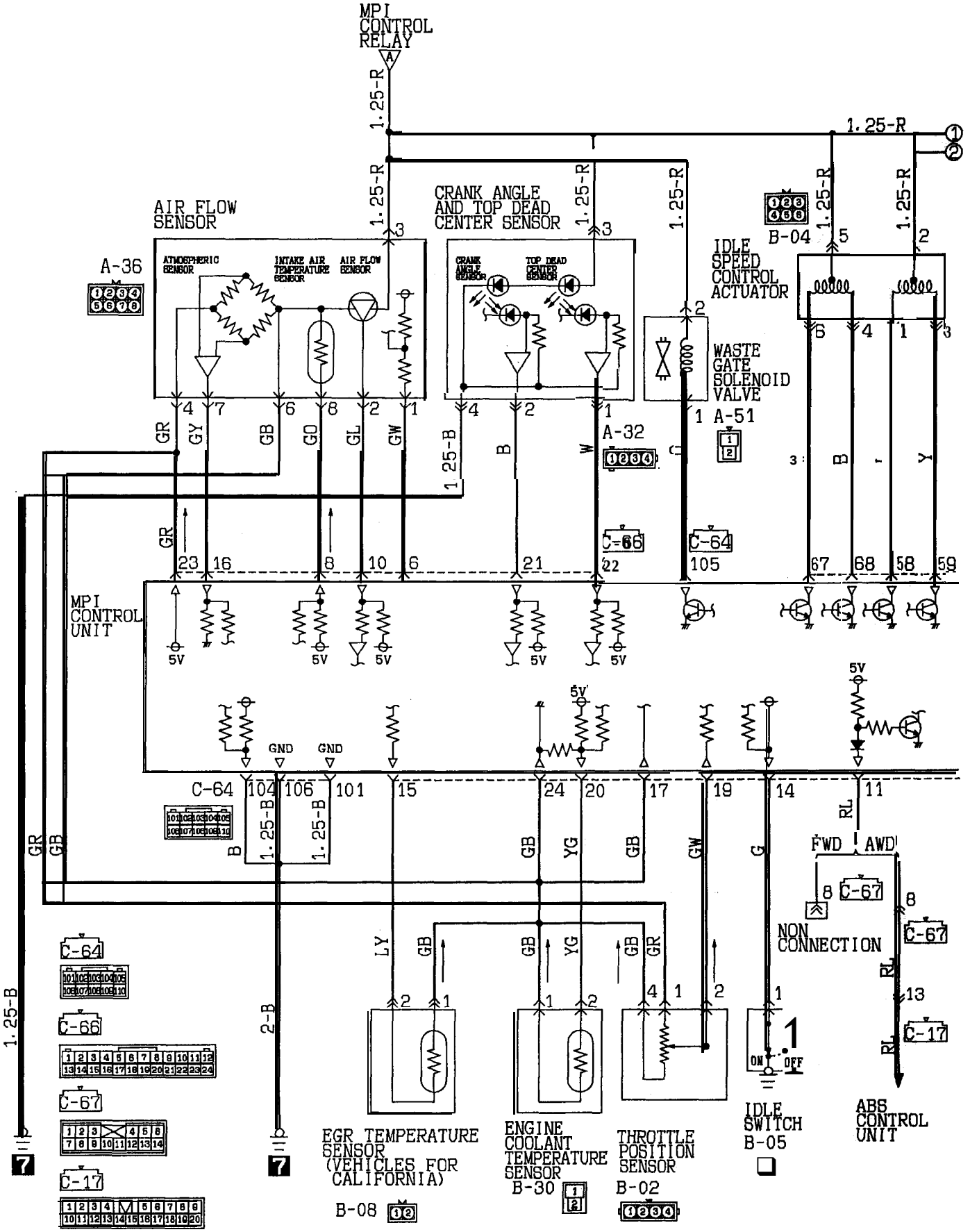

C-66
C-66
C-50
2.5 - R
1.25-R
1.25-YW
1.25-YB
1.25-YR
1.25-YG
1.25-YW
PURGE CONTROL SOLENOID VALVE
A-14
EGR CONTROL SOLENOID VALVE (VEHICLES FOR CALIFORNIA)
A-16
INJECTOR
B-10
B-09
B-06
B-01
BW
BrW
YL
YB
Lg
LgW
62
53
51
52
60
61
C-64
102
POWER SOURCE
5V
4-SPEED AUTOMATIC TRANSAXLE CONTROL UNIT
C-60
C-59
C-67
C-66
105
NO CONNECTION
C-70
D-06
COMBINATION METER
REED
D-05
C-45
C-50
J/B
C-54
SELFDIAGNOSIS CHECK CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
IGNITION TIMING ADJUSTMENT CONNECTOR
A-60
OXYGEN SENSOR CHECK CONNECTOR
C-56
OXYGEN SENSOR
B-26
8
7


SUB FUSIBLE LINK ⑧
5-WR
5-WR
3-LR
3-LY
A-22
6
C-47
1
J/B
⑲
10A
C-50
2
④
10A
DEDICATED FUSE
0.85-WR
RB
C-67
7
RB
C-64
103
MPI CONTROL UNIT
BATTERY BACK UP
A-19X
OFF
ON
1
3
0.85-BW
0.85-BW
MAGNETIC CLUTCH
AIR CONDITIONER CONTROL UNIT
C-40
1
GW
C-12
3
GW
C-58
12
GW
2
ON→OFF: 210kPa (30psi)
OFF→ON: 235kPa (33psi)
ON→OFF: 2700kPa (384psi)
OFF→ON: 2100kPa (299psi)
DUAL PRESSURE SWITCH
OFF
ON
A-08
⑫⑬
1
GY
GY
4
C-58
GY
5
C-72
GY
5
A-21
GY
4
GY
ELC 4-SPEED AUTOMATIC TRANSAXLE CONTROL UNIT
1
4
A-21
(RB)
6
C-72
(RB)
5
C-67
(RB)
65
C-65
BG
7
C-66
ENGINE COOLANT TEMPERATURE SWITCH
2
B-31
⑩⑭
ON→OFF: 115°C (239°F)
OFF→ON: 108°C (226°F)

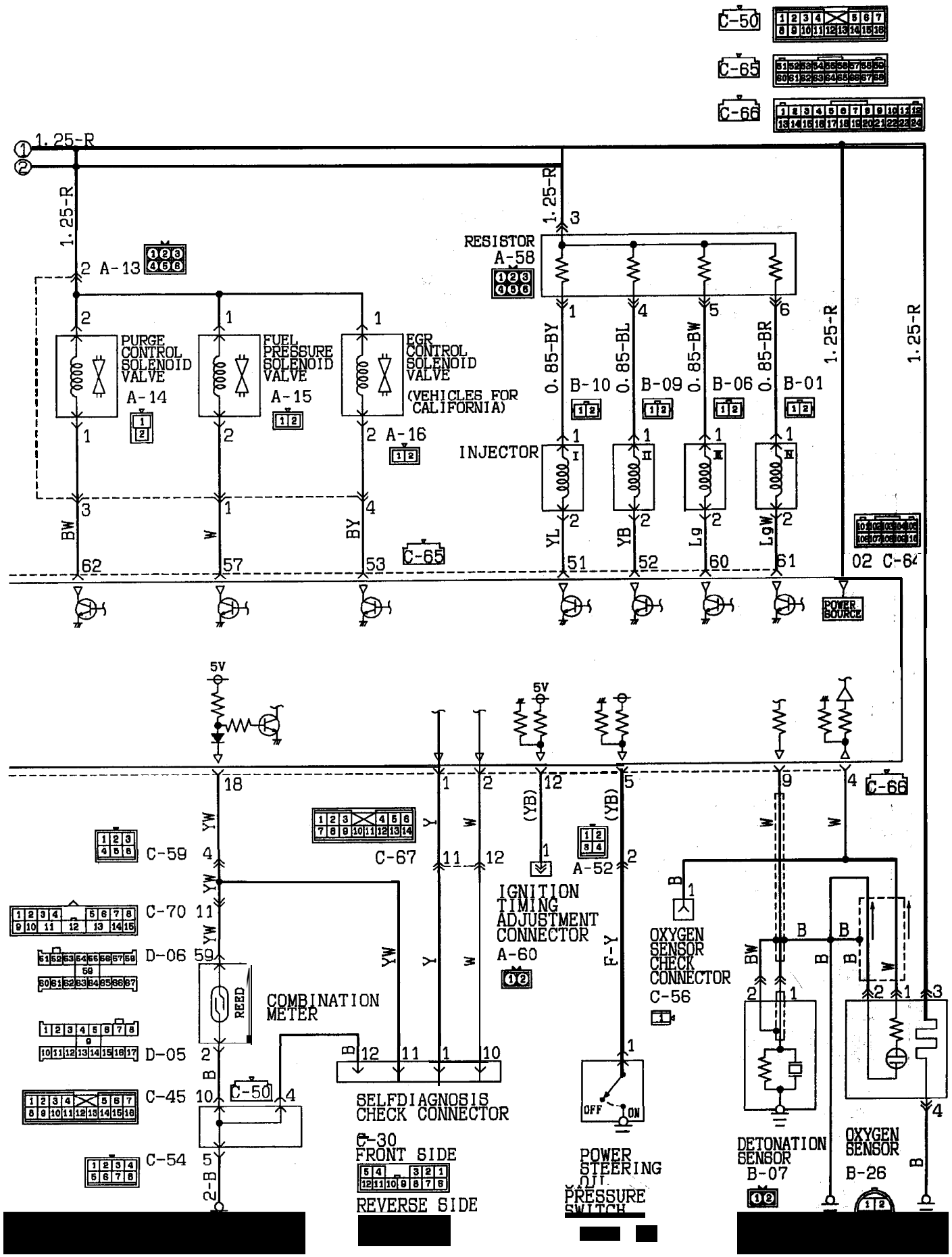
## 2.0L DOHC Engine (Turbo) <M/T>

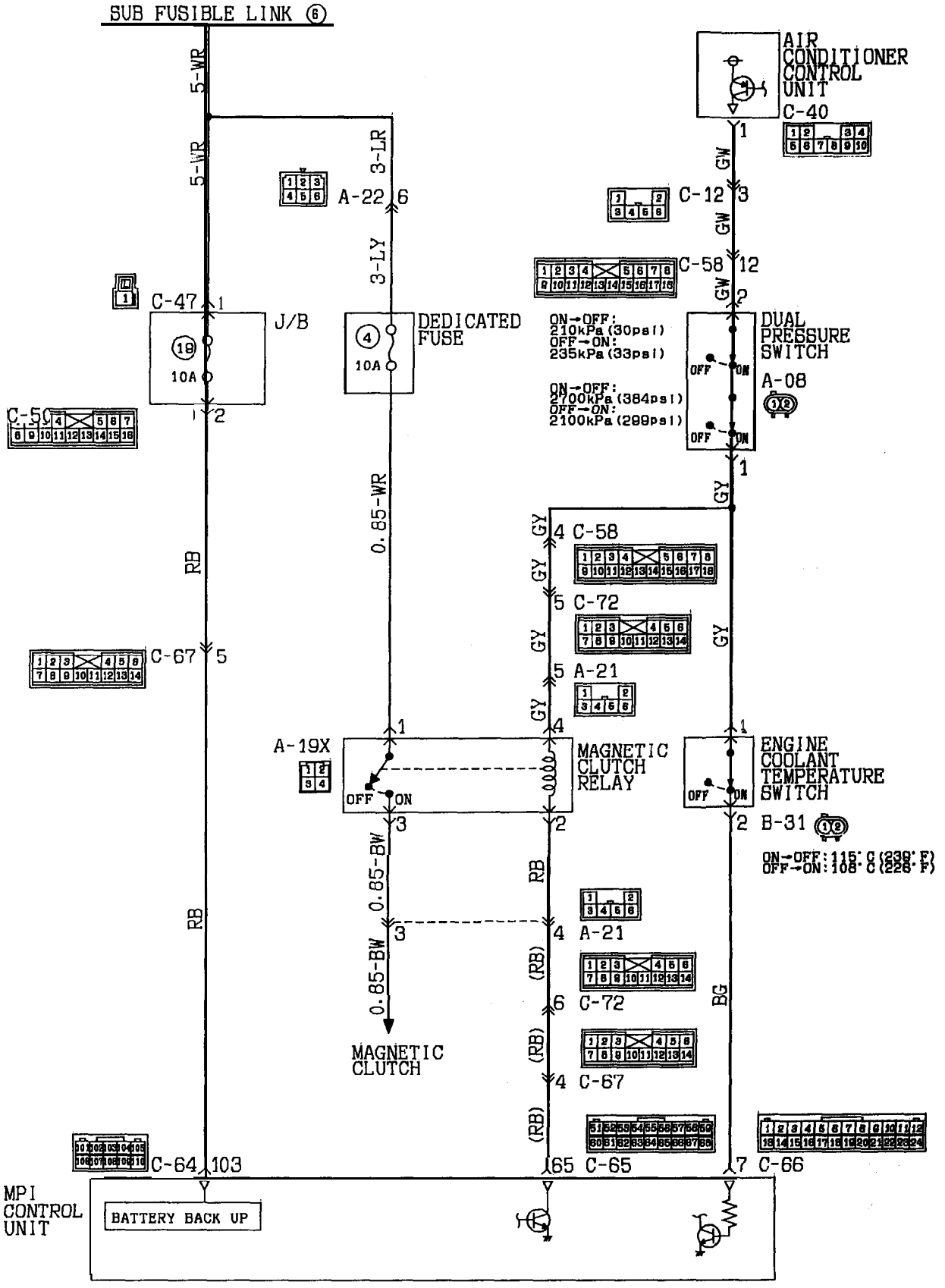



3-BW
C-54
7
J/B
11
10A
C-45
6
2-BW
2-BW
3
IGNITION COIL
B-14
RW
2
1
YG
TO SPARK PLUG
WB
1 A-59
ENGINE SPEED ADJUSTMENT CONNECTOR
YG
YB
14
COMBINATION METER
C-05
CHECK ENGINE
PRESSURE
6
8
1
POWER TRANSISTOR
B-15
8
6
RG
BR
C-69
10
10
C-70
4
7
2
3
W
B
RG
BR
W
W
Y
YR
C-67
13
9
RG
BR
COMBINATION METER (TACHO)
109
54
55
C-65
64
3
C-66



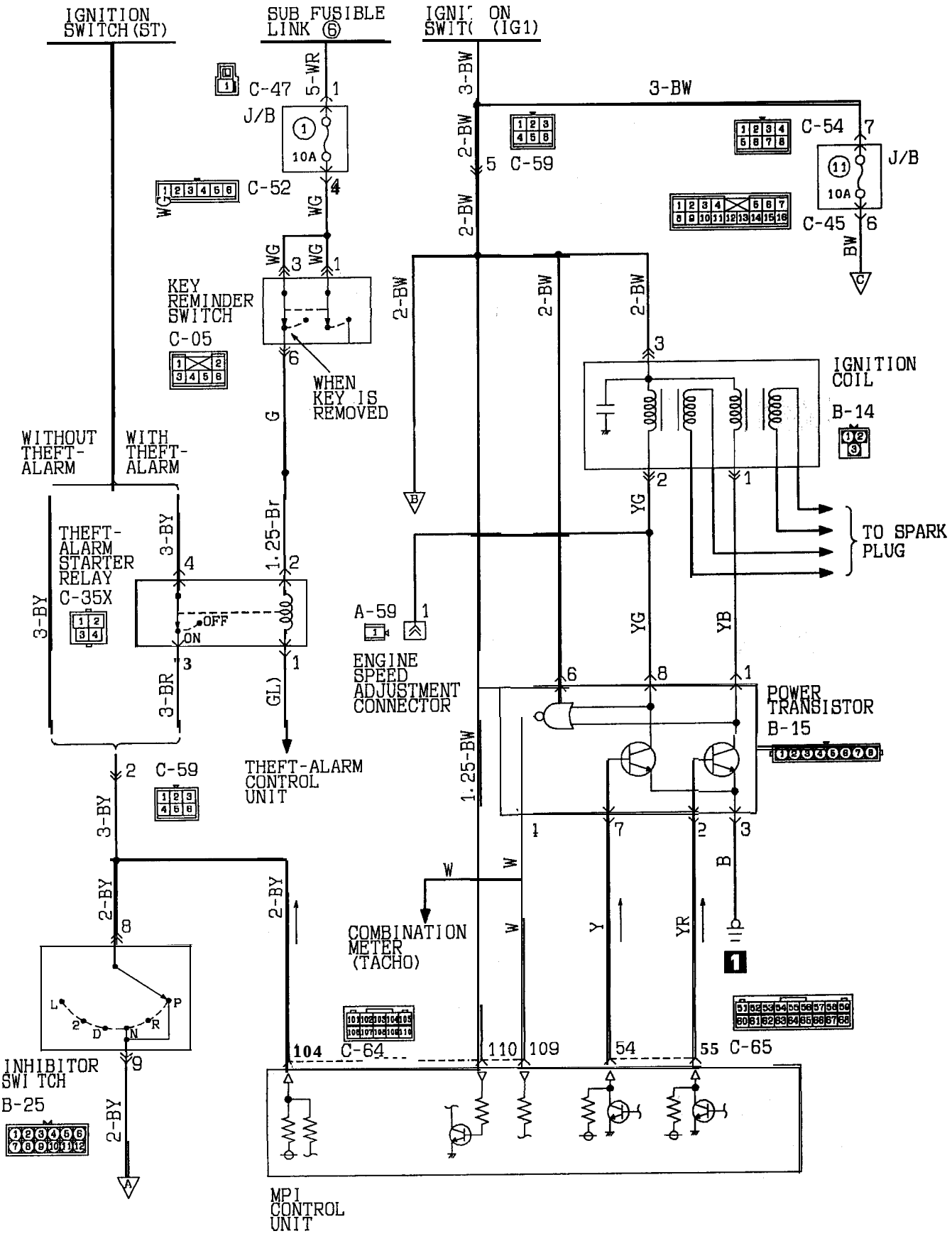

KX35-AC-U0518A-NC


C-50
C-65
C-66
1.25-R
2 A-13
RESISTOR
A-58
PURGE CONTROL SOLENOID VALVE
A-14
FUEL PRESSURE SOLENOID VALVE
A-15
EGR CONTROL SOLENOID VALVE
(VEHICLES FOR CALIFORNIA)
2 A-16
INJECTOR
0.85-BY
0.85-BL
0.85-BW
0.85-BR
B-10
B-09
B-06
B-01
BW
W
BY
YL
YB
Lg
LgW
62
57
53
51
52
60
61
C-65
02 C-66
POWER SOURCE
5V
C-59
C-67
C-70
D-06
D-05
C-45
C-54
C-50
C-66
A-52
IGNITION TIMING ADJUSTMENT CONNECTOR
A-60
OXYGEN SENSOR CHECK CONNECTOR
C-56
REED
COMBINATION METER
SELFDIAGNOSIS CHECK CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
OFF
ON
POWER STEERING OIL PRESSURE SWITCH
DETONATION SENSOR
B-07
OXYGEN SENSOR
B-26

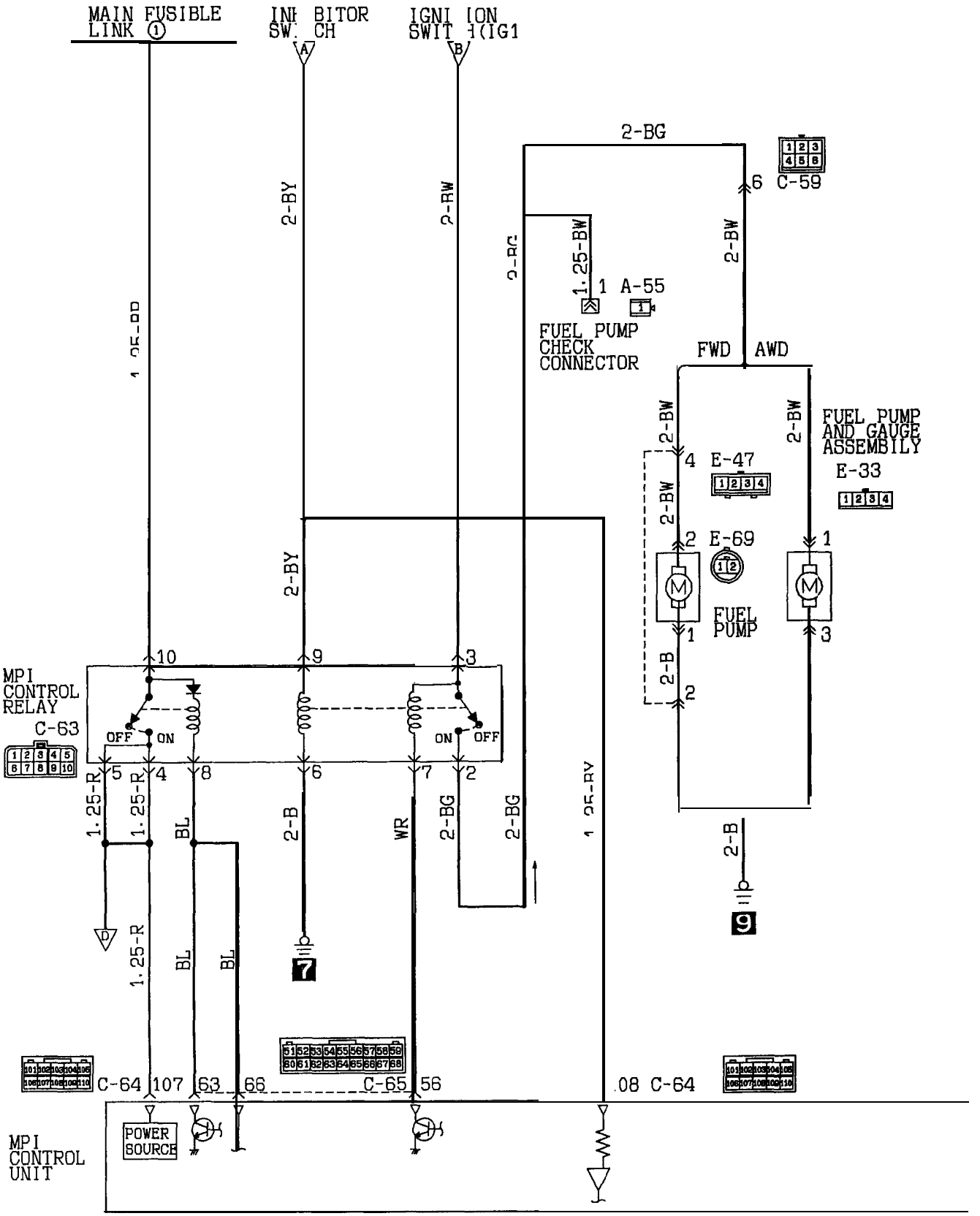


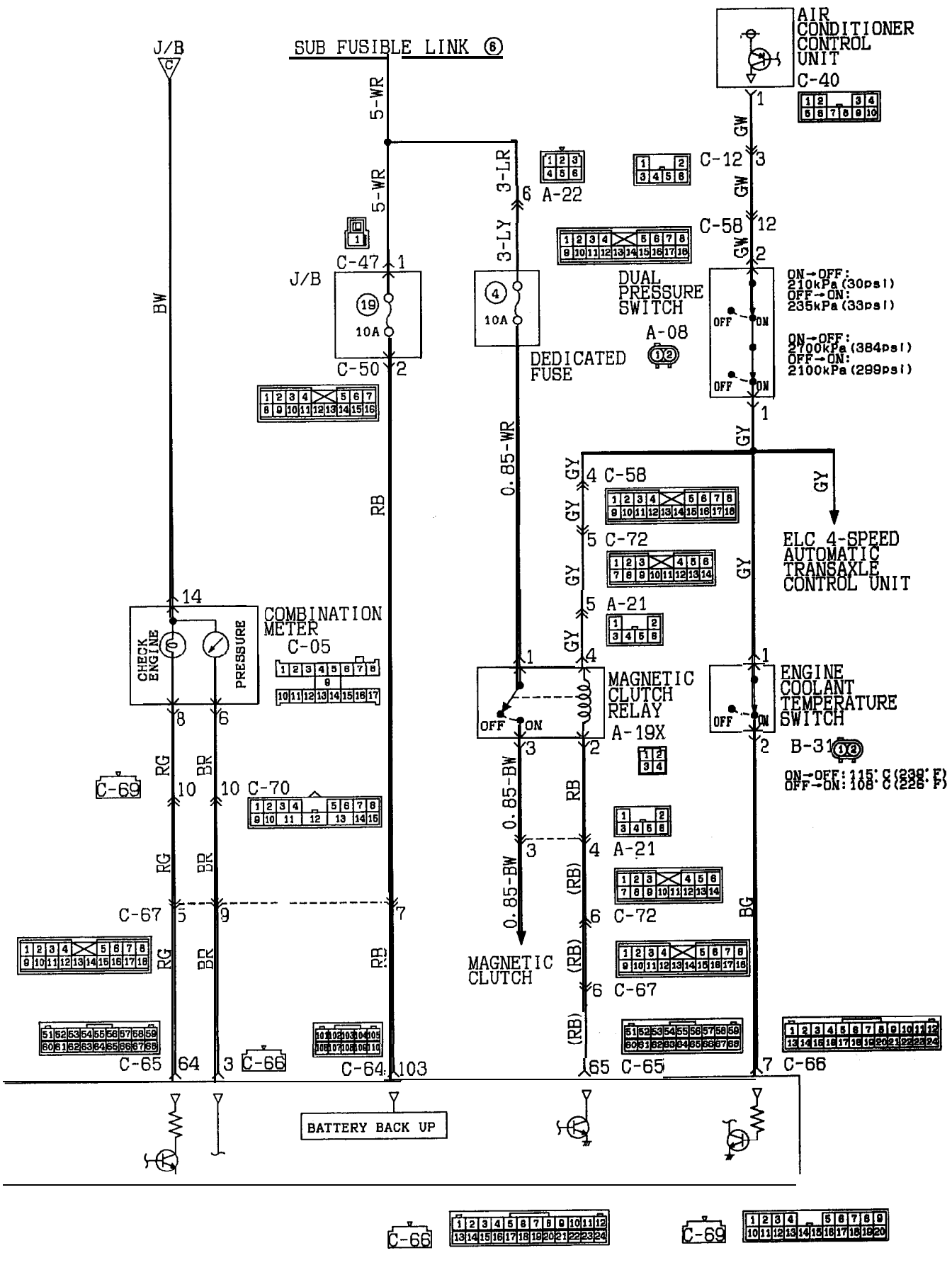

KX35-AC-U0518B-NC

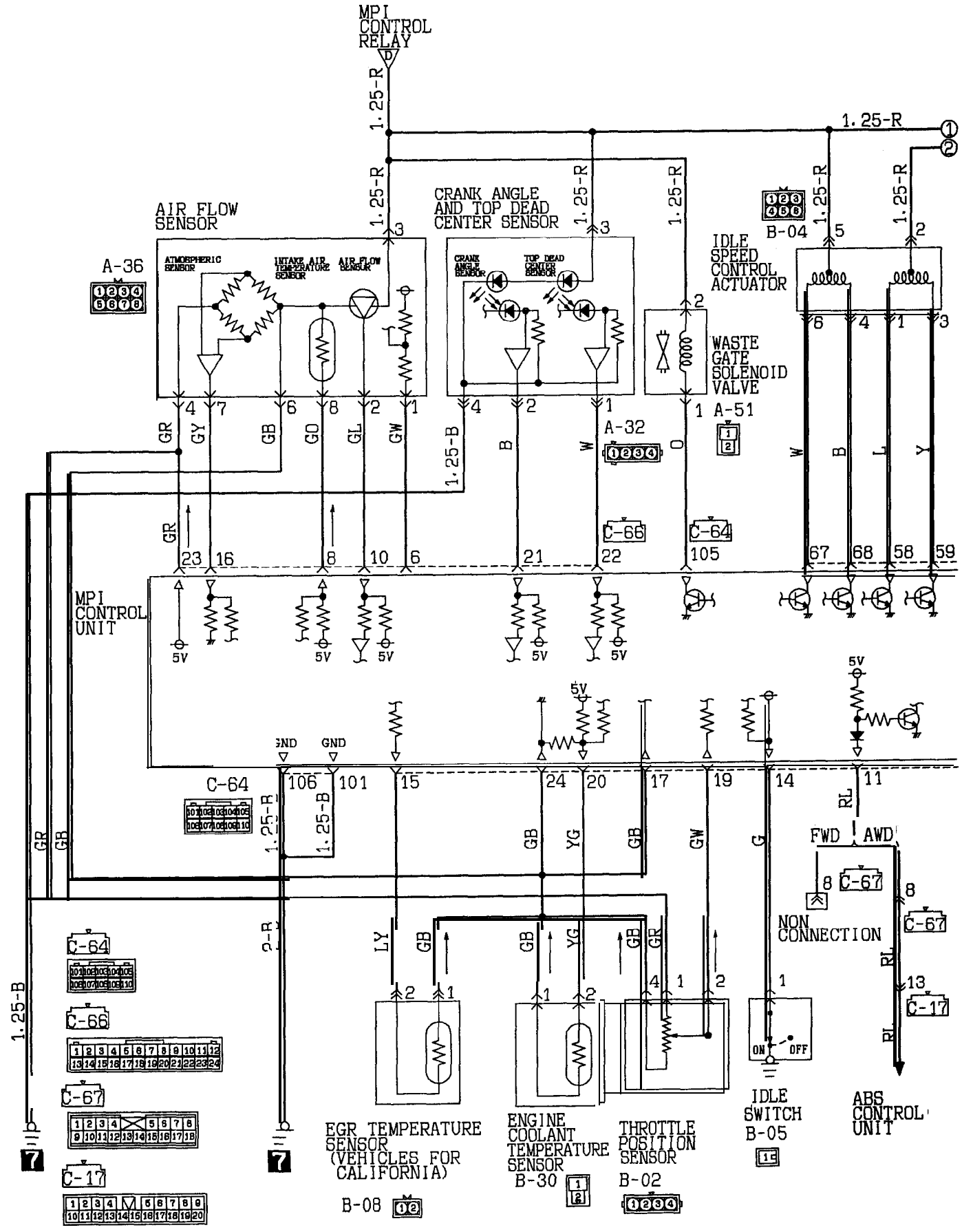
## 2.0L DOHC Engine (Turbo) <A/T>



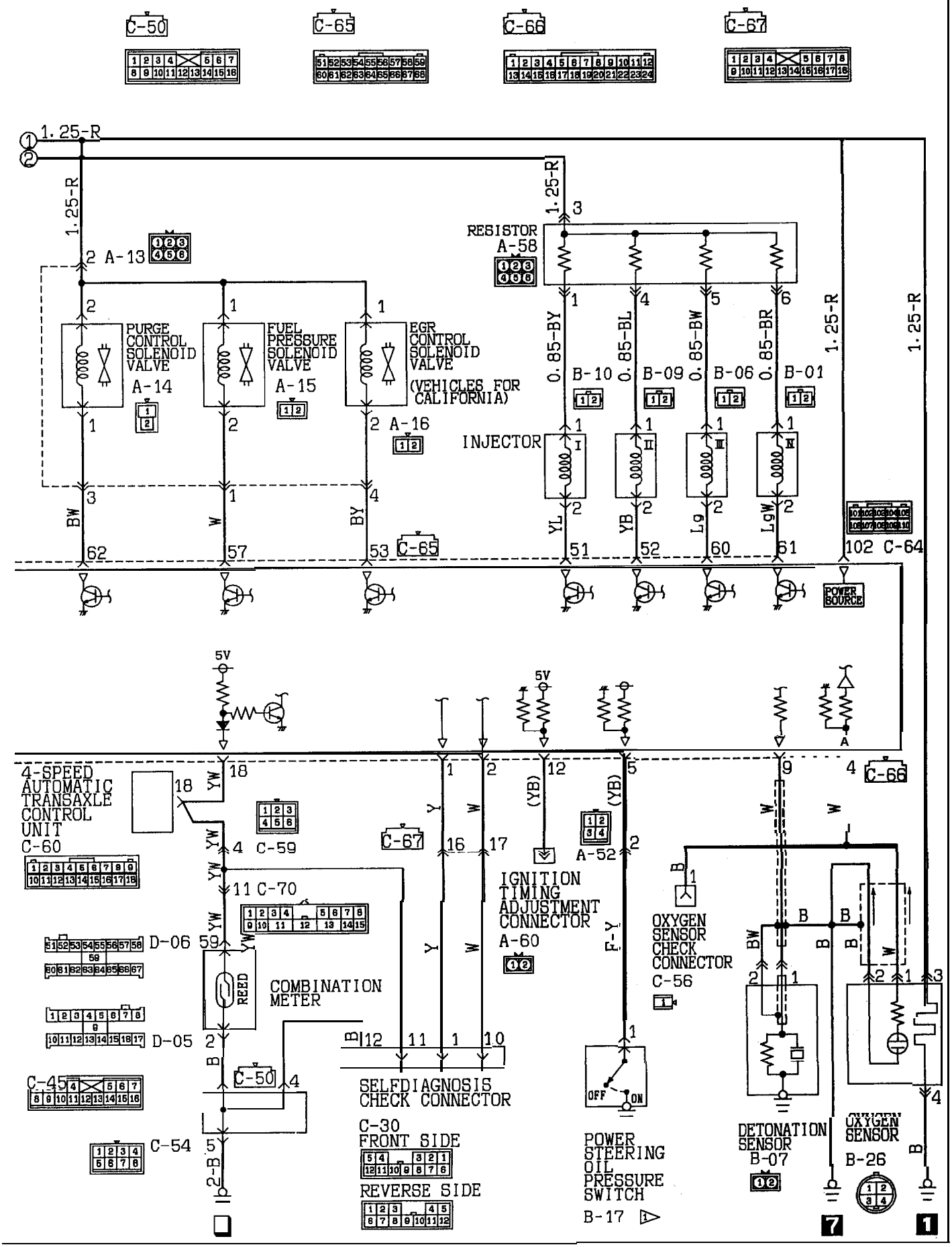

EX35-AC-U0519-NC


MAIN FUSIBLE LINK ①
INJECTOR SW. CH
IGNITION SWITCH (IG1
2-BG
C-59
6
2-BY
2-RW
2-BW
1.25-BW
1 A-55
FUEL PUMP CHECK CONNECTOR
FWD
AWD
FUEL PUMP AND GAUGE ASSEMBLY
E-33
E-47
E-69
FUEL PUMP
MPI CONTROL RELAY
C-63
OFF
ON
1.25-R
BL
2-B
WR
2-BG
1.25-BV
7
9
C-64
C-65
107
63
66
56
08
POWER SOURCE
MPI CONTROL UNIT


J/B
SUB FUSIBLE LINK ⑥
AIR CONDITIONER CONTROL UNIT
C-40
5-WR
3-LR
3-LY
BW
GW
C-12
A-22
C-58
C-47
J/B
10A
C-50
DEDICATED FUSE
DUAL PRESSURE SWITCH
A-08
ON→OFF: 210kPa (30psi)
OFF→ON: 235kPa (33psi)
ON→OFF: 2700kPa (384psi)
OFF→ON: 2100kPa (299psi)
0.85-WR
RB
GY
C-72
A-21
ELC 4-SPEED AUTOMATIC TRANSAXLE CONTROL UNIT
COMBINATION METER
C-05
CHECK ENGINE
PRESSURE
MAGNETIC CLUTCH RELAY
A-19X
ENGINE COOLANT TEMPERATURE SWITCH
B-31
ON→OFF: 115°C (239°F)
OFF→ON: 108°C (226°F)
C-69
C-70
RG
BR
0.85-BW
(RB)
BG
C-67
C-65
C-66
C-64
MAGNETIC CLUTCH
BATTERY BACK UP



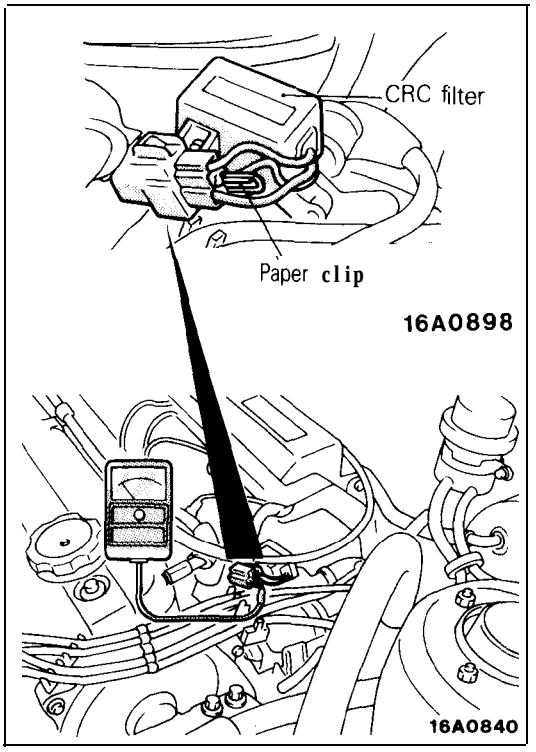

KX35-AC-U0519B-NC


C-50
C-65
C-66
C-67
1.25-R
2 A-13
RESISTOR
A-58
PURGE CONTROL SOLENOID VALVE
A-14
FUEL PRESSURE SOLENOID VALVE
A-15
EGR CONTROL SOLENOID VALVE
(VEHICLES FOR CALIFORNIA)
2 A-16
INJECTOR
0.85-BY
0.85-BL
0.85-BW
0.85-BR
B-10
B-09
B-06
B-01
BW
W
BY
YL
YB
Lg
LgW
62
57
53 C-65
51
52
60
61
102 C-64
POWER SOURCE
5V
4-SPEED AUTOMATIC TRANSAXLE CONTROL UNIT
C-60
18
YW
4 C-59
11 C-70
D-06
59
REED
COMBINATION METER
D-05
C-45
C-54
C-50
2-B
C-67
16
17
IGNITION TIMING ADJUSTMENT CONNECTOR
A-60
(YB)
A-52
F-Y
SELFDIAGNOSIS CHECK CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
OFF
ON
POWER STEERING OIL PRESSURE SWITCH
B-17
OXYGEN SENSOR CHECK CONNECTOR
C-56
C-66
DETONATION SENSOR
B-07
OXYGEN SENSOR
B-26
7
1

# SERVICE ADJUSTMENT PROCEDURES <1.8L Engine>

## CURB IDLE SPEED INSPECTION N14FHAE

**Caution**
**The improper setting (throttle valve opening) will increase exhaust gas temperature at deceleration, reducing catalyst life greatly and deteriorating exhaust gas cleaning performance. It also has effect on fuel consumption and engine braking.**




Pre-conditions for inspection
- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric cooling fan and accessories: OFF
- Transaxle: Neutral (P for vehicles with an automatic transaxle)
- Steering wheel: Neutral position (vehicles with a power steering)
- Check ignition timing and adjust if necessary. Refer to GROUP 8.

NOTE
With vehicles for Canada, the headlights and taillights, etc. remain on even when the lighting switch is turned OFF, but this causes no problems during inspection.

(1) Insert the paper clip to the connector.
(2) Connect the tachometer to the inserted clip.
(3) Run the engine for more than 5 seconds at an engine speed of 2,000 to 3,000 rpm.
(4) Run the engine at idle for 2 minutes.
(5) Read the idling rpm. If it is not within the specified speed, check the idle speed control system.

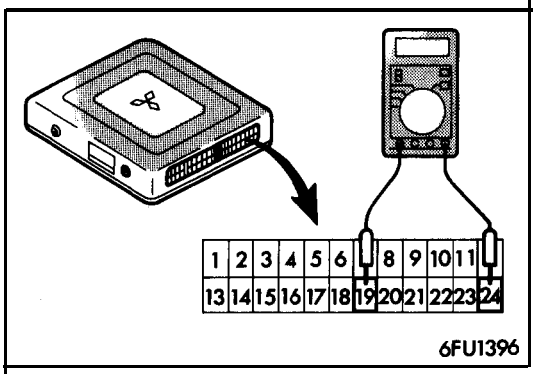
**Curb idle speed: 700 ± 100 rpm**

NOTE
Adjustment of the idling speed is usually unnecessary, because this system controls the idling speed.

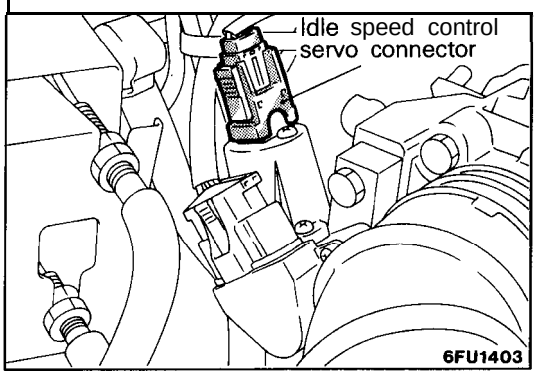
## IDLE SPEED CONTROL AND THROTTLE POSITION SENSOR ADJUSTMENT N14FIAT

Adjustment conditions
- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric cooling fan and accessories: Set to OFF
- Transaxle: Neutral (P for vehicles with an automatic transaxle)
- Steering wheel: Neutral position (vehicles with a power steering)

(1) Slacken the accelerator cable enough.
(2) Connect a tachometer.




(3) Connect a digital voltmeter between terminal 19 (throttle position sensor output voltage) of the engine control unit and terminal 24 (ground).
(4) Set the ignition switch at ON (without starting the engine) hold it in that position for more than 15 seconds or more.
(5) Set the ignition switch at OFF.

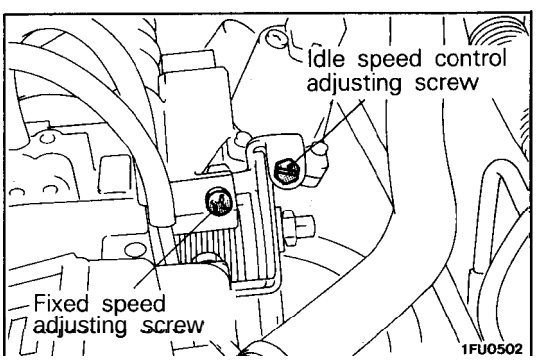



(6) Disconnect the connectors of the idle speed control servo and lock the idle speed control plunger at the initial position.
(7) Back out the fixed SAS enough.

(8) Start the engine and let it run at idle.
(9) Check to ensure that the engine is running at the standard basic idle speed.

**Basic idle speed: 700±50 rpm**

**Caution**
**1. On a new vehicle [driven less than 500 km (300 miles)], the engine speed may 'be 20 to 100 rpm lower, but no adjustment is necessary.**
**2. If the engine stalls or the engine speed is low after the vehicle has been driven a distance of 500 km (300 miles) or more, a deposit on the throttle valve area is suspected. Clean the throttle valve area.**



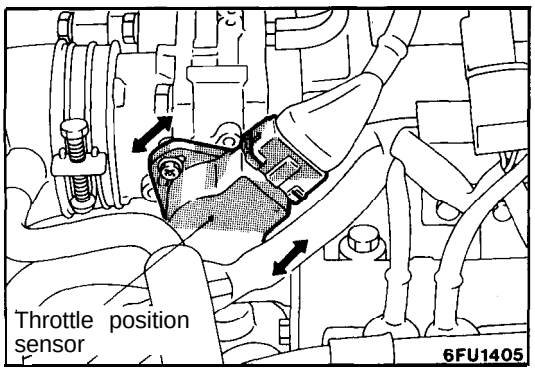

(10) If the engine speed does not conform to the standard value, adjust it with the idle speed control adjusting screw.

**Caution**
**When adjusting the idle speed control, use a hexagon wrench whenever possible.**

(11) Turn in the fixed SAS until the engine speed rises. Then back out the fixed SAS until the "touch point" where the engine speed does not fall any longer is found. Back out the fixed SAS an additional half a turn from the touch point.
(12) Stop the engine.

(13) Set the ignition switch at ON (do not start the engine) and check that the output voltage from the throttle position sensor is as specified.

**Standard value: 0.48–0.52 V**




(14)If it is out of specification, adjust by loosing the throttle position sensor mounting screws and rotating the throttle position sensor. After adjustment, tighten the screws firmly.

NOTE
Clockwise rotation of the throttle position sensor increases the output voltage.

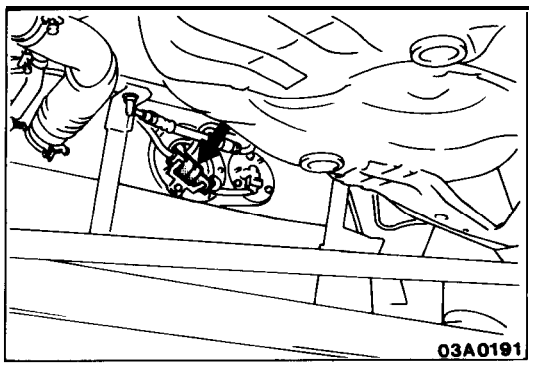
(15)Set the ignition switch at OFF.
(16)Adjust the free play of the accelerator cable.
(17)Reconnect the connectors of the idle speed control servo.
(18)Remove the voltmeter.
(19)Start the engine and check that the engine is running at the curb idle speed.

**Curb idle speed: 700 ± 100 rpm**

(20)Set the ignition switch at OFF, disconnect the negative battery cable and reconnect it more than 10 seconds later (By doing so, the memory storing the diagnosis data during the idle speed control adjustment is cleared.)
(21)Restart the engine, let it run at idle for about 5 minutes, and check that the engine is running in good idle quality.

## THROTTLE BODY (THROTTLE VALVE AREA) CLEANING N14FICK

(1) Warm up the engine, then stop it.
(2) Remove the air intake hose from the throttle body.
(3) Spray cleaning solvent into the valve through the throttle body intake port and leave it for about 5 minutes.
(4) Start the engine, race it several times and idle it for about 1 minute. If the idling speed becomes unstable slightly open the throttle valve to keep the engine running.
(5) If the throttle valve deposits are not removed, repeat steps (3) and (4).
(6) Attach the air intake hose.
(7) Disconnect the battery terminal for 10 seconds or more, and then reconnect it.
(8) Adjust the idle speed control and throttle position sensor.

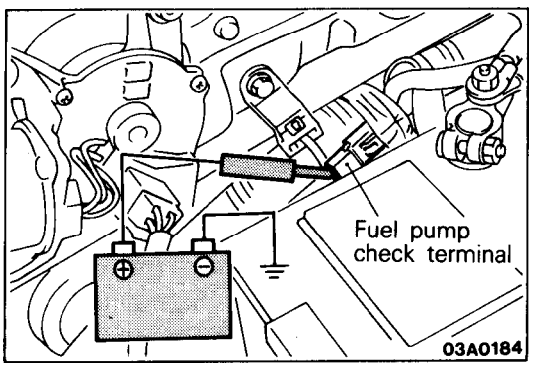



## RELEASE OF RESIDUAL PRESSURE FROM HIGH PRESSURE FUEL HOSE

N14FGAE

Make the following operations to release the pressure remaining in fuel pipe line so that fuel will not flow out.

(1) Disconnect the fuel pump harness connector at the fuel tank rear side.
(2) Start the engine and after it stops by itself, turn the ignition switch to OFF.
(3) Disconnect the battery (–) terminal.
(4) Connect the fuel pump harness connector.

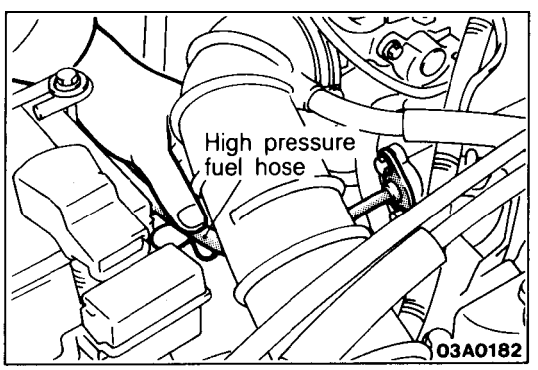



## FUEL PUMP OPERATION CHECK

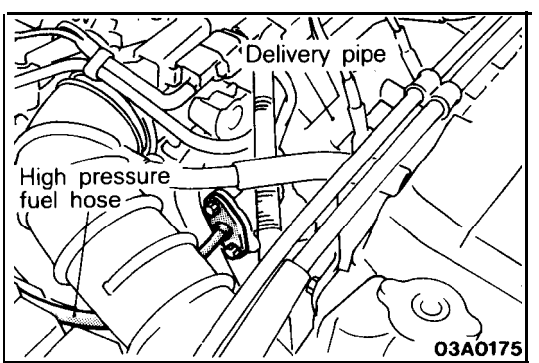
N14FDAG

(1) Set the ignition switch at OFF.
(2) Check that when the batten/ voltage is directly applied to the fuel pump check terminal, the operating sound of the pump can be heard.

NOTE
Since the fuel pump is installed in the fuel tank, its operating sound cannot be readily heard. Remove the fuel tank cap and listen to the operating sound through the filler port.




(3) Hold the high pressure fuel hose between your fingers and check that the fuel pressure can be felt.

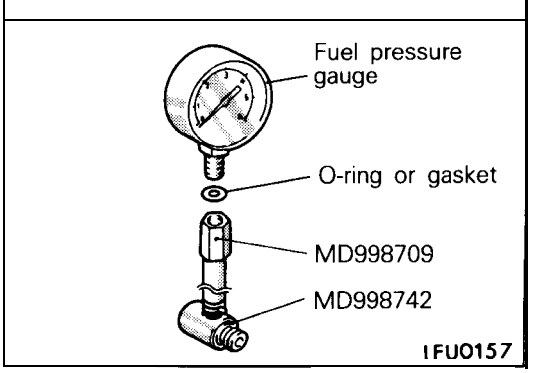



## FUEL PRESSURE TEST

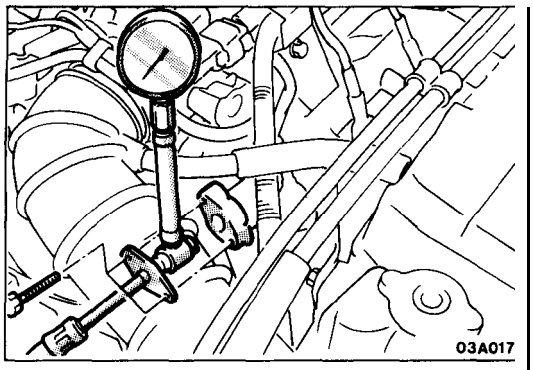
N14FNAN

(1) Reduce the fuel pressure in the fuel line.
(2) Disconnect the high pressure fuel hose from the delivery pipe.

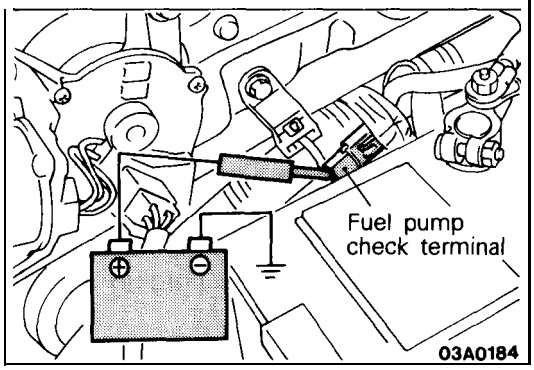
**Caution**
**Cover the hose connection with shop towel to prevent splash of fuel that could be caused by residual pressure in the fuel pipe line.**



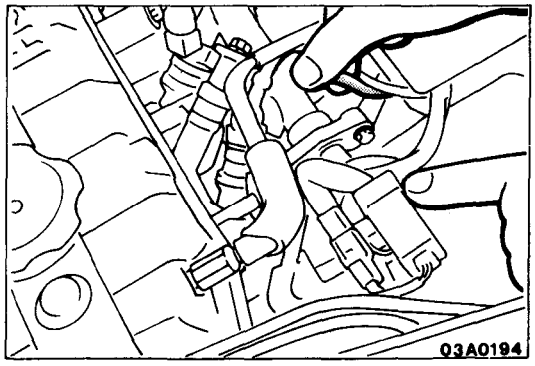

(3) Connect a fuel pressure gauge to the special tool (hose adapter).
Use a suitable O-ring or gasket between the fuel pressure gauge and the special tool so as to seal in order to prevent fuel leakage at this time.




(4) Install the special tool, which was set in place in step (3), between the delivery pipe and the high pressure fuel hose.
(5) Connect the ⊖ terminal of the batten/.

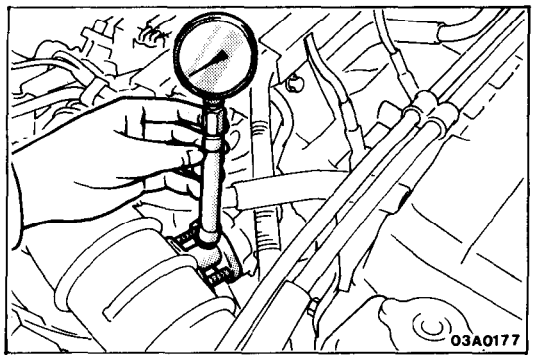



(6) Apply battery voltage to the fuel pump check terminal and activate the fuel pump; then, with fuel pressure thus applied, check to be sure that there is no fuel leakage from the pressure gauge or the special tool connection part.




(7) Start the engine and run at curb idle speed.
(8) Disconnect the vacuum hose form the pressure regulator and clog the vacuum hose end. Measure the fuel pressure.

**Standard value: 330–350 kPa (47–50 psi) at curb idle**




(9) Measure the fuel pressure when the vacuum hose is connected to the pressure regulator:

**Standard value: Approx. 270 kPa (38 psi) at curb idle**

(10) Race the engine repeatedly in two or three series. Then check that the fuel pressure does not fall when the engine is running at idle.
(11) Check to be sure that there is fuel pressure in the return hose also (by gently pressing the fuel return hose with a finger while repeatedly racing the engine).

NOTE
There will be no fuel pressure in the return hose when the volume of fuel flow is not sufficient.

(12) If the results of the measurements made in steps (8) and (9) above are not within the standard value, use the table below to determine the probable cause, and then make the necessary repair.

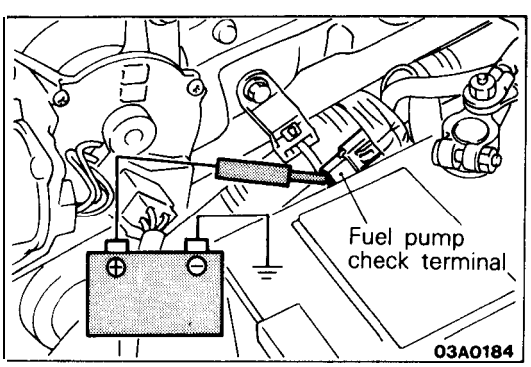
| Condition | Probable cause | Remedy |
|---|---|---|
| Fuel pressure too low | a. Clogged fuel filter<br>b. Fuel leaking toward return port due to improper seating of valve in fuel pressure regulator<br>c. Low delivery pressure of fuel pump | a. Replace fuel filter.<br>b. Replace fuel pressure regulator.<br>c. Replace fuel pump. |
| Fuel pressure too high | a. Stuck valve in fuel pressure regulator<br>b. Clogged or bent fuel return hose or pipe | a. Replace fuel pressure regulator.<br>b. Repair or replace hose or pipe. |
| Fuel pressure with vacuum hose connected not different from fuel pressure with vacuum hose not connected | a. Clogged or broken vacuum hose or nipple<br>b. Stuck valve in fuel pressure regulator or defective valve seating | a. Repair or replace the vacuum hose or nipple.<br>b. Replace fuel pressure regulator. |

(13)Stop the engine and check for change in fuel pressure gauge indication, which should not drop.
If the gauge indication drops, observe the rate of drop and determine and remove the causes according to the following table.

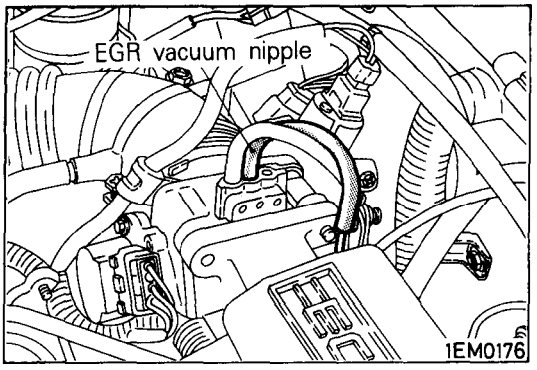
| Condition | Probable cause | Remedy |
|---|---|---|
| Fuel pressure drops slowly after engine is stopped. | Leakage from injector | Replace injector. |
| Fuel pressure drops immediately after engine is stooped. | Check valve in fuel pump does not close | Replace fuel pump. |

(14)Reduce the fuel pressure in the fuel line.
(15)Disconnect the high pressure fuel hose and remove the fuel pressure gauge from the delivery pipe.

**Caution**
**Cover the hose connection with shop towel to prevent splash of fuel that could be caused by residual pressure in the fuel pipe line.**




(16)Mount a new O-ring in the groove at the end of the high pressure fuel hose.
(17)Connect the high pressure fuel hose to the delivery pipe, and tighten the screws to the specified torque.
(18)Check for fuel leaks.
① Apply battery voltage to the fuel pump check terminal to operate the fuel pump.
② With fuel pressure acting, check the fuel line for leaks.




## EGR VALVE CONTROL VACUUM CHECK N14FVBB <California>

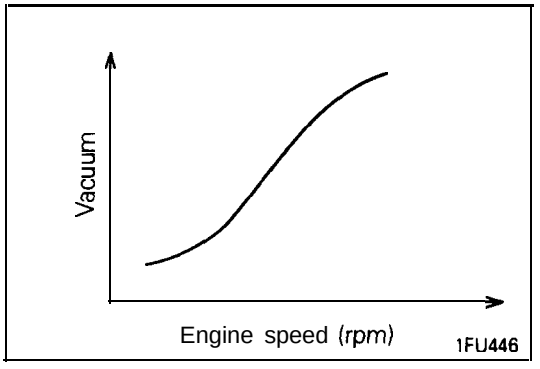
### Check Condition

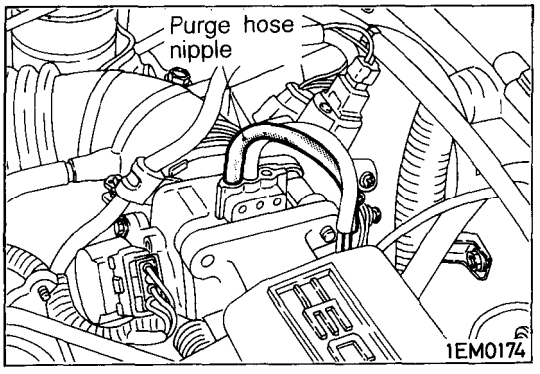
Engine coolant temperature: 85–95°C (185–205°F)

(1) Disconnect the vacuum hose from the throttle body EGR vacuum nipple and connect a hand vacuum pump to the nipple.

(2) Start the engine and check to see that, after raising the engine speed by racing the engine, vacuum raises proportionately with the rise in engine speed.

NOTE
If there is a problem with the change in vacuum, it is possible that the throttle body port may be clogged and require cleaning.



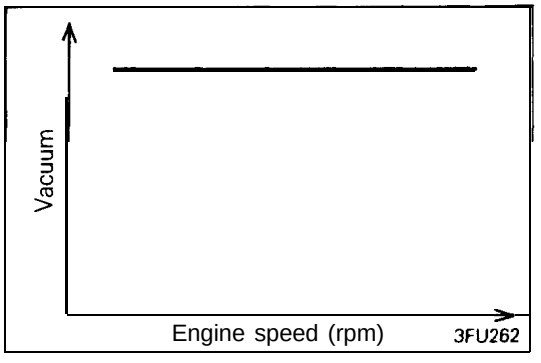




## PURGE PORT VACUUM CHECK N14FVBC

### Check Condition

Engine coolant temperature: 85–95°C (185–205°F)

(1) Disconnect the vacuum hose from the throttle body purge hose nipple and connect a hand vacuum pump to the nipple.




(2) Start the engine and check to see that, after raising the engine speed by racing the engine, vacuum remains fairly constant.

NOTE
If there is no vacuum created, it is possible that the throttle body port may be clogged and require cleaning.

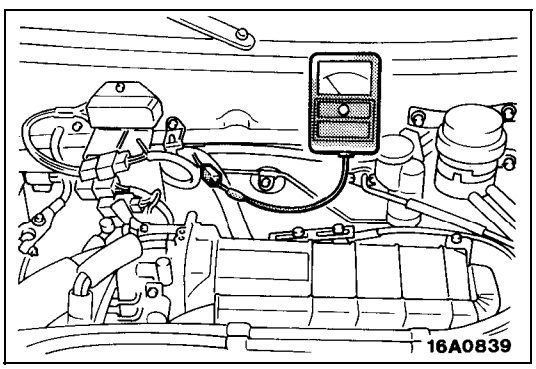
# SERVICE ADJUSTMENT PROCEDURES <2.0L DOHC Engine>

## CURB IDLE SPEED INSPECTION N14FHAD

**Caution**
**The improper setting (throttle valve opening) will increase exhaust gas temperature at deceleration, reducing catalystic converter life greatly and deteriorating exhaust gas cleaning performance. It also has effect on fuel 'consumption and engine braking.**

Pre-conditions for inspection
- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric cooling fan and accessories: OFF
- Transaxle: Neutral (P for vehicles with automatic transaxle)
- Steering wheel: Neutral position (vehicles with a power-steering)
- Check ignition timing and adjust if necessary. Refer to GROUP 8.

NOTE
With vehicles for Canada, the headlights and taillights, etc. remain on even when the lighting switch is turned OFF, but this causes no problems during inspection.



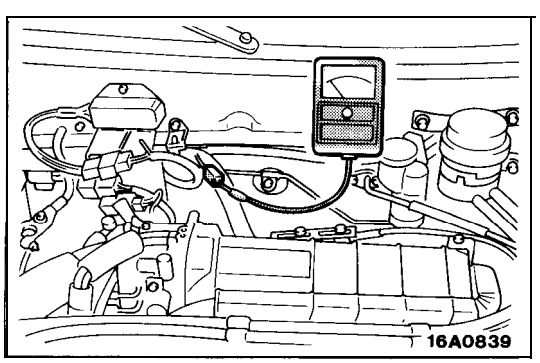

(1) Connect the tachometer to the engine speed detection terminal.
(2) Run the engine for more than 5 seconds at an engine speed of 2,000 to 3,000 rpm.
(3) Run the engine at idle for 2 minutes.
(4) Read the idling rpm. If it is not within the specified speed, check the idle speed control system.

**Curb idle speed: 750 ± 100 rpm**

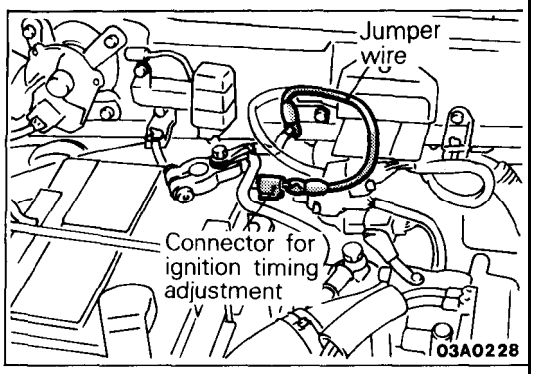
NOTE
1. Adjustment of the idling speed is usually unnecessary, because this system controls the idling speed.
2. For rpm, one-half of the actual engine rpm is indicated, so the actual engine rpm is two times the indicated value shown by the tachometer.

## BASIC IDLE SPEED ADJUSTMENT N14FHBI

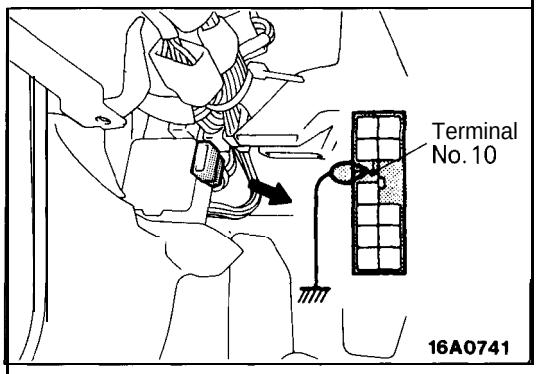
Pre-conditions for inspection
- Engine coolant temperature: 85–95°C (185–205°F)
- Lights, electric cooling fan, and accessories: OFF
- Transaxle: Neutral (P for vehicles with automatic transaxle)
- Steerig wheel: Neutral position (vehicles with a power-steering)




(1) Connect a tachometer.




(2) Disconnect the female connector (for waterproof protection of the connector) from the connector for ignition timing adjustment.
(3) Connect the ignition timing adjusting terminal to the ground using a jumper wire with alligator clips.




(4) Connect terminal No. 10 of the self-diagnosis connector to the ground with a jumper wire with alligator clips.
(5) Start the engine and run at idle.
(6) Check to be sure that the engine idling speed is the basic idle speed.

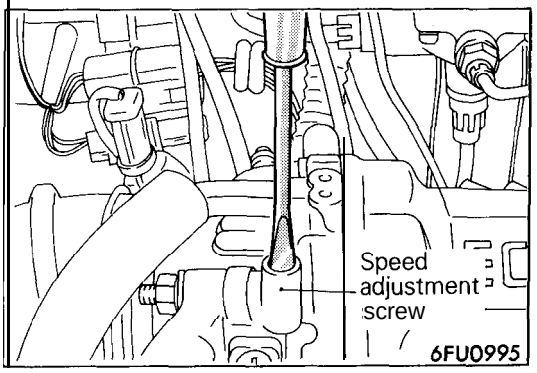
**Basic idle speed: 750 ±50 rpm**

If there is a deviation of the engine speed from the basic idle speed, first determine whether or not the conditions described below exist, and then use the speed adjustment screw to adjust to the basic idle speed.

**(a) The engine speed may be 20–100 rpm low for a new vehicle [driven about 500 km (300 miles) or less], but adjustment is not necessary.**

**(b) If engine stalling occurs or the engine speed is low even though the vehicle has been driven about 500 km (300 miles) or more, it is probable that these are deposits adhered to the throttle valve, so it should be cleaned.**
**(Refer to P.14–51.)**

**(c) If the engine speed is higher than the standard value even though the speed adjusting screw is fully close, check for any indication that the idle position switch (fixed speed adjusting screw) position has changed; if there is such an indication, adjust the idle position switch (fixed speed adjusting screw).**
**If there is no evidence of a change of position, it is probable that there is leakage resulting from deterioration of the fast-idle air valve (FIAV), so replace the throttle body.**

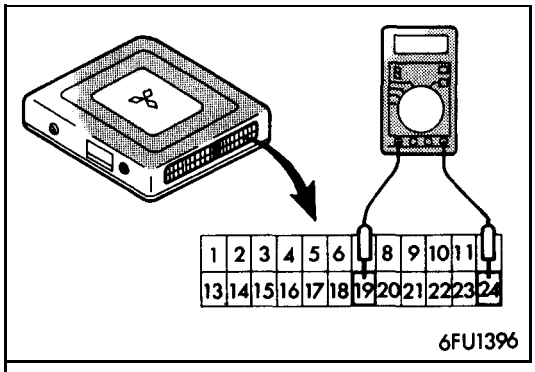



(7) Turn OFF the ignition switch and stop the engine.
(8) Disconnect the grounding jumper wire from the diagnosis connector.
(9) Disconnect the grounding jumper wire from the ignition timing connector and mount a waterproof connector.
(10) Disconnect the tachometer.
(11) Start the engine once again and let it idle for about 5 minutes; check to be sure that the idling condition is normal.

## THROTTLE POSITION SENSOR ADJUSTMENT

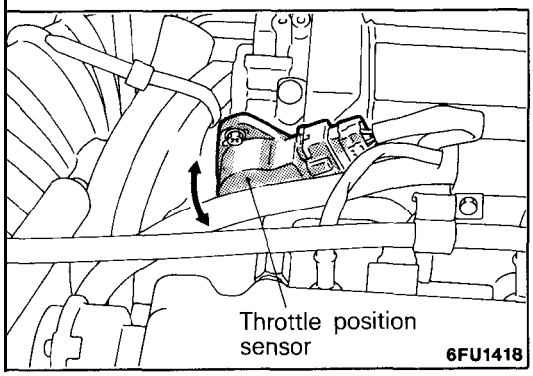
N14FlAUa

(1) Slacken the accelerator cable enough.




(2) Connect a digital voltmeter between terminal 19 (throttle position sensor output voltage) of the engine control unit and terminal 24 (ground).
(3) Set the ignition switch at ON (do not start the engine) and check that the output voltage from the throttle position sensor is as specified.

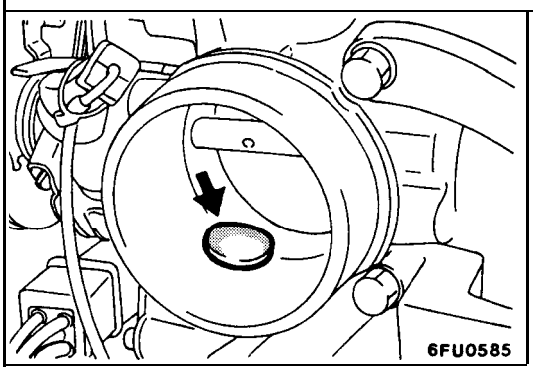
**Standard value: 0.48–0.52 V**




(4) If it is out of specification adjust by loosening the throttle position sensor mounting screws and rotating the throttle position sensor. After adjustment, tighten the screws firmly.

NOTE
1. Clockwise rotation of the throttle position sensor increases the output voltage.
2. For information concerning the removal and installation of the throttle body, refer to P.14-89.

(5) Set the ignition switch at OFF.
(6) Adjust the free play of the accelerator cable.
(7) Remove the voltmeter.
(8) Disconnect the negative battery cable, and reconnect it more than 10 seconds later. (By doing so, the memory storing the diagnosis data during the idle speed control adjustment is cleared.)




## THROTTLE BODY (THROTTLE VALVE AREA) CLEANING N14FICL

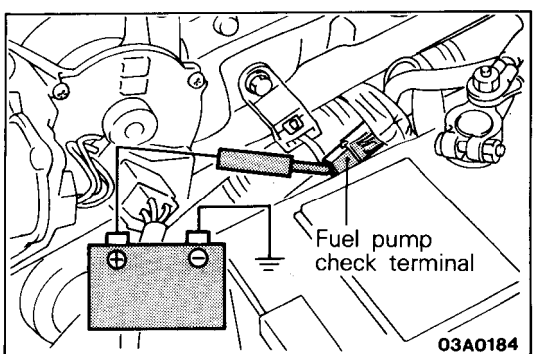
(1) Warm up the engine, then stop it.
(2) Remove the air intake hose from the throttle body.
(3) Plug the bypass passage inlet of the throttle body.

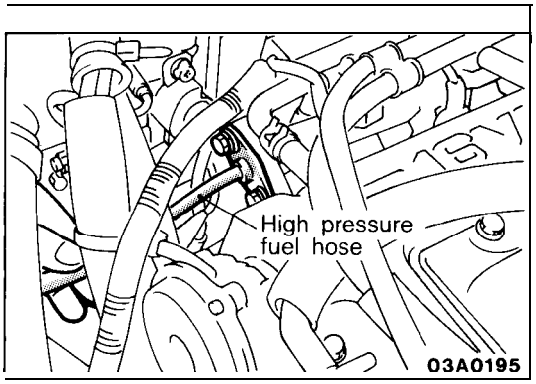
**Caution**
**Do not allow cleaning solvent to enter the bypass passage.**

(4) Spray cleaning solvent into the valve through the throttle body intake port and leave it for about 5 minutes.
(5) Start the engine, race it several times and idle it for about 1 minute. If the idling speed becomes unstable (or if the engine stalls), slightly open the throttle valve to keep the engine running.
(6) If the throttle valve deposits are not removed, repeat steps (4) and (5).
(7) Unplug the bypass passage inlet.
(8) Attach the air intake hose.
(9) Disconnect the battery terminal for 10 seconds or more, and then reconnect it.
(lO)Adjust the basic idle speed. (Refer to P.14–48.)

## RELEASE OF RESIDUAL PRESSURE FROM HIGH PRESSURE FUEL HOSE N14FGAF

Refer to P.14–44.




## FUEL PUMP OPERATION CHECK N14FDAG

(1) Set the ignition switch at OFF.
(2) Check that when the battery voltage is directly applied to the fuel pump check terminal, the operating sound of the pump can be heard.

NOTE
Since the high pressure fuel pump is installed in the fuel tank, its operating sound cannot be readily heard. Remove the fuel tank cap and listen to the operating sound through the filler port.

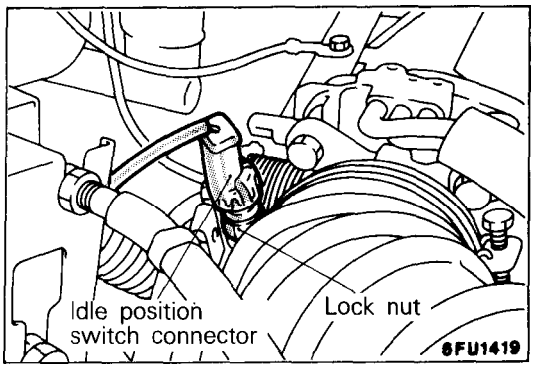
(3) Hold the high pressure fuel hose between your fingers and check that the fuel pressure can be felt.

## IDLE POSITION SWITCH ADJUSTMENT N14FIDA

**Caution**
**The idle position switch has been adjusted by the manufacturer.**
**Do not, therefore, disturb the setting of the idle-position switch.**
**If the setting is disturbed as a result of carelessness, or if the idle-position switch is replaced, make the necessary setting as described below.**

(1) Sufficiently loosen the tension of the accelerator cable.
(2) Disconnect the connector of the idle position switch (fixed speed adjusting screw).
(3) Loosen the lock nut of the idle position switch (fixed speed adjusting screw).
(4) Sufficiently loosen the idle position switch by turning it in the counterclockwise direction and fully close the throttle valve.

**Caution**
**Be sure to completely close the throttle valve.**




(5) Connect a tester (ohm range) between the switch's terminal and the body.
(6) Turn down the idle position switch until it enter the "ON" state where the switch establishes a continuity to body (this point is called "touch point"). Turn the switch down 15/16 of a turn more from that point.

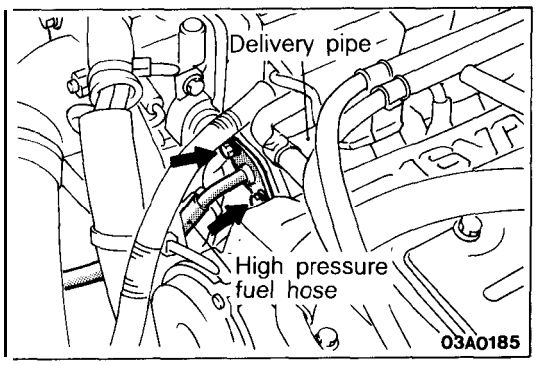
NOTE
The "touch point" refers to the point where the throttle valve begins opening.

(7) While holding the idle position switch to make sure that it does not turn, tighten the lock nut.
(8) Adjust the accelerator cable.
(9) Adjust the basic idle speed. (Refer to P.14–48.)
(IO)Setting the throttle position sensor.

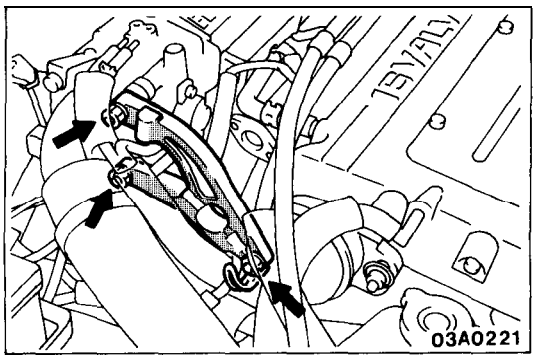
## FUEL PRESSURE TEST N14FNAO

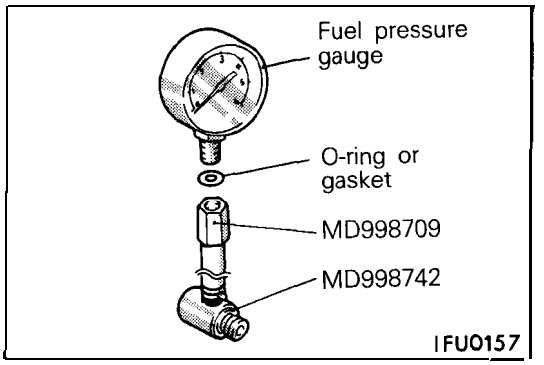
(1) Reduce the fuel pressure in the fuel line. (Refer to P.14–44.)
(2) Disconnect the high pressure fuel hose from the delivery pipe.

**Caution**
**Cover the hose connection with shop towel to prevent splash of fuel that could be caused by residual pressure in the fuel pipe line.**

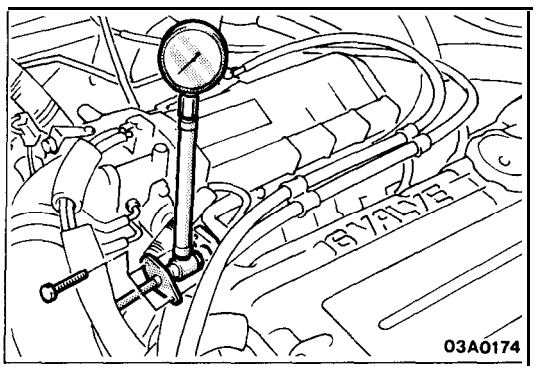



(3) Remove the throttle body stay.

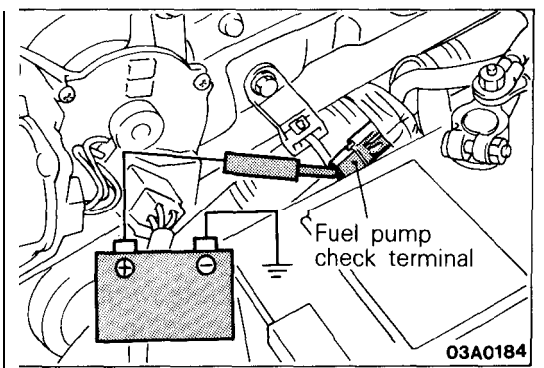




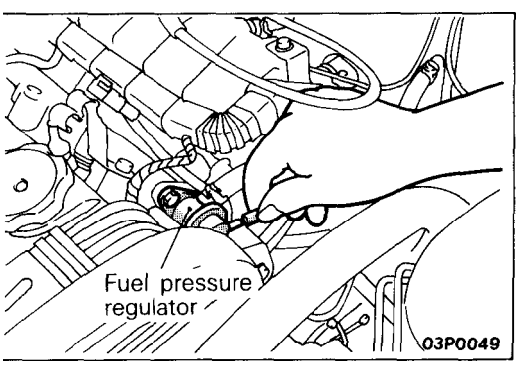

(4) Connect a fuel pressure gauge to the special tool (hose adapter).
Use a suitable O-ring or gasket between the fuel-pressure gauge and the special tool so as to seal in order to prevent fuel leakage at this time.




(5) Install the special tool, which was set in place in step (4), between the delivery pipe and the high-pressure fuel hose.
(6) Connect the ⊖ terminal of the battery.

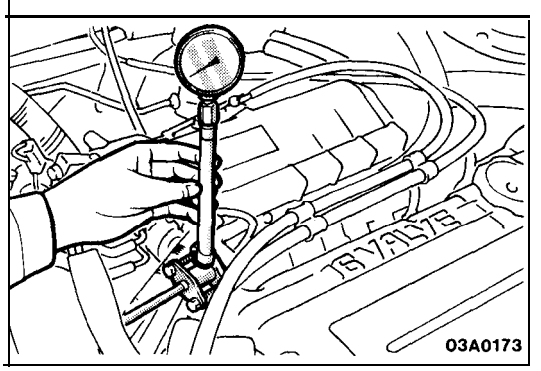



(7) Apply battery voltage to the fuel pump check terminal and activate the fuel pump; then, with fuel pressure thus applied, check to be sure that there is no fuel leakage from the pressure gauge or the special tool connection part.




(8) Start the engine and run at curb idle speed.
(9) Disconnect the vacuum hose from the pressure regulator and clog the vacuum hose end. Measure the fuel pressure.

**Standard value:**
**<Non Turbo> 330–350 kPa (47–50 psi) at curb idle**
**<Turbo-M/T> 250–270 kPa (36-38 psi) at curb idle**
**<Turbo-A/T> 290–320 kPa (41-46 psi) at curb idle**




(10) Measure the fuel pressure when the vacuum hose is connected to the pressure regulator:

**Standard value:**
**<Non Turbo> Approx. 270 kPa (38 psi) at curb idle**
**<Turbo-M/T> Approx. 190 kPa (27 psi) at curb idle**
**<Turbo-A/T> Approx. 230 kPa (33 psi) at curb idle**

(11)Race the engine repeatedly in two or three series. Then check that the fuel pressure does not fall when the engine is running at idle.
(12)Check to be sure that there is fuel pressure in the return hose also (by gently pressing the fuel return hose with a finger while repeatedly racing the engine).

NOTE
There will be no fuel pressure in the return hose when the volume of fuel flow is not sufficient.

(13)If the results of the measurements made in steps (9) and (10) above are not within the standard value, use the table below to determine the probable cause, and then make the necessary repair.

| Condition | Probable cause | Remedy |
|---|---|---|
| Fuel pressure too low | a. Clogged fuel filter<br>b. Fuel leaking toward return port due to improper seating of valve in fuel pressure regulator<br>c. Low delivery pressure of fuel pump | a. Replace fuel filter.<br>b. Replace fuel pressure regulator.<br>c. Replace fuel pump. |
| Fuel pressure too high | a. Stuck valve in fuel pressure regulator<br>b. Clogged or bent fuel return hose or pipe | a. Replace fuel pressure regulator.<br>b. Repair or replace hose or pipe. |
| Fuel pressure with vacuum hose connected not different from fuel pressure with vacuum hose not connected | a. Clogged or broken vacuum hose or nipple<br>b. Stuck valve in fuel pressure regulator or defective valve seating | a. Repair or replace vacuum hose or nipple.<br>b. Replace fuel pressure regulator. |

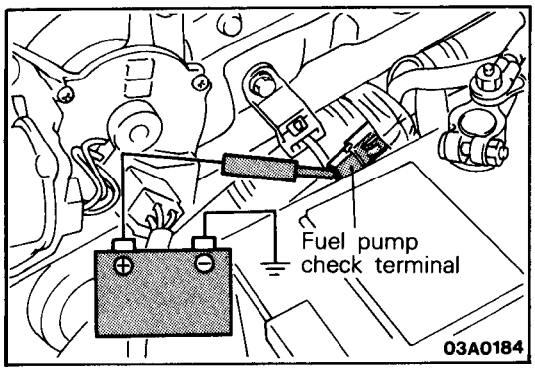
(14)Stop the engine and check for change in fuel pressure gauge indication, which should not drop.
If the gauge indication drops, observe the rate of drop and determine and remove the causes according to the following table.

| Condition | Probable cause | Remedy |
|---|---|---|
| Fuel pressure drops slowly after engine is stopped. | Leakage from injector | Replace injector. |
| Fuel pressure drops immediately after engine is stopped. | Check valve in fuel pump does not close | Replace fuel pump. |

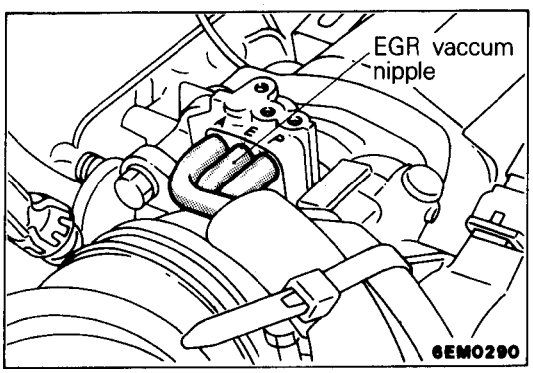
(15)Reduce the fuel pressure in the fuel line.
(16)Disconnect the high pressure fuel hose and remove the fuel-pressure gauge from the delivery pipe.

**Caution**
**Cover the hose connection with shop towel to prevent splash of fuel that could be caused by residual pressure in the fuel pipe line.**

(17)Mount a new O-ring in the groove at the end of the high pressure fuel hose.




(18)Connect the high-pressure fuel hose, to the delivery pipe and tighten the screws to the specified torque.
(19)Check for fuel leaks.
① Apply battery voltage to the fuel pump check terminal to operate the fuel pump.
② With fuel pressure acting, check the fuel line for leaks.



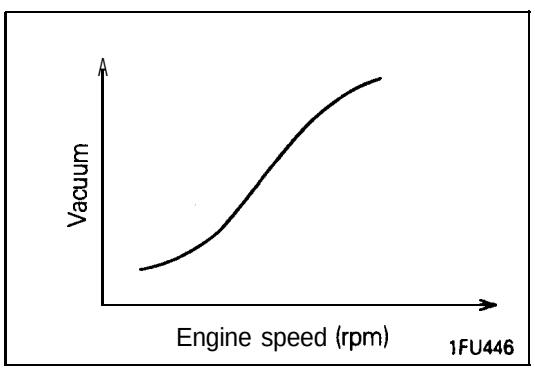

## EGR VALVE CONTROL VACUUM CHECK N14FVBB1

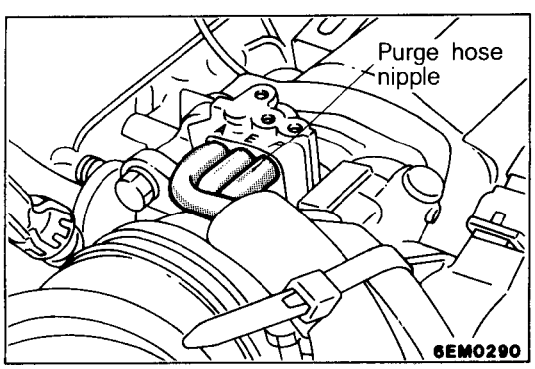
**Check Condition**

Engine coolant temperature: 85–95°C (185–205°F)

(1) Disconnect the vacuum hose from the throttle body EGR vacuum nipple and connect a hand vacuum pump to the nipple.
(2) Start the engine and check to see that, after raising the engine speed by racing the engine, vacuum raises proportionately with the rise in engine speed.

NOTE
If there is a problem with the change in vacuum, it is possible that the throttle body port may be clogged and require cleaning.



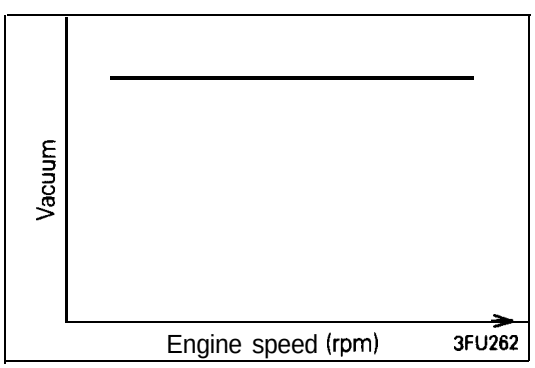




## PURGE PORT VACUUM CHECK N14FVBC1

**Check Condition**

Engine coolant temperature: 85–95°C (185–205°F)

(1) Disconnect the vacuum hose from the throttle body purge hose nipple and connect a hand vacuum pump to the nipple.




(2) Start the engine and check to see that, after raising the engine speed by racing the engine, vacuum remains fairly constant.

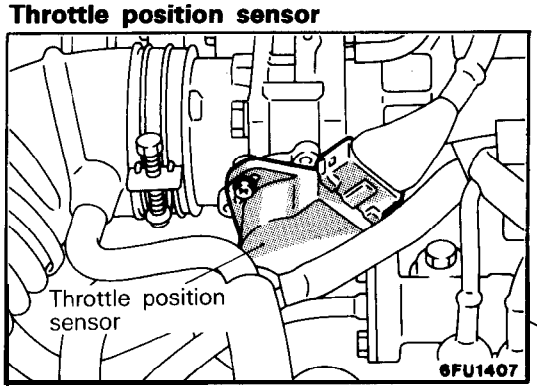
NOTE
If there is no vacuum created, it is possible that the throttle body port may be clogged and require cleaning.

# MPI SYSTEM INSPECTION <1.8L Engine>

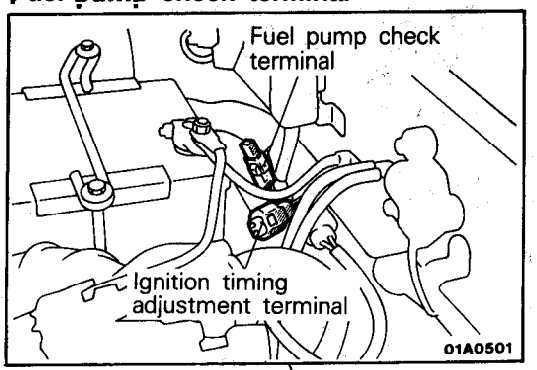
N14PAAM

## COMPONENTS LOCATION

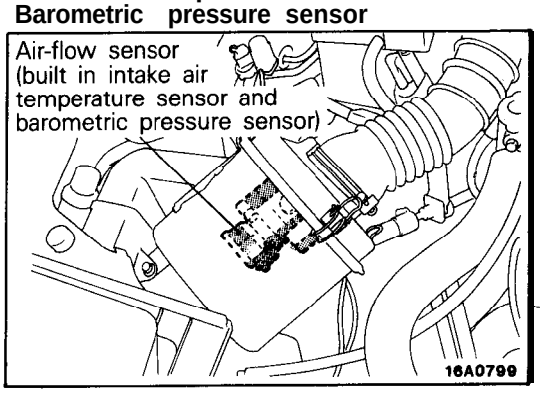
**Throttle position sensor**

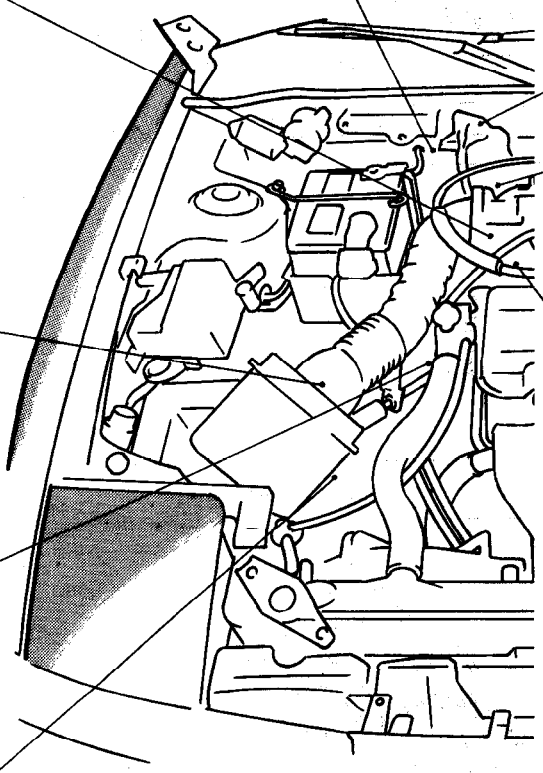



**Ignition timing adjustment terminal**
**Fuel pump check terminal**

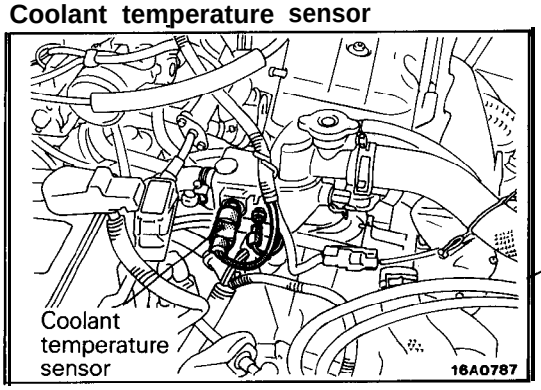



**Air-flow sensor**
**Intake air temperature sensor**
**Barometric pressure sensor**

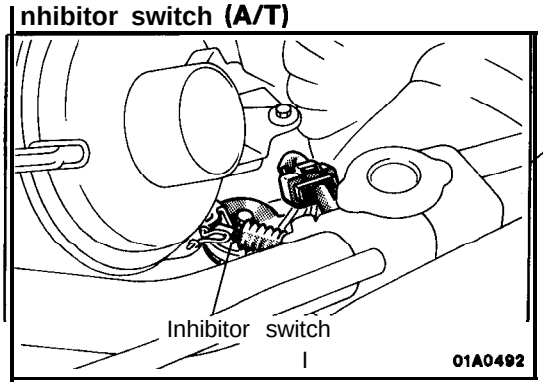


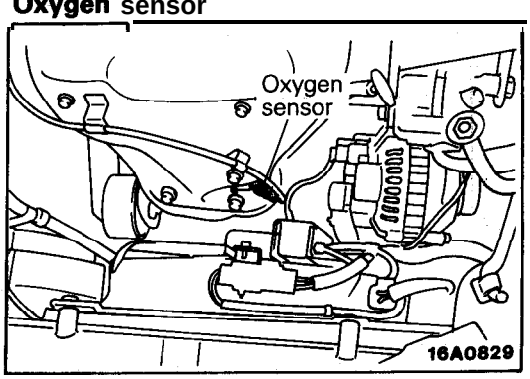
**Coolant temperature sensor**



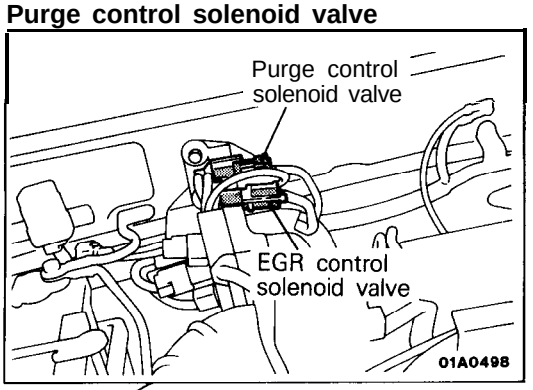

**nhibitor switch (A/T)**



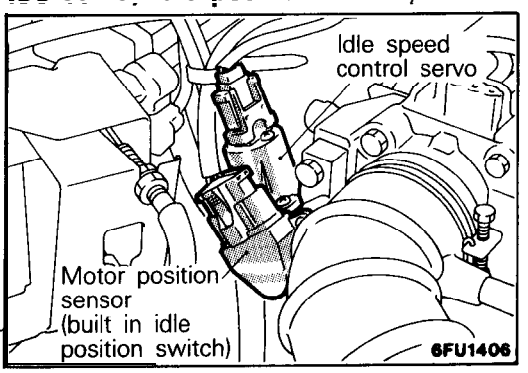

**Oxygen sensor**



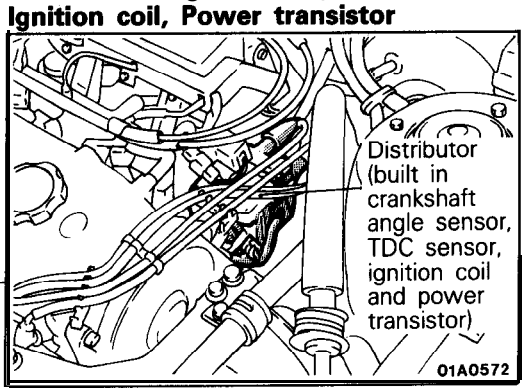
**EGR control solenoid valve [Calif. only]**
**Purge control solenoid valve**

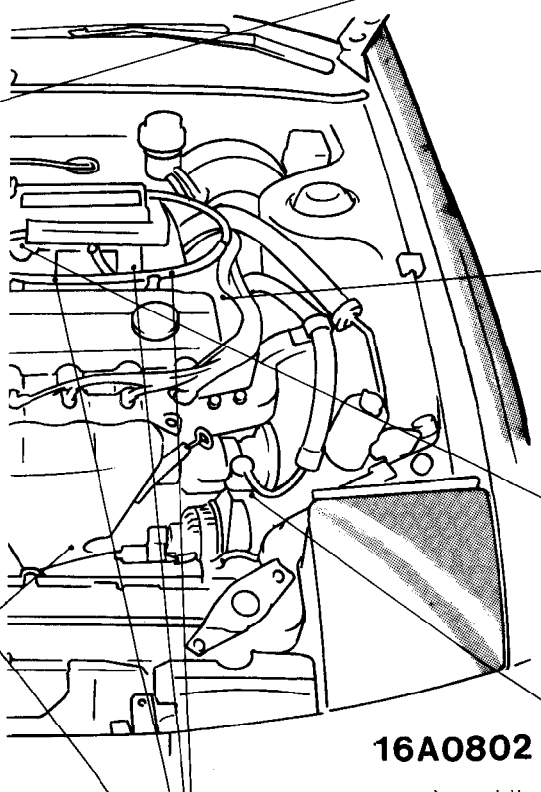



**ISC servo, Idle position switch, MPS**

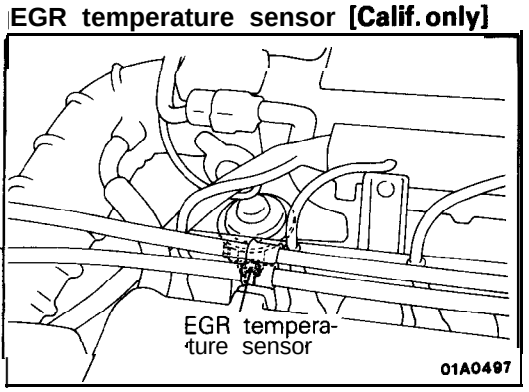



**Crankshaft angle sensor, TDC sensor**
**Ignition coil, Power transistor**

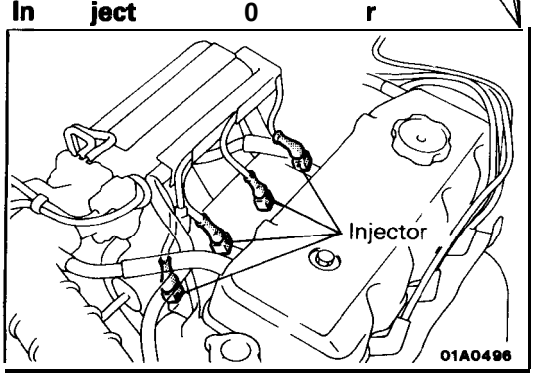


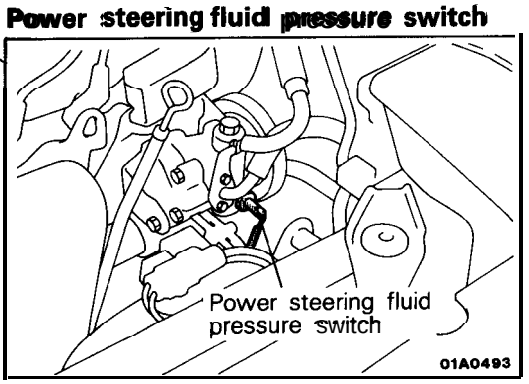

**EGR temperature sensor [Calif. only]**

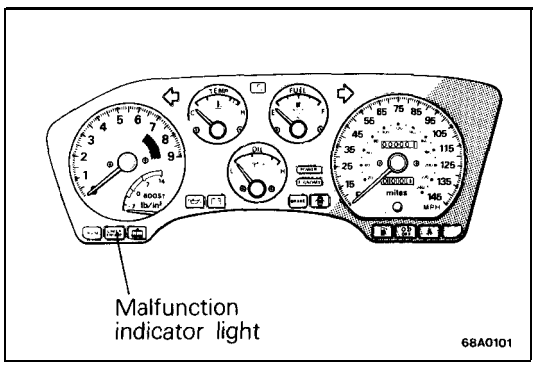



**Injector**




**Power steering fluid pressure switch**






## MALFUNCTION INDICATOR LIGHT N14PQAB

Among the self-diagnosis items, a malfunction indicator light comes on to notify the driver of the emission control items when an irregularity is detected.
However, when an irregular signal returns to normal 'and the engine control unit judges that it has returned to normal, the malfunction indicator light goes out.
Moreover, when the ignition switch is turned off, the light goes out. Even if the ignition switch is turned on again, the light does not come on until the irregularity is detected.
Here, immediately after the ignition switch is turn on, the malfunction indicator light is lit for 5 seconds to indicate that the malfunction indicator light operates normally.

**Items indicated by the lightening malfunction light**

| |
|---|
| Engine control unit |
| Oxygen sensor |
| Air-flow sensor |
| Intake air temperature sensor |
| Throttle position sensor |
| Motor position sensor |
| Engine coolant temperature sensor |
| Crank angle sensor |
| No. 1 cylinder TDC sensor |
| Barometric pressure sensor |
| Ignition timing adjustment signal |
| Injector |
| Fuel pump |
| EGR system <California> |

**Caution**
**The malfunction indicator light lights up when the ignition timing adjustment terminal is short-circuited to ground. Consequently, it lights up when the ignition timing adjustment is grounded when adjusting ignition timing, but in this case there is no abnormality.**

### MALFUNCTION INDICATOR LIGHT INSPECTION

When turning on the ignition switch, check that the light comes on.

NOTE
If the light does not come on, check the harness and light for breakage.

### SELF-DIAGNOSIS N14PAAFa

The engine control unit monitors the input/output signals (some signals at all times and the others under specified conditions) of the engine control unit.

When it is noticed that an irregularity has continued for a specified time or longer from when the irregular signal is initially monitored. Passing a certain number, the engine control unit judges that an irregularity has occurred, memorizes the malfunction code, and outputs the signal to the self-diagnosis output terminal.
There are 14 diagnosis items, and the diagnosis results can be read out with a voltmeter.
Moreover, since memorization of the malfunction codes is backed up directly by the battery, the diagnosis results are memorized even if the ignition key is turned off. The malfunction codes will, however, be erased when the battery terminal or the engine control unit connector is disconnected.

**Caution**
**If the sensor connector is disconnected with the ignition switch turned on, the malfunction code is memorized. In this case, disconnect the battery terminal' (−) for 10 seconds or more, and the diagnosis memory will be erased.**

The 14 diagnosis items are provided as follows, and if plural items are activated, they are all indicated sequentially from the smallest code number.

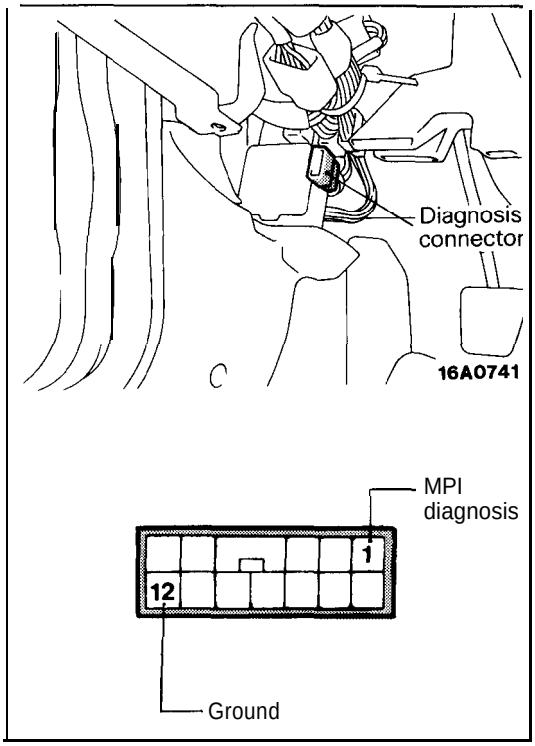
| Malfunction code | Diagnosis item | Malfunction code | Diagnosis item |
|---|---|---|---|
| 11 | Oxygen sensor | 24 | Vehicle speed sensor (reed switch) |
| 12 | Air flow sensor | 25 | Barometric pressure sensor |
| 13 | Intake air temperature sensor | 36 | Ignition timing adjustment signal |
| 14 | Throttle position sensor | 41 | Injector |
| 15 | Motor position sensor | 42 | Fuel pump |
| 21 | Engine coolant temperature sensor | 43 | EGR <California> |
| 22 | Crank angle sensor | – | – |
| 23 | No. 1 cylinder TDC sensor | | |

Caution
**For the malfunction code of the ignition timing adjustment signal, the light for the ignition timing adjustment terminal lights up when short-circuited to ground.**
**Consequently, it is output when the ignition timing adjustment is grounded when adjusting ignition timing, but in this case there is not abnormality.**

**CHECK PROCEDURE (SELF-DIAGNOSIS)** N14PCAE1

**Precautions for Operation**

(1) When battery voltage is low, no detection of failure is possible. Be sure to check the battery for voltage and other conditions before starting the test.
(2) Diagnosis item is erased if the battery or the engine control unit connector is disconnected. Do not disconnect the battery before the diagnosis result is completely read.
(3) After check and correction are over, disconnect ground cable for 10 seconds or more from negative terminal of battery and connect it again to make sure that failure code is erased.

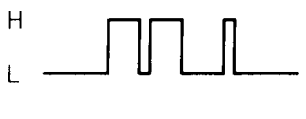
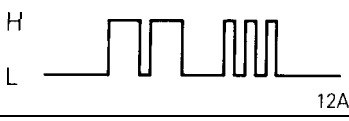
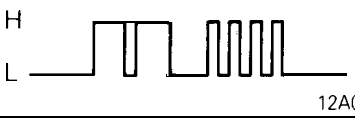
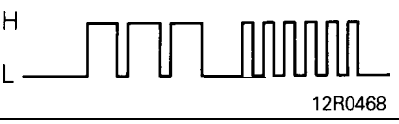
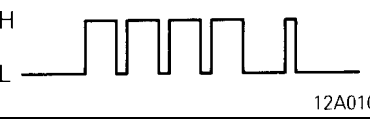
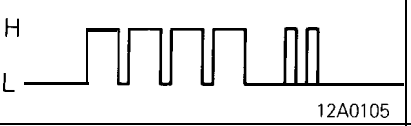
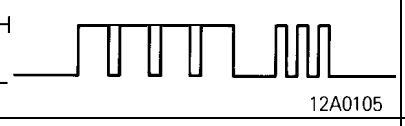
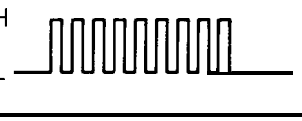



**INSPECTION PROCEDURE – USING VOLTMETER** N14PCAG1

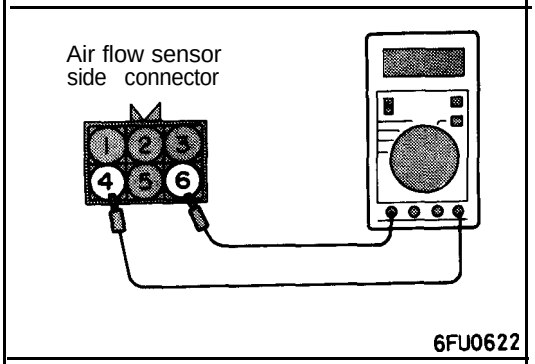
(1) Connect an analogue voltmeter to the self-diagnosis connector.
(2) Turn ignition switch to ON, and indication of engine control unit memory contents will immediately start. If the system is in normal condition, pointer of voltmeter indicates normal pattern. If any abnormality is in memory, the pointer of voltmeter will deflect, indicating abnormal item as described in "Diagnosis Chart".
After recording the abnormal item, check and repair each part according to the check items in "Diagnosis Chart".
(3) If the defective parts have been repaired, disconnect the negative terminal of battery cable for 10 seconds or more and connect it again to make sure that the abnormal code has been erased.

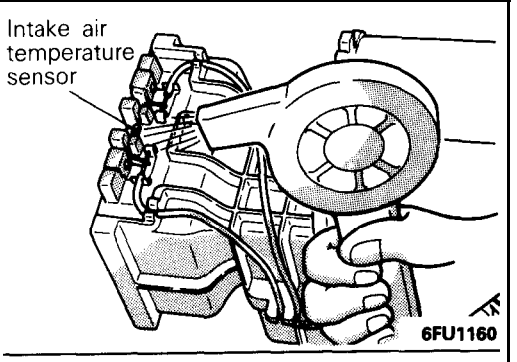
**DIAGNOSIS CHART (FAULT TREE)** N14PRAC

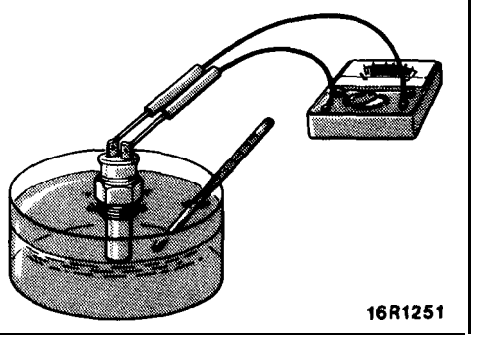
| output preference order | Diagnosis item | Diagnosis code | | | Check item (Remedy) |
|---|---|---|---|---|---|
| | | Output signal pattern | No. | Memory | |
| 1 | Engine control unit | H L 12A0104 | – | – | (Replace engine control unit) |
| 2 | Oxygen sensor | H L 12A0104 | 11 | Retained | • Harness and connector<br>• Fuel, pressure<br>• Injectors (Replace if defective)<br>• Intake air leaks<br>• Oxygen sensor |
| 3 | Air flow sensor | H L 12A0104 | 12 | Retained | • Harness and connector (If harness and connector are normal, replace air flow sensor assembly.) |
| 4 | Intake air temperature sensor | H L 12A0104 | 13 | Retained | • Harness and connector<br>• Intake air temperature sensor |
| 5 | Throttle position sensor | H L 12A0104 | 14 | Retained | • Harness and connector<br>• Throttle position sensor<br>• Idle position switch |
| 6 | Motor position sensor | H L 12A0104 | 15 | Retained | • Harness and connector<br>• Motor position sensor<br>• Throttle position sensor |

| output reference order | Diagnosis item | Diagnosis code | | | Check item (Remedy) |
|---|---|---|---|---|---|
| | | Output signal pattern | No. | Memory | |
| 7 | Engine coolant temperature sensor |  12A0107 | 21 | Retained | • Harness and connector<br>• Engine coolant temperature sensor |
| 8 | Crank angle sensor |  12A0107 | 22 | Retained | • Harness and connector (If harness and connector are normal, replace distributor assembly.) |
| 9 | No. 1 cylinder top dead center sensor |  12A0107 | 23 | Retained | • Harness and connector (If harness and connector are normal, replace distributor assembly.) |
| 10 | Vehicle speed sensor (reed switch) |  12A0107 | 24 | Retained | • Harness and connector<br>• Vehicle speed sensor (reed switch) |
| 11 | Barometric pressure sensor |  12A0107 | 25 | Retained | • Harness and connector (If harness and connector are normal, replace barometric pressure sensor assembly.) |
| 12 | Ignition timing adjustment signal |  12R0468 | 36 | – | • Harness and connector |
| 13 | Injector |  12A0105 | 41 | Retained | • Harness and connector<br>• Injector coil resistance |
| 14 | Fuel pump |  12A0105 | 42 | Retained | • Harness and connector<br>• Control relay |
| 15 | EGR <California> |  12A0105 | 43 | Retained | • Harness and connector<br>• EGR temperature sensor<br>• EGR valve<br>• EGR valve control solenoid valve<br>• EGR valve control vacuurr |
| 16 | Normal state |  12A0104 | – | – | – |

NOTE
Replace the engine control unit if a malfunction code is output although the inspection reveals that there is no problem with the check items.




## INTAKE AIR TEMPERATURE SENSOR

N14QHAB

### INSPECTION

(1) Disconnect the air flow sensor connectors.
(2) Measure resistance between terminals ④ and ⑥.

| Temperature °C (°F) | Resistance kΩ |
|---|---|
| 0 (32) | 6.0 |
| 20 (68) | 2.7 |
| 80 (176) | 0.4 |

(3) Measure resistance while heating the sensor using a hair drier.

| Temperature °C (°F) | Resistance kΩ |
|---|---|
| Higher | Smaller |

(4) If the value deviates from the standard value or the resistance remains unchanged, replace the air flow sensor assembly.

## ENGINE COOLANT TEMPERATURE SENSOR

N14QABE

### INSPECTION

(1) Remove engine coolant temperature sensor from the intake manifold.
(2) With temperature sensing portion of engine coolant temperature sensor immersed in hot water, check resistance.

| Temperature °C (°F) | Resistance kΩ |
|---|---|
| 0 (32) | 5.9 |
| 20 (68) | 2.5 |
| 40 (104) | 2.7 |
| 80 (176) | 0.3 |

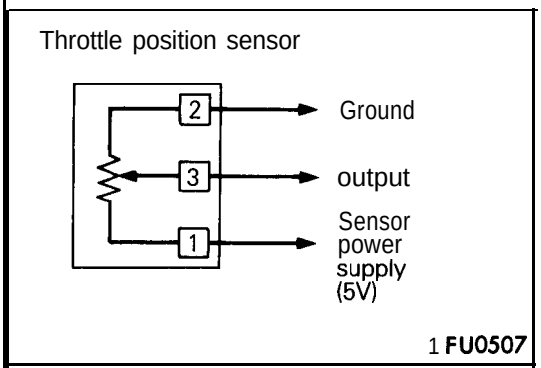
(3) If the resistance deviates from the standard value greatly, replace the sensor.

### INSTALLATION

(1) Apply specified sealant to threaded portion and tighten to specified torque.

**Specified sealant: MOPAR Part No. 4318034 or equivalent**
**Specified torque: 20 – 40 Nm (15 – 29 ft.lbs.)**

(2) Fasten harness connectors securely.




## THROTTLE POSITION SENSOR N14QBBKa

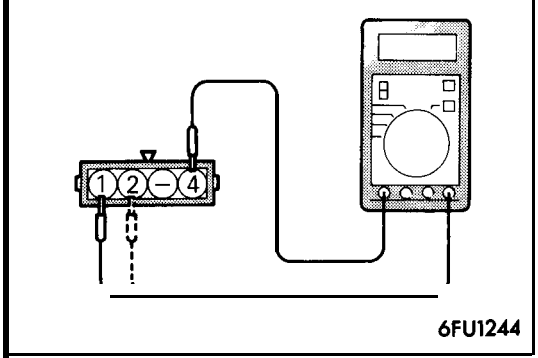
### INSPECTION

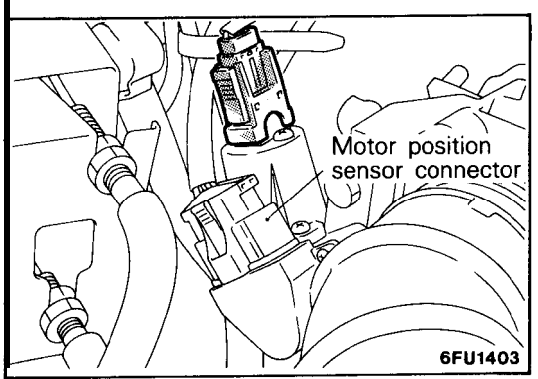
(1) Disconnect the throttle position sensor connector.
(2) Measure resistance between terminal ④ (sensor ground) and terminal ① (sensor power).

**Standard value: 3.5-6.5 kΩ**

(3) Connect a pointer type ohmmeter between terminal ④ (sensor ground) and terminal ② (sensor output).
(4) Operate the throttle valve slowly from the idle position to the full open position and check that the resistance changes smoothly in proportion with the throttle valve opening angle.
(5) If the resistance is out of specification, or fails to change smoothly, replace the throttle position sensor.

**Throttle position sensor installation torque: 1.5 – 2.5 Nm (1.1 – 1.6 ft.lbs.)**

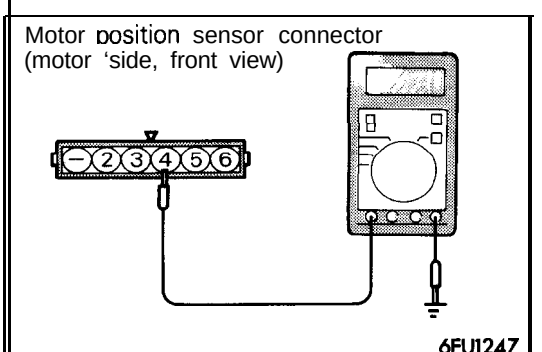



## IDLE POSITION SWITCH N14QKADa

### INSPECTION

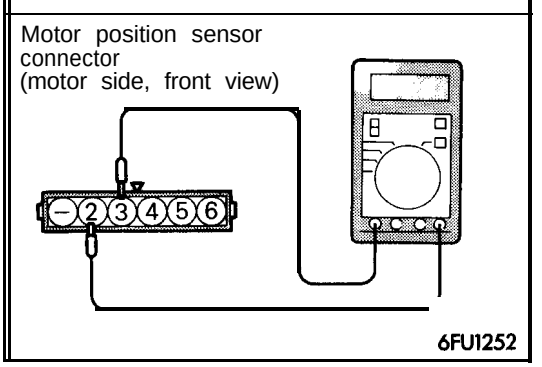
(1) Disconnect the connectors of the motor position sensor.




(2) Check the continuity between terminal ④ and the body ground.

| Accelerator pedal | Continuity |
|---|---|
| Depressed | Non-conductive (∞ Ω) |
| Released | Conductive (0 Ω) |

(3) If defective, replace the idle speed control servo assembly.

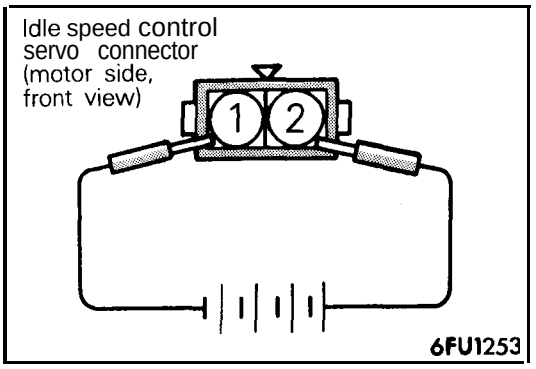



## MOTOR POSITION SENSOR N14QLAJ

### INSPECTION

(1) Disconnect the motor position sensor connector.
(2) Measure the resistance between terminals ② and ③.

**Standard value:** 4 – 6 kΩ




(3) Disconnect the idle speed control servo connector.
(4) Connect DC 6V between terminals ① and ② of the idle speed control servo connector, and then measure the resistance between terminals ③ and ⑤ of the motor position sensor connector when the idle speed control servo is activated (caused to expand and contract).

**Standard value: Smooth increase/decrease in accordance with extension and retraction of idle speed control servo plunger.**

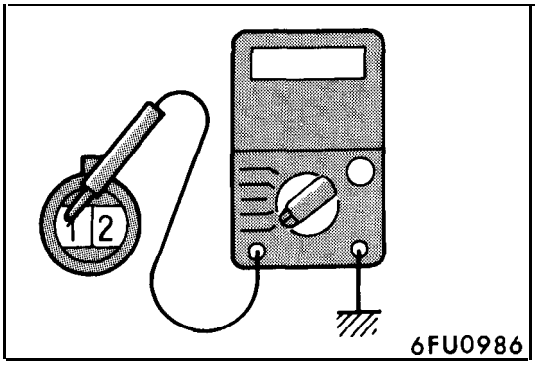
**Caution**
**Apply only a 6V DC or lower voltage. Application of higher voltage could cause locking of the servo gears.**

(5) If there is a deviation from the standard value, or if the change is not smooth, replace the idle speed control servo assembly.

## OXYGEN SENSOR N14QDBAb

### INSPECTION

**Caution**
**1. Before checking, warm up the engine until engine coolant temperature reaches 85 to 95°C (185 to 205°F).**
**2. Use an accurate digital voltmeter.**




(1) Disconnect the oxygen sensor connector and connect a voltmeter to the oxygen sensor connector.
(2) While repeating engine racing, measure the oxygen sensor output voltage.

| Engine | Oxygen sensor output voltage | Remarks |
|---|---|---|
| Race | 0.6–1.0V | Make air-fuel mixture rich by accelerator operation |

NOTE
For removal and installation of the oxygen sensor, refer to GROUP 11 – Exhaust Manifold.

**Oxygen sensor installation torque:**
40 – 50 Nm (30 – 36 **ft.lbs.**)

## EGR TEMPERATURE SENSOR <California> N14RCHAa

Refer to GROUP 25 – Exhaust Gas Recirculation System.

## VEHICLE SPEED SENSOR N14QEBBa

Refer to GROUP 8 – Meters and Gauges.

## AIR CONDITIONER SWITCH N14QQABa

Refer to GROUP 8 – Column Switch.

## INHIBITOR SWITCH

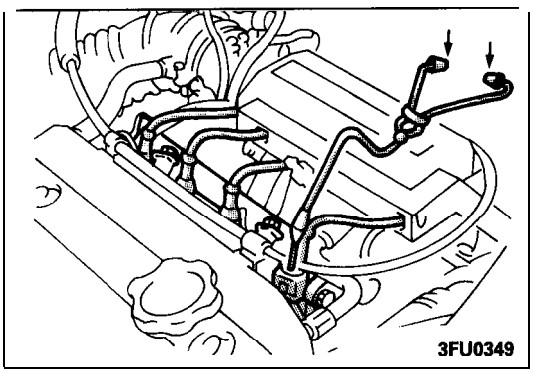
N14QRACa

Refer to GROUP 21 – Service Adjustment Procedures.

## POWER STEERING OIL PRESSURE SWITCH

N14RCJB

Refer to GROUP 19 for power steering system inspection.


3FU0349

## INJECTORS

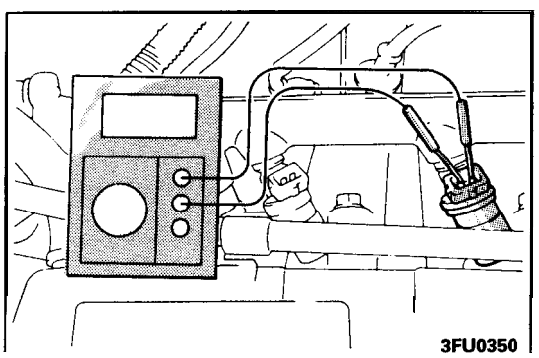
N14QTAG

### CHECKING OPERATION SOUND

Using a sound-scope, check the operation sound ("chi-chi-chi") of injectors during idling or during cranking.
Check that as the rotating speed increases, the frequency of the operating sound also increases.

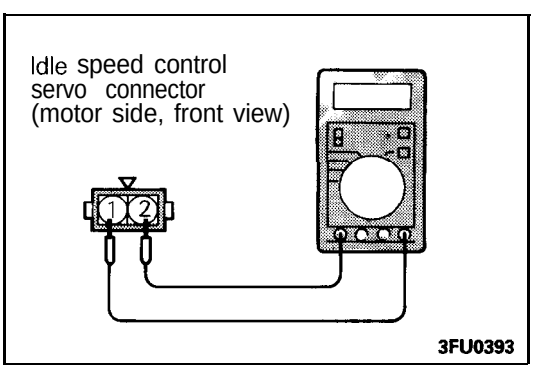
**Caution**
**Note that even if the injector you are checking is not operating, you will hear the operating sound of the other injectors.**

NOTE
If no operating sound is heard from the injector that is being checked, check the injector drive circuit. If there is nothing wrong with the circuit, a defective injector or engine control unit is suspected.


3FU0350

### MEASURING RESISTANCE BETWEEN TERMINALS

(1) Remove the injector connector.
(2) Measure the resistance between the terminals.
**Standard value: 13 – 16 Ω [at 20°C (68°F)]**
(3) Install the injector connector.



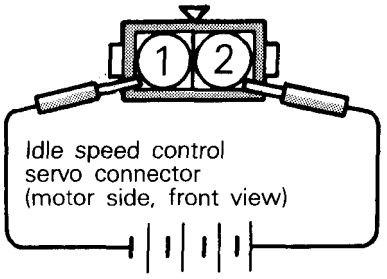

## IDLE SPEED CONTROL SERVO

N14QUAAb

### INSPECTION

(1) Disconnect the idle speed control servo connector.
(2) Check continuity of the idle speed control servo coil.

| Measuring terminals | Continuity |
|---|---|
| ① – ② Conductive | 5 to 35 Ω resistance at 20°C (68°F) |



6FU1253

(3) Connect 6V DC between terminal ① and terminal ② of the idle speed control servo connector, and check to be sure that the idle speed control servo operates.

**Caution**
**Apply only a 6V DC or lower voltage. Application of higher voltage could cause locking of the servo gears.**

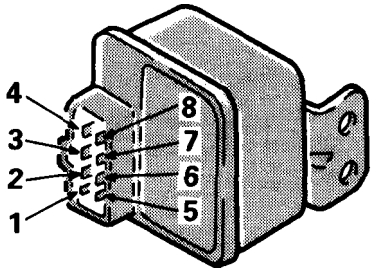
(4) If not, replace idle speed control servo as an assembly.

## CONTROL RELAY

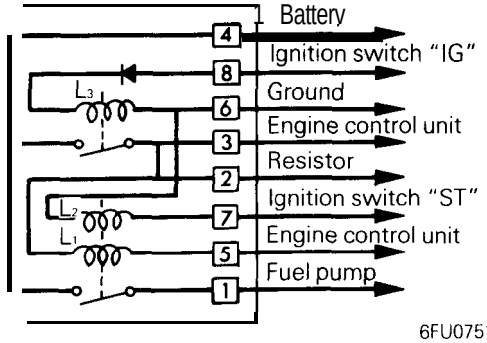
N14QYAE

### INSPECTION

(1) Remove the control relay.
(2) Inspect the continuity between the control relay terminals.




| Inspection terminals | Continuity |
|---|---|
| ③–⑤ | Yes (approx. 95Ω) |
| ②–⑤ | |
| ⑥–⑦ | Yes (approx. 35Ω) |
| ⑥–⑧ | Yes in 1 direction only |

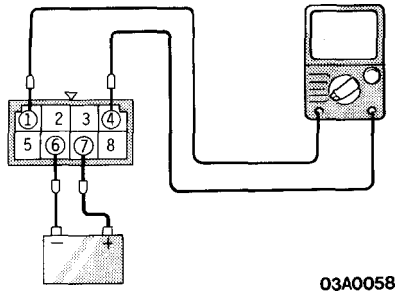


6FU0751

(3) Use jumper wires and connect control relay terminal ⑦ to the battery ⊕ terminal and terminal ⑥ to the battery ⊖ terminal.

**Caution**
**Be very careful when connecting the jumper wires because the relay will be damaged if a mistake is made with the contact terminals.**

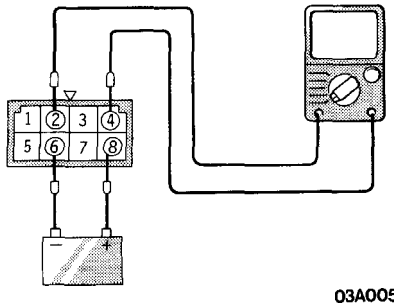
(4) With the battery ⊖ terminal jumper wire connected and disconnected, check the continuity between control relay terminals ①–④.



03A0058

| Jumper wire | Continuity between terminals ①–④ |
|---|---|
| Connection | Yes (0Ω) |
| Not connected | No (∞Ω) |

(5) Use jumper wires to connect control relay terminal ⑧ to the battery ⊕ terminal and terminal ⑥ to the battery ⊖ terminal.
(6) With the battery ⊖ terminal jumper wire connected and disconnected, check the continuity between control relay terminals ②–④.



03A0057

| Jumper wire | Continuity between terminals ②–④ |
|---|---|
| Connection | Yes (0Ω) |
| Not connected | No (∞Ω) |

(7) Replace the control relay if faulty.

## POWER TRANSISTOR N14RCGA

Refer to GROUP 8 – Ignition System

## AIR CONDITIONER POWER RELAY N14RCLB

Refer to GROUP 24 – Air Conditioner.

## PURGE CONTROL SOLENOID VALVE N14RCKA

Refer to GROUP 25 – Evaporative Emission Control System.

## EGR CONTROL SOLENOID VALVE <California> N14RCLA

Refer to GROUP 25 – Exhaust Gas Recirculation System.

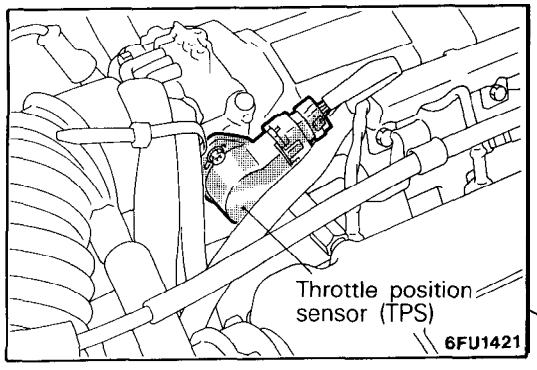
# MPI SYSTEM INSPECTION <2.0L DOHC Engine>

N14PAAN

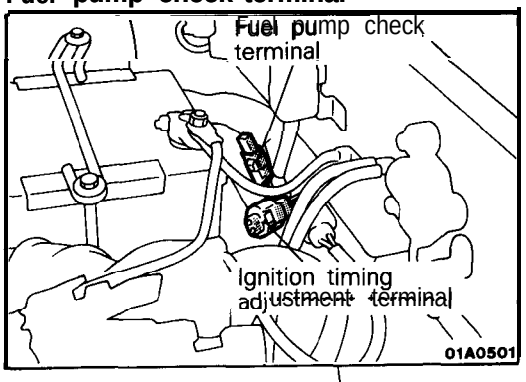
## COMPONENTS LOCATION

<Non-Turbo>

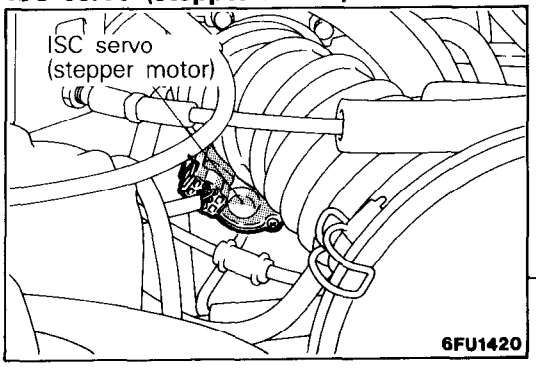
**Throttle position sensor**

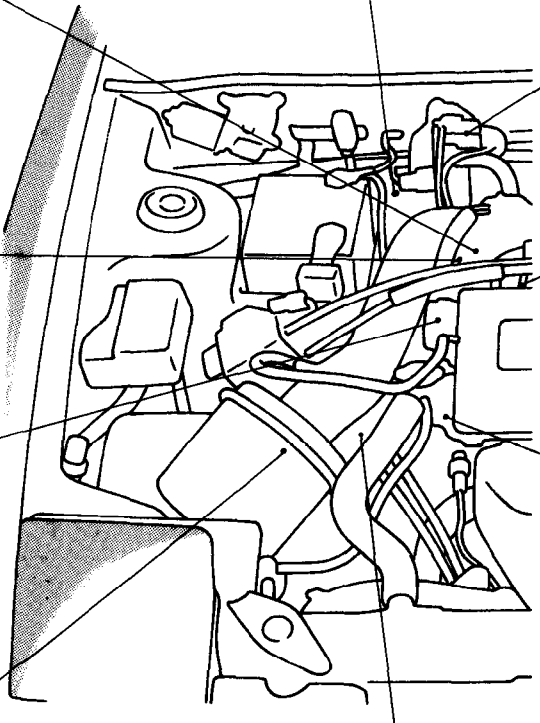



**Ignition timing adjustment terminal**
**Fuel pump check terminal**

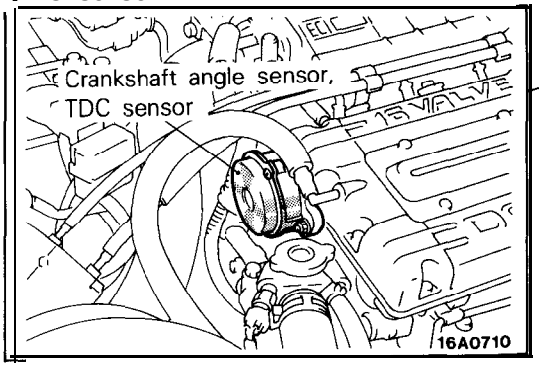



**ISC servo (stepper motor)**

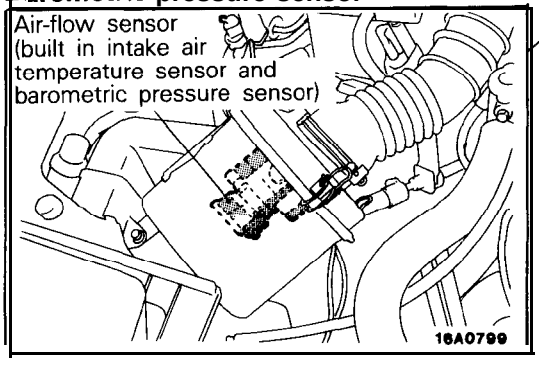


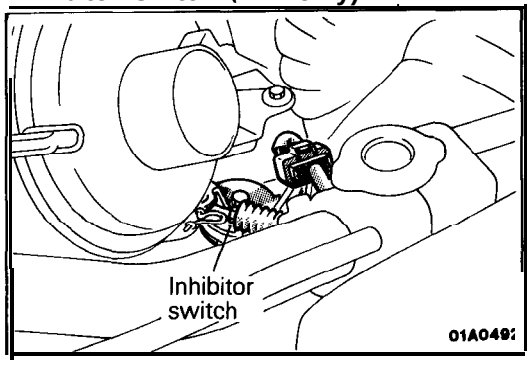
**Crankshaft angle sensor**
**T'DC sensor**



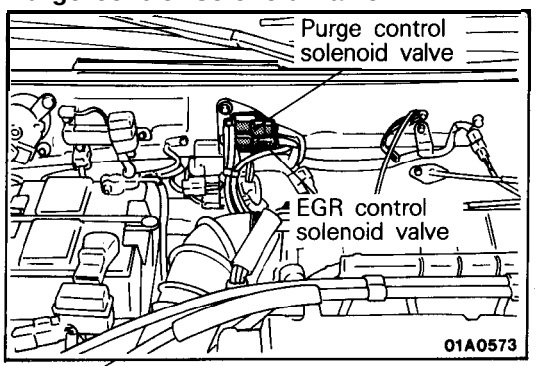

**Air-flow sensor**
**Intake air temperature sensor**
**Barometric pressure sensor**




**nhibitor switch (A/T only)**



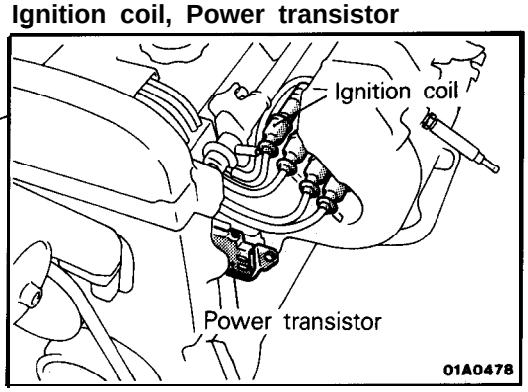
EGR control solenoid valve [Calif. only]
Purge control solenoid valve

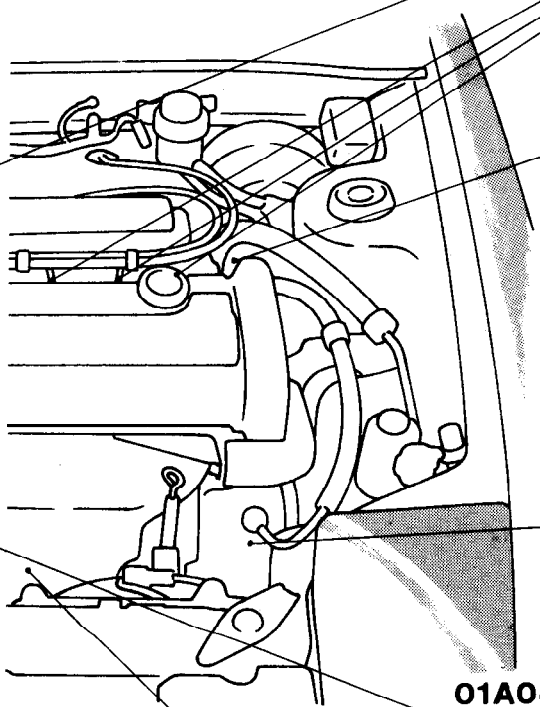




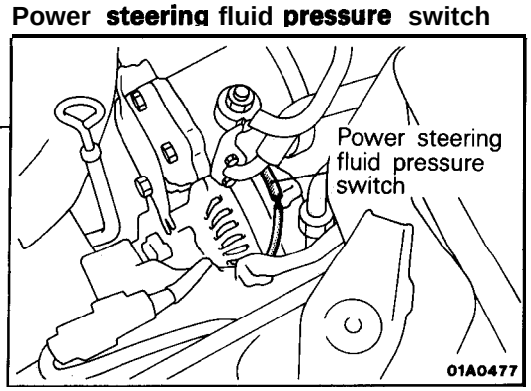


Ignition coil, Power transistor

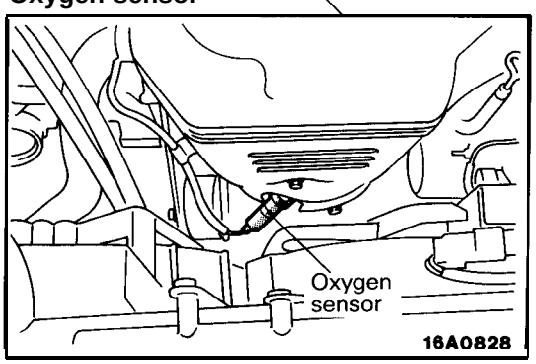


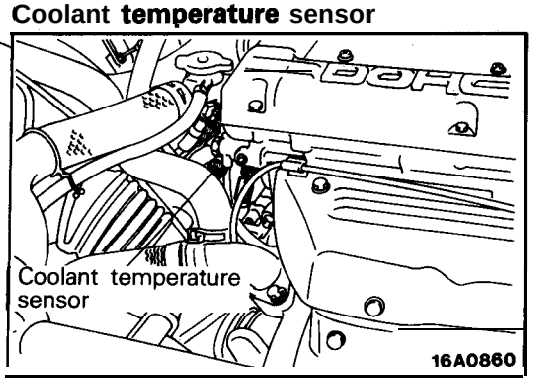

Power steering fluid pressure switch




Oxygen sensor

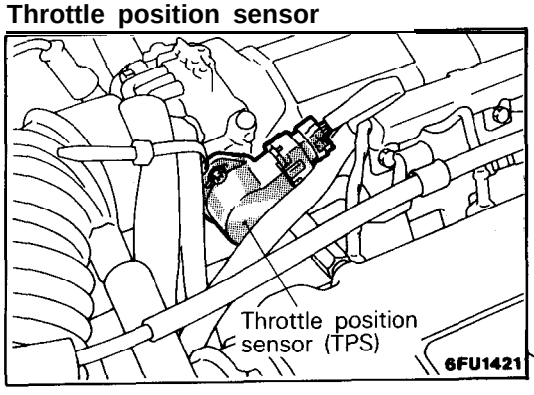



Coolant temperature sensor

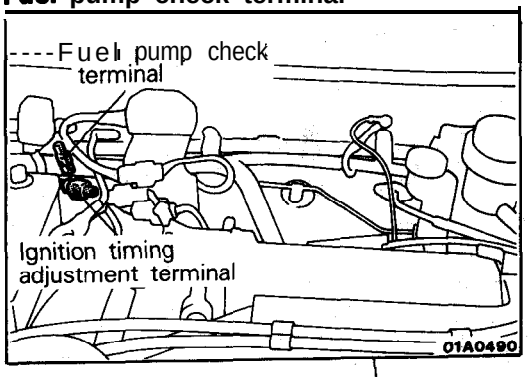


<Turbo>

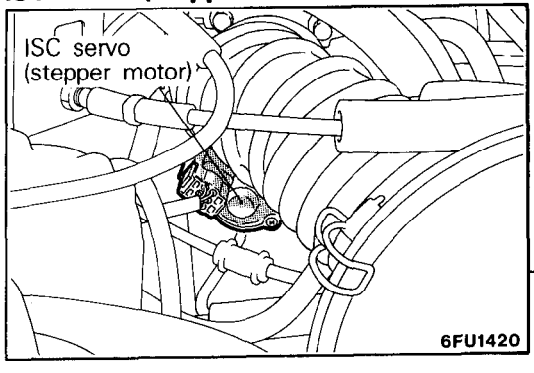
Throttle position sensor

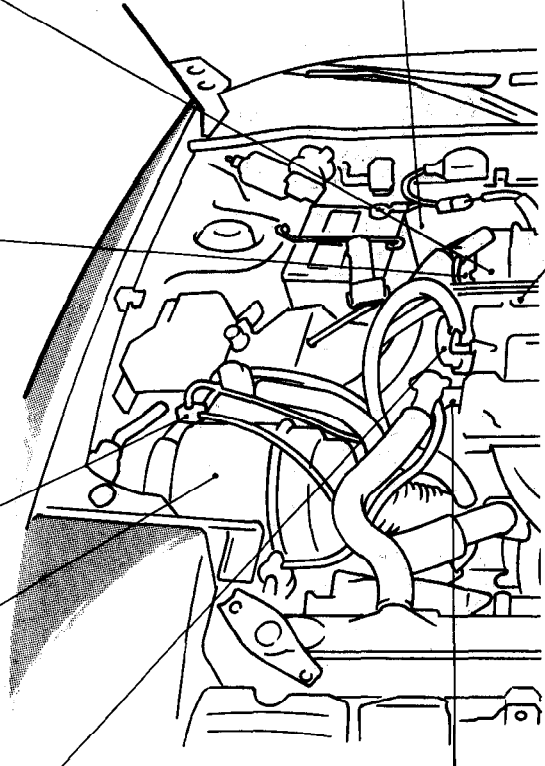



Ignition timing adjustment terminal
Fuel pump check terminal

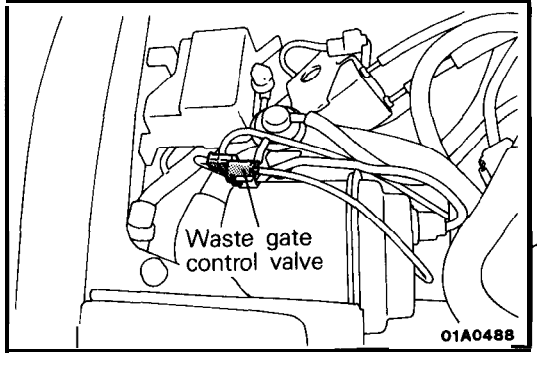



ISC servo (stepper motor)

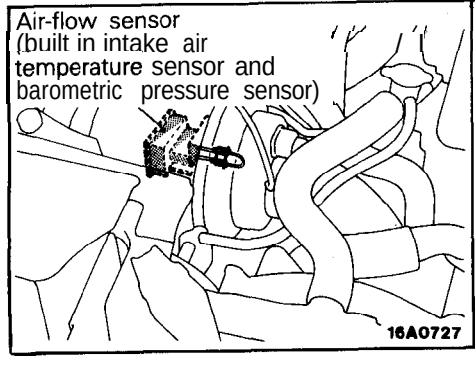


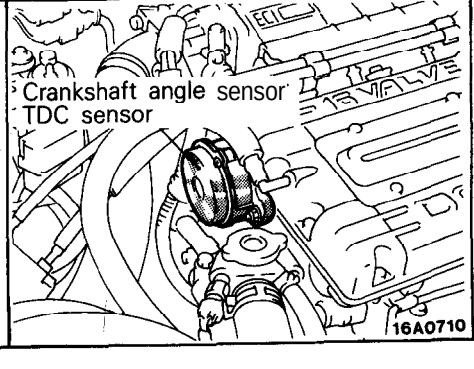
Waste gate control valve [Turbo only]



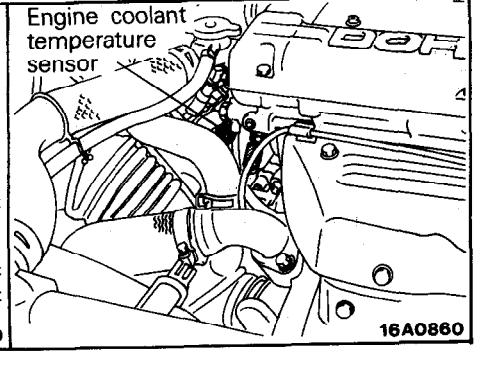

Air-flow sensor
Intake air temperature sensor
Barometric pressure sensor



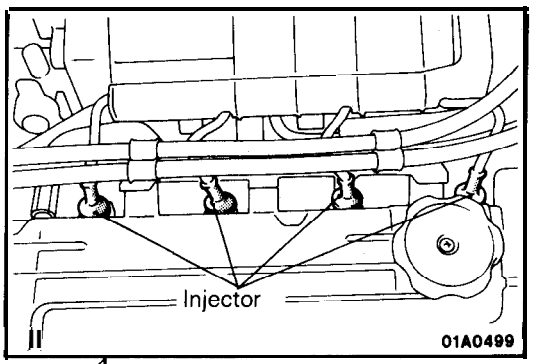

Crankshaft angle sensor
TDC sensor



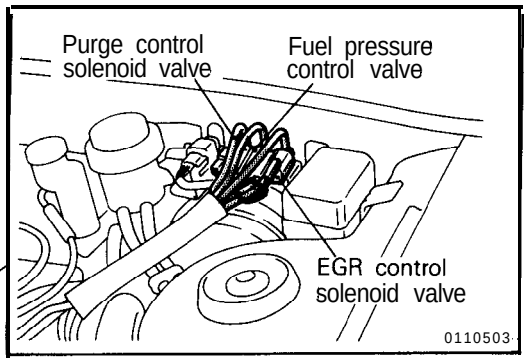

Engine coolant temperature sensor

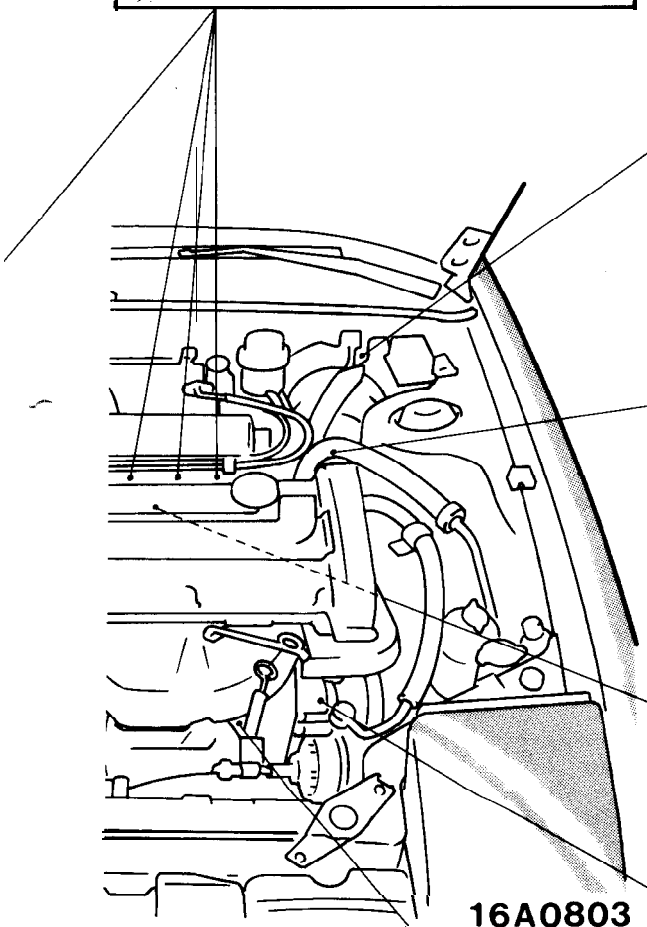


**Injector**

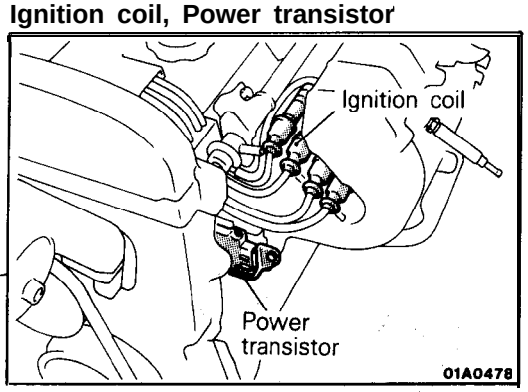



**EGR control solenoid valve [Calif. only]**
**Purge control solenoid valve**
**Fuel pressure control valve [Turbo only]**

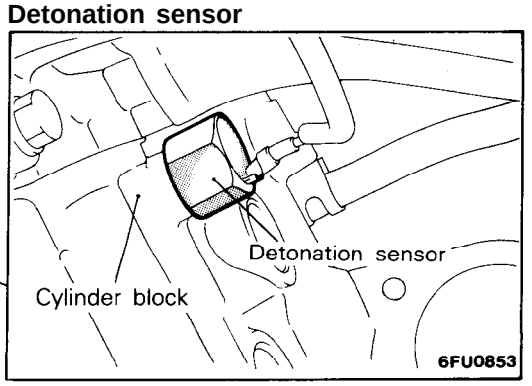


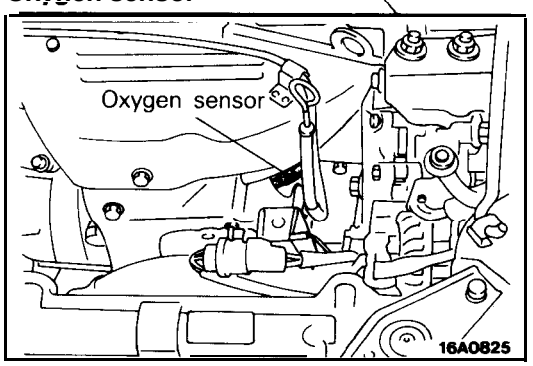

**Ignition coil, Power transistor**



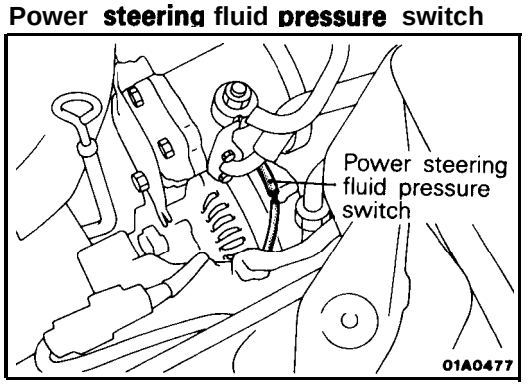

**Detonation sensor**




**Oxygen sensor**

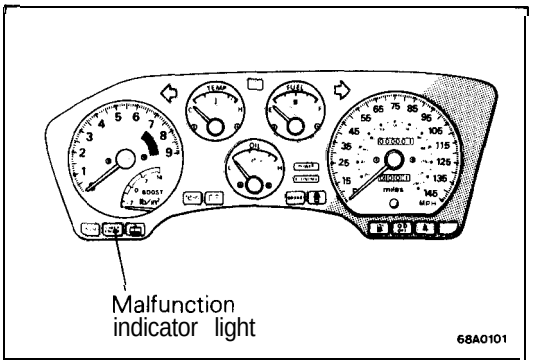



**Power steering fluid pressure switch**



## MALFUNCTION INDICATOR LIGHT N14PQAC

Among the self-diagnosis items, a malfunction indicator light comes on to notify the driver of the emission control items when an irregularity is detected.
However, when an irregular signal returns to normal and the engine control unit judges that it has returned to normal. the malfunction indicator light goes out.
Moreover, when the ignition switch is turned off, the light goes out. Even if the ignition switch is turned on again, the light does not come on until the irregularity is detected.
Here, immediately after the ignition switch is turn on, the malfunction indicator light is lit for 5 seconds to indicate that the malfunction indicator light operates normally.




**Items indicated by the lightening malfunction light**

| |
|---|
| Engine control unit |
| Oxygen sensor |
| Air flow sensor |
| Intake air temperature sensor |
| Throttle positron sensor |
| Engine coolant temperature sensor |
| Crank angle sensor |
| Top dead center sensor |
| Barometric pressure sensor |
| Detonation sensor <Turbo> |
| Injector |
| Fuel pump |
| EGR <California> |
| Ignition coil |

### MALFUNCTION INDICATOR LIGHT INSPECTION

When turning on the ignition switch, check that the light comes on.

NOTE
If the light does not come on, check the harness and light for breakage.

## SELF-DIAGNOSIS N14PAAE

The engine control unit monitors the input/output signals (some signals at all times and the others under specified conditions) of the engine control unit.
When it is noticed that an irregularity has continued for a specified time or longer from when the irregular signal is initially monitored. Passing a certain number, the engine control unit judges that an irregularity has occurred, memorizes the malfunction code, and outputs the signal to the self-diagnosis output terminal.
There are 14 diagnosis items, and the diagnosis results can be read out with a voltmeter.
Moreover, since memorization of the malfunction codes is backed up directly by the battery, the diagnosis results are memorized even if the ignition key is turned off. The malfunction codes will, however, be erased when the battery terminal or the engine control unit connector is disconnected.

**Caution**
**If the sensor connector is disconnected with the ignition switch turned on, the malfunction code is memorized. In this case, disconnect the battery terminal (–) for 10 seconds or more, and the diagnosis memory will be erased.**

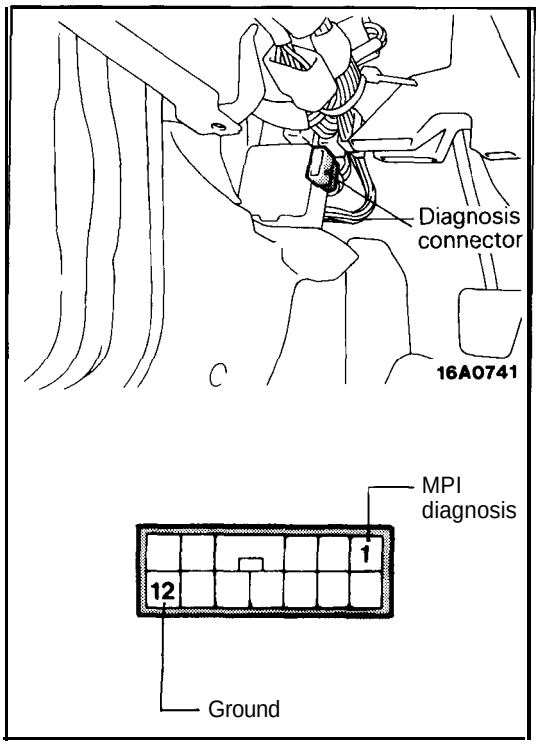
The 14 diagnosis items are provided as follows, and if plural items are activated, they are all indicated sequentially from the smallest code number.

| Malfunction code | Diagnosis item | Malfunction code | Diagnosis item |
|---|---|---|---|
| 11 | Oxygen sensor | 24 | Vehicle speed sensor (reed switch) |
| 12 | Air flow sensor | 25 | Barometric pressure sensor |
| 13 | Intake air temperature sensor | 31 | Detonation sensor <Turbo> |
| 14 | Throttle position sensor | 41 | Injector |
| 21 | Engine coolant temperature sensor | 42 | Fuel pump |
| 22 | Crank angle sensor | 43 | EGR <California> |
| 23 | Top dead center sensor | 44 | Ignition coil |

## CHECK PROCEDURE (SELF-DIAGNOSIS) N14PCAE2

### Precautions for Operation

(1) When battery voltage is low, no detection of failure is possible. Be sure to check the battery for voltage and other conditions before starting the test.
(2) Diagnosis item is erased if the battery or the engine control unit connector is disconnected. Do not disconnect the battery before the diagnosis result is completely read.
(3) After check and correction are over, disconnect ground cable for 10 seconds or more from negative terminal of battery and connect it again to make sure that failure code is erased.




### INSPECTION PROCEDURE – USING VOLTMETER N14PCAG2

(1) Connect an analogue voltmeter to the self-diagnosis connector.
(2) Turn ignition switch to ON, and indication of engine control unit memory contents will immediately start. If the system is in normal condition, pointer of voltmeter indicates normal pattern. If any abnormality is in memory, the pointer of voltmeter will deflect, indicating abnormal item as described in "Diagnosis Chart".
After recording the abnormal item, check and repair each part according to the check items in "Diagnosis Chart".
(3) If the defective parts have been repaired, disconnect the negative terminal of battery cable for 10 seconds or more and connect it again to make sure that the abnormal code has been erased.

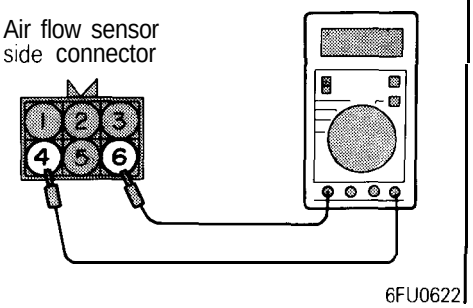
### DIAGNOSIS CHART (FAULT TREE) N14PRAD

| output ıreference order | Diagnosis item | Diagnosis code | | | Check item (Remedy) |
|---|---|---|---|---|---|
| | | Output signal pattern | No. | Memory | |
| 1 | Engine control unit | H – – (Replace unit) L 12A0104 | | engine | control |
| 2 | Oxygen sensor | : - J - I - J - 12A0104 | 11 | Retained | • Harness and connector<br>• Oxygen sensor<br>o Fuel pressure<br>• Injectors (Replace if defective)<br>• Intake air leaks |
| 3 | Air flow sensor | H L 12A0104 | 12 | Retained | • Harness and connector (If harness and connector are normal, replace air flow sensor assembly.) |
| 4 | **Intake** air temperature sensor | H L 12A0104 | 13 | Retained | • Harness and connector<br>• Intake air temperature sensor |
| 5 | Throttle position sensor | H L 12A0104 | 14 | Retained | • Harness and connector<br>• Throttle position sensor<br>• Idle position switch |
| 6 | Engine coolant temperature sensor | H L 12A0107 | 21 | Retained | • Harness and connector<br>• Engine coolant temperature sensor |

| output reference order | Diagnosis item | Diagnosis code | | | Check item (Remedy) |
|---|---|---|---|---|---|
| | | Output signal pattern | No. | Memory | |
| 7 | Crank angle sensor |  12A0107 | 22 | Retained | • Harness and connector (If harness and connector are normal, replace crank angle sensor assembly.) |
| 8 | Top dead center sensor (No. 1 and No. 4 cylinder) |  12A0107 | 23 | Retained | • Harness and connector (If harness and connector are normal, replace crank angle sensor assembly.) |
| 9 | Vehicle speed sensor (reed switch) |  12A0107 | 24 | Retained | • Harness and connector<br>• Vehicle speed sensor (reed switch) |
| 10 | Barometric pressure sensor |  12A0107 | 25 | Retained | • Harness and connector (If harness and connector are normal, replace barometric pressure sensor assembly.) |
| 11 | Detonation sensor <Turbo> |  12R0468 | 31 | Retained | • Harness and connector<br>• Detonation sensor |
| 12 | Injector |  12A0105 | 41 | Retained | • Harness and connector<br>• Injector coil resistance |
| 13 | Fuel pump |  12A0105 | 42 | Retained | • Harness and connector<br>• Control relay |
| 14 | EGR <California> |  12A0105 | 43 | Retained | • Harness and connector<br>• EGR temperature sensor<br>• EGR valve<br>• EGR valve control solenoid valve<br>• EGR valve control vacuum |
| 15 | Ignition coil |  12A0105 | 44 | Retained | • Harness and connector<br>• Ignition coil<br>• Power transistor |
| 16 | Normal state |  12A0104 | – | – | – |

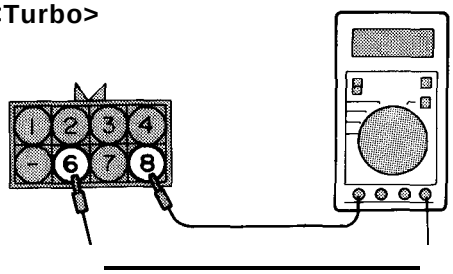
NOTE
Replace the engine control unit if a malfunction code is output although the inspection reveals that there is no problem with the check items.

<Non-Turbo>

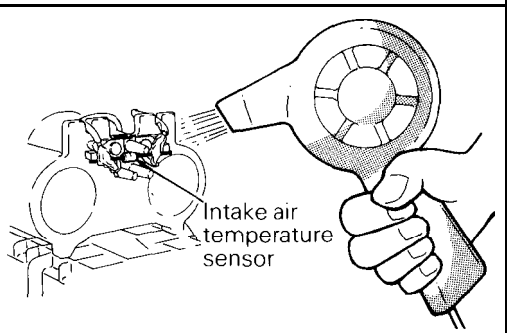



6FU0622

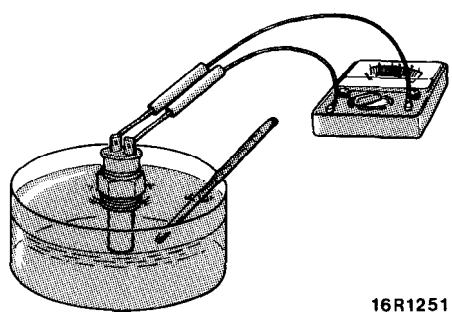
<Turbo>




6FU0623




ECI60(



16R1251

## INTAKE AIR TEMPERATURE SENSOR

N14QHAB

### INSPECTION

(1) Disconnect the air flow sensor connectors.
(2) Measure resistance between terminals ④ and ⑥ <Non-Turbo>
(3) Measure resistance between terminals ⑥ and ⑧ <Turbo>

| Temperature °C (°F) | Resistance kΩ |
|---|---|
| 0 (32) | 6.0 |
| 20 (68) | 2.7 |
| 80 (176) | 0.4 |

(4) Measure resistance while heating the sensor using a hair drier.

| Temperature °C (°F) | Resistance kΩ |
|---|---|
| Higher | Smaller |

(5) If the value deviates from the standard value or the resistance remains unchanged, replace the air flow sensor assembly.

## ENGINE COOLANT TEMPERATURE SENSOR

N14QABE1

INSPECTION

(1) Remove engine coolant temperature sensor from the intake manifold.
(2) With temperature sensing portion of engine coolant temperature sensor immersed in hot water, check resistance.

| Temperature °C (°F) | Resistance kΩ |
|---|---|
| 0 (32) | 5.9 |
| 20 (68) | 2.5 |
| 40 (104) | 2.7 |
| 80 (176) | 0.3 |

(3) If the resistance deviates from the standard value greatly, replace the sensor.

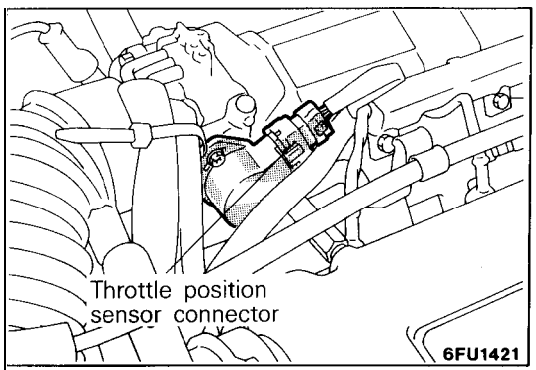
**INSTALLATION**

(1) Apply specified sealant to threaded portion and tighten to specified torque.

**Specified sealant: MOPAR Part No.4318034 or equivalent**

**Specified torque: 20 – 40 Nm (15 – 29 ft.lbs.)**

(2) Fasten harness connectors securely.



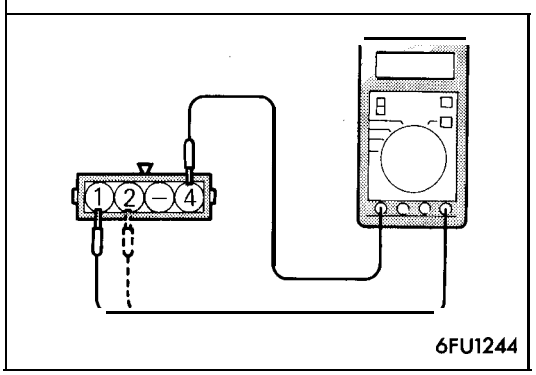

## THROTTLE POSITION SENSOR N14QBBK1

**INSPECTION**

(1) Disconnect the throttle position sensor connector.

(2) Measure resistance between terminal ④ (sensor ground) and terminal ① (sensor power).

**Standard value: 3.5 – 6.5 kΩ**

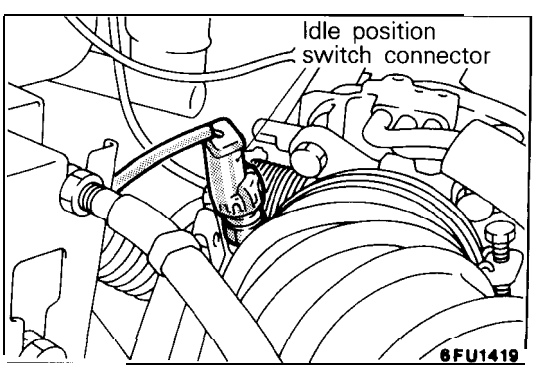



(3) Connect a pointer type ohmmeter between terminal ④ (sensor ground) and terminal ② (sensor output).

(4) Operate the throttle valve slowly from the idle position to the full open position and check that the resistance changes smoothly in proportion with the throttle valve opening angle.

(5) If the resistance is out of specification, or fails to change smoothly, replace the throttle position sensor.

**Throttle position sensor installation torque: 1.5 – 2.5 Nm (1.1 – 1.8 ft.lbs.)**




## IDLE POSITION SWITCH N14QKAEa

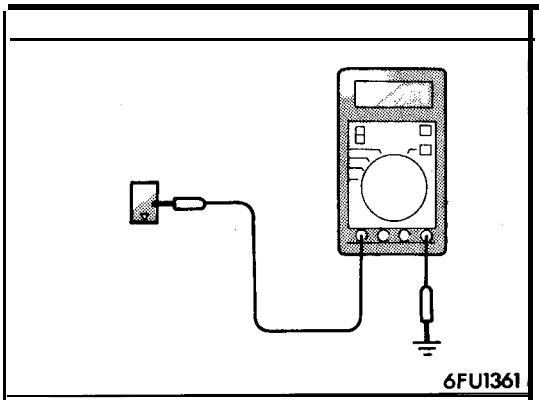
**INSPECTION**

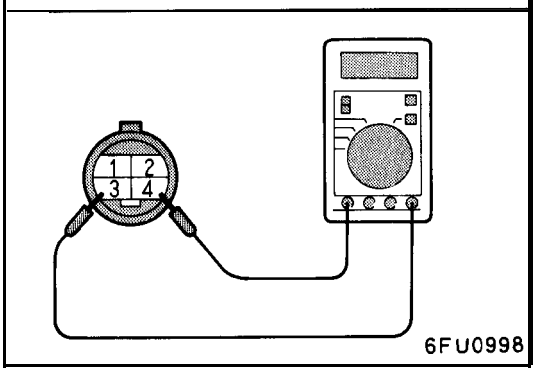
(1) Keeping the acceleration pedal released, check that the throttle valve lever or the idle position switch is pushed.

NOTE
If it is not pushed, adjust the idle position switch (fixed speed adjusting screw). (Refer to P.14-52.)

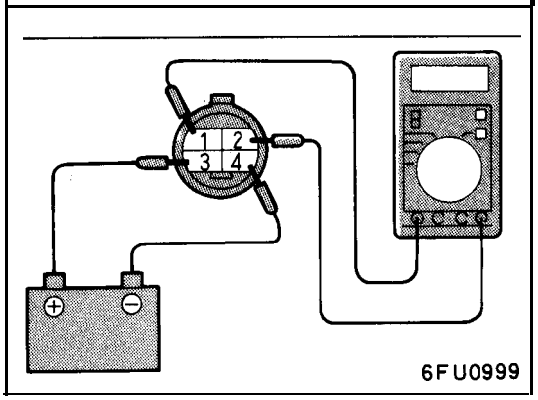
(2) Disconnect the idle position switch connector.

(3) Check the continuity between terminal ① to the ground.


6FU1361



6FU0998



6FU0999

| Accelerator pedal | Continuity |
|---|---|
| Depressed | Non-conductive (∞ Ω) |
| Released | Conductive (0 Ω) |

(4) Replace the idle position switch if faulty.

NOTE
For replacement procedure, refer to the idle position switch (fixed speed adjusting screw) adjustment section (P.14-52.).

## OXYGEN SENSOR N140D8J

### INSPECTION

(1) Disconnect the oxygen sensor connector.
(2) Check that there is continuity [approx. 12 Ω at 20°C (68°F)] between oxygen sensor connector terminal ③ and terminal ④.
(3) If there is no continuity, replace the oxygen sensor.
(4) Warm up the engine until the engine coolant temperature exceeds 80°C (176°F).
(5) Use jumper wires to connect oxygen sensor terminal ③ and terminal ④ to the battery ⊕ terminal and ⊖ terminal.

**Caution**
**Be very careful when connecting the jumper wires because the oxygen sensor will be damaged if a mistake is made in the connecting terminals.**

(6) Connect a digital voltmeter between terminal ① and terminal ②.
(7) While repeatedly racing the engine, measure the 'output voltage of the oxygen sensor.

| Engine | Oxygen sensor output voltage | Remark |
|---|---|---|
| When racing engine | 0.6–1.0 V | When the air/fuel mixture ratio becomes rich by repeatedly racing the engine, the normal oxygen sensor output is approximately 1 V. |

### INSTALLATION

1. For removal and installation of oxygen sensor, refer to GROUP 11 – Exhaust Manifold.
2. Oxygen sensor tighten to specified torque.

**Specified torque: 40 – 50 Nm (29 – 36 ft.lbs.)**

## EGR TEMPERATURE SENSOR N14RCHAa

Refer to GROUP 25 – Exhaust Gas Recirculation System.

## VEHICLE SPEED SENSOR N14QEBBa

Refer to GROUP 8 – Meters and Gauges.

## AIR CONDITIONER SWITCH N14QQABa

Refer to GROUP 8 – Column Switch.

## POWER STEERING OIL PRESSURE SWITCH N14RCJB

Refer to GROUP 19 for power steering system inspection.

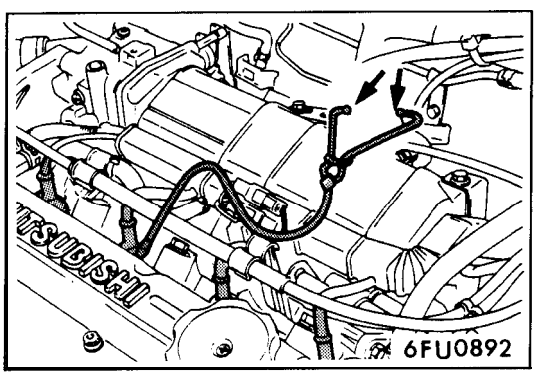
## INJECTORS N14QTAH

### CHECKING OPERATION SOUND

Using a sound-scope, check the operation sound ("chi-chi-chi") of the injectors during idling or during cranking.
Check to be sure that the operation sound increases when the engine speed is increased.

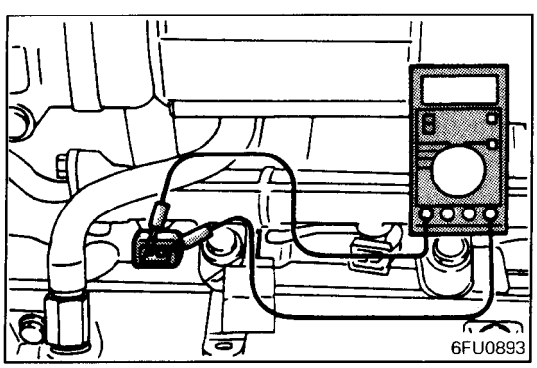
**Caution**
**Note that the sounds of other injectors may be heard even though the injector being checked is not operating, so care must be taken when checking.**

NOTE
If the operation sounds cannot be heard, check the injector activation circuit.
If this circuit is normal, there is probably a malfunction of the injector or of the engine control unit.




### MEASURING OF RESISTANCE BETWEEN TERMINALS

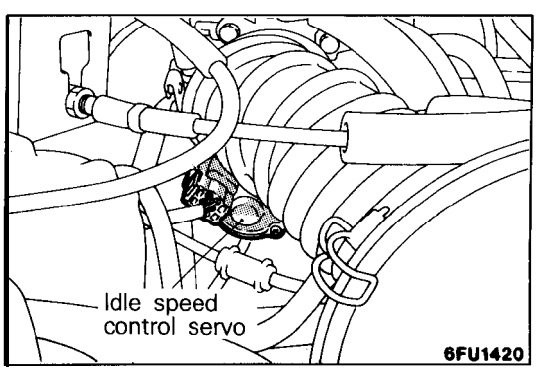
(1) Disconnect the connector for the injectors.
(2) Measure the resistance between terminals.
**Standard value:**
**<Non-Turbo> 13 – 16 Ω [at 20°C (68°F)]**
**<Turbo> 2 – 3 Ω [at 20°C (68°F)]**
(3) Connect the connector for the injectors.

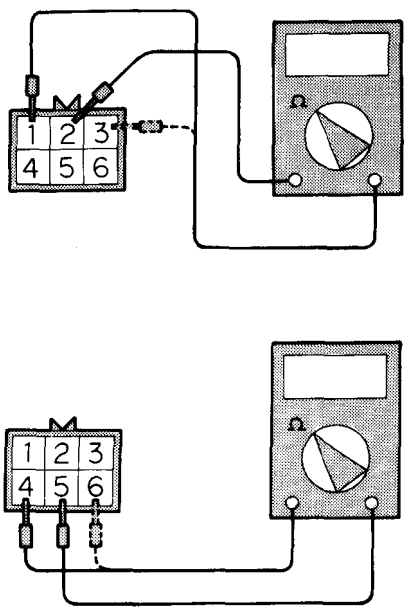



## IDLE SPEED CONTROL SERVO N14QUAD

### CHECKING OPERATING SOUND

(1) Check that when the ignition switch is placed in the ON position (the engine not started), the operating sound of the stepper motor can be heard over the idle speed control servo.
(2) If no operating sound can be heard, check the stepper motor drive circuit.
(If the circuit is good, a defective stepper motor or engine control unit is suspected.)





7FU0010

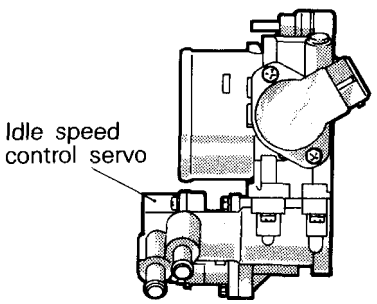
### CHECKING COIL RESISTANCE

(1) Disconnect the idle speed control servo connector.
(2) Measure the resistance between terminals ② and ① or between terminals ② and ③ of the idle speed control servo connector.

**Standard resistance: 28 – 33 Ω [at 20°C (68°F)]**

(3) Measure the resistance between terminals ⑤ and ⑥ or between terminals ⑤ and ④ of the idle speed control servo connector.

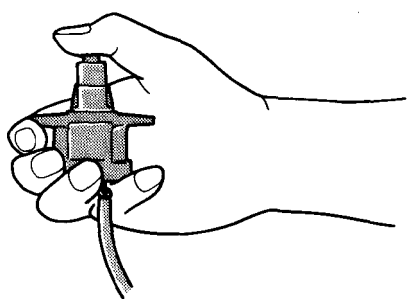
**Standard resistance: 28 – 33 Ω [at 20°C (68°F)]**

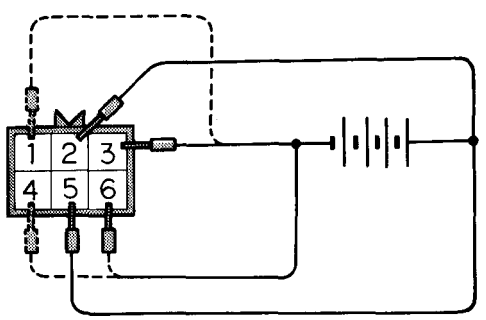


6FU1426

### OPERATION CHECK

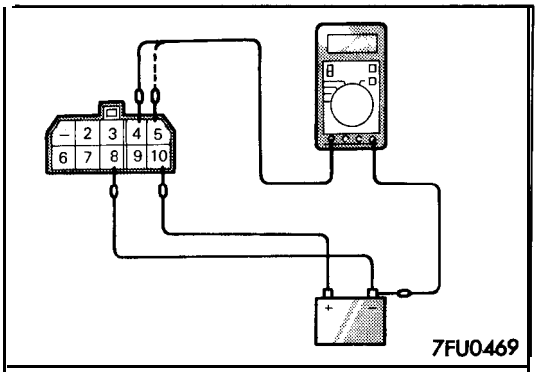
(1) Remove the throttle body.
(2) Remove the stepper motor.

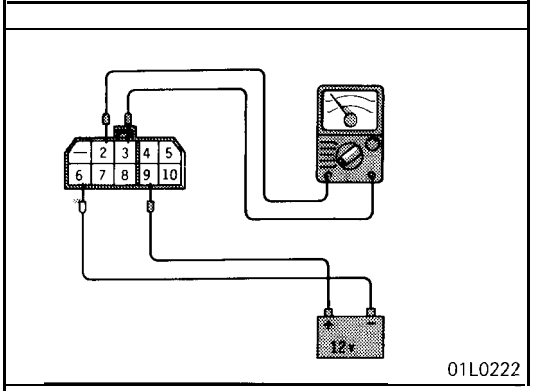


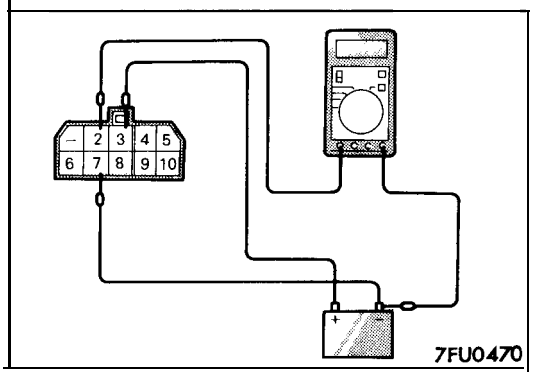


7FU0011

(3) Apply voltage as indicated below and check for presence/absence of vibration due to stepper motor operation.
   1. Connect the positive terminal of the power supply (about 6V) to terminals ② and ⑤ of the connector.
   2. Connect the negative terminal of the power supply to terminals ③ and ⑥.
   3. Connect the negative terminal to terminals ① and ⑥.
   4. Connect the negative terminal to terminals ① and ④.
   5. Connect the negative terminal to terminals ③ and ④.
   6. Connect the negative terminal to terminals ③ and ⑥.
   7. Connect the terminals in sequence from step 6 to 2.
(4) If vibration is felt as a result of the inspections, the stepper motor can be judged as normal.




## CONTROL RELAY

N14QYAC

### INSPECTION

(1) Remove the control relay.
(2) Use jumper wires and connect control relay terminal ⑩ to the battery ⊕ terminal and terminal ⑧ to the battery ⊖ terminal.

**Caution**
**Be very careful when connecting the jumper wires because the relay will be damaged if a mistake is made with the contact terminals.**

(3) With battery ⊖ terminal jumper wire connected and disconnected, measure the voltage at control relay terminals ④ and ⑤.

| Jumper wire | Terminal voltage ④ | Terminal voltage ⑤ |
|---|---|---|
| Connection | SV | SV |
| Not connected | 0V | 0V |

(4) Use jumper wires to connect control relay terminal ⑨ to the battery ⊕ terminal and terminal ⑥ to the battery ⊖ terminal.
(5) With the battery ⊖ terminal jumper wire connected and disconnected, measure the voltage at control relay terminals ② and ③.

| Jumper wire | Continuity between terminals ②–③ |
|---|---|
| Connection | Yes |
| Not connected | No |

(6) Use jumper wires and connect control relay terminal ③ to the battery ⊕ terminal and terminal ⑦ to the battery ⊖ terminal.
(7) With the battery ⊖ terminal jumper wire disconnected, measure the voltage at control relay terminal ②.

| Jumper wire | Terminal voltage ② |
|---|---|
| Connection | SV |
| Not connected | 0V |

(8) Replace the control relay if faulty.

## POWER TRANSISTOR N14RCGA1

Refer to GROUP 8 – Ignition System

## AIR CONDITIONER POWER RELAY N14RCLB

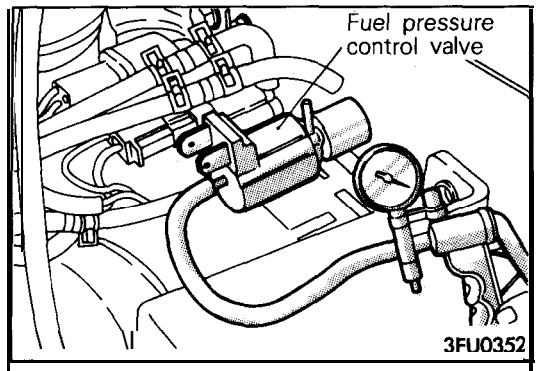
Refer to GROUP 24 – Air Conditioner.

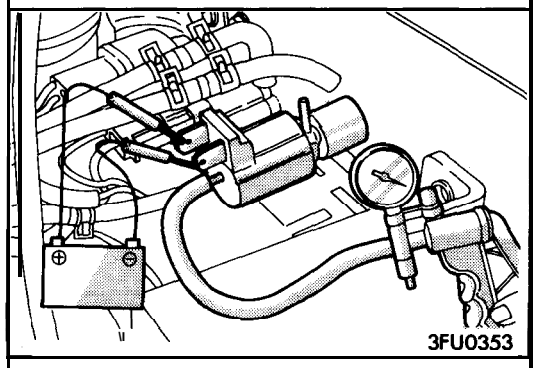
## PURGE CONTROL SOLENOID VALVE N14RCKA

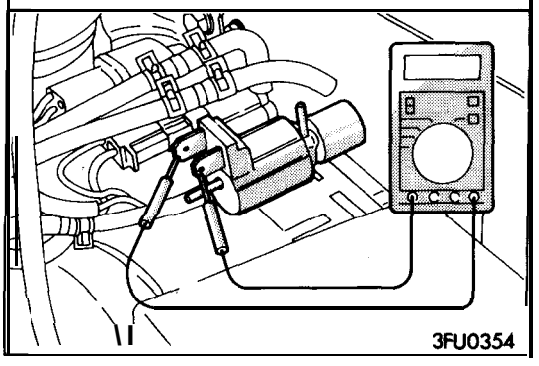
Refer to GROUP 25 – Evaporative Emission Control System.

## EGR CONTROL SOLENOID VALVE <California> N14RCLA

Refer to GROUP 25 – Exhaust Gas Recirculation System.




## FUEL PRESSURE CONTROL VALVE <Turbo> N14RCMAa

### OPERATIONAL CHECK

NOTE
Before the vacuum hoses are removed, make a mark on the hose for visual identification so that they can be reconnected in their original positions.

(1) Remove the vacuum hoses (blue stripes and black) from the solenoid valve.
(2) Disconnect the harness connector.

(3) Apply vacuum with a hand vacuum pump to the nipple to which the black vacuum hose was connected and check for air tightness both when a voltage is applied to the solenoid valve terminal and when the voltage is removed.

| Battery voltage | Other nipple of solenoid valve | Normal condition |
|---|---|---|
| When voltage is removed | Open | Vacuum leaks |
| | Blocked by finger | Vacuum is retained |
| When voltage is applied | Open | Vacuum is retained |

### CHECKING COIL RESISTANCE

Measure the coil resistance with a tester.

**Standard resistance: 36 – 46 Ω [at 20°C (68°F)]**

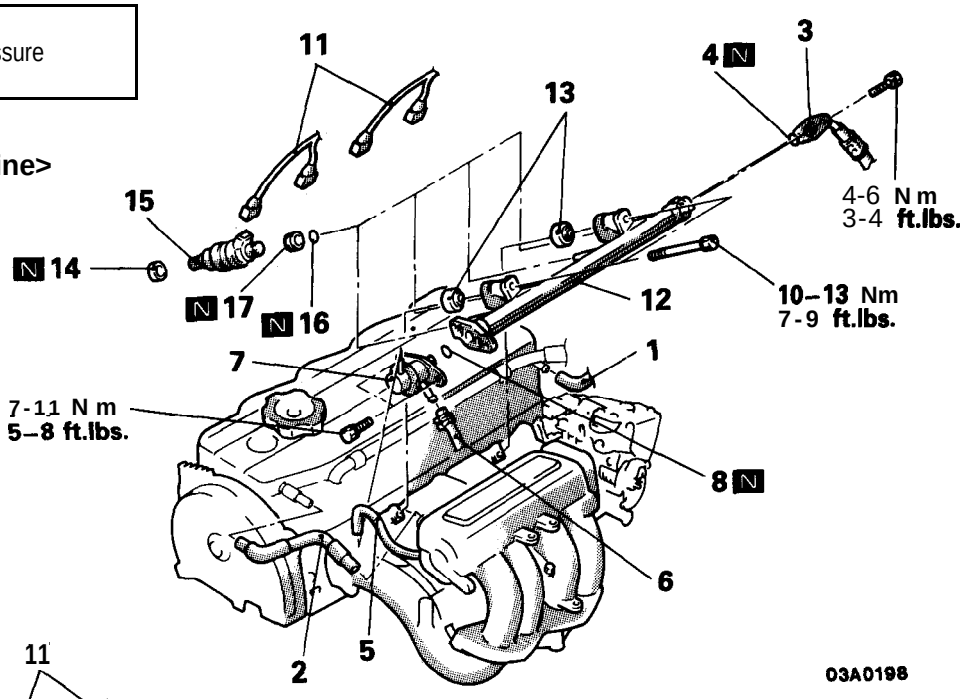
# INJECTOR

## REMOVAL AND INSTALLATION

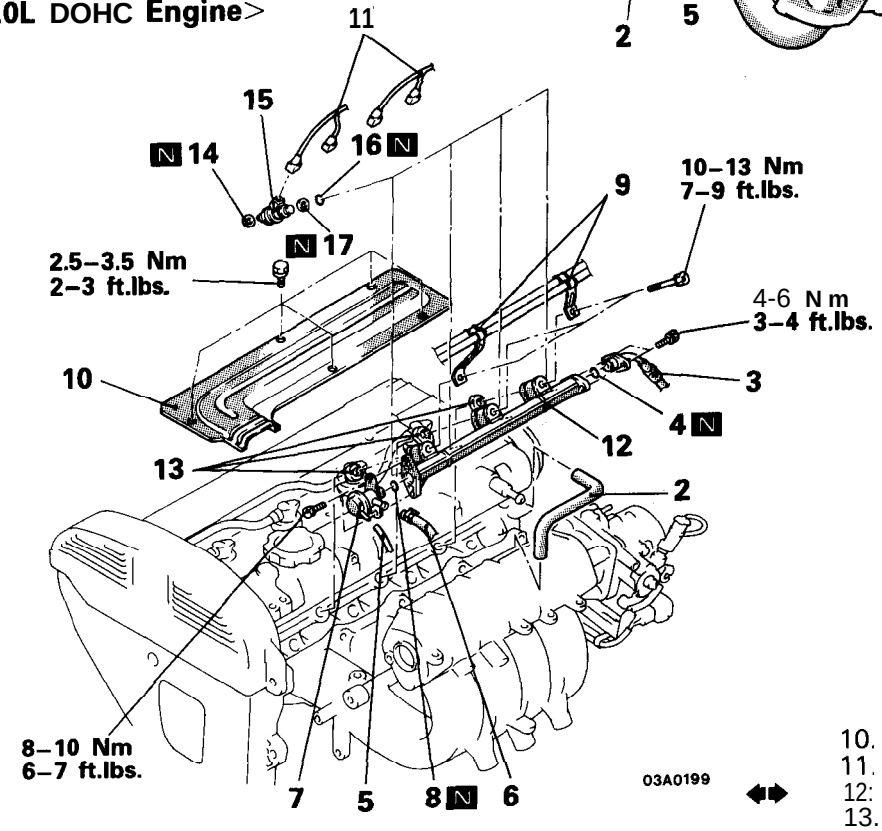
N14SA-A

**Post-installation Operation**
- Measurement of Fuel Pressure (Refer to P.14-44, 52.)

<1.8L Engine>




<2.0L DOHC Engine>




**Removal steps**

1. Connection for breather hose
2. Connection for PCV hose
◆◆ ◆◆ 3. Connection for high pressure fuel hose
4. O-ring
5. Connection for vacuum hose
6. Connection for fuel return hose
● + 7. Fuel pressure regulator
8. O-ring
9. Accelerator cable clamp
10. Center cover
11. Connection for control harness
◆◆ 12. Delivery pipe
13. Insulator
14. Insulator
◆◆ ● + 15. Injector
◆◆ 16. O-ring
● + 17. Grommet

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ●: Refer to "Service Points of Installation"
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL N14SBAD1

**3. DISCONNECTION OF THE HIGH PRESSURE FUEL HOSE**

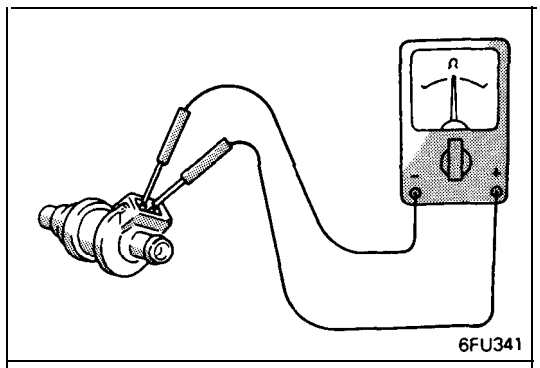
Bleed the residual pressure within the fuel pipe line so as to prevent the flow of fuel.
For information concerning the method to be followed for bleeding the residual pressure, refer to P.14-44.

**Caution**
**Cover the hose connection with rags to prevent splash, of fuel that could be caused by some residual pressure in the fuel pipe line.**

**12. REMOVAL OF DELIVERY PIPE/ 15. INJECTOR**

Remove the deliver-y pipe (with the injectors attached to it).

**Caution**
**Care must be taken, when removing the delivery pipe, not to drop the injector.**



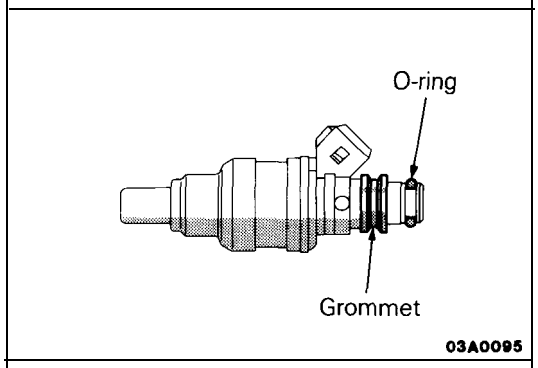

## INSPECTION N14NGAA

**INJECTORS**

(1) Measure resistance between terminals of injector using a circuit tester.

**Standard value:**
**13–16Ω [at 20°C (68°F)] <1.8L Engine, 2.0L DOHC Engine (Non-Turbo)>**
**2–3Ω [at 20°C (68°F)] <2.0L DOHC Engine (Turbo)>**

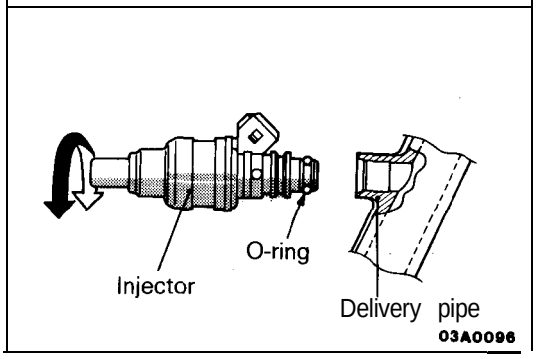
(2) If the resistance is out of specification, replace the injector.




## SERVICE POINTS OF INSTALLATION N14SDAE1

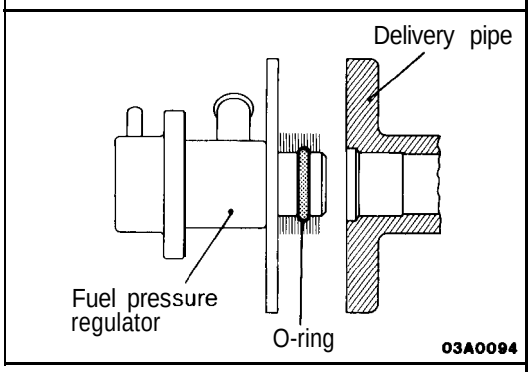
**17. INSTALLATION OF GROMMET/16. O-RING/15. INJECTOR**

(1) After installation of the grommet and O-ring (in that sequence) to the injector, apply light oil or petrol to the O-ring.



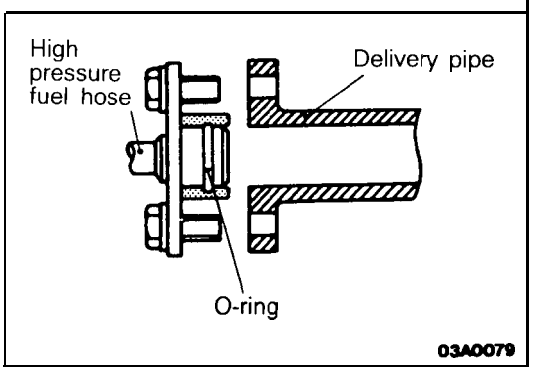

(2) While turning the injector to the left and right, install it to the delivery pipe.
(3) Check to be sure that the injector turns smoothly.

**Caution**
**If it does not turn smoothly, the O-ring may be trapped remove the injector and then re-insert it into the delivery pipe and check once again.**




**7. INSTALLATION OF FUEL PRESSURE REGULATOR**

When connecting the fuel-pressure regulator to the delivery pipe, apply light oil or petrol to the O-ring, and then insert, being careful not to damage the O-ring.




**3. CONNECTION OF THE HIGH PRESSURE FUEL HOSE**

When connecting the high pressure fuel hose to the delivery pipe, apply petrol to the hose union, and then insert, being careful not to damage the O-ring.

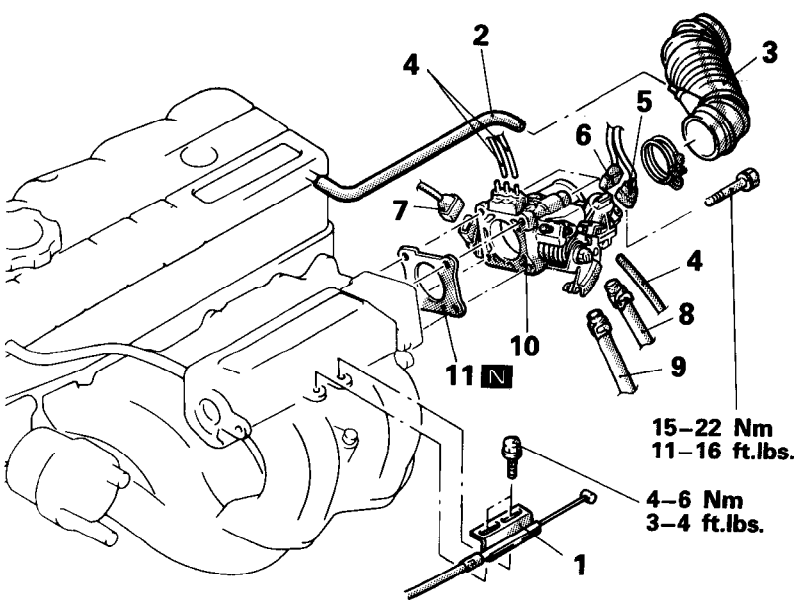
# THROTTLE BODY <1.8L Engine>

N14SA-A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

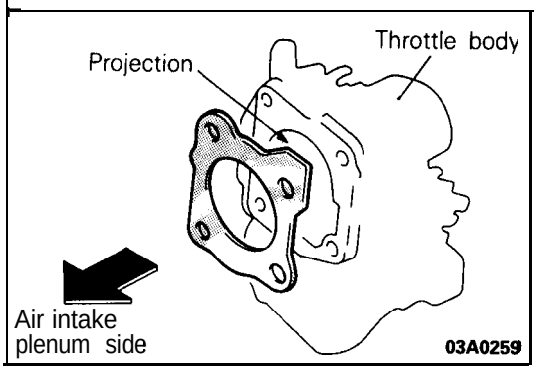
**Post-installation Operation**
- Supplying of Engine Coolant (Refer to GROUP 0–Maintenance Service.)




**Removal steps**

- ● 4 1. Connection for accelerator cable
  2. Connection for breather hose
  3. Connection for air intake hose
  4. Connection for vacuum hose
  5. Connection for ISC motor connector
  6. Connection for TPS connector
  7. Connection for MPS connector
  8. Connection for water hose
  9. Connection for water by-pass hose
  10. Throttle body
- ● 4 11. Gasket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".
(3) N: Non-reusable parts




## SERVICE POINTS OF INSTALLATION N14SDAM

### 11. INSTALLATION OF GASKET

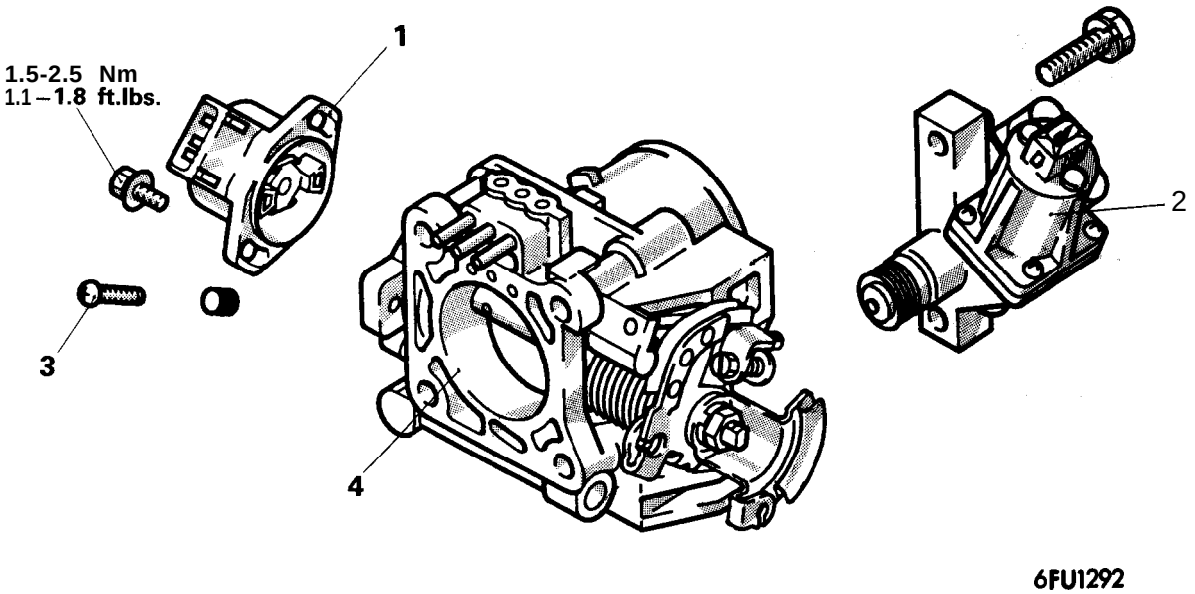
Install the gasket so that the projection is where shown in the figure.

**Caution**
**Poor idling, etc. may result if the gasket is installed incorrectly.**

### 1. ACCELERATOR CABLE ADJUSTMENT

For information concerning adjustment of the accelerator cable, refer to P.14-106.

## DISASSEMBLY AND REASSEMBLY N14SE-A



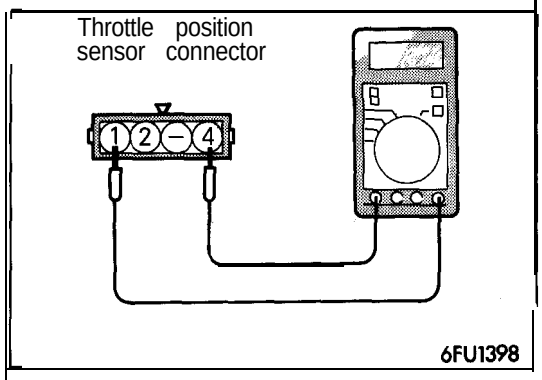

**Disassembly steps**

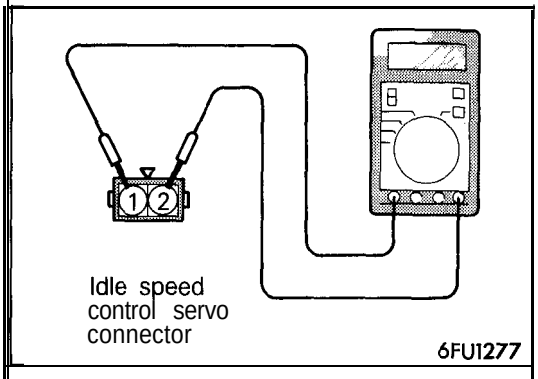
◆◆ 1. Throttle position sensor
2. Idle speed control servo assembly
3. Throttle valve set screw
4. Throttle body

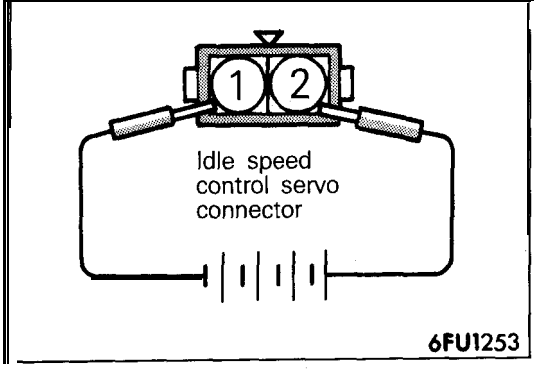
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● +: Refer to "Service Points of Reassembly".

## SERVICE POINTS OF DISASSEMBLY N14SFAE

**Caution**
1. **When loosening a Phillips screw which has been firmly tightened, use a Phillips screwdriver that is an exact fit for the screw.**
2. **Do not remove the throttle valve.**
3. **Be careful when removing the throttle position sensor screw as it has been coated with adhesive.**




## INSPECTION

N14SHACa

### THROTTLE POSITION SENSOR CONTINUITY CHECK

(1) Measure resistance between terminals ① and ④ of the throttle position sensor using a circuit tester.

**Standard value: 3.5-6.5 kΩ**

(2) Check sensor body for cracks and damages.

### IDLE SPEED CONTROL SERVO CONTINUITY CHECK

Measure resistance between terminals ① and ② using a circuit tester.

**Standard value: 5-35 Ω [at 20°C (68°F)]**

### IDLE SPEED CONTROL SERVO OPERATION INSPECTION

**Caution**

**Apply only a 6V DC or lower voltage. Application of higher voltage could cause locking of the servo gears.**

(1) Connect 6V DC to terminals ① and ② and check that the idle speed control servo extends and retracts by itself.

| | Idle speed control servo motion |
|---|---|
| When terminal ① is ⊕ | Retracts |
| When terminal ② is ⊕ | Extends |

(2) If the idle speed control servo does not move, replace the idle speed control servo assembly.

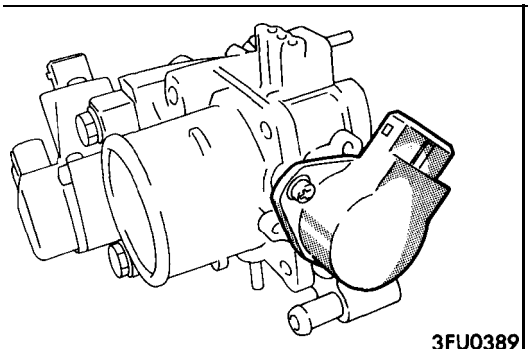
## THROTTLE BODY COMPONENTS CLEANING

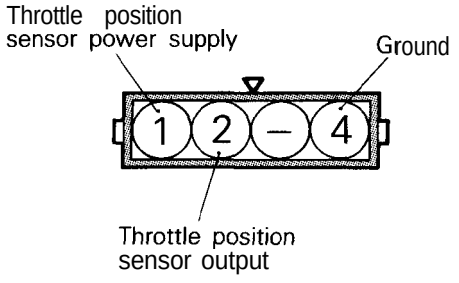
(1) Clean all components, but the following components must not be cleaned by using a cleaning agent.

- Throttle position sensor
- Idle speed control servo assembly

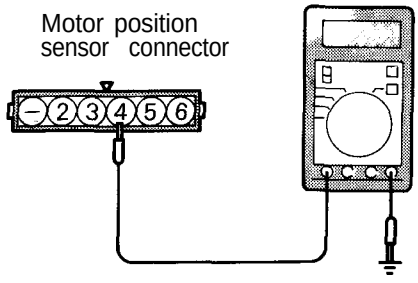
The insulation of these components will be damaged if they are immersed in a cleaning agent. They should be cleaned by using only a piece of cloth.

(2) Check for clogging of the vacuum port or passage. Clean the vacuum passage by using compressed air.


3FU0389



7FU0535



6FU1247

## SERVICE POINTS OF REASSEMBLY N14SGADa

### 1. INSTALLATION OF THROTTLE POSITION SENSOR

(1) Install throttle position sensor on throttle body and temporarily tighten screw.

**Caution**
**Adjust the throttle position sensor and idling speed control according to the engine load condition.**

(2) Check correct installation of the throttle position sensor. While moving the throttle lever in both open and close directions, that resistance between terminals ① and ② or ② and ④ changes. If resistance changes smoothly, the throttle position sensor has been installed correctly.

## AFTER REASSEMBLY INSPECTION

### IDLE POSITION SWITCH CONTINUITY CHECK

(1) Using a circuit tester, check continuity between the body and terminal ④ when the throttle valve is fully closed and when fully opened.

| Throttle valve | Continuity |
|---|---|
| Fully closed | Conductive |
| Fully opened | Non-conductive |

(2) If otherwise than shown above, replace the idle speed control servo assembly.

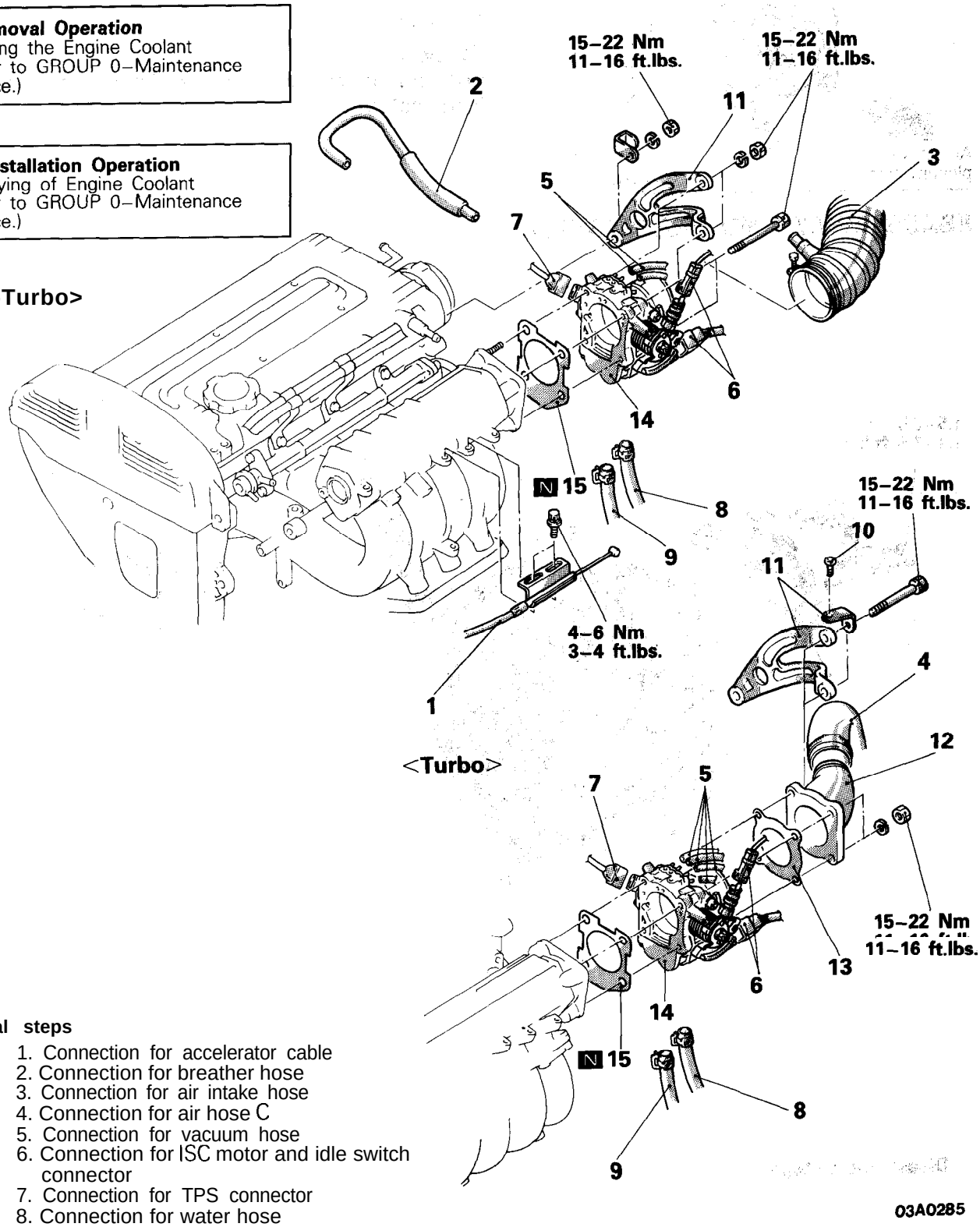
# THROTTLE BODY

M13SA--C

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining the Engine Coolant (Refer to GROUP 0–Maintenance Service.)

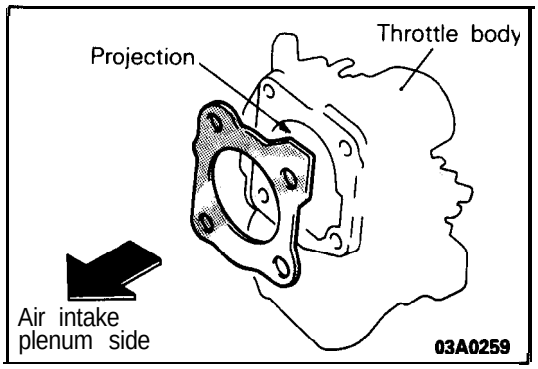
**Post-installation Operation**
- Supplying of Engine Coolant (Refer to GROUP 0–Maintenance Service.)




**Removal steps**

1. Connection for accelerator cable
2. Connection for breather hose
3. Connection for air intake hose
4. Connection for air hose C
5. Connection for vacuum hose
6. Connection for ISC motor and idle switch connector
7. Connection for TPS connector
8. Connection for water hose
9. Connection for water by-pass hose
10. Ground plate mounting screw
11. Throttle body stay and ground plate
12. Air fitting
13. Gasket
14. Throttle body
- * 15. Gasket

NOTE
(1) Reverse the removal procedures to reinstall
(2) ● : Refer to "Service Points of Installation".
(3) N : Non-reusable parts



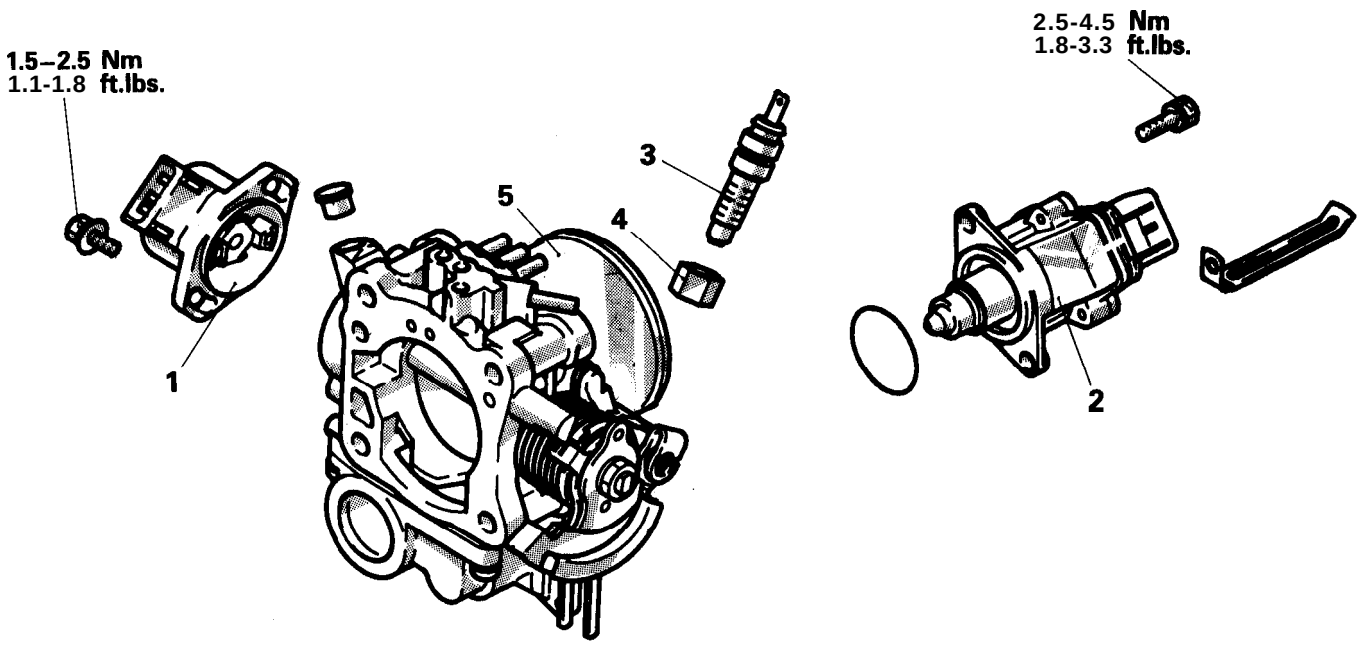

## SERVICE POINTS OF INSTALLATION N14SDAU

### 15. INSTALLATION OF GASKET

Install the gasket so that the projection is where shown in the figure.

**Caution**
**Poor idling, etc. may result if the gasket is installed incorrectly.**

## DISASSEMBLY AND REASSEMBLY N14SE-B




**Disassembly steps**

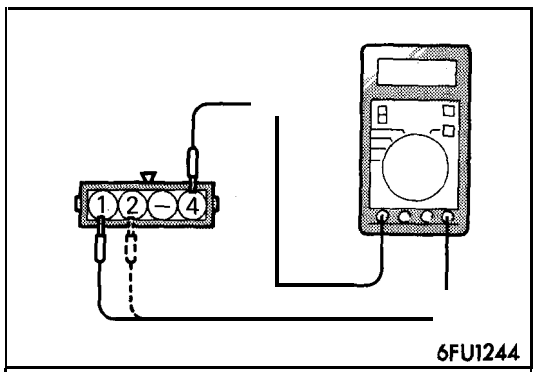
1. Throttle position sensor
2. Idle position speed control servo
3. Idle position switch
4. Adjusting nut
5. Throttle body

NOTE
Reverse the disassembly procedures to reassemble.

## SERVICE POINTS OF DISASSEMBLY N14SFAF

**Caution**

1. **When loosening a Phillips screw which, has been firmly tightened, use a Phillips screwdriverthat is an exact fit for the screw.**
2. **Do not remove the throttle valve.**
3. **Be careful when removing the throttle position sensor screw and the idle speed control servo- screw as they have been coated with adhesive.**



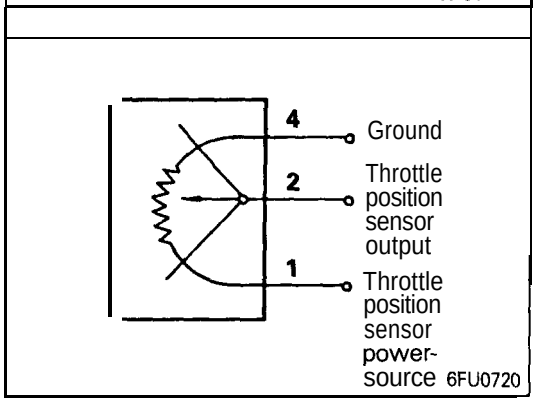
6FU1244

## INSPECTION N14SHAB

### THROTTLE POSITION SENSOR CONTINUITY TEST

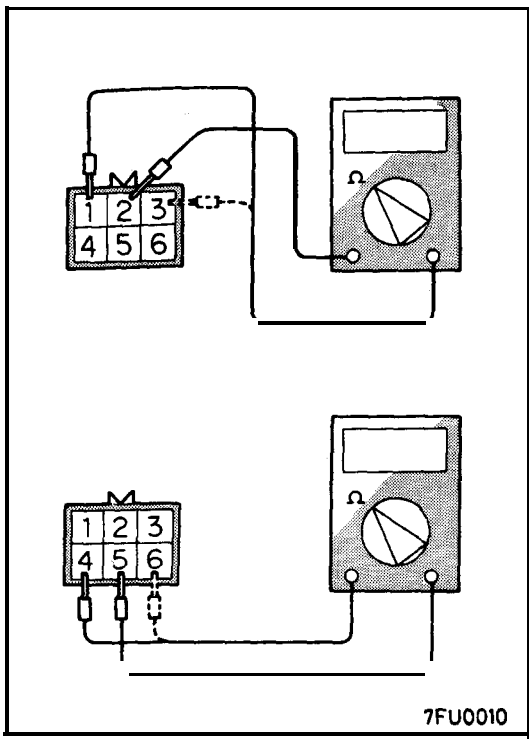
(1) Using a circuit tester, measure the resistance between terminal ① and terminal ④ of the throttle position sensor connector.

**Standard resistance: 3.5–6.5 kΩ**



6FU0720

(2) While the circuit tester is connected to terminals ① and ②, or ② and ④ of the throttle position sensor connector, slowly operate the throttle valve until it is at its maximum open position and check that the resistance changes smoothly.



7FU0010

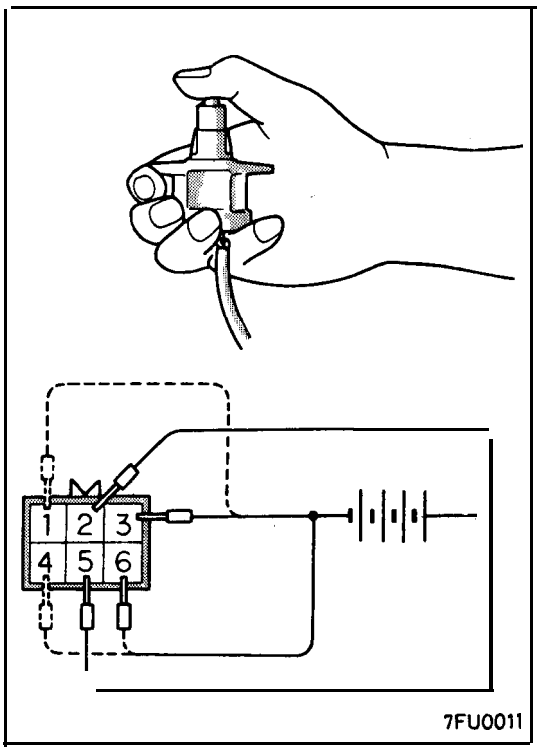
### IDLE SPEED CONTROL SERVO CONTINUITY CHECK

Measure the resistance between each of the terminals.

**Standard resistance:**

**Between terminal ② and either terminal ① or ③ 28-33 Ω [at 20°C (68°F)]**

**Between terminal ⑤ and either terminal ⑥ or ④ 28-33 Ω [at 20°C (68°F)]**



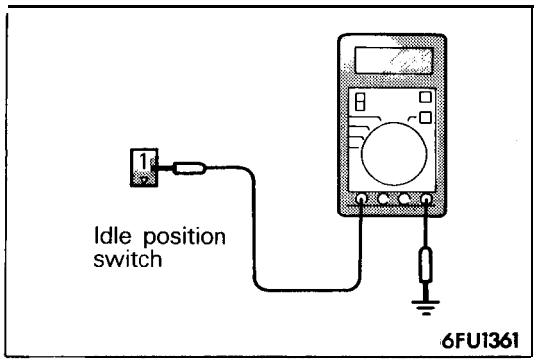

### IDLE SPEED CONTROL SERVO OPERATIONAL CHECK

(1) Connect the positive terminal of a DC power supply of approx. 6V to terminals ② and ⑤ of the idle speed control servo connector.
(2) Holding the idle speed control servo as indicated in the illustration, connect the negative terminal of the power supply to each pair of its terminals in the order given below, and ascertain whether or not small vibration is created due to the operation of the stepper motor.
   ① Connect the negative terminal of the power supply to terminal ③ and terminal ⑥.
   ② Connect the negative terminal of the power supply to terminal ① and terminal ⑥.
   ③ Connect the negative terminal of the power supply to terminal ① and terminal ④.
   ④ Connect the negative terminal of the power supply to terminal ③ and terminal ④.
   ⑤ Connect the negative terminal of the power supply to terminal ③ and terminal ⑥.
   ⑥ Repeat the test in the order from step 5 to 1.
(3) The stepper motor is functioning properly if vibration is felt each time.

## CLEANING THROTTLE BODY PARTS N14SIAA

(1) Clean all parts. A cleanser should not be used to clean the following parts:
   - Throttle position sensor
   - Idle speed control servo
   - Idle position switch

   Immersing these parts in cleanser damages the insulation. Wipe them with a cloth only.
(2) Check that the vacuum port and passage are not plugged up. Clean the vacuum passage with compressed air.




## INSPECTION AFTER REASSEMBLY

### IDLE POSITION SWITCH CONTINUITY CHECK

(1) Check the continuity between connector terminal ① and the body of the throttle position sensor both when the throttle valve is at its completely closed position and at maximum open position.

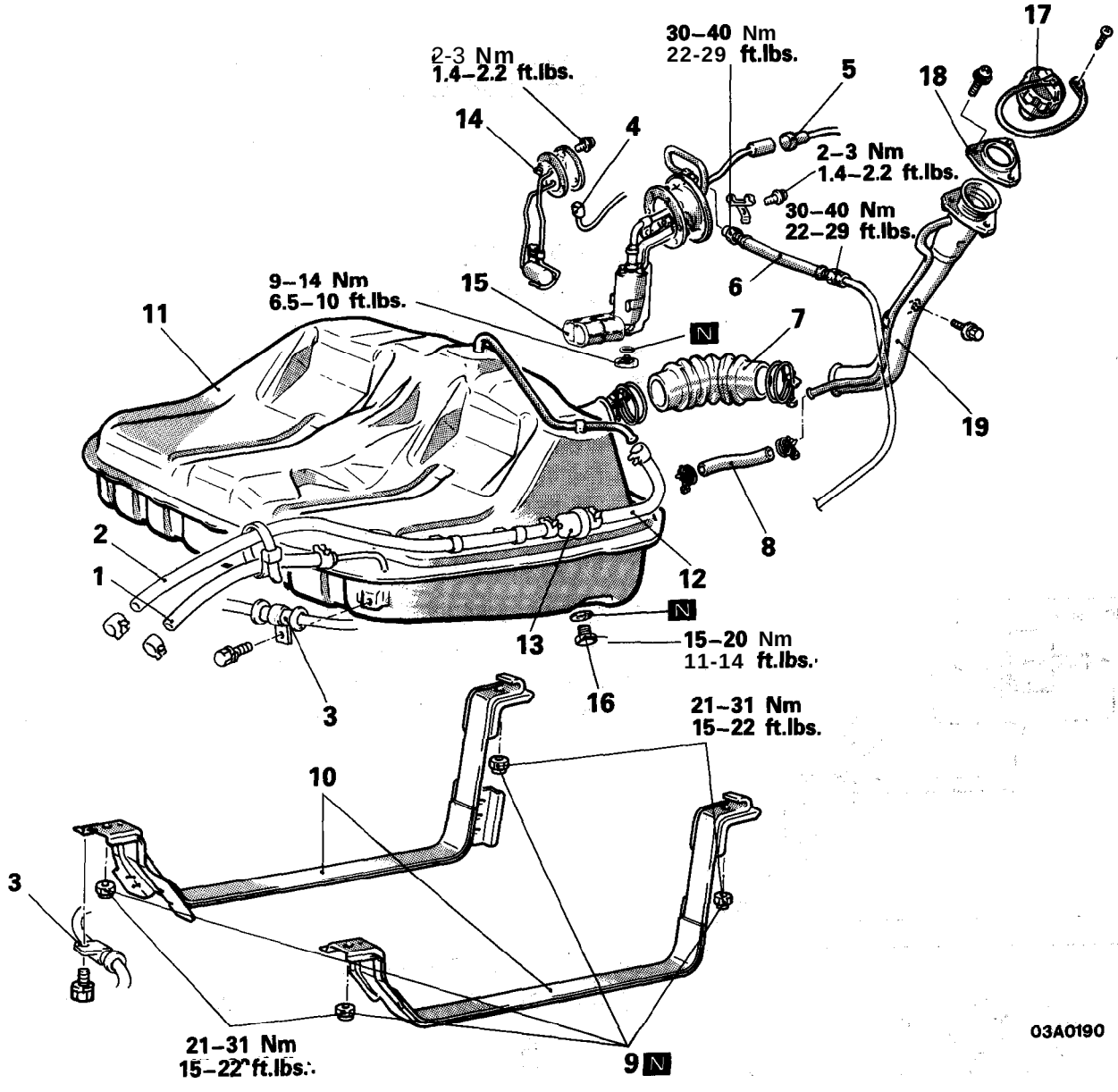
| Throttle valve | Continuity |
|---|---|
| Completely closed | Conductive |
| Fully opened | Non-conductive |

(2) If the results of the test do not conform to the above, replace the idle position switch.

# FUEL TANK <FWD>

N14GA--

## REMOVAL AND INSTALLATION




**Removal steps**

- ● +1. Return hose
- ◖ + 2. Vapor hose
- 3. Clamp
- 4. Fuel gauge unit connector
- 5. Electrical fuel pump connector
- ◖ +◖ q 6. High pressure fuel hose
- ● + 7. Filler hose
- ● + 8. Vapor hose
- ◆◆ 9. Self-locking nut
- 10. Tank band
- 11. Fuel tank
- ● + 12. Vapor hose
- ● + 13. Overfill limiter (Two-way valve)
- ◆◆ 14. Fuel gauge unit
- ● + 15. Electrical fuel pump
- 16. Drain plug
- 17. Fuel tank cap
- 18. Packing
- 19. Fuel filler neck

**Pre-removal Operation**
- Draining of the Fuel.
- Release of Residual Pressure from High Pressure Hose. (Refer to P.14-44.)

**Post-installation Operation**
- Measurement of Fuel Pressure (Refer to P.14-44, 52.)
- Supplying of the Fuel.

NOTE
(1) Reverse the removal procedures to reinstall,
(2) ◆◆: Refer to "Service Points of Removal":,,
(3) ◆◆: Refer to "Service Points of Installation .
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL N14GBAH

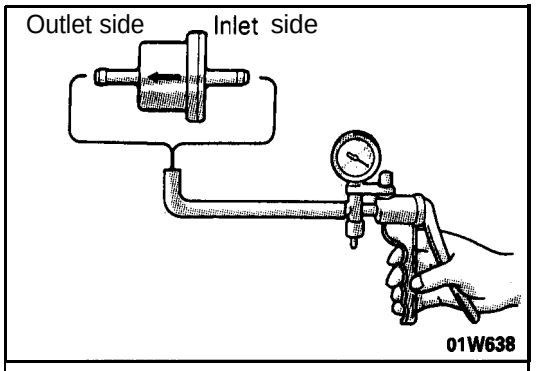
### 6. DISCONNECTION OF HIGH PRESSURE FUEL HOSE

**Caution**
**Cover the hose connection with rags to prevent splash of fuel that could be caused by some residual pressure in the fuel pipe line.**

## INSPECTION N14GCAI

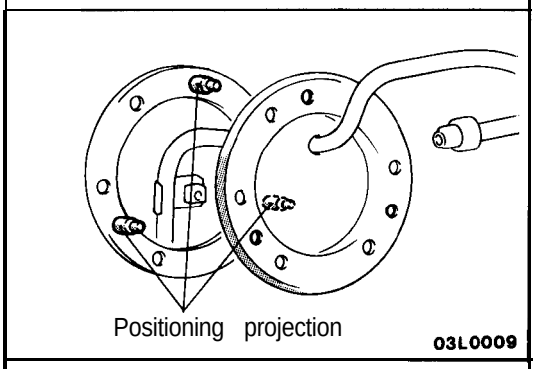
- Check the hoses and the pipes for crack or damage.
- Check the fuel tank cap for malfunction.
- Check the fuel tank for deformation, corrosion or crack.
- Check the fuel tank for dust or foreign material.

NOTE
If the inside of the fuel tank is to be cleaned, use any one of the following:
(1) Kerosene
(2) Trichloroethylene
(3) A neutral emulsion type detergent




### OVERFILL LIMITER (TWO-WAY VALVE)

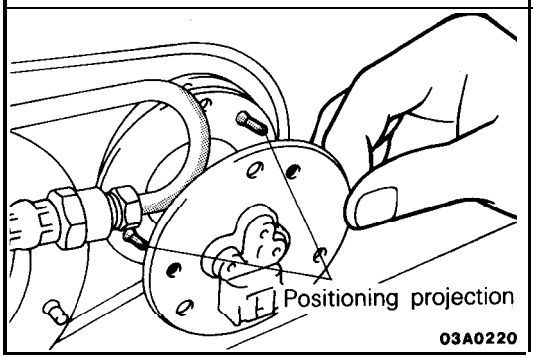
Set a hand vacuum pump at inlet side or outlet side; the valve is good if, when a negative pressure (vacuum) is applied, air flows after a slight negative pressure is initially maintained.




## SERVICE POINTS OF INSTALLATION. N14GDAL

### 15. INSTALLATION OF ELECTRICAL FUEL PUMP

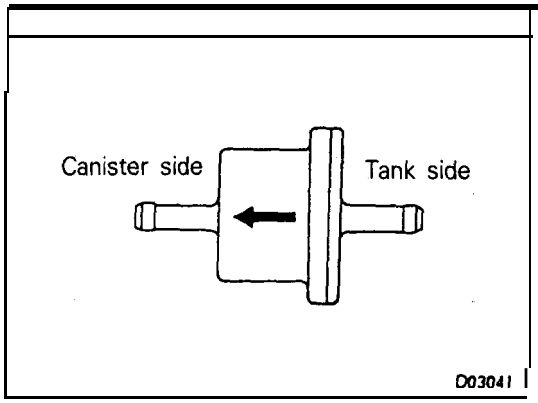
(1) Align the three positioning projections of the packing **with the holes in** the fuel pump.
(2) When the fuel pump is installed, the holding bolt at the lower side of the fuel tank should be installed first. Care should be taken at this time that the O-ring is not pinched.




### 14. INSTALLATION OF FUEL GAUGE UNIT

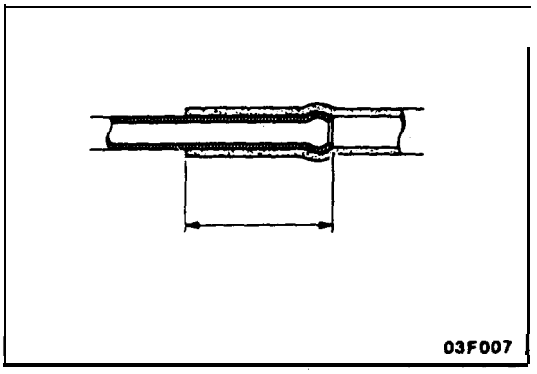
Align the two positioning projections of the packing with the holes in the fuel gauge unit.

**Caution**
**When mounting the fuel gauge unit, incline the float at the end leftward, and insert it into the fuel tank. Since the reserver cap is provided in the fuel tank, the fuel gauge unit will contact the reserver cap if the fuel gauge unit is inclined rightward during insertion.**




**13. INSTALLATION OF OVERFILL LIMITER (TWO-WAY VALVE)**

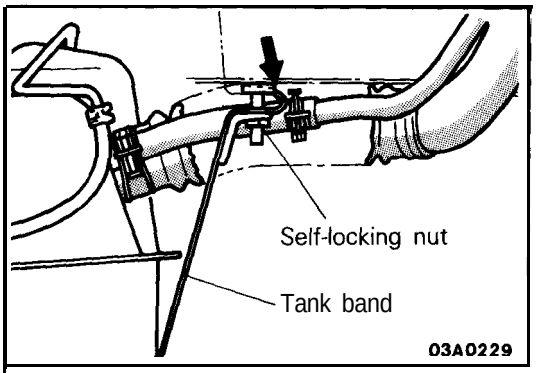
Install so that the overfill limiter is facing in the direction shown in the figure.




**12. CONNECTION OF VAPOR HOSE/1. RETURN HOSE**

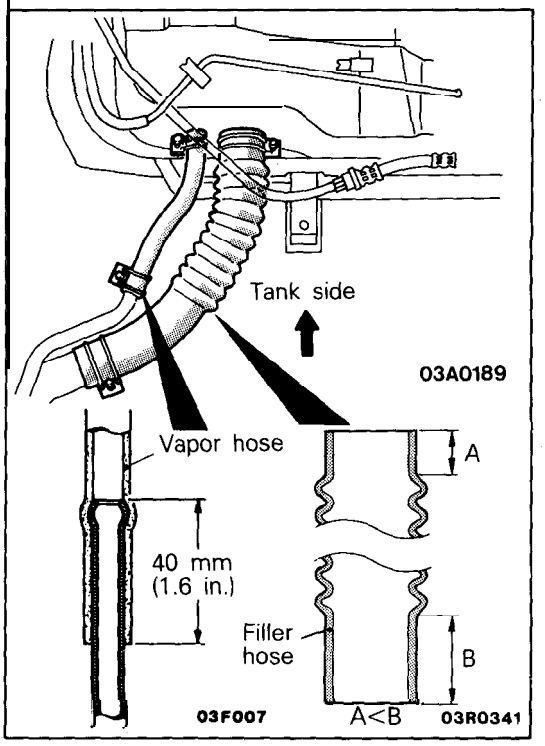
When attaching the fuel hose to the pipe, be sure that the hose is attached as shown in the illustration.

**Standard value: 25–30 mm (1.0–1.2 in.)**




**9. INSTALLATION OF SELF-LOCKING NUT**

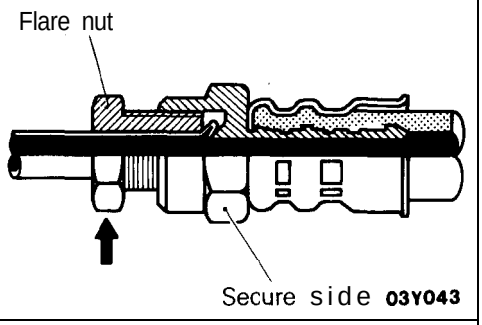
Tighten the self-locking nuts until the rear end of the tank band contacts the body.




**6. CONNECTION OF VAPOR HOSE/7. FILLER HOSE**

(1) The vapor hose should be connected all the way at the tank, and approximately 40 mm (1.6 in.) at the filler neck.

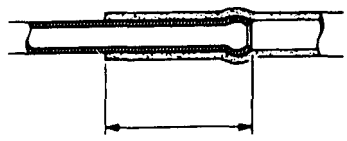
(2) The end of the filler hose with the shorter straight pipe part should be connected at the tank side.




**6. CONNECTION OF HIGH PRESSURE FUEL HOSE TO FUEL PUMP**

Temporarily tighten the flare nut by hand, and then tighten it to the specified torque, being careful that the high pressure fuel hose does not become twisted.

**Caution**
**When tightening flare nut, be careful not to bend or twist line to prevent damage to fuel pump low connection.**




**2. CONNECTION OF VAPOR HOSE/I. RETURN HOSE**

When attaching the fuel hose to the pipe, be sure that the hose is attached as shown in the illustration.

**Standard value: 25–30 mm (1 .0–1.2 in.)**

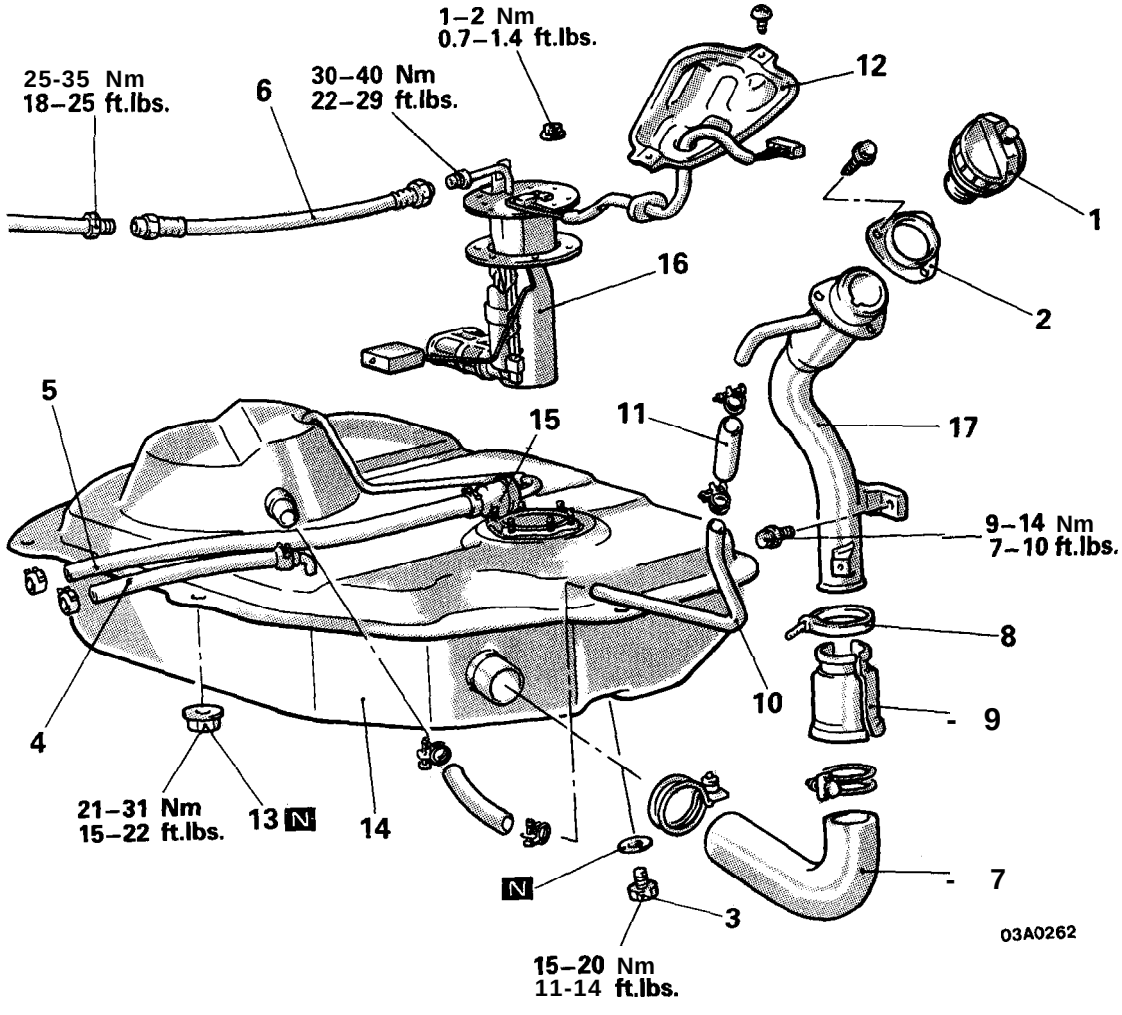
# FUEL TANK <AWD>

N14GA--A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining of the fuel.
- Release of Residual Pressure from High Pressure Fuel Hose (Refer to P.14-44.)

**Post-installation Operation**
- *Measurement of Fuel Pressure (Refer to P.14-44, 52.)
- .Supplving of the Fuel.




**Removal steps**

1. Fuel tank cap
2. Packing
3. Drain plug
4. Return hose
5. Vapor hose
6. High pressure fuel hose
7. Fuel filler hose
8. Cable band
9. Protector
10. Vapor pipe
11. Vapor hose
- 4 12. Hole cover
13. Self-locking nut
14. Fuel tank
15. Overfill limiter (Two-way valve)
- + 16. Fuel pump and fuel gauge unit assembly
17. Fuel filler neck

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL N14GBAH1

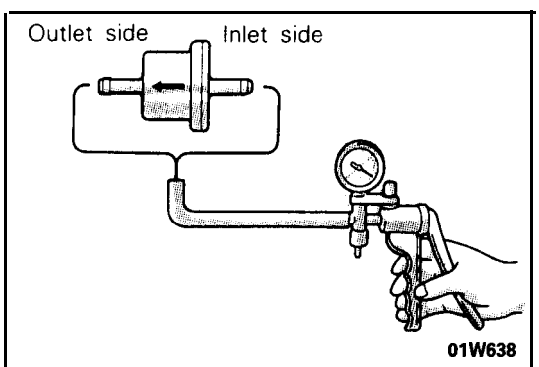
**6. DISCONNECTION OF HIGH PRESSURE FUEL HOSE**

**Caution**
**Cover the hose connection with rags to prevent splash of fuel that could be caused by some residual pressure in the fuel pipe line.**

## INSPECTION N14GCAI1

- Check the hoses and the pipes for crack or damage.
- Check the fuel tank cap for malfunction.
- Check the fuel tank for deformation, corrosion or crack.
- Check the fuel tank for dust or foreign material.

NOTE
If the inside of the fuel tank is to be cleaned, use any one of the following:
(1) Kerosene
(2) Trichloroethylene
(3) A neutral emulsion type detergent



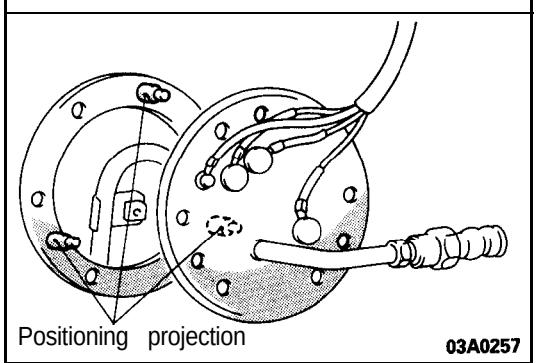

**OVERFILL LIMITER (TWO-WAY VALVE)**

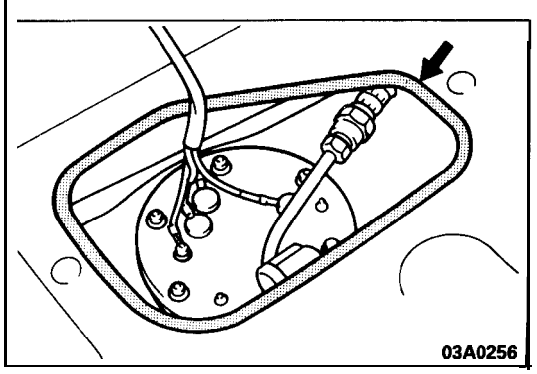
Set a hand vacuum pump at inlet side or outlet side; the valve is good if, when a negative pressure (vacuum) is applied, air flows after a slight negative pressure is initially maintained.

## SERVICE POINTS OF INSTALLATION N14GDAO

**16. INSTALLATION OF FUEL PUMP AND FUEL GAUGE UNIT ASSEMBLY**

Align the three positioning projections of the packing with the holes in the fuel pump and fuel gauge unit assembly.




**12. INSTALLATION OF HOLE COVER**

(1) Before installing the hole cover, apply the specified sealant to the rear floor pan.

**Specified sealant: MOPAR Rope Caulk Sealer 3/16 × 80" roll Part No.4026044 or equivalent**

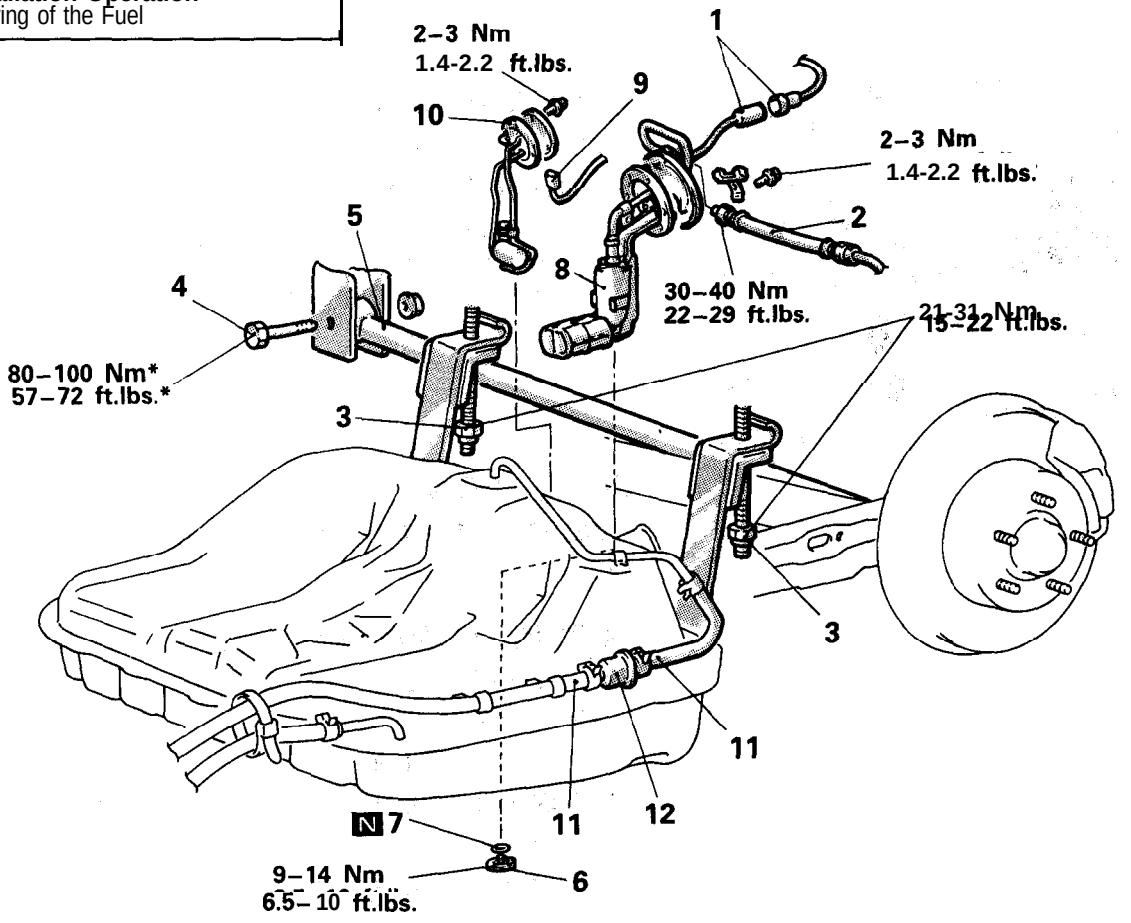
(2) After installing the fuel pump and fuel gauge assembly, start the engine and check to ensure that there is no fuel leakage.

# FUEL PUMP, FUEL GAUGE UNIT AND OVERFILL LIMITER (TWO-WAY VALVE) <FWD>

## REMOVAL AND INSTALLATION

N14UA--

| |
|---|
| **Pre-removal Operation**<br>•Draining of the Fuel |
| |
| **Post-installation Operation**<br>● supplying of the Fuel |




**Fuel pump removal steps**

- ● * 1. Connection for fuel pump connector
- ◆◆ ◆◆ 2. High pressure fuel hose
- ◆◆ ● + 3. Self locking nut
- 4. Lateral rod attaching bolt
- ◆◆ 5. Lateral rod and body connection
- ● 6. Bolt
- ● + 7. O-ring
- ● 8. Electric fuel pump

**Fuel gauge unit removal steps**

- ◆◆ ◆◆ 3. Self locking nut
- 4. Lateral rod attaching bolt
- ◆◆ 5. Lateral rod and body connection
- 9. Connection for fuel gauge unit connector
- ◆◆ 10. Fuel gauge unit

**Overfill limiter removal steps**

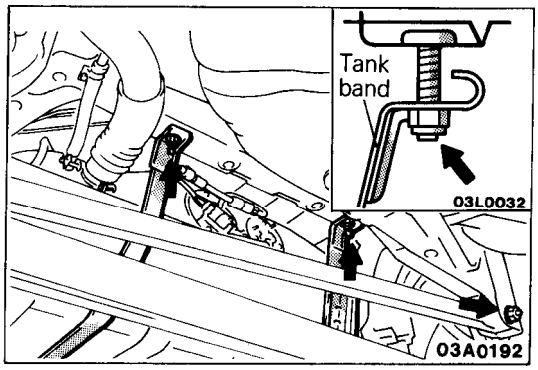
- 11. Connection for vapor hose
- ● 12. Overfill limiter (Two-way valve)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) For places indicated by the * symbol, first tighten loosely, and then, with the vehicle unladen, tighten completely.

## SERVICE POINTS OF REMOVAL N14UBAA

**2. DISCONNECTION OF HIGH PRESSURE FUEL HOSE**

Refer to P.14-94.




**3. LOOSENING OF SELF-LOCKING NUT**

Loosen the self-locking nuts to the end of the stud bolt.

**5. DISCONNECTION OF LATERAL ROD AND BODY**

Disconnect the lateral rod right side body coupling; then lower the lateral rod and use wire or similar material to suspend from the axle beam.

## INSPECTION N14UCAA

**OVERFILL LIMITER (TWO-WAY VALVE)**

Refer to P.14-94.

## SERVICE POINTS OF INSTALLATION N14UDAA

**12. INSTALLATION OF OVERFILL LIMITER (TWO-WAY VALVE)**

Refer to P.14-95.

**10. INSTALLATION OF FUEL GAUGE UNIT**

Refer to P.14-94.

**8. INSTALLATION OF ELECTRIC FUEL PUMP / 7. O-RING / 6. BOLT**

Refer to P.14-94.

**3. TIGHTENING OF SELF-LOCK NUT**

Refer to P.14-95.

**2. CONNECTION OF HIGH PRESSURE FUEL HOSE**

Refer to P.14-96.

**1. CONNECTION OF FUEL PUMP CONNECTOR**

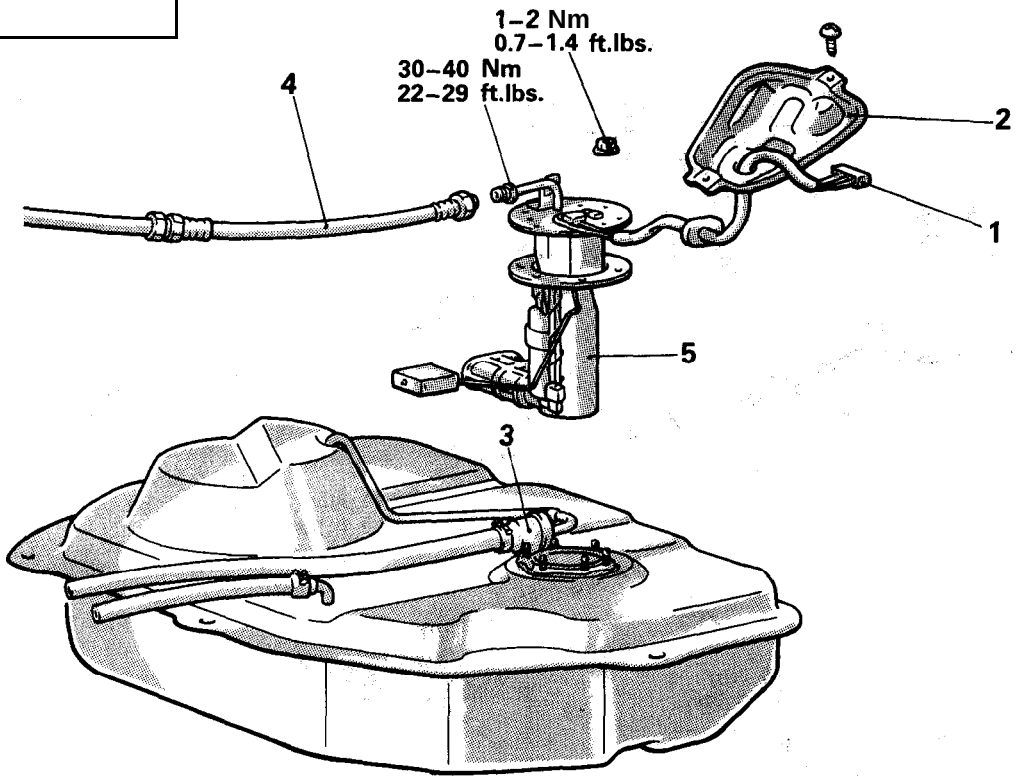
After connecting the fuel pump connector, check the fuel pressure. (Refer to P.14-44, 52.)

# FUEL PUMP, FUEL GAUGE UNIT AND OVERFILL LIMITER (TWO-WAY VALVE) <AWD>

## REMOVAL AND INSTALLATION

N14UA--A

| |
|---|
| **Pre-removal Operation**<br>*Draining of the Fuel. |
| |
| **Post-installation Operation**<br>●Supplying of the Fuel. |




03A0263

**Removal steps**

1. Fuel pump and fuel gauge unit assembly connector
2. Hole cover
3. Overfill limiter (Two-way valve)
4. High pressure fuel hose connection
5. Fuel pump and fuel gauge unit assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".

### SERVICE POINTS OF REMOVAL

N14UBAA1

**4. DISCONNECTION OF HIGH PRESSURE FUEL HOSE**

Refer to P.14-98.

### INSPECTION

N14UCAA1

**OVERFILL LIMITER (TWO-WAY VALVE)**

Refer to P.14-98.

### SERVICE POINTS OF INSTALLATION

N14UDAAa

**5. INSTALLATION OF FUEL PUMP AND FUEL GAUGE UNIT ASSEMBLY**

Refer to P.14-98.

**2. INSTALLATION OF HOLE COVER**

Refer to P.14-98.

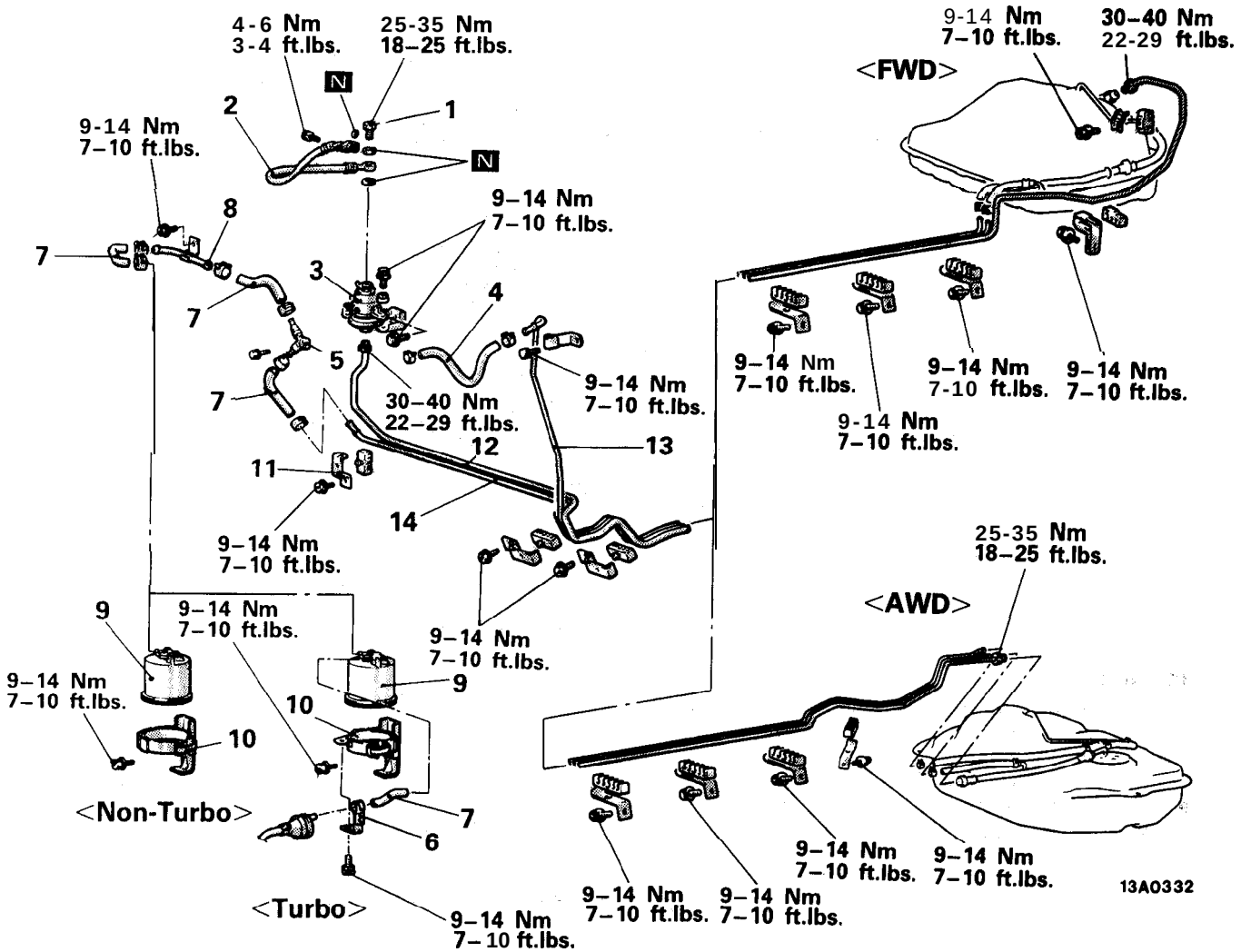
# FUEL LINE AND VAPOR LINE

## REMOVAL AND INSTALLATION

N14KA--

**Pre-removal Operation**
- Removal of the Battery Trav (Refer to GROUP 8-Starter Motor)
- Release of Residual Pressure from High Pressure Hose. (Refer to P.14-44.)

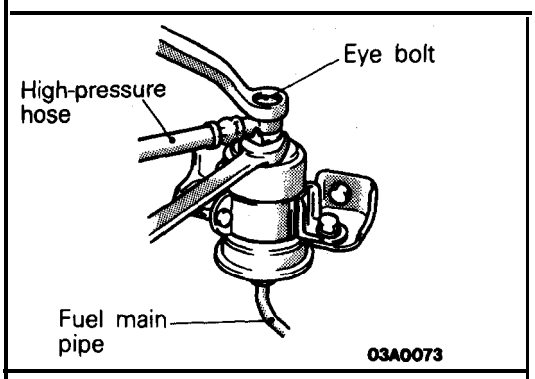
**Post-installation Operation**
- Measurement of Fuel Pressure (Refer to P.14-44, 52.)
- Installatron of the Battery Tray (Refer to GROUP 8-Starter Motor)

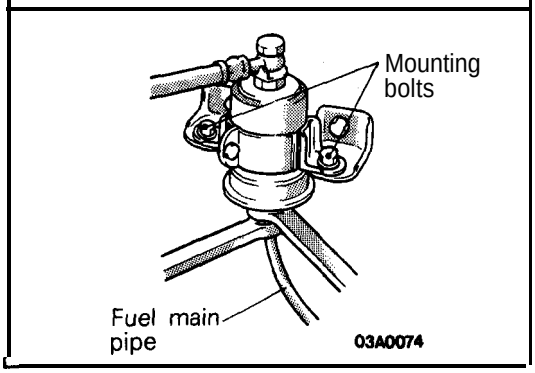



**Removal steps**

- ◗ ☒ 1. Eye bolt
- ● + 2. High pressure fuel hose
- ◆◆ ● + 3. Fuel filter
- ◆◆ 4. Fuel return hose
- 5. Check valve
- 6. Clamp
- ◆◆ 7. Fuel vapor hose
- 8. Vapor pipe assembly
- 9. Canister
- 10. Canister holder
- ● *● *11. Clamp
- 12. Fuel main pipe
- 13. Fuel return pipe
- 14. Fuel vapor pipe

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE. POINTS OF REMOVAL N14KBALa

### 1. REMOVAL OF EYE BOLT

Remove the eye bolt while holding the fuel filter nut securely.

**Caution.**
**Cover the hose connection with rags to prevent splash of fuel that could be caused by some residual pressure in the fuel pipe line.**

### 3. REMOVAL OF FUEL FILTER

(1) Loosen the main pipe flare nut-while holding the fuel filter nut securely.
(2) Remove the fuel filter mounting bolts, and then remove the fuel filter from the bracket.

### 11. REMOVAL OF CLAMP

After removing the crossmember, remove the clamp. (Refer to GROUP 2–Centermember and Crossmember.)

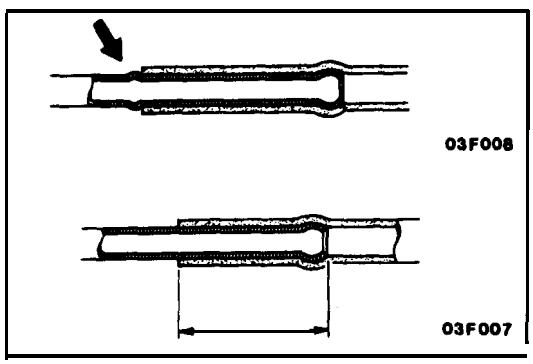
## INSPECTION N14KCAB

- Check the hose and pipes for cracks, bend, deformation and clogging.
- Check the canister for clogging.
- Check the fuel filter for clogging and damage.

## SERVICE POINTS OF INSTALLATION N14KDAI

### 11. INSTALLATION OF CLIP

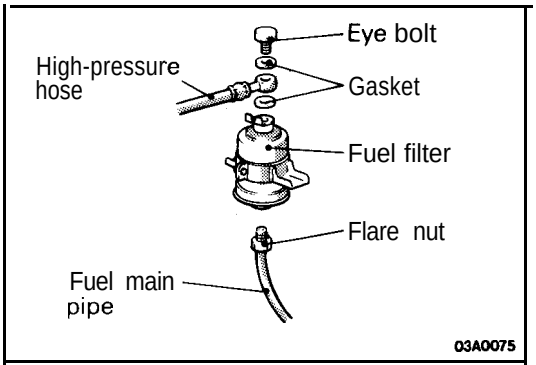
(1) Insert the clip.
(2) Insert the crossmember. (Refer to GROUP 2–Centermember and Crossmember.)

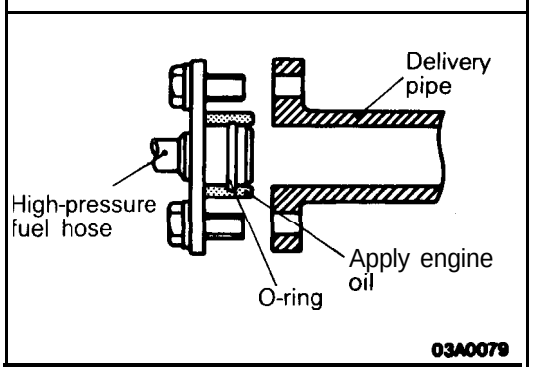



### 7. INSTALLATION OF FUEL VAPOR HOSE/4. FUEL RETURN HOSE

(1) If the fuel pipe has a stepped part, connect the fuel hose to the pipe securely, up to the stepped part, as shown in the figure.
(2) If the fuel pipe does not have a stepped part, connect the fuel hose to the pipe securely, so that it is the standard value.

**Standard value: 20–25 mm (.8–1.0 in.)**




**3. INSTALLATION OF FUEL FILTER**

(1) When installing the fuel filter, first temporarily install the filter to the filter bracket; then insert the main pipe at the connector part of the filter, and manually screw in the main pipe's flare nut.
(2) Holding the fuel filter nut, tighten the fuel main pipe's flare nut and eye bolt at the specified torque. Then tighten the filter to the bracket.

**2. INSTALLATION OF HIGH PRESSURE FUEL HOSE**

Apply engine oil to the hose union.
Insert the hose, being careful not to damage the O-ring, and tighten securely.

**Caution**
**Because there is high pressure applied between the fuel pump and the injection mixer, be especially sure that there is no fuel leakage in this area.**

# FUEL FILTER

## REMOVAL AND INSTALLATION

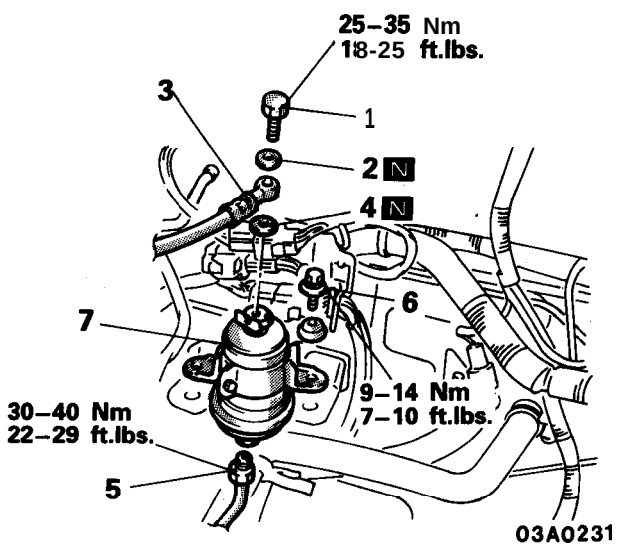
N14VA--

**Pre-removal Operation**
- Release of Residual Pressure from High Pressure Hose. (Refer to P.14-44.)

**Post-installation Operation**
- Measurement of Fuel Pressure (Refer to P.14-44, 52.)

**Fuel filter removal steps**

◆◆ 1. Eye bolt
2. Gasket
3. Connection for Fuel high-pressure hose
4. Gasket
5. Connection for Fuel main pipe
6. Mounting bolt
◆◆ ● ◆7. Fuel filter




NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation"
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL

N14VBAA

**1. REMOVAL OF EYE BOLT**

Refer to P.14-103.

**7. REMOVAL OF FUEL FILTER**

Refer to P.14-103.

## SERVICE POINTS OF INSTALLATION

N14VCAA

**7. INSTALLATION OF FUEL FILTER**

Refer to P. 14-104.

# ENGINE CONTROL SPECIFICATIONS

## SERVICE SPECIFICATIONS

N14CB-A

| Items | Specifications |
|---|---|
| Standard value | |
| Accelerator cable play mm (in.) | |
| <M/T> | 1–2 (.04–.08) |
| <A/T> | 3–5 (.12–.20) |
| Accelerator switch switching point mm (in.) | 2–6 (.08–.24) |

## TORQUE SPECIFICATIONS

N14CC-A

| Items | Nm | ft.lbs. |
|---|---|---|
| Accelerator arm bracket to body | 8–12 | 6–9 |
| Throttle body side inner cable to air intake plenum | 4–6 | 3–4 |
| Accelerator arm side inner cable to body | 4–6 | 3–4 |

## LUBRICANTS

| Items | Specified lubricants | Quantity |
|---|---|---|
| Accelerator arm and return spring | MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent | As required |

## SEALANT

N14CE-B

| Items | Specified sealant |
|---|---|
| Accelerator arm bracket | 3M ATD Part No.8663 or equivalent |

# TROUBLESHOOTING

N14EGABa

## ACCELERATOR CABLE AND ACCELERATOR PEDAL

| Symptom | Probable cause | Remedy |
|---|---|---|
| Throttle valve will not fully open or close | Misadjusted accelerator cable<br>Misadjusted automatic speed-control cable | Adjust |
| | Broken return spring<br>Throttle lever malfunction | Replace |
| Accelerator pedal operation not smooth (over acceleration) | Accelerator pedal wrongly tightened<br>Misinstalled accelerator cable | Repair |
| | Accelerator cable requires lubrication | Lubricate or replace |

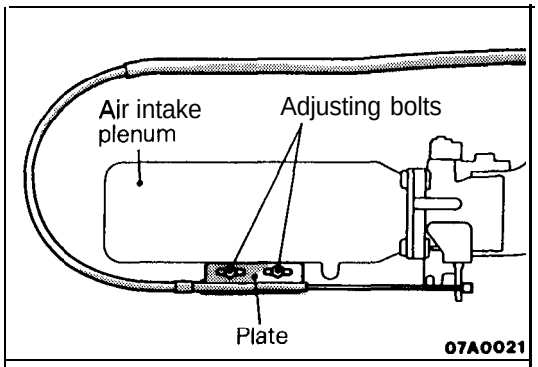
# SERVICE ADJUSTMENT PROCEDURES

N14FBCE

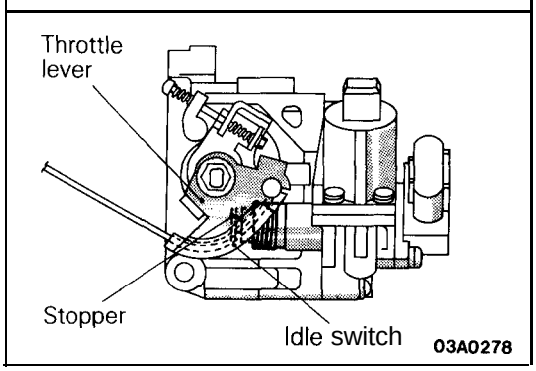
## ACCELERATOR CABLE INSPECTION AND ADJUSTMENT

For models equipped with the auto-cruise control system, refer to P.14-136.

(1) Turn air conditioner and lights OFF.
Inspect and adjust at no load.
(2) Warm engine until stabilized at idle.
(3) Confirm idle speed is at prescribed rpm.
(4) Stop engine (ignition switch OFF).
(5) Confirm there are no sharp bends in accelerator cable.
(6) Check inner cable for correct slack.
(7) If there is too much slack or no slack, adjust play by the following procedures.




① On models with an SOHC engine, turn the ignition switch to the ON position (without starting the engine) and leave in that condition for approximately 15 seconds.




② Loosen the adjusting bolts on the air intake plenum, and then secure the outer cable so that the free play of the inner cable will be the standard value.

**Standard value:**

| | |
|---|---|
| **<M/T>** | **1–2 mm (.04–.08 in.)** |
| **<A/T>** | 3-5 **mm (.12–.20 in.)** |

NOTE
If there is excessive play of the accelerator cable, the vehicle speed drop (“undershoot”) when climbing a slope will be large.
If there is no play (excessive tension) of the accelerator cable, the idling speed will increase.

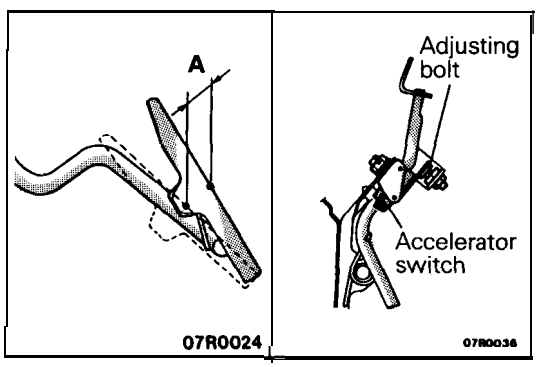
(8) After adjusting, confirm that throttle valve fully opens and closes by operating pedal.
(9) Adjust accelerator cable play and confirm throttle lever stopper touches the idle switch.

## ACCELERATOR SWITCH INSPECTION AND ADJUSTMENT

N14FTBB

(1) After warming up the engine, check to be sure that the accelerator switch is ON when the accelerator pedal’ is in the free condition. If there is a malfunction, adjust by using the adjusting bolt.
(2) Press the accelerator pedal by hand until the accelerator switch switches from ON to OFF and confirm that the amount of pedal movement (A in the figure) is within the standard value range.

**Standard value:**
**Accelerator switch switching point**
2-6 **mm (.08–.24 ‘in.)**



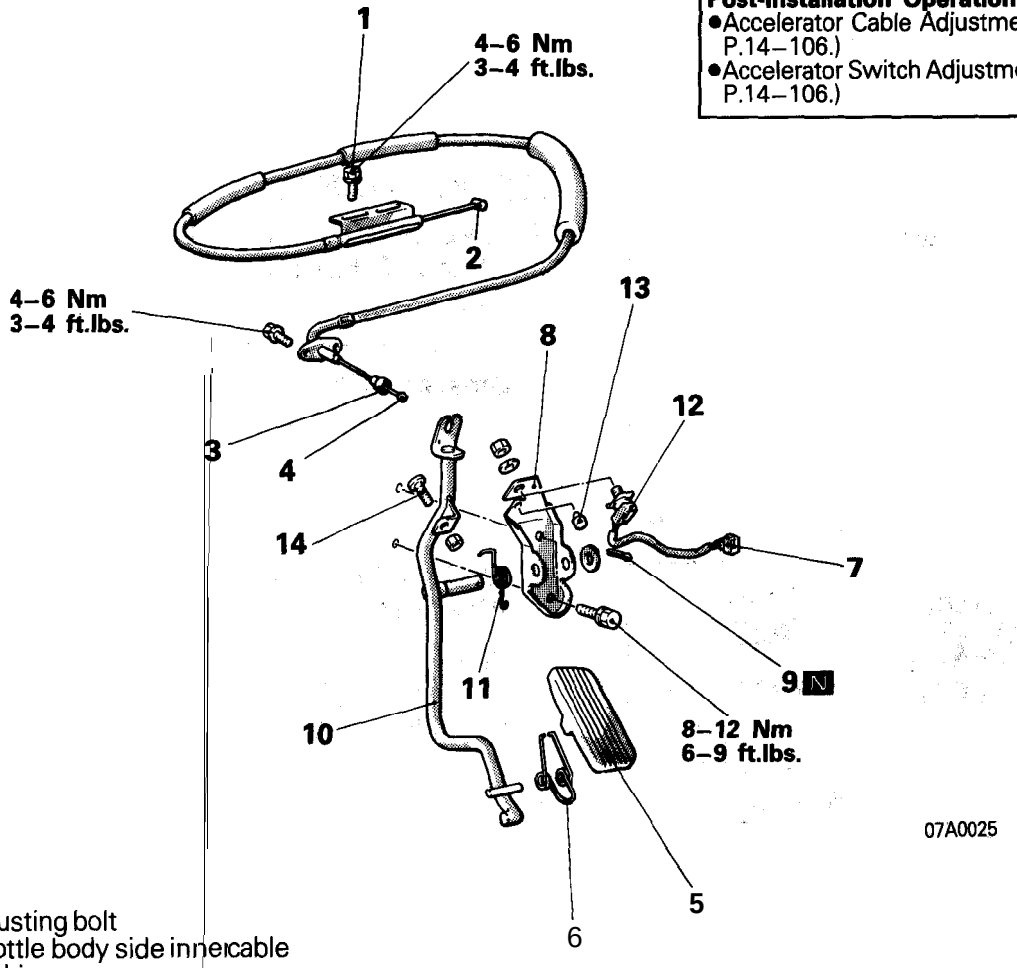

(3) If the distance (A in the figure) is not within the standard value, adjust it by using the adjusting bolt.

# ENGINE CONTROL

## REMOVAL AND INSTALLATION

N140A--

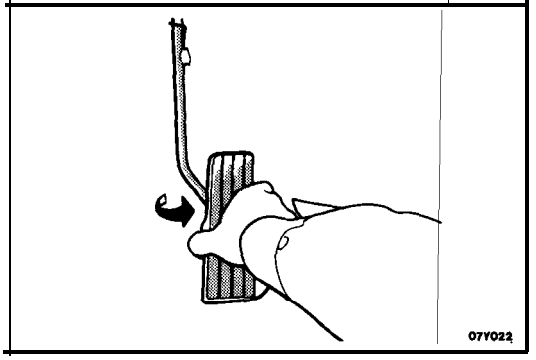
**Post-installation Operation**
- Accelerator Cable Adjustment (Refer to P.14–106.)
- Accelerator Switch Adjustment (Refer to P.14–106.)




**Removal steps**

1. Adjusting bolt
2. Throttle body side inner cable
● 3. Bushing
◆◆ 4. Accelerator arm side inner cable
◆◆ 5. Accelerator pedal
6. Spring
7. Accelerator switch connector <A/T>
● ◆ 8. Accelerator arm bracket
9. Split pin
● ◆ 10. Accelerator arm
◆◆ 11. Return spring
12. Accelerator switch <A/T>
13. Accelerator arm stopper
14. Bolt <A/T>

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆ : Refer to "Service Points of Removal".
(3) ● : Refer to "Service Points of Installation".
(4) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL

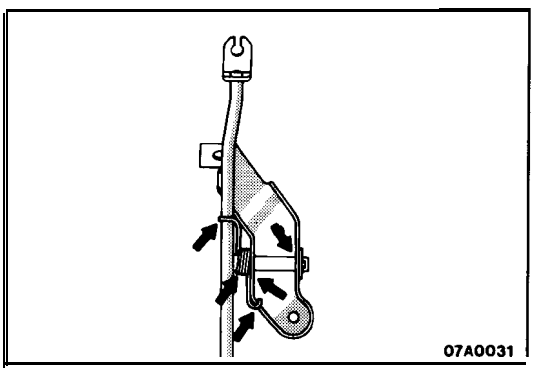
N140BAC

### 5. REMOVAL OF ACCELERATOR PEDAL

Pull the left side of the accelerator pedal toward you, and then remove the accelerator pedal from the accelerator arm.

## INSPECTION N140CAH

- Check the inner and outer cable for damage.
- Check the cable for smooth movement.
- Check the accelerator arm for bending.
- Check the return spring for deterioration.
- Check the connection of bushing to end metal fitting.
- Check the accelerator switch for ON/OFF switching. <A/T>

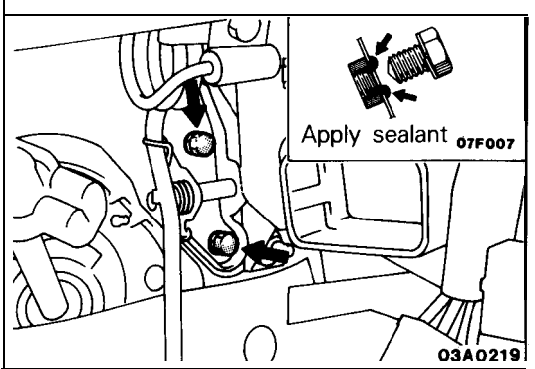



## SERVICE POINTS OF INSTALLATION N140DAP

### 11. APPLICATION OF GREASE TO RETURN SPRING/ 10. ACCELERATOR ARM

Apply multipurpose grease around the each moving point of the accelerator arm.

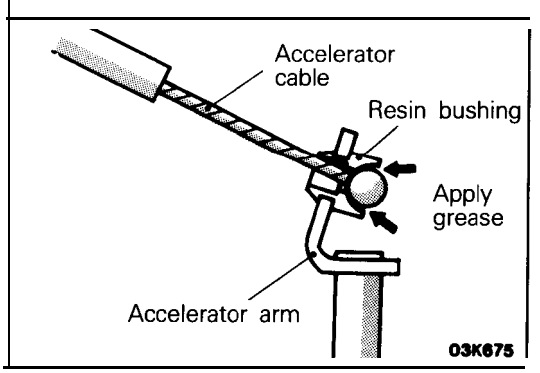
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**




### 8. APPLICATION OF SEALANT TO ACCELERATOR ARM BRACKET

Apply the specified sealant to the bolt mounting hole, and then tighten the accelerator arm bracket.

**Specified sealant: 3M ATD Part No. 8663 or equivalent**




### 4. APPLICATION OF GREASE TO ACCELERATOR ARM SIDE INNER CABLE/B. BUSHING

(1) Securely install the resin bushing of the accelerator cable on the end of the accelerator arm.
(2) Apply multipurpose grease around the cable end.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

# AUTO-CRUISE CONTROL SYSTEM SPECIFICATIONS

## GENERAL SPECIFICATIONS

N14CA-B

| Items | Specifications |
|---|---|
| Auto-cruise control switch | |
| Rated load A | |
| MAIN | 3.0±0.5 |
| SET | 0.2±0.1 |
| RESUME | 0.2±0.1 |
| Voltage drop V | 0.2 or less |
| Stop light switch | |
| Rated load A | 0.1–0.9 |
| Voltage drop (at rated load) V | 0.25 or less |
| Clutch switch | |
| Rated load A | 0.005–1 |
| Voltage drop (at rated load) V | 0.15 or less |
| Auto-cruise control unit | |
| Range of speed control km/h (mph) | 40 (25)±3 (1.8)–145 (90)±5 (3.1) |
| Auto-cruise control actuator | |
| Drive system | Vacuum type |
| Stroke mm (in.) | 38–42 (1.5–1.7) |
| Auto-cruise vacuum pump | |
| Rated load A | 0.4 or less |

## SERVICE SPECIFICATIONS

N14CB-C

| Items | Specifications |
|---|---|
| Accelerator cable play mm (in.) | |
| <M/T> | 0–1 (0–.04) |
| <A/T> | 2–3 (.08–.12) |
| Throttle cable play mm (in.) | 1–2 (.04–.08) |
| Auto-cruise cable play mm (in.) | 1–2 (.04–.08) |
| Control valve, Release valve resistance Ω | 50–60 |

## TORQUE SPECIFICATIONS

N14CC-C

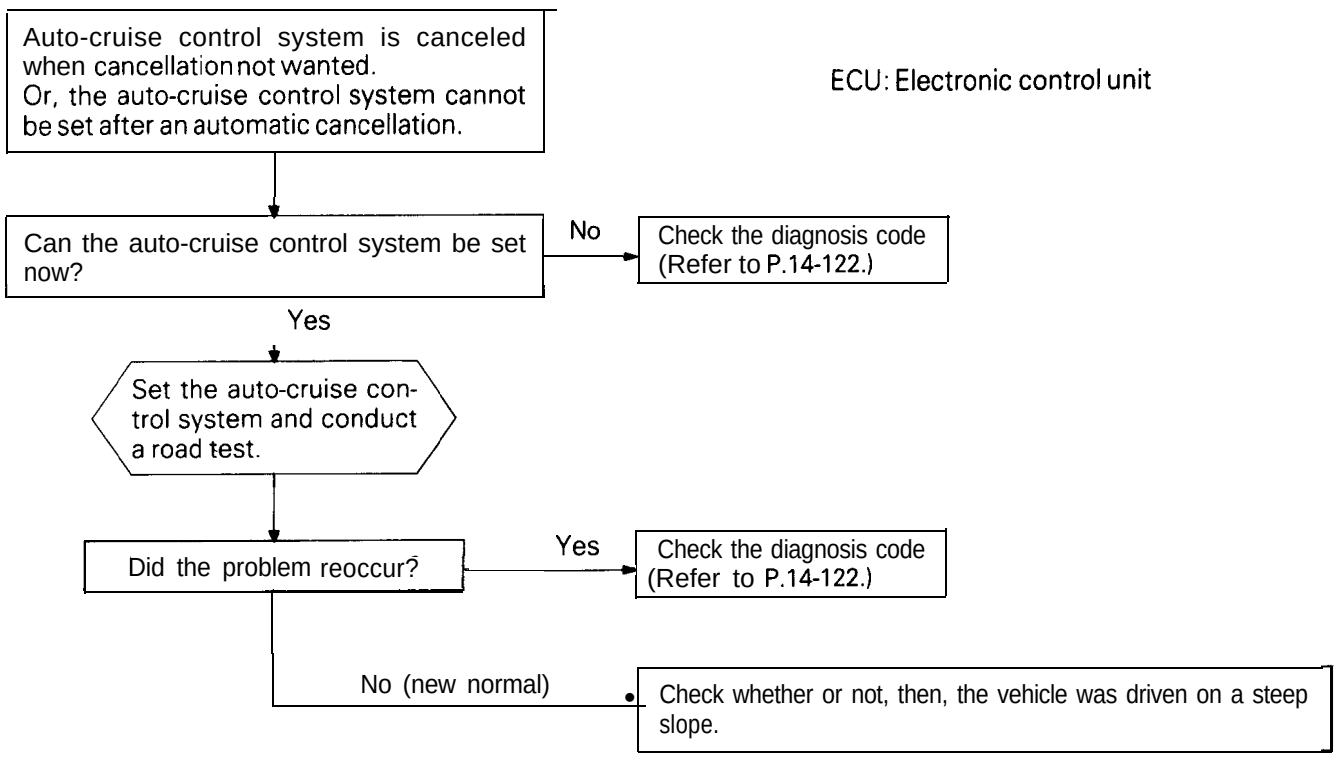
| Items | Nm | ft.lbs. |
|---|---|---|
| Link protector | 4–6 | 3–4 |
| Link assembly | 9–14 | 7–10 |
| Auto-cruise vacuum pump | 4–6 | 3-4 |
| Accelerator cable plate | 4–6 | 3–4 |

# TROUBLESHOOTING

N14EBDW

The auto-cruise control system performs control functions for the setting or cancellation of the fixed-speed driving speed based upon the data provided by input signals. As a result, when the auto-cruise control system is canceled by abnormal system operation, the cause of the cancellation is memorized in a separate circuit by the ECU, thus providing the ECU with the self-diagnosis function by certain fixed patterns, as well as the function of being able to check whether or not the ECU's input switches or sensor are normal. Thus, by effectively using these function, the time required checking and repair can be shortened.

## TROUBLESHOOTING QUICK-REFERENCE CHART



Auto-cruise control system cannot be set.

NOTE
This chart is to be used, then, for troubleshooting if it is not possible to use the self-diagnosis for checking.

Prepare to conduct input check. (Refer to P.14-124.)

Where codes No.21, 22, 23, 25 and 26 displayed when, with the vehicle stationary, the input check codes were recalled?

No →
- Damaged or disconnected wiring of the ECU power-supply circuit (Go to check chart 1.)
- Damaged or disconnected wiring of the SET or RESUME switch (Go to check chart 2 and 3.)
- Damaged or disconnected wiring of the stop light switch clutch switch or inhibitor switch (Go to check chart 6, 7 or 8.)

Yes

Are the results of all input checks normals?

Yes

No

| Check results | Probable cause | Remedy | Check chart No. |
|---|---|---|---|
| Code 21 remains even though SET switch is set to OFF. | SET switch ON malfunction | Replace the control switch | No. 2 |
| | SET switch input line short-circuit | Repair the harness | |
| Code 22 remains even though RESUME switch is set to OFF. | RESUME switch ON malfunction | Replace the control switch | No. 3 |
| | RESUME switch input line short-circuit | Repair the harness | |
| Code 23 is not canceled even if the stop light switch is turned OFF by releasing the brake pedal. | Malfunction of stop light switch circuit. | Replace stop light switch or repair harness. | No. 6 |
| Code 25 does not disappear, and code 24 does not appear, even though vehicle speed reaches approximately 40 km/h (25 mph) or higher. | Malfunction of the vehicle-speed sensor circuit (damaged or disconnected wiring, or short-circuit) | Check or repair the vehicle speed sensor circuit. | No. 4 |
| Code 26 is not canceled even if the clutch switch is turned OFF by releasing the clutch pedal. | Malfunction of clutch switch circuit. | Replace clutch switch or repair harness. | No. 8 |
| Code 26 is not canceled even if the select lever is moved to anything but N, P <A/T>. | Malfunction of inhibitor switch circuit. | Replace inhibitor switch or repair harness. | No. 7 |

Check the auto-cruise vacuum pump circuit. (Go to check chart No.5.)

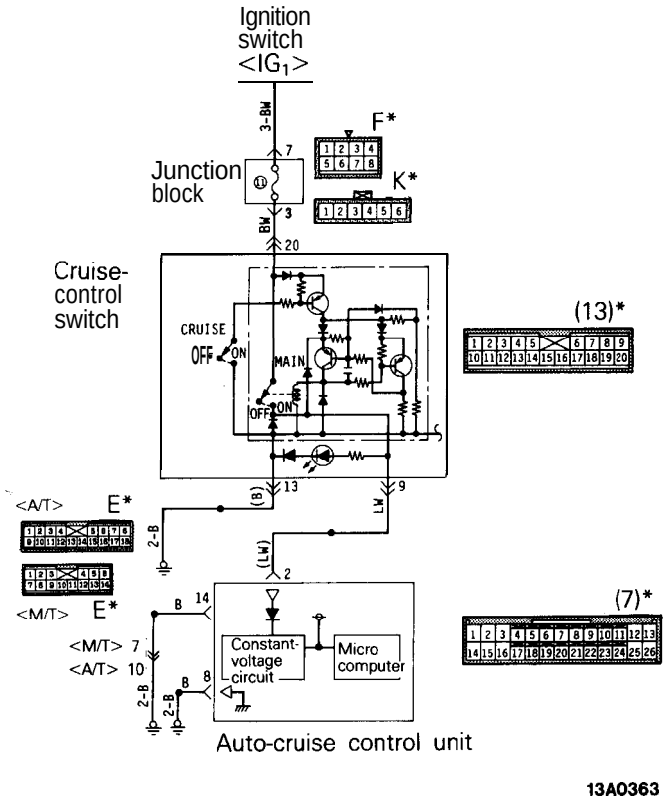
NOTE
If the results of the check of the auto-cruise vacuum pump circuit (check chart No. 5) and of the auto-cruise vacuum pump and actuator itself (P.14-138.) reveal no abnormal condition, replace the electronic control unit (ECU).

| Trouble symptom | Probable cause | Check chart No. | Remedy |
|---|---|---|---|
| • The set vehicle speed varies greatly upward or downward.<br>• "Hunching" (repeated alternating acceleration and deceleration) occurs after setting is made. | Malfunction of the vehicle speed sensor circuit | No. 4 | Repair the vehicle speed sensor system, or replace the part. |
| | Malfunction of the speedometer cable or speedometer drive gear | | |
| | Auto-cruise vacuum pump circuit poor contact | No. 5 | Repair the auto-cruise vacuum pump, or replace the part. |
| | Malfunction of the auto-cruise vacuum pump | | |
| | Malfunction of the ECU | – | Replace the ECU. |
| The auto-cruise control system is not canceled when the brake pedal is depressed. | Damaged or disconnected wiring of the stop light switch input circuit; brake switch (for auto-cruise control) malfunction (short-circuit) | If the input check code No. 23 indicates a malfunction. No. 6 | Repair the harness or replace the stop light switch. |
| | Auto-cruise vacuum pump drive circuit short-circuit | No. 5 | Repair the harness or replace the auto-cruise vacuum pump. |
| | Malfunction of the ECU | – | Replace the ECU. |
| The auto-cruise control system is not canceled when the clutch pedal is depressed. (vehicles with a manual transaxle)<br>(It is canceled, however, when the brake pedal is depressed.) | Damaged or disconnected wiring of clutch switch input circuit | If the input check code No. 26 indicates a malfunction. No. 8 | Repair the harness, or repair or replace the clutch switch. |
| | Clutch switch improper installation (won't switch ON) | | |
| | Malfunction of the ECU | – | Replace the ECU. |
| The auto-cruise control system is not canceled when the shift lever is moved to the "N" position. (vehicles with an automatic transaxle)<br>(It is canceled, however, when the brake pedal is depressed.) | Damaged or disconnected wiring of inhibitor switch input circuit | If the input check code No. 26 indicates a malfunction. No. 7 | Repair the harness, or repair or replace the inhibitor switch. |
| | Improper adjustment of inhibitor switch | | |
| | Malfunction of the ECU | – | Replace the ECU. |
| Cannot decelerate by using the SET switch | Temporary damaged or disconnected wiring of SET switch input circuit | No. 2 | Repair the harness or replace the SET switch. |
| | Auto-cruise vacuum pump circuit poor contact | No. 5 | Repair the harness or replace the auto-cruise vacuum pump and actuator. |
| | Malfunction of the auto-cruise vacuum pump and actuator (including clogging of negative pressure passage) | | |
| | Malfunction of the ECU | – | Replace the ECU. |

| Trouble symptom | Probable cause | Check chart No. | Remedy |
|---|---|---|---|
| Cannot accelerate or resume speed by using the RESUME switch. | Damaged or disconnected wiring, or short-circuit, of RESUME switch input circuit | No. 3 | Repair the harness or replace the RESUME switch. |
| | Auto-cruise vacuum pump circuit poor contact | No. 5 | Repair the harness or replace the auto-cruise vacuum pump and actuator. |
| | Malfunction of the auto-cruise vacuum pump and actuator (including air leak from negative pressure passage) | | |
| | Malfunction of the ECU | – | Replace the ECU. |
| Auto-cruise control system can be set while traveling at a vehicle speed of less than 40 km/h (25 mph), or there is no automatic cancellation at that speed. | Malfunction of the vehicle-speed sensor circuit | No. 4 | Repair the vehicle-speed sensor system, or replace the part. |
| | Malfunction of the speedometer cable or the speedometer drive gear | | |
| | Malfunction of the ECU | – | Replace the ECU. |
| The indicator light of combination meter does not illuminate. (But auto-cruise control system is normal.) | Damaged or disconnected bulb of indicator light | – | Repair the harness or replace the bulb. |
| | Harness damaged or disconnected | | |
| Malfunction of control function by ON/OFF switching of ELC 4 A/T accelerator switch (Non-operation of damper clutch, 2nd gear hold, etc.) | Malfunction of circuit related to accelerator switch OFF function | No. 9 | Repair the harness or replace the part. |
| | Malfunction of the ECU | | |
| Overdrive is not canceled during fixed speed driving. <A/T> | Malfunction of circuit related to overdrive cancellation, or malfunction of ECU | No. 10 | Repair the harness or replace the part. |
| No shift to overdrive during manual driving. <A/T> | | | |

## CHECK CHART

### 1. CHECKING THE CONTROL UNIT POWER SUPPLY CIRCUIT




13A0363

**Description of operation**

When the cruise control switch (CRUISE) is switched ON while the ignition switch is ON, current flows to the ignition switch ($IG_1$), to fuse No.(11) of the junction block, and to the cruise-control switch (MAIN switch), the control unit, and to ground.
When the ignition switch is turned OFF, the MAIN switch in the cruise control switch is also turned OFF.

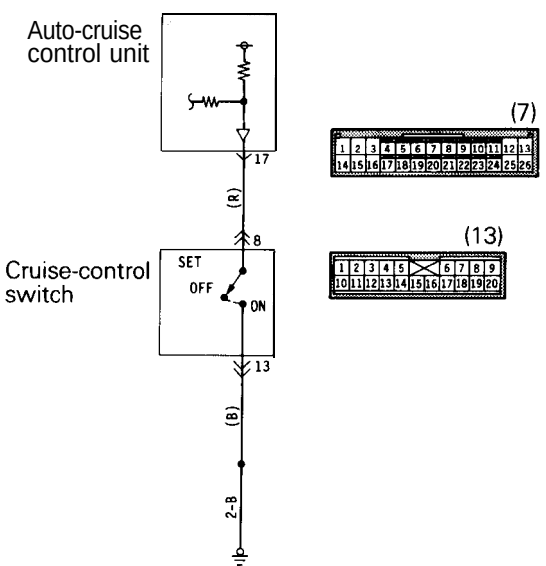
**Troubleshooting hint**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 2 | Control unit power supply | When the cruise-control switch (CRUISE) is switched ON. | System voltage |
| 8, 14 | Control unit ground | At all times | ov |

NOTE
*: The connector Nos. in Section "AUTO-CRUISE CONTROL RELATED HARNESSES" and the connector names in the junction block are represented.
(Applicable on the next page and subsequence.)

### 2. CHECKING THE SET SWITCH




13A0364

**Description of operation**

When the SET switch is switched ON (at the vehicle speed desired to be maintained, and with the CRUISE switch of the cruise-control switches ON) that vehicle speed is maintained as a constant speed.
Furthermore, the constant speed is gradually reduced (the "coasting" feature) when the SET switch is pressed and held while the vehicle is traveling at the previously set constant speed, and, when the SET switch is released, the vehicle then maintains that newly set constant speed (the speed at which **the SET switch was released).**
Current flows to the control unit, the cruise control switch ("SET"), and to ground.

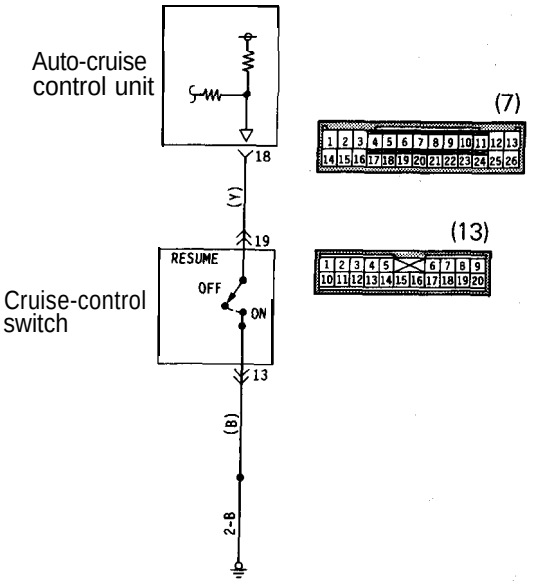
**Troubleshooting hint**

**Diagnosis-No. 15 (automatically cancelled)**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 17 | SET switch | When the SET switch is switched ON. | 0V |
| | | When the SET switch is switched OFF. | System voltage |

## 3. CHECKING THE RESUME SWITCH CIRCUIT




13A0365

**Description of operation**

The set speed (before cancellation) resumes when the RESUME switch is switched ON, even if the constant-speed control has been cancelled.
That speed will not resume, however, even if the RESUME switch is switched ON, if the CRUISE switch is switched OFF and if the vehicle speed decreases to 40 km/h' (25 mph) or lower.
In addition, when the RESUME is switched ON and held while the vehicle is traveling at a constant speed, the vehicle speed will increase; the speed at which the switch is subsequently released will become the newly set constant speed.
Current flows to the control unit, the cruise control switch (RESUME), and to ground.

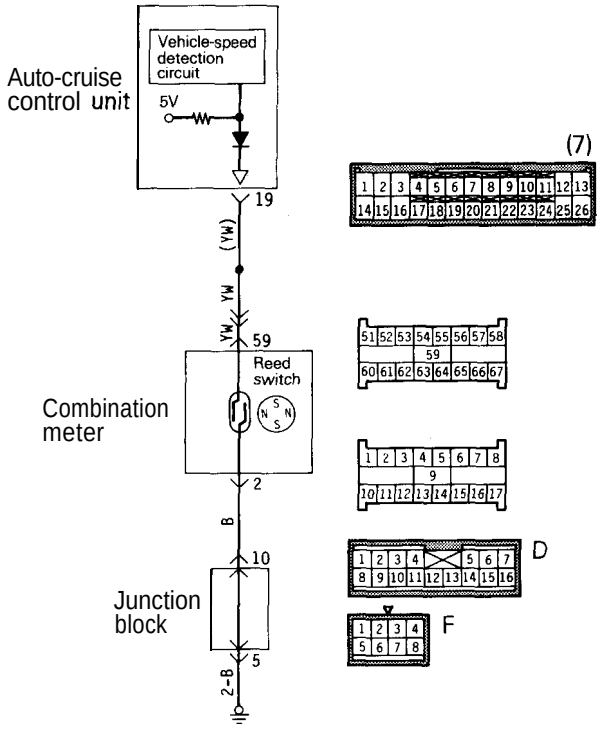
**Troubleshooting hint**

**Diagnosis-No. 15 (automatically cancelled)**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 18 | RESUME switch | When the RESUME switch is switched ON. | 0V |
| | | When the RESUME switch is switched OFF. | System voltage |

## 4. CHECKING THE VEHICLE-SPEED SENSOR CIRCUIT




13A0366

**Description of operation**

The vehicle-speed sensor is installed within the speedometer; it sends to the control unit pulse signals that are proportional to the rotation speed (i.e., the vehicle speed) of the transaxle's output gear.
This vehicle-speed sensor is the reed switch type of sensor; it generates four pulse signals for each rotation of the speedometer's driven gear.

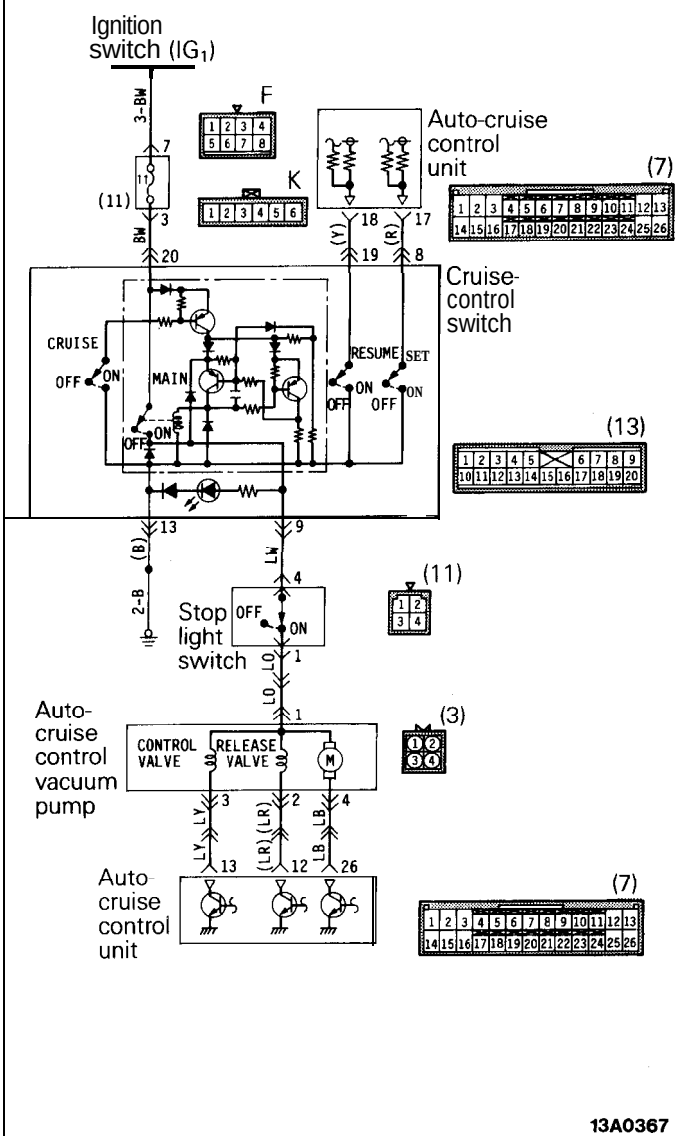
**Troubleshooting hint**

**Diagnosis-No. 12 (automatically cancelled)**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 19 | Vehicle-speed sensor | Move the vehicle forward slowly. | 0V–0.7V ↑ Flashing ↓ 3V–higher |

## 5. CHECKING THE AUTO-CRUISE CONTROL VACUUM PUMP




13A0367

**Description of operation**

Hold mode
When the SET switch is turned ON by the driver turning the CRUISE switch ON when a determined speed is reached, the control unit receives a set signal, and turns the auto-cruise vacuum pump motor ON. After the constant speed is reached, the motor, control valve and release valve are repeatedly turned ON and OFF according to driving conditions.

Acceleration mode
When the RESUME switch is pressed, the control unit receives a RESUME signal and it not only turns the auto-cruise vacuum pump motor ON but also turns the control valve and release valve ON (valve is closed).

Deceleration mode
When the SET switch is held down, the control unit receives a set signal and it not only turns the auto-cruise vacuum pump motor and control valve OFF (valve is opened) but also turns the release valve ON (valve is closed).

Release mode
When the CRUISE switch is turned OFF, the control unit receives a cancel signal and it not only turns the auto-cruise vacuum pump motor OFF but also turns the control valve and release valve OFF (valve is opened).

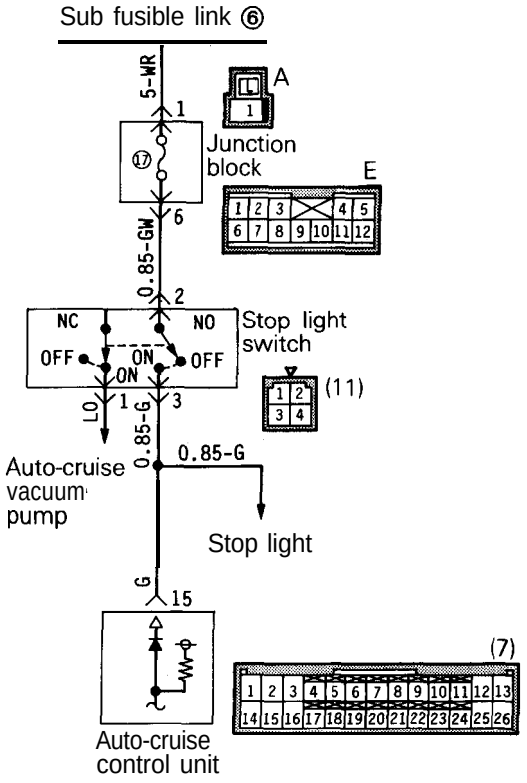
**Troubleshooting hint**

**Diagnosis-No. 11 (automatically cancelled)**

**ECU terminal voltage**

| Terminal No. | Signal | Mode/Terminal voltage (V) | | | |
|---|---|---|---|---|---|
| | | Hold | Accel-eration | Decel-eration | Release |
| 26 | Auto-cruise vacuum pump drive | System voltage or 0 | 0 | System voltage | System voltage |
| 13 | Control valve open/close | | 0 | System voltage | System voltage |
| 12 | Release valve open/close | | 0 | 0 | System voltage |

## 6. CHECKING THE STOP LIGHT SWITCH CIRCUIT




13A0368

**Description of operation**

When the brake pedal is depressed during constant-speed travel, the stop light switch's (NC) contacts for the cruise-control system open, with the result that the current to the auto-cruise vacuum pump is interrupted, thus canceling the constant-speed travel.
At the same time, moreover, the closing of the (NO) contacts for the stop light results in the sending of the cancel signal to the control unit, so that the auto-cruise vacuum pump current is discontinued within the control unit, thereby canceling the constant-speed travel.
The flow of current is from the sub fusible link ⑥ to fuse No. ⑰ of the junction block, the stop light switch, and the control unit.

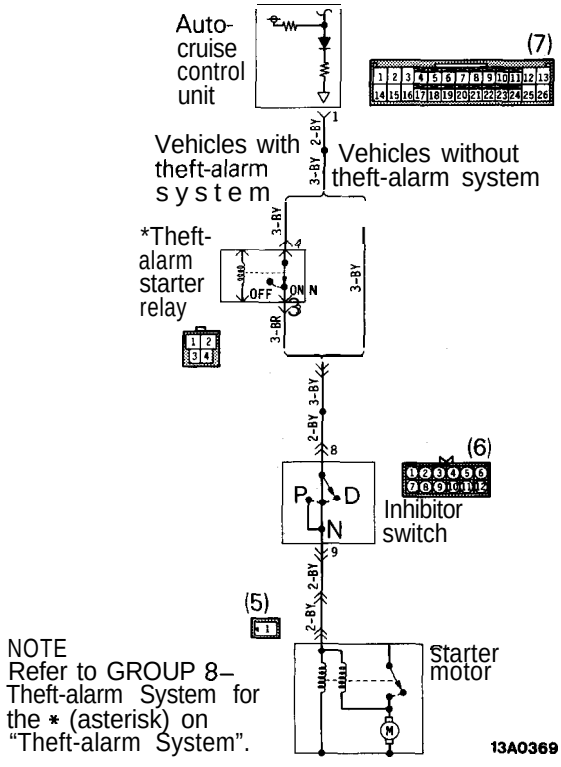
**Troubleshooting hint**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 15 | Stop light switch (load side) | When the brake pedal is depressed. | System voltage |
| | | When the brake pedal is not depressed. | 0V |

NOTE
NC: Indicates ON at all times. (For cruise control)
NO: Indicates OFF at all times. (For stop light)

## 7. CHECKING THE INHIBITOR SWITCH CIRCUIT <A/T>




NOTE
Refer to GROUP 8– Theft-alarm System for the * (asterisk) on "Theft-alarm System".

13A0369

**Description of operation**

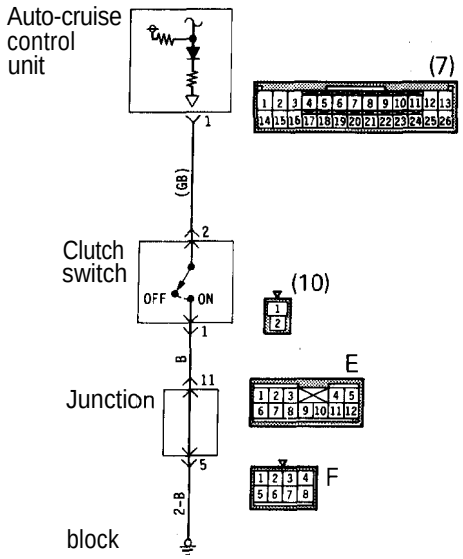
The inhibitor switch also functions as the switch for the starter. If the selector lever is moved to the "N" position during constant-speed travel, current flows to the control unit, inhibitor switch, theft-alarm starter relay (vehicles with theft-alarm system), starter motor, and to ground; the cancel signal is therefore input to the control unit, thus canceling the constant-speed travel.

**Troubleshooting hint**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 1 | Inhibitor switch | At all times | System voltage |

## 8. CHECKING THE CLUTCH SWITCH CIRCUIT <M/T>




13A0370

**Description of operation**

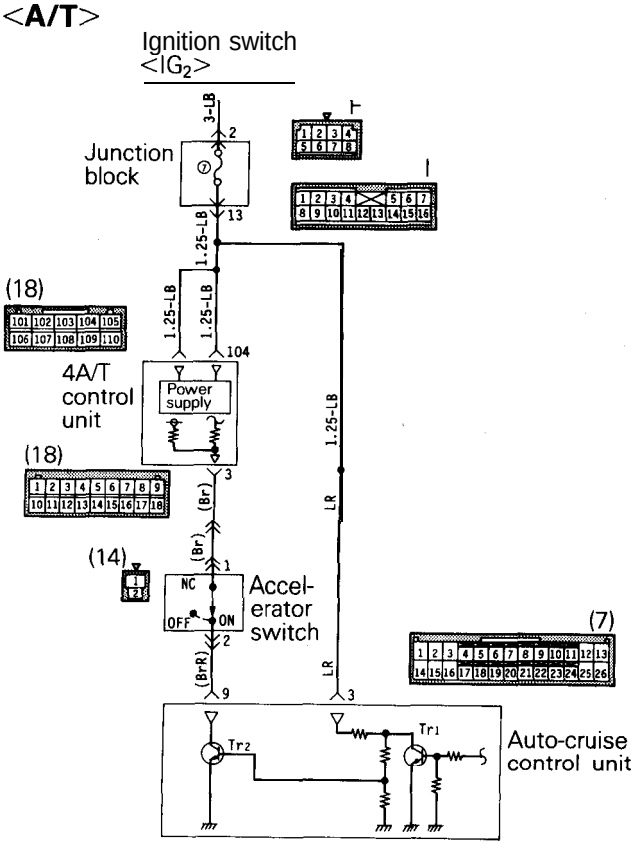
If the clutch pedal is pressed wht driving at a constant speed, the clutch switch is turned ON and a cancel signal is input to the control unit and the determined driving speed is canceled because current flows to the clutch, switch junction block from the control unit and to ground.

**Troubleshooting hint**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 1 | Clutch switch | When the clutch pedal is depressed. | System voltage |
| | | When the clutch pedal is not depressed. | 0V |

## 9. CHECKING THE CIRCUITS RELATED TO THE ACCELERATOR SWITCH OFF FUNCTION <A/T>




13A0371

**Description of operation**

The accelerator switch is a switch that detects the operational status of the accelerator pedal; it is one of the sensors of the automatic, transaxle.
Because the status of the accelerator pedal during constant-speed driving is non-operational, the ground circuit (transistor $Tr_2$) of the accelerator switch is switched OFF only during constant-speed driving in order not to interfere with the function of the automatic transaxle.

**Troubleshooting hint**

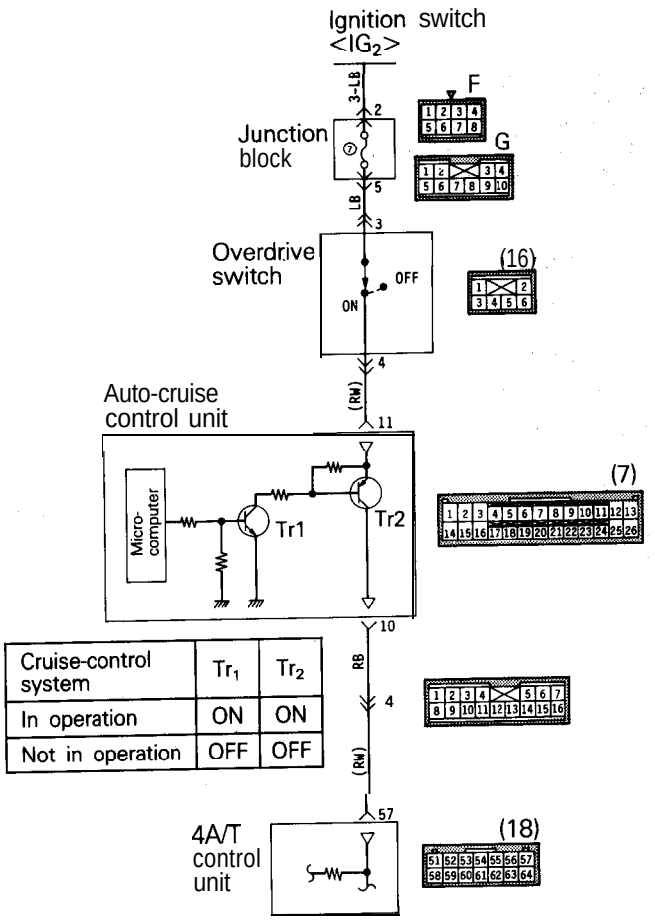
**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 3 | Control unit power supply | At all times | System voltage |
| 9 | Accelerator switch | When the accelerator pedal is depressed. | ov |
| | | When the accelerator pedal is not depressed. | System voltage |

NOTE
NC: Indicates ON at all time.

| Cruise-control system | $Tr_1$ | $Tr_2$ |
|---|---|---|
| In operation | ON | OFF |
| Not in operation | OFF | ON |

## 10. CHECKING THE CIRCUITS RELATED TO THE OVERDRIVE-CANCELLATION FUNCTION <A/T>




**Description of operation**

This is a function that cancels the overdrive function for a certain fixed period of time, if during constant-speed travel in overdrive, the actual vehicle speed decreases to less than the vehicle speed retained in the memory, and then after a short time causes the vehicle speed to return to the vehicle speed retained in the memory.

Overdrive is cancelled under the following conditions.

If, during constant-speed travel, the actual vehicle speed decreases to 7 km/h (4.4 mph) or more below the set vehicle speed.

Under either of the conditions described above, the overdrive-ON signals output from the microcomputer (with the control unit) are no longer output, **and** transistor $Tr_1$ is switched OFF. As a result, transistor $Tr_2$ is also switched OFF, causing the current passing through the overdrive switch of the selector handle to be interrupted at transistor $Tr_2$, with the result that the drive is controlled 'at 3rd gear.

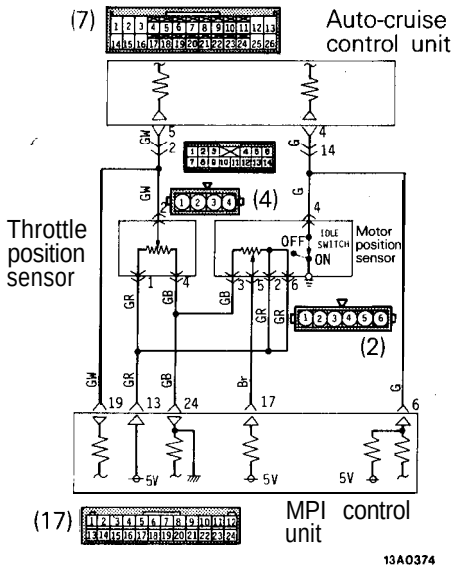
**Troubleshooting hint**

**ECU terminal voltage**

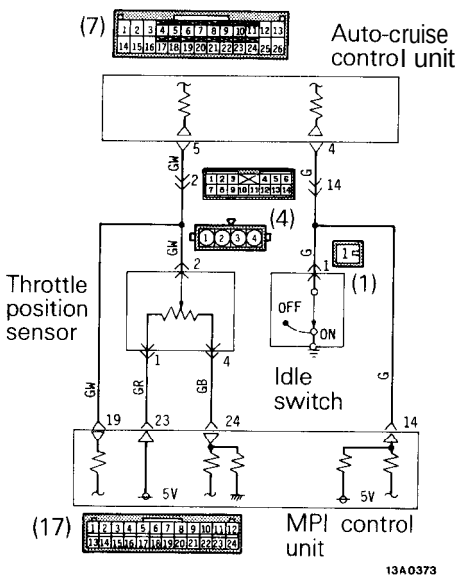
| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 10 | 4A/T control, unit | When the overdrive switch IS switched ON. | System voltage |
| 11 | Overdrive switch | When the overdrive switch IS switched ON. | System voltage |

## 11. CHECKING THE THROTTLE POSITION SENSOR AND IDLE SWITCH CIRCUIT

**<1.8L Engine>**




**<2.0L DOHC Engine>**




**Description of operation**

The throttle position sensor and idle switch are mounted in the motor position sensor or throttle body and are sensors in the MPI system. The idle switch is turned OFF when the accelerator pedal is pressed and ON when it is released. In addition, throttle position sensor output voltage varies according to the degree of opening of the throttle valve.

**Troubleshooting hint**

**<Throttle position sensor>**

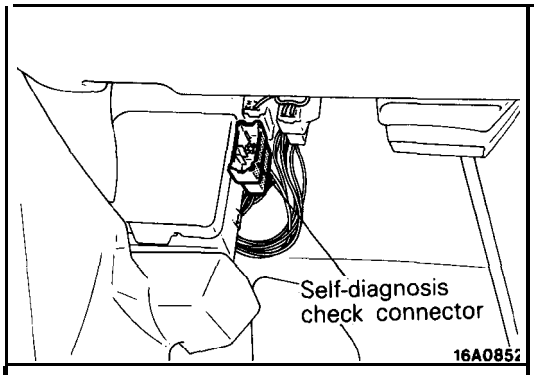
**Diagnosis-No. 17**

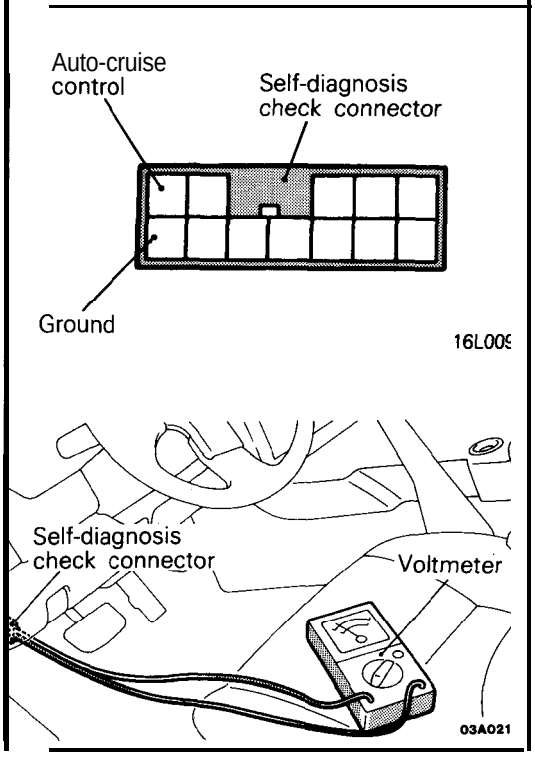
**<Idle switch>**

**Diagnosis-No. 17**

**ECU terminal voltage**

| Terminal No. | Signal | Conditions | Terminal voltage |
|---|---|---|---|
| 4 | Idle switch | When accelerator pedal is pressed | System voltage |
| | | When accelerator pedal is released | ov |
| 5 | Throttle position sensor | When accelerator pedal is pressed all the way down | 4.0V–5.5V |
| | | When accelerator pedal is released | 0.48–0.72V |




## SELF-DIAGNOSIS CHECK

Self-diagnosis checking is performed when there has been an automatic cancellation, without cancel switch operation.

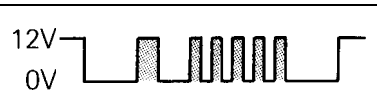
(1) The following method can be used for checking the diagnosis. Note that the diagnosis check connector is located under the driver's side instrument panel.
Connect a voltmeter between the ground terminal and the terminal for auto-cruise control of the diagnosis check connector.
It is possible to discover which circuit is the cause of the cancellation by verifying the indication shown by the voltmeter with the display patterns shown on the next page.

(2) When the diagnosis code No. is displayed, inspect according to the inspection chart No. related to each code No.

NOTE
Canceling the diagnosis codes
The diagnosis codes remain in memory until the battery is turned off but they can be canceled in the following ways without disconnecting the battery terminals.

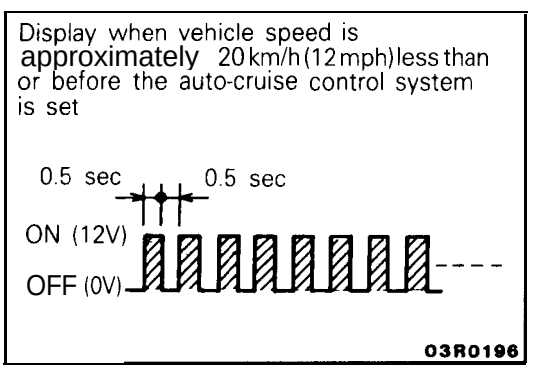
1. By turning on the ignition switch
2. By turning the cruise switch ON while the SET switch is ON and then, within 1 second, turning the RESUME switch ON. (Put into condition for input check reception)
3. By turning ON set SET switch and stop light switch at the same time and continuing the ON condition for 5 seconds or more.
4. By checking that the diagnosis codes are canceled using a voltmeter.

## DIAGNOSIS DISPLAY PATTERNS AND CODES

| Code No. | Display patterns (output codes) (Use with voltmeter) | Probable cause | Check chart No. |
|---|---|---|---|
| 11 |   | Abnormal condition of auto-cruise vacuum pump drive system | No. 5 |
| 12 |   | Abnormal condition of vehicle-speed signal system | No. 4 |
| 15" |   | Control switch malfunction (when SET and RESUME switches switched ON simultaneously for more than 25 seconds) | No. 2, 3 |
| 16" |   | Abnormal condition of auto-cruise control unit | No. 6, 7, 8 |
| 17 |   | Abnormal condition of throttle position sensor<br>Abnormal condition of idle switch | No. 11 |

NOTE

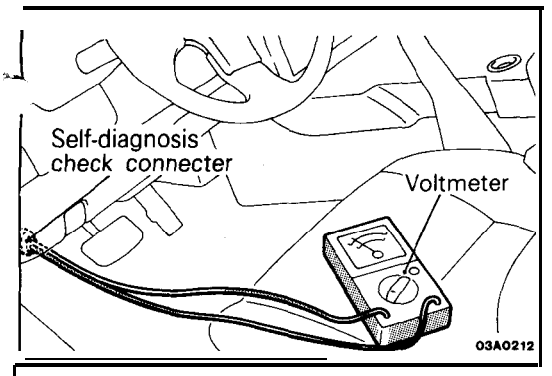
1. Codes indicated by the * symbol are displayed, if the conditions are satisfied, even if the system is normal. In either case, the system is normal if it can be reset. If there is an automatic cancellation not intentionally made by the driver, however, excluding cancellations explicitly made by the cancel procedure, there may be a temporary malfunction such as poor contact of a harness connector even though the system can be reset, and for that reason it is necessary to check according to each individual check chart that is applicable.

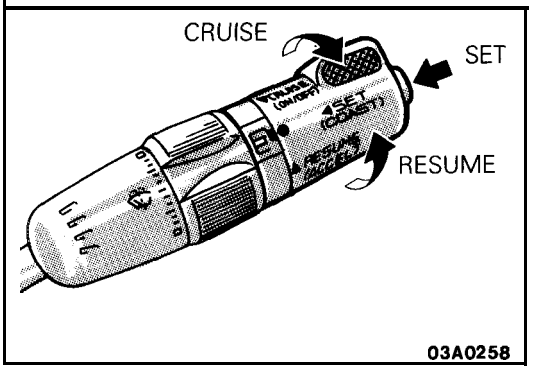



2. Diagnosis codes are displayed when, after cancellation of the auto-cruise control system, the vehicle speed decreases to less than approximately 20 km/h (12 mph), and are canceled by turning OFF the battery or canceling the diagnosis codes. (Refer to P.14-121.)

   After the diagnosis codes in the memory are erased, if (when the power supply of the electroinc control unit is switched ON once again) the power supply of the electronic control unit is normal, the diagnosis output code display will be as below, regardless of whether the system condition is normal or not.

   Continuous ON/OFF signals will be displayed at 0.5-second intervals.
   (Refer to the figure at the left.)




## INPUT CHECK

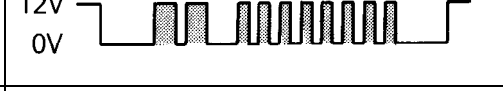
Input checks should be made when the auto-cruise control system. cannot be set and when it is necessary to check. (when a malfunction related to the auto-cruise control system, occurs) whether or not the input signals are normal.

NOTE

1. If inspection of self-diagnosis is necessary, confirm diagnosis code first and conduct input check.'
2. Input check can be conducted by set operations. Self-diagnosis terminal outputs display patterns.
3. Display codes are displayed only if the circuit is normal according to the conditions shown in the table on the next page.

(1) The voltmeter is set in the same way as for the self-diagnosis check.
(2) Turn the ignition switch to ON and switch OFF the CRUISE switch.
(3) With the SET switch in the ON position, turn the CRUISE switch ON. Then, within 1 .0 second, place the RESUME switch in the ON position..
(4) Perform each input operation according to the input check table (on the next page) and read the codes.
(5) Switch the CRUISE switch OFF.

**INPUT CHECK TABLE**

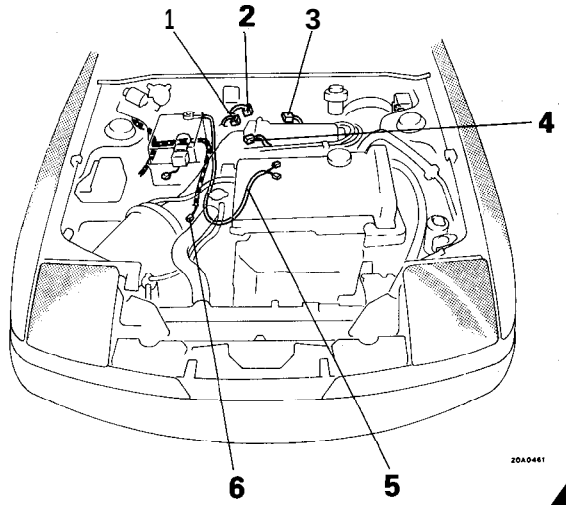
| Check No. | Input operation | Code No. | Display patterns (output codes) (use with voltmeter) | Check results |
|---|---|---|---|---|
| 1 | SET switch ON | 21 |   | SET switch circuit normal |
| 2 | RESUME switch ON | 22 |   | RESUME switch circuit normal |
| 3 | Stop light switch ON (brake pedal depressed) | 23 |   | Stop light switch normal |
| 4 | Driving at approximately to 40 km/h (25 mph) or higher | 24 |   | When both No. 4 and No. 5 can be confirmed, vehicle-speed sensor circuit normal. |
| 5 | Driving at less than approximately 40 km/h (25 mph) or stopped | 25 |   | |
| 6 | 1. Clutch switch ON (clutch pedal depressed) <M/T><br>2. Inhibitor switch ON (shift lever to "N" or "P" range) <A/T> | 26 |   | Clutch switch inhibitor switch normal |
| 7 | Throttle position sensor output voltage over 1.5V (when the accelerator pedal is pressed more than half way) | 28 |   | Throttle position sensor normal |
| 8 | Idle switch OFF (accelerator pedal depressed) | 29 |   13A0357 | Idle switch normal |

NOTE

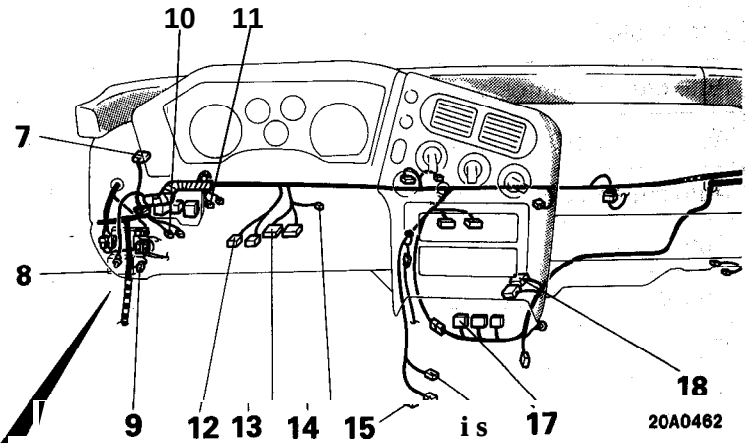
1. Each code will be displayed in an order of priority beginning from No. 1.
   If there is no display, it is possible that there is a malfunction of the ECU power-supply circuit or the SET and/or RESUME switch, so check according to check charts 1,2 and 3.
2. Continue each input operation until the output code is emitted.
   If no output codes are emitted for inputs even though the display pattern is repeated two or more times, there is a malfunction of the switch sensor.
3. When each input operation is performed and the signals for the conditions are received by the computer, each output code will be repeatedly displayed in the sequence of priority for as long as that signal continues.
4. If, during the display of output codes, the input operation is canceled (if, for example, the SET switch is set from ON to OFF), the code will be displayed for one cycle of the display, but will not be displayed during the next cycle.
   This makes it possible, therefore, to check the OFF condition (existence of not of a short-circuit of the input line or the switch).

## AUTO-CRUISE CONTROL RELATED HARNESSES

<ENGINE COMPARTMENT>



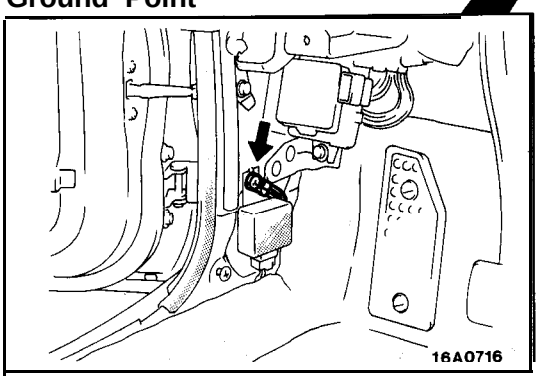

<DASH PANEL>



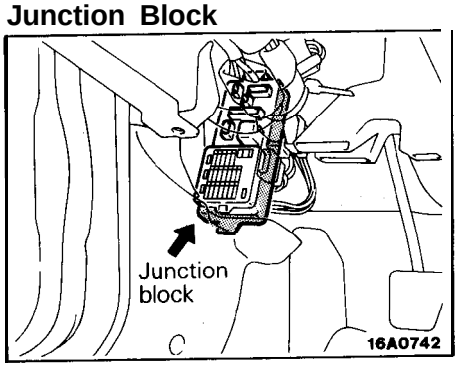

1. Idle switch <2.0L DOHC engine>
2. Motor position sensor (Idle switch) <1.8L engine>
3. Auto-cruise control vacuum pump
4. Throttle position sensor
5. Starter motor
6. Inhibitor switch <A/T>
7. Auto-cruise control unit
8. Junction block
9. Self-diagnosis connector
10. Clutch switch <M/T>
11. Stop light switch
12. Ignition switch
13. Column switch
14. Accelerator switch <A/T>
15. Power/Economy changeover switch <A/T>
16. Overdrive switch <A/T>
17. MPI control unit
18. 4A/T control unit

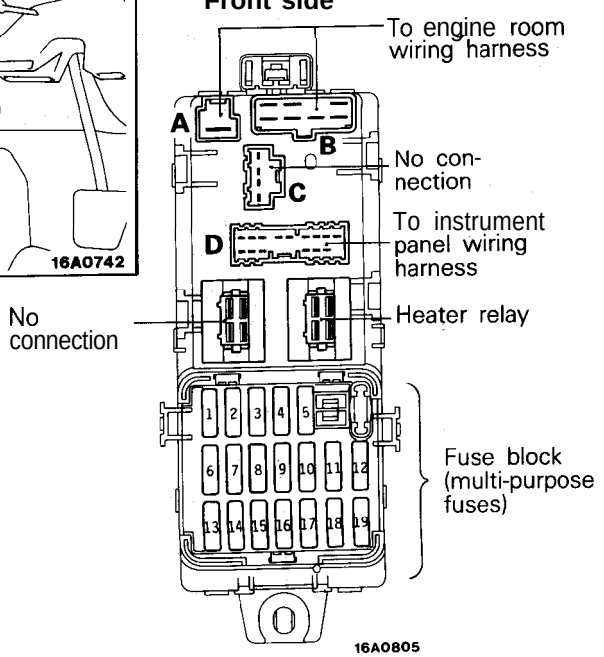
NOTE
Refer to P.14-126 for details about the mounting positions of the auto-cruise control unit, etc.

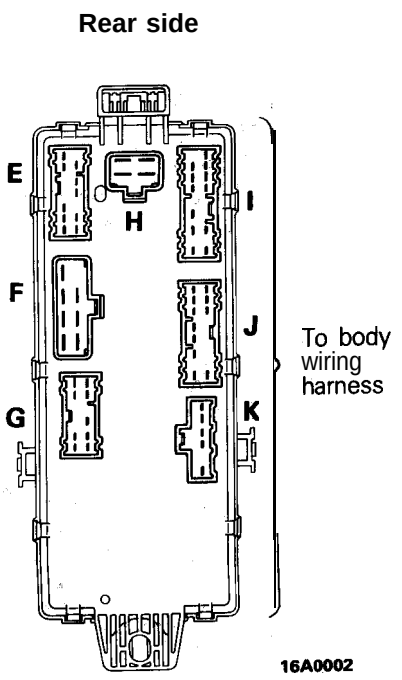
### Ground Point




### Junction Block



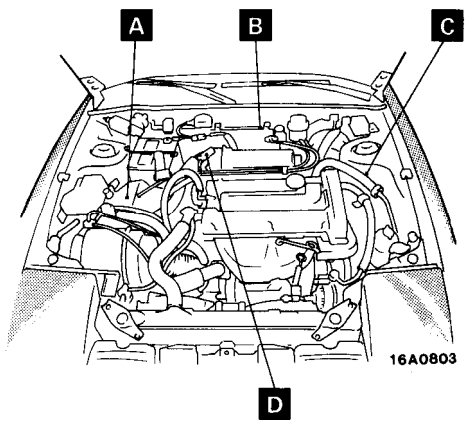



## AUTO-CRUISE CONTROL COMPONENTS LOCATION

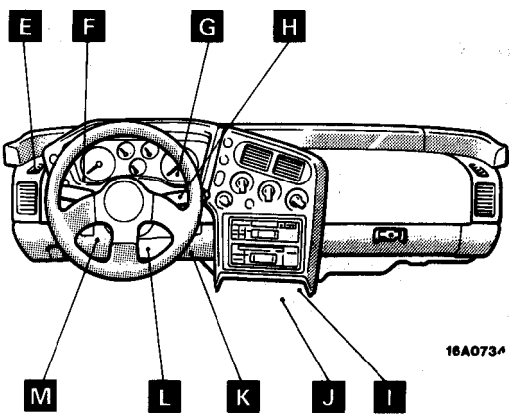
| Name | Symbol | Name | Symbol |
|---|---|---|---|
| Accelerator pedal switch <A/T> | K | Idle switch | D |
| Auto-cruise control actuator | C | Inhibitor switch <A/T> | A |
| Auto-cruise control switch | H | Motor position sensor (Idle switch) | D |
| Auto-cruise control unit | E | Overdrive switch <A/T> | J |
| Auto-cruise control vacuum pump | B | Stop light switch | L |
| Auto-cruise indicator light | F | Throttle position sensor | D |
| Clutch switch <M/T> | M | Vehicle speed sensor (Reed switch) | G |
| 4 A/T control unit | I | | |

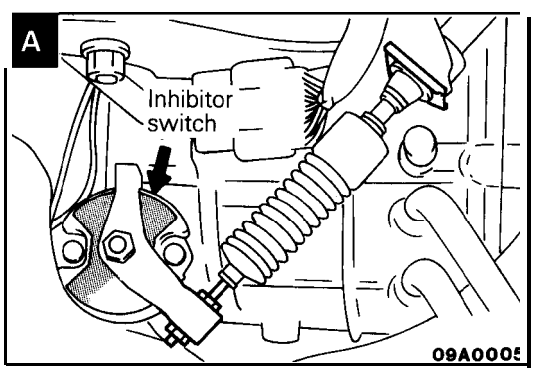
NOTE
The "Name" column is arranged in alphabetical order.

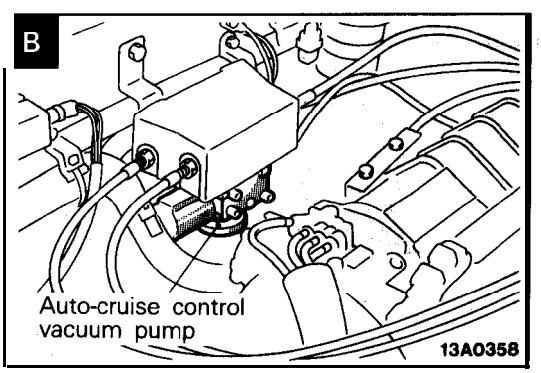
**<Engine compartment>**

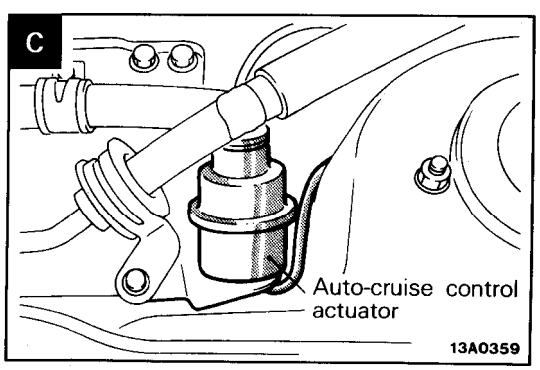



**<Interior>**

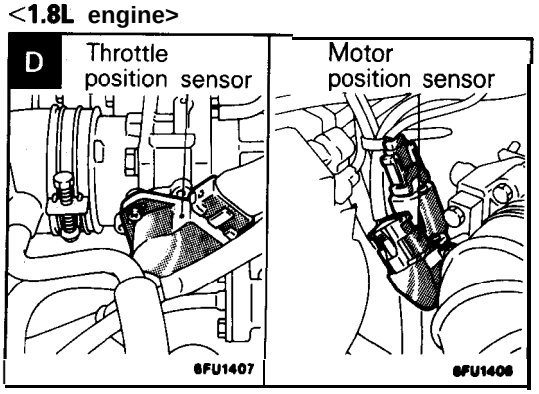


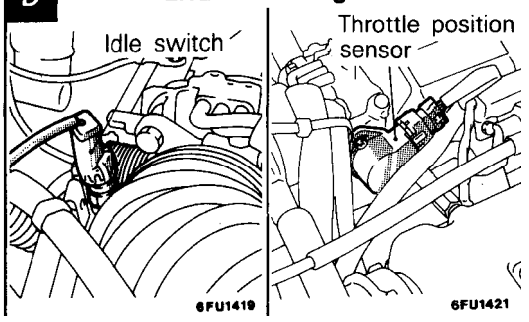




**<1.8L engine>**

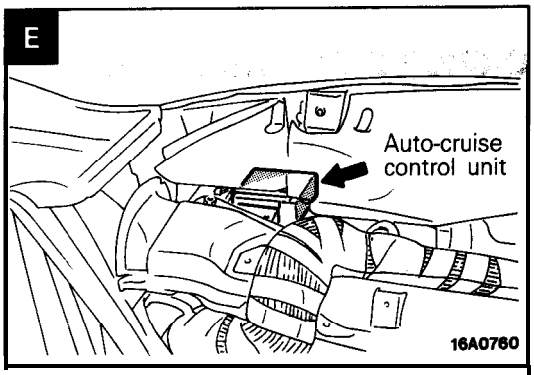


D

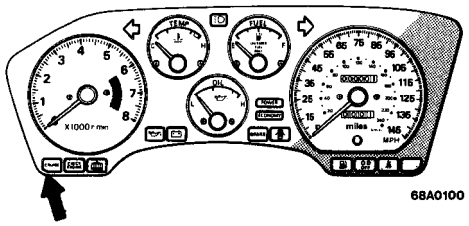
<2.0L DOHC engine>




E

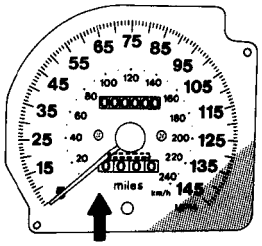



F

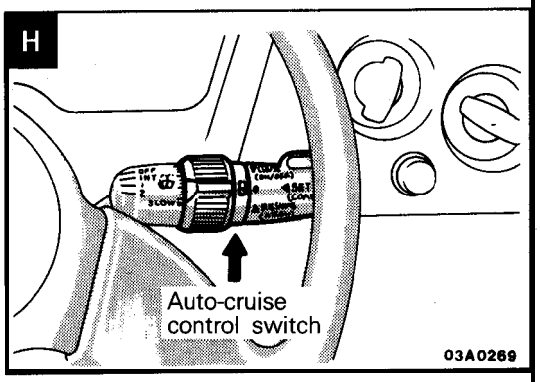



Auto-cruise indicator light

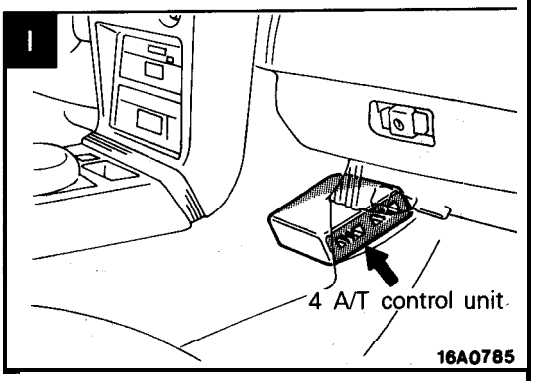
G



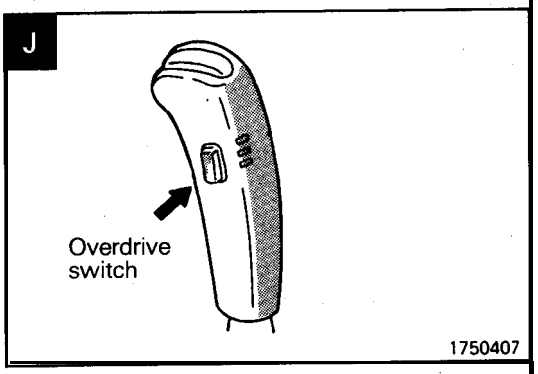

H



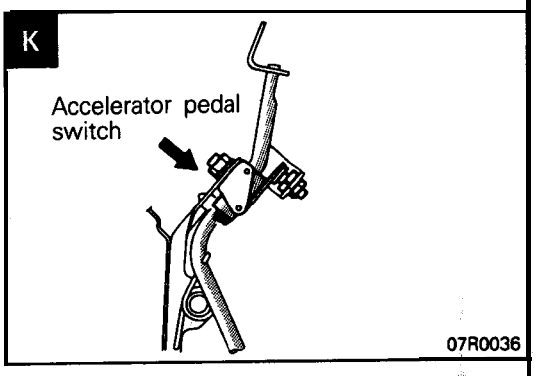

I



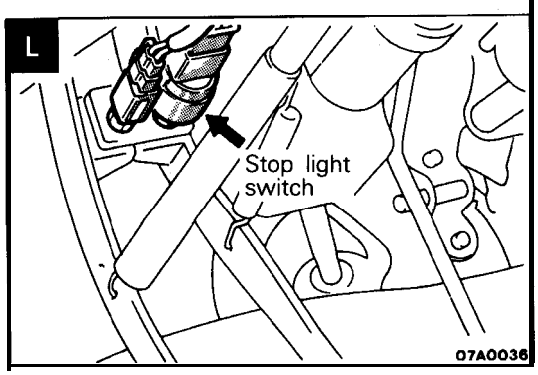

J



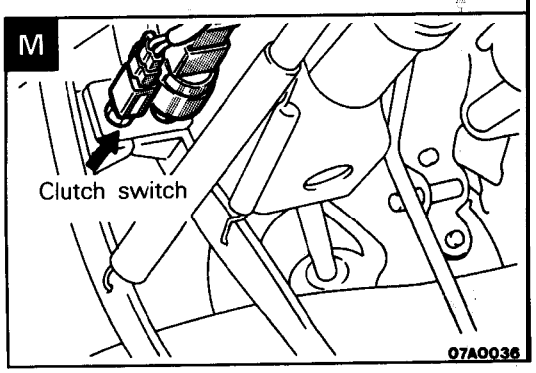

K




L

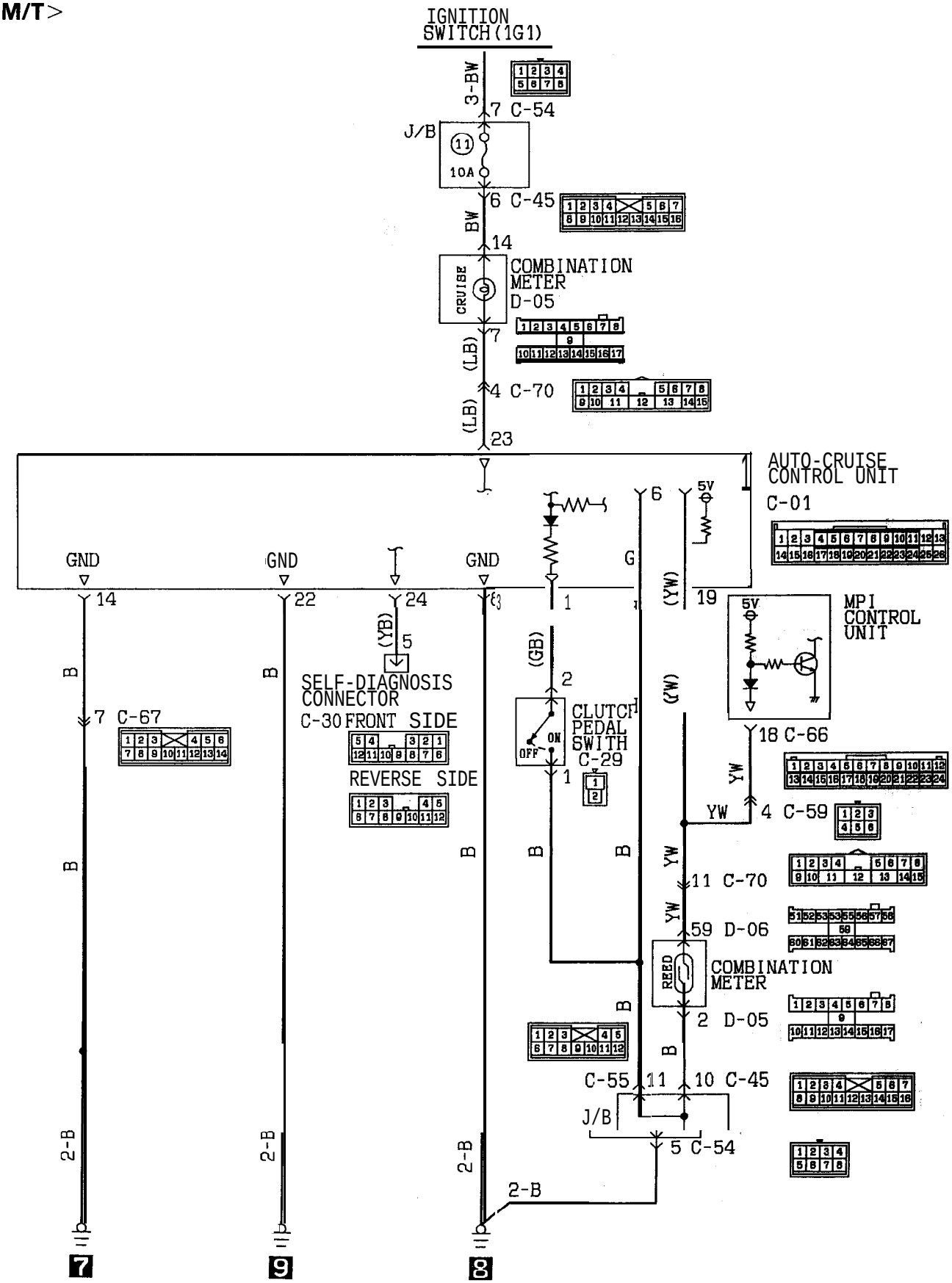



M

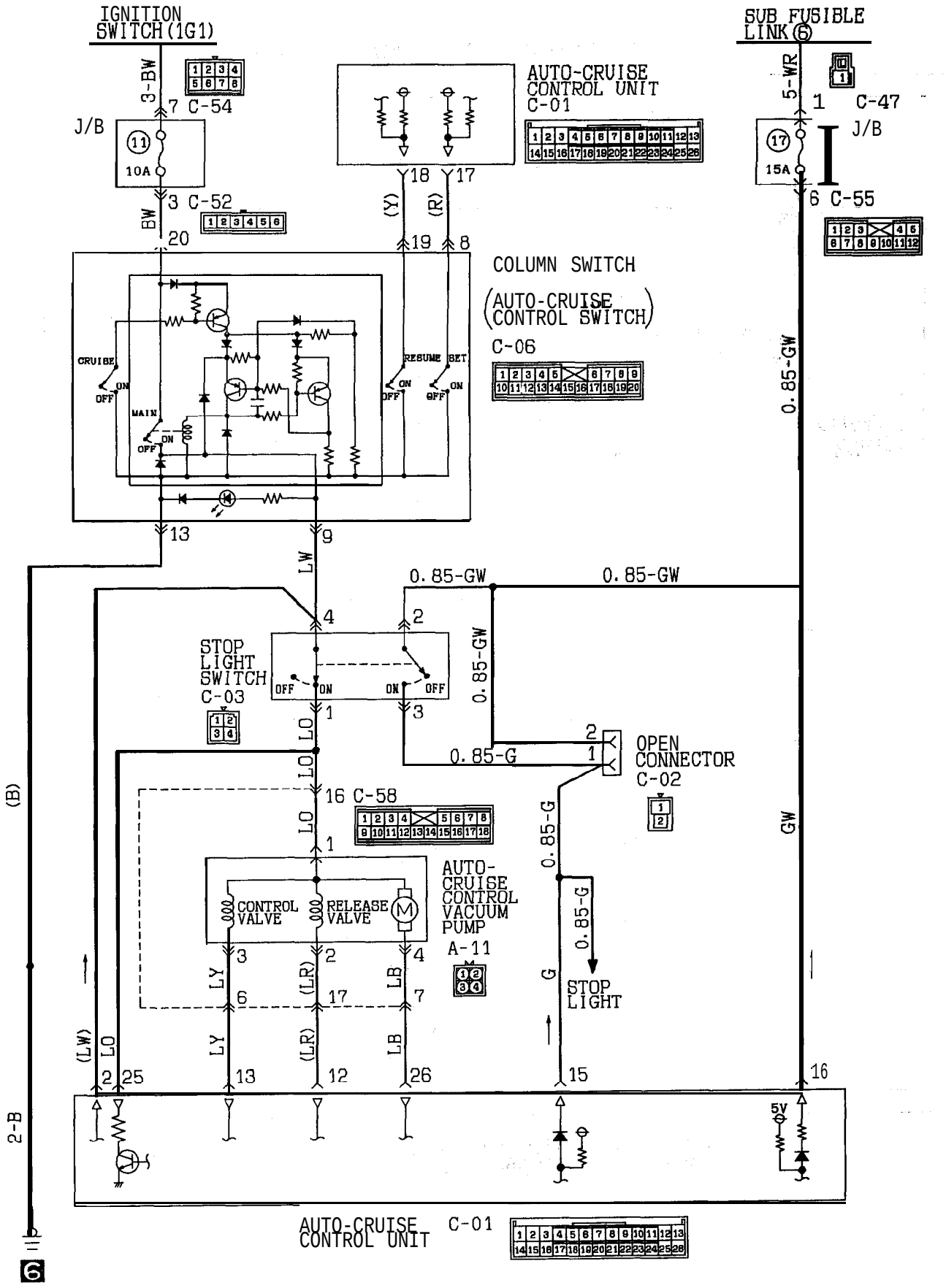


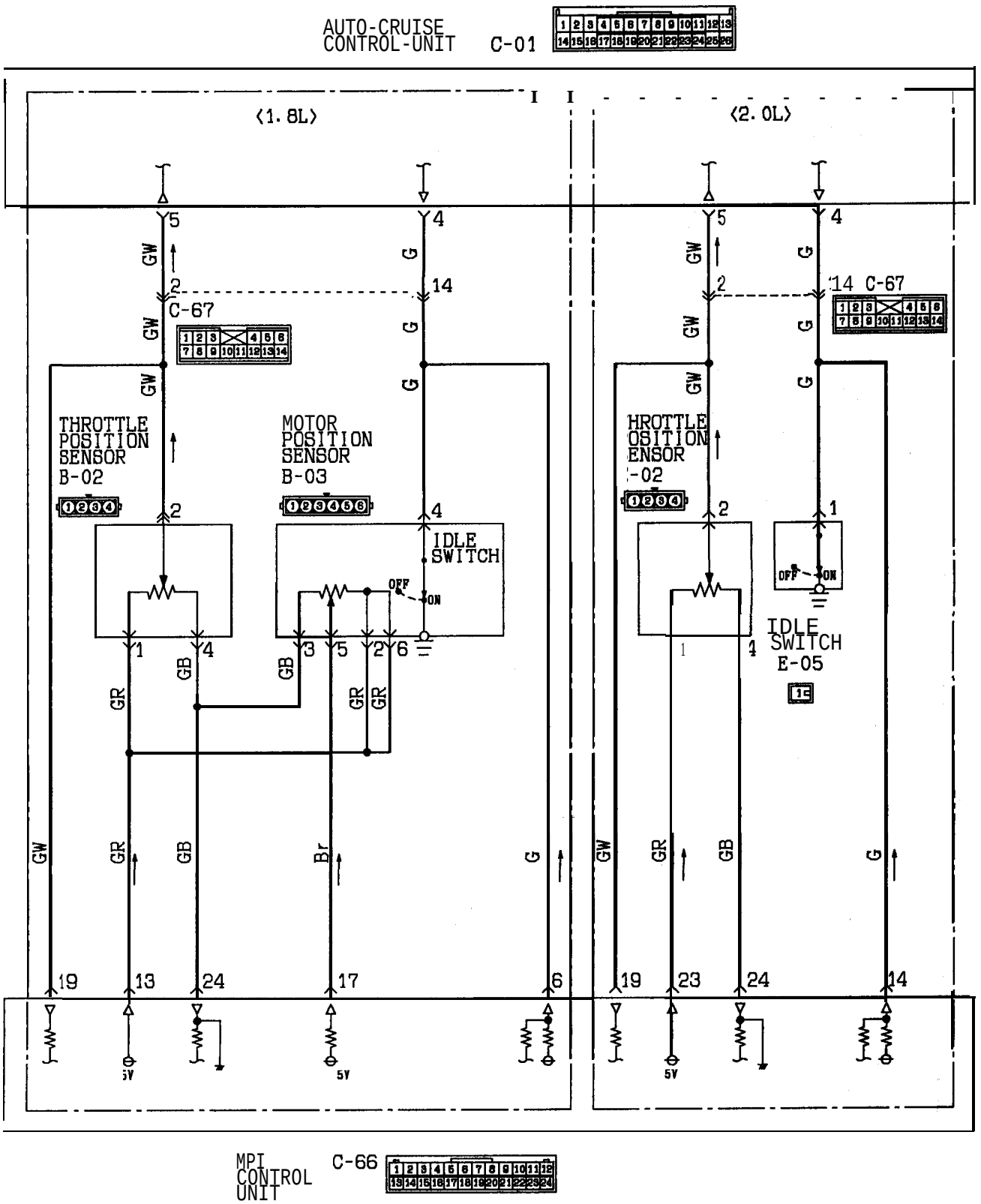
## AUTO-CRUISE CONTROL CIRCUIT

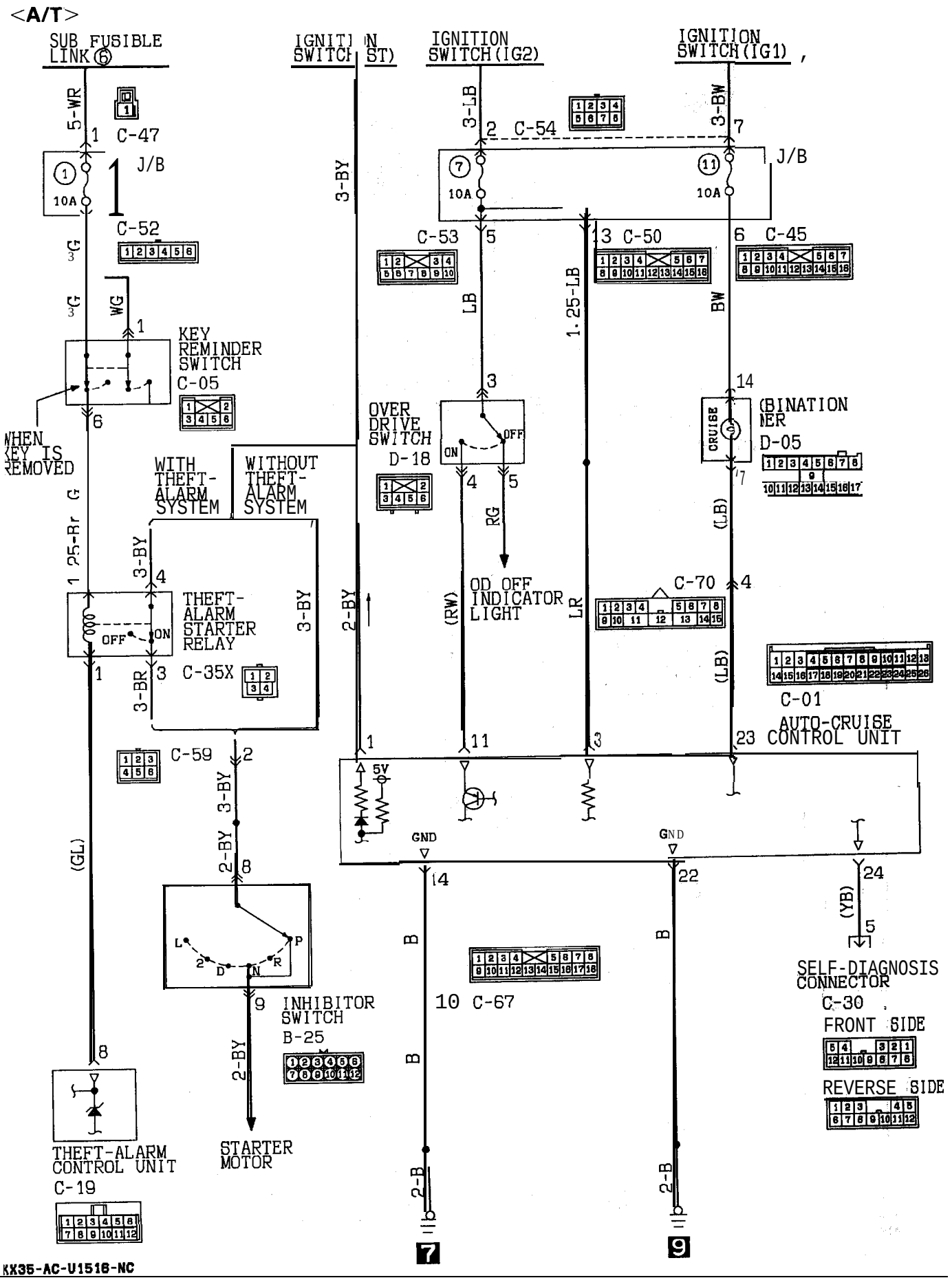
<M/T>

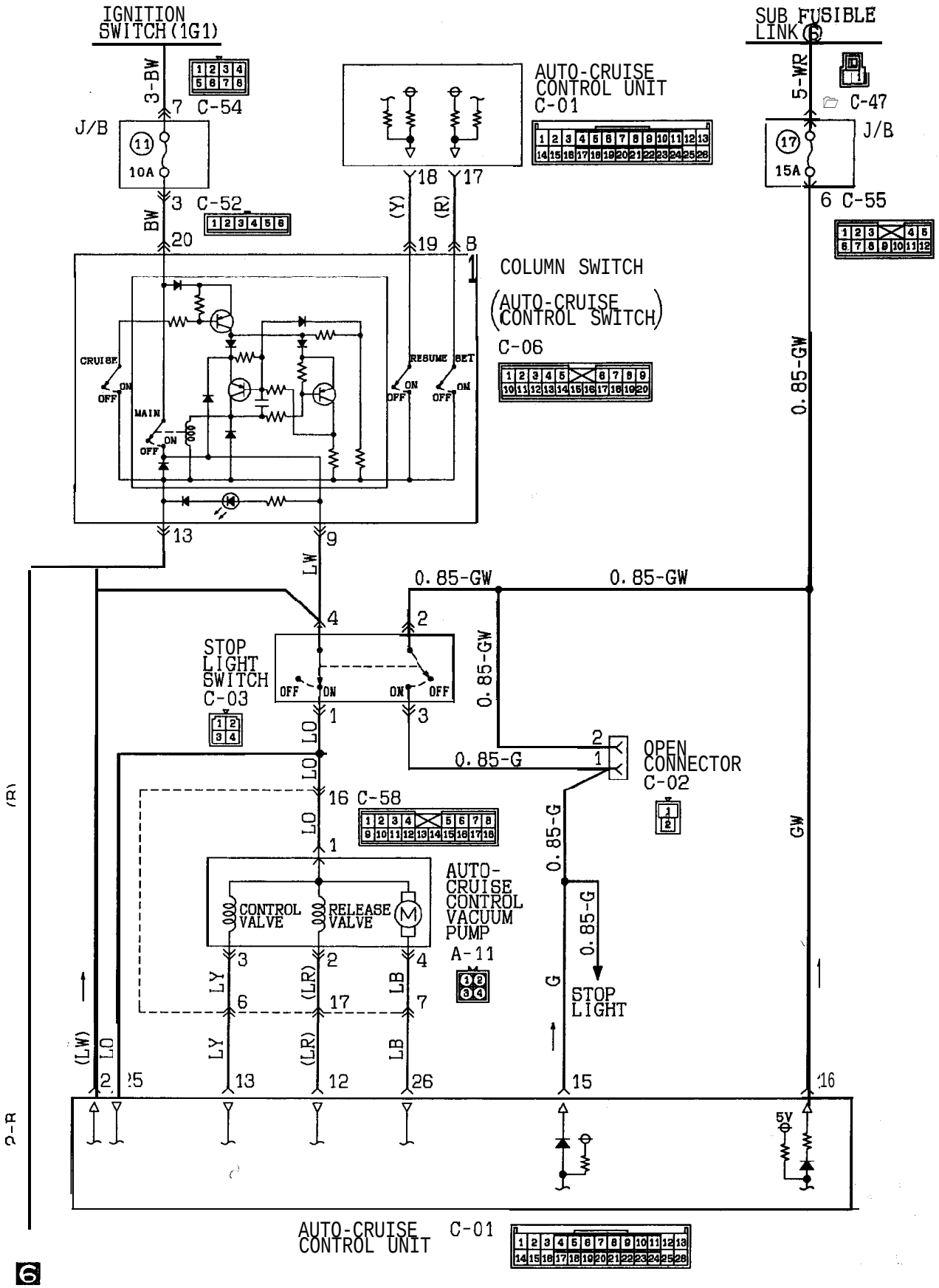


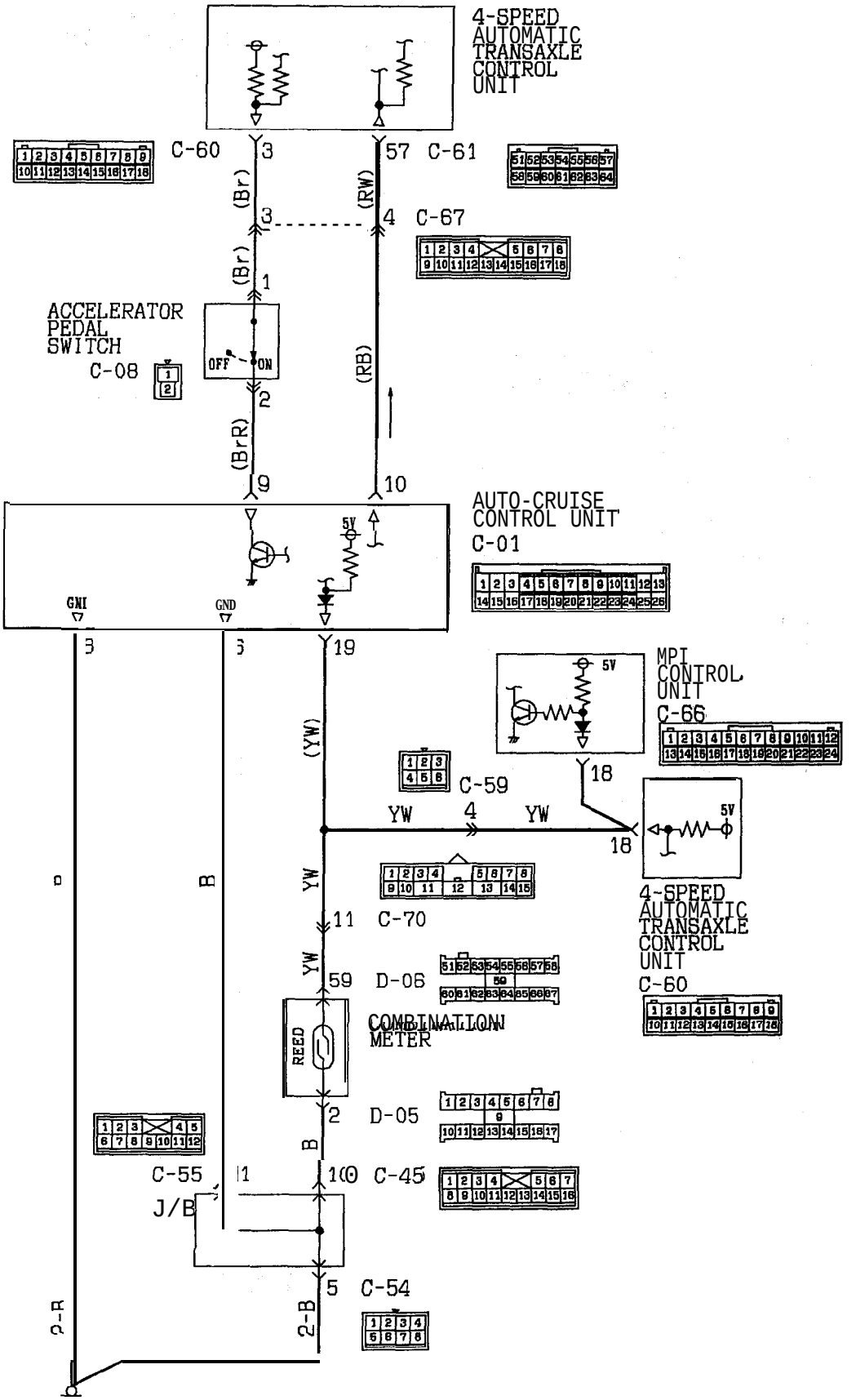

X35-AC-U1515-NC


IGNITION SWITCH(1G1)
SUB FUSIBLE LINK⑥
AUTO-CRUISE CONTROL UNIT C-01
3-BW
7 C-54
J/B
10A
3 C-52
BW
20
18
17
(Y)
(R)
19
8
5-WR
1 C-47
J/B
15A
6 C-55
0.85-GW
COLUMN SWITCH
(AUTO-CRUISE CONTROL SWITCH)
C-06
CRUISE
ON
OFF
MAIN
RESUME
SET
13
9
LW
0.85-GW
0.85-GW
4
2
STOP LIGHT SWITCH C-03
OFF
ON
ON
OFF
1
3
0.85-GW
2
1
0.85-G
OPEN CONNECTOR C-02
LO
LO
16 C-58
LO
1
(B)
0.85-G
GW
AUTO-CRUISE CONTROL VACUUM PUMP A-11
CONTROL VALVE
RELEASE VALVE
3
2
4
LY
(LR)
LB
6
17
7
G
0.85-G
STOP LIGHT
(LW)
LO
LY
(LR)
LB
2
25
13
12
26
15
16
5V
2-B
AUTO-CRUISE CONTROL UNIT C-01
6

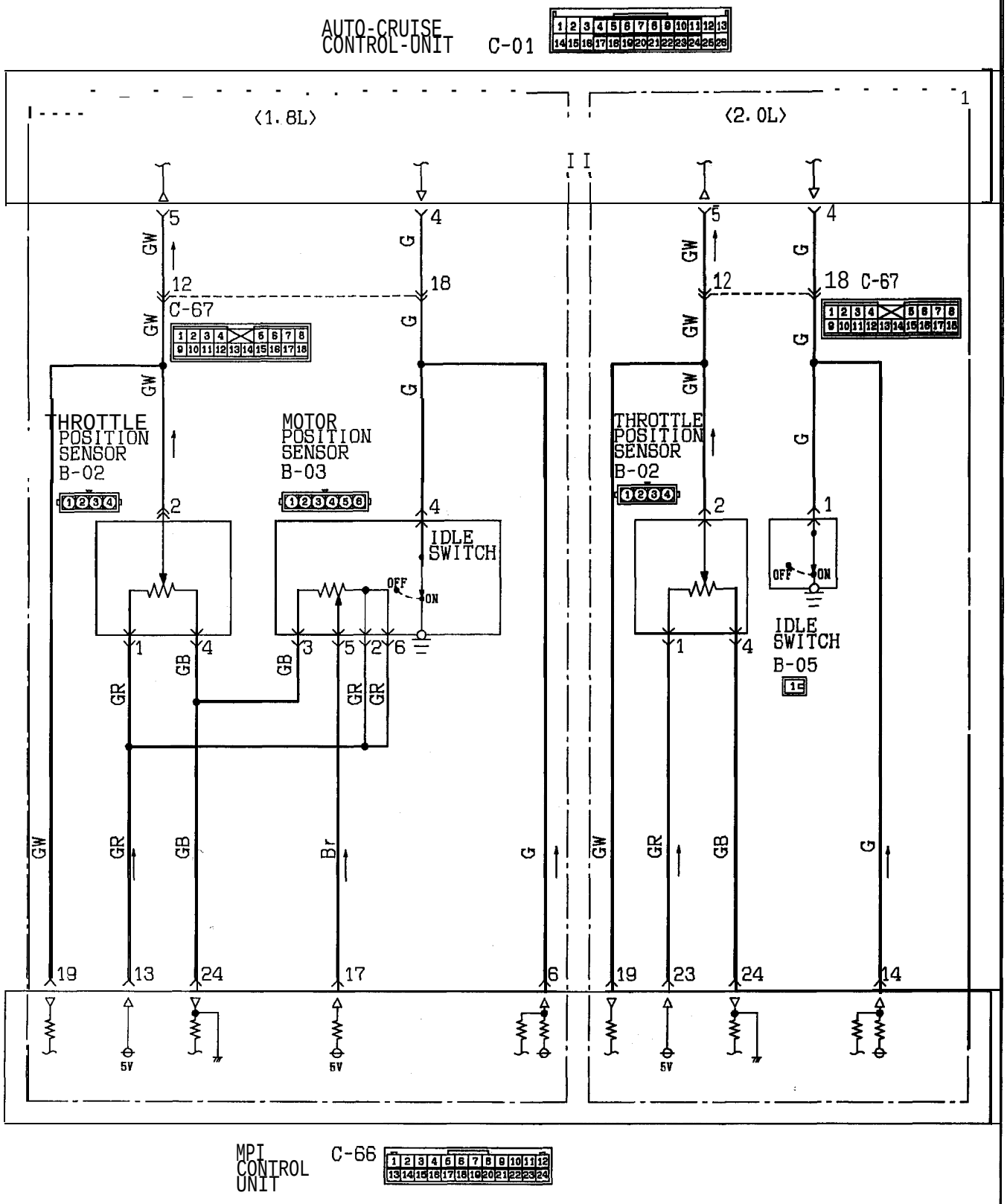

AUTO-CRUISE CONTROL-UNIT C-01
<1.8L>
<2.0L>
C-67
THROTTLE POSITION SENSOR B-02
MOTOR POSITION SENSOR B-03
IDLE SWITCH
IDLE SWITCH E-05
OFF
ON
GW
GR
GB
Br
G
5V
MPI CONTROL UNIT C-66

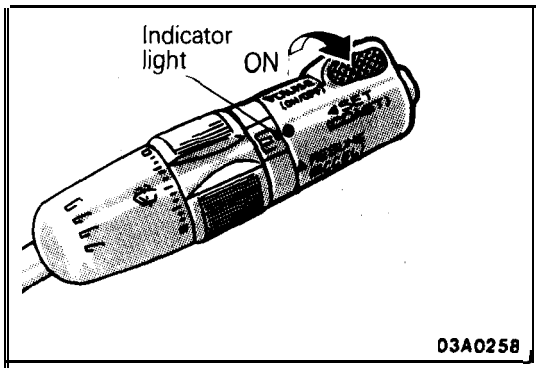

<A/T>
SUB FUSIBLE LINK ⑥
IGNITION SWITCH (ST)
IGNITION SWITCH (IG2)
IGNITION SWITCH (IG1)
5-WR
C-47
J/B
10A
C-52
3-LB
C-54
3-BW
7
11
C-53
5
C-50
3
C-45
6
LB
1.25-LB
BW
3-BY
WG
KEY REMINDER SWITCH
C-05
OVER DRIVE SWITCH
D-18
ON
OFF
4
5
RG
14
(BINATION METER
D-05
CRUISE
7
(LB)
WHEN KEY IS REMOVED
WITH THEFT-ALARM SYSTEM
WITHOUT THEFT-ALARM SYSTEM
1.25-Rr G
THEFT-ALARM STARTER RELAY
C-35X
3-BR
2-BY
(RW)
OD OFF INDICATOR LIGHT
LR
C-70
C-01
AUTO-CRUISE CONTROL UNIT
23
C-59
5V
GND
(GL)
L
2
D
N
R
P
9
INHIBITOR SWITCH
B-25
10 C-67
B
22
24
(YB)
SELF-DIAGNOSIS CONNECTOR
C-30
FRONT SIDE
REVERSE SIDE
THEFT-ALARM CONTROL UNIT
C-19
STARTER MOTOR
2-B
7
9
KX35-AC-U151B-NC

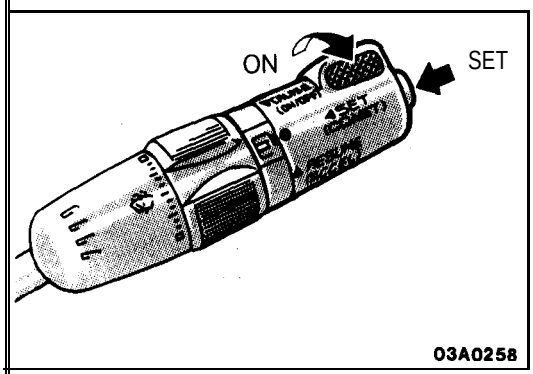

IGNITION SWITCH(1G1)
SUB FUSIBLE LINK
AUTO-CRUISE CONTROL UNIT C-01
3-BW
5-WR
C-54
C-47
J/B
10A
15A
C-52
C-55
BW
(Y)
(R)
COLUMN SWITCH
(AUTO-CRUISE CONTROL SWITCH)
C-06
CRUISE
RESUME
SET
MAIN
0.85-GW
LW
STOP LIGHT SWITCH C-03
LO
0.85-G
OPEN CONNECTOR C-02
C-58
AUTO-CRUISE CONTROL VACUUM PUMP A-11
CONTROL VALVE
RELEASE VALVE
LY
(LR)
LB
G
STOP LIGHT
(LW)
5V
AUTO-CRUISE CONTROL UNIT C-01

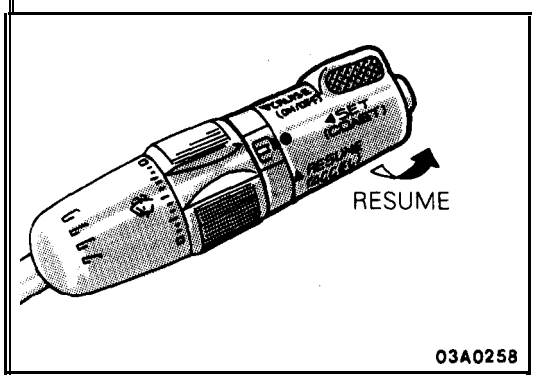


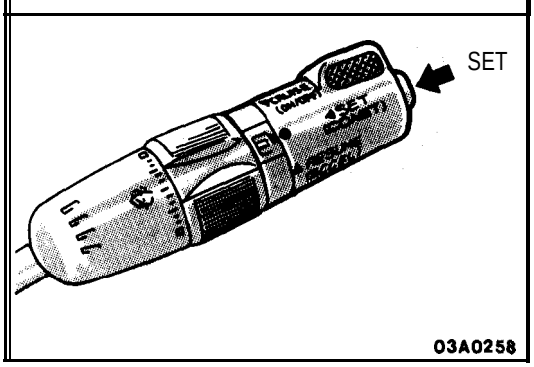

KX35-AC-U1516A-NC


AUTO-CRUISE CONTROL-UNIT C-01
(1.8L)
(2.0L)
THROTTLE POSITION SENSOR B-02
MOTOR POSITION SENSOR B-03
IDLE SWITCH
IDLE SWITCH B-05
C-67
THROTTLE POSITION SENSOR B-02
IDLE SWITCH
C-67
GW
G
GR
GB
Br
OFF
ON
5V
MPI CONTROL UNIT C-66




# SERVICE ADJUSTMENT PROCEDURES

N14FTAX

## AUTO-CRUISE CONTROL SYSTEM INSPECTION

### AUTO-CRUISE CONTROL SWITCH CHECK

(1) Turn the ignition key to ON.
(2) Check to be sure that the indicator light within the switch illuminates when the cruise control switch is switched ON. (Turn the cruise control switch to the "CRUISE" position.)

### AUTO-CRUISE CONTROL SETTING CHECK

(1) Switch ON the cruise control switch.
(2) Drive at the desired speed within the range of approximately 40–145 km/h (25–90 mph).
(3) Press the SET button.
(4) Check to be sure that the speed is the desired constant speed when the switch is released, and also check to be sure that the auto cruise indicator light (within the combination meter) illuminates.

NOTE
If the vehicle speed decreases to approximately 15 km/h (9 mph) below the set speed, because of climbing a hill for example, the auto-cruise control will be cancelled.

### SPEED-INCREASE SETTING CHECK

(1) Set to the desird speed.
(2) Turn the control switch to RESUME position.
(3) Check to be sure that acceleration continues while the switch is hold, and that when it is released the constant speed at the time when it was released becomes the driving speed.

NOTE
Even if, during acceleration, the vehicle speed reaches or exceeds the high limit [approximately 145 km/h (90 mph)], acceleration will continue, however, when the switch is released, the set speed ("memorized speed") will become the high limit of the vehicle speed.

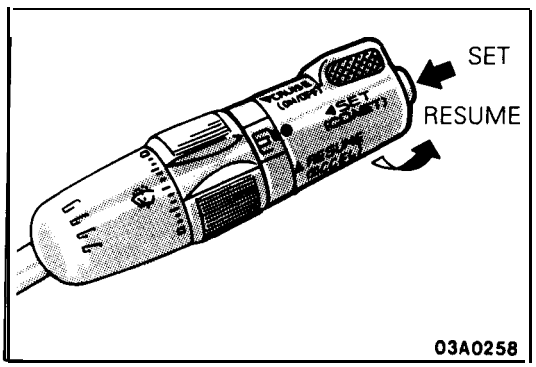
### SPEED REDUCTION SETTING CHECK

(1) Set to the desired speed.
(2) Press the SET button.
(3) Check to be sure that deceleration continues while the switch is pressed, and that when it is released the constant speed at the time when it was released becomes the driving speed.

NOTE
When the vehicle speed reaches the low limit [approximately 40 km/h (25 mph)] during deceleration, the automatic speed control will be cancelled.

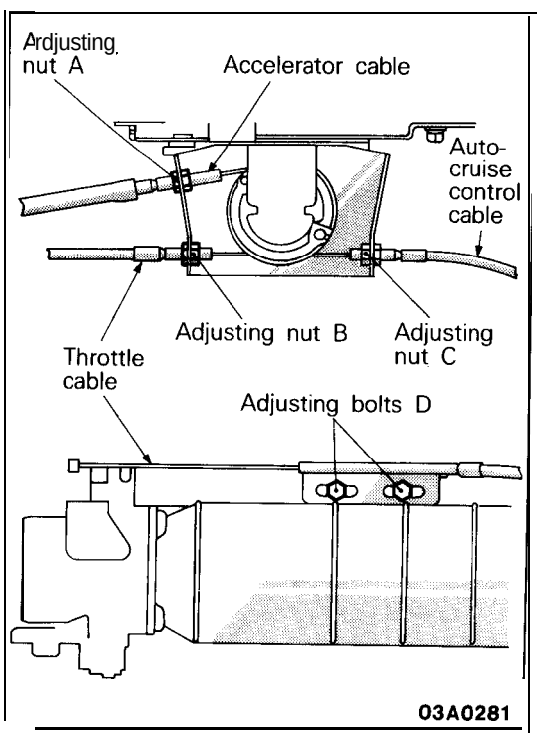
### AUTO-CRUISE CONTROL CANCELLATION CHECK

(1) Set the auto-cruise control.
(2) Check to be sure that there is a return to ordinary driving, and that the illumination of the auto-cruise indicator stops, when either of the operations below is performed.
① The brake pedal is depressed.
② The clutch pedal is depressed. <M/T>
③ The shift lever is moved to the "N" or "P" range. <A/T>
④ The auto-cruise control main switch is switched OFF.
⑤ The ignition switch is turned to OFF.



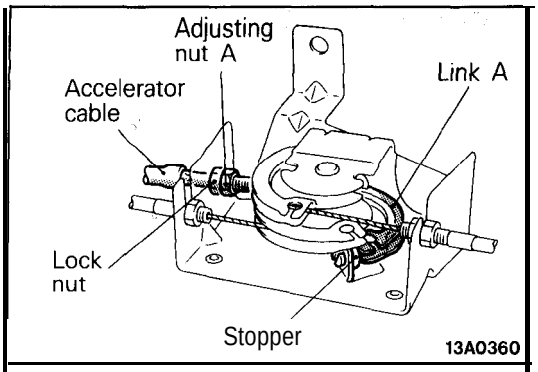

### CHECK OF RETURN TO THE SET SPEED BEFORE CANCELLATION

(1) Set the auto-cruise control.
(2) Check to be sure that the auto-cruise control is cancelled when either of the operations below is performed.
① The brake pedal is depressed.
② The clutch pedal is depressed. <M/T>
③ The shift lever is moved to the "N" range. <A/T>
(3) Turn the control switch to RESUME position and release (RESUME switch ON→OFF) while driving at a vehicle speed of approximately 40 km/h (25 mph) or higher.
(4) After switching RESUME switch to OFF, check to be sure that there is a return to the auto-cruise control speed before it will be cancelled and the vehicle will travel at the constant speed.




## ACCELERATOR CABLE, THROTTLE CABLE AND AUTO-CRUISE CONTROL CABLE INSPECTION AND ADJUSTMENT

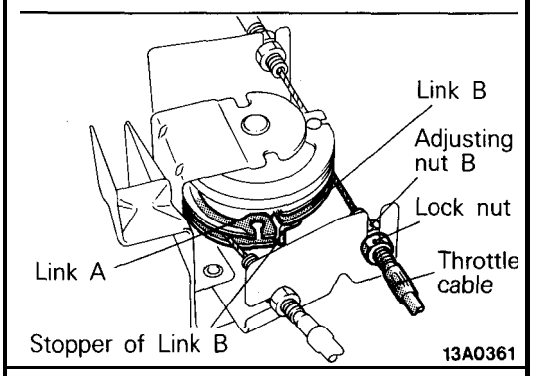
(1) Remove the link protector. (Refer to P.14-140.)
(2) Check that there are no sharp bends and breaks in the accelerator cable, throttle cable and auto-cruise control cable.
(3) Turn the ignition switch to the ON position (without starting the engine) and leave in that condition for approximately 15 seconds.
(4) Leave plenty of play in each cable and temporarily install adjusting nuts A, B, C and adjusting bolts D.




(5) Adjust with adjusting nut A so when link A hits the stopper, the accelerator cable play (inner cable play) reaches the standard value.

**Standard value**
**M/T: O-l mm (0–.04 in.)**
**A/T: 2-3 mm (.08–.12 in.)**

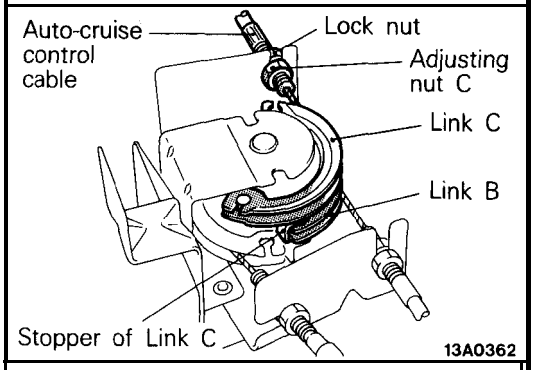
(6) Fix the accelerator cable with the lock nut.




(7) Adjust with adjusting nut B so when the link B stopper hits the end of link A, throttle cable play (inner cable play) reaches the standard value.

**Standard value: 1–2 mm (.04–.08 in.)**

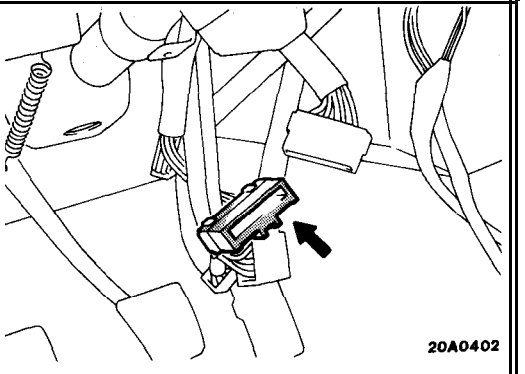
(8) Fix the throttle cable with lock nut and adjusting bolt D.

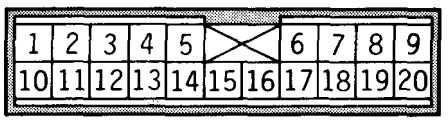



(9) Adjust with adjusting nut C so when the link C stopper hits the end of link B, the auto-cruise control cable play (inner cable play) reaches the standard value.

**Standard value: 1–2 mm (.04–.08 in.)**

(IO)Fix the auto-cruise control cable with the lock nut.
(1 l)After adjusting, confirm that throttle valve fully opens and closes by operating pedal.




16A0192

## INDIVIDUAL PARTS INSPECTION

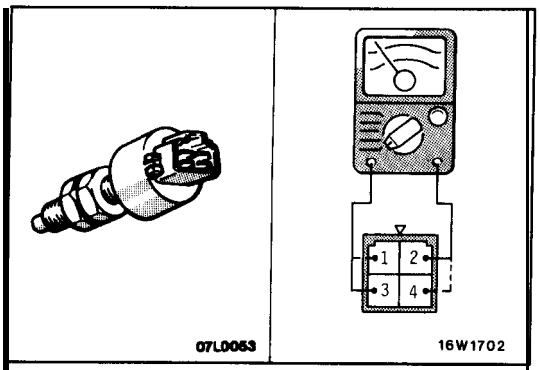
### AUTO-CRUISE CONTROL SWITCH INSPECTION

(1) Remove the knee protector assembly and the lower column cover.
(2) Disconnect the column switch connector and check the continuity between the terminals.

O—O: continuity

| Switch position \ Terminal | 13 | 8 | 9 | 19 | 20 |
|---|---|---|---|---|---|
| OFF | | | | | |
| SET switch ON | O | O | | | |
| Neutral | | | | | |
| RESUME switch ON | 0 | | | 0 | |

NOTE
If there is an abnormal condition (any condition not described in the table above), replace the column switch.

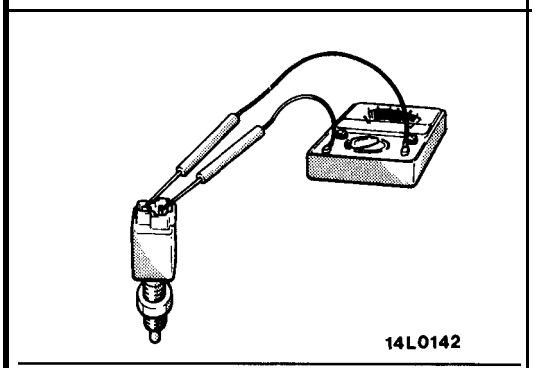



## STOP LIGHT SWITCH/BRAKE SWITCH INSPECTION

(1) Diconnect the connector.
(2) Check for continuity between the terminals of the switch.

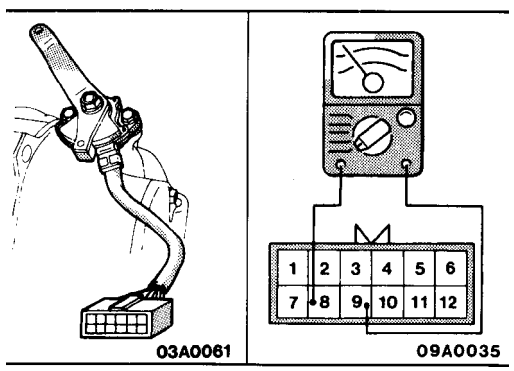
O—O :continuity

| Switch / Measurement conditions / Terminal | Brake switch 1 | Brake switch 4 | Stop light siwtch 2 | Stop light siwtch 3 |
|---|---|---|---|---|
| When brake pedal depressed. | | | 0 —— | —0 |
| When brake pedal not depressed. | 0 —— | —0 | | |




## CLUTCH SWITCH INSPECTION

(1) Disconnect the connector.
(2) Check to be sure that there is continuity between connector terminals when the clutch pedal is depressed.




## INHIBITOR SWITCH ("N" AND "P" POSITIONS) INSPECTION

(1) Disconnect the connector.
(2) Check to be sure that there is continuity between connector terminals 8 and 9 when the shift lever is moved to the "N" or "P" range.

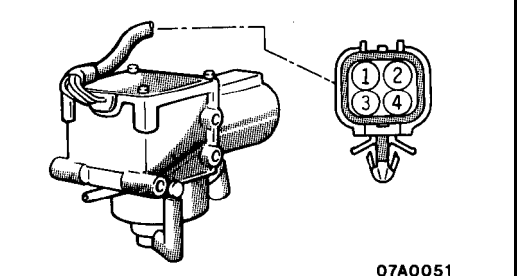
## AUTO-CRUISE CONTROL VACUUM PUMP INSPECTION

### Inspection of solenoid valves (control valve, release valve)

(1) Remove the auto-cruise control vacuum pump connector.
(2) Measure the resistance value between terminals ①–② and between ①–③.

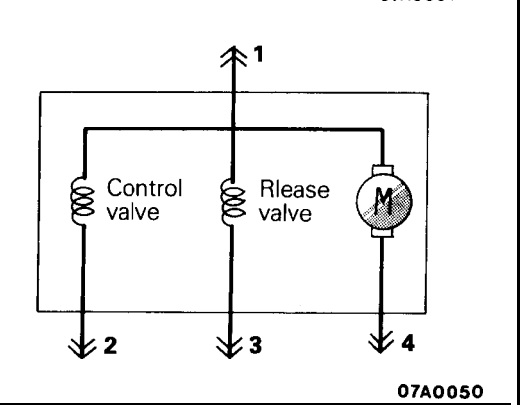
**Standard value: 50–60Ω**

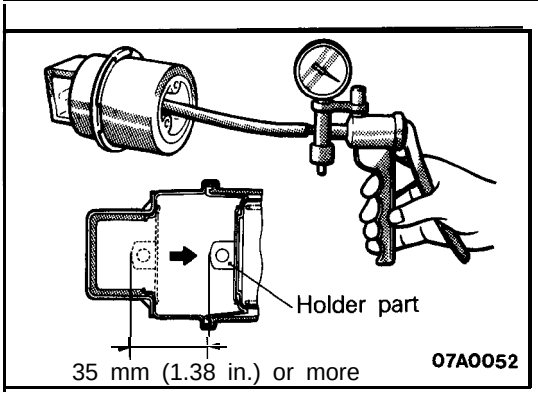
(3) Check that the solenoid valve makes an operating noise when battery voltage is impressed between terminals ①–② and between ①–③.
(4) If there is a malfunction of the solenoid valve, replace the auto-cruise control vacuum pump assembly.




### Motor inspection

(1) Remove the auto-cruise control vacuum pump connector.
(2) Check that the motor revolves when battery voltage is impressed between terminals ①–④.






## ACTUATOR INSPECTION

(1) Remove the actuator.
(2) Apply negative pressure to the actuator with the vacuum pump and check that the holder moves more than 35 mm (1.38 in.). In addition, check that there is no change in the position of the holder when negative pressure is maintained in that condition.
(3) First install the actuator and then inspect and adjust the cruise control cable (Refer to P.14-136.).

## VEHICLE-SPEED SENSOR INSPECTION

Refer to GROUP 8–Meters and Gauges for checking of vehicle speed sensor.

## ACCELERATOR SWITCH INSPECTION

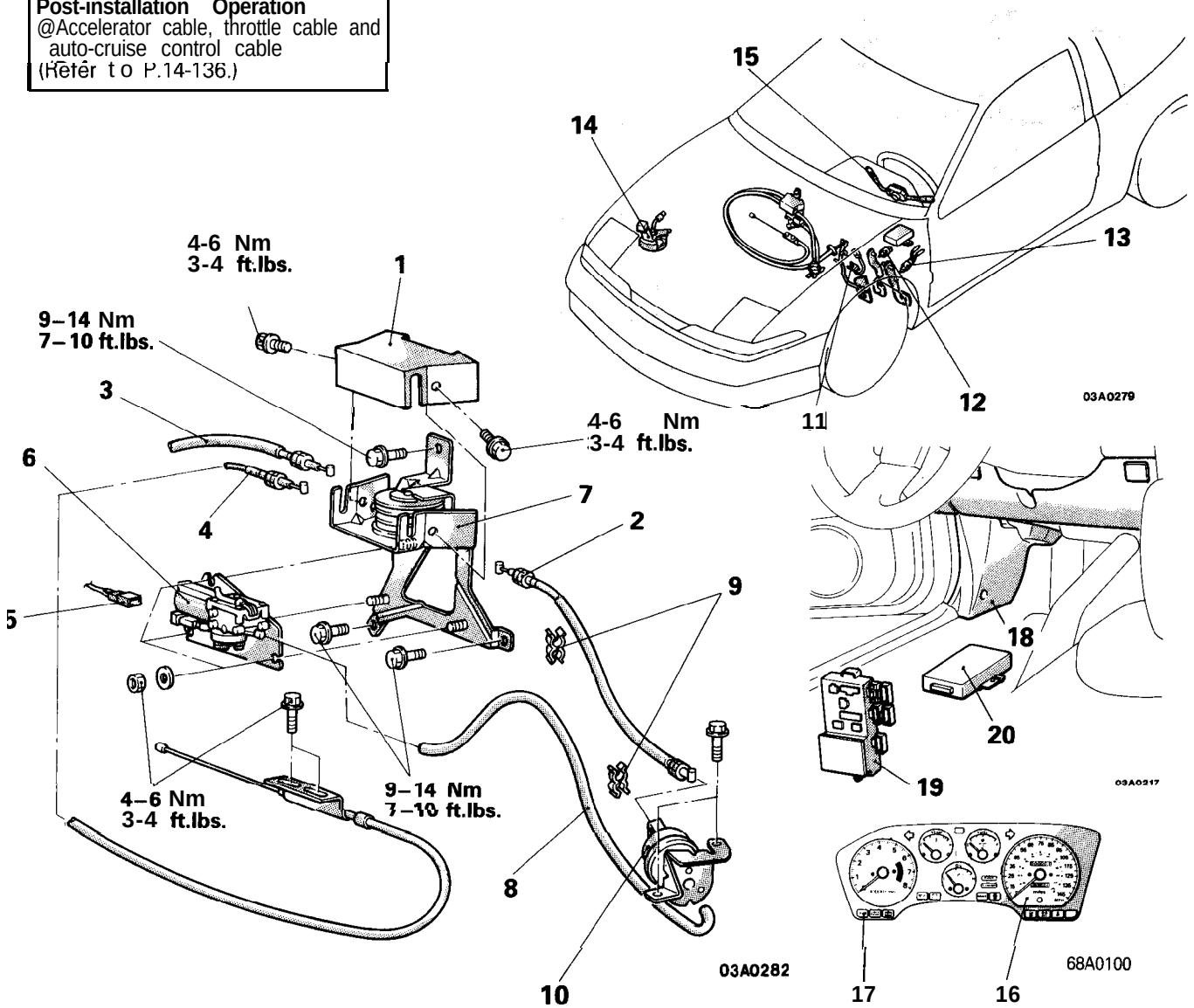
Refer to GROUP 21 -Troubleshooting.

# AUTO-CRUISE CONTROL

N14TD--

## REMOVAL AND INSTALLATION

**Post-installation Operation**
@Accelerator cable, throttle cable and auto-cruise control cable
(Refer to P.14-136.)




**Removal steps of actuator**

1. Link protector
2. Auto-cruise control cable
3. Accelerator cable
4. Throttle cable
5. Auto-cruise control vacuum pump connector
6. Auto-cruise control vacuum pump
7. Link assembly
8. Vacuum hose
9. Clip
10. Auto-cruise control actuator

**Removal steps of sensor and switches**

11. Accelerator switch <A/T>
12. Stop light switch
13. Clutch switch <M/T>
14. Inhibitor switch <A/T>
◆◆ ◆◆ 15. Auto-cruise control switch
◆◆ ● + 16. Vehicle speed sensor
◆◆ ● + 17. Auto-cruise control indicator light

**Removal steps of control unit**

18. Cowl side trim
19. Junction block
20. Auto-cruise control unit

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal"
(3) ● *: Refer to "Service Points of Installation".
(4) Refer to P.14-63, 77 for throttle position sensor and idle switch.

## SERVICE POINTS OF REMOVAL N14TDBC

**15. REMOVAL OF AUTO-CRUISE CONTROL SWITCH**

Refer to GROUP 8–Column Switch.

**16. REMOVAL OF VEHICLE SPEED SENSOR**

Refer to GROUP 8–Meters and Gauges.

**17. REMOVAL OF AUTO-CRUISE CONTROL INDICATOR LIGHT**

Refer to GROUP 8–Meters and Gauges.

## INSPECTION N14TDCE

- Check the inner and outer cable for damage.
- Check the cable for smooth movement.
- Check the link protector for damage.

**CHECKING THE AUTO-CRUISE CONTROL ACTUATOR**

Refer to P.14-138.

## SERVICE POINTS OF INSTALLATION N14TDDD

**17. INSTALLATION OF AUTO-CRUISE CONTROL INDICATOR LIGHT**

Refer to GROUP 8–Meters and Gauges.

**16. INSTALLATION OF AUTO-CRUISE CONTROL SWITCH**

Refer to GROUP 8–Column Switch.

**15. INSTALLATION OF VEHICLE SPEED SENSOR**

Refer to GROUP 8–Meter and Gauges.

**NOTES**

# PROPELLER SHAFT

## CONTENTS

N16AA--


**PROPELLER SHAFT** ..... 4

**SPECIAL TOOLS** ..... 3

**SPECIFICATIONS** ..... 2

General Specifications ..... 2

Lubricants ..... 3

Service Specifications ..... 2

Torque Specifications ..... 2

**TROUBLESHOOTING** ..... 3

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N16CA--

| Items | | Specifications |
|---|---|---|
| Propeller shaft | | |
| Type | | 4 joint propeller shaft |
| Length × O.D. | mm (in.) | |
| Front | | 707 × 50.8 (27.8 × 2.00) |
| Center | | 647.5 × 50.8 (25.5 × 2.00) |
| Rear | | 530.5 × 50.8 (20.9 × 2.00) |
| Universal joint | | |
| Type | | |
| No. 1 (front) | | Cross type |
| No. 2 (center front) | | Cross type |
| No. 3 (center rear) [Lobro joint] | | Equal velocity type |
| No. 4 (rear) | | Cross type |
| Cross type universal joint bearing | | Needle roller bearing (oilless type) |
| Cross type universal joint | | |
| Journal O.D. | mm (in.) | 14.689 (.5783) |
| Equal velocity joint type | | Lobro joint (oilless type) |
| Equal velocity joint size O.D. | mm (in.) | 94 (3.7) |

NOTE
Propeller shaft length indicates the length between the center points of each joint.

## SERVICE SPECIFICATIONS

N16CB--

| Items | | Specifications |
|---|---|---|
| Standard value | | |
| Journal axial play | mm (in.) | 0.02–0.06 (.0008–.0024) |
| Limit | | |
| Propeller shaft runout(Dial indicator reading) | | |
| Front | mm (in.) | 0.6 (.024) or less |
| Center | mm (in.) | 0.6 (.024) or less |
| Rear | mm (in.) | 0.6 (.024) or less |

## TORQUE SPECIFICATIONS

N16CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Center bearing self locking nut | 30–40 | 22-29 |
| Flange yoke to differential companion flange | 30–35 | 22-25 |
| Center propeller shaft to center yoke | 160–220 | 116-159 |
| Rear propeller shaft to companion flange | 160–220 | 116-159 |
| Companion flange to Lobro joint assembly | 30–40 | 22-29 |

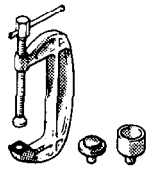
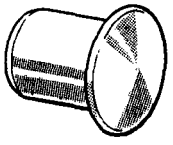
## LUBRICANTS

N16CD--

| Items | | Specified lubricant | Quantity |
|---|---|---|---|
| Sleeve yoke surface | | MOPAR Hypoid Gear Oil/API classification GL-4 or higher, SAE 75W–85W | As required |
| Lobro joint assembly | Outer and inner races ball grooves<br>Rubber packing | Repair kit grease | As required |
| | Lobro joint assembly inner part | Repair kit grease | 45-55 g (1.59-1.94 oz) |
| Center bearing front and rear grease grooves and dust seal lip<br>Shafts and grease sumps of journal, dust seal lips and needle bearings | | MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent | As required |

## SPECIAL TOOLS

N16DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB990840 | Universal joint remover and installer | Disassembly/reassembly of the universal joint |
|  | MB991193 | Plug | Prevention of entry of foreign objects into the transaxle and transfer |

## TROUBLESHOOTING

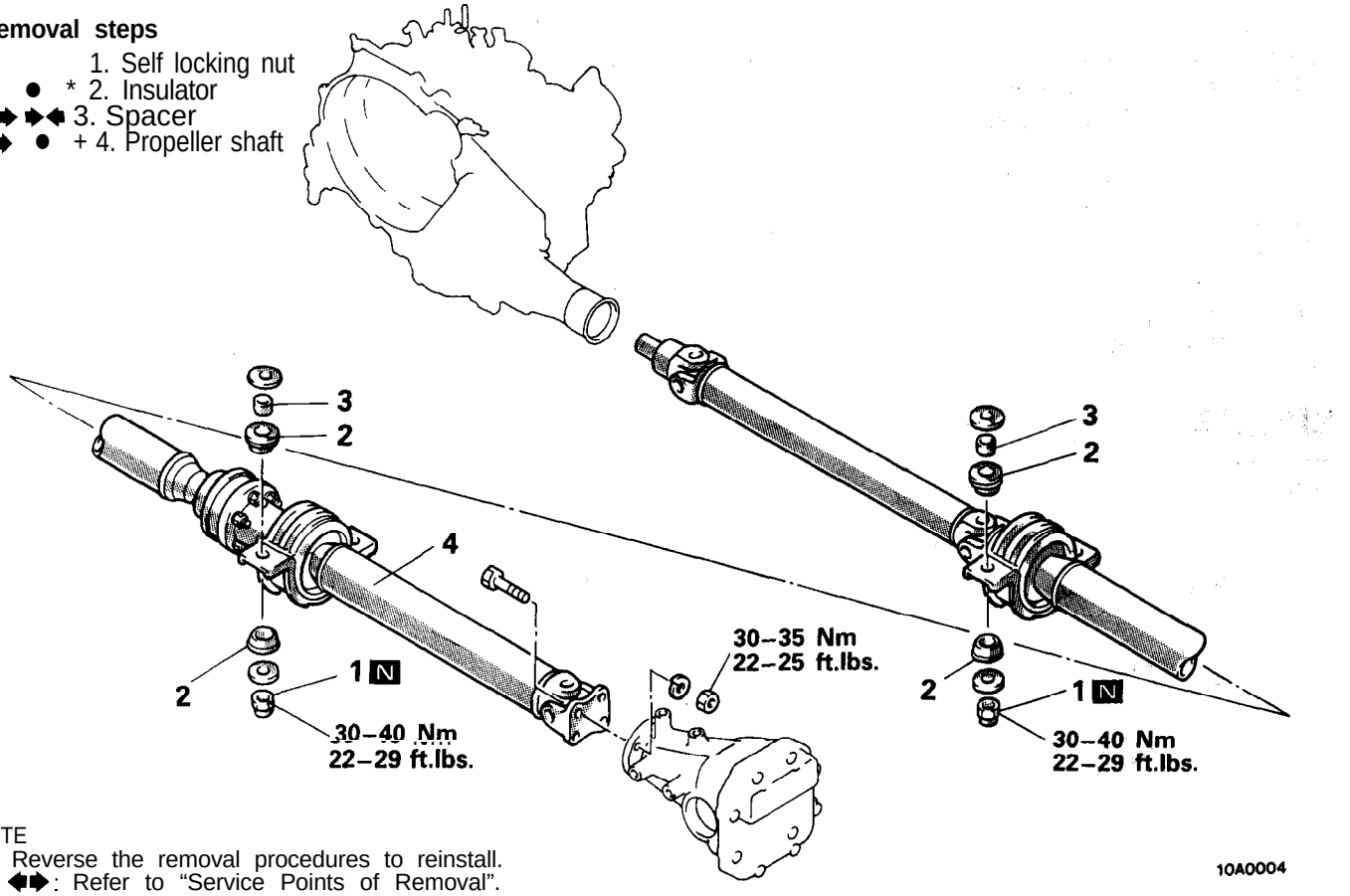
N16EAAB

| Symptom | Probable cause | Remedy |
|---|---|---|
| Noise at start | Worn journal bearing<br>Worn sleeve yoke spline | Replace |
| | Loose propeller shaft installation | Retighten |
| Noise and vibration at high speed | Unbalanced propeller shaft<br>Worn journal bearing | Replace |
| | Improper snap ring selection | Adjust the clearance |

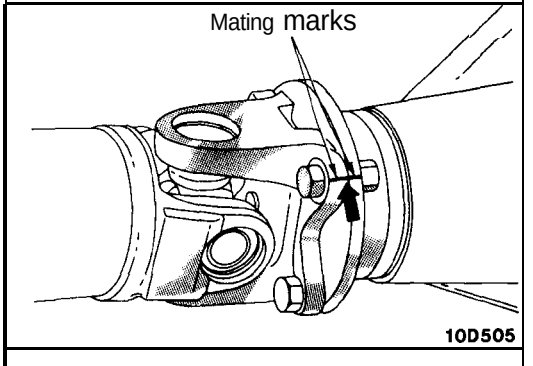
# PROPELLER SHAFT

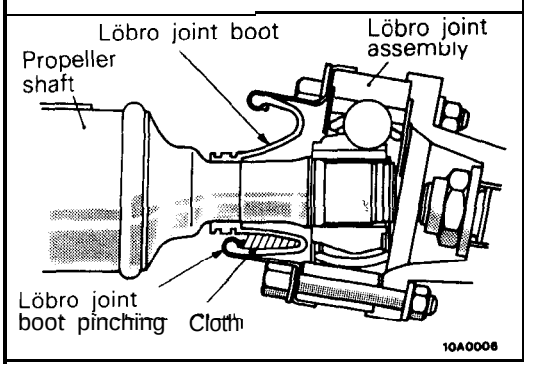
## REMOVAL AND INSTALLATION

N16GA--




NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◀▶: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL

N16GBAH

### 3. REMOVAL OF SPACER

The number of spacers used on each vehicle differs. Check the number of spacers used and write it down for reference during reassembly.

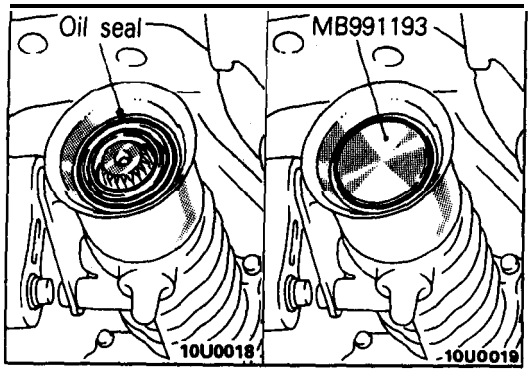
### 4. REMOVAL OF PROPELLER SHAFT

Make mating marks on the differential companion flange and flange yoke.

**Caution**

**1. Remove the propeller shaft in a straight and level manner so as to ensure that the boot is not damaged through pinching.**

NOTE
Damage to the boot can be avoided, and the work will be easier, if a piece of cloth or similar material is inserted in the boot.



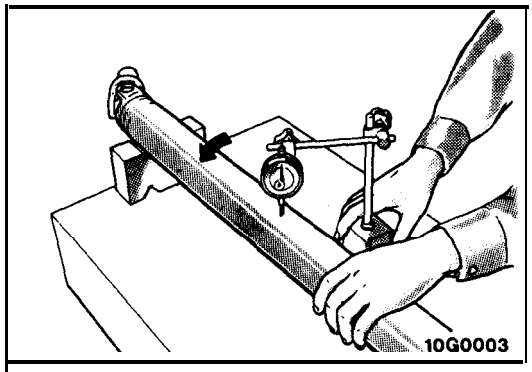

2. **Do not lower rear end of the vehicle as the oil will flow out of the transfer.**
3. **Be cautious to avoid damage to the oil seal lip of the transfer.**
4. **Use the special tool provided as a cover to prevent the entry of foreign objects into the transfer.**

## INSPECTION N16GCAH

- Check the sleeve yoke, center yoke and flange yoke for wear,. damage or cracks.
- Check the propeller shaft yokes for wear, damage or cracks.
- Check the propeller shaft for bends, twisting or damage.
- Measure the propeller shaft runout with a dial indicator.

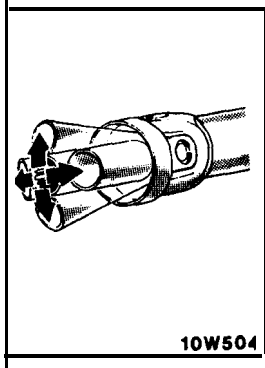
**Limit:**

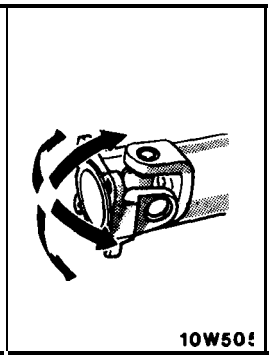
| | |
|---|---|
| **Front propeller shaft** | **0.6 mm (.024 in.) or less** |
| **Center propeller shaft** | **0.6 mm (.024 in.) or less** |
| **Rear propeller shaft** | **0.6 mm (.024 in.) or less** |

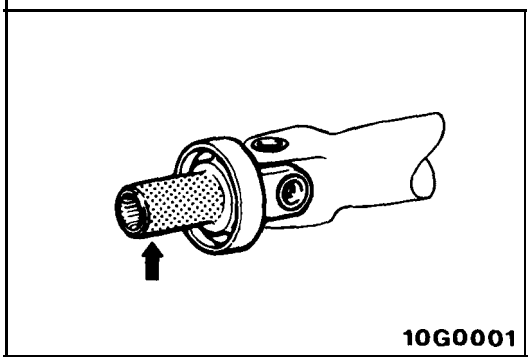



NOTE
Set the V-blocks as much as possible to the end of the shaft. Measure deflection at the center of the shaft.

- Check the universal joints for smooth operation in all directions.
- Check the center bearing for smooth movement.
- Check the center bearing mounting rubber for damage or deterioration.



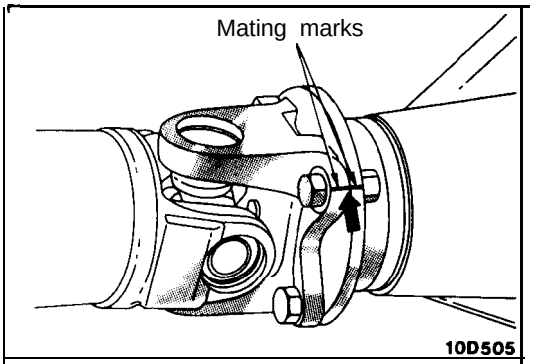




## SERVICE POINTS OF INSTALLATION N16GDAO

### 4. INSTALLATION OF PROPELLER SHAFT

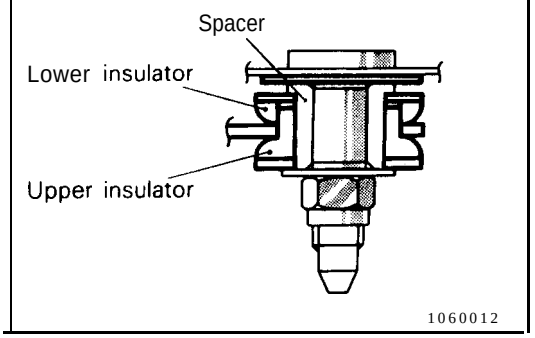
(1) Apply the specified gear oil to the sleeve yoke.

**Specified oil: MOPAR Hypoid Gear Oil/API classification GL-4 or higher, SAE 75W–85W**




(2) Install the propeller shaft to the companion flange with the mating marks properly aligned.

**Caution**
**Tighten installation bolts after removing oil and grease from threads to prevent them from loosening due to lubrication.**




### 3. INSTALLATION OF SPACER/2. INSULATOR

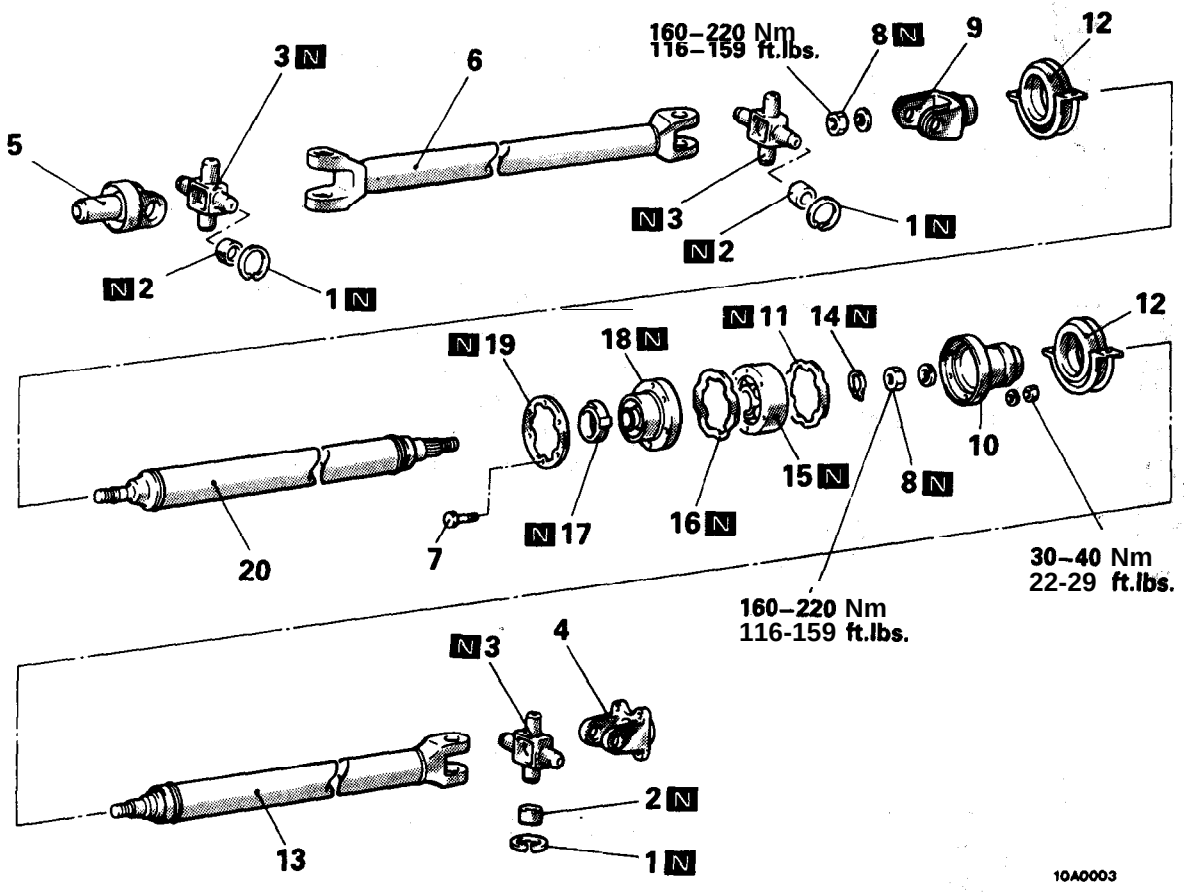
Install spacers and insulators as indicated in the illustration.

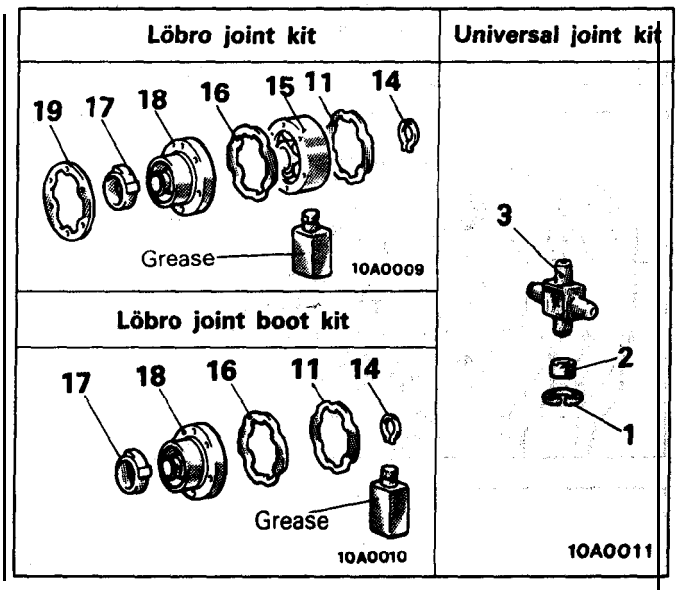
**Caution**
**When installing the center bearing, assemble the same spacers as removed from it (or new spacers of equal thickness).**

# PROPELLER SHAFT

## DISASSEMBLY AND REASSEMBLY

N16GE--

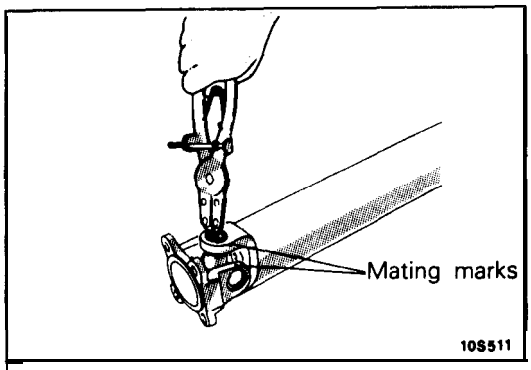



**Disassembly steps**

- ● *+* 1. Snap ring
- ◆◆ ● + 2. Journal bearing
- ◆◆ 3. Journal
- 4. Flange yoke
- 5. Sleeve yoke
- 6. Front propeller shaft
- ◆◆ ◆◆ 7. Lobro joint assembly installation bolt
- ◆◆ ◆◆ 8. Self locking nut
- ◆◆ ◆◆ 9. Center yoke
- ◆◆ ● +10. Companion flange
- ◆◆ 11. Rubber packing
- ◆◆ ◆◆ 12. Center bearing assembly
- 13. Rear propeller shaft
- ● I 14. Snap ring
- ◆◆ ● + 15. Lobro joint assembly
- ◆◆ 16. Rubber packing
- ◆◆ ● + 17. Boot band
- ◆◆ 18. Lobro joint boot
- ◆◆ 19. Washer
- 20. Center propeller shaft

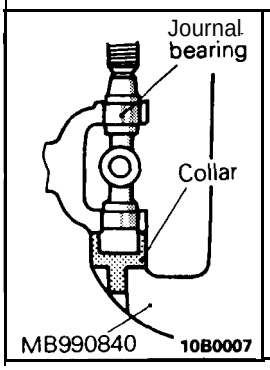
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to “Service Points of Disassembly”.
(3) ● : Refer to “Service Points of Reassembly”.
(4) N : Non-reusable parts

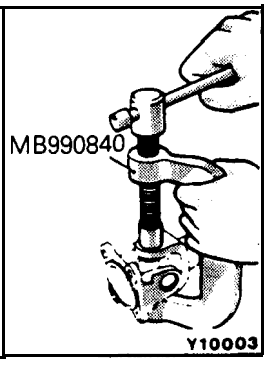



## SERVICE POINTS OF DISASSEMBLY N16GFAK

### 1. REMOVAL OF SNAP RING

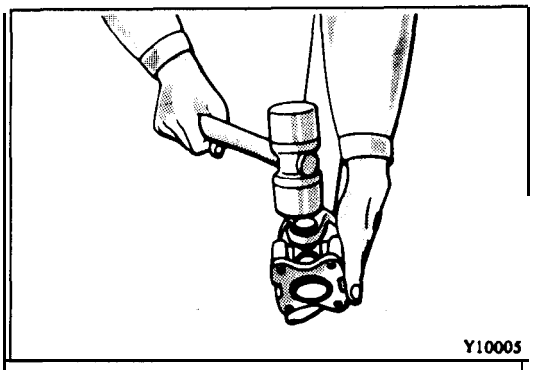
(1) Make mating marks on the yoke and universal joint that is to be disassembled.
(2) Remove the snap rings from the yoke with snap ring pliers.




### 2. REMOVAL OF JOURNAL BEARING

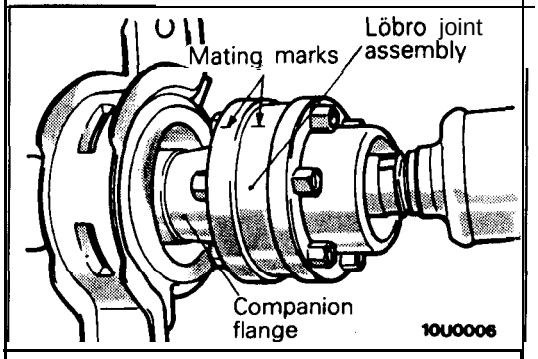
Force out the journal bearings from the yoke with a special tool by the following procedures.
① Install the collar to the special tool proper.
② Press the journal bearing by using the special tool to force out the journal bearing on the opposite side.




③ Pull out the journal bearing from the yoke.

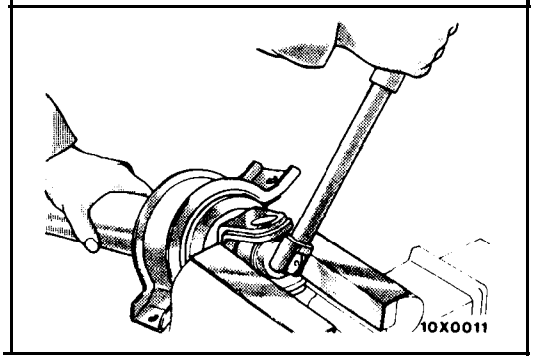
NOTE
If the journal bearing is hard to remove, strike the yoke with a plastic hammer.

④ Press the journal shaft by using the special tool to force out the remaining bearings.
⑤ Pull out the journal.




### 7. REMOVAL OF LÖBRO JOINT ASSEMBLY INSTALLATION BOLT

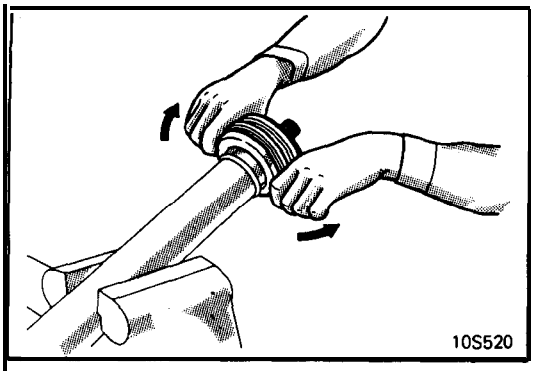
(1) Place mating marks on the companion flange and Lobro joint assembly.
(2) Remove the Lobro joint installation bolts and separate the Lobro joint from the companion flange.




### 8. REMOVAL OF SELF LOCKING NUT/9. CENTER YOKE/10. COMPANION FLANGE/12. CENTER BEARING ASSEMBLY

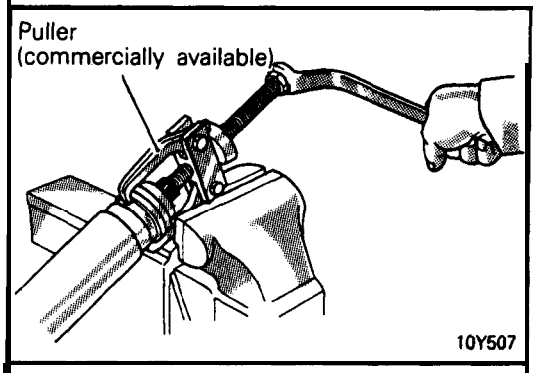
(1) After placing mating marks on the center yoke and center propeller shaft, and companion flange and rear propeller shaft, remove the self locking nuts, then remove the center yoke and companion flange.

NOTE
Be careful not to damage or deform the dust seals on center propeller shaft assembly and rear propeller shaft.

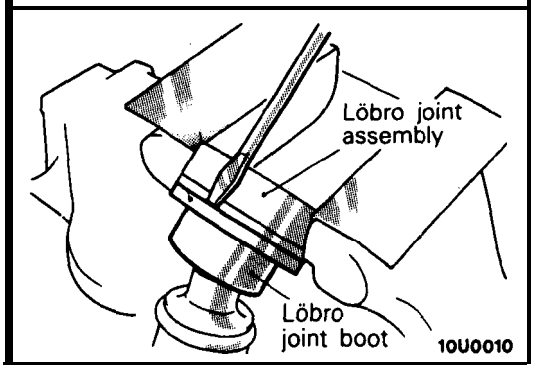



(2) After placing mating marks. on the center bearing assembly (front) bracket and center propeller shaft, and the center bearing assembly (rear) bracket. and rear propeller shaft, remove the center bearing! 'bracket.

**Caution**
**The mounting rubber cannot be removed from the center bearing bracket.**

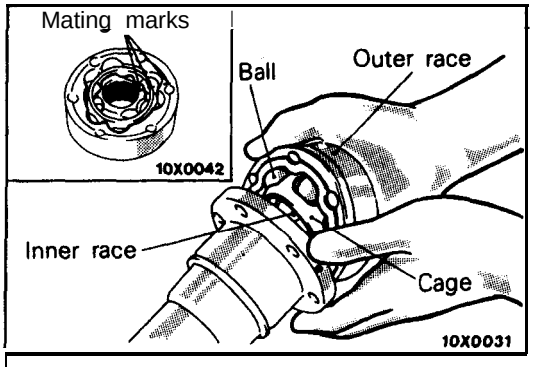



(3) Pull out the front and rear center bearings with a commercially available puller.



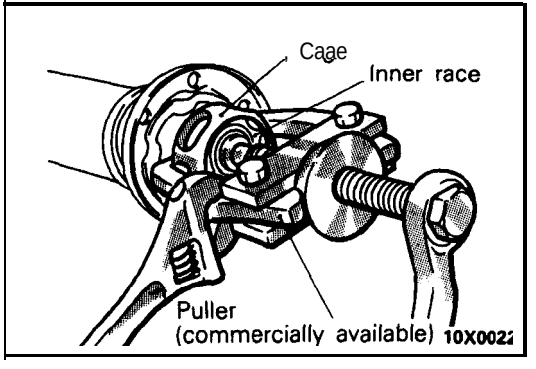

## 15. REMOVAL OF LÖBRO JOINT ASSEMBLY

(1) Remove the Lobro joint boot from the Lobro joint assembly.



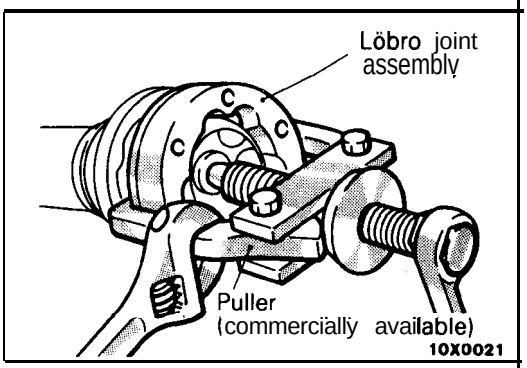

(2) Remove the Lobro joint assembly as follows:
① Put mating marks on the outer race, cage and inner race with a scriber.
② Remove the outer race and balls.

**Caution**
**Note the positions of balls so that they can be reinstalled in their' original positions.**

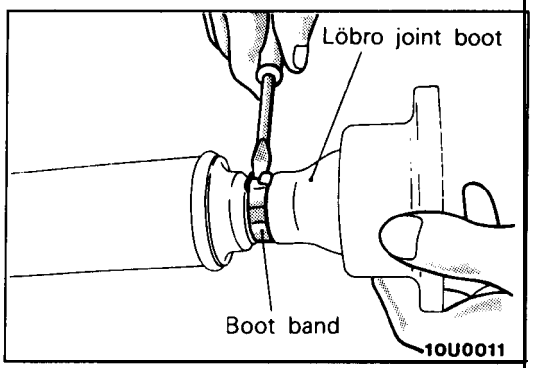



③ Remove the inner race with cage from the center propeller shaft by using a commercially available puller.

NOTE
When changing the grease on the Lobro joint assembly, wipe off the grease and clean the outer and inner races, cage and balls.




(3) If the outer race cannot be removed, remove the complete Lobro joint assembly from the center propeller shaft by using a commercially available puller.

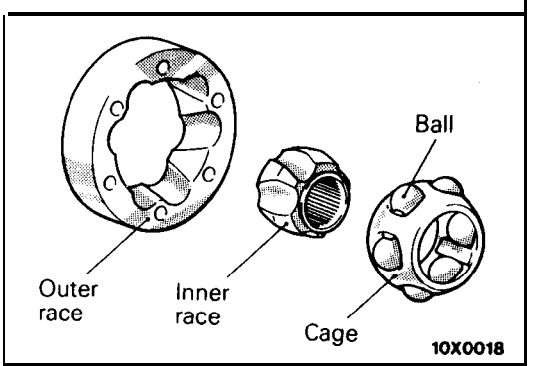



**17. REMOVAL OF BOOT BAND**

**Caution**
**Be careful not to damage the Löbro joint boot when the boot band is loosened.**

## INSPECTION N16GCAF

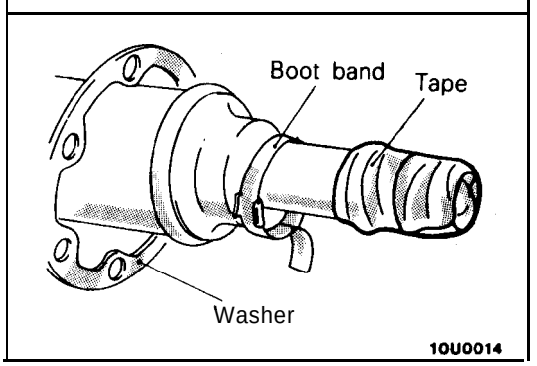
- Check the propeller shaft splines for wear or damage.
- Check the ball grooves in inner and outer races for uneven wear, damage or rust.
- Check ball surface for rust, wear or other damage.
- Check the cage for rust or damage.



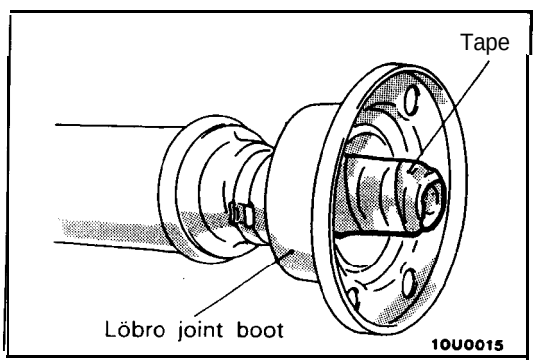

## SERVICE POINTS OF REASSEMBLY N16GHAP

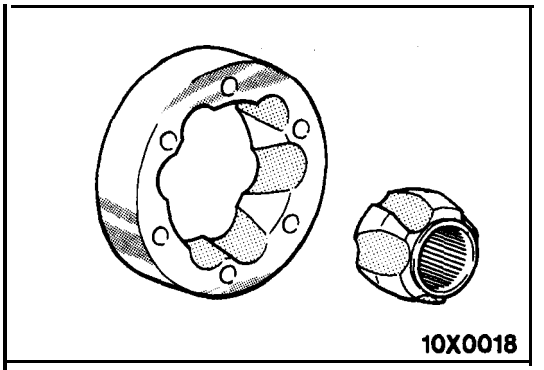
**19. INSTALLATION OF WASHER /18. LÖBRO JOINT BOOT/ 17. BOOT BAND/16. RUBBER PACKING/ 15. LÖBRO JOINT ASSEMBLY/14. SNAP RING**

(1) Put the washer and boot band on the center propeller shaft.
(2) Wrap the splined end of center propeller shaft with adhesive tape.

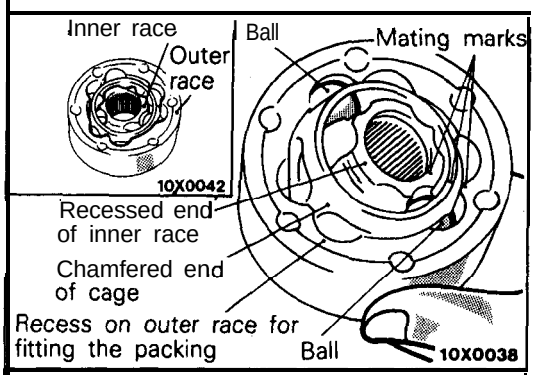



(3) Install the Löbro joint boot on the center propeller shaft and then remove the adhesive tape on the splined end of the propeller shaft.



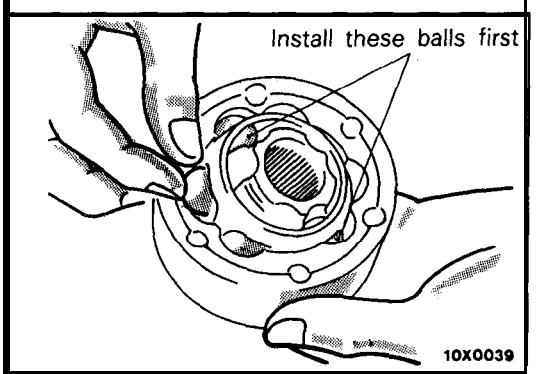

10X0018

(4) Assemble the Lobro joint as follows:
① Apply a thin coat of the specified grease to the ball grooves of the inner and outer races.
**Specified grease: Repair kit grease**

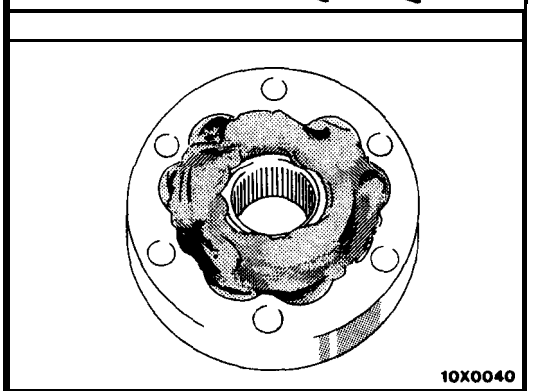



② Put the cage on the inner race with the mating marks aligned and install two balls, one in a groove and the other in the groove opposite to that groove. Both balls should be placed in the grooves where they were before disassembly.
③ Assemble the inner race and cage in the outer race with their mating marks aligned.

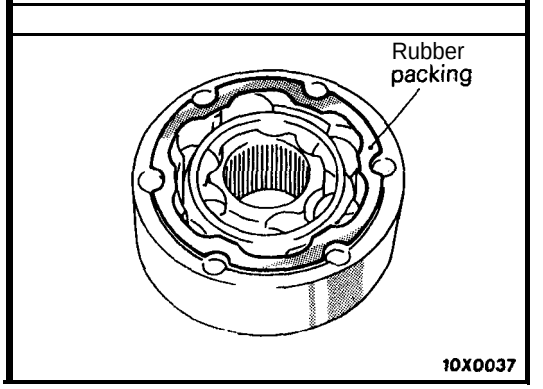
NOTE
Make sure that the recessed end (where snap ring will be fitted) of the inner race, the recessed end (where packing will be fitted) of the outer race, and the chamfered end of the cage are all on the same side. Also ensure that the relative positions of the inner and outer races are as shown in the illustration.




④ Install the remaining balls in their original positions.
⑤ Check that the outer race rotates on the inner race smoothly.

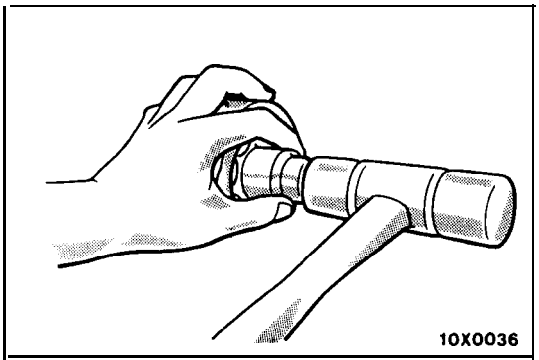

10X0040

(5) Apply specified grease to the Lobro joint assembly.
**Specified grease: Repair kit grease**
**[45–55 g (1.59-1.94 oz.)]**

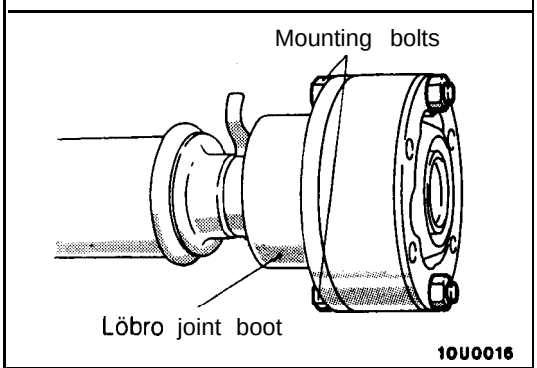



(6) Apply a thin and even coat of the specified grease to the rubber packing and fit the packing in the boot side end of the Lobro joint assembly.
**Specified grease: Repair kit grease**

**Caution**
**For the Löbro joint assembly, the side that has the concave part (for the rubber packing) in the outer race is the Löbro joint boot side.**

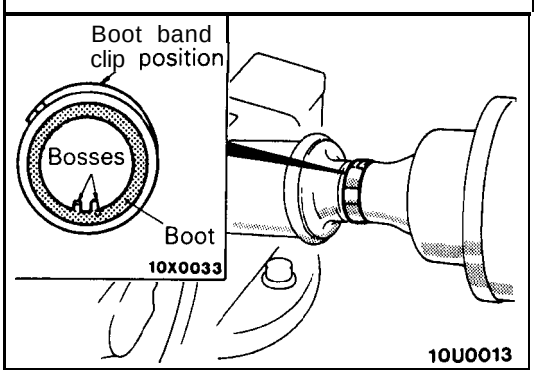

10X0036

(7) Install the Lobro joint assembly on the rear propeller shaft while aligning their bolt holes, and drive the joint assembly with a hammer using a socket wrench on the inner race for complete installation.



10U0016

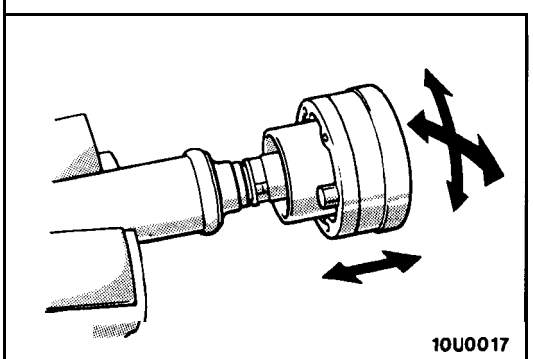
(8) Secure the inner race with the snap ring.
(9) Realign the bolt holes in the boot and Lobro joint assembly utilizing the mounting bolts and fit the boot on the joint assembly.



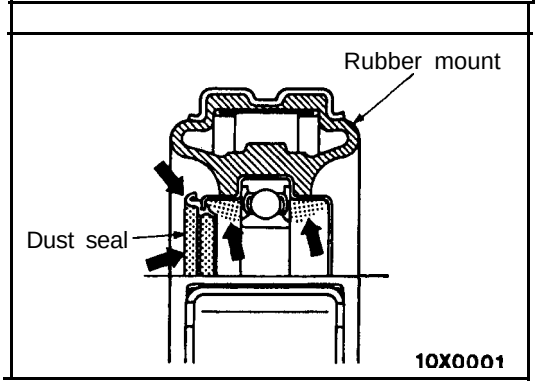
10U0013

(10) Secure the boot with the boot band.

**Caution**
**Position the boot band clip on the side opposite to the bosses which are provided in the boot for ventilation. Be sure to remove grease, if present, from around the bosses. Grease obstructs the ventilation air passage.**


10U0017

(11) Check that the Lobro joint assembly moves smoothly.



10X0001

## 12. INSTALLATION OF CENTER BEARING ASSEMBLY

(1) Apply multipurpose grease to the center bearing front and rear grease grooves and to the dust seal lip.

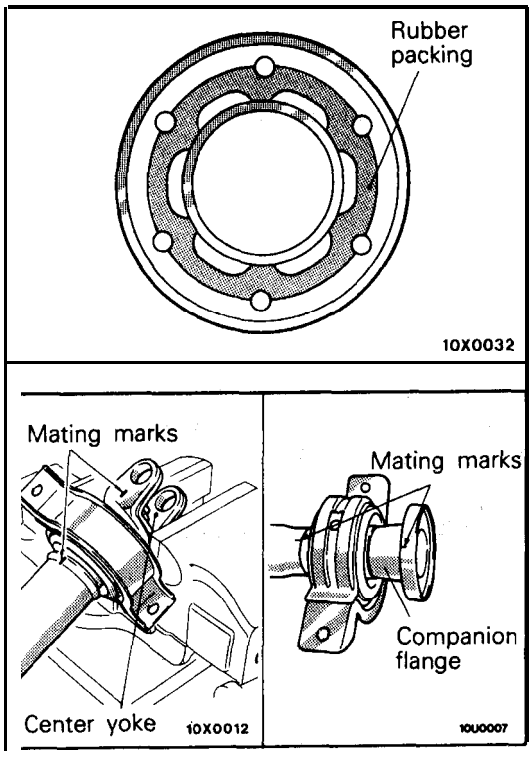
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

(2) Be sure to fit the bearing into the rubber mount groove on the center bearing bracket.

NOTE
Face the bearing dust seal to the side of center bearing bracket mating mark.

(3) Assemble the center bearings to the center propeller shaft and rear propeller shaft.

NOTE
Face the side onto which the center bearing bracket mating mark is placed and the dust seal is installed to the side of the center propeller shaft and rear propeller shaft.




**11. INSTALLATION OF RUBBER PACKING/10. COMPANION FLANGE/9. CENTER YOKE/8. SELF LOCKING NUT**

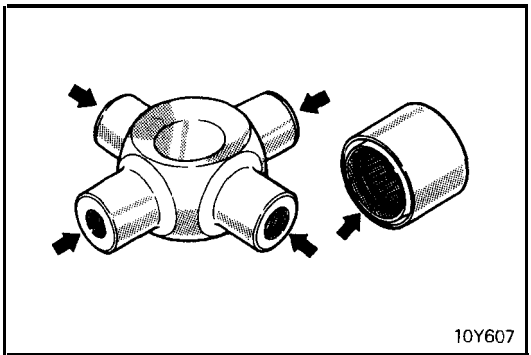
(1) Apply a thin and even coat of the specified grease to the rubber packing and fit the packing on the companion flange.

**Specified grease: Repair kit grease**

(2) Align the mating marks on the center propeller shaft and center yoke, and the rear propeller shaft and companion flange, then press fit the center bearing with self locking nuts, tightening to the specified torque.

**7. INSTALLATION OF LÖBRO JOINT ASSEMBLY INSTALLATION BOLTS**

(1) Secure the companion flange and Lobro joint assembly with installation bolts.
(2) Check for grease leakage from the Lobro joint boot and companion flange installation parts.

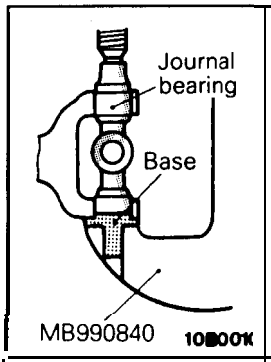


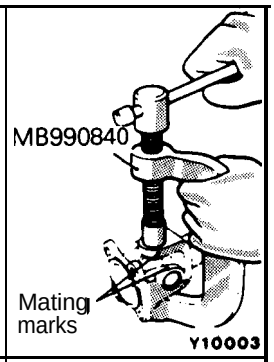

**3. JOURNAL/2. JOURNAL BEARING**

(1) Apply multipurpose grease to the following parts of the universal joint kit.
① Shafts and grease sumps of journal
② Dust seal lips
③ Needle roller bearings

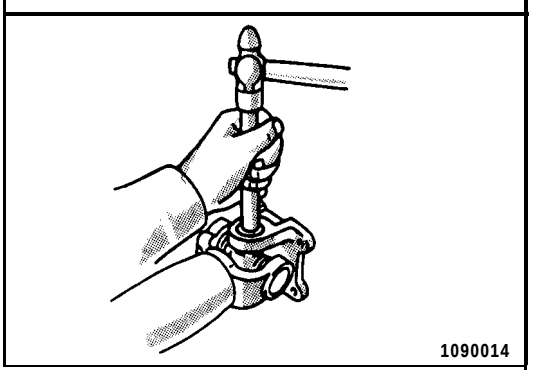
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

**Caution**
**Do not apply excessive grease. Otherwise, faulty fitting of bearing caps and errors in the selection of snap rings may result.**



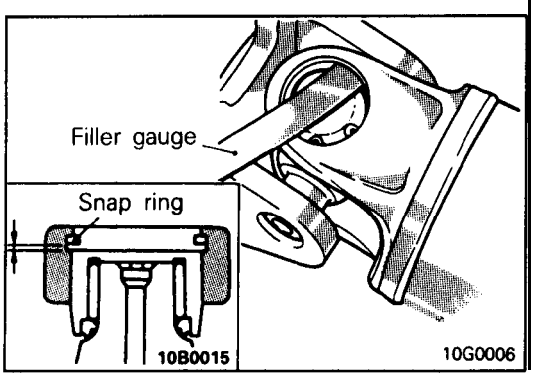




(2) Press fit the journal bearings to the yoke by using the special tool according to the following procedures.
① Install the base to the special tool proper.
② Insert both bearings in the yoke, and hold and press fit them by using the special tool.




## 1. INSTALLATION OF SNAP RINGS

(1) Install snap rings of the same thickness onto both sides of each yoke.
(2) Press the bearing and journal into one side by using a brass bar with a diameter of 15 mm (.59 in.).




(3) Measure the clearance between the snap ring and the groove wall of the yoke with a filler gauge.
If the clearance exceeds the standard value, the snap rings should be replaced.

**Standard value: 0.02–0.06 mm (.0008–.0024 in.)**

# REAR SUSPENSION

## CONTENTS

N17AA--


<FWD>

LATERAL ROD ..... 11

REAR AXLE HUB ..... 14

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# SPECIFICATIONS <FWD>

## GENERAL SPECIFICATIONS

N17CA-A

| Items | Vehicles with 1.8L Engine | Vehicles with 2.0L DOHC Engine |
|---|---|---|
| Suspension system | 3-link, torsion axle with coil spring type | |
| Coil spring | | |
| Wire dia. × O.D. × free length mm (in.) | 10.1x 105.1 x 336.5 (.40 x 4.14 x 13.25) | 10.2 x 105.2 x 316.5 (.40 x 4.14 x 12.46) |
| [Coil spring identification color] | [Light Blue ×1] | [Orange ×1] |
| Spring constant N/mm (lbs./in.) | 20 (112.0) | 23 (128.8) |
| Shock absorber | | |
| Type | Hydraulic, cylindrical, double-acting type | |
| Max. length mm (in.) | 495 (19.5) | 485 (19.1) |
| Min. length mm (in.) | 315 (12.4) | 315 (12.4) |
| Stroke mm (in.) | 180 (7.1) | 170 (6.7) |
| Damping force [at 0.3 m/sec. (0.9 ft./sec.)] | | |
| Expansion N (lbs.) | 800 (176) | |
| Contraction N (lbs.) | 300 (66) | |
| Wheel bearing | | |
| Type | Unit ball bearing | |

## SERVICE SPECIFICATIONS

N17CB-A

| Items | Specifications |
|---|---|
| Standard value | |
| Toe-in (Left-right difference) mm (in.) | 0 ± 3 (0 ± .1 18) |
| Camber | -45' ± 30' |
| Limit | |
| Wheel bearing end play mm (in.) | 0.01 (.004) or less |
| Rear hub rotary-sliding resistance N (lbs.) | 31 (7) or less |
| Rear hub rotary-sliding torque Nm (ft.lbs.) | 1.8 (1.30) or less |

NOTE
Toe-in and camber cannot be adjusted.

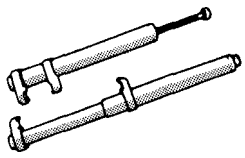
## TORQUE SPECIFICATIONS

N17CC-A

| Items | Nm | ft.lbs. |
|---|---|---|
| Wheel bearing nut | 200–260 | 144-188 |
| Shock absorber upper mounting nut | 40–50 | 29-36 |
| Shock absorber lower mounting nut | 80–100 | 58-72 |
| Lateral rod mounting nut (body side) | 80–100 | 58-72 |
| Lateral rod mounting bolt (axle beam side) | 100–120 | 72-87 |
| Trailing arm mounting bolt | 100–120 | 72-87 |
| Piston rod tightening nut | 20–25 | 14-18 |
| Brake hose and tube bracket mounting bolt | 17-26 | 12-19 |
| Caliper assembly mounting nut | 50–60 | 3 6 - 4 3 |
| Rear speed sensor mounting bolt | 9-14 | 7–10 |

## SPECIAL TOOL

N17DA-A

| Tool | Number | Name | Use |
|---|---|---|---|
|  | L-4514 | Spring compressor body | Removal and installation of the coil spring |

## TROUBLESHOOTING

N17EA-A

| Symptom | Probable cause | Remedy |
|---|---|---|
| Squeaks or other abnormal noise | Loose rear suspension installation bolts and nuts | Retighten |
| | Malfunction of shock absorber<br>Worn bushings | Replace |
| Poor ride | Excessive tire inflation pressure | Adjust the pressure |
| | Malfunction of shock absorber<br>Weak or broken springs | Replace |
| Body tilting | Weak or deteriorated bushings<br>Weak or broken springs | Replace |

## SERVICE ADJUSTMENT PROCEDURES

### REAR WHEEL ALIGNMENT INSPECTION

N17FAAC

The rear suspension assembly must be free of worn, loosen or damaged parts prior to measurement of rear wheel alignment.

**Standard value:**

| | |
|---|---|
| **Toe-in (Left-right difference)** | **0 ± 3 mm (0 ± .118 in.)** |
| **Camber** | **-45' ± 30'** |

NOTE

The rear wheel alignment is set at the factory and cannot be adjusted.

If toe-in or camber is not within the standard value, replace bent or damaged parts.

### WHEEL BEARING END PLAY ADJUSTMENT

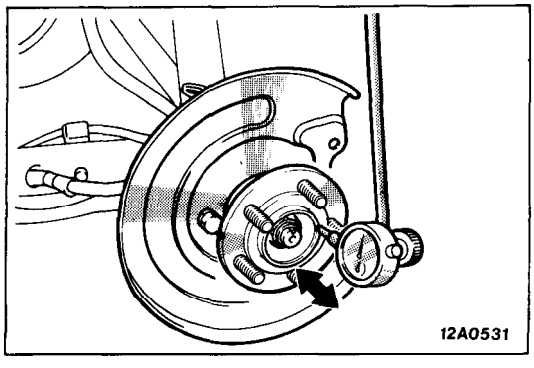
N17FBAG

1. Inspect the play of the bearings while the vehicle is jacked up and resting on floor jack.
2. Remove the hub cap and then release the parking brake.
3. Remove the caliper assembly and the brake disc.
4. Check the bearing's end play.
   Place a dial gauge against the hub surface; then move the hub in the axial direction and check whether or not there is end play.

   **Limit: 0.01 mm (.004 in.) or less**

   NOTE

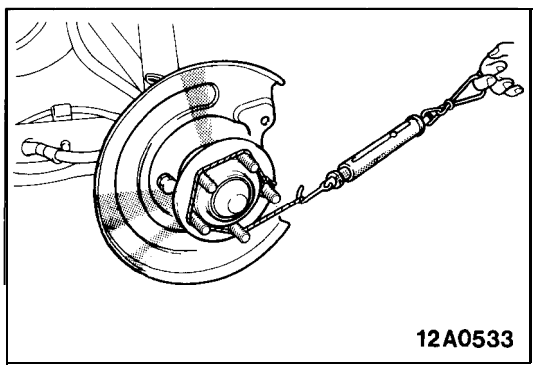
   If the limit value is exceeded, the lock nut should be tightened to the specified torque and check the end play again.
5. Replace the rear hub bearing unit if an adjustment cannot be made to within the limit.



## REAR HUB ROTARY-SLIDING RESISTANCE (TORQUE) ADJUSTMENT

N17FCAC

1. Inspect the play of the bearings while the vehicle is jacked. up and resting on floor jack.
2. Release the parking brake.
3. Remove the caliper assembly and the brake disc.




4. After turning the hub a few times to seat the bearing, attach a spring balance to the hub bolt, and, pulling at a 90° angle from the hub bolt, measure to determine whether or not the rotary-sliding resistance of the rear hub (the rotary-sliding torque of the rear hub) is the standard value.

   **Limit:**

   **Rear hub rotary-sliding resistance**
   **31N (7 lbs.) or less**

   **Rear hub rotary-sliding torque**
   **1.8 Nm (1.30 ft.lbs.) or less**

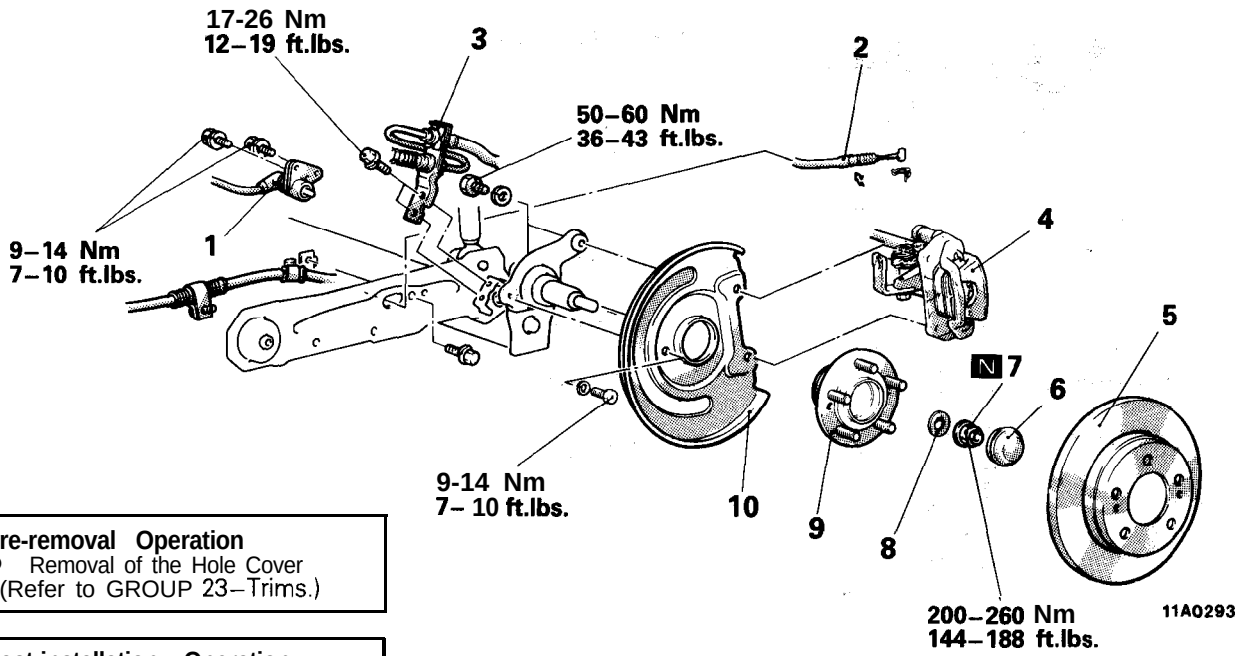
   NOTE
   If the limit value is exceed, loosen the nut and then tighten it to the specified torque, and check the rear hub rotary-sliding torque again.

5. Replace the rear hub bearing unit if an adjustment cannot be made to within the limit.

# REAR SUSPENSION ASSEMBLY

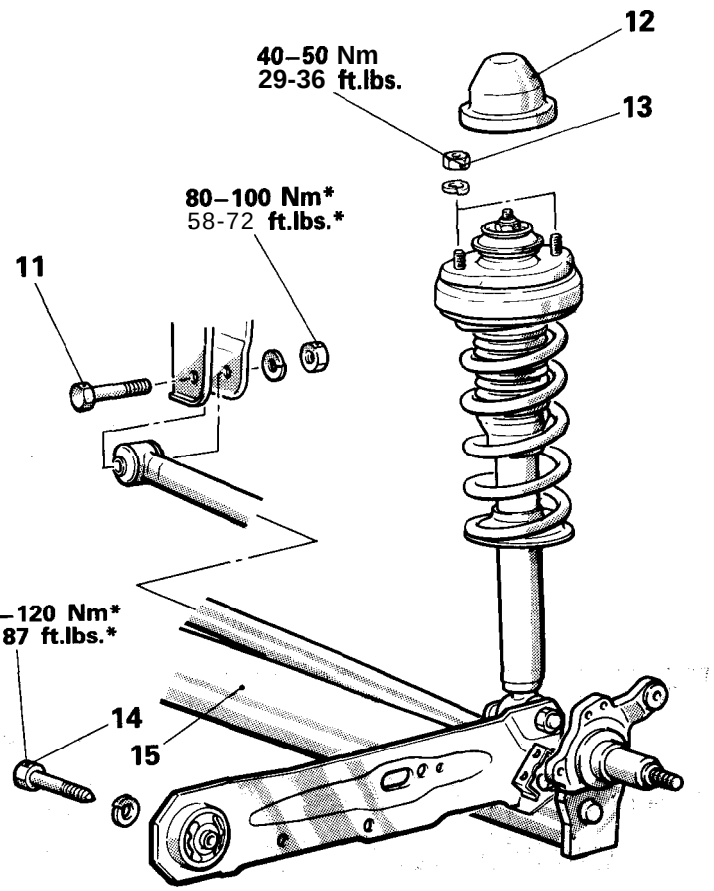
## REMOVAL AND INSTALLATION

N17GA-A




**Pre-removal Operation**
- Removal of the Hole Cover (Refer to GROUP 23–Trims.)

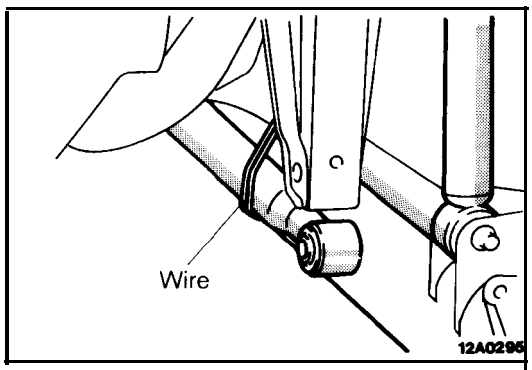
**Post-installation Operation**
@Installation of the Hole Cover (Refer to GROUP 23–Trims.)
- Checking and Adjustment of Brake Disc Deflection (Refer to GROUP 5–Service Adjustment Procedures.)
- Checking and Adjustment of Rear Disc Brake Dragging Torque (Refer to GROUP 5–Service Adjustment Procedures.)
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 5–Service Adjustment Procedures.)

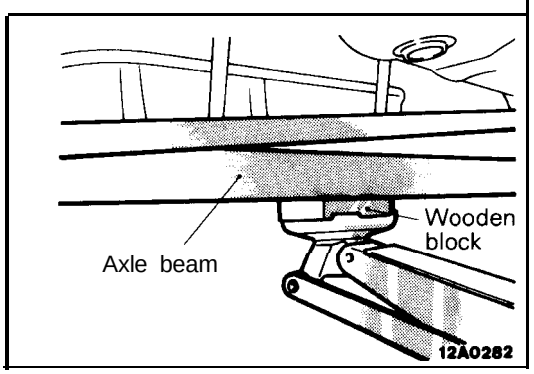



**Removal steps**

◆◆ ● 1. Rear speed sensor <Vehicles with ABS>
2. Parking brake cable
3. Brake hose and tube bracket
4. Caliper assembly
5. Brake disc
6. Hubcap
● + 7. Wheel bearing nut
8. Tongued washer
9. Rear hub bearing unit
10. Dust shield
◆◆ 11. Lateral rod mounting bolt (body side)
12. Cap
◆◆ 13. Shock absorber upper mounting nut
◆◆ 14. Trailing arm mounting bolt
◆◆ 15. Rear suspension assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) ❑ : Non-reusable parts
(5) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.




## SERVICE POINTS OF REMOVAL N17GBAR

**1. REMOVAL OF REAR SPEED SENSOR <VEHICLES WITH ABS>**

Refer to GROUP 5–Wheel Speed Sensor.

**11. REMOVAL OF LATERAL ROD MOUNTING BOLT**

(1) Remove the lateral rod mounting bolt.
(2) Secure and hold the lateral rod to the axle beam with wire, etc.

**13. REMOVAL OF SHOCK ABSORBER UPPER 'MOUNTING NUTS/14. TRAILING ARM MOUNTING BOLTS/15. REAR SUSPENSION ASSEMBLY**

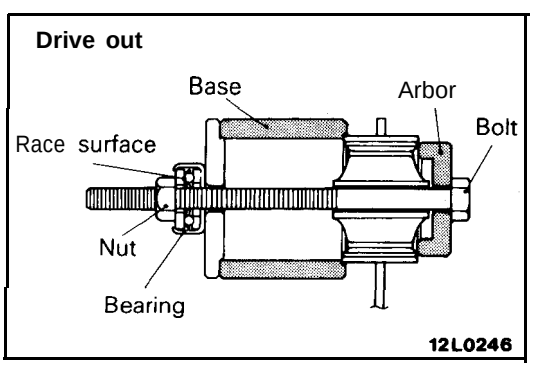
(1) Jack up the torsion axle and arm assembly in order to raise it slightly.

**Caution**
**1. Always insert a wooden block between the jack receptacle and the axle beam and place the jack at the center of the axle beam.**
**2. Make sure that the jack does not contact the lateral rod.**

(2) Remove the shock absorber mounting nuts and trailing arm mounting bolts.
(3) Lower the jack slowly, and then remove the rear suspension assembly.

## INSPECTION N17GCAL

- Check the trailing arm and axle beam for deformation or damage.
- Check the torsion bar for damage.
- Check the lateral rod for damage or deformation.
- Check the bushings for cracking, deterioration, or unusual wear.

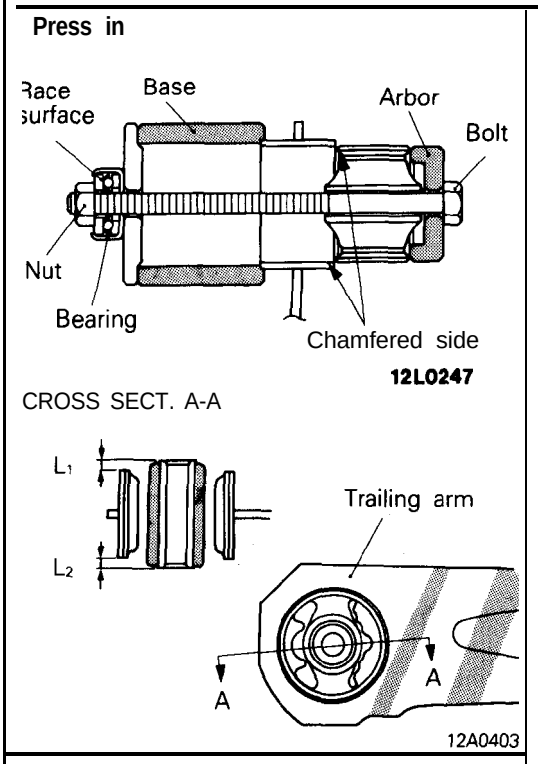



## BUSHING REPLACEMENT N17GTAE

**TRAILING ARM BUSHING**

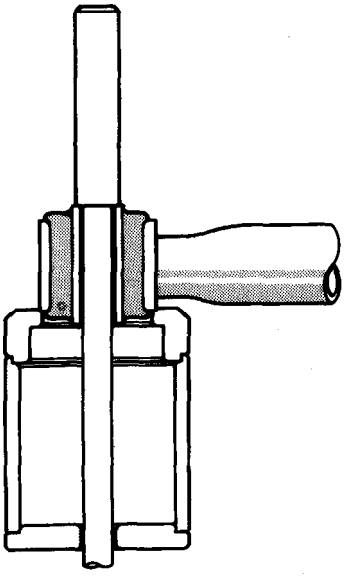
(1) Drive out the trailing arm bushing as shown in the illustration.

**Caution**
**The bearing within the special tool should be installed, as shown in the figure, at the race surface nut side of the bearing.**




(2) Press in the bushing into the trailing arm (from the chamfered side of the trailing arm).
(3) Be careful that the bushing hole is at the position' indicated in the figure and that the difference in bushing projection distances does not exceed the following value.

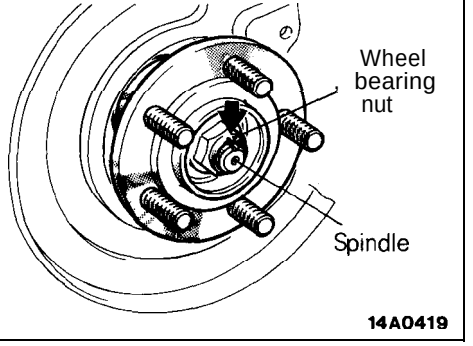
$L_1 - L_2 = 0 \pm 1.0$ mm (0 ± .04 in.)




**LATERAL ROD BUSHING (BODY SIDE)**

(1) Drive out the lateral rod bushing as shown in the figure.
(2) Press in the bushing using the special tool so that the amount of projection is equal at the left and right.

NOTE
The replacement of the lateral rod bushing at the axle beam side is made by the same procedures described in steps (1) and (2) above.




## SERVICE POINTS OF INSTALLATION N17GDAU

### 7. INSTALLATION OF WHEEL BEARING NUT

After tightening the wheel bearing nut, align with the spindle's indentation and crimp.

### 1. INSTALLATION OF REAR SPEED SENSOR <VEHICLES WITH ABS>

Refer to GROUP 5–Wheel Speed Sensor.

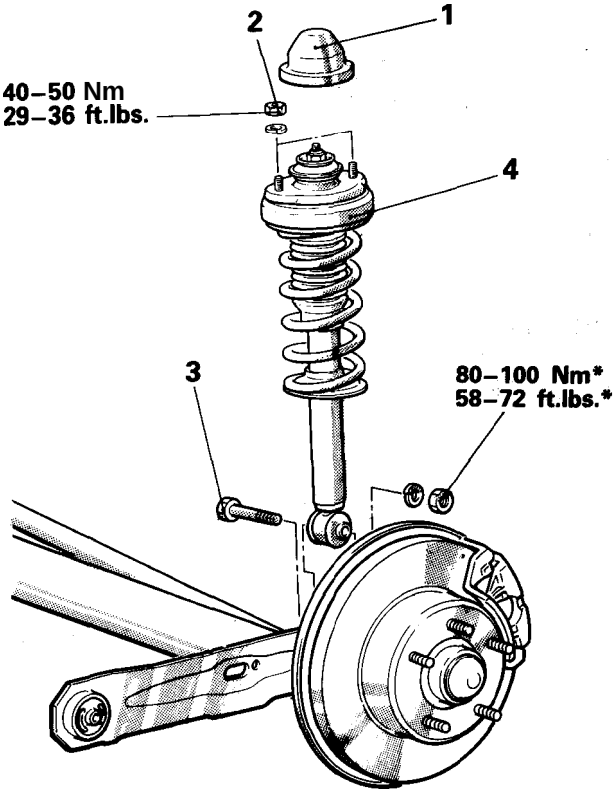
# SHOCK ABSORBER ASSEMBLY

## REMOVAL AND INSTALLATION

N17NA-A

**Pre-removal Operation**
- Removal of the Hole Cover (Refer to GROUP 23–Trims.)

**Post-installation Operation**
- Installation of the Hole Cover (Refer to GROUP 23–Trims.)

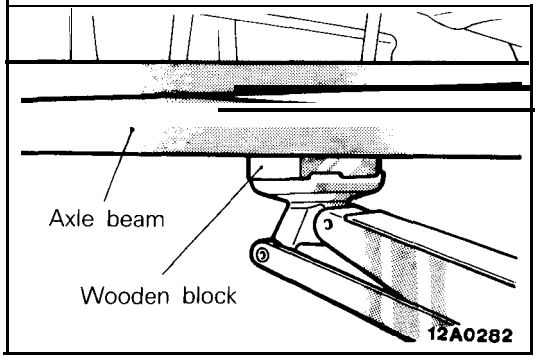



12A0530

**Removal steps**

1. Cap
2. ◆◆ Shock absorber upper mounting nut
3. ◆◆ Shock absorber lower mounting bolt
4. ◆◆ Shock absorber

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.




## SERVICE POINTS OF REMOVAL

N17NBAA

### 2. REMOVAL OF SHOCK ABSORBER UPPER MOUNTING NUT/3. SHOCK ABSORBER LOWER MOUNTING BOLT/4. SHOCK ABSORBER

(1) Jack up the torsion axle and arm assembly in order to raise it slightly.

**Caution**
1. **Always insert a wooden block between the jack receptacle and the axle beam and place the jack at the center of the axle beam.**
2. **Be sure that the jack does not contact the lateral rod..**

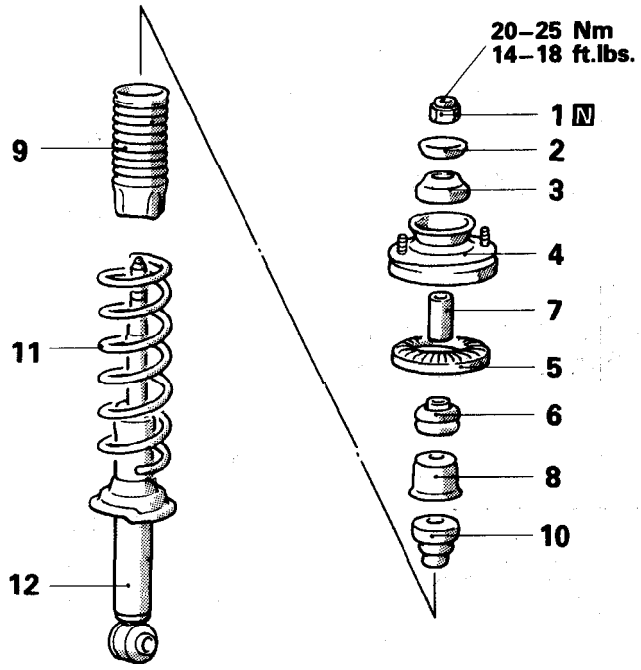
(2) Remove the shock absorber's upper mounting nuts and lower mounting bolt, and then remove the shock absorber.

## DISASSEMBLY AND REASSEMBLY

N17GM-A

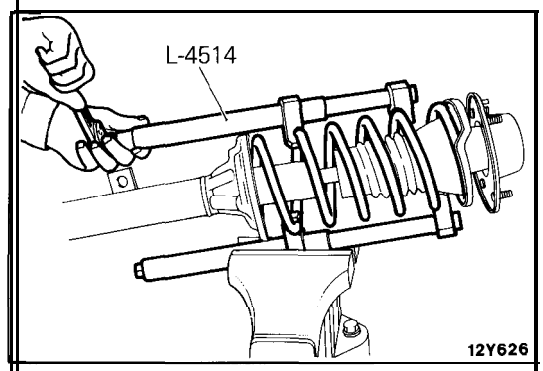
**Disassembly steps**

◆◆ ▶◀ 1. Piston rod tightening nut
2. Washer
3. Upper bushing (A)
▶◀ 4. Bracket assembly
5. Upper spring pad
6. Upper bushing (B)
7. Collar
● + 8. Cup assembly
● + 9. Dust cover
10. Bump rubber
● 4 11. Coil spring
12. Shock absorber

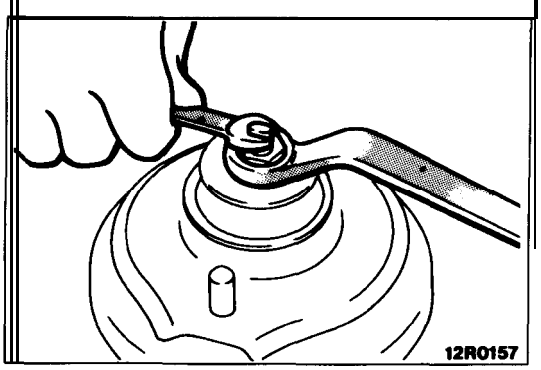



12A0328

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".
(4) ❑ : Non-reusable parts




12Y626



12R0157

## SERVICE POINTS OF DISASSEMBLY

N17GNAA1

### 1. REMOVAL OF PISTON ROD TIGHTENING NUT

(1) Before removing the piston rod tightening nut, compress the coil spring using the special tools.

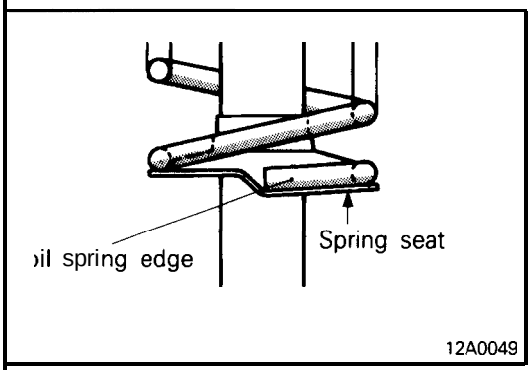
**Caution**
**Do not use an air tool to tighten the bolt of the special tool.**

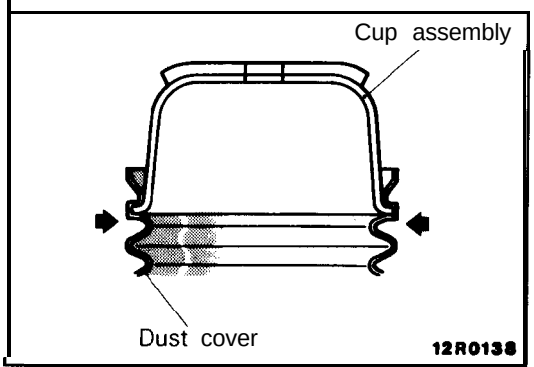
(2) While holding the piston rod, remove the piston rod tightening nut.

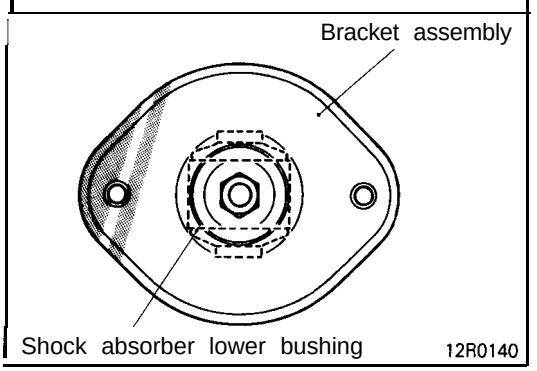
## INSPECTION

N17GOAA1

- Check the rubber parts for damage.
- Check the coil springs for crack, damage or deterioration.




## SERVICE POINTS OF REASSEMBLY N17GPAB

### 11. INSTALLATION OF COIL SPRING

(1) Use the special tool (L-4514) to compress the coil spring and insert it in the shock absorber.
(2) Align the edge of the coil spring to the position of the shock absorber spring seat as shown.

### 9. INSTALLATION OF DUST COVER/8. CUP ASSEMBLY

As shown in the illustration, fit the dust cover to the cup assembly.

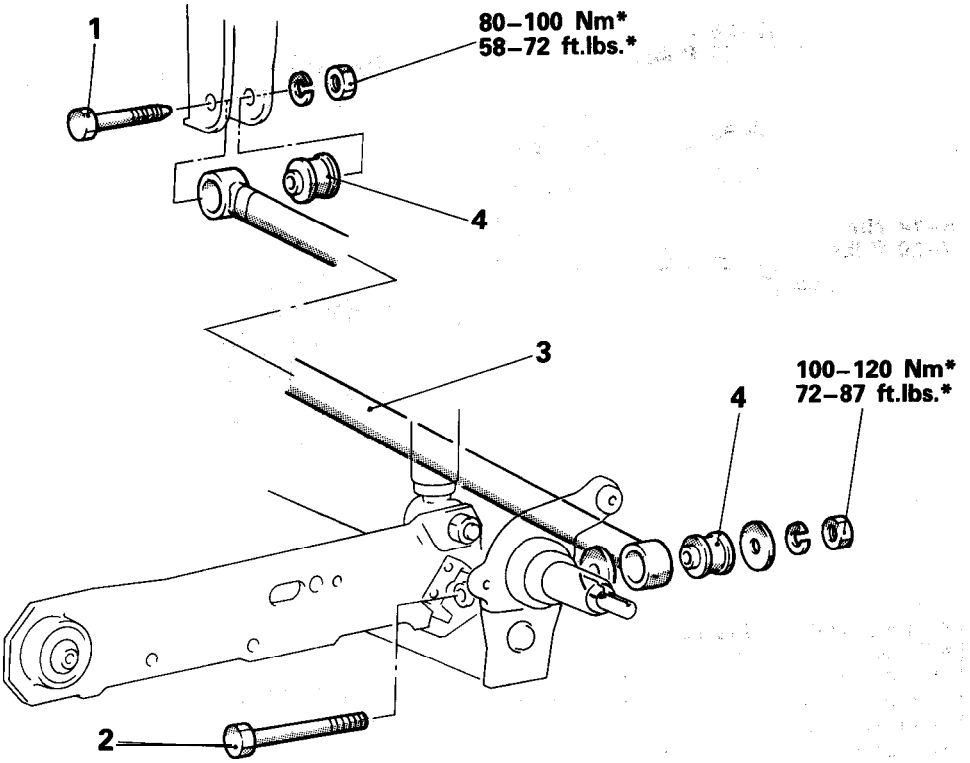
### 4. INSTALLATION OF BRACKET ASSEMBLY/1. PISTON ROD TIGHTENING NUT

(1) With the position of the bracket assembly as shown in the figure, tighten the tightening nut to the specified torque.
(2) Install the coil spring so that the lower edge fits into the spring seat groove and the upper edge fits into the spring pad groove, then remove the special tool (L-4514).

# LATERAL ROD

## REMOVAL AND INSTALLATION

N170A--




**Removal steps**

1. Lateral rod mounting bolt (body side)
- + 2. Lateral rod mounting bolt (axle beam side)
3. Lateral rod
4. Lateral rod bushing

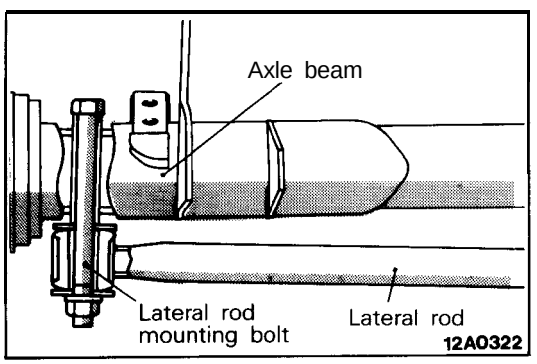
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● 4 : Refer to "Service Points of Installation".
(3) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

## INSPECTION

N17OCAAa

- Check the lateral rod for damage or deformation.
- Check the bushings for cracking, deterioration, or unusual wear.

NCTE
For information concerning the replacement of the lateral rod bushing, refer to P.17–7.




## SERVICE POINTS OF INSTALLATION

N17ODAA

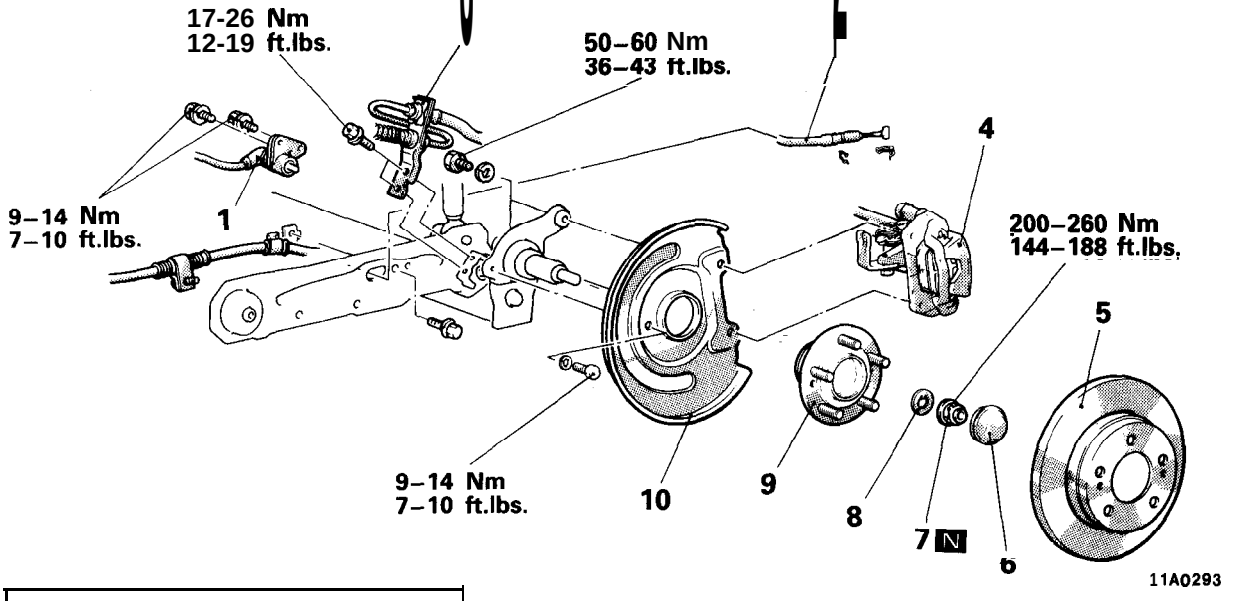
### 2. INSTALLATION OF LATERAL ROD MOUNTING BOLT (AXLE BEAM SIDE)

Install the lateral rod mounting bolt from the direction shown in the illustration.

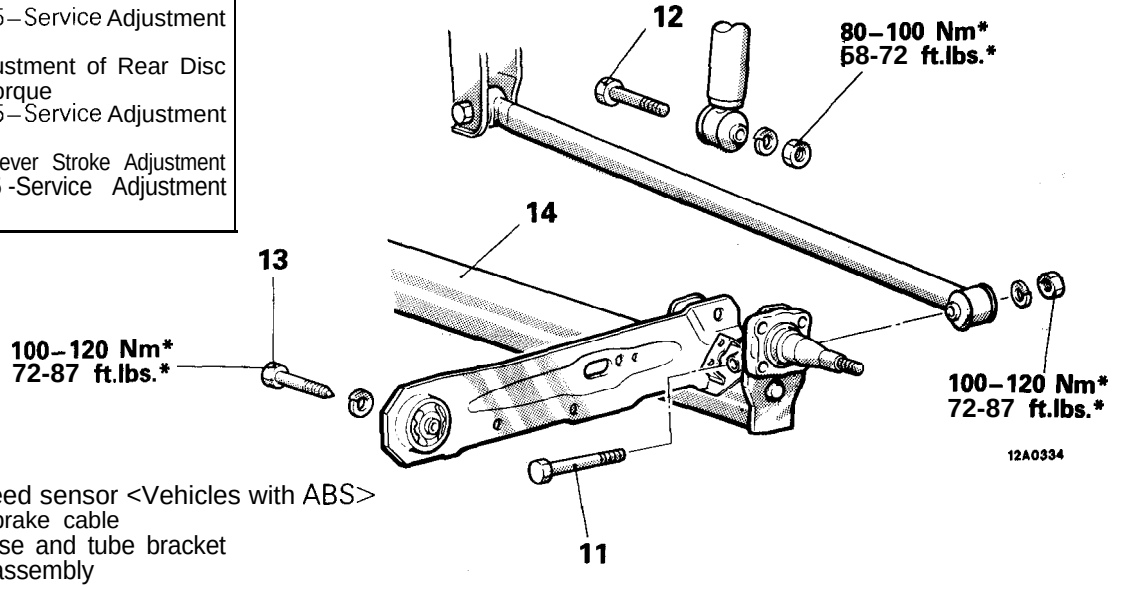
# TORSION AXLE AND ARM ASSEMBLY

## REMOVAL AND INSTALLATION

N17PA--



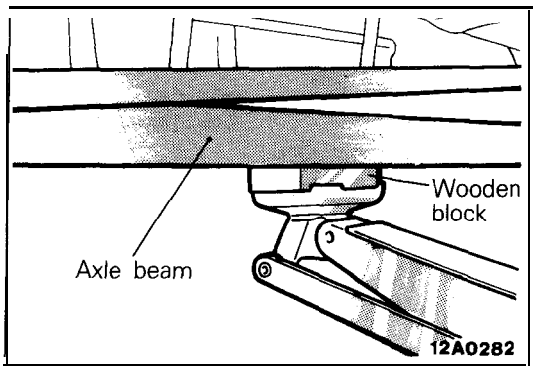

**Post-installation Operation**
- Checking and Adjustment of Brake Disc Deflection (Refer to GROUP 5–Service Adjustment Procedures.)
- Checking and Adjustment of Rear Disc Brake Dragging Torque (Refer to GROUP 5–Service Adjustment Procedures.)
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 5 -Service Adjustment Procedures.)

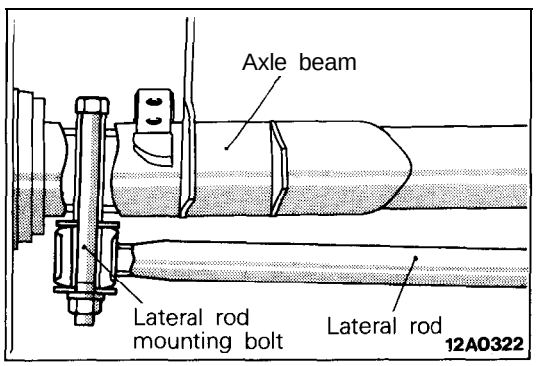


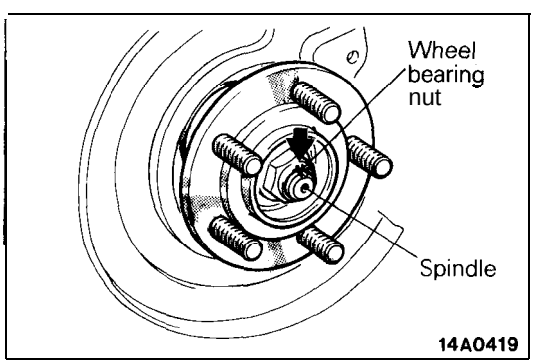

**Removal steps**

◆◆▶◆ 1. Rear speed sensor <Vehicles with ABS>
2. Parking brake cable
3. Brake hose and tube bracket
● ☒ 4. Caliper assembly
5. Brake disc
6. Hub cap
▶◆ 7. Wheel bearing nut
8. Tongued washer
◆◆▶◆ 9. Rear hub bearing unit
10. Dust shield
● 11. Lateral rod mounting bolt (axle beam side)
◆◆ 12. Shock absorber lower mounting bolt
◆◆ 13. Trailing arm mounting bolt
◆◆ 14. Torsion axle and arm assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ▶◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.




## SERVICE POINTS OF REMOVAL N17PBAG

**1. REMOVAL OF REAR SPEED SENSOR <VEHICLES WITH ABS>**

Refer to GROUP 5–Wheel Speed Sensor.

**4. REMOVAL OF CALIPER ASSEMBLY**

Remove the caliper assembly and suspend it with a piece of wire.

**9. REMOVAL OF REAR HUB BEARING UNIT**

NOTE
Rear hub bearing unit cannot be disassemble.

**12. REMOVAL OF SHOCK ABSORBER LOWER MOUNTING BOLT/13. TRAILING ARM MOUNTING BOLT/ 14. TORSION AXLE AND ARM ASSEMBLY**

(1) Jack up the torsion axle and arm assembly in order to raise it slightly.

**Caution**
**1. Always insert a wooden block between the jack receptacle and the axle beam and place the jack at the center of the axle beam.**
**2. Make sure that the jack does not contact the lateral rod.**

(2) Remove the shock absorber's mounting bolts and the trailing arm mounting bolts.
(3) Lower the jack slowly, and then remove the torsion axle and arm assembly.

## INSPECTION N17PCAAa

- Check the trailing arm and axle beam for deformation or damage.
- Check the torsion bar for damage.
- Check the bushings for cracking, deterioration, or unusual wear.

NOTE
For information concerning the replacement of the trailing arm bushing, refer to P.17–6.

## SERVICE POINTS OF INSTALLATION N17PDAJ

11. INSTALLATION OF LATERAL ROD **MOUNTING BOLT (AXLE BEAM SIDE)**

Install the lateral rod mounting bolt from the direction shown in the illustration.

**9. INSTALLATION OF REAR HUB BEARING UNIT**

Press inner race further until inner race contacts with spindle end.

**7. INSTALLATION OF WHEEL BEARING NUT**

After tightening the wheel bearing nut, align with the spindle's indentation and crimp.

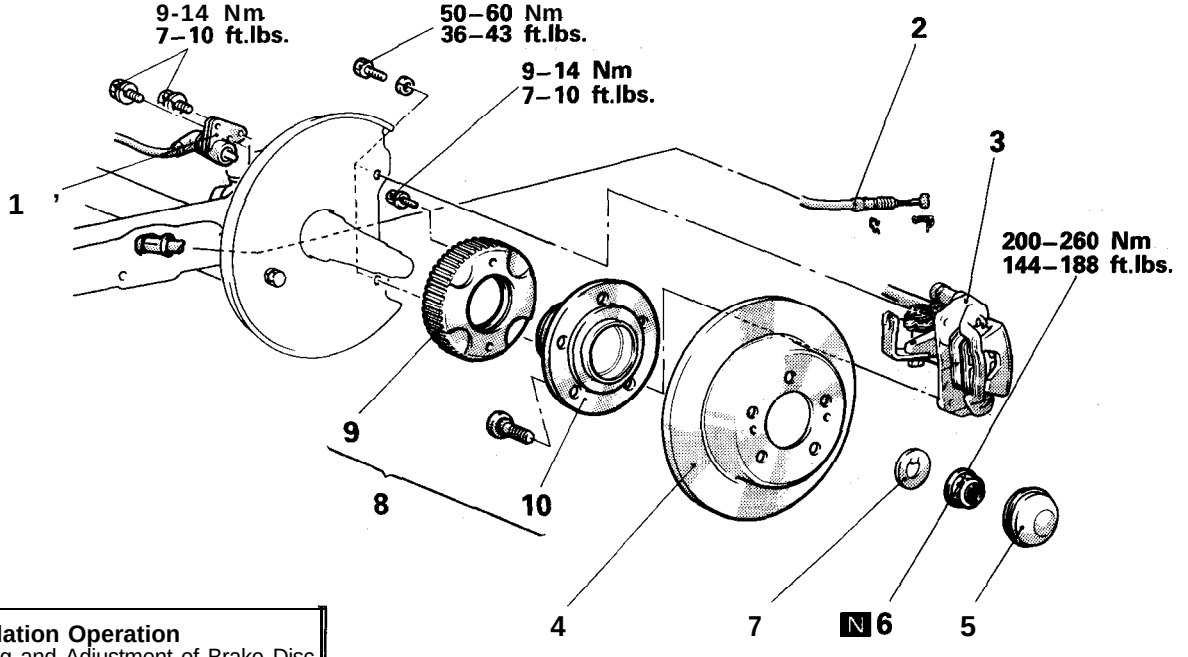
**1. INSTALLATION OF REAR SPEED SENSOR <VEHICLES WITH ABS>**

Refer to GROUP 5–Wheel Speed Sensor.

# REAR AXLE HUB

## REMOVAL AND INSTALLATION

N17MA--




**Post-installation Operation**
- checking and Adjustment of Brake Disc Deflection (Refer to GROUP 5–Service Adjustment Procedures.)
- checking and Adjustment of Rear Disc Brake Dragging Torque (Refer to GROUP 5–Service Adjustment Procedures.)
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 5–Service Adjustment Procedures.)

**Removal steps**

◆◆ ● + 1. Rear speed sensor <Vehicles with ABS>
'2. Parking brake cable
◆◆ 3. Caliper assembly
4. Brake disc
5. Hubcap
● + 6. Wheel bearing nut
7. Tongued washer
8. Rear hub assembly <Vehicles with ABS>
◆◆ 9. Rear rotor <Vehicles with ABS>
◆◆ ● + 10. Rear hub bearing unit

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL

N17MBAE

**1. REMOVAL OF REAR SPEED SENSOR <VEHICLES WITH ABS>**

Refer to GROUP 5–Wheel Speed Sensor.

**3. REMOVAL OF CALIPER ASSEMBLY**

Remove the caliper assembly and suspend it with a piece of wire.

**9. REMOVAL OF REAR ROTOR**

**Caution**
**Care must be taken not to scratch or otherwise damage the teeth of the rotor. The rotor must never be dropped. If the teeth of the rotor are chipped, resulting in a deformation of the rotor, it will not be-able to accurately detect the wheel rotation speed', and the system will not function normally.**

**10. REMOVAL OF REAR HUB BEARING UNIT**

NOTE
Rear hub bearing unit cannot be disassembled.,

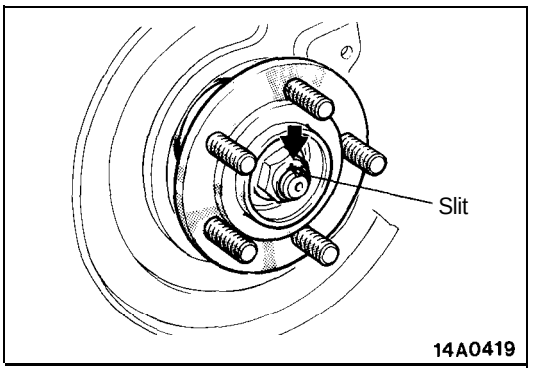
## INSPECTION N17MCAB

- Check the oil seal for crack or damage.
- Check the rear hub for wear or damage.

## SERVICE POINTS OF INSTALLATION N17MDAG

**10. INSTALLATION OF REAR HUB BEARING UNIT**

Press inner race further until inner race contacts with spindle end.




**6. INSTALLATION OF WHEEL BEARING, NUT**

After tightening the wheel bearing 'nut, align with the spindle's indentation and crimp.

**1. INSTALLATION OF REAR SPEED SENSOR <VEHICLES WITH ABS>**

Refer to GROUP 5–Wheel Speed Sensor.

# SPECIFICATIONS <AWD>

## GENERAL SPECIFICATIONS

N17CA-B

| Items | | Specifications |
|---|---|---|
| Suspension system | | Double wishbone suspension type |
| Coil spring | | |
| Wire dia. x O.D. x free length | mm (in.) | 11.0 x 106.0 x 332.5 (.43 x 4.17 x 13.1) |
| Coil spring identification color | | Purple x 1 |
| Spring constant | N/mm (lbs./in.) | 25.0 (140) |
| Shock absorber | | |
| Type | | Hydraulic, cylindrical, double-acting type |
| Max. length | mm (in.) | 568 (22.4) |
| Min. length | mm (in.) | 380 (15.0) |
| Stroke | mm (in.) | 188 (7.4) |
| Damping force [at 0.3 m/sec. (0.9 ft./sec.)] | | |
| Expansion | N (lbs.) | 900 (198) |
| Contraction | N (lbs.) | 300 (66) |

## SERVICE SPECIFICATIONS

N17CB-B

| Items | | Specifications |
|---|---|---|
| Standard value | | |
| Toe-in | mm (in.) | 3.6 ± 3 (.14 ± .118) |
| Camber | | −1°33′ ± 30′ |

## TORQUE SPECIFICATIONS

N17CC-B

| Items | Nm | ft.lbs. |
|---|---|---|
| Rear suspension assembly | | |
| Center exhaust pipe to main muffler installation bolt | 40–50 | 29-36 |
| Hook installation bolt | 10–15 | 7–11 |
| Hanger installation bolt | 10–15 | 7-11 |
| Center exhaust pipe to front exhaust pipe installation nut | 30–40 | 22-29 |
| Rear shock absorber installation nut | 40–50 | 29-36 |
| Differential carrier to differential support member | 80–100 | 58-72 |
| Differential support member to body | 110–130 | 80–94 |
| Brake tube bracket to rear shock absorber | 17-26 | 12-19 |
| Differential carrier to propeller shaft | 30–35 | 22-25 |
| Crossmember bracket to body | 70–85 | 51-61 |
| Crossmember bracket to crossmember | 110–130 | 80–94 |
| Rear brake assembly installation bolt | 50–60 | 36-43 |
| Rear speed sensor installation bolt | 9-14 | 7–10 |
| Upper and lower arm | | |
| Upper arm to crossmember | 140–160 | 101–116 |
| Upper arm to knuckle | 60–72 | 43-52 |
| Lower arm to crossmember | 90–110 | 65–80 |
| Lower arm to knuckle | 60–72 | 43-52 |
| Trailing arm | | |
| Companion flange to rear axle shaft | 160–220 | 116-159 |
| Companion flange to drive shaft | 55-65 | 40–47 |
| Trailing arm to crossmember | 140–160 | 101–116 |
| Upper arm to knuckle | 60–72 | 43-52 |
| Lower arm to knuckle | 60–72 | 43-52 |
| Rear shock absorber (lower) | 90–110 | 65–80 |
| Rear brake assembly installation bolt | 50–60 | 36-43 |
| Rear speed sensor installation bolt | 9-14 | 7–10 |
| Shock absorber assembly | | |
| Shock absorber installation nut | 40–50 | 29-36 |
| Shock absorber installation bolt | 90–110 | 65–80 |
| Brake tube bracket to rear shock absorber | 17-26 | 12-19 |
| Piston rod tightening nut | 20–25 | 14-18 |
| Stabilizer bar | | |
| Differential support member to body | 110–130 | 80–94 |
| Crossmember bracket to crossmember | 110–130 | 80–94 |
| Crossmember bracket to body | 70–85 | 51-61 |
| Stabilizer link to stabilizer bar | 35-45 | 25-33 |

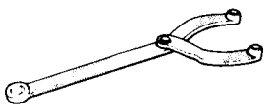
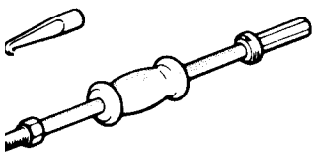
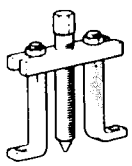
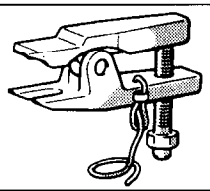
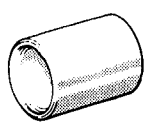
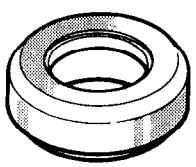
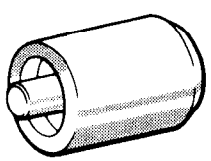
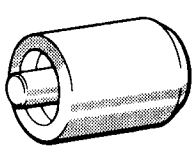
## LUBRICANT

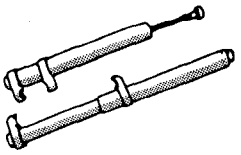
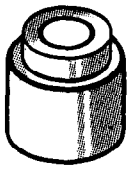
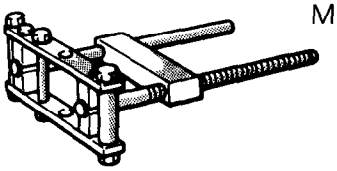
N17CD-

| Items | Specified lubricant |
|---|---|
| Lip and inside of the dust cover (upper and lower arm, stabilizer link) | MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent |

# SPECIAL TOOLS

N17DA-B

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB990767 | End yoke holder | For measurement of rotation torque of the limited-slip differential<br>To stop axle shaft turning |
|  | C-637 | Sliding hammer set | For removal of the axle shaft |
|  | CT-1003 | Axle shaft puller | For removal of the axle shaft |
|  | MB991113 | Steering linkage puller | Disconnection of the ball joint |
|  | MB990847 | Base | Removal and press-fitting of the lower arm bushing |
|  | MB991245 | Lower arm bushing ring | |
|  | MB991246 | Lower arm bushing arbor | |
|  | MB990849 | Upper arm bushing arbor | Removal and press-fitting of the trailing arm bushing |
|  | MB990646 | Control arm bushing installer and remover | |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | L-4514 | Spring compressor body | Compression of the coil spring |
|  | MB990800 | Ball joint remover and installer | Installation of the ball joint dust cover |
|  | MB991254 | Rod remover and installer | Replacement of trailing arm connecting rod |

# TROUBLESHOOTING

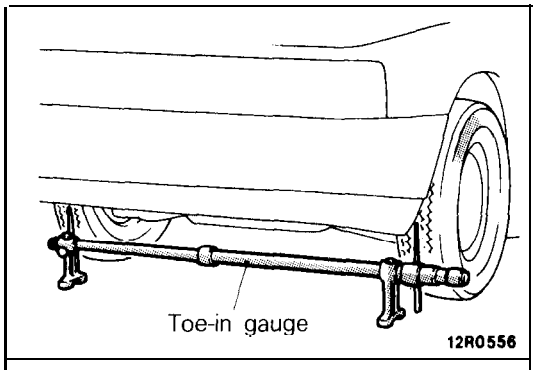
N17EA-B

| Symptom | Probable cause | Remedy |
|---|---|---|
| Squeaks or other abnormal noise | Loose rear suspension installation bolts and nuts | Retighten |
| | Malfunction of shock absorber<br>Worn bushings | Replace |
| | Upper arms and/or lower arms deformed or damaged | |
| | Trailing arms deformed or damaged | |
| | Crossmember deformed or damaged | |
| Poor ride | Excessive tire inflation pressure | Adjust the pressure |
| | Malfunction of shock absorber<br>Weak or broken springs | Replace |
| | Stabilizer bar and/or stabilizer link deformed or damaged | |
| Body tilting | Weak or deteriorated bushings<br>Weak or broken springs | Replace |
| | Upper arms and/or lower arms deformed or damaged | |
| | Trailing arms deformed or damaged | |
| | Crossmember deformed or damaged | |

# SERVICE ADJUSTMENT PROCEDURES

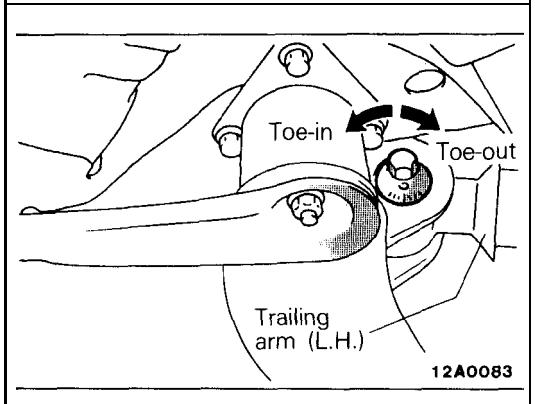
## REAR WHEEL ALIGNMENT INSPECTION N17FDAB

Measure the wheel alignment with the vehicle parked on level ground.
The rear suspension and wheels should be inspected for wear or damage and repaired prior to measurement of wheel, alignment.



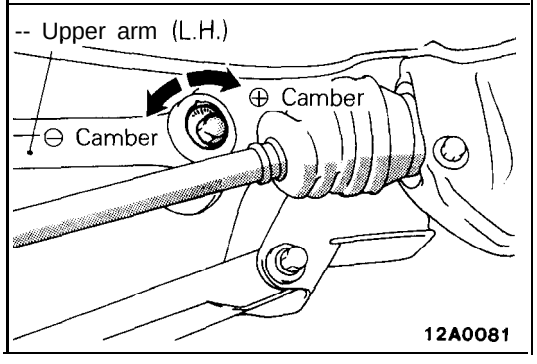

### TOE-IN

(1) Measure the toe-in with a toe-in gauge.
**Standard value: 3.6±3 mm (.14±.118 in.)**




(2) If the toe-in is not within the standard value, adjust it by moving the mounting bolts located on the crossmember side of the trailing arm.

NOTE
Make the adjustment by moving the left and the right bolts equally.
Movement of one division on the scale will cause toe-in variation of about 2 mm (.08 in.).




### CAMBER

(1) Measure the camber with a camber/caster/kingpin gauge.
**Standard value: −1°33′±30′**

(2) If the camber is not within the standard value, adjust it by moving the mounting bolt located on the crossmember side of the upper arm.

NOTE
Movement of one division on the scale will cause camber variation of about 15'.

**Caution**
1. **As toe-in will vary 0.9 mm (.035 in.) for every camber scale adjustment, adjust the toe after adjusting camber.**
2. **The difference between the left and the right camber shall be less than 15'.**

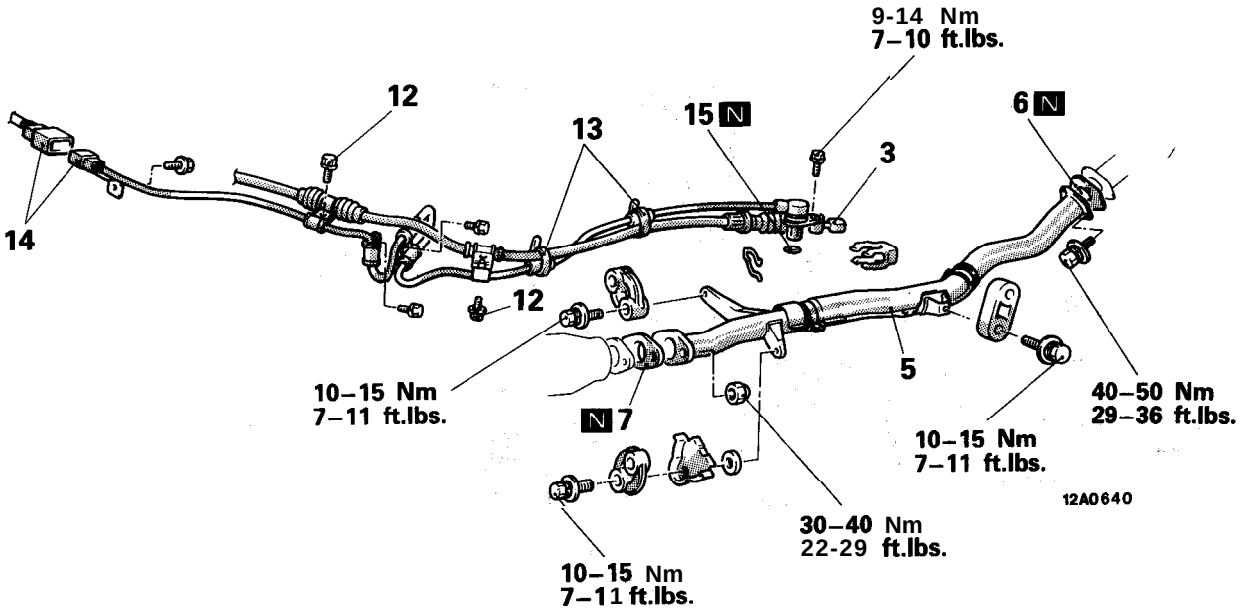
# REAR SUSPENSION ASSEMBLY

## REMOVAL AND INSTALLATION

N17GA-B

**Pre-removel Operation**
- Removal of Hole Cover
  (Refer to GROUP 23–Trims.)

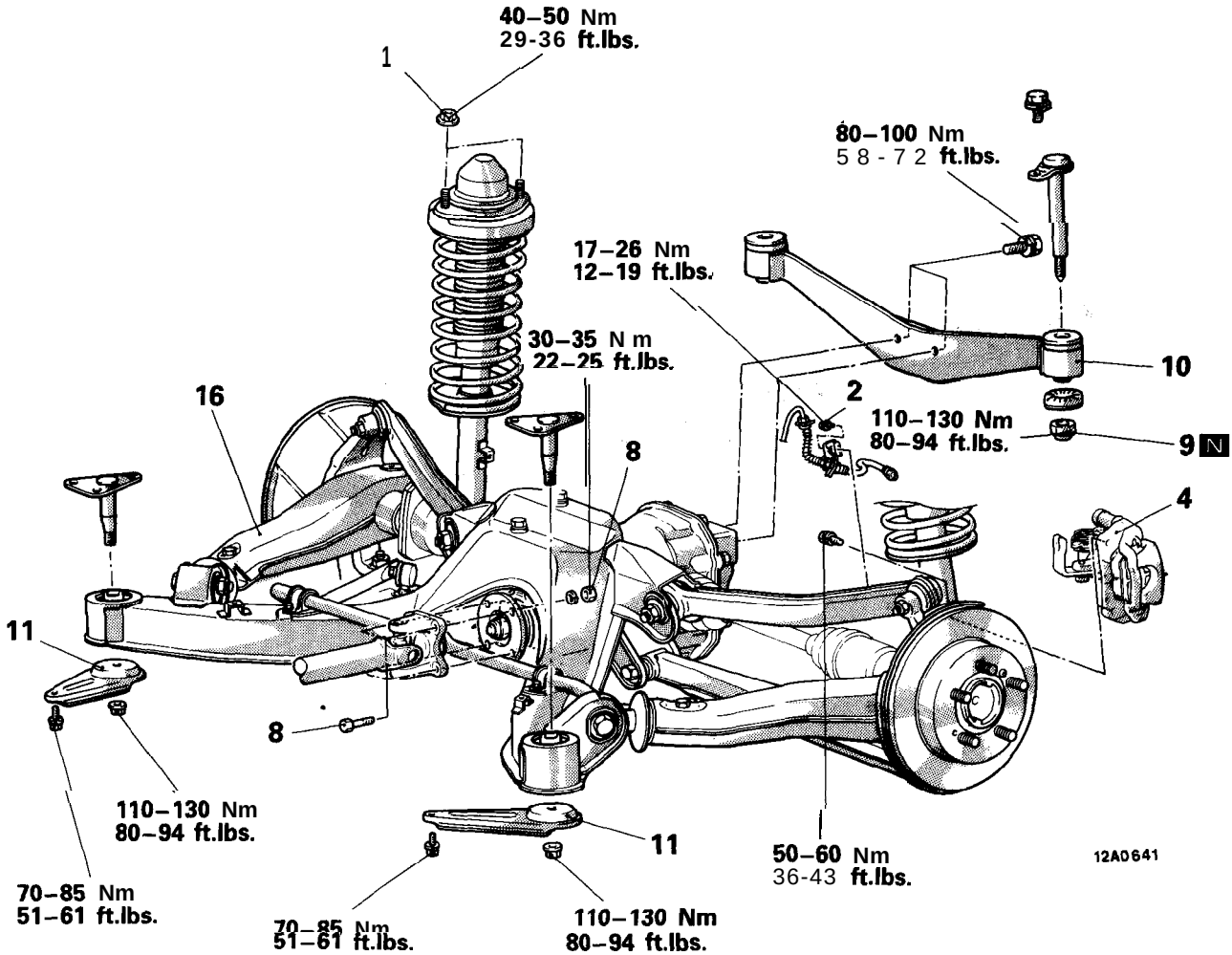
**Post-installation Operation**
- Check of Wheel Alignment
  (Refer to P.17-20.)
- Check of Parking Brake Lever Stroke
  (Refer to GROUP 5–Service Adjustment Procedures.)
- installation of Hole Cover
  (Refer to GROUP 23–Trims.)




**Removal steps**

1. Shock absorber installation nut
2. Brake tube bracket installation bolt
3. ● + Parking brake cable end
4. ◆◆ Caliper assembly
5. Center exhaust pipe
6. Gasket
7. Gasket
8. ◆◆ ● + Propeller shaft installation bolt and nut

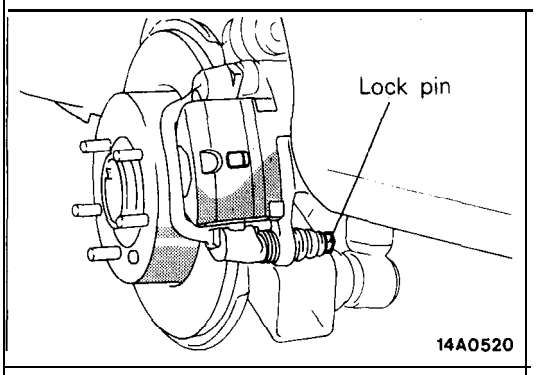
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

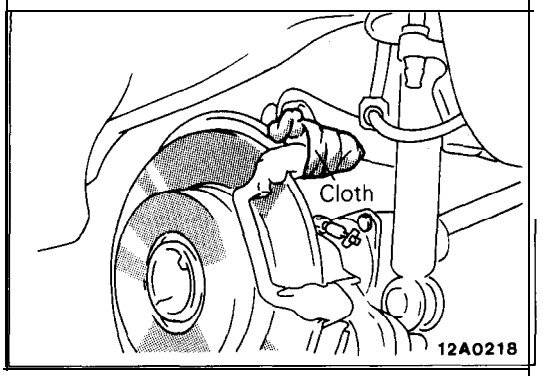


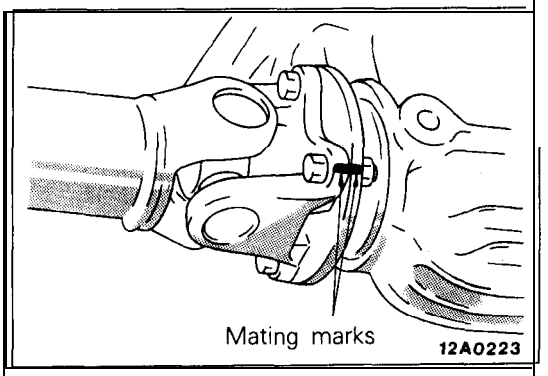

**Removal steps**

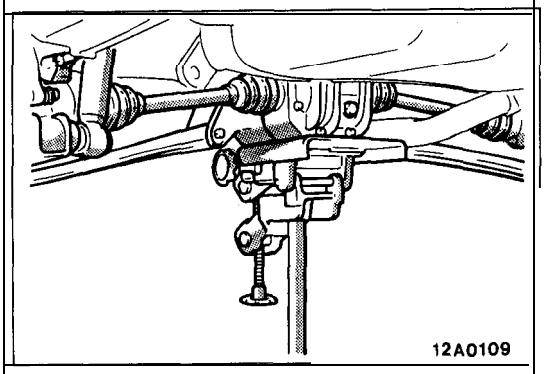
◆◆ 9. Self locking nut
10. Differential support member
11. Crossmember bracket
◆◆ 12. Parking brake cable and rear speed sensor installation bolt
13. Cable band
14. Rear speed sensor connector <Vehicles with ABS>
15. O-ring
◆◆ 16. Rear suspension assembly

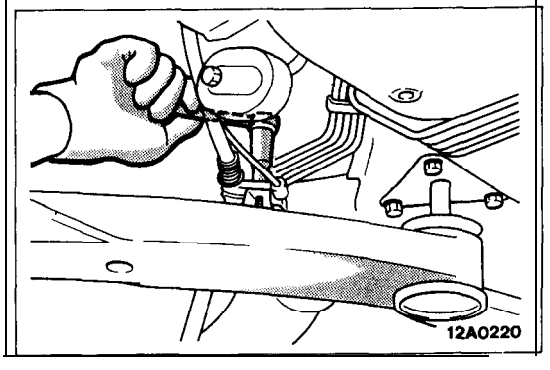
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ●: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL

N17GBAOa

### 4. REMOVAL OF CALIPER ASSEMBLY

(1) Remove the lock pin, rotate the caliper assembly upward, then remove the caliper assembly and secure it with wire, etc.

**Caution**
**The lock pin has a special grease applied to it, so be sure not to wipe it off, and ensure that the lock pin stays clean.**

(2) After removing the caliper assembly, cover the guide pin with a cloth, etc.

### 8. REMOVAL OF PROPELLER SHAFT INSTALLATION BOLT AND NUT

Place mating marks on the differential carrier companion flange and the propeller shaft flange yoke.

NOTE
The mating marks should be used as a reference for re-installation.

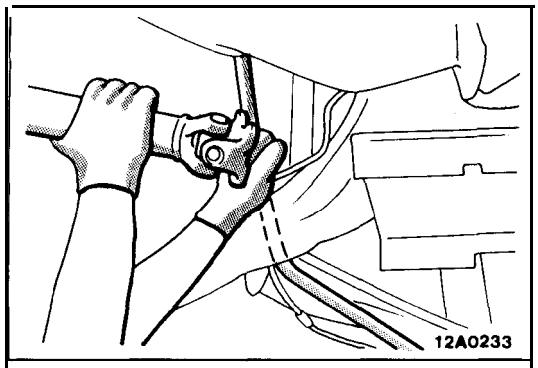
### 9. REMOVAL OF SELF LOCKING NUT

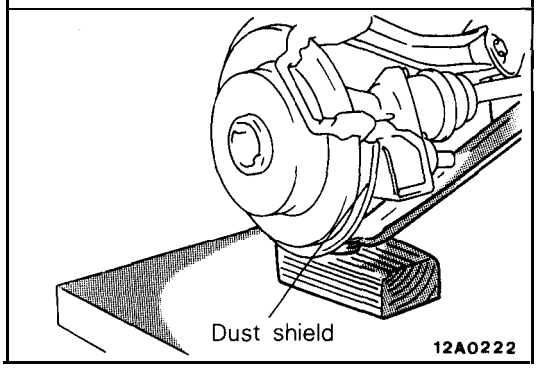
(1) Before removing the self' locking nuts, support the differential case with a transaxle jack.
(2) Remove the self locking nuts.

### 12. REMOVAL OF PARKING BRAKE CABLE AND REAR SPEED SENSOR INSTALLATION BOLT

(1) Lower the transaxle jack slightly.
(2) Remove the parking brake cable installation bolts.

NOTE
The task may be made easier by increasing the gap between the body and the crossmember.




### 16. REMOVAL OF REAR SUSPENSION ASSEMBLY

(1) Supporting the rear suspension assembly with a transmission jack, move it toward the rear (in the direction of the fuel tank).

(2) Gradually lower the transmission jack, avoiding contact with the stabilizer bar and the propeller shaft.

**Caution**

**1. Ensure that the propeller shaft does not bend greatly.**

**2. Ensure that the löbro joint does not receive any shock.**

NOTE

The lowering of the rear suspension assembly from the transmission jack requires three individuals due to the amount of weight being handled (one on the differential, and one on either side of the lower arm).

(3) In order to protect the rear suspension assembly dust shield, support the lower arm ball joint with a wooden block.

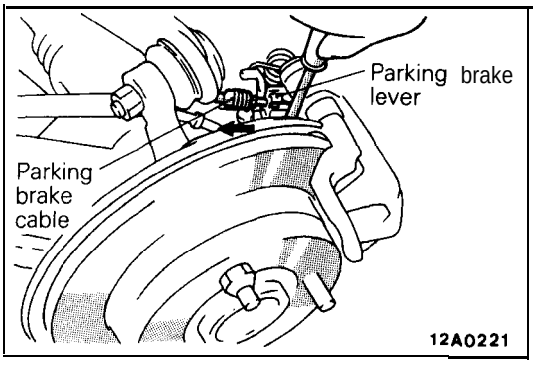
## INSPECTION N17GCAM

- Check crossmember for cracks or other damage.

## SERVICE POINTS OF INSTALLATION N17GDAR

### 8. INSTALLATION OF PROPELLER SHAFT INSTALLATION BOLT AND NUT

Install the propeller shaft to the differential carrier, ensuring that the mating marks are aligned.




### 3. INSTALLATION OF PARKING BRAKE CABLE END

NOTE

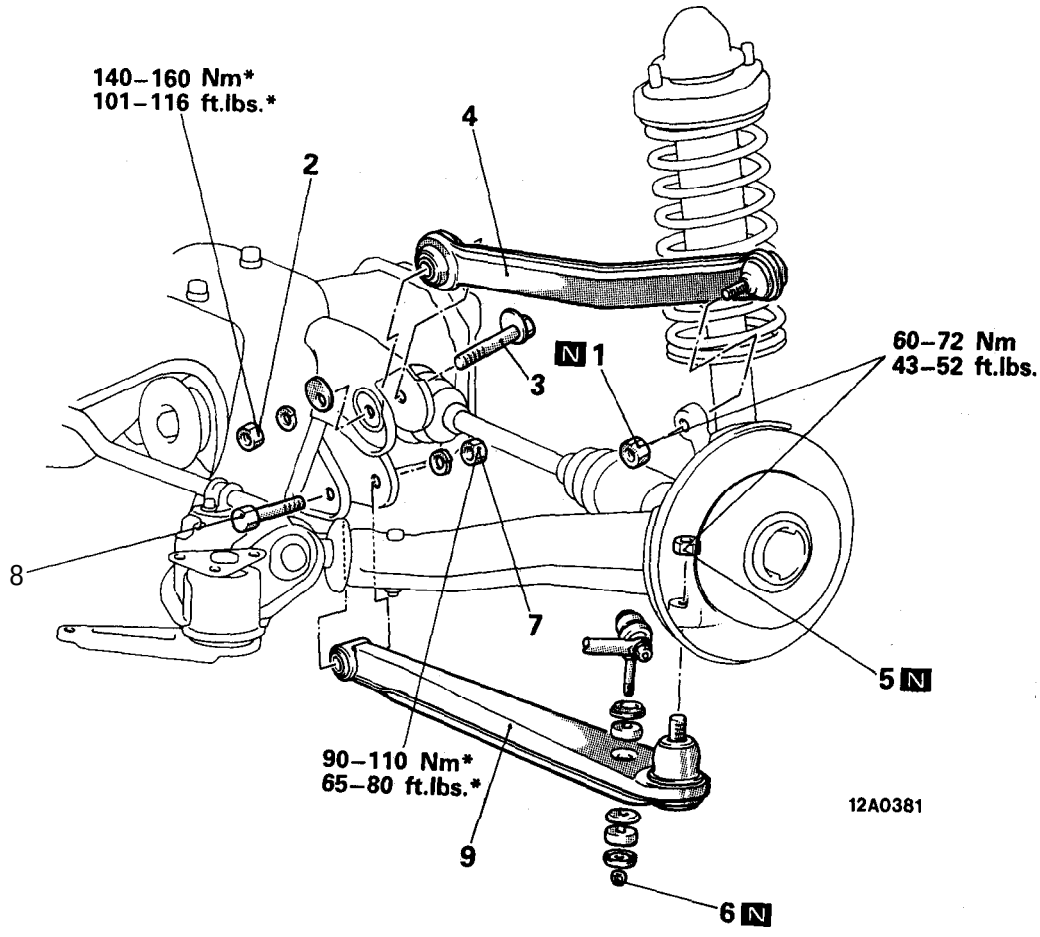
Connecting a parking brake cable end to parking brake lever and prying up the parking brake lever, the installation of the other cable end will be easy.

# UPPER AND LOWER ARM

N17SA-

## REMOVAL AND INSTALLATION

**Post-installation Operation**
- Check of Wheel Alignment (Refer to P.17-20.)



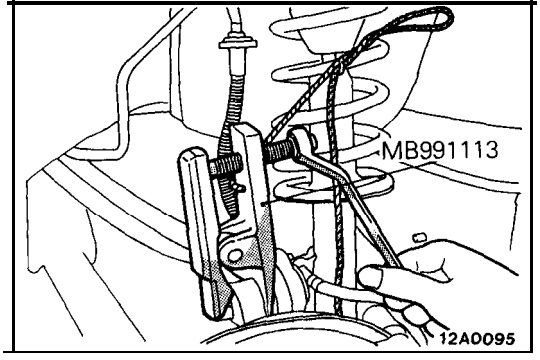

**Upper arm removal steps**

1. Self locking nut
2. Upper arm installation nut
3. Upper arm installation bolt
4. Upper arm

**Lower arm removal steps**

5. Self locking nut
6. Stabilizer link installation nut
7. Lower arm installation nut
8. Lower arm installation bolt
9. Lower arm

NOTE
(1) Reverse the removal procedures to reinstall.
(2) : Refer to "Service Points of Removal".
(3) : Refer to "Service Points of installation".
(4) N : Non-reusable parts
(5) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.



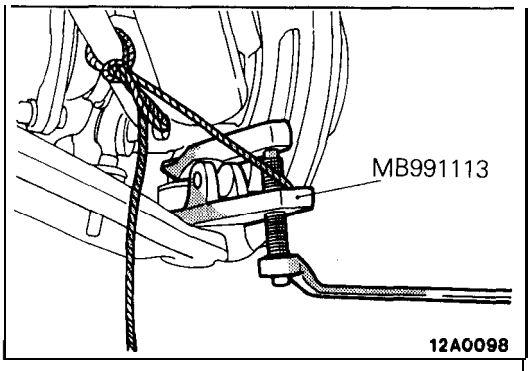

## SERVICE POINTS OF REMOVAL

N17SBAA

### 1. REMOVAL OF SELF LOCKING NUT

With the special tool, disconnect the upper arm ball joint and knuckle.

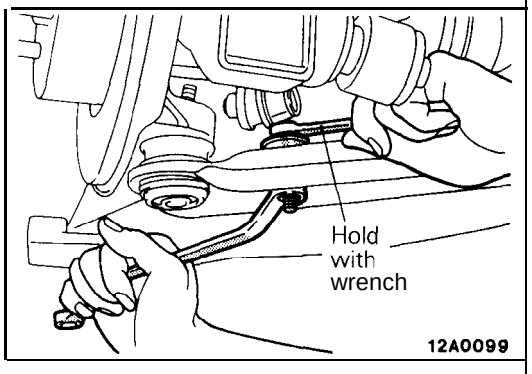
**Caution**
**While the special tool is being used, do not remove the self locking nut; only loosen it.**




**5. REMOVAL OF SELF LOCKING NUT**

With the special tool, disconnect the lower arm ball joint and knuckle.

**Caution**
**While the special tool is being used, do not remove the self locking nut; only loosen it.**




**6. REMOVAL OF STABILIZER LINK INSTALLATION NUT**

Hold the stabilizer link with a wrench and remove the installation nut.

## INSPECTION N17SCAA

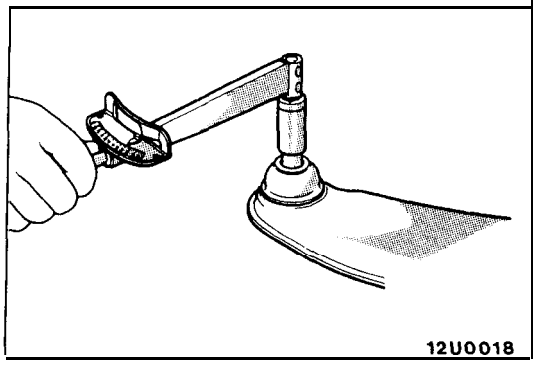
- Check the bushing for wear and deterioration.
- Check the upper arm or lower arm for bend or breakage.
- Check the ball joint dust cover for cracks.
- Check all bolts for condition and straightness.

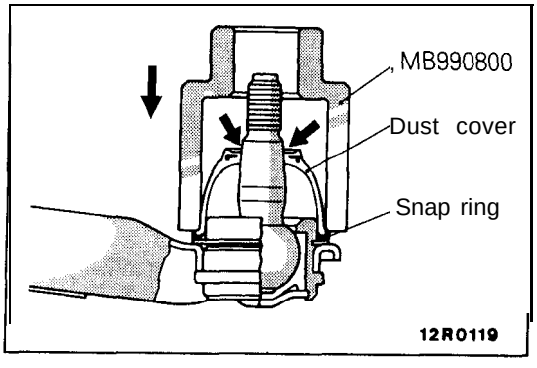
**CHECKING OF BALL JOINT FOR STARTING TORQUE**

(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Deflect side to side the ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

**Standard value: 2-9 Nm (17-78 in.lbs.)**

(4) If the starting torque exceeds the upper limit of standard value, replace the upper and lower arm assembly.
(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.



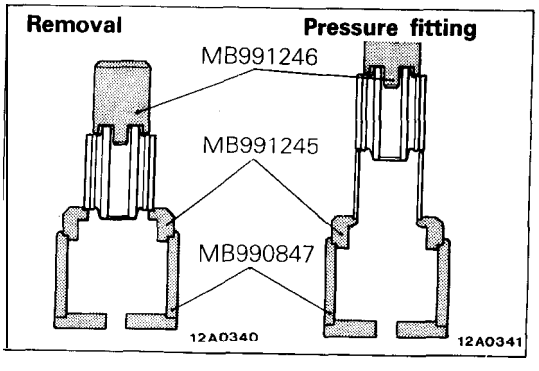




## BALL JOINT DUST COVER REPLACEMENT N17SEAA

(1) Remove the dust cover.
(2) Apply multipurpose grease to the lip and inside of the dust cover.

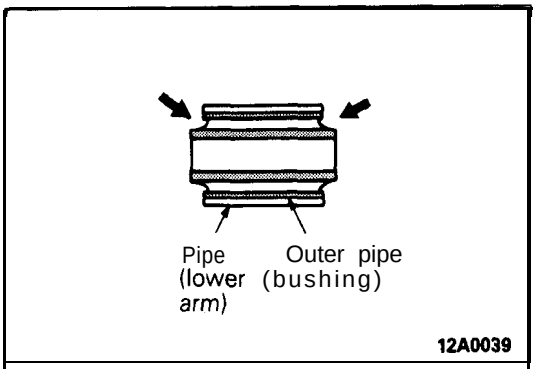
**Grease: MOPAR Multi-mileage, Lubricant**
**Part No.2525035 or equivalent**

(3) Drive in the dust cover with special tool until it is fully seated.

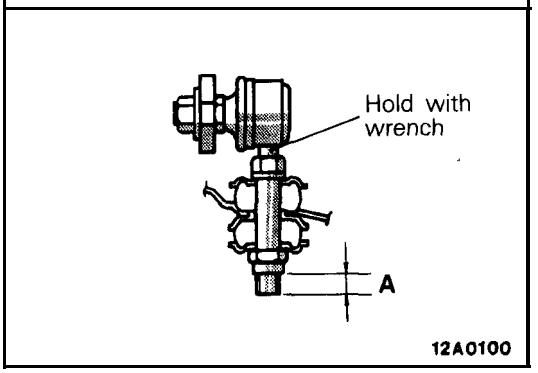



## LOWER ARM BUSHING REPLACEMENT N17SFAA

(1) Use the special tool to remove and press fit the bushing,




(2) Press fit the lower arm bushing until the bushing outer pipe edge flush with the lower arm pipe edge.




## SERVICE POINTS OF INSTALLATION N17SDAA

### 6. INSTALLATION OF STABILIZER LINK INSTALLATION NUT

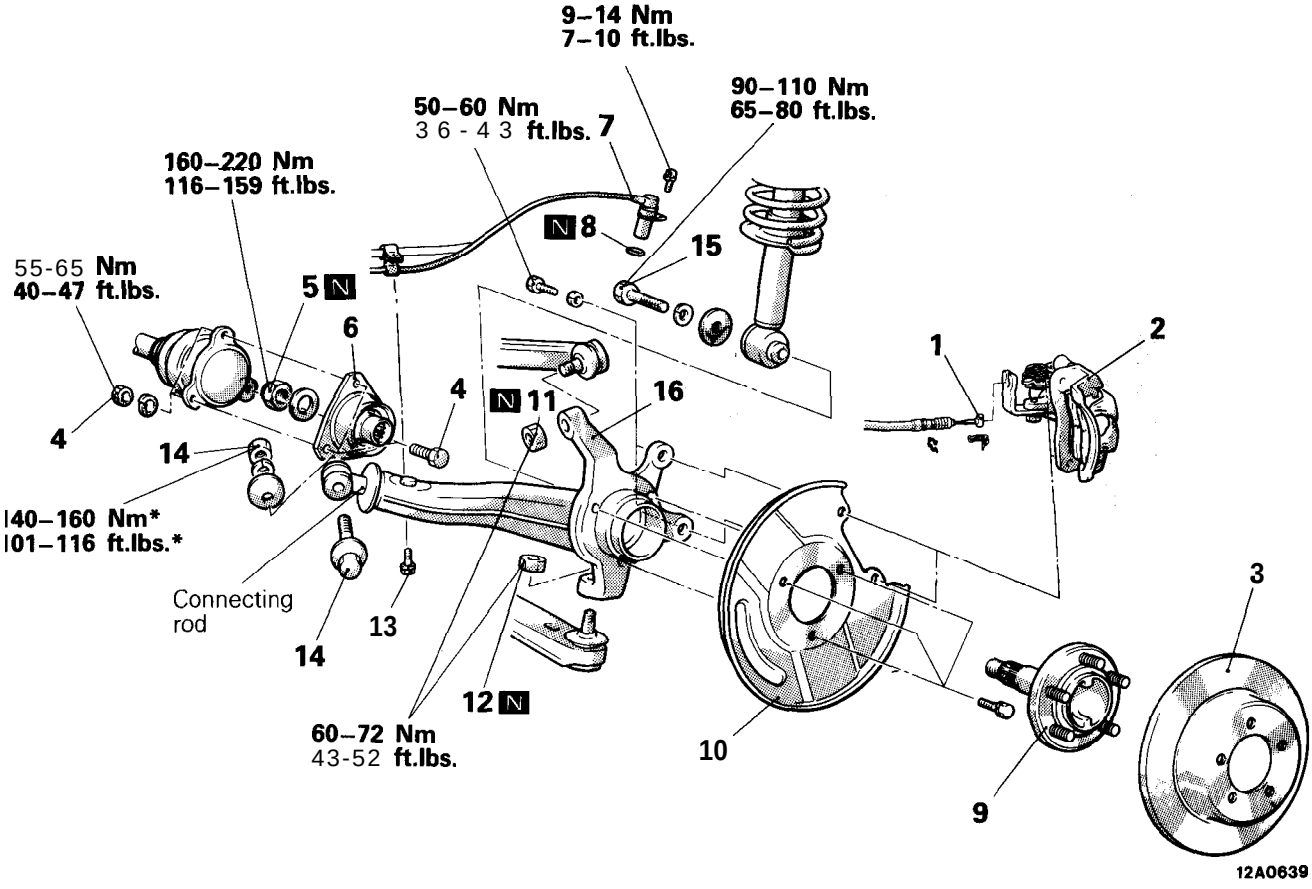
Holding the stabilizer link with a wrench, tighten the self locking nut so that the protrusion of the stabilizer link (dimension A indicated in illustration) is within the standard value.

**Standard value: 9–11 mm (.354–.433 in.)**

# TRAILING ARM

## REMOVAL AND INSTALLATION

N17TA--

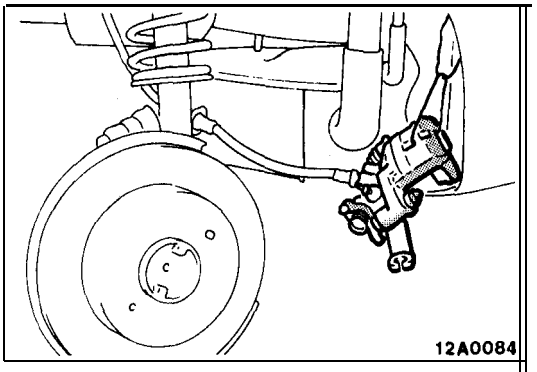



**Removal steps**

1. Parking cable end
2. Rear brake assembly
3. Rear brake disc
4. Drive shaft and companion flange installation bolt, nut
5. Self locking nut
6. Companion flange
7. Rear speed sensor <Vehicles with ABS>
8. O-ring
9. Rear axle shaft
10. Dust shield
11. Self locking nut (upper arm)
12. Self locking nut (lower arm)
13. Parking brake cable and rear speed sensor installation bolt
14. Trailing arm installation bolt, nut
15. Rear shock absorber installation bolt
16. Trailing arm

**Post-installation Operation**
- Check of Wheel Alignment (Refer to P.17-20.)
- Check of Parking Brake Lever Stroke (Refer to GROUP 5–Service Adjustment Procedures.)
- Rear Brake Disc Run-out Check (Refer to GROUP 5–Service Adjustment Procedures.)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) : Refer to “Service Points of Removal”.
(3) : Refer to “Service Points of Installation”.
(4) N : Non-reusable parts
(5) * : Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle in the unladen condition.

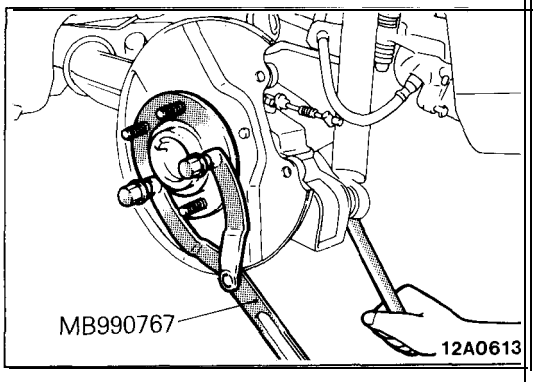



## SERVICE POINTS OF REMOVAL

N17TBAA

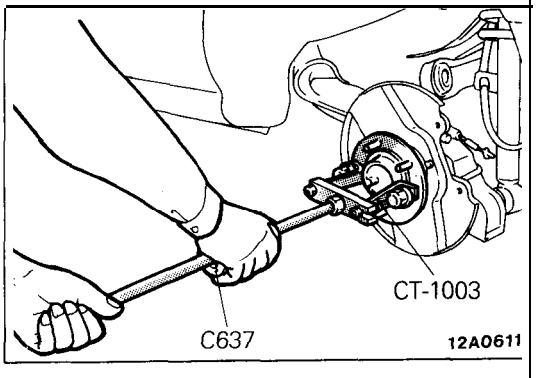
### 2. REMOVAL OF REAR BRAKE ASSEMBLY

Remove the rear brake assembly installation bolts, then suspend the rear brake assembly from the vehicle with wire, etc.



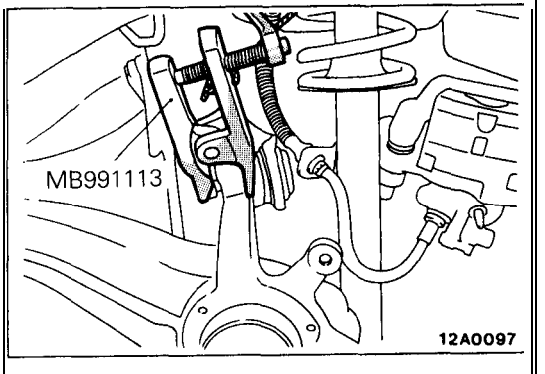

### 5. REMOVAL OF SELF LOCKING NUT

With the special tool, secure the rear axle shaft, then remove the self locking nut.




### 9. REMOVAL OF REAR AXLE SHAFT

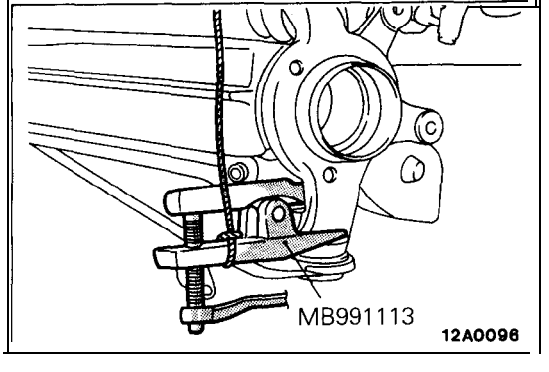
With the special tool, remove the rear axle shaft.




### 11. REMOVAL OF SELF LOCKING NUT (UPPER ARM)

With the special tool, disconnect the upper arm ball joint and knuckle.

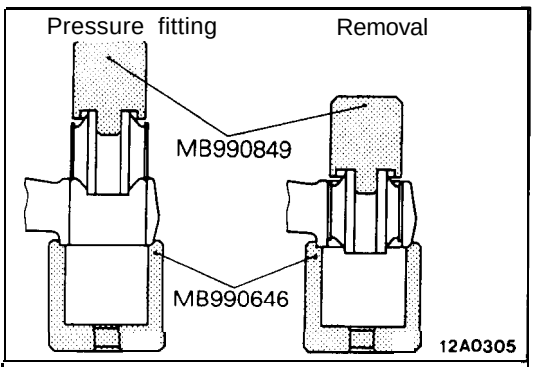
**Caution**
**While the special tool is being used, do not remove the self locking nut; only loosen it.**




### 12. REMOVAL OF SELF LOCKING NUT (LOWER ARM)

With the special tool, disconnect the lower arm ball joint and knuckle.

**Caution**
**While the special tool is being used, do not remove the self locking nut; only loosen it.**

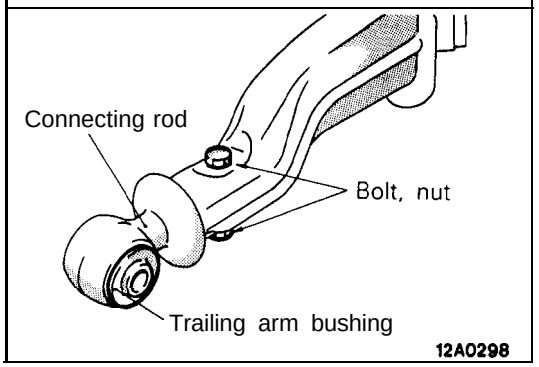



## INSPECTION N17TCAA

- Check trailing arm for cracks and deformation.
- Check bushing for cracks, deterioration and wear.

## TRAILING ARM BUSHING REPLACEMENT N17TEAA

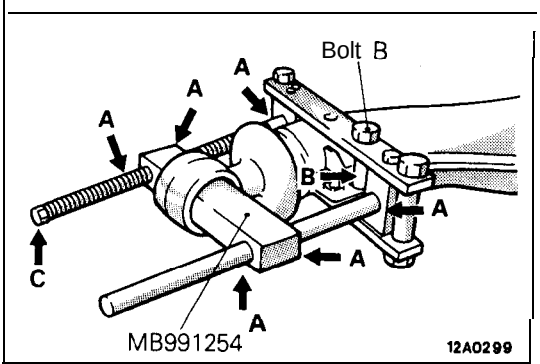
Use the special tool to remove and press fit the bushing.




## CONNECTING ROD REPLACEMENT N17TFAA

Replace the connecting rod using the following procedure:

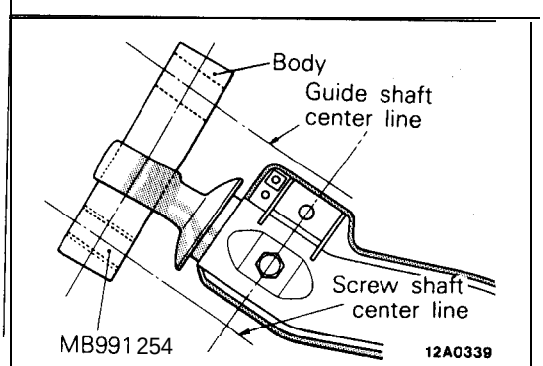
(1) Remove the trailing arm bushing.
(2) Remove the bolt and nut.



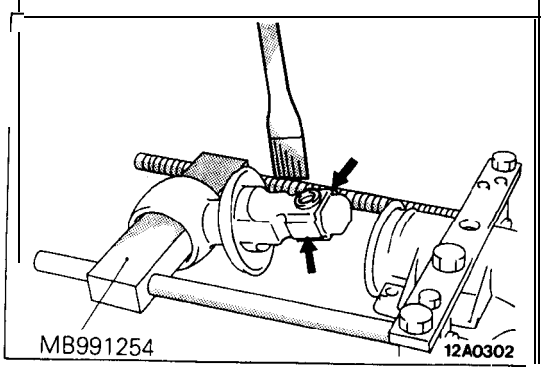

(3) Set the special tool onto the trailing arm as shown in the illustration.

NOTE
(1) Apply lubricant to the sliding portion of the special tool (at the arrow marked “A” in the illustration).
(2) Install bolt B to the trailing arm, at the point shown in the figure.

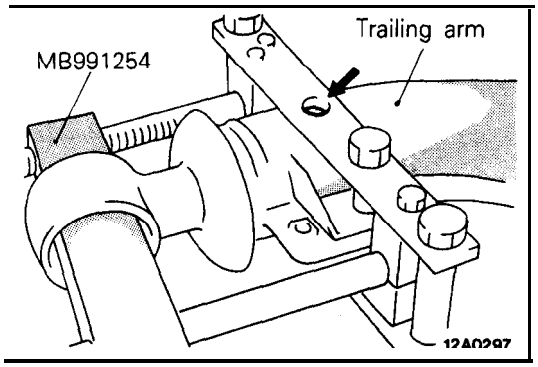
(4) Use a spanner, etc., to turn the portion marked “C” in the illustration to remove the connecting rod.




(5) Installation of the body (special tool) should be performed with the screw shaft and guide shaft center lines oriented as shown in the illustration.




(6) Apply soapy water to the rubber portion of the connecting rod.
(7) Reverse the removal procedures to press fit.



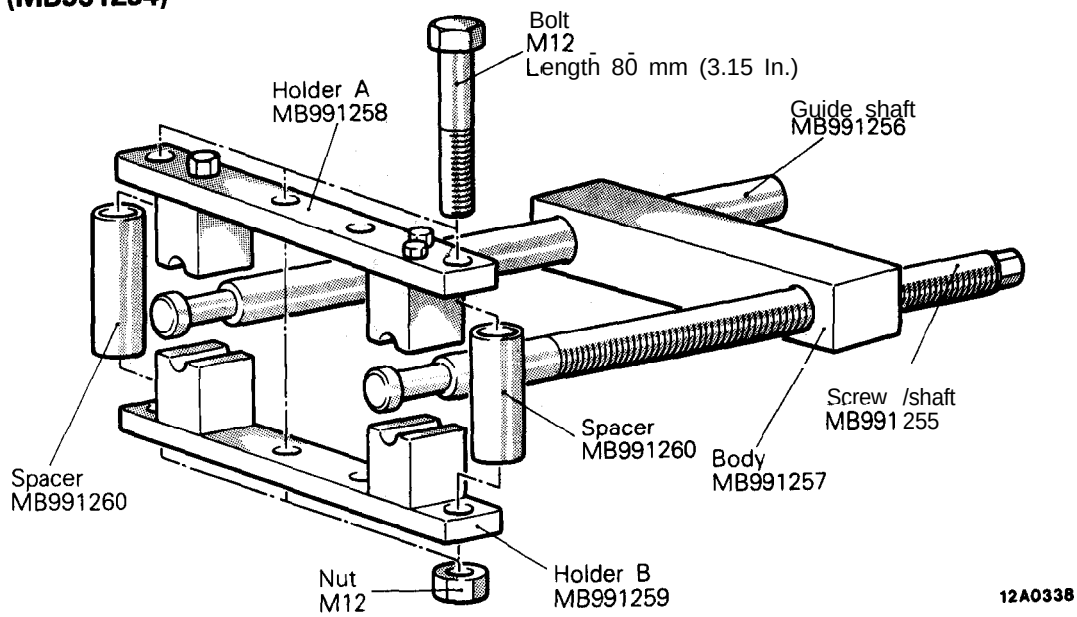

(8) Remove the special tool after aligning the holes in the special tool and trailing arm.
(9) Tighten the bolts and nuts to the specified torque.

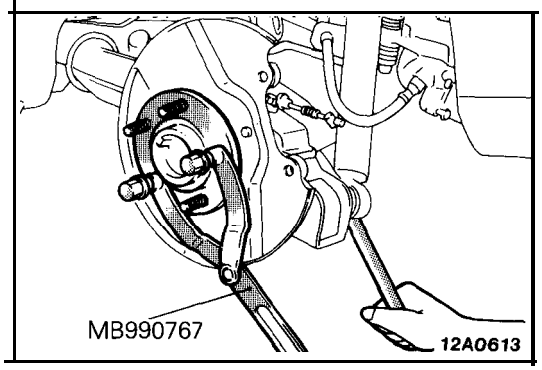
**Tightening torque: 85–110 Nm (61–80 ft.lbs.)**

(IO)Press fit the trailing arm bushing. (Refer to P.17-30.)

**<Reference>**

**Special tool (MB991254)**




## SERVICE POINTS OF INSTALLATION N17TDAA

### 9. INSTALLATION OF REAR AXLE SHAFT/6. COMPANION FLANGE/5. SELF LOCKING NUT

(1) Temporarily assemble the rear axle shaft to the trailing arm.
(2) Install the companion flange to the rear axle shaft, then install the self locking nut.
(3) Hold the rear axle shaft with the special tool so that it doesn't turn and tighten the locking nut.

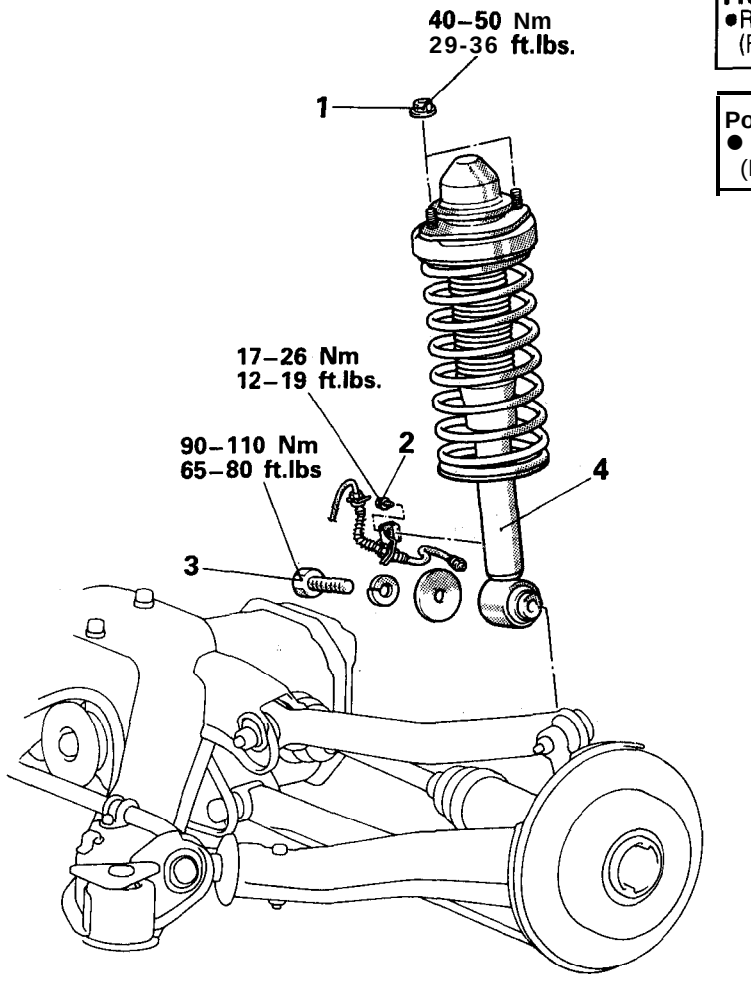
# SHOCK ABSORBER ASSEMBLY

## REMOVAL AND INSTALLATION

N17NA-B

**Pre-removal Operation**
- Removal of Trunk Room Trim
(Refer to GROUP 23–Trims.)

**Post-installation Operation**
- installation of Trunk Room Trim
(Refer to GROUP 23–Trims.)




12A0383

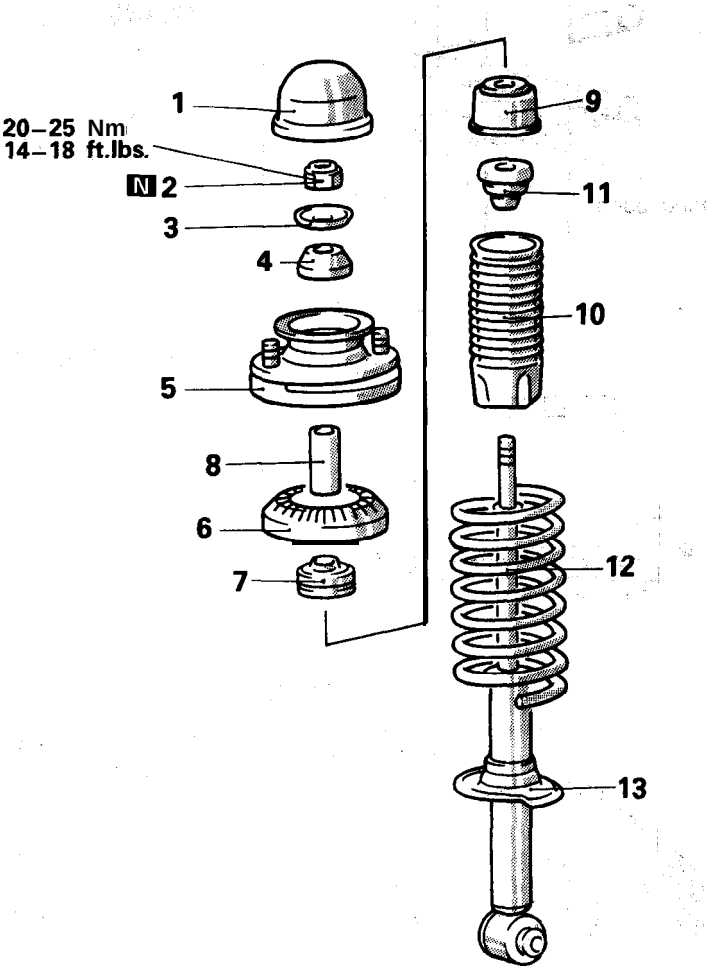
**Removal steps**

1. Shock absorber upper installation nut
2. Brake tube bracket installation bolt
3. Shock absorber lower installation bolt
4. Shock absorber assembly

NOTE
Reverse the removal procedures to reinstall.

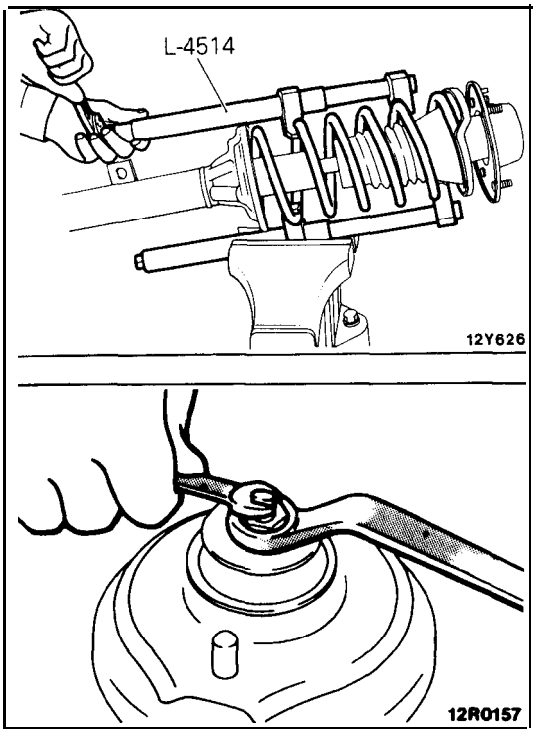
## DISASSEMBLY AND REASSEMBLY

N17GM-B




**Disassembly steps**

1. Cap
◆◆ ◆◆ 2. Piston rod tightening nut
3. Washer
4. Upper bushing (A)
◆◆ 5. Bracket assembly
6. Spring pad
7. Upper bushing (B)
8. Collar
◆◆ 9. Cup assembly
◆◆ 10. Dust cover
11. Bump rubber
◆◆ 12. Coil spring
13. Shock absorber




## SERVICE POINTS OF DISASSEMBLY

N17GNAA2

### 2. REMOVAL OF PISTON ROD TIGHTENING NUT

(1) Before removing the piston rod tightening nut compress the coil spring using the special tools.

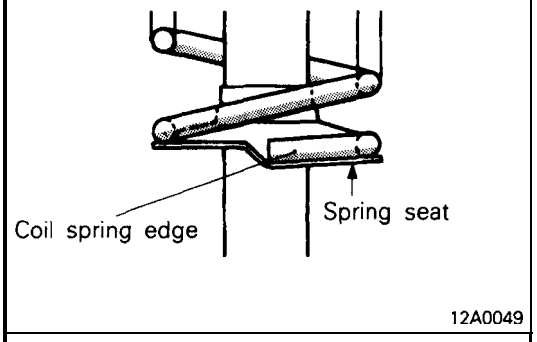
**Caution**
**Do not use an air tool to tighten the bolt of the special tool.**

(2) While holding the piston rod, remove the piston rod tightening nut.

## INSPECTION

N17GOAA2

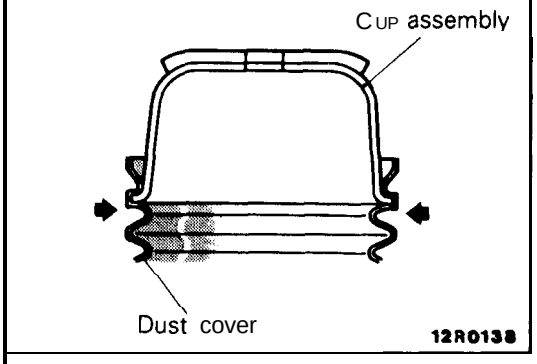
- Check the rubber parts for damage.
- Check the coil springs for crack, damage or deterioration.




## SERVICE POINTS OF REASSEMBLY N17GPABa

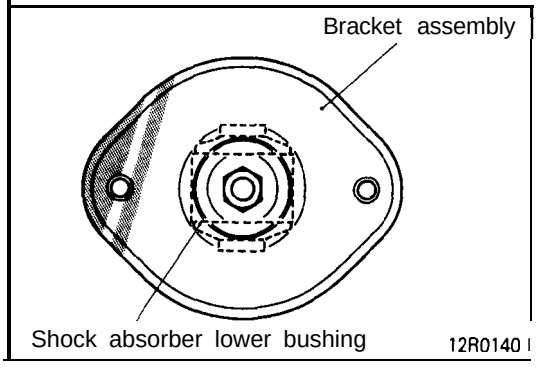
### 12. INSTALLATION OF COIL SPRING

(1) Use the special tools (L-4514) to compress the coil spring and insert it in the shock absorber.
(2) Align the edge of the coil spring to the position of the shock absorber spring seat as shown.




### 10. INSTALLATION OF DUST COVER/9. CUP ASSEMBLY

As shown in the illustration, fit the dust cover to the cup assembly.

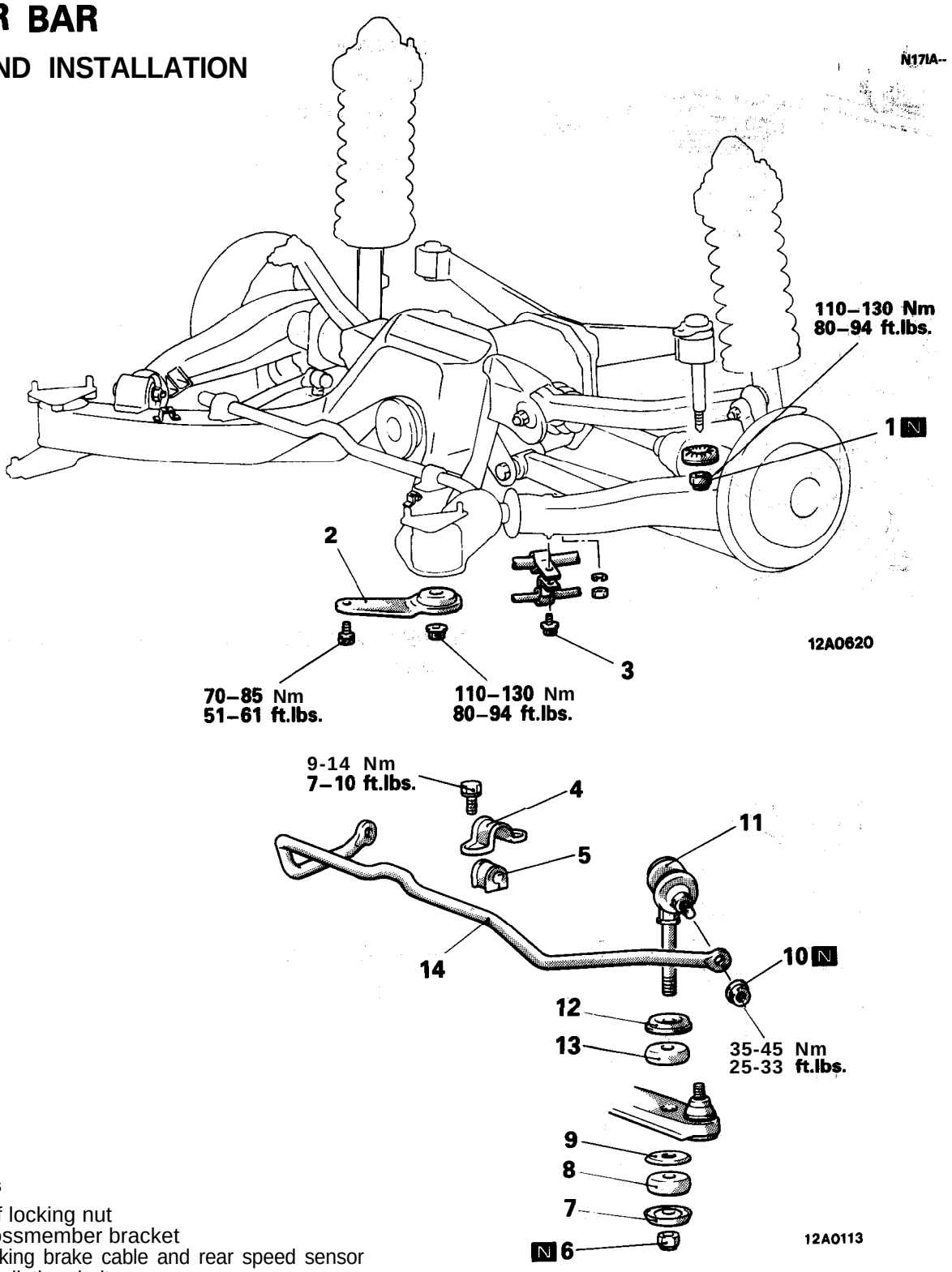



### 5. INSTALLATION OF BRACKET ASSEMBLY/Z. PISTON ROD TIGHTENING NUT

(1) With the position of the bracket assembly as shown in the figure, tighten the tightening nut to the specified torque.
(2) Install the coil spring so that the lower edge fits into the spring seat groove and the upper edge fits into the spring pad groove, then remove the special tools (L-4514).

# STABILIZER BAR

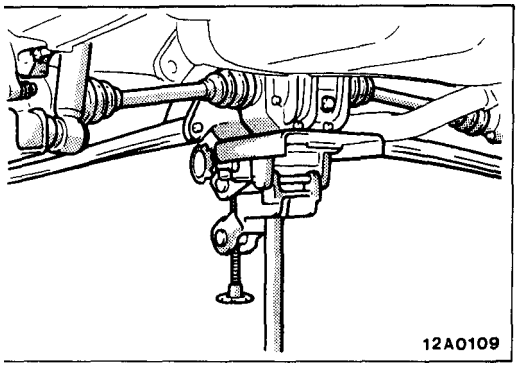
## REMOVAL AND INSTALLATION




**Removal steps**

◆◆ 1. Self locking nut
◆◆ 2. Crossmember bracket
3. Parking brake cable and rear speed sensor installation bolt
4. Stabilizer bracket
5. Bushing
◆◆ ● + 6. Self locking nut
7. Joint cup (A)
8. Stabilizer rubber
9. Joint cup (B)
◆◆ ● a10. Self locking nut
◆◆ ● + 11. Stabilizer link
12. Joint cup (A)
13. Stabilizer rubber
◆◆ 14. Stabilizer bar

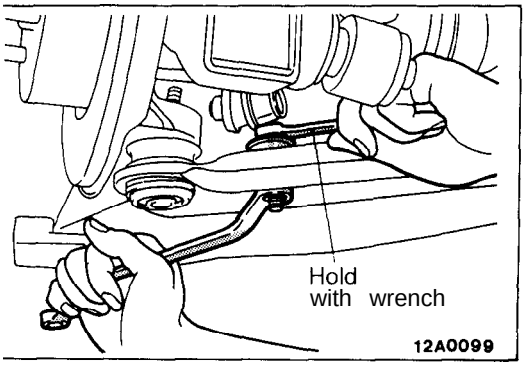
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N17IDAB

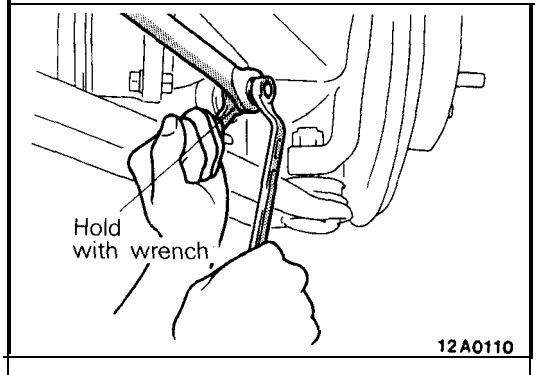
**1. REMOVAL OF SELF LOCKING NUT/2. CROSSMEMBER BRACKET**

(1) Support the rear suspension assembly with a transaxle jack.
(2) Remove the self locking nuts and crossmember brackets.



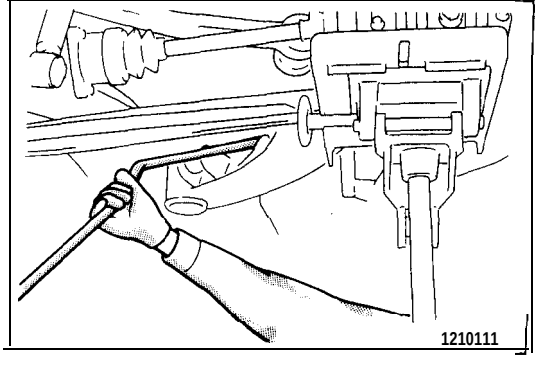

**6. REMOVAL OF SELF LOCKING NUT**

Hold the stabilizer link with a wrench, then remove the self locking nut.




**10. REMOVAL OF SELF LOCKING NUT/ 11. STABILIZER LINK**

(1) Hold the stabilizer links with a wrench and remove the self locking nut.
(2) Remove the stabilizer link.

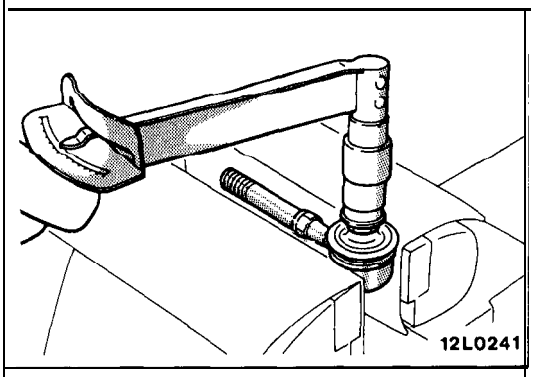



**14. REMOVAL OF STABILIZER BAR**

(1) Lower the transaxle jack slightly, maintaining a gap between the rear suspension and the body.
(2) Remove the stabilizer bar.

## INSPECTION N02TCAF

- Check the bushing for wear and deterioration.
- Check the stabilizer bar for deterioration or damage..
- Check the stabilizer link ball joint dust cover for cracks.
- Check all bolts for condition and straightness.




**CHECKING OF STABILIZER LINK BALL JOINT FOR STARTING TORQUE**

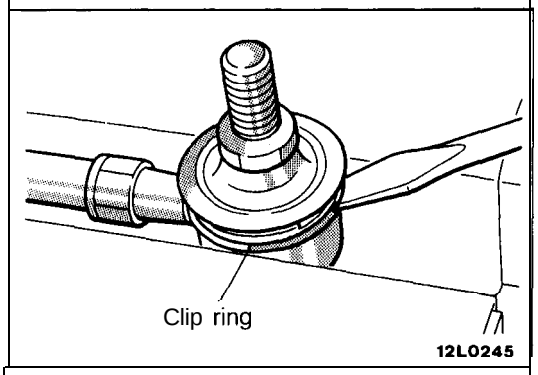
(1) If a crack is noted in the dust cover, replace it, adding grease.
(2) Deflect side to side the stabilizer link ball joint stud several times.
(3) Mount two nuts on the ball joint, and then measure the ball joint starting torque.

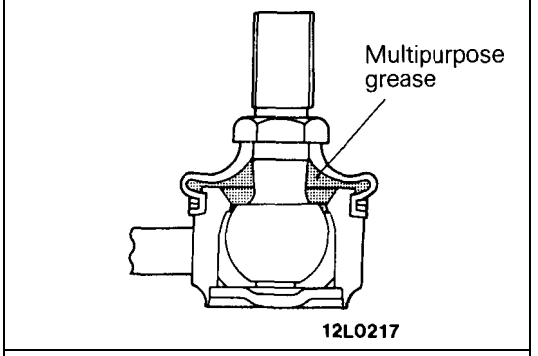
**Standard value: 1.7–3.2 Nm (15–28 in.lbs.)**

(4) If the starting torque exceeds the upper limit of standard value, replace the stabilizer link.
(5) Even if the starting torque is below the lower limit of the standard value, the ball joint may be reused unless it has drag and excessive play.

## BALL JOINT DUST COVER REPLACEMENT N02TEAA

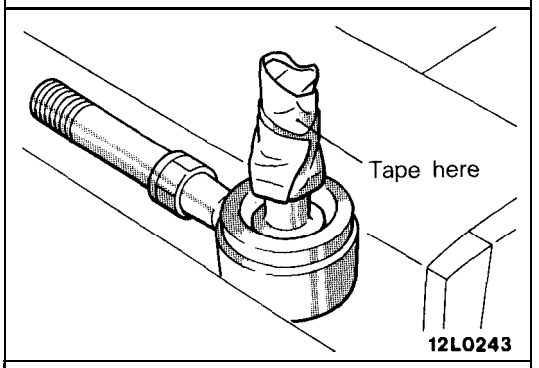
(1) Remove the clip ring and the dust cover.



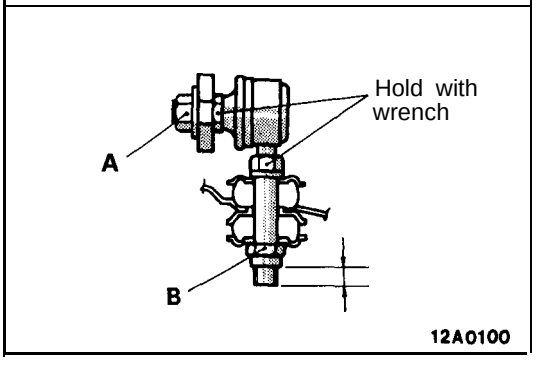




(2) Apply multipurpose grease to the lip and inside of the dust cover.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**




(3) Use vinyl tape to tape the stabilizer link where shown in the illustration, and then install the dust cover to the stabilizer link.
(4) Secure the dust cover by the clip ring.




## SERVICE POINTS OF INSTALLATION N17ICAD

**11. INSTALLATION OF STABILIZER LINK/ 10. SELF LOCKING NUT/G. SELF LOCKING NUT**

(1) Hold the stabilizer link ball studs with a wrench and install the self locking nut (A).
(2) Holding the stabilizer link with a wrench, tighten the self locking nut(B) so that the protrusion of the stabilizer link is within the standard value.

**Standard value: 9-11 mm (.354–.433 in.)**

NOTES

# STEERING

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N19AA-


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# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N19CA--

| Items | Specifications |
|---|---|
| Steering wheel | |
| Steering wheel O.D. mm (in.) | 372 (14.6) |
| Gear box | |
| Steering gear type | Rack and pinion |
| Power steering oil pump | |
| Oil pump type | Vane type |
| Displacement $cm^3$/rev. (cu.in./rev.) | 9.6 (.59) |
| Relief set pressure MPa (psi) | 8 (1,138) |

## SERVICE SPECIFICATIONS

### MANUAL STEERING

N19CB--

| Items | Specifications |
|---|---|
| Standard value | |
| Steering angle | |
| Inner wheel | 37°00′ ± 2° |
| Outer wheel | 30°00′ |
| Tie rod end ball joint starting torque Nm (in.lbs.) | 0.5–2.5 (4-22) |
| Assembly dimension of lower column tube mm (in.) | 24.8-25.2 (.98–.99) |
| Total pinion torque Nm (in.lbs.) | |
| From 0–90° | 0.6–1.3 (5–11) |
| From 90°–650° | 0.2–1.0 (2–9) |
| Tie-rod joint swing resistance N (lbs.) | 8–20 (1.8–4.4) |
| Tie-rod joint swing torque Nm (in.lbs.) | 2-5 (17–43) |
| Limit | |
| Steering wheel free play mm (in.) | 30 (1.2) |
| Variation of tie rod end ball joint shaft direction mm (in.) | 1.5 (.059) |

### POWER STEERING

| Items | Specifications |
|---|---|
| Standard value | |
| Steering wheel free play (with engine stopped) mm (in. | 11 (.43) |
| Steering angle | |
| Turbo <A/T> | |
| Inner wheel | 31°30′±2° |
| Outer wheel | 27°00′ |
| Other models | |
| Inner wheel | 35°00′±2° |
| Outer wheel | 29°20′ |
| Tie rod end ball joint starting torque Nm (in.lbs.) | 0.5–2.5 (4-22) |
| Stationary steering effort N (lbs.) | 37 (8) or less |
| Assembly dimension of lower column tube mm (in.) | 24.8-25.2 (.98–.99) |
| V-belt deflection mm (in.) | 6-9 (.24–.35) |

| Items | Specifications |
|---|---|
| Oil pump pressure MPa (psi.) | |
| Pressure gauge valve closed | 7.5-8.2 (1,067–1,166) |
| Pressure gauge valve opened | 0.8–1.0 (114-142) |
| Oil pressure switch operating pressure MPa (psi) | |
| Oil pressure switch contacts closed (continuity) | 1.5–2.0 (213–284) |
| Oil pressure switch contacts opened (no continuity) | 0.7–1.2 (100–171) |
| Total pinion torque Nm (in.lbs.) | 0.6–1.3 (5–11) |
| Tie-rod joint swing resistance N (lbs.) | 8–20 (1.9–4.6) |
| Tie-rod joint swing torque Nm (in.lbs.) | 2-5 (17–43) |
| Limit | |
| Steering wheel free play (when hydraulic operation) mm (in.) | 30 (1.2) |
| Variation of tie rod end ball joint shaft direction m m (in.) | 1.5 (.059) |
| Oil pump pressure | |
| Pressure gauge valve opened MPa (psi) | 1.5 (213) |
| Space between vane and rotor mm (in.) | 0.06 (.0024) |
| Shaft backlash of pump body bushing and pulley assembly mm (in.) | 0.1 (.004) |

## TORQUE SPECIFICATIONS

N19CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Steering wheel and shaft | | |
| Steering wheel lock nut | 35-45 | 25-33 |
| Lower bracket | 8-12 | 6-9 |
| Tilt bracket installation bolt | 8-12 | 6-9 |
| Joint assembly | 15–20 | 11–14 |
| Column support | 8-12 | 6-9 |
| Column tube clamp | 4-5 | 3-4 |
| Manual steering gear box | | |
| Joint assembly to gear box | 15–20 | 11–14 |
| Tie rod end to knuckle | 24-34 | 17-25 |
| Stay to crossmember | 70–80 | 51-58 |
| Stabilizer bar bracket | 30–42 | 22–30 |
| Front roll stopper insulator nut | 50–65 | 36-47 |
| Center member to body | 80–100 | 58-72 |
| Front exhaust pipe to rubber hanger | 10–15 | 7–11 |
| Front exhaust pipe mounting bolt | 30–40 | 22-29 |
| Front exhaust pipe mounting nut | 30–40 | 22-29 |
| Gear box mounting bracket to crossmember | 60–80 | 43-58 |
| Tie rod end lock nut | 50–55 | 36–40 |
| Tie rod to rack | 80–100 | 58-72 |
| Rack support cover locking nut | 50–70 | 36-51 |
| Top plug locking nut | 50–70 | 36-51 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Power steering gear box | | |
| Joint assembly | 15–20 | 11-14 |
| Pressure hose to gear box | 12-18 | 9 - 13 |
| Return tube to gear box | 12-18 | 9-13 |
| Tie rod end to knuckle | 24-34 | 17-25 |
| Stay to crossmember | 70–80 | 51-58 |
| Stabilizer bar bracket | 30–42 | 22–30 |
| Front roll stopper insulator nut | 50–65 | 36-47 |
| Centermember to body | 80–100 | 58-72 |
| Front exhaust pipe to rubber hanger | 10–15 | 7-11 |
| Front exhaust pipe mounting bolt | 30–40 | 22-29 |
| Front exhaust pipe mounting nut <FWD> | 30–40 | 22-29 |
| Gear box mounting bracket to crossmember | 60–80 | 43-58 |
| Tie rod end lock nut | 50–55 | 36–40 |
| Tie rod to rack | 80–100 | 58-72 |
| Feed tubes | 12-18 | 9-13 |
| End plug | 50–70 | 36-51 |
| Pinion and valve assembly to self-locking nut | 20–30 | 14-22 |
| Rack support cover locking nut | 50–70 | 36-51 |
| Valve housing installation bolts | 17-26 | 12–19 |
| Power steering oil pump | | |
| Pressure hose to oil pump | 14-21 | 10–15 |
| Oil pump to oil pump bracket | 35-45 | 25-33 |
| Heat protector installation nut | 9-14 | 7–10 |
| Oil pump bracket to engine | | |
| 1.8L Engine | | |
| Front side | 27-41 | 20–30 |
| Left side | 25-33 | 18-24 |
| 2.0L DOHC Engine | 25-33 | 18-24 |
| Oil reservoir installation bolt | 9-14 | 7–10 |
| Oil reservoir bracket installation bolt | 9-14 | 7–10 |
| Pump cover to pump body | 18-22 | 13-16 |
| Suction connector to pump body | 6–10 | 4-7 |
| Connector to pump body | 50–70 | 36-51 |
| Terminal assembly to pump body | 25–30 | 18-22 |
| ower steering hoses | | |
| Cooler tube to body | 9-14 | 7–10 |
| Cooler tube to hood lock stay | 4-6 | 29-43 |
| Cooler tube clamp | 3.0–4.5 | '2-3 |
| Return tube to body | 9-14 | 7–10 |
| Pressure tube to gear box | 12-18 | 9-13 |
| Return tube to gear box | 12-18 | 9-13 |
| Pressure hose to body | 9-14 | 7–10 |
| Pressure hose to oil pump | 14-21 | 10–15 |
| Pressure hose to pressure tube | 30–40 | 22-29 |
| Pressure hose bracket | 9-14 | 7–10 |

## LUBRICANTS

N19CD--

| Items | | Specified lubricant | Quantity |
|---|---|---|---|
| Steering column and shaft | The sliding part of the bearing<br>The surfaces of the bearing spacer<br>The mating surfaces of the joint and cover assemblies | MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent | As required |
| Manual steering gear box | Bellows | Silicone grease | As required |
| | The toothed surface of the rack and to the inner side of the rack bushing<br>The toothed surface of the pinion<br>The surface of the rack support that contacts<br>Inner side of the rack support spring<br>Tie rod end dust cover | MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent | |
| Power steering gear box | Bellows | Silicone grease | As required |
| | Bearing<br>O-ring<br>Oil seal<br>Special tool (MB991 213)<br>Pinion and valve assembly seal ring part | MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II" | |
| | Coating of the rack teeth face<br>Pinion and valve assembly pinion gear part<br>Rack support surface in contact with the rack bar<br>Tie rod end dust cover | MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent | |
| Power steering oil pump | Power steering fluid | MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II" | 0.9 liter (.95 qt.) |
| | Flow control valve<br>Friction surface of rotor, vane, cam ring and pump cover<br>O-ring | MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II" | As required |

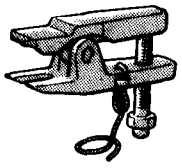
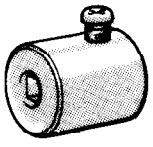
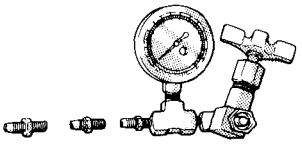
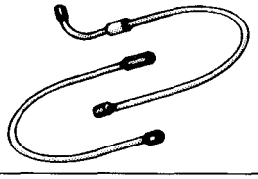
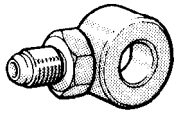
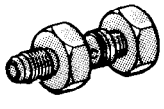
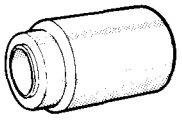
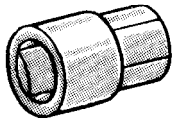
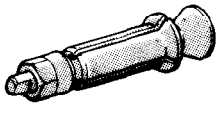
## SEALANTS AND ADHESIVES

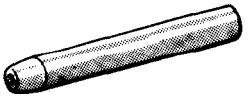
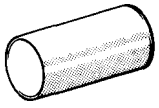
N19CE--

| Items | | Specified sealant and adhesive |
|---|---|---|
| Manual steering gear box | Top plug screw<br>Rack support cover<br>Dust cover | 3M ATD Part No. 8663 or equivalent |
| Power steering gear box | End plug screw<br>Power steering rack support cover screw<br>Dust cover | 3M ATD Part No. 8663 or equivalent |

# SPECIAL TOOLS

N19DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB991113 | Steering linkage puller | Disconnection of tie-rod end |
|  | CT-1108 | Preload socket | Measurement of the total pinion torque |
|  13Y855 | C-3309-E | Oil pressure gauge assembly | Measurement of oil pressure |
|  | C-4535 | Power steering oil pressure hose set | Measurement of oil pressure |
|  13E113 | MB991217 | Power steering oil pressure gauge adapter (pump side) | Measurement of oil pressure |
|  | MB990994 | Power steering oil pressure gauge adapter (hose side) | Measurement of oil pressure |
|  | MB990776-A | Front axle base | Installation of the dust cover |
|  | MB991204 | Torque wrench socket | Removal and installation of the rack support cover |
|  | MB991120 | Needle bearing puller | Removal of rack housing needle bearing |

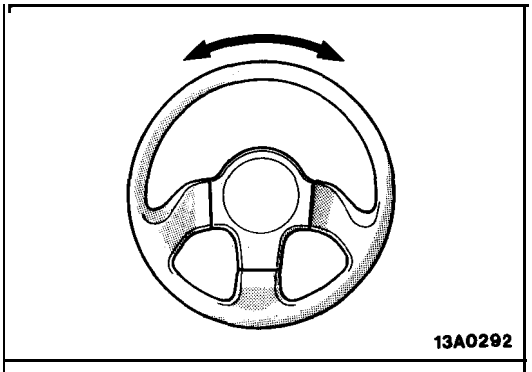
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB991213 | Rack installer | Rack installation |
|  | MB991317 | Seal ring installer | Compression of the seal rings after replacement of the pinion seal rings |

# SERVICE ADJUSTMENT PROCEDURES <MANUAL STEERING>

## STEERING WHEEL FREE PLAY CHECK N19FAAE

1. Set front wheels straight ahead.
2. Measure the play on steering wheel circumference before wheels move when slightly moving steering wheel in both directions.

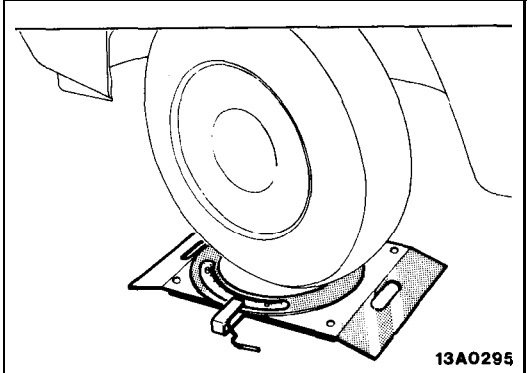
   **Limit: 30 mm (1.2 in.)**
3. When the play exceeds the limit, check play in steering shaft connection and steering linkage. Correct or replace.
4. When (3) check provides good results, check the following to adjust:
   - Remove the steering gear box, check and adjust total pinion starting torque.


13A0292

## STEERING ANGLE CHECK N19FDBF1

1. Set front wheels on turning radius gauge and measure steering angle.

   **Standard values:**
   **Inner wheel 37000' ±2°**
   **Outer wheel 30000'**
2. When not within the standard value, it is probably a toe problem. Adjust toe (refer to GROUP 2–Service Adjustment Procedures) and recheck.

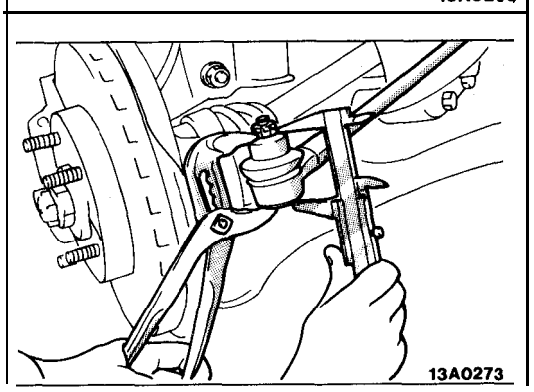

13A0295

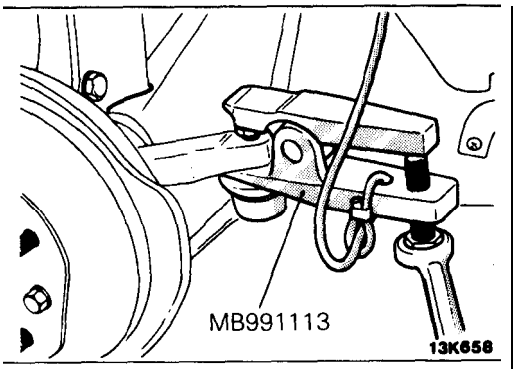
## TIE ROD END BALL JOINT VARIATION CHECK (SHAFT DIRECTION) N19FPAB

1. Hold the ball joint with pliers.
2. Set a caliper gauge as illustrated and measure the displacement with the ball stud compressed.

   **Limit: 1.5 mm (.059 in.)**
3. If the measured displacement exceeds the limit, replace the tie-rod end.

   **Caution**
   **Even if the variation is within the limit, check ball joint starting torque.**


13A0273

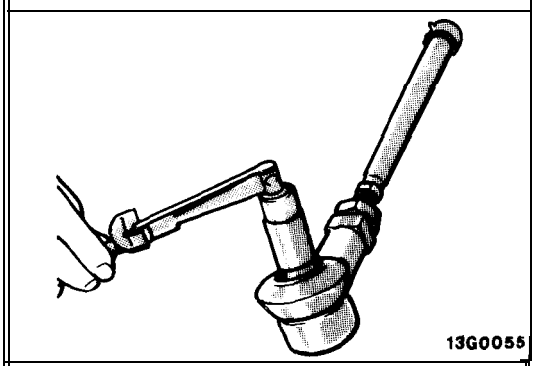



## TIE ROD END BALL JOINT STARTING TORQUE CHECK

N19FEBCa

1. Disconnect tie rod and knuckle with special tool.

**Caution**
**Be sure to tie the cord of the special tool to the nearby part.**




2. Move ball joint stud several times and install nut on stud. Measure ball joint starting torque.

**Standard value: 0.5–2.5 Nm (4-22 in.lbs.)**

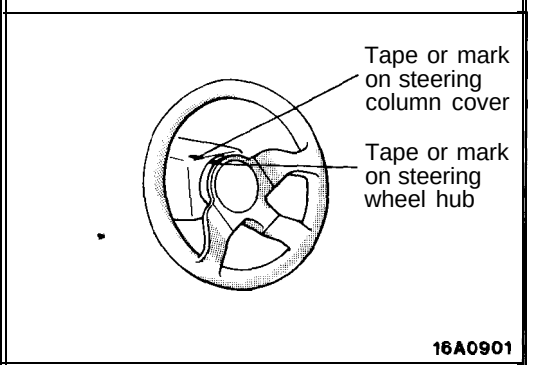
3. When starting torque exceeds the standard value, replace tie rod end.
4. When the starting torque is under the standard value, check for play or ratcheting in ball joint. If none of these, it is still serviceable.

## STEERING WHEEL CENTERING

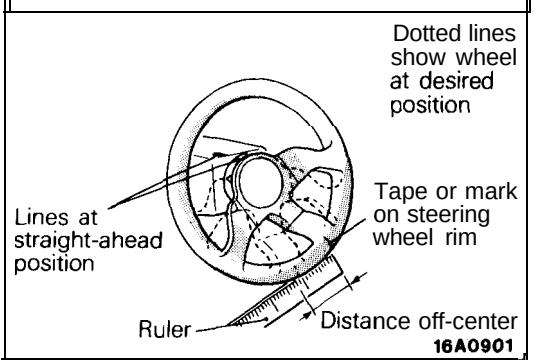
N19FNAC

### SIMPLIFIED STEERING WHEEL CENTERING

**Determining Steering Wheel's Off Center**



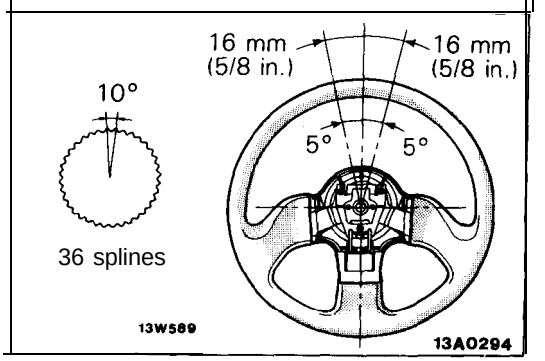

1. For the road test, take along chalk or tape and a ruler.
2. Drive straight ahead on an uncambered level surface.
3. When the vehicle's wheels are pointing straight ahead, mark the steering wheel hub and column cover with a chalk or tape line.
4. Stop the vehicle and line up the marks on the hub and column cover.
5. Place a tape strip or mark on the steering wheel rim.
6. Hold a ruler next to the rim as shown in the illustration, and then steer the steering wheel until it is in the desired centered position.
7. Record the distance the strip or mark on the rim has moved. This is how far the steering wheel is off center. If it is more than 16 mm (5/8 in.) off center, it can be centered by indexing it ten degrees towards the center.

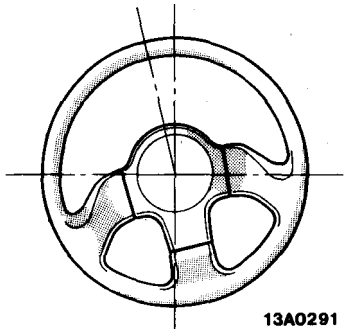



**Indexing Steering Wheel to Center It**

The steering wheel shaft has 36 splines, allowing the steering wheel to be indexed in tendegree increments.

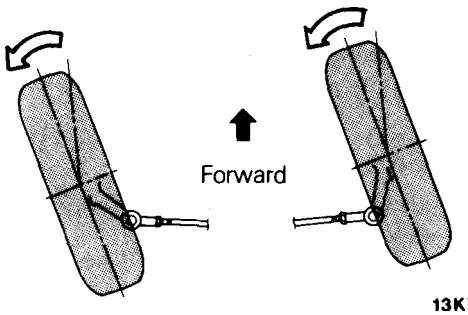
1. Remove the steering wheel.
2. Without disturbing the position of the steering wheel shaft, re-install the wheel as near on-center as possible.



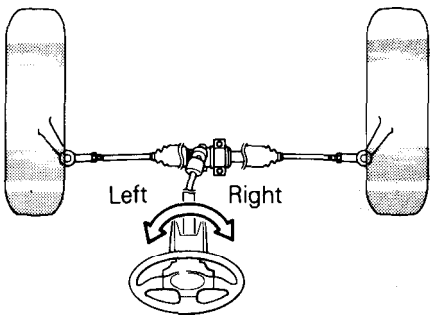


13A0291

Steering wheel off center left



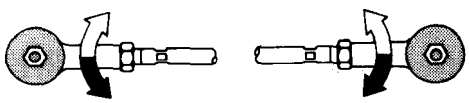

13K710




13A0289

Off center to left

Off center to left



Off center to right

Off center to right

Turn both tie rods in the same direction.

13R0555

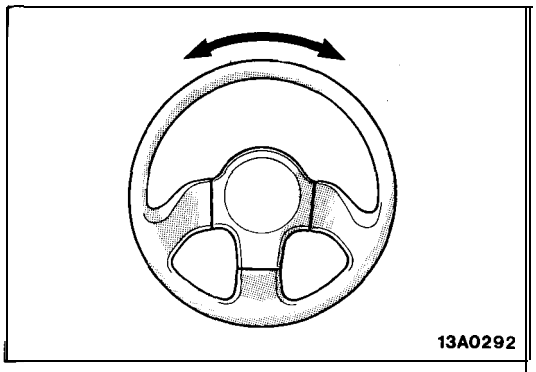
## PRECISION STEERING WHEEL CENTERING

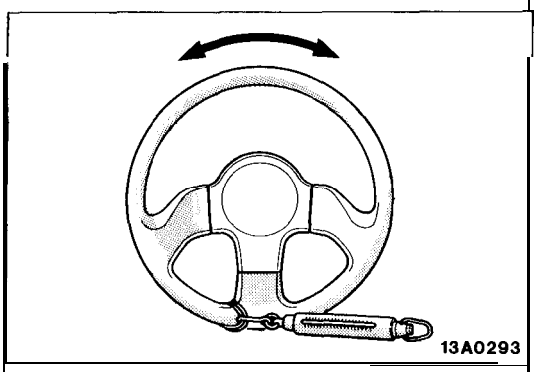
In general,. the tie rods are adjusted to steer the'front wheels in the same direction that the steering wheel is off center. If the steering wheel is off canter to the left, center it by adjusting the tie rods to make the front wheels steer toward the left, and vice versa.

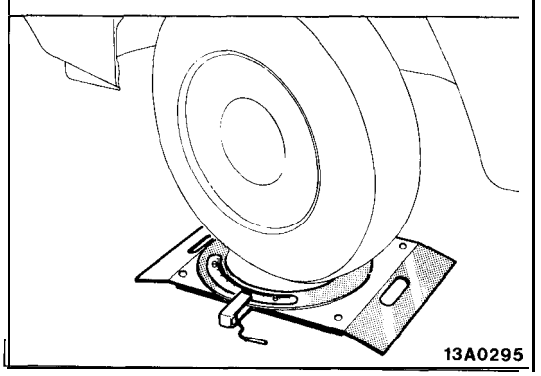
1. Mark the tie rods and tie rod ends with chalk before loosening the lock nuts.
2. Hold the tie rod with a wrench and loosen the lock nut.
3. Hold the tie rod end with a wrench and turn the tie rod the desired number of turns.

   **For 2° or 6 mm (.25 in.) at the steering wheel rim 1/5 turn of tie rods**

4. Tighten the lock nut to specified torque, taking care not to turn the tie rod.


13A0292


13A0293


13A0295

# SERVICE ADJUSTMENT PROCEDURES <POWER STEERING>

## STEERING WHEEL FREE PLAY CHECK N19FABH

1. With engine running (hydraulic operation), set front wheels straight ahead.
2. Measure the play on steering wheel circumference before wheels start to move when slightly moving steering wheel in both directions.

   **Limit: 30 mm (1.2 in.)**
3. When the play exceeds the limit, check for play on steering shaft connection and steering linkage. Correct or replace.
4. If the free play still exceeds the limit value set steering wheel straight ahead with engine stopped. Load 5 N(1lb.) towards steering wheel circumference and check play.

   **Standard value (steering wheel play with engine stopped): 11 mm (.43 in.)**

   If the play exceeds the standard value, remove steering gear box and check total pinion torque.

## STEERING ANGLE CHECK N19FDBJ

1. Set front wheels on turning radius gauge and measure steering angle.

   **Standard values:**

   | | |
   |---|---|
   | **Turbo <A/T>** | |
   | **Inner wheel** | **31°30′±2°** |
   | **Outer wheel** | **27°00′** |
   | **Other models** | |
   | **Inner wheel** | **35°00′±2°** |
   | **Outer wheel** | **2990′** |

2. When not within the standard value, it is probably a toe problem. Adjust toe (refer to GROUP 2–Service Adjustment Procedures) and recheck.

## TIE ROD END BALL JOINT VARIATION CHECK (SHAFT DIRECTION) N19FVAB

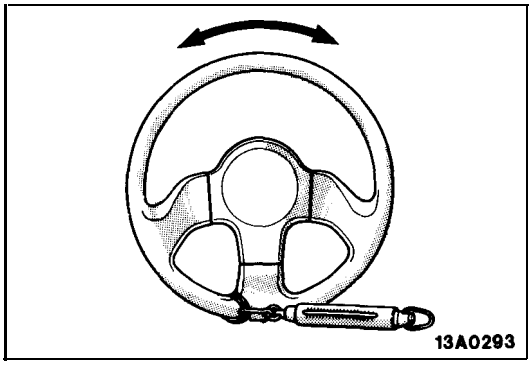
The inspection procedure for the tie rod end ball joint variation is the same as for the manual steering system. (Refer to P. 19–7.)

## TIE ROD END BALL JOINT STARTING TORQUE CHECK N19FEBD

The inspection procedure for the tie rod end ball joint starting torque is the same as for the manual steering system. (Refer to P.19–8.)

## STEERING WHEEL CENTERING N19FNAF

Center the steering wheel in the same way as the manual steering. (Refer to P.19–8.)




## STATIONARY STEERING EFFORT CHECK N19FFAI

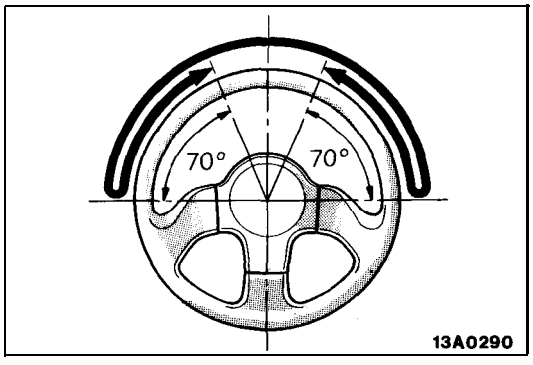
1. With the vehicle stopped on a flat, paved surface, turn the steering wheel to the straight ahead position.
2. Start the engine and set it to 1,000 ± 100 rpm.

   **Caution**
   **After checking the engine rpm., there must be a return to the standard idling rpm.**

3. Attach a spring balance to the outer circumference of the steering wheel and measure the steering force required to turn the steering wheel from the straight ahead position to the left and right (within a range of 1.5 turns).
   Also check to be sure that there is no significant fluctuation of the required steering force.

   **Standard value:**

| | |
|---|---|
| **Steering effort** | **37 N (8 lbs.) or less** |
| **Fluctuation allowance** | **6 N (1.3 lbs.) or less** |

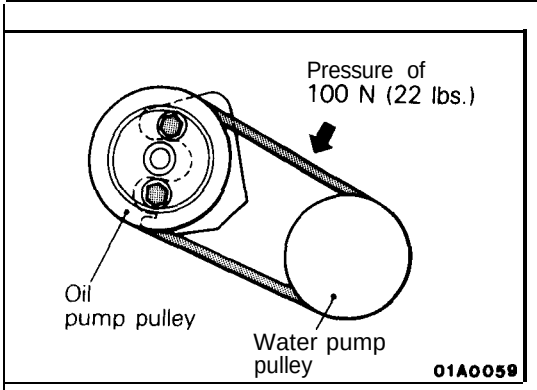



## STEERING WHEEL RETURN TO CENTER CHECK N19FGAE

To make this test, conduct a road test and check as follows.

1. Make both gradual and sudden turns and check the steering "feeling" to be sure that there is no difference in the steering force required and the wheel return between left and right turns.
2. At a speed of 35 km/h (22 mph), turn the steering wheel 90°, and release the steering wheel after 1 or 2 seconds. If the steering wheel then returns 70° or more, the return can be judged to the satisfactory.

   NOTE
   There will be a momentary feeling of "heaviness" when the wheel is turned quickly, but this is not abnormal. (This is because the oil pump discharge amount is especially apt to be insufficient during idling. )




## V-BELT TENSION CHECK

N19FHAI

1. Check to be sure that the belt is not damaged and that the V-belt is correctly attached to the groove of the pulley.

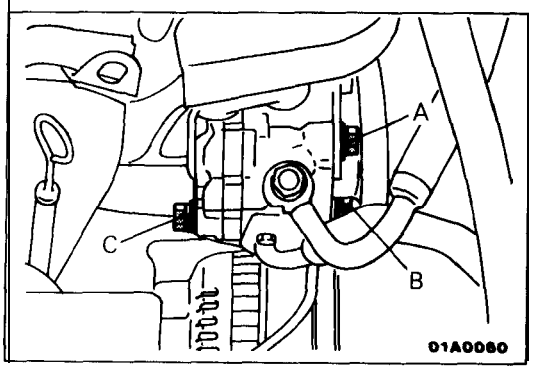
NOTE

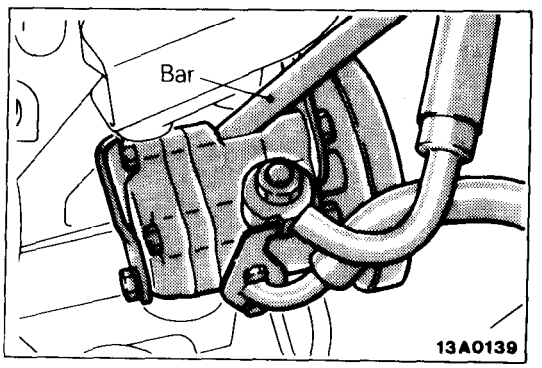
, If there is abnormal noise or belt slippage, check the belt tension and check for unusual wear or abrasion, or damage, of the pulley contact surface, and for scars or scratches on the pulley.

2. Press in V-belt at the illustrated position with about 100 N (22 lbs.) and measure deflection.

**Standard value: 6-9 mm (.24–.35 in.)**

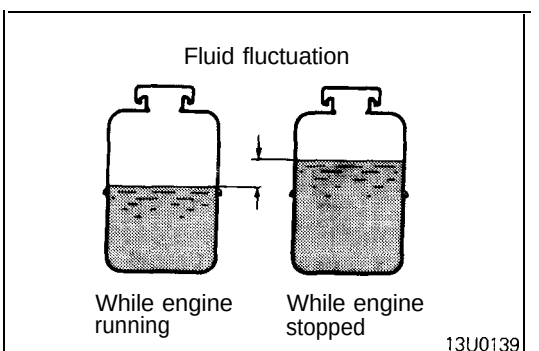
3. If there is a deviation from the standard value range, make an adjustment of the belt tension by following the procedures described below.
   (1) Loosen bolts A, B and C (for holding the oil pump).




   (2) Place a bar or similar object against the body of the oil pump, and, while manually providing the suitable amount of tension, adjust the amount of flexion of the belt.
   (3) Tighten bolts A, B and C (for holding the oil pump).
   (4) Check the amount of flexion of the belt; readjust if necessary.

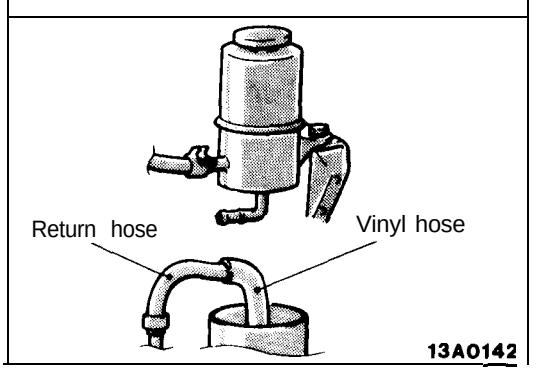
**Caution**
**The check should be made after turning the engine one time or more in the regular direction of rotation (to the right).**




## FLUID LEVEL CHECK

N19FIAI

1. Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel several times to raise the temperature of the fluid to approximately 50–60°C (122–140°F).
2. With the engine running, turn the wheel all the way to the left and right several times.
3. Check the fluid in the oil reservoir for foaming or milkiness. Check the difference of the fluid level when the engine is stopped, and while it is running. If the fluid level changes considerably, air bleeding should be done.




## FLUID REPLACEMENT

N19FJAJ

1. Raise the front wheels on a jack, and then support them with rigid racks.
2. Disconnect the return hose connection.
3. Connect a vinyl hose to the return hose, and drain the oil into a container.

4. Disconnect the high-tension cable, and then while operating the starting motor intermittently, turn the steering wheel all; the way to the left and right several times to drain all of the fluid.

**Caution**
**Be careful not to position the high-tension cable near the carburetor or the delivery pipe.**

5. Connect the return hoses securely, and then secure it with the clip.
6. Fill the oil reservoir with the specified fluid up to the lower position of the filter, and then bleed the air.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

## BLEEDING

N19FKAG

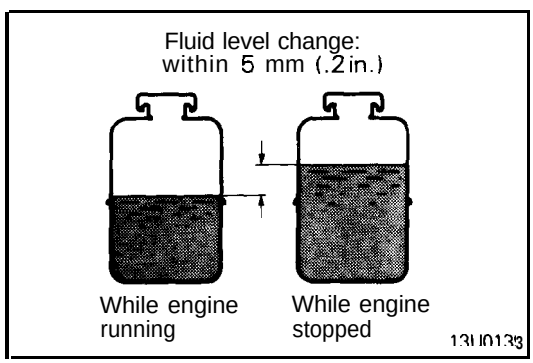
1. Jack up the front wheels and support them by using a floor stand.
2. Manually turn the oil pump pulley a few times.
3. Turn the steering wheel all the *way* to the left and right several times.
4. Disconnect the high-tension cable, and then, while operating the starting motor intermittently, turn the steering wheel all the way to the left and right several times (for 15 to 20 seconds).

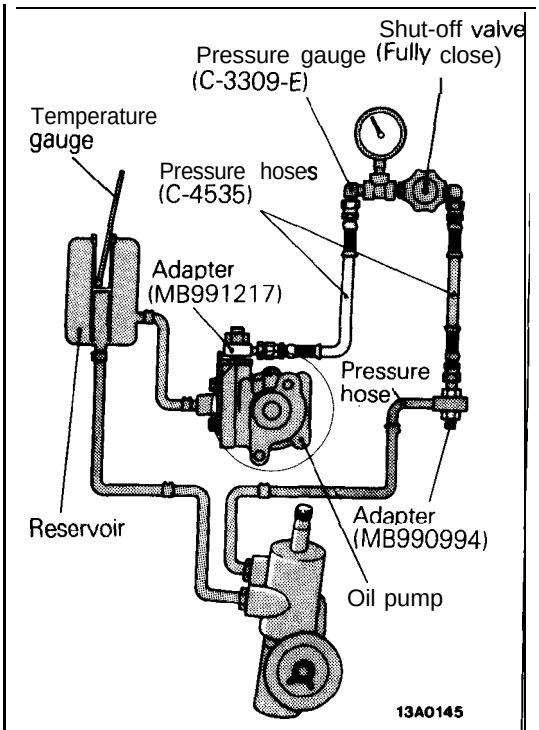
**Caution**
**1. During air bleeding, replenish the fluid supply so that the level never falls below the lower positiin of the filter.**
**2. If air bleeding is done while engine is running, the air will be broken up and absorbed into the fluid; be sure to do the bleeding only while cranking.**

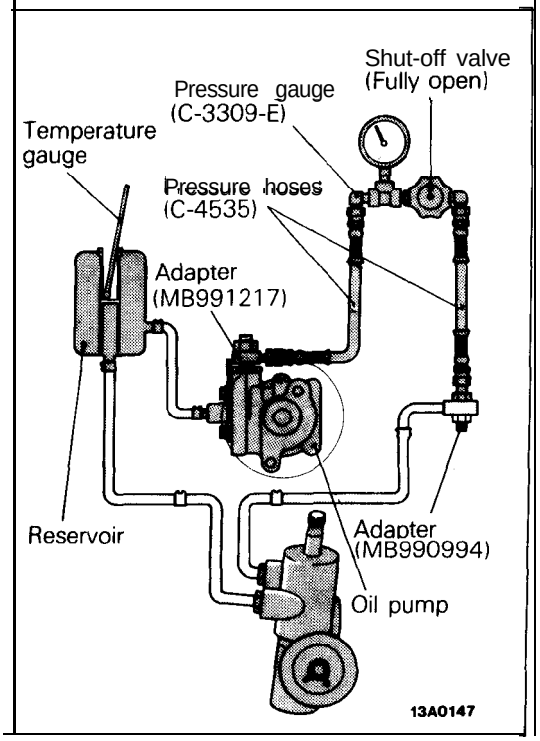
5. Connect the ignition cable, and then start the engine (idling).
6. Turn the steering wheel to the left and right until there are no air bubbles in the oil reservoir.
7. Confirm that the fluid is not milky, and that the level is up to the specified position on the level gauge.
8. Confirm that there is very little change in the fluid level when the steering wheel is turned left and right.

9. Check whether or not the change in the fluid level is within 5 mm (.2 in.) when the engine is stopped and when it is running.

**Caution**
**1. If the change of the fluid level is 5 mm (.2 in.) or more, the air has not been completely bled from the system, and thus must be bled completely.**
**2. If the fluid level rises suddenly after the engine is stopped, the air has not been completely bled.**
**3. If air bleeding is not complete, there will be abnormal noises from the pump and the flow-control valve, and this condition could cause a lessening of the life of the pump, etc.**






## OIL PUMP PRESSURE TEST

N19FLAF

### CHECKING THE OIL PUMP RELIEF PRESSURE

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C (122–140°F).
3. Start the engine and idle it at 1,000 ± 100 rpm.
4. Fully close the shut-off valve of the pressure gauge and measure the oil pump relief pressure to confirm that it is within the standard value range.

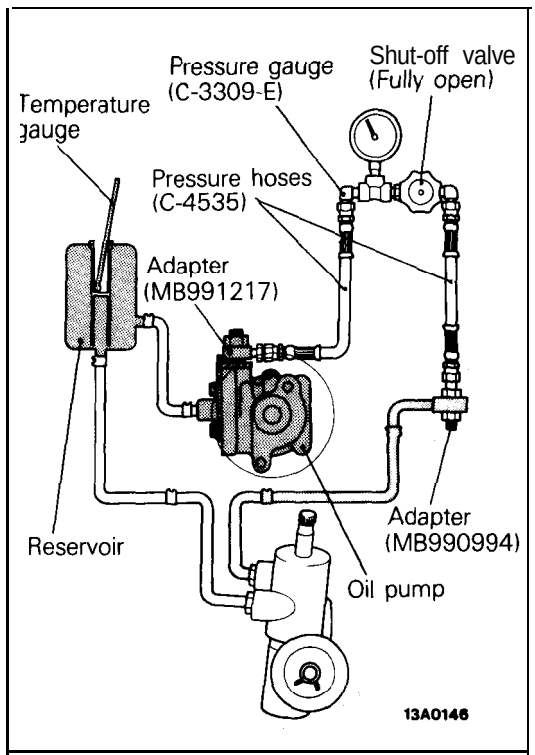
   **Standard value: 7.5-8.2 MPa (1,067–1,166 psi)**

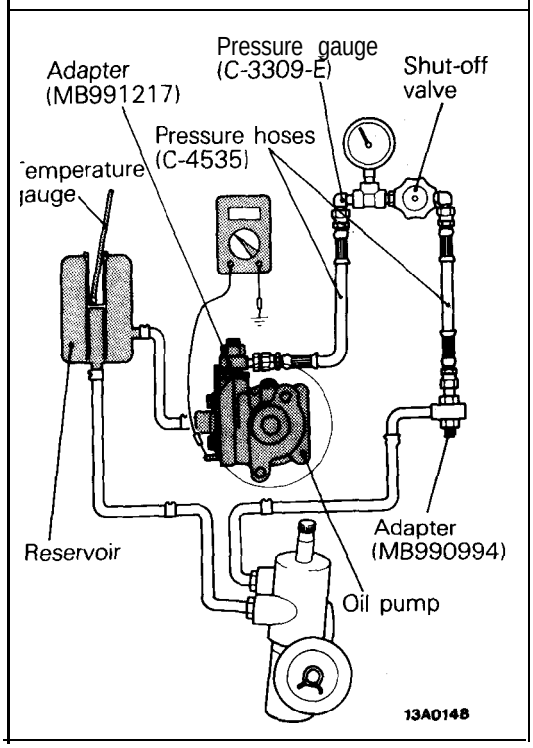
   **Caution**
   **Pressure gauge shut off valve must not remain closed for more than 10 seconds.**
5. If it is not within the standard value, overhaul the oil pump.
6. Remove the special tools, and then tighten the pressure hose to the specified torque.
7. Bleed the system.

### CHECKING THE PRESSURE UNDER NO-LOAD CONDITIONS

1. Disconnect the pressure hose from the oil pump, and then connect the special tool.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C (122–140°F).
3. Start the engine and idle it at 1,000 ± 100 rpm.
4. Check whether or not the hydraulic pressure is the standard value when no-load conditions are created by fully opening the shut-off valve of the pressure gauge.

   **Standard value: 0.8–1.0 MPa (114–142 psi)**
   **Limit: 1.5 MPa (213 psi)**
5. If it is not within the standard value, the probable cause is a malfunction of the oil line or steering gear box, so check these parts and repair as necessary.
6. Remove the special tools, and then tighten the pressure hose to the specified torque.
7. Bleed the system.




## CHECKING THE STEERING GEAR RETENTION HYDRAULIC PRESSURE

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C (122–140°F).
3. Start the engine and idle it at 1,000 ± 100 rpm.
4. Fully close and fully open the shut-off valve of the pressure gauge.
5. Turn the steering wheel all the way to the left or right; then check whether or not the retention hydraulic pressure is the standard value.

   **Standard value: 7.5-8.2 MPa (1,067–1,166 psi)**
6. When not within the standard value, overhaul the steering gear box.
   Remeasure fluid pressure.
7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.

## OIL PRESSURE SWITCH CHECK N19FUAB

1. Disconnect the pressure hose from the oil pump, and then connect the special tools.
2. Bleed the air, and then turn the steering wheel several times while the vehicle is not moving so that the temperature of the fluid rises to approximately 50–60°C (122–140°F).
3. The engine should be idling.
4. Disconnect the connector for the oil pressure switch, and place an ohmmeter in position.
5. Gradually close the shut-off valve of the pressure gauge and increase the hydraulic pressure then check whether the hydraulic pressure that activates the switch is the standard value.

   **Standard value: 1.5–2.0 MPa (213–284 psi)**
6. Gradually open the shut-off valve and reduce the hydraulic pressure; then check whether the hydraulic pressure that deactivates the switch is the standard value.

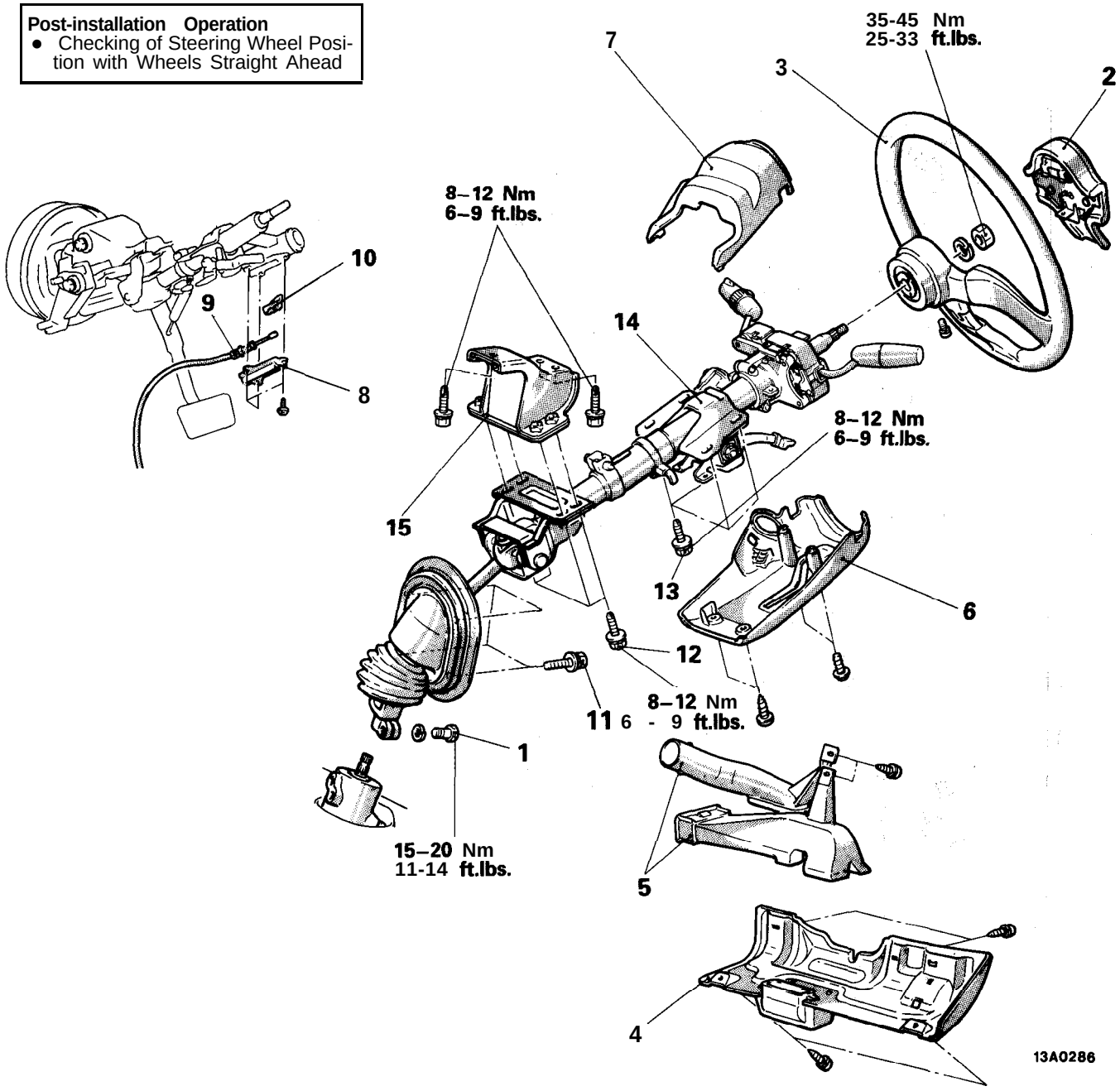
   **Standard value: 0.7–1.2 MPa (100–171 psi)**
7. Remove the special tools, and then tighten the pressure hose to the specified torque.
8. Bleed the system.

# STEERING WHEEL AND SHAFT

## REMOVAL AND INSTALLATION

N19GA--

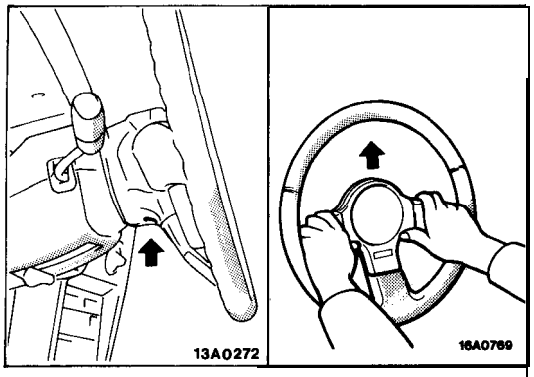
**Post-installation Operation**
- Checking of Steering Wheel Position with Wheels Straight Ahead

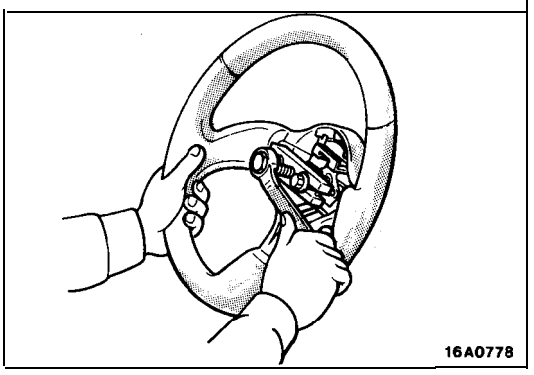



**Removal steps**

1. Joint assembly and gear box connecting bolt
2. Horn pad
3. Steering wheel
4. Instrument under cover
5. Foot shower duct and lap shower duct
6. Column cover lower
7. Column cover upper
8. Cover <A/T>
9. Key interlock cable (steering lock assembly side) <A/T>
10. Slide lever <A/T>
11. Cover attaching bolts
12. Lower bracket installation bolts
13. Tilt bracket installation bolts
14. Steering column assembly
15. Column support

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".




## SERVICE POINTS OF REMOVAL N19GBAS

**2. REMOVAL OF HORN PAD**

(1) Remove the horn pad attaching screw.
(2) The horn pad can be removed by pressing upward.

**3. REMOVAL OF STEERING WHEEL**

Remove the steering wheel by using a steering wheel puller.

**Caution**
**Do not hammer on the steering wheel to remove it; doing so may damage the collapsible mechanism.**

**4. REMOVAL OF INSTRUMENT UNDER COVER**

Refer to GROUP 23–Instrument Panel.

## SERVICE POINTS OF INSTALLATION N19GDAN

**10. INSTALLATION OF SLIDE LEVER/9. KEY INTERLOCK CABLE (STEERING LOCK ASSEMBLY SIDE)**

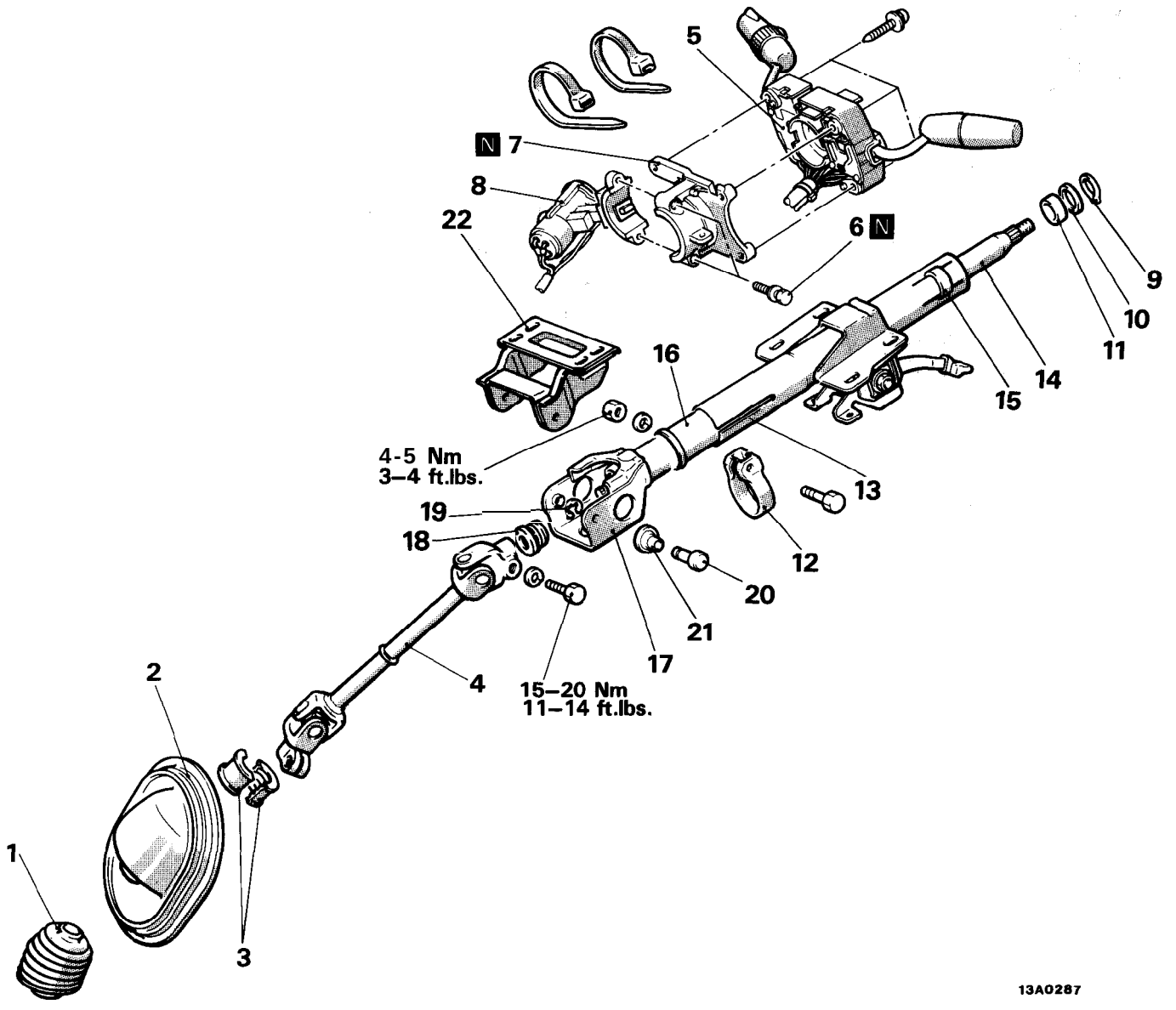
Refer to GROUP 21 -Transaxle Control.

4. INSTALLATION OF INSTRUMENT UNDER COVER

Refer to GROUP 23–Instrument Panel.

## DISASSEMBLY AND REASSEMBLY

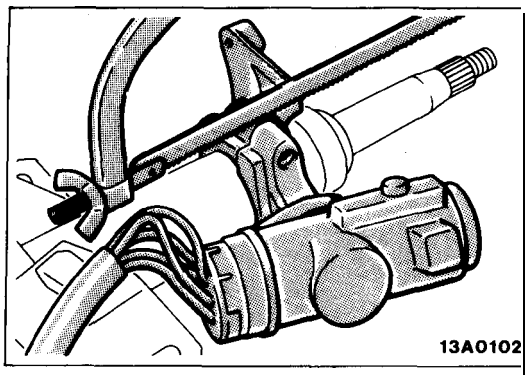
N19GE--




**Disassembly steps**

1. Boot
◆◆ 2. Cover assembly
● * 3. Bearing
● + 4. Joint assembly
5. Column switch
● , ◆◆ 6. Steering lock installation special bolt
● * ● + 7. Steering lock bracket
◆◆ ● + 8. Steering lock
9. Snap ring
10. Stopper
◆◆ 11. Bearing spacer
◆◆ 12. Column tube clamp
13. Column tube upper
14. Steering shaft
● + 15. Bearing spacer
16. Column bushing
17. Column tube tower
◆◆ ◆◆ 18. Bearing
19. Snap ring
◆◆ 20. Clevis pin
21. Bushing
22. Lower bracket

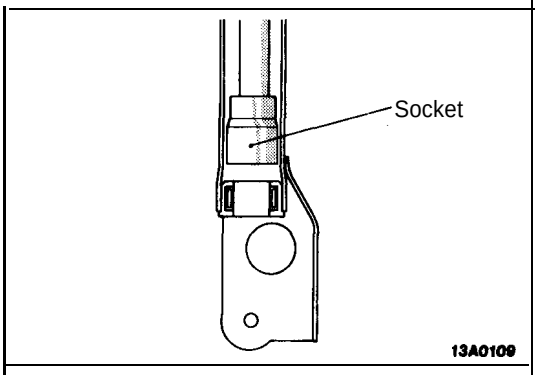
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to “Service Points of Disassembly”.
(3) ◆◆: Refer to “Service Points of Reassembly”.
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N19GFAK

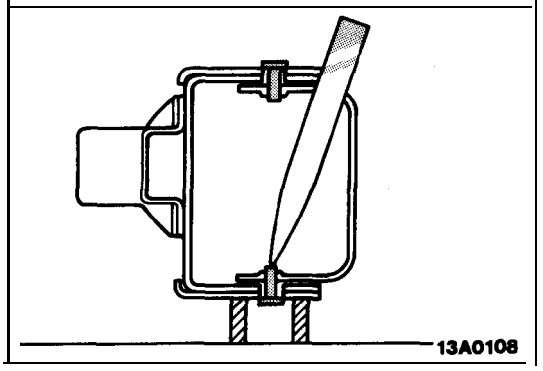
**6. REMOVAL OF STEERING LOCK INSTALLATION SPECIAL BOLT/7. STEERING LOCK BRACKET/8. STEERING LOCK**

If it is necessary to remove the steering lock, use 'a hacksaw to cut the special bolts at the steering lock bracket side.




**18. REMOVAL OF BEARING**

Using a socket wrench or similar tool [30 mm (1.2 in.) outer diameter], remove the bearing.

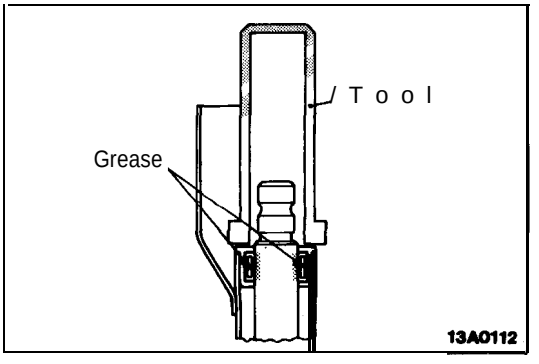



**20. REMOVAL OF CLEWS PIN**

Remove the snap ring and then tap out the clevis pin from the inner side of the column tube lower.

## INSPECTION N19GGAD

- Check the steering shaft for damage and deformation.
- Check the joints for play, damage, or rough movement.
- Check the joint bearing for wear and damage.
- Check the tilt bracket for cracks and damage.,
- Check the column bushing for damage.
- Check the dust cover for damage.



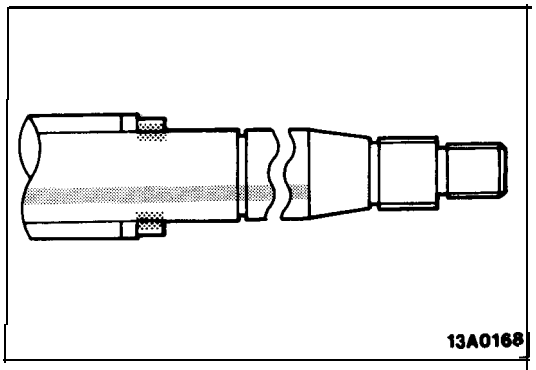

## SERVICE POINTS OF REASSEMBLY N19GHBA

**18. APPLICATION OF GREASE TO BEARING**

(1) Apply a coating of multipurpose grease to the sliding part of the bearing.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

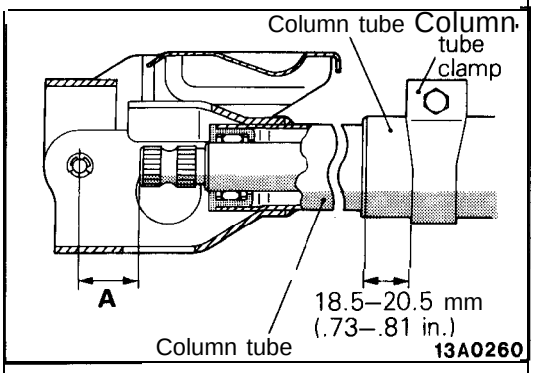
(2) Press the oil seal into the column tube 'lower.




**15. APPLICATION OF GREASE TO BEARING SPACER**

Apply multipurpose grease to the surfaces of the bearing spacer which contacts the steering shaft.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

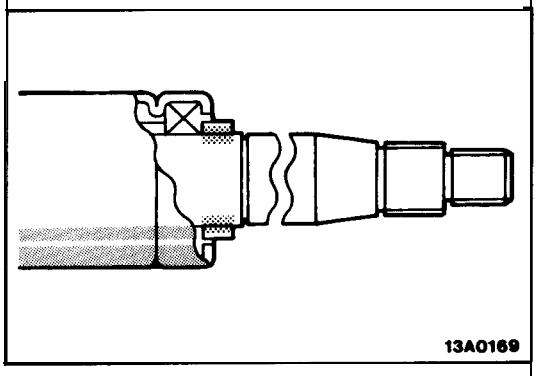



**12. INSTALLATION** OF COLUMN TUBE CLAMP

(1) Slide the colum tube and adjust so that dimension A in the figure is the standard value.

**Standard value: 24.8-25.2 mm (.98–.99 in.)**

(2) Install the column tube clamp at the position where the dimension shown in the figure is obtained.




**11. APPLICATION OF GREASE TO BEARING SPACER**

Apply multipurpose grease to the surfaces of the bearing spacer which contacts the steering shaft.

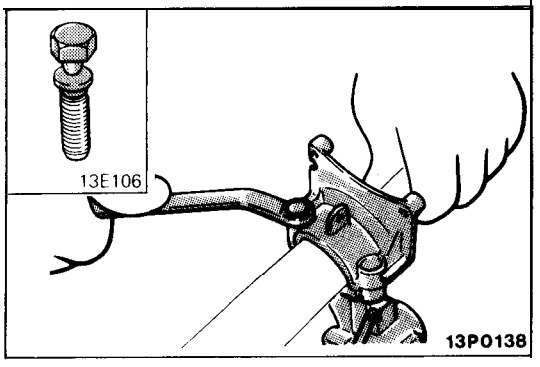
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

**8. INSTALLATION OF STEERING LOCK/7. STEERING LOCK BRACKET/G. STEERING LOCK INSTALLATION SPECIAL BOLT**

(1) When installing the steering lock and steering lock bracket to the column tube, temporarily install the steering lock in alignment with the column boss.

(2) After checking that the lock works properly, tighten the special bolts until the head twists off.

**Caution**
**The steering lock bracket and blots must be replaced with new ones when the steering lock is installed.**




**4. INSTALLATION OF JOINT ASSEMBLY /3. BEARING/ 2. COVER ASSEMBLY**

(1) Install the cover assembly on the joint assembly.

(2) Fill the inside of the bearing with multipurpose grease.

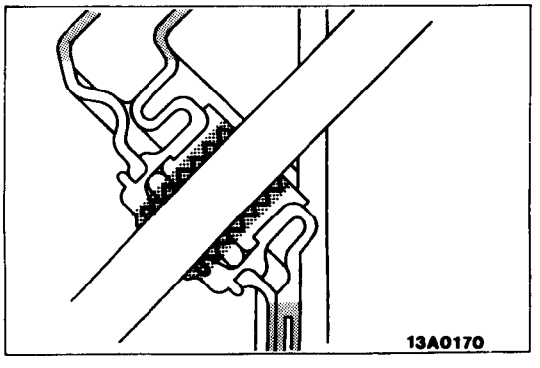
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

(3) Install the bearings to the shaft on the joint assembly.

(4) Wrap vinyl tape approximately one and one-half times around the concave circumferences of the bearings, and then press fit the bearings into the cover assembly.

(5) Apply multipurpose grease to the mating surfaces of the joint and cover assemblies.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

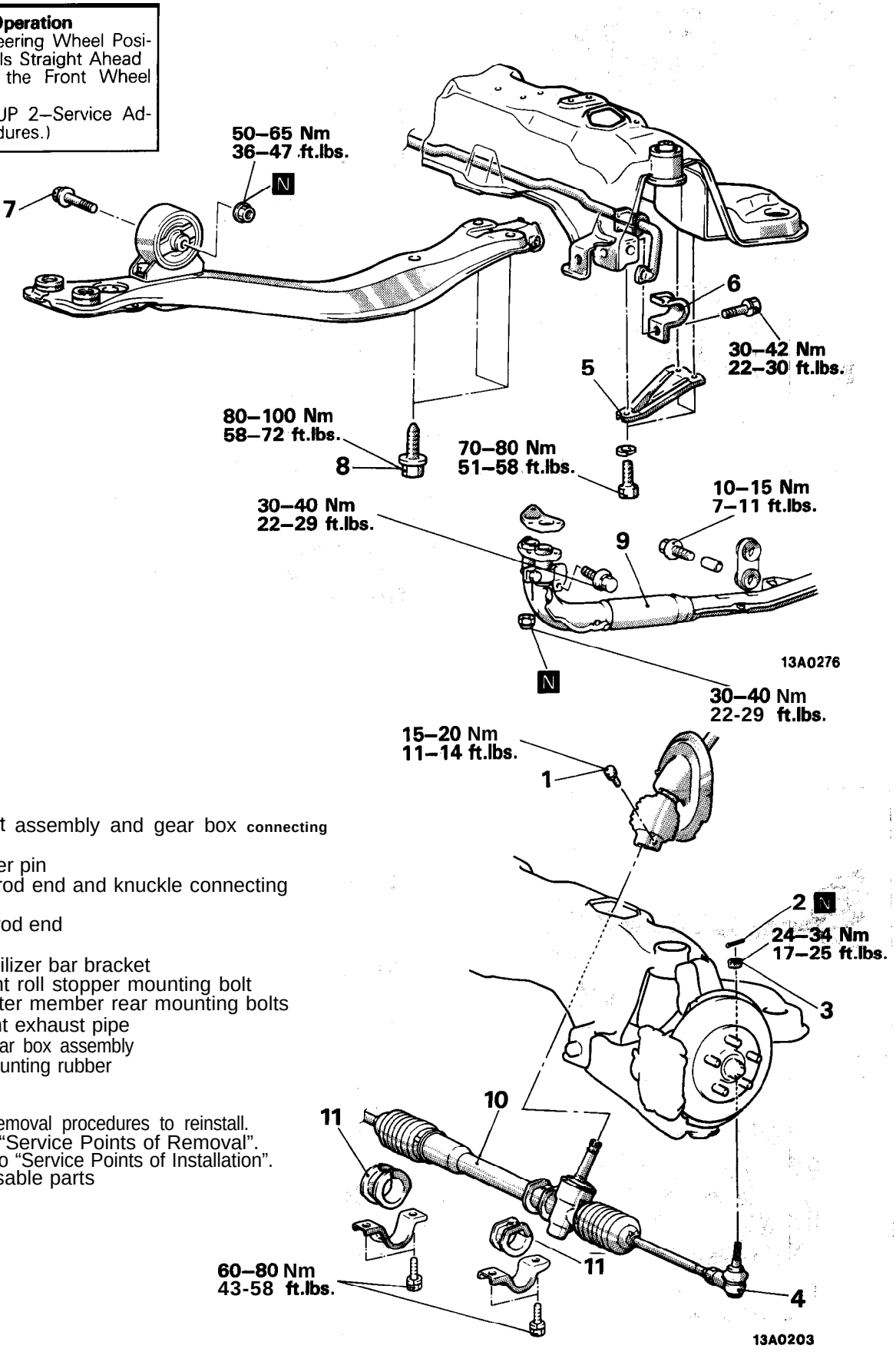


# MANUAL STEERING GEAR BOX

## REMOVAL AND INSTALLATION

N19LA--

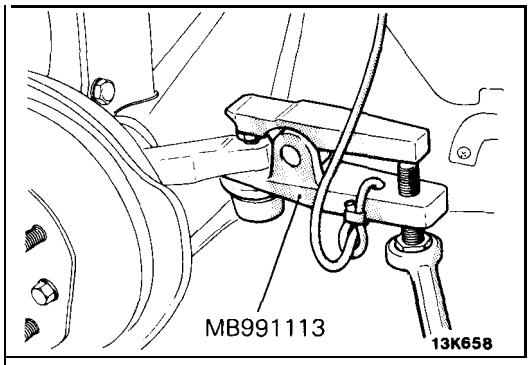
**Post-installation Operation**
- Checking of Steering Wheel Position with Wheels Straight Ahead
- Adjustment of the Front Wheel Alignment
(Refer to GROUP 2–Service Adjustment Procedures.)

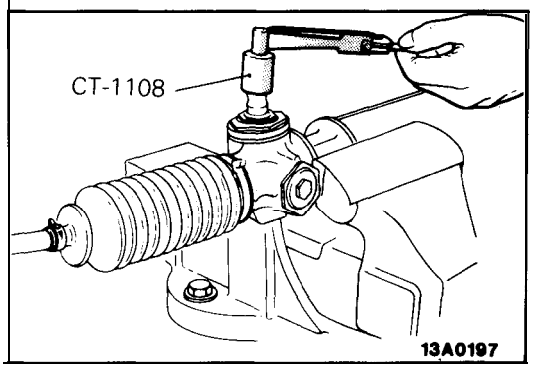



**Removal steps**

1. Joint assembly and gear box connecting bolt
2. Cotter pin
3. Tie-rod end and knuckle connecting nuts
◆◆ 4. Tie-rod end
5. Stav
6. Stabilizer bar bracket
7. Front roll stopper mounting bolt
8. Center member rear mounting bolts
9. Front exhaust pipe
◆◆ ● +10. Gear box assembly
● + 11. Mounting rubber

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to “Service Points of Removal”.
(3) ● *: Refer to “Service Points of Installation”.
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N19LBAF

### 4. DISCONNECTION OF TIE ROD END

Using the special tool, disconnect the tie' rod from the knuckle.

**Caution**

1. **Be sure to tie the cord of the special tool to the nearby part.**
2. **loosen the nut but do not remove it.**

### 10. REMOVAL OF GEAR BOX ASSEMBLY

(1) Move the rack completely to the right and then remove the gear box from the crossmember.
(2) While tilting the gear box downward, remove it to the left.

**Caution**

**When removing the gear box, pull it out carefully and slowly to avoid damaging the boots.**

## INSPECTION N19LCAFa

### GEAR BOX FOR TOTAL PINION TORQUE

Using the special tools, rotate the pinion gear at the rate of one rotation in approximately 4 to 6 seconds to check the total pinion torque.

**Standard value:**

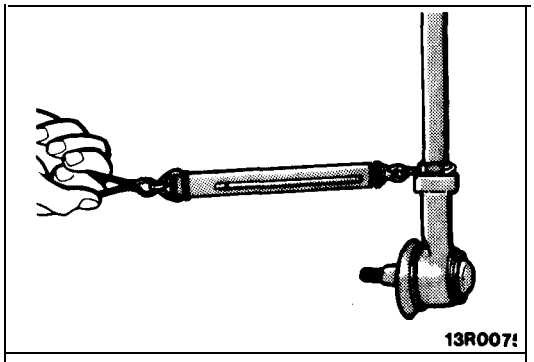
| | |
|---|---|
| **From 0–90°** | **0.6–1.3 Nm (5–11 in.lbs.)** |
| **From 90°–650°** | **0.2–1.0 Nm (2-9 in.lbs.)** |

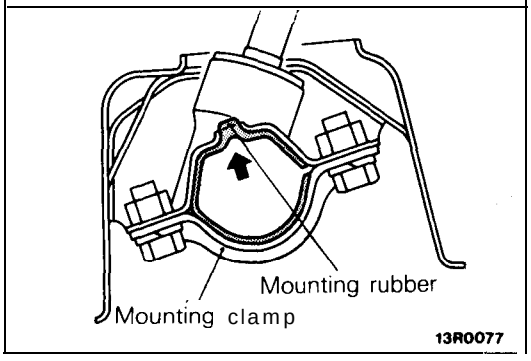
NOTE

Measure the pinion torque through the whole stroke of the rack.

If the measured value is not within the standard range, first adjust the rack support cover, and then check the total pinion torque again.

If the total pinion torque cannot be adjusted to within the standard range by adjusting the rack support cover, check the rack support cover, rack support spring, rack support and replace any parts necessary.




### CHECK THE TIE ROD FOR SWING RESISTANCE

(1) Give 10 hard swings to the tie rod.
(2) Measure the tie rod swing resistance with a spring balance.

**Standard value: 8–20 N (1.8-4.4 lbs.)**
**[2–5 Nm (17–43 in.lbs.)]**

(3) If the measured value exceeds the standard value, replace tie rod assembly.

NOTE

Even if the measured value is below the standard value, the tie rod which swings smoothly without excessive play may be used.

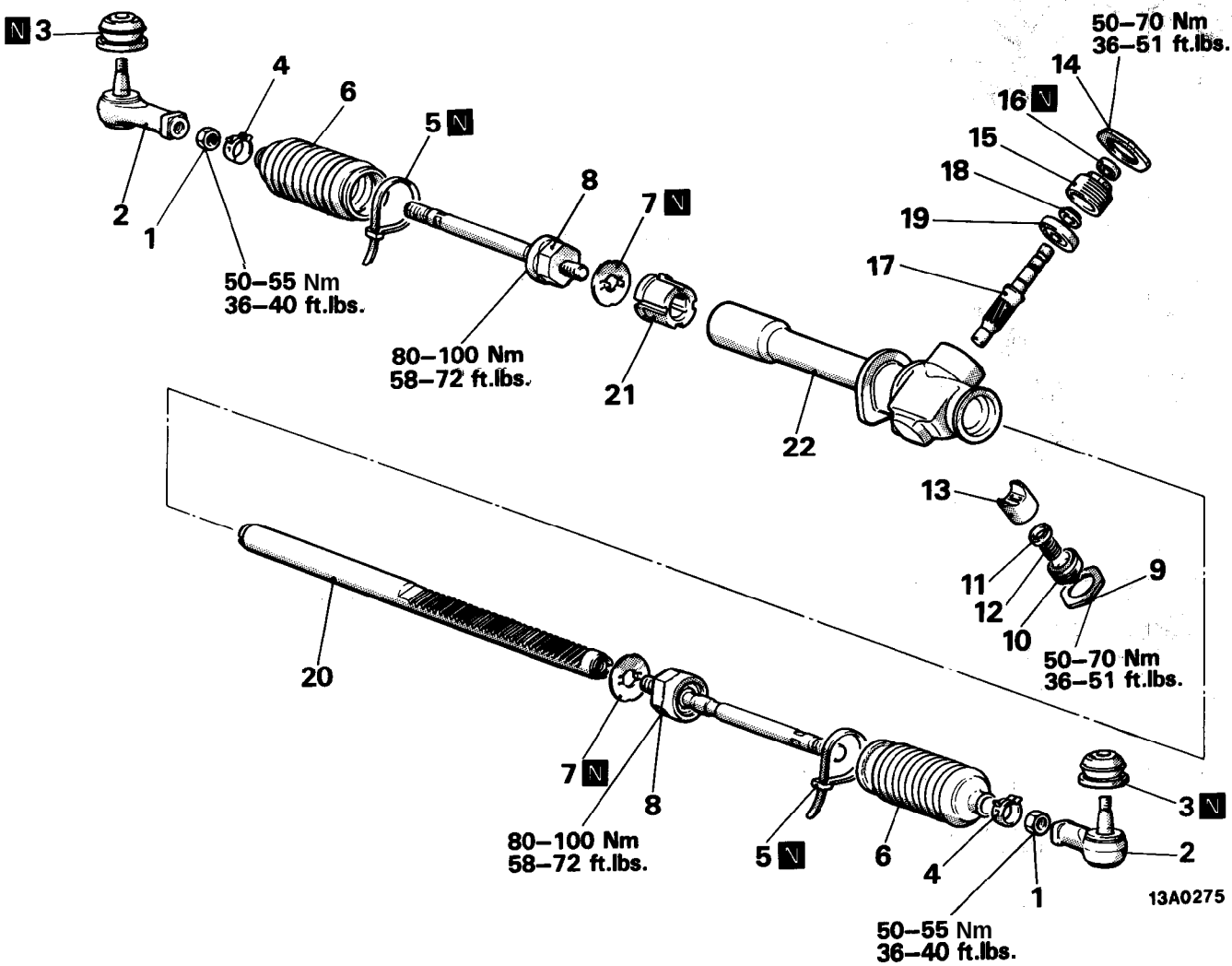
## SERVICE POINTS OF INSTALLATION N19LDAF

### 11. INSTALLATION OF MOUNTING RUBBER/10. GEAR BOX ASSEMBLY

When installing the mounting rubber, align the projection of the mounting rubber with the indentation in the cross-member to install the gear box.

## DISASSEMBLY AND REASSEMBLY

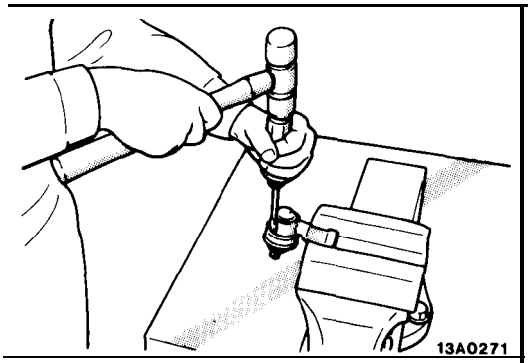
N19LE--




**Disassembly steps**

1. Tie-rod end locking nut
- a 2. Tie-rod end
- ◆◆ ◆◆ 3. Dust cover
4. Bellows clip
- ◆◆ 5. Bellows band
- ◆◆ 6. Bellows
- ◆◆ 7. Tab washer
- + 8. Tie-rod
- ◆◆ Adjustment of total pinion torque
9. Locking nut
- 10. Rack support cover
- ◆◆ 11. Cushion rubber
- ◆◆ 12. Rack support spring
- 4 13. Rack support
14. Locking nut
- 4 15. Top plug
- 16. Oil seal
- + 17. Pinion
18. Pinion collar
- ◆◆ 19. Ball bearing
- ◆◆ a 20. Rack
21. Rack bushing
22. Rack housing

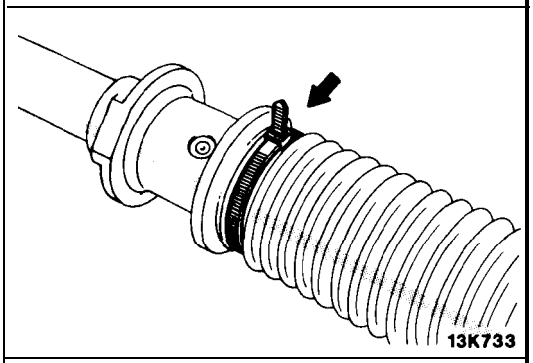
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly
(4) ■: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N19LFAG

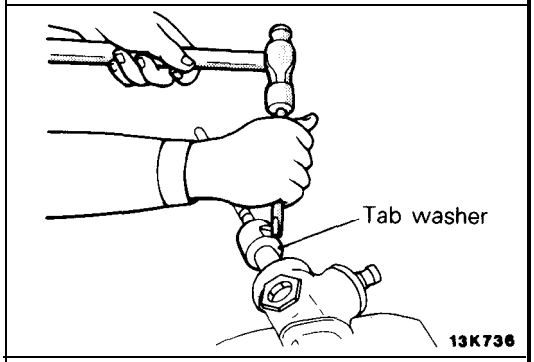
### 3. REMOVAL OF DUST COVER

Remove the dust cover from the tie rod end.



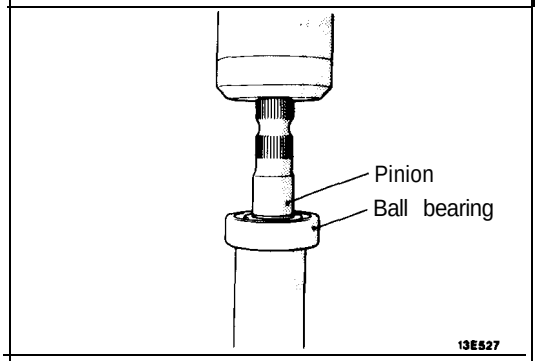

### 5. REMOVAL OF BELLOWS BAND

Cut the bellows band, and then remove the band.



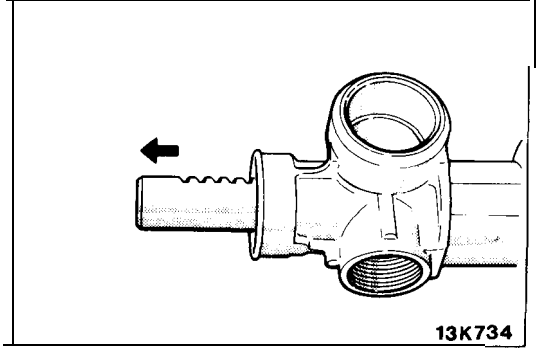

### 7. REMOVAL OF TAB WASHER

Unstake the tab washer which fixes the tie rod and rack with a chisel.




### 19. REMOVAL OF BALL BEARING

Remove the ball bearing from the pinion.



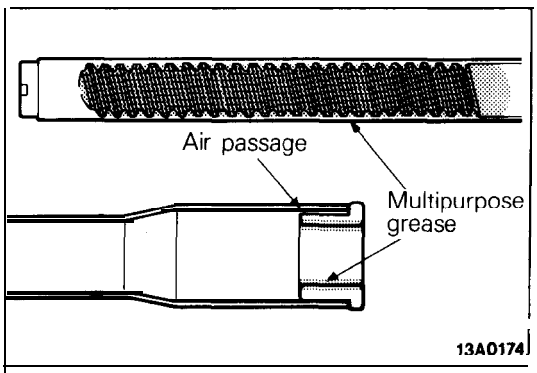

### 20. REMOVAL OF RACK

Pull out the rack from the gear housing in the ‘direction shown in the illustration.

**Caution**
**If the rack is pulled out in the wrong direction, the bushing in the gear box may be damaged by the rack threads.**

## INSPECTION N19LGAE

- Check the rack support for uneven wear or damage.
- Check the rack support spring for deterioration.
- Check the oil seal for cracks or damage.
- Check the rack pinion tooth surfaces for wear or damage.
- Check the ball bearings or pinion bushing for noise, uneven rotation, or damage.
- Check the rack bushing for damage.
- Check the dust cover for cracks or damage.



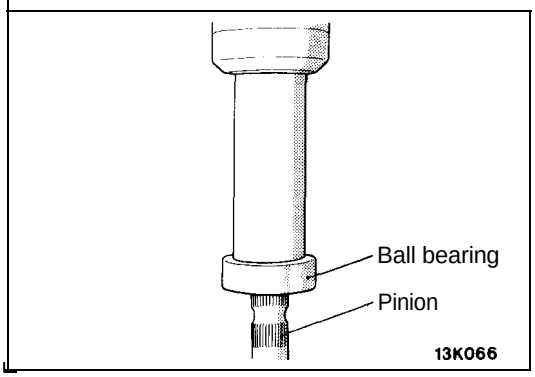

## SERVICE POINTS OF REASSEMBLY N19LHAN

### 20. INSTALLATION OF RACK

Apply a coating of multipurpose grease to the toothed surface of the rack and to the inner side of the rack bushing, and then install the rack to the rack housing.

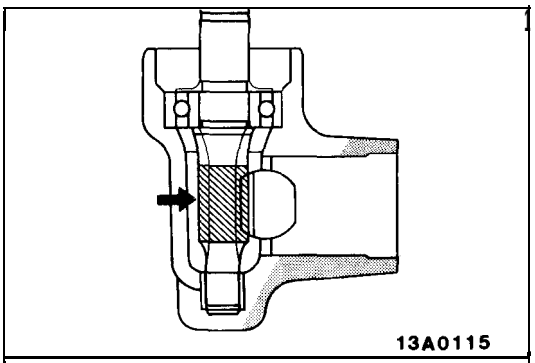
**Caution**
**Take care that the applied grease does not obstruct the air passage of the rack bushing.**

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**




### 19. INSTALLATION OF BALL BEARING

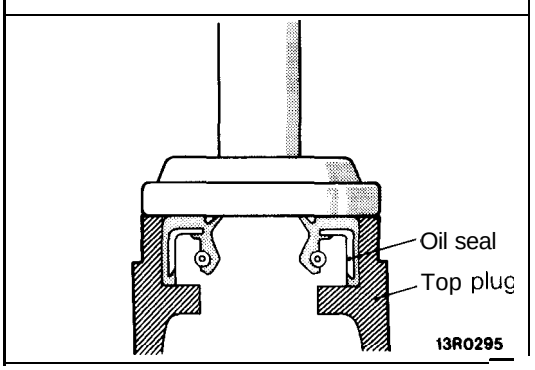
Press fit the ball bearing onto the pinion.




### 17. INSTALLATION OF PINION

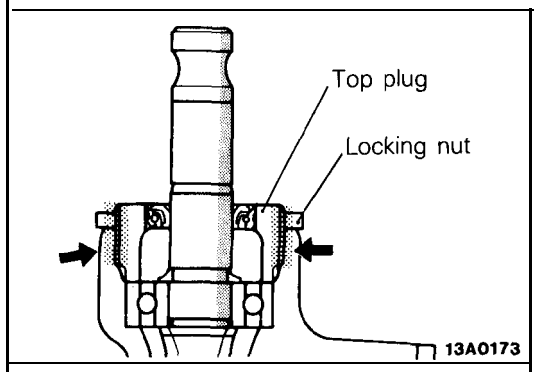
Apply a coating of multipurpose grease to the toothed surface of the pinion, and then install the pinion to the rack housing.

Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent



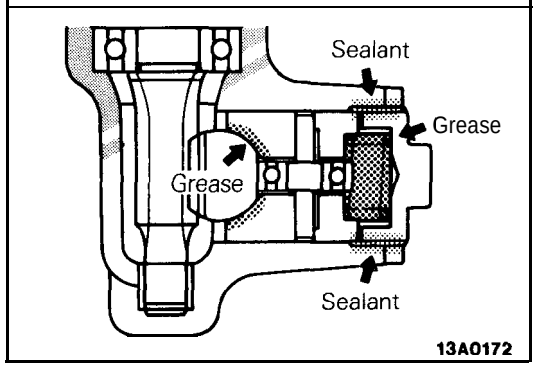

### 16. INSTALLATION OF OIL SEAL/15. TOP PLUG

(1) Press the oil seal into the top plug.




(2) Apply specified sealant to the threaded portion of the top plug.

**Specified sealant: 3M ATD, Part No. 8663 or equivalent**




**13. INSTALLATION OF RACK SUPPORT/12. RACK SUPPORT SPRING/11. CUSHION RUBBER/10. RACK SUPPORT COVER**

(1) Apply a coating of multipurpose grease to the surface of the rack support that contacts the rack, and then install the rack support to the rack housing.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

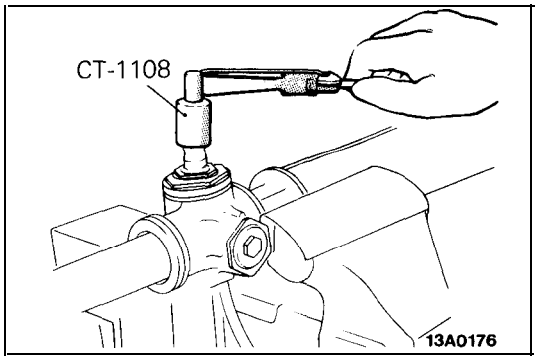
(2) Fill the inner side of the rack support spring with multipurpose grease, and then install the rack support spring to the rack housing.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

(3) Install the rubber cushion to the rack support cover.

(4) Apply a coating of the specified sealant to the threaded part of the rack support cover, and then install the rack support cover to the rack housing.

**Specified sealant: 3M ATD, Part No. 8663 or equivalent**




**● ADJUSTMENT OF TOTAL PINION TORQUE**

(1) Position rack at its center and tighten rack support cover to 15 Nm (1.5 kgm, 11 ft.lbs.).

(2) In neutral position, rotate pinion shaft clockwise one turn/4–6 seconds with special tool. Return rack support cover 30°–60° and adjust torque to the standard value.

**Standard value:**

| | |
|---|---|
| **From 0–90°** | **0.6–1.3 Nm (5–11 in.lbs.)** |
| **From 90°–650°** | **0.2–1.0 Nm (2-9 in.lbs.)** |

**Caution**

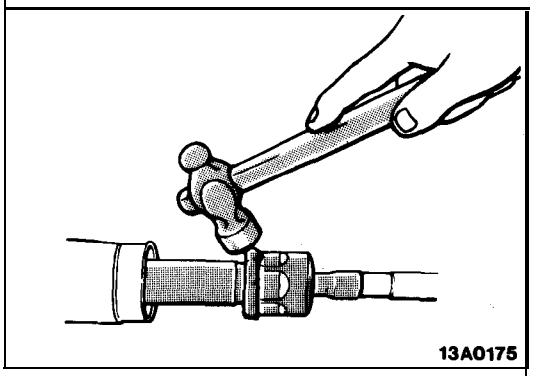
**1. When adjusting, set the standard value at its highest value.**

**2. Assure no ratcheting or catching when operating rack towards the shaft direction.**

NOTE

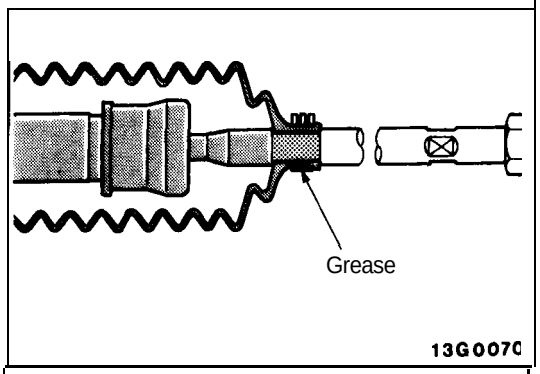
When it cannot be adjusted within the specified return angle, check rack support cover components or replace.

(3) After adjusting, lock rack support cover with locking nut.




**8. INSTALLATION OF TIE-ROD**

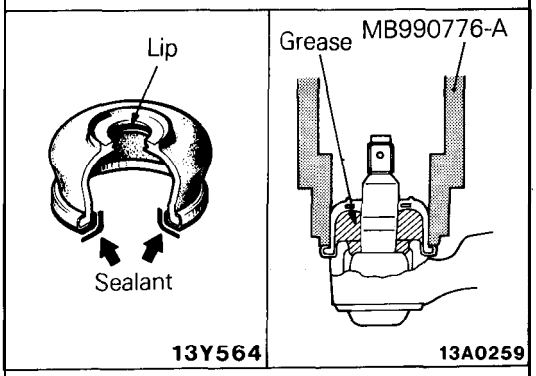
**After installing tie-rod to rack, fold tab washer** end (2 locations) to tie-rod notch.




**6. APPLICATION OF GREASE TO BELLOW**

Pack tie rod bellows lock groove with specified grease.

**Specified grease: Silicone grease**




**3. INSTALLATION OF DUST COVER**

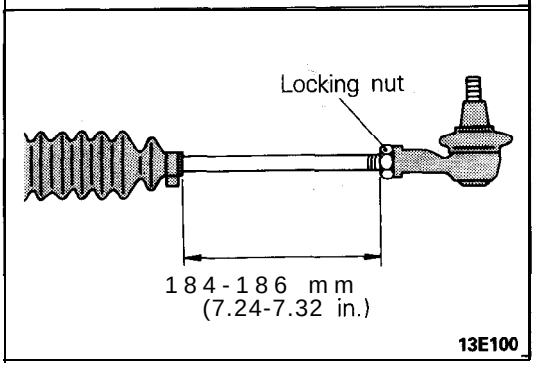
(1) Pack dust cover interior and lip with multipurpose grease.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

(2) Apply specified sealant to dust cover.

**Specified sealant: 3M ATD, Part No. 8663 or equivalent**

(3) Using the special tool, press dust cover to tie-rod end.




**2. INSTALLATION OF TIE-ROD END**

Screw in tie-rod end to have its right and left 'length as illustrated. Lock with locking nut.

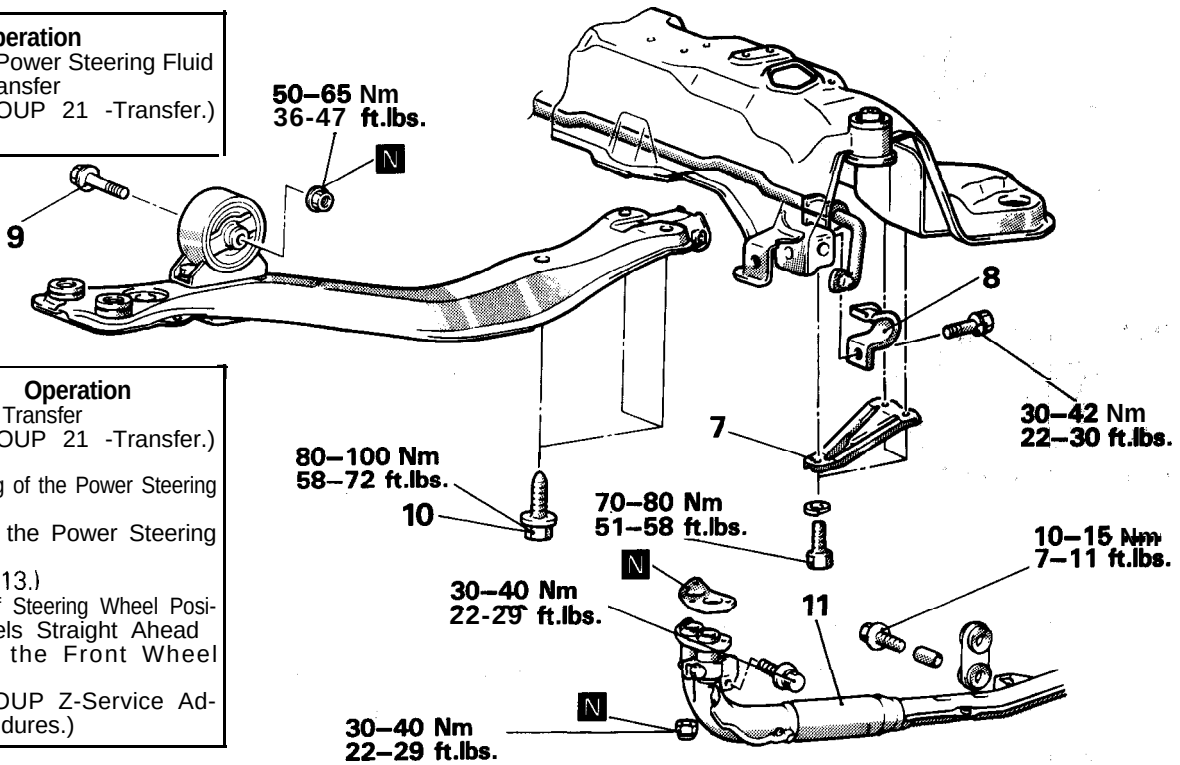
# POWER STEERING GEAR BOX

N19PA--

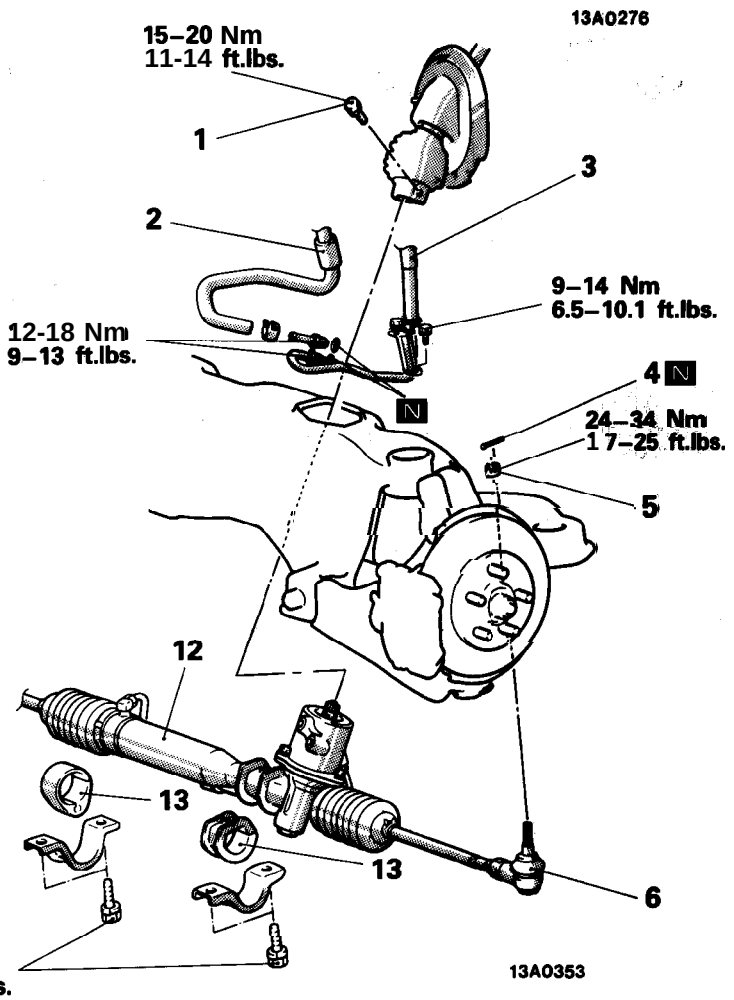
## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining of the Power Steering Fluid
- Removal of Transfer (Refer to GROUP 21 -Transfer.) <AWD>

**Post-installation Operation**
- Installation of Transfer (Refer to GROUP 21 -Transfer.) <AWD>
- SSy,lying of the Power Steering
- Bleedino of the Power Steering Fluid Line (Refer to P.19-13.)
- khecking of Steering Wheel Position with Wheels Straight Ahead
- Adjustment of the Front Wheel Alignment (Refer to GROUP Z-Service Adjustment Procedures.)




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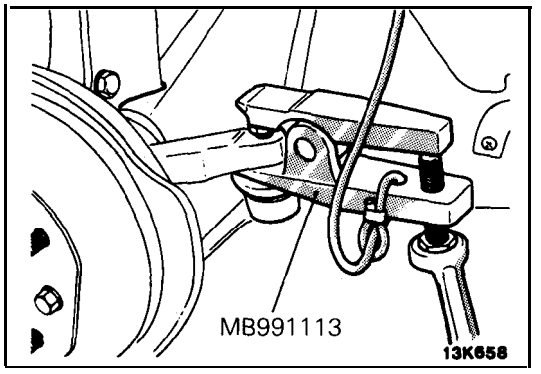



13A0353

**Removal steps**

1. Joint assembly and gear box connecting bolt
2. Connection for return tube
3. Connection for pressure hose
4. Cotter pin
5. Tie-rod end and knuckle connecting nuts
- ◆◆ 6. Tie-rod end
7. Stay
8. Stabilizer bar bracket
9. Front roll stopper mounting bolt
10. Center member rear mounting bolt
- ◆◆ 11. Front exhaust pipe <FWD>
- ● * ● + 12. Gear box assembly
- ● + 13. Mounting rubber

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL N19PBAB

### 6. DISCONNECTION OF TIE-ROD END

Using the special tool, disconnect the tie rod from the knuckle.

**Caution**

1. **Be sure to tie the cord of the special tool to the nearby part.**
2. **Loosen the nut but do not remove it.**

### 11. REMOVAL OF FRONT EXHAUST PIPE

Refer to GROUP 2–Stabilizer Bar.

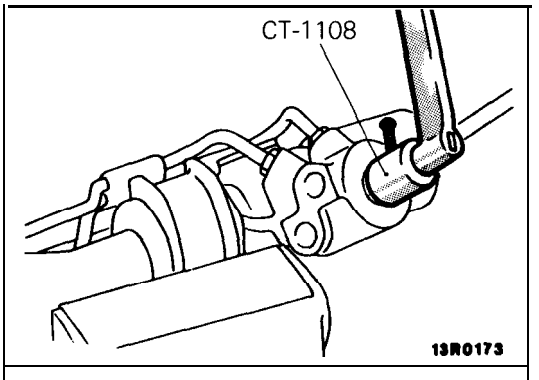
### 12. REMOVAL OF GEAR BOX ASSEMBLY

(1) Move the rack completely to the right and then remove the gear box from the crossmember.
(2) While tilting the gear box downward, remove it to the left.

**Caution**
**When removing the gear box, pull it out carefully and slowly to avoid damaging the boots.**

## INSPECTION N19PCADa

### GEAR BOX FOR TOTAL PINION TORQUE



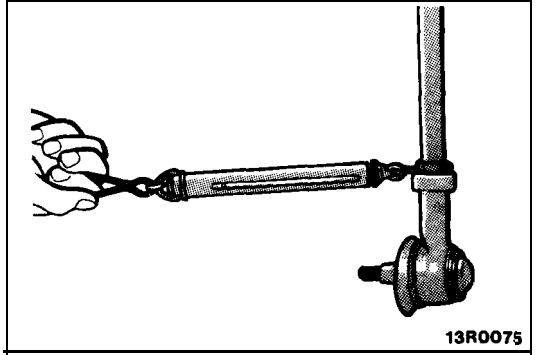

Using the special tools, rotate the pinion gear at the rate of one rotation in approximately 4 to 6 seconds to check the total pinion torque.

**Standard value: 0.6–1.3 Nm (5–11 in.lbs.)**

NOTE
Measure the pinion torque through the whole stroke of the rack.

If the measured value is not within the standard range, first adjust the rack support cover, and then check the total pinion torque again.
If the total pinion torque cannot be adjusted to within the standard range by adjusting the rack support cover, check the rack support cover, rack support spring, rack support and replace any parts necessary.

### CHECK THE TIE ROD FOR SWING RESISTANCE

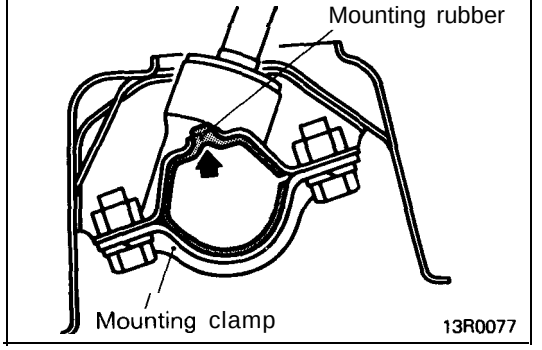



(1) Give 10 hard swings to the tie rod.
(2) Measure the tie rod swing resistance with a spring balance.

**Standard value: 8–20 N (1.8-4.4 lbs.)**
**[2–5 Nm (17-43 in.lbs.)]**

(3) If the measured value exceeds the standard value, replace tie rod assembly.

NOTE
Even if the measured value is below the standard value, the tie rod which swings smoothly without excessive play may be used.



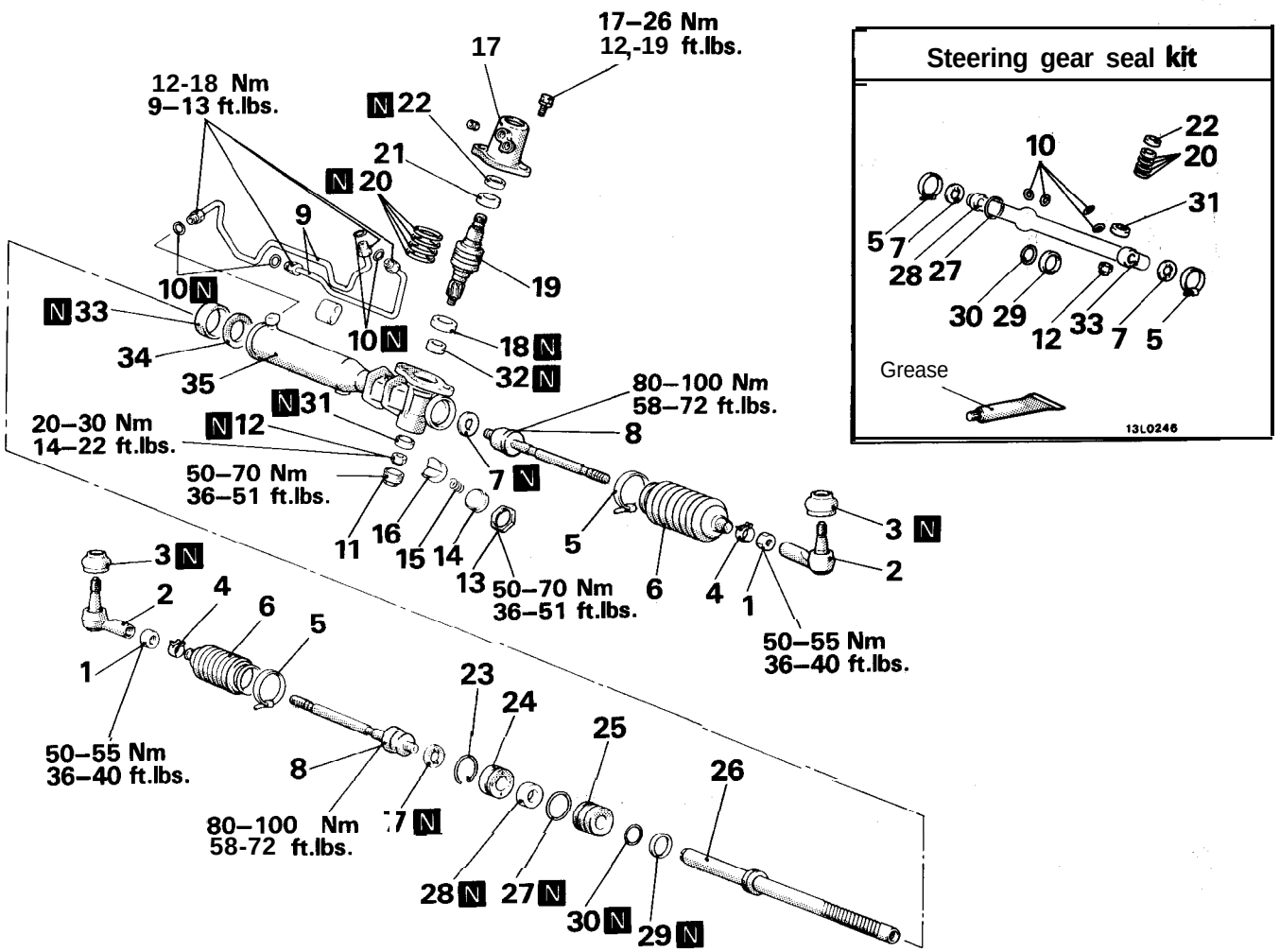

## SERVICE POINTS OF INSTALLATION N19PDAB

### 13. INSTALLATION OF MOUNTING RUBBER/12. GEAR BOX ASSEMBLY

When installing the mounting rubber, align the projection of the mounting rubber with the indentation in the crossmember to install the gear box.

## DISASSEMBLY AND REASSEMBLY

N19PE--

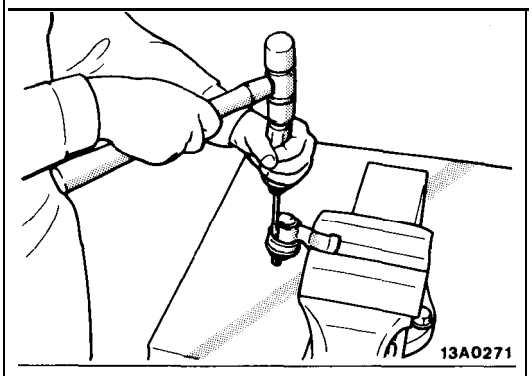



13A0258

**Disassembly steps**

1. Tie rod end locking nut
- ● 4 **2.** Tie rod end
- ◆◆ ◆◆ 3. Dust cover
- **4.** Bellows clip
- ◆◆ 5. Bellows band
- ◆◆ **6.** Bellows
- ◆◆ 7. Tab washer
- ● 4 **8.** Tie rods
- 9. Feed tube
- 10. O-rings
- ◆◆ Adjustment of total pinion torque
- ◆◆ ● *11. End plug
- 12. Self-locking nut
- 13. Locking nut
- ● *● * 14. Rack support cover
- 15. Rack support spring
- ◆◆ 16. Rack support
- 17. Valve housing
- ◆◆ ● * 18. Oil seal
- ◆◆ 19. Pinion and valve assembly
- ● + 20. Seal ring
- ◆◆ ● a 21. Ball bearing
- ● ☒ ● *** 22.** Oil seal
- ● *● 4 23. Circlip
- 24. Rack stopper
- ● * 25. Rack bushing
- ◆◆ ● *** 26.** Rack
- ● * 27. O-ring
- ◆◆ ● **+ 28.** Oil seal
- 29. Seal ring
- 30. O-ring
- ◆◆ ● 31. Ball bearing
- ◆◆ ● 32. Needle roller bearing
- ◆◆ ● **a 33.** Oil seal
- ◆◆ ● a 34. Back-up washer
- 35. Rack housing

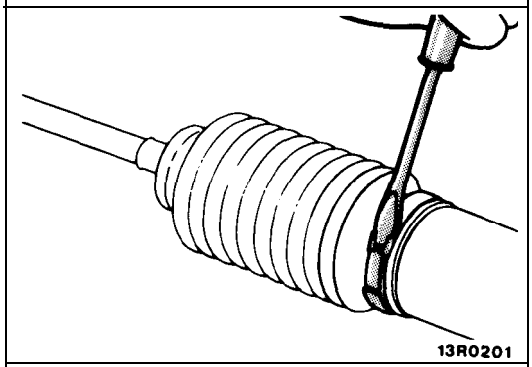
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) ❑ : Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY N19PFAK

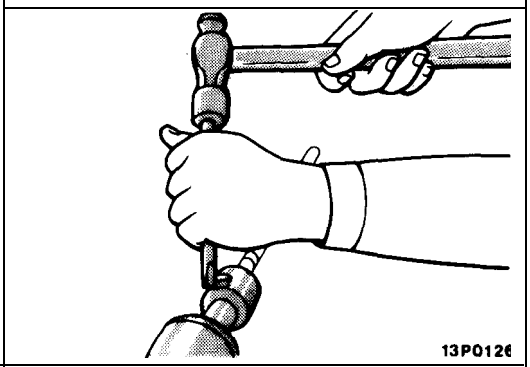
3. REMOVAL OF DUST COVER

Remove the dust cover from the tie rod end.



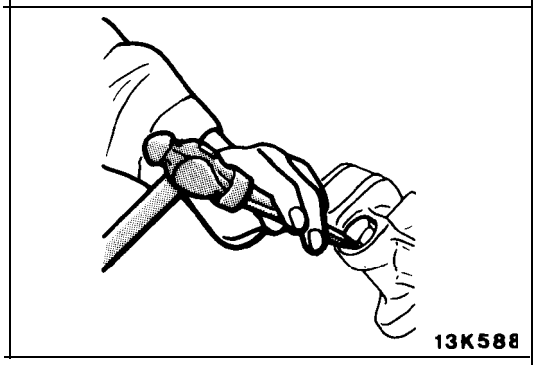

5. REMOVAL OF BELLOWS BAND

Using a screwdriver or similar tool, loosen and then remove the boot retaining band.



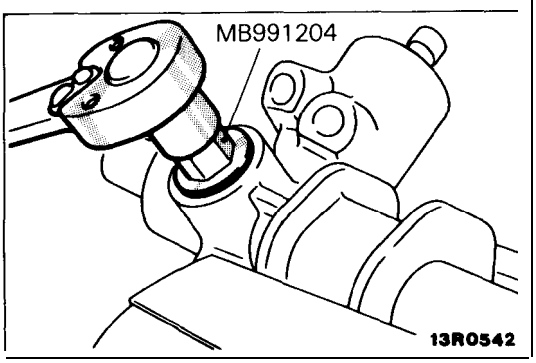

7. REMOVAL OF TAB WASHER

Unstake the tab washer which fixes the tie rod and rack with a chisel.



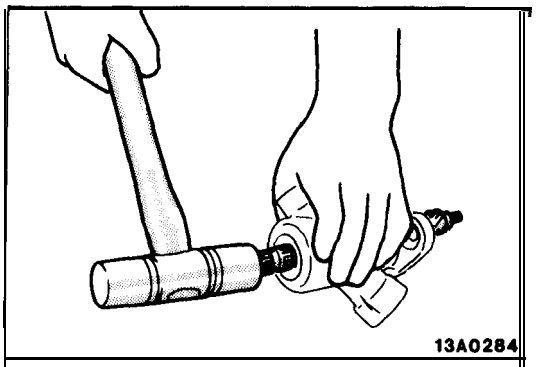

**11.** REMOVAL OF END PLUG

Disconnect end plug caulking and remove end plug.



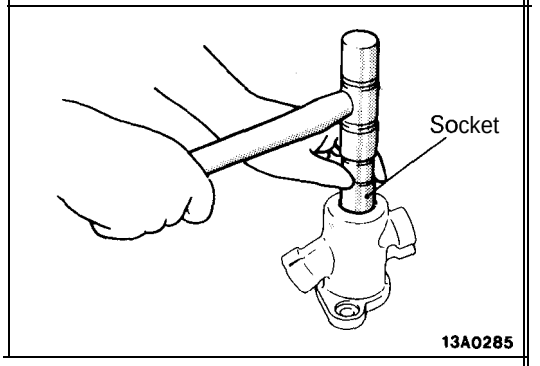

14. REMOVAL OF RACK SUPPORT COVER

Using the special tool, remove the rack support cover from the gear box.


13A0284

**18. REMOVAL OF OIL SEAL**

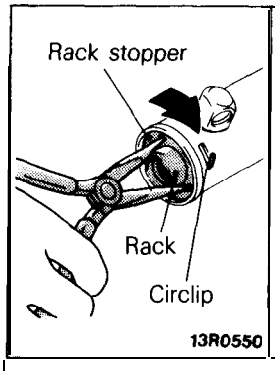
Using a plastic hammer, gently tap the pinion to remove it.



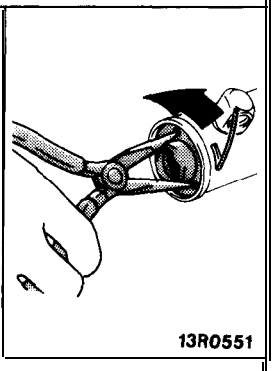
13A0285

**21. REMOVAL OF BALL BEARING/22. OIL SEAL**

Using a socket, remove the oil seal and the ball bearing from the valve housing simultaneously.

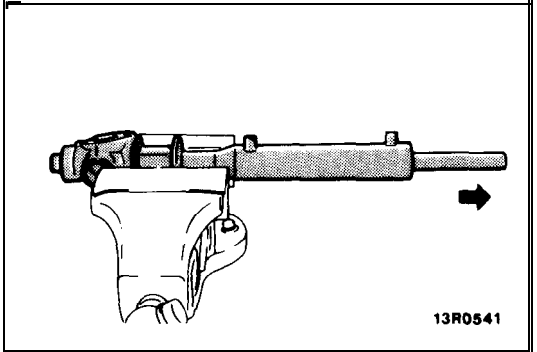


13R0550


13R0551

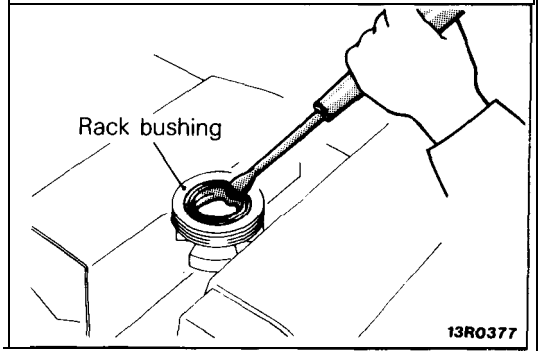
**23. REMOVAL OF CIRCLIP**

(1) Turn the rack stopper clockwise until the end of the circlip comes out of the slot in the rack housing.
(2) Turn the rack stopper anticlockwise to remove the circlip.


13R0541

**26. REMOVAL OF RACK**

Pull out the rack slowly.
At this time also take out the rack stopper and the rack bushing simultaneously.

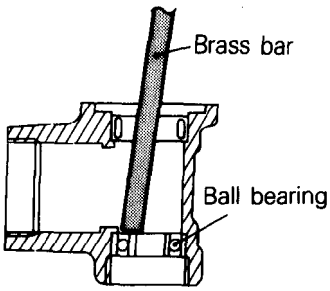


13R0377

**28. REMOVAL OF OIL SEAL**

Partially bend oil seal and remove from rack bushing.

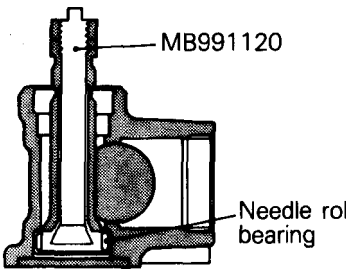
**Caution**
**Do not damage oil seal press fitting surface.**



13R0548

### 31. REMOVAL OF BALL BEARING

Use a brass bar to remove the ball bearing from the gear housing.



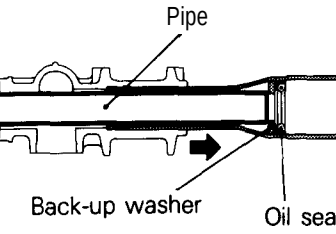
13R0581

### 32. REMOVAL OF NEEDLE ROLLER BEARING

Use the special tool to remove the needle roller bearing from the rack housing.

**Caution**

**Do not open special tool excessively to prevent damaging housing interior.**



13R0218

### 33. REMOVAL OF OIL SEAL/34. BACK-UP WASHER

Use a piece of pipe or similar tool to remove the back-up washer and oil seal from the gear housing.

**Caution**

**Be careful not to damage the inner surface of the rack cylinder of the gear housing.**

## INSPECTION

N19PGAG

### RACK

- Check the rack tooth surfaces for damage or wear.
- Check the oil seal contact surfaces for uneven wear
- Check the rack for bends.

### PINION AND VALVE ASSEMBLY

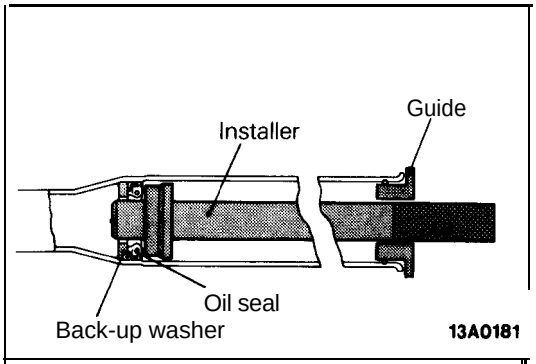
- Check the pinion gear tooth surfaces for damage or wear.
- Check for worn or defective seal ring.

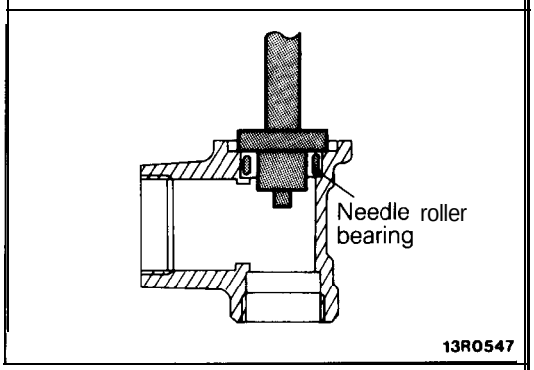
### BEARING

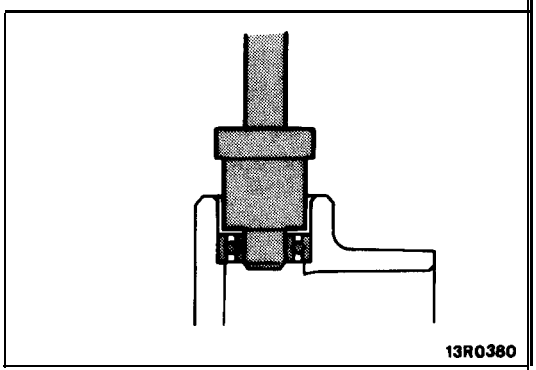
- Check for roughness or abnormal noise during bearing operation.
- Check the bearing for play.
- Check the needle roller bearings for roller slip-off.

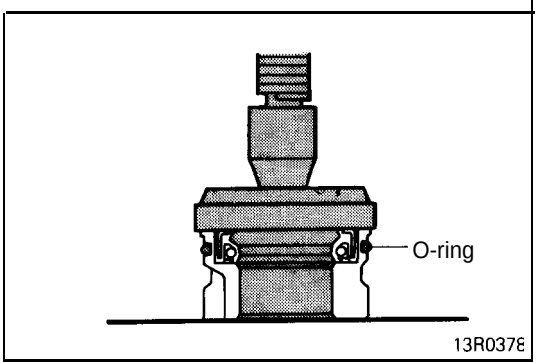
### OTHERS

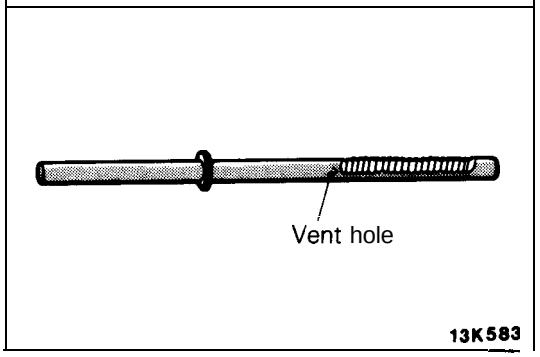
- Check the cylinder inner surface of the rack housing for damage.
- Cheek the boots for damage, cracking or deterioration.
- Check the rack support for uneven wear or dents.
- Check the rack bushing for uneven wear or damage.




## SERVICE POINTS OF REASSEMBLY N19PHAV

### 34. INSTALLATION OF BACK-UP WASHER/33. OIL SEAL

(1) Apply a coating of the specified fluid to the outside of the oil seal.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

(2) Using a tool, press the back-up washer and the oil seal into the rack housing to the specified position (where the upper surface of the press-in guide coincides with the stepped part of the press-in tool).

### 32. INSTALLATION OF NEEDLE ROLLER BEARING

(1) Apply specified fluid to housing, bearing and oil seal press fitting surface.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

(2) Press fit needle roller bearing.

**Caution**
**Press fit straight as valve housing is aluminium.**

### 31. INSTALLATION OF BALL BEARING

Press fit ball bearing.

### 28. INSTALLATION OF OIL SEAL/27. O-RING

(1) Apply a coating of the specified fluid to the outside of the oil seal and O-ring.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

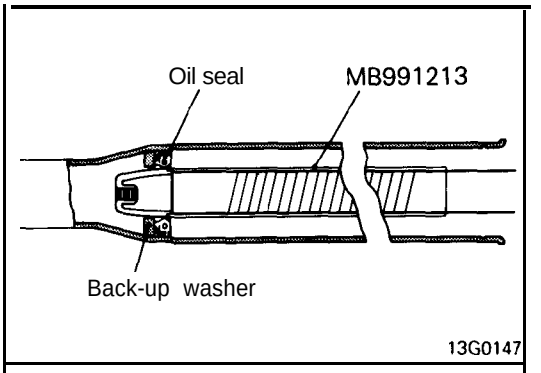
(2) Press fit oil seal until it touches rack bush end.

### 26. INSTALLATION OF RACK ASSEMBLY

(1) Apply a coating of multipurpose grease to the rack teeth face.

**Grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**

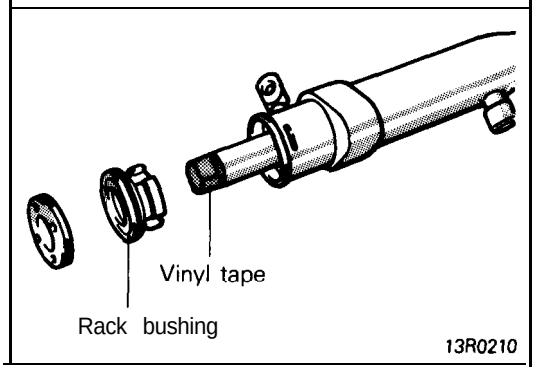
**Caution**
**Do not close the vent hole in the rack with grease.**




(2) Cover rack serrations with special tool.
(3) Apply specified fluid on special tool.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

(4) Match oil seal center with rack to prevent retainer spring from slipping and slowly insert rack from power cylinder side.

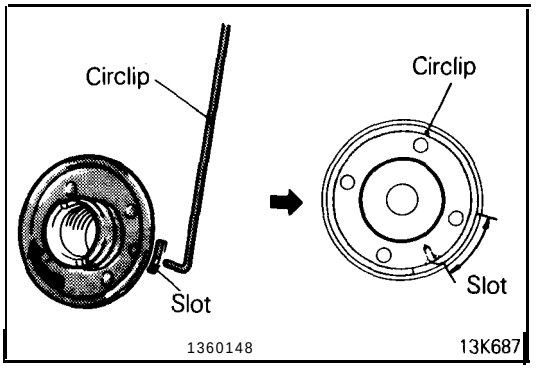



### 25. INSTALLATION OF RACK BUSHING ASSEMBLY

Wrap the rack end with vinyl tape, apply a coating of the specified fluid, and then install the rack bushing and rack stopper.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

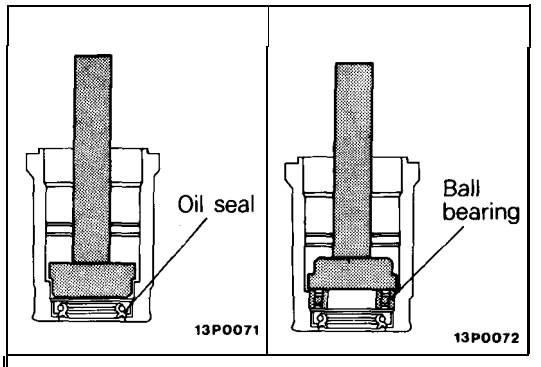
**Caution**
**Do not allow oil seal retainer spring to slip out.**




### 23. INSTALLATION OF CIRCLIP

Insert circlip to rack stopper hole through cylinder hole. Turn rack stopper clockwise and insert circlip firmly.

**Caution**
**Insert circlip to rack stopper hole while turning rack stopper clockwise.**




### 22. INSTALLATION OF OIL SEAL

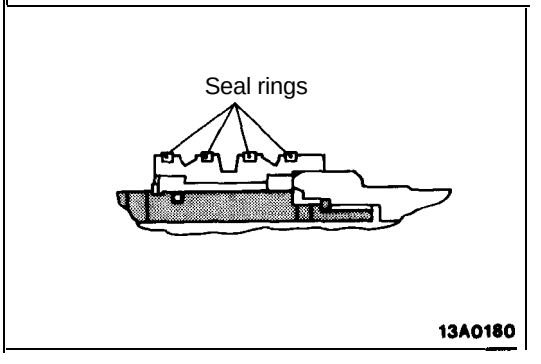
Apply a coating of the specified fluid to the outside of the oil seal. Press the oil seal into the valve housing.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

### 21. INSTALLATION OF BALL BEARING

Apply a coating of the specified fluid to the outside of the ball bearing. Press the ball bearing into the valve housing.

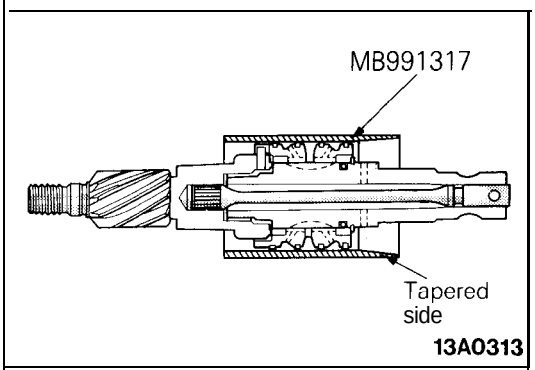
**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**



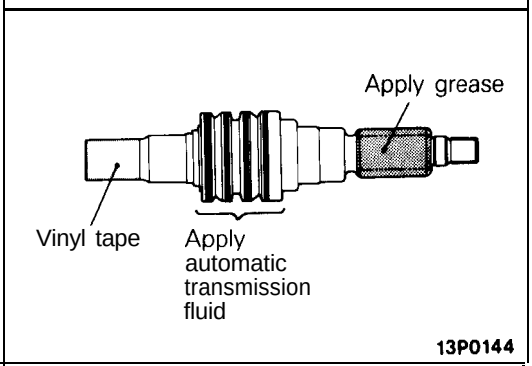

### 20. INSTALLATION OF SEAL RING /19. PINION AND VALVE ASSEMBLY

(1) When installing seal rings, press firmly into valve groove. Apply specified fluid.

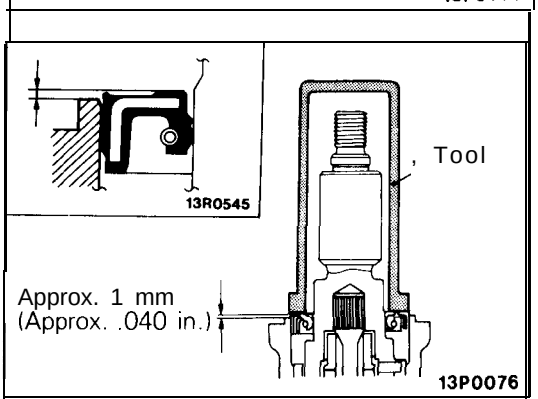
**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**




NOTE
Because the seal rings expand at the time of installation, use the special tool to compress the seal rings so that they are well seated.



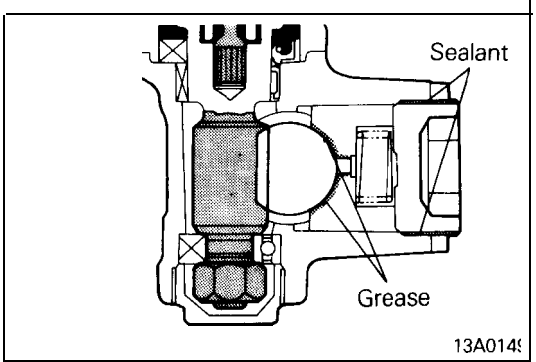

(2) Apply multipurpose grease to pinion gear and housing bearing.
**Grease: MOPAR Multi-mileage Lubricant Part No.2525035 or equivalent**
(3) Wrap vinyl tape around the serrated part so that the oil seal won't be damaged when the pinion and valve assembly is installed to the valve housing.
(4) Mount the pinion and valve assembly to the valve housing.




**18. INSTALLATION OF OIL SEAL**

Using a tool, press the oil seal into the valve housing.

**Caution**
**In order to eliminate a seal malfunction at the valve housing alignment surface, the upper surface of the oil seal should project outward approximately 1 mm (.040 in.) from the housing edge surface.**



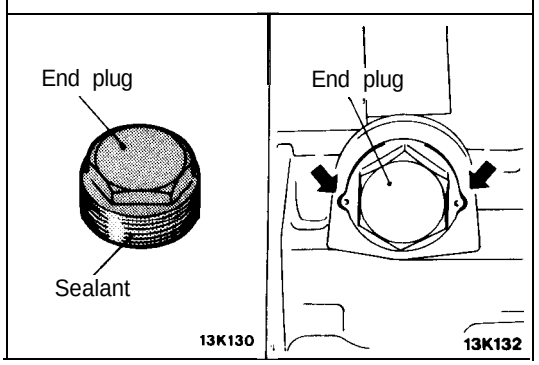

**16. INSTALLATION OF RACK SUPPORT**

Apply multipurpose grease to the rack support surface in contact with the rack bar.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

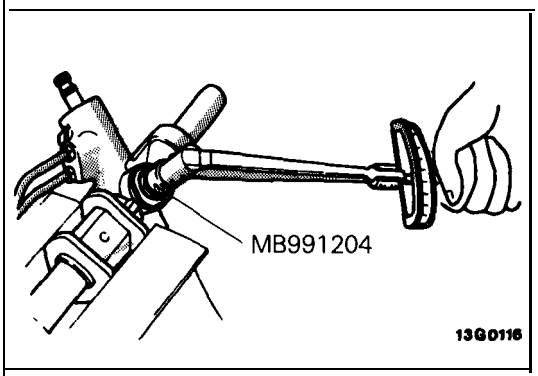
**14. INSTALLATION OF RACK SUPPORT COVER**

Apply semi-drying sealant to rack support cover screw. Lock temporarily with locking nut.




**11. INSTALLATION OF END PLUG**

(1) Apply the specified sealant to the threaded part of the end plug.
**Specified sealant: 3M ATD Part No.8663 or equivalent**
(2) Secure the threaded portion of the end plug at two places by using a punch.

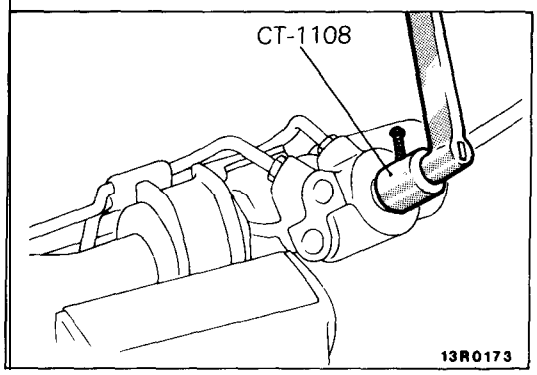



- **ADJUSTMENT OF TOTAL PINION TORQUE**

(1) Position rack at its center. With special tool, tighten rack support cover to 15 Nm (11 ft.lbs.).

(2) In neutral position, rotate pinion shaft clockwise one turn/4–6 seconds with special tool. Return rack, support cover 30°–60° and adjust torque to the standard value.

**Standard value: 0.6–1.3 Nm (5–11 in.lbs.)**




**Caution**

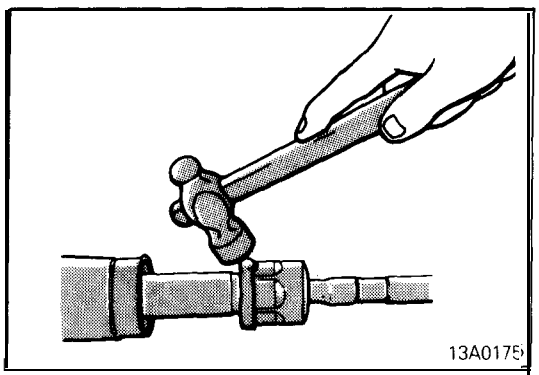
**1. When adjusting, set the standard value at its highest value.**

**2. Assure no ratcheting or catching when operating rack towards the shaft direction.**

NOTE

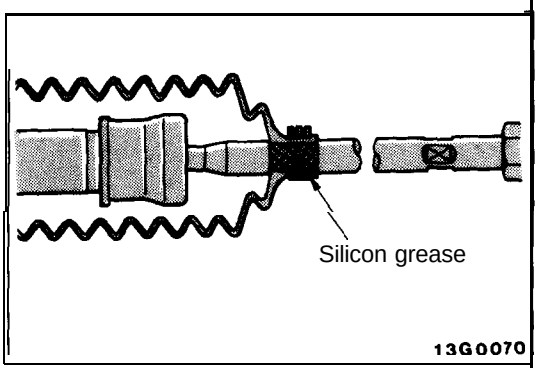
When it cannot be adjusted within the specified return angle, check rack support cover components or replace.

(3) After adjusting, lock rack support cover with locking nut.




**8. INSTALLATION OF TIE ROD**

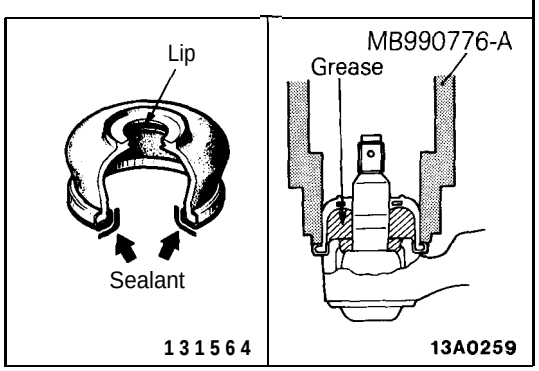
After installing tie rod to rack, fold tab washer end (2 locations) to tie rod notch.




**6. APPLICATION OF GREASE TO BELLOWS**

Pack tie rod bellows lock groove with specified grease.

**Specified grease: Silicone grease**




**3. INSTALLATION OF DUST COVER**

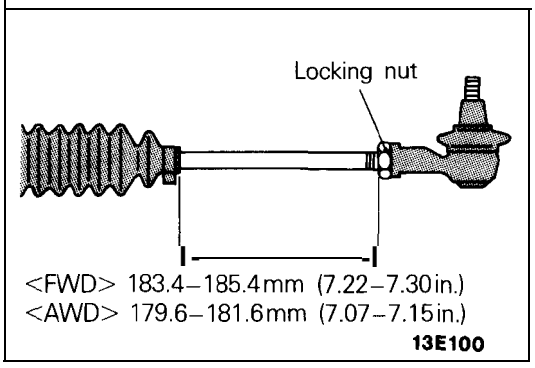
(1) Pack dust cover interior and lip with multipurpose grease.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

(2) Apply specified sealant to dust cover.

**Specified sealant: 3M ATD Part No. 8663 or equivalent**

(3) Using the spcial tool, press dust cover to tie rod end.




**2. INSTALLATION OF TIE ROD END**

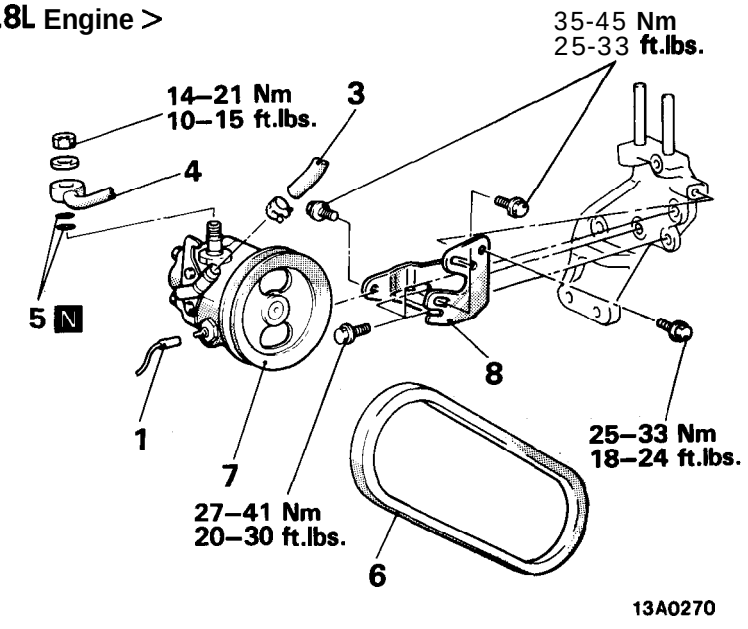
Screw in tie rod end to have its right and left length as illustrated. Lock with locking nut.

# POWER STEERING OIL PUMP

## REMOVAL AND INSTALLATION

N19RA--

<1.8L Engine>

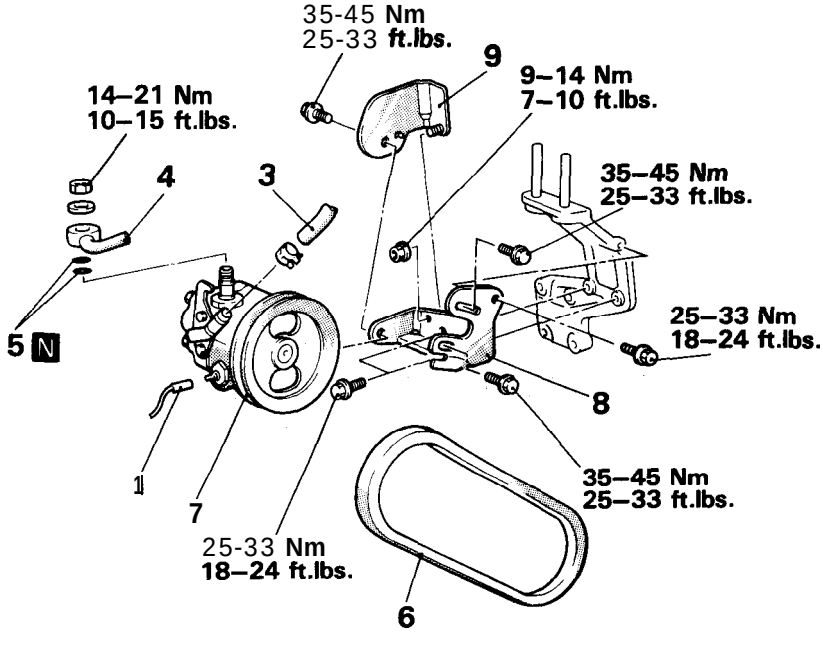



13A0270

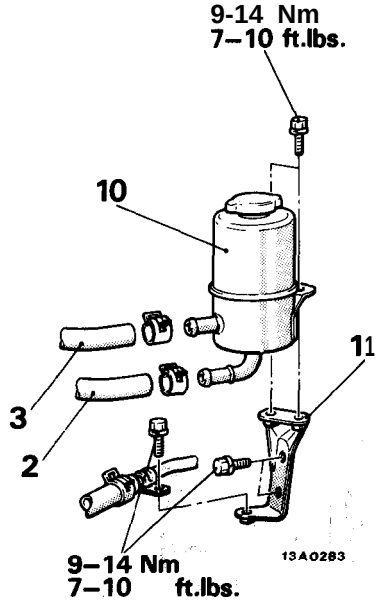
**Pre-removal Operation**
- Draining the Power Steering Fluid

**Post-installation Operation**
- Supplying of the Power Steering Fluid
- Bleeding the Power Steering Fluid Line (Refer to P.19–13.)
- Checking of the Oil Pump Pressure (Refer to P.19–14.)

<2.0L DOHC Engine>




13A0269




13A0283

**Removal steps**

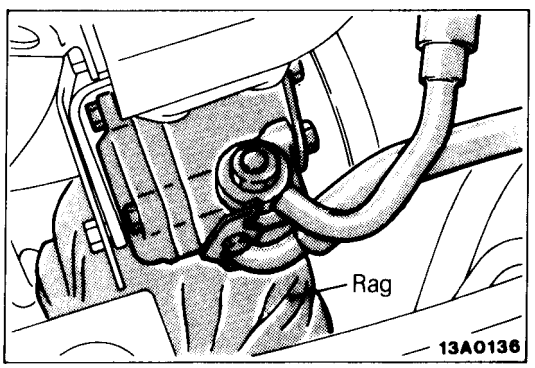
1. Pressure switch connector
◆◆ 2. Return hose
◆◆ 3. Suction hose
◆◆ ◆◆ 4. Pressure hose
5. O-ring
6. V-belt
7. Oil pump
8. Oil pump bracket
9. Heat protector <2.0L DOHC Engine>
10. Oil reservoir
11. Reservoir bracket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● a: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL N19RBAJ

### 2. DISCONNECTION OF RETURN HOSE

(1) Removal the reservoir cap and disconnect the return hose from the reservoir to drain the fluid.
(2) Jack up the front wheels.
(3) Disconnect the high tension cable and turn the engine over several times to drain the fluid from the gear box.

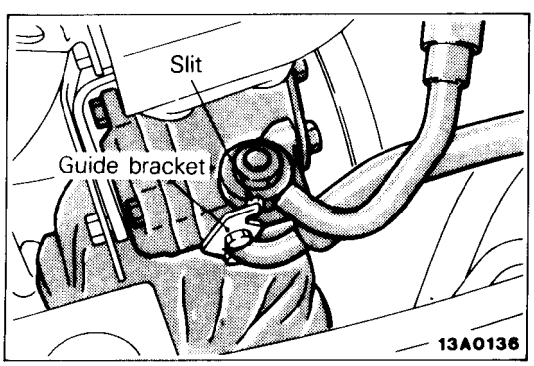



### 3. DISCONNECTION OF SUCTION HOSE/4. PRESSURE HOSE

**Caution**
**The alternator is located under the oil pump. If any of the hoses are to be removed, cover the alternator with a rag to protect it from oil.**

## INSPECTION N19RCAA

- Check the V-belt for cracks.
- Check the pulley assembly for uneven rotation.



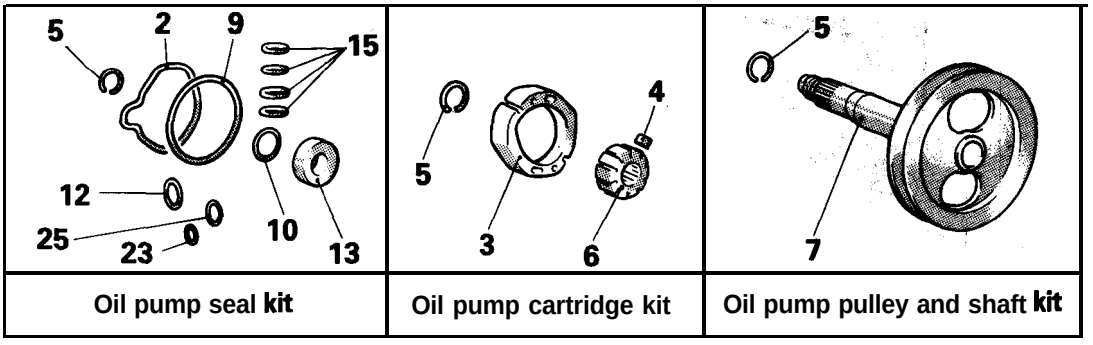

## SERVICE POINTS OF INSTALLATION N19RDAH

### 4. INSTALLATION OF PRESSURE HOSE

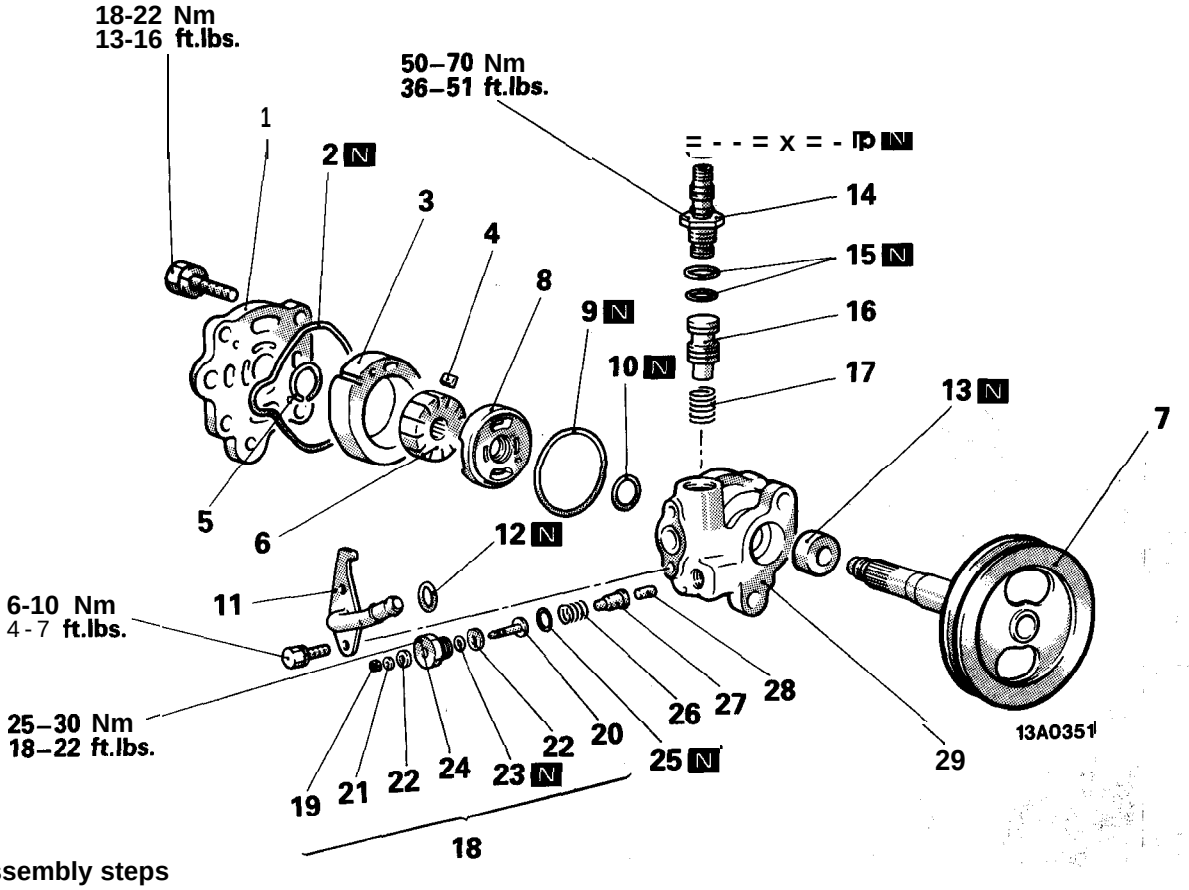
Connect the pressure hose so that its slit part contacts the oil pump's guide bracket.

## DISASSEMBLY AND REASSEMBLY

M37RE--



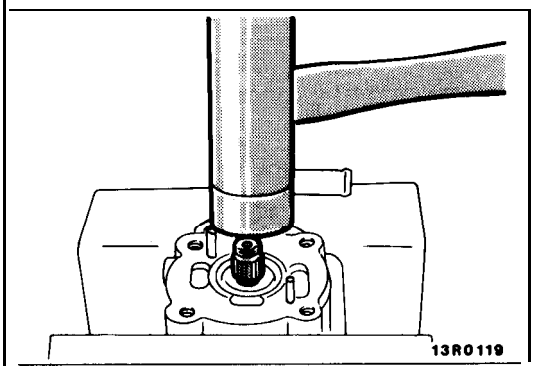

| Oil pump seal kit | Oil pump cartridge kit | Oil pump pulley and shaft kit |
|---|---|---|




### Disassembly steps

- ◆◆ 1. Pumpcover
- ● + 2. O-ring
- ● 4 3. Cam ring
- ● 4. Vanes
- ● + 5. Snap ring
- ● 4 6. Rotor
- ◆◆ 7. Pulley assembly
- ● 8. Side plate
- ◆◆ 9. O-ring
- ● a 10. O-ring
- 11. Suction connector
- ● + 12. O-ring
- ◆◆ 13. Oil seal
- 14. Connector
- ● + 15. O-ring
- ● + 16. Flow control valve
- 17. Flow control spring
- 18. Terminal assembly
- 19. Snap ring
- 20. Terminal
- 21. Washer
- 22. Insulator
- ● + 23. O-ring
- 24. Plug
- ● 25. O-ring
- ● 26. Spring
- 27. Plunger
- 28. Piston rod
- 29. Oil pump body

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



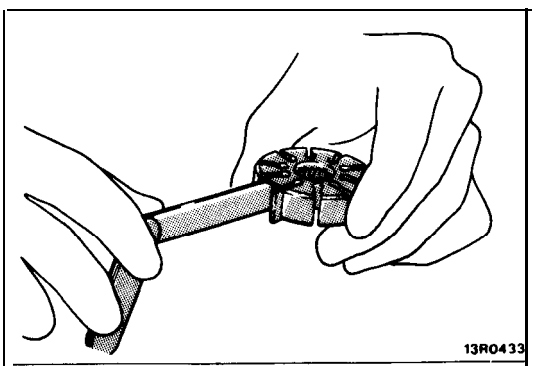

## SERVICE POINTS OF DISASSEMBLY N19RFAM

### 7. REMOVAL OF PULLEY ASSEMBLY

Tap the rotor side of the shaft lightly with a plastic hammer, and take out the pulley assembly.

## INSPECTION N19RGAK

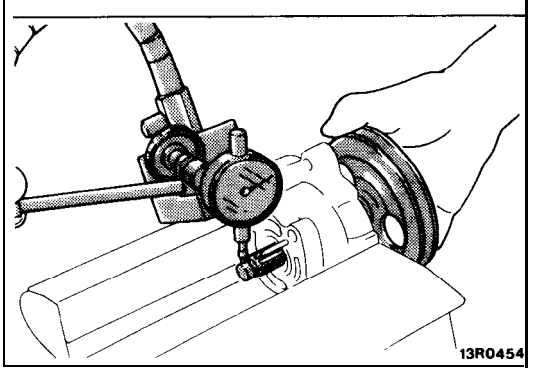
- Check the flow control spring for wear.
- Check the shaft of the pulley for wear and bend.
- Check the groove of rotor vane for "stepped" wear.
- Check the contact surface of cam ring and vanes for "stepped" wear.
- Check the vanes for breakage.




### CHECK OF GAP BETWEEN VANE AND ROTOR GROOVE

Install vane to rotor groove as illustrated. Measure the gap between vane and rotor groove with thickness gauge.

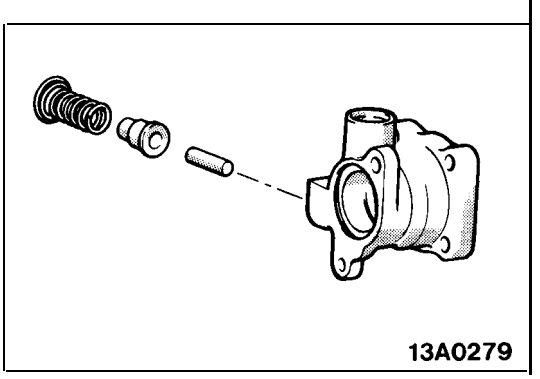
**Limit: 0.06 mm (.0024 in.)**




### CHECK OF SHAFT BACKLASH OF PUMP BODY BUSHING AND PULLEY ASSEMBLY

(1) Place a dial gauge at the end of the shaft of the pulley assembly.
(2) Move the pulley assembly up and down, and measure the play.

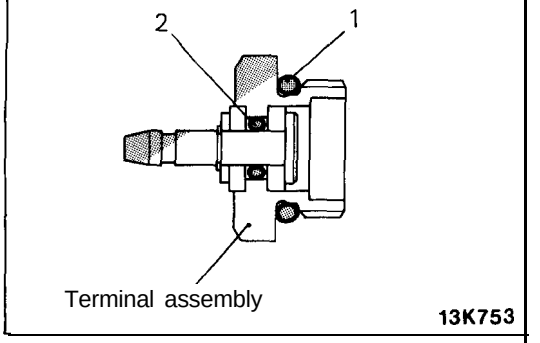
**Limit: 0.1 mm (.004 in.)**

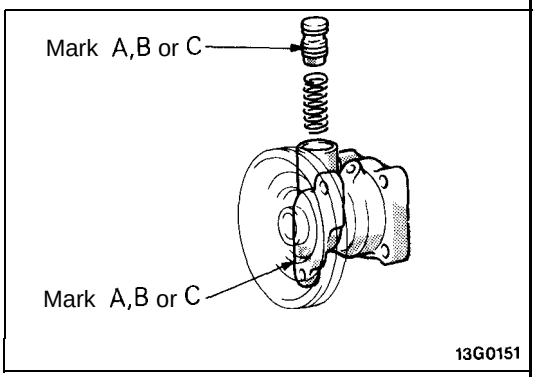


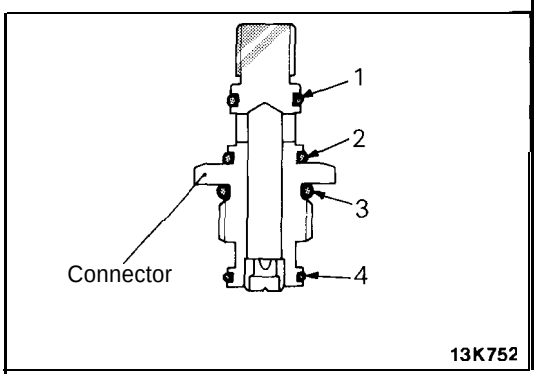

## SERVICE POINTS OF REASSEMBLY N19RHBH

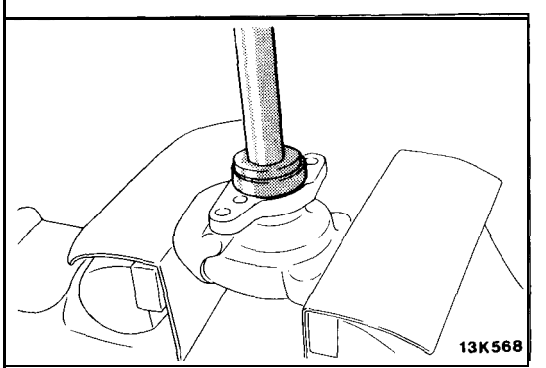
### 26. INSTALLATION OF SPRING

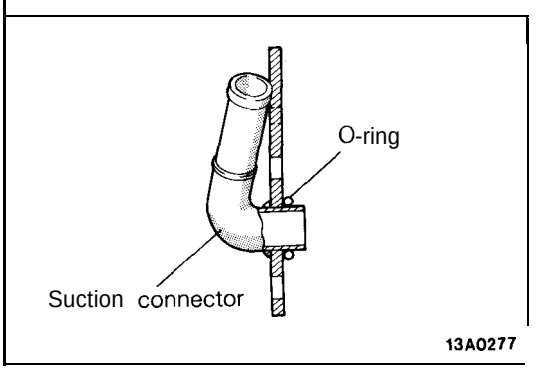
Fit the spring to the oil pump body with the larger-diameter end at the terminal assembly side.




### 25./23. INSTALLATION OF O-RINGS

Apply specified fluid on O-rings to install.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

| No. | I.D. × Width mm (in.) | Identification color |
|---|---|---|
| 1 | 13 × 1.9 (.51 × .0748) | Blue |
| 2 | 3.8 × 1.9 (.15 × .0748) | — |

### 16. INSTALLATION OF FLOW CONTROL VALVE

(1) If the flow control valve is to be replaced, install the flow control valve to the oil pump body corresponding with the body identification mark (A, B, C).

(2) Apply the specified fluid to the outside of the flow control valve.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

### 15. INSTALLATION OF O-RINGS

Apply specified fluid on O-rings to install.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

| No. | I.D. × Width mm (in.) | Identification color |
|---|---|---|
| 1 | 11 × 1.9 (.43 × .0748) | Yellow |
| 2 | 13 × 1.9 (.51 × .0748) | Blue |
| 3 | 17.8 × 2.4 (.70 × .0945) | — |
| 4 | 13.5 × 1.5 (.53 × .0590) | Red |

### 13. INSTALLATION OF OIL SEAL

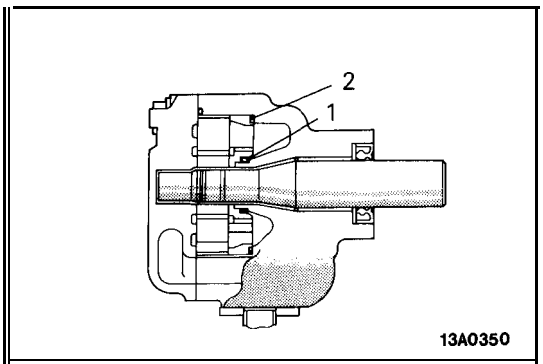
Drive the oil seal into the pump body.

### 12. INSTALLATION OF O-RING

Apply specified fluid on O-ring to install.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

| I.D. × Width mm (in.) | Identification color |
|---|---|
| 17.8 × 2.4 (.70 × .0945) | — |

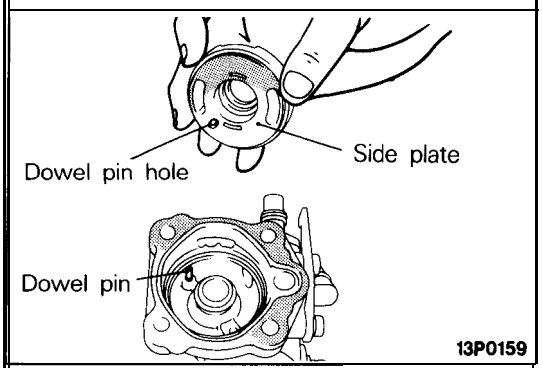



### 10. INSTALLATION OF O-RING/9. O-RING

Apply specified fluid on O-ring to install.

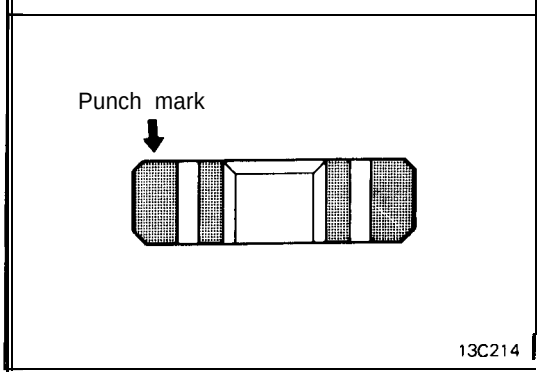
**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

| No. | I.D. × Width mm (in.) | Identification color |
|---|---|---|
| 21 | 47.2 16.8 XX 2.4 2.4 (1.86 (.66 XX .0945).0945) | -- |



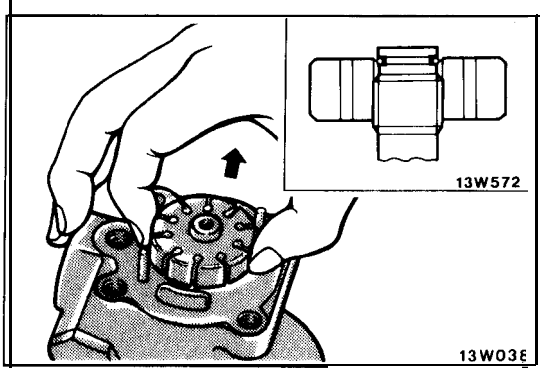

### 8. INSTALLATION OF SIDE PLATE

Align the dowel pin of the pump body with the dowel pin hole of the side plate to install the side plate.



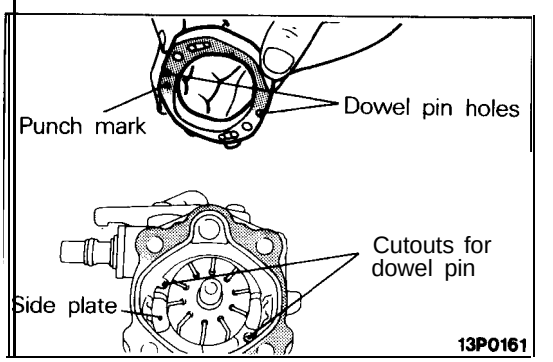

### 6. INSTALLATION OF ROTOR

Install the rotor to the pulley assembly so that the rotor's punch mark is at the pump cover side.




### 5. INSTALLATION OF SNAP RING

Lift the rotor and check to be sure that the snap ring is in the countersunk part.

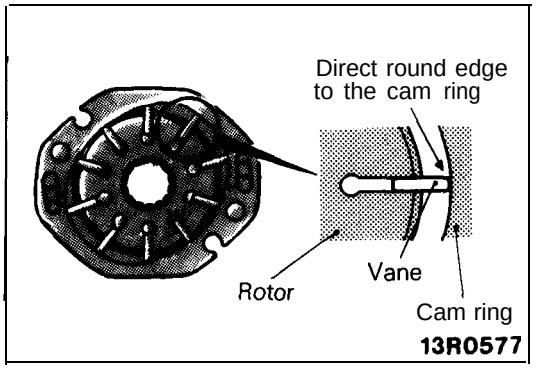



### 4. INSTALLATION OF VANE/3. CAM RING

(1) Apply specified fluid to vane and cam ring friction surface.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

(2) Align the dowel pins of the pump body with the dowel holes of the cam ring, and then install so that the cam ring's punch mark is at the pump body side.



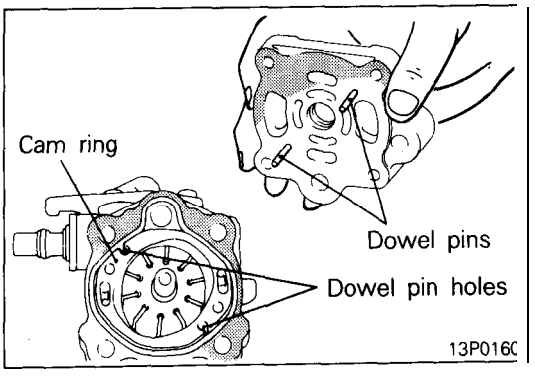

(3) Apply specified fluid to the vanes and install the vanes on the rotor, paying close attention to the installation direction.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II"**

**2. INSTALLATION OF O-RING**

Apply specified fluid to O-ring and install firmly on oil pump body.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II".**




**1. INSTALLATION OF PUMP COVER**

(1) Apply specified fluid to rotor friction surface of pump cover.

**Specified fluid: MOPAR ATF PLUS (Automatic Transmission Fluid, Type 7176)/Automatic transmission fluid "DEXRON" or "DEXRON II".**

(2) Align the dowel pin of the pump cover with the dowel pin hole in the cam ring to install the pump cover.

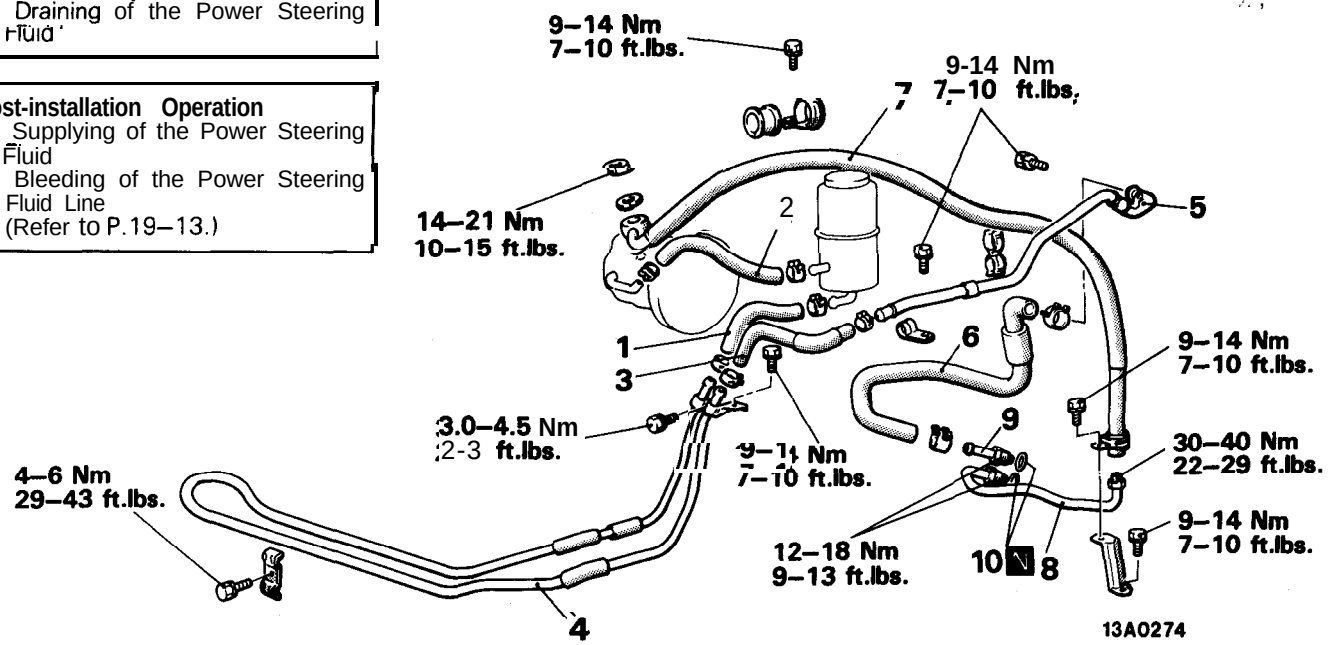
# POWER STEERING HOSES

N19TA--

## REMOVAL AND INSTALLATION

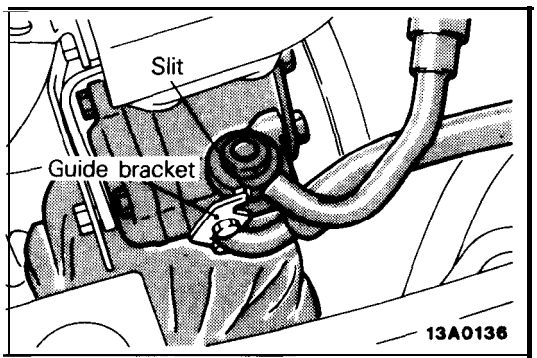
**Pre-removal Operation**
- Draining of the Power Steering Fluid

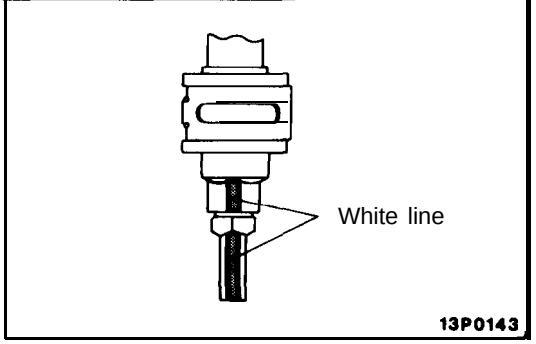
**Post-installation Operation**
- Supplying of the Power Steering Fluid
- Bleeding of the Power Steering Fluid Line (Refer to P.19–13.)




**Removal** steps
1. Return hose
2. Suction hose
3. Return hose
4. Cooler tube
5. Return tube
6. Rubber hose
◆◆ 7. Pressure hose
8. Pressure tube
9. Return tube
10. O-ring

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● a : Refer to "Service Points of Installation".
(3) ❑ : Non-reusable parts




## SERVICE POINTS OF INSTALLATION

N19TDAD

### 7. INSTALLATION OF PRESSURE HOSE

(1) Connect the pressure hose so that its slit pat-t contacts the oil pump's guide bracket.

(2) When the pressure hose is installed, align the white line on the pressure hose with the white line on the pressure tube so that together they form a straight line.

# TRANSAXLE
# MANUAL AND AUTOMATIC

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N21AA--


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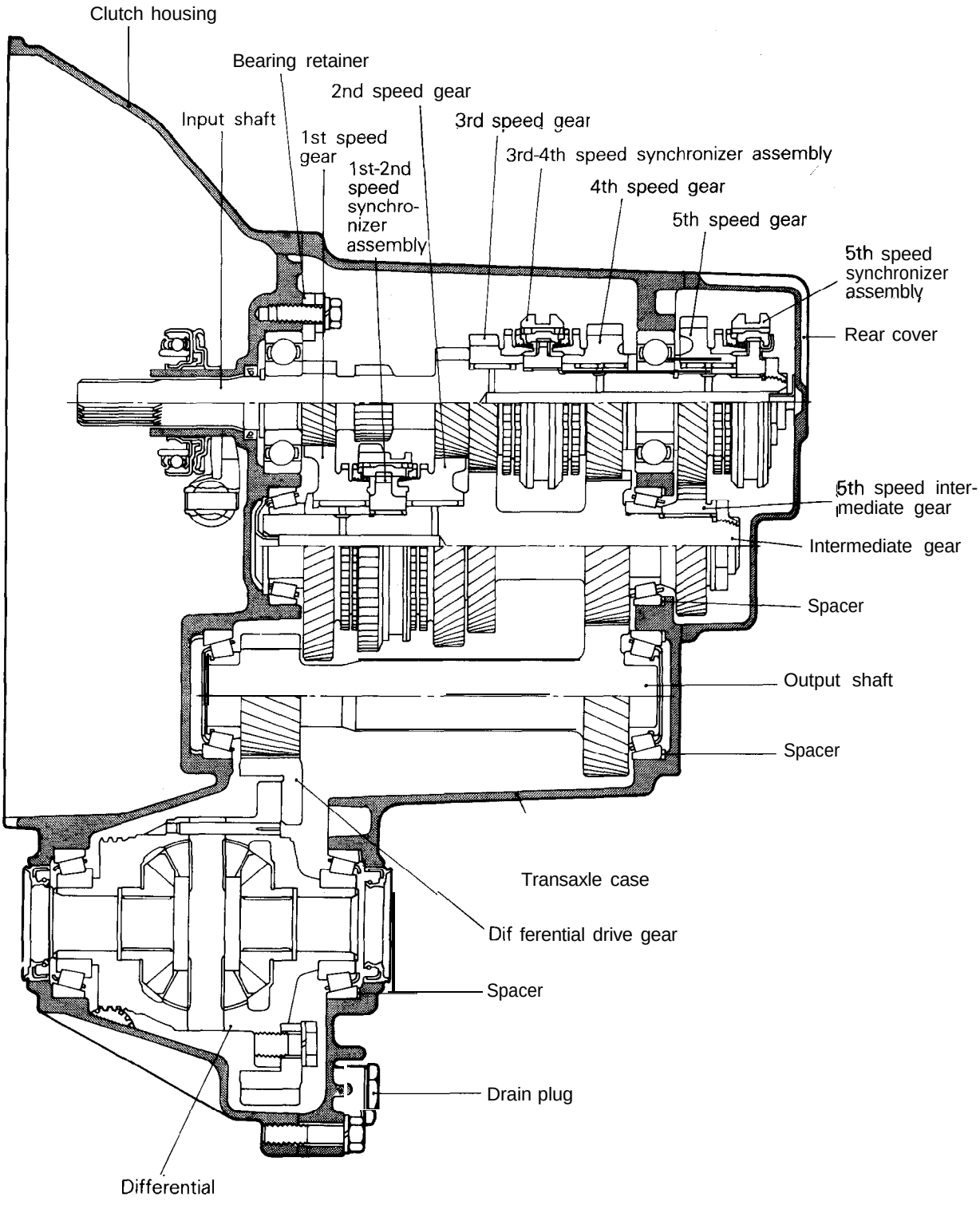
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# MANUAL TRANSAXLE <FWD>

## GENERAL INFORMATION

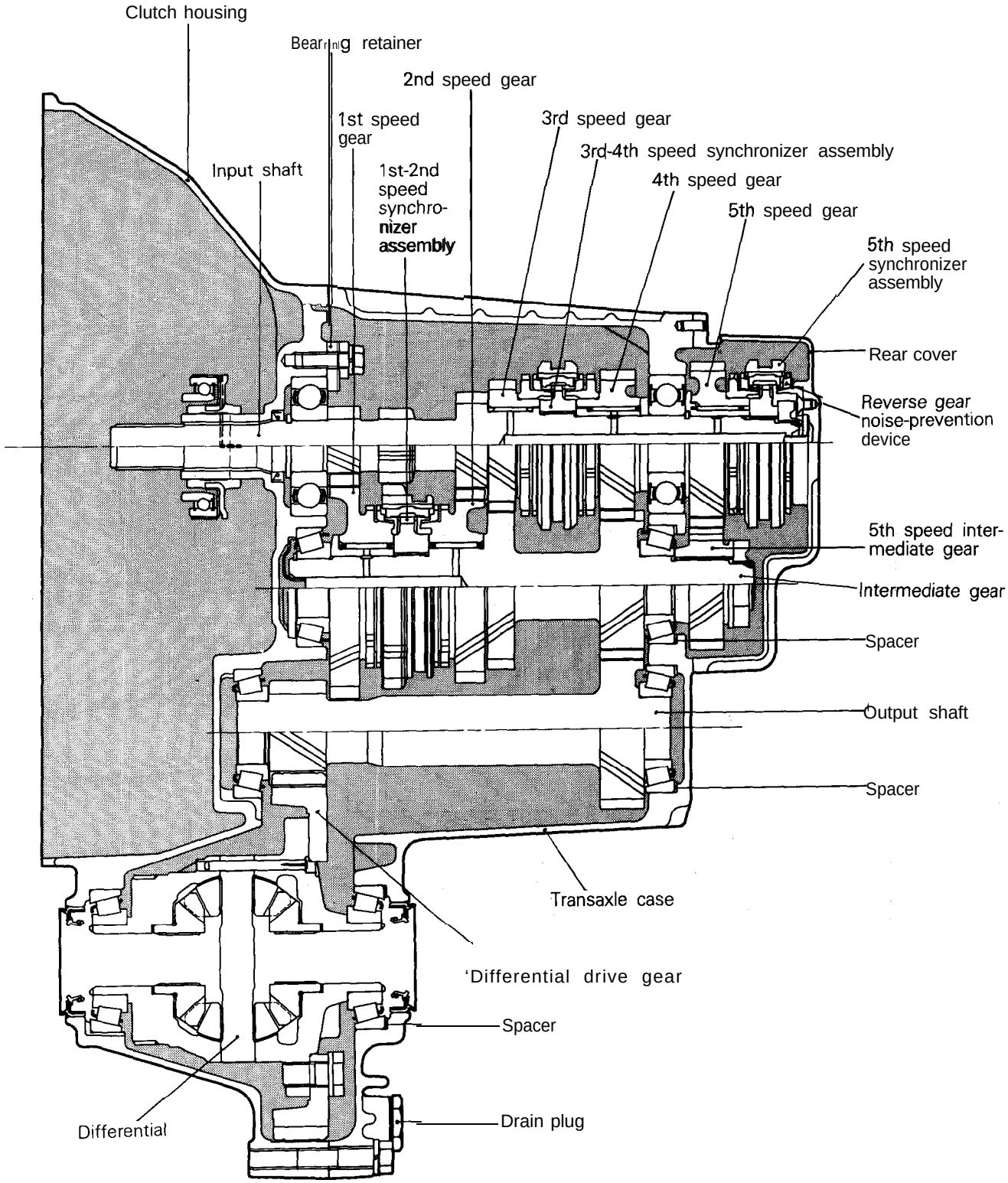
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### F5M22 (4G37 Engine)



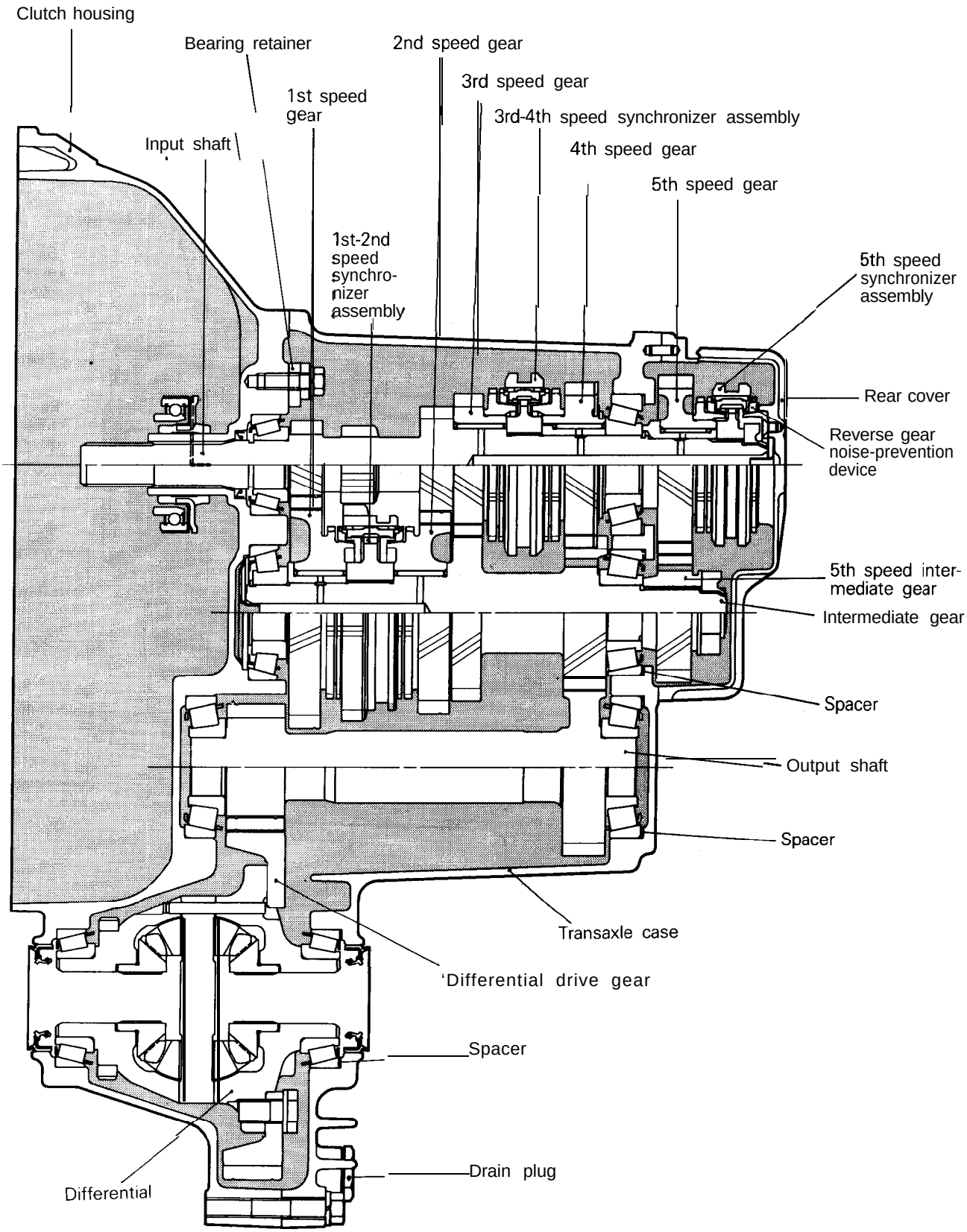

2060020

## F5M22 (4G63 Engine)




TFM0011

**F5M33**




TFM0025

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N21CA-A

| Items | Specifications | | |
|---|---|---|---|
| Model | F5M22-1-VPKV | F5M22-2-VPZV | F5M33-2-SPZV |
| Applicable engine | 4G37 | 4G63-DOHC | 4G63-DOHC (Turbo) |
| Type | 5-speed transaxle floor shift | 5-speed transaxle floor shift | 5-speed transaxle floor shift |
| Gear ratio | | | |
| 1st | 3.363 | 3.363 | 3.090 |
| 2nd | 1.947 | 1.947 | 1.833 |
| 3rd | 1.285 | 1.285 | 1.217 |
| 4th | 0.939 | 0.939 | 0.888 |
| 5th | 0.756 | 0.756 | 0.741 |
| Reverse | 3.083 | 3.083 | 3.166 |
| Final reduction ratio | 4.322 | 4.322 | 4.153 |
| Speedometer gear ratio (driven/drive) | 29/36 | 29/36 | 29/36 |
| Oil quantity liters (qts.) | 1.8 (1.9) | 1.8 (1.9) | 2.2 (2.3) |

## SERVICE SPECIFICATIONS

M22CB-A

| Items | Specifications mm (in.) |
|---|---|
| Standard value | |
| Transaxle | |
| Input shaft end play <F5M33> | 0–0.05 (0–.002) |
| Input shaft front bearing end play <F5M22> | 0.01–0.12 (.0004–.005) |
| Input shaft rear bearing end play | 0.01–0.09 (.0004–.004) |
| Intermediate gear bearing end play | 0.01–0.14 (.0004–.006) |
| Intermediate gear preload | 0.05–0.10 (.002–.004) |
| Output shaft preload | 0.05–0.10 (.002–.004) |
| Differential | |
| Differential case preload | 0.05–0.10 (.002–.004) |
| Differential pinion backlash | 0.025–0.150 (.001–.006) |
| Limit | |
| Synchronizer ring and clutch gear clearance | 0.5 (.02) |

## SNAP RING (FOR ADJUSTMENT) AND SPACER

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Snap ring (F5M22)<br>(For adjustment of input shaft front bearing end play) | 2.24 (.0882) | None | MD706537 |
| | 2.31 (.0909) | Blue | MD706538 |
| | 2.38 (.0937) | Brown | MD706539 |
| Snap ring (F5M22)<br>(For adjustment of input shaft rear bearing end play) | 1.80 (.0709) | Blue | MD730785 |
| | 1.87 (.0736) | White | MD730786 |
| | 1.94 (.0764) | None | MD730787 |
| | 2.01 (.0791) | Green | MD730788 |
| | 2.08 (.081 9) | Yellow | MD730834 |
| | 2.15 (.0846) | Brown | MD730835 |
| Snap ring (F5M33)<br>(For adjustment of input shaft rear bearing end play) | 1.40 (.0551) | Blue | MD723276 |
| | 1.45 (.0571) | Purple | MD730889 |
| | 1.50 (.0591) | Red | MD723277 |
| | 1.55 (.0610) | White | MD730890 |
| | 1.60 (.0630) | Yellow | MD723278 |
| | 1.65 (.0650) | Brown | MD730891 |
| | 1.70 (.0670) | Green | MD723279 |
| | 1.75 (.0689) | Orange | MD730892 |
| Spacer (F5M33)<br>(For adjustment of input shaft end play) | 0.80 (.031 5) | 80 | MD727661 |
| | 0.83 (.0327) | 83 | MD720937 |
| | 0.86 (.0338) | 86 | MD720938 |
| | 0.89 (.0350) | 89 | MD720939 |
| | 0.92 (.0362) | 92 | MD720940 |
| | 0.95 (.0374) | 95 | MD720941 |
| | 0.98 (.0386) | 98 | MD720942 |
| | 1 .01(.0398) | 01 | MD720943 |
| | 1.04 (.0409) | 04 | MD720944 |
| | 1.07 (.0421) | 07 | MD720945 |
| | 1.10 (.0433) | J | MD71 0454 |
| | 1 .13(.0445) | D | MD700270 |
| | 1.16 (.0457) | K | MD71 0455 |
| | 1.19 (.0468) | L | MD71 0456 |
| | 1.22 (.0480) | G | MD700271 |
| | 1.25 (.0492) | M | MD71 0457 |
| | 1.28 (.0504) | N | MD71 0458 |
| | 1.31 (.0516) | E | MD706574 |
| | 1.34 (.0527) | 0 | MD710459 |
| | 1.37 (.0539) | P | MD710460 |
| | 1.40 (.0551) | – | MD706573 |
| | 1.43 (.0563) | Q | MD710461 |
| | 1.46 (.0575) | R | MD7 10462 |
| nap ring<br>or adjustment of intermediate gear front bearing nd play) | 1 . 4 (.0551) | None | MD703779 |
| | 1.5 (.0591) | Brown | MD703780 |
| | 1.6 (.0630) | Blue | MD703781 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Spacer (F5M22)<br>(For adjustment of intermediate gear preload) | 0.68 (.0268) | 68 | MD735663 |
| | 0.71 (.0280) | 71 | MD735664 |
| | 0.74 (.0291) | 74 | MD735665 |
| | 0.77 (.0303) | 77 | MD735666 |
| | 0.80 (.0315) | 80 | MD723307 |
| | 0.83 (.0327) | 83 | MD723308 |
| | 0.86 (.0338) | 86 | MD723309 |
| | 0.89 (.0350) | 89 | MD723310 |
| | 0.92 (.0362) | 92 | MD723311 |
| | 0.95 (.0374) | 95 | MD723312 |
| | 0.98 (.0394) | 98 | MD723313 |
| | 1.01 (.0398) | 01 | MD723314 |
| | 1.04 (.0409) | 04 | MD723315 |
| | 1.07 (.0421) | 07 | MD723316 |
| | 1.10 (.0433) | 10 | MD723317 |
| | 1.13 (.0445) | 13 | MD723318 |
| | 1.16 (.0457) | 16 | MD723319 |
| | 1.19 (.0468) | 19 | MD723320 |
| | 1.22 (.0480) | 22 | MD723321 |
| | 1.25 (.0492) | 25 | MD723322 |
| | 1.28 (.0504) | 28 | MD723323 |
| | 1.31 (.0516) | 31 | MD723324 |
| | 1.34 (.0527) | 34 | MD723325 |
| | 1.37 (.0539) | 37 | MD723326 |
| Spacer (F5M33)<br>For adjustment of intermediate gear preload) | 0.80 (.0315) | 80 | MD724142 |
| | 0.83 (.0327) | 83 | MD724143 |
| | 0.86 (.0338) | 86 | MD724144 |
| | 0.89 (.0350) | 89 | MD724145 |
| | 0.92 (.0362) | 92 | MD724146 |
| | 0.95 (.0374) | 95 | MD724147 |
| | 0.98 (.0386) | 98 | MD724148 |
| | 1.01 (.0398) | 01 | MD724149 |
| | 1.04 (.0409) | 04 | MD724150 |
| | 1.07 (.0421) | 07 | MD724151 |
| | 1.10 (.0433) | 10 | MD724152 |
| | 1.13 (.0445) | 13 | MD724153 |
| | 1.16 (.0457) | 16 | MD724154 |
| | 1.19 (.0468) | 19 | MD724155 |
| | 1.22 (.0480) | 22 | MD724156 |
| | 1.25 (.0492) | 25 | MD724157 |
| | 1.28 (.0504) | 28 | MD724158 |
| | 1.31 (.0516) | 31 | MD724159 |
| | 1.34 (.0527) | 34 | MD724160 |
| | 1.37 (.0539) | 37 | MD724161 |
| Spacer<br>For adjustment of output shaft preload) | 0.83 (.0327) | 83 | MD720949 |
| | 0.86 (.0338) | 86 | MD720950 |
| | 0.89 (.0350) | 89 | MD720951 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Spacer (For adjustment of output shaft preload) | 0.92 (.0362) | 92 | MD720952 |
| | 0.95 (.0374) | 95 | MD720953 |
| | 0.98 (.0386) | 98 | MD720954 |
| | 1.01(.0398) | 01 | MD720955 |
| | 1.04 (.0409) | 04 | MD720956 |
| | 1.07 (.0421) | 07 | MD720957 |
| | 1.10 (.0433) | 10 | MD720958 |
| | 1.13(.0445) | 13 | MD720959 |
| | 1.16 (.0457) | 16 | MD720960 |
| | 1.19(.0468) | 19 | MD720961 |
| | 1.22 (.0480) | 22 | MD720962 |
| | 1.25 (.0492) | 25 | MD712346 |
| | 1.28 (.0504) | 28 | MD712347 |
| | 1.31 (.0516) | 31 | MD712348 |
| | 1.34 (.0527) | 34 | MD712349 |
| Spacer (F5M33) (For adjustment of output shaft preload) | 0.83 (.0327) | 83 | MD720937 |
| | 0.86 (.0338) | 86 | MD720938 |
| | 0.89 (.0350) | 89 | MD720939 |
| | 0.92 (.0362) | 92 | MD720940 |
| | 0.95 (.0374) | 95 | MD720941 |
| | 0.98 (.0386) | 98 | MD720942 |
| | 1.01(.0398) | 01 | MD720943 |
| | 1.04 (.0409) | 04 | MD720944 |
| | 1.07 (.0421) | 07 | MD720945 |
| | 1.10(.0433) | J | MD710454 |
| | 1.13(.0445) | D | MD700270 |
| | 1.16 (.0457) | K | MD710455 |
| | 1.19(.0468) | L | MD710456 |
| | 1.22 (.0480) | G | MD700271 |
| | 1.25 (.0492) | M | MD710457 |
| | 1.28 (.0504) | N | MD710458 |
| | 1.31 (.0516) | E | MD706574 |
| | 1.34 (.0527) | 0 | MD710459 |
| Spacer (For adjustment of differential case preload) | 0.80 (.0315) | 80 | MD727661 |
| | 0.83 (.0327) | 83 | MD720937 |
| | 0.86 (.0338) | 86 | MD720938 |
| | 0.89 (.0350) | 89 | MD720939 |
| | 0.92 (.0362) | 92 | MD720940 |
| | 0.95 (.0374) | 95 | MD720941 |
| | 0.98 (.0394) | 98 | MD720942 |
| | 1.01 (.0398) | 01 | MD720943 |
| | 1.04 (.0409) | 04 | MD720944 |
| | 1.07 (.0421) | 07 | MD720945 |
| | 1.10(.0433) | J | MD710454 |
| | 1.13(.0445) | D | MD700270 |
| | 1.16(.0457) | K | MD710455 |
| | 1.19 (.0468) | L | MD710456 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Spacer (For adjustment of differential case preload) | 1.22 (.0480) | G | MD700271 |
| | 1.25 (.0492) | M | MD710457 |
| Spacer (For adjustment of differential pinion backlash) | 0.75–0.82 (.0295–.0323) | – | MA180862 |
| | 0.83–0.92 (.0327–.0362) | – | MA180861 |
| | 0.93–1.00 (.0366–.0394) | – | MA180860 |
| | 1.01–1.08 (.0398–.0425) | – | MA180875 |
| | 1.09–1.16 (.0429–.0457) | – | MA186876 |

## TORQUE SPECIFICATIONS

N21CC-A

| Items | Nm | ft.lbs. |
|---|---|---|
| Shift lever to lever (A) | 19-28 | 13–20 |
| Lever (A) to bracket assembly | 17-26 | 12-18 |
| Drain plug | 30–35 | 22-25 |
| Filler plug | 30–35 | 22-25 |
| Starter motor mounting bolt | 27-34 | 20–25 |
| Transaxle bracket | 60–80 | 43-58 |
| Shift lever knob | 4.5-7.5 | 3-5 |
| Shift cable and select cable to body | 9-14 | 7–10 |
| Shift lever assembly to body | 9-14 | 7–10 |
| Automatic seat belt guide ring attaching bolt | 17-26 | 12-19 |
| Clutch release cylinder mounting bolt | 15-22 | 11–16 |
| Clutch tube to transaxle assembly | 15-22 | 11–16 |
| Transaxle mount bracket to transaxle | 60–80 | 43-58 |
| Shift cable and select cable to transaxle | 15-22 | 11–16 |
| Under cover | 9-13 | 7–10 |
| Transaxle mounting bolt [12 mm (.47 in.) diameter bolt] | 43-55 | 32-39 |
| Transaxle mounting bolt [IO mm (.40 in.) diameter bolt] | 30–35 | 22-25 |
| Transaxle mounting bolt [8 mm (.31 in.) diameter bolt] | 10–12 | 7-9 |
| Tie rod end to knuckle | 24-35 | 17-25 |
| Lower arm ball joint to knuckle | 60–72 | 43-52 |
| Bell housing cover | 10–12 | 7-9 |
| Rear cover bolt | 15-22 | 11–15 |
| Backup light switch | 30–35 | 22-25 |
| Poppet plug | 30–42 | 22–30 |
| Speedometer sleeve bolt | 3.0–5.0 | 2.5-3.5 |
| nput shaft lock nut | 140–160 | 102–115 |
| ntermediate gear lock nut | 140–160 | 102–115 |
| Reverse idler gear shaft bolt | 43-55 | 32-39 |
| Transaxle case tightening bolt | 35-42 | 26–30 |
| stopper bracket bolt | 15–22 | 11-15 |
| Restrict ball assembly | 30–35 | 22-25 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Reverse shift lever assembly attaching bolt | 15–22 | 11-15 |
| Bearing retainer bolt | 15-22 | 11-15 |
| Differential drive gear bolt | 130–140 | 94–101 |
| Interlock plate bolt | 20–27 | 15-19 |
| Select lever assembly mounting bolt | 15-22 | 11-15 |

## LUBRICANTS

N21CD-A

| Items | Specified lubricant | Quantity lit. (qts.) |
|---|---|---|
| Manual transaxle oil | MOPAR Hypoid gear oil or equivalent API classification GL-4 or higher | <F5M22> 1.8 (1.9)<br><F5M33> 2.2 (2.3)' |
| Drive shaft oil seal lip | MOPAR Hypoid gear oil or equivalent API classification GL-4 or higher | As required |
| Shift lever bushing | MOPAR Front Wheel Bearing Grease Part No. 3837794 or equivalent | As required |

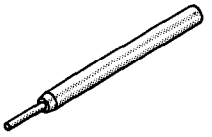
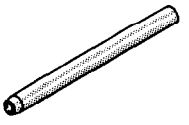
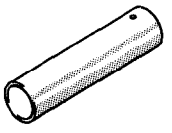
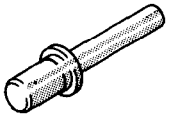
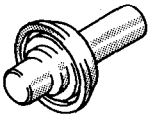
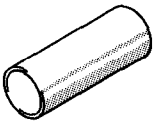
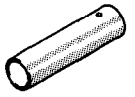
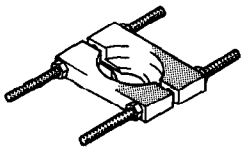
## SEALANTS AND ADHESIVES

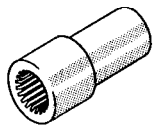
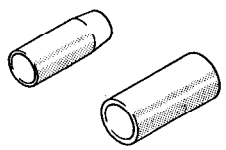
N21CE-A

| Items | Specified sealants and adhesives |
|---|---|
| Transaxle case-clutch housing mating surfaces<br>Transaxle case-rear cover mating surfaces | Mitsubishi genuine Part No. MD997740 or equivalent |
| Differential drive gear bolts<br>Bearing retainer screw (flush head screw) | MOPAR Part No. 4318031 or MOPAR Part No. 4318032 or equivalent |
| Air breather | MOPAR Part No. 4318025 or equivalent |

# SPECIAL TOOLS

N21DA-A

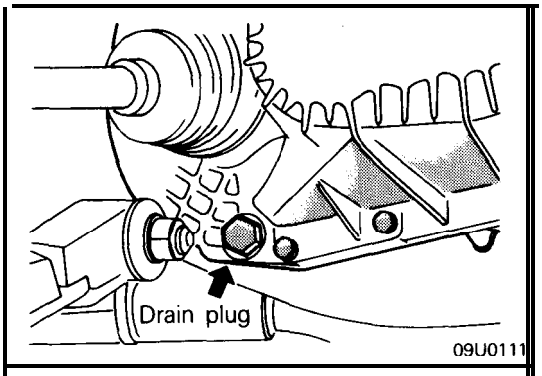
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB991113 | Steering linkage puller | Removal of the lower arm joint and tie rod end ball joint |
|  | MD998019 | Lock pin extractor | Removal of spring pin and lock pin |
|  | MD998245 | Lock pin installer | Installation of spring pin and lock pin |
|  | MD998320 | Bearing installer | Installation of input shaft bearing and input shaft gear and input shaft bearing sleeve |
|  | MD998321 | Oil seal installer | Installation of input shaft oil seal |
|  | MD998325 | Differential oil seal installer | Installation of differential oil seal |
|  | MD998350 | Bearing installer | Installation of 1st-2nd speed synchronizer assembly and 1st speed gear bearing sleeve |
|  | MD998369 | Bearing installer | Installation of input shaft front bearing |
|  | MD998801 | Bearing remover | Removal of gears and bearings of input shaft, intermediate shaft and output shaft |

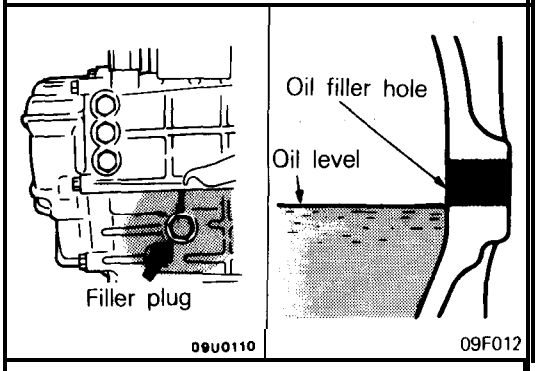
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998802 | Input shaft holder | Installation and removal of input shaft and intermediate shaft lock nut |
|  | MD998808 | Snap ring installer | Installation of input shaft rear snap ring |
|  | MD998812 | Installer cap | Use with MD998818, MD998822 |
|  | MD998819 | Installer adapter | Installation of differential case bearing |
|  | MD998822 | Installer adapter | Installation of differential case bearing |

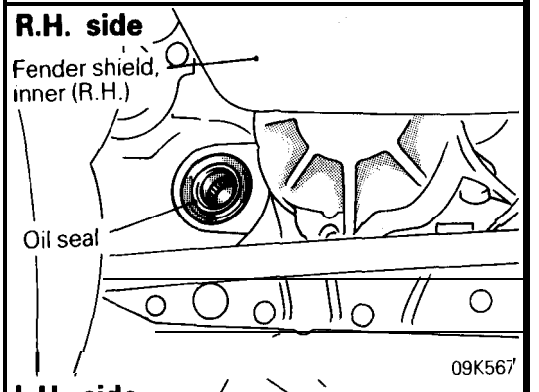
## TROUBLESHOOTING

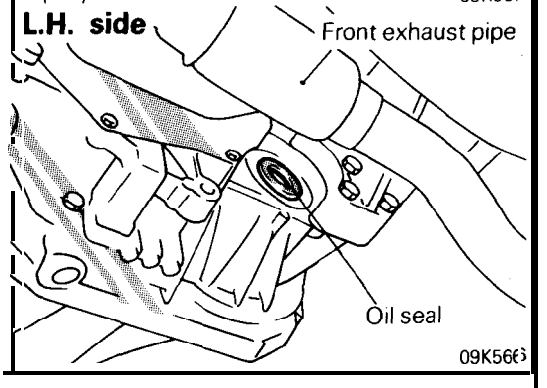
N21EAABa

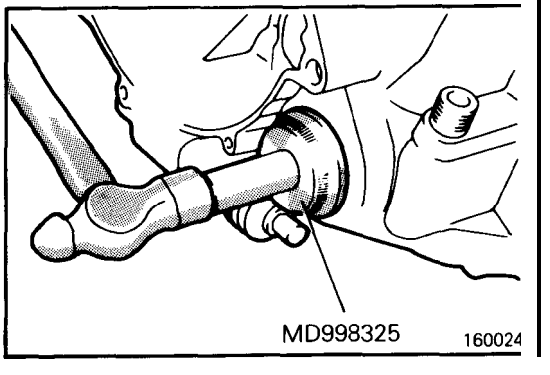
| Symptom | Probable cause | Remedy |
|---|---|---|
| Vibration, noise | a. Loose or damaged transaxle and engine mounts | a. Tighten or replace mounts |
| | b. Inadequate shaft end play | b. Correct end play |
| | c. Worn of damaged gears | c. Replace gears |
| | d. Use of inadequate grade of oil | d. Replace with specified oil |
| | e. Low oil level | e. Replenish |
| | f. Inadequate engine idle speed | f. Adjust idle speed |
| Oil leakage | a. Broken or damaged, oil seal or O-ring | a. Replace oil seal or O-ring |
| Hard shift | a. Faulty control cable | a. Replace control cable |
| | b. Poor contact or wear of synchronizer ring and gear cone | b. Correct or replace |
| | c. Weakened synchronizer spring | c. Replace synchronizer spring |
| | d. Use of inadequate grade of oil | d. Replace with specified oil |
| Jumps out of gear | a. Worn gear shift fork or broken poppet spring | a. Replace shift fork or poppet spring |
| | b. Synchronizer hub to sleeve spline clearance too large | b. Replace synchronizer hub and sleeve |




# SERVICE ADJUSTMENT PROCEDURES

N21FBAB1

## TRANSAXLE OIL LEVEL INSPECTION

Refer to GROUP O-Maintenance Service.

## TRANSAXLE OIL REPLACEMENT

N21FCADa

(1) Position vehicle on a flat level.
(2) Remove filler and drain plugs and allow the transaxle oil to drain.
(3) Refill the transaxle to the proper level with specified transaxle oil. The oil level should be the bottom of the oil filler hole.

**Transaxle oil: MOPAR Hypoid gear oil or equivalent API classification GL-4 or hiqher**
**<F5M22> 1.8 liters (1.9 qts.)**
**<F5M33> 2.2 liters '(2.3 qts.)**

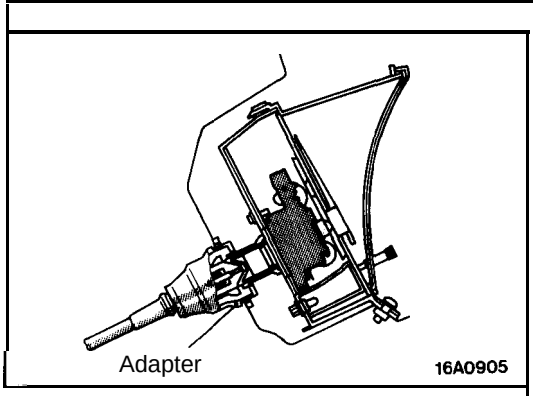
## DRIVE SHAFT OIL SEALS REPLACEMENT

N21FDACa

(1) Disconnect the drive shaft from the transaxle. (Refer to GROUP 2–Drive Shaft.)
(2) Using a flat-tip (–) screwdriver, remove the oil seal.

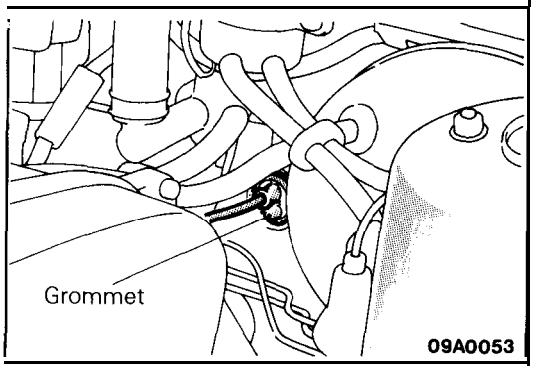
(3) Using the special tool, tap the drive shaft oil seal into the transaxle.
(4) Apply a coating of the transaxle oil to the lip of the oil seal.

**Transaxle oil: MOPAR Hypoid gear oil or equivalent API classification GL-4 or higher**




## SPEEDOMETER CABLE REPLACEMENT N21FEAK1

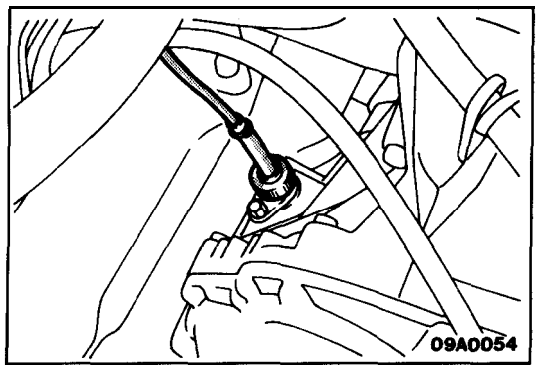
1. Correctly insert the adapter into the instrument panel, and fasten the new speedometer cable.




2. Install the grommet so that, as shown in the illustration, the cable attachment is positioned upward.

**Caution**

1. **The cable arrangement should be made so that the radius of cable bends is 150 mm (5.9 in.) or more.**
2. **The arrangement of the speedometer cable should be such that it does not interfere with other parts.**




3. At the transaxle end of the speedometer cable, the key joint should be inserted into the transaxle, and the nut should be securely tightened.

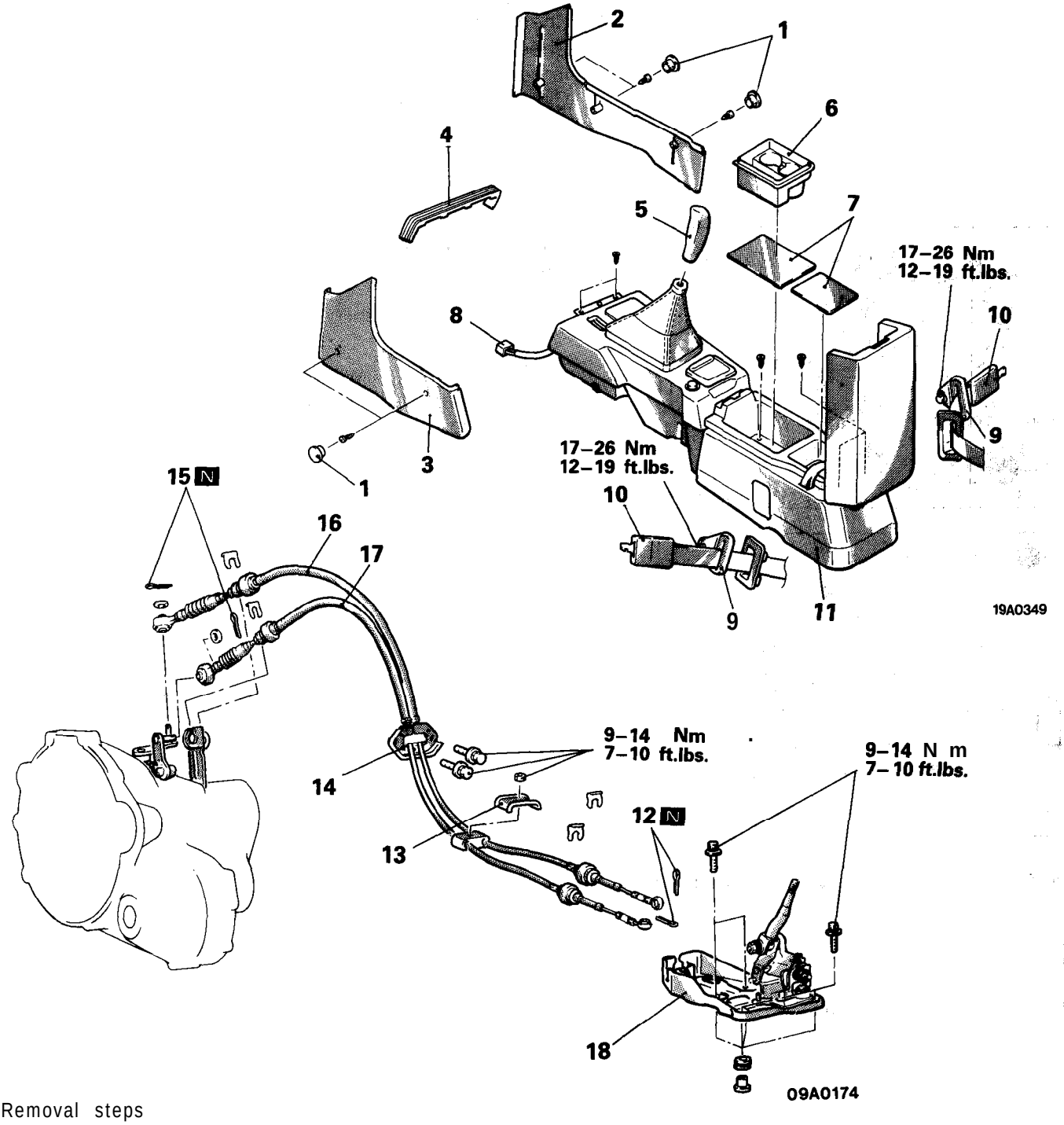
**Caution**

**If the cable is not correctly and securely connected, it may cause incorrect indication by the speedometer, or abnormal noise. Be sure to connect it correctly.**

# TRANSAXLE CONTROL

## REMOVAL AND INSTALLATION

N21JA-A



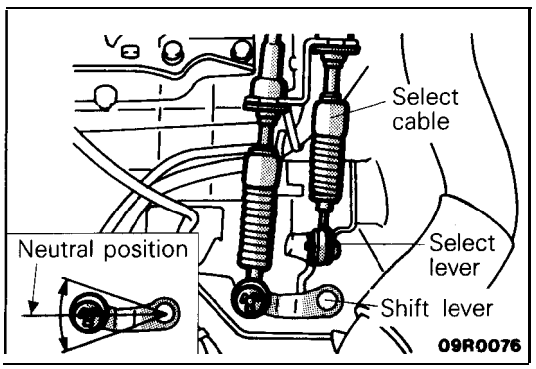

Removal steps

1. Plug
2. Side cover (A)
3. Side cover(B)
4. Cover(B)
5. Manual transaxle shift lever knob
6. Cup holder
7. Carpet
8. Connection for floor console wiring harness
9. Guide ring
10. Shoulder belt
11. Floor console
12. Cotter pin
13. Retainer
14. Retainer
15. Cotter pin
16. Shift cable
17. Select cable
18. Shift lever assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".
(3) N: Non-reusable parts

## INSPECTION N21JCAD

- Check the select cable for function and for damage.
- Check the shift cable for function and for damage.
- Check the boot for damage.
- Check each bushing for wear or abrasion, sticking, impeded action, and damage.
- Check the spring for deteriorated strength.

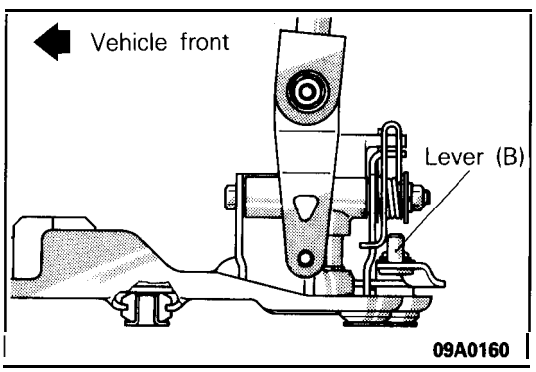



## SERVICE POINTS OF INSTALLATION N21JDAK

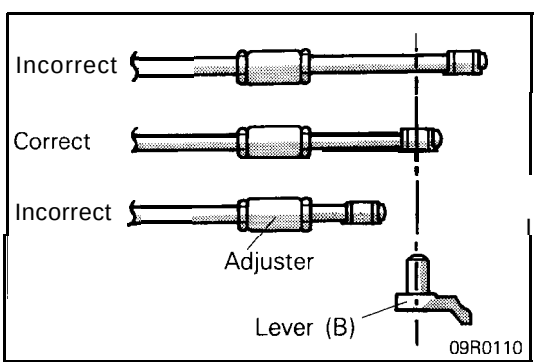
### 17. INSTALLATION OF SELECT CABLE

(1) Move the transaxle shift lever to the neutral position.

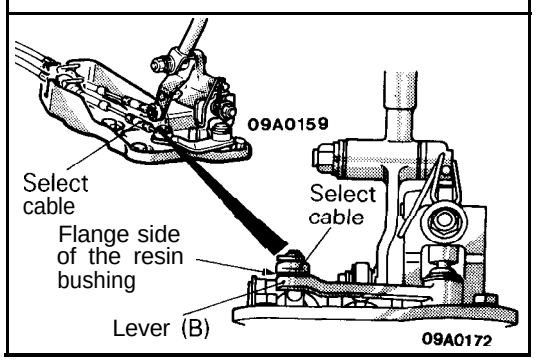
NOTE
The select lever will be set to the neutral position when the transaxle shift lever is moved to the neutral position.



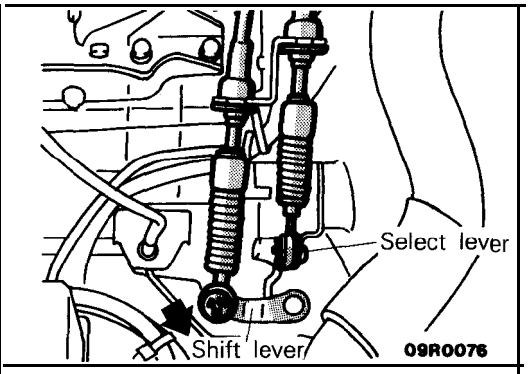

(2) Move lever (B) to the neutral position.




(3) Adjust, by using the adjuster, so that the end of the select cable is positioned as shown in the illustration relative to lever (B).



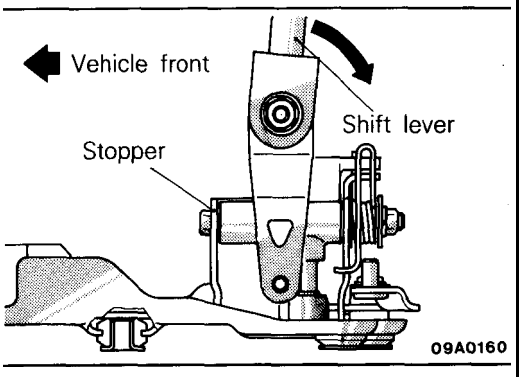

(4) The flange side of the resin bushing at the select cable end should be at the lever (B) end surface.



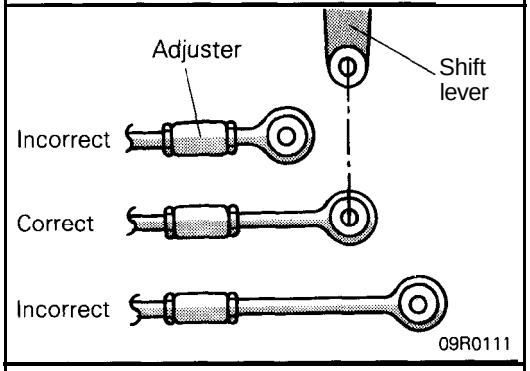

## 16. INSTALLATION OF SHIFT CABLE

(1) With the select lever in neutral, move the transaxle shift lever (in the direction shown in the illustration) to set it to 4th gear.

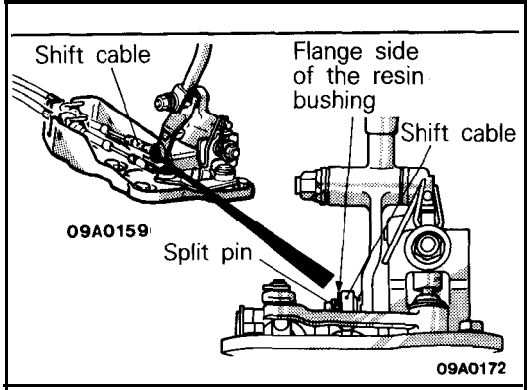
NOTE
If the shift lever does not move easily, depress and hold the clutch pedal.



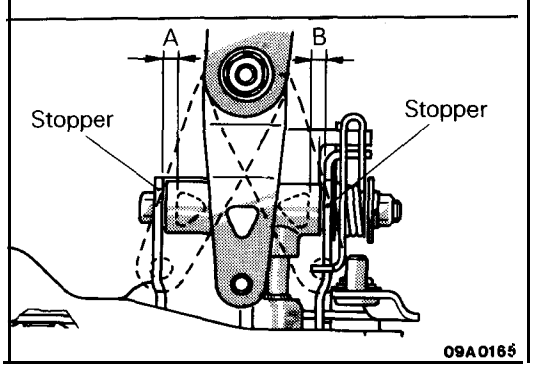

(2) Move the shift lever (at the vehicle interior side) downward, in the direction (4th gear position) shown in the illustration until it contacts the stopper.




(3) Adjust, by using the adjuster, so that the end of the shift cable is positioned as shown in the illustration relative to the shift lever (interior side).




(4) The flange side of the resin bushing at the shift cable end should be at the split pin side.



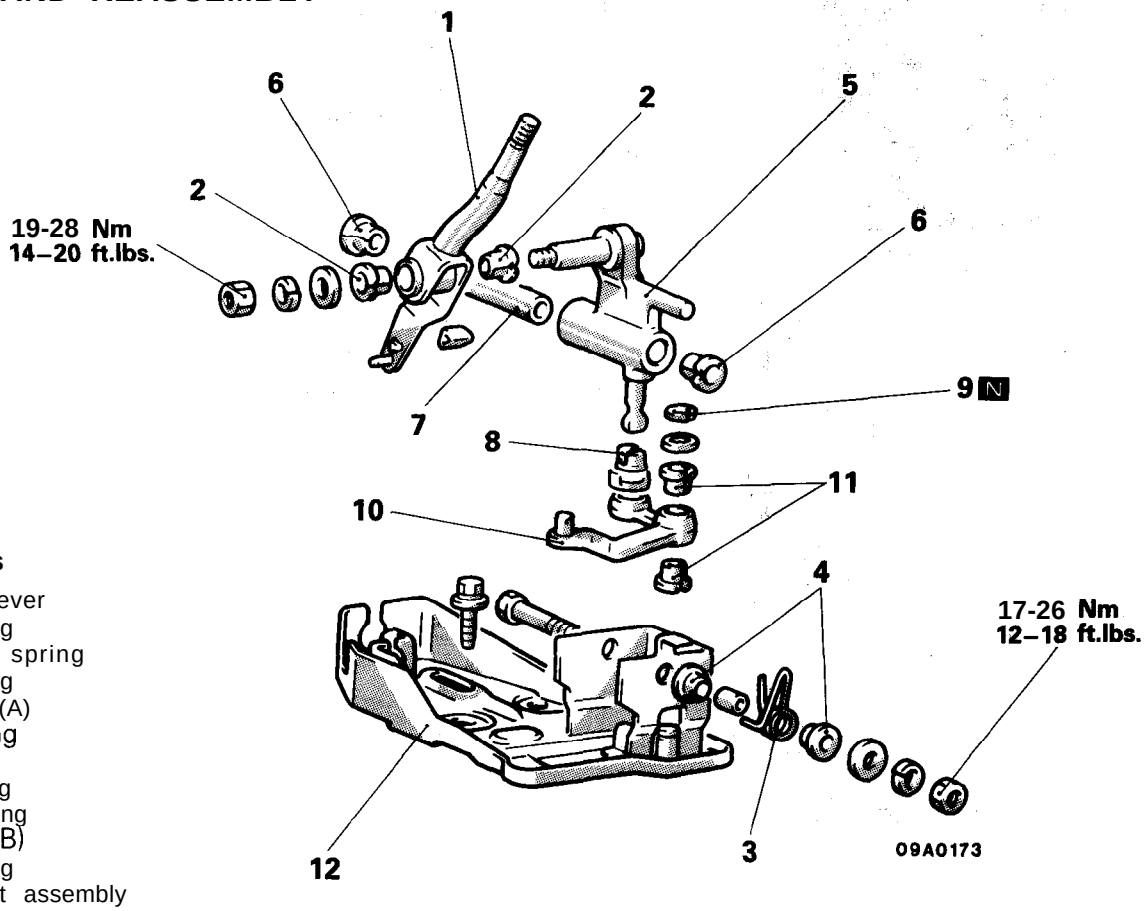

(5) Adjust the length of the shift cable, by using the adjuster, so that the clearance (A) and (B) between the shift lever and the two stoppers are equal when the shift lever is shifted to 3rd gear and 4th gear.

(6) Move the shift lever to each position and check that the shifting is smooth.

# SHIFT LEVER ASSEMBLY

## DISASSEMBLY AND REASSEMBLY

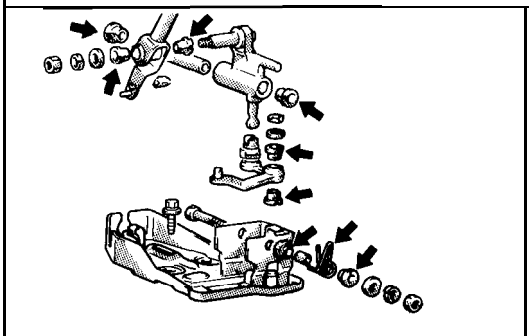
N21GE-A

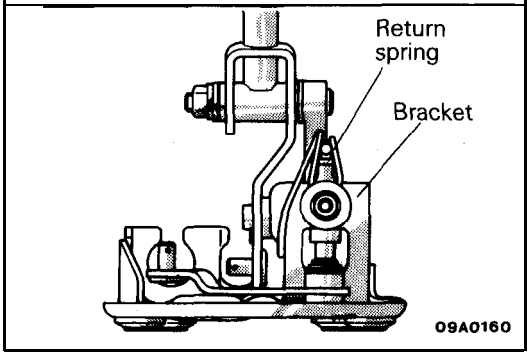



**Disassembly steps**

1. Shift lever
2. Bushing
3. Return spring
4. Bushing
5. Lever (A)
6. Bushing
7. Collar
8. Bushing
9. Snap ring
10. Lever (B)
11. Bushing
12. Bracket assembly

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● + : Refer to "Service Points of Reassembly".
(3) •J : Non-reusable parts.






## SERVICE POINTS OF REASSEMBLY

N21GHAP

### 11./8./6./4./3./2. APPLICATION OF GREASE TO BUSHINGS

Apply multi-purpose grease to the sliding part of the bushings shown in the figure.

**Grease: MOPAR Front Wheel Bearing Grease Part No.3837794 or equivalent**

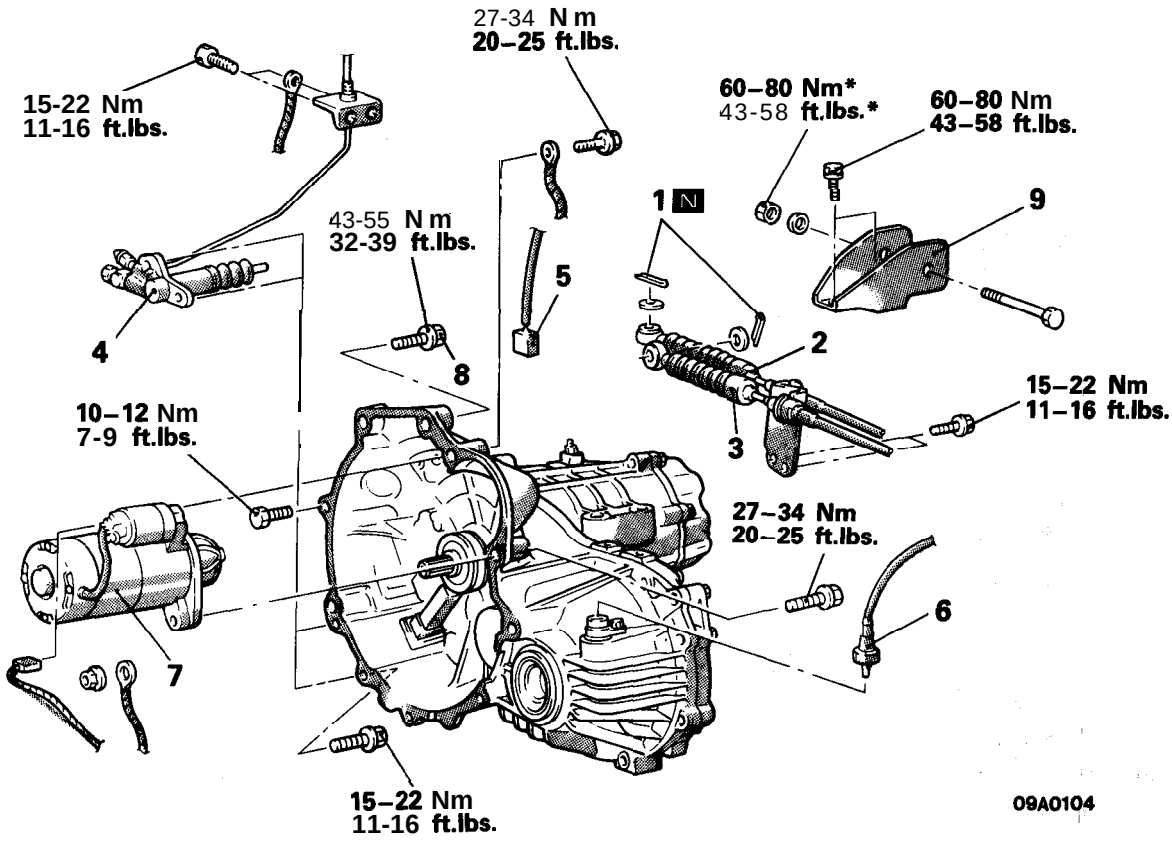
### 3. INSTALLATION OF RETURN SPRING

Make sure that the end of the spring contacts the part (shown in the illustration) of the bracket.

# TRANSAXLE

## REMOVAL AND INSTALLATION

N21MA-A



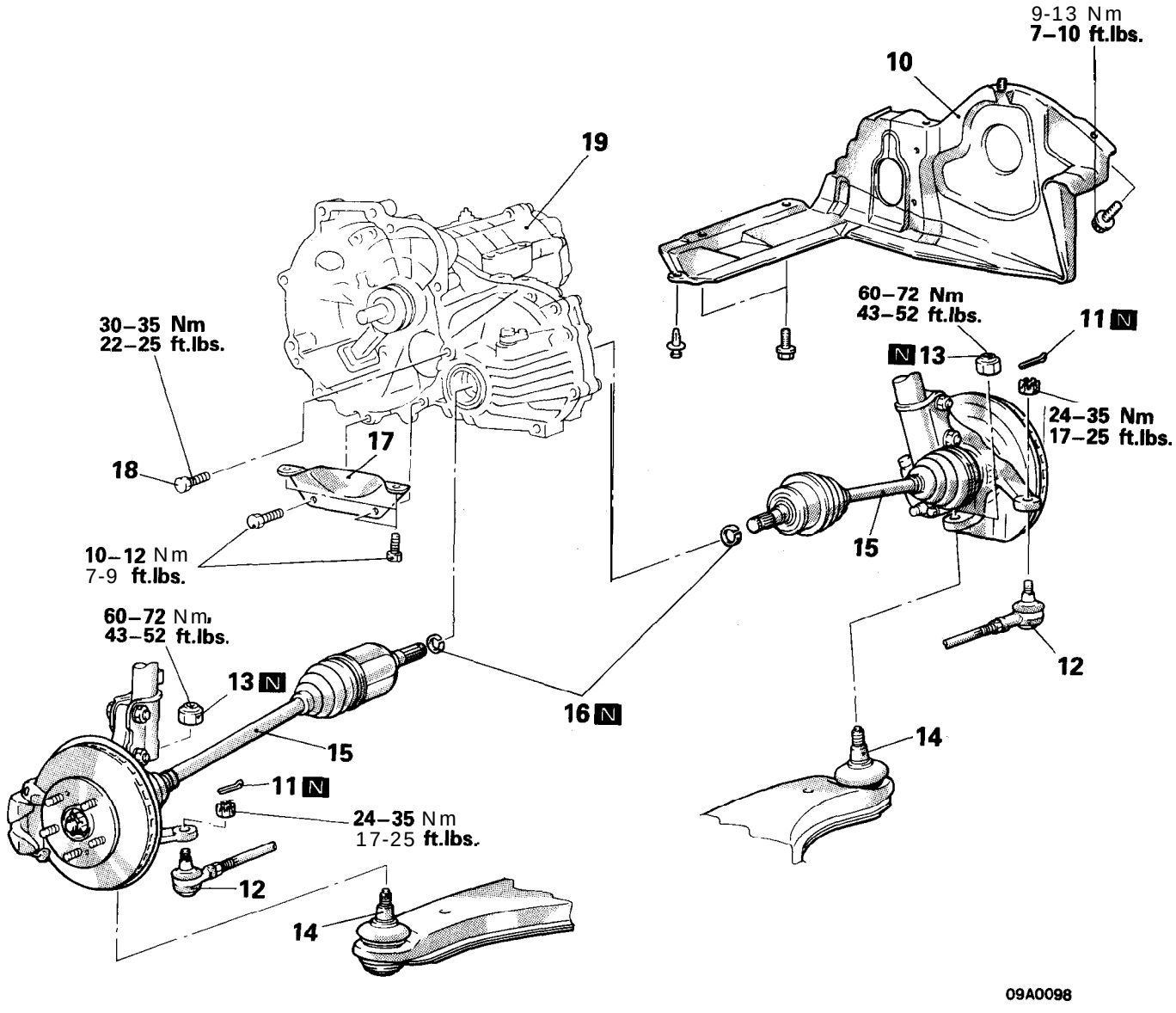

**Pre-removal Operation**
- Removal of the Battery
- Draining of the Transaxle Oil (Refer to P.21-13.)
- Removal of the Air Hose
  (Refer to GROUP 11–Air Cleaner.)

**Post-installation Operation**
- installation of the Battery
- supplying of Transaxle Oil (Refer to P.21-13.)
- Installation of the Air Hose
  (Refer to GROUP 11 -Air Cleaner.)
- checking the Operation of the Shift Lever
- checkina the Operation of the Meters and Gauges

**Removal steps**

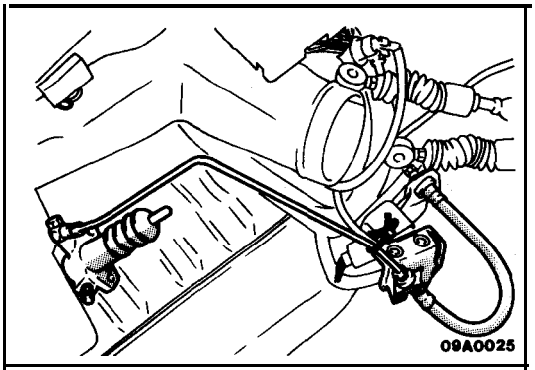
1. Cotter pin
2. Connection for select cable
3. Connection for shift cable
4. ◆◆ Connection for clutch release cylinder
5. Backup light switch connector
6. Connection for speedometer cable
7. ◆◆ Starter
8. Transaxle assembly upper part coupling bolt
9. Transaxle mount bracket

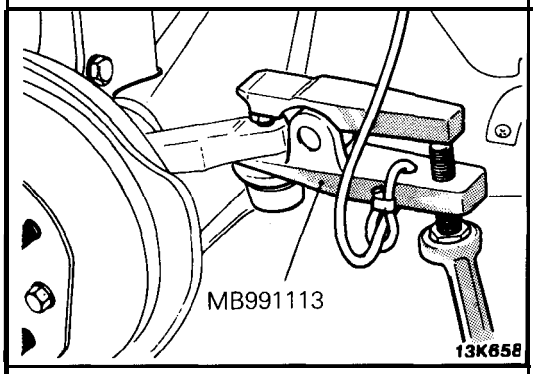
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) For tightening locations indicated by the * symbol, first tighten temporarily, and then make the final tightening with the entire weight of the engine applied to the vehicle body.
(6) If the grease has been wiped from the input shaft spline or if the input shaft has been replaced, apply special grease (MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent) to the input shaft spline.

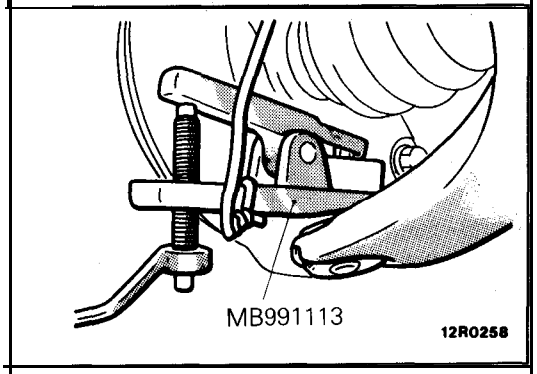


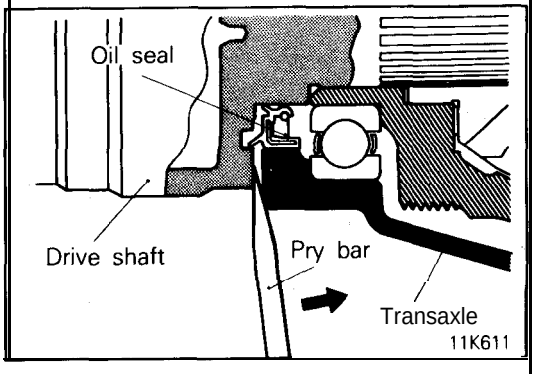

◆◆ 10. Under cover
11. Cotter pin
◆◆ 12. Connection for tie rod end
13. Self-locking nut
◆◆ 14. Connection for lower arm ball joint
◆◆ ● I 15. Connection for drive shaft
16. Circlip
17. Bell housing *cover*
18. Transaxle assembly lower part coupling bolt
◆◆◆◆ 19. Transaxle assembly

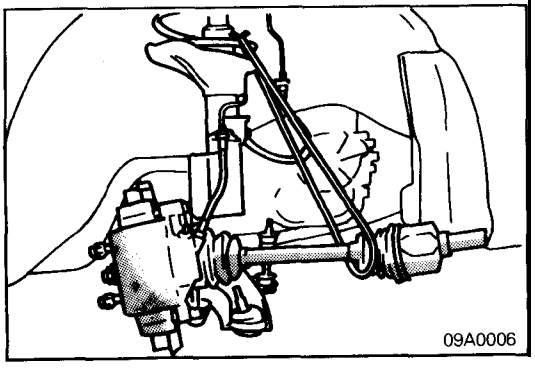
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL N12MBAR

**4. DISCONNECTION OF CLUTCH 'RELEASE CYLINDER FROM TRANSAXLE ASSEMBLY**

Remove the clutch release cylinder and clutch oil line bracket installation bolt, and then secure at the body side without disconnecting the oil line coupling.

**10. REMOVAL OF UNDER COVER**

Lift the vehicle before removing the under cover.

**12. DISCONNECTION OF TIE ROD END FROM KNUCKLE**

Using the special tool, disconnect the tie rod end from the knuckle.

**Caution**

**1. Be sure to tie the cord of the special tool to the nearby part.**
**2. Loose the nut but do not remove it.**

**14. DISCONNECTION OF LOWER ARM BALL JOINT**

Using the special tool, disconnect the lower arm ball joint from the knuckle.

**Caution**

**1. Be sure to tie the cord of the special tool to the nearby part.**
**2. Loose the nut but do not remove it.**

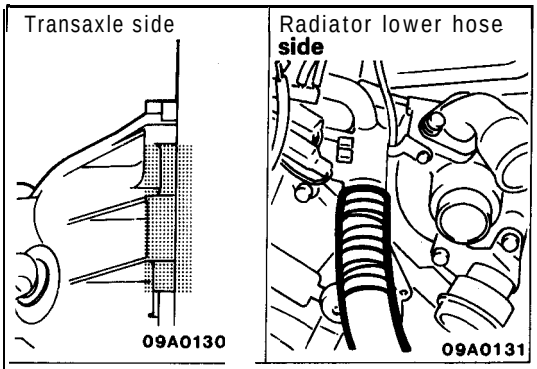
**15. DISCONNECTION OF DRIVE SHAFT**

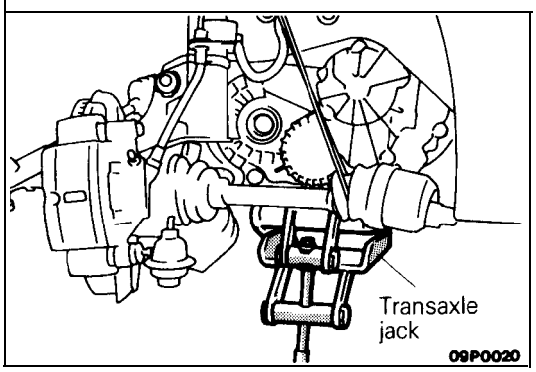
(1) Insert a pry bar between the transaxle case and the drive shaft, and then pry the drive shaft from the transaxle.

**Caution**

**1. Do not pull on the drive shaft; doing so will damage the inboard joint; be sure to use the pry bar.**
**2. Do not insert the pry bar so deep as to damaged the oil seal.**

(2) Keep the removed drive shaft as far away from the transaxle case as possible, and secure (by using rope, etc.) the joints to the body so that it does not fall.



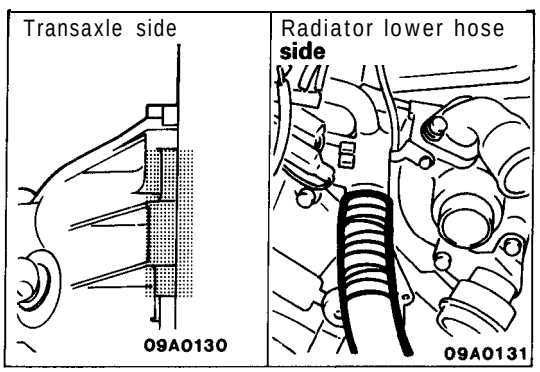




### 19. REMOVAL OF TRANSAXLE ASSEMBLY

**Caution**
**On the turbo vehicle, take care to prevent damaging the lower hose of the radiator with the end of the transaxle housing.**
**As a protective countermeasure, wind tape around the lower hose and the transaxle housing at the positions shown in the figure.**

Support the transaxle assembly by using a transaxle jack; then, after moving the transaxle assembly to the right, lower it.

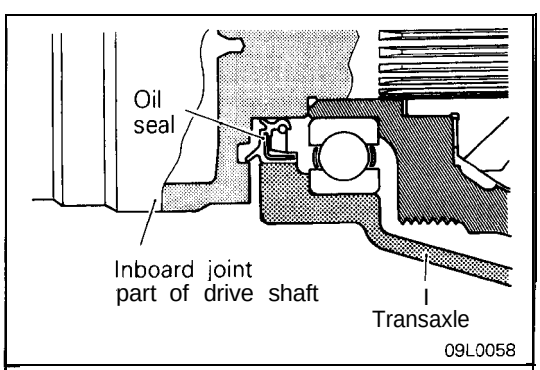
NOTE
When supporting the transaxle assembly by the transaxle jack, take care to be sure that the jack's force is applied to a wide area, not to only a small localized area.




## SERVICE POINTS OF INSTALLATION N21MDAP

### 19. INSTALLATION OF TRANSAXLE ASSEMBLY

**Caution**
**On the turbo vehicle, take care to prevent damaging the lower hose of the radiator with the end of the transaxle housing.**
**As a protective countermeasure, wind tape around the lower hose and the transaxle housing at the positions shown in the figure.**

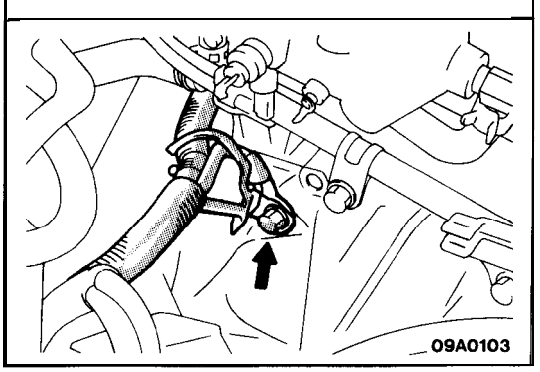



### 15. INSTALLATION OF DRIVE SHAFT

(1) Provisionally install the drive shaft so that the inboard joint part of the drive shaft is straight, and not bent relative to the transaxle.

**Caution**
**Care must be taken to ensure that the oil seal lip part of the transaxle is not damaged by the serrated part of the drive shaft.**

(2) Align the serrations and securely insert the drive shaft into the transaxle.



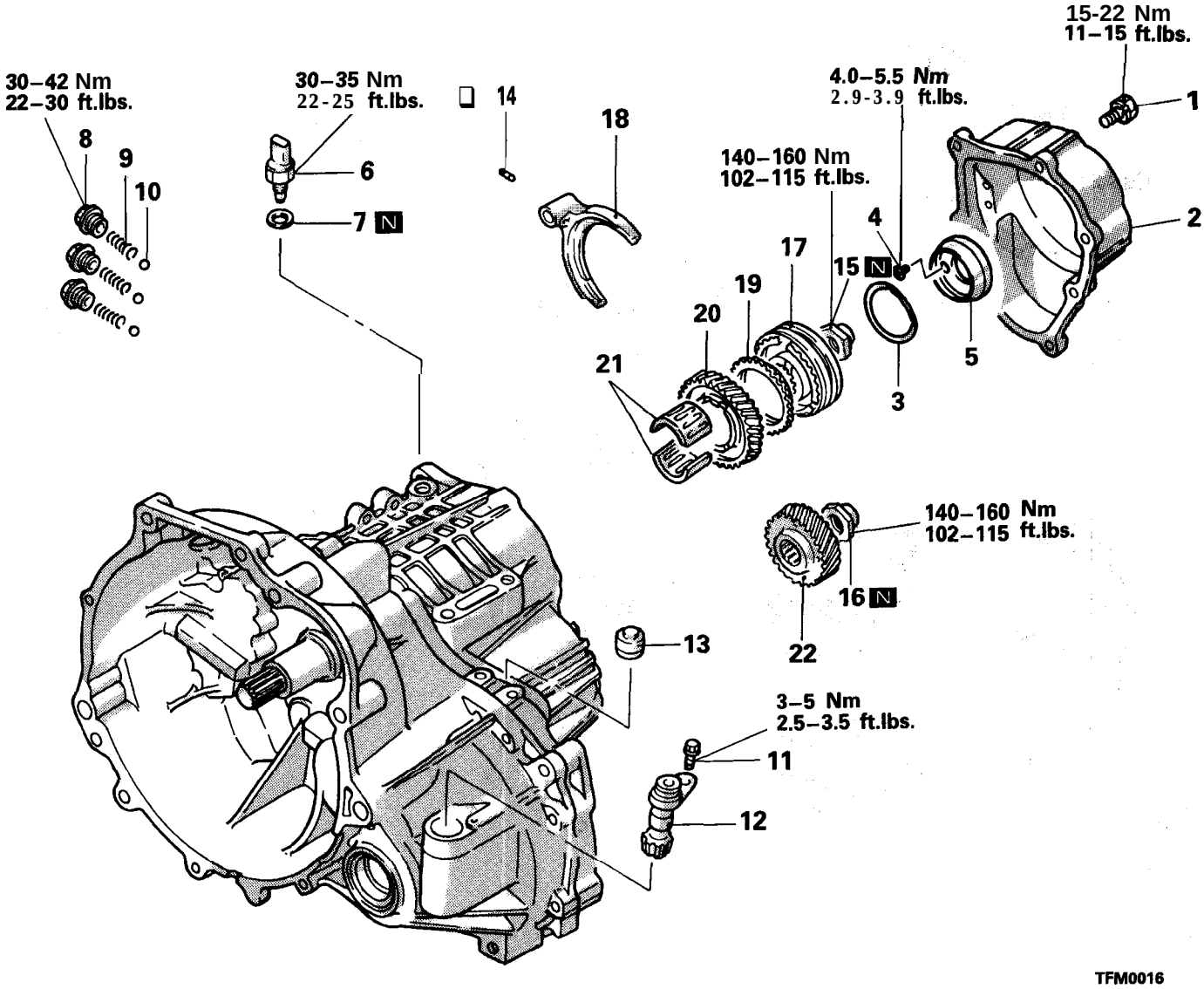

### 7. INSTALLATION OF STARTER

Tighten the starter installation bolts with the wiring harness clip and the ground cable.

# TRANSAXLE ASSEMBLY <F5M22>

## DISASSEMBLY AND REASSEMBLY

N21ME-A

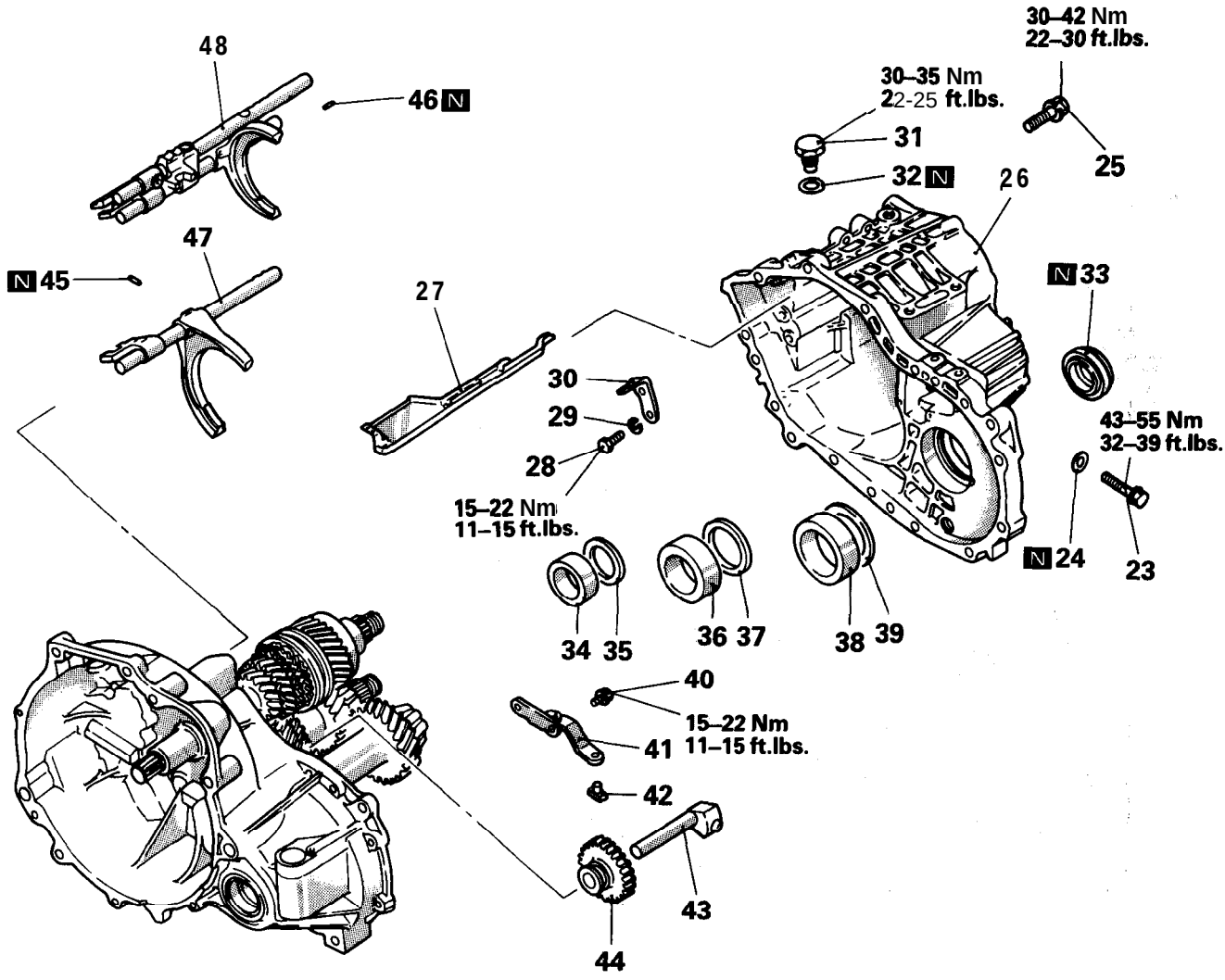



**Disassembly steps**

- 1. Bolt
- ● + 2. Rear cover
- 3. Wave spring
- ● 4. Screw bolts
- 5. Reverse brake cone
- 6. Backup light switch
- 7. Gasket
- 8. Poppet plug
- 9. Poppet spring
- 10. Poppet ball
- 11. Bolt
- 12. Speedometer driven gear assembly
- ● * 13. Air breather
- ◆◆ ● * 14. Spring pin
- ◆◆ ● *15. Lock nut
- ◆◆ ◆◆ 16. Lock nut
- 17. 5th speed synchronizer assembly
- 18. 5th speed shift fork
- 19. Synchronizer ring
- 20. 5th speed gear
- 21. Needle bearing
- 22. 5th speed intermediate gear

<F5M22-2>

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● *: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

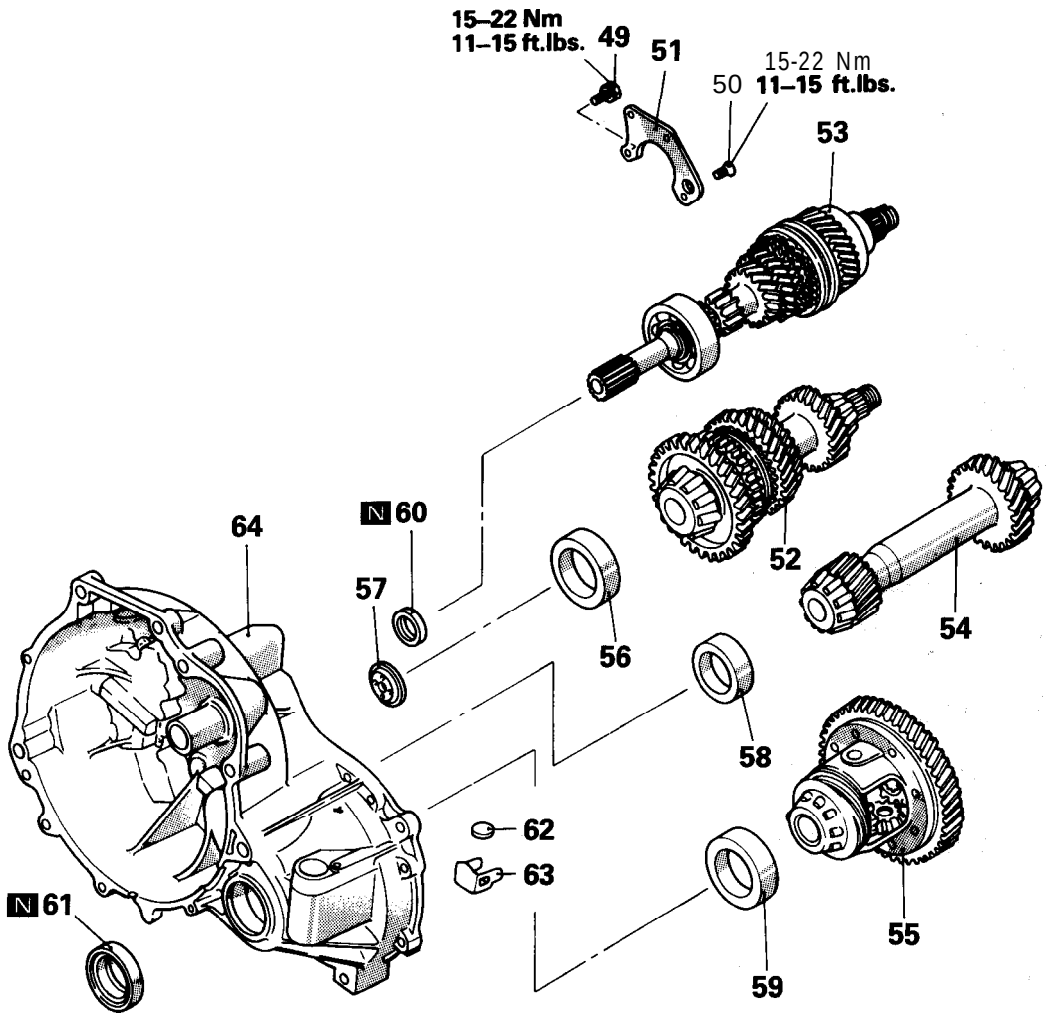



**Disassembly steps**

- 23. Reverse idler gear shaft bolt
- 24. Gasket
- 25. **Bolt**
- ◆◆ 26. Transaxle case
- ● + 27. Oil guide
- 28. **Bolt**
- 29. Spring washer
- 30. Stopper bracket
- 31. Restrict ball assembly
- 32. Gasket
- ● 4 33. Oil seal
- 34. Bearing outer race
- ◆◆ 35. Spacer
- 36. Bearing outer race
- ● * 37. Spacer
- 38. Bearing outer race
- ● + 39. Spacer
- 40. Bolt
- 41. Reverse shift lever assembly
- 42. Reverse shift lever shoe
- 43. Reverse idler gear shaft
- 44. Reverse idler gear
- ◆◆ ● 4 45. Spring pin
- ◆◆ ◆◆ 46. Spring pin
- ◆◆ ● + 47. Shift rails and forks
- ◆◆ ● 48. Shift rails and forks

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● *: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

206003

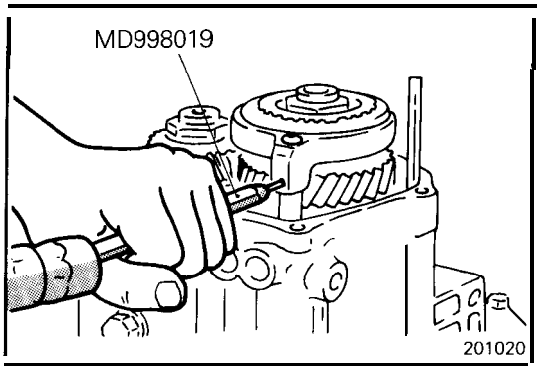



Disassembly steps

- ● +49. Bolt
- 50. Screw
- 51. Bearing retainer
- ◆◆ ● +52. Intermediate gear assembly
- ● +53. Input shaft assembly
- 54. Output shaft assembly
- 55. Differential gear assembly
- 56. Bearing outer race
- 57. Oil guide
- 58. Bearing outer race
- 59. Bearing outer race
- ● 60. Oil seal
- ◆◆ 61. Oil seal
- 62. Magnet
- 63. Magnet holder
- 64. Clutch housing assembly

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

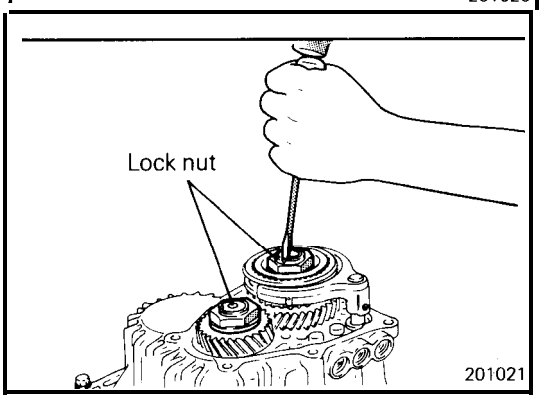
2100021




## SERVICE POINTS OF DISASSEMBLY N21MFAR

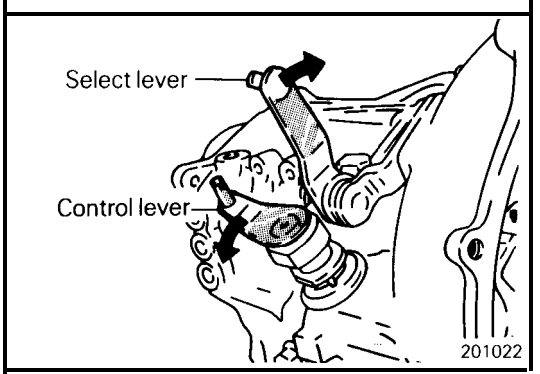
### 14. REMOVAL OF SPRING PIN

Remove the spring pin using the special tool.

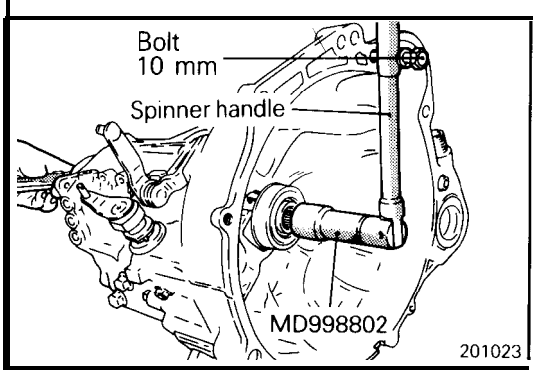



### 15./16. REMOVAL OF LOCK NUTS

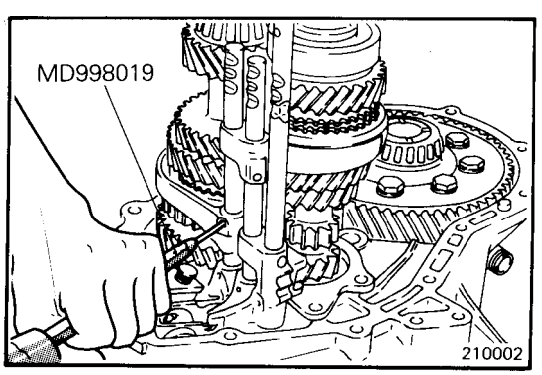
(1) Unstake lock nuts of the input shaft and intermediate gear.




(2) Shift the transmission in reverse using the control lever and select lever.

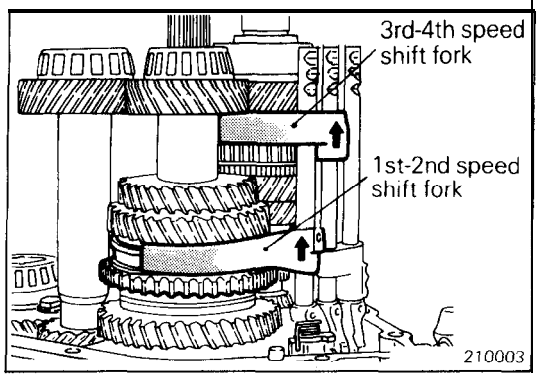



(3) install the special tool onto the input shaft.
(4) Screw a bolt [IO mm] into the hole on the periphery of clutch housing and attach a spinner handle to the special tool.
(5) Remove the lock nut, while using the bolt as a spinner handle stopper.



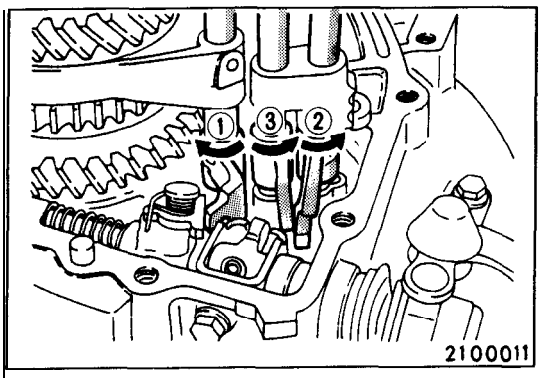

### 45./46. REMOVAL OF SPRING PINS

Remove the spring pins for 1 st-2nd and 3rd-4th speed shift forks using the pin punch.

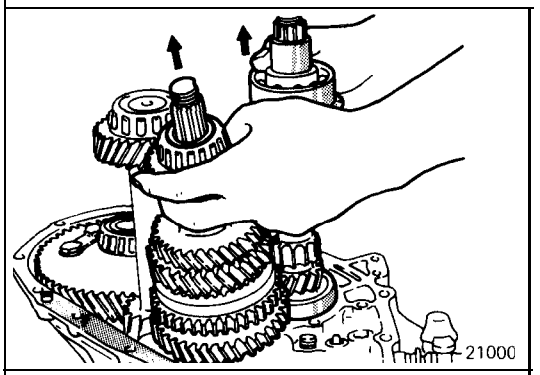



**47./48. REMOVAL OF SHIFT RAILS AND FORKS'**

(1) Shift the 1st-2nd speed shift fork to the 2nd speed.
(2) Shift the 3rd-4th speed shift fork to the 4th speed.

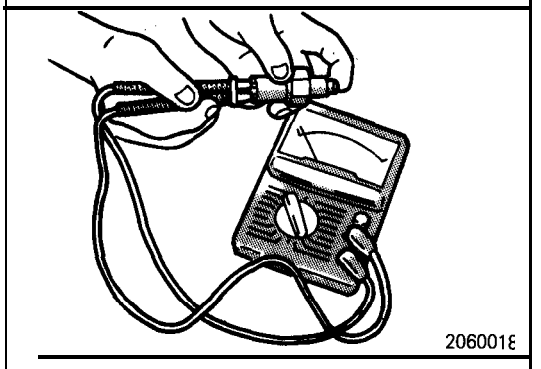



(3) Rotate the the shift controls in the direction of the arrow in numerical order. Remove the shift lugs from the control finger and interlock plate.
(4) Raise each of the shift rails upward and remove them from the clutch housing.
(5) Remove the all shift rails and forks.




**52. REMOVAL OF INTERMEDIATE GEAR ASSEMBLY**

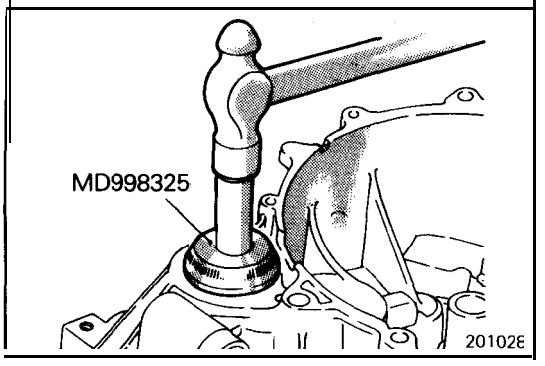
Lift up the input shaft assembly and remove the intermediate gear assembly.




## INSPECTION N21MOAA

**BACKUP LIGHT SWITCH**

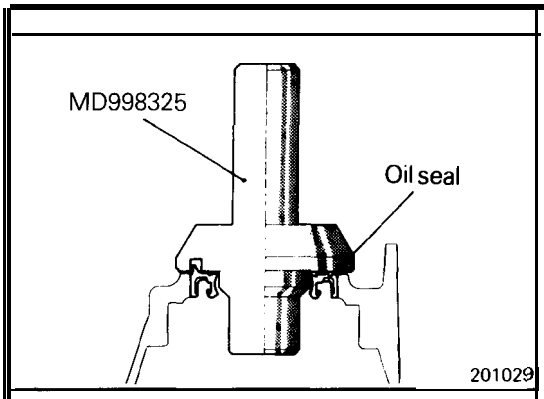
Operate the backup light switch to check continuity with a circuit tester. If without continuity, replace the switch.

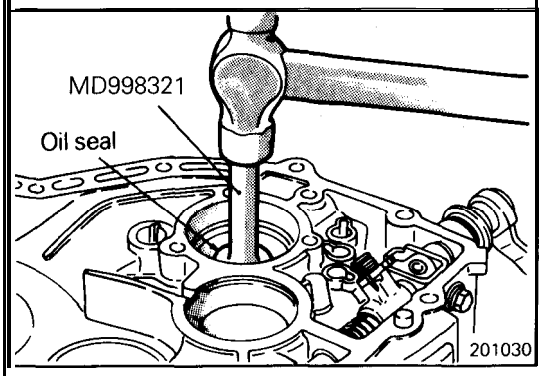



## SERVICE POINTS OF REASSEMBLY N21MGAU

**61. INSTALLATION OF OIL SEAL**

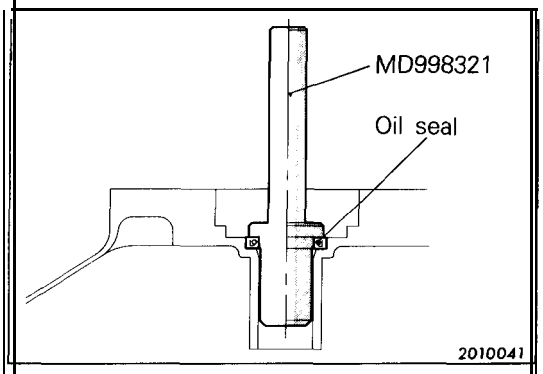
Install the drive shaft oil seal using the special tool.

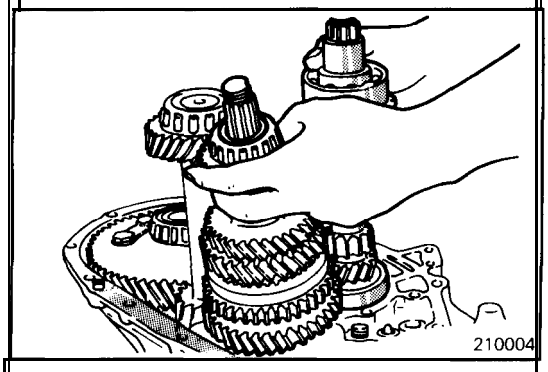



**60. INSTALLATION OF OIL SEAL**

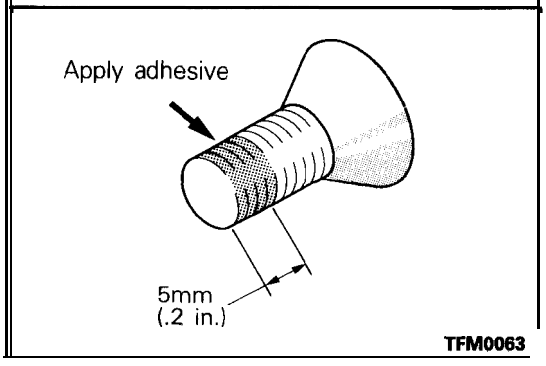
Install the input shaft front oil seal using the special tool.




**52. INSTALLATION OF INTERMEDIATE GEAR ASSEMBLY / 53. INPUT SHAFT ASSEMBLY**

Lifting up the input shaft assembly, install it simultaneously with the intermediate gear assembly.

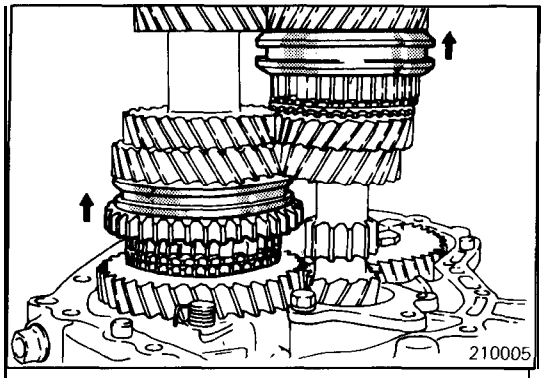



**49. APPLICATION OF ADHESIVE TO BOLT**

Apply specified adhesive to the bolt threads.

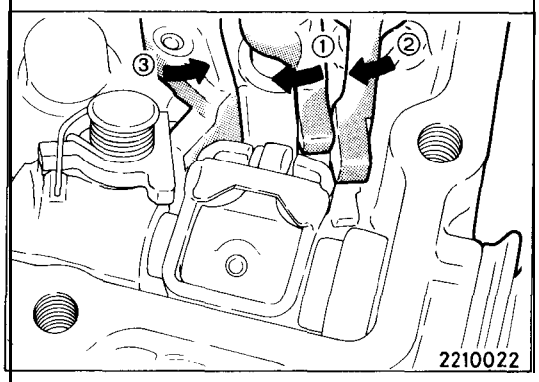
**Caution**
**Do not apply to the bolt head.**

**Specified adhesive: MOPAR Part No.4318031**
**or MOPAR Part No.4318032**
**or equivalent**

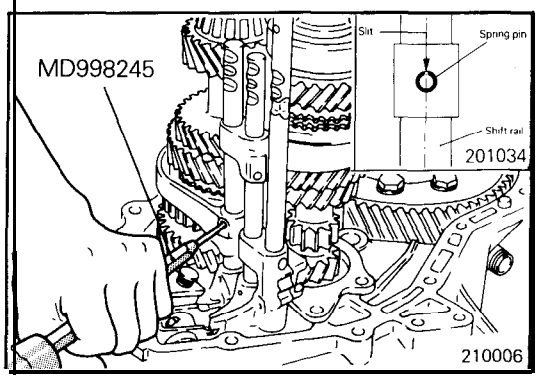



### 47./48. INSTALLATION OF SHIFT RAILS AND FORKS

(1) Set the 1st-2nd speed shift sleeve at 2nd Speed.
(2) Set the 3rd-4th speed shift sleeve at 4th speed.
(3) Fit the shift forks of shift rail assembly to groove of sleeves.



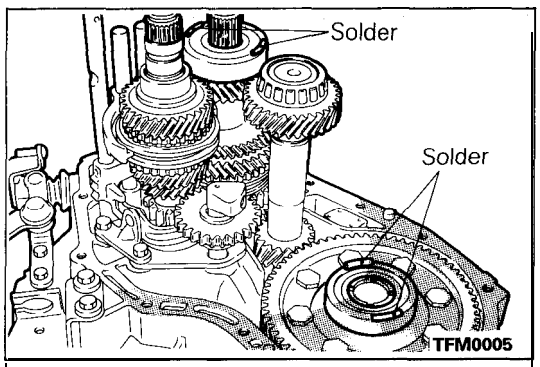

(4) Insert the shift rails into the shift rail holes of clutch housing.
(5) Turn the shift rails in the directions indicated by the arrows in the order shown in the illustration, and engage the shift lugs to control finger and interlock plate.




### 45./46. INSTALLATION OF SPRING PINS

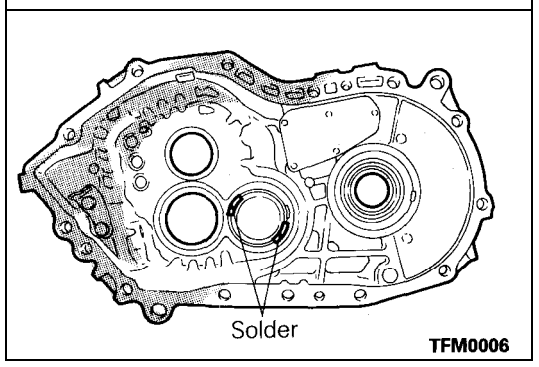
Install the spring pins using the special tool or a pin Punch. When installing, make sure that the slit of the spring pin is aligned with the shift rail center line.

**Caution**
**Do not reuse the spring pins.**

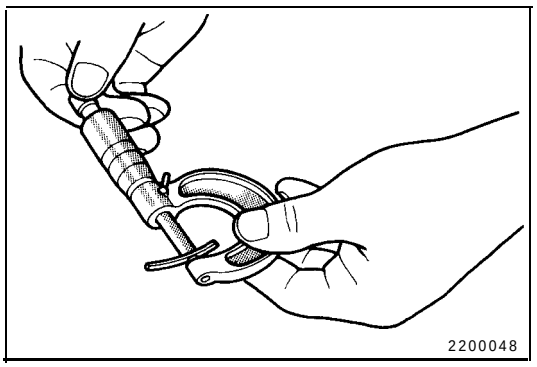



### 35./37./39. SELECTION OF SPACERS

(1) Place two pieces of solder measuring about 10 mm (.4 in.) in length and 1.6 mm (.06 in.) in diameter as illustrated and install the outer races of intermediate gear and differential.

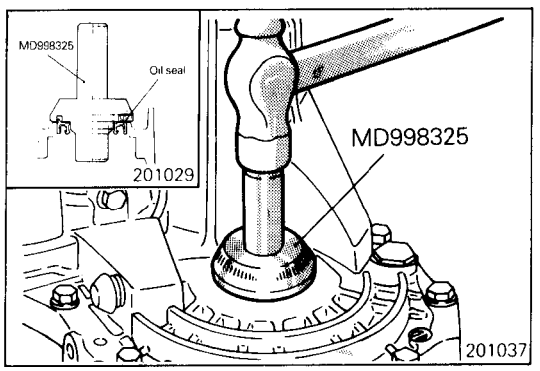



(2) With a solder puddle measuring 10 mm (.39 in.) long and 1.6 mm (.06 in.) across on the transaxle case at the location shown in the figure, install the bearing outer race of the shaft.
(3) Install the transaxle case and tighten the bolts to specified torque.
(4) Remove the transaxle case.
(5) Remove the outer races and take out the crushed solder.
(6) If the solder is not broken, carry out the work in steps (1)–(5) with large diameter solder.



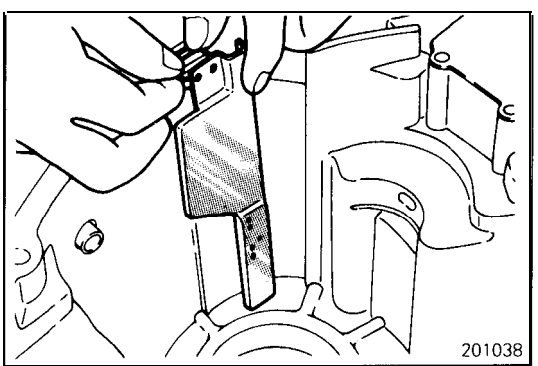

(7) Measure the thickness of the crushed solder with a micrometer and select a spacer of thickness that gives standard preload.

**Standard value:**
**Intermediate shaft**
**0.05–0.10 mm (.002–.004 in.)**
**Output shaft**
**0.05–0.10 mm (.002–.004 in.)**
**Differential case**
**0.05–0.10 mm (.002–.004 in.)**



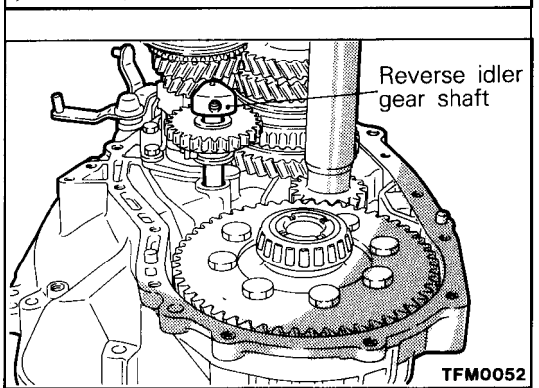

### 33. INSTALLATION OF OIL SEAL

Install the drive shaft oil seal using the special tool.




### 27. INSTALLATION OF OIL GUIDE

Install the oil guide to the transaxle case as illustrated.

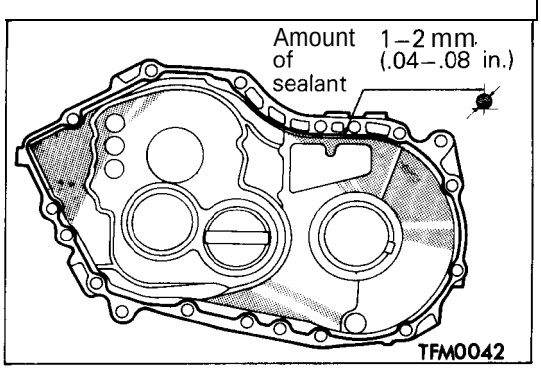



### 26. INSTALLATION OF TRANSAXLE CASE

(1) Place the selected spacers on the intermediate gear and the differential's bearing outer race. Also insert the selected spacer between the output shaft bearing outer race and the transaxle case.

**(2)** Set so that the threaded hole of the reverse idler gear shaft's head is facing in the direction indicated in the illustration.

NOTE
If there is a great deviation in the direction in which the threaded hole is facing, it will be impossible to align the threaded hole and the hole in the case after the transaxle case is installed.

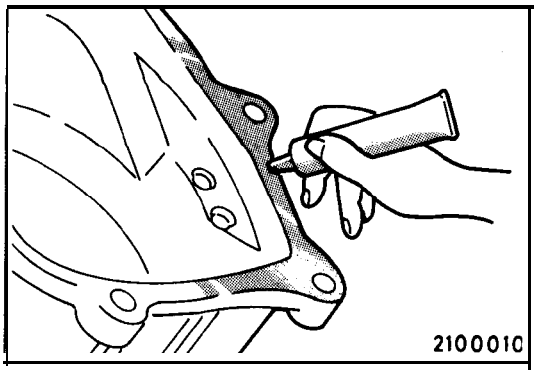


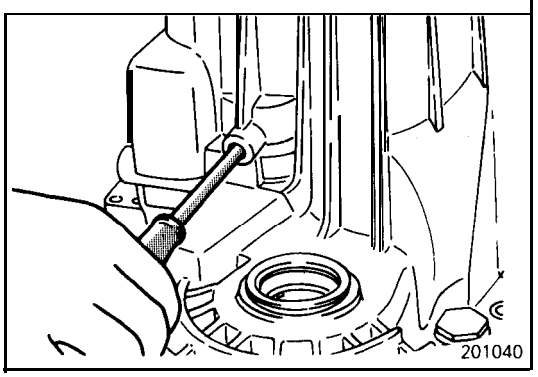

(3) Apply specified sealant to the clutch housing side of the transaxle case.

**Specified sealant: MITSUBISHI Genuine Part No.MD997740 or equivalent**

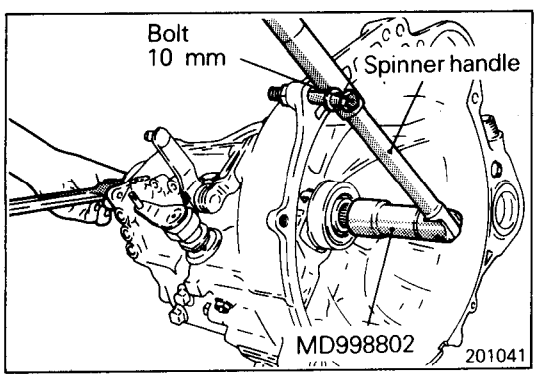
**Caution**
**Squeeze out sealant from the tube uniformly without excess or discontinuity.**

(4) Install the transaxle case onto the clutch housing.



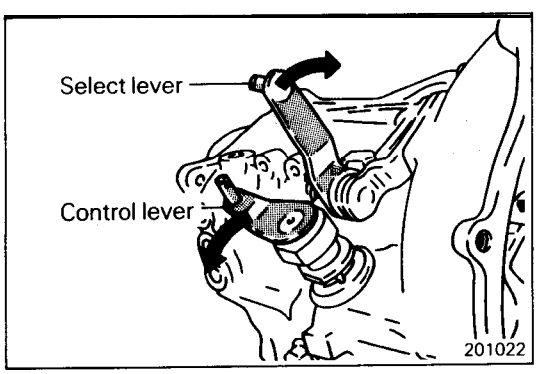




(5) Insert a Phillips screwdriver [8 mm (.32 in.) shaft diameter] into the bolt hole in the case, as shown in the figure, and use it to align the threaded hole of the reverse idler gear shaft with the bolt hole in the transaxle case.
(6) Install the reverse idler gear shaft bolt and tighten the bolt by fingers.
(7) Tighten the all transaxle tightening bolts to specified torque.
(8) Tighten the reverse idle gear shaft bolt to specified torque.

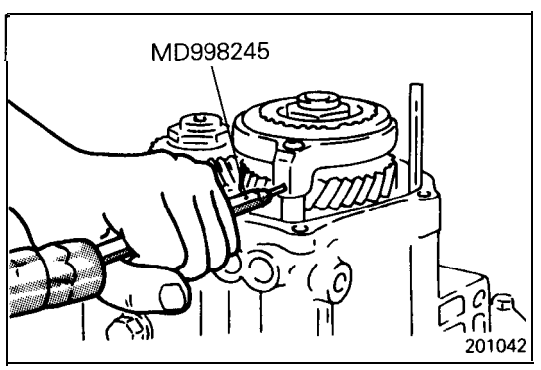



**15./ 16. INSTALLATION OF LOCK NUTS**

(1) Install the special tool to the splined end of input shaft.
(2) Screw a bolt (10 mm) into the hole on the periphery of clutch housing and attach a spinner handle to the special tool.



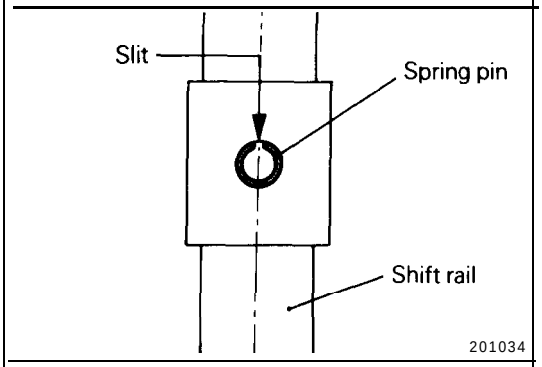

(3) Shift the transmission in reverse using control lever and select lever.
(4) Tighten the lock nut to specified torque, while using the bolt attached in the above step as a spinner handle stopper.
(5) Loosen the lock nuts.
(6) Retighten the lock nuts to the specified torque.
(7) Stake the lock nut.



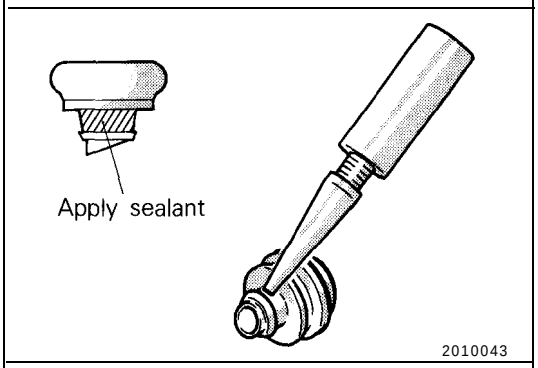

**14. INSTALLATION OF SPRING PIN**

(1) Install the spring pin using the special tool or a pin punch.

**Caution**
**Do not reuse the spring pins.**



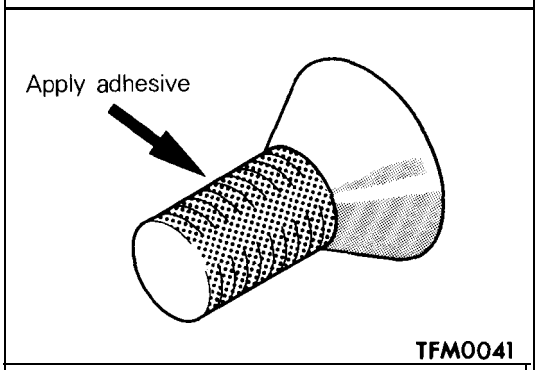

(2) When installing, make sure that the slit of the spring pin is aligned with the shift rail center line.




**13. APPLICATION OF SEALANT TO AIR BREATHER**

Apply specified sealant to air breather mounting portion and install to the clutch housing.

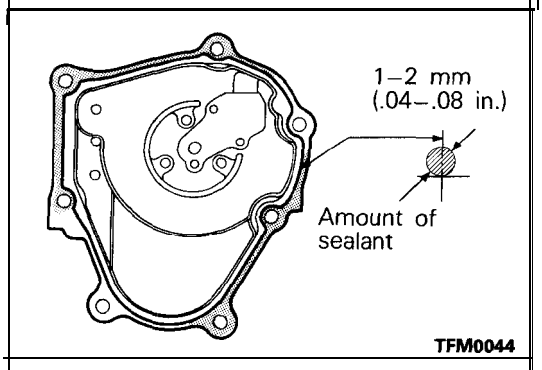
**Specified sealant: MOPAR Part No.4318025 or equivalent**




**4. INSTALLATION OF SCREW BOLTS**

Apply specified adhesive to screw bolts mounting portion.

**Specified adhesive: 3M Stud Locking No.4170**

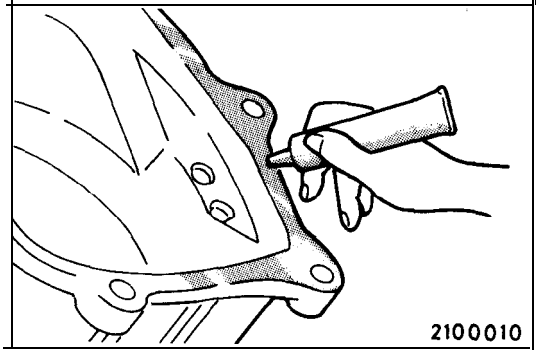



**2. APPLICATION OF SEALANT TO REAR COVER**

Apply specified sealant to the rear cover.

**Specified sealant: MITSUBISHI Genuine Part No. MD997740 or equivalent**

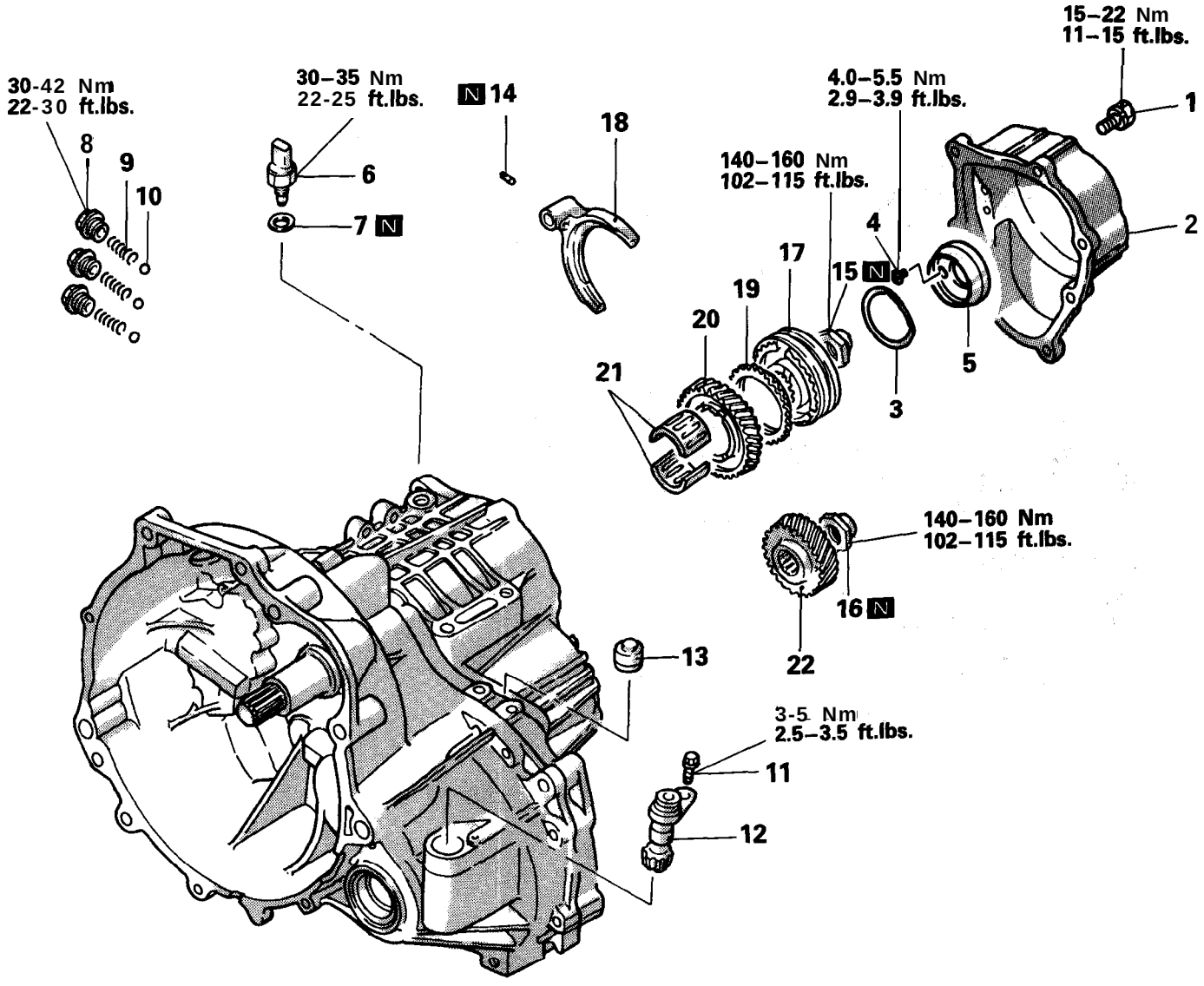
**Caution**
**Squeeze out sealant from the tube uniformly wlthout excess or discontinuity.**



# TRANSAXLE ASSEMBLY <F5M33>

## DISASSEMBLY AND REASSEMBLY

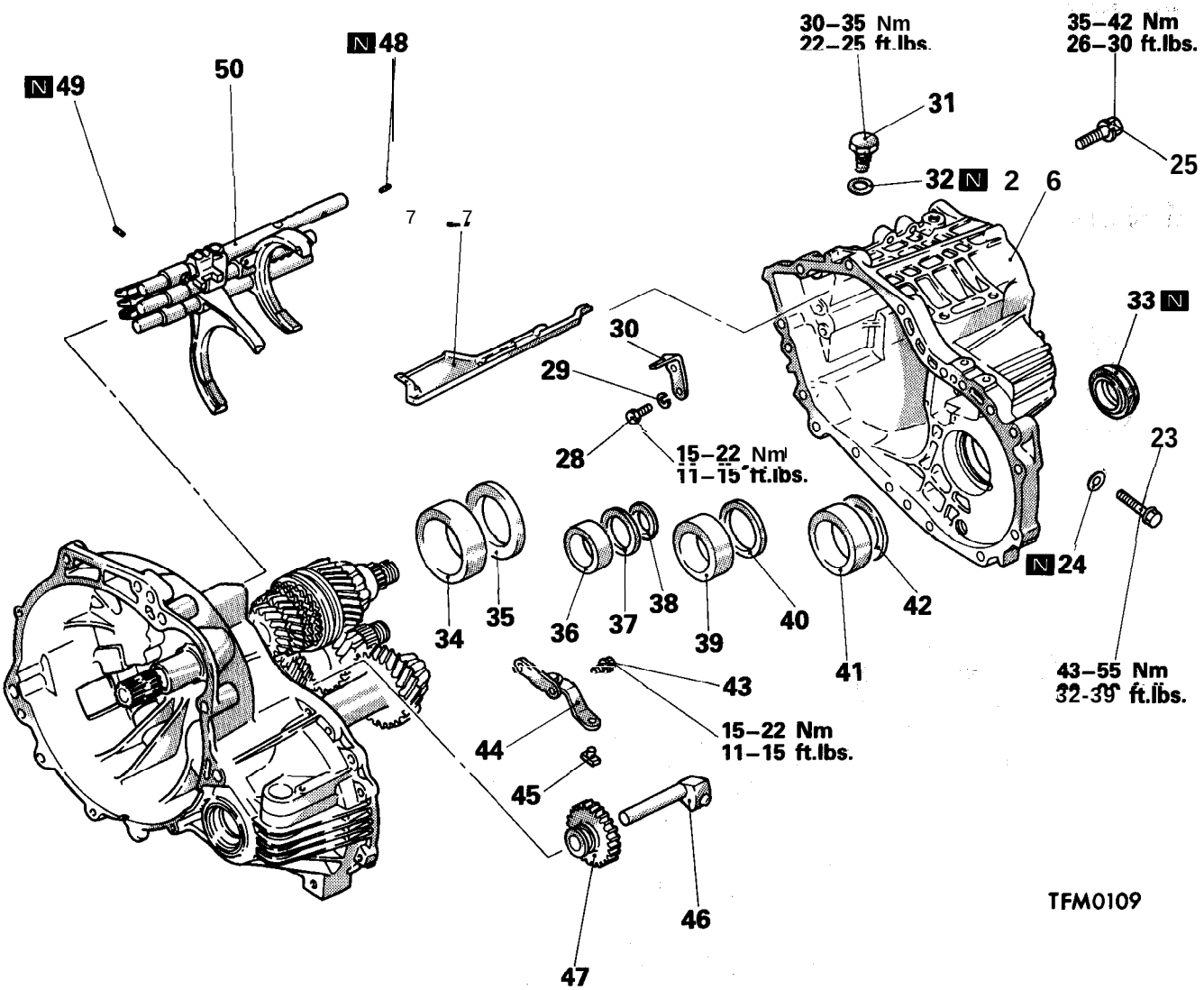
N21ME-B




**Disassembly steps**

1. Bolt
● * 2. Rear cover
3. Wave spring
◆◆ **4.** Screw bolts
5. Reverse brake cone
6. Backup light switch
7. Gasket
8. Poppet plug
9. Poppert spring
10. Poppet ball
11. Bolt
12. Speedometer driven gear assembly
● 13. Air breather
◆◆ ● * 14. Spring pin
◆◆ ◆◆ 15. Lock nut
◆◆ ● 16. Lock nut
17. 5th speed synchronizer assembly
18. 5th speed shift fork
19. Synchronizer ring
**20.** 5th speed gear
21. Needle bearing
22. 5th speed intermediate gear

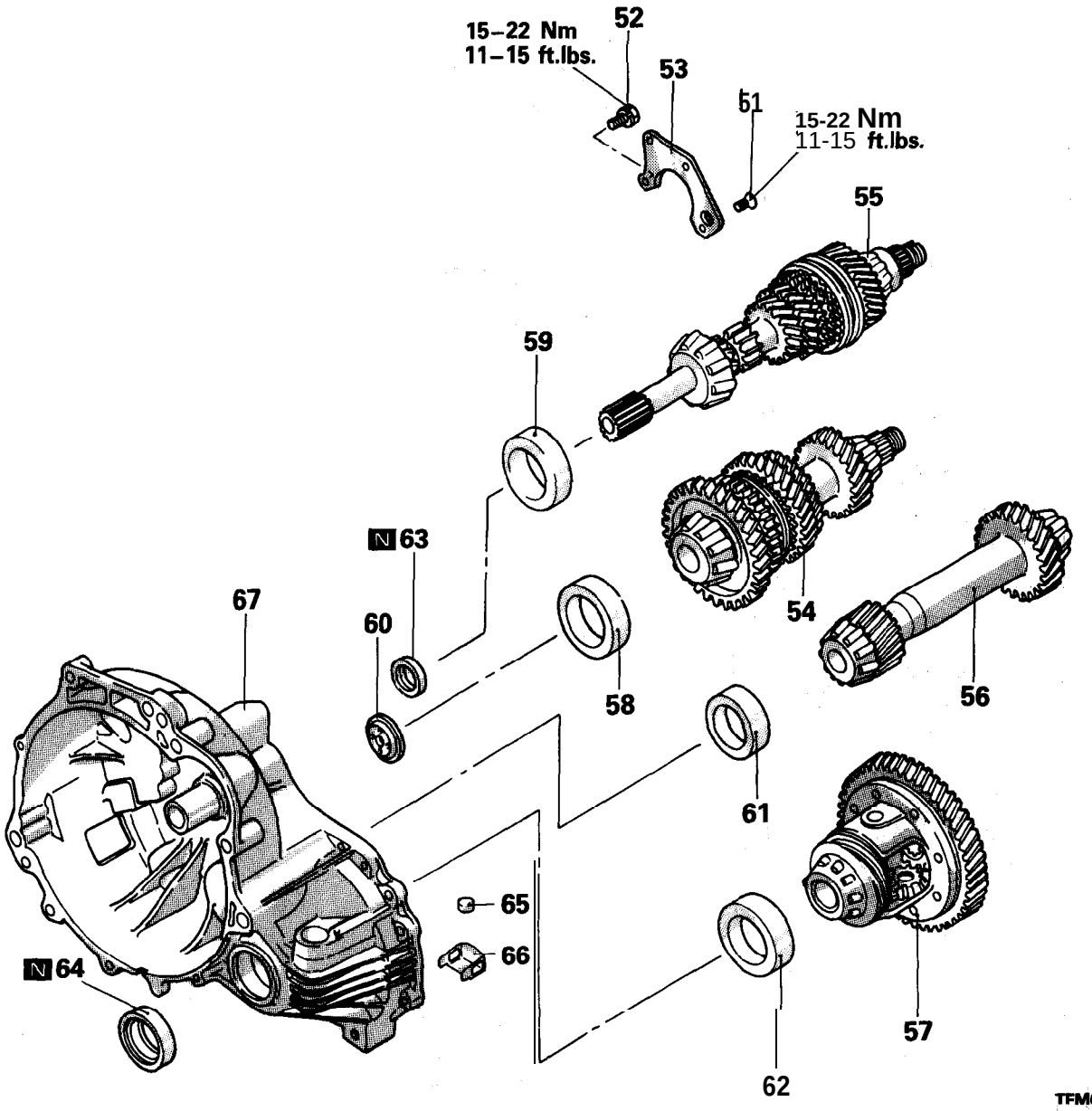
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ● ◆ : Refer to "Service Points of Reassembly
(4) ❑ : Non-reusable parts




**Disassembly steps**

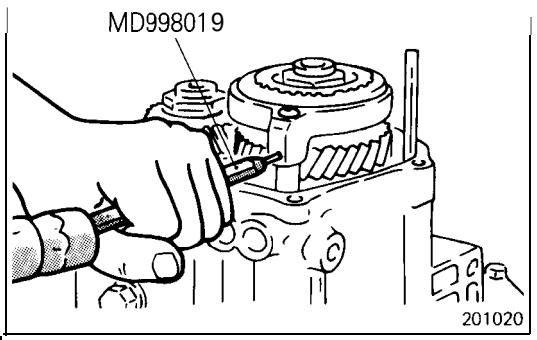
- 23. Reverse idler gear shaft bolt
- 24. Gasket
- **25.** Bolt
- ● + 26. Transaxle case
- ◆◆ 27. Oil guide
- 28. Bolt
- 29. Spring washer
- 30. Stopper bracket
- 31. Restrict ball assembly
- 32. Gasket
- ● 4 **33.** Oil seal
- 34. Bearing outer race
- ● * 35. Spacer
- 36. Bearing outer race
- ● 4 37. Spacer
- 38. Oil filter
- 39. Bearing outer race
- ● 4 40. Spacer
- 41. Bearing outer race
- ◆◆ 42. Spacer
- 43. Bolt
- 44. Reverse shift lever assembly
- 45. Reverse shift lever shoe
- ● + 46. Reverse idler gear shaft
- 47. Reverse idler gear
- ◆◆ ● + 48. Spring pin
- ● * ● + 49. Spring pin
- ◆◆ ● 50. Shift rail assembly

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ◆◆ : Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts




●◀ 51. Bolt
52. Bolt
53. Bearing retainer
54. Intermediate gear assembly
55. Input shaft assembly
56. Output shaft assembly
57. Differential gear assembly
58. Bearing outer race
59. Bearing outer race
60. Oil guide
61. Bearing outer race
62. Bearing outer race
◆◀ 63. Oil seal
◆◀ 64. Oil seal
65. Magnet
66. Magnet holder
67. Clutch housing assembly

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◀ : Refer to "Service Points of Reassembly".
(3) N : Non-reusable parts

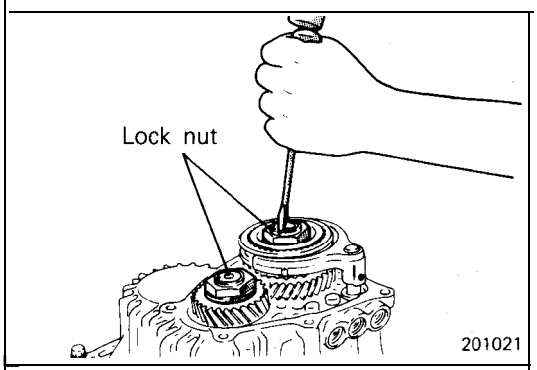



## SERVICE POINTS OF DISASSEMBLY N21MFAS

### 14. REMOVAL OF SPRING PIN

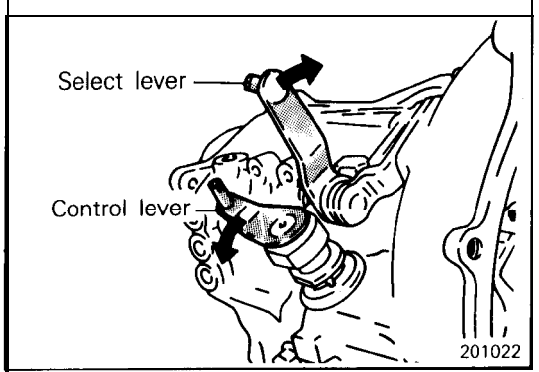
Remove the spring pin using a special tool.

NOTE
If the spring pin interferes with the synchronizer ring or cone gear, rotate the gear for dislocation and remove the spring pin.

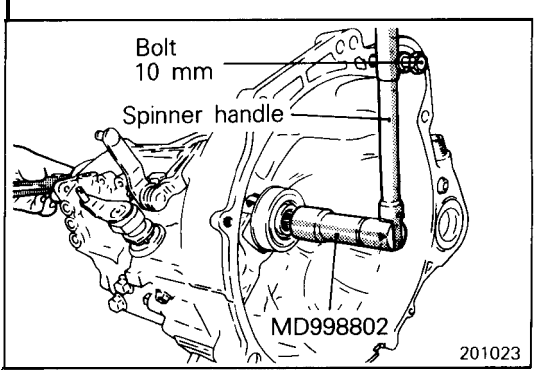



### 15. / 16. REMOVAL OF LOCK NUTS

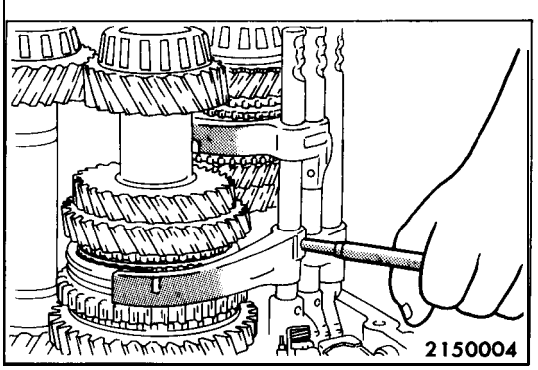
(1) Unstake lock nuts of the input shaft and intermediate gear.




(2) Shift the transaxle in reverse using the control lever and select lever.

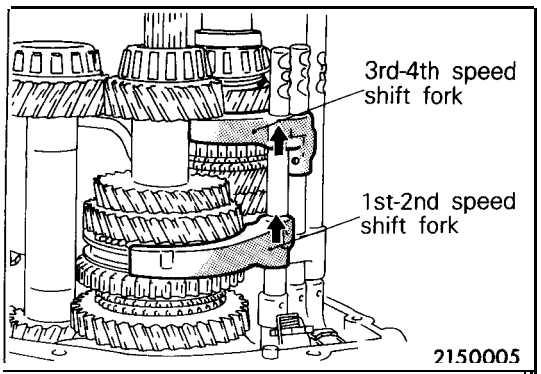



(3) Install the special tool onto the input shaft.
(4) Screw a bolt [IO mm] into the hole on the periphery of clutch housing and attach a spinner handle to the special tool.
(5) Remove the lock nut, while using the bolt as a spinner handle stopper.



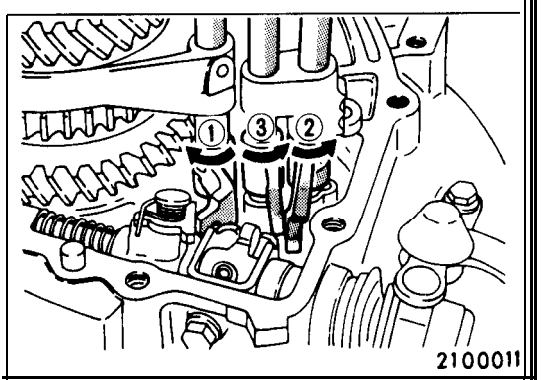

### 48./49. REMOVAL OF SPRING PINS

Remove the spring pins for 1 st-2nd and 3rd-4th speed shift forks using a pin punch.




**50. REMOVAL OF SHIFT RAIL ASSEMBLY**

(1) Shift the 1st-2nd speed shift fork to the 2nd speed.
(2) Shift the 3rd-4th speed shift fork to the 4th speed.

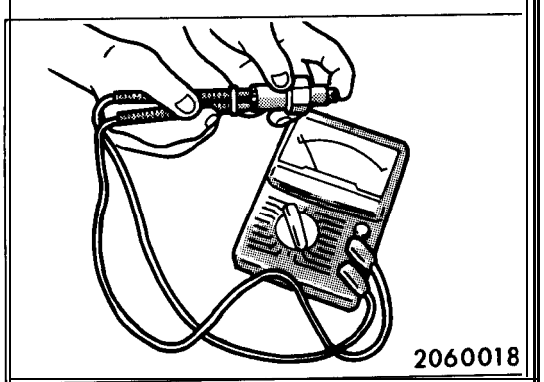



(3) Remove the shift rail assembly.

## INSPECTION N21M0AA

**BACKUP LIGHT SWITCH**

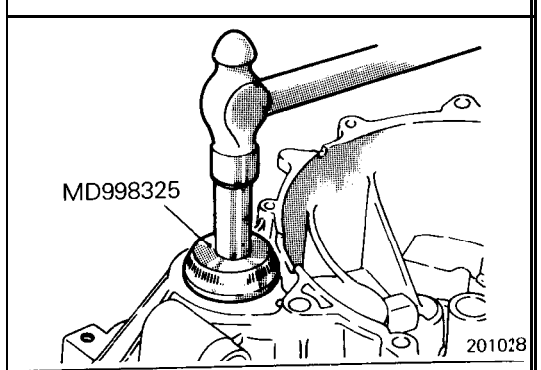
Operate the backup light switch to check continuity with a circuit tester.
If without continuity, replace the switch.

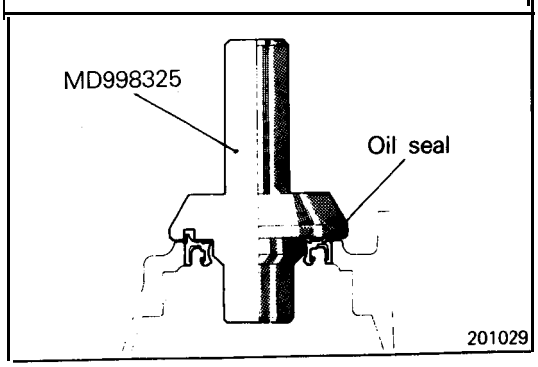


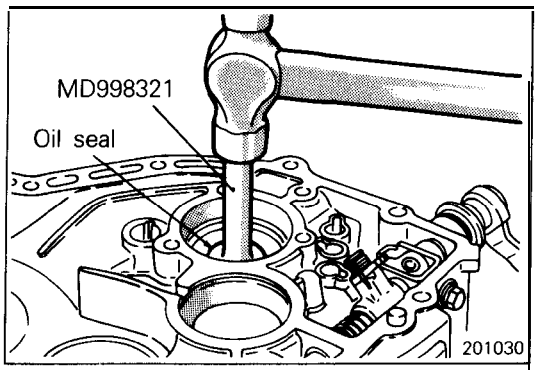

## SERVICE POINTS OF REASSEMBLY N21MGAW

**64. INSTALLATION OF OIL SEAL**

Install the drive shaft oil seal using the special tool.

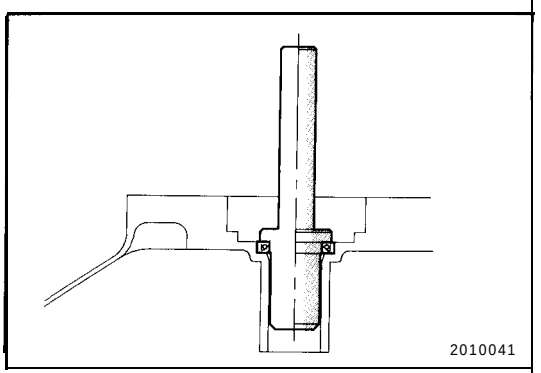





**63. INSTALLATION OF OIL SEAL**

Install the input shaft front oil seal using the special tool.

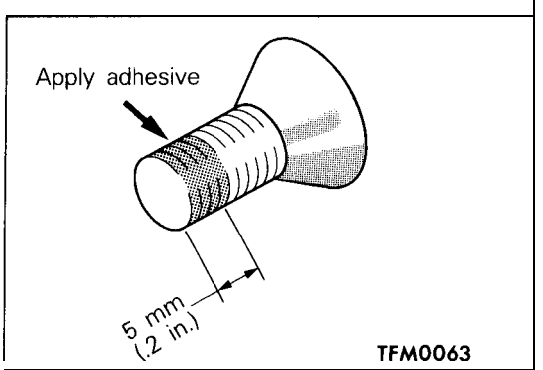



**51. APPLICATION OF ADHESIVE TO BOLT**

Apply specified adhesive to the bolt threads.

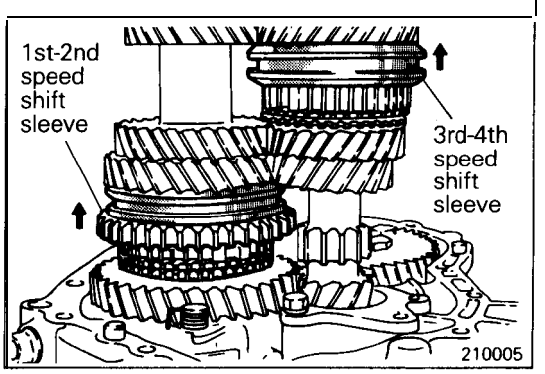
**Caution**
**Do not apply to the bolt head.**

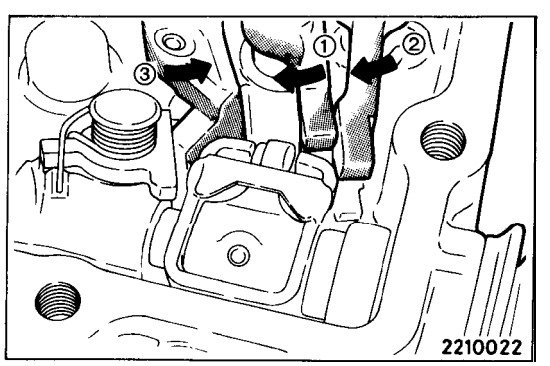
**Specified adhesive: MOPAR Part No.4318031 or MOPAR Part No.4318032 or equivalent**



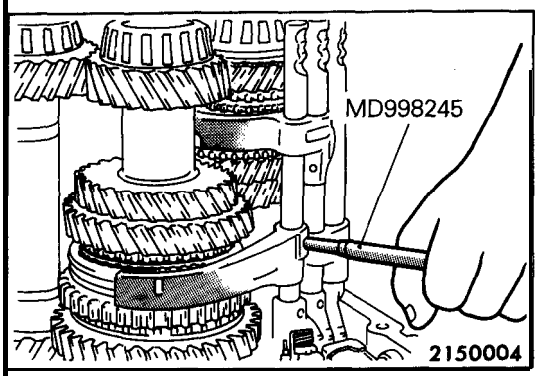

**50. INSTALLATION OF SHIFT RAIL ASSEMBLY**

(1) Set the 1st-2nd speed shift sleeve at 2nd speed.
(2) Set the 3rd-4th speed shift sleeve at 4th speed.
(3) Fit the shift forks of shift rail assembly to groove of sleeves.



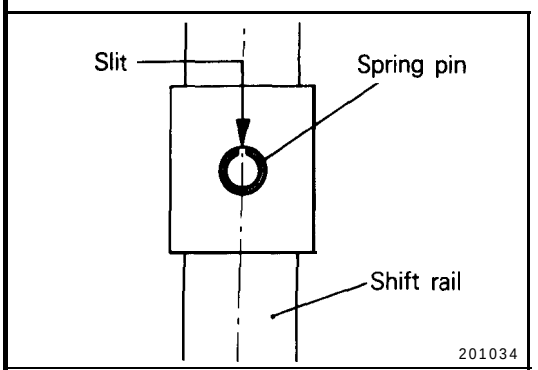

(4) Insert the shift rails into the shift rail holes of clutch housing.
(5) Turn the shift rails in the directions indicated by the arrows in the order shown in the illustration, and engage the shift lugs to control finger and interlock plate.



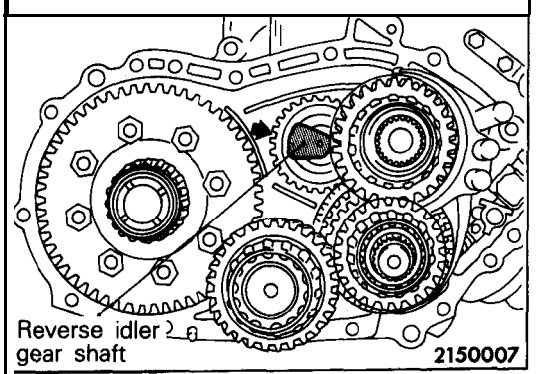

**48./49. INSTALLATION OF SPRING PINS**

(1) Install the spring pins using the special tool or a pin punch.

Caution
**Do not reuse the spring** pins.

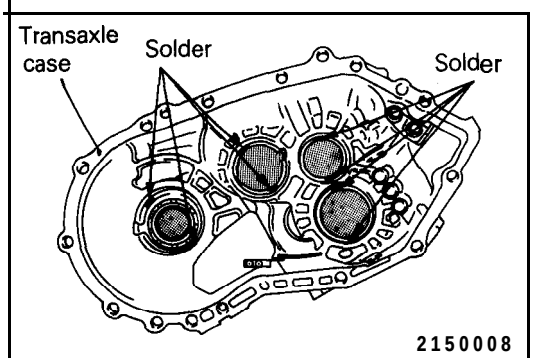



(2) When installing, make sure that the slit of the spring pin is aligned with the shift rail center line.



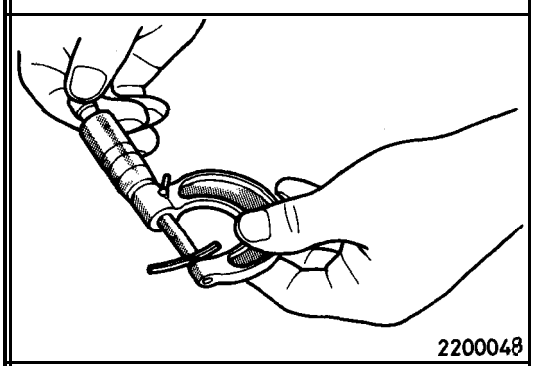

**46. INSTALLATION OF REVERSE IDLER GEAR SHAFT**

Install in the direction illustrated.



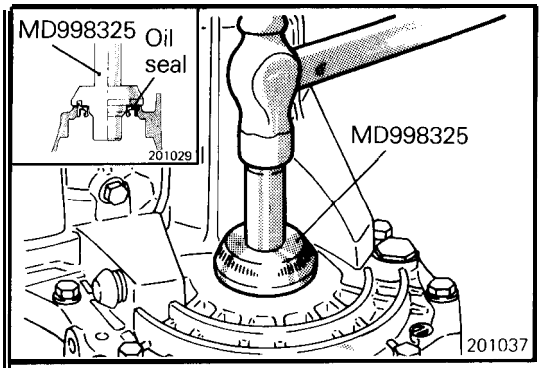

**35. /37./40./42. INSTALLATION OF SPACERS**

(1) Place two pieces of solder measuring about 10 mm (.4 in.) in length and 1.6 mm (.06 in.) in diameter as illustrated and install the outer races.
(2) Install the transaxle case and tighten the bolts to specified torque.
(3) Remove the transaxle case.
(4) Remove the outer races and remove the solder.
(5) If the solder is not broken, carry out the work- in steps (1)–(4) with large diameter solder.



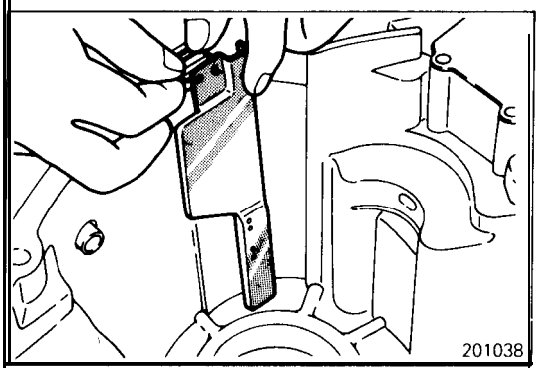

(6) Measure the thickness of the crushed solder with a micrometer and select and install a spacer of thickness that gives standard preload and end play.

**Standard value:**
**Input shaft end play**
**0–0.05 mm (0–.002 in.)**
**Intermediate gear preload**
**0.05–0.10 mm (.002–.004 in.)**
**Output shaft preload**
**0.05–0.10 mm (.002–.004 in.)**
**Differential case preload**
**0.05–0.10 mm (.002–.004 in.)**



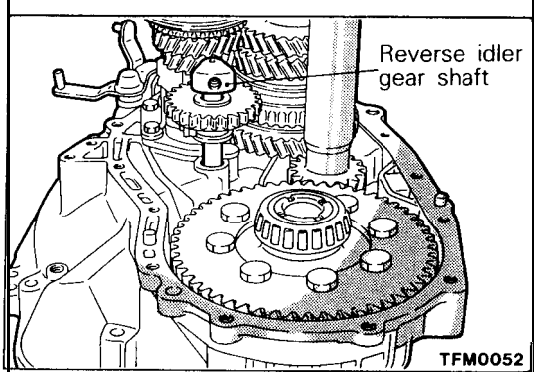

### 33. INSTALLATION OF OIL SEAL

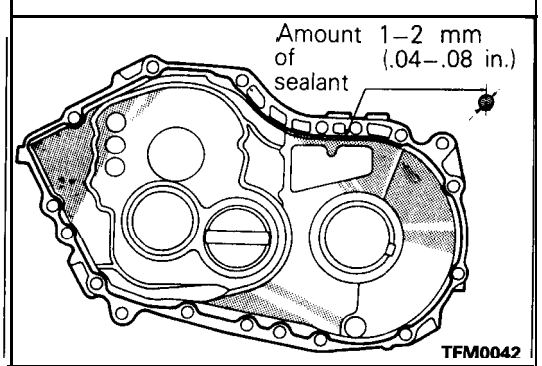
Install the drive shaft oil seal using the special tool.

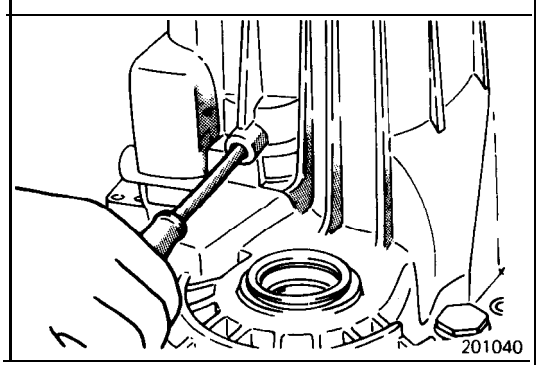



### 27. INSTALLATION OF OIL GUIDE

Install the oil guide to the transaxle case as illustrated.




### 26. INSTALLATION OF TRANSAXLE CASE

(1) Place the selected spacers on the intermediate gear and the differential's bearing outer race. Also insert the selected spacer between the output shaft bearing outer race and the transaxle case.

(2) Set so that the threaded hole of the reverse idler gear shaft's head is facing in the direction indicated in the illustration.

NOTE
If there is a great deviation in the direction in which the threaded hole is facing, it will be impossible to align the threaded hole and the hole in the case after the transaxle case is installed.

(3) Apply specified sealant to the clutch housing side of the transaxle case.

**Specified sealant: MITSUBISHI Genuine Part No. MD997740 or equivalent**

**Caution**
**Squeeze out sealant from the tube uniformly without excess or discontinuity.**

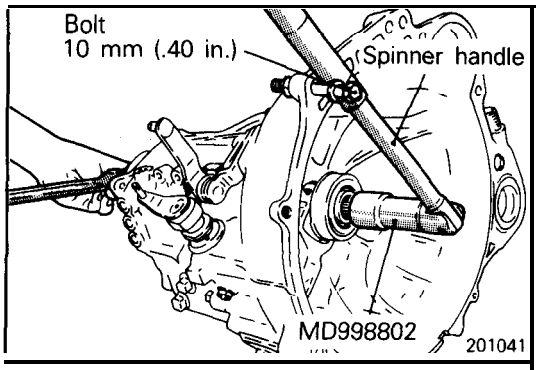
(4) Install the transaxle case onto the clutch housing.

(5) Insert a Phillips screwdriver [8 mm (.32 in.) shaft diameter] into the bolt hole in the case, as shown in the figure, and use it to align the threaded hole of the reverse idler gear shaft with the bolt hole in the transaxle case.

(6) Install the reverse idler gear shaft bolt and tighten the bolt by fingers.

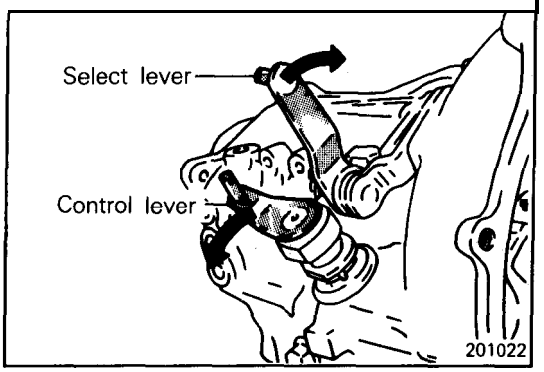
(7) Tighten the all transaxle tightening bolts to specified torque.

(8) Tighten the reverse idler gear shaft bolt to specified torque.

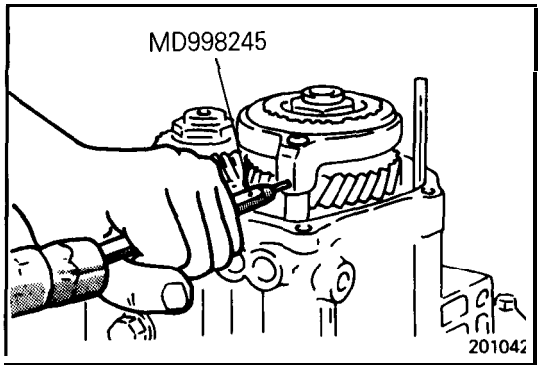



**16. / 15. INSTALLATION OF LOCK NUTS**

(1) install the special tool to the splined end of input shaft.
(2) Screw a bolt [IO mm (.40 in.)] into the hole on the periphery of clutch housing and attach a spinner handle to the special tool.



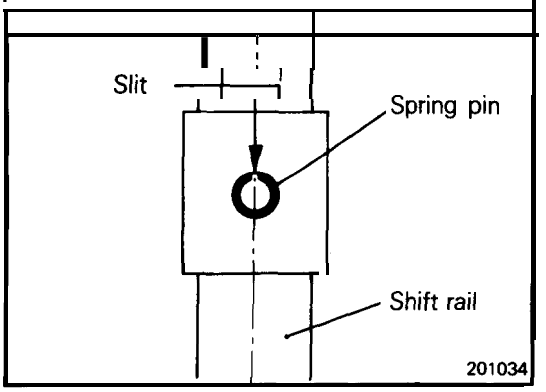

(3) Shift the transaxle in reverse using control lever and select lever.
(4) Tighten the lock nut to specified torque, while using the bolt attached in the above step as a spinner handle stopper.
(5) Loosen the lock nuts.
(6) Retighten the lock nuts to the specified torque.
(7) Stake the lock nut.



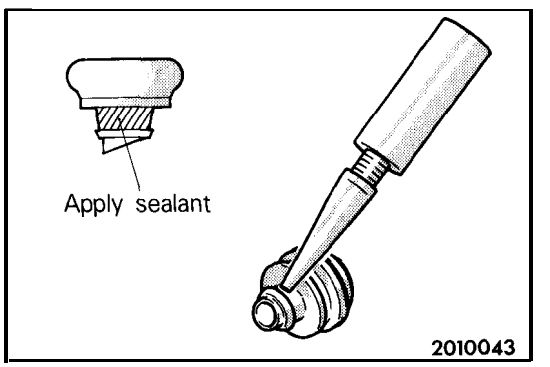

**14. INSTALLATION OF SPRING PIN**

(1) Install the spring pin using the special tool or a pin punch.

**Caution**
**Do not reuse the spring pins.**



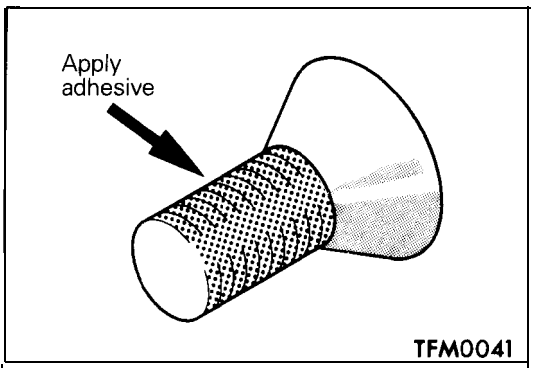

(2) When installing, make sure that the slit of the spring pin is aligned with the shift rail center line.




**13. APPLICATION OF SEALANT TO AIR BREATHER**

Apply specified sealant to air breather mounting portion and install to the clutch housing.

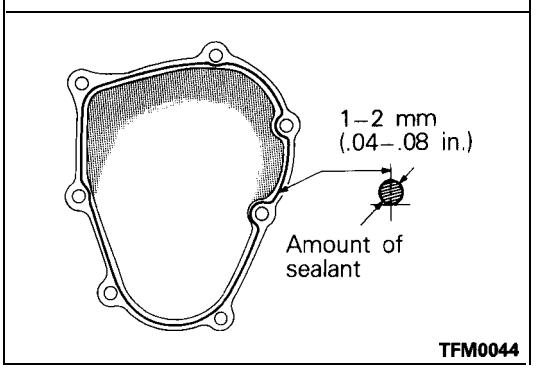
**Specified sealant: MOPAR Part No.4318025 or equivalent**




**4. INSTALLATION OF SCREW BOLTS**

Apply specified adhesive to screw bolts mounting portion.

**Specified adhesive: MOPAR Part No. 4318031**
**or MOPAR Part No. 4318032**
**or 'equivalent**




**2. APPLICATION OF SEALANT TO THE REAR COVER**

Apply specified sealant to the rear cover.

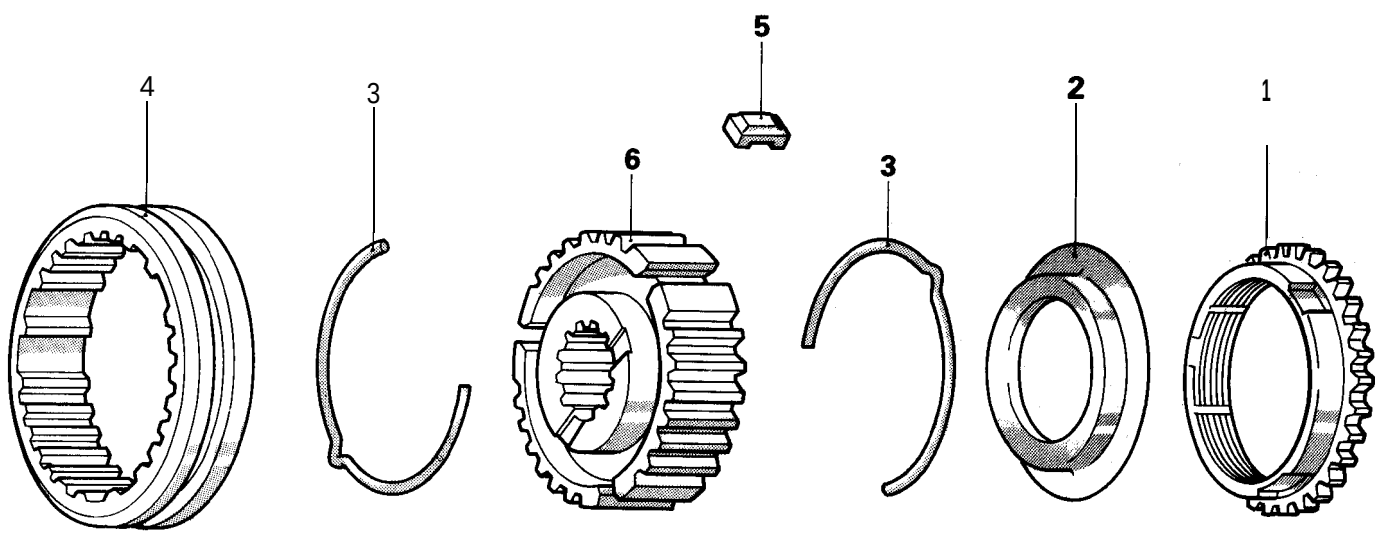
**Specified sealant: MITSUBISHI Genuine**
**Part No. MD997740**
**or equivalent**

**Caution**
**Squeeze out sealant from the tube uniformly without excess or discontinuity.**

# 5TH SPEED SYNCHRONIZER ASSEMBLY

N21MHAK

## DISASSEMBLY AND REASSEMBLY

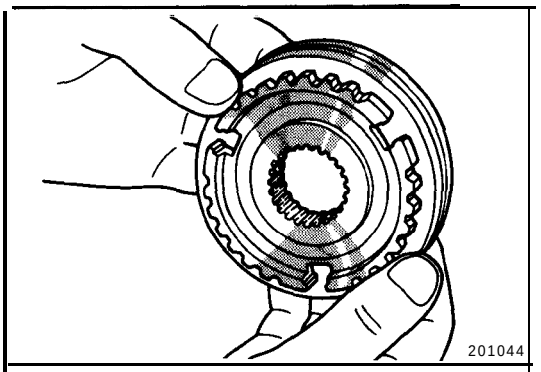


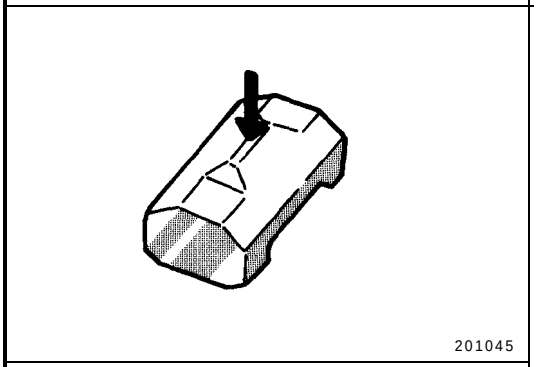

TFM0055

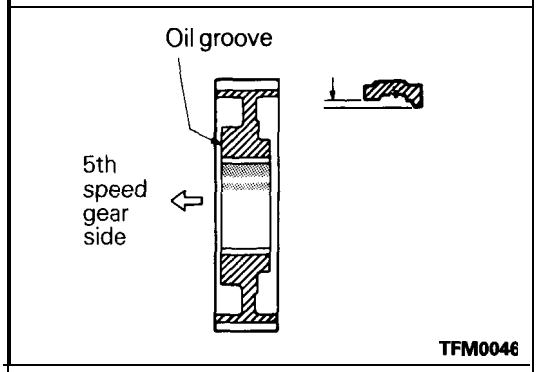
**Disassembly steps**

1. Reverse brake ring (F5M22-2, F5M33)
2. Stop plate (F5M22-1)
◆◆ 3. Synchronizer spring
4. Synchronizer sleeve
◆◆ 5. Synchronizer key
◆◆ 6. Synchronizer hub

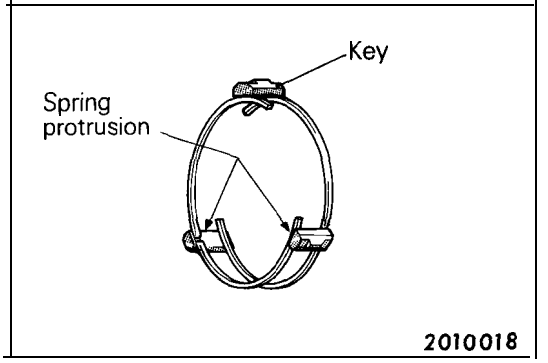
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Reassembly".


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## INSPECTION

### SYNCHRONIZER SLEEVE AND HUB

- Combine the synchronizer sleeve and hub and check that they slide smoothly.
- Check that the sleeve is free from damage at its inside front and rear ends.
- Check for wear of the hub front end (surface in contact with the 5th speed gear).

**Caution**
**When replacing, replace the synchronizer hub and sleeve as a set.**

### SYNCHRONIZER KEY AND SPRING

- Check for wear of the synchronizer key center protrusion.
- Check the spring for weakness, deformation and breakage.

## SERVICE POINTS OF REASSEMBLY

### 6. INSTALLATION OF SYNCHRONIZER HUB/5. SYNCHRONIZER KEY

Assemble the synchronizer hub, and key noting their direction.

NOTE
Only the direction of the keys for the F5M22-1 has to be observed.

### 3. INSTALLATION OF SYNCHRONIZER SPRING

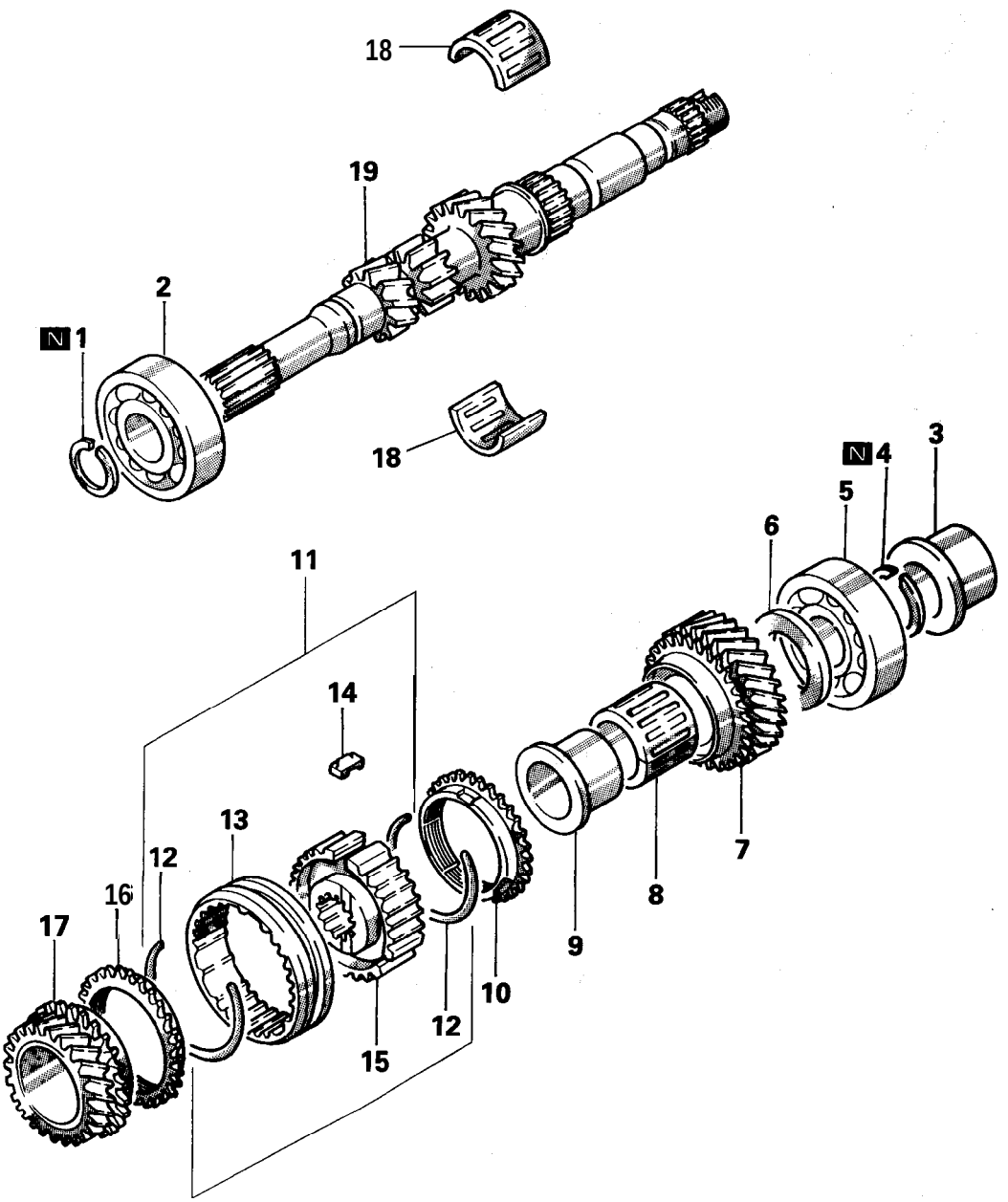
Assemble the synchronizer spring so that its projection may be engaged in the groove of the synchronizer key.

NOTE
Take care to prevent the projections of the front and rear spring from sitting in the groove of the same key.

# INPUT SHAFT ASSEMBLY <F5M22>

N21MIAZ

## DISASSEMBLY AND REASSEMBLY

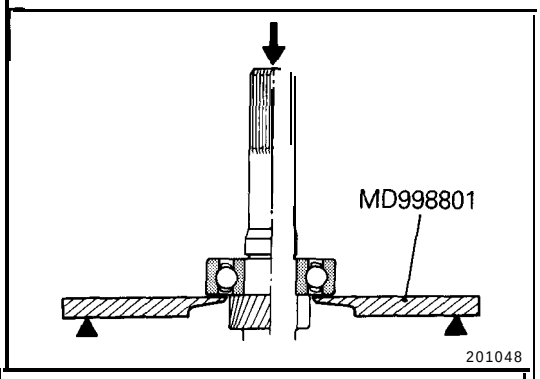



2060019

**Disassembly steps**

- ➡◀ 1. Snap ring
- ◀➡ ➡◀ 2. Ball bearing
- ◀➡ ➡◀ 3. Bearing sleeve
- ● ◀4. Snap ring
- ◀➡ ➡◀ 5. Ball bearing
- ● ◀6. Spacer
- 7. 4th speed gear
- 8. Needle bearing
- ➡◀ 9. Bearing sleeve
- 10. Synchronizer ring
- ● ◀11. 3rd-4th speed synchronizer assembly
- ● ◀12. Synchronizer spring
- 13. Synchronizer sleeve
- 14. Synchronizer key
- 15. Synchronizer hub
- 16. Synchronizer ring
- ● ☒ 17. 3rd speed gear
- 18. Needle bearing
- 19. Input shaft

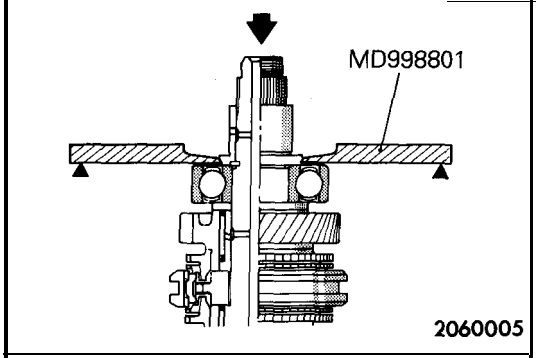
NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ● ➡: Refer to "Service Points of Disassembly".
(3) ➡◀ : Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY

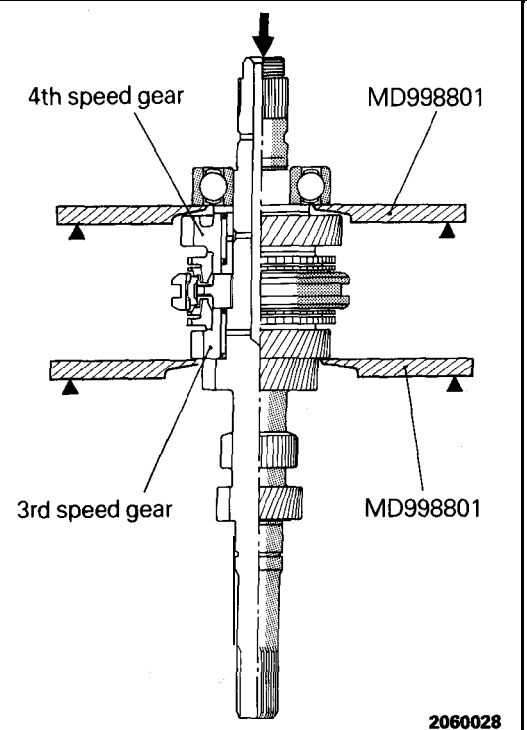
### 2. REMOVAL OF BALL BEARING

Remove the front bearing using the special tool as illustrated.




### 3. REMOVAL OF BEARING SLEEVE

Remove the bearing sleeve using the special tool as illustrated.

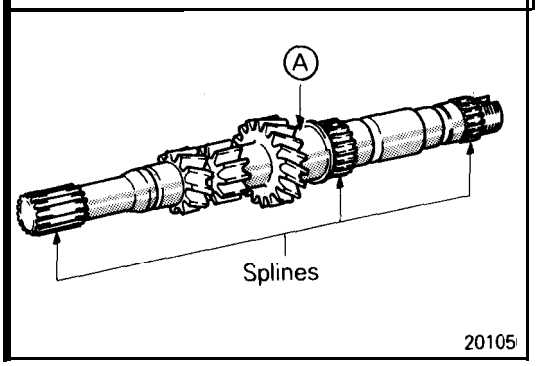



### 5. REMOVAL OF BALL BEARING

Remove the ball -bearing together using the special tool as illustrated.

### 17. REMOVAL OF 3RD SPEED GEAR

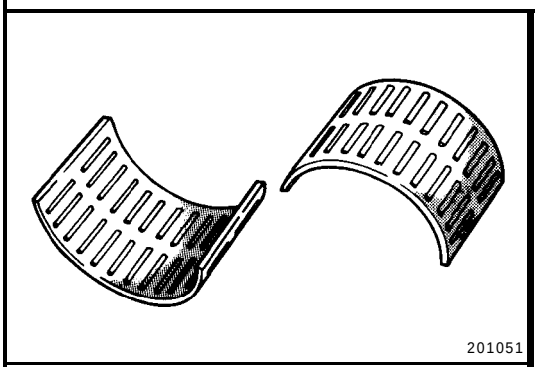
Remove the bearing sleeve, 3rd-4th speed synchronizer assembly and 3rd speed gear together using the special tool as illustrated.




## INSPECTION

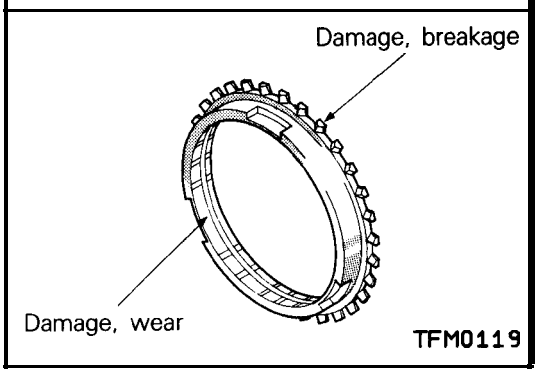
### INPUT SHAFT

- Check the outer surface of the input shaft where the needle bearing is mounted for damage, abnormal wear and seizure [portion Ⓐ].
- Check the splines for damage and wear.


201051

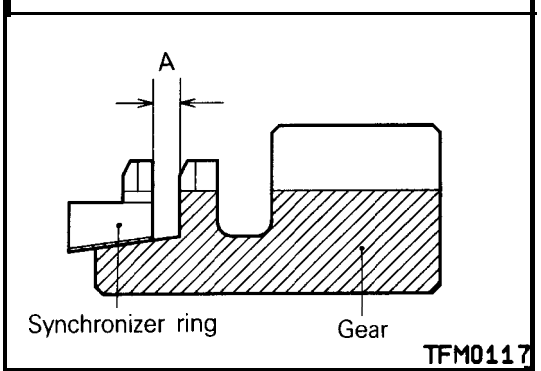
**NEEDLE BEARING**

- Combine the needle bearing with the shaft or bearing sleeve and gear and check that it rotates smoothly without abnormal noise or play.
- Check the needle bearing cage for deformation.



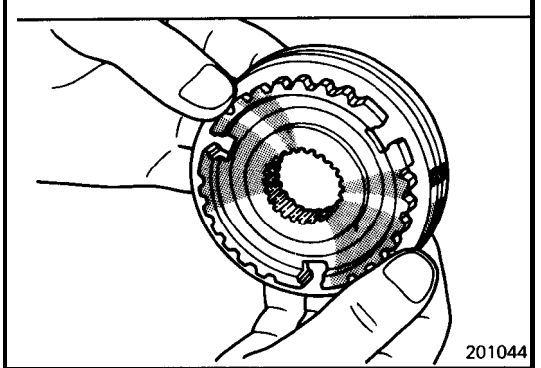

**SYNCHRONIZER RING**

- Check the clutch gear teeth for damage and breakage.
- Check the cone inside paper lining for damage, wear or peeling.




- Force the synchronizer ring toward the clutch gear and check clearance "A". Replace if it is out of specification.

  Limit: **0.5 mm (.02 in.)**

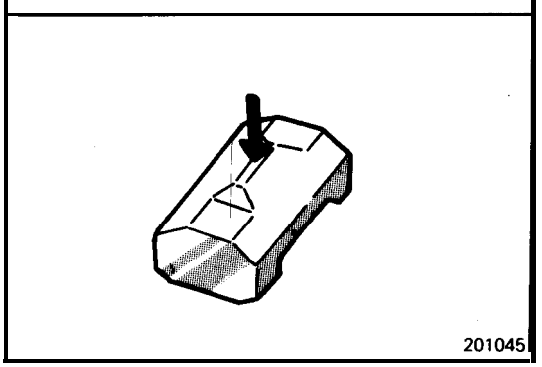

201044

**SYNCHRONIZER SLEEVE AND HUB**

- Combine the synchronizer sleeve and hub and check that they slide smoothly.
- Check that the sleeve is free from damage at its inside front and rear ends.
- Check for wear of the hub end surfaces (in contact with each speed gear).

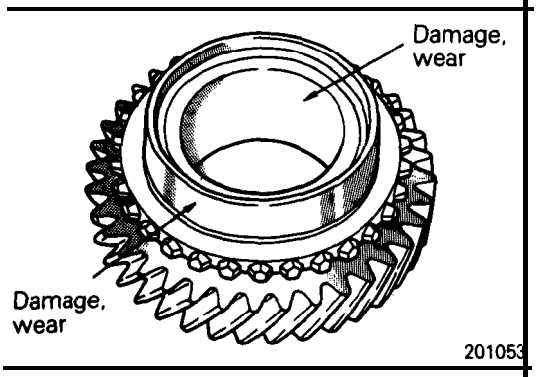
  Caution

  **When replacing, replace the synchronizer hub and sleeve as a set.**


201045

**SYNCHRONIZER KEY AND SPRING**

- Check for wear of the synchronizer key center protrusion.
- Check the spring for deterioration, deformation and breakage.



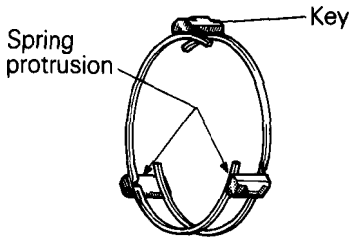

**SPEED GEARS**

- Check the bevel gear and clutch gear teeth for damage and wear.
- Check the synchronizer cone for rough surface, damage and wear.
- Check the gear 'bore and front and rear ends for damage and wear.

## SERVICE POINTS OF REASSEMBLY

### 12. INSTALLATION OF SYNCHRONIZER SPRING

Install the synchronizer spring so that its protrusion fits into the groove in the synchronizer key. Make sure that the protrusions in the front and rear springs are not in the groove of the same key.




### 11. INSTALLATION OF 3RD-4TH SPEED SYNCHRONIZER ASSEMBLY

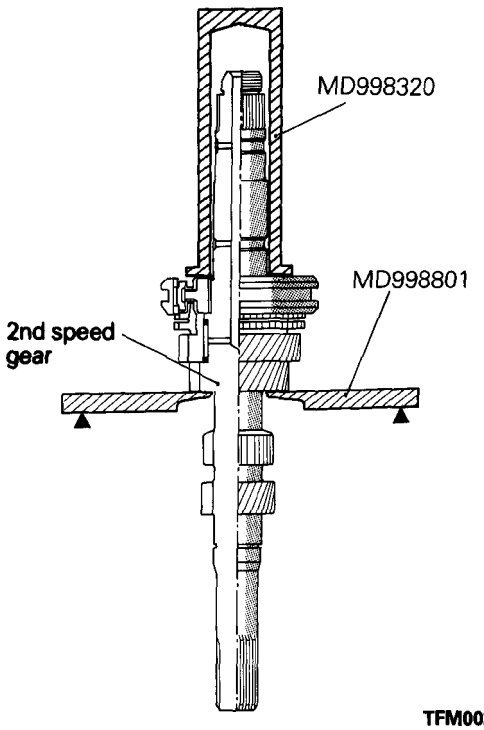
(1) Install the synchronizer assembly so that the part that has the small round indentation is in the oil groove at the hub end.

NOTE
If the installation is in the opposite way, press-in might not be possible. This is because the edge of the hub inner diameter spline at the part that has the small round indentation is made to facilitate pressing in.

(2) Press the 3rd-4th speed synchronizer assembly onto the input shaft using the special tool as illustrated.

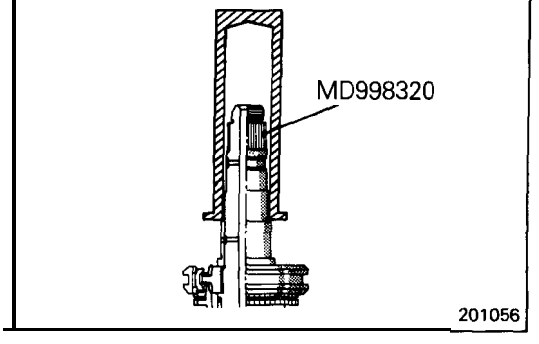
**Caution**
**When installing the synchronizer assembly, make sure that three synchronizer keys are seated correctly in respective grooves of the synchronizer ring.**

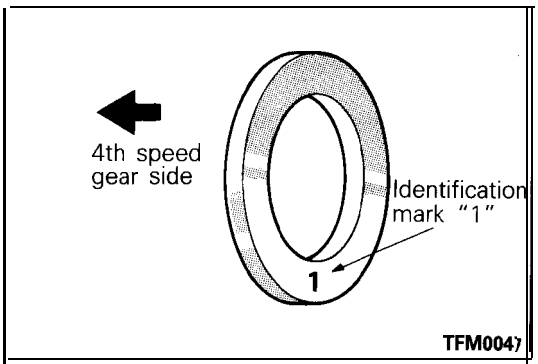
**(3)** Check the 3rd speed gear rotates smoothly.




### 9. INSTALLATION OF BEARING SLEEVE

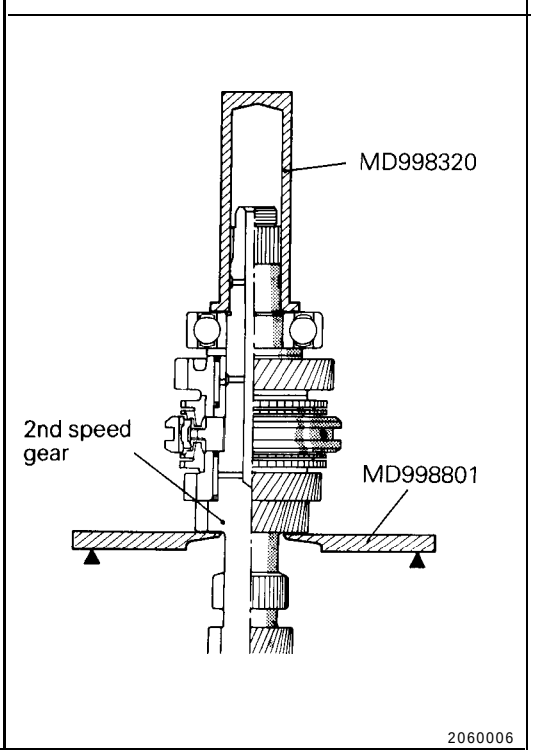
Use the special tool as illustrated.





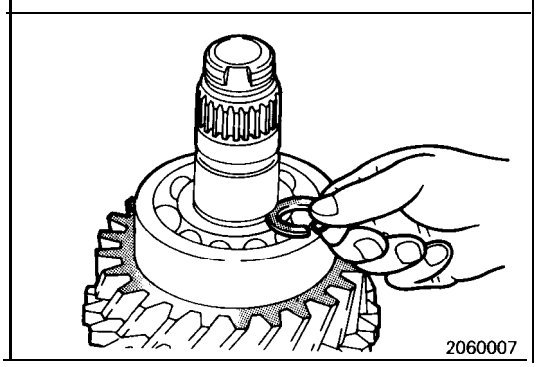

### 6. INSTALLATION OF SPACER

Some spacers have an inscribed identification mark. For such spacers, installation should be so that the surface that has no mark is facing toward the 4th gear side. Spacers without identification mark may be installed" in either direction.




### 5. INSTALLATION OF BALL BEARING

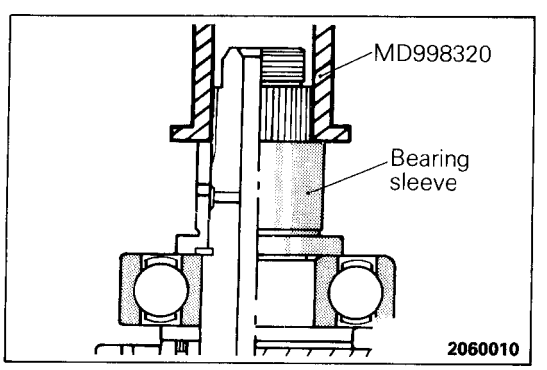
Install the ball bearing over the input shaft using the special tool.




### 4. INSTALLATION OF SNAP RING

Install a snap ring so that the input shaft rear bearing end play will be the standard value.

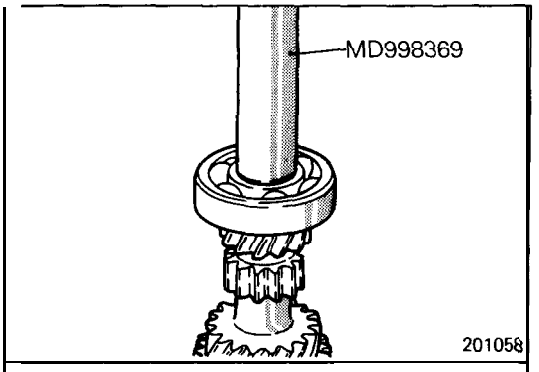
**Standard value: 0.01–0.09 mm (.0004–.004 in.)**




### 3. INSTALLATION OF BEARING SLEEVE

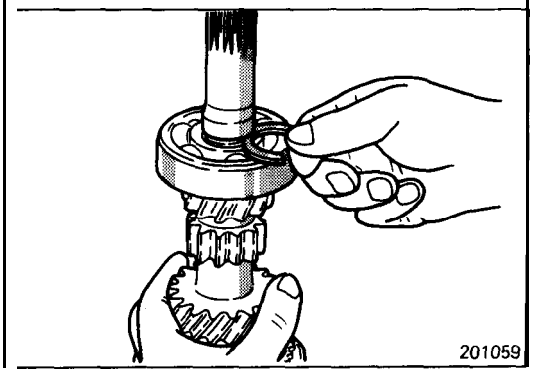
Using the special tool, attach the bearing sleeve on the input shaft.

**Caution**
**When press-fitting the sleeve on the input shaft, verify that the flange of the sleeve fits closely on the bearing.**




**2. INSTALLATION OF BALL BEARING**

Install the ball bearing over the input shaft using the special tool.




**1. INSTALLATION OF SNAP RING**

Snap rings are available in three different thickness. Select the thickest one that fits in the snap ring groove.

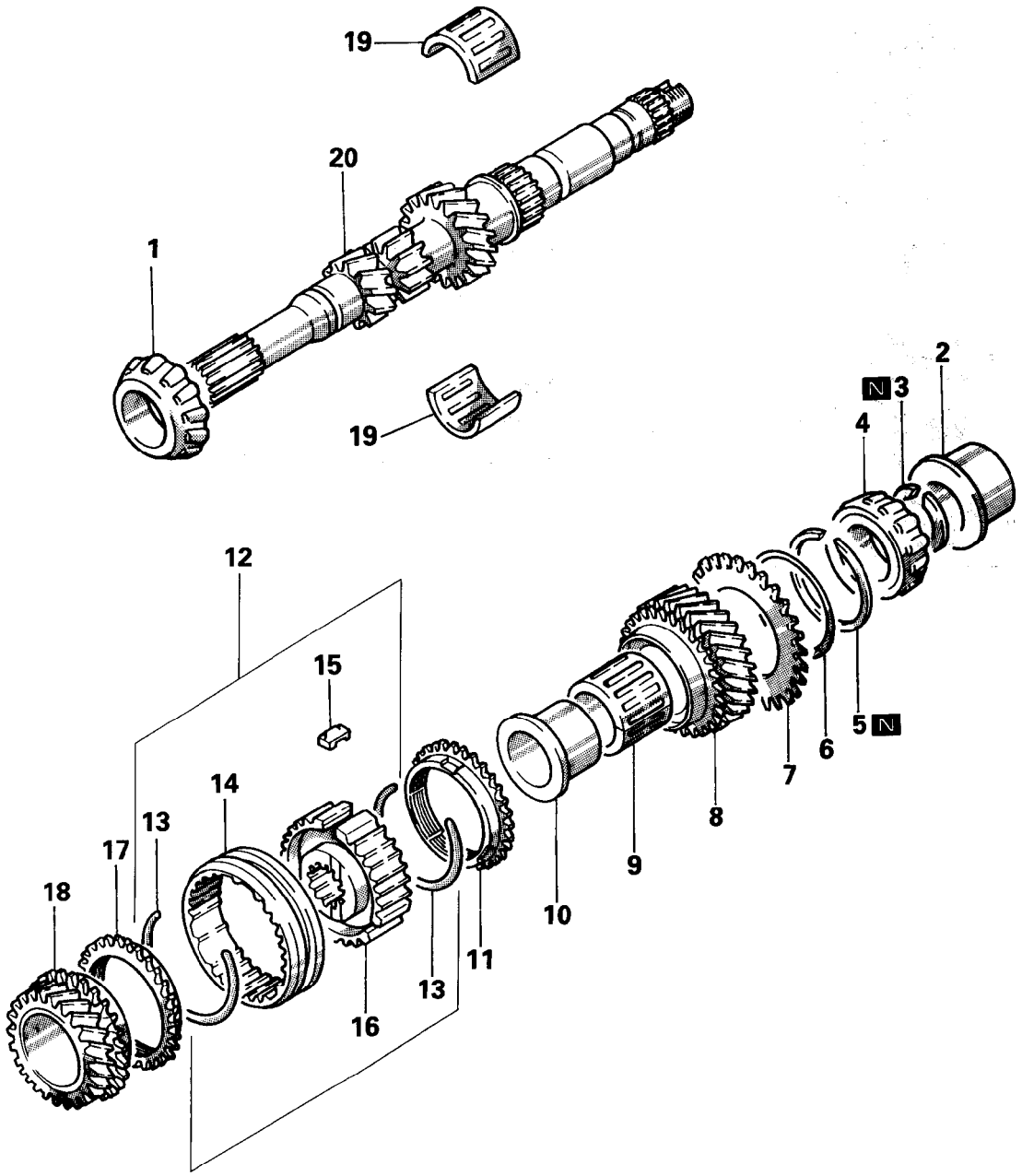
**Caution**
**Do not cause damage to the input shaft oil seal contacting portion.**

**Standard value: 0.01–0.12 mm (.0004–.005 in.)**

# INPUT SHAFT ASSEMBLY <F5M33>

N21MIAUa

## DISASSEMBLY AND REASSEMBLY

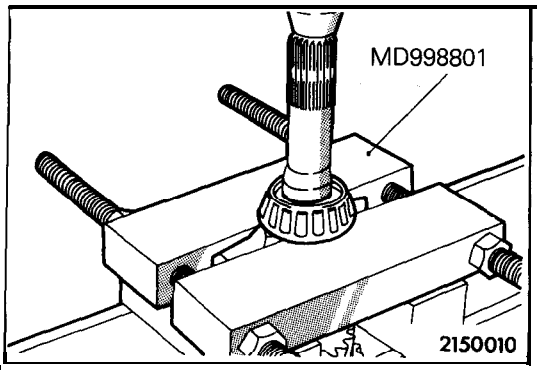



2150009

**Disassembly steps**

- ◆◆ ● ◆ 1. Taper roller bearing
- ◆◆ ▶◆ 2. Bearing sleeve
- ▶◆ 3. Snap ring
- ◆◆ ▶◆ 4. Taper roller bearing
- ● ◆ 5. Snap ring
- ▶◆ 6. Cone spring
- ▶◆ 7. Sub gear
- 8. 4th speed gear
- 9. Needle bearing
- ▶◆ 10. Bearing sleeve
- 11. Synchronizer ring
- ● ◆ 12. 3rd-4th speed synchronizer assembly
- ● ◆ 13. Synchronizer spring
- 14. Synchronizer sleeve
- 15. Synchronizer key
- 16. Synchronizer hub
- 17. Synchronizer ring
- ◆◆ 18. 3rd speed gear
- 19. Needle bearing
- 20. Input shaft

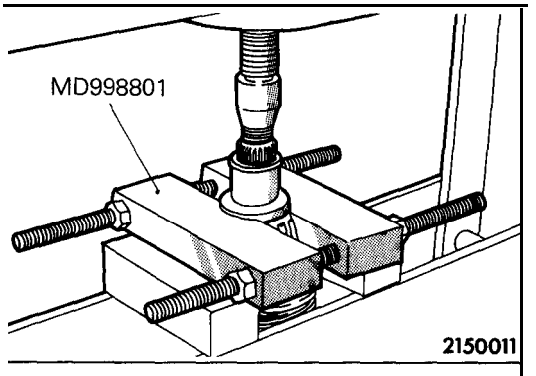
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ● ◆ : Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY

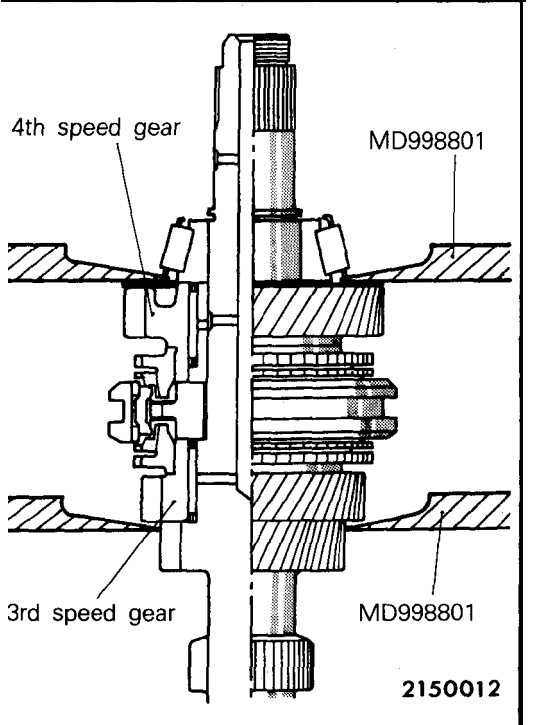
### 1. REMOVAL OF TAPER ROLLER BEARING

Remove the front bearing using the special tool as illustrated.




### 2. REMOVAL OF BEARING SLEEVE

Remove the bearing sleeve using the special tool as illustrated.

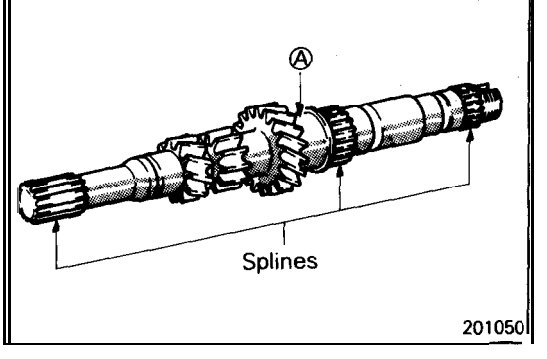



### 4. REMOVAL OF TAPER ROLLER BEARING

Remove the taper roller bearing together using the special tool as illustrated.

### 18. REMOVAL OF 3RD SPEED GEAR

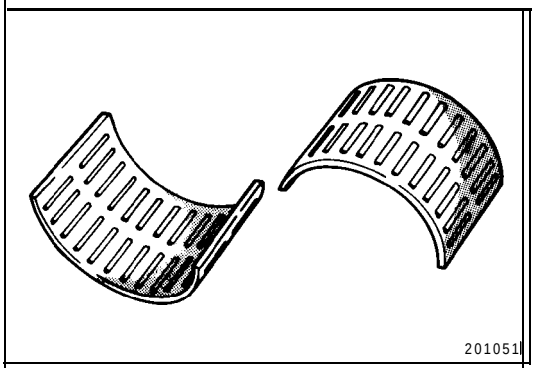
Remove the bearing sleeve, 3rd-4th speed synchronizer assembly and 3rd speed gear together using the special tool as illustrated.




## INSPECTION

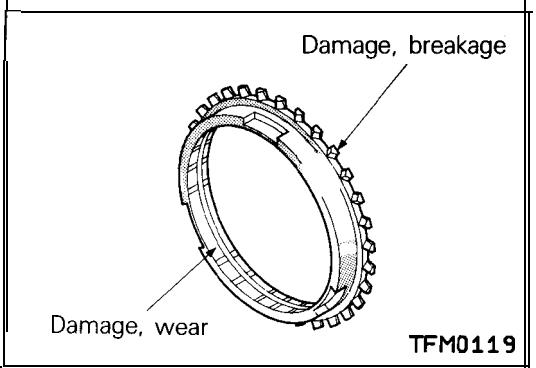
### INPUT SHAFT

- Check the outer surface of the input shaft where the needle bearing is mounted for damage; abnormal wear and seizure [portion Ⓐ].
- Check the splines for damage and wear.


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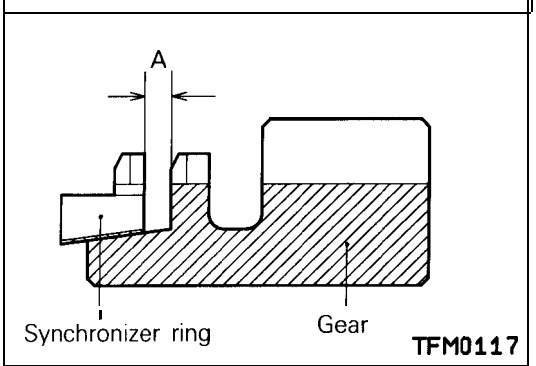
**NEEDLE BEARING**

- Combine the needle bearing with the shaft or bearing sleeve and gear and check that it rotates smoothly without abnormal noise or play.
- Check the needle bearing cage for deformation.



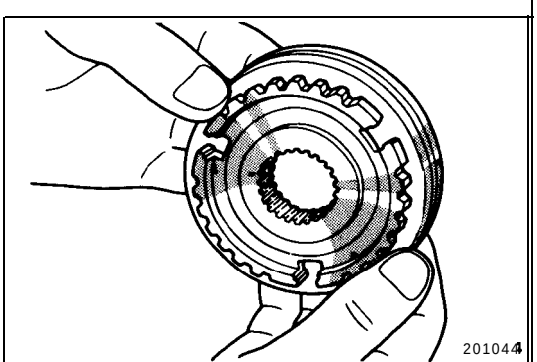

**SYNCHRONIZER RING**

- Check the clutch gear teeth for damage and breakage.
- Check the cone inside paper lining for damage, wear or peeling.




- Force the synchronizer ring toward the clutch gear and check clearance “A”. Replace if it is out of specification.

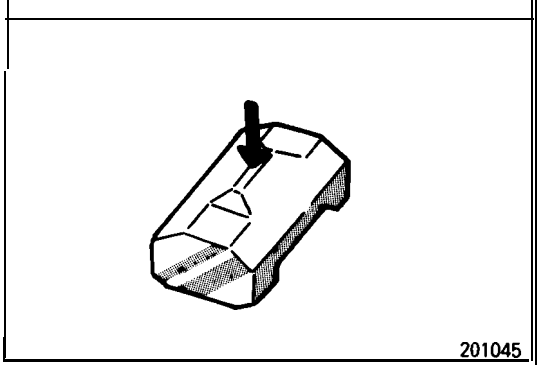
  **Limit: 0.5 mm (.02 in.)**


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**SYNCHRONIZER SLEEVE AND HUB**

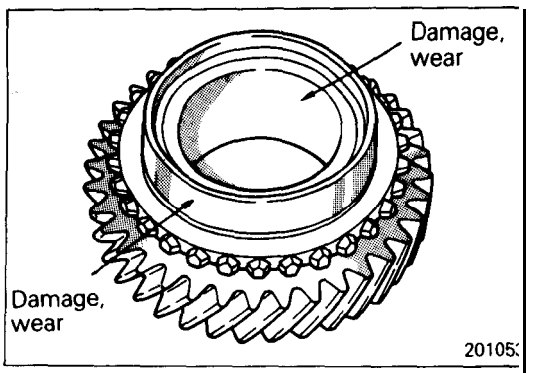
- Combine the synchronizer sleeve and hub and check that they slide smoothly.
- Check that the sleeve is free from damage at its inside front and rear ends.
- Check for wear of the hub end surfaces (in contact with each speed gear).

**Caution**
**When replacing, replace the synchronizer hub and sleeve as a set.**


201045

**SYNCHRONIZER KEY AND SPRING**

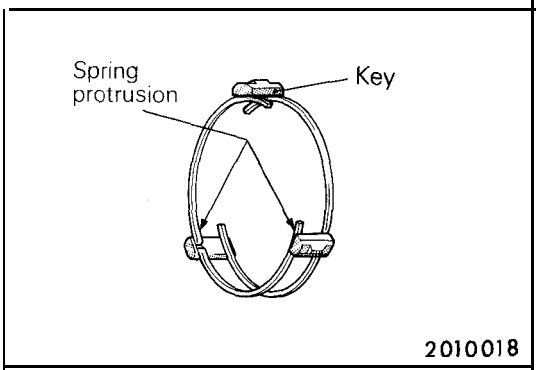
- Check for wear of the synchronizer key center protrusion.
- Check the spring for deterioration, deformation and breakage.




## SPEED GEARS

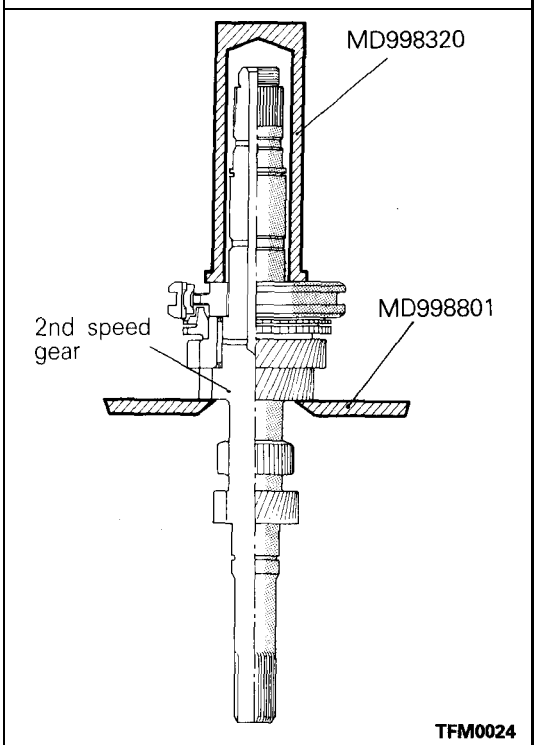
- Check the bevel gear and clutch gear teeth for damage and wear.
- Check the synchronizer cone for rough surface, damage and wear.
- Check the gear bore and front and rear ends for damage and wear.

## SERVICE POINTS OF REASSEMBLY




### 13. INSTALLATION OF SYNCHRONIZER SPRING

Assemble the synchronizer spring so that its projection may be engaged in the groove of the synchronizer key. Take care to prevent the projections of the front and rear spring from sitting in the groove of the same key.




### 12. INSTALLATION OF 3RD-4TH SPEED SYNCHRONIZER ASSEMBLY

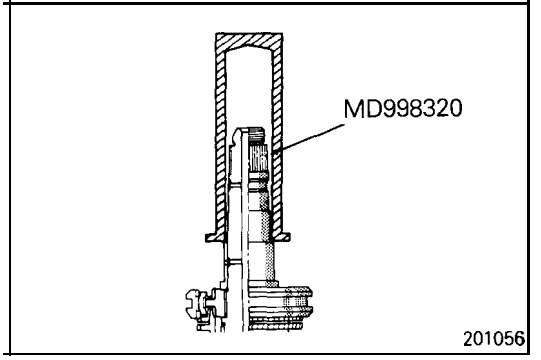
(1) Install the synchronizer assembly so that the part that has the small round indentation is in the oil groove at the hub end.

NOTE
If the installation is in the opposite way, press-in might not be possible. This is because the edge of the hub inner diameter spline at the part that has the small round indentation is made to facilitate pressing in.

(2) Press the 3rd-4th speed synchronizer assembly onto the input shaft using the special tool as illustrated.

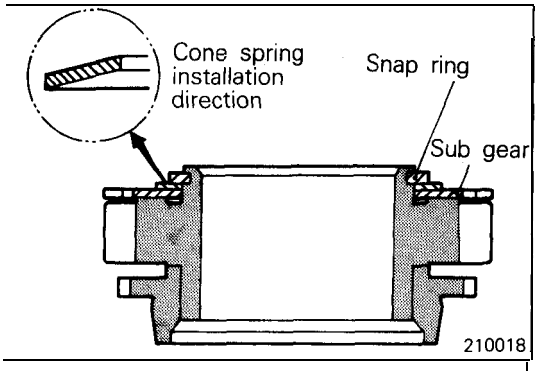
**Caution**
**When installing the synchronizer assembly, make sure that three synchronizer keys are seated correctly in respective grooves of the synchronizer ring.**

(3) Check the 3rd speed gear rotates smoothly.




### 10. INSTALLATION OF BEARING SLEEVE

Use the special tool as illustrated.

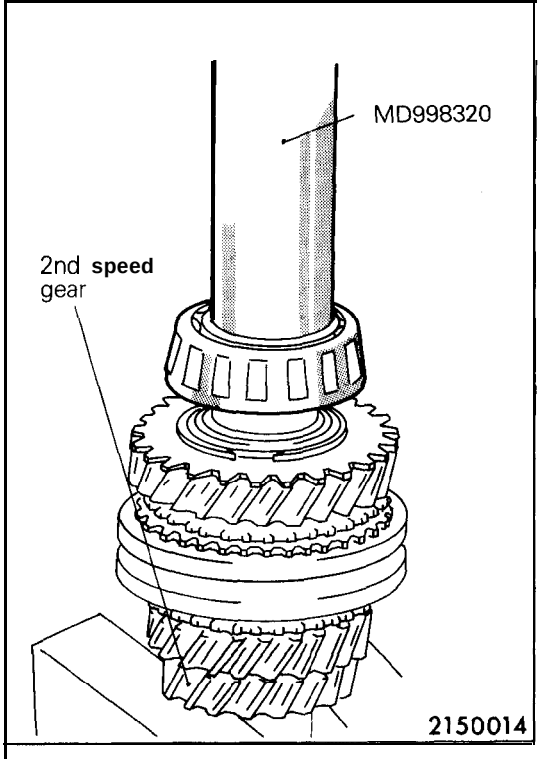



**7. INSTALLATION OF SUB GEAR/G. CONE SPRING/ 5. SNAP RING**

Install the sub gear and cone spring to 4th gear, and then install the snap ring.

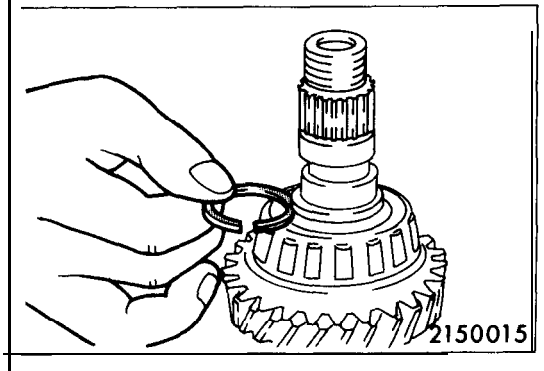
NOTE

Be sure that the cone spring is installed so that it is facing in the correct direction.




**4. INSTALLATION OF TAPER ROLLER BEARING**

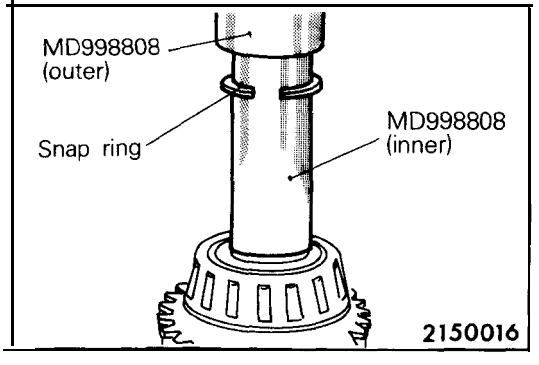
Install the taper roller bearing over the input shaft using the special tool.




**3. REASSEMBLY OF SNAP RING**

(1) Select the thickest possible snap ring which can enter the snap ring groove.

**Standard value: 0.01–0.09 mm (.0004–.004 in.)**

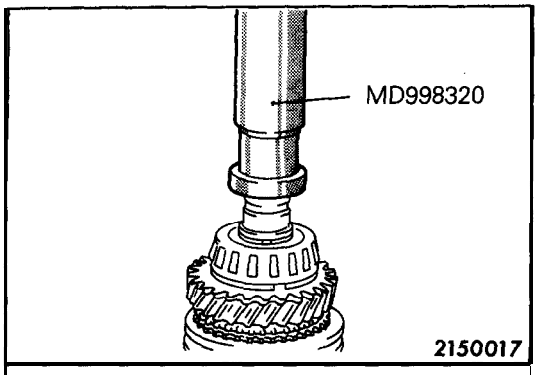



(2) Using a special tool, attach the snap ring to the input shaft.

**Caution**

**1. Don't reuse the old snap ring.**

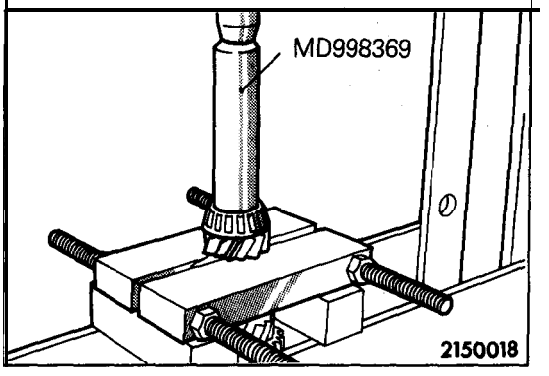
**2. If snap ring pliers are used, the snap ring may sometimes be expanded excessively. This will prevent proper mounting of the sleeve.**




**2. REASSEMBLY OF BEARING SLEEVE**

(1) Using a special tool, fit the bearing sleeve to the input shaft.

**Caution**
**After fitting, check that the sleeve flange is closely fit to the bearing.**



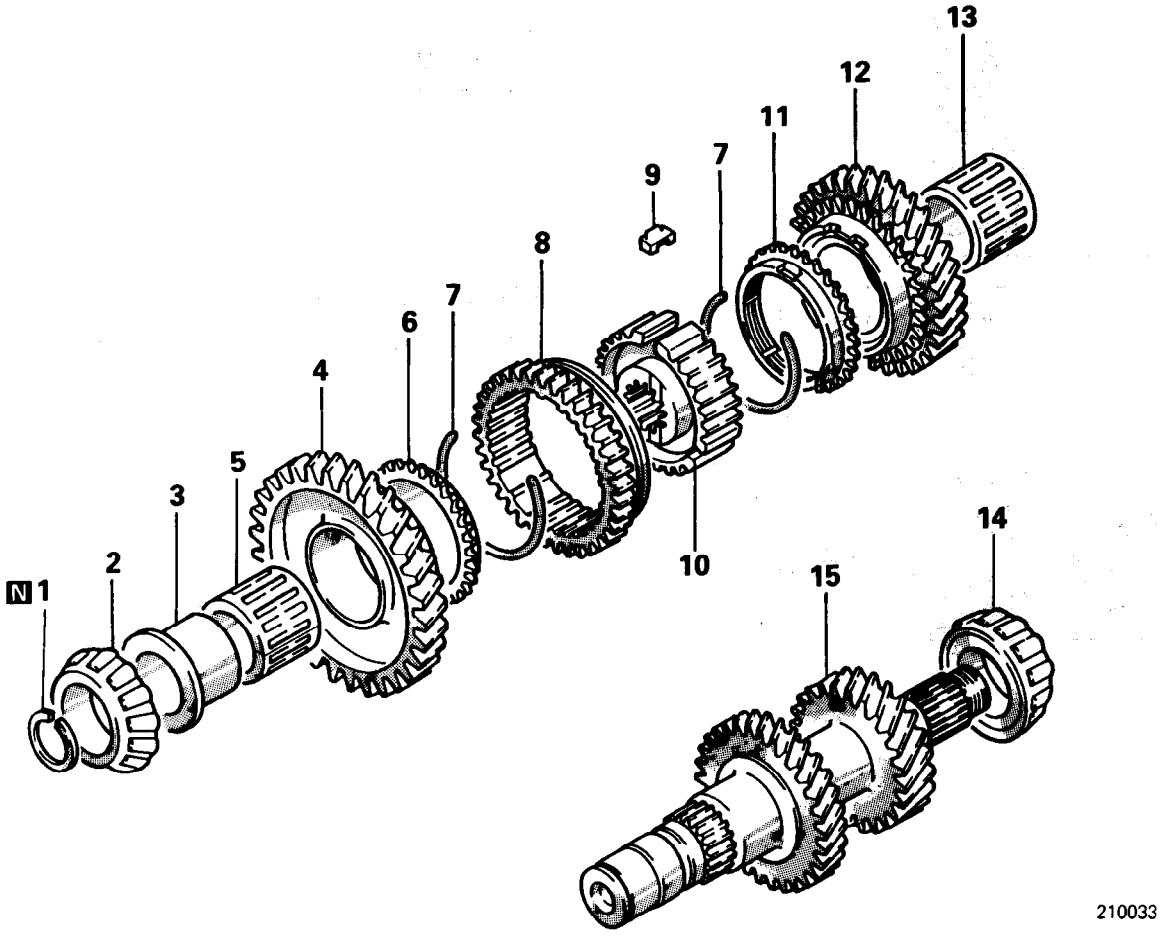

**1. INSTALLATION OF TAPER ROLLER BEARING**

Install the taper roller bearing over the input shaft using the special tool.

# INTERMEDIATE GEAR ASSEMBLY

N21MJAC

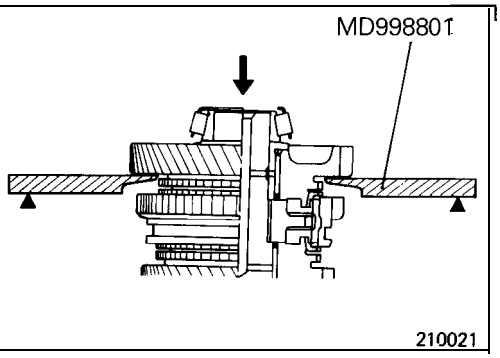
## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

- ◆ 1. Snap ring
- ◆◆ 2. Taper roller bearing
- ◆◆ 3. Bearing sleeve
- ◆◆ 4. 1st speed gear
- 5. Needle bearing
- ◆ 6. Synchronizer ring
- ◆◆ 7. Synchronizer spring
- ◆◆ 8. 1st-2nd speed synchronizer sleeve
- ◆ 9. Synchronizer key
- ◆◆ ◆◆ 10. 1st-2nd speed synchronizer hub
- ● ◆ 11. Synchronizer ring
- ◆ ☒ 12. 2nd speed gear
- 13. Needle bearing
- ◆◆ ◆◆ 14. Taper roller bearing
- 15. Intermediate gear

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ● ◆ : Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts



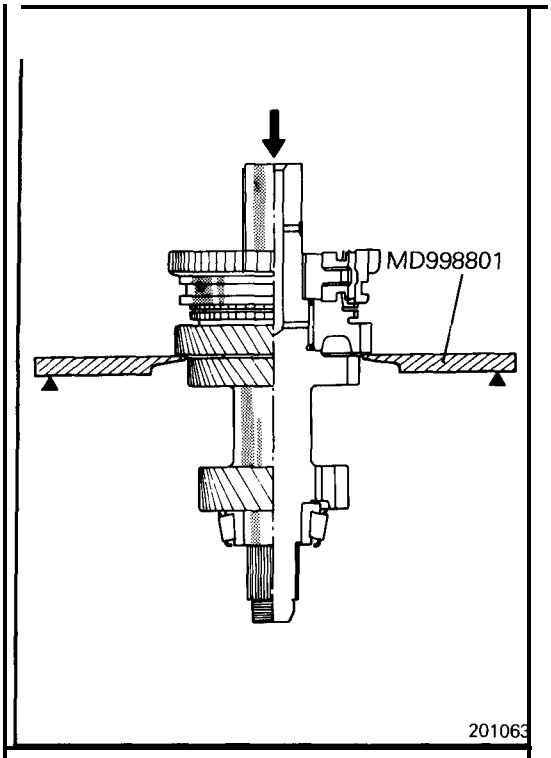

## SERVICE POINTS OF DISASSEMBLY

### 2. REMOVAL OF TAPER ROLLER BEARING/4. 1ST SPEED GEAR

Remove the taper roller bearing, 1 st speed gear and bearing sleeve using the special tool as illustrated.

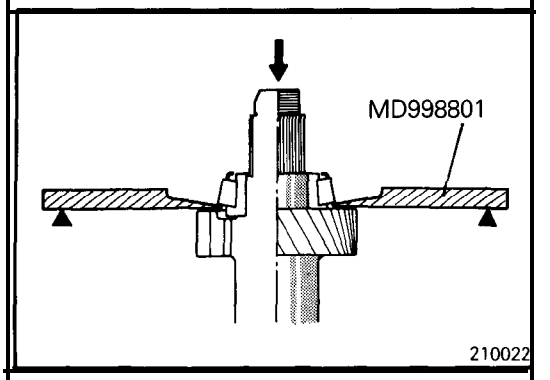
**Caution**

**1. Do not reuse the bearing removed from the shaft.**
**2. Replace the inner and outer races of the taper roller bearing as a set.**




**10. REMOVAL OF 1ST-2ND SPEED SYNCHRONIZER HUB/ 12. 2ND SPEED GEAR**

Remove the 1 st-2nd speed synchronizer assembly and 2nd speed gear together using the special tool as illustrated.



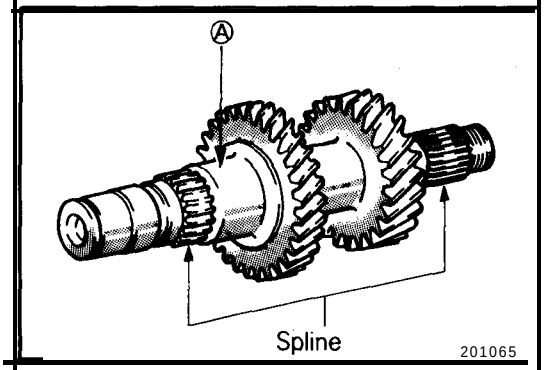

**14. REMOVAL OF TAPER ROLLER BEARING**

Use the special tool as illustrated.

**Caution**

**1. Do not reuse the bearing removed from the shaft.**

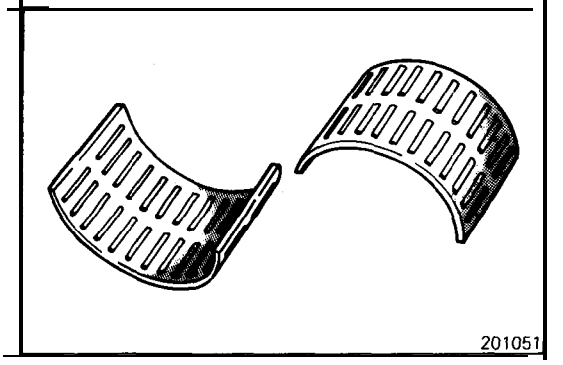
**2. Replace the inner and outer races of the taper roller bearing as a set.**




## INSPECTION

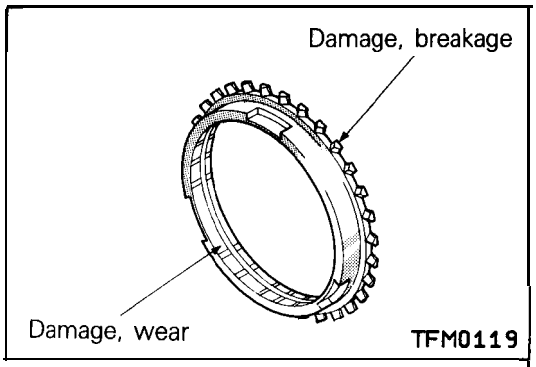
### INTERMEDIATE GEAR

- Check the outer surface of the intermediate gear where the needle bearing is mounted for damage, abnormal wear and seizure [portion Ⓐ.]
- Check the splines for damage and wear.



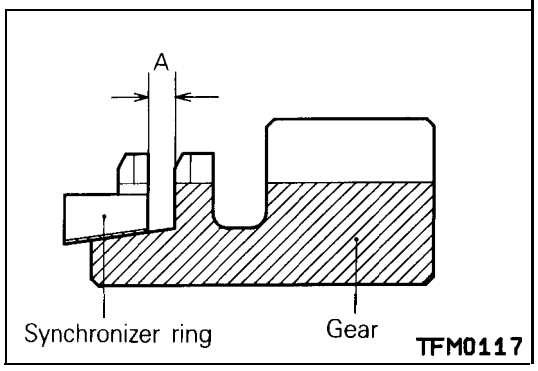

### NEEDLE BEARING

- Combine the needle bearing with the shaft or bearing sleeve and gear and check that it rotates smoothly without abnormal noise or play.
- Check the needle bearing cage for deformation.



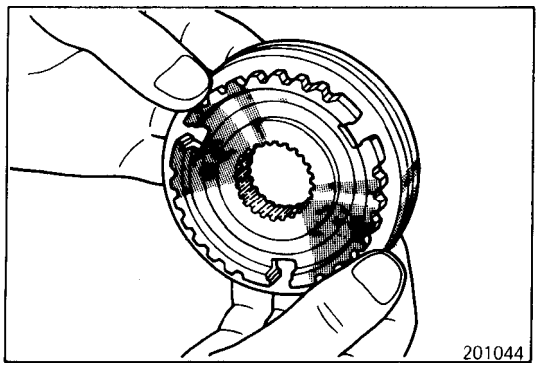

### SYNCHRONIZER RING

- Check the clutch gear teeth for damage and breakage.
- Check the cone inside paper lining for damage, wear or peeling.




- Force the synchronizer ring toward the clutch gear and check clearance "A". Replace if it is out of specification.

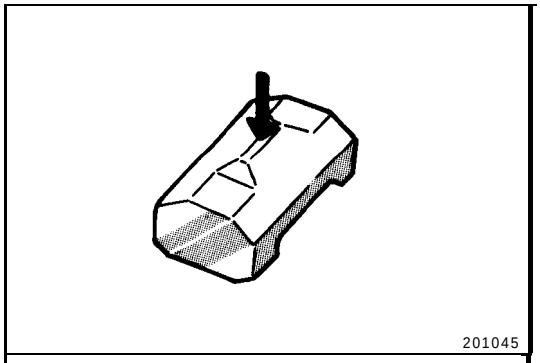
**Limit :** 0.5 **mm (.02 in.)**




### SYNCHRONIZER SLEEVE AND HUB

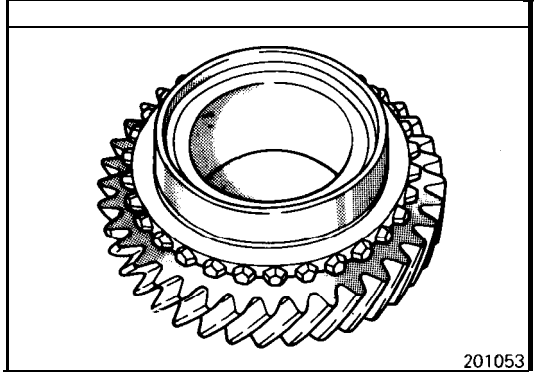
- Combine the synchronizer sleeve and hub and check that they slide smoothly.
- Check that the sleeve is free from damage at its inside front and rear ends.
- Check for wear of the hub end surfaces (in contact with each speed gear).

**Caution**
**When replacing, replace the synchronizer hub and sleeve as a set.**



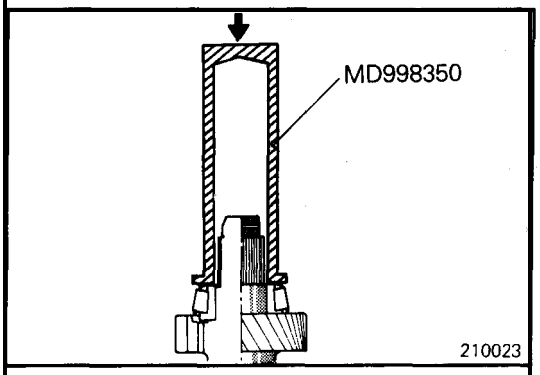

### SYNCHRONIZER KEY AND SPRING

- Check for wear of the synchronizer key center protrusion.
- Check the spring for weakness, deformation and breakage.




### SPEED GEARS

- Check the bevel gear and clutch gear teeth for damage and wear.
- Check the synchronizer cone for rough surface, damage and wear.
- Check the gear bore and front and rear ends for damage and wear.

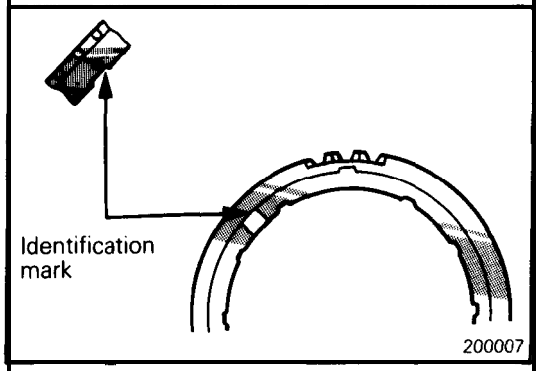



## SERVICE POINTS OF REASSEMBLY

### 14. INSTALLATION OF TAPER ROLLER BEARING

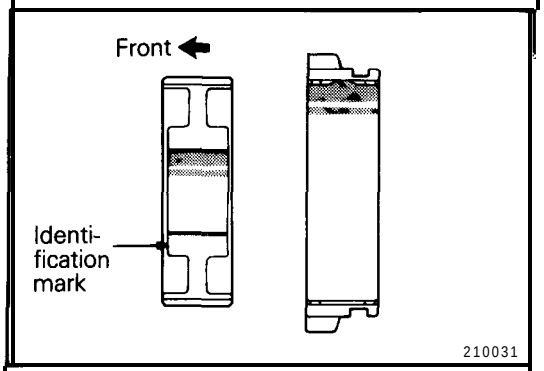
Install the taper roller bearing over the intermediate gear using the special tool.

**Caution**
**When installing the bearing, push the inner race only.**



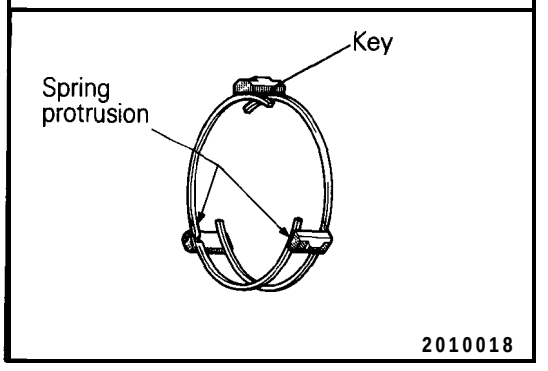

### 11. /6. INSTALLATION OF SYNCHRONIZER RINGS

The 1 st speed synchronizer ring has an identification mark.



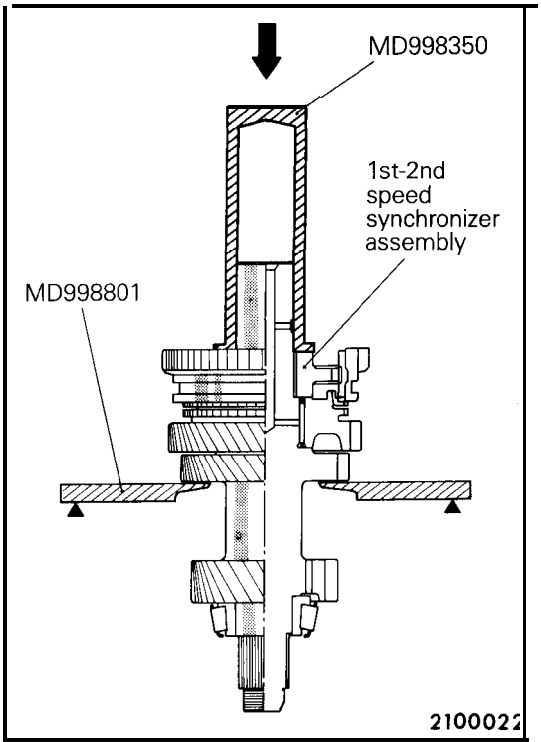

### 10. INSTALLATION OF 1ST-2ND SPEED SYNCHRONIZER HUB/9. SYNCHRONIZER KEY/8. 1ST-2ND SPEED SYNCHRONIZER SLEEVE/7. SYNCHRONIZER SPRING

(1) Combine the 1st-2nd speed synchronizer hub and sleeve as illustrated.




(2) Assemble the synchronizer spring so that its projection may be engaged in the groove of the synchronizer key.

NOTE
(1) Take care to prevent the projections of the front and rear spring from sitting in the groove of the same key.
(2) A synchronizer spring different from the one shown in the figure may be used but the explanation is the same.

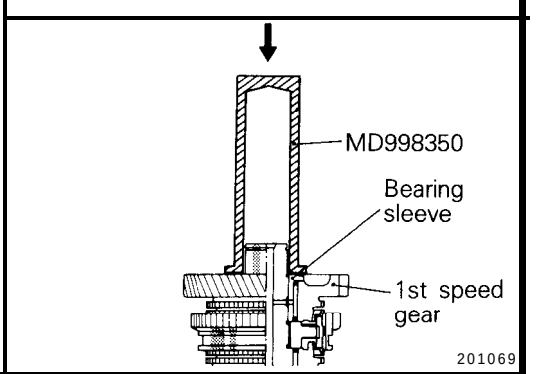



(2) install the 1st-2nd speed synchronizer assembly over the intermediate gear using the special tool.

**Caution**

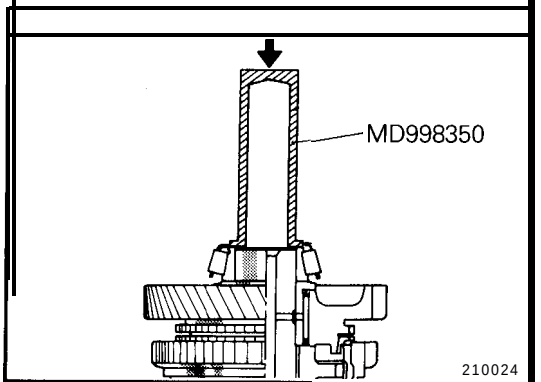
**1. When installing the synchronizer assembly, make sure that three synchronizer keys are seated correctly in respective grooves of the synchronizer ring.**

**2. After installation of synchronizer assembly, check that the 3rd speed gear rotates smoothly.**




### 3. INSTALLATION OF BEARING SLEEVE

Install the 1 st speed gear and bearing sleeve together over the intermediate gear using the special tool.

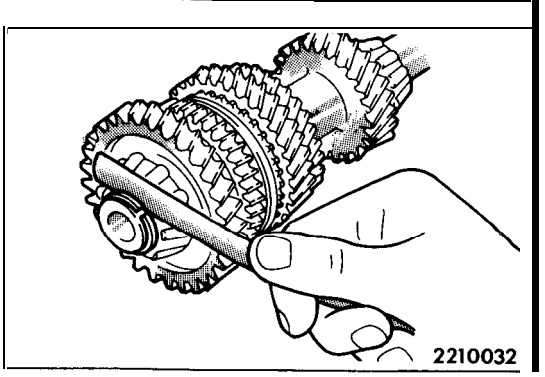



### 2. INSTALLATION OF TAPER ROLLER BEARING

Install the taper roller bearing over the intermediate using the special tool.

**Caution**

**When installing the bearing, push the inner race only.**




### 1. INSTALLATION OF SNAP RING

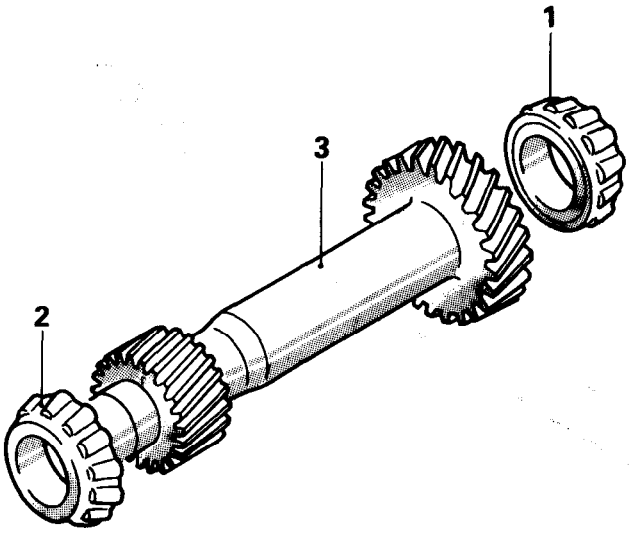
Select and install a snap ring that will result in an intermediate gear bearing end play that is the standard value.

**Standard value: 0.01–0.14 mm (.0004–.006 in.)**

# OUTPUT SHAFT ASSEMBLY

N21MKAG

## DISASSEMBLY AND REASSEMBLY

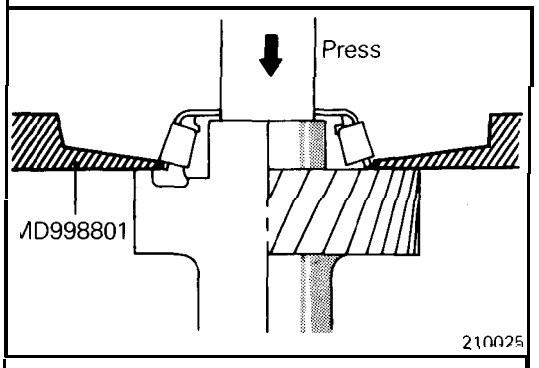


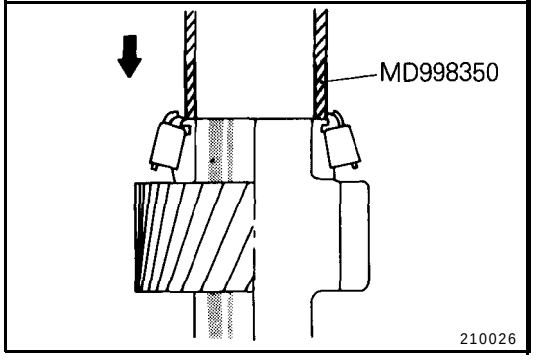

**Disassembly steps**

◆◆ ▶◀ 1. Taper roller bearing
◆◆ ▶◀ 2. Taper roller bearing
3. Output shaft

NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ▶◀ : Refer to "Service Points of Reassemby".

210028




## SERVICE POINTS OF DISASSEMBLY

### 1./2. REMOVAL' OF TAPER ROLLER BEARINGS

Remove the taper roller bearing using the special tool as illustrated.

**Caution**
1. **Do not reuse the bearings removed from the shaft.**
2. **Replace the inner and outer races of the taper roller bearing as a set.**

## SERVICE POINTS OF REASSEMBLY

### 1./2. REMOVAL OF TAPER ROLLER BEARINGS

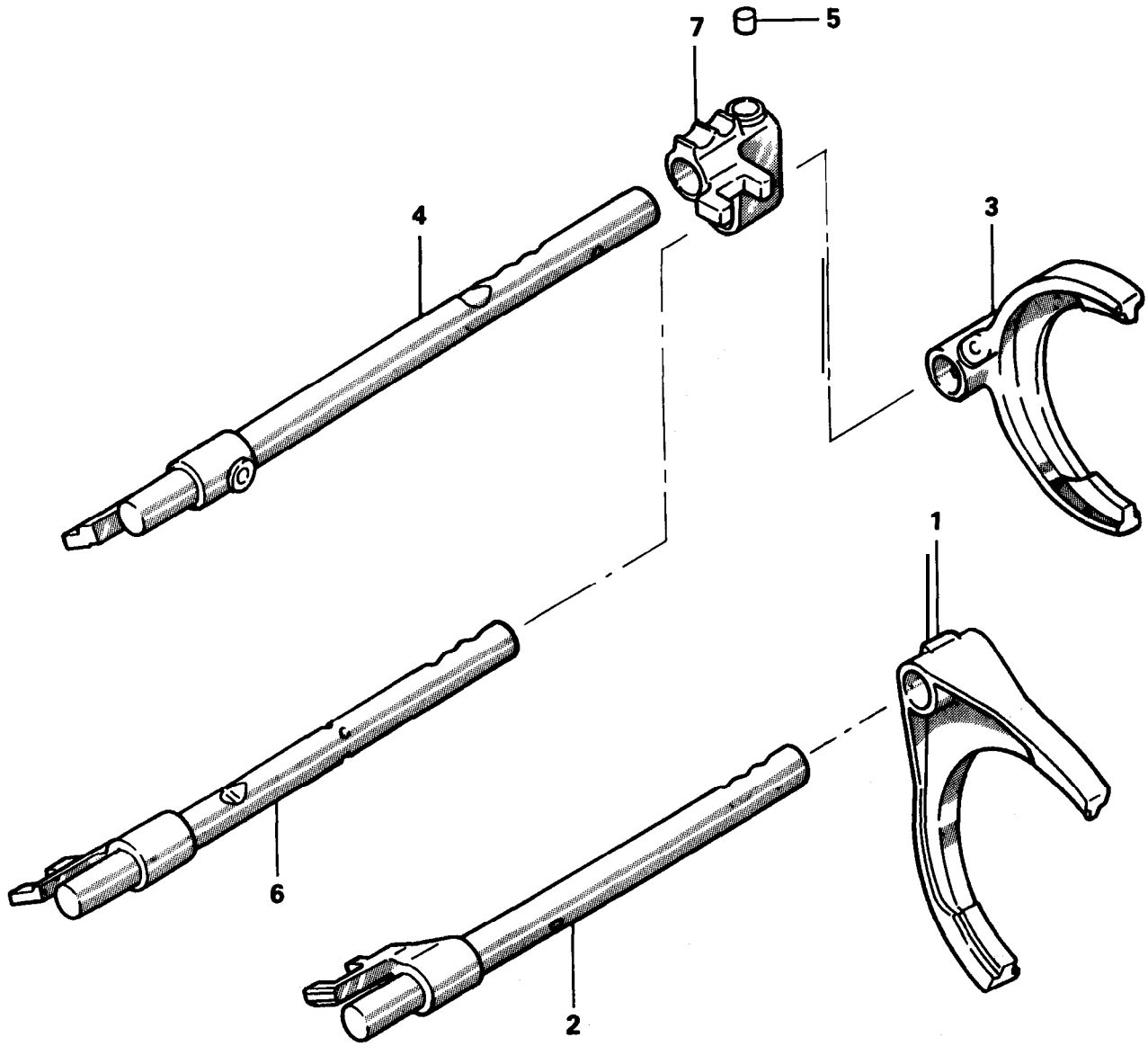
install the taper roller bearing using the special tool.

**Caution**
**When installing the bearing, push the inner race only.**

# SHIFT RAILS AND FORKS

N21MLAAa

## DISASSEMBLY AND REASSEMBLY

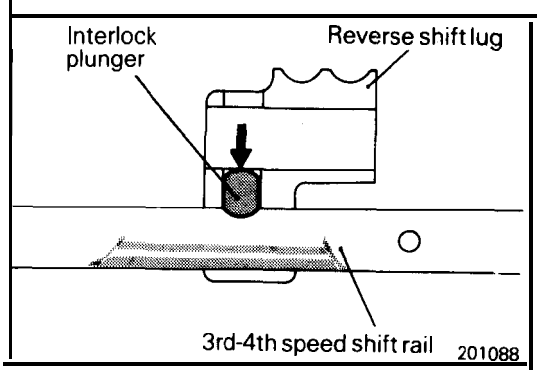



**Disassembly steps**

1. 1st-2nd speed shift fork
2. 1st-2nd speed shift rail
3. 3rd-4th speed shift fork
4. 5th-reverse speed shift rail
◆◆ 5. Interlock plunger
6. 3rd-4th speed shift rail
7. Reverse shift lug

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● ◆: Refer to "Service Points of Reassembly".

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## SERVICE POINTS OF REASSEMBLY

### 5. INSTALLATION OF INTERLOCK PLUNGER

insert the interlock plunger at illustrated position of the 3rd-4th speed shift rail.

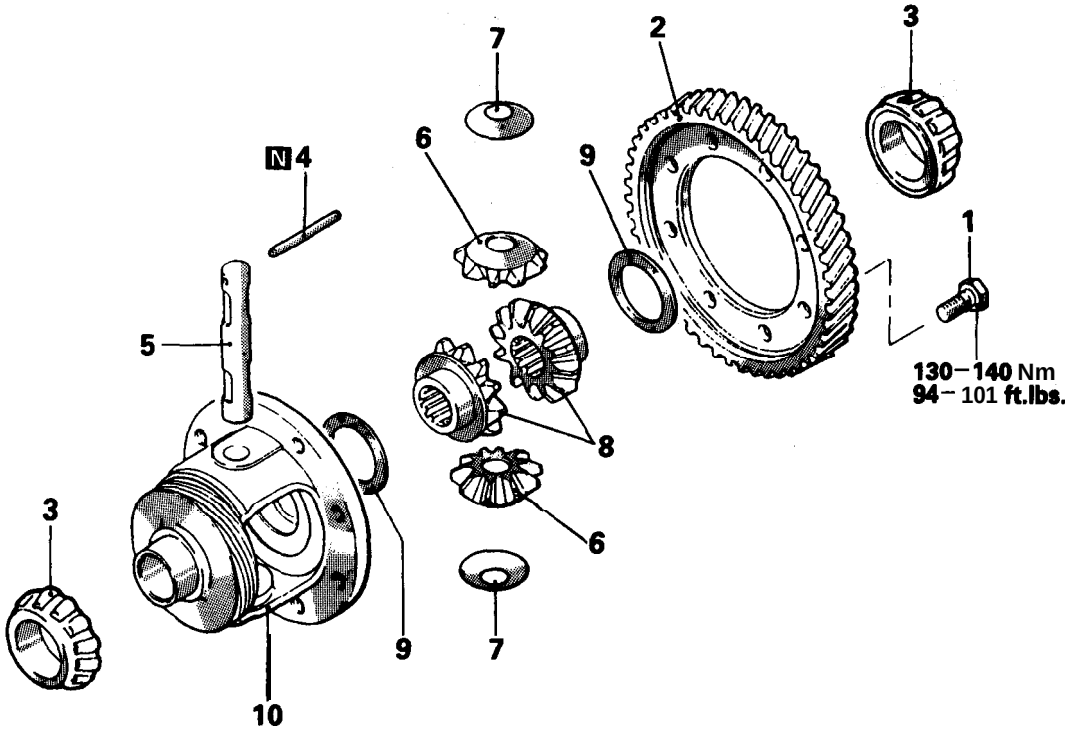
# DIFFERENTIAL ASSEMBLY

N21MMAF

## DISASSEMBLY AND REASSEMBLY

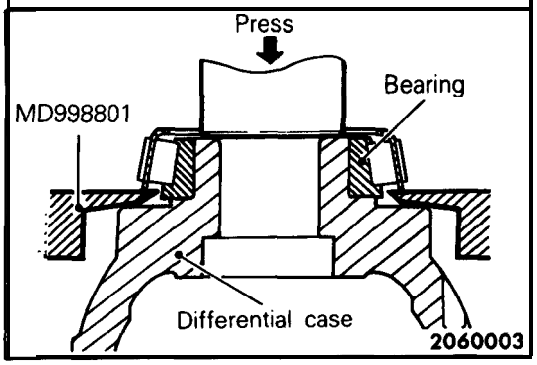
**Disassembly steps**

- ◆1. Bolt
- 2. Differential drive gear
- ● ● a 3. Taper roller bearing
- ◆◆ ● + 4. Lock pin
- ◆◆ 5. Pinion shaft
- ● 6. Pinion
- ◆◆ 7. Washer
- ● + 8. Side gear
- ● + 9. Spacer (Select)
- 10. Differential case




NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Disassembly".
(3) ◆◆ : Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts

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## SERVICE POINTS OF DISASSEMBLY

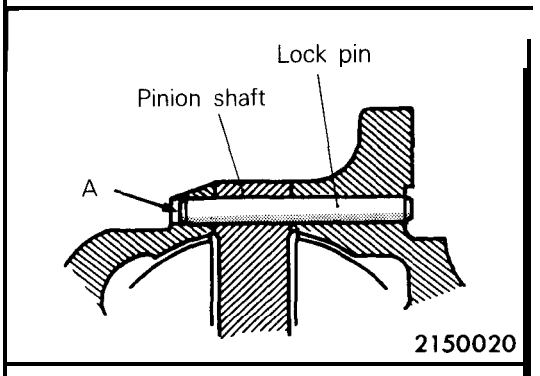
### 3. REMOVAL OF TAPER ROLLER BEARING

Remove the taper roller bearing using the special tool as illustrated.

**Caution**

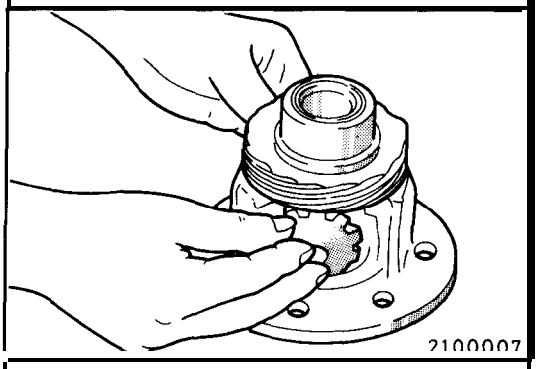
**1. Do not reuse the bearing removed from the differential case.**

**2. Replace the inner and outer races of the taper roller bearing as a set.**




**4. REMOVAL OF LOCK PIN**

Drive out the lock pin from the hole A using a punch.

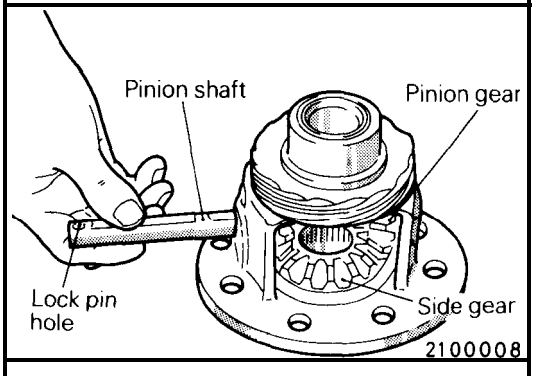



## SERVICE POINTS OF REASSEMBLY

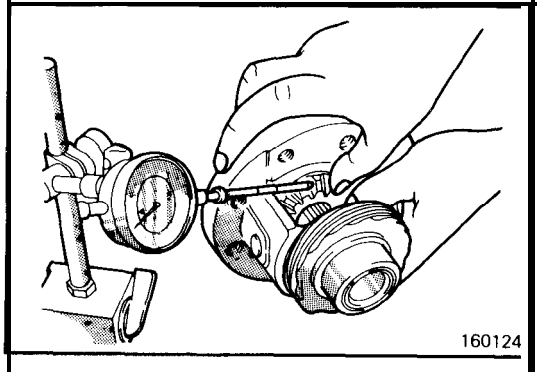
**9. INSTALLATION OF SPACER / 8. SIDE GEAR / 7. WASHER / 6. PINION / 5. PINION SHAFT**

(1) Install the spacer on the back of the side gear and then install the gear in the differential case.

**Caution**
**When installing a new side gear, use a spacer of medium thickness [0.93–1.00 mm (.36–.04 in.)].**




(2) Set the washer on the back of each pinion and insert the two pinions to specified position while engaging them with the side gears and turning them.
(3) Insert the pinion shaft.

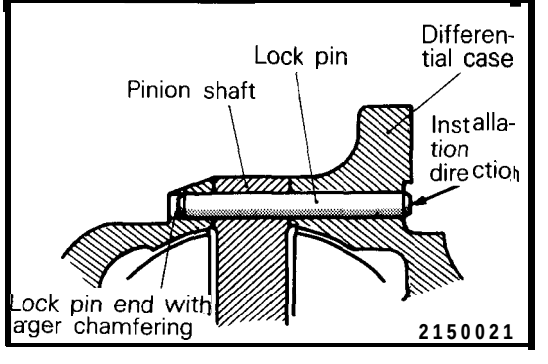



(4) Measure the backlash between the side gears and pinions.

**Standard value:**
**0.025–0.150 mm (.001–.006 in.)**

(5) If the backlash is out of specification, disassemble again and using correct spacer, reassemble and adjust.

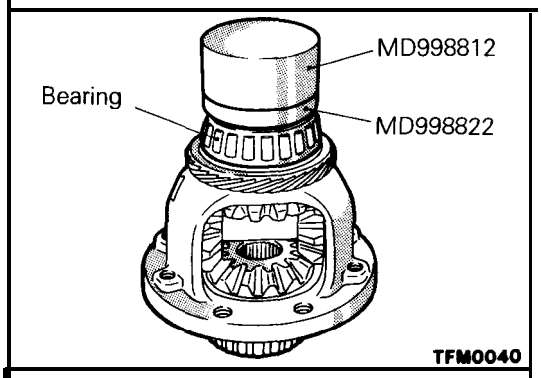
**Caution**
**Adjust for same backlash of both side gears.**




**4. INSTALLATION OF LOCK PIN**

Align the pinion shaft lock pin hole with the case lock pin hole and insert the lock pin.

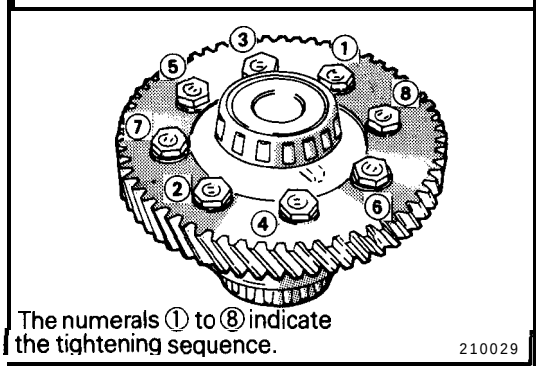
**Caution**
**1. Do not reuse the lock pin.**
**2. The lock pin head must be sunk from the flange surface of the differential case.**




### 3. INSTALLATION OF TAPER ROLLER BEARING

Install the taper roller bearings on both sides of the differential case.

**Caution**
**When press-fitting the bearings, push the inner race only.**




### 1. INSTALLATION OF BOLTS

Apply specified adhesive to the entire threads of the bolts and quickly tighten in the order shown to specified torque.

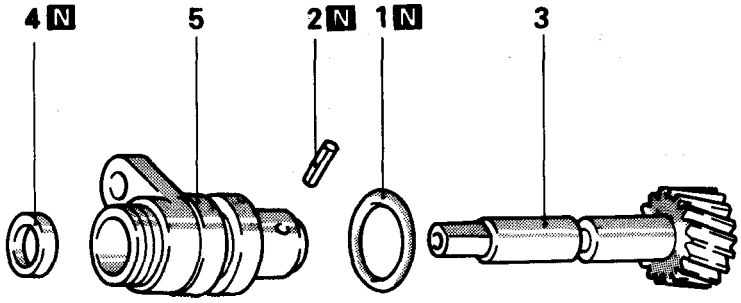
**Specified adhesive: MOPAR Part No. 4318031 or MOPAR Part No. 4318032 or equivalent**

**Caution**
**If a bolt is reused, remove traces of old adhesive completely from the threads.**

## SPEEDOMETER GEAR ASSEMBLY

N21MNAB

### DISASSEMBLY AND REASSEMBLY

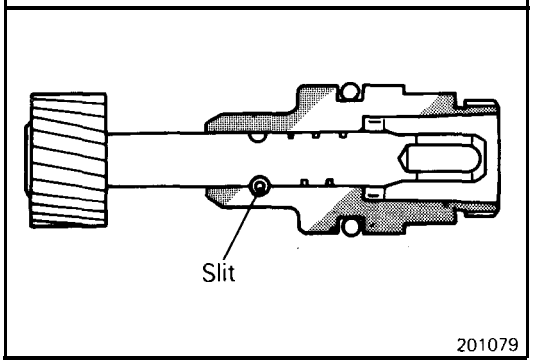



**Disassembly steps**

1. O-ring
• 4 2. Spring pin
◆◆ 3. Speedometer driven gear
4. Oil seal
**5. Sleeve**

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆ : Refer to "Service Points of Reassembly".
(3) ❑ :Non-reusable parts

201078




### SERVICE POINTS OF REASSEMBLY

### 3. INSTALLATION OF SPEEDOMETER DRIVEN GEAR

Apply gear oil sparingly to the speedometer driven gear shaft and insert the shaft.

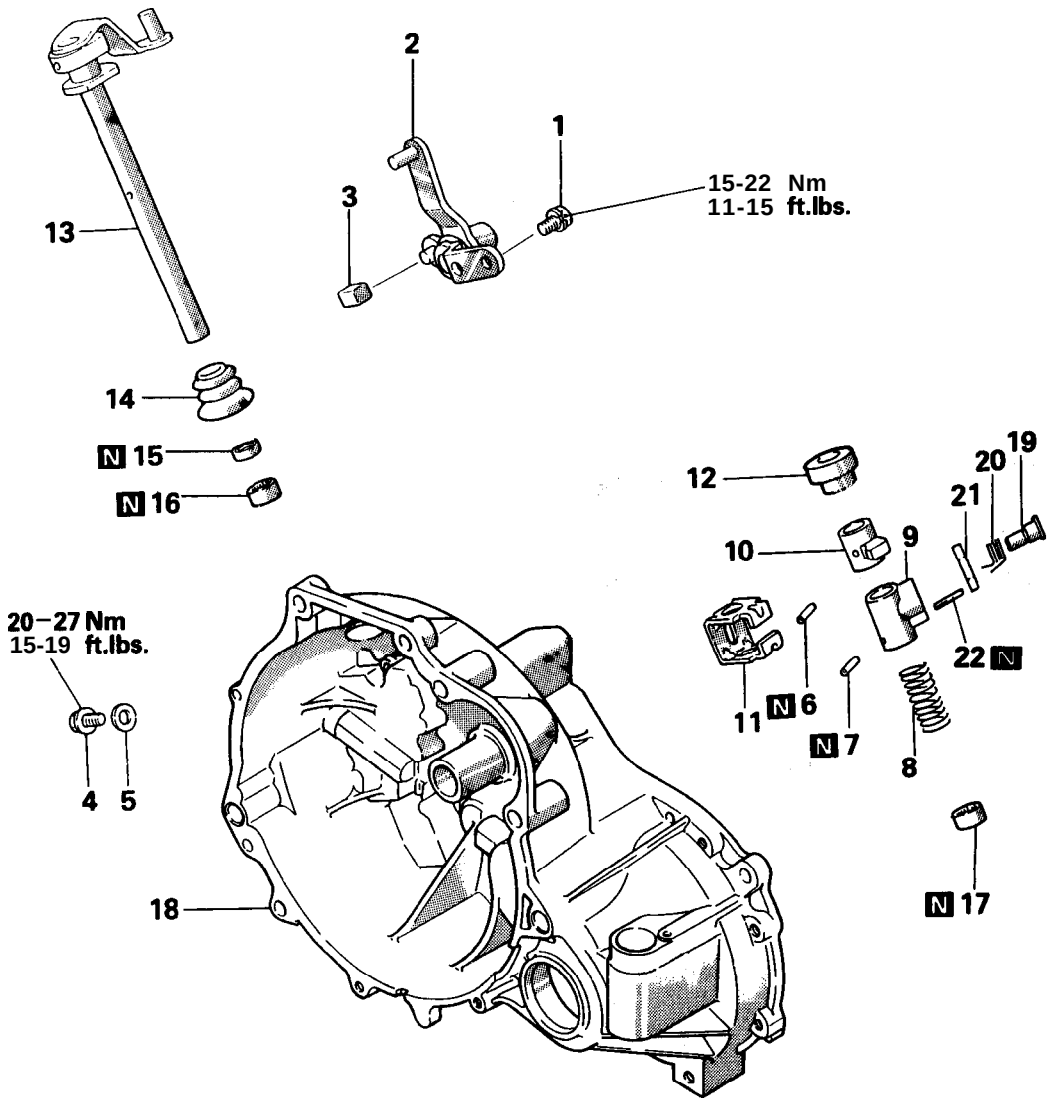
### 2. INSTALLATION OF SPRING PIN

Install the spring pin in such a way that its slit does not face the gear shaft.

# CLUTCH HOUSING ASSEMBLY

N21MPAL

## DISASSEMBLY AND REASSEMBLY

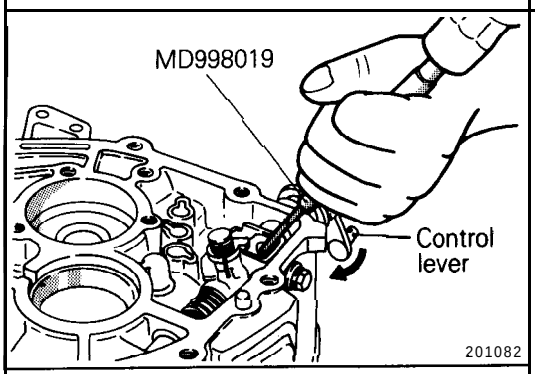



2100019

**Disassembly steps**

1. Bolt
2. Select lever assembly
3. Select lever shoe
4. Interlock place bolt
5. Gasket
◆◆ ● * 6. Lock pin
● *● * 7. Spring pin
8. Neutral return spring
9. Stopper body
10. Control finger
11. Interlock plate
12. Neutral return spring assembly
13. Control shaft
14. Control shaft boot
● 4 15. Oil seal
● * 16. Needle bearing
● a 17. Needle bearing
18. Clutch housing
19. Pin
20. Return spring
21. Stopper plate
22. Spring pin

**NOTE**
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of **Reassembly".**
(4) ❑ : **Non-reusable parts**

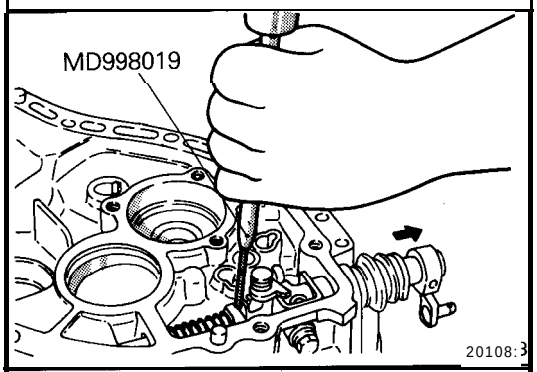



## SERVICE POINTS OF DISASSEMBLY

**6. REMOVAL OF LOCK PIN**

Drive out the lock pin from the control finger using the special tool.

**Caution**
**When removing the lock pin, turn the control lever to, such position that the lock pin will not contact the clutch housing.**




**7. REMOVAL OF SPRING PIN**

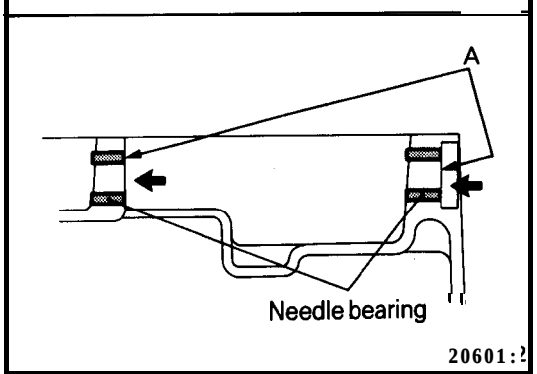
Drive out the spring pin from the stopper body using the special tool.

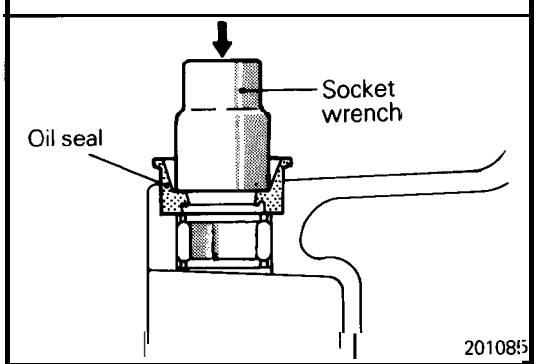
**Caution**
**When removing the spring pin, pull the control shaft in the direction illustrated so that the spring pin will not contact the clutch housing.**

## SERVICE POINTS OF REASSEMBLY

**17. / 16. INSTALLATION OF NEEDLE BEARINGS**

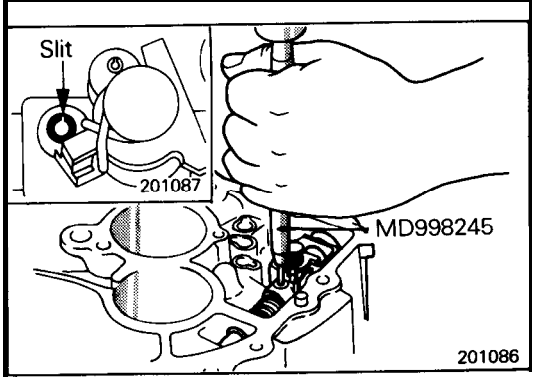
Install the needle bearing flush with the surface A of the clutch housing.




**15. INSTALLATION OF OIL SEAL**

Install the control shaft oil seal using a socket wrench.




**7. / 6. INSTALLATION OF SPRING PIN AND LOCK PIN**

(1) Install new spring pin and lock pin using the special tool.

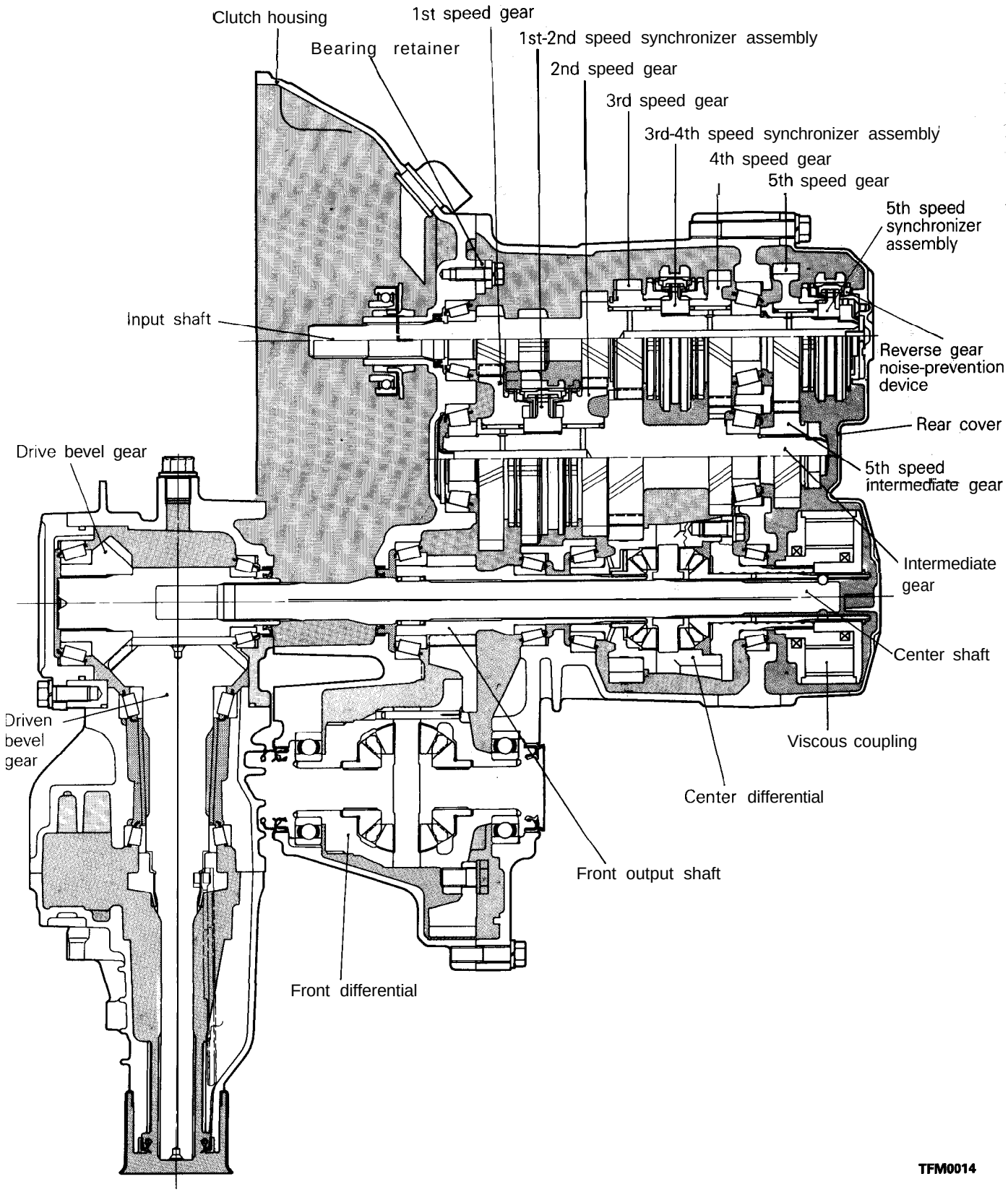
**Caution**
**Do not reuse the spring pin and lock pin.**

(2) install the spring pin with its slit at right angle to the control shaft center.

# MANUAL TRANSAXLE <AWD>

## GENERAL INFORMATION

M22BAAQ



# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N21CA-B

| Items | Specifications |
|---|---|
| Model | W5M33-2-NPZV |
| Applicable engine | 4G63 |
| Type | 5-speed transaxle floor shift |
| Gear ratio | |
| 1 st | 3.083 |
| 2nd | 1.684 |
| 3rd | 1.115 |
| 4th | 0.833 |
| 5th | 0.666 |
| Reverse | 3.166 |
| Reduction ratio | |
| Primary | 1.275 |
| Front differential | 3.866 |
| Transfer | 1.090 |
| Speedometer gear ratio (driven/drive) | 29/36 |
| Oil quantity lit. (qts.) | |
| Transaxle | 2.3 (2.43) |
| Transfer | 0.6 (.63) |

## SERVICE SPECIFICATIONS

N21CB-B

| Items | Specifications mm (in.) |
|---|---|
| Standard value | |
| Transaxle | |
| Input shaft end play | 0–0.05 (0–.002) |
| Input shaft rear bearing end play | 0.01–0.09 (.0004–.004) |
| Intermediate gear preload | 0.08–0.14 (.0031–.006) |
| Intermediate gear bearing end play | 0.01–0.11 (.0004–.004) |
| Front output shaft preload | 0.08–0.13 (.0031–.005) |
| Center differential | |
| Viscous coupling end play | 0.1–0.26 (.0039–.010) |
| Differential case preload | 0.08–0.13 (.0031–.005) |
| Differential pinion backlash | 0.025–0.150 (.0001–.006) |
| Front differential | |
| Differential case end play | 0.05–0.17 (.0020–.007) |
| Differential pinion backlash | 0.025–0.150 (.0001–.006) |
| Transfer | |
| Bevel gear set backlash | 0.08–0.13 (.0031–.005) |
| Driven bevel gear turning drive torque | 1.0–1.7 Nm (0.72–1.23 ft.lbs.) |
| Drive bevel gear shaft turning drive torque | 1.7-2.5 Nm (1.23-1.81 ft.lbs.) |

## SNAP RING (FOR ADJUSTMENT) AND SPACER

| Part name | Thickness mm (in.) | Identification symbol | Part No |
|---|---|---|---|
| Snap ring (For input shaft rear bearing end play) | 0.80 (.0315) | 80 | MD727661 |
| | 0.83 (.0327) | 83 | MD720937 |
| | 0.86 (.0339) | 86 | MD720938 |
| | 0.89 (.0350) | 89 | MD720939 |
| | 0.92 (.0362) | 92 | MD720940 |
| | 0.95 (.0374) | 95 | MD720941 |
| | 0.98 (.0386) | 98 | MD720942 |
| | 1.01 (.0398) | 01 | MD720943 |
| | 1.04 (.0409) | 04 | MD720944 |
| | 1.07 (.0421) | 07 | MD720945 |
| | 1.10 (.0433) | J | MD710454 |
| | 1.13 (.0445) | D | MD700270 |
| | 1.16 (.0457) | K | MD710455 |
| | 1.19 (.0469) | L | MD710456 |
| | 1.22 (.0480) | G | MD700271 |
| | 1.25 (.0492) | M | MD710457 |
| | 1.28 (.0504) | N | MD710458 |
| | 1.31 (.0516) | E | MD706574 |
| | 1.34 (.0528) | 0 | MD710459 |
| | 1.37 (.0539) | P | MD710460 |
| | 1.40 (.0551) | None | MD706573 |
| | 1.43 (.0563) | Q | MD710461 |
| | 1.46 (.0575) | R | MD710462 |
| Spacer (For adjustment of intermediate gear preload) | 0.80 (.0315) | 80 | MD720948 |
| | 0.83 (.0327) | 83 | MD720949 |
| | 0.86 (.0339) | 86 | MD720950 |
| | 0.89 (.0350) | 89 | MD720951 |
| | 0.92 (.0362) | 92 | MD720952 |
| | 0.95 (0.374) | 95 | MD720953 |
| | 0.98 (.0386) | 98 | MD720954 |
| | 1.01 (.0398) | 01 | MD720955 |
| | 1.04 (.0409) | 04 | MD720956 |
| | 1.07 (.0421) | 07 | MD720957 |
| | 1.10 (.0433) | 10 | MD720958 |
| | 1.13 (.0445) | 13 | MD720959 |
| | 1.16 (.0457) | 16 | MD720960 |
| | 1.19 (.0469) | 19 | MD720961 |
| | 1.22 (.0480) | 22 | MD720962 |
| | 1.25 (.0492) | 25 | MD712346 |
| | 1.28 (.0504) | 28 | MD712347 |
| | 1.31 (.0516) | 31 | MD712348 |
| | 1.34 (.0528) | 34 | MD712349 |
| | 1.37 (.0539) | 37 | MD712329 |
| | 1.40 (.0551) | 40 | MD712330 |
| | 1.43 (.0563) | 43 | MD712331 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Snap ring (For adjustment of intermediate gear bearing end play) | 1.40 (.0551) | None | MD703779 |
| | 1.50 (.0591) | Brown | MD703780 |
| | 1.60 (.0630) | Blue | MD703781 |
| Spacer (For adjustment of front output shaft preload) | 1.28 (.0504) | B28 | MD726167 |
| | 1.31 (.0516) | B37 | MD726168 |
| | 1.34 (.0528) | B34 | MD726169 |
| | 1.37 (.0539) | B37 | MD724326 |
| | 1.40 (.0551) | B40 | MD724327 |
| | 1.43 (.0563) | B43 | MD724328 |
| | 1.46 (.0575) | B46 | MD724329 |
| | 1.49 (.0587) | B49 | MD724330 |
| | 1.52 (.0598) | B52 | MD724331 |
| | 1.55 (.0610) | B55 | MD724332 |
| | 1.58 (.0622) | B58 | MD724333 |
| | 1.61 (.0634) | B61 | MD724334 |
| | 1.64 (.0646) | B64 | MD724335 |
| | 1.67 (.0657) | B67 | MD724336 |
| | 1.70 (.0669) | B70 | MD724337 |
| | 1.73 (.0681) | B73 | MD724338 |
| | 1.76 (.0693) | B76 | MD724339 |
| | 1.79 (.0705) | B79 | MD724340 |
| | 1.82 (.0717) | B82 | MD724341 |
| | 1.85 (.0728) | B85 | MD724342 |
| | 1.88 (.0740) | B88 | MD724343 |
| | 1.91 (.0752) | B91 | MD724344 |
| Snap ring (For adjustment of viscous coupling end play) | 1.30 (.0512) | Orange | MD727650 |
| | 1.40 (.0551) | Red | MD720686 |
| | 1.50 (.0591) | Blue | MD720687 |
| | 1.60 (.0630) | None | MD720688 |
| | 1.70 (.0670) | White | MD720689 |
| | 1.80 (.0709) | Yellow | MD720690 |
| | 1.90 (.0748) | Green | MD727651 |
| Spacer (For adjustment of center differential case preload) | 1.13 (.0445) | 13 | MD736928 |
| | 1.16 (.0457) | 16 | MD736929 |
| | 1.19 (.0469) | 19 | MD736751 |
| | 1.22 (.0480) | 22 | MD736931 |
| | 1.25 (.0492) | 25 | MD726166 |
| | 1.28 (.0504) | 28 | MD718517 |
| | 1.31 (.0516) | 31 | MD718518 |
| | 1.34 (.0528) | 34 | MD718519 |
| | 1.37 (.0539) | 37 | MD718520 |
| | 1.40 (.0551) | 40 | MD718521 |
| | 1.43 (.0563) | 43 | MD718522 |
| | 1.46 (.0575) | 46 | MD718523 |
| | 1.49 (.0587) | 49 | MD718524 |
| | 1.52 (.0598) | 52 | MD718525 |
| | 1.55 (.0610) | 55 | MD718526 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Spacer (For adjustment of center differential case preload) | 1.58 (.0622) | 58 | MD718527 |
| | 1.61 (.0634) | 61 | MD718528 |
| | 1.64 (.0646) | 64 | MD718529 |
| | 1.67 (.0657) | 67 | MD718530 |
| | 1.70 (.0669) | 70 | MD718531 |
| | 1.73 (.0681) | 73 | MD721959 |
| | 1.76 (.0693) | 76 | MD721960 |
| | 1.79 (.0705) | 79 | MD721961 |
| Spacer (For adjustment of center differential pinion backlash-Front side) | 2.09–2.16 (.0823–.0850) | 0 | MD730350 |
| | 2.17–2.24 (.0854–.0882) | 9 | MD730349 |
| | 2.25-2.32 (.0886–.0913) | 8 | MD730348 |
| | 2.33-2.42 (.0917–.0953) | 7 | MD730347 |
| | 2.43–2.50 (.0957–.0984) | 6 | MD730346 |
| | 2.51–2.58 (.0988–.1016) | 5 | MD730345 |
| | 2.59-2.66 (.1020–.1047) | 4 | MD730344 |
| | 2.67-2.74 (.1051–.1079) | 3 | MD730343 |
| | 2.75-2.82 (.1083–.1110) | 2 | MD730342 |
| Spacer (For adjustment of center differential pinion backlash- Rear side) | 0.59–0.66 (.0232–.0260) | 74 | MD724974 |
| | 0.67–0.74 (.0264–.0291) | 50 | MD724950 |
| | 0.75–0.82 (.0295–.0323) | 80 | MD720680 |
| | 0.83–0.92 (.0327–.0362) | 79 | MD720679 |
| | 0.93–1.00 (.0366–.0394) | 78 | MD720678 |
| | 1.01–1.08 (.0398–.0425) | 76 | MD720676 |
| | 1.09–1.16 (.0429–.0457) | 77 | MD720677 |
| | 1.17-1.24 (.0461–.0488) | 49 | MD724949 |
| Spacer (For adjustment of front differential case end play) | 0.56 (.0220) | 56 | MD727658 |
| | 0.65 (.0256) | 65 | MD727659 |
| | 0.74 (.0291) | 74 | MD727660 |
| | 0.83 (.0327) | 83 | MD720937 |
| | 0.92 (.0362) | 92 | MD720940 |
| | 1.01 (.0398) | 01 | MD720943 |
| | 1.10 (.0433) | J | MD710454 |
| | 1.19 (.0469) | L | MD710456 |
| | 1.28 (.0504) | N | MD710458 |
| | 1.37 (.0539) | P | MD710460 |
| Spacer (For adjustment of front differential pinion backlash) | 0.75–0.82 (.0295–.0323) | – | MA180862 |
| | 0.83–0.92 (.0327–.0362) | – | MA180861 |
| | 0.93–1.00 (.0366–.0394) | – | MA180860 |
| | 1.01–1.08 (.0398–.0425) | – | MA180875 |
| | 1.09–1.16 (.0429–.0457) | – | MA180876 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Spacer (For adjustment of drive bevel gear mount) | 1.34 (.0528) | 34 | MD723600 |
| | 1.37 (.0539) | 37 | MD723601 |
| | 1.40 (.0551) | 40 | MD723602 |
| | 1.43 (.0563) | 43 | MD723603 |
| | 1.46 (.0575) | 46 | MD723604 |
| | 1.49 (.0587) | 49 | MD723605 |
| | 1.52 (.0598) | 52 | MD723606 |
| | 1.55 (.0610) | 55 | MD723607 |
| | 1.58 (.0622) | 58 | MD723608 |
| | 1.61 (.0634) | 61 | MD723609 |
| | 1.64 (.0646) | 64 | MD726170 |
| | 1.67 (.0657) | 67 | MD726171 |
| Spacer (For adjustment of drive bevel gear train preload) | 1.28 (.0504) | B28 | MD726167 |
| | 1.31 (.0516) | B31 | MD726168 |
| | 1.34 (.0528) | B34 | MD726169 |
| | 1.37 (.0539) | B37 | MD724326 |
| | 1.40 (.0551) | B40 | MD724327 |
| | 1.43 (.0563) | B43 | MD724328 |
| | 1.46 (.0575) | B46 | MD724329 |
| | 1.49 (.0587) | B49 | MD724330 |
| | 1.52 (.0598) | B52 | MD724331 |
| | 1.55 (.0610) | B55 | MD724332 |
| | 1.58 (.0622) | B58 | MD724333 |
| | 1.61 (.0634) | B61 | MD724334 |
| | 1.64 (.0646) | B64 | MD724335 |
| | 1.67 (.0657) | B67 | MD724336 |
| | 1.70 (.0669) | B70 | MD724337 |
| | 1.73 (.0681) | B73 | MD724338 |
| | 1.76 (.0693) | B76 | MD724339 |
| | 1.79 (.0705) | B79 | MD724340 |
| | 1.82 (.0717) | B82 | MD724341 |
| | 1.85 (.0728) | B85 | MD724342 |
| Spacer (For adjustment of driven bevel gear train preload) | 1.19 (.0469) | 19 | MD726172 |
| | 1.22 (.0480) | 22 | MD722081 |
| | 1.25 (.0492) | 25 | MD722082 |
| | 1.28 (.0504) | 28 | MD722083 |
| | 1.31 (.0516) | 31 | MD722084 |
| | 1.34 (.0528) | 34 | MD722085 |
| | 1.37 (.0539) | 37 | MD722086 |
| | 1.40 (.0551) | 40 | MD722087 |
| | 1.43 (.0563) | 43 | MD722088 |
| | 1.46 (.0575) | 46 | MD722089 |
| | 1.49 (.0587) | 49 | MD722090 |
| | 1.52 (.0598) | 52 | MD722091 |
| | 1.55 (.0610) | 55 | MD722092 |
| | 1.58 (.0622) | 58 | MD722093 |

| Part name | Thickness mm (in.) | Identification symbol | Part No. |
|---|---|---|---|
| Spacer (For adjustment of driven bevel gear train preload) | 1.61 (.0634) | 61 | MD722094 |
| | 1.64 (.0646) | 64 | MD722095 |
| | 1.67 (.0657) | 67 | MD722096 |
| | 1.70 (.0669) | 70 | MD722097 |
| | 1.73 (.0681) | 73 | MD722098 |
| | 1.76 (.0693) | 76 | MD722099 |
| | 1.79 (.0705) | 79 | MD722100 |
| | 1.82 (.0717) | 82 | MD722101 |
| | 1.85 (.0728) | 85 | MD722102 |
| | 1.88 (.0740) | 88 | MD722103 |
| | 1.91 (.0752) | 91 | MD722104 |
| | 1.94 (.0764) | 94 | MD722105 |
| Spacer (For adjustment of driven bevel gear mount) | 0.13 (.0051) | 13 | MD720353 |
| | 0.16 (.0063) | 16 | MD720354 |
| | 0.19 (.0075) | 19 | MD720355 |
| | 0.22 (.0087) | 22 | MD720356 |
| | 0.25 (.0098) | 25 | MD720357 |
| | 0.28 (.0110) | 28 | MD720358 |
| | 0.31 (.0122) | 31 | MD720359 |
| | 0.34 (.0134) | 34 | MD720360 |
| | 0.37 (.0146) | 37 | MD720361 |
| | 0.40 (.0517) | 40 | MD720362 |
| | 0.43 (.0169) | 43 | MD720363 |
| | 0.46 (.0181) | 46 | MD720364 |
| | 0.49 (.0193) | 49 | MD720365 |
| | 0.52 (.0205) | 52 | MD720366 |

## TORQUE SPECIFICATIONS

N21CC-B

**TRANSAXLE**

| Items | Nm | ft.lbs. |
|---|---|---|
| Bell housing cover mounting bolt | 10–12 | 7-9 |
| Starter motor mounting bolt | 27-34 | 20–25 |
| Transaxle mount bracket mounting bolt | 60–80 | 43-58 |
| Shift cable and select cable bracket mounting bolt | 15-22 | 11–16 |
| Rear cover mounting bolt | 35-42 | 26–30 |
| Transaxle case mounting bolt | 35-42 | 26–30 |
| Clutch release cylinder mounting bolt | 15-22 | 11–16 |
| Clutch tube to transaxle assembly | 15-22 | 11–16 |
| Under cover | 9-13 | 7–10 |
| Transaxle mounting bolt [12 mm (.47 in.) diameter bolt] | 43-55 | 32-39 |
| Transaxle mounting bolt [IO mm (.40 in.) diameter bolt] | 30–35 | 22-25 |
| Transaxle mounting bolt [8 mm (.31 in.) diameter bolt] | 10–12 | 7-9 |
| Tie rod end to knuckle | 24-35 | 17-25 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Lower arm ball joint to knuckle | 60–72 | 43-52 |
| Center bearing bracket installation bolts | 36-46 | 26-33 |
| Right member installation bolt (front) | 80–100 | 58-72 |
| Right member installation bolt (rear) | 70–80 | 51–58 |
| Transfer assembly mounting bolt | 55–60 | 40–43 |
| Poppet plug | 30–42 | 22–30 |
| Backup light switch | 30–35 | 22-25 |
| Restrict ball | 30–35 | 22-25 |
| Speedometer mounting bolt | 3-5 | 2.5-3.5 |
| Oil filler plug | 30–35 | 22-25 |
| Oil drain plug | 30–35 | 22-25 |
| Input shaft lock nut | 140–160 | 102–115 |
| Intermediate shaft lock nut | 140–160 | 102–115 |
| Center differential drive gear mounting bolt | 70–80 | 51-57 |
| Front differential drive gear mounting bolt | 130–140 | 95–101 |
| Stopper bracket mounting bolt | 15-22 | 11–15 |
| Reverse idler gear shaft mounting bolt | 43-55 | 32-39 |
| Reverse shift lever mounting bolt | 15-22 | 11–15 |
| Bearing retainer mounting bolt | 15-22 | 11–15 |
| Interlock plate mounting bolt | 20–27 | 15-19 |
| Center member mounting bolt | 60–80 | 43-58 |
| Drive shaft center bearing mounting bolt | 36-46 | 26-33 |
| Driven bevel gear lock nut | 140–160 | 101–115 |
| Select lever assembly mounting bolt | 15-22 | 11–15 |
| Reverse brake cone screw bolts | 4.0–5.5 | 2.9-3.9 |

**TRANSFER**

| Items | Nm | ft.lbs. |
|---|---|---|
| Transfer assembly mounting bolt | 55–60 | 40–43 |
| Cover mounting bolt | 8–10 | 6-7 |
| Extension housing mounting bolt | 15-22 | 11–15 |
| Transfer cover mounting bolt | 35-42 | 26–30 |
| Transfer case adapter mounting bolt | 35-42 | 26–30 |
| Driven bevel gear lock nut | 140–160 | 102–115 |
| Hanger bracket mounting bolt | 15-22 | 11–15 |

## LUBRICANTS

N21CD-B

| Items | Specified lubricant | Quantity lit. (qts.) |
|---|---|---|
| Transmission oil | MOPAR Hypoid gear oil or equivalent, API classification GL-4 or higher | 2.3 (2.43) |
| Transfer oil | MOPAR Hypoid gear oil or equivalent, API classification GL-4 or higher | 0.6 (.63) |

## SEALANTS AND ADHESIVES

N21CE-B

**Transaxle**

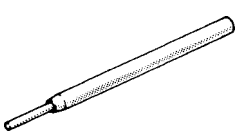
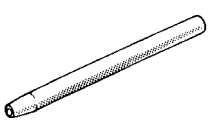
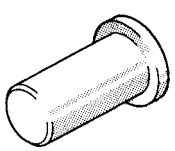
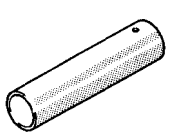
| Items | Specified sealants and adhesives |
|---|---|
| Transaxle case-clutch housing mating surfaces<br>Transaxle case-adapter mating surfaces<br>Adapter-rear cover mating surfaces | Mitsubishi genuine part No.997740 or equivalent |
| Front differential drive gear bolts<br>Center differential drive gear bolts<br>Bearing retainer screw (flush head screw)<br>Reverse brake cone mounting screw bolts | MOPAR part No.4318031 or MOPAR part No. 4318032 or equivalent |
| Air breather | MOPAR part No.4318025 or equivalent |

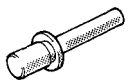
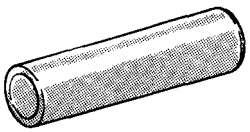
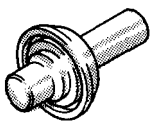
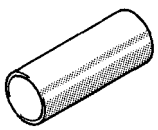
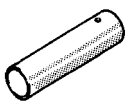
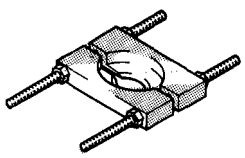
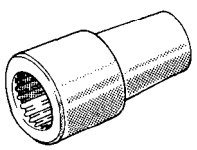
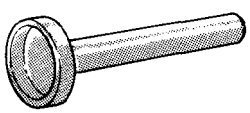
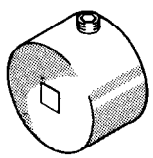
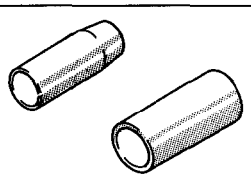
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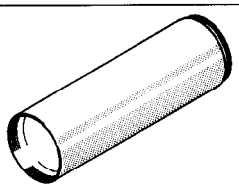
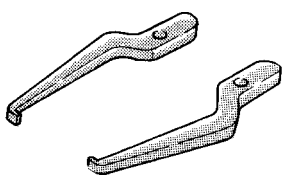
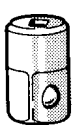
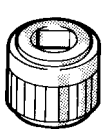
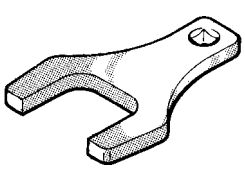
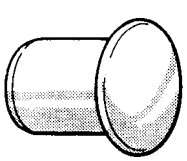
| Items | Specified sealants and adhesives |
|---|---|
| Adapter-extension housing mating surfaces | Mitsubishi genuine part No. MD997740 or equivalent |
| Air breather | MOPAR part No.4318025 or equivalent |

## SPECIAL TOOLS

N21DA-B

| ool | Number | Name | Use |
|---|---|---|---|
|  | MD99801 9 | Lock pin extractor | Removal of spring pin and lock pin |
|  | MD998245 | Lock pin installer | Installation of spring pin and lock pin |
|  | MD998304 | Oil seal installer | Installation of front output shaft bearing and transfer extention housing oil seal |
|  | MD998320 | Bearing installer | Installation of input shaft bearing and input shaft gear |

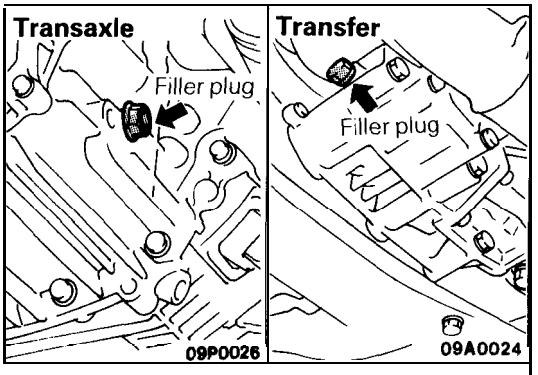
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998321 | Oil seal installer | Installation of input shaft front oil seal |
|  | MD998323 | Bearing installer | Installation of rear output shaft oil seal and transfer case oil seal |
|  | MD998325 | Differential oil seal installer | Installation of differential oil seal |
|  | MD998350 | Bearing installer | Installation of front output shaft, intermediate gear, transfer drive bevel gear, and intermediate gear |
|  | MD998369 | Bearing installer | Installation of input shaft front bearing |
|  | MD998801 | Bearing remover | Removal of input shaft, intermediate gear, anc output shaft bearing and gears |
|  | MD998802 | Input shaft holder | nstallation and removal of input shaft and ntermediate gear lock nut |
|  | MD998803 | Differential oil seal installer | nstallation of differential oil seal |
|  | MD998806 | Wrench adapter | djustment of tooth contact and inspection of urning drive torque |
|  | MD998808 | Snap ring installer | nstallation of input shaft rear snap ring |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998812 | Installer cap | Use with MD998914, MD998818, MD998820, MD998827 |
|  | MD998814 | Installer-200 | Use with MD998812, MD998820 |
|  | MD998819 | **Installer adapter** (40) | **Installation of front differential bearings** |
|  | MD998820 | **Installer adapter (42)** | **Installation of center differential bearings and driven bevel gear bearing** |
|  | MD999566 | **Claw** | **Removal of bearing outer race from intermediate gear, front output shaft, and center differential** |
|  | MD998827 | **Installer adapter (56)** | **Installation of drive bevel gear bearing** |
|  | MB990326 | **Preload socket** | **Measurement of drive bevel gear shaft rotating torque** |
|  | MB990900 **(included in** MB990988) | **Side gear holding Tool (A)** | **Measurement of drive bevel gear shaft rotating torque** |
|  | MB991 **013** | **Special spanner** | **Installation and removal of driven bevel gear lock nut** |
|  | MB991 **193** | **Plug** | **Prevention of transfer oil discharge and foreign object entry** |

## TROUBLESHOOTING

N21EAAE

Refer to P.21-12.

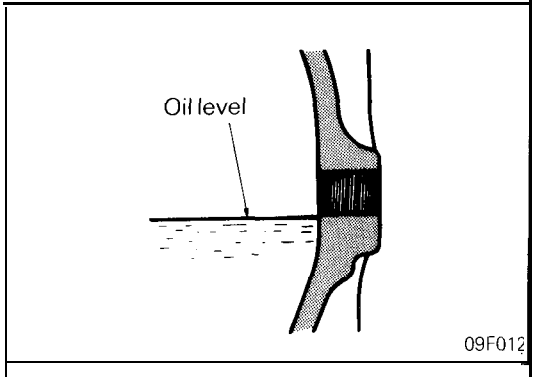



## SERVICE ADJUSTMENT PROCEDURES

### TRANSAXLE OIL LEVEL INSPECTION

N21FBAB2

Refer to GROUP O-Maintenance Service.

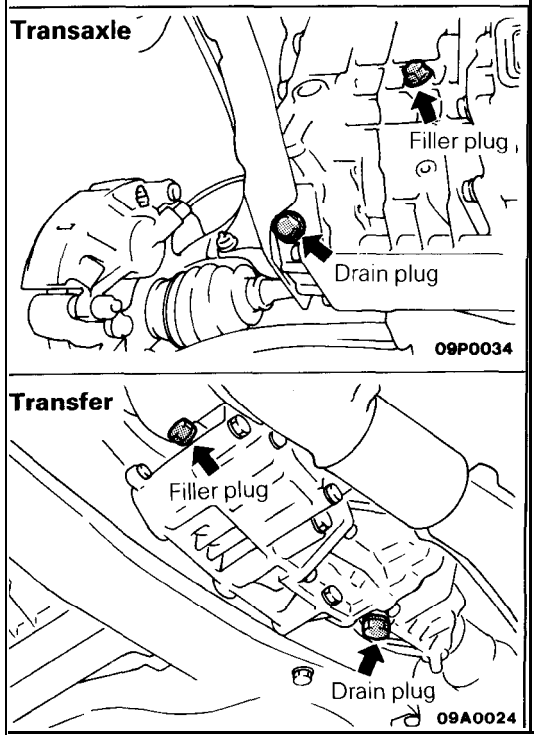


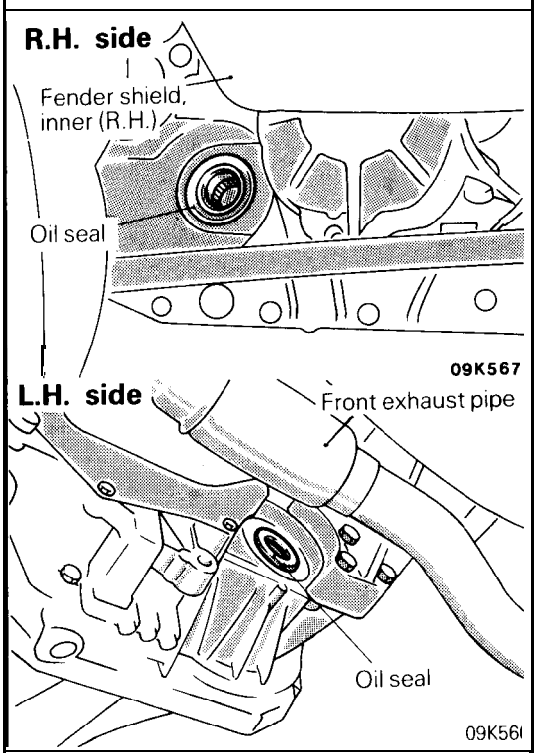

### TRANSAXLE OIL REPLACEMENT

N21FCAH

(1) Position vehicle on a flat level and remove filler and drain plugs to drain transaxle oil.
(2) Pour in fresh transaxle oil through filler port until it reaches **the bottom of filler port.**

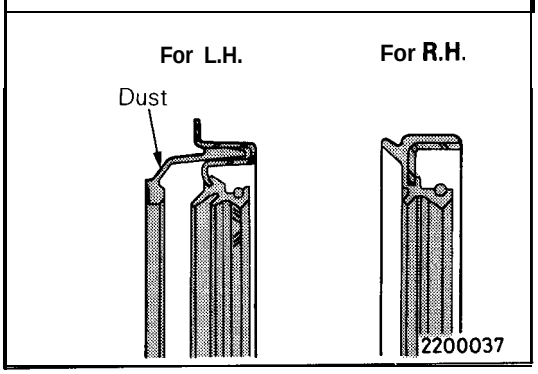
**Transaxle oil: MOPAR Hypoid gear oil or equivalent, API classification GL-4 or higher.**
**Transaxle: 2.3 liters (2.4 qts.)**
**Transfer: 0.6 liter (.6 qt.)**



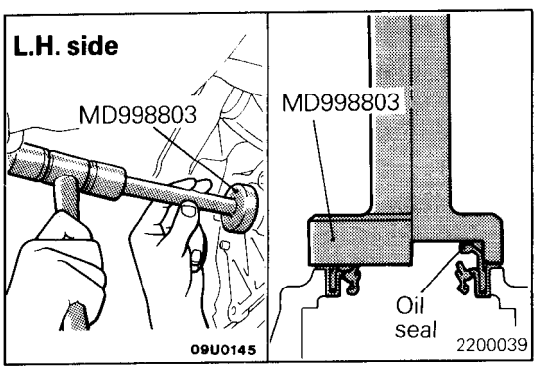


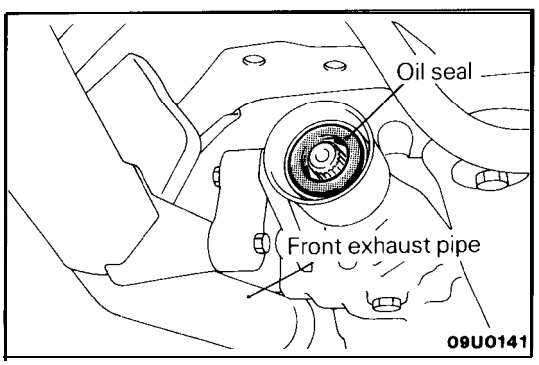

## DRIVE SHAFT OIL SEALS REPLACEMENT N21FDAF

(1) Disconnect the drive shaft from the transaxle. (Refer to GROUP 2 – Drive Shaft.)
(2) Remove the transfer assembly.
(3) Using a flat-tip (–) screwdriver, remove the oil seal.



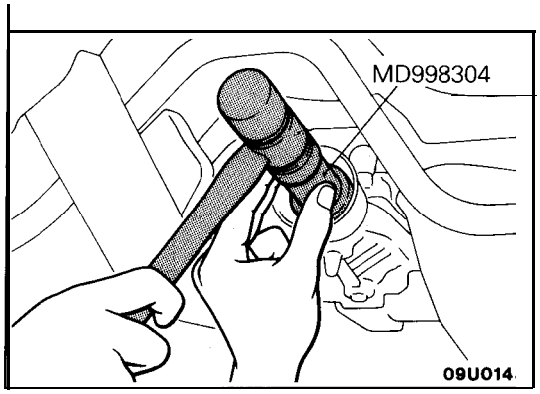

(4) Install the oil seals using the following procedure:
Using the special tool, tap the oil seal into the transaxle. Note that there are two types of oil seals, one for R.H. and the other for L.H., and the shape of each type is different, as shown.




## TRANSFER OIL SEAL REPLACEMENT N21FGAF

(1) Pull out the propeller shaft from the transaxle. (Refer to GROUP 16 – Propeller Shaft.)
(2) Using a flat-tip (–) screwdriver, remove the oil seal.




(3) Using the special tool, tap the drive shaft oil seal into the transaxle.
(4) Apply a coating of the transaxle.

**Transaxle oil: MOPAR Hypoid gear oil or equivalent, API classification GL-4**

## SPEEDOMETER CABLE REPLACEMENT N21FEAH

Refer to P.21-14.

## TRANSAXLE CONTROL N21JA-B

Refer to P.21-15.

## SHIFT LEVER ASSEMBLY N21GE-B

Refer to P.21-18.

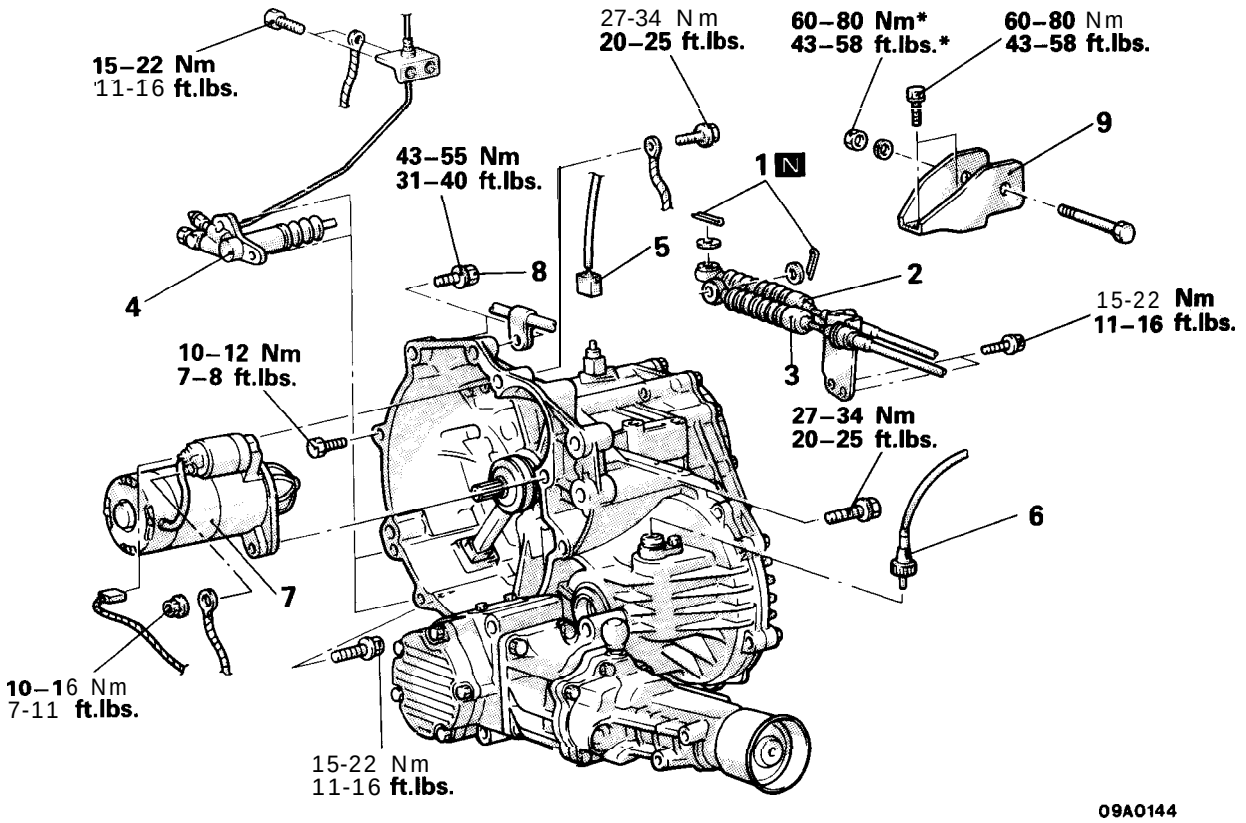
# TRANSAXLE

## REMOVAL AND INSTALLATION

N21MA-B

Pre-removal Operation
- Removal of the Battery
*Draining of the Transaxle Oil (Refer to P.21-13.)
- Removal of the Air Hose
(Refer to GROUP 11 -Air Cleaner.)

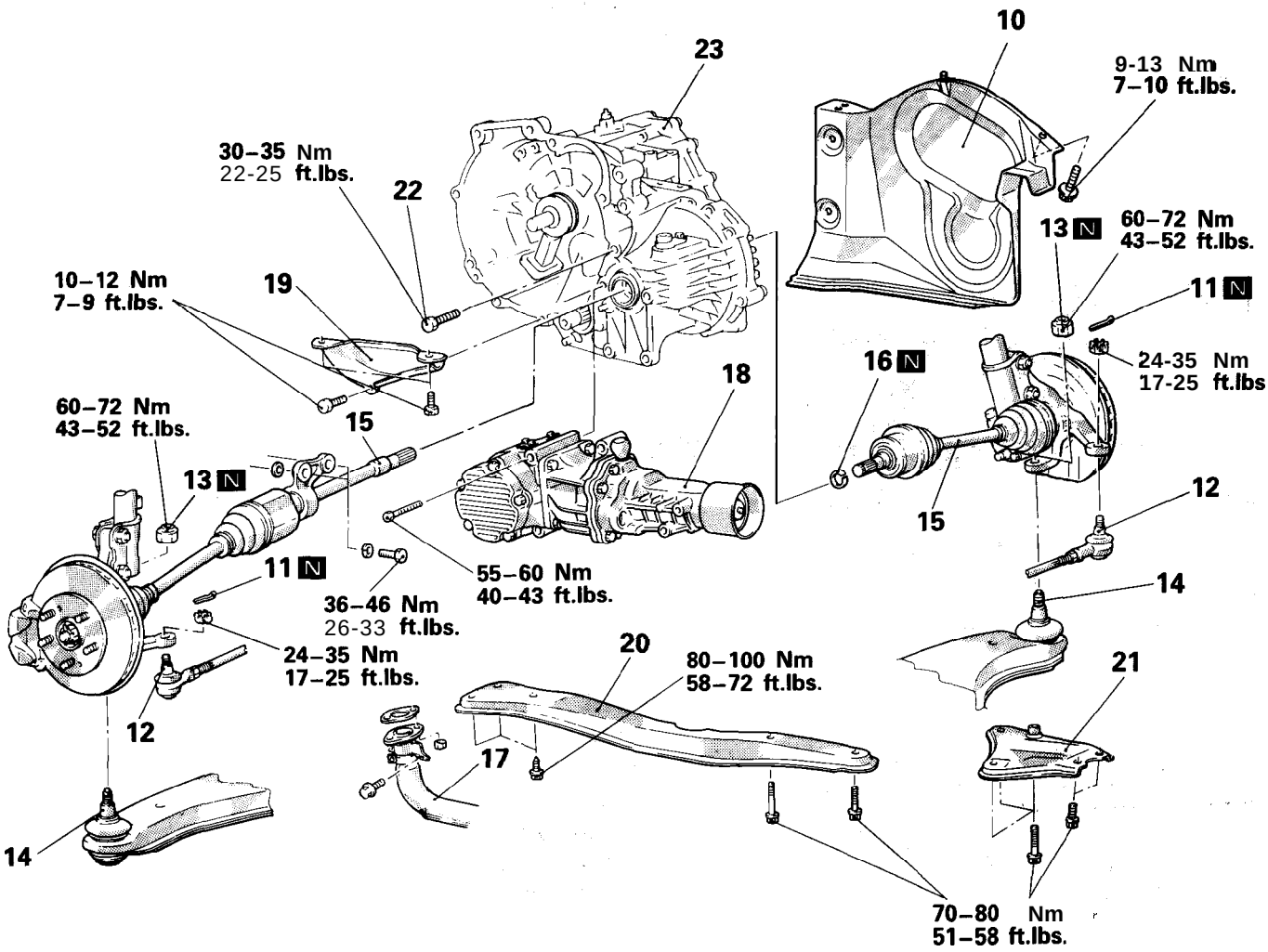
Post-installation Operation
- Installation of the Battery
*Supplying of Transaxle Oil (Refer to P.21-13.)
- Installation of the Air Hose
(Refer to GROUP II-Air Cleaner.)
*Checking the Operation of the Shift Lever
- Checking the Operation of the Meters and Gauges




**Removal steps**

1. Cotter pin
2. **Connection for select cable**
3. Connection for shift cable
4. **Connection for clutch release cylinder**
5. **Backup light switch connector**
6. Connection for speedometer cable
7. *** 7. Starter**
8. Transaxle **assembly upper part coupling** bolt
9. **Transaxle mount bracket**

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts
(5) For tightening locations indicated by the * symbol, first tighten temporarily, and then make the final tightening with the entire weight of the engine applied to the vehicle body.
(6) If the grease has been wiped from the input shaft and center shaft splines or if the input shaft and center shaft have been replaced, apply special grease (MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent) **to** the input shaft and center shaft splines.



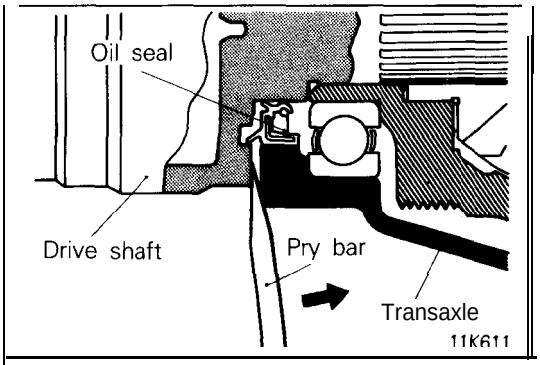

10. **Under cover**
**11. Cotter pin**
◆▶ 1 **2. Connection for tie rod end**
**13. Self-locking nut**
◆▶ **14. Connection for lower arm ball joint**
◆▶▶◀ **15. Connection for drive shaft**
**16.** Circlip
◆▶ **17. Front exhaust pipe**
◆▶ **18. Transfer assembly**
**19. Bell housing cover**
**20. Right member**
21. **Gusset**
**22.** Transaxle **assembly lower part coupling** bolt
◆▶▶◀ **23. Transaxle assembly**

**NOTE**
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ● 4: Refer to "Service Points of Installation".
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL N21MBAV

**4. DISCONNECTION OF CLUTCH RELEASE CYLINDER/ 12. TIE ROD END / 14. LOWER ARM BALL JOINT**

Refer to P.21-21.




**15. DISCONNECTION OF DRIVE SHAFT**

**<R.H.>**

Insert a pry bar between the transaxle case and the drive shaft, and then pry the drive shaft from the transaxle.

**Caution**

1. **Do not pull on the drive shaft; doing so will damage the inboard joint; be sure to use the pry bar.**
2. **Do not insert the pry bar so deep as to damaged the oil seal.**

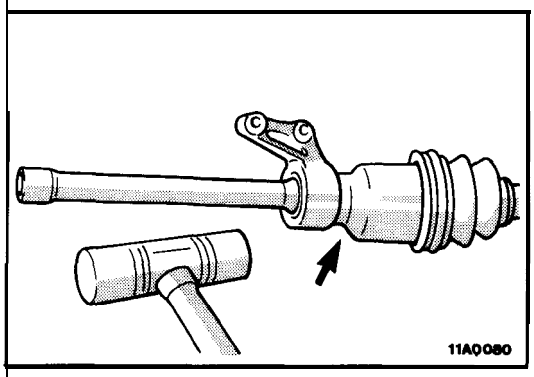
**<L.H.>**

(1) Take out the drive shaft by lightly tapping the drive shaft T.J. case with a plastic hammer.

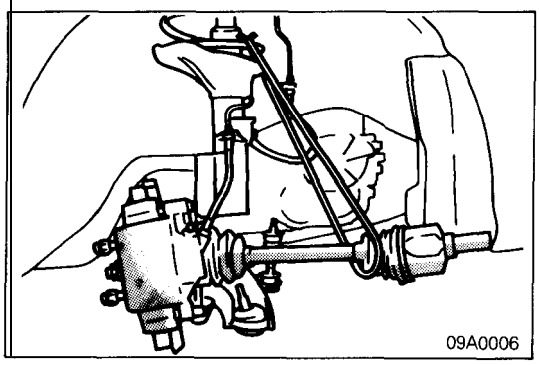
NOTE
Remove the drive shaft with the hub and knuckle, etc., as an assembly.

**Caution**

1. **Removing the drive shaft from the,, outboard joint side can cause damage to the inboard joint. Always use a plastic hammer, etc., to remove the drive shaft.**
2. **Tapping on the center bearing can damage it. Never tap on the bearing.**




(2) Keep the removed drive shaft as far away from the transaxle case as possible, and secure (by using rope, etc.) the joints to the body so that it does not fall.




17. **REMOVAL OF FRONT EXHAUST PIPE**

Refer to GROUP 1 l-Exhaust Pipe and Main Muffler.

**18. REMOVAL OF TRANSFER ASSEMBLY**

Refer to P.21-85.

**23. REMOVAL OF TRANSAXLE ASSEMBLY**

Refer to P.21-22.

## SERVICE POINTS OF INSTALLATION N21MDAQ

**23. REMOVAL OF TRANSAXLE ASSEMBLY**

Refer to P.21-22.

**15. INSTALLATION OF DRIVE SHAFT**

Refer to P.21-22.

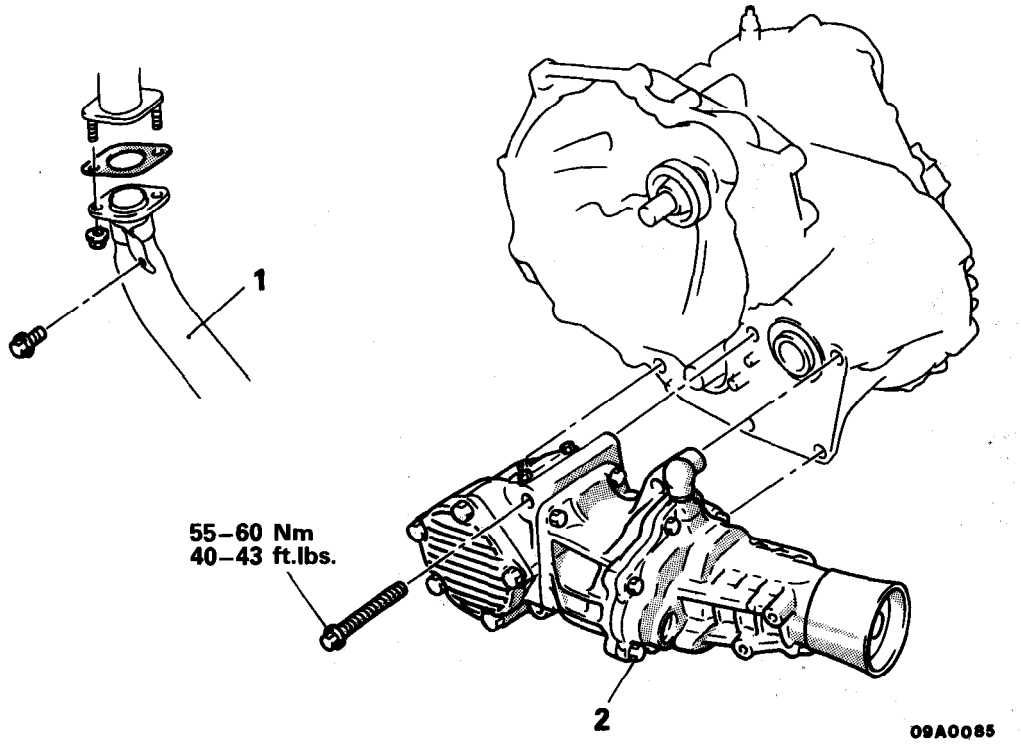
**7. INSTALLATION OF STARTER**

Refer to P.21-22.

# TRANSFER

## --- REMOVAL AND INSTALLATION

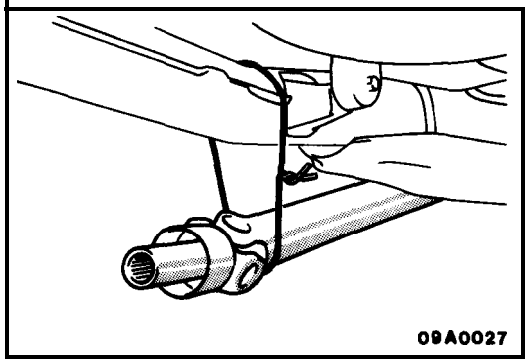
N21MA-C

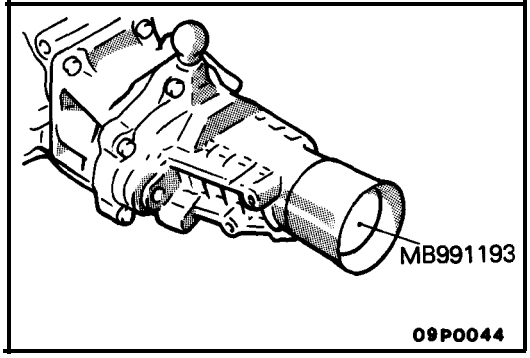



**Removal steps**

◆◆ 1. Front exhaust pipe
◆◆ 2. Transfer assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ❑ : Non-reusable parts.
(4) If the grease has been wiped from the center shaft spline or if the center shaft has been replaced, apply special grease (MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent) to the center shaft spline.




## SERVICE POINTS OF REMOVAL

N21MBAU

**1. REMOVAL OF FRONT EXHAUST PIPE**

**Refer to GROUP 11 -Exhaust Pipe and Main Muffler.**

2. REMOVAL OF TRANSFER ASSEMBLY

After moving the transfer assembly to the left and lowering, the front side, then remove it from the propeller shaft.

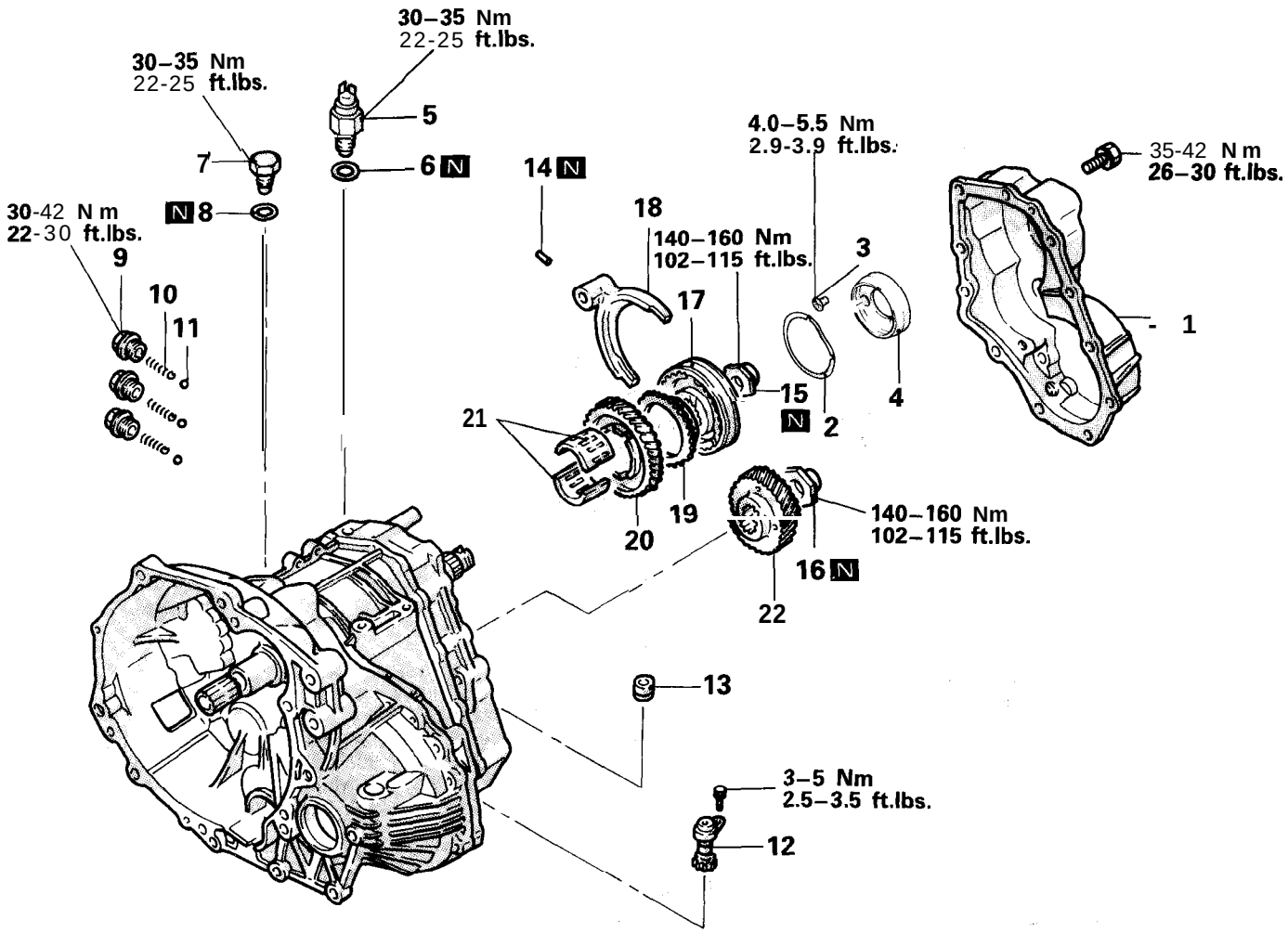
**Caution**

1. **Be cautious to avoid damaging the transfer oil seal lip.**
2. **The propeller shaft should be suspended so that it' is not sharply bent.**
3. **Cover the transfer opening with the special tool to prevent transaxle oil discharge and the entry of foreign objects.**

# TRANSAXLE ASSEMBLY

N21ME-B

## DISASSEMBLY AND REASSEMBLY



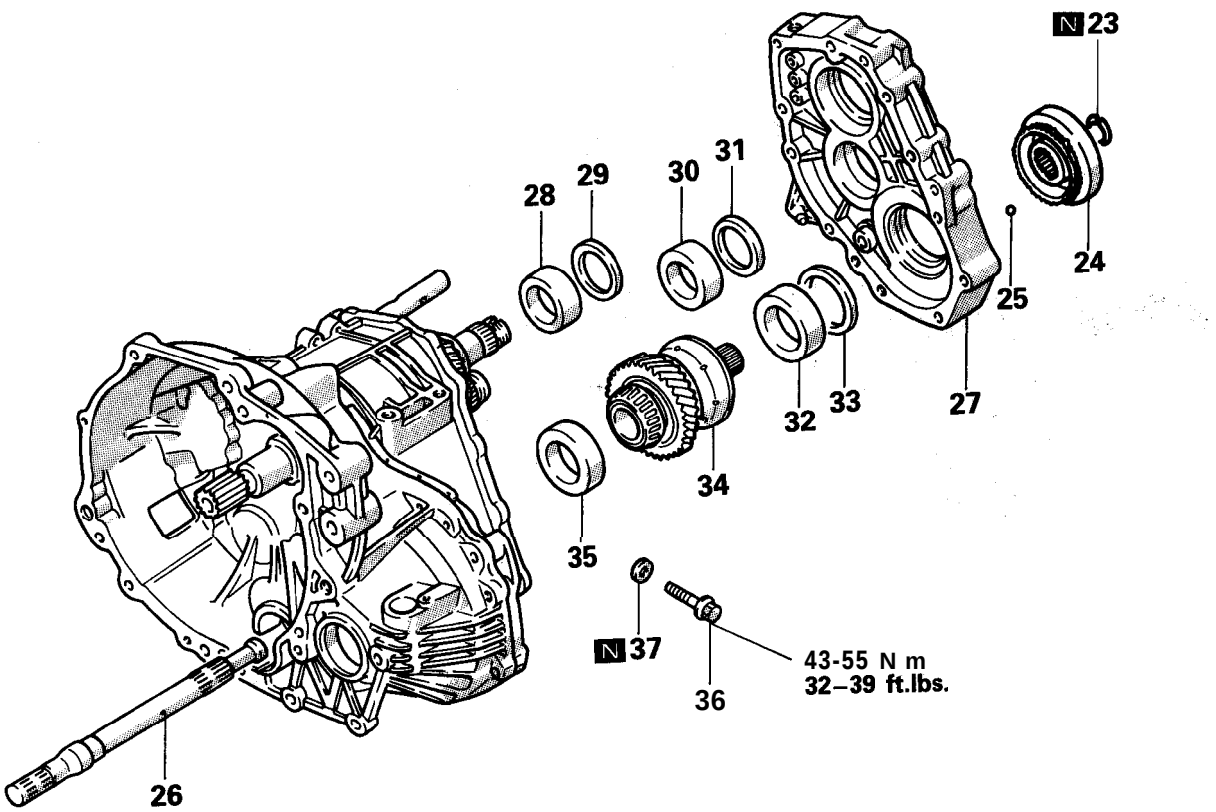

TFM0028

**Disassembly steps**

- ● **+ 1. Rear cover**
- **2. Wave spring**
- ◆◆ **3. Screw bolts**
- **4. Reverse brake cone**
- 5. Badkup **light switch**
- 6. Gasket
- 7. **Restrict ball assembly**
- **8. Gasket**
- **9. Poppet plug**
- 10. Poppet **spring**
- 11. **Poppet ball**
- **12. Speedometer driven gear assembly**
- ● **+ 13. Air breather**
- ● * ● 4 14. Spring pin
- ◆◆◆◆ **15. Lock nut**
- ◆◆ ● 4 16. **Lock nut**
- ● **+ 17.** 5th **speed synchronizer assembly**
- ◆◆ **18. Shift fork**
- **19. Synchronizer ring**
- 20. 5th **speed gear**
- **21. Needle bearing**
- **22.** 5th **speed intermediate gear**

**NOTE**

(1) Reverse the assembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts.

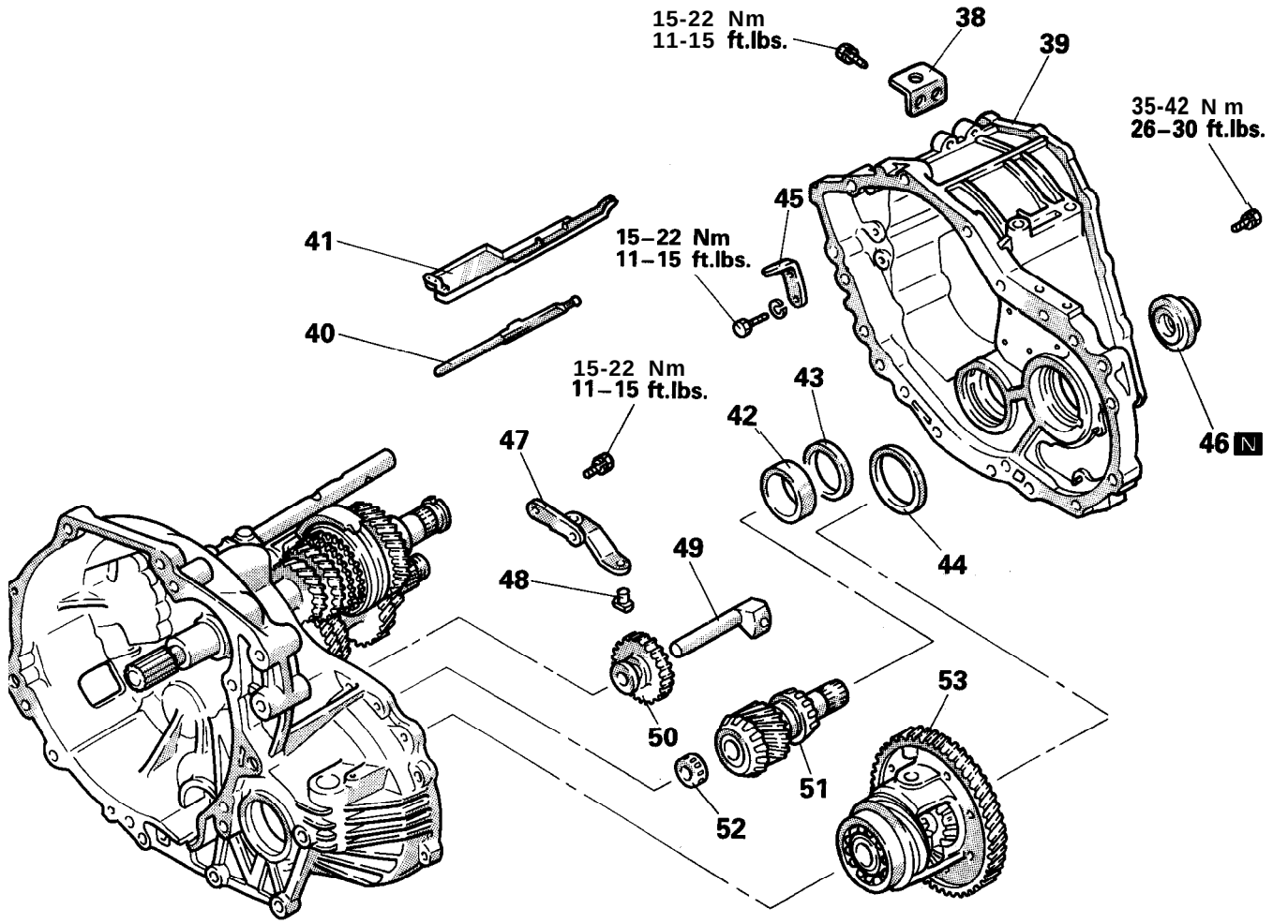



TFM0029

**Disassembly steps**

- ◆◆ 23. Snap ring
- ◆◆ 24. Viscous coupling
- ● 4 25. Steel ball
- 26. Center shaft
- ● 27. Transaxle case adapter
- 28. Outer race
- ● *29. Spacer
- 30. Outer race
- ● 4 31. Spacer
- 32. Outer race
- ● *33. Spacer
- 34. Center differential
- ◆◆ 35. Outer race
- ● + 36. Reverse idler gear shaft bolt
- 37. Gasket

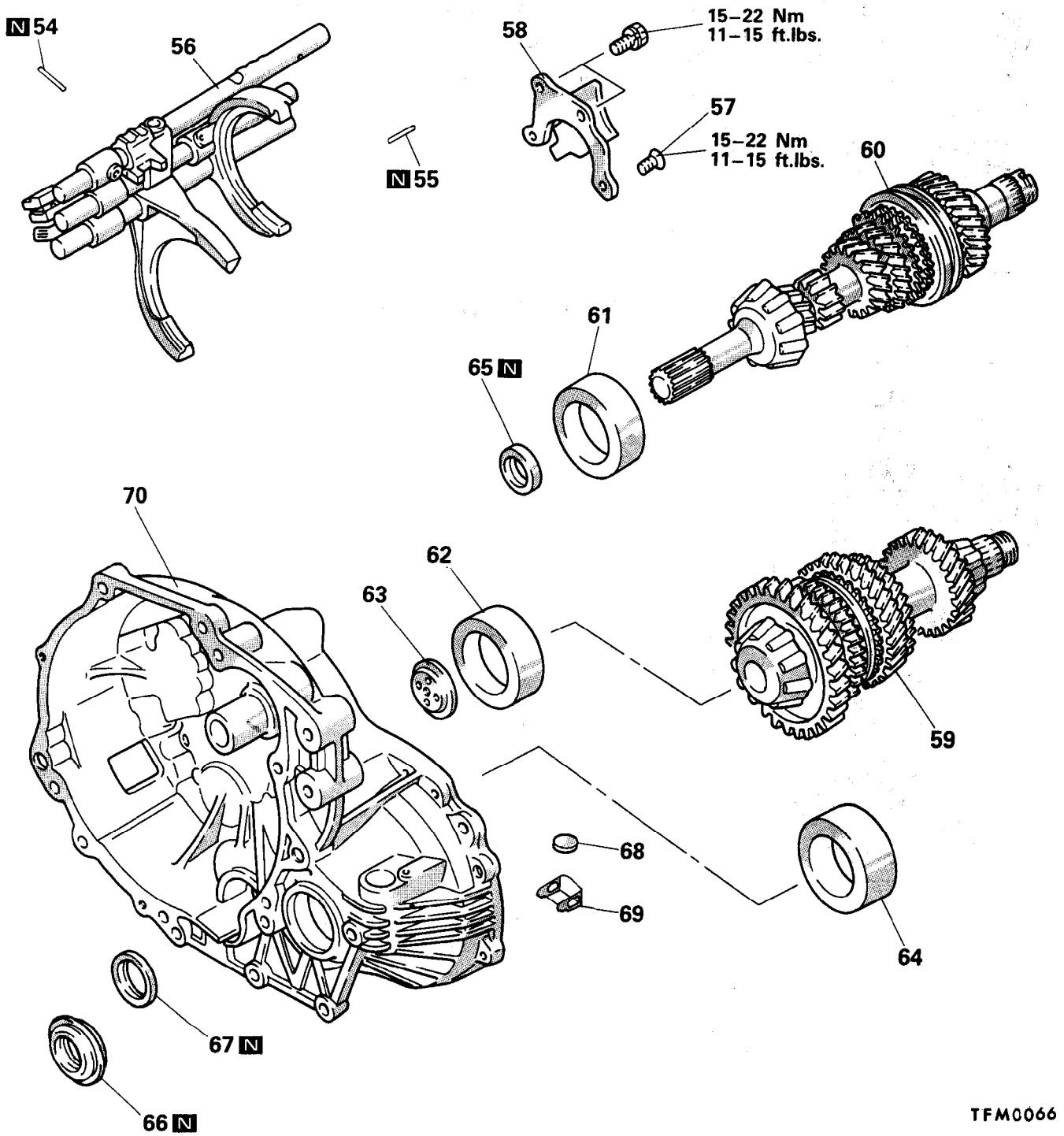
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts.




**Disassembly steps**

- 38. Clutch oil line bracket
- ● + 39. Transaxle case
- ● + 40. Oil guide
- ● + 41. Oil guide
- 42. Outer race
- ● + 43. Spacer
- ● * 44. Spacer
- 45. Stopper bracket
- ● 46. Oil seal
- 47. Reverse shift lever assembly
- 48. Reverse shift lever shoe
- 49. Reverse idler gear shaft
- 50. Reverse idler gear
- 51. Front output shaft assembly
- 52. Needle bearing
- 53. Front differential

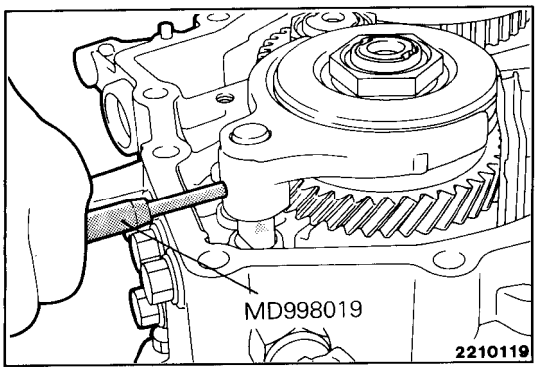
**NOTE**
(1) Reverse the disassembly procedures to reassemble.
(2) ● + : Refer to "Service Points of Reassembly".
(3) N : Non-reusable parts.




**Disassembly steps**

- ◆▶ ● + 54. Spring pin
- ◆▶ ● + 55. Spring pin
- ◆▶ ▶◀ 56. Shift rail assembly
- ● + 57. Bolt
- 58. Bearing retainer
- ◆▶ ● + 59. Intermediate gear assembly
- ◆▶ ▶◀ 60. Input shaft assembly
- ◆▶ 61. Outer race
- ◆▶ 62. Outer race
- 63. Oil guide
- ◆▶ 64. Outer race
- ● 4 65. Oil seal
- ● 4 66. Oil seal
- ● 4 67. Oil seal
- ● + 68. Magnet
- ▶◀ 69. Magnet holder
- 70. Clutch housing assembly

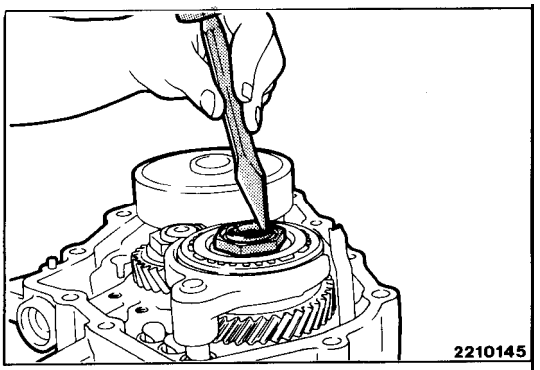
**NOTE**
(1) Reverse the disassembly procedures to reassemble.
(2) ◆▶: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts.




## SERVICE POINTS OF DISASSEMBLY N21MFAT

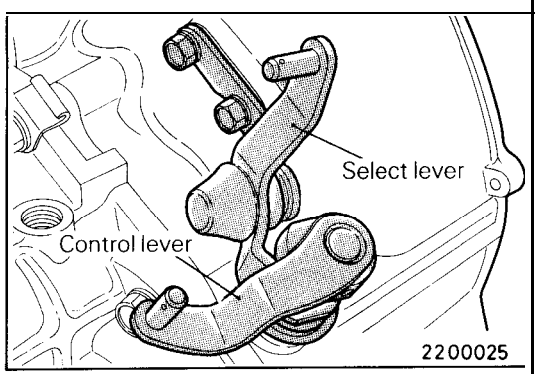
### 14. REMOVAL OF SPRING PIN

Remove the spring pin using the special tool.

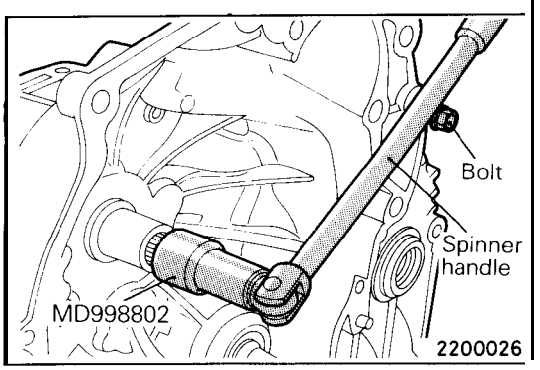



### 15. / 16. REMOVAL OF LOCK NUTS

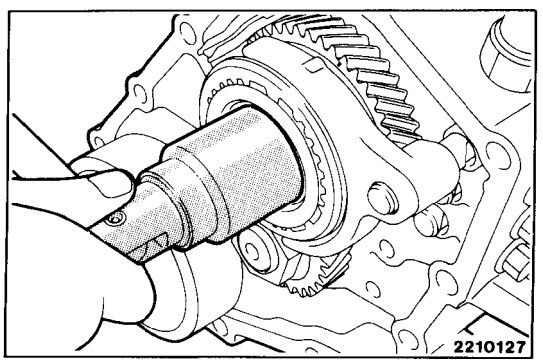
(1) Unstake lock nuts of the input shaft and intermediate gear.




(2) Shift the transaxle into reverse using the control lever and select lever.

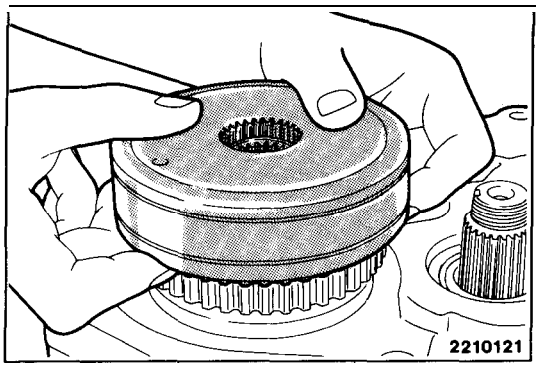



(3) Install the special tool on the input shaft.
(4) Install the spinner handle and 10 mm (.039 in.) bolt.



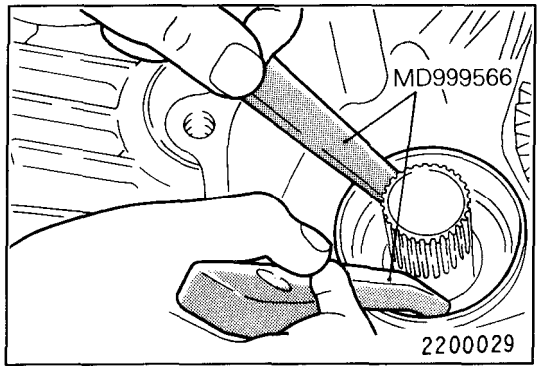

(5) Remove the lock nuts.

A



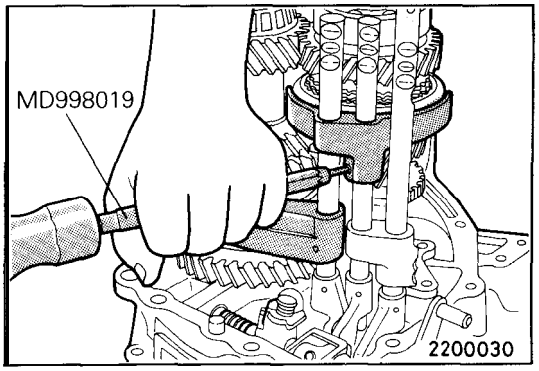

**24. REMOVAL OF VISCOUS COUPLING**

Using a flat-blade screwdriver, pry off the viscous coupling little by little.



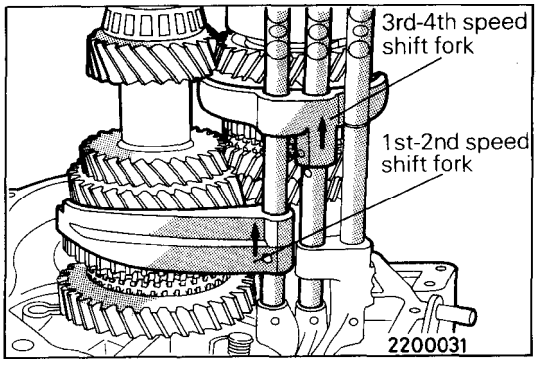

**35. REMOVAL OF OUTER RACE**

Using the special tool, remove the outer race.



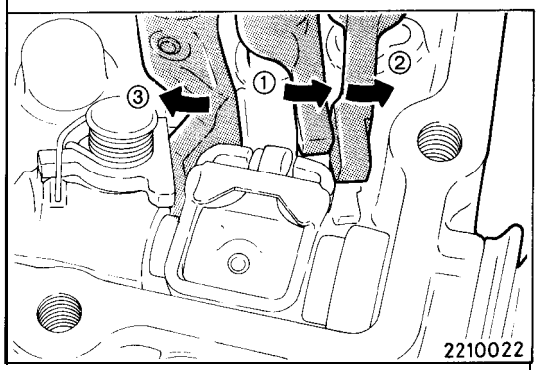

**54./55. REMOVAL OF SPRING PINS**

Remove the spring pins using the special tool.

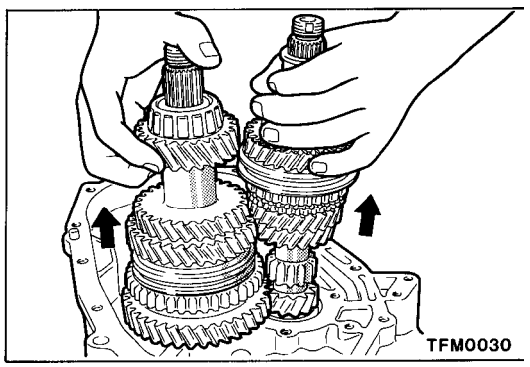



**56. REMOVAL OF SHIFT RAIL ASSEMBLY**

(1) Shift the 1st-2nd speed shift fork into 2nd speed.
(2) Shift the 3rd-4th speed shift fork into 4th speed.

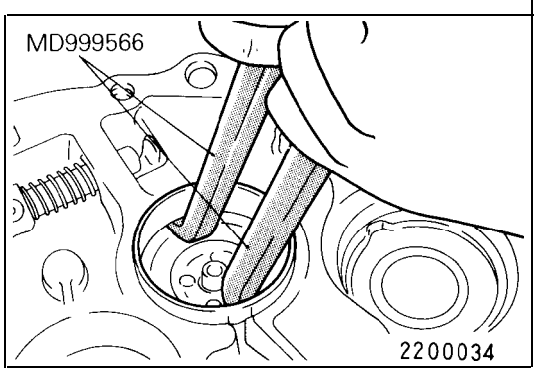



(3) Rotate the shift controls in the direction of the arrow in numerical order. Remove the shift lugs from the control finger and interlock plate.
(4) Raise each of the shift rails upward and remove them from the clutch housing.
(5) Remove the all shift rails and forks.




**59. REMOVAL OF INTERMEDIATE GEAR ASSEMBLY/ 60. INPUT SHAFT ASSEMBLY**

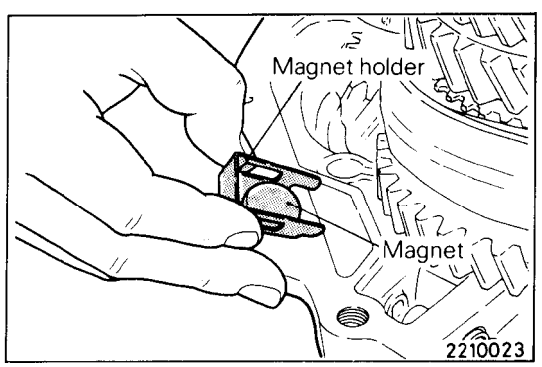
Lift up the input shaft assembly and remove the intermediate gear assembly.




**61./62./64. REMOVAL OF OUTER RACE**

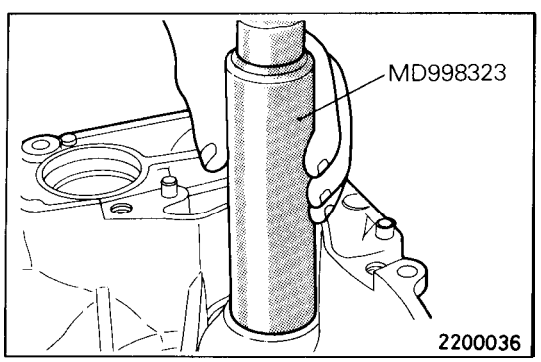
Using the special tool, remove the outer race.

## SERVICE POINTS OF REASSEMBLY N21MGAPa



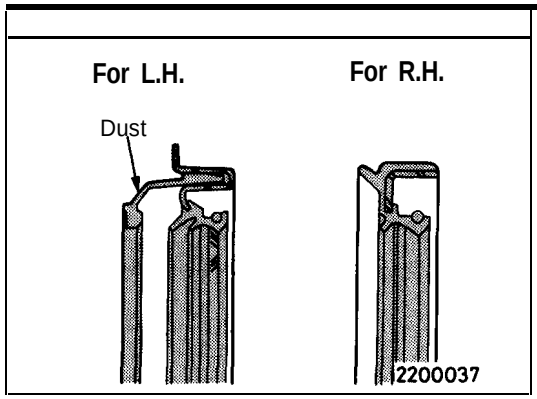

**69. INSTALLATION OF MAGNET HOLDER/68. MAGNET**

Install the magnet and magnet holder, ensuring they are installed in the correct direction.




**67. INSTALLATION OF OIL SEAL**

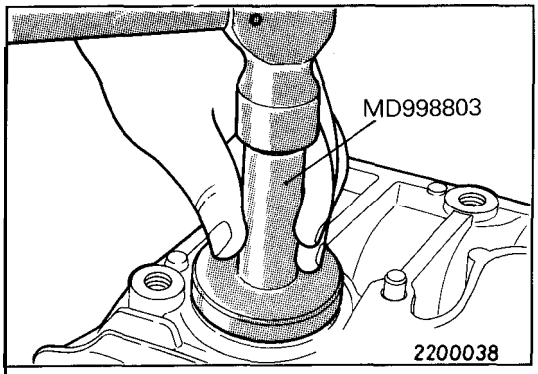
Using the special tool, install the rear output shaft oil seal.

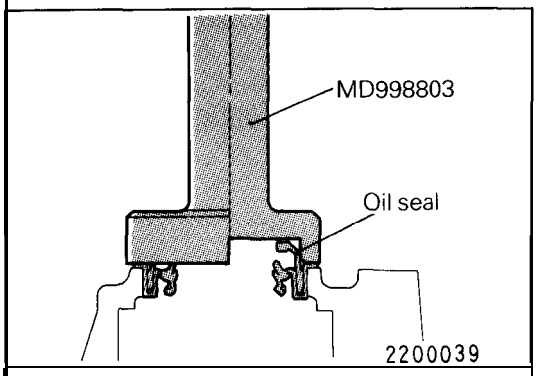



**66. INSTALLATION OF OIL SEAL**

Using the special tool, install the drive shaft oil seals, making sure that the seal for each side is in its proper location.

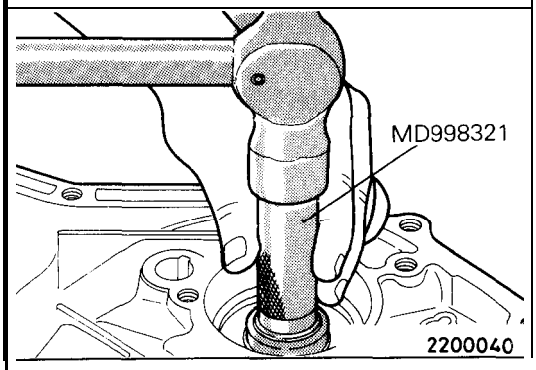
**Caution**
**Make sure that the notch in the L.H. oil seal flange is on the up side where it is installed.**



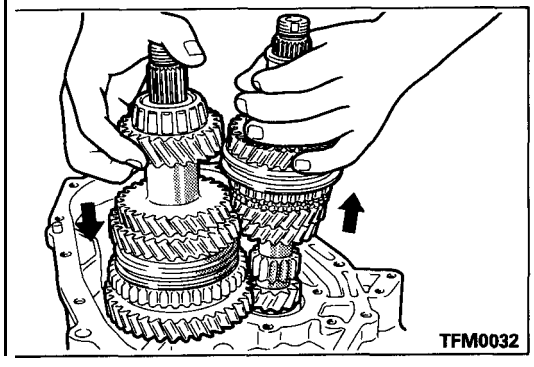

**65. INSTALLATION OF OIL SEAL**

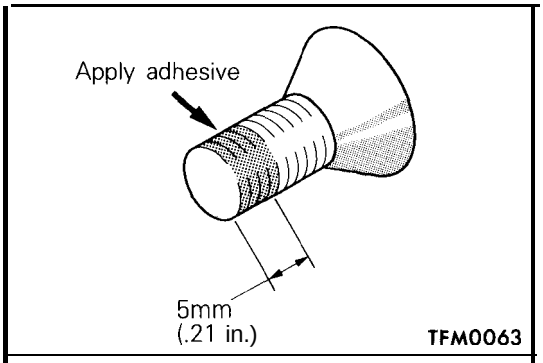
Using the special tool, install the input shaft front oil seal.




**60. INSTALLATION OF INPUT SHAFT ASSEMBLY/ 59. INTERMEDIATE GEAR ASSEMBLY**

Lifting up the input shaft assembly, install it together with the intermediate gear assembly.



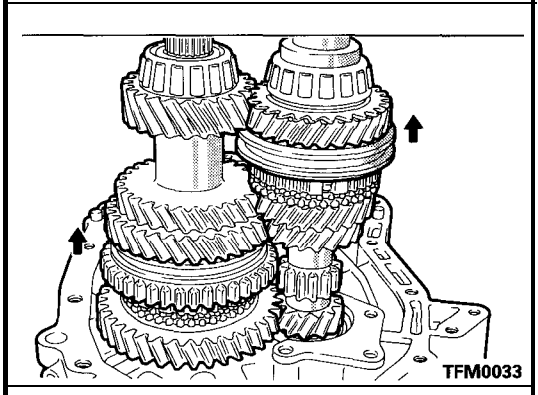



**57. INSTALLATION OF BOLT**

Apply adhesive to the bolt threads.

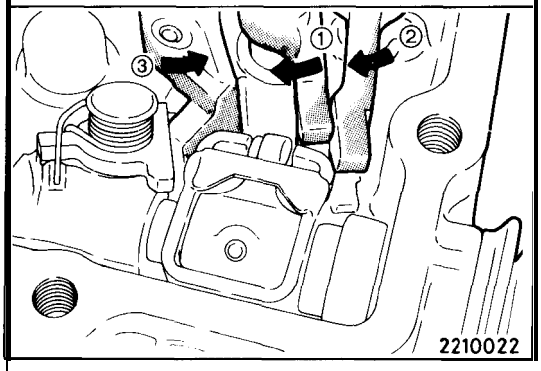
**Specified adhesive: MOPAR Part No.4318031**
**or MOPAR Part No.4318032**
**or equivalent**

**Caution**
**Be careful not to apply to adhesive to the bold head.**

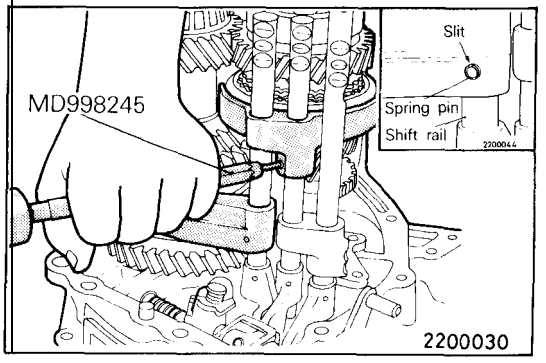



**56. INSTALLATION OF SHIFT RAIL ASSEMBLY**

(1) Shift the 1st-2nd synchronizer sleeve into 2nd speed.
(2) Shift the 3rd-4th synchronizer sleeve into 4th speed.
(3) Fit the shift forks of shift rail assembly to their groove of sleeves.



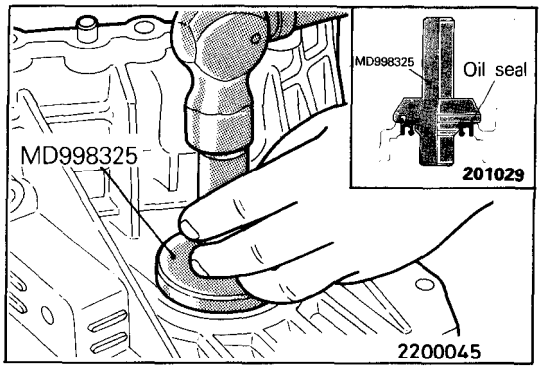

(4) Install the shift rails, rail holes of clutch housing.
(5) Turn the shift rails in the directions indicated by the arrows in the order shown in the illustration, and engage the shift lugs to control finger and interlock plate.




**55./54. INSTALLATION OF SPRING PINS**

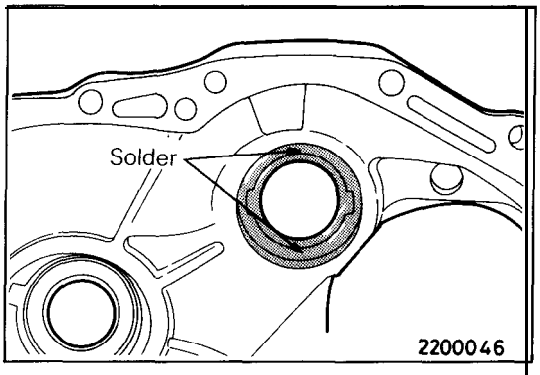
Using the special tool, drive the spring pins into position. Make sure that the slit in the spring pin is aligned with the shift rail centerline.

**Caution**
**Do not reuse the spring pins.**



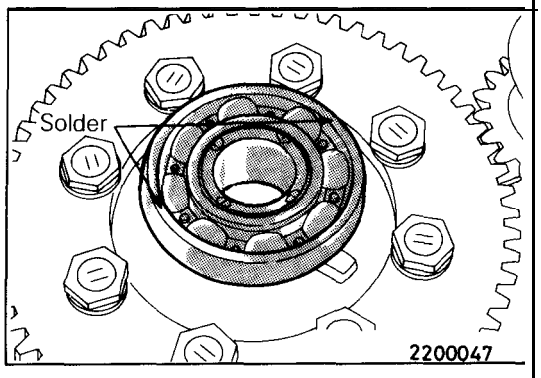

**46. INSTALLATION OF OIL SEAL**

Using the special tool, install the drive shaft oil seal.

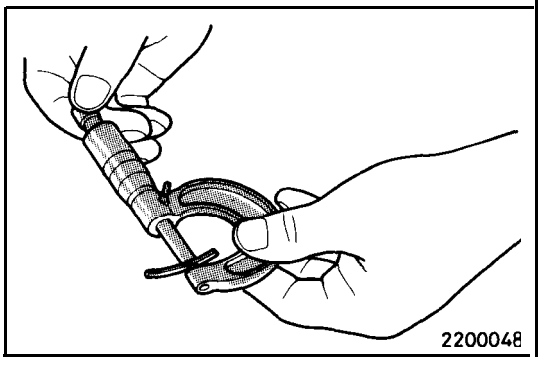



**44./43. INSTALLATION OF SPACER**

(1) Place two pieces of approximately 10 mm (.39 in.) long, 1.6 mm (.06 in.) dia. solder at the locations shown on the transaxle case and install each outer race.




(2) Place two pieces of approximately 10 mm (.39 in.) long, 1.6 mm (.06 in.) dia. solder at the locations shown on the bearing outer race.
(3) Install the transaxle case, and tighten bolts to specification.
(4) Remove the transaxle case.
(5) Remove the outer races and remove the solder.
(6) If the solder is not broken, carry out the work in steps (1)–(5) with large diameter solder.




(7) Using a micrometer, measure the thickness of the flattened solder and select a spacer of a thickness that gives the specified end play and preload.

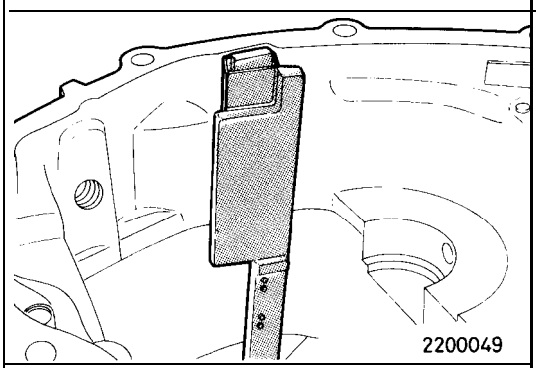
**Standard values:**

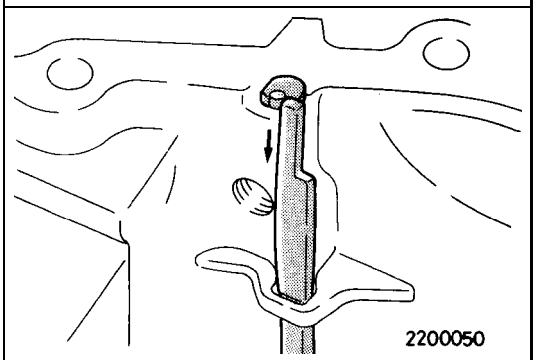
Front output shaft preload

**0.08–0.13 mm (.0031–.005 in.)**

**Front differential case end play**

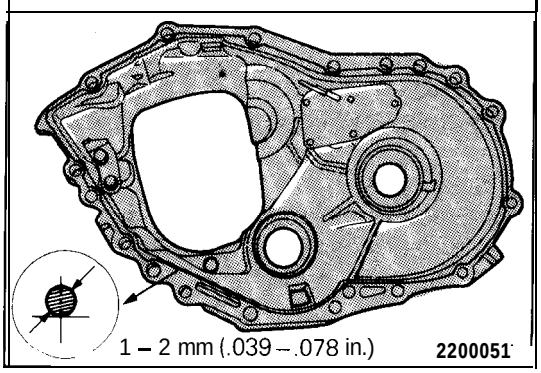
**0.05–0.17 mm (.0020–.007 in.)**




### 41./40. INSTALLATION OF OIL GUIDE

Install the oil guide or the transaxle case.

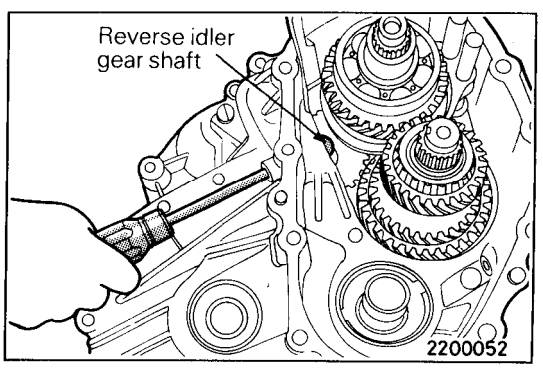



### 39. INSTALLATION OF TRANSAXLE CASE

Apply sealant (liquid gasket) to the clutch housing side of the transaxle case.

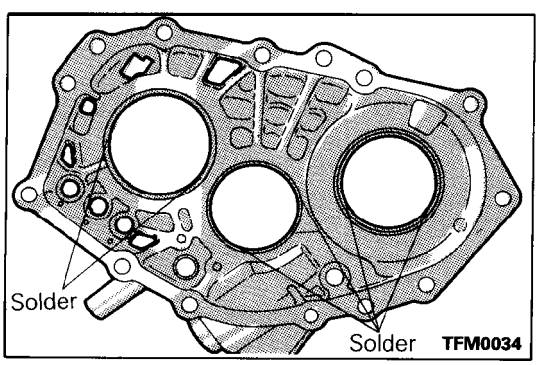
**Specified sealant: Mitsubishi genuine Part No. 997740 or equivalent**

**Caution**
**Squeeze out sealant from the tube uniformly without excess or discontinuities.**



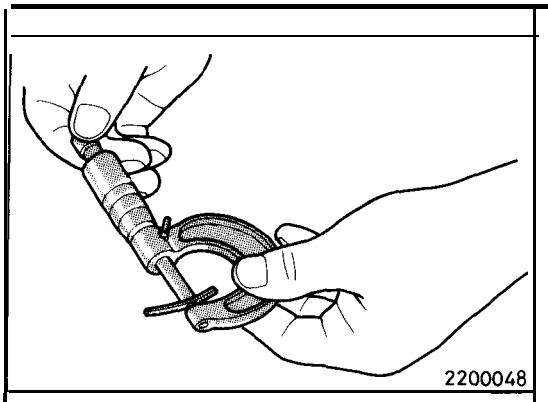

### 36. INSTALLATION OF REVERSE IDLER GEAR SHAFT BOLT

(1) Center the shaft with a screwdriver [shaft diameter 8 mm (.31 in.) or similar object].
(2) Tighten the reverse idler gear shaft bolt to specification.



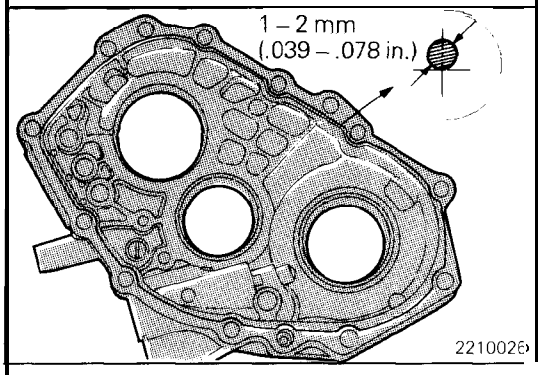

### 33./31./29 INSTALLATION OF SPACER

(1) Place four pieces of approximately 10 mm (.39 in.) long, 1.6 mm (.06 in.) dia. solder at the locations shown on the transaxle case adapter assembly and install each outer race.
(2) Install the transaxle case adapter assembly and rear cover, and tighten bolts to specification.
(3) Remove the transaxle case adapter assembly and rear cover.




(4) Remove the outer races and remove the solder.
(5) If the solder is not broken, carry out the work in steps, (1)–(4) with large diameter solder.
(6) Using a micrometer, measure the thickness of the flattened solder and select a spacer of a thickness that gives the specified end play and preload.

**Standard values:**
**Input shaft end play**
**0–0.05 mm (0–.0020 in.)**
**Intermediate gear preload**
**0.08–0.14 mm (.0031–.005 in.)**
**Center differential case preload**
**0.08–0.13 mm (.0031–.005 in.)**

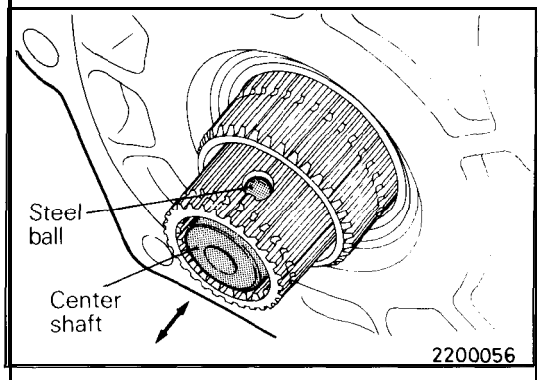



**27. INSTALLATION OF TRANSAXLE CASE ADAPTER**

Apply sealant (liquid gasket) to the transaxle case side of the transaxle case adapter assembly.

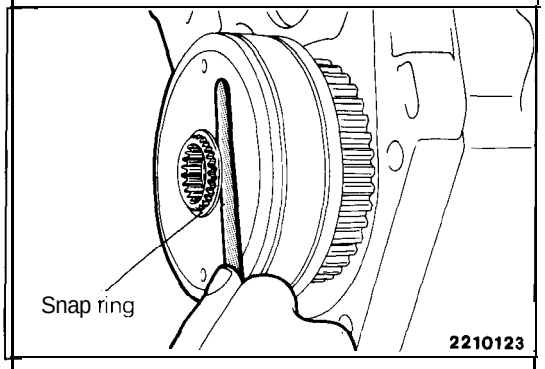
**Specified sealant: Mitsubishi genuine sealant Part No. MD997740 or equivalent**

**Caution**
**Squeeze out sealant from the tube uniformly without excess or discontinuities.**




**25. INSTALLATION OF STEEL BALL**

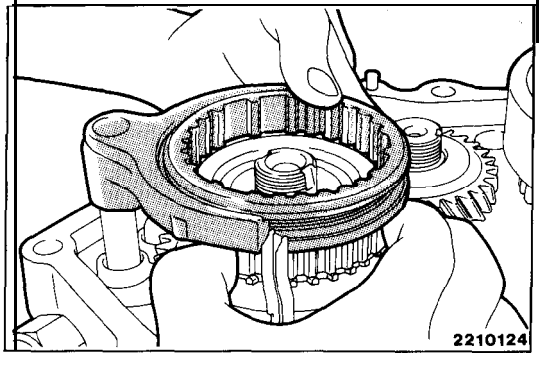
Move the center shaft so that the steel ball is seated securely into the groove in center shaft.




**23. INSTALLATION OF SNAP RING**

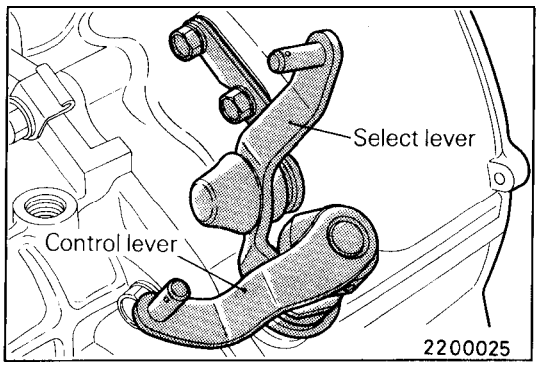
Select the snap ring so that the end play in the viscous coupling is up to specification.

**Standard value: 0.1–0.26 mm (.0039–.010 in.)**



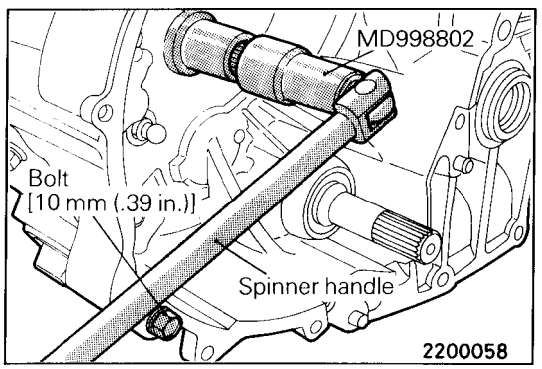

**18. INSTALLATION OF SHIFT FORK/17.5TH SPEED SYNCHRONIZER ASSEMBLY**

Mate the 5th speed shift fork with the 5th gear synchronizer assembly and install them simultaneously.

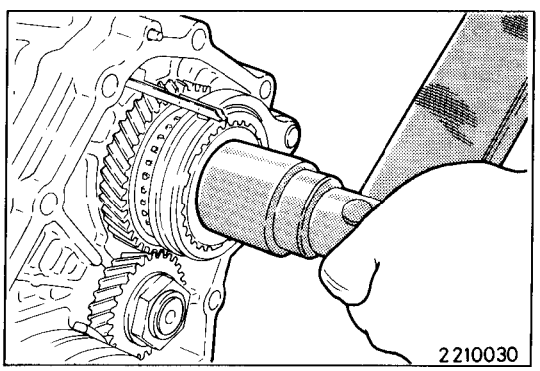



**16./15. INSTALLATION OF LOCK NUTS**

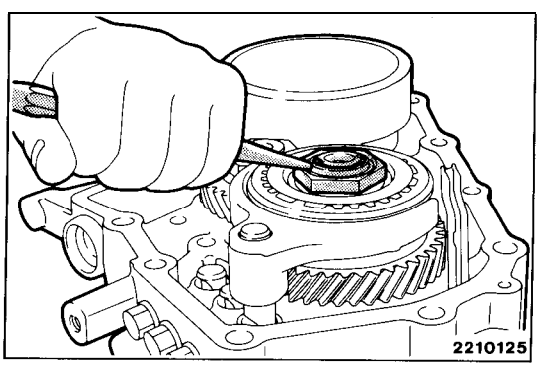
(1) Shift the transaxle into reverse using the control lever and select lever.



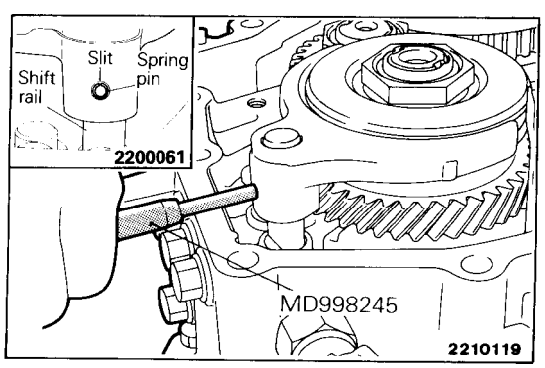

(2) Install the special tool on the input shaft.
(3) Fit on the spinner handle and bolt.




(4) Tighten the lock nut to specification and then loosen it completely before tightening it again to the specified torque.



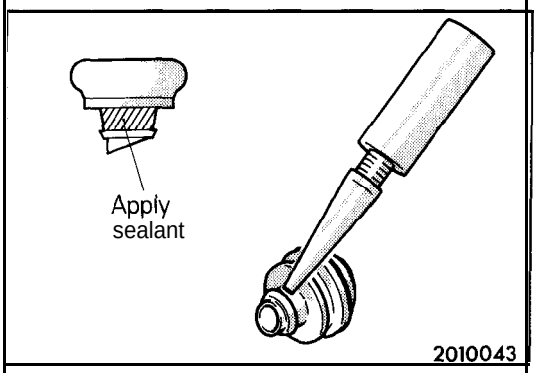

(5) Punch the lock nut into locked position.
(Punch two places on the lock nut of the input shaft and one place on the lock nut of the intermediate gear.)




**14. INSTALLATION OF SPRING PIN**

(1) Using the special tool, drive the spring pin into position.
(2) Make sure that the slit in the spring pin is aligned with the shift rail center line.

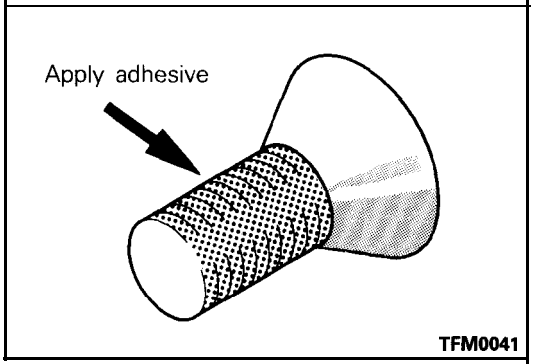
**Caution**
**Do not reuse the spring pin.**




**13. INSTALLATION OF AIR BREATHER**

Apply sealant to the areas with which the air breather makes contact, and isntall the air breather on the clutch housing.

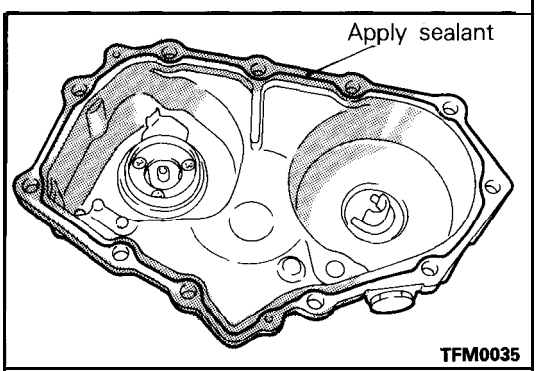
**Specified sealant: MOPAR Part No.4318025 or equivalent**




**3. INSTALLATION OF SCREW BOLTS**

Apply specified adhesive to screw bolts mounting portion.

**Specified adhesive: MOPAR Part No.4318031 or MOPAR Part No.4318032 or equivalent**

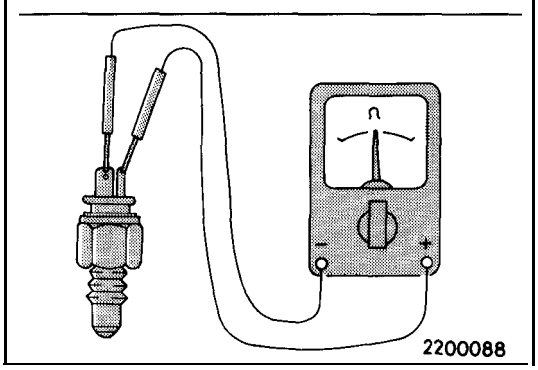



**1. INSTALLATION OF REAR COVER**

Apply sealant to the rear cover.

**Specified sealant: Mitsubishi genuine Part No. MD997740 or equivalent**

**Caution**
**Squeeze out sealant from the tube uniformly without excess or discontinuities.**




# BACKUP LIGHT SWITCH

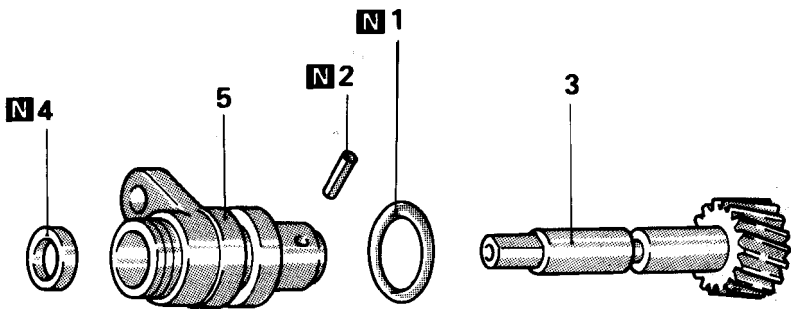
## INSPECTION

- Actuate the switch and check for continuity with a circuit tester. If there is no continuity, replace the backup light switch.

# SPEEDOMETER GEAR ASSEMBLY

N21MNAD

## DISASSEMBLY AND REASSEMBLY




Disassembly steps

1. O-ring
- * 2. Spring pin
- 3. Speedometer driven gear
4. Oil seal
5. Sleeve

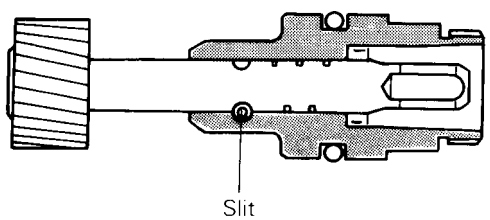
NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ◆◆: Refer to "Service Poirits of Reassembly".
(3) ❑ : Non-reusable parts.

201078

## SERVICE POINTS OF REASSEMBLY

### 3. INSTALLATION OF SPEEDOMETER DRIVEN GEAR

Apply a small amount of gear oil to the speedometer driven gear shaft and insert the gear into position.




201079

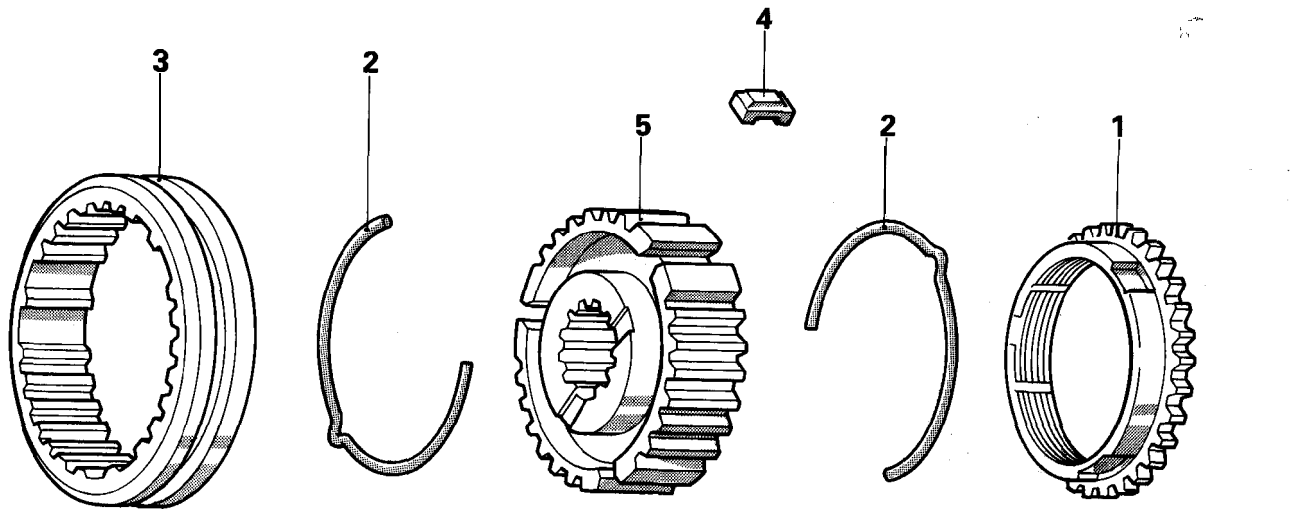
### 2. INSTALLATION OF SPRING PIN

Install the spring pin so that its slit is not in contact with the gear shaft.

# 5TH SPEED SYNCHRONIZER ASSEMBLY

N21MHAL

## DISASSEMBLY AND REASSEMBLY

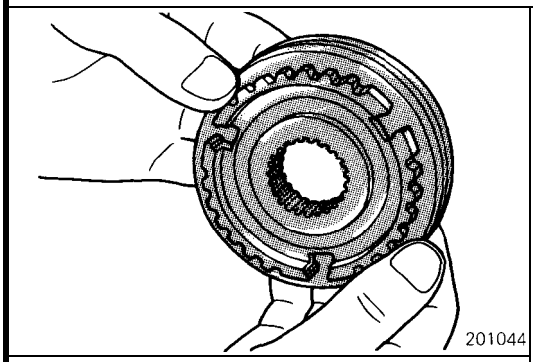


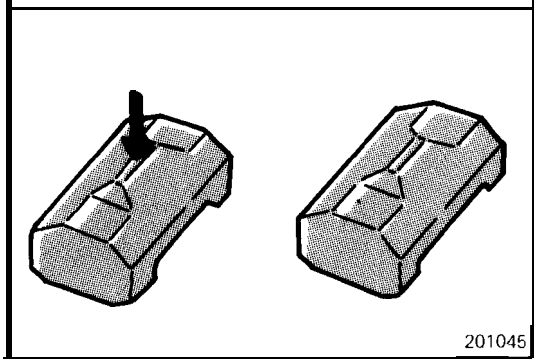

TFM0056

Disassembly steps

1. Reverse brake ring
● 2. Synchronizer spring
3. Synchronizer sleeve
➡⬅ 4. Synchronizer key
➡⬅ 5. Synchronizer hub

NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ➡⬅: Refer to "Service Points of Reassembly".




## INSPECTION

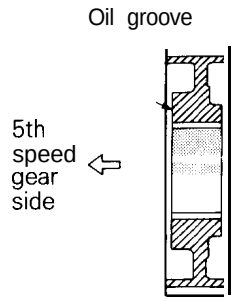
### SYNCHRONIZER SLEEVE AND HUB

(1) Mate the synchronizer sleeve and hub and check to see if they slide smoothly without binding.
(2) Make sure that the sleeve is free from damage at its inside front and rear ends.

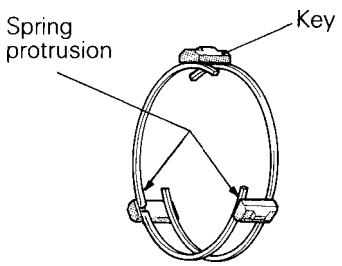
NOTE
If replacement is necessary, replace the synchronizer hub and sleeve as a set.

### SYNCHRONIZER KEY AND SPRING

(1) Make sure that the center protrusion of the synchronizer key is not worn.
(2) The spring must offer proper tension with no deformation or damage.



TFM0046



2010018

## SERVICE POINTS FOR REASSEMBLY

### 5. INSTALLATION OF SYNCHRONIZER HUB./4. SYNCHRONIZER KEY

Install the synchronizer hub, and key in the directions as shown.

### 2. INSTALLATION OF SYNCHRONIZER SPRINGS

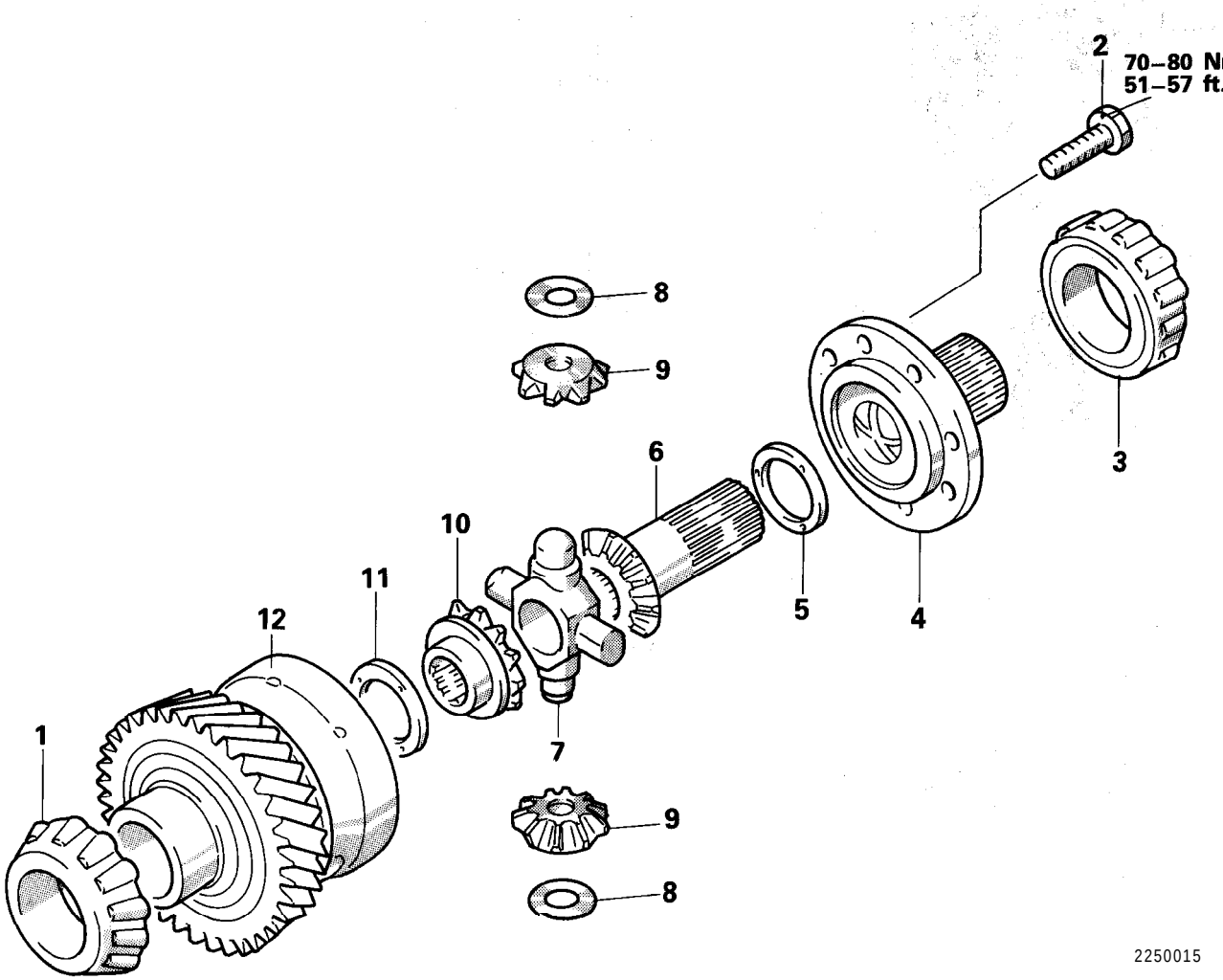
Install the synchronizer springs so that its protrusion fits into the synchronizer key. Make sure that the protrusions in the front and rear springs do not fit over the same key.

A

# CENTER DIFFERENTIAL

N21MSAB

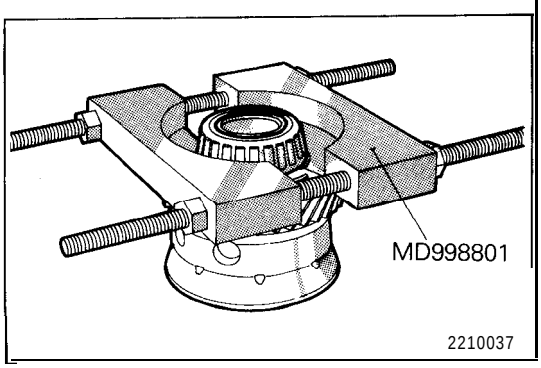
## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

- ◆◆ ● + **1. Taper roller bearing**
- ● + 2. Bolt
- ● *● + **3. Taper roller bearing**
- **4. Output flange**
- ◆◆ **5. Spacer**
- **6. Side gear**
- **7. Pinion shaft**
- **8. Washer**
- **9. Pinion**
- 10. Side gear
- ● **+ 11. Spacer**
- **12. Center differential case**

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● *: Refer to "Service Points of Disassembly".
(3) ● a: Refer to "Service Points of Reassembly".



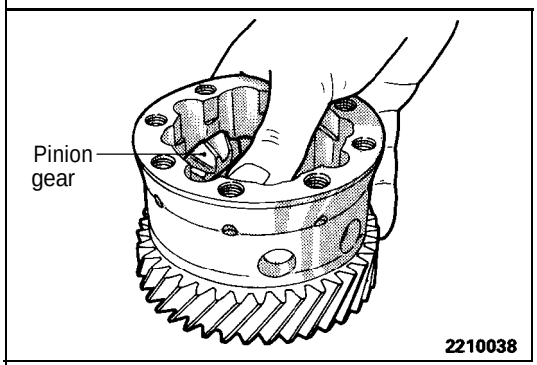

## SERVICE POINTS OF DISASSEMBLY

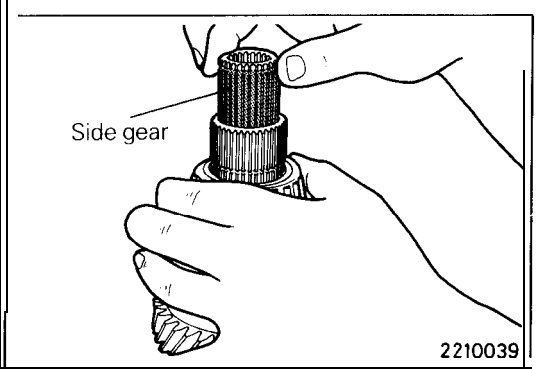
### 1./3. REMOVAL OF TAPER ROLLER BEARINGS

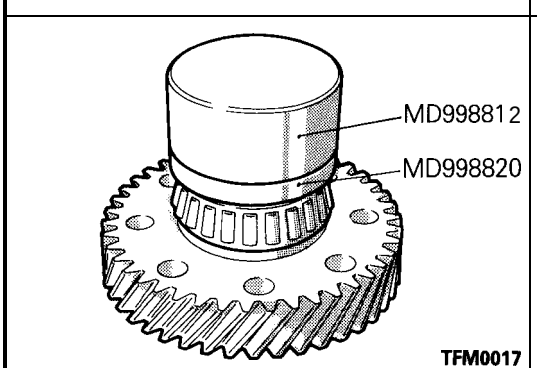
**Using the special tool, remove the taper roller bearings.**

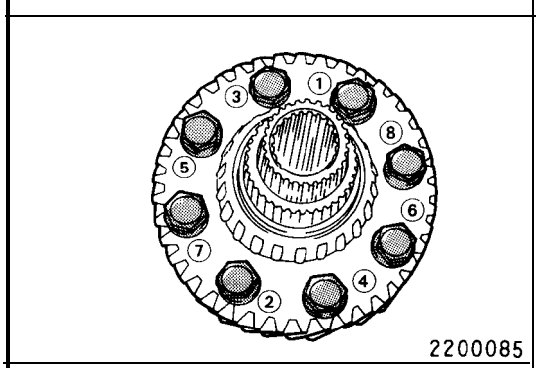
**Caution**

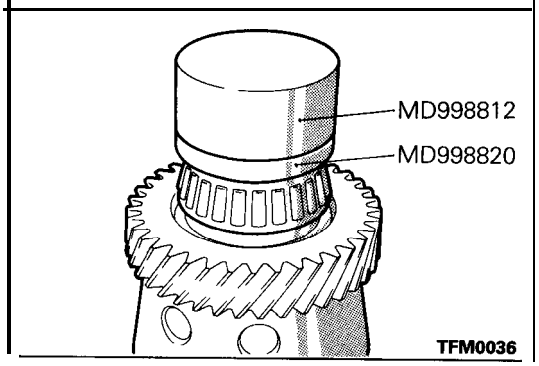
1. **Do not reuse the bearing if it has been removed from the shaft.**
2. **Replace the inner and outer races of the taper roller bearing as a set.**




## SERVICE POINTS OF REASSEMBLY

### 11. /5. INSTALLATION OF SPACERS

(1) Install the spacer, side gear, pinion gear, washer, and pinion shaft into the center differential case.
(2) Select and install the thickest spacer that ensures smooth and light rotation of the pinion gear when turned while holding the pinion shaft.
(3) Install the side gear, spacer, and output flange, and tighten bolts to specification.
(4) Select and install the thickest spacer, that allows smooth rotation of side gear.
(5) Make sure that the two side gears turn smoothly.

**Standard value:**
**Center differential pinion backlash**
**0.025 – 0.150 mm (.0001 – .0060 in.)**

### 3. INSTALLATION OF TAPER ROLLER BEARINGS

Using the special tool, press-fit the taper roller bearing into position.

**Caution**
**Apply the special tool to the inner race only when installing the bearing.**

### 2. INSTALLATION BOLTS

Apply adhesive to the entire thread section of the bolts and quickly tighten bolts to specification in the order shown.

**Specified adhesive: MOPAR Part No. 4318031**
**or MOPAR Part No. 4318032**
**or equivalent**

NOTE
If the bolts are to be reused, completely remove the old adhesive from the threads.

### 1. INSTALLATION OF TAPER ROLLER BEARINGS

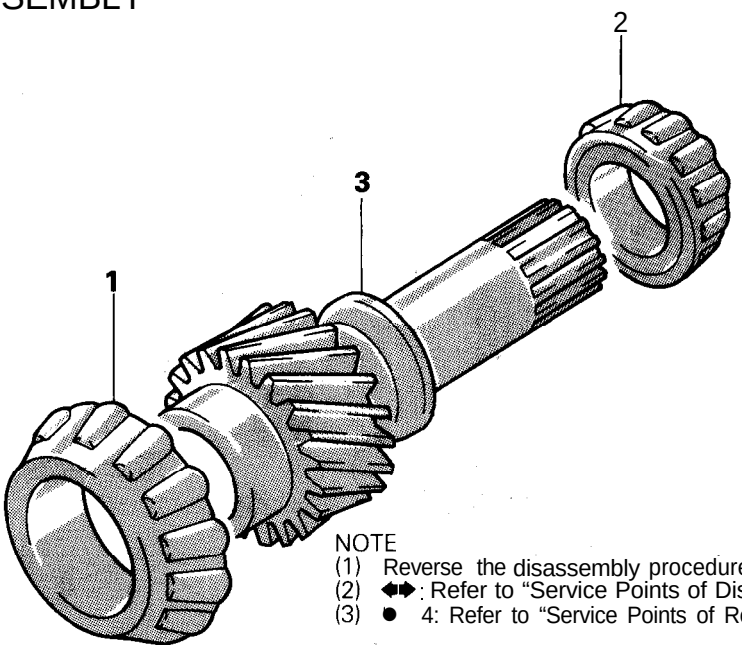
Using the special tool, press-fit the taper roller bearing into position.

**Caution**
**Apply the special tool to the inner race only when installing the bearing.**

# FRONT OUTPUT SHAFT ASSEMBLY

N21MKAF

## DISASSEMBLY AND REASSEMBLY

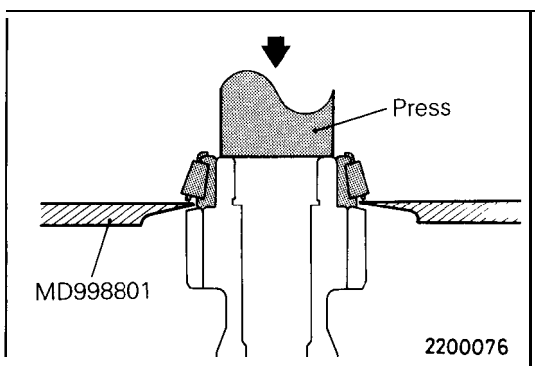


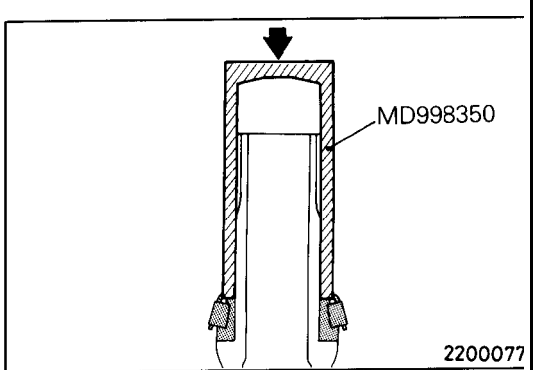

**Disassembly steps**

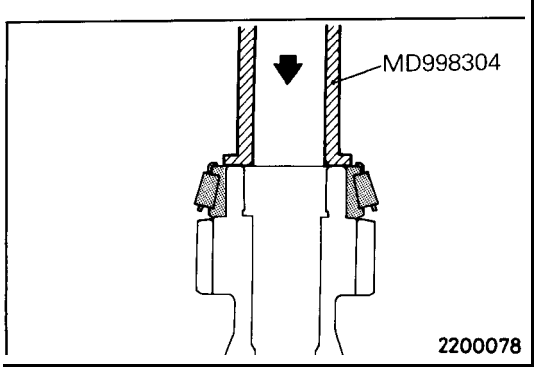
- ● ➡◀ 1. Taper roller bearing
- ◀➡ ● + 2. Taper roller bearing
- 3. Front output shaft

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◀➡: Refer to "Service Points of Disassembly".
(3) ● 4: Refer to "Service Points of Reassembly".

2200075




## SERVICE POINTS OF DISASSEMBLY

### 1./2. REMOVAL OF TAPER ROLLER BEARINGS

Using the special tool, remove the taper roller bearing.

**Caution**

**1. Do not reuse the bearing if it has been,, removed from the shaft.**
**2. Replace the inner and outer races of the taper roller bearing as a set.**

## SERVICE POINTS OF REASSEMBLY

### 2. INSTALLATION OF TAPER ROLLER BEARINGS

Using the special tool, press-fit the taper roller bearing into position.

**Caution**

**Apply the special tool to the inner race' only when installing the bearing.**

### 1. INSTALLATION OF TAPER ROLLER BEARINGS

Using the special tool, press-fit the taper roller bearing into position.

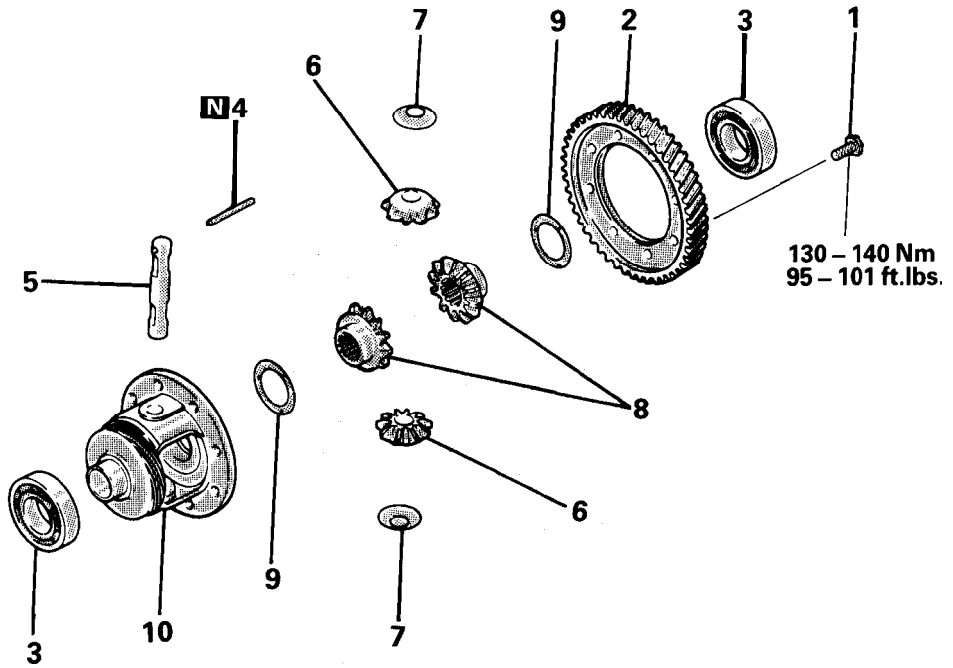
**Caution**

**Apply the special tool to the inner race only when installing the bearing.**

# FRONT DIFFERENTIAL

N21MMAG

## DISASSEMBLY AND REASSEMBLY

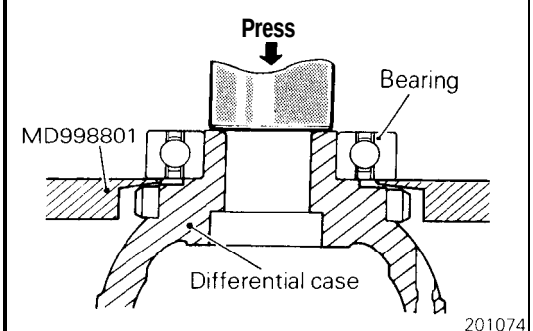



**Disassembly steps**

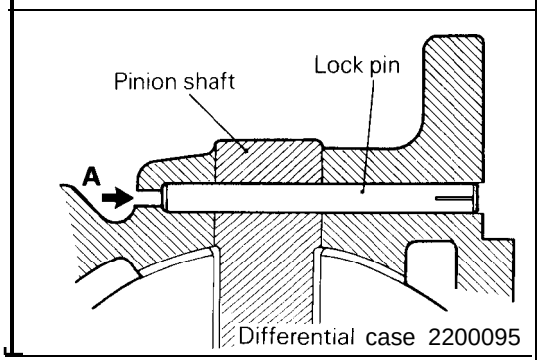
- ● **+ 1. Bolt**
  **2. Differential drive gear**
- ◆◆ ● + **3. Ball bearing**
- ◆◆ ● *** 4. Lock pin**
- ◆◆ **5. Pinion shaft**
- ● *** 6. Pinion**
- ◆◆ **7. Washer**
- ● **+ 8.** Side gear
- ● *** 9. Spacer**
  10. **Differential case**

NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) ❑ : Non-reusable parts.

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## SERVICE POINTS OF DISASSEMBLY

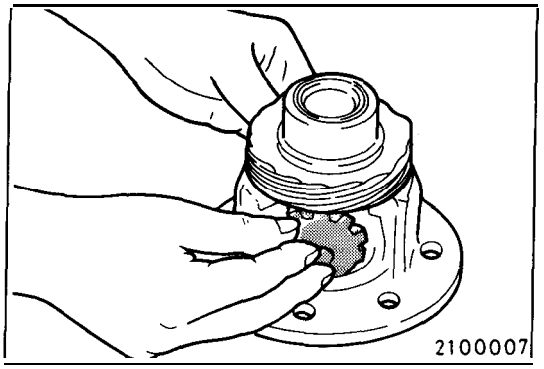
### 3. REMOVAL OF BALL BEARING

Using the special tool, remove the ball bearing.

**Caution**
**Do not reuse the bearing if it has been removed from the differential case.**

### 4. REMOVAL OF LOCK PIN

Drive out the lock pin from hole A using a punch.

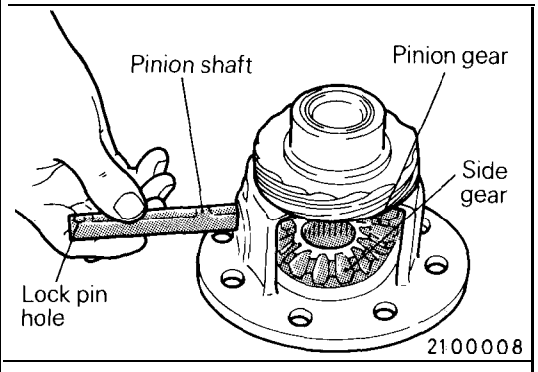



## SERVICE POINTS OF REASSEMBLY

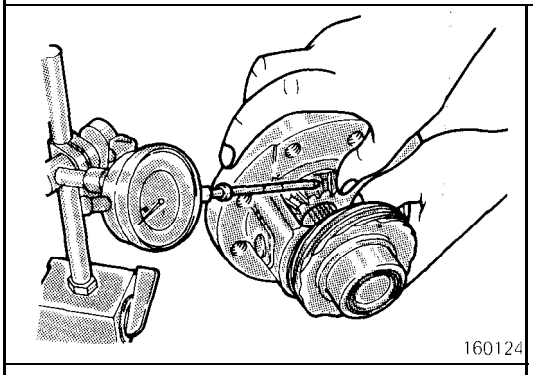
### 9. INSTALLATION OF SPACER / 8. SIDE GEAR / 7. WASHER / 6. PINION / 5. PINION SHAFT

(1) Fit a spacer on to the back of the side gear and then install the gear in the differential case.

**Caution**
**When a new side gear is used, use a spacer of intermediate thickness [0.93–1.00 mm (.0366-.0394 in.)]**




(2) Place a washer at the back of each of the two pinions and insert the two pinions at the same time, meshing them with the side gear and rotating them.
(3) Insert the pinion shaft.




(4) Measure the backlash between the side gear and pinion.

**Standard value: 0.025 – 0.150 mm (.0001–.0060 in.)**

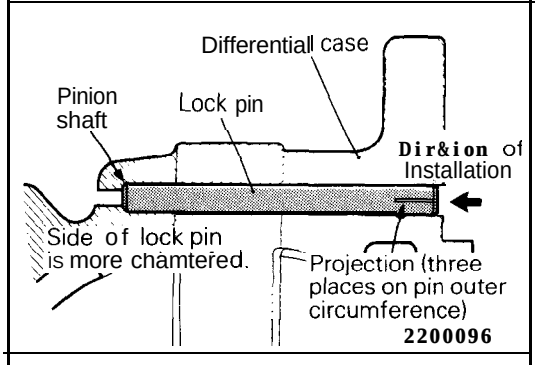
(5) If the backlash is out of specification, disassemble and reassemble the gears with a new spacer.

**Caution**
**Adjust to provide the same backlash for both side gears.**

### 4. INSTALLATION OF LOCK PIN

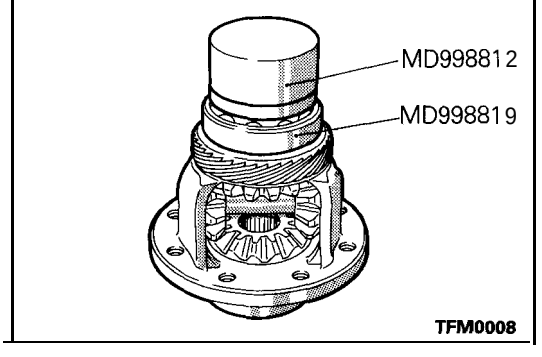
Align the lock pin hole in the pinion shaft with that in the case and press the lock pin into position.

**Caution**
**1. Do not reuse the lock pin.**
**2. Make sure that the lock pin head is lower than the differential case flange surface.**

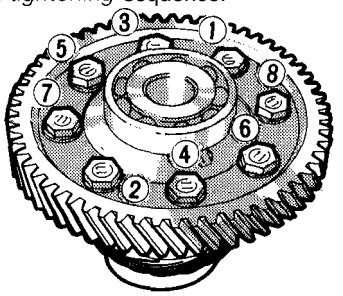



### 3. INSTALLATION OF BALL BEARINGS

Install the ball bearings in both sides of the differential case.



Numerals (1) through (8) indicate the bolt tightening sequence.




160030

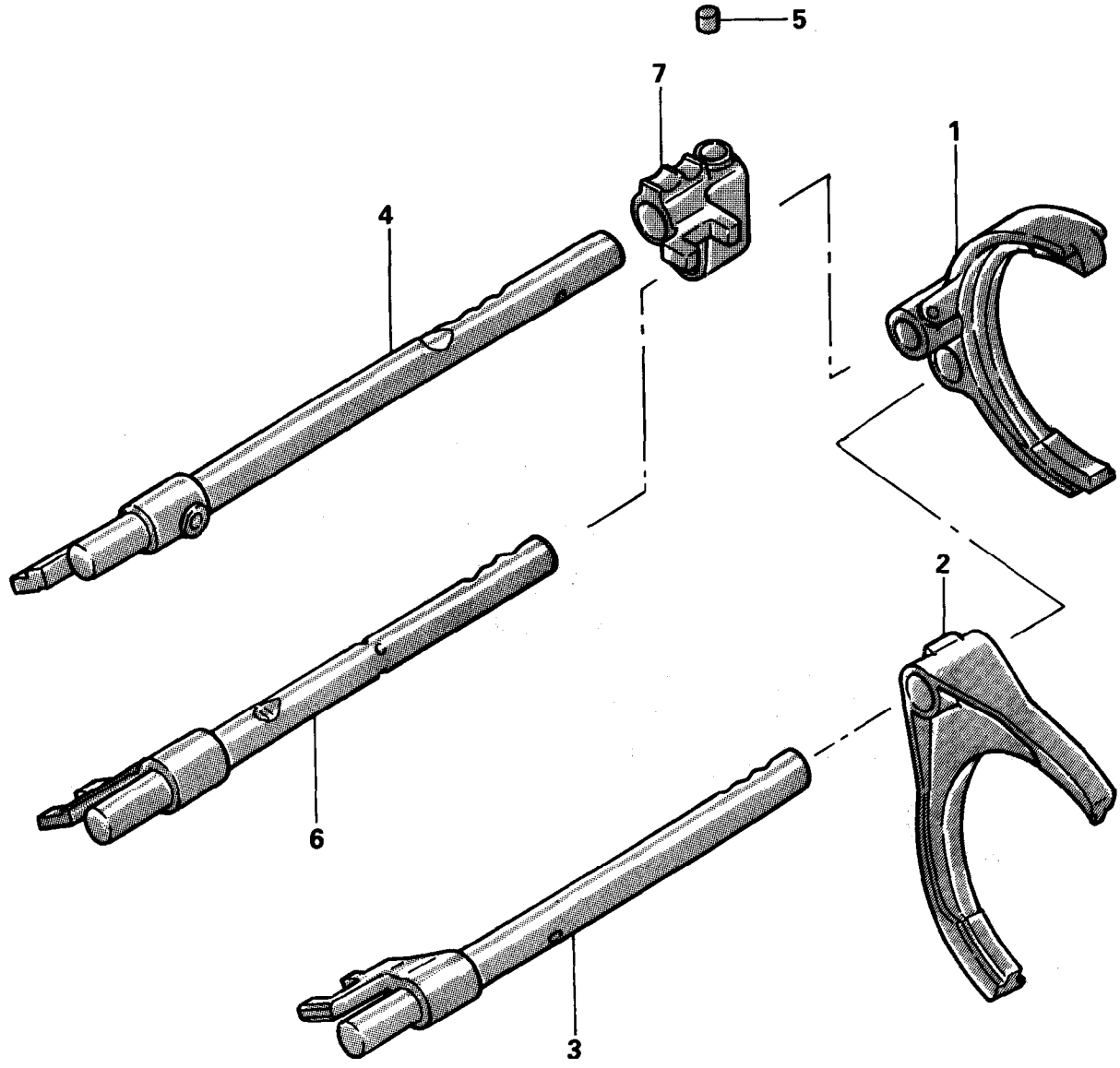
**1. INSTALLATION OF BOLTS**

Apply adhesive to the entire thread section of the bolts and quickly tighten bolts to specification in the order shown.

**Specified adhesive: MOPAR Part No. 4318031**
**or MOPAR Part No. 4318032**
**or equivalent**

**Caution**
**If the bolts are to be reused, completely remove the old adhesive from the threads.**

## DISASSEMBLY AND REASSEMBLY

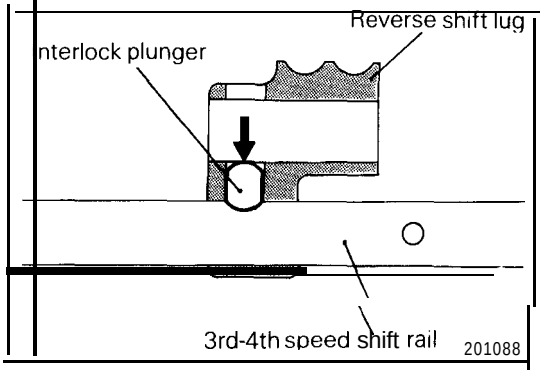



**Disassembly steps**

1. 3rd-4th speed shift fork
2. **1** st-2nd **speed shift fork**
3. **1** st-2nd **speed shift rail**
4. 5th-Rev. **speed shift rail**
- 4 **5. interlock plunger**
6. 3rd-4th **speed shift rail**
7. **Reverse shift lug**

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● 4: Refer to "Service Points of Reassembly".

210027




## SERVICE POINTS OF REASSEMBLY

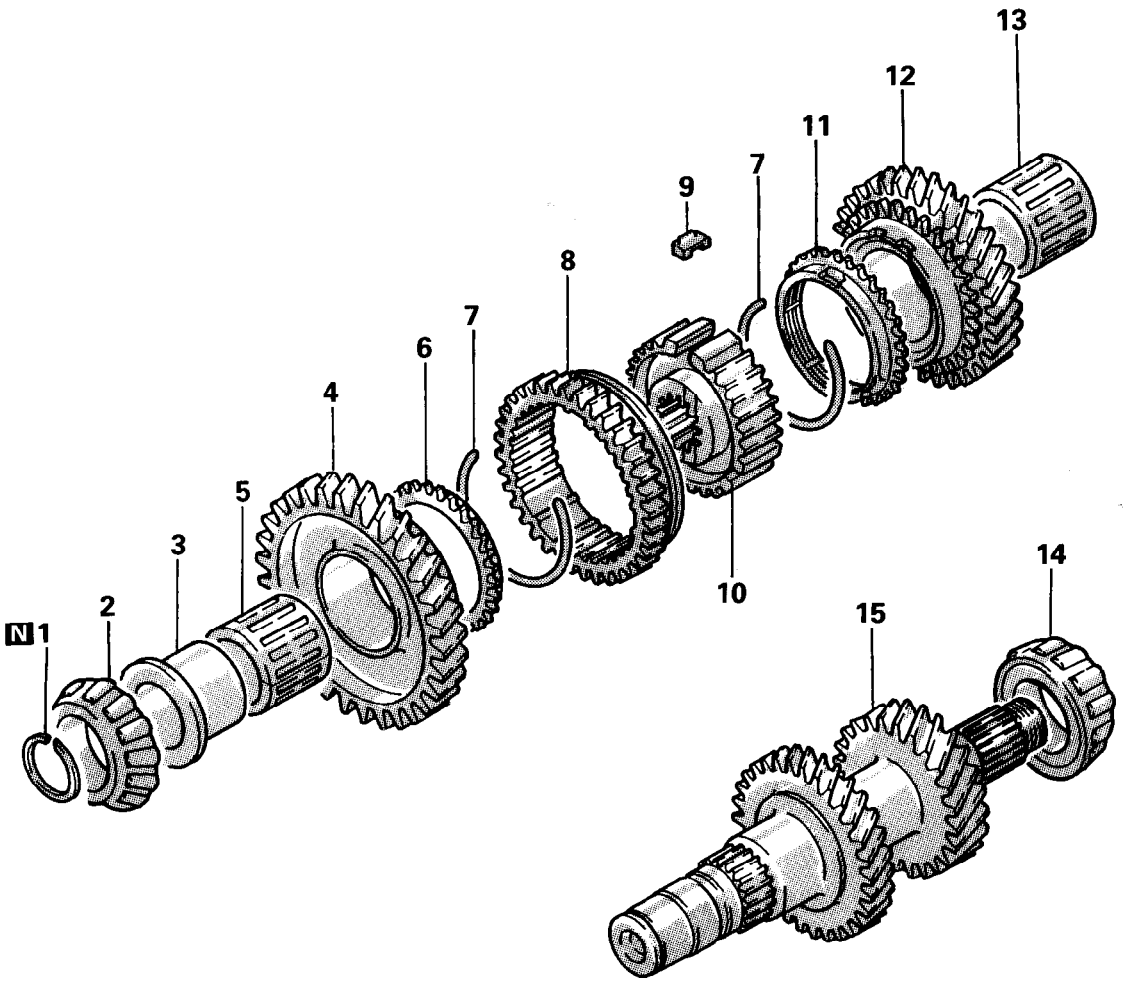
### 5. INSTALLATION OF INTERLOCK PLUNGER

**Fit the interlock plunger into** the position shown in 3rd-4th speed shift rail.

# INTERMEDIATE GEAR ASSEMBLY

N21MJAR

## DISASSEMBLY AND REASSEMBLY

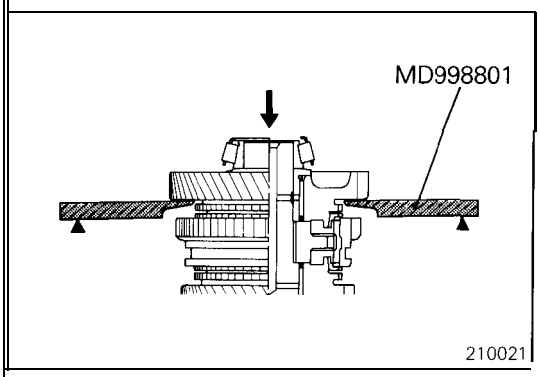



**Disassembly steps**

- ◆◆ 1. Snap ring
- ● *● + 2. Taper roller bearing
- ● * 3. Bearing sleeve
- ● ☒ 4. 1 st speed gear
- 5. Needle bearing
- ● a 6. Synchronizer ring
- ● + 7. Synchronizer spring
- ● a 8. 1 st-2nd speed synchronizer sleeve
- ● * 9. Synchronizer key
- ◆◆ ● a 10. 1st-2nd speed synchronizer hub
- ● *11. Synchronizer ring
- ◆◆ 12. 2nd speed gear
- 13. Needle bearing
- ● *● * 14. Taper roller bearing
- 15. Intermediate gear

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● C: Refer to "Service Points of Reassembly".
(4) ❑ : Non-reusable parts.

210033



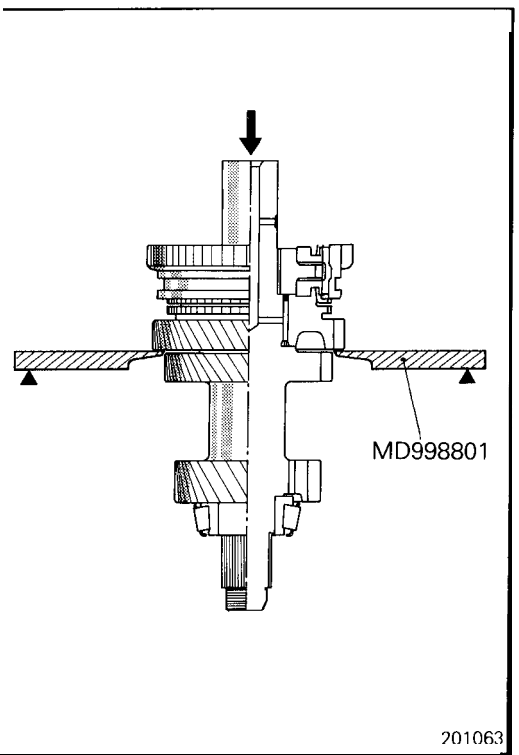

## SERVICE POINTS OF DISASSEMBLY

**2. REMOVAL OF TAPER ROLLER BEARING / 4. 1ST SPEED GEAR**

Using the special tool, remove the taper roller bearing, the 1st speed gear, and the bearing sleeve.

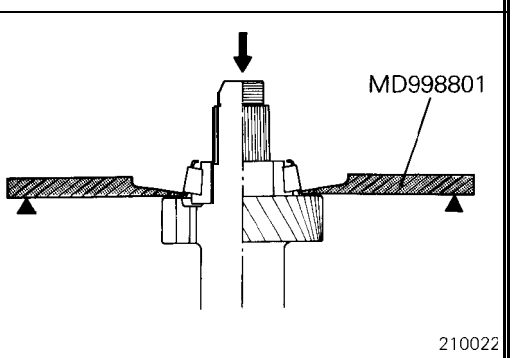
**Caution**

**1. Do not reuse the bearing if it has been removed from the shaft.**
**2. Replace the inner and outer races of the taper roller bearing as a set.**




**10. REMOVAL OF 1ST-2ND SPEED SYNCHRONIZER HUB / 12. 2ND SPEED GEAR**

Using the special tool, remove the 1st-2nd speed synchronizer assembly and 2nd speed gear.

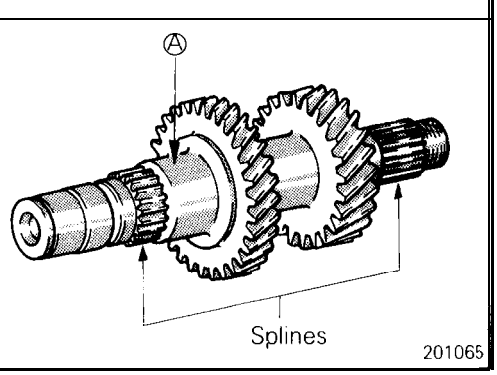



**14. REMOVAL OF TAPER ROLLER BEARING**

Using the special tool, remove the taper roller bearing.

**Caution**

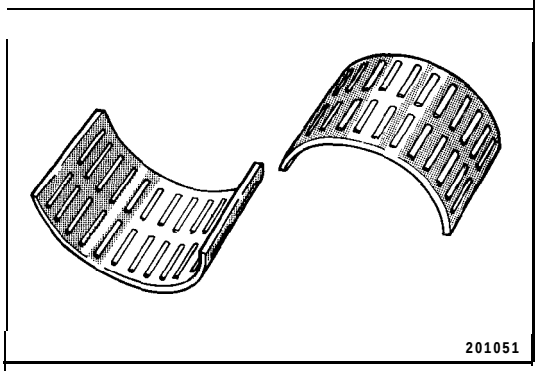
**1. Do not reuse the bearing if it has been removed from the shaft.**
**2. Replace the inner and outer races of the taper roller bearing as a set.**




## INSPECTION

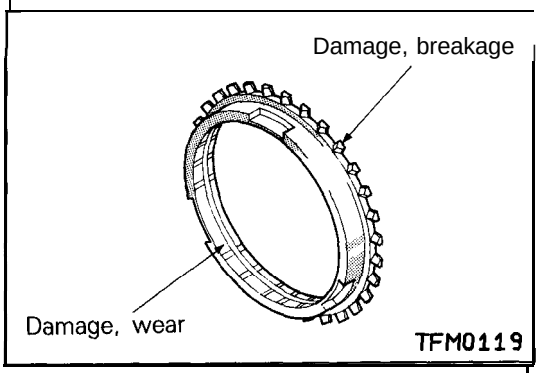
**INTERMEDIATE GEAR**

- Check the outer surface of the intermediate gear where the needle bearing is mounted for damage; abnormal wear, and seizure (portion Ⓐ).
- Check splines for damage and wear.


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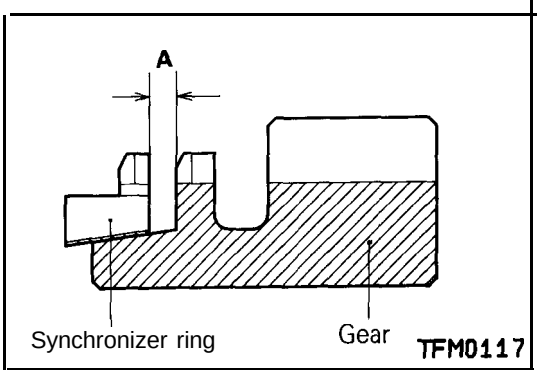
**NEEDLE BEARING**

- Mate the needle bearing with the shaft or bearing sleeve and gear, and check to see if rotation is smooth with no binding, noise, or play.
- Check the needle bearing cage for possible deformation.



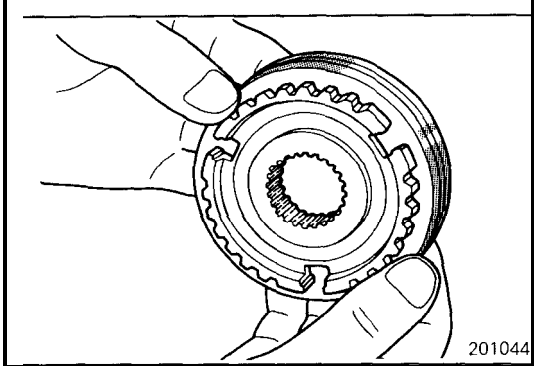

**SYNCHRONIZER RING**

- Check the clutch gear teeth for damage and breakage.
- Check the cone inside paper lining for damage, wear or peeling.




- Force the synchronizer ring toward the clutch gear and check clearance “A”. Replace if the measurement is below the limit.

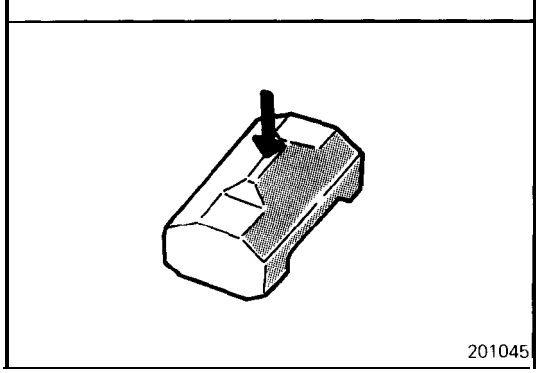
  **Limit: 0.5 mm (.020 in.)**


201044

**SYNCHRONIZER SLEEVE AND HUB**

- Mate the synchronizer sleeve with the hub and check to see if they slide smoothly.
- Check to see if the sleeve is free from damage at its inside front and rear ends.
- Check the hub front and rear end faces (in contact with each speed gear) for wear.

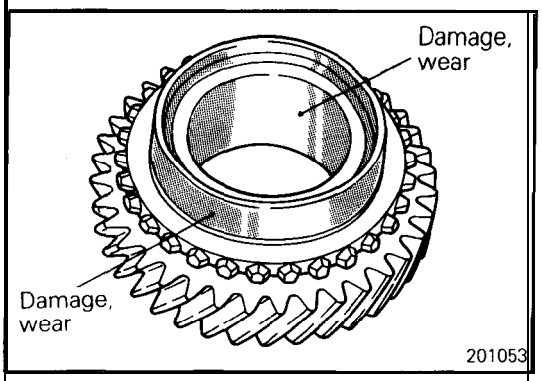
  **Caution**
  **When replacement is necessary, replace the synchronizer hub and sleeve as a set.**


201045

**SYNCHRONIZER KEY AND SPRING**

- Check the synchronizer key center protrusion for wear.
- Check the spring for proper tension, possible deformation and breakage.

A




**SPEED GEARS**

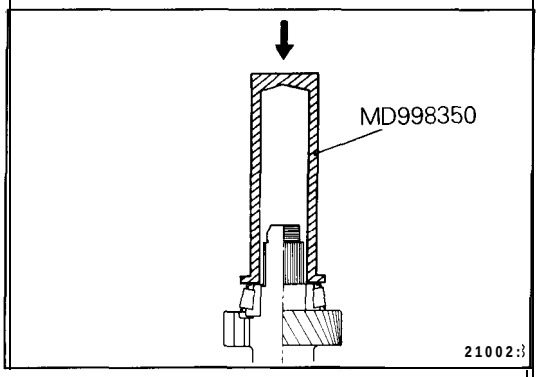
- Check the bevel and clutch gear teeth for damage and wear.
- Check the synchronizer cone for rough surface, damage, and wear.
- Check the gear bore and front and rear ends for damage and wear.

## SERVICE POINTS OF REASSEMBLY

### 14. INSTALLATION OF TAPER ROLLER BEARING

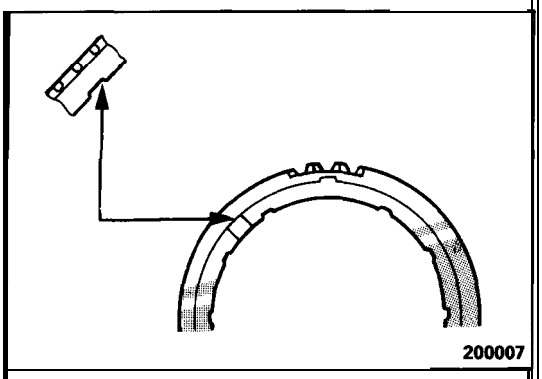
Using the special tool, press-fit the taper roller bearing over the intermediate gear.

**Caution**
**Apply pressure with the special tool only to the inner race when installing the bearing.**



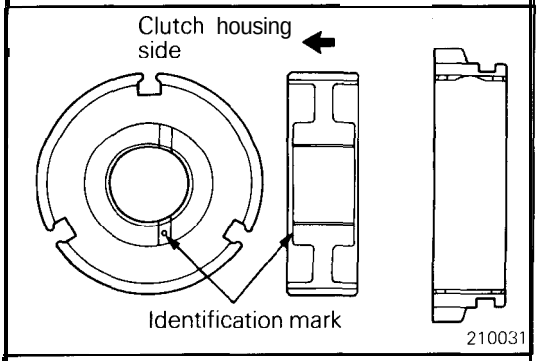

### 11. / 6. INSTALLATION OF SYNCHRONIZER RING

Note the identification mark made on the 1st speed synchronizer ring.




### 10. INSTALLATION OF 1ST-2ND SYNCHRONIZER HUB / 9. SYNCHRONIZER KEY / 8. 1ST-2ND SYNCHRONIZER SLEEVE / 7. SYNCHRONIZER SPRING

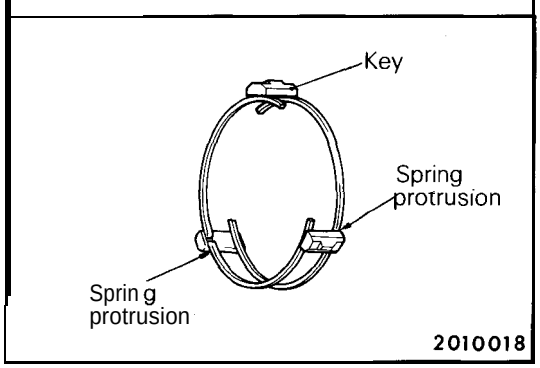
(1) Mate the 1 st-2nd speed synchronizer hub and sleeve as shown.

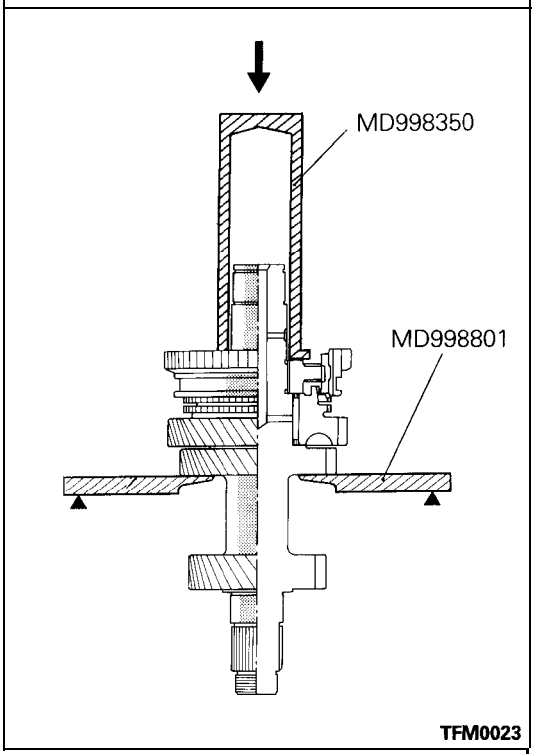



(2) Install the synchronizer spring so that its protrusion fits into the groove in synchronizer key.

**Caution**
**Make sure that the protrusions in the front and rear springs are not in the groove of the same key.**

NOTE
A synchronizer spring different from the one shown in the figure may be used but the explanation is the same.

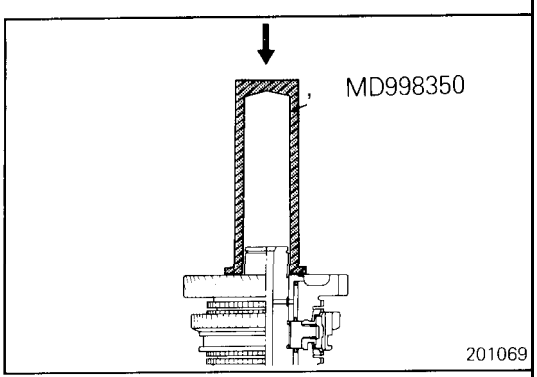





(3) Using the special tool, press-fit the 1st-2nd speed synchronizer assembly over the intermediate gear.

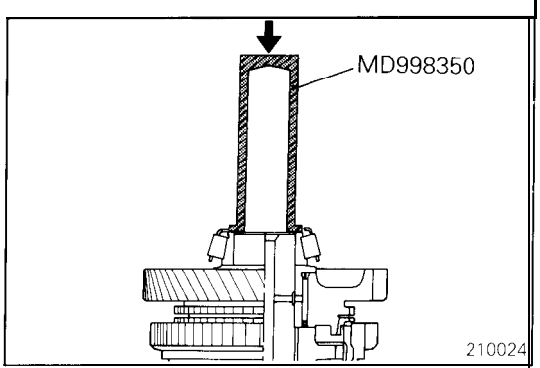
**Caution**

1. **When installing the synchronizer assembly, make sure that the three synchronizer keys are seated correctly in their respective grooves in the synchronizer ring.**
2. **After installing the synchronizer assembly, check to see if the 3rd speed gear rotates smoothly.**




### 3. INSTALLATION OF BEARING SLEEVE

Using the special tool, press-fit the 1st speed gear and bearing sleeve.

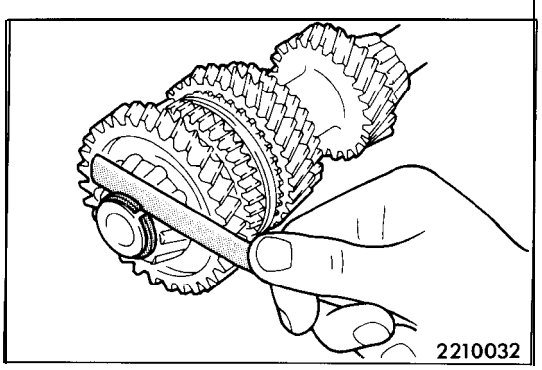



### 2. INSTALLATION OF TAPER ROLLER BEARING

Using the special tool, press-fit the taper roller **bearing.**

**Caution**

**Apply pressure with the special tool only to the inner race when installing the bearing.**




### 1. INSTALLATION OF SNAP RING

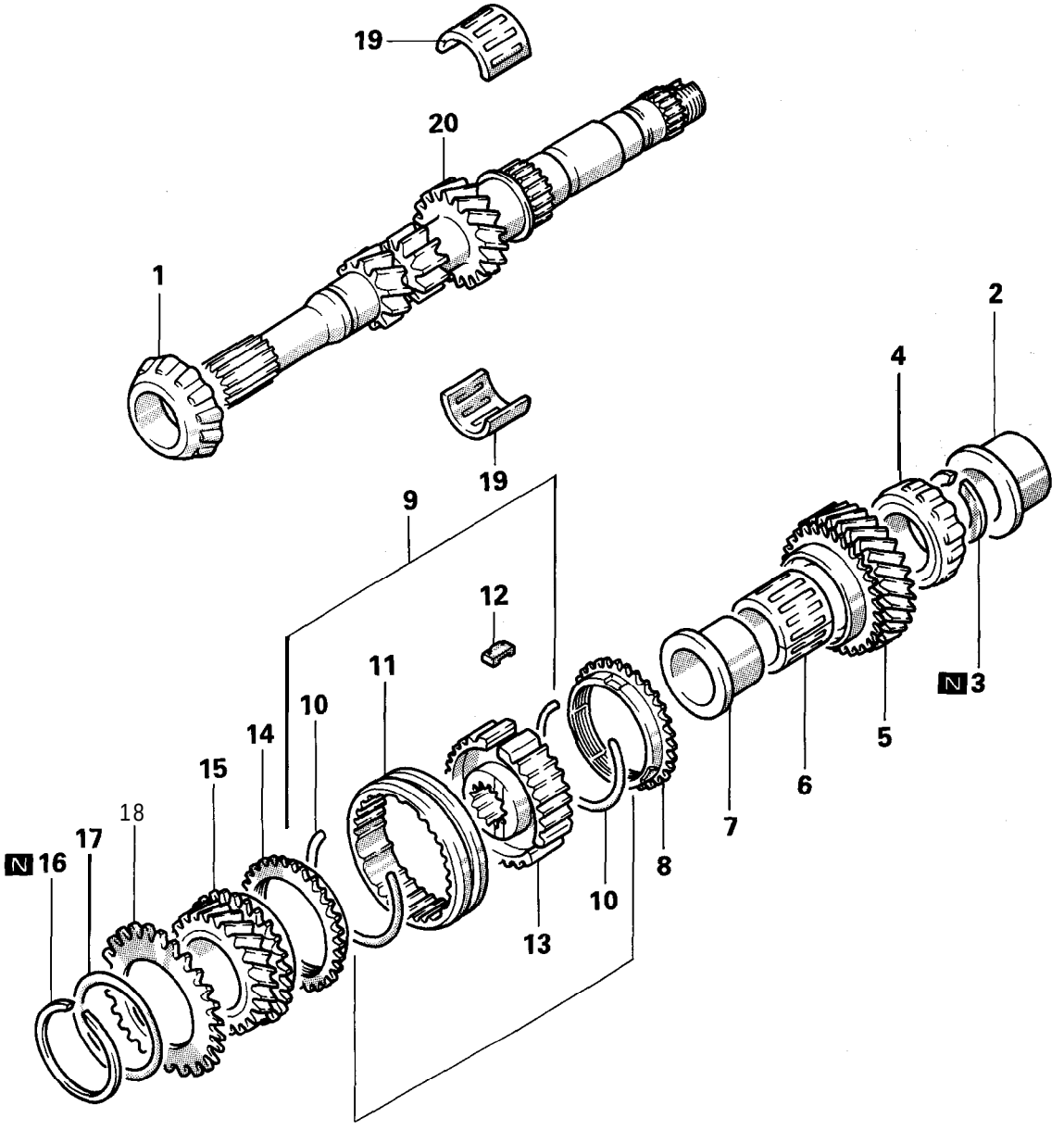
Select and install the snap ring so that the end play of the intermediate shaft is up to specification.

**Standard value: 0.01–0.11 mm (.0004–.0043 in.)**

# INPUT SHAFT ASSEMBLY

N21MIASa

## -- DISASSEMBLY AND REASSEMBLY

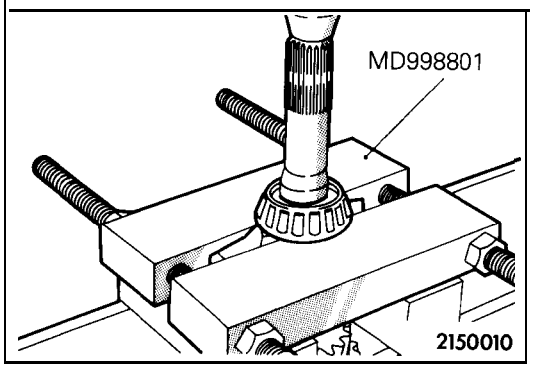



TFM0037

Disassembly steps

- ◆◆◆◆ 1. Taper roller bearing
- ◆◆◆◆ 2. Bearing sleeve
- ◆◆ 3. Snap ring
- ◆◆◆◆ 4. Taper roller bearing
- 5. 4th speed gear
- 6. Needle bearing
- ◆◆ 7. Bearing sleeve
- 8. Synchronizer ring
- ◆◆ 9. 3rd-4th speed synchronizer assembly
- ◆◆ 10. Synchronizer spring
- 11. 3rd-4th speed synchronizer assembly
- 12. Synchronizer key
- 13. 3rd-4th speed synchronizer hub
- 14. Synchronizer ring
- ◆◆ 15. 3rd speed gear
- ◆◆ 16. Snap ring
- ◆◆ 17. Cone spring
- ◆◆ 18. Sub gear
- 19. Needle bearing
- 20. Input shaft

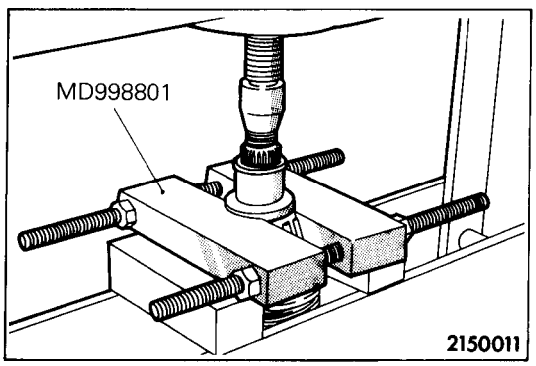
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to “Service Points of Disassembly”.
(3) ◆◆: Refer to “Service Points of Reassembly”.
(4) N: Non-reusable parts.




## SERVICE POINTS OF DISASSEMBLY

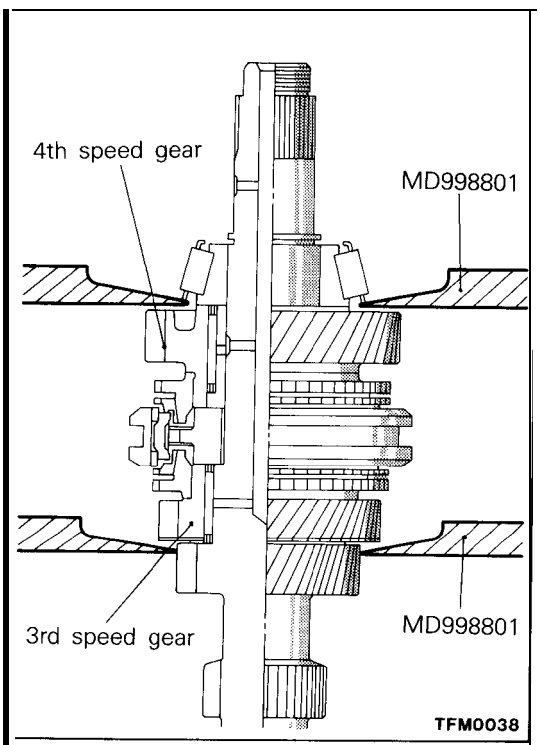
### 1. REMOVAL OF TAPER ROLLER BEARING

Using the special tool, remove the front bearing.




### 2. REMOVAL OF BEARING SLEEVE

Remove the bearing sleeve using the special tool as illustrated.

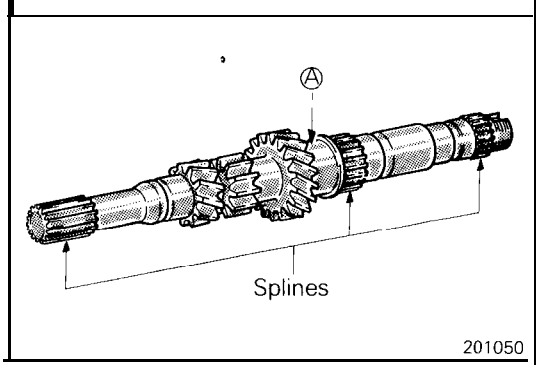



### 4. REMOVAL OF TAPER ROLLER BEARING

Using the special tool, remove the bearing sleeve and rear bearing.

### 15. REMOVAL OF 3RD SPEED GEAR

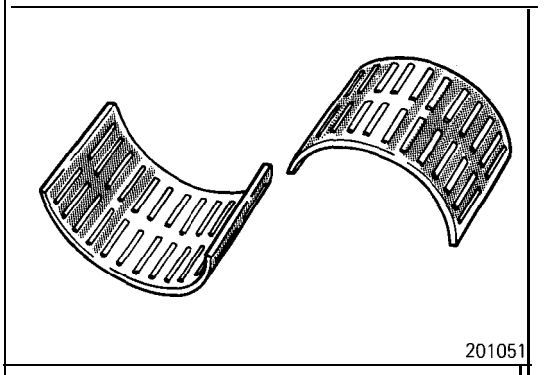
Using the special tool, remove the bearing sleeve, 3rd-4th speed synchronizer assembly, and 3rd speed gear.




## INSPECTION

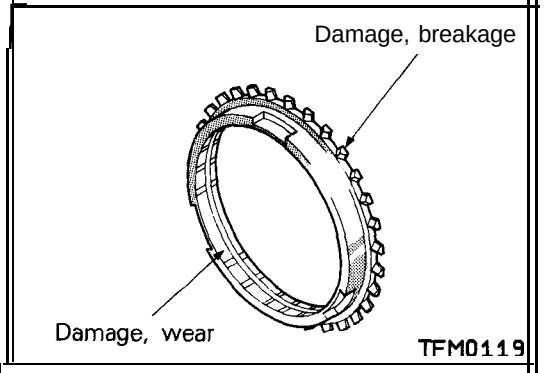
### INPUT SHAFT

- Check the outer surface of the input shaft where the needle bearing is mounted for damage, abnormal wear, and seizure (portion Ⓐ).
- Check the splines for damage and wear.


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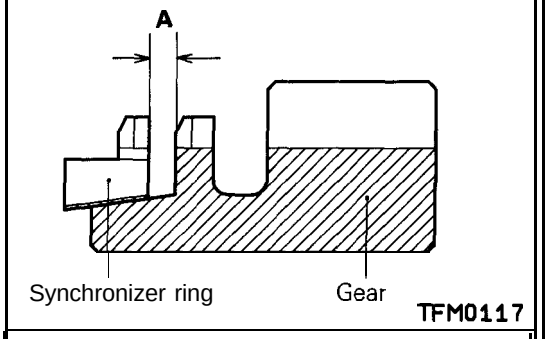
**NEEDLE BEARING**

- Mate the needle bearing with the shaft or bearing sleeve and gear, and check to see if rotation is smooth with no binding, noise, or play.
- Check the needle bearing cage for possible deformation.



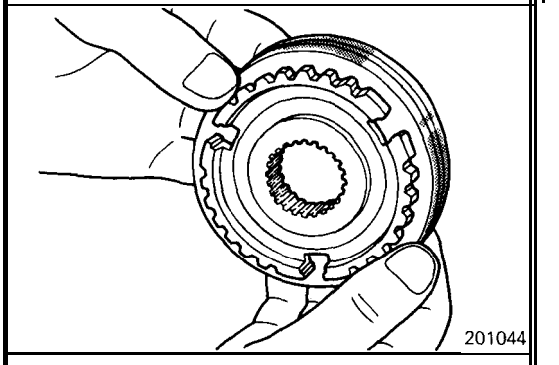

**SYNCHRONIZER RING**

- Check the clutch gear teeth for damage and breakage.
- Check the cone inside paper lining for damage, wear or peeling.




- Force the synchronizer ring toward the clutch gear and check clearance “A”. Replace if the clearance is below the limit.

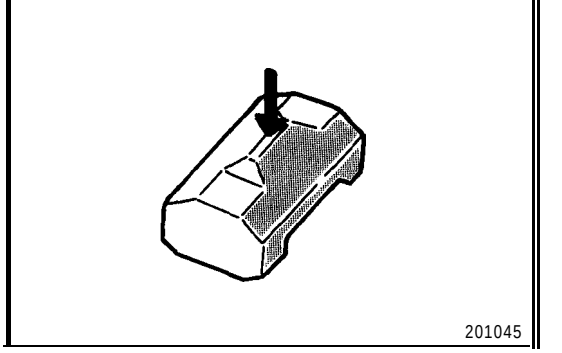
  **Limit: 0.5 mm (.020 in.)**


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**SYNCHRONIZER SLEEVE AND HUB**

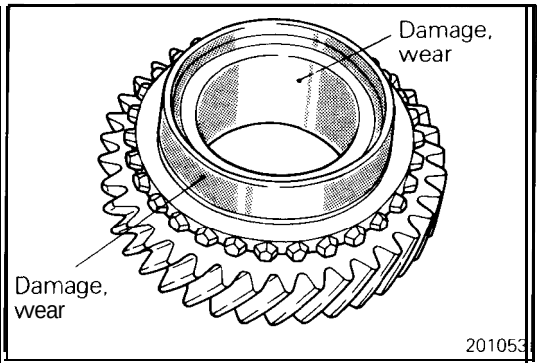
- Mate the synchronizer sleeve with the hub and check to see if they slide smoothly.
- Check to see if the sleeve is free from damage at its inside front and rear ends.
- Check the hub front and rear end faces (in contact with each speed gear) for wear.

  **Caution**
  **When replacement is necessary, replace the synchronizer hub and sleeve as a set.**


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**SYNCHRONIZER KEY AND SPRING**

- Check the synchronizer key center protrusion for wear.
- Check the spring for proper tension, possible deformation and breakage.

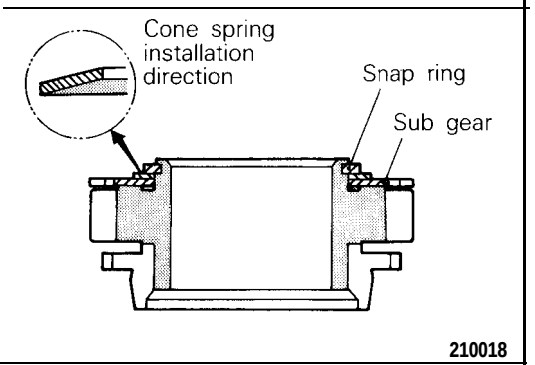



**SPEED GEARS**

- Check the bevel and clutch gear teeth for damage and wear.
- Check the synchronizer cone for rough surfaces, damage, and wear.
- Check the gear bore and front and rear ends for damage and wear.

## SERVICE **POINTS** OF REASSEMBLY

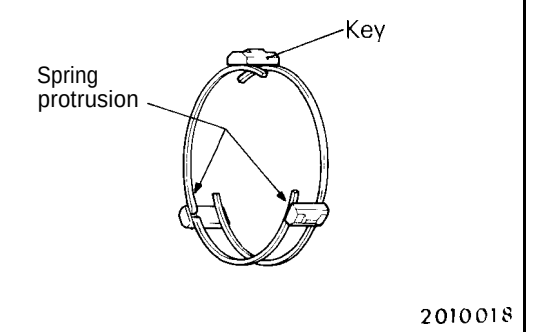
### 18. INSTALLATION OF SUB GEAR/17. CONE SPRING/16. SNAP RING




Install the sub gear and cone spring to 3rd speed gear, and then install the snap ring.

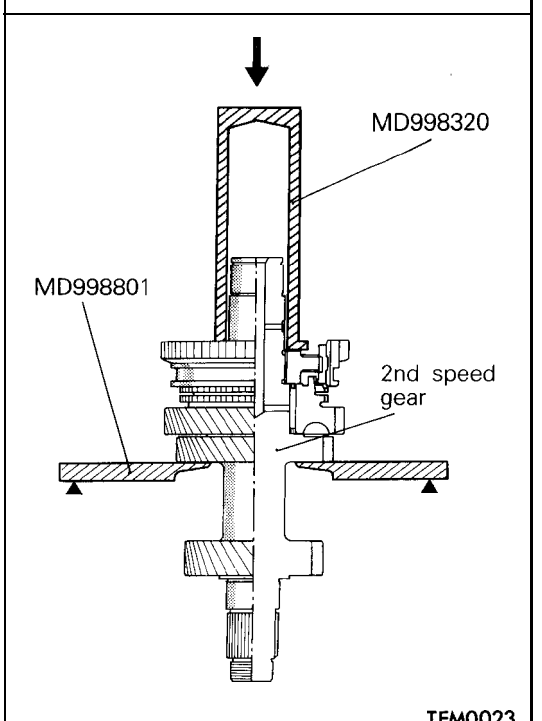
NOTE
Be sure that the cone spring is installed so that it is facing in the correct direction.

### 10. INSTALLATION OF SYNCHRONIZER SPRINGS




(1) Install the synchronizer spring so that its protrusion fits into the groove in synchronizer key. Make sure that the protrusions in the front and rear springs are not in the groove of the same key.

### 9. INSTALLATION OF 3RD-4TH SPEED SYNCHRONIZER ASSEMBLY

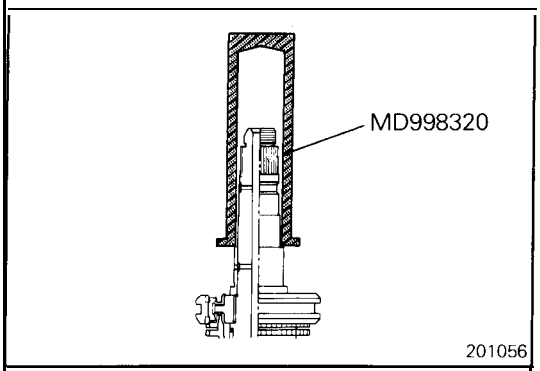



(1) Install the synchronizer assembly so that the part that has the small round indentation is in the oil groove at the hub end.

NOTE
If the installation is in the opposite way, press-in might not be possible. This is because the edge of the hub inner diameter spline at the part that has the small round indentation is made to facilitate pressing in.

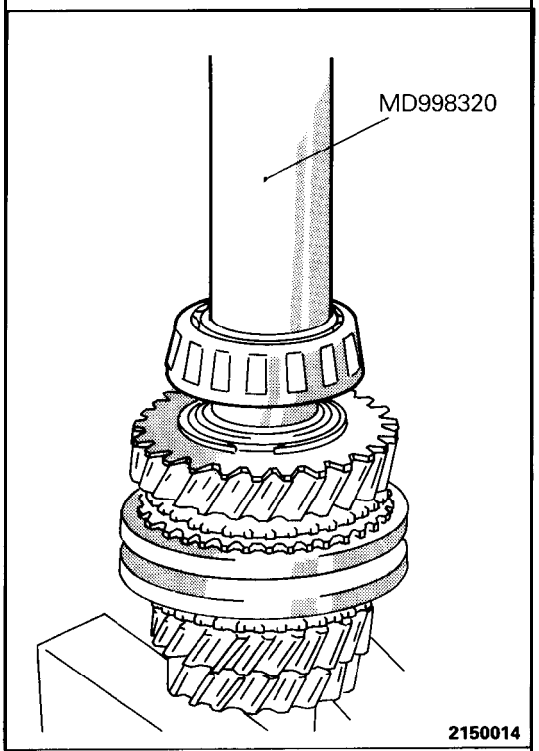
(2) Using the special tools, press-fit the 3rd-4th speed synchronizer assembly over the input shaft.

**Caution**
**1. When installing the synchronizer assembly, make sure that the three synchronizer keys are seated correctly in their respective grooves in the synchronizer ring.**
**2. After installing the synchronizer assembly, check to see if the 3rd speed gear rotates smoothly.**




**7. INSTALLATION OF BEARING SLEEVE**

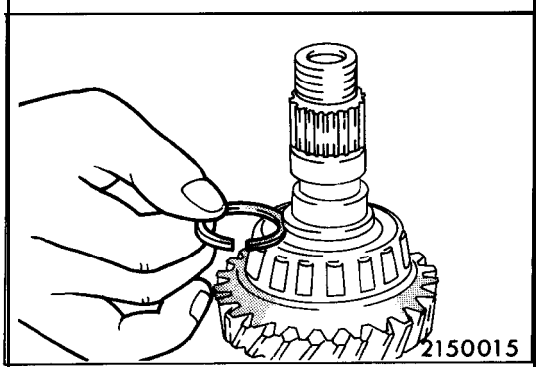
Using the special tool, press-fit the bearing sleeve.




**4. INSTALLATION OF TAPER ROLLER BEARING**

Using the special tools, press-fit the bearing over the input shaft.

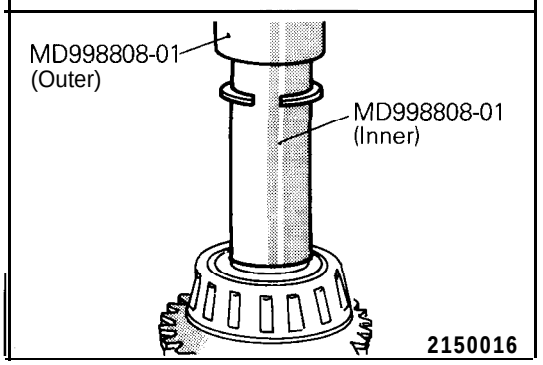
**Caution**
**Apply the special tool to the inner race only when installing the bearing.**




**3. INSTALLATION OF SNAP RING**

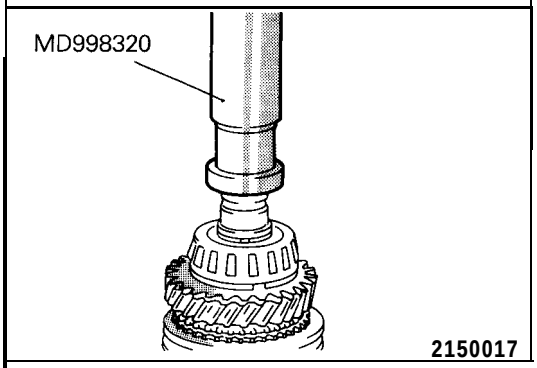
(1) Select the thickest snap ring that fits in the snap ring groove.

**Standard value: 0.01–0.09 mm (.0004–.004 in.)**




(2) Using the special tool, fit the snap ring to the input shaft.

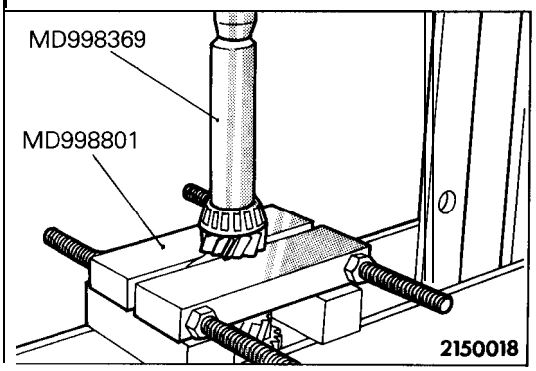
NOTE
(1) Do not reuse the snap ring.
(2) The use of snap ring plier can cause the snap ring to expand too much, making correct installation of the sleeve difficult.




**2. INSTALLATION OF BEARING SLEEVE**

Using the special tool, install the bearing sleeve over the input shaft.

**Caution**
**When the sleeve has been press-fitted over the input shaft, make sure that the sleeve flange is in tight contact with the bearing.**



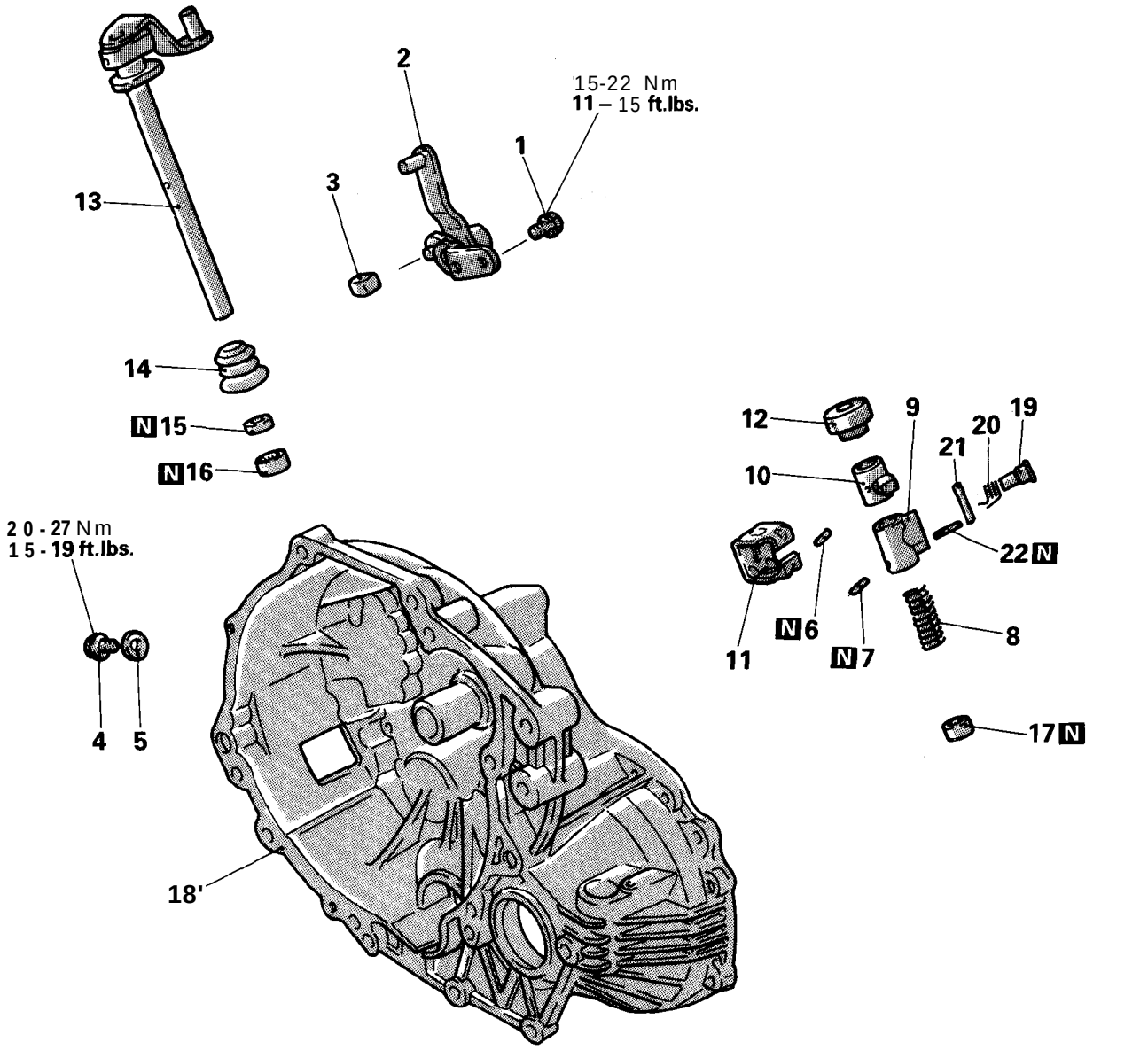

**1. INSTALLATION OF TAPER ROLLER BEARING**

Using the special tool, press-fit the ball bearing over the input shaft.

# CLUTCH HOUSING ASSEMBLY

N21MPAH

-- DISASSEMBLY AND REASSEMBLY

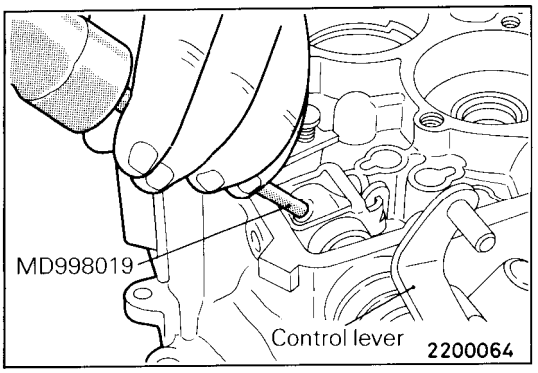



2210128

Disassembly steps

1. Bolt
2. Select lever assembly
3. Select lever shoe
4. Interlock plate bolt
5. Gasket
◆◆ ◆◆ 6. Lock pin
● *● * 7. Spring pin
8. Neutral return spring
9. Stopper body
10. Control finger
11. Interlock plate
12. Neutral return spring assembly
13. Control shaft
14. Control shaft boot
● * 15. Oil seal
◆◆ ● * 16. Needle bearing
◆◆ ● + 17. Needle bearing
18. Clutch housing
19. Pin
20. Return spring
21. Stopper plate
22. Spring pin

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● +: Refer to “Service Points of Disassembly”.
(3) ● C: Refer to “Service Points of Reassembly”.
(4) N: Non-reusable parts.

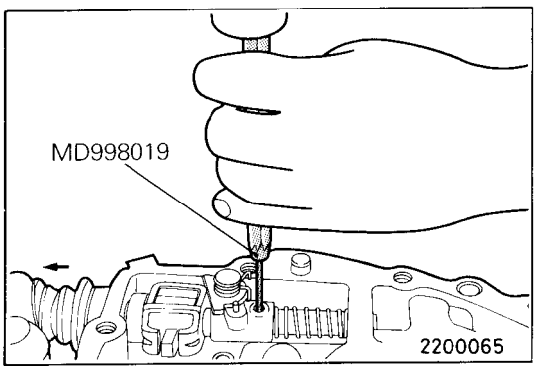



## SERVICE POINTS OF DISASSEMBLY

### 6. REMOVAL OF LOCK PIN

Drive out the lock pin from the control finger using the special tool or a pin punch.

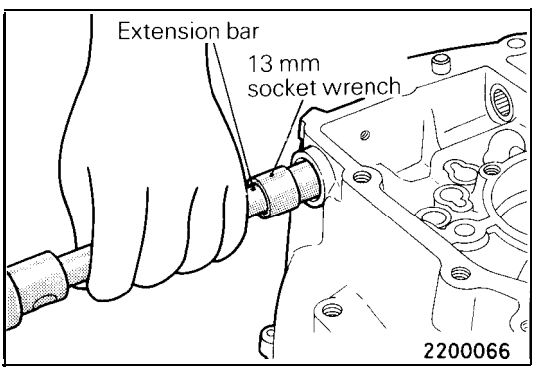
**Caution**
**When removing the lock pin, turn the control lever to a position so that the lock pin will not contact the clutch housing.**




### 7. REMOVAL OF SPRING PIN

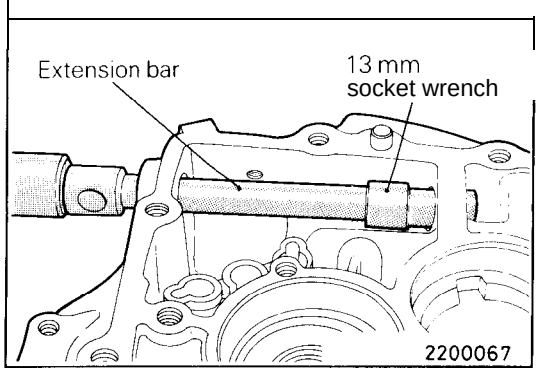
Using the special tool or a pin punch, drive out the spring pin from the stopper body.

**Caution**
**When removing the spring pin, pull the control shaft in the direction shown so that the spring pin will not contact the clutch housing.**




### 16. / 17. REMOVAL OF NEEDLE BEARING

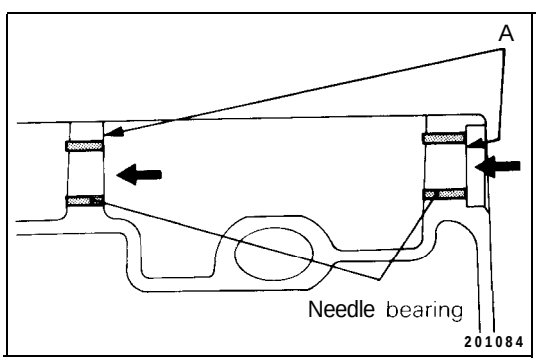
Drive out the needle bearing using a socket wrench.

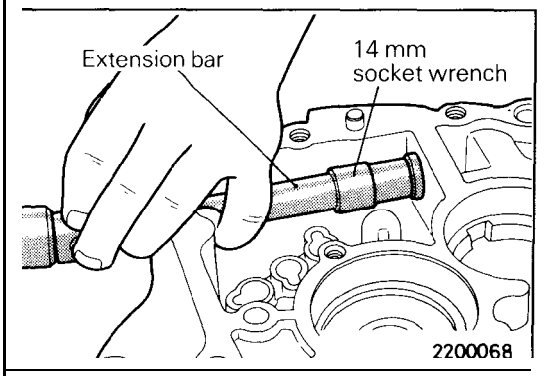


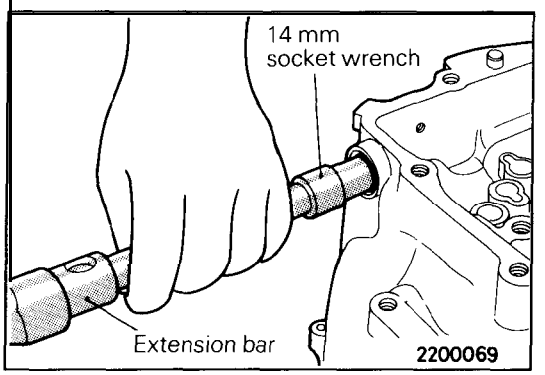

## SERVICE POINTS OF REASSEMBLY

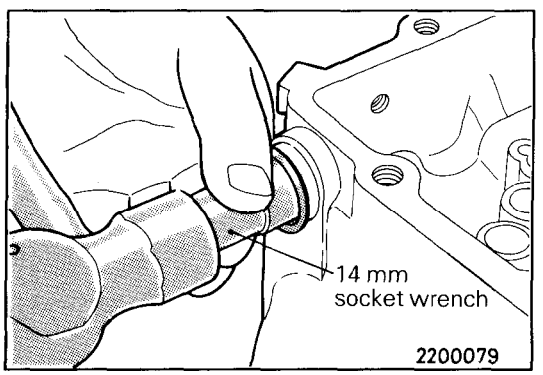
### 17. / 16. INSTALLATION OF NEEDLE BEARINGS

(1) Using a socket wrench, press-fit the needle bearing flush with surface A in the clutch housing.
(2) Make sure that the side of the bearing with a stamped type number faces surface A.



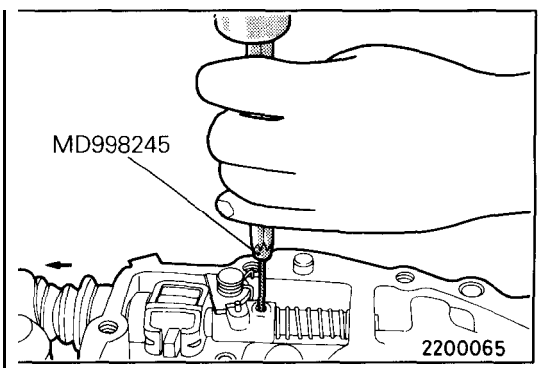


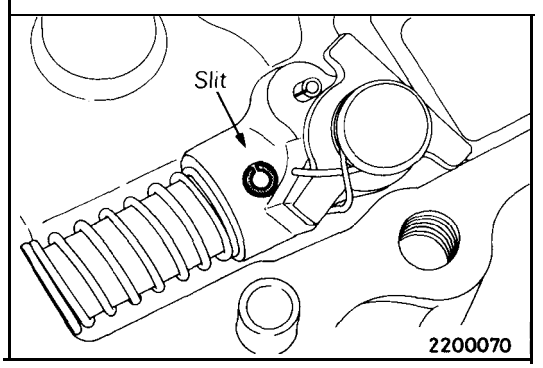




**15. INSTALLATION OF OIL SEAL**

Using a socket wrench, install the control shaft oil seal.




**7. INSTALLATION OF SPRING PIN / 6. LOCK PIN**

Using the special tool, drive a new spring pin and lock pin into position.

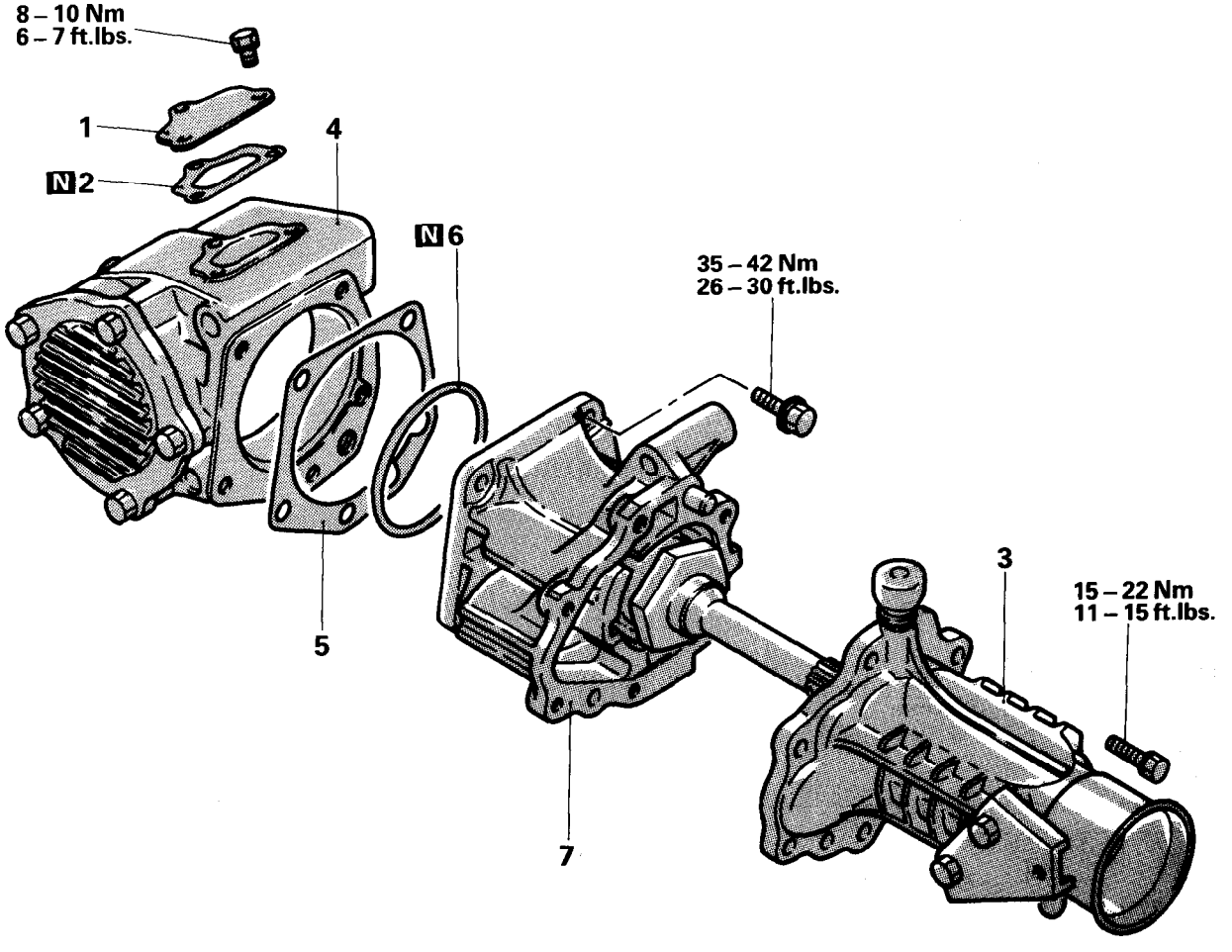
**Caution**

1. Do not reuse the spring pin or lock pin.
2. **Install the spring pin so that its slit will be at right angles to the control shaft centerline.**

# TRANSFER ASSEMBLY

N21MRAI

## DISASSEMBLY AND REASSEMBLY

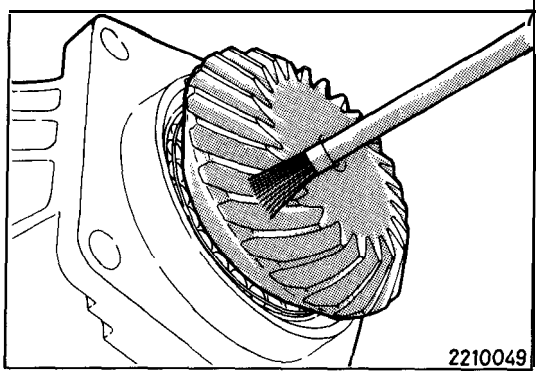



2210130

Disassembly steps

1. Cover
2. Cover gasket
- * 3. Extension housing assembly
- * 4. Transfer case sub assembly
- * 5. Spacer
6. O-ring
- * 7. Transfer case adapter sub assembly

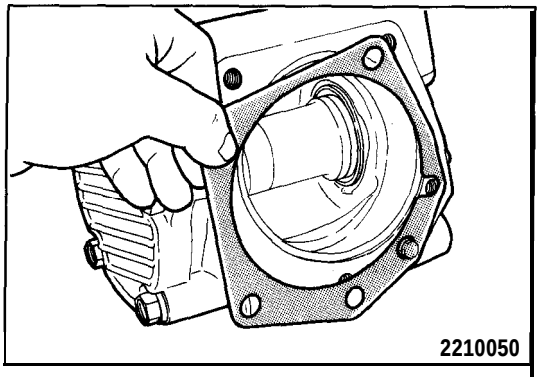
NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ● +: Refer to "Service Points of Reassembly".
(3) N: Non-reusable parts.




## SERVICE POINTS OF REASSEMBLY

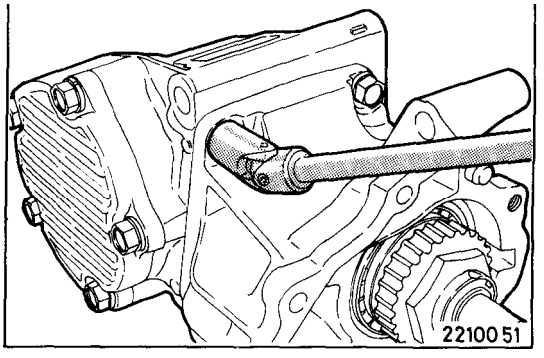
### 7. INSTALLATION OF TRANSFER CASE ADAPTER SUB-ASSEMBLY

Using a brush, apply a thin even coat of machine blue or minium to both tooth surfaces of the driven bevel gear.



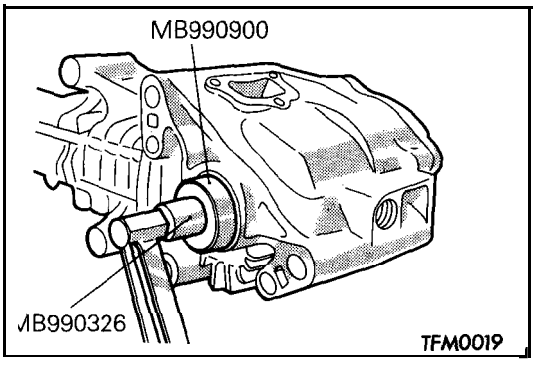

### 5. INSTALLATION OF SPACER

Install the spacer which has been used so far.



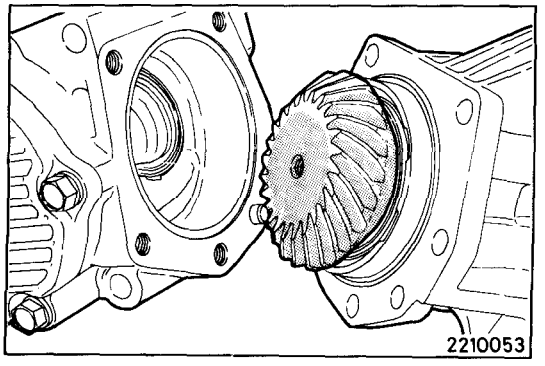

### 4. INSTALLATION OF TRANSFER CASE SUBASSEMBLY

(1) Tighten the transfer case adapter subassembly on the transfer case subassembly to the specified torque.



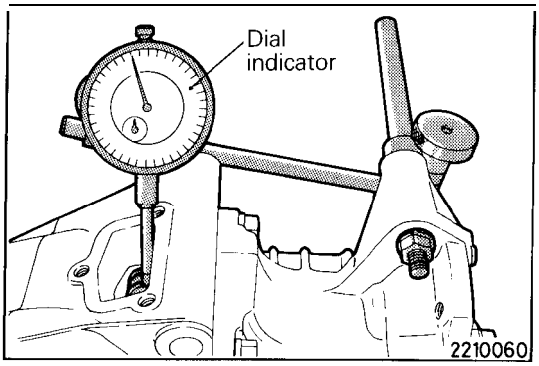

(2) Using the special tool, turn the drive bevel gear shaft one turn each in the direction of normal and reverse rotation.

**Caution**
Do not rotate the drive bevel gear shaft more than **one turn as it cause a blurred tooth contact pattern.**



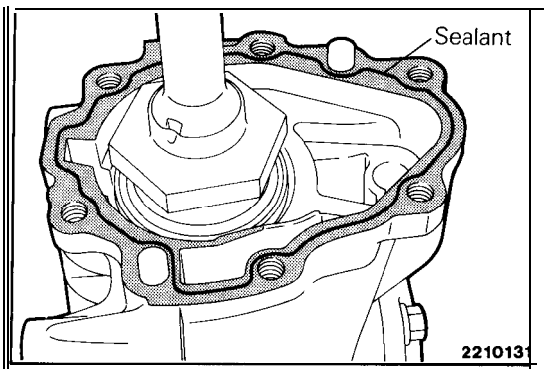

(3) Make sure that the contact pattern of the driven bevel gear teeth is correct.

NOTE
See Tooth Contact Adjustment Procedure on next page for the standard tooth contact pattern.




(4) Check to see if the backlash between the drive and driven bevel gears is up to specification.

**Standard value**
**Bevel gear set backlash:**
**0.08–0.13 mm (.0031–.005 in.)**

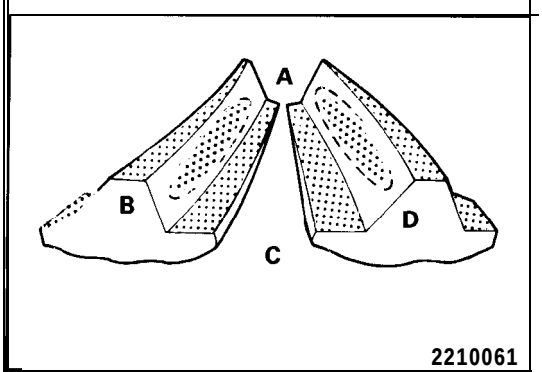



### 3. INSTALLATION OF EXTENSION HOUSING

Apply sealant to the flange surface of the adapter and install the housing.

**Specified sealant: Mitsubishi genuine Part No. 997740 or equivalent**

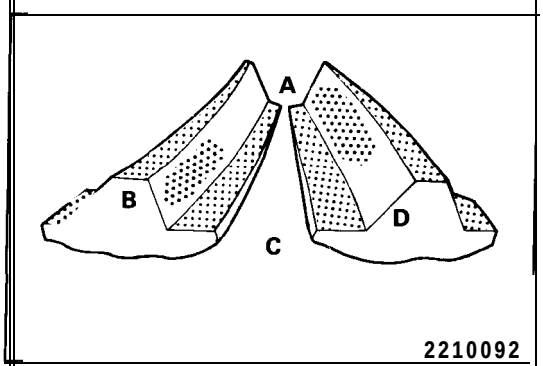
**Caution**
**Squeeze out the sealant from the tube uniformly without excess or discontinuities.**




### TOOTH CONTACT ADJUSTMENT PROCEDURE

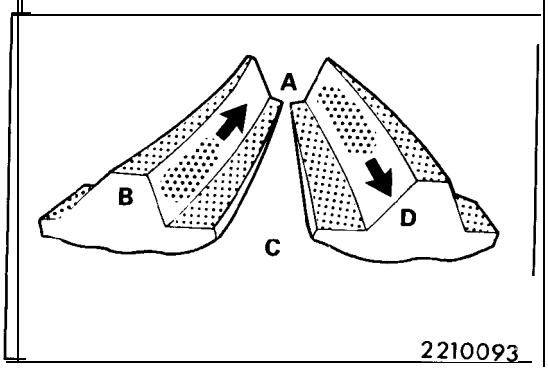
**1. Standard tooth contact pattern**

A: Small end
B: Drive side tooth surface
(The side receiving force in forward motion)
C: Big end
D: Coast side tooth surface
(The side receiving force in reverse motion)

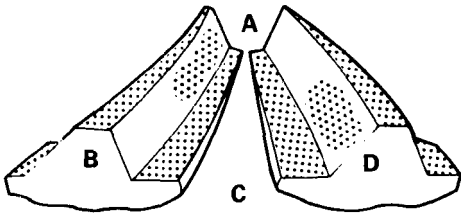



**2. Tooth contact pattern when driven bevel gear is too high**

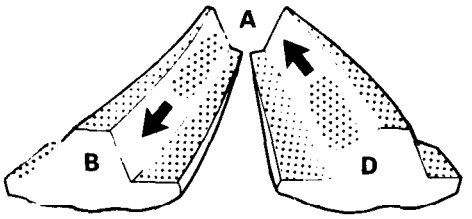
Possible cause:
The driven bevel gear is too close to the drive bevel gear.




Remedy:
Use a thicker spacer for the driven bevel gear mount adjustment so that the driven bevel gear is further away from the drive bevel gear.




2210094

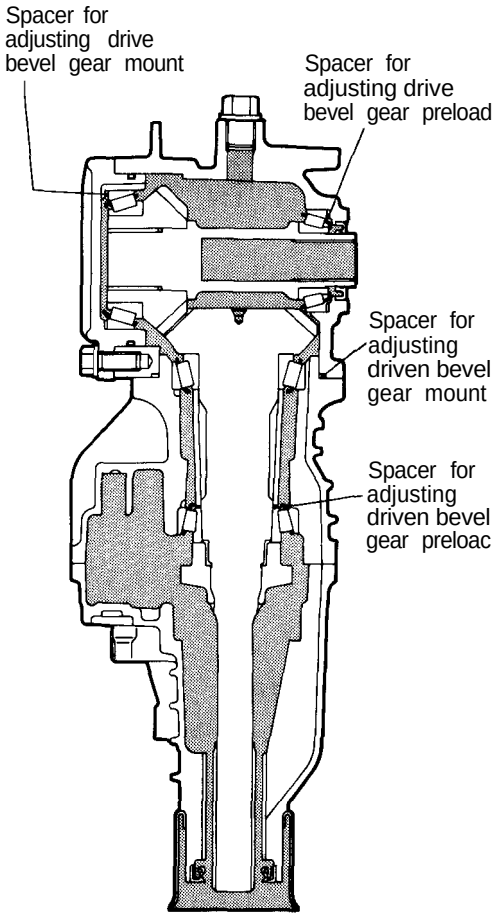



2210095

**3. Tooth contact pattern when driven bevel gear is too low**

Possible cause:
The driven bevel gear is further away from the drive bevel gear than necessary.

Remedy:
Use a thinner spacer for the driven bevel gear mount adjustment so that the driven bevel gear is closer to the drive bevel gear.




2210129

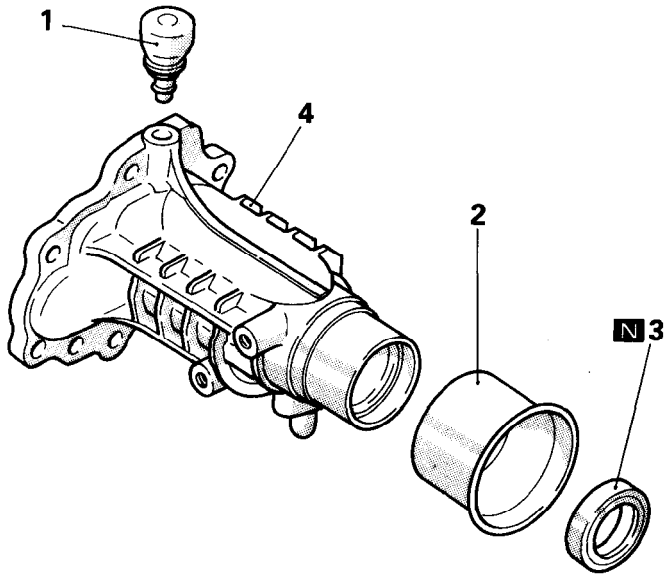
NOTE
(1) If correct tooth contact cannot be obtained by replacement of spacer for adjusting driven bevel gear mount, change the spacers for adjustment of drive bevel gear preload and drive bevel gear mount adjustment to those of appropriate thickness as described below and adjust the tooth contact again.
- If the driven bevel gear height is still too small when the thinnest spacer for driven bevel gear mount adjustment [0.13 mm (.005 in.)] is used;
  Change the spacer for drive bevel gear mount adjustment to the next thicker one and change the spacer for drive bevel gear preload adjustment to the next thinner one.
- If the driven bevel gear height is still too large when the thickest spacer for driven bevel gear mount adjustment [0.52 mm (.020 in.)] is used;
  Change the spacer for drive bevel gear mount adjustment to the next thinner one and change the spacer for drive bevel gear preload adjustment to the next thicker one.
  Repeat above steps until standard tooth contact pattern is obtained.

(2) If the tooth contact pattern cannot be brought close to the standard pattern by the adjustment described above, replace the drive bevel gear and driven bevel gear as a set and adjust the tooth contact again.

# EXTENSION HOUSING ASSEMBLY

N21MTAA

## DISASSEMBLY AND REASSEMBLY

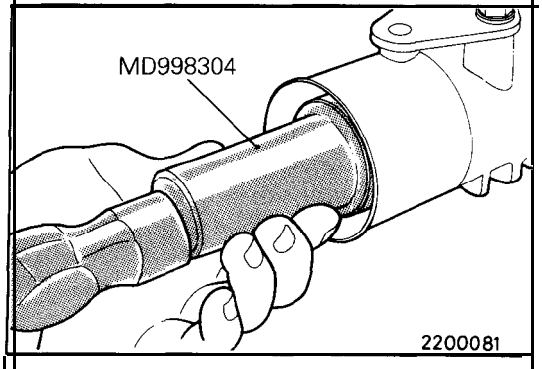


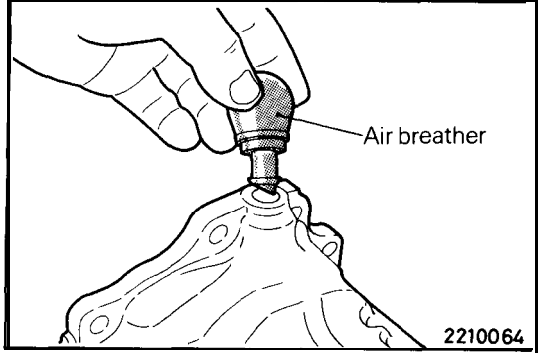

TFM0039

Disassembly steps

- ◆◆ 1. Air breather
- 2. Dust seal guard
- ◆◆ 3. Oil seal
- 4. Extension housing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● *: Refer to "Service Points of Reassembly".
(3) ❑ : Non-reusable parts.




## SERVICE POINTS OF REASSEMBLY

### 3. INSTALLATION OF OIL SEAL

Using the special tool, install the oil seal.

### 1. INSTALLATION OF AIR BREATHER

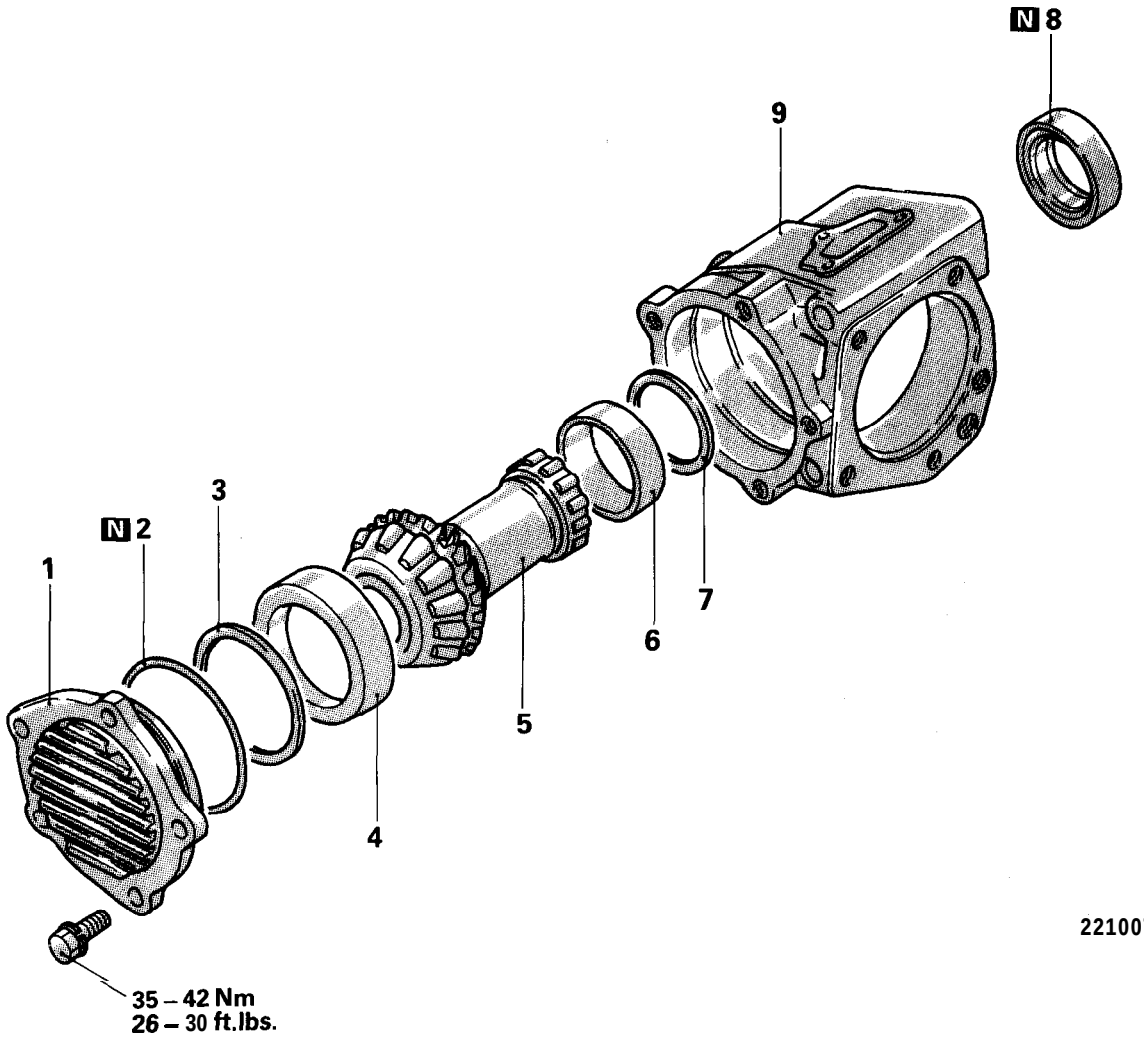
Apply sealant to the air breather port and fit the air breather in position.

**Specified sealant: MOPAR Part No.4318025 or equivalent**

# TRANSFER CASE SUB ASSEMBLY

N21MUAA

## DISASSEMBLY AND REASSEMBLY

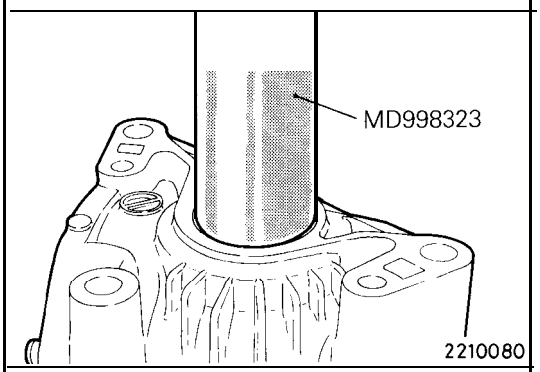



2210079

Disassembly steps

1. Transfer cover
2. O-ring
- a 3. Spacer
4. Outer race
5. Drive bevel gear assembly
6. Outer race
- ➡◀ 7. Spacer
- • * 8. Oil seal
9. Transfer case

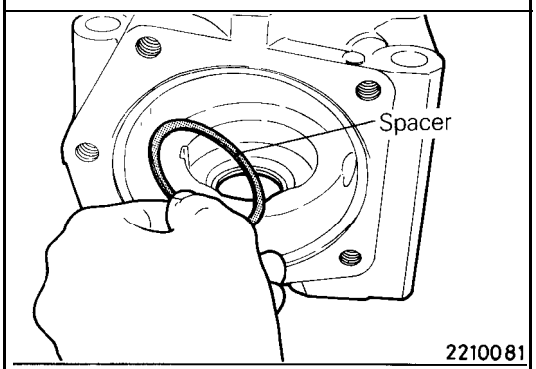
NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ➡◀: Refer to “Service Points of Reassembly”.
(3) ❑ : Non-reusable parts.




## SERVICE POINTS OF REASSEMBLY

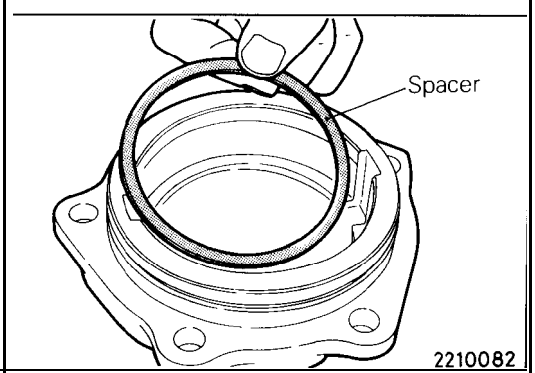
**8. INSTALLATION OF OIL SEAL**

Using the special tool, install the oil seal.



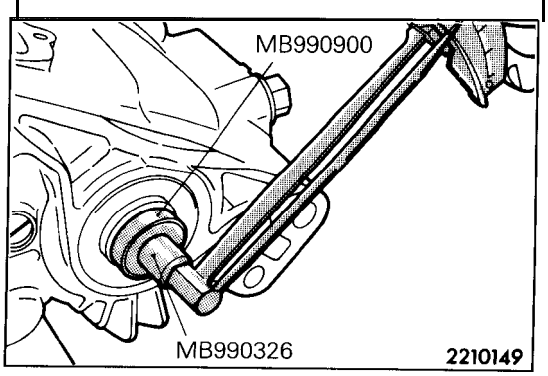

**7. INSTALLATION OF SPACER**

Install the spacer which has been used so far




**3. INSTALLATION OF SPACER**

Install the spacer which has been used so far




## INSPECTION

**DRIVE BEVEL GEAR ASSEMBLY**

Using the special tools, check to see if the turning drive torque of the drive bevel gear is up to specification.

**Standard value: 1.7 – 2.5 Nm (1.23 – 1.81 ft.lbs.)**

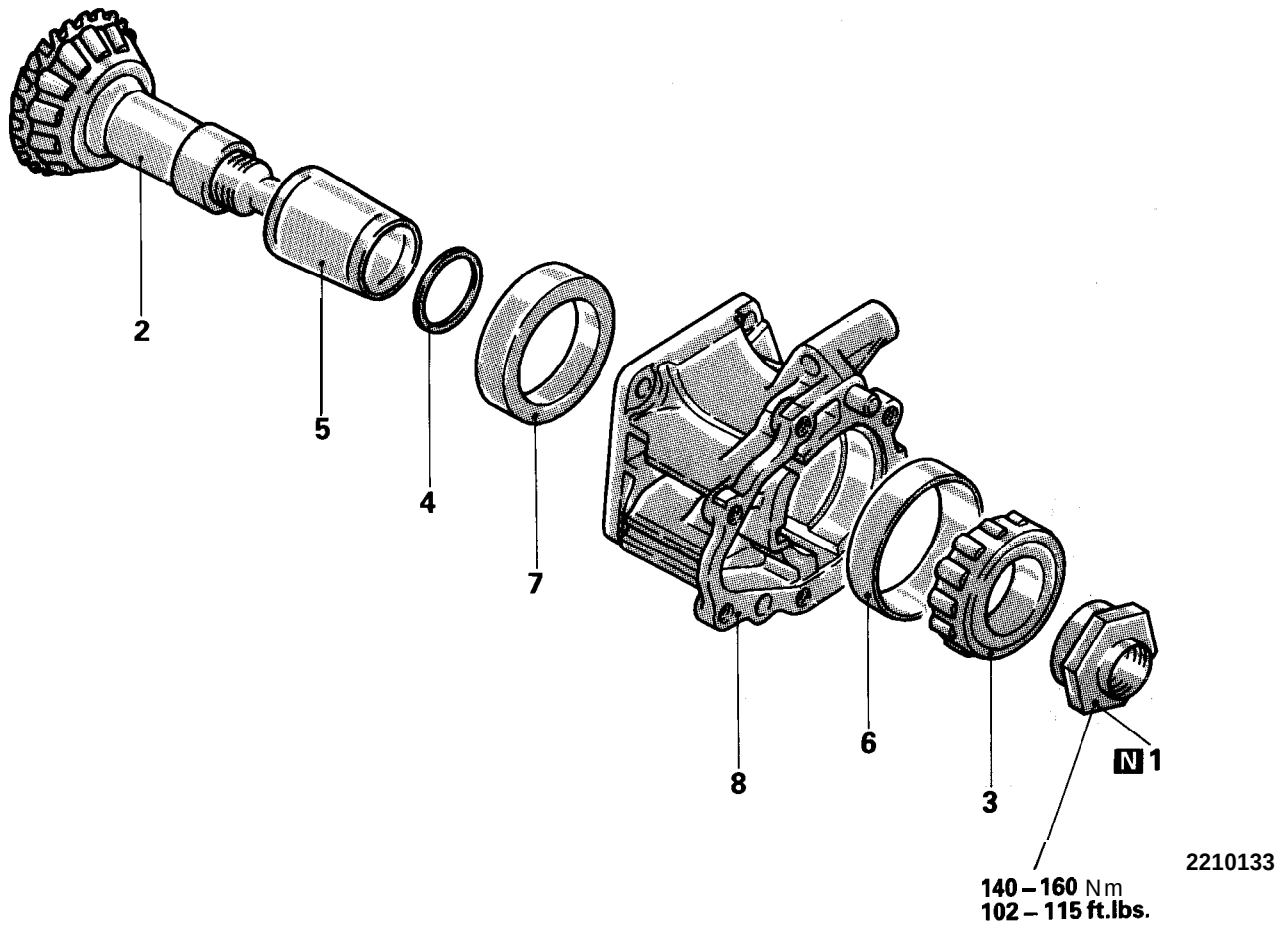
**Caution**

1. **If the turning drive torque is out of specification, adjust by using adjusting spacers.**
2. **Select spacers of nearly same thickness on both sides.**

# TRANSFER CASE ADAPTER SUB ASSEMBLY

N21MVAB

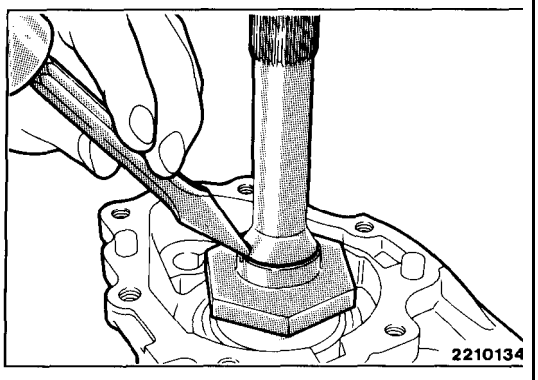
## DISASSEMBLY AND REASSEMBLY




Disassembly steps

- ◆◆ ● a 1. Locknut
- ◆◆ 2. Driven bevel gear assembly
- ◗ * 3. Taper roller bearing
- ● * 4. Spacer
- 5. Collar
- ◗ ☒ 6. Outer race
- ◗ ☒ 7. Outer race
- 8. Transfer case adapter

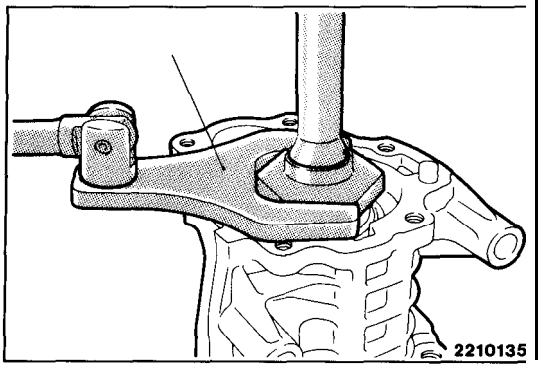
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to “Service Points of Disassembly”.
(3) ◆◆: Refer to “Service Points of Reassembly”.
(4) ❑ : Non-reusable parts.



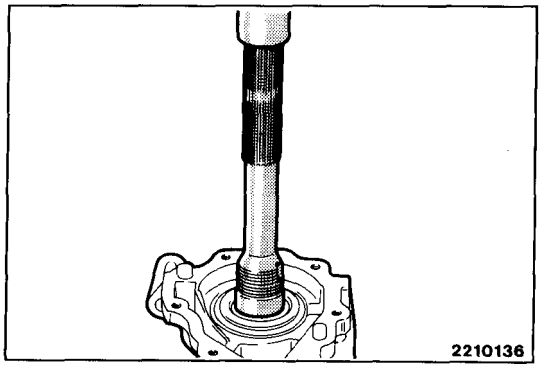

## SERVICE POINTS OF DISASSEMBLY

**1. REMOVAL OF LOCK NUT**

(1) Unstake the lock nut.

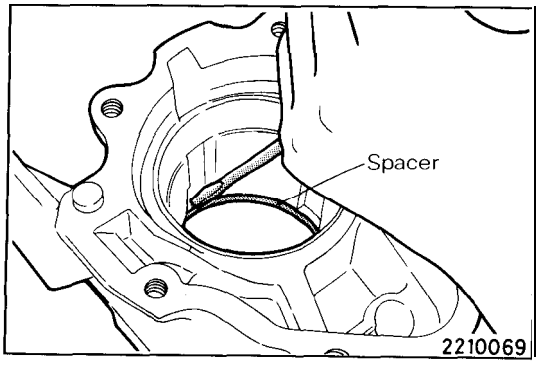



**(2)** Remove the driven bevel gear's lock nut by using the special tool.



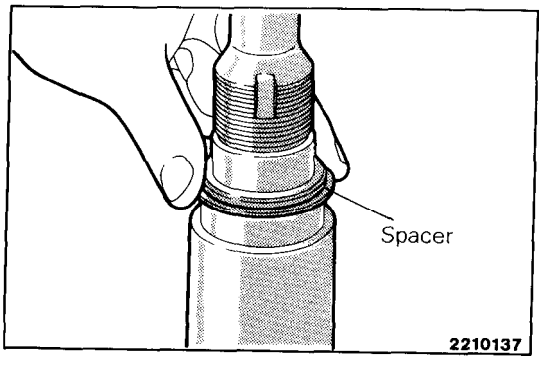

**2. REMOVAL OF DRIVEN BEVEL GEAR ASSEMBLY**

Using a press, remove the driven bevel gear assembly.




**6./7. REMOVAL OF OUTER RACE**

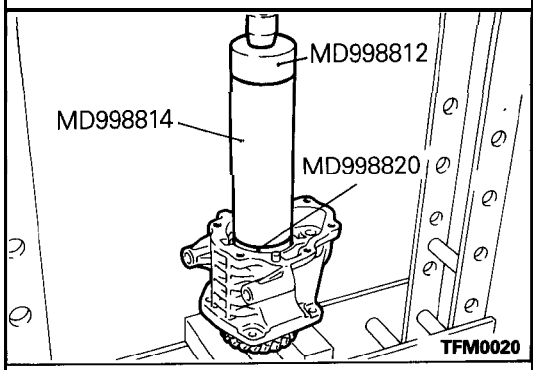
Apply a screwdriver to the outer race and tap it to remove the outer race.




## SERVICE POINTS OF REASSEMBLY

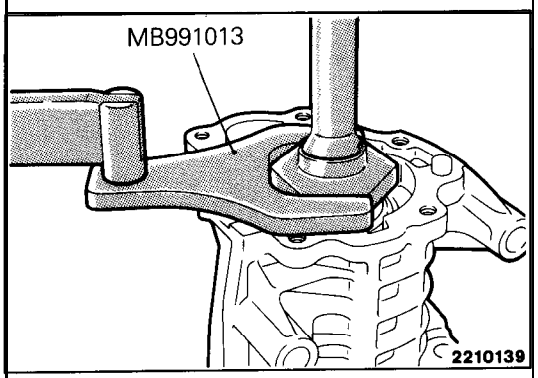
**4. INSTALLATION OF SPACER**

Install the spacer which has been used so far.



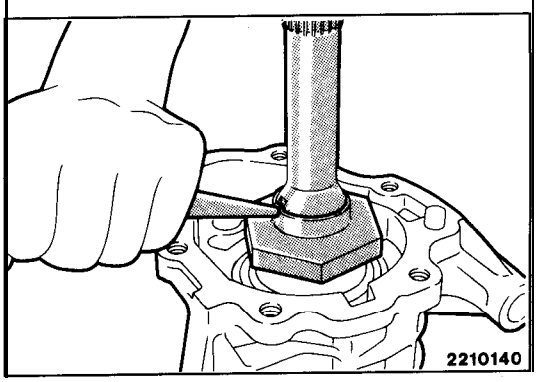

**3. INSTALLATION OF TAPER ROLLER BEARING**

Using the special tool, install the taper roller bearing.

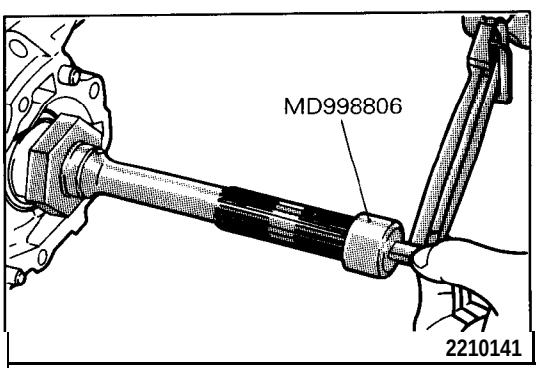



**1. INSTALLATION OF LOCK NUT**

(1) Tighten the driven bevel gear's lock nut at the specified torque by using the special tool.




(2) Stake the lock nut at two places for locking




## INSPECTION

**DRIVEN BEVEL GEAR ASSEMBLY**

Using the special tool, check to see if the turning drive torque of the driven bevel gear is up to specification.

**Standard value: 1.0 – 1.7 Nm (0.72 – 1.23 ft.lbs.)**

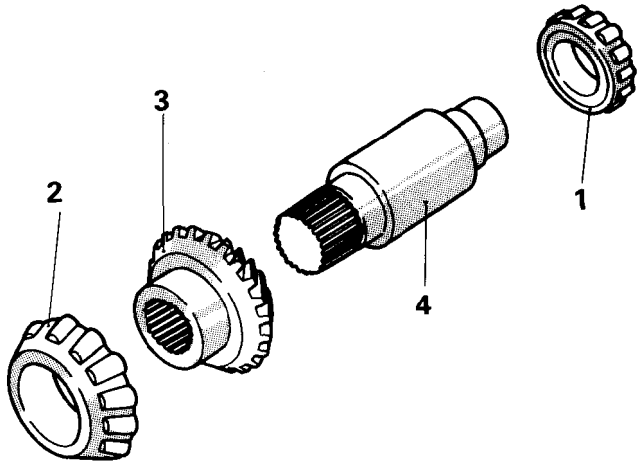
**Caution**

**If the turning drive torque is out of specification, adjust with the adjusting spacer.**

# DRIVE BEVEL GEAR ASSEMBLY

N21MWAA

## DISASSEMBLY AND REASSEMBLY

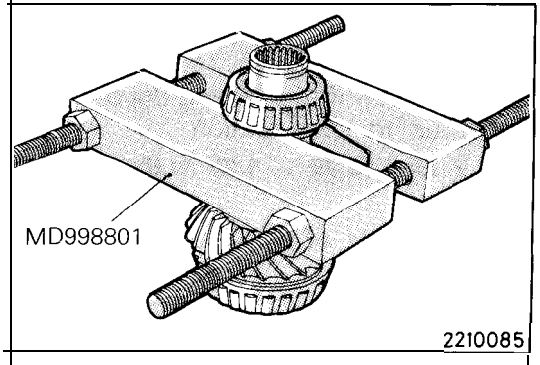


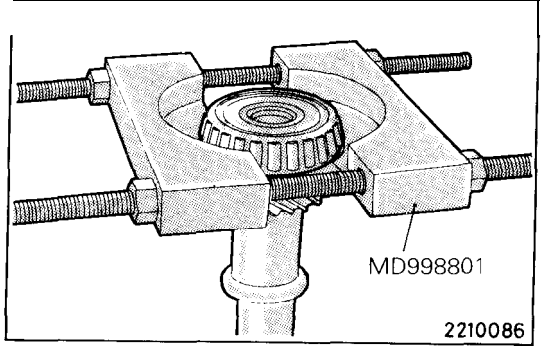

TFM0053

Disassembly steps

◆◆ ▶◀ 1. Taper roller bearing
◆◆ ● 4 2. Taper roller bearing
● ☒ 3. Drive bevel gear
4. Drive bevel gear shaft

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ▶◀: Refer to "Service Points of Reassembly".

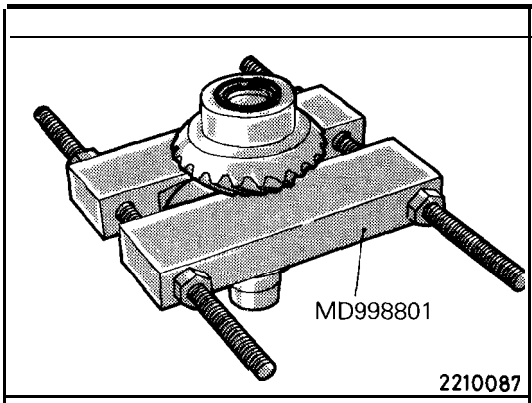



## SERVICE POINTS OF DISASSEMBLY

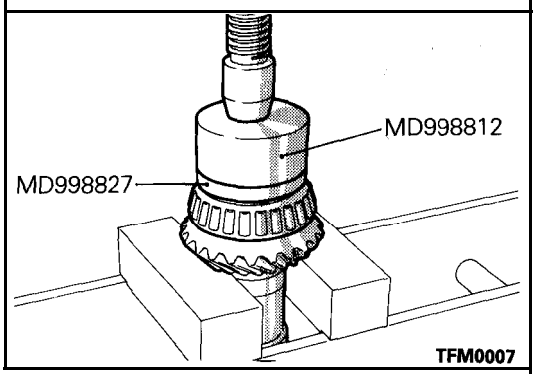
### 1./2. REMOVAL OF TAPER ROLLER BEARING

Using the special tool, remove the taper roller bearing.




**3. REMOVAL OF DRIVE BEVEL GEAR**

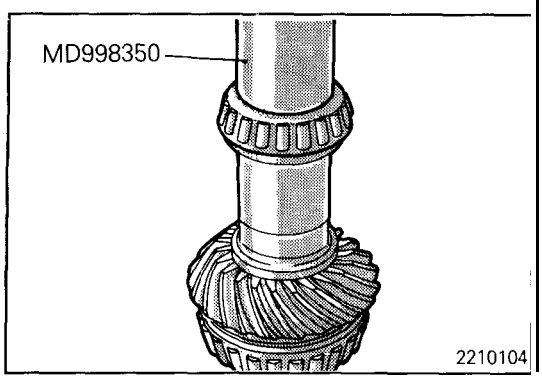
Using the special tool, remove the drive bevel gear.




## SERVICE POINTS OF REASSEMBLY

**2./1. INSTALLATION OF TAPER ROLLER BEARING**

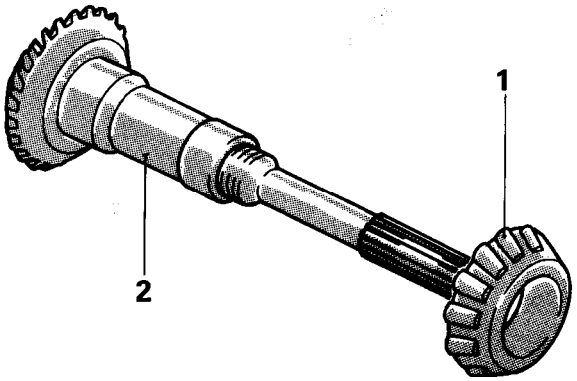
Using the special tool, install the taper roller bearing.



# DRIVEN BEVEL GEAR ASSEMBLY

N21MXAA

## DISASSEMBLY AND REASSEMBLY

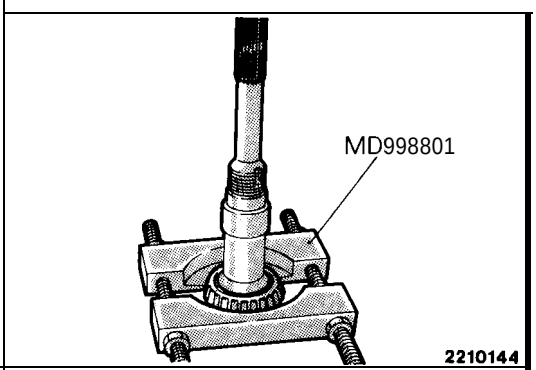



2210143

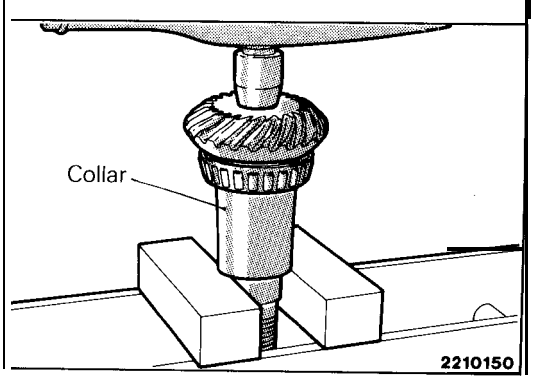
Disassembly steps

◆■► ►◆ 1. Taper roller bearing
2. Driven bevel gear

NOTE
(1) Reverse the disassembly procedures to reassemble,
(2) ◆■►: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".




2210144




2210150

## SERVICE POINTS OF DISASSEMBLY

1. **REMOVAL OF TAPER ROLLER BEARING**

Using the special tool, remove the taper roller bearing.

A

## SERVICE POINTS OF REASSEMBLY

1. **INSTALLATION OF TAPER ROLLER BEARING**

Using the collar, install the taper roller bearing.

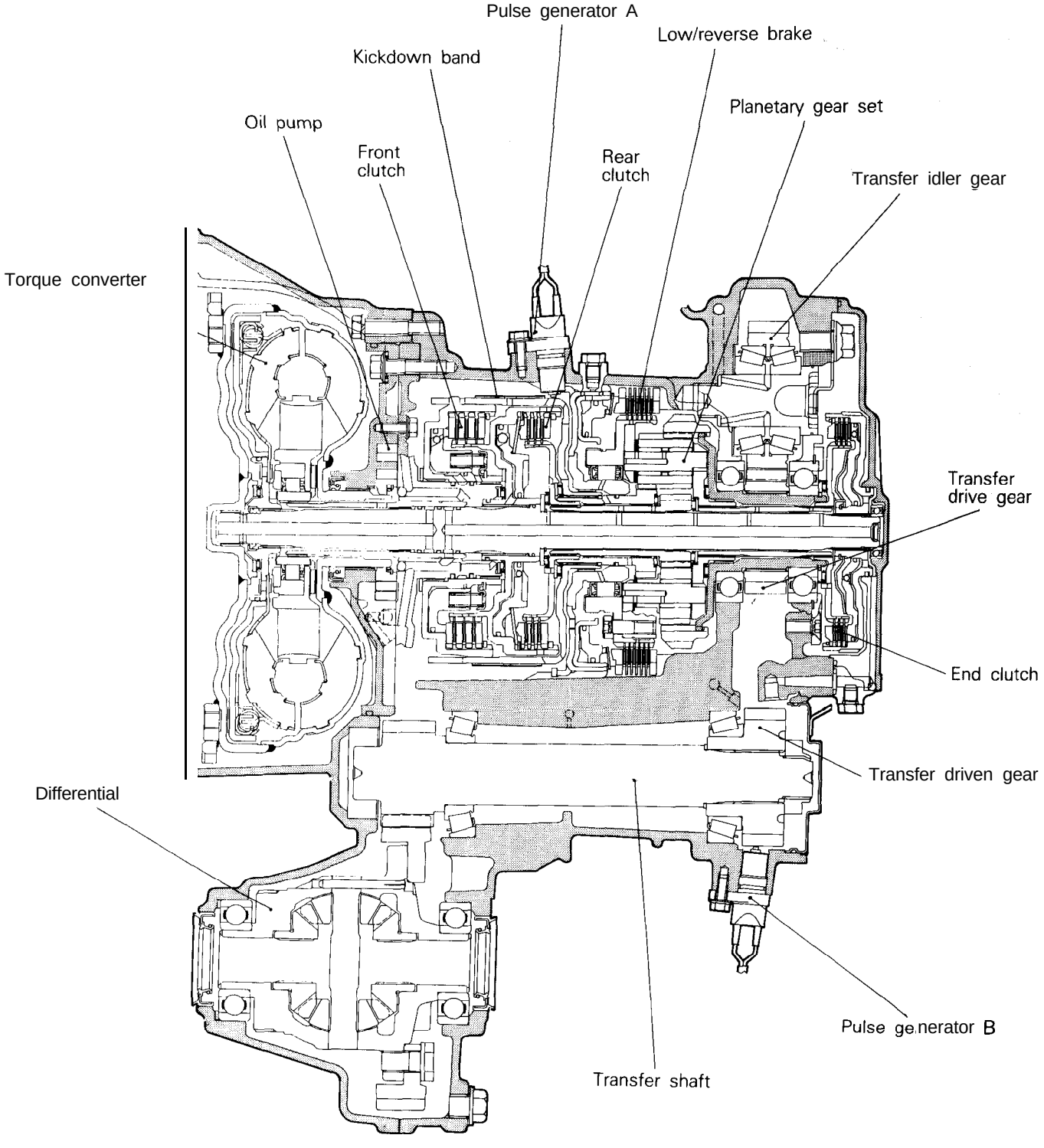
# AUTOMATIC TRANSAXLE

## GENERAL INFORMATION N21BABTa

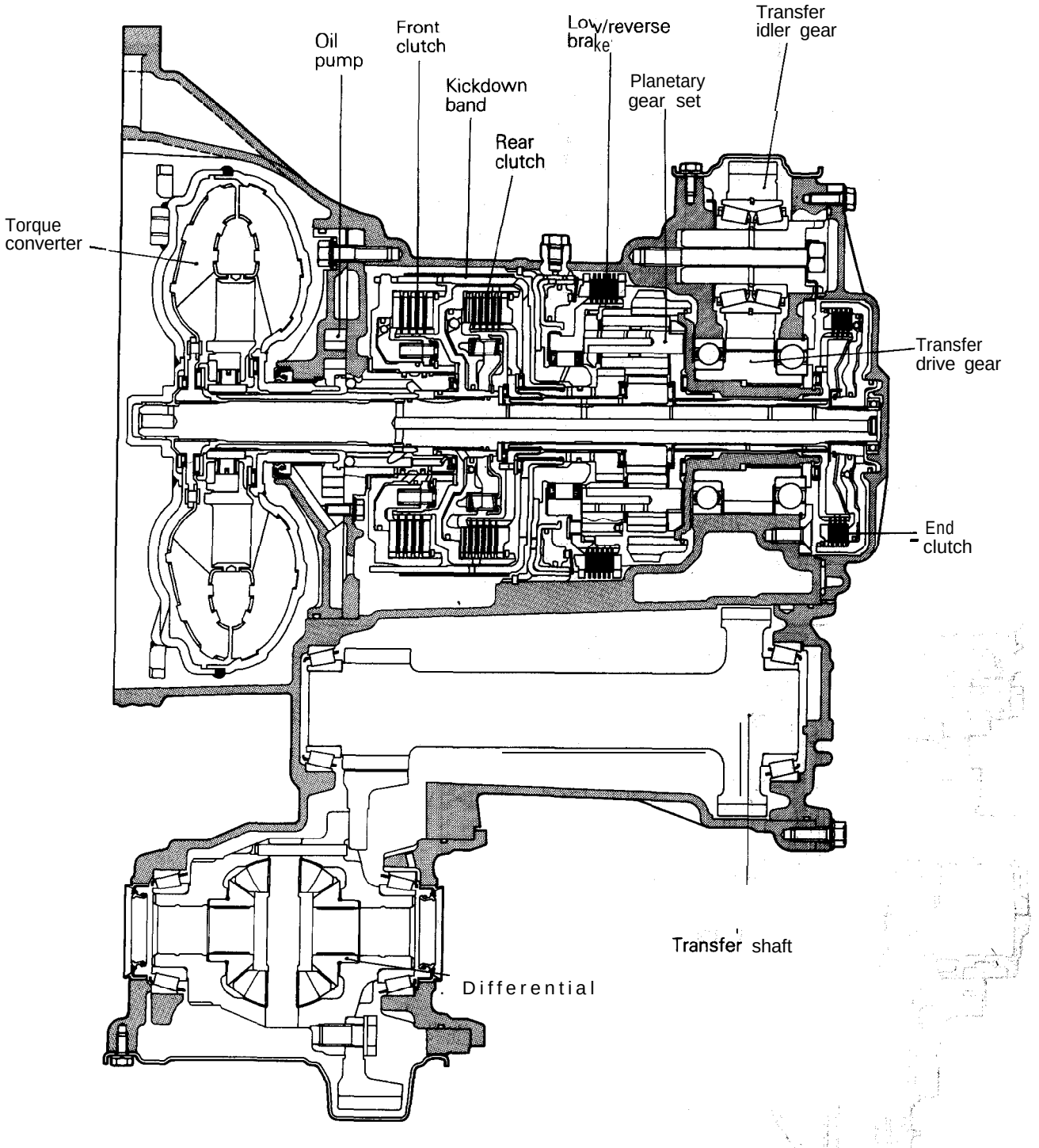
**Cautionary points during disassembly and assembly of the transaxle**

- Because the automatic transaxle is composed of component parts of an especially high degree of precision, these parts should be very carefully handled during disassembly and assembly so as not to scar or scratch them.
- A rubber mat should be placed on the workbench, and it should always be kept clean.
- During disassembly, cloth gloves or shop towels should not be used.
  If such items must be used, use articles made of nylon, or use paper towels.
- All disassemblyed parts must be thoroughly cleaned.
  Metal parts may be cleaned with ordinary detergents, but must be thoroughly air dried.
- Clean the clutch disc, resin thrust plate and rubber parts by using ATF (automatic transmission fluid), being very careful that dust, dirt, etc. do not adhere.
- Do not reuse gaskets, oil seals and rubber parts. Replace them with new ones at every reassembly. O-ring of oil level gauge need not be replaced.
- Do not use grease other than petrolatum jelly.
- Apply ATF to friction element, rotating parts, and sliding parts before installation.
- New clutch disc should be immersed in ATF for more than two hours before installation.
- Do not apply sealer or adhesive to gaskets.
- When bushing must be replaced, replace assembly which includes it.
- If the transaxle main unit is damaged, also disassembly and clean the cooler system.
- In order to prevent a sudden start as a result of accidental misoperation of the select lever, this model is provided with the automatic-transaxle safety-lock system.

<F4A22>

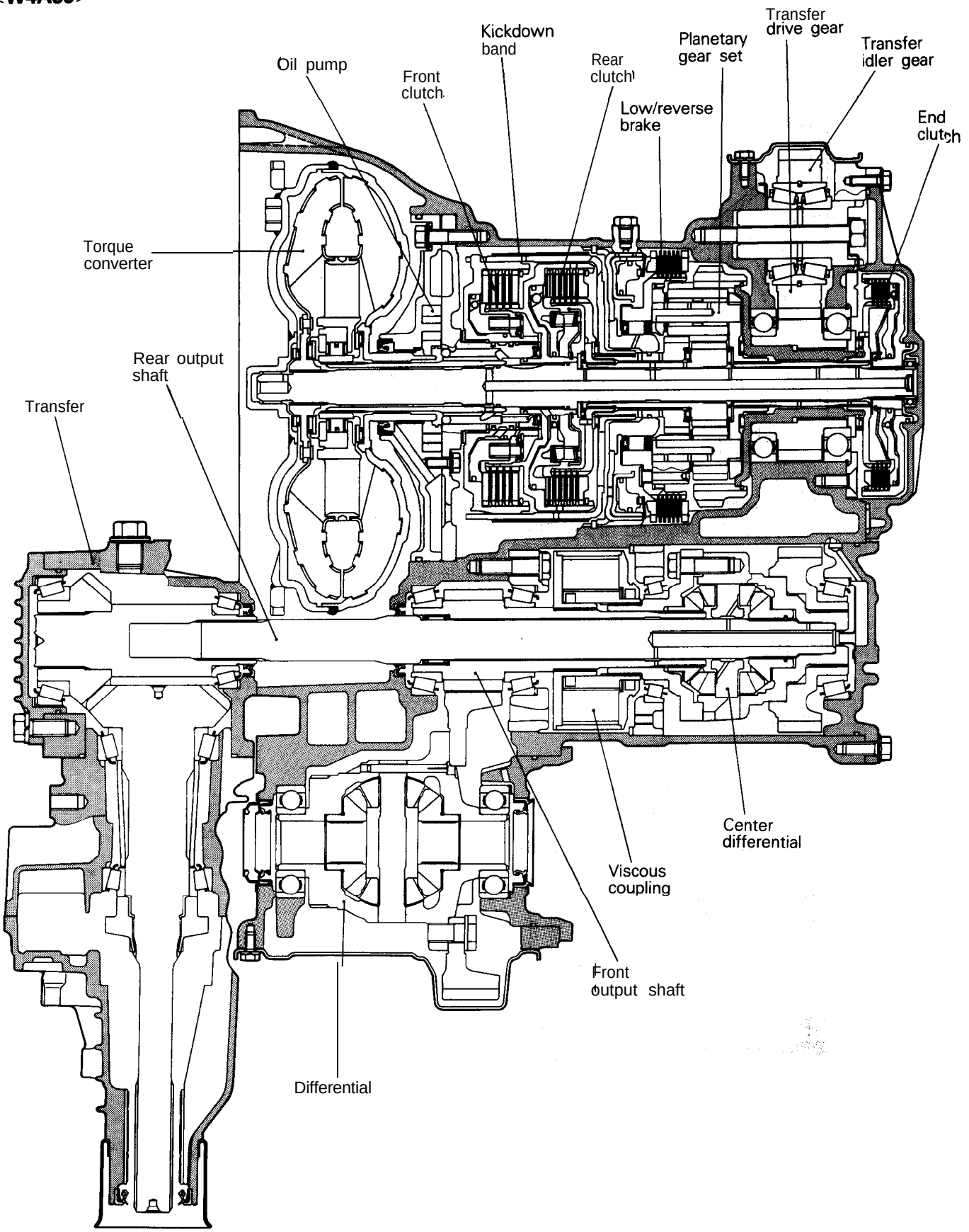

Pulse generator A
Low/reverse brake
Kickdown band
Planetary gear set
Oil pump
Front clutch
Rear clutch
Transfer idler gear
Torque converter
Transfer drive gear
End clutch
Transfer driven gear
Differential
Pulse generator B
Transfer shaft
TFA0480

<F4A33>



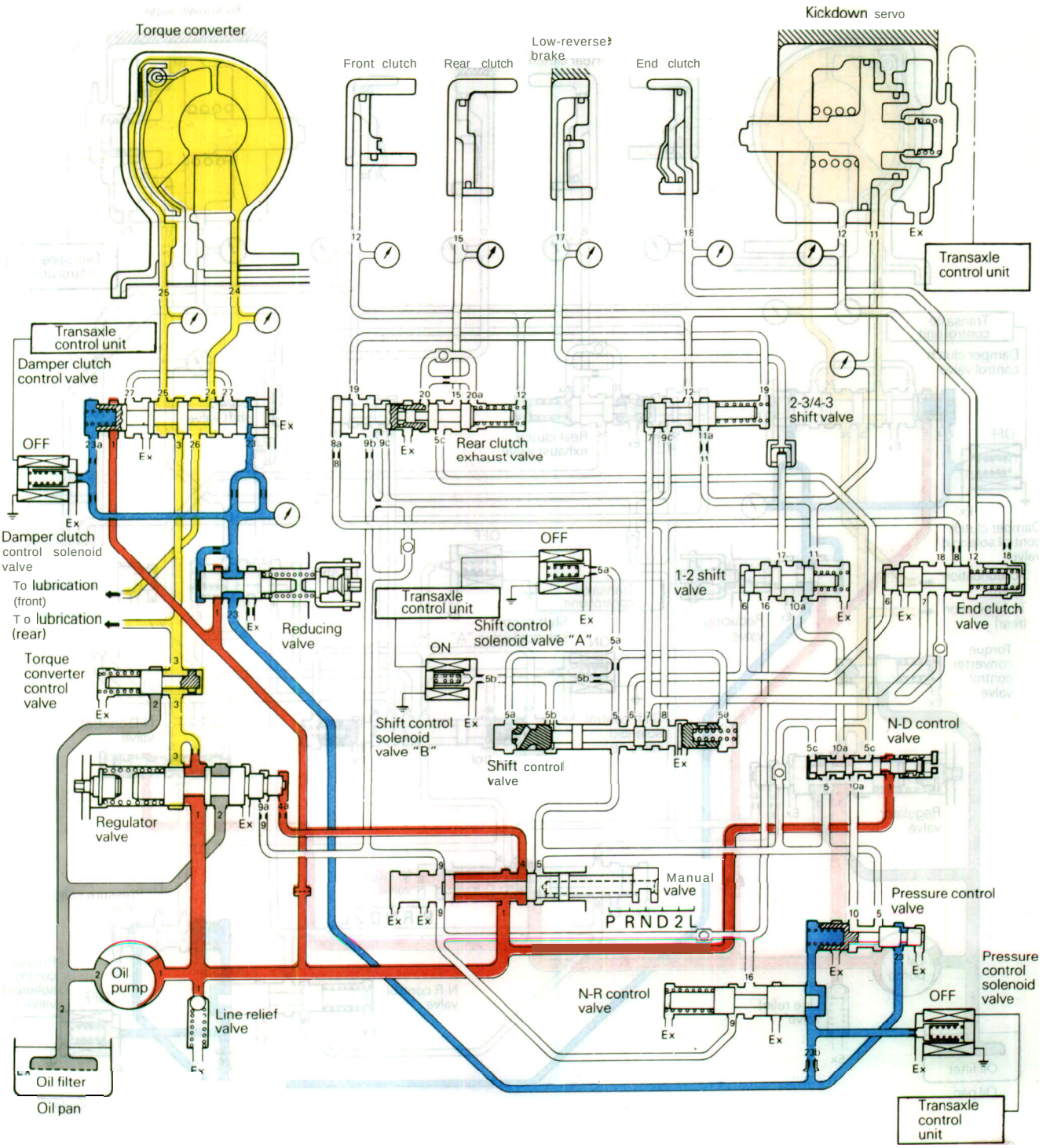

TFA0101

<W4A33>




TFA0102

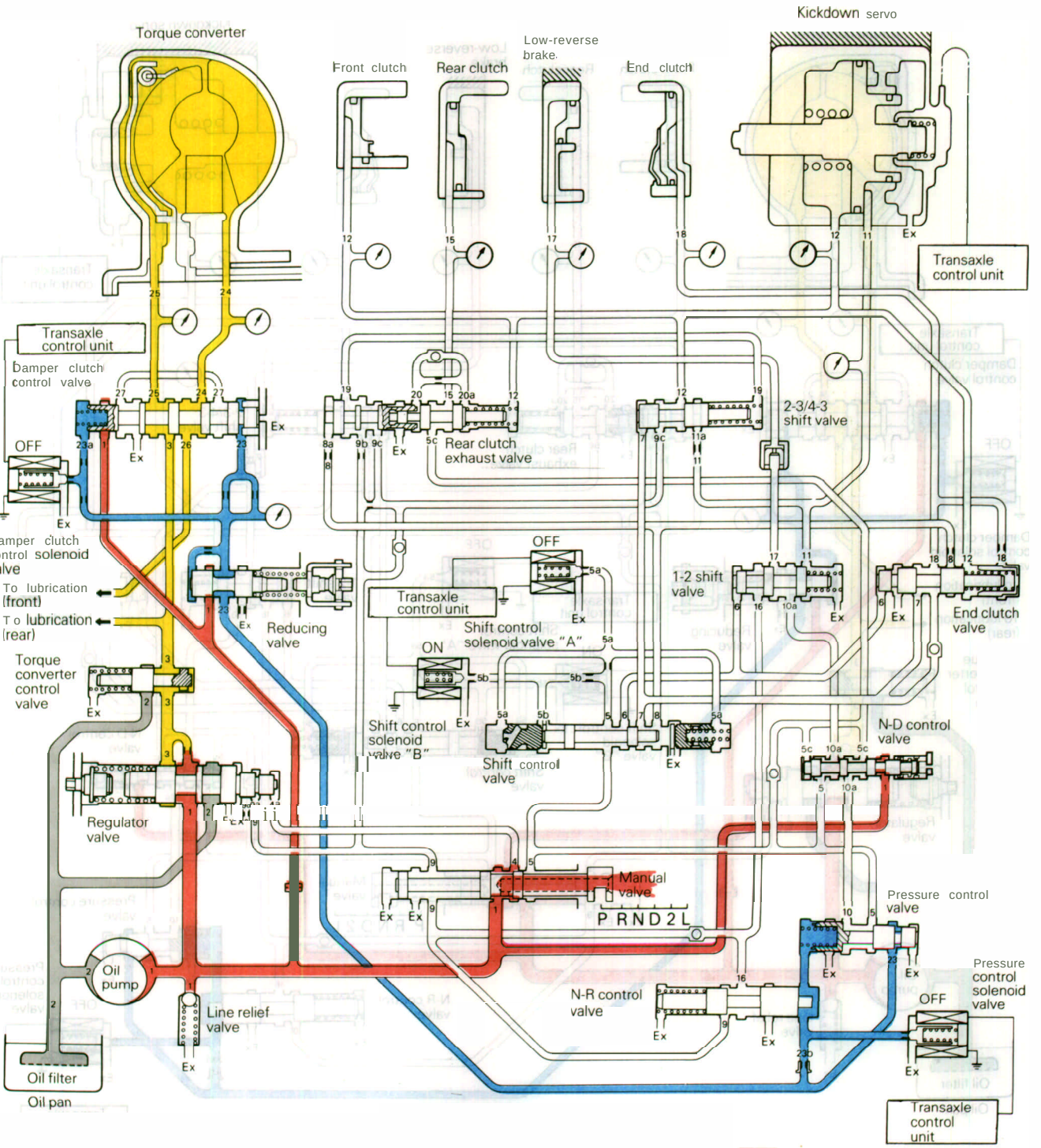
<F4A22 – Neutral>




**Neutral**

TFA0070

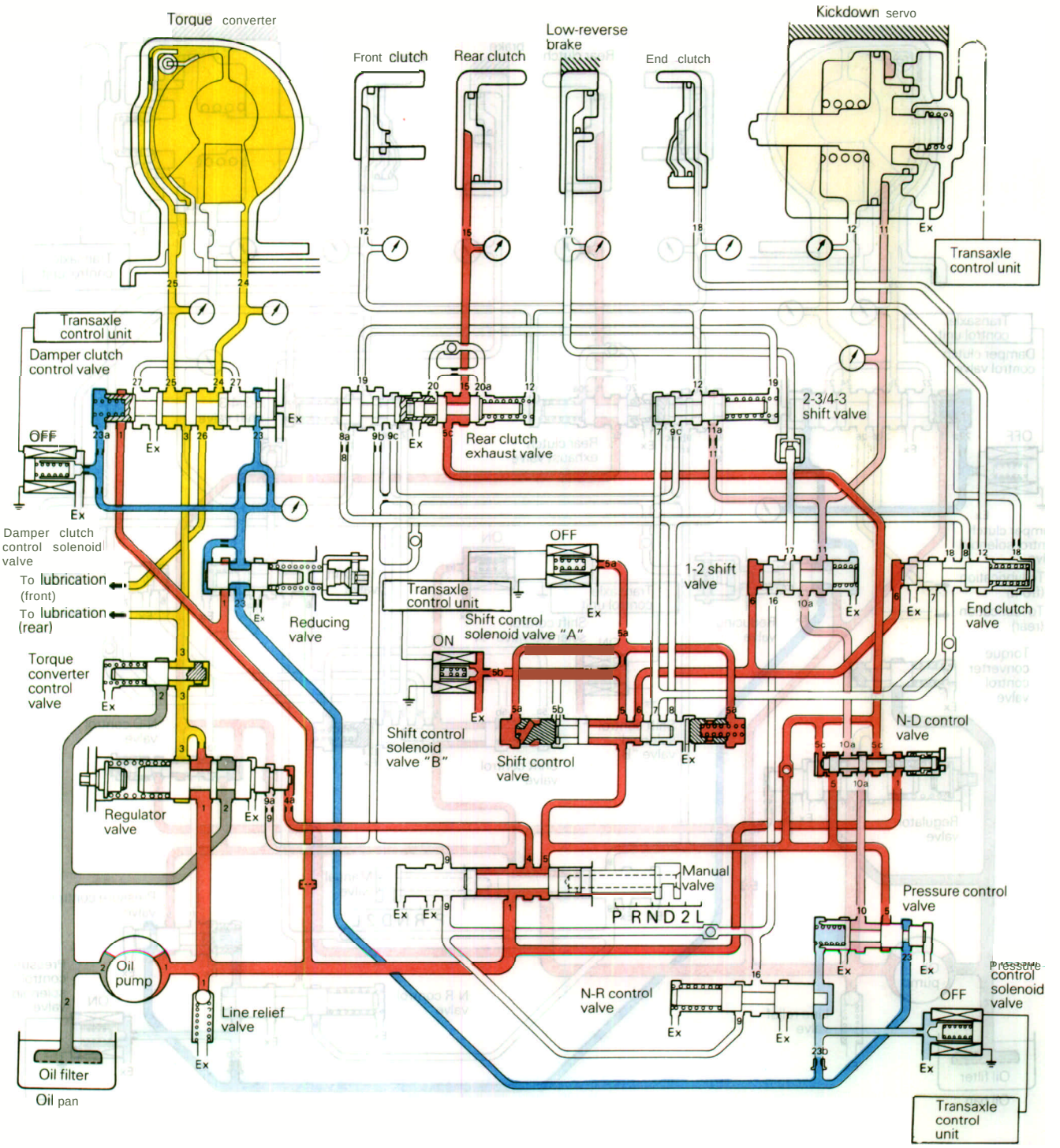
<F4A22 – Parking>




**Parking**

TFA0071

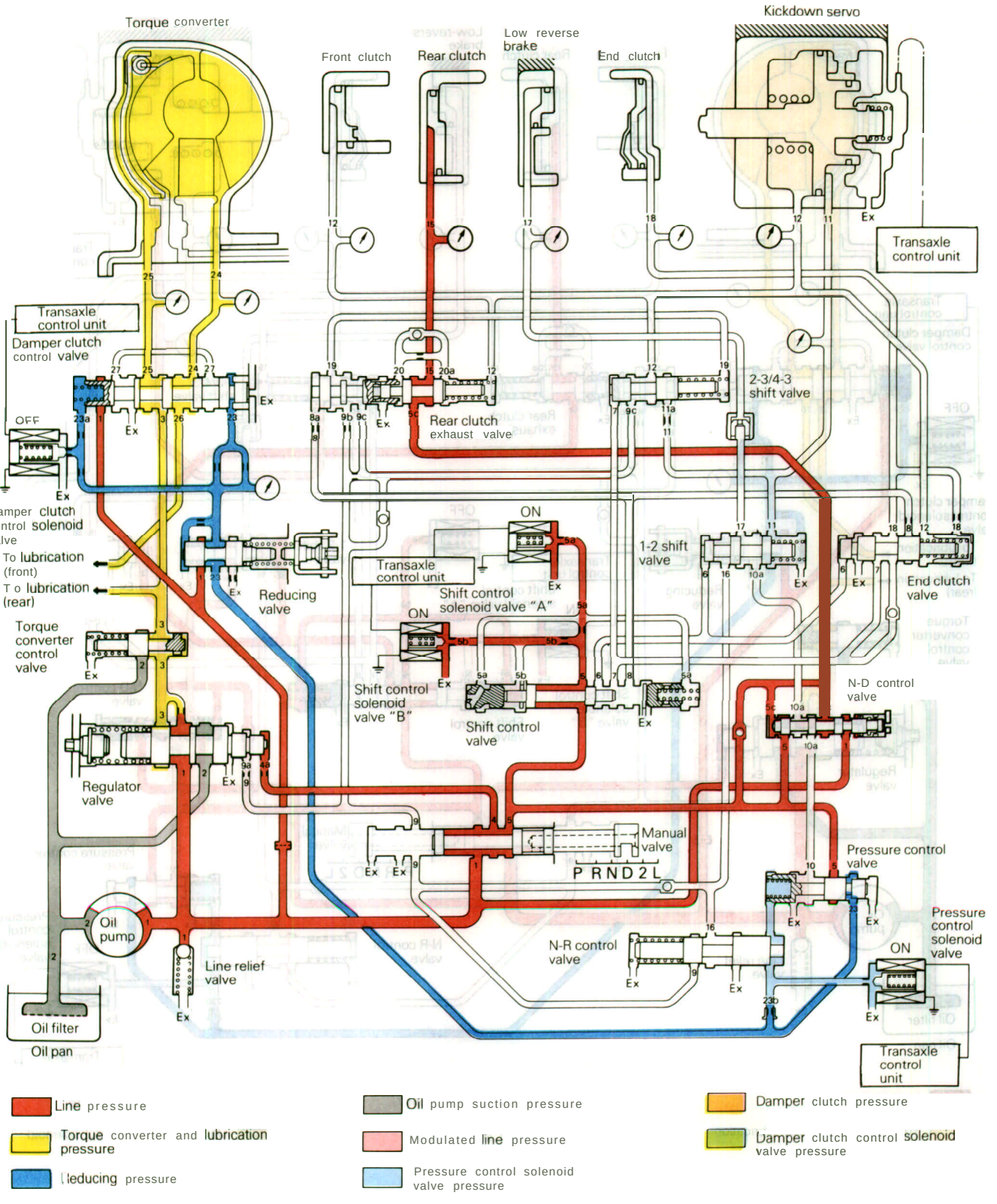
## <F4A22– Drive-Stopping >




**Drive (Stopping)**

TFA0242

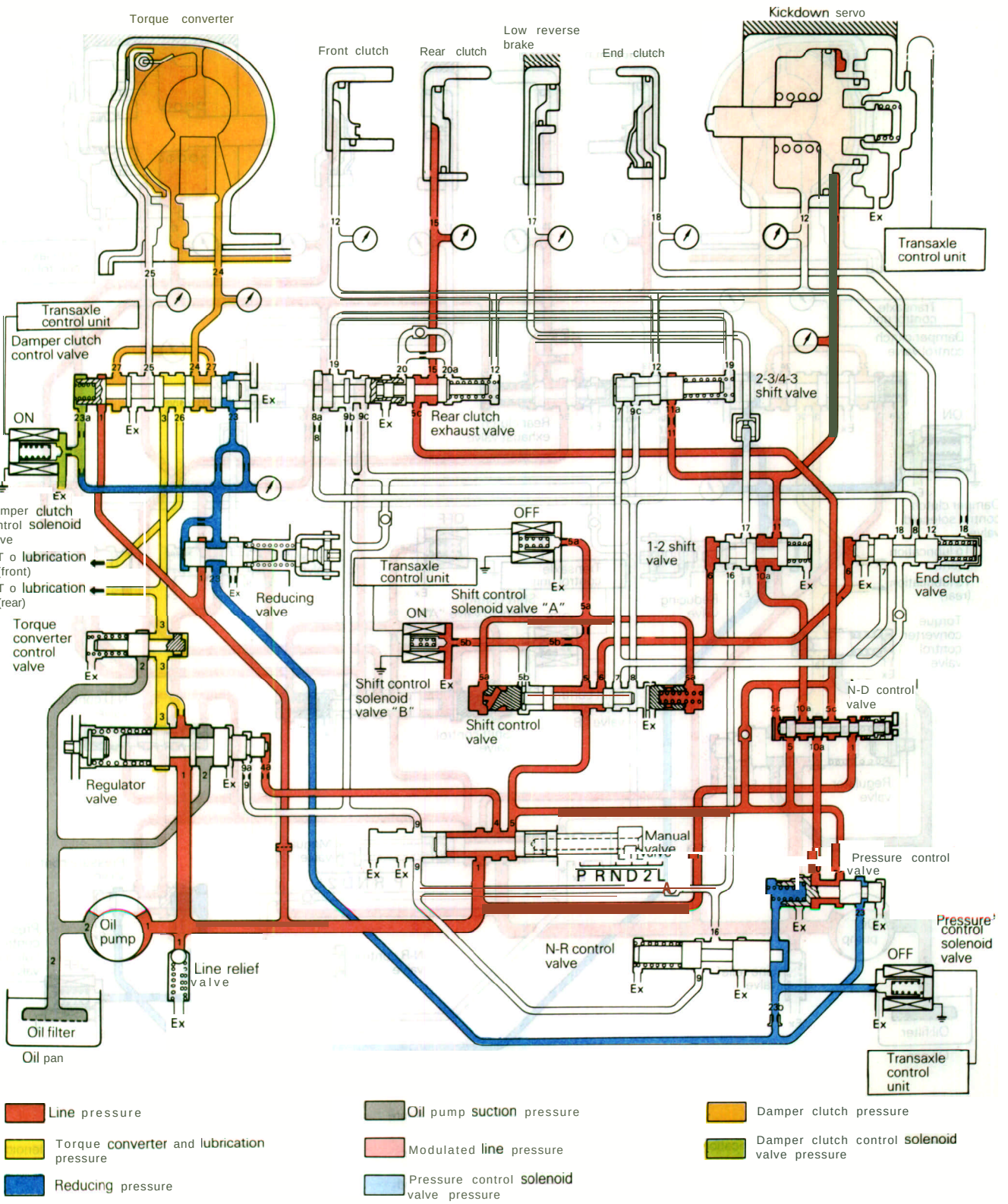
## <F4A22 – Drive-First>




**Drive (First)**

TFA0072

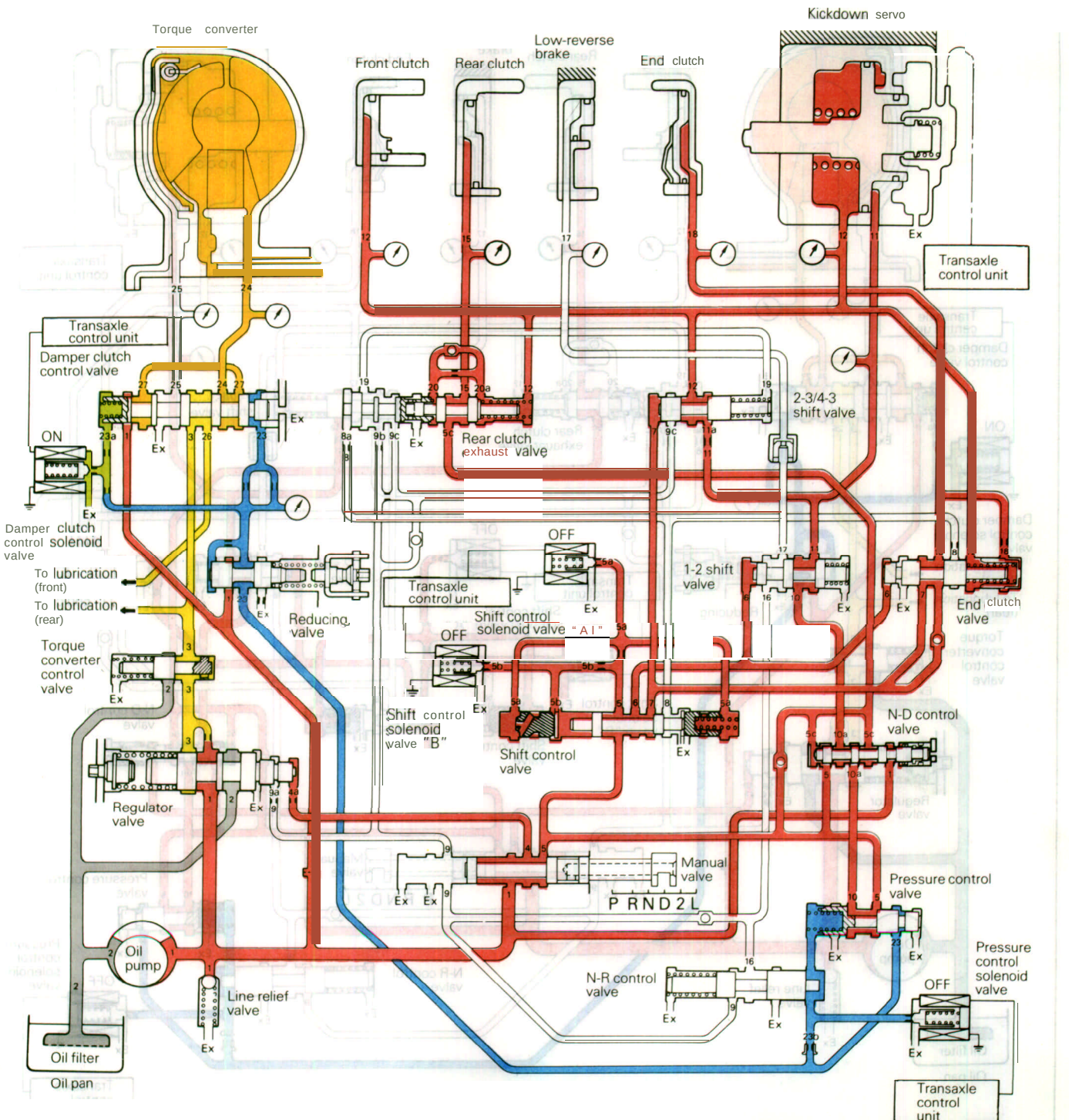
## <F4A22 – Drive-Second>




**Drive (Second)**

TFA0073

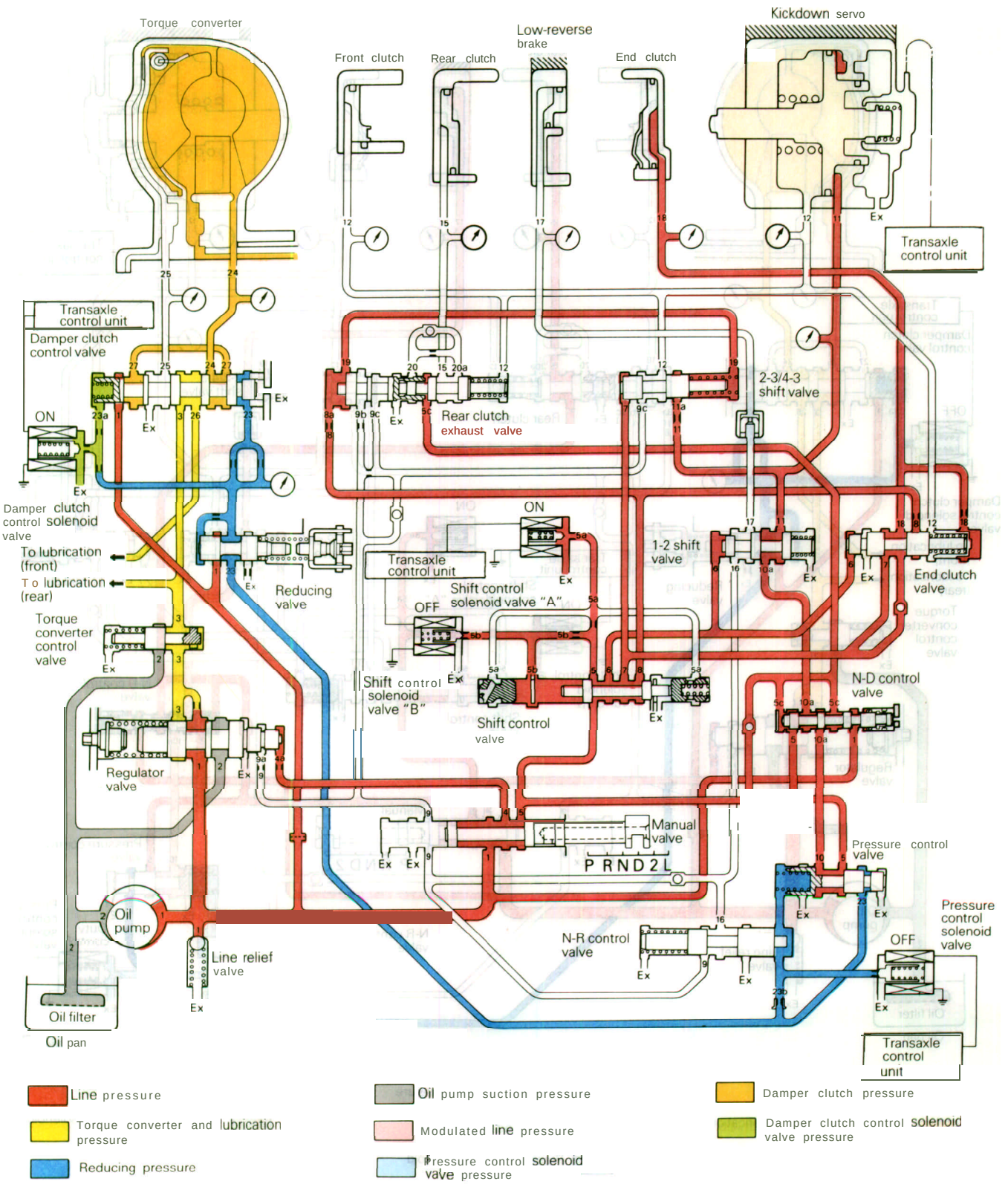
<F4A22 – Drive-Third>




**Drive (Third)**

TFA0074

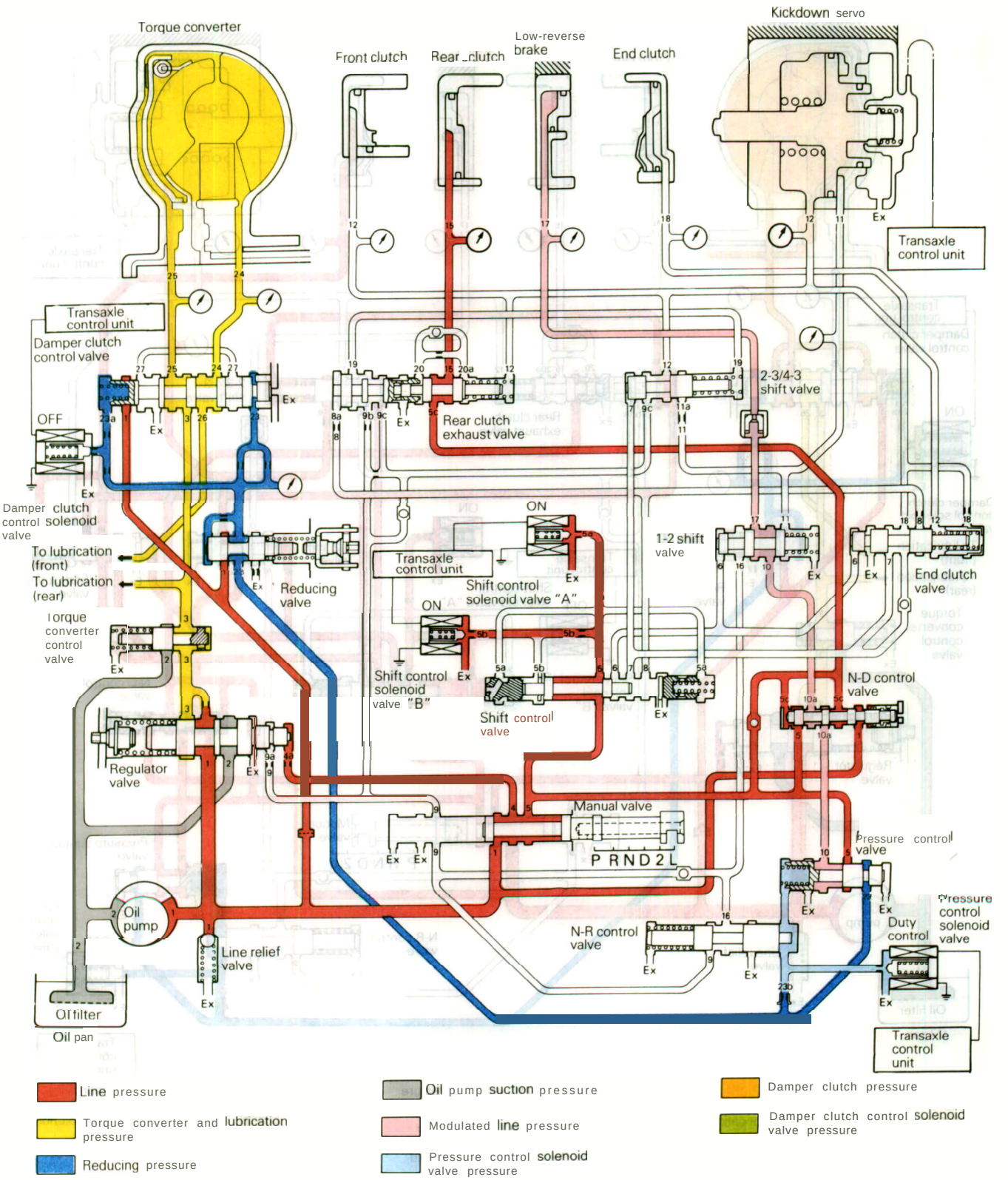
## <F4A22 – Drive-Fourth>




**Drive (Fourth)**

TFA0075

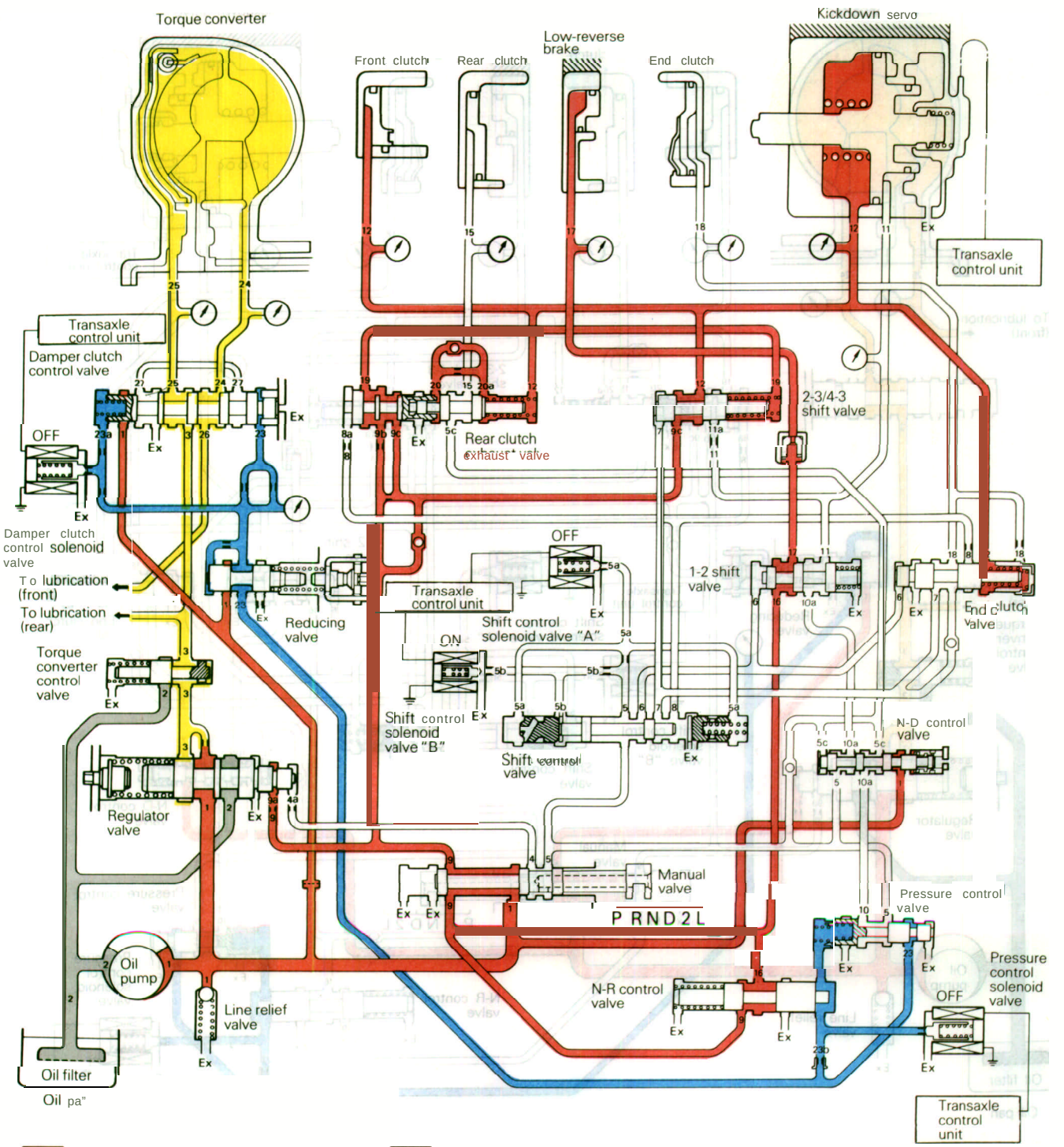
<F4A22 – Lock-up>




**Lock-up (First)**

TFA0076

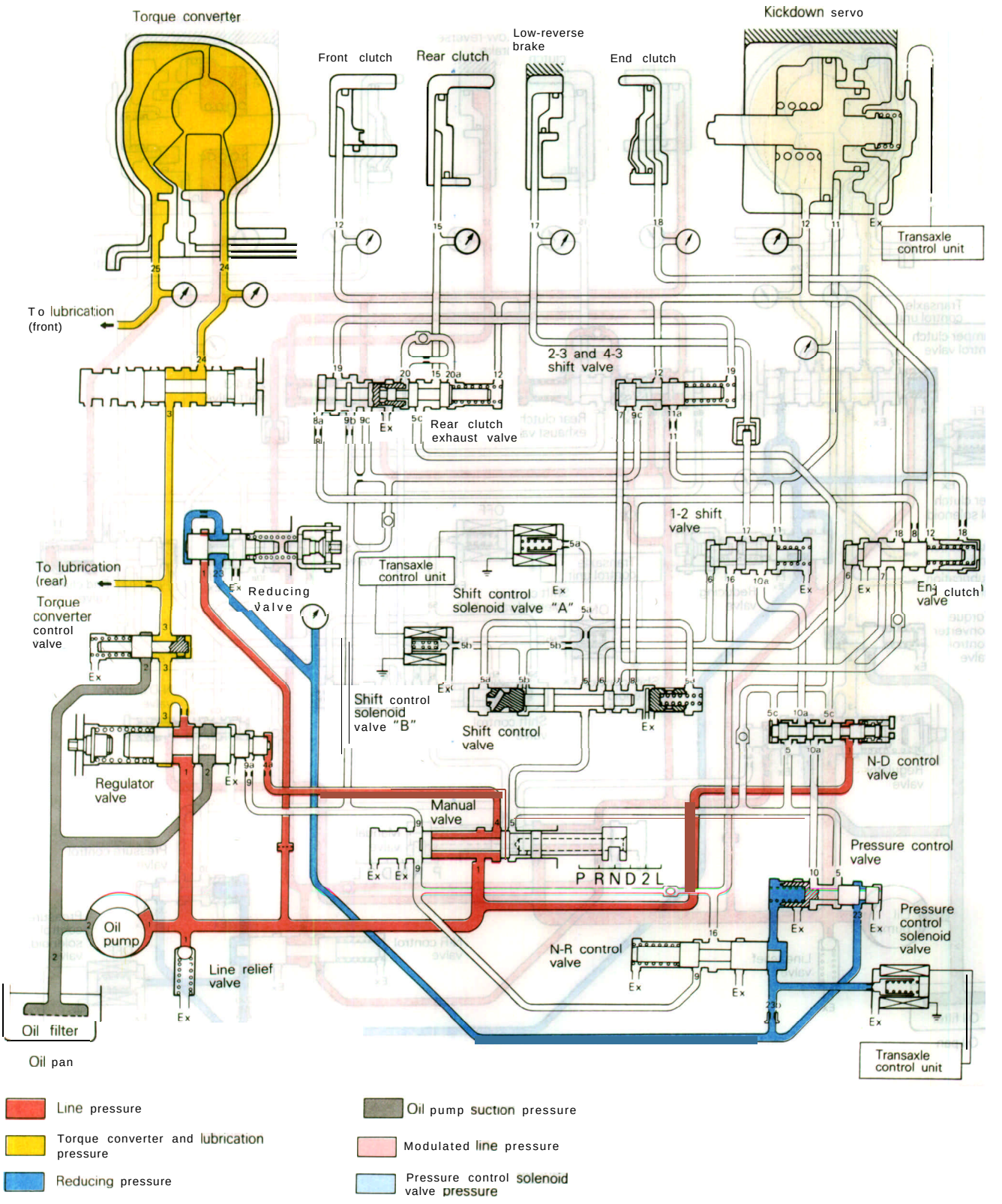
## <F4A22 – Reverse>




Reverse

TFA0077

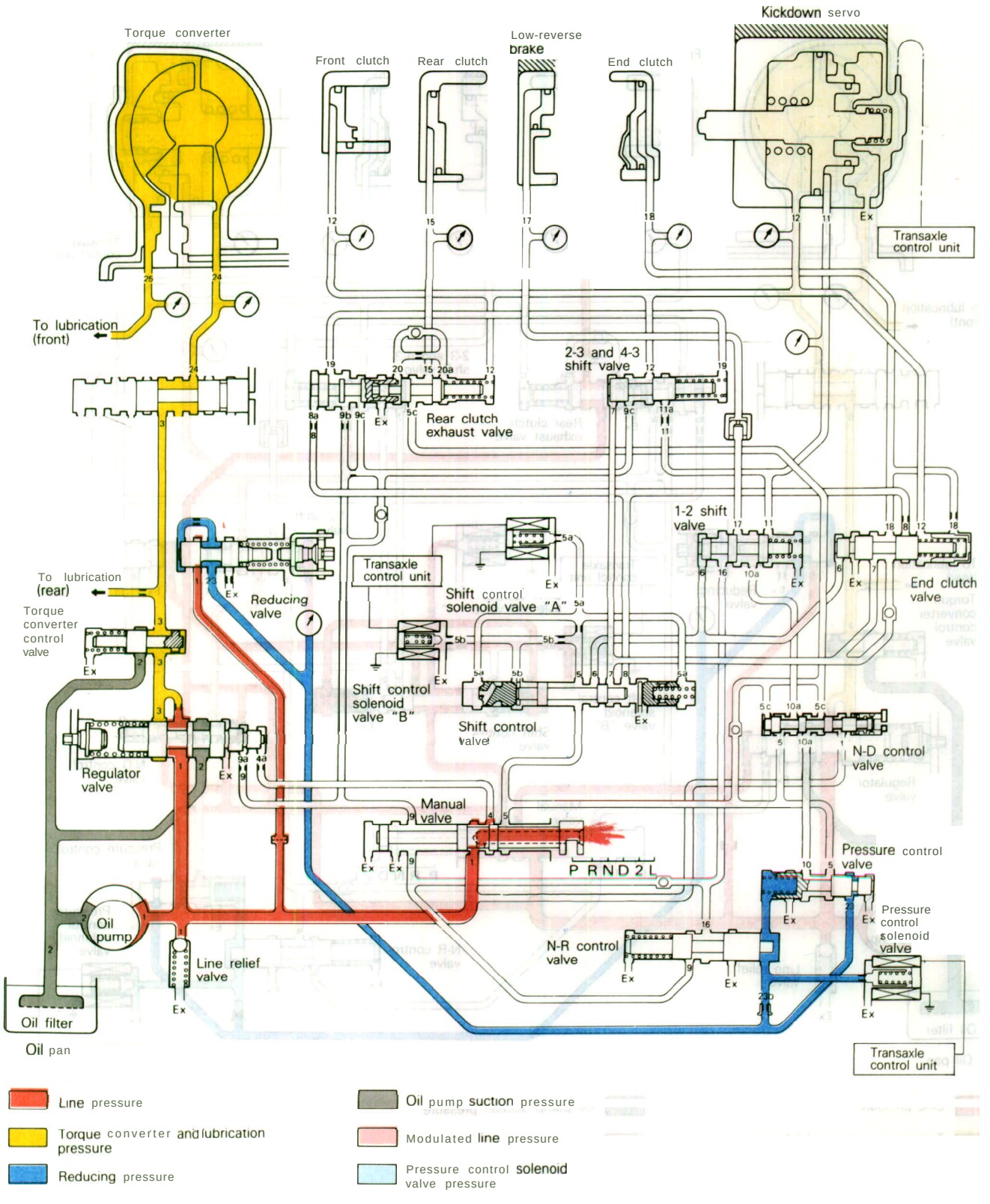
## <F4A33·W4A33–Neutral>




Neutral

TFA0078

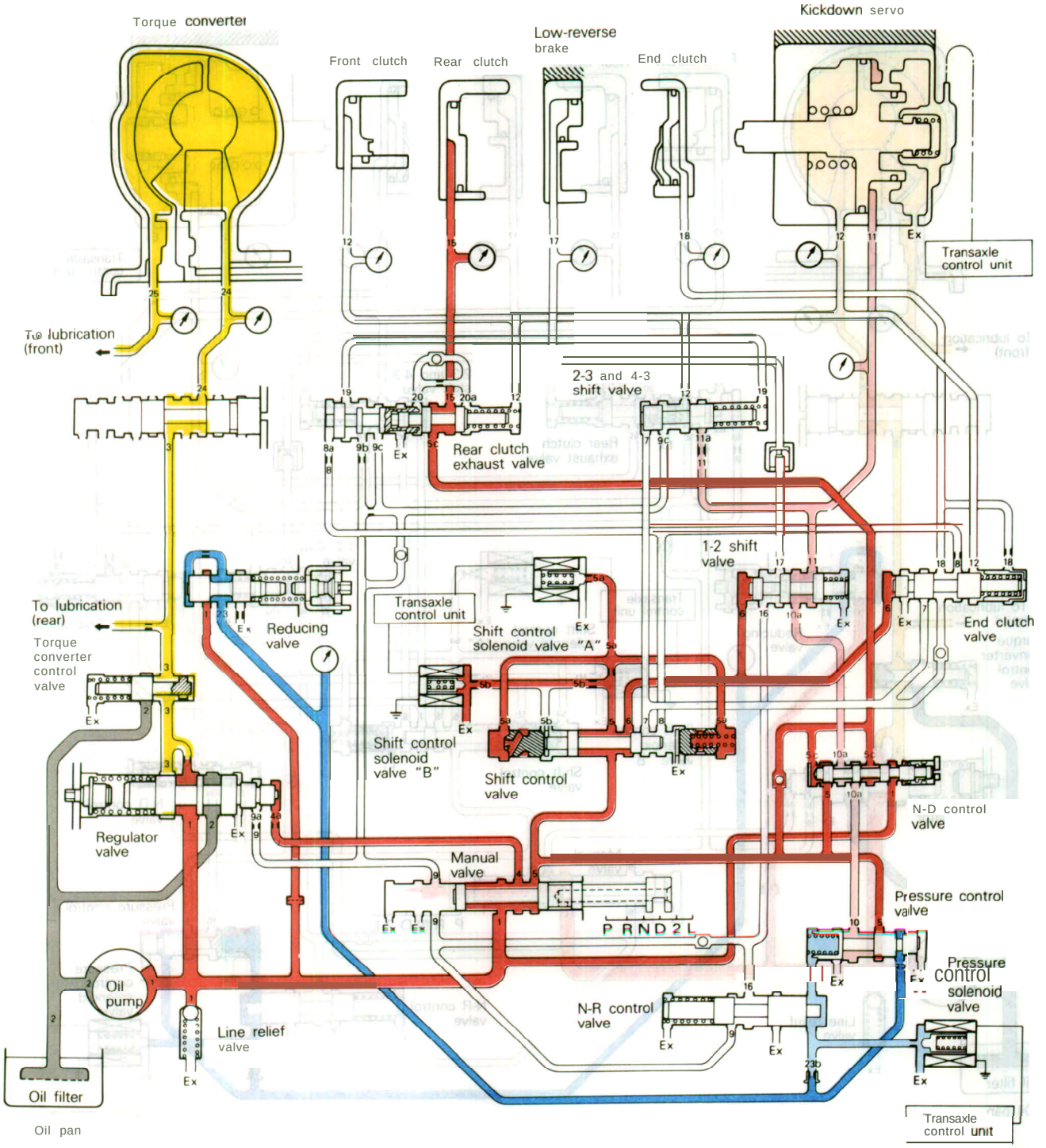
## <F4A33·W4A33–Parking>




Parking

TFA0079

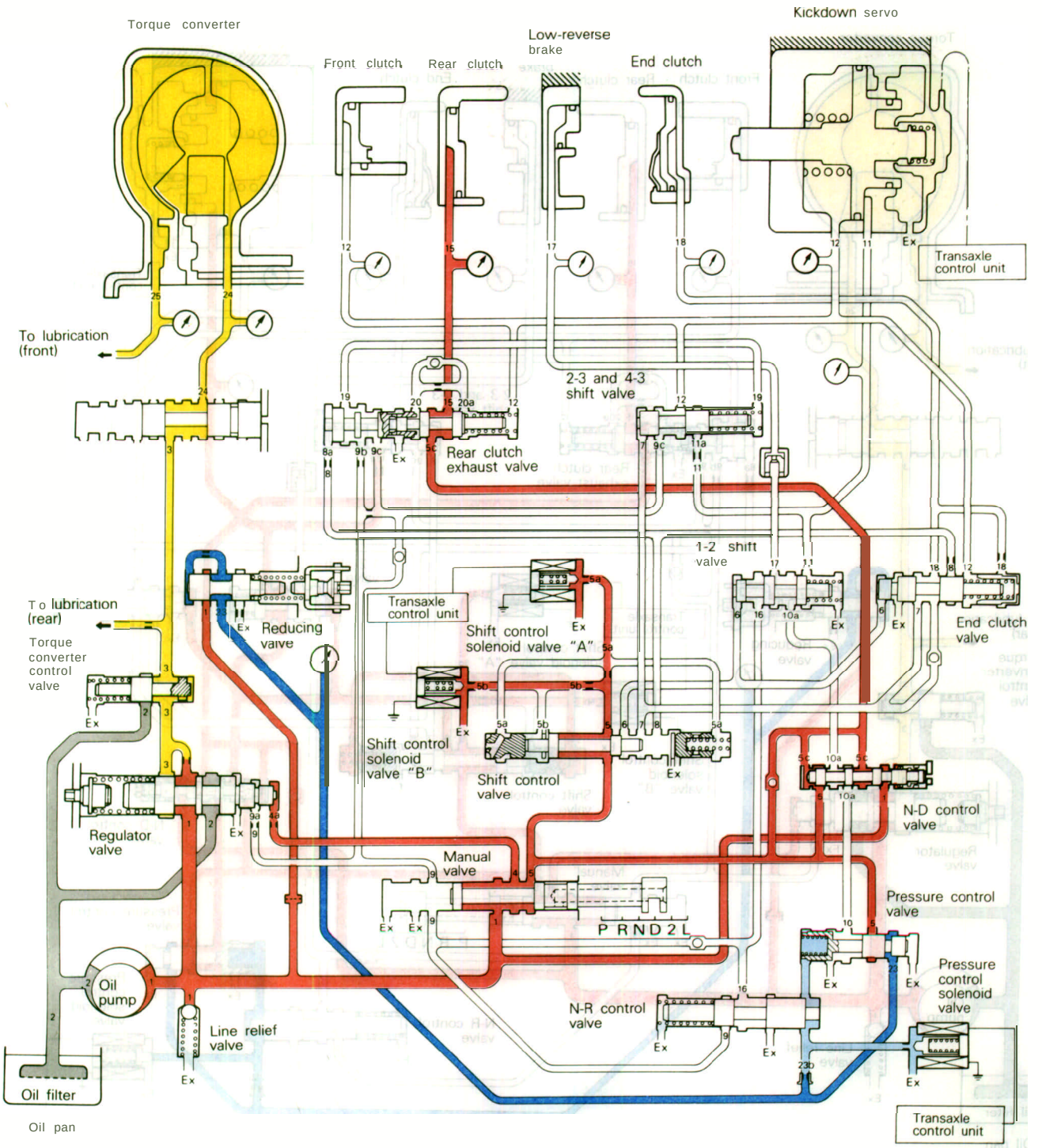
## <F4A33·W4A33–Drive-Stopping>




**Drive (Stopping)**

TFA0080

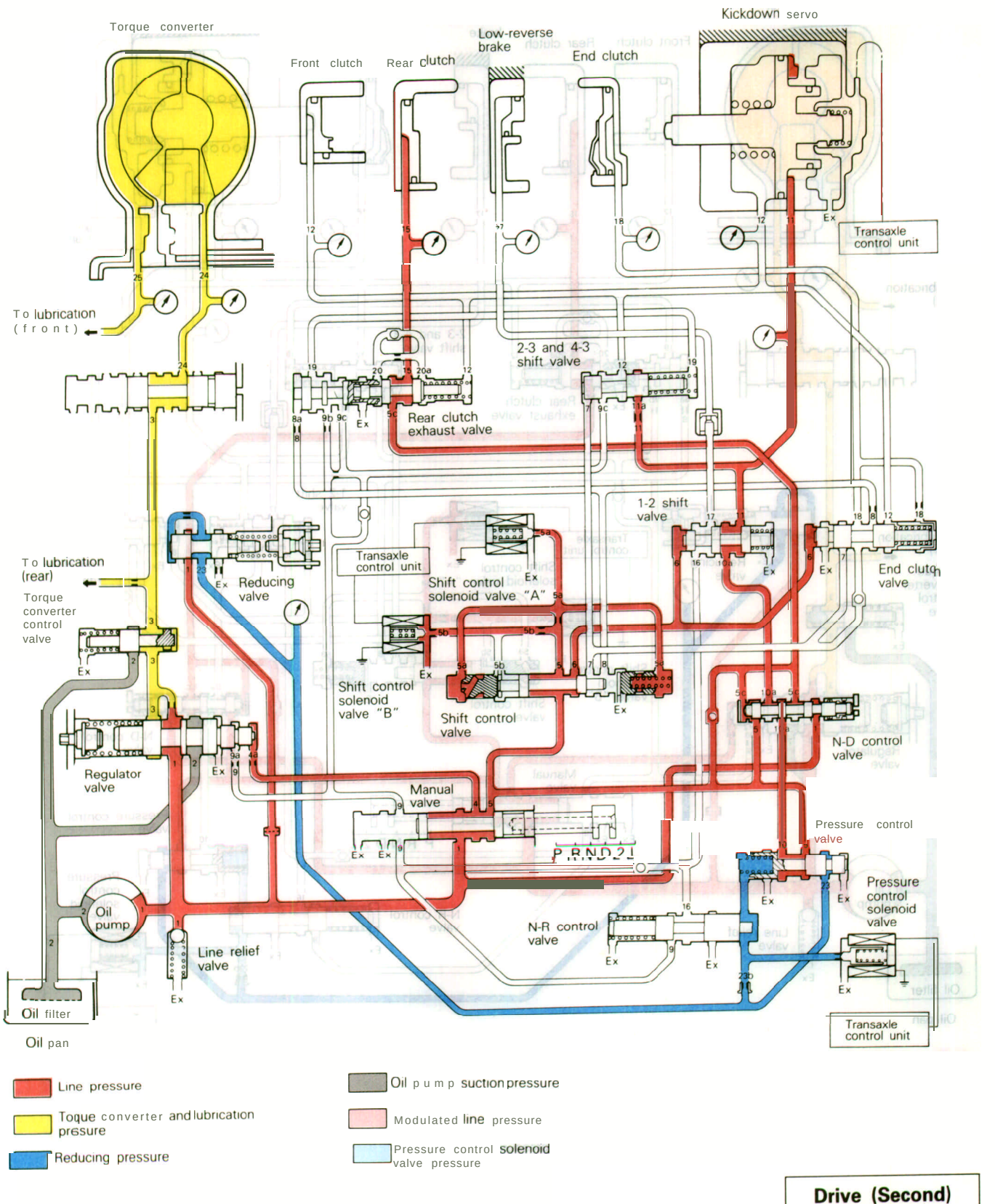
## <F4A33·W4A33–Drive-First>



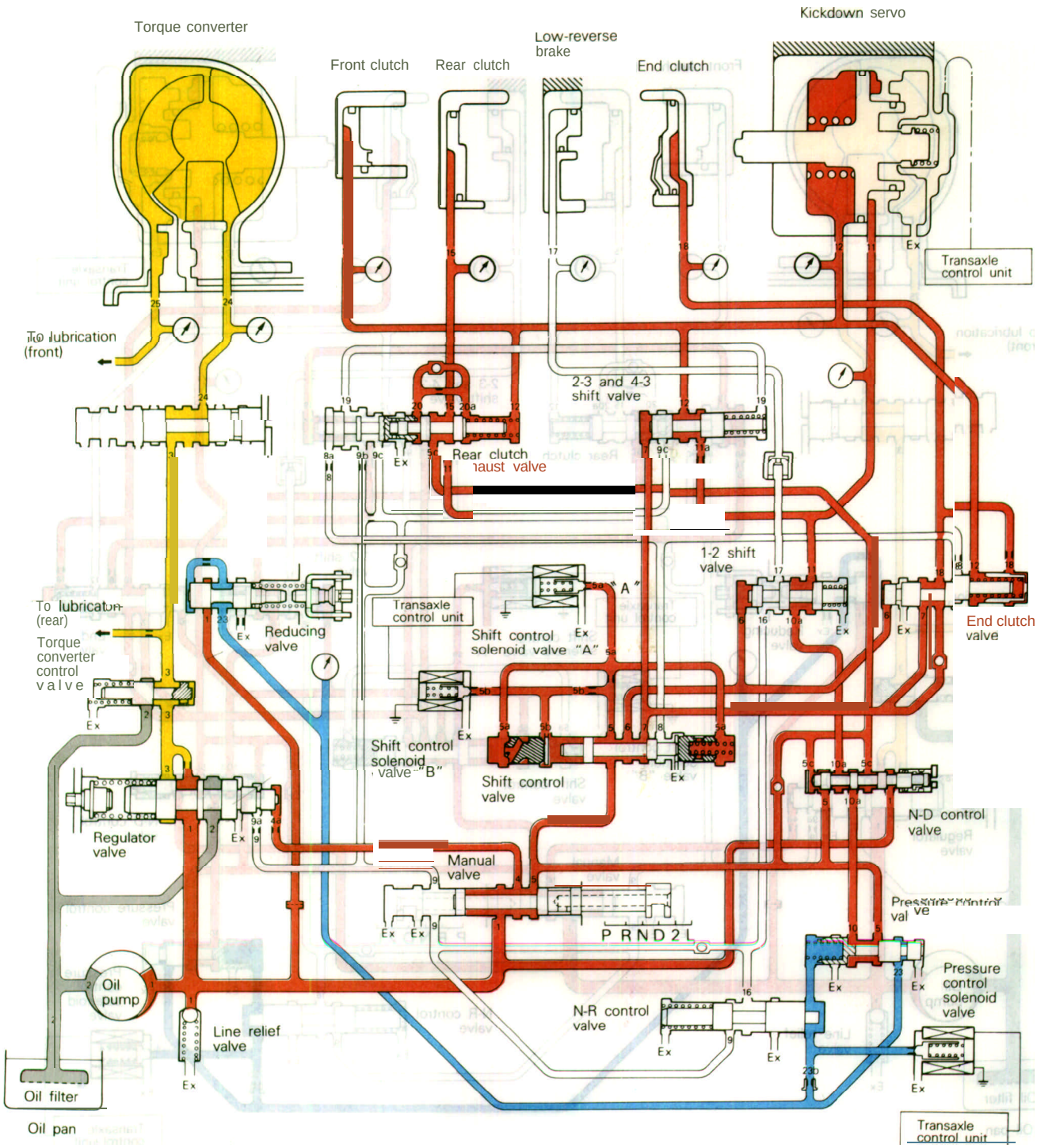

**Drive (First)**

TFA0081

<F4A33·W4A33– Drive-Second >



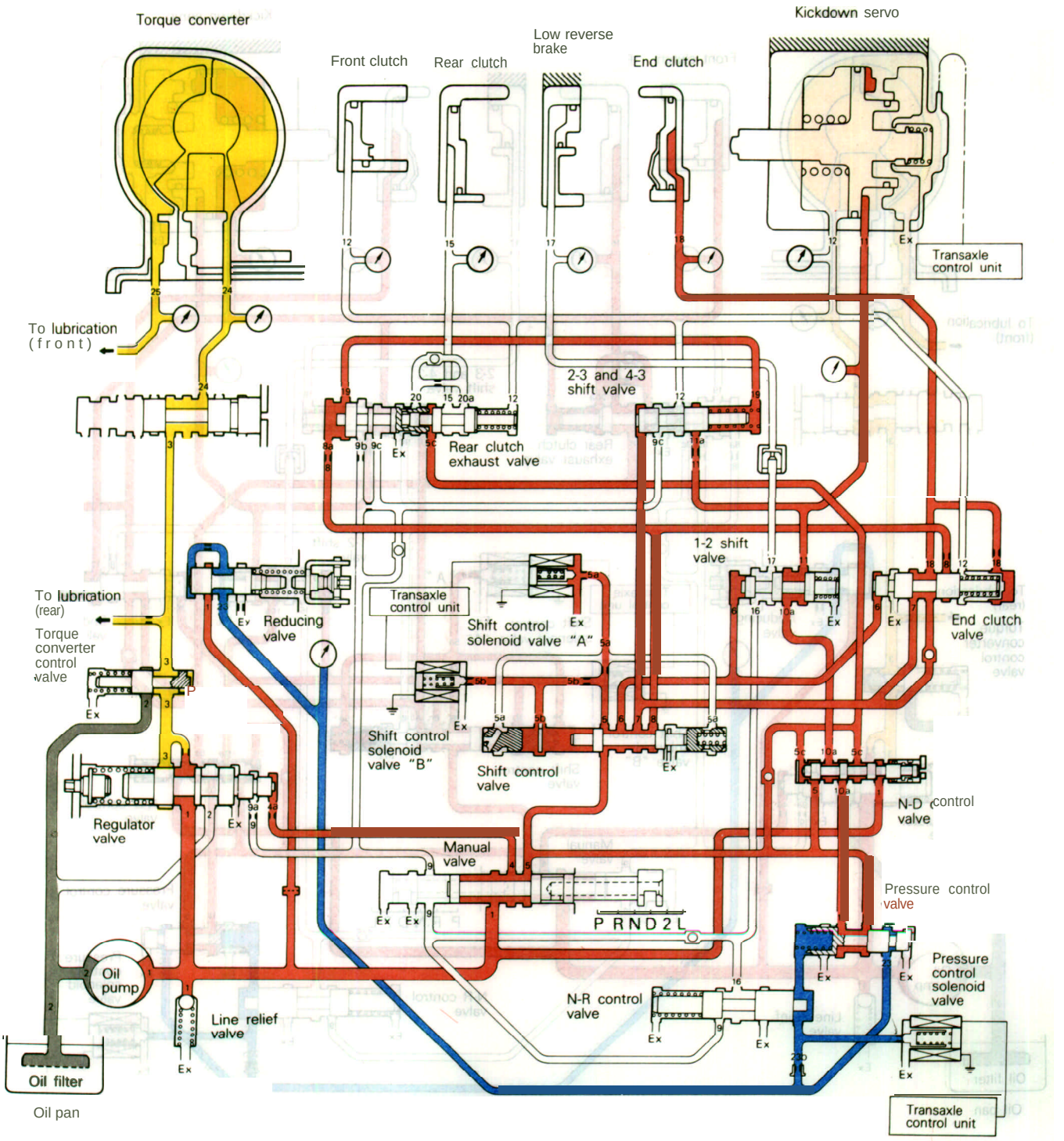
## <F4A33·W4A33–Drive-Third>




Drive (Third)

TFA0083

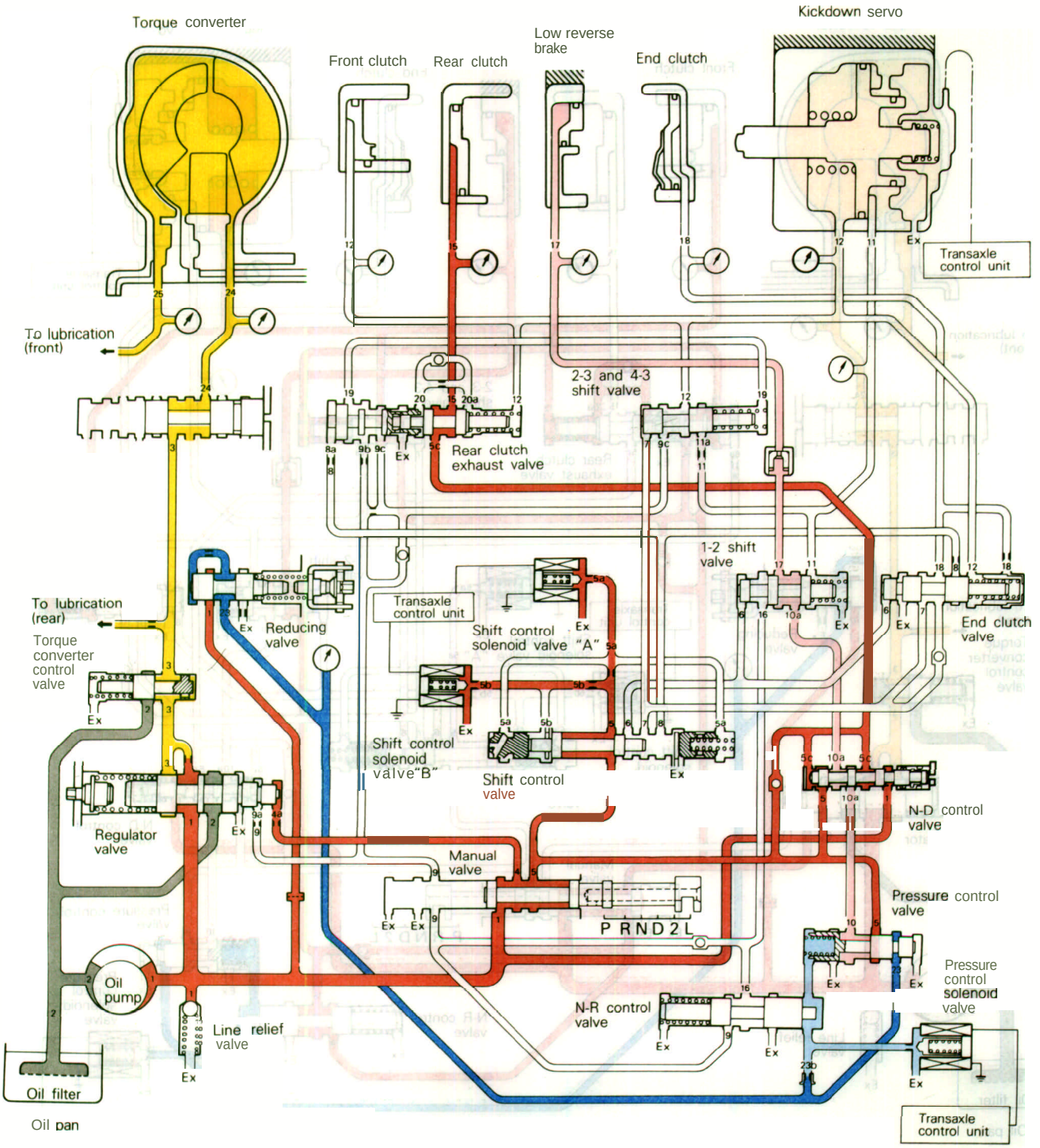
## <F4A33·W4A33 – Drive-Fourth >




Drive (Fourth)

TFA0084

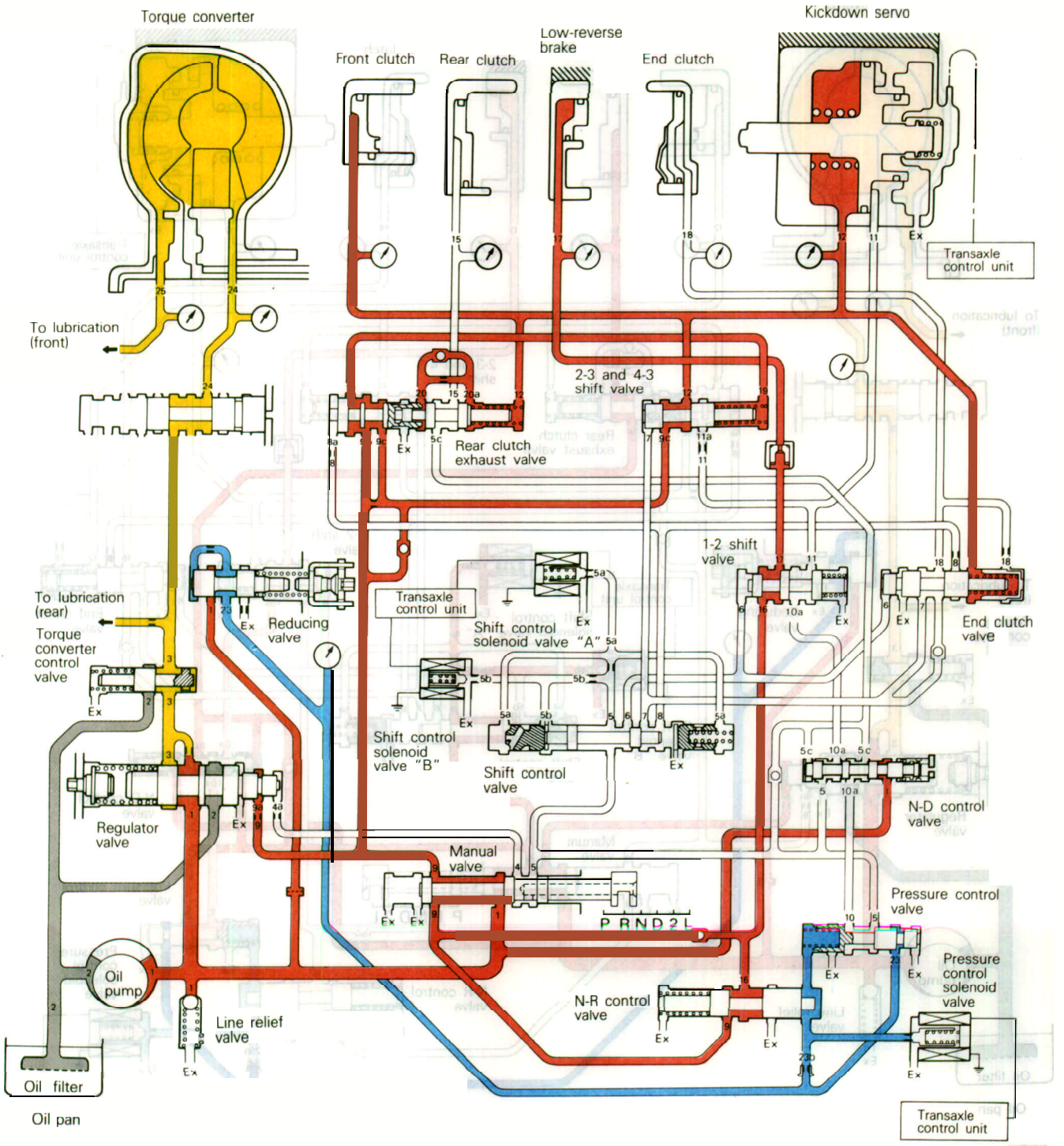
## <F4A33·W4A33–Lock-up>




**Lock-up (First)**

TFA0085

<F4A33·W4A33–Reverse>



# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N21CA-C

| Items | 1.8L Engine | 2.0L DOHC Engine | 2.0L DOHC Turbo Engine | 2.0 DOHC Turbo Engine |
|---|---|---|---|---|
| Type | F4A22-2-M PD<br>Full automatic 4 speed transaxle | F4A22-2-M PD 1<br>Full automatic 4 speed transaxle | F4A33-UP61<br>Full automatic 4 speed transaxle | W4A33-1-UP6<br>Full automatic 4 speed transaxle |
| Torque converter | | | | |
| Type | 3 element with damper clutch | 3 element with damper clutch | 3 element with damper clutch | 3 element with damper clutch |
| Engine stall speed | 1,800–2,800 rpm | 1,800–2,800 rpm | 1,800–2,800 rpm | 1,800–2,800 rpm |
| Stall speed ratio | 2.05 | 1.90 | 1.74 | 1.74 |
| Transaxle | | | | |
| Type | Electronically controlled 4 speed full automatic | Electronically controlled 4 speed full automatic | Electronically controlled 4 speed full automatic | Electronically controlled 4 speed full automatic |
| Gear ratio | | | | |
| First | 2.846 | 2.846 | 2.551 | 2.551 |
| Second | 1.581 | 1.581 | 1.488 | 1.488 |
| Third | 1.000 | 1.000 | 1.000 | 1.000 |
| Fourth | 0.685 | 0.685 | 0.685 | 0.685 |
| Reverse | 2.176 | 2.176 | 2.176 | 2.176 |
| Final gear ratio | 4.007 | 4.007 | 4.376 | 4.42'2 |
| Speedometer gear ratio [drive/driven) | 36/29 | 36/29 | 36/29 | 36/29 |

## SERVICE SPECIFICATIONS

N21C8-

Transaxle

| Items | | Specifications |
|---|---|---|
| Standard value | | |
| Transfer driven gear preload (Center differential case preload) <F4A33, W4A33> | mm (in.) | 0.075–0.135 (.0030–.0053) |
| **Transfer shaft end play <F4A22>** | **mm (in.)** | 0–0.025 (0–.0010) |
| Low reverse brake end play | mm (in.) | 1.0–1.2 (.039–.047) |
| Input shaft end play | mm (in.) | 0.3–1.0 (.012–.039) |
| Differential case end play <F4A22> | mm (in.) | 0–0.15 (0–.006) |
| Differential case preload <F4A33> | mm (in.) | 0.075–0.135 (.0030–.0053) |
| Differential case end play <W4A33> | mm (in.) | 0.045–0.165 (.0017–.0064) |
| Differential gear and pinion backlash | mm (in.) | 0.025–0.150 (.0010–.0059) |
| Oil pump side clearance | mm (in.) | 0.03–0.05 (.0012–.0020) |
| Output flange bearing play <F4A22> | mm (in.) | 0–0.06 (0–.0024) |

| Items | | Specifications |
|---|---|---|
| Output flange bearing end play <F4A33, W4A33> | mm (in.) | 0–0.09 (0–.0035) |
| Front clutch end play <F4A22> | mm, (in.) | 0.7–0.9 (.028–.035) |
| Rear clutch end play <F4A22> | mm (in.) | 0.4–0.6 (.016–.024) |
| End clutch end play <F4A22> | mm (in.) | 0.4–0.65 (.016–.026) |
| Front clutch end play <F4A33, W4A33> | mm (in.) | 0.8–1.0 (.032–.039) |
| Rear clutch end play <F4A33, W4A33> | mm (in.) | 1.0–1.2 (.039–.047) |
| End clutch end play <F4A33, W4A33> | mm (in.) | 0.60–0.85 (.024–.034) |
| Transfer idler gear preload <F4A22> | Nm (ft.lbs.) | 0.8 (1) |
| Center differential side gear end play <W4A33> | mm (in.) | 0.01–0.03 (.0004–.0012) |
| Front output shaft end play <W4A33> | mm (in.) | 0.055–0.115 (.0022–.0045) |
| Transfer <W4A33> | | |
| Drive bevel gear starting torque | Nm (ft.lbs.) | 1.7-2.5 (1.23-1.81) |
| Driven bevel gear starting torque | Nm (ft.lbs.) | 1.0–1.7 (0.72–1.23) |
| Bevel gear backlash | mm (in.) | 0.08–0.13 (.0031–.0051) |

## VALVE BODY SPRING IDENTIFICATION CHART

| Part name | Wire diameter mm (in.) | Outside dia. mm (in.) | Length mm (in.) | No. of turns |
|---|---|---|---|---|
| Regulator valve spring | 1.4 (.055) | 15 (.59) | 52 (2.05) | 11.5 |
| 1-2 shift valve spring | 0.6 (.024) | 7.6 (.299) | 26.6 (1.047) | 13.5 |
| Pressure control valve spring | 0.45 (.0177) | 7.6 (.299) | 21.3 (.839) | 8.5 |
| Rear clutch exhaust valve spring | 0.7 (.028) | 6.8 (.268) | 27.4 (1.079) | 12.5 |
| End clutch valve spring | 0.6 (.024) | 6.6 (.260) | 24.4 (.961) | 15.5 |
| 2-3 shift valve spring | 0.8 (.031) | 7.0 (.276) | 27.5 (1.883) | 15.5 |
| N-R control valve spring | 0.7 (.028) | 9.2 (.362) | 32.1 (1.264) | 8.5 |
| Reducing valve spring | 1.2 (.047) | 8.9 (.350) | 29.5 (1.161) | 12.5 |
| Line relief spring | 1.0 (.039) | 7.0 (.276) | 17.3 (.681) | 10 |
| Torque converter valve spring | 1.3 (.051) | 9.0 (.354) | 22.6 (.890) | 9.5 |
| Shift control valve spring | 0.5 (.020) | 5.7 (.224) | 26.8 (1.055) | 22 |
| Damper clutch control valve spring <F4A22> | 0.7 (.028) | 6.2 (.244) | 14.2 (.559) | 9.5 |

## SPACER SET

| Part name | Thickness mm (in.) | Part No. |
|---|---|---|
| Spacer set (for adjustment of input shaft end play) | 1.4 (.055), 1.0 (.040) | MD997854 |
| | 1.4 (.055), 1.2 (.047) | MD997847 |
| | 1.8 (.071), 1.4 (.055) | MD997848 |
| | 1.8 (.071), 1.6 (.063) | MD997849 |
| | 2.2 (.087), 1.8 (.071) | MD997850 |
| | 2.2 (.087), 2.0 (.079) | MD997851 |
| | 2.6 (.102), 2.2 (.087) | MD997852 |
| | 2.6 (.102), 2.4 (.095) | MD997853 |

## SPACER AND SNAP RING

| Part name | Thickness mm (in.) | Identification mark | Part No. |
|---|---|---|---|
| Snap ring (F4A22)<br>(for transfer drive gear end play adjustment) | 1.82 (.0717) | None | MD722538 |
| | 1.88 (.0740) | Blue | MD721014 |
| | 1.94 (.0764) | Brown | MD721015 |
| | 2.00 (.0787) | None | MD721016 |
| | 2.06 (.0811) | Blue | MD721017 |
| | 2.12 (.0835) | Brown | MD722538 |
| Spacer (F4A22)<br>(for adjustment of transfer shaft end play) | 1.20 (.0472) | 20 | MD723160 |
| | 1.23 (.0484) | 23 | MD723161 |
| | 1.26 (.0496) | 26 | MD723162 |
| | 1.29 (.0508) | 29 | MD723163 |
| | 1.32 (.0520) | 32 | MD723164 |
| | 1.35 (.0531) | 35 | MD723165 |
| | 1.38 (.0543) | 38 | MD723166 |
| | 1.41 (.0555) | 41 | MD723167 |
| | 1.44 (.0567) | 44 | MD723168 |
| | 1.47 (.0579) | 47 | MD723169 |
| | 1.50 (.0591) | 50 | MD723170 |
| | 1.53 (.0602) | 53 | MD723171 |
| | 1.56 (.0614) | 56 | MD723172 |
| | 1.59 (.0626) | 59 | MD723173 |
| | 1.62 (.0638) | 62 | MD723174 |
| | 1.65 (.0650) | 65 | MD723175 |
| | 1.68 (.0661) | 68 | MD723176 |
| | 1.71 (.0673) | 71 | MD723177 |
| | 1.74 (.0685) | 74 | MD723178 |
| | 1.77 (.0697) | 77 | MD723179 |
| | 1.80 (.0709) | 80 | MD723180 |
| Snap ring (F4A22)<br>[for adjustment of front clutch and rear clutch snap ring clearance) | 1.6 (.063) | None | MD955630 |
| | 1.7 (.067) | Brown | MD730930 |
| | 1.8 (.071) | Blue | MD955631 |
| | 1.9 (.075) | None | MD730931 |
| | 2.0 (.079) | Brown | MD955632 |
| | 2.1 (.083) | Blue | MD730932 |
| | 2.2 (.087) | None | MD955633 |
| | 2.3 (.091) | Brown | MD730933 |
| | 2.4 (.095) | Blue | MD955634 |
| | 2.5 (.098) | None | MD730934 |
| | 2.6 (.102) | Brown | MD955635 |
| | 2.7 (.106) | Blue | MD730935 |
| | 2.8 (.110) | None | MD955636 |
| | 2.9 (.114) | Brown | MD730936 |
| | 3.0 (.118) | Blue | MD955637 |
| Spacer (F4A33·W4A33)<br>for adjustment of transfer driven gear (center differential case) preloadl | 0.62 (.0244) | 62 | MD737444 |
| | 0.65 (.0256) | 65 | MD737445 |
| | 0.68 (.0268) | 68 | MD737446 |
| | 0.71 (.0280) | 71 | MD737447 |

| Part name | Thickness mm (in.) | Identification mark | Part No. |
|---|---|---|---|
| Spacer (F4A33·W4A33) [for adjustment of transfer driven gear (center differential case) preload] | 0.74 (.0291) | 74 | MD728802 |
| | 0.77 (.0303) | 77 | MD728803 |
| | 0.80 (.0315) | 80 | MD728804 |
| | 0.83 (.0327) | 83 | MD728805 |
| | 0.86 (.0339) | 86 | MD728806 |
| | 0.89 (.0350) | 89 | MD728807 |
| | 0.92 (.0362) | 92 | MD728808 |
| | 0.95 (.0374) | 95 | MD728809 |
| | 0.98 (.0386) | 98 | MD728810 |
| | 1 .01(.0398) | 01 | MD728811 |
| | 1.04 (.0409) | 04 | MD728812 |
| | 1.07 (.0421) | 07 | MD728813 |
| | 1 .10(.0433) | 10 | MD728814 |
| | 1 .13(.0445) | 13 | MD728815 |
| | 1.16 (.0457) | 16 | MD728816 |
| | 1.19 (.0469) | 19 | MD728817 |
| | 1.22 (.0480) | 22 | MD728818 |
| | 1.25 (.0492) | 25 | MD728819 |
| | 1.28 (.0504) | 28 | MD728820 |
| | 1.31 (.0516) | 31 | MD728821 |
| Pressure plate play)adjustment of low/reverse brake end | 5.9 (.232) | A | MD731736 |
| | 6.0 (.236) | 0 | MD731737 |
| | 6.1 (.240) | 1 | MD731738 |
| | 6.2 (.244) | 2 | MD731739 |
| | 6.3 (.248) | 3 | MD731740 |
| | 6.4 (.252) | 4 | MD731588 |
| | 6.5 (.256) | 5 | MD731741 |
| | 6.6 (.260) | 6 | MD731742 |
| | 6.7 (.264) | 7 | MD731743 |
| | 6.8 (.268) | 8 | MD731744 |
| | 6.9 (.272) | 9 | MD731745 |
| Spacer (F4A33·W4A33) (for adjustment of differential case preload) *: W4A33 only | 0.83 (.0327) | 83 | MD720937 |
| | **0.86** (.0339) | **86** | MD720938 |
| | 0.89 (.0350) | 89 | MD720939 |
| | 0.92 (.0362) | 92 | MD720940 |
| | 0.95 (.0374) | 95 | MD720941 |
| | 0.98 (.0386) | 98 | MD720942 |
| | 1.01* (.0398) | 01 | MD720943 |
| | 1.04 (.0409) | 04 | MD720944 |
| | 1.07 (.0421) | 07 | MD720945 |
| | 1 10* (.0433) | J | MD710454 |
| | 1.13 (.0445) | D | MD700270 |
| | 1.16 (.0457) | K | MD710455 |
| | 1.19* (.0469) | L | MD710456 |
| | 1.22 (.0480) | G | MD700271 |
| | 1.25 (.0492) | M | MD710457 |
| | 1.28" (.0504) | N | MD710458 |
| | 1.31 (.0516) | E | MD706574 |

| Part name | Thickness mm (in.) | Identification mark | Part No. |
|---|---|---|---|
| Spacer (F4A33)<br>(for adjustment of differential case preload) | 1.34 (.0528)<br>1.37 (.0539) | 0<br>P | MD71 0459<br>MD7 10460 |
| Snap ring (F4A33·W4A33)<br>(for adjustment of output flange bearing end play) | 1.76 (.0693)<br>1.82 (.0717)<br>1.88 (.0740)<br>1.94 (.0764)<br>2.00 (.0787)<br>2.06 (.0811)<br>2.12 (.0835)<br>2.18 (.0858) | Brown<br>None<br>Blue<br>Brown<br>None<br>Blue<br>Brown<br>None | MD733314<br>MD722538<br>MD721014<br>MD721015<br>MD721016<br>MD721 017<br>MD722539<br>MD733315 |
| Snap ring (F4A33·W4A33)<br>(for adjustment of front clutch and rear clutch end play)<br>*: Rear clutch only | 1.3* (.051)<br>1.4" (.055)<br>1.5 (.059)<br>1.6 (.063)<br>1.7 (.067)<br>1.8 (.071)<br>1.9 (.075)<br>2.0 (.079)<br>2.1 (.083)<br>2.2 (.087)<br>2.3 (.091)<br>2.4 (.094) | None<br>Blue<br>Brown<br>None<br>Blue<br>Brown<br>None<br>Blue<br>Brown<br>None<br>Blue<br>Brown | MD731 747<br>MD731 748<br>MD731 749<br>MD731 750<br>MD731 751<br>MD731 752<br>MD731 753<br>MD731 754<br>MD731 755<br>MD731756<br>MD731757<br>MD731758 |
| Snap ring<br>(for adjustment of end clutch snap ring clearance) | 1.05 (.04)<br>1.30 (.05)<br>1.55 (.06)<br>1.80 (.07)<br>2.05 (.08) | White<br>Yellow<br>None<br>Green<br>Pink | MD71 5800<br>MD715801<br>MD715802<br>MD715803<br>MD71 5804 |
| Spacer (F4A22)<br>(for adjustment of differential case preload) | 1.85 (.073)<br>1.94 (.076)<br>2.03 (.080)<br>2.12 (.083)<br>2.21 (.087)<br>2.30 (.091)<br>2.39 (.094) | H<br>CC<br>FF<br>II<br>LL<br>0 0<br>RR | MD700272<br>MD715956<br>MD71 5959<br>MD715962<br>MD71 5965<br>MD71 5968<br>MD71 5971 |
| Spacer<br>(for adjustment of differential pinion and side gear backlash) | 0.75–0.82 (.0295–.0323)<br>0.83–0.92 (.0327–.0362)<br>0.93–1.00 (.0366–.0394)<br>1.01–1.08 (.0398–.0425)<br>1.09–1.16 (.0429–.0457) | | MD722986<br>MD722985<br>MD722984<br>MD722983<br>MD722982 |
| Spacer (W4A33)<br>(for adjustment of front output bearing preload) | 1.16 (.0457)<br>1.19 (.0469)<br>1.22 (.0480)<br>1.25 (.0492)<br>1.28 (.0504)<br>1.31 (.0516)<br>1.34 (.0528) | 16<br>19<br>22<br>25<br>28<br>31<br>34 | MD736929<br>MD736751<br>MD736931<br>MD726166<br>MD718517<br>MD718518<br>MD718519 |

| Part name | Thickness mm (in.) | Identification mark | Part No. |
|---|---|---|---|
| Spacer (W4A33) (for adjustment of front output bearing preload) | 1.37 (.0539) | 37 | MD71 8520 |
| | 1.40 (.0551) | 40 | MD718521 |
| | 1.43 (.0563) | 43 | MD718522 |
| | 1.46 (.0575) | 46 | MD718523 |
| | 1.49 (.0587) | 49 | MD718524 |
| | 1.52 (.0598) | 52 | MD718525 |
| | 1.55 (.0610) | 55 | MD718526 |
| | 1.58 (.0622) | 58 | MD71 8527 |
| | 1.61 (.0634) | 61 | MD71 8528 |
| | 1.64 (.0646) | 64 | MD71 8529 |
| | 1.67 (.0657) | 67 | MD718530 |
| | 1.70 (.0669) | 70 | MD718531 |
| | 1.73 (.0681) | 73 | MD721959 |
| | 1.76 (.0693) | 76 | MD721960 |
| Spacer (W4A33) [for adjustment of center differential front side gear end play) | 0.53–0.60 (.0209–.0236) | 28 | MD727928 |
| | 0.72–0.76 (.0284–.0299) | 3 0 | MD727930 |
| | 0.85–0.92 (.0335–.0362) | 32 | MD727932 |
| | 1 .01–1.08 (.0398–.0425) | 34 | MD727934 |
| | 1.17–1.24 (.0461–.0489) | 41 | MD727941 |
| Spacer (W4A33) (for adjustment of center differential rear side gear end play) | 0.59–0.66 (.0232–.0260) | 73 | MD724973 |
| | 0.75–0.82 (.0295–.0323) | 4 6 | MD724946 |
| | 0.93–1.00 (.0366–.0394) | 8 1 | MD724981 |
| | 1.09–1.16 (.0429–.0457) | 4 3 | MD724943 |
| | 1.25-1.32 (.0492–.0520) | 72 | MD724972 |
| Spacer (W4A33) (for adjustment of drive bevel gear mount) | 1.34 (.0528) | 34 | MD723600 |
| | 1.37 (.0539) | 37 | MD723601 |
| | 1.40 (.0551) | 40 | MD723602 |
| | 1.43 (.0563) | 43 | MD723603 |
| | 1.46 (.0575) | 46 | MD723604 |
| | 1.49 (.0587) | 49 | MD723605 |
| | 1.52 (.0598) | 52 | MD723606 |
| | 1.55 (.0610) | 55 | MD723607 |
| | 1.58 (.0622) | 58 | MD723608 |
| | 1 .61 (.0634) | 61 | MD723609 |
| | 1.64 (.0646) | 64 | MD7261 70 |
| | 1.67 (.0657) | 67 | MD726171 |
| Spacer (W4A33) (for adjustment of drive bevel gear train preload) | 1.28 (.0504) | B28 | MD726167 |
| | 1.31 (.0516) | B31 | MD7261 68 |
| | 1.34 (.0528) | B34 | MD7261 69 |
| | 1.37 (.0539) | B37 | MD724326 |
| | 1.40 (.0551) | B40 | MD724327 |
| | 1.43 (.0563) | B43 | MD724328 |
| | 1.46 (.0575) | B46 | MD724329 |
| | 1.49 (.0587) | B49 | MD724330 |
| | 1.52 (.0598) | B52 | MD724331 |
| | 1.55 (.0610) | B55 | MD724332 |
| | 1.58 (.0622) | B58 | MD724333 |
| | 1.61 (.0634) | B61 | MD724334 |

| Part name | Thickness mm (in.) | Identification mark | Part No. |
|---|---|---|---|
| Spacer (W4A33) (for adjustment of drive bevel gear train preload) | 1.64 (.0646) | B64 | MD724335 |
| | 1.67 (.0657) | B67 | MD724336 |
| | 1.70 (.0669) | B70 | MD724337 |
| | 1.73 (.0681) | B73 | MD724338 |
| | 1.76 (.0693) | B76 | MD724339 |
| | 1.79 (.0705) | B79 | MD724340 |
| | 1.82 (.0717) | B82 | MD724341 |
| | 1.85 (.0728) | B85 | MD724342 |
| Spacer (W4A33) (for adjustment of driven bevel gear train preload) | 1.19 (.0469) | 19 | MD726172 |
| | 1.22 (.0480) | 22 | MD722081 |
| | 1.25 (.0492) | 25 | MD722082 |
| | 1.28 (.0504) | 28 | MD722083 |
| | 1.31 (.0516) | 31 | MD722084 |
| | 1.34 (.0528) | 34 | MD722085 |
| | 1.37 (.0539) | 37 | MD722086 |
| | 1.40 (.0551) | 40 | MD722087 |
| | 1.43 (.0563) | 43 | MD722088 |
| | 1.46 (.0575) | 46 | MD722089 |
| | 1.49 (.0587) | 49 | MD722090 |
| | 1.52 (.0598) | 52 | MD722091 |
| | 1.55 (.0610) | 55 | MD722092 |
| | 1.58 (.0622) | 58 | MD722093 |
| Spacer (W4A33) (for adjustment of driven bevel gear train preload) | 1.61 (.0634) | 61 | MD722094 |
| | 1.64 (.0646) | 64 | MD722095 |
| | 1.67 (.0657) | 67 | MD722096 |
| | 1.70 (.0669) | 70 | MD722097 |
| | 1.73 (.0681) | 73 | MD722098 |
| | 1.76 (.0693) | 76 | MD722099 |
| | 1.79 (.0705) | 79 | MD722100 |
| | 1.82 (.0717) | 82 | MD722101 |
| | 1.85 (.0728) | 85 | MD722102 |
| | 1.88 (.0740) | 88 | MD722103 |
| | 1.91 (.0752) | 91 | MD722104 |
| | 1.94 (.0764) | 94 | MD722105 |
| Spacer (W4A33) (for adjustment of driven bevel gear mount) | 0.13 (.0051) | 13 | MD720353 |
| | 0.16 (.0063) | 16 | MD720354 |
| | 0.19 (.0075) | 19 | MD720355 |
| | 0.22 (.0087) | 22 | MD720356 |
| | 0.25 (.0098) | 25 | MD720357 |
| | 0.28 (.0110) | 28 | MD720358 |
| | 0.31 (.0122) | 31 | MD720359 |
| | 0.34 (.0134) | 34 | MD720360 |
| | 0.37 (.0146) | 37 | MD720361 |
| | 0.40 (.0517) | 40 | MD720362 |
| | 0.43 (.0169) | 43 | MD720363 |
| | 0.46 (.0181) | 46 | MD720364 |
| | 0.49 (.0193) | 49 | MD720365 |
| | 0.52 (.0205) | 52 | MD720366 |

## TORQUE SPECIFICATIONS

N21CC-

| Items | Nm | ft.lbs. |
|---|---|---|
| Tie rod end to knuckle | 24-35 | 17-25 |
| Lower arm ball joint to knuckle | 60–72 | 43-52 |
| Transaxle mounting bracket to transaxle | 60–80 | 43-58 |
| Special bolts | 46-53 | 33-38 |
| Selector lever assembly mounting bolts | 9-14 | 7–10 |
| Automatic seat belt guide ring attaching bolt | 17-26 | 12-19 |
| Shift lock cable to selector lever assembly | 4-6 | 3-4 |
| Clamp to body | 4-6 | 3-4 |
| Starter motor mounting bolt | 27-34 | 20–25 |
| Oil cooler mounting bolt | 8-12 | 6-8 |
| Eye bolt | 30–35 | 22-25 |
| Tube bracket | 3-5 | 2-4 |
| Tube bracket | 8-12 | 6-8 |
| Oil cooler hose clamp | 4-6 | 3-4 |
| Hose bracket | 3-5 | 2-4 |
| Cover to selector knob | 2.0 or more | 1.4 or more |
| Selector knob to lever assembly | 2.0 or more | 1.4 or more |
| Bell housing cover to engine | 10–12 | 7-9 |
| Transaxle mounting bolt [10 mm (.40 in.) diameter bolt] | 10–12 | 7.2-8.7 |
| Transaxle mounting bolt [8 mm (.31 in.) diameter bolt] | 30–35 | 22-25 |
| Torque converter to drive plate | 73-77 | 53-55 |
| Transaxle control cable to body | 9-14 | 7–10 |
| Transaxle control cable adjusting nut | 10–14 | 7–10 |
| Drive shaft nut | 200–260 | 144-188 |
| Under cover | 9-13 | 7–10 |
| Transfer mounting bolt | 60–80 | 43-58 |
| Indicator panel | 1.0–2.0 | 0.7–14 |
| Lever assembly to bracket assembly | 14–20 | 10–14 |
| Right member installation bolt | | |
| Front | 80–100 | 58-72 |
| Rear | 70–80 | 51–58 |
| Gusset | 70–80 | 51–58 |
| Center bearing bracket | 36-46 | 26-33 |
| <F4A22> | | |
| Oil pan bolt | 10–12 | 7-9 |
| Drive plate-to-converter tightening bolt | 46-53 | 34-38 |
| Drain plug | 30–35 | 22-25 |
| Pressure check plug | 8–10 | 6-7 |
| Pulse generator mounting bolt | 10–12 | 7-9 |
| Bearing retainer screw | 17–22 | 12-15 |
| Lock plate bolt | 35-45 | 26-32 |
| Converter housing bolt | 19-23 | 14-16 |
| One-way clutch outer race bolt | 25-35 | 18-25 |
| Differential drive gear bolt | 130–140 | 94–101 |
| Manual control lever nut | 17–21 | 13-15 |
| Manual control shaft set screw | 8–10 | 6-7 |

| Items | Nm | ft.lbs. |
|---|---|---|
| Inhibitor switch | 10–12 | 7–9 |
| Sprag rod support bolt | 20–27 | 15-19 |
| Pump housing-to-reaction shaft support bolt | 10–12 | 7–9 |
| Oil pump assembly mounting bolt | 15-22 | 11-15 |
| Valve body bolt | 4-6 | 3-4 |
| Valve body assembly mounting bolt | 10–12 | 7–9 |
| Oil filter bolt | 5-7 | 4-5 |
| Speedometer sleeve locking plate bolt | 3-5 | 2-4 |
| End clutch cover | 6-8 | 5-6 |
| Kickdown lock nut | 25-32 | 18-23 |
| <F4A33, W4A33> | | |
| Air exhaust plug | 30–35 | 22-25 |
| Center bearing retainer stopper bolt <W4A33> | 4-6 | 3-4 |
| Center differential drive gear bolt <W4A33> | 70–80 | 51-57 |
| Differential cover bolt | 10–12 | 7–9 |
| Differential drive gear bolt | 130–140 | 94–101 |
| Differential front bearing cap bolt | 60–80 | 43-58 |
| Differential rear bearing retainer bolt | 30–40 | 22-29 |
| End clutch cover bolt | 10–12 | 7-9 |
| Front bearing retainer bolt <W4A33> | 43-55 | 32–39 |
| Idler gear cover bolt | 10–12 | 7–9 |
| Idler shaft lock bolt | 31-44 | 22-32 |
| Inhibitor switch bolt | 10–12 | 7-9 |
| Kickdown servo lock nut | 25-32 | 18-23 |
| Manual control lever nut | 17-21 | 12-15 |
| Manual control shaft set screw | 8–10 | 6-7 |
| Oil drain bolt | 30–35 | 22-25 |
| Oil filter bolt | 5-7 | 4-5 |
| Oil level gauge guide bolt | 20–27 | 15–19 |
| Oil pan bolt | 10–12 | 7–9 |
| Oil pressure check plug | 4-6 | 3-4 |
| Oil pump assembly mounting bolt | 19-23 | 13-17 |
| Oil pump bolt | 10–12 | 7–9 |
| Output bearing retainer bolt | 20–27 | 15–19 |
| Output flange bearing retainer bolt | 17-22 | 12–16 |
| Parking rod support bolt | 20–27 | 15–19 |
| Pulse generator bolt | 10–12 | 7–9 |
| Roll stopper bracket bolt | 43-55 | 32-39 |
| Shift control cable bracket bolt | 20–27 | 15–19 |
| Speedometer gear locking plate bolt | 4-6 | 3-4 |
| Transaxle mount bracket bolt | 60–80 | 43–58 |
| Valve body assembly mounting bolt | 10–12 | 7-9 |
| Valve body bolt | 4-6 | 3-4 |

TRANSFER <W4A33>

| Items | Nm | ft.lbs. |
|---|---|---|
| Cover mounting bolt | 4 - 6 | 3 - 4 |
| Driven bevel gear lock nut | 140–160 | 102–115 |
| Extension housing mounting bolt | 15–22 | 11–15 |
| Oil drain plug | 30–35 | 22-25 |
| Oil filler plug | 30–35 | 22-25 |
| Transfer case adapter mounting bolt | 35-42 | 26–30 |
| Transfer cover mounting bolt | 35-42 | 36–30 |

## LUBRICANTS

N21CD-C

| Items | Specified lubricant | Quantity |
|---|---|---|
| Transaxle fluid liters (qts.) | MOPAR ATF PLUS (Automatic transmission fluid type 7176) or Dia ATF SP or equivalent | 6.1 (6.4) <F4A22><br>7.6 (8.0) <F4A33, W4A33> |
| Key interlock cable<br>Select lever assembly<br>Bushing, sleeve, spring, pushbutton and lock cam | MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent | As required |
| Drive shaft oil seal lip | MOPAR ATF PLUS (Automatic transmission fluid type 7176) or Dia ATF SP or equivalent | As required |

## SEALANTS AND ADHESIVES

N21CE-C

<F4A22>

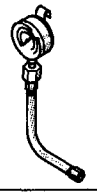
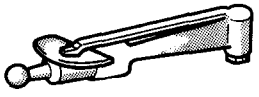
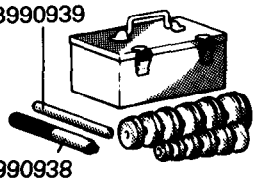
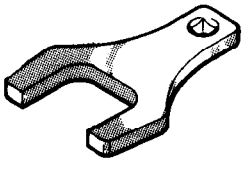
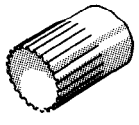
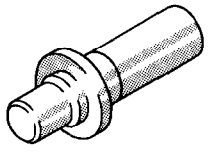
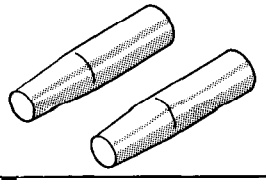
| Items | Specified sealants and adhesives |
|---|---|
| Transaxle case gasket | Silicone grease |
| Bearing retainer screw bolts | MOPAR Part No.4318031 or MOPAR Part No. 4318032 or equivalent |

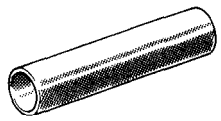
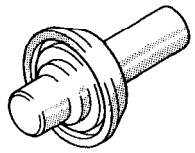
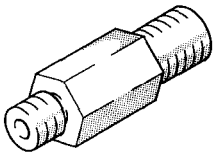
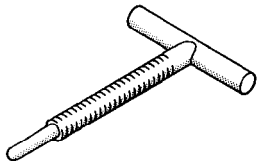
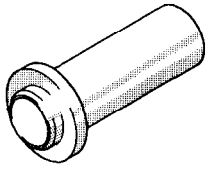
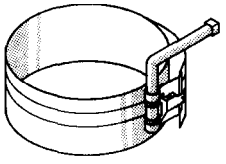
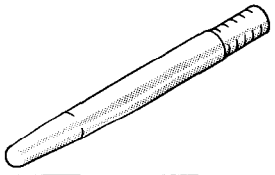
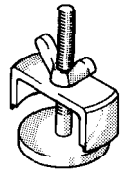
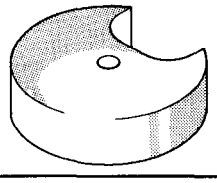
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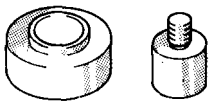
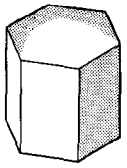
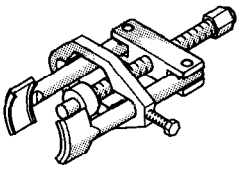
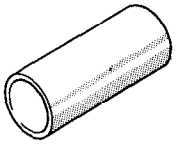
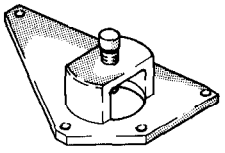
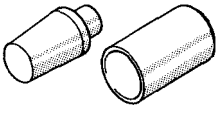
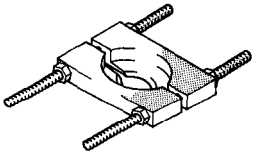
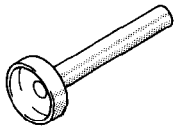
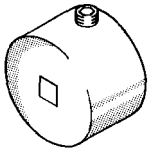
| Items | Specified sealants and adhesives |
|---|---|
| Transfer extension housing-Transfer adapter | MITSUBISHI Genuine Part No.997740 or equivalent |
| Front bearing retainer bolts<br>Center differential flange bolts | MOPAR Part No.4318031 or MOPAR 'Part'" No.4318032 or equivalent |
| Air breather | MOPAR Part No.4318025 or equivalent |

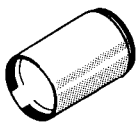
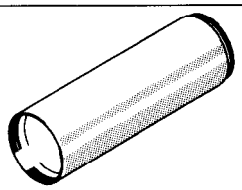
# SPECIAL TOOLS

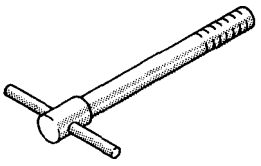
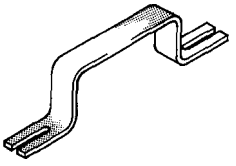
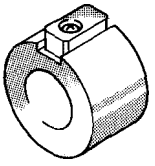
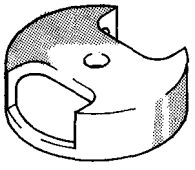
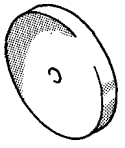
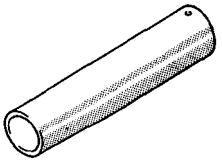
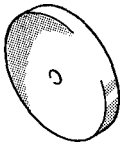
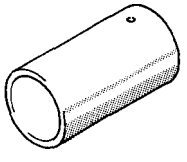
N21DA-C

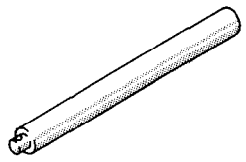
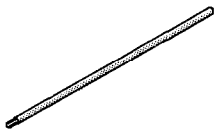
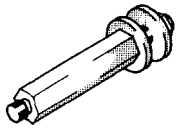
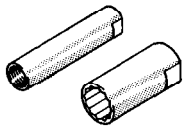
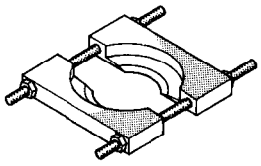
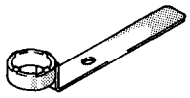
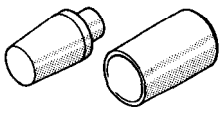
| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB991113 | Steering linkage puller | Removal of the lower arm joint and tie rod end ball joint |
|  | C-3292 | 1,000 kPa pressure checking gauge | Measurement of the hydraulic pressure |
|  | C-3293 | 3,000 kPa pressure checking gauge | Measurement of the hydraulic pressure |
|  | C-3380-A | Torque wrench | Measurement of idle gear preload |
| MB990939  MB990938 | MB990925 | Bearing and oil seal installer | Installation of bearing outer race |
|  | MB991013 | Special spanner | Removal and installation of transfer lock nut |
|  | MB991144 | Side gear holding tool | Measurement of transfer drive gear drive torque (W4A33) |
|  | MD998200 | Oil seal installer | Installation of rear output shaft oil seal |
|  | MD998266 | Guide pins | Alignment of intermediate plate and valve bodies |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998322 | Bearing installer | Installation of bearing |
|  | MD998325 | Drive shaft oil seal installer | Installation of drive shaft oil seal, common to manual and automatic transaxle |
|  | MD998332 | Adapters | Measurement of the hydraulic pressure |
|  | MD998333 | Removers | Removal of oil pump |
|  | MD998334 | Oil pump oil seal installer | Installation of oil pump oil seal |
|  | MD998335 | Oil pump band | Installation of oil pump |
|  | MD998336 | Guide pin | Alignment of oil pump housing and reaction shaft support |
|  | MD998337 | Spring compressor | Use the MD998907 and MD998338 |
|  | MD998338 | Spring compressor | Disassembly of rear clutch |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998341 | Kickdown servo tool | Removal and installation of kickdown servo |
|  | MD998344 | Wrench adapter "B" | Removal and installation of transfer idler shaft |
|  | MD998348 | Bearing/gear puller | Removal of output flange bearing/gear |
|  | MD998349 | Bearing installer | Installation of output flange bearing gear |
|  | MD998351 | Transfer shaft retainer | Installation of transfer shaft rear bearing and gear |
|  | MD998367 | Snap ring installer | Assembly of the end clutch |
|  | MD998801 | Bearing remover | Removal of bearing |
|  | MD998803 | Oil seal installer | Installation of drive shaft oil seal (W4A33) |
|  | MD998806 | Wrench adapter | Measurement of transfer driven bevel gear drive torque (W4A33) |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998812 | Installer cap | Driving of bearing |
|  | MD998813 | Installer–100 | Driving of bearing |
|  | MD998814 | Installer–200 | Driving of bearing |
|  | MD998818 | Installer adapter (38) | Driving of bearing |
|  | MD998819 | Installer adapter (40) | Driving of bearing |
|  | MD998822 | Installer adapter (46) | Driving of bearing |
|  | MD998825 | Installer adapter (52) | Driving of bearing |
|  | MD998827 | Installer adapter (56) | Driving of bearing |
|  | MD998829 | Installer adapter (60) | Driving of bearing |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998830 | Installer adapter (66) | Driving of bearing |
|  | MD998904 | Bolt | Pull-out of idler shaft |
|  | MD998905 | Handle | Removal and installation of center support |
|  | MD998906 | Wrench adapter | Preload measurement of transfer idler shaft<br>Measurement on transfer idler gear |
|  | MD998907 | Spring compressor | Disassembly of front clutch |
|  | MD998908 | Bearing installer | Installation of transfer shaft front bearing |
|  | MD998909 | Bearing installer | Installation of transfer shaft bearing |
|  | MD998910 | Bearing installer | Installation of transfer shaft rear bearing |
|  | MD998911 | Bearing installer | Installation of transfer driven gear bearing |

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MD998912 | Handle | Use the MD998908 and MD998910 |
|  | MD998913 | Dial gauge extension | Measurement of the low-reverse brake end play |
|  | MD998915 | Wrench adapter | Use the MD998918 |
|  | MD998916 | Socket wrench | Adjustment of kickdown servo |
|  | MD998917 | Bearing remover | Disassembly and reassembly of output flange |
|  | MD998918 | Kickdown servo wrench | Adjustment of kickdown servo |
|  | MD998919 | Snap ring installer | Reassembly of end clutch |

Based upon use of the troubleshooting guide, the probable location of the problem should be estimated.

⇩

Checks should be made of fluid levels and the condition of the ATF, as well as the condition of the manual control cables; adjustments should then be made if found to be necessary.

⇩

If a presumption has been made that there is an abnormal condition somewhere in the electronic-control system, check the fault code, in order to determine the probable location of the problem, by using a voltmeter.

⇩

When the abnormal system is discovered, check each element (sensors, etc.) one by one, and make repairs as necessary.

⇩

When the abnormal condition is presumed to be in the oil-pressure-control system, check by making an oil-pressure test.

⇩

When the result of the oil-pressure test does not satisfy the specified pressure, check each system at places related to the valve body, check the oil-pressure passages for leakage, etc.

⇩

If the problem is unusually dirty ATF, abnormal noises, oil leakage, or slippage of the clutch or brakes, or an abnormal condition of the transaxle itself, disassemble and repair the transaxle.

# TROUBLESHOOTING

N21EBAY

Functional malfunctions of the ELC-4A/T can lead to other problems, such as those described below:
(1) Improper maintenance and/or adjustments
(2) Malfunctions of the electronic control functions
(3) Malfunctions of mechanical functions
(4) Malfunctions of hydraulic control functions
(5) Malfunctions of engine performance
etc.

In order to properly determine ("Troubleshoot") the source of these malfunctions, it is first essential to methodically question the user concerning the details of the problem, such as the condition of the problem, the situation at the time the problem occurred, and any other relevant information, all in as much detail as possible. The user should also be asked whether or not the problem has occurred more than once, and under what conditions.
Subsequently, certain tests should be conducted in a certain order, as described at the left.

## TROUBLESHOOTING GUIDE

| | | Problem / Presumed cause | Driving impossible or abnormal (before start-off) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Starter motor won't function | Forward/backward movement impossible | Forward movement impossible | Backward movement impossible | Engine stalls when N → D or R | Clutch slips at D (stall rpm too high) | Clutch slips at R (stall rpm too high) | Stall rpm too low | Vehicle moves at P or N | Engine starts, or vehicle moves, between N-R or N-D | Parking doesn't hold | Abnormal vibration-shock when shift to D-2-L-R |
| Engine | 1 | Abnormal idling rpm | | | | | ⊗ | | | | | | | × |
| | 2 | Performance malfunction | | | | | × | | | × | | | | |
| Transaxle (power train) | 3 | Improper adjustment of manual linkage | × | ⊗ | ⊗ | ⊗ | | ⊗ | ⊗ | | ⊗ | ⊗ | ⊗ | ⊗ |
| | 4 | Malfunction of torque convertor | | × | × | × | | | | × | | | | |
| | 5 | Operation malfunction of oil pump | | × | × | × | | × | × | | | | | |
| | 6 | Malfunction of one-way clutch | | | × | | | × | | | | | | |
| | 7 | Damaged or worn gear or other rotating part, or improper adjustment of the preload | | | | | | | | | | | | |
| | 8 | Malfunction of parking mechanism | | | | | | | | | × | | × | |
| | 9 | Cracked drive plate, or loose bolt | | × | | | | | | | | | | |
| | 10 | Worn inside diameter of front clutch retainer | | | | × | | | × | | | | | |
| Oil-pressure system (including friction elements) | 11 | Low fluid level | | ⊗ | ⊗ | ⊗ | | × | × | | | | | |
| | 12 | Line pressure too low (seal damaged, leakage, looseness, etc.) | | ⊗ | ⊗ | ⊗ | | ⊗ | ⊗ | | | | | |
| | 13 | Malfunction of valve body (sticking valve, working cavity, adjustment, etc.) | | ⊗ | ⊗ | ⊗ | × | × | × | | × | × | | × |
| | 14 | Malfunction of front clutch or piston | | | | × | | | × | | | | | × |
| | 15 | Malfunction of rear clutch or piston | | | ⊗ | | | × | | | | | | × |
| | 16 | Malfunction of kickdown band or piston | | | | | | | | | | | | |
| | 17 | Improper adjustment of kickdown servo | | | | | | | | | | | | |
| | 18 | Malfunction of low-reverse brake or piston | | × | | × | | | × | | | | | × |
| | 19 | O-ring of low-reverse brake circuit between valve body and case not installed | | | | × | | | × | | | | | |
| | 20 | Malfunction of end clutch or piston (check ball hole, other) | | | | | | | | | | | | |
| Electronic-control system | 21 | Malfunction of inhibitors switch, damaged or disconnected wiring, or improper adjustment | × | | | | | | | | × | × | | × |
| | 22 | Malfunction of TPS, or improper adjustment | | | | | | | | | | | | × |
| | 23 | Pulse generator (A) damaged or disconnected wiring, or short-circuit | | | | | | | | | | | | |
| | 24 | Pulse generator (B) damaged or disconnected wiring, or short-circuit | | | | × | | | | | | | | |
| | 25 | Malfunction of kickdown servo switch | | | | | | | | | | | | |
| | 26 | SCSV-A or B damaged or disconnected wiring, or short-circuit or sticking (valve open) | | | | | | | | | | | | |
| | 27 | Malfunction of ignition signal system | | | | | | | | | | | | |
| | 28 | Incorrectly grounded ground strap | | | | | | | | | | | | |
| | 29 | PCSV damaged or disconnected wiring, or short-circuit | | | | | | | | | | | | |
| | 30 | PCSV damaged or disconnected wiring (valve open) | | ⊗ | ⊗ | ⊗ | | × | × | | | | | |
| | 31 | DCCSV damaged or disconnecting wiring (valve closed) | | | | | | | | | | | | |
| | 32 | DCCSV short-circuit or sticking (valve open) | | | | | ⊗ | | | | | | | |
| | 33 | Malfunction of overdrive control switch | | | | | | | | | | | | |
| | 34 | Malfunction of accelerator switch, or improper adjustment | | | | | | | | | | | | × |
| | 35 | Malfunction of oil-temperature sensor | | | | | | | | | | | | |
| | 36 | Malfunction of lead switch | | | | | | | | | | | | |
| | 37 | Poor contact of ignition switch | | | | | | | | | | | | |
| | 38 | Malfunction of transaxle control unit | | | | | | | | | | | | × |

NOTE: ⊗ indicates items of high priority during inspection.
Abbreviations: TPS = Throttle position sensor SCSV = Shift control solenoid valve

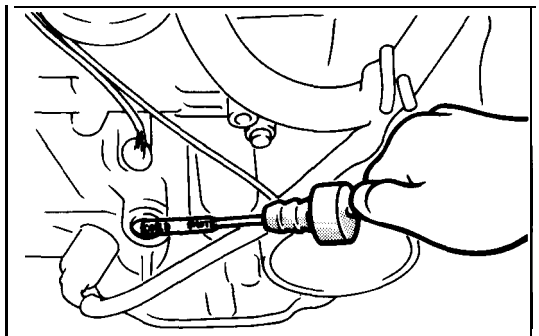
| | Transaxle malfunction of shift-shock (after start-off) | | | | | | | | | | | | | | | | Abnormal noise, other | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Won't shift from 2nd to 3rd | Won't shift to 4th | Overdrive control switch doesn't function | Doesn't shift according to shift pattern (shifting is possible) | Improper start-off (starts off from 2nd, etc.) | Excessive creeping or idling vibration | Excessive vibration-shock when shift 1-2 or 3-4 | Excessive vibration-shock when shift 2-3 or 4-3 | Excessive vibration-shock during upshift | Excessive vibration-shock during D-2 downshift | Sudden engine rpm increase during upshift | Sudden engine rpm increase during 3-2 shift, excessive vibration | Excessive vibration-shock only when cold | Excessive vibration-shock (other than already described) | Damper clutch won't function | Abnormal vibration in high-load region in low gear (approx. 1 Hz) | Abnormal noise from convertor housing together with engine rpm | Mechanical noise (clatter noise) from convertor housing | Abnormal noise inside transaxle case | 3rd gear is held |
| 1 | | | | | | × | | | | | | | | | | | | | | |
| 2 | | | | | × | | × | × | × | × | | | × | × | | × | | | | |
| 3 | | × | | | × | | | | | | | | | | | | | | | × |
| 4 | | | | | × | | | | | | | | | | × | × | | | | |
| 5 | | | | | | | | | | | | × | | | | | × | | | |
| 6 | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | × | |
| 8 | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | × | | |
| 10 | × | × | | | | | | | | | × | × | | | | | | | | × |
| 11 | | | | | | | | | | | | × | | | | | | | | × |
| 12 | | | | | | | | | | | ⊗ | ⊗ | | × | | | | | | × |
| 13 | × | | | × | × | | × | × | × | × | × | × | × | × | × | × | | | | × |
| 14 | × | | | | | | | × | × | | × | | | | | | | | | × |
| 15 | | | | | | | | | | | | | | | | | | | | × |
| 16 | | | | | | | × | | | | × | × | | | | | | | | × |
| 17 | | | | | | | × | | | | × | × | | × | | | | | | |
| 18 | | | | | | | | | | × | | | | | | | | | | × |
| 19 | | | | | | | | | | | | | | | | | | | | × |
| 20 | | ⊗ | | | | | × | | | | × | | | | | | | | | × |
| 21 | | × | | | × | | | | | | | | | | | | | | | × |
| 22 | | | | ⊗ | | | × | × | ⊗ | × | ⊗ | × | | × | × | × | | | | |
| 23 | | | | | | | × | × | × | × | × | × | | × | × | × | | | | × |
| 24 | | | | × | | | | | | | | | | | × | × | | | | × |
| 25 | | | | | | | × | | | | | × | | | | | | | | × |
| 26 | | | | | | | | | | | | | | | | | | | | × |
| 27 | | | | | | | × | × | × | × | × | × | | × | × | | | | | |
| 28 | | | | | | | | | | | | | | | | | | | | × |
| 29 | | | | | | | | | | | | | | | | | | | | × |
| 30 | × | × | | | | | | | | | × | × | | | | | | | | × |
| 31 | | | | | | | | | | | | | | | × | | | | | |
| 32 | | | | | | | | | | | | | | | | × | | | | × |
| 33 | | × | × | | | | | | | | | | | | | | | | | |
| 34 | | | | | × | × | | | | | | | | | × | | | | | |
| 35 | | | | | | | | | | | | | | × | × | × | | | | |
| 36 | | | | | | | | | | | | | | | | | | | | × |
| 37 | | | | × | | | | | | | | | | | | | | | | × |
| 38 | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | × | | | × |

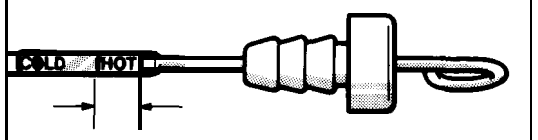
PSCV = Pressure control solenoid valve
DCCSV = Damper clutch control solenoid valve

## DIAGNOSIS AND TEST

### FLUID LEVEL AND CONDITION

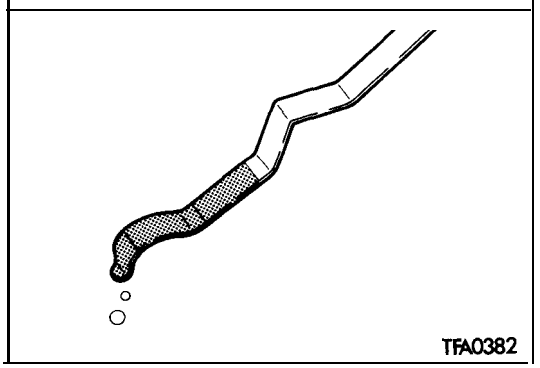
1. Drive until the fluid temperature reaches the usual temperature [70–80°C (160–180°F)].
2. Place vehicle on level floor.
3. Move selector lever sequentially to every position to fill torque converter and hydraulic circuit with fluid, then place lever in "N" Neutral position. This operation is necessary to be sure that fluid level check is accurate.
4. Before removing dipstick, wipe all dirt from area around dipstick. Then take out the dipstick and check the condition of the fluid.
   The transaxle should be overhauled under the following conditions.
   - If there is a "burning" odor.
   - If the fluid color has become noticeably blacker.
   - If there is a noticeably great amount of metal particles in the fluid.
5. Check to see if fluid level is in "HOT" range on dipstick. If fluid level is low, add automatic transaxle fluid until level reaches "HOT" range.
   Low fluid level can cause a variety of conditions because it allows pump to take in air along with fluid. Air trapped in hydraulic circuit forms bubbles which make fluid spongy. Therefore, pressures will be erratic.
   Improper filling can also raise fluid level too high. When transaxle has too much fluid, gears churn up foam and cause same conditions which occur with low fluid level, resulting in accelerated deterioration of automatic transaxle fluid.
   In either case, air bubbles can cause overheating, fluid oxidation, which can interfere with normal valve, clutch, and servo operation. Foaming can also result in fluid escaping from transaxle vent where it may be mistaken for a leak.
6. Be sure to examine fluid on dipstick closely.


09P0010



Fluid level must be within this range.

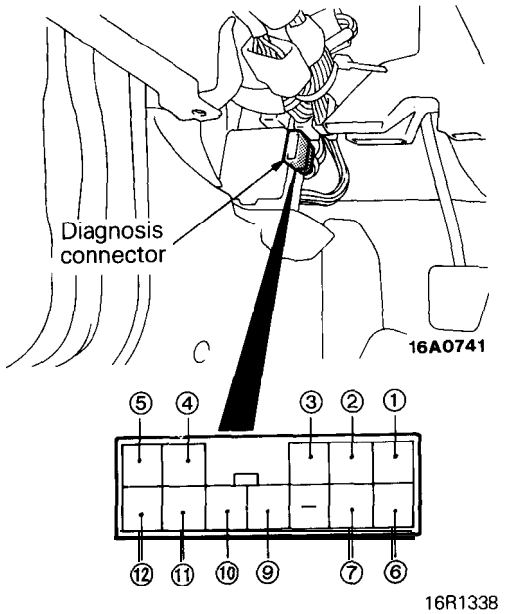
09P0011


TFA0382

### CONTROL CABLE

Whether control cable is properly adjusted can be confirmed by checking whether inhibitor switch is performing well.

1. Apply parking brakes and service brakes securely.
2. Place selector lever to "R" range.
3. Set ignition key to "ST" position.
4. Slowly move the selector lever upward until it clicks as it fits in notch of "P" range. If starter motor operates when lever makes a click, "P" position is correct.
5. Then slowly move selector lever to "N" range by the same procedure as in foregoing paragraph. If starter motor operates when selector lever fits in "N", "N" position is correct.
6. Also check to be sure the vehicle doesn't begin to move and the lever doesn't stop between P-R-N-D.
7. The control cable is properly adjusted if, as described above, the starter motor starts at both the "P" range and the "N" range.




⑥: ELC-4A/T
⑩: Diagnosis control
⑫: Ground

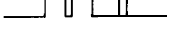
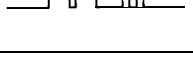
OBTAINING FAULT CODES

(1) Connect the voltmeter to the connector for diagnosis.
(2) Read the output fault codes.
Then follow the remedy procedures according to the "FAULT CODE DESCRIPTION" on the following page.

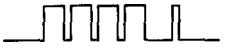
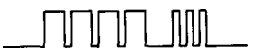
NOTE
- As many as a maximum of ten fault codes, in the sequence of occurrence, can be stored in the Random Access Memory (RAM) incorporated within the control unit.
- If the number of stored fault codes or fault patterns exceeds ten, already stored fault codes will be erased, in sequence beginning with the oldest.
- Do not disconnect the battery until all fault codes or fault patterns have been read out, because all stored fault codes or fault patterns will be canceled when the battery is disconnected.

(3) If the fail-safe system is activated and the transaxle is locked in 3rd gear, the fault code in the Fail-Safe Code Description will be stored in the RAM.
Three of these fault codes can be stored.
(4) The cancelation will occur if, with the transaxle locked in 3rd gear, the ignition key is turned to the OFF position, but the fault code is stored in the RAM.

## FAULT CODE DESCRIPTION

| Code No. | Output pattern | Description | Remedy |
|---|---|---|---|
| 11 |  | Abnormal increase of TPS output | • Check the throttle position sensor connector.<br>• Check the throttle position sensor itself.<br>• Adjust the throttle position sensor.<br>• Check the accelerator switch (Code No. 24 output or not). |
| 12 |  | Abnormal decrease of TPS output | |
| 13 |  | Malfunction of the throttle-position sensor or incorrect adjustment | |
| 15 |  | Damaged or disconnected wiring of low oil temperature sensor | • Check the oil temperature sensor connector.<br>• Check the oil temperature sensor itself. |
| 16 |  | Short circuit of high oil temperature sensor | |
| 17 |  | Damaged or disconnected wiring of high oil temperature sensor or short-circuit of low oil temperature sensor | |
| 21 |  | Damaged or disconnected wiring of the kickdown servo switch | • Check the kickdown servo switch connector.<br>• Check the kickdown servo switch itself. |
| 22 |  | Short circuit of the kickdown servo switch | |
| 23 |  | Damaged or disconnected wiring of the ignition pulse pick-up cable | • Check the ignition pulse signal line. |
| 24 |  | Short circuit of the accelerator switch or improper adjustment | • Check the accelerator switch connector.<br>• Check the accelerator switch itself.<br>• Adjust the accelerator switch. |
| 31 |  | Damaged or disconnected wiring of the pulse generator A | • Check the pulse generator A and pulse generator B themselves.<br>• Check the vehicle speed reed switch (for chattering). |
| 32 |  | Damaged or disconnected wiring of the pulse generator B | |

12A0104
12A0107

| Code No. | Output pattern | Description | Remedy |
|---|---|---|---|
| 41 |  | Damaged or disconnected wiring of the shift control solenoid valve A | • Check the solenoid valve connector.<br>• Check shift control solenoid valve A itself. |
| 42 |  | Short circuit of the shift control solenoid valve A | |
| 43 |  | Damaged or disconnected wiring of the shift control solenoid valve B | • Check the solenoid valve connector.<br>• Check shift control solenoid valve B itself. |
| 44 |  | Short circuit of the shift control solenoid valve B | |
| 45 |  | Damaged or disconnected wiring of the pressure control solenoid valve | • Check the solenoid valve connector.<br>• Check the pressure control solenoid valve itself. |
| 46 |  | Short circuit of the pressure control solenoid valve | |
| 47 |  | Damaged or disconnected wiring of the damper clutch control solenoid valve | • Check the solenoid valve connector.<br>• Check the damper clutch control solenoid valve itself. |
| 48 |  | Short circuit of the damper clutch control solenoid valve | |
| 49 |  | Malfunction of the damper clutch system | • Check the damper clutch hydraulic pressure system.<br>• Check the damper clutch control solenoid valve itself.<br>• Replace the control unit. |
| 51 |  | First gear non-synchronous | • Check the pulse generator A and pulse generator-B connectors.<br>• Check pulse generator A and pulse generator B themselves.<br>• Rear clutch slippage. |
| 52 |  | Second gear non-synchronous | • Check the pulse generator A and pulse generator B connectors.<br>• Check pulse generator A and pulse generator B themselves.<br>• Rear clutch slippage.<br>• Kickdown brake slippage. |

12A0105
12A0106

| Code No. | Output pattern | Description | Remedy |
|---|---|---|---|
| 53 |  | Third gear non-synchronous | • Check the pulse generator A output circuit harness.<br>• Check the pulse generator A and pulse generator B connectors.<br>• Check the pulse generator A and pulse generator B themselves.<br>• Front clutch slippage.<br>• Rear clutch slippage. |
| 54 |  | Fourth gear non-synchronous | • Check the pulse generator A output circuit harness.<br>• Check the pulse generator A and pulse generator B connectors.<br>• Check pulse generator A and pulse generator B themselves.<br>• End clutch slippage.<br>• Kickdown brake slippage. |

12A0106

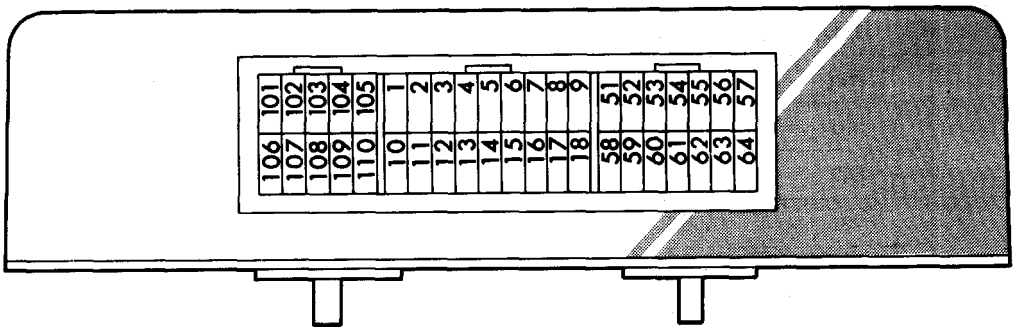
## FAIL-SAFE CODE DESCRIPTION

| Code No. | Output pattern | Description | Fail-safe | Note (relation to fault code) |
|---|---|---|---|---|
| 81 |  | Damaged or disconnected wiring of the pulse generator A | 3rd gear (D) or 2nd gear (2, L) hold | 31 |
| 82 |  | Damaged or disconnected wiring of the pulse generator B | 3rd gear(D) or 2nd gear (2, L) hold | 32 |
| 83 |  | Damaged or disconnected wiring, or short circuit, of shift control solenoid valve A | 3rd gear hold | 41, 42 |
| 84 |  | Damaged or disconnected wiring, or short circuit, of shift control solenoid valve B | 3rd gear hold | 43, 44 |
| 85 |  | Damaged or disconnected wiring, or short circuit, of the pressure control solenoid valve | 3rd gear(D) or 2nd gear (2, L) hold | 45, 46 |
| 86 |  | Shift steps non-synchronous | 3rd gear (D) or 2nd gear (2,L) hold | 51, 52, 53, 54 |

12L0296

## TRANSAXLE CONTROL UNIT

The 42 pin connector is for increased sensor input. Terminal layout for the 42 pin connector is as shown below.




TFA0360

101. Damper clutch control solenoid valve <F4A22>
102. Shift control solenoid valve A
103. Oil temperature warning light <W4A33>
104. Power supply
105. Ground
106. Pressure control solenoid valve
107. Shift control solenoid valve B
108. –
109. Power supply
110. Ground

1. Ground
2. –
3. Accelerator switch
4. –
5. Diagnosis output terminal
6. Air conditioner relay signal
7. –
8. Diagnosis control terminal
9. –
10. Power supply (Backup)
11. Kickdown servo switch
12. –
13. –
14. Oil temperature sensor
15. High oil temperature sensor <F4A33·W4A33>
16. Throttle position sensor
17. Sensor ground
18. Vehicle speed reed switch

51. Inhibitor switch (P)
52. Inhibitor switch (R)
53. Inhibitor switch (N)
54. Inhibitor switch (D)
55. Inhibitor switch (2)
56. inhibitor switch (L)
57. Overdrive switch
58. Pulse generator B
59. Pulse generator B
60. Pulse generator A
61. Pulse generator A
62. Ground
63. Ignition pulse
64. Power mode signal

## ELEMENT IN USE AT EACH POSITION OF SELECTOR LEVER

| Selector lever position | Overdrive control switch | Shifting gear | Gear ratio | Engine start | Parking mechanism | Clutch | | | | Brake | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | C1 | C2 | C3 | OWC | B1 | B2 |
| P | – | Neutral | – | Possible | ● | | | | | | |
| R | – | Reverse | 2.176 | | | ● | | | | | ● |
| N | – | Neutral | – | Possible | | | | | | | |
| D | ON | 1st | 2.846 | | | | ● | | ● | | |
| | | 2nd | 1.581 | | | | ● | | | ● | |
| | | 3rd | 1.000 | | | ● | ● | ● | | | |
| | | OD | 0.685 | | | | | ● | | ● | |
| D | OFF | 1st | 2.846 | | | | ● | | ● | | |
| | | 2nd | 1.581 | | | | ● | | | ● | |
| | | 3rd | 1.000 | | | ● | ● | ● | | | |
| 2 | – | 1st | 2.846 | | | | ● | | ● | | |
| | | 2nd | 1.581 | | | | ● | | | ● | |
| L | – | 1st | 2.846 | | | | ● | | | | ● |

C1 Front clutch
C2 Rear clutch
C3 End clutch

B1 Kickdown brake
B2 Low-reverse brake
OWC Oneway clutch

## SHIFT PATTERNS

Two shift patterns are pre-stored in the control unit of this transaxle. One is the power pattern (for more powerful performance), and the other is the economy pattern (for improved fuel consumption and quieter operation).

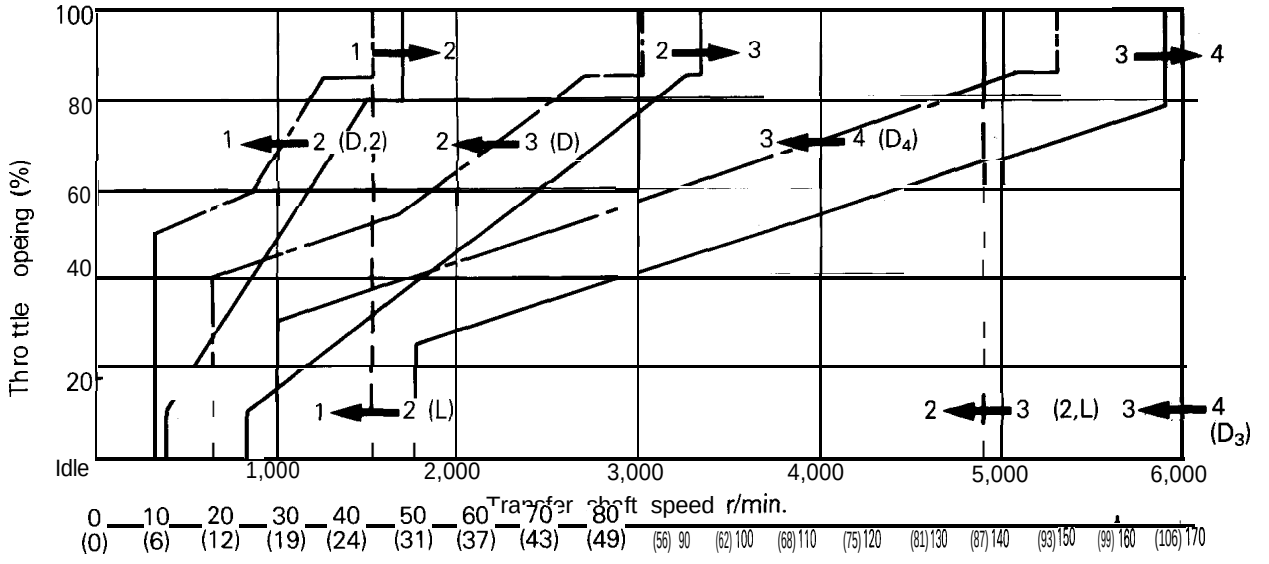
The driver can select and switch to the desired pattern by using the power/economy select switch on the center console.

The solid lines shown in these shift patterns indicate up-shifts, and the broken lines indicate down-shifts. The reason why there is a difference between the shift points for up-shifts and for down-shifts is so that up-shifts and down-shifts will not occur frequently when driving at a speed in the vicinity of the shift point.

When the vehicle is stopped, there is a shift to 2nd gear in order to obtain a suitable "creeping", but when the accelerator pedal is then depressed the vehicle starts off in 1st gear.

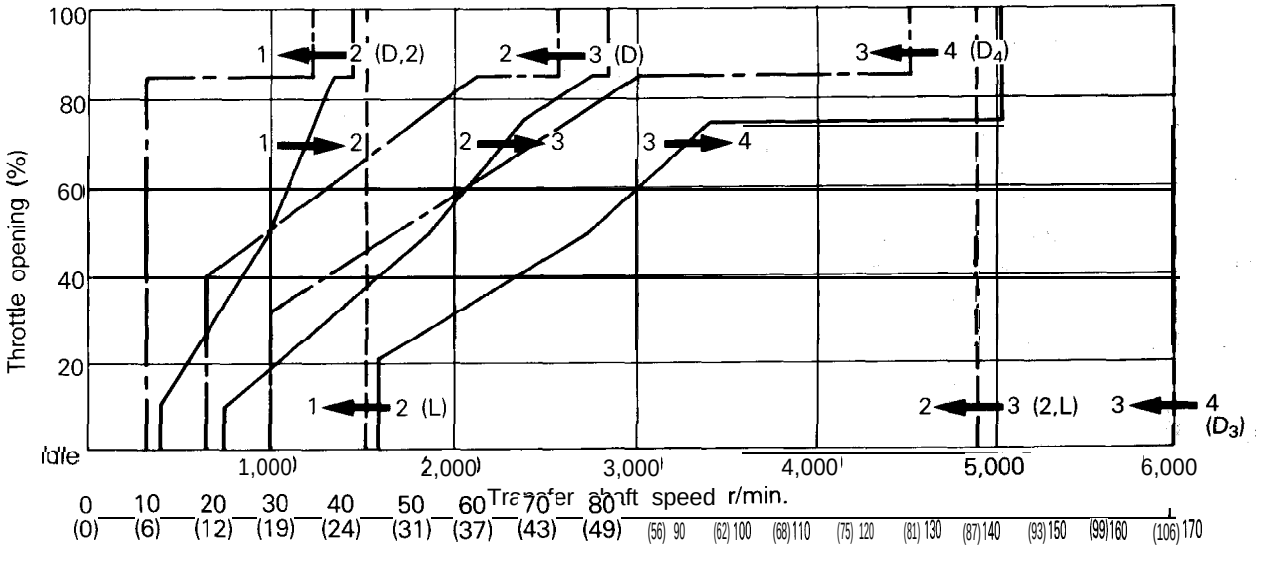
## 1.8L Engine (F4A22-2-MPD)

**P range**




TFA0486

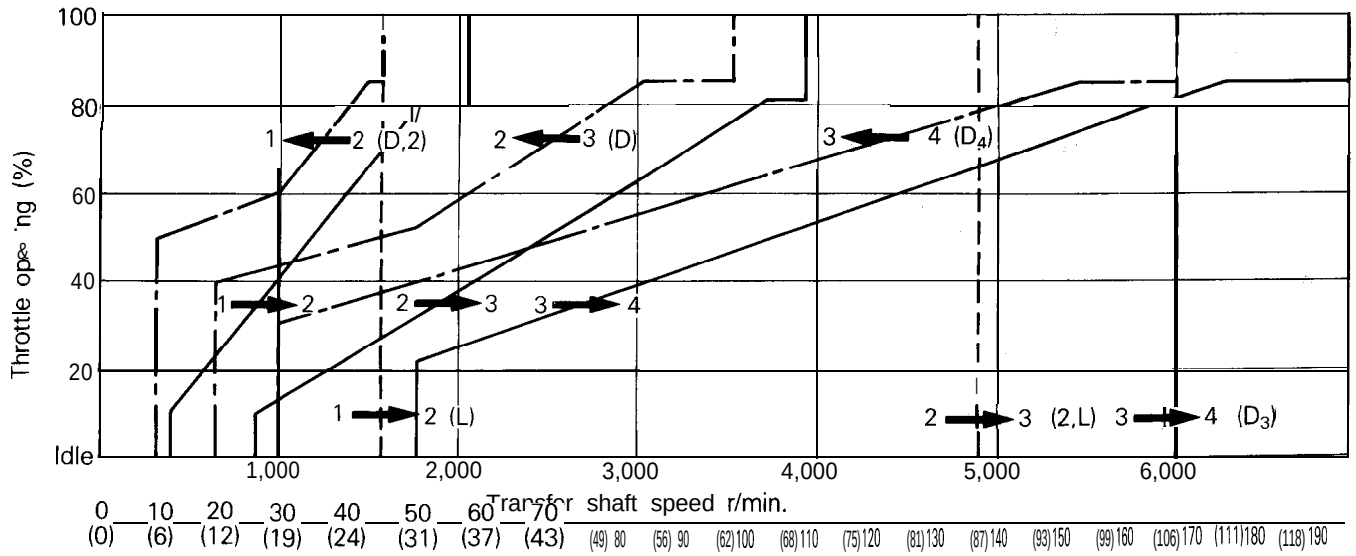
**E range**




TFA0487

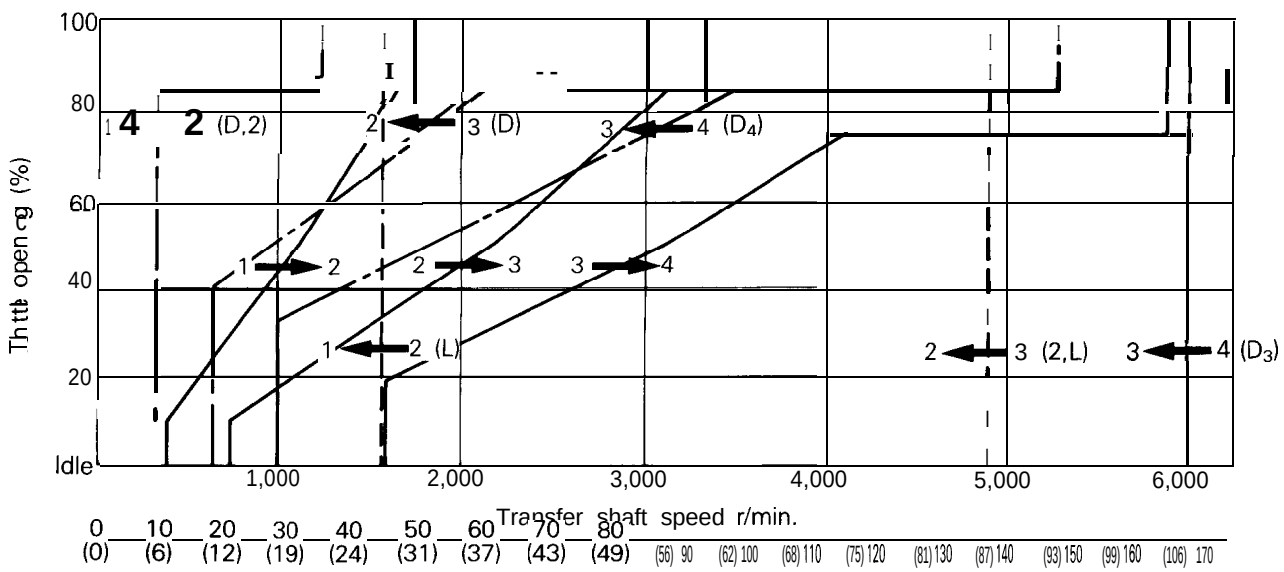
## 2.0L DOHC Engine (F4A22-2-MPDI)

**P range**




TFA0488

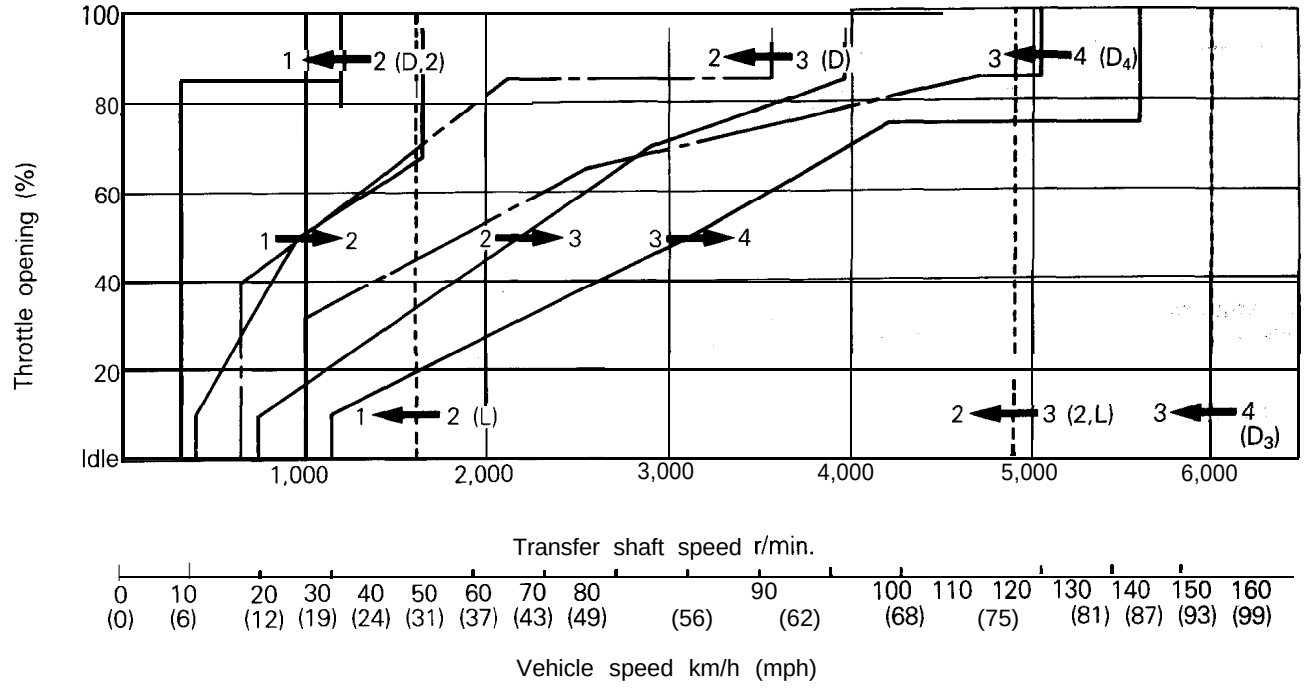
**E range**




TFA0489

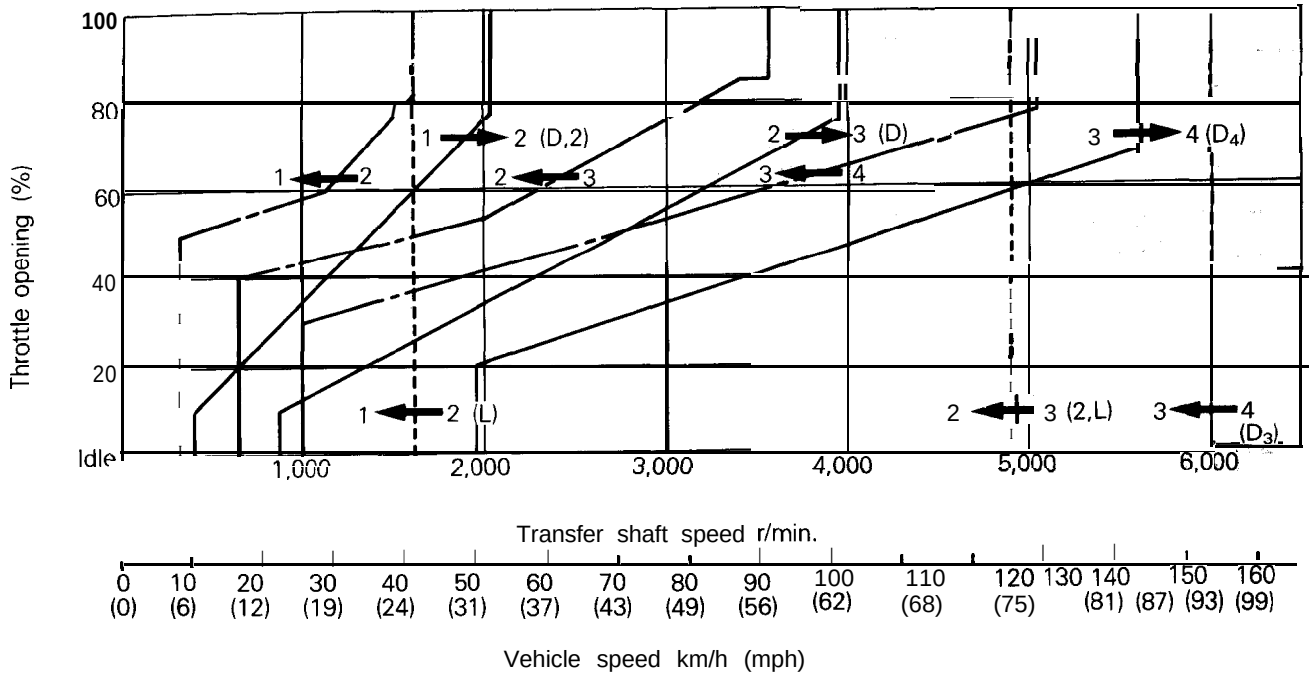
## 2.0L DOHC Turbo Engine (F4A33·W4A33)

**P range**




TFA0572

**E range**




TFA0575

## INSPECTION OF ELECTRONIC CONTROL SYSTEM COMPONENTS

**1. Wiring**

→ Based on the wiring diagram, check whether the continuity and grounding of each harness is OK.

→ No continuity

→ Improper connection of connector, damaged or disconnected harness, or incorrect wiring connection.

→ Reconnect the connector; repair or replace the harness.

Based on the wiring diagram, check whether the continuity and grounding of each harness is OK.

→ Continuity

→ Normal

**2. Oil-temperature sensor**

→ Vary the thermo-sensitive part from low temperature to high temperature and check the resistance between the terminals 1 and 2 or 2 and 3.

→ No continuity (resistance: ∞)

→ Damaged or disconnected wiring

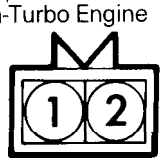
→ Replace the oil-temoerature sensor

Vary the thermo-sensitive part from low temperature to high temperature and check the resistance between the terminals 1 and 2 or 2 and 3.

→ Changes of the resistance continuous and smooth.

→ Normal

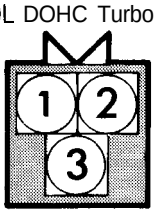
1.8L, 2.0L DOHC Non-Turbo Engine




1750446

1: (+) side
2: (−) side

2.0L DOHC Turbo Engine




1. Low temperature side
2. Ground
3. High temperature side

1750447

**3. Throttle-position sensor (TPS)**

→ Check the resistance between terminals 1 and 4 (1 and 2 for SOHC models) of the TPS.

→ Resistance: high or infinite

→ Damaged or disconnected wiring

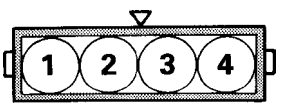
→ Replace the TPS.

Check the resistance between terminals 1 and 4 (1 and 2 for SOHC models) of the TPS.

→ 3.5-6.5 Ω/20°C (68°F)

TPS terminal

2.0L Engine




1. power
2. output
3. –
4. ground

7FU0535

Check the resistance between terminals 4 and 2 (2 and 3 for SOHC models) with the engine idling after throttle-valve opening warm-up.

→ Resistance: more or less than 0.4 kilohm/20°C (68°F)

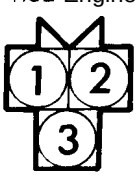
→ Improper adjustment

→ Readjust the TPS installation.

Check the resistance between terminals 4 and 2 (2 and 3 for SOHC models) with the engine idling after throttle-valve opening warm-up.

→ Resistance: approx. 0.4 kilohm/20°C (68°F)

1.8L Engine




1. power
2. ground
3. output

1750445

Check for changes of the resistance between terminals 4 and 2 (for SOHC between terminals 3 and 2 when the throttle valve is operated from the idling position to the fully open position.

→ Changes of the resistance are not continuous.

→ Poor contact

→ Replace the TPS.

Check for changes of the resistance between terminals 4 and 2 (for SOHC between terminals 3 and 2 when the throttle valve is operated from the idling position to the fully open position.

→ Changes of the resistance continuous and smooth.

→ Normal

**4. Pulse generator A or B**

Check the resistance between terminals 1 and 2 or 3 and 4.

- Resistance: too low or too high → Short-circuit; or damaged or disconnected wiring → Replace the pulse generator.
- 215-275 Ω/20°C (68°F) → Normal

Pulse generator terminals

1–2: pulse generator A
3–4: pulse generator B




1750338

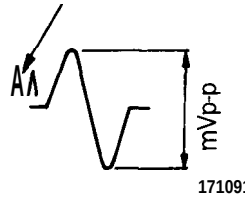
**5. Pulse generator A or B (checking by an oscilloscope)**

Connect the pulse generator and body harness, and connect an oscilloscope. Check with the chassis on a dynamo or with the front wheels raised.

With the selector lever at the "L" position and the engine running at 1,000 rpm, check the voltage waveform between terminals 1 and 2.

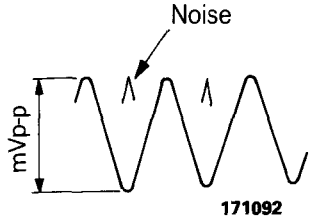
- Very low voltage → Incorrect installation of the pulse generator, or malfunction of the pulse generator. → Correct the installation condition, or replace the pulse generator.
- Noise in the waveform → Improper grounding of the pulse generator circuit's shielded wiring. → Replace the pulse generator.
- 1,000 mVp-p or higher

Oscilloscope waveform
1,8L, 2.0L DOHC Non-Turbo Engine




171091

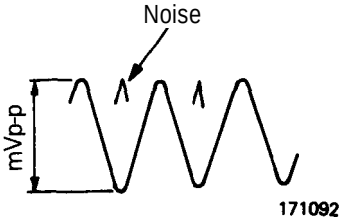
2.0L DOHC Turbo Engine




171092

With the selector lever at the "L" position and the engine running at 1,000 rpm, check the voltage waveform between terminals 3 and 4.

- Very low voltage → Incorrect installation of the pulse generator, or malfunction of the pulse generator. → Correct the installation condition, or replace the pulse generator.
- Noise in the waveform → Improper grounding of the pulse generator circuit's shielded wiring. → Replace the pulse generator.
- 500 mVp-p or higher




171092

Normal

**6. Pressure-control solenoid valve (PCSV)**

Check the resistance between terminal 1 of the solenoid valve connector and the transaxle case.

- Resistance: too low or too high → Short-circuit, or damaged or disconnected wiring → Replace the PCSV.
- 2.9 ± 0.3Ω/20°C (68°F)

Connect 12V between the transaxle case and terminal 2; switch ON and OFF and check for operation noise.

- No operation noise. (stroke: 0.3 mm (.012 in.) or less) → Foreign material caught between the valve and guide → Replace the PCSV.
- Noise exists.
- Normal

Solenoid valve connector terminals




1750338

1: PCSV
2: DCCSV
3: SCSV-A
4: SCSV-B

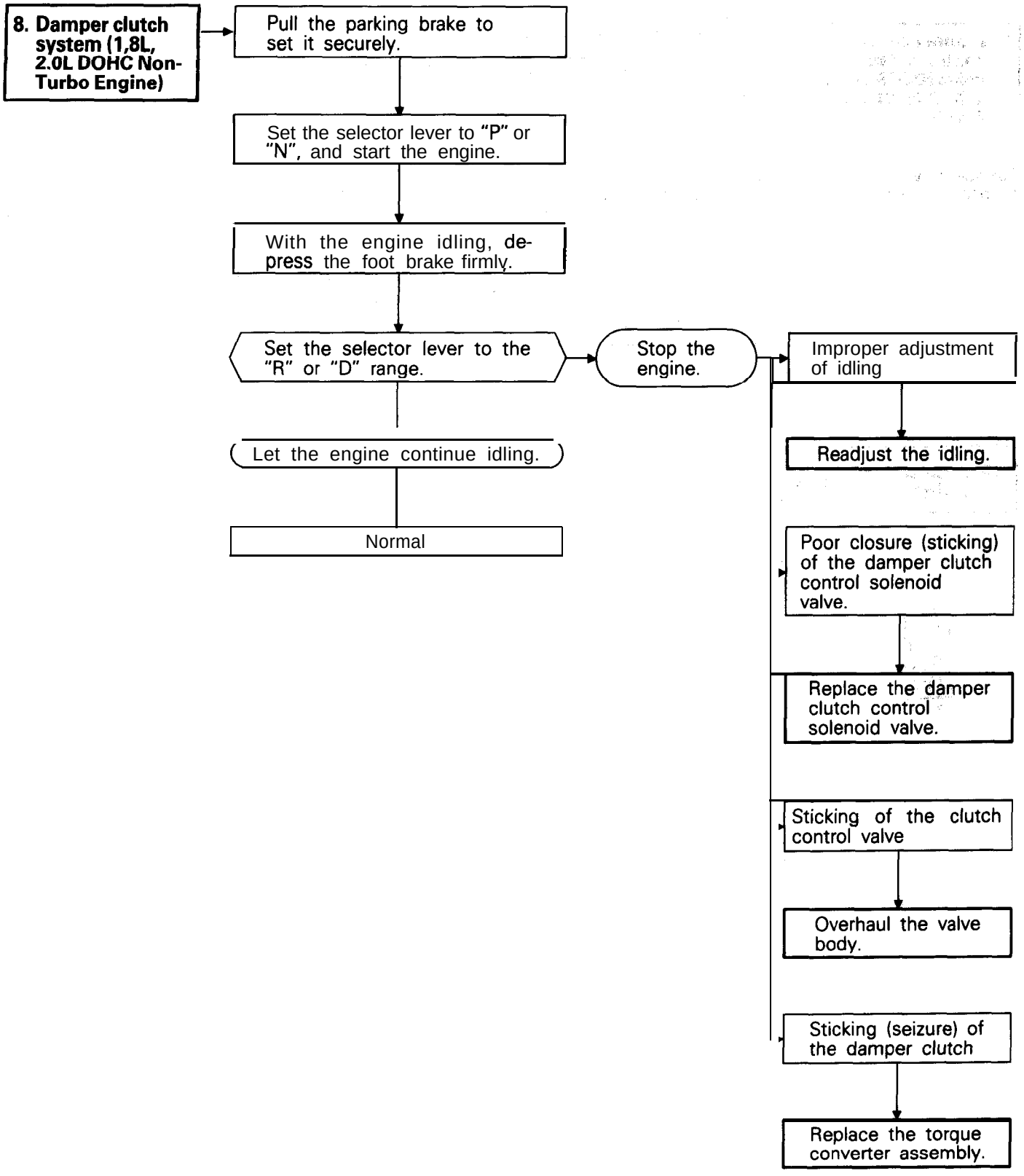
**7. Shift-control solenoid valve (SCSV) A or B**

Check the resistance between terminal 3 or 4 of the solenoid valve connector and the transaxle case.

- Resistance: too low or too high → Short-circuit, or damaged or disconnected wiring → Replace the SCSV.
- 22.3 ±1.5Ω/20°C (68°F)

Connect 12V between the transaxle case and terminal 3 or 4; switch ON and OFF and check for operation noise of the solenoid valve, and check the valve stroke.

- No operation noise. (stroke: 0.25 mm (.010 in.) or less) → Residue accumulated in valve and core. → Replace the SCSV.
- Noise exists.
- Normal


8. Damper clutch system (1,8L, 2.0L DOHC Non-Turbo Engine)
Pull the parking brake to set it securely.
Set the selector lever to "P" or "N", and start the engine.
With the engine idling, depress the foot brake firmly.
Set the selector lever to the "R" or "D" range.
Stop the engine.
Improper adjustment of idling
Readjust the idling.
Let the engine continue idling.
Normal
Poor closure (sticking) of the damper clutch control solenoid valve.
Replace the damper clutch control solenoid valve.
Sticking of the clutch control valve
Overhaul the valve body.
Sticking (seizure) of the damper clutch
Replace the torque converter assembly.

**9. Damper clutch control solenoid valve (DCCSV) 1,8L, 2.0L DOHC Non-Turbo Engine**

Solenoid valve connector terminals




1: PCSV
2: DCCSV
3: SCSV-A
4: SCSV-B

1750338

Check the resistance between terminal 2 of the solenoid valve connector and the transmission case.

Standard value: 3 Ω/20°C

Resistance: too low or too high → Short-circuit, or damaged or disconnected wiring → Replace the DCCSV.

Connect 12V between the transmission case and terminal 2; switch ON and OFF and check for operation noise.

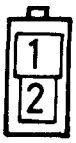
Noise exists.

No operation noise. Check for sticking. * (Valve stroke: 0.3 mm (.012 in.) or less) → Foreign terminal caught between the valve and guide → Replace the DCCSV.

*Sticking is usually at the release side.

Normal

**10. Accelerator switch**




171096

With the accelerator pedal not depressed, check the resistance between terminals 1 and 2.

No continuity (resistance: ∞) → Check the installation of the accelerator switch; adjust if necessary. → Problem not solved. → Replace the accelerator switch.

Continuity exists (resistance: 0)

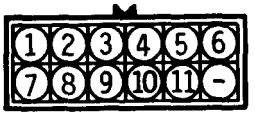
With the accelerator pedal depressed slightly (about 5%), check the resistance between terminals 1 and 2.

Continuity exists (resistance: 0)

No continuity (resistance: ∞)

Normal

**11. Inhibitor switch**




1750339

In the "P" range, check for continuity between terminals 3 and 4, and terminals 8 and 9.

Continuity exists

In the "R" range, check for continuity between terminals 4 and 7, and terminals 10 and 11.

Continuity exists

In the "N" range, check for continuity between terminals 2 and 4, and terminals 8 and 9.

Continuity exists

In the "D" range, check for continuity between terminals 4 and 6.

Continuity exists

In the "2" range, check for continuity between terminals 1 and 4.

Continuitv exists

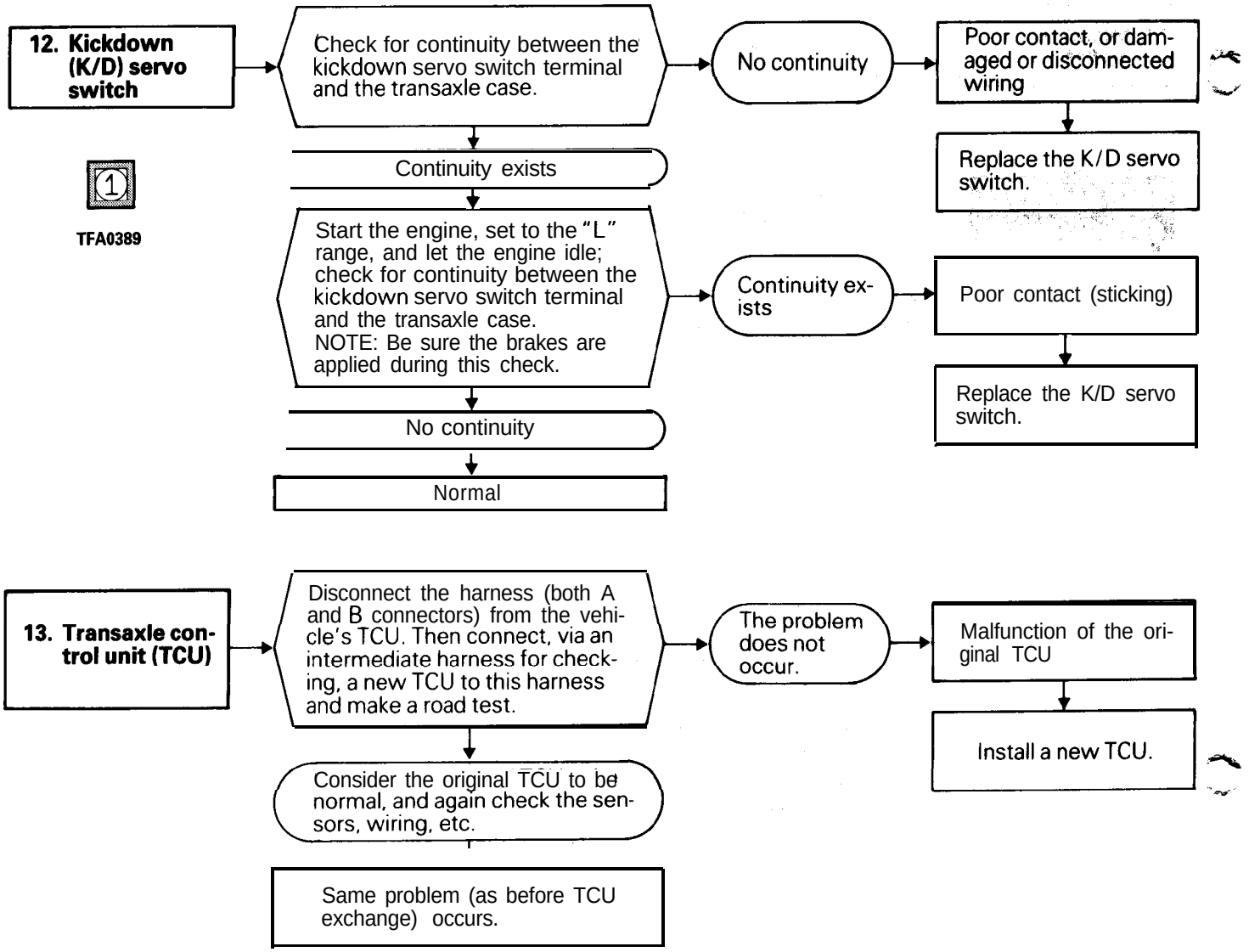
In the "L" range, check for continuity between terminals 4 and 5.

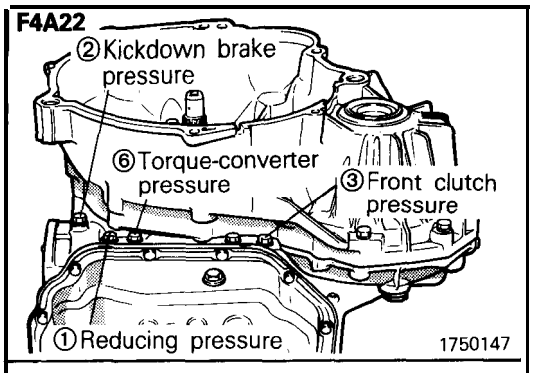
Continuity exists

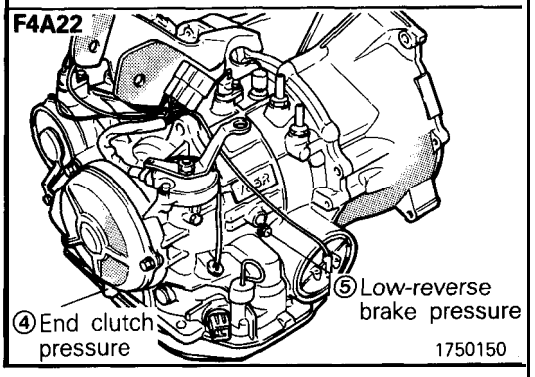
Normal

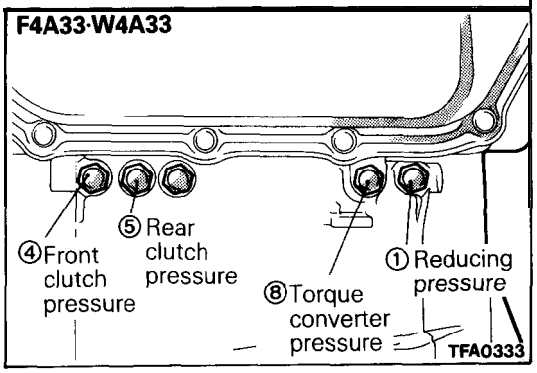
No continuity → Poor contact, or damaged or disconnected wiring.

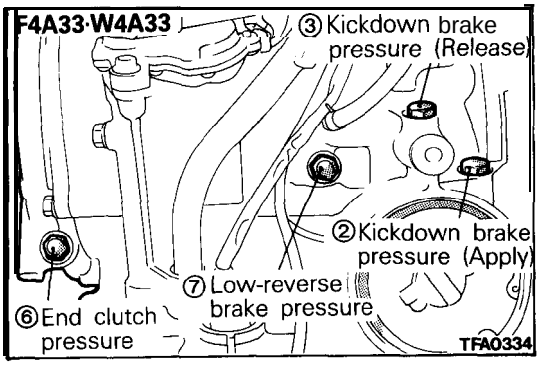
Replace the inhibitor switch.


12. Kickdown (K/D) servo switch
Check for continuity between the kickdown servo switch terminal and the transaxle case.
No continuity
Poor contact, or damaged or disconnected wiring
Replace the K/D servo switch.
Continuity exists
1
TFA0389
Start the engine, set to the "L" range, and let the engine idle; check for continuity between the kickdown servo switch terminal and the transaxle case.
NOTE: Be sure the brakes are applied during this check.
Continuity exists
Poor contact (sticking)
Replace the K/D servo switch.
No continuity
Normal
13. Transaxle control unit (TCU)
Disconnect the harness (both A and B connectors) from the vehicle's TCU. Then connect, via an intermediate harness for checking, a new TCU to this harness and make a road test.
The problem does not occur.
Malfunction of the original TCU
Install a new TCU.
Consider the original TCU to be normal, and again check the sensors, wiring, etc.
Same problem (as before TCU exchange) occurs.




## OIL PRESSURE TESTS

1. Completely warm up the transaxle.
2. Raise the vehicle by using a jack so that the drive wheels can be rotated.
3. Connect an engine tachometer and place it in a position where it's easy to see.
4. Attach the special oil-pressure gauge (C-3292 or C-3293) and the adaptor (MD998332) to each oil-pressure outlet port.
   When the reverse pressure is to be tested, the 3,000 kPa (400 psi) type of gauge should be used.
5. Measure the oil pressure under various conditions , and check to be sure that the measured results are within the standard value range shown in the "Standard oil pressure table" below.
   If the oil pressure is not within the specified range, check and repair as described in the section "Remedial steps if oil pressure is not normal" on the next page.

## Standard Oil Pressure Table

### F4A22

| No. | Conditions | | | Standard oil pressure kPa (psi) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Select lever position | Engine speed rpm | Shift position | ① Reducing pressure | ② Kickdown brake pressure | ③ Front clutch pressure | ④ End clutch pressure | ⑤ Low-reverse brake pressure | ⑥ Torque-converter pressure |
| 1 | N | Idling | Neutral | 360–490 (51–70) | – | – | – | – | ☆ |
| 2 | D | Idling | 2nd gear | 360–490 (51–70) | 100–210 (14–30) | – | – | – | ☆ |
| 3 | D (SW-ON) | Approx. 2,500 | 4th gear | 360–490 (51–70) | 830–900 (118–128) | – | 830–900 (118–128) | – | 350–450 (50–64) |
| 4 | D (SW-OFF) | Approx. 2,500 | 3rd gear | 360–490 (51–70) | 830–900 (118–128) | 830–900 (118–128) | 830–900 (118–128) | – | 350–450 (50–64) |
| 5 | 2 | Approx. 2,500 | 2nd gear | 360–490 (51–70) | 830–900 (118–128) | – | – | – | 350–450 (50–64) |
| 6 | L | Approx. 1,000 | 1st gear | 360–490 (51–70) | – | – | – | 300–420 (43–60) | ☆ |
| 7 | R | Approx. 2,500 | Reverse | 360–490 (51–70) | – | 1,640–2,240 (233–319) | – | 1,640–2,240 (233–319) | 350–450 (50–64) |
| | | Approx. 1,000 | | | | 1,500 (213) or more | | 1,500 (213) or more | |

### F4A33·W4A33

| No. | Conditions | | | Standard oil pressure kPa (psi) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Select lever position | Engine speed rpm | Shift position | ① Reducing pressure | ② Kickdown brake pressure (Apply) | ③ Kickdown brake pressure (Release) | ④ Front clutch pressure | ⑤ Rear clutch pressure | ⑥ End clutch pressure | ⑦ Low-reverse brake pressure | ⑧ Torque-converter pressure |
| 1 | N | Idling | Neutral | 360–480 (51–68) | – | | | | | – | ☆ |
| 2 | D | Idling | 2nd gear | 360–480 (51–68) | 100–210 (14–30) | | | 730–830 (104–118) | – | – | ☆ |
| 3 | D (SW-ON) | Approx. 2,500 | 4th gear | 360–480 (51–68) | 830–900 (118–128) | | | – | 830–900 (118–128) | | 450–650 (64–92) |
| 4 | D (SW-OFF) | Approx. 2,500 | 3rd gear | 360–480 (51–68) | 830–900 (118–128) | 830–900 (118–128) | 830–900 (118–128) | 830–900 (118–128) | 830–900 (118–128) | | 450–650 (64–92) |
| 5 | 2 | Approx. 2,500 | 2nd gear | 360–480 (51–68) | 830–900 (118–128) | | | 830–900 (118–128) | – | – | 450–650 (64–92) |
| 6 | L | Approx. 1,000 | 1st gear | 360–480 (51–68) | – | | | 830–900 (118–128) | – | 300–450 (43–64) | ☆ |
| 7 | R | Approx. 2,500 | Reverse | 360–480 (51–68) | – | 1,640–2,240 (233–319) | 1,640–2,240 (233–319) | – | – | 1,640–2,240 (233–319) | 450–650 (64–92) |
| | | Approx. 1,000 | | | | 1,500 (213) or more | 1,500 (213) or more | | | 1,500 (213) or more | |

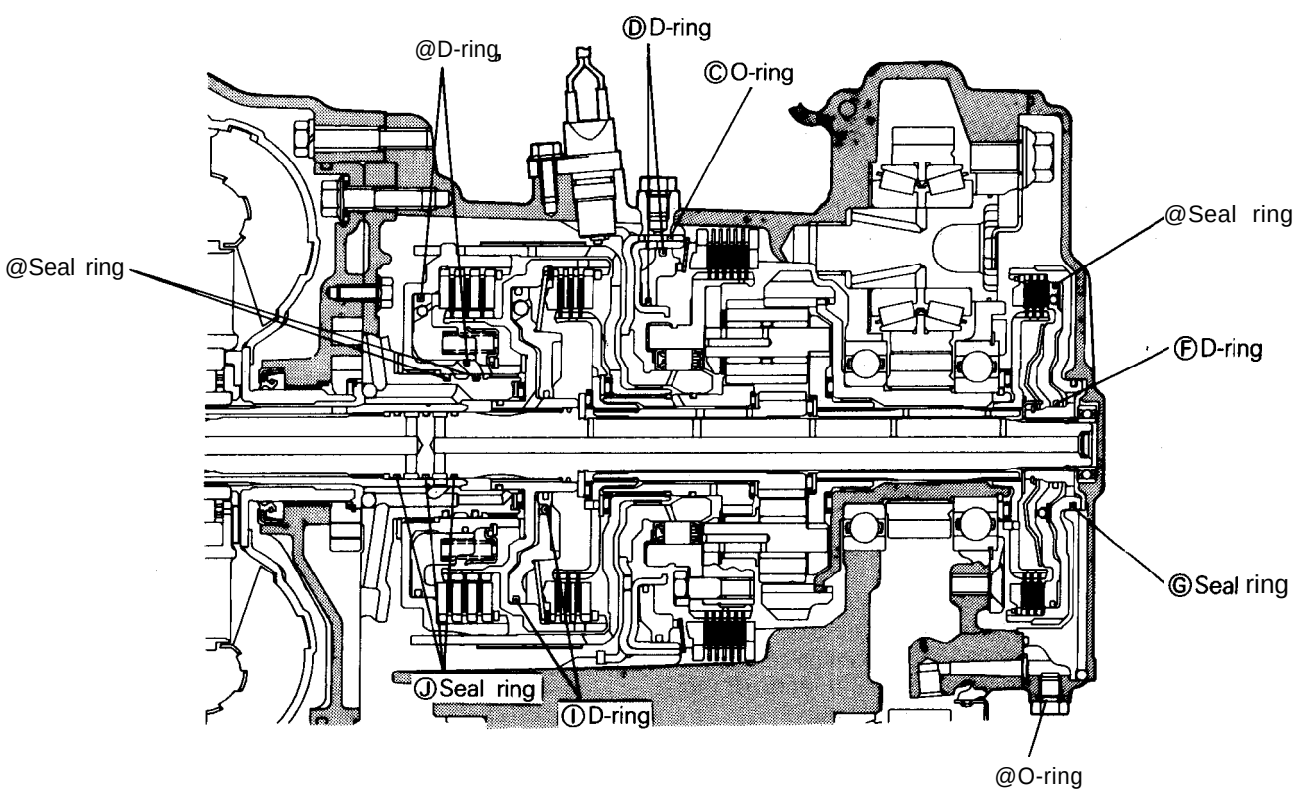
NOTE
– must be 10 kPa (1.4 psi) or less.
SW-ON: Switch ON the overdrive control switch
SW-OFF: Switch OFF the overdrive control switch
☆: Hydraulic pressure is generated, but not the standard value.

## Remedial Steps If Oil Pressure Is Not Normal

**F4A22**

| Trouble symptom | Probable cause | Remedy |
|---|---|---|
| 1. *Line pressures are all low (or high).<br>NOTE<br>*"Line pressures" refers to oil pressures ②, ③, ④ and ⑤ in the "Standard oil pressure table" on the previous page. | a. Clogging of oil filter | a. Visually inspect the oil filter; replace the oil filte if it is clogged. |
| | b. Improper adjustment of oil pressure (line pressure) of regulator valve | b. Measure line pressure ② (kickdown brake pressure); if the pressure is not the standard value, readjust the line pressure, or, if necessary, replace the valve body assembly. |
| | c. Sticking of regulator valve | c. Check the operation of the regulator valve; repair if necessary, or replace the valve body assembly. |
| | d. Looseness of valve body tightening part | d. Tighten the valve body tightening bolt and installation bolt. |
| | e. Improper oil pump dischange pressure | e. Check the side clearance of the oil pump gear; replace the oil pump assembly if necessary. |
| 2. Improper reducing pressure | a. Improper line pressure | a. Check the ② kickdown brake pressure (line pressure); if the line pressure is not the standard value, check as described in item 1 above. |
| | b. Clogging of the filter (L-shaped type) of the reducing-pressure circuit | b. Disassemble the valve body assembly and check the filter; replace the filter if it is clogged. |
| | c. Improper adjustment of the reducing pressure | c. Measure the ① reducing pressure; if it is not the standard value, readjust, or replace the valve body assembly. |
| | d. Sticking of the reducing valve | d. Check the operation of the reducing valve; if necessary, repair it, or replace the valve body assembly. |
| | e. Looseness of valve body tightening part | e. Tighten the valve body tightening bolt and installation bolt. |
| 3. Improper kickdown brake pressure | a. Malfunction of the D-ring or seal ring of the sleeve or kickdown servo piston. | a. Disassemble the kickdown servo and check whether the seal ring or D-ring is damaged. If it is cut or has scratches, replace the seal ring or D-ring. |
| | b. Looseness of valve body tightening part | b. Tighten the valve body tightening bolt and installation bolt. |
| | c. Functional malfunction of the valve body assembly | c. Replace the valve body assembly. |
| 4. Improper front clutch pressure | a. Malfunction of the D-ring or seal ring of the sleeve or kickdown servo piston. | a. Disassemble the kickdown servo and check whether the seal ring or D-ring is damaged. If it is cut or has scratches, replace the seal ring or D-ring. |
| | b. Looseness of valve body tightening part | b. Tighten the valve body tightening bolt and installation bolt. |
| | c. Functional malfunction of the valve body assembly | c. Replace the valve body assembly. |
| | d. Wear of the front clutch piston or retainer, or malfunction of the Ⓐ D-ring, Ⓑ seal, ring. (Refer to the figure on the next page.) | d. Disassemble the transaxle itself and check whether or not there is wear of the front clutch piston and retainer inner circumference, or damage of the D-ring. If there is any wear or damage, replace the piston, retainer, D-ring and/or seal ring. |
| 5. Improper end clutch pressure | a. Malfunction of a D-ring Ⓕ or seal ring Ⓔ, Ⓖ of the end clutch or O-ring Ⓗ of the pipe (Refer to the following figure.) | a. Disassemble the end clutch and check the seal ring, D-ring of the piston, seal ring of the retainer, etc.; replace if there are cuts, scars, scratches or damage. |
| | b. Looseness of valve body tightening part | b. Tighten the valve body tightening bolt and installation bolt. |
| | c. Functional malfunction of the valve body assembly | c. Replace the valve body assembly. |

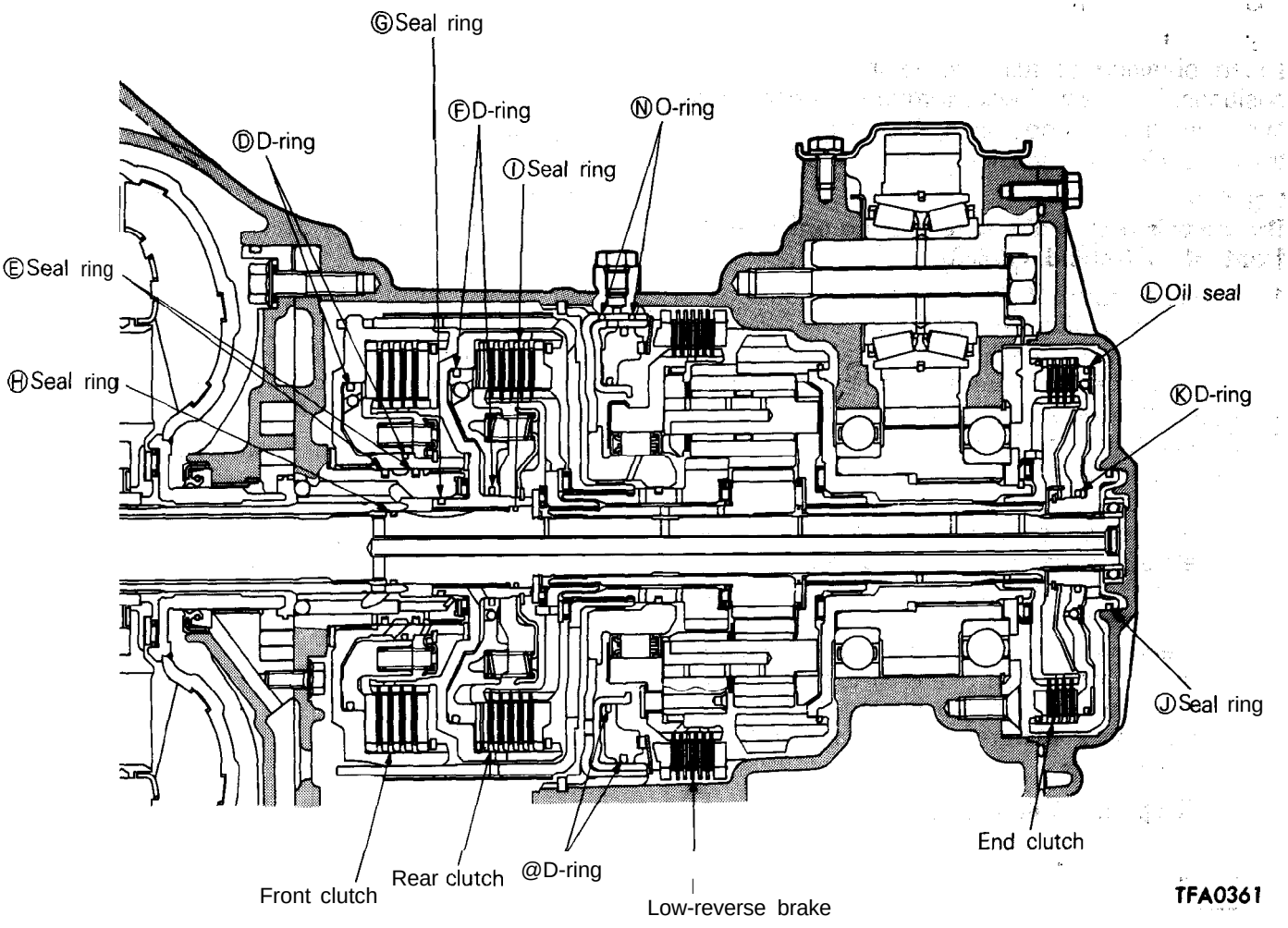
| Trouble symptom | Probable cause | Remedy |
|---|---|---|
| 6. improper low-reverse brake pressure | a. O-ring between valve body and transaxle damaged or missing | a. Remove the valve body assembly and check to be sure that the O-ring at the upper surface of the upper valve body is not missing or damaged; install or replace the O-ring if necessary. |
| | b. Looseness of valve body tightening part | b. Tighten the valve body tightening bolt and installation bolt. |
| | c. Functional malfunction of the valve body assembly | c. Replace the valve body assembly. |
| | d. Malfunction of the O-ring Ⓓ of the low-reverse brake piston or the O-ring Ⓒ of the retainer (Refer to the figure below.) | d. Disassemble the transaxle itself and check the O-ring for damage; replace if there are cuts, scars, scratches or damage. |
| 7. Improper torque converter pressure | a. Sticking of the damper clutch control solenoid valve (DCCSV) or the damper clutch control valve. | a. Check the operation of the damper clutch system and the DCCSV. |
| | b. Clogging or leaking of the oil cooler and/or piping | b. Repair or replace, as necessary, the cooler and/or piping. |
| | c. Damaged seal ring Ⓙ of the input shaft (Refer to the figure below.) | c. Disassemble the transaxle itself and check for damage of the seal ring; replace the seal ring if there is damage. |
| | 3. Malfunction of the torque converter | d. Replace the torque converter. |

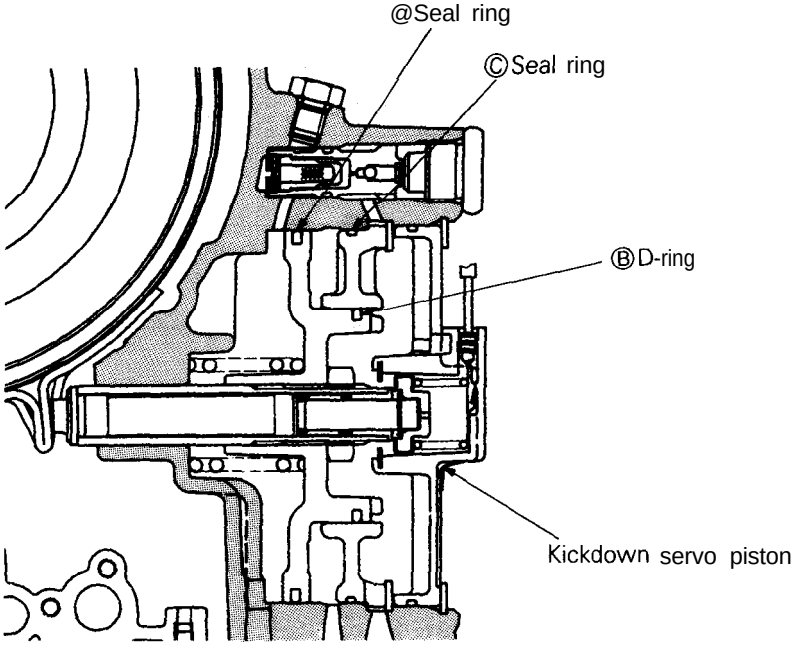


**F4A33·W4A33**

| Trouble symptom | Probable cause | Remedy |
|---|---|---|
| 1. Line pressures are all low (or high).<br>NOTE<br>* "Line pressures" refers to oil pressure ②, ③, ④, ⑤, ⑥ and ⑦, in the "Standard oil pressure table" on the previous page. | a. Clogging of oil filter<br>b. Improper adjustment of oil pressure (line pressure of regulator valve<br>c. Functional malfunction of valve body assembly<br>d. Looseness of valve body tightening part<br>e. Improper oil pump dischange pressure | a. Visually inspect the oil filter; replace the oil filter if it is clogged.<br>b. Measure line pressure ② (kickdown brake pressure); if the pressure is not the standard value, readjust the line pressure, or, if necessary, replace the valve body assembly.<br>c. Replace the valve body assembly.<br>d. Tighten the valve body tightening bolt and installation bolt.<br>e. Check the side clearance of the oil pump gear; replace the oil pump assembly if necessary. |
| 2. Improper reducing pressure | a. Clogging of the filter (L-shaped type) of the reducing-pressure circuit<br>b. Improper adjustment of oil pressure<br>c. Functional malfunction of the valve body assembly | a. Disassemble the valve body assembly and check the filter; replace the filter if it is clogged.<br>b. Measure the ① reducing pressure; if it is not the standard value, readjust, or replace the valve body assembly.<br>c. Replace the valve body assembly. |
| 3. Improper kickdown brake pressure (Apply) | a. Malfunction of the seal ring Ⓐ, D-ring Ⓑ or seal ring Ⓒ of the sleeve of the kickdown servo piston.<br>b. Functional malfunction of the valve body assembly | a. Disassemble the kickdown servo and check whether the seal ring or D-ring is damaged. If it is cut or has scratches, replace the seal ring or D-ring.<br>b. Replace the valve body assembly. |
| 4. Improper kickdown brake pressure (Release) | a. Malfunction of the seal ring Ⓐ, D-ring Ⓑ or seal ring Ⓒ of the sleeve of the kickdown servo piston.<br>b. Functional malfunction of the valve body assembly | a. Disassemble the kickdown servo and check whether the seal ring or D-ring is damaged. If it is cut or has scratches, replace the seal ring or D-ring.<br>b. Replace the valve body assembly. |
| 5. Improper front clutch pressure | a. Malfunction of the seal ring Ⓐ, D-ring Ⓑ or seal ring Ⓒ of the sleeve of the kickdown servo piston.<br>b. Functional malfunction of the valve body assembly<br>c. Wear of the front clutch piston or retainer, or malfunction of the D-ring Ⓓ or seal ring Ⓔ. | a. Disassemble the kickdown servo and check whether the seal ring or D-ring is damaged. If it is cut or has scratches, replace the seal ring or D-ring.<br>b. Replace the valve body assembly.<br>c. Disassemble the transaxle itself and check whether or not there is wear of the front clutch piston and retainer inner circumference, or damage of the D-ring and/or seal ring. If there is any wear or damage, replace the piston, retainer, D-ring and/or seal ring. |

| Trouble symptom | Probable cause | Remedy |
|---|---|---|
| 6. Improper rear clutch pressure | a. Malfunction of D-ring Ⓕ of rear clutch piston, retainer seal ring Ⓖ and seal rings Ⓗ and Ⓘ of input shaft.<br>b. Functional malfunction of the valve body assembly | a. Disassemble the rear clutch, check input shaft seal ring, retainer seal ring, piston D ring, etc. and replace broken or damaged parts.<br>b. Replace the valve body assembly. |
| 7. Improper end clutch pressure | a. Malfunction of seal ring Ⓙ or the D-ring Ⓚ and/or oil seal Ⓛ of end clutch.<br>b. Functional malfunction of the valve body assembly | a. Disassemble the end clutch and check the oil seal or D-ring of the piston, seal ring of the retainer, etc.; replace if there are cuts, scars, scratches or damage.<br>b. Replace the valve body assembly. |
| 8. Improper low-reverse brake pressure | a. O-ring between valve body and transaxle damaged or missing<br>b. Functional malfunction of the valve body assembly<br>c. Malfunction of the D-ring Ⓜ of the low-reverse brake piston or the O-ring Ⓝ of the retainer | a. Remove the valve body assembly and check to be sure that the O-ring at the upper surface of the upper valve body is not missing or damaged; install or replace the O-ring if necessary.<br>b. Replace the valve body assembly.<br>c. Disassemble the transaxle itself and check the D-ring and O-ring for damage; replace if there are cuts, scars, scratches or damage. |
| 9. Improper torque converter pressure | a. Clogging or leaking of the oil cooler and/or piping<br>b. Malfunction of the torque converter | a. Repair or replace, as necessary, the cooler and/or piping.<br>b. Replace the torque converter. |


Ⓖ Seal ring
Ⓕ D-ring
Ⓝ O-ring
Ⓓ D-ring
Ⓘ Seal ring
Ⓔ Seal ring
Ⓗ Seal ring
Ⓛ Oil seal
Ⓚ D-ring
Ⓙ Seal ring
End clutch
Front clutch
Rear clutch
@ D-ring
Low-reverse brake
TFA0361


@ Seal ring
Ⓒ Seal ring
Ⓑ D-ring
Kickdown servo piston
TFA0362

## CONVERTER STALL TEST

Stall test consist of determining maximum engine speed obtained at full throttle in "D" and "R" positions. This test checks torque converter stator overrunning clutch operation, and holding ability of transaxle clutches and low-reserve brake.

Caution
During this test, make sure that no one stand in front of or behind vehicle.

1. Check transaxle fluid level. Fluid should be at normal operating temperature [70–80°C (160–180°F)]. Engine coolant should also be at normal operating temperature [80–90°C (180–190°F)].
2. Apply chocks to both rear wheels.
3. Attach engine tachometer.
4. Apply parking and service brakes fully.
5. Start engine.
6. With selector lever in "D" position, depress accelerator pedal fully to read engine maximum rpm. Do not hold throttle wide open any longer than is necessary to obtain maximum engine rpm reading, and never longer than 5 seconds at a time. If more than one stall test is required, operate engine at approximatey 1,000 rpm in neutral for 2 minutes to cool transaxle fluid between tests.

   Stall speed: **1,800–3,200** rpm
7. Place selector lever to "R" position and perform stall test by the same procedure as in foregoing item.

Stall Speed Above Specification in "D"
If stall speed is higher than specification, rear clutch or overrunning clutch of transaxle is slipping. In this case, perform hydraulic test to locate cause of slippage.

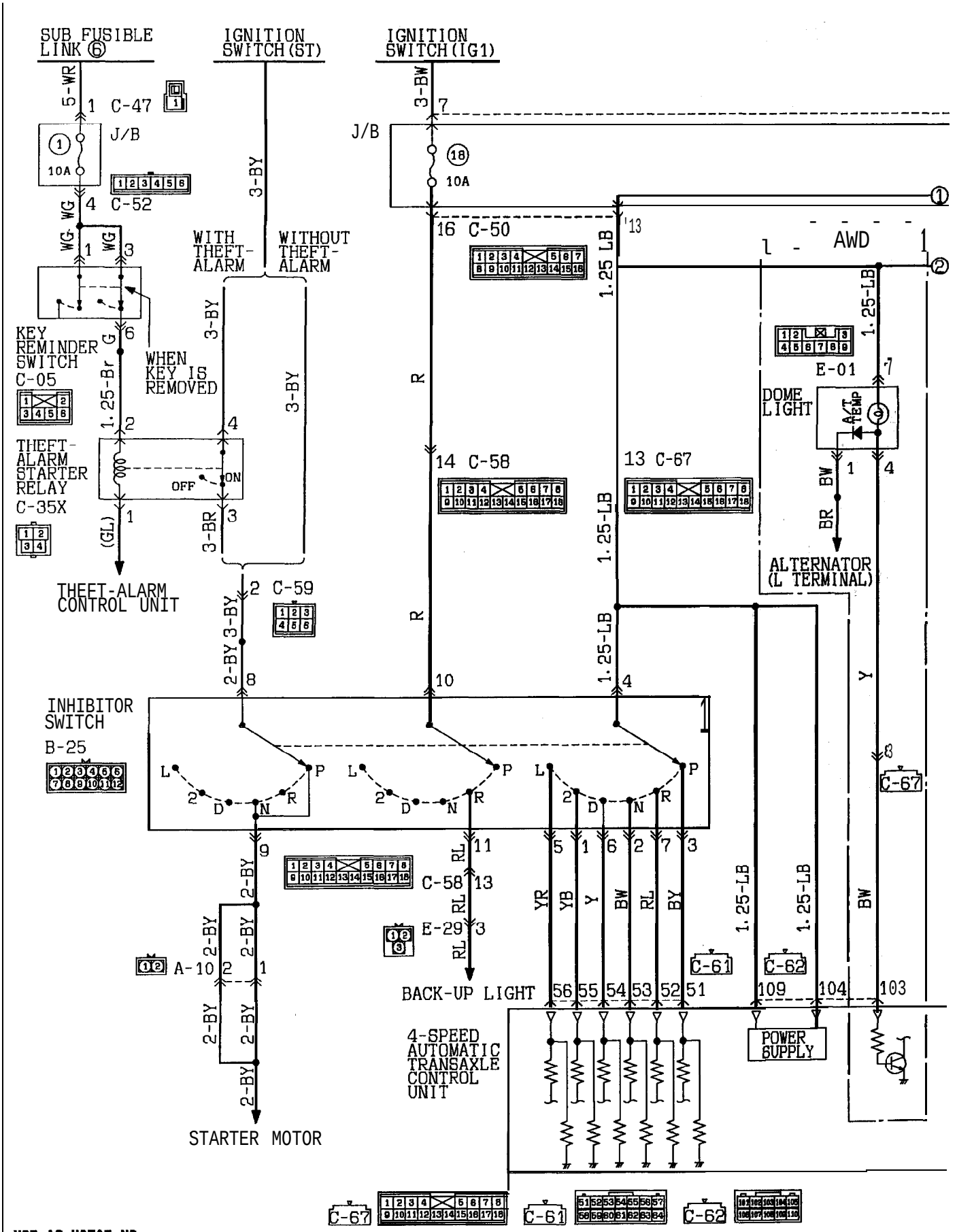
Stall Speed Above **Specification** in "R"
If stall speed is higher than specification, front clutch of transaxle or low-reverse brake is slipping. In this case, perform hydraulic test to locate cause of slippage.

Stall Speed Below Specification in "D" and "R"
If stall speed is lower than specification, insufficient engine output or faulty torque converter is suspected. Check for engine misfiring, ignition timing, valve clearance etc. If these are good, torque converter is faulty.

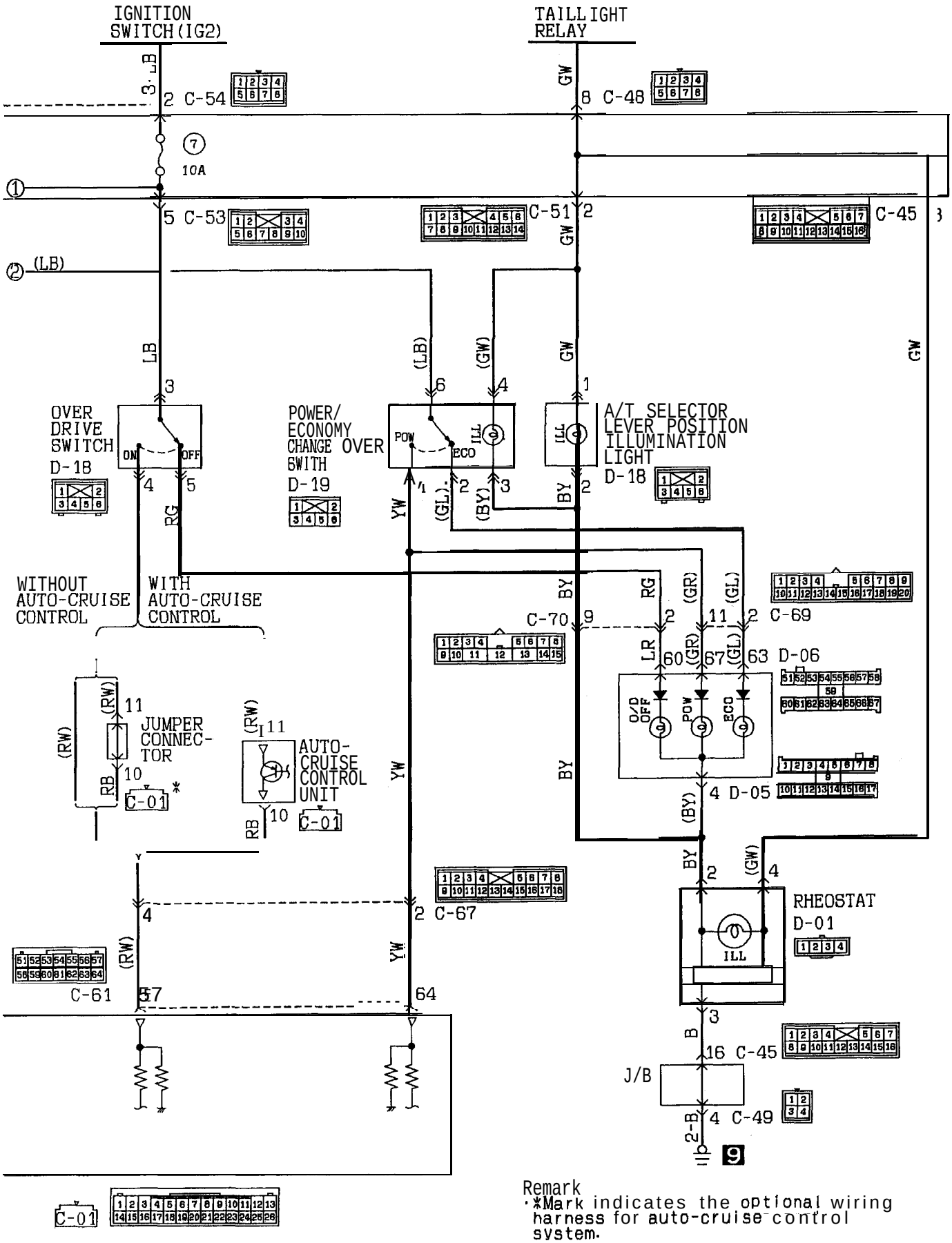
TRANSAXLE CONTROL

| Symptom | Probable cause | Remedy |
|---|---|---|
| Selector lever operation is stiff | Incorrect adjustment of sleeve<br>Incorrect adjustment of control cable | Adjust |
| | Excessive wear of detent plate<br>Worn contact surfaces of pushbutton and sleeve | Replace |
| Starter motor does not operate with the selector lever in the "N" or "P" position | Malfunction in inhibitor switch<br>**Malfunction of starter relay** | Replace |
| | Incorrect adjustment of control cable | **Adjust** |
| Will not shift to 4-speed | Malfunction of OD switch | Replace |

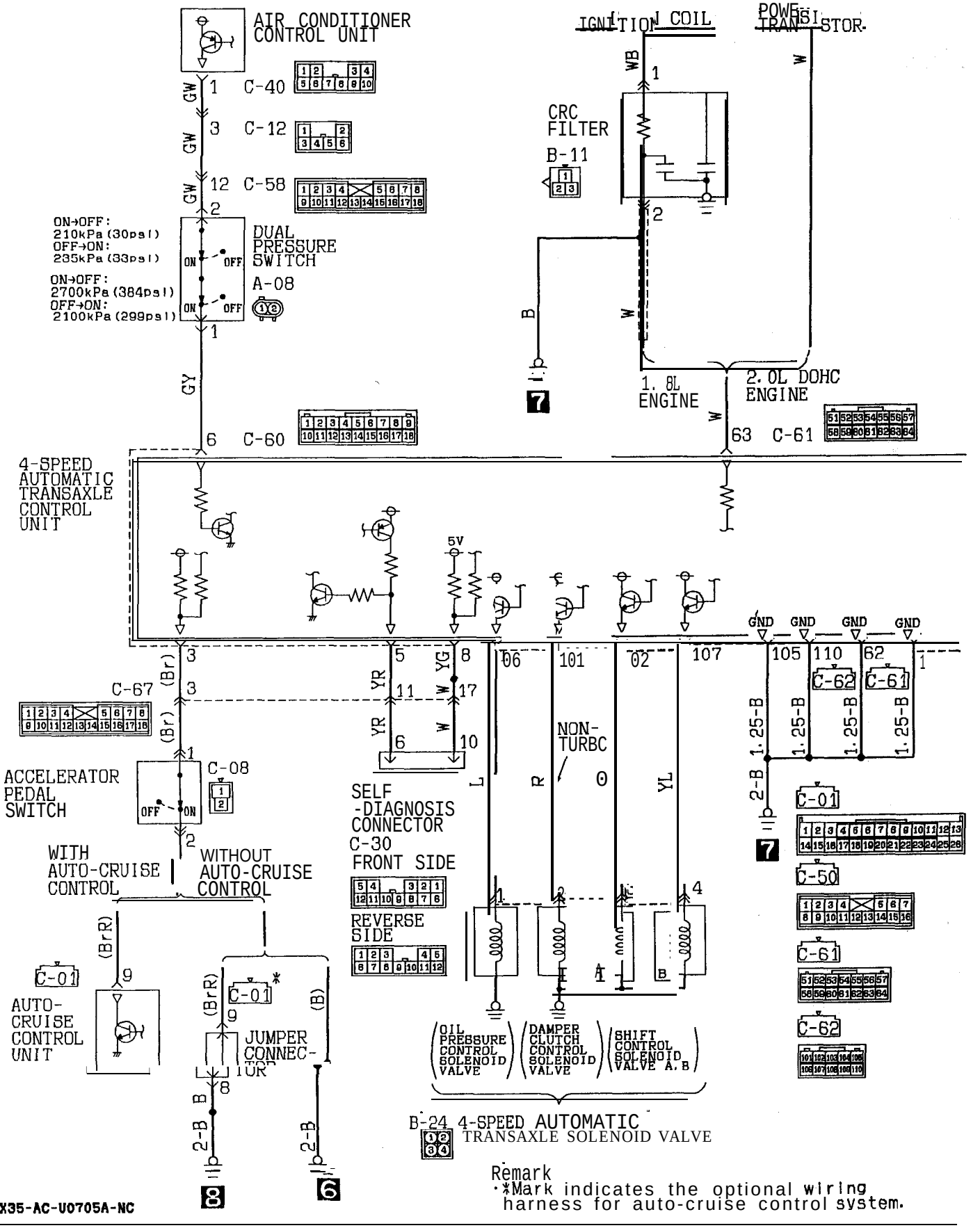
CIRCUIT DIAGRAM




X35-AC-U0705-NC

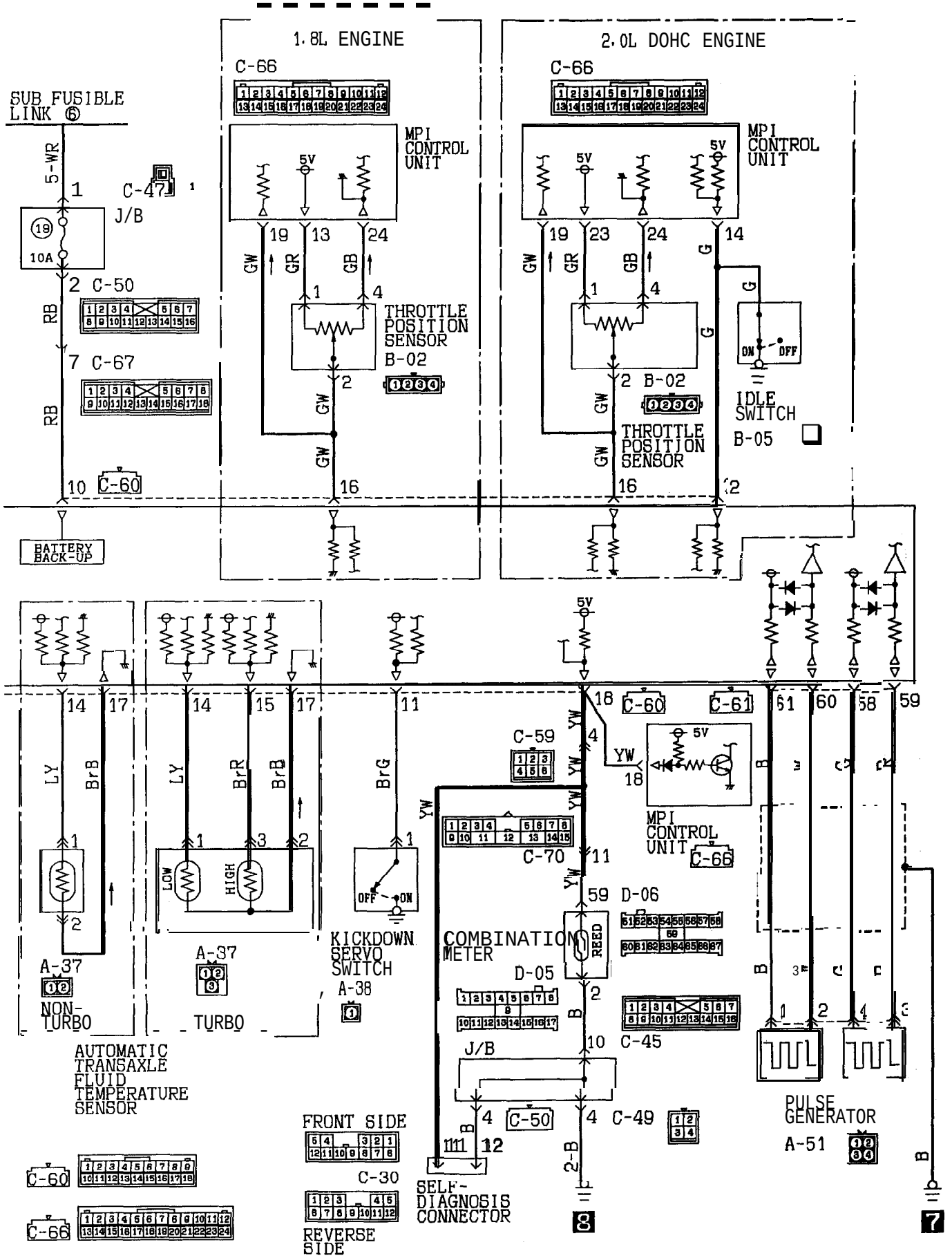



Remark
*Mark indicates the optional wiring harness for auto-cruise control system.




Remark
*Mark indicates the optional wiring harness for auto-cruise control system.

KX35-AC-U0705A-NC

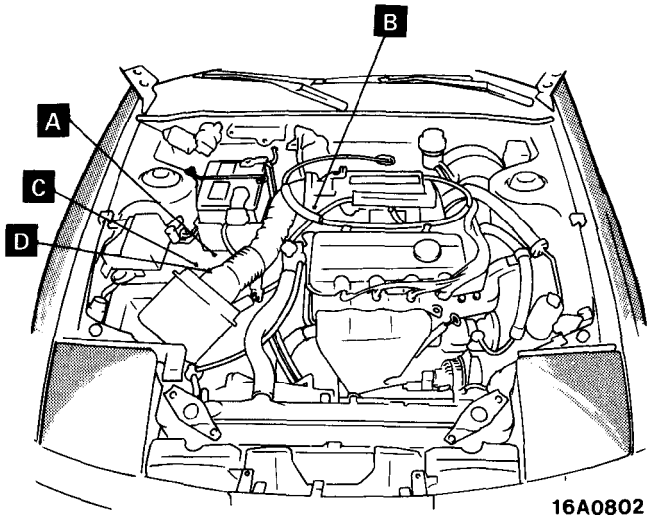

1.8L ENGINE
2.0L DOHC ENGINE
C-66
MPI CONTROL UNIT
5V
SUB FUSIBLE LINK ⑥
5-WR
C-47
J/B
10A
C-50
RB
C-67
C-60
BATTERY BACK-UP
THROTTLE POSITION SENSOR
B-02
GW
GR
GB
G
IDLE SWITCH
B-05
ON
OFF
C-61
C-59
C-70
C-45
D-05
D-06
COMBINATION METER
REED
LY
BrB
BrR
BrG
YW
A-37
NON-TURBO
TURBO
LOW
HIGH
KICKDOWN SERVO SWITCH
A-38
AUTOMATIC TRANSAXLE FLUID TEMPERATURE SENSOR
FRONT SIDE
C-30
REVERSE SIDE
SELF-DIAGNOSIS CONNECTOR
C-49
C-50
PULSE GENERATOR
A-51
2-B
8
7

## E.L.C. 4-SPEED AUTOMATIC TRANSAXLE CONTROL COMPONENTS LAYOUT

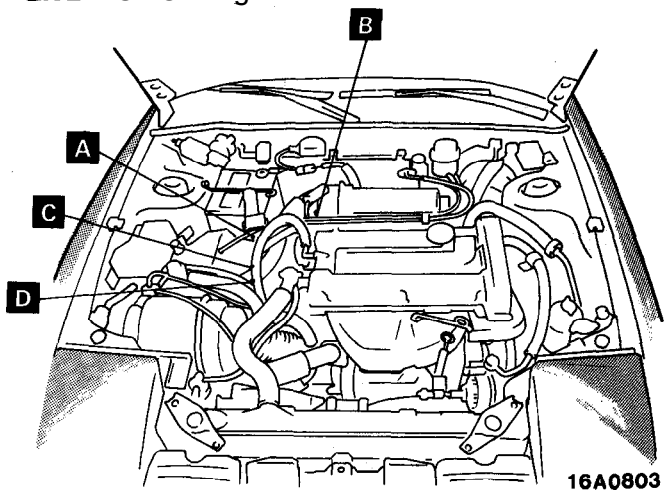
| Name | Symbol | Name | Symbol |
|---|---|---|---|
| Diagnosis connector | F | Pulse generator B | A |
| Engine control unit | I | Solenoid valves | C |
| Oil temperature sensor | D | Throttle position sensor | B |
| Power (PWR)/Economy (ECO) select switch | G | Transaxle control unit | H |
| Pulse generator A | A | Vehicle-speed sensor | E |

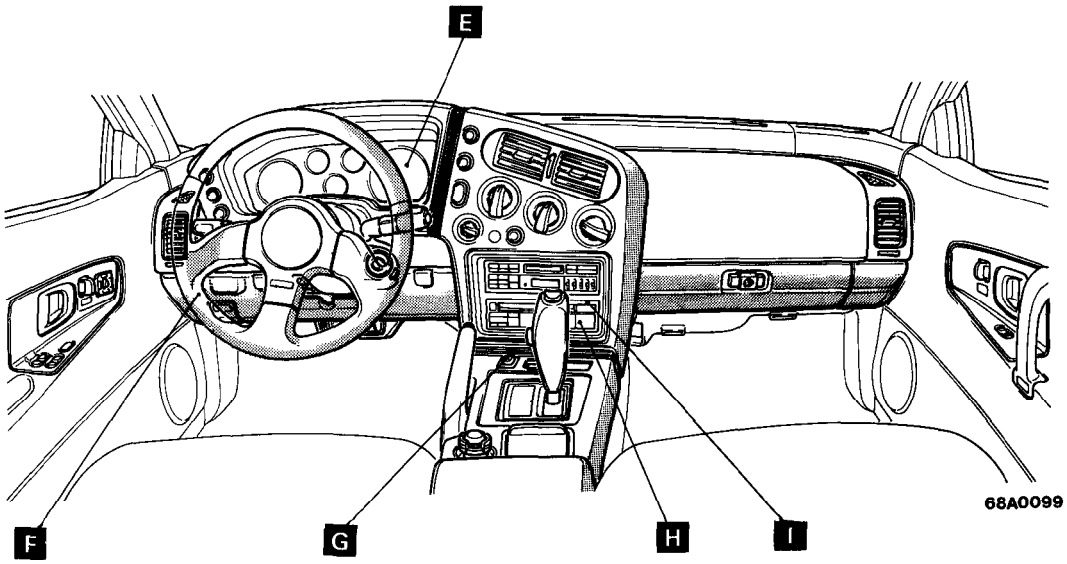
NOTE
1. The "Name" column is arranged in alphabetical order.
2. Refer to GROUP 14–On vehicle inspection of MPI components for installation position of B throttle position sensor.

**1.8L** Engine

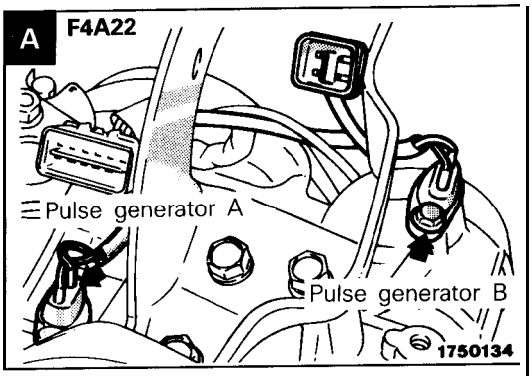



**2.0L** DOHC Engine

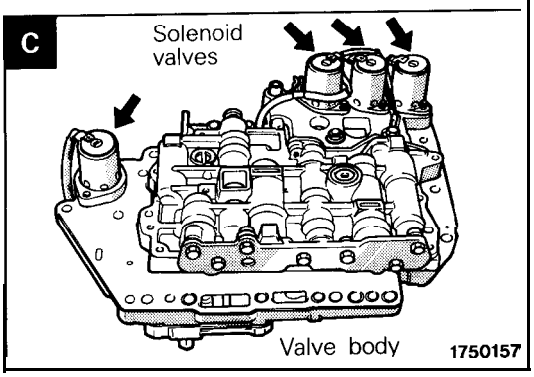


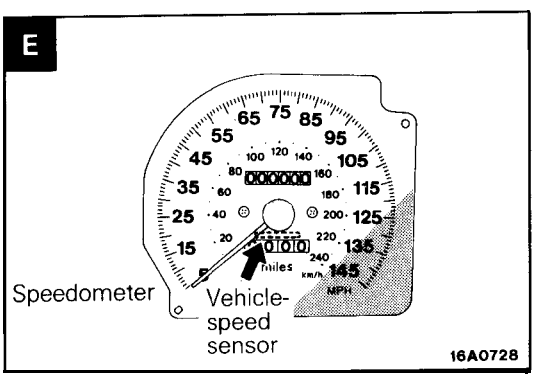
A F4A22



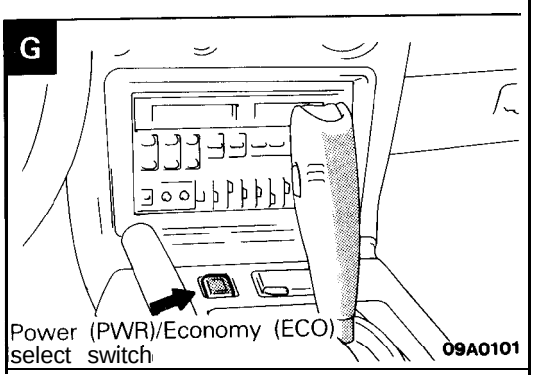

C



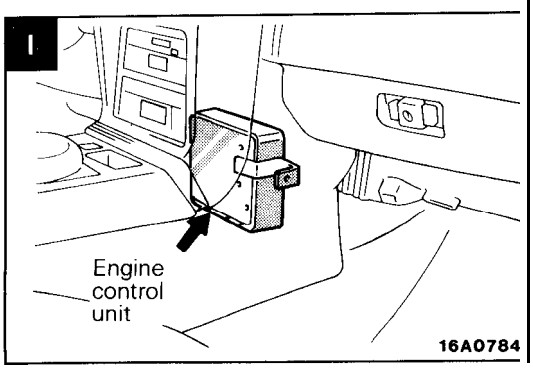

E



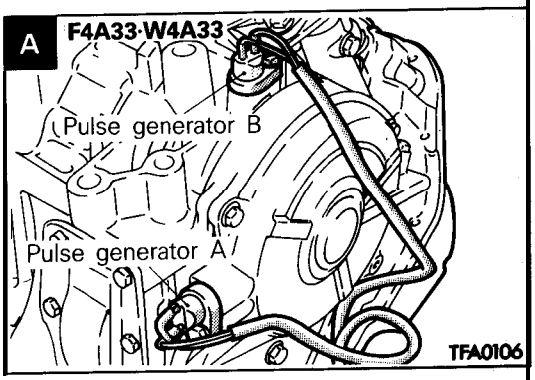

G



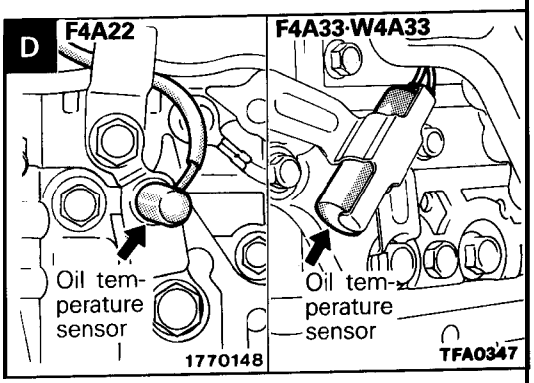

I



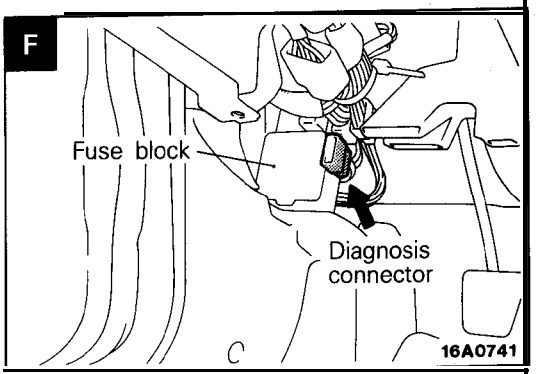

A F4A33·W4A33



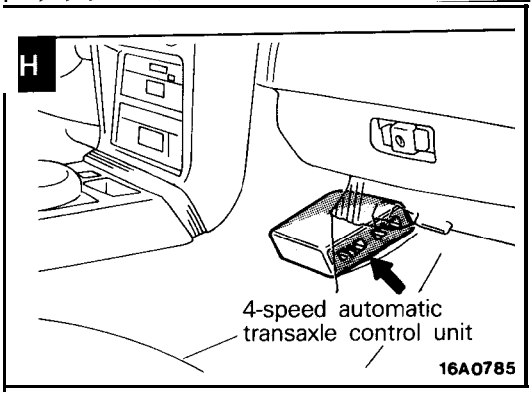

D F4A22 F4A33·W4A33

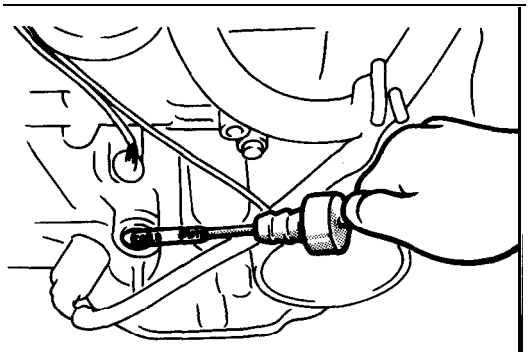


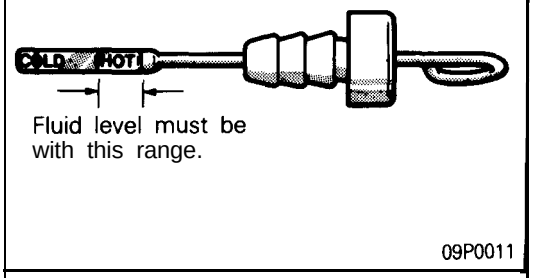

F




H

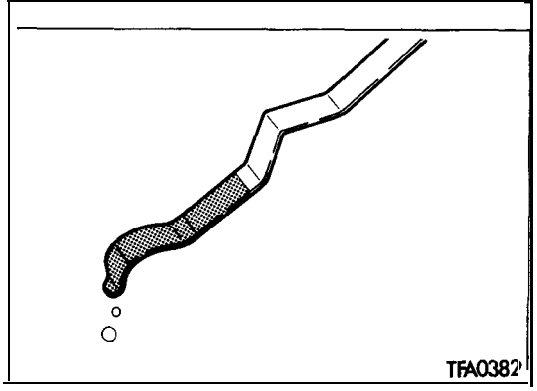



09P001a



Fluid level must be with this range.

09P0011


TFA0382

# SERVICE ADJUSTMENT PROCEDURES N21FBBE

## TRANSAXLE FLUID LEVEL INSPECTION

1. Drive until the fluid temperature reaches the usual temperature [70–80°C (160–180°F)].
2. Place vehicle on level floor.
3. Move selector lever sequentially to every position to fill torque converter and hydraulic circuit with fluid, then place lever in "N" Neutral position.
4. Before removing dipstick, wipe all dirt from area around dipstick. Then take out the dipstick and check the condition of the fluid.
   The transaxle should be overhauled under the following conditions.
   - If there is a "burning" odor.
   - If the fluid color has become noticeably blacker.
   - If there is a noticeably great amount of metal particles in the fluid.
5. Check to see if fluid level is in "HOT" range on dipstick. If fluid level is low, add automatic transaxle fluid until level reaches "HOT" range.
   Transaxle fluid: MOPAR ATF PLUS (Automatic transmission fluid type 7176) or Dia ATF SP or equivalent

   Low fluid level can cause a variety of conditions because it allows pump to take in air along with fluid. Air trapped in hydraulic circuit forms bubbles which make fluid spongy. Therefore, pressures will be erratic, causing delayed shift, slippy clutch and brakes, etc.
   Improper filling can also raise fluid level too high. When transaxle has too much fluid, gears churn up foam and cause the same conditions which occur with low fluid level, resulting in accelerated deterioration of automatic transaxle fluid.
   In either case, air bubbles can cause overheating, fluid oxidation, which can interfere with normal valve, clutch, and servo operation. Foaming can also result in fluid escaping from transaxle vent where it may be mistaken for a leak.
6. Be sure to examine fluid on dipstick closely.

## TRANSAXLE FLUID REPLACEMENT N21FCBAa

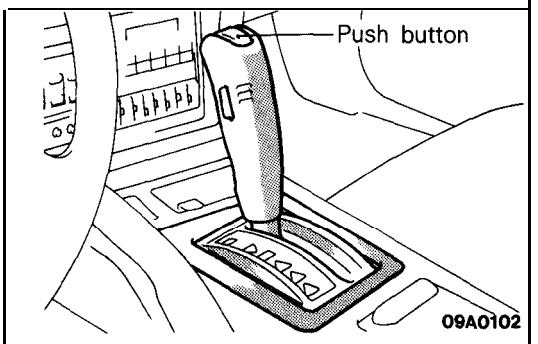
Refer to GROUP O-Maintenance Service.

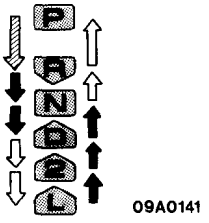
### TRANSFER OIL LEVEL INSPECTION N21FXAA

Transfer oil level inspection is the same as for the manual transaxle transfer.
Refer to GROUP 22–Service Adjustment Procedures.

### TRANSFER OIL REPLACEMENT N21FYAA

Transfer oil replacement is the same as for manual transaxle transfer.
Refer to GROUP 22–Service Adjustment Procedures.



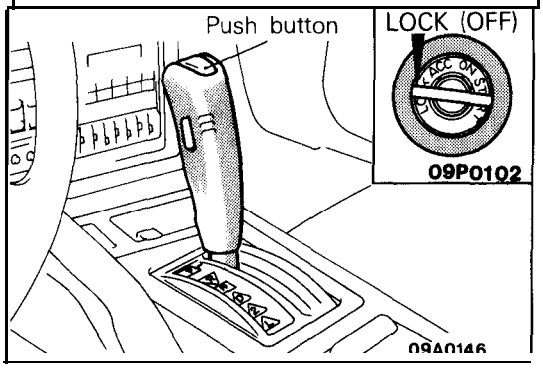




⇦ Button pressed (while brake pedal is depressed)
● Button not pressed
⇦ Button pressed

## SELECTOR LEVER OPERATION CHECK N21FIAE

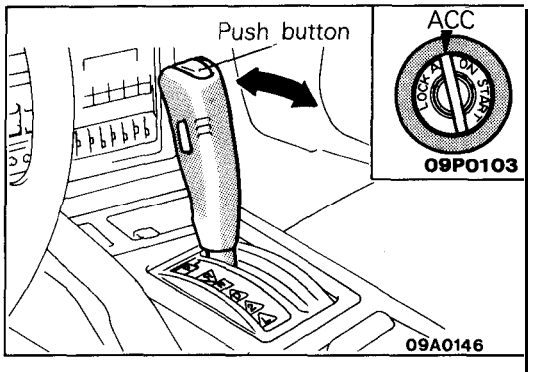
1. Shift selector lever to each range and check that lever moves smoothly and is controled. Check that position indicator is correct.
2. Check to be sure the selector lever can be shifted to each position (by button operation as shown in the illustration).
3. Start the engine and check if the vehicle moves forward when the selector lever is shifted from N to D, and moves backward when shifted to R.
4. When the shift lever malfunctions, adjust control cable and selector lever sleeve. Check for worn shift lever assembly sliding parts.

NOTE
To move the selector lever from the "P" position to any other position, first turn the ignition key to any position other than "LOCK (OFF)" and depress the brake pedal.

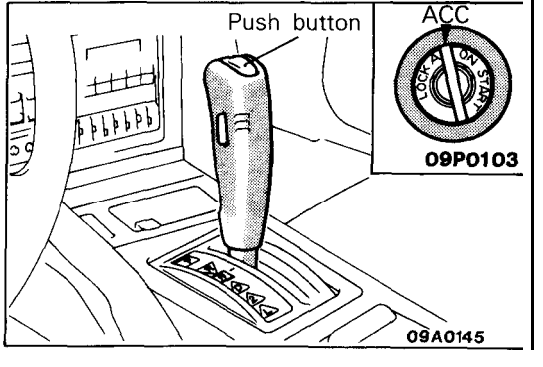



## KEY INTERLOCK MECHANISM CHECK N21FUAA

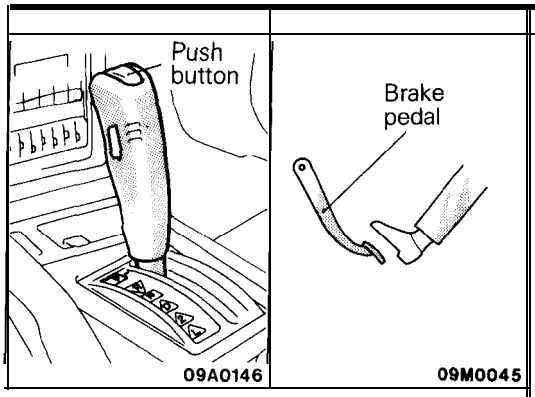
1. Completely stop the vehicle and switch OFF the engine before making the check.
2. Check to be sure that, under the following conditions, the select lever cannot be moved from the "P" position to any other position.
   Also check, at the same time, that the button cannot be pressed.
   Ignition key position: "LOCK (OFF)", or removed
   Brake pedal: Depressed

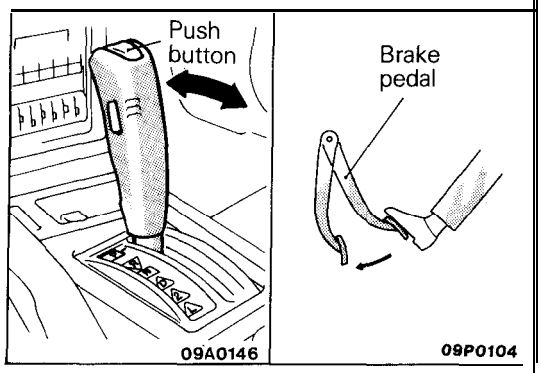


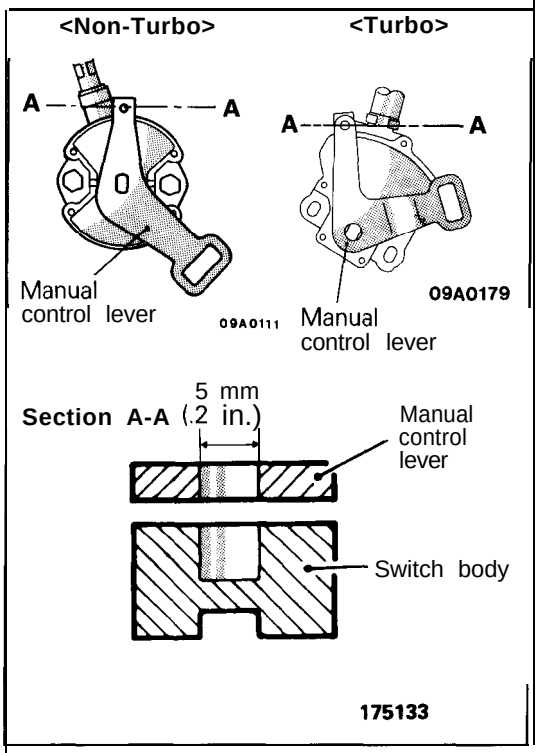

3. Check to be sure that, under the following conditions, the select lever can be moved from the "P" position to any other position.
   Press the button a few times and check to be sure that the select lever moves smoothly.
   Ignition key position: "ACC"
   Brake pedal : Depressed
   Button : Pressed




4. Check to be sure that, at all positions of the select lever (other than "P"), the ignition key cannot be turned to the "LOCK (OFF)" position.
   Check to be sure that the ignition key smoothly turns to the "LOCK (OFF)" position when the select lever is then set to the "P" position and the button is released.
5. If a malfunction is discovered when following the above checking procedures, either adjust or check the key interlock cable mechanism. (Refer to P.21-220.)



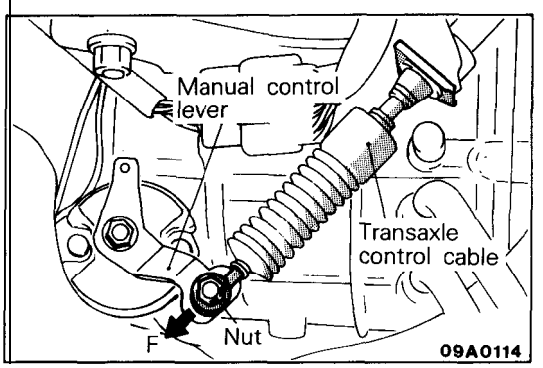

## SHIFT LOCK MECHANISM CHECK N21FVAA

1. Check to be sure that, under the following conditions, the select lever cannot be moved from the "P" position to any other position.
   Ignition key position: "ACC"
   Brake pedal: Not depressed
   **Button:** Pressed
2. Check to be sure that, under the following conditions, the select lever can be moved smoothly from the "P" position to other position.
   Ignition key position: "ACC"
   Brake pedal: Depressed
   Button: Pressed
3. Check to be sure that, under the following conditions, the select lever can be moved smoothly from the "R" position to the "P" position.
   Ignition key position: "ACC"
   Brake pedal: Released
   Button: Pressed
4. If a malfunction is discovered when following the above checking procedures, either adjust or check the shift lock cable mechanism. (Refer to P.21-220.)

## INHIBITOR SWITCH ADJUSTMENT N21FKAJ

INHIBITOR SWITCH

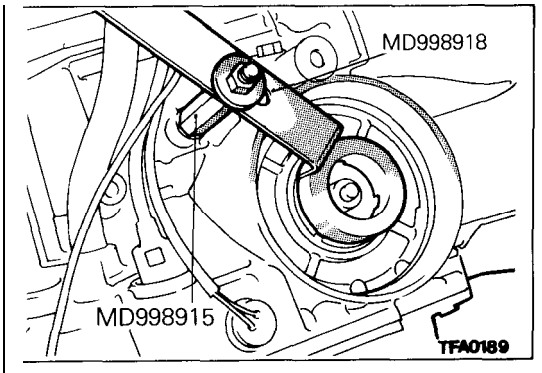
1. Place selector lever in "N" (Neutral) position.
2. Place manual control lever in "N" (Neutral) position.
3. To adjust, rotate the switch body so that the manual control lever 5 mm (.2 in.) hole and the switch body 5 mm (.2 in.) hole are aligned.
4. Tighten the mounting bolts of the inhibitor switch body to the specified torque. At this time, take care to prevent dropping the switch body.
   Specified torque: **10–12** Nm (7-9 **ft.lbs.)**




5. Loosen the nut shown in the figure, and lightly pull the end of the transaxle control cable in the "F" direction by hand.
6. Tighten the nut to the specified torque.
   Specified torque: **10–14** Nm **(7–10 ft.lbs.)**
7. Check that the selector lever is in "N" position.
8. Check that it securely operates and functions on the transaxle side in the range which corresponds to each position of the selector lever.

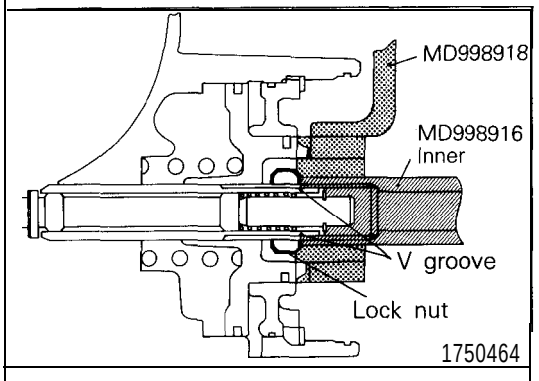
## KICKDOWN SERVO ADJUSTMENT N21FRAB

1. Completely remove all dirt and other materials adhered around the kickdown servo switch.
2. Remove the snap ring.
3. Remove the kickdown servo switch.

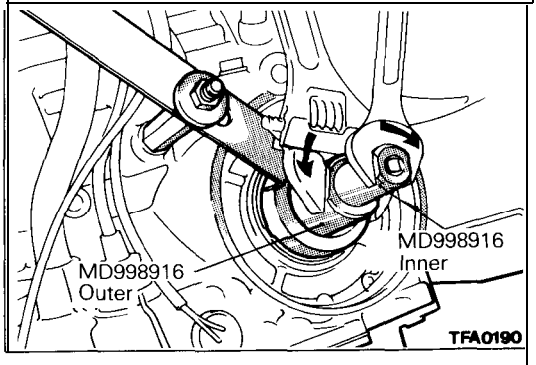



4. To prevent rotation of the piston, engage the pawl of the special tool into the notch of the piston, and using the adapter, fix the piston as shown in the left.

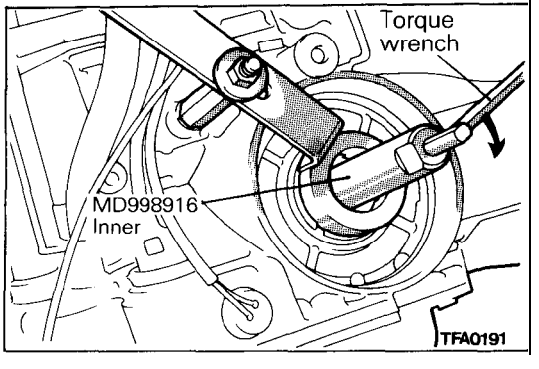
Caution
1. Don't press in the piston with the special tool.
2. When mounting the adapter on the transaxle case, tighten it by hand. Don't apply much torque.



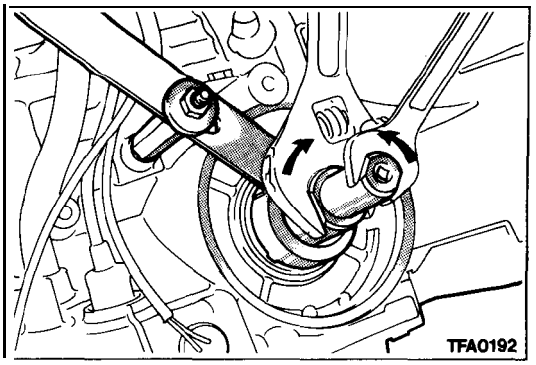

5. Loosen the lock nut to before the V groove of the adjusting rod, and tighten the special tool (inner) until it contacts the lock nut.




6. Engage the special tool (outer) on the lock nut. Rotating the outer cylinder counterclockwise and the inner cylinder clockwise, lock the lock nut and special tool (inner).

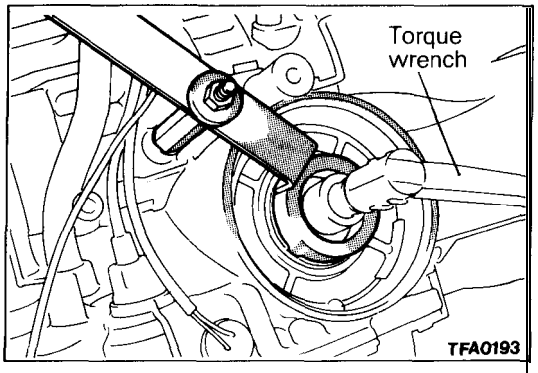



7. Attach the torque wrench to the special tool (inner), and repeat "tightening" and "returning" at a torque of 10 Nm (7.2 ft.lbs.) two times. Then, tighten it to a torque of 5 Nm (3.6 ft.lbs.). Then, back off the special tool (inner) 2 to 2¼ turns.




8. Engage the special tool (outer) on the lock nut. Rotating the outer cyliner clockwise and the inner cylinder counterclockwise, unlock the lock nut and special tool (inner).

**Caution**
**When unlocking the lock, apply equal force to both tools.**

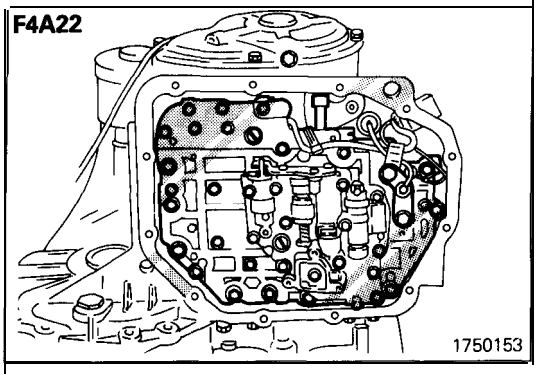



9. Tighten the lock nut by hand until the lock nut contacts the piston. Then, using the torque wrench, tighten to the specified torque.

**Lock nut: 25-32 Nm (18-23 ft.lbs.)**

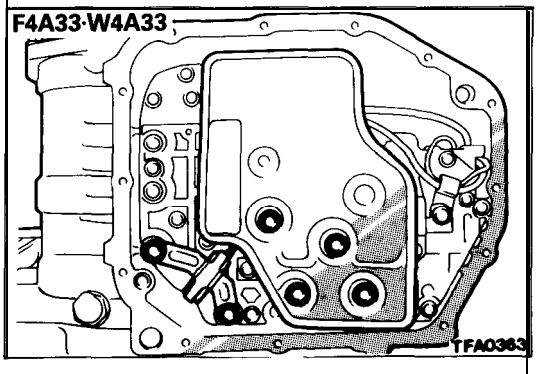
**Caution**
**If it is rapidly tightened with the socket wrench or torque wrench, the lock nut and adjusting rod may rotate together.**

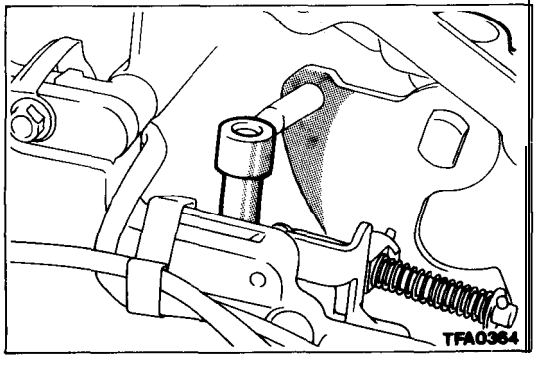
10. Remove the special tool which fastens the piston. Attach the plug to the outlet of the low reverse pressure.



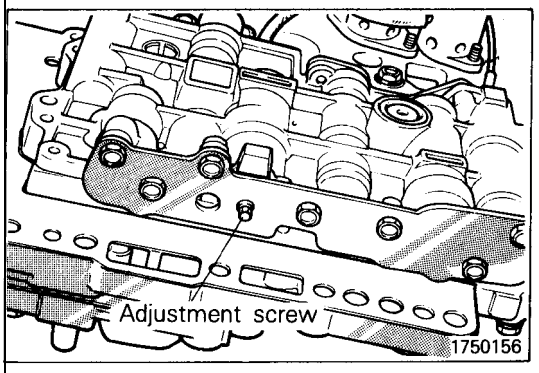

## LINE PRESSURE ADJUSTMENT N21FSABa

1. Drain out the automatic transaxle fluid.
2. Remove the oil pan.
3. Remove the oil filter.
4. Remove the oil-temperature sensor.
5. Press the solenoid valve harness grommet and connector into the transaxle case.



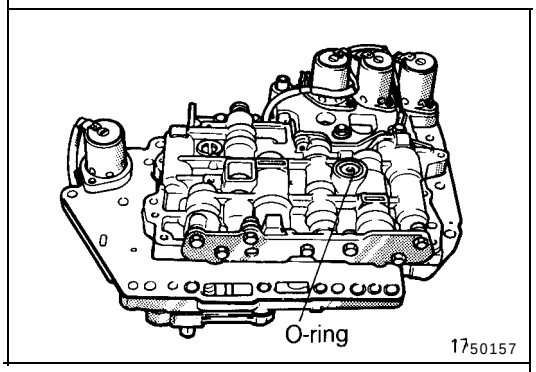




6. Remove the valve body assembly. The manual valve can come out, so be careful not to drop it.

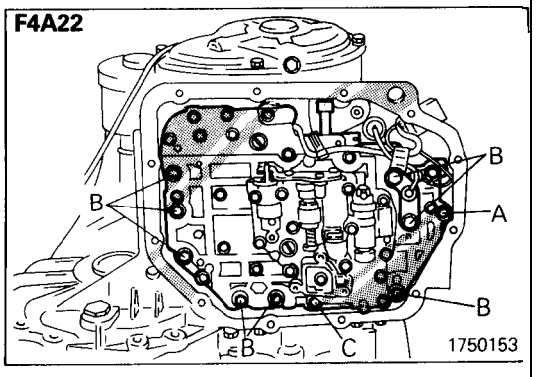



7. Turn the adjustment screw of the regulator valve **and adjust** so that the line pressure (kickdown brake pressure) becomes the standard value.
   When the adjustment screw is turned to the clockwise, the line pressure becomes lower; when it is turned to counter-clockwise, it becomes higher.

   **Standard value: 870–890 kPa (124-127 psi)**
   **Oil pressure change for each turn of adjustment screw: 38 kPa (54 psi)**

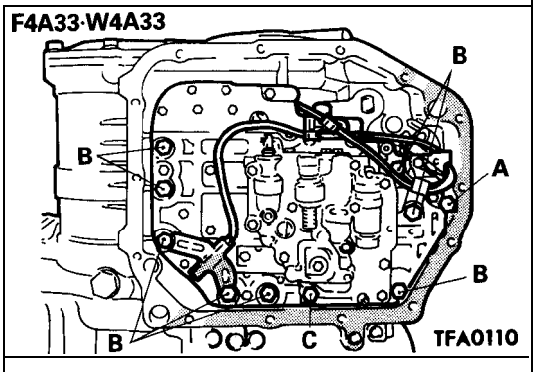


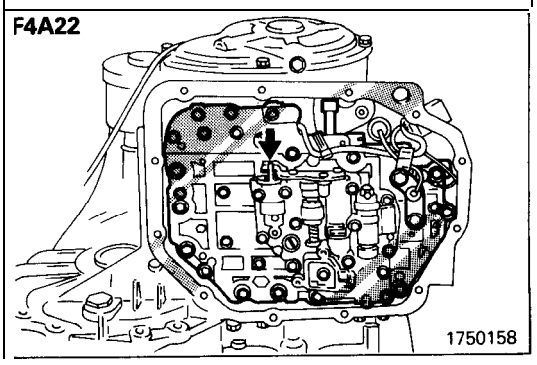

8. Check to be sure that the O-ring is installed on the upper surface of the valve body at the place shown in the figure.
9. Replace the O-ring of the solenoid valve harness grommet with a new one.
10. Insert the solenoid valve harness grommet in the axle case.




11. Install the valve body and oil temperature sensor, and then tighten valve body assembly mounting bolts (10 pieces) to 10–12 Nm (7.5-8.5 ft.lbs.).

    **A: 18 mm (.709 in.) long**
    **B: 25 mm (.984 in.) long**
    **C: 40 mm (1.575 in.) long**
12. Install the oil filter.
13. Install a new oil pan gasket and oil pan.
14. Pour in the specified amount of Automatic transaxle fluid.
15. Make the oil pressure test. Readjust if necessary.

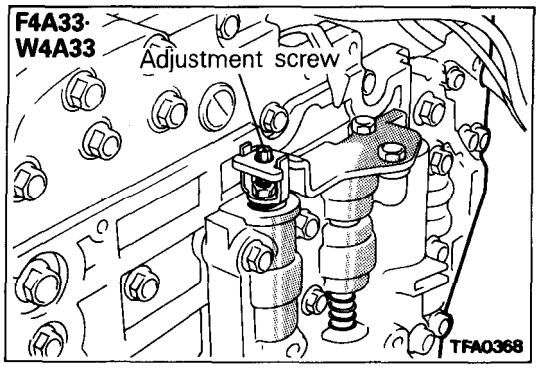



## REDUCING PRESSURE ADJUSTMENT N21FTAC

**(If the multi-use tester is not available)**

1. Remove parts up to the oil filter in the same way **as for** adjustment of the line pressure. The valve body need not be removed.
2. Turn the adjustment screw of the lower valve body and adjust so that the reducing pressure is the standard value. When the adjustment screw is turned to the right, the reducing pressure becomes lower; when it is turned to the left, it becomes higher.




NOTE
When adjusting the reducing pressure, aim for the center value (425 kPa, 60 psi) of the standard value allowance.

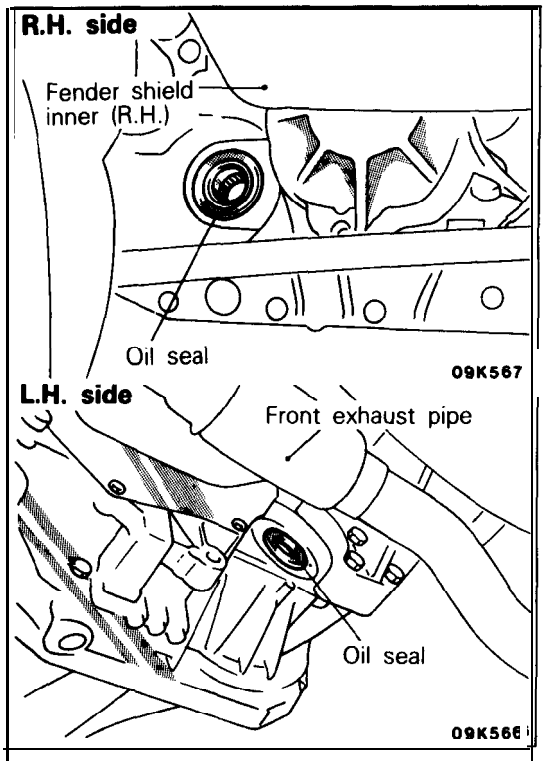
**Standard value: 425 ± 10 kPa (60 ± 1 psi)**

**Oil pressure change for each turn of adjustment screw: F4A22 ..... 22 kPa (3.1 psi)**
**F4A33·W4A33 ..... 86 kPa (12.2 psi)**

3. Install the oil filter and oil pan in the same way as for adjustment of the line pressure.
4. Make the oil pressure test. Readjust if necessary.

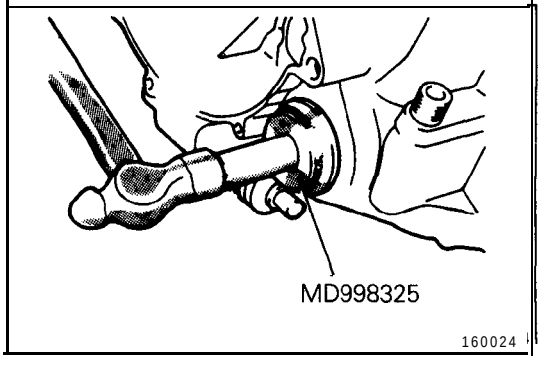
## THROTTLE-POSITION SENSOR ADJUSTMENT N21FWAA

Refer to GROUP 14–Service Adjustment Procedures.



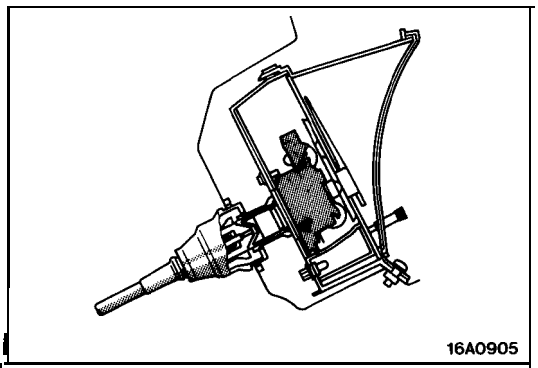

## DRIVE SHAFT OIL SEALS REPLACEMENT N21FDBAa

(1) Disconnect the drive shaft from the transaxle. (Refer to GROUP 2–Drive Shaft.)
(2) Using a flat-tip (–) screwdriver, remove the oil seal.



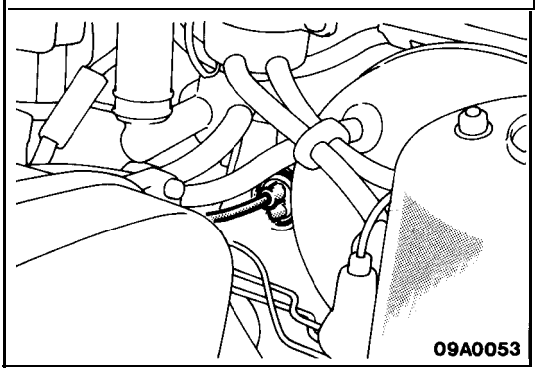

(3) Using the special tool, tap the drive shaft oil seal into the transaxle.
(4) Apply a coating of the transaxle fluid to the lip of the oil seal.

**Transaxle fluid: MOPAR ATF PLUS (Automatic transmission fluid type 7176) or Dia ATF SP or equivalent**




## SPEEDOMETER CABLE REPLACEMENT N21FEAK2

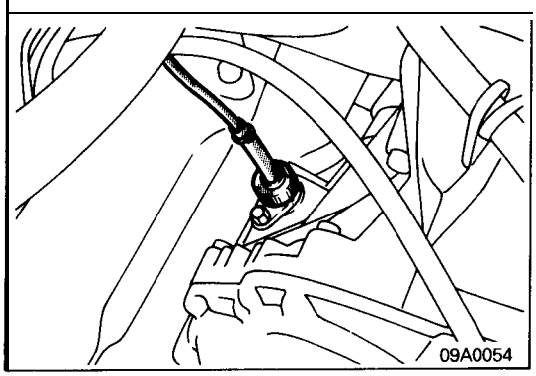
1. Correctly insert the adapter into the instrument panel, and fasten the new speedometer cable.




2. Install the grommet so that, as shown in the illustration, the cable attachment is positioned upward.

**Caution**

**1. The cable arrangement should be made so that the radius of cable bends is 150 mm (5.9 in.) or more.**
**2. The arrangement of the speedometer cable should be such that it does not interfere with other parts.**




3. At the transaxle end of the speedometer cable, the key joint should be inserted into the transaxle, and the nut should be securely tightened.

**Caution**

**If the cable is not correctly and securely connected, it may cause incorrect indication by the speedometer, or abnormal noise. Be sure to connect it correctly.**

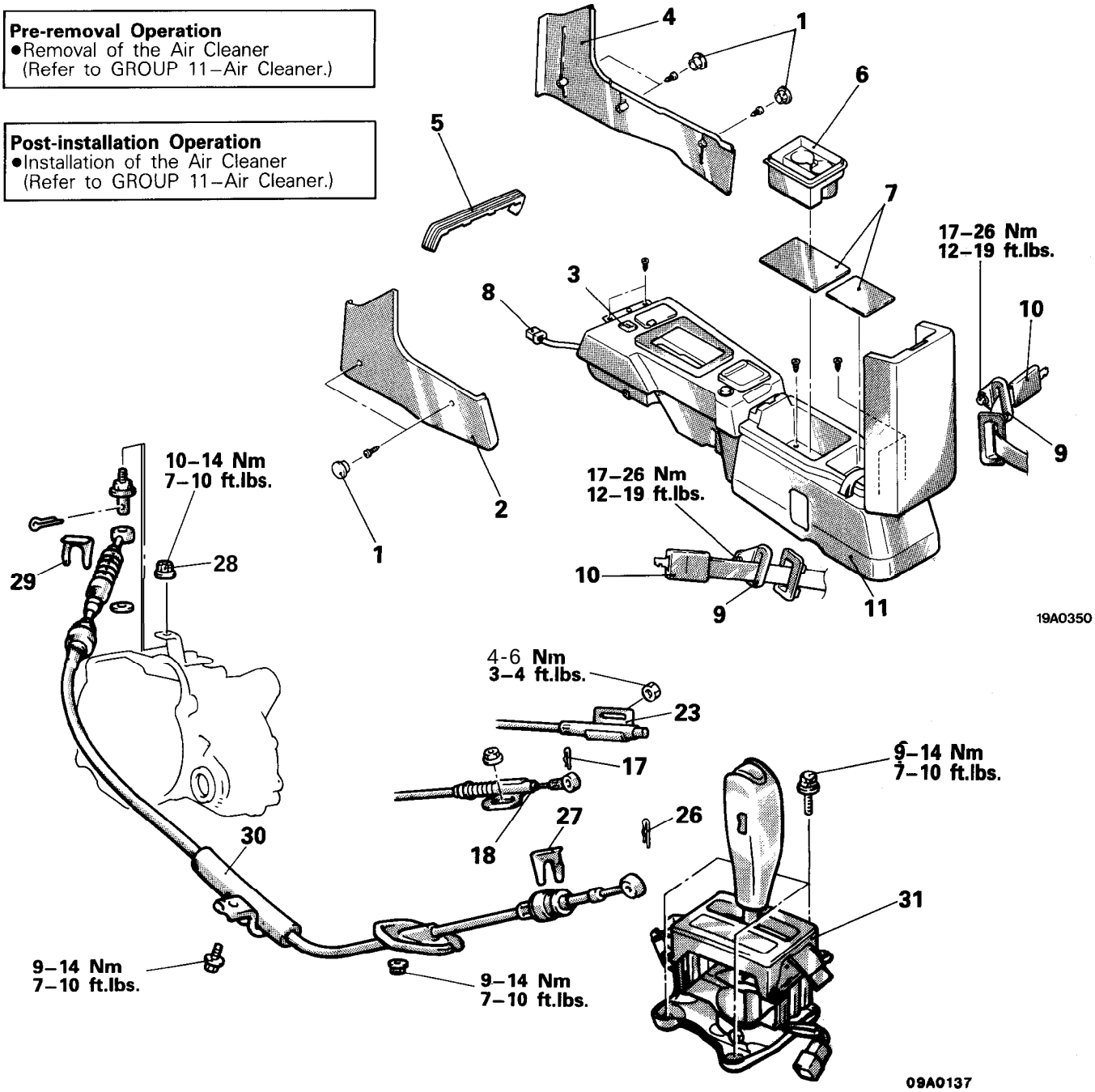
# TRANSAXLE CONTROL

## REMOVAL AND INSTALLATION

N21IA--

**Pre-removal Operation**
- Removal of the Air Cleaner
(Refer to GROUP 11–Air Cleaner.)

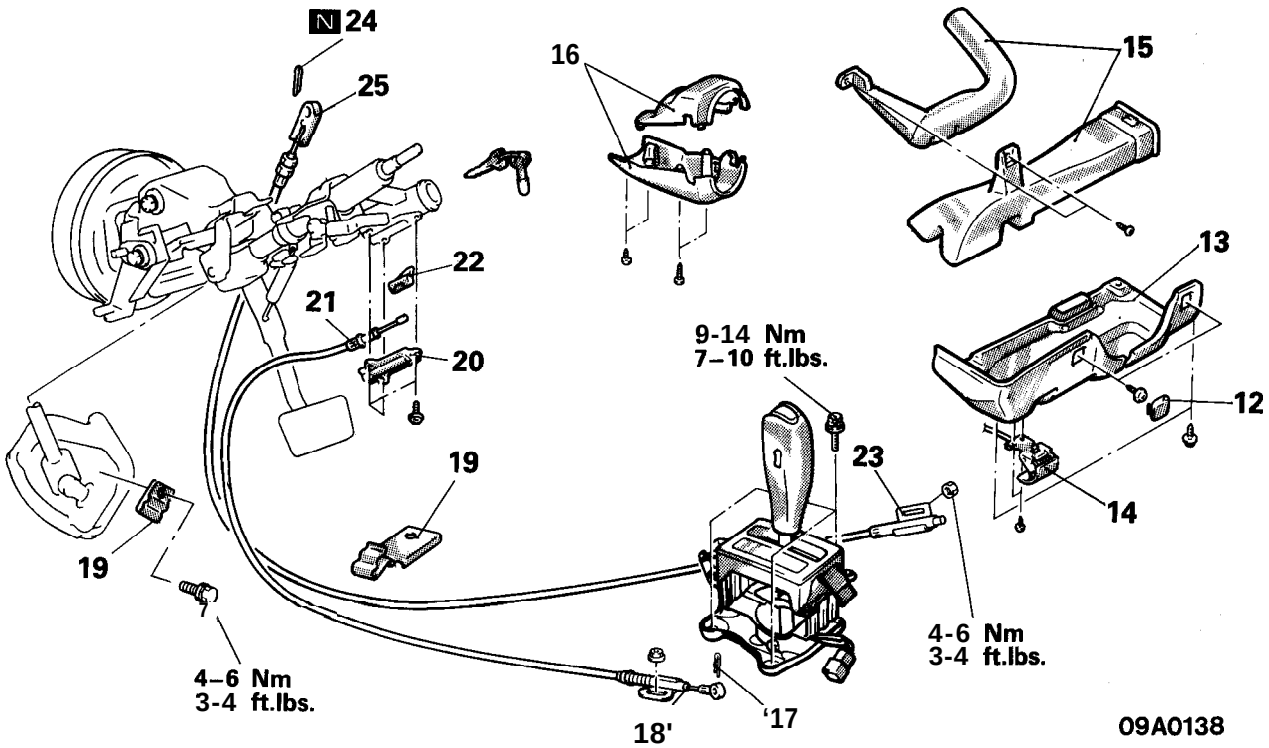
**Post-installation Operation**
- Installation of the Air Cleaner
(Refer to GROUP 11–Air Cleaner.)




**Transaxle control cable and selector lever assembly removal steps**

1. Plug
2. Side cover (B)
3. Power (PWR)/Economy (ECO) switch
4. Side cover(B)
5. Cover(B)
6. Cup holder
7. Carpet
8. Connection of floor console wiring harness
9. Guide ring <Vehicles for U.S.>
10. Shoulder belt <Vehicles for U.S.>
11. Floor console
17. Snap pin
18. Key interlock cable (selector lever assembly side)
23. Shift lock cable (selector lever assembly side)
26. Snap pin
27. Clip
28. Adjusting nut
- 4 29. Clip
- 30. Transaxle control cable
31. Selector lever assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● +: Refer to "Service Points of Installation"




**Key interlock cable removal steps**

1. Plug
2. Side cover(B)
3. Power (PWR)/Economy (ECO) switch
4. Side cover(B)
5. Cover (B)
6. Cup holder
7. Carpet
8. Connection of floor console wiring harness
9. Guide ring <Vehicles for U.S.>
10. Shoulder belt <Vehicles for U.S.>
11. Floor console.
12. Plug
13. Knee protector assembly
14. Hood lock release handle
15. Lap cooler duct and shower duct (L.H.)
16. Column cover
17. Snap pin
- + 18. Key interlock cable (selector lever assembly side)
19. Clamp
20. Cover
- + 21. Key interlock cable (steering lock assembly side)
- ◆◆ 22. Slide lever

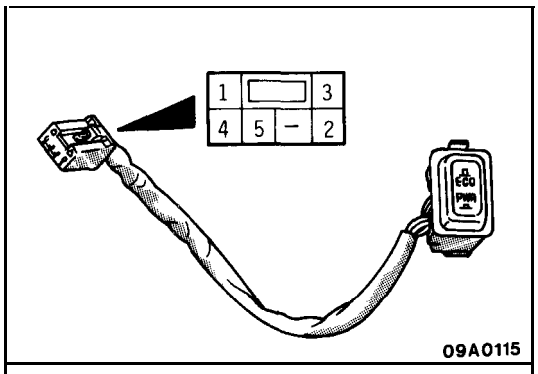
**Shift lock cable removal steps**

1. Plug
2. Side cover(B)
3. Power (PWR)/Economy (ECO) switch
4. Side cover(B)
5. Cover(B)
6. Cup holder
7. Carpet
8. Connection of floor console wiring harness
9. Guide ring <Vehicles for U.S.>
10. Shoulder belt <Vehicles for U.S.>
11. Floor console
12. Plug
13. Knee protector assembly
14. Hood lock release handle
15. Lap cooler duct and shower duct (L.H.)
19. Clamp
- + 23. Shift lock cable (selector lever assembly side)
24. Split pin
25. Shift lock cable (brake pedal side)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● 4 : Refer to "Service Points of Installation".
(3) Be sure to connect and adjust the transaxle control cable before connecting the key interlock cable or shift lock cable

## INSPECTION N21ICAH

- Check the control cable for function and for damage.
- Check the bushing for wear or damage.

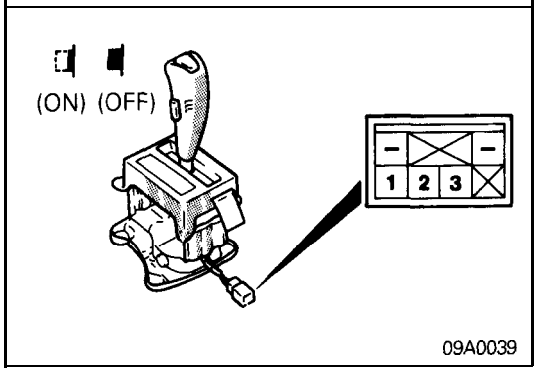



### POWER (PWR)/ECONOMY (ECO) SWITCH

Check for continuity between terminals when the switch is OFF and when ON.

| Switch position \ Terminal | 1 | 2 | 3 | 4 | – | 5 |
|---|---|---|---|---|---|---|
| ON (PWR) | O | O | | O | O | O |
| OFF (ECO) | | O | O | O | O | O |

NOTE
O-O indicates that there is continuity between the terminals.

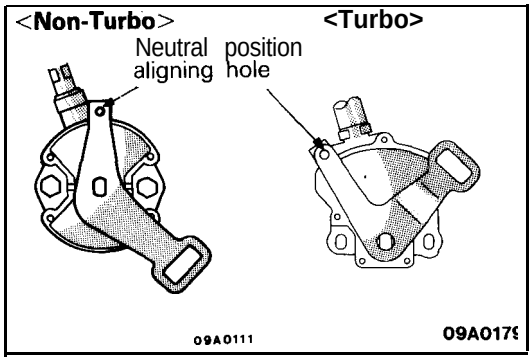



### OVERDRIVE CONTROL SWITCH

Check for continuity between terminals when the switch is OFF and when ON.

| Switch position \ Terminal | 1 | 2 | 3 |
|---|---|---|---|
| ON (Overdrive activation) | 0 | 0 | |
| OFF (Overdrive non-activation) | 0 | | 3 |

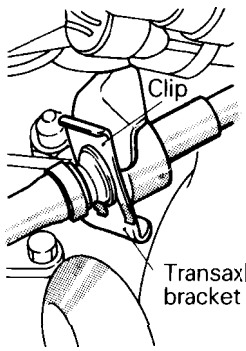
NOTE
O–O indicates that there is continuity between the terminals.




## SERVICE POINTS OF INSTALLATION N21IDAQ

### 30. INSTALLATION OF TRANSAXLE CONTROL CABLE

Move the selector lever and the inhibitor switch to the "N" position, and install the transaxle control cable.

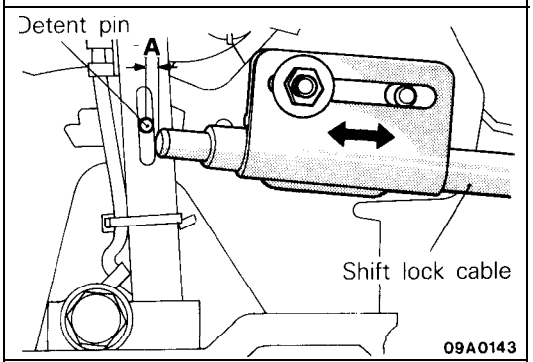



**29. INSTALLATION OF CLIP**

When connecting the control cable to the transaxle mount bracket, install the clip until it contacts the control cable, in the position shown in the figure.

- **ADJUSTMENT OF TRANSAXLE CONTROL CABLE**

Refer to the section concerning adjustment of the inhibitor switch. (Refer to P.21–211.)

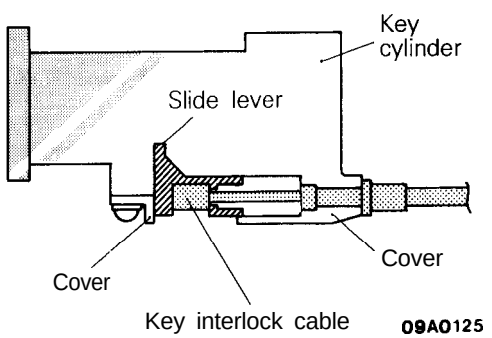



**23. INSTALLATION OF SHIFT LOCK CABLE (SELECT LEVER ASSEMBLY SIDE)**

(1) Move the select lever to the "R" position.
(2) Clamp the shift lock cable.
(3) Connect the shift lock cable to the select lever assembly, and temporarily tighten the nut.
(4) Slide the shift lock cable so that the distance between the select lever assembly's detent pin and the end of the shift lock cable is the standard value, and then tighten the nut at the specified torque.

**Standard value (A): 1–4 mm (.04–.15 in.)**

(5) After connecting the shift lock cable, check the shift lock mechanism. (Refer to P.21–211.)

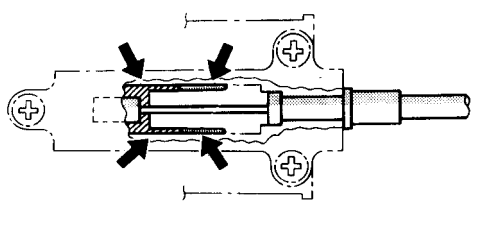


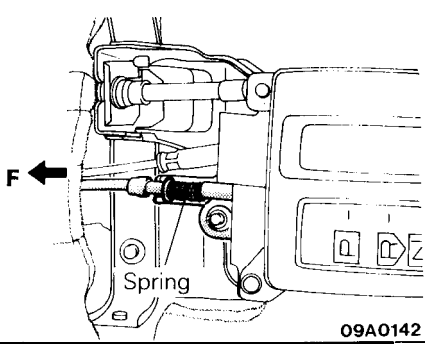

**22. INSTALLATION OF THE SLIDE LEVER/21. KEY INTERLOCK CABLE (STEERING LOCK ASSEMBLY SIDE)**

(1) With the ignition key either at the "LOCK" position or removed, install the slide lever to the key cylinder.
(2) Connect, as shown in the figure, the key interlock cable to the slide lever and the key cylinder.
(3) Apply a light coating of multipurpose grease where shown in the figure.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

(4) Install the key interlock cable.



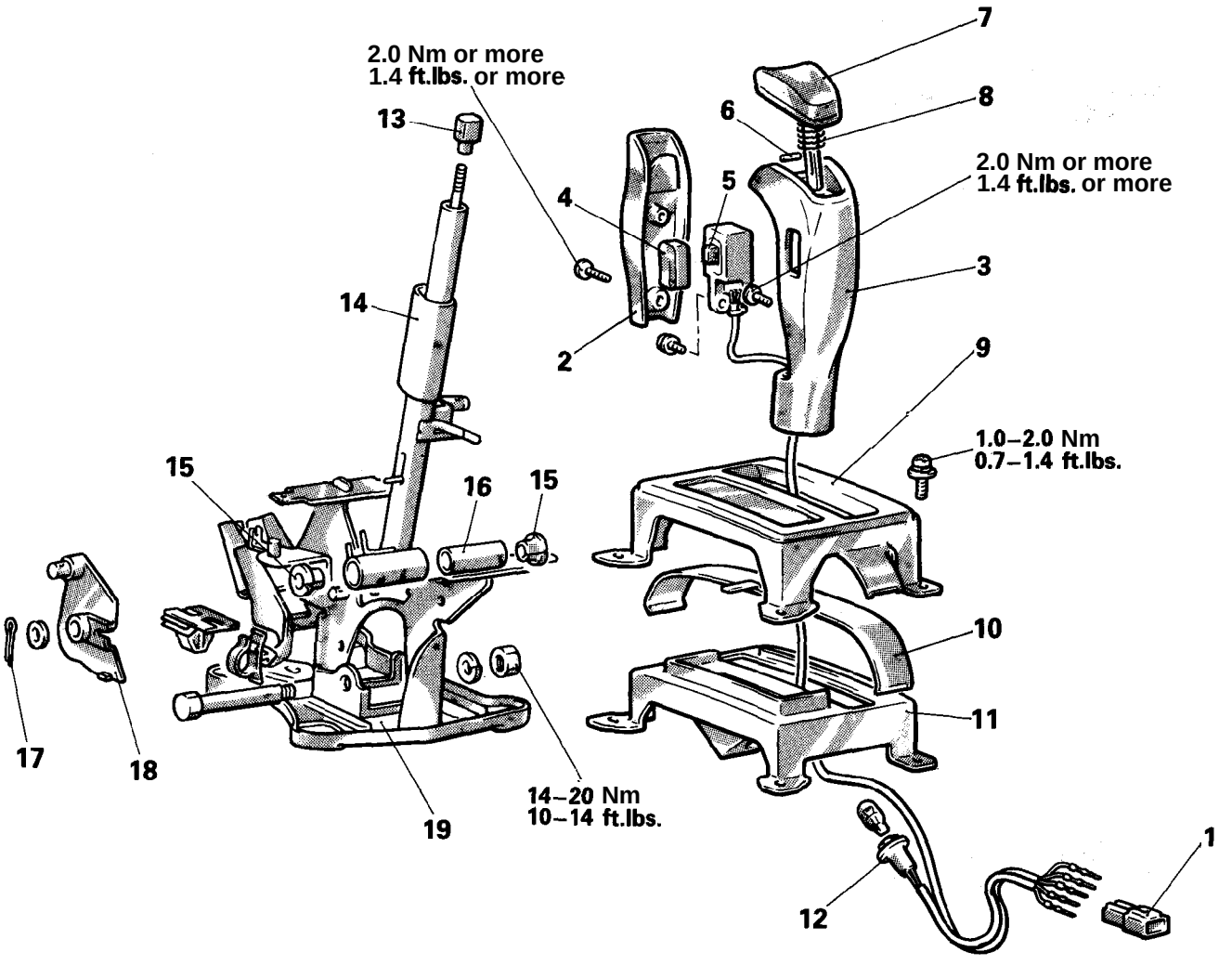




**18. INSTALLATION OF KEY INTERLOCK CABLE (SELECT LEVER ASSEMBLY SIDE)**

(1) Move the select lever to the "P" postion.
(2) Connect the key interlock cable to the select lever assembly's lock cam. Be sure that the spring installed to the key interlock cable is as shown in the figure.
(3) While gently pressing the lock cam in the F direction, tighten the nut to secure the key interlock cable.
(4) After connecting the key interlock cable, check the key interlock mechanism. (Refer to P.21–210.)

## DISASSEMBLY AND REASSEMBLY (SELECT LEVER ASSEMBLY)

N21OE--

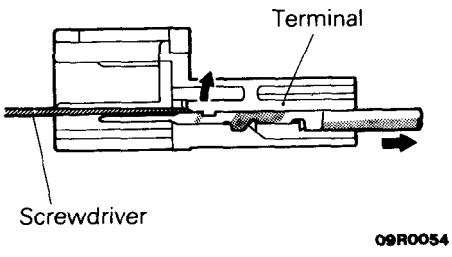



09A0135

**Disassembly steps**

- ◆◆ 1. Overdrive control switch connector
- **2.** Cover
- ◆◆ 3. Selector knob
- ◆◆ 4. Overdrive control switch button
- 5. Overdrive control switch
- **6.** Pin
- ● * 7. Pushbutton
- ◆◆ 8. Spring
- 9. Indicator panel
- 10. Slider
- 11. indicator panel lower
- 12. Socket assembly
- ◆◆ 13. Sleeve
- 14. Lever assembly
- ◆◆ 15. Bushing
- 16. Pipe
- 17. Split pin
- ● *** 18.** Lock cam
- 19. Bracket assembly

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".



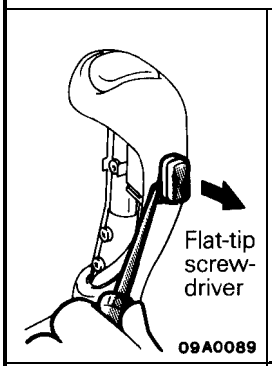

09R0054

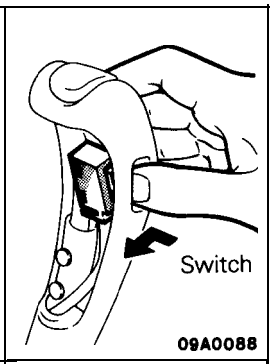
## SERVICE POINTS OF DISASSEMBLY

N21OFAC

### 1. REMOVAL OF OVERDRIVE CONTROL SWITCH CONNECTOR

Disconnect the overdrive control switch connector and then remove the terminal from the overdrive control switch connector.



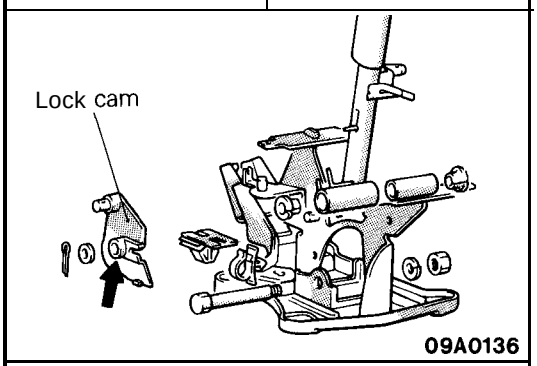

**4. REMOVAL OF OVERDRIVE CONTROL SWITCH BUTTON/5. OVERDRIVE CONTROL SWITCH**

(1) Using the flat-tip screwdriver, remove the overdrive control switch button.
(2) Pressing the switch, remove the overdrive control switch.

## INSPECTION N210GAD

- Check the detent plate for wear.
- Check the bushing for wear or damage.
- Check the spring for damage or deterioration.

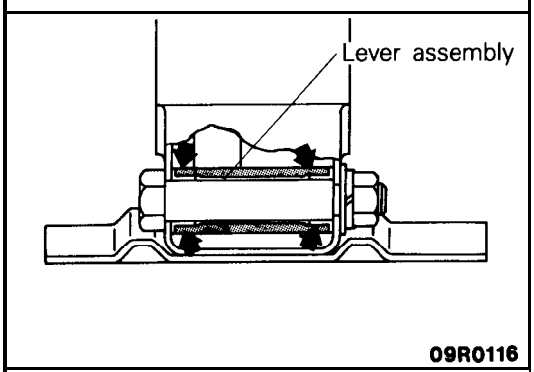
## SERVICE POINTS OF REASSEMBLY N210HAM




**18. APPLICATION OF GREASE TO LOCK CAM**

Apply a coating of multipurpose grease to the sliding part of the bushing.

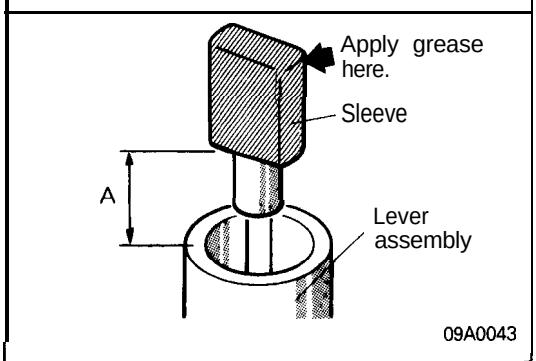
**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**




**15. APPLICATION OF GREASE TO BUSHING**

Apply a coating of multipurpose grease to the sliding part of the bushing.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**



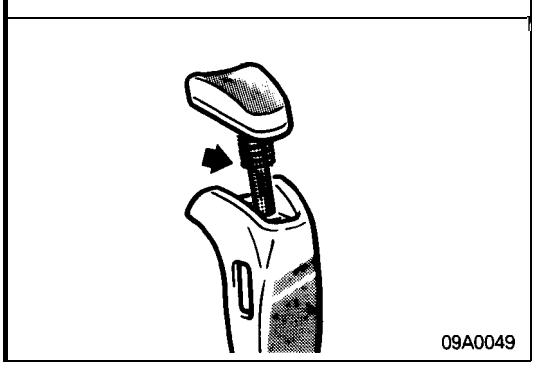

**13. INSTALLATION OF SLEEVE**

(1) Place the shift lever in the "N" position, and then turn the sleeve so that the clearance between the sleeve and the lever assembly end is within the standard value.

**Standard value (A): 15.2-15.9 mm (.598–.625 in.)**

(2) Apply a coating of multipurpose grease to the surface of the sleeve.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**




**8. APPLICATION OF GREASE TO SPRING/7. PUSHBUTTON**

Apply multipurpose grease at the places shown in the figure.

**Grease: MOPAR Multi-mileage Lubricant Part No. 2525035 or equivalent**

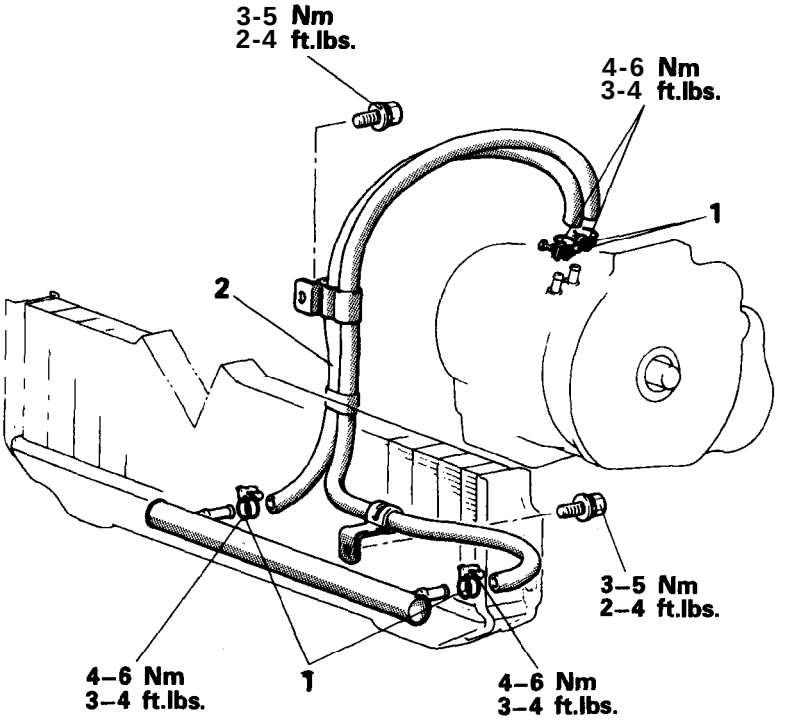
# TRANSAXLE OIL COOLER HOSES <NON-TURBO>

N21SA-A

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Drainage of Automatic Transaxle Fluid (Refer to GROUP 0 – Maintenance Service.)

**Post-installation Operation**
- Filling of Automatic Transaxle Fluid (Refer to GROUP 0 – Maintenance Service.)




09A0041

**Removal steps**

1. Hose clamp
◆■► 2. Oil cooler hose assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆■►: Refer to "Service Points of Removal".

## SERVICE POINTS OF REMOVAL

N21SBAD

### 2. REMOVAL OF OIL COOLER HOSE ASSEMBLY

**Caution**
1. **Take care not to spill the transaxle fluid when removing components.**
2. **After removing the oil cooler hose assembly, plug so that foreign materials cannot enter the transaxle.**

## INSPECTION

N21SCAF

- Check the hose for crack, damage and clog.
- Check for rusted or clogged radiator oil cooler.

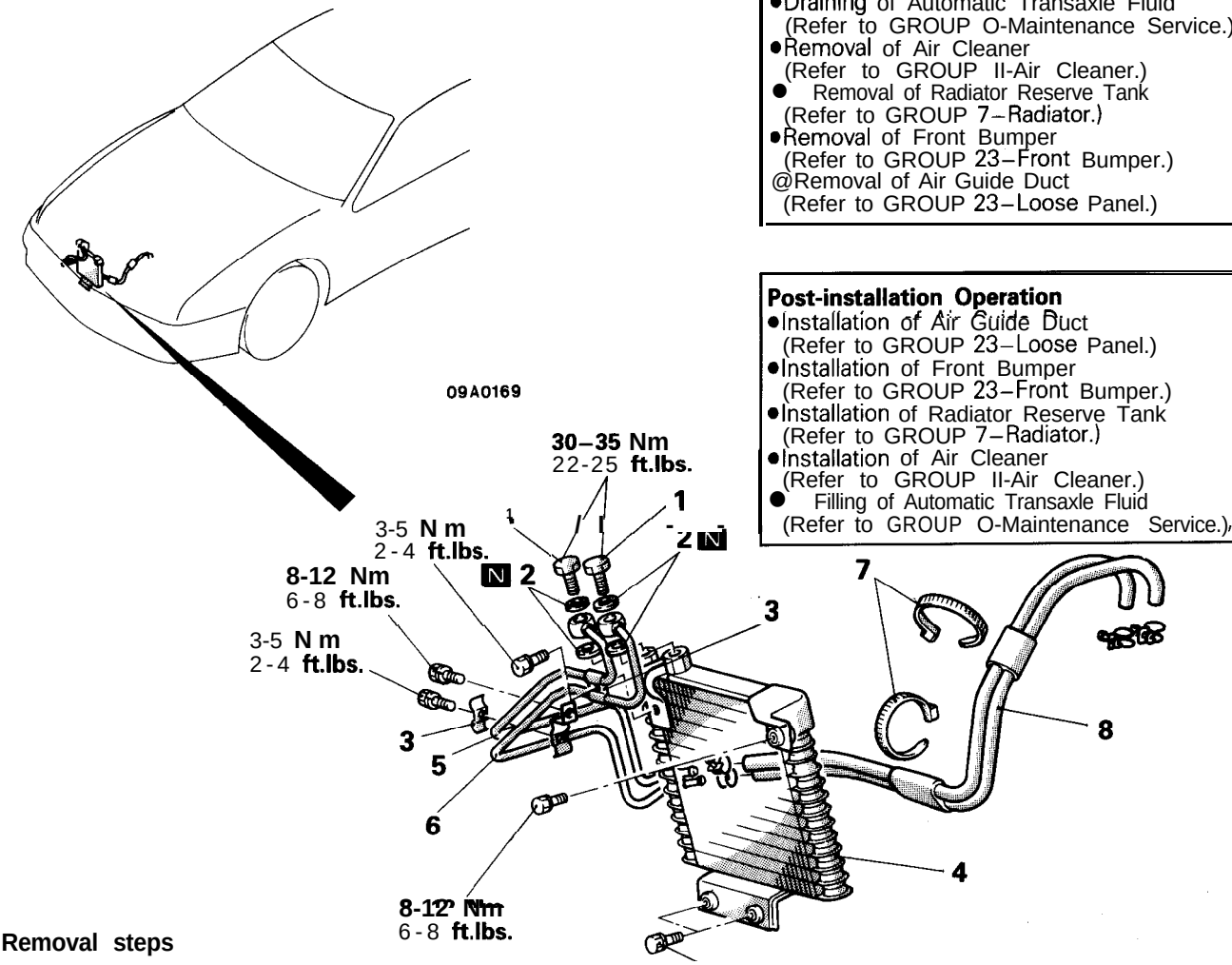
# TRANSAXLE OIL COOLER <TURBO>

N21SA-B

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Draining of Automatic Transaxle Fluid (Refer to GROUP O-Maintenance Service.)
- Removal of Air Cleaner (Refer to GROUP II-Air Cleaner.)
- Removal of Radiator Reserve Tank (Refer to GROUP 7–Radiator.)
- Removal of Front Bumper (Refer to GROUP 23–Front Bumper.)
- @Removal of Air Guide Duct (Refer to GROUP 23–Loose Panel.)

**Post-installation Operation**
- Installation of Air Guide Duct (Refer to GROUP 23–Loose Panel.)
- Installation of Front Bumper (Refer to GROUP 23–Front Bumper.)
- Installation of Radiator Reserve Tank (Refer to GROUP 7–Radiator.)
- Installation of Air Cleaner (Refer to GROUP II-Air Cleaner.)
- Filling of Automatic Transaxle Fluid (Refer to GROUP O-Maintenance Service.)




**Removal steps**
1. Eye bolts
2. Gasket
3. Bracket
4. Transaxle oil cooler
5. Oil cooler feed tube
6. Oil cooler return tube
7. Band

◆◆ ● + 8. Oil cooler hose

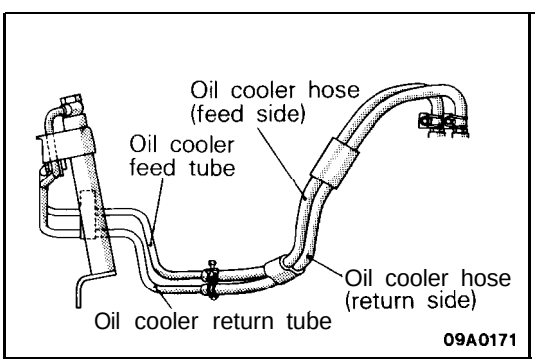
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation"
(4) N: Non-reusable parts

## SERVICE POINTS OF REMOVAL

N21SBAF

### 8. REMOVAL OF OIL COOLER HOSE ASSEMBLY

Refer to P.21-223.




## INSPECTION

N21SCAG

- Check the hose and tube for crack, damage or clog.
- Check for rusted or clogged oil cooler.
- Check the eye bolt for clogging or deformation.

## SERVICE POINTS OF INSTALLATION

N21SDAC

### 8. INSTALLATION OF OIL COOLER HOSE

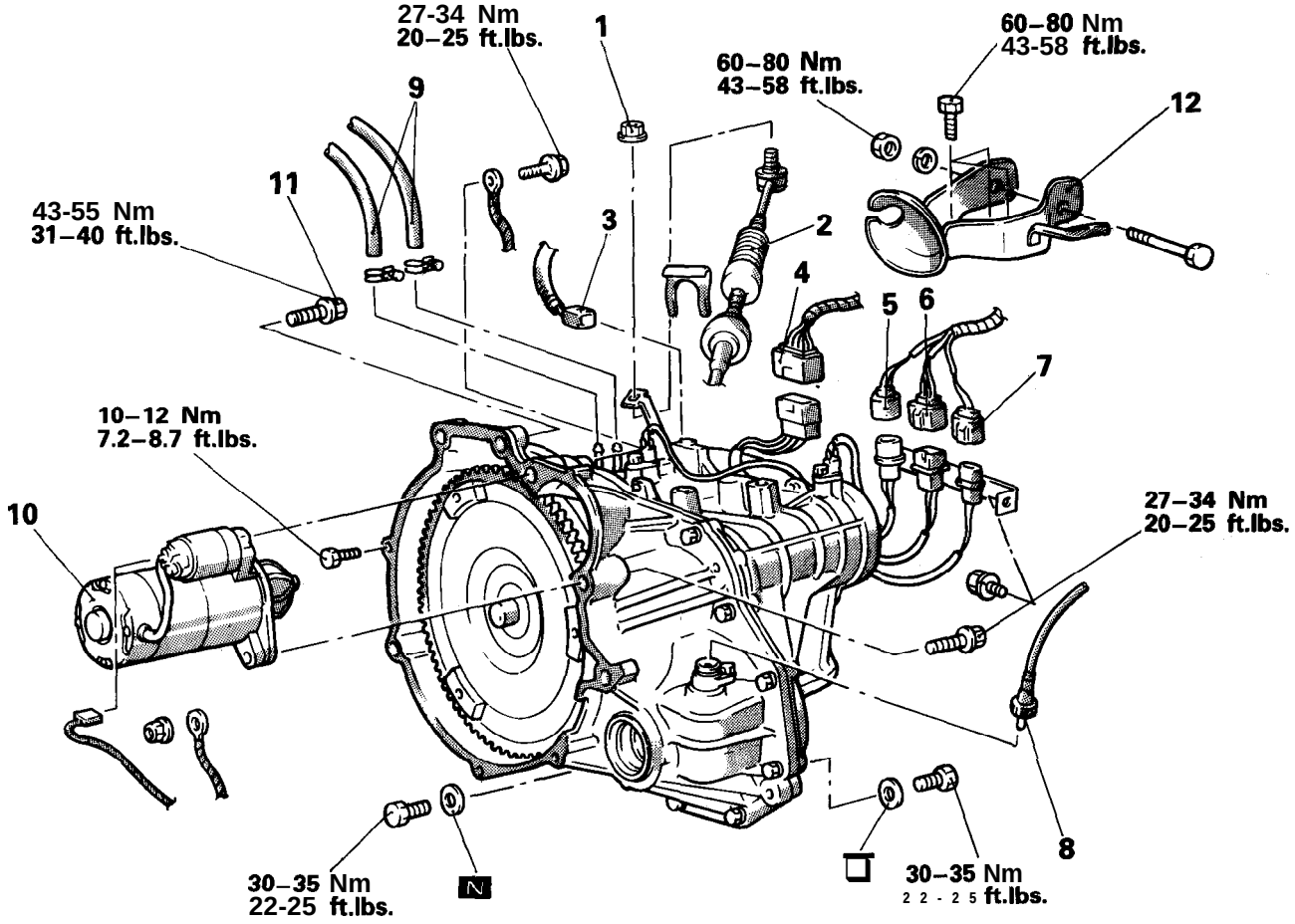
There are 2 types of oil cooler hoses, a long one and a short one. Connect the long one to the oil cooler return tube and the short one to the oil cooler feeder tube.

# TRANSAXLE ASSEMBLY <F4A22>

N21LA-A

## REMOVAL AND INSTALLATION

| Pre-removal Operation | Post-installation Operation |
|---|---|
| •Removal of Battery<br>•Draining of Transaxle Fluid<br>(Refer to GROUP O-Maintenance Service.)<br>•Removal of Air Cleaner<br>(Refer to GROUP 11 -Air Cleaner.) | •Installation of Air Cleaner<br>(Refer to GROUP 11 -Air Cleaner.)<br>•Installation of Battery<br>•Supplying of Transaxle Fluid<br>(Refer to GROUP O-Maintenance Service.) |

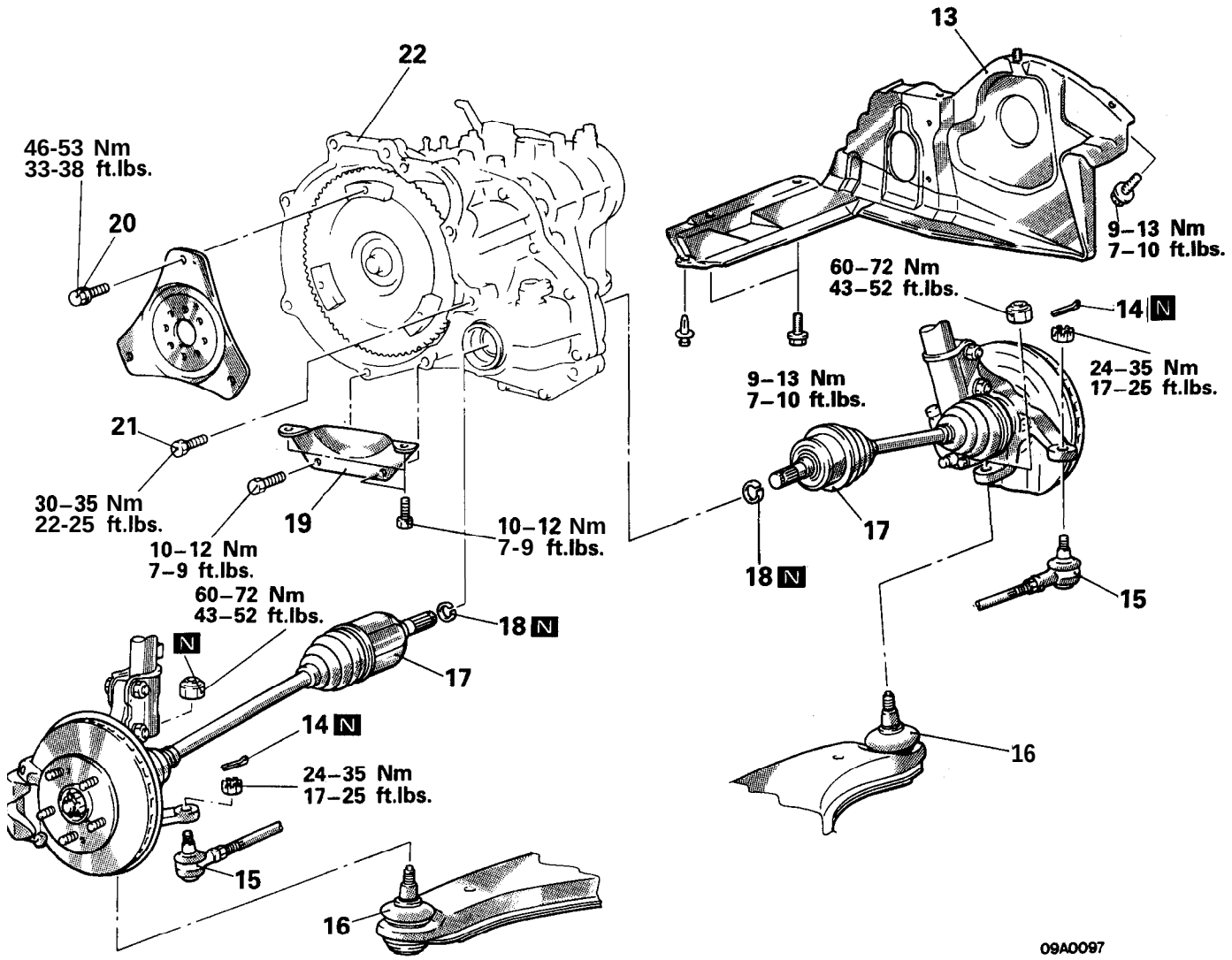



09A0109

**Removal steps**

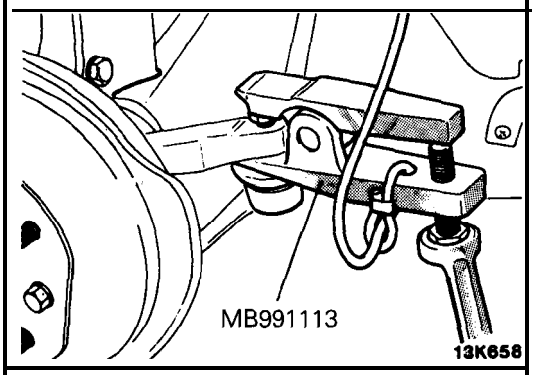
1. Adjusting nut
● * 2. Connection for transaxle control cable
3. Connection for solenoid connector
4. Connection for inhibitor switch connector
5. Connection for pulse generator connector
6. Connection for kickdown servo switch connector
7. Connection for oil temperature sensor connector
8. Connection for speedometer cable
9. Connection for oil cooler hose
10. Starter motor
11. Upper coupling bolt for transaxle assembly and engine assembly
12. Transaxle mount bracket

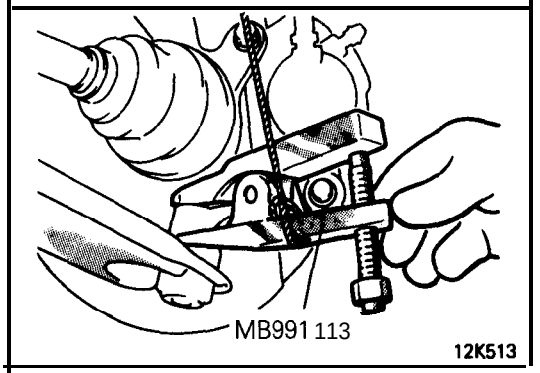
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● 4 : Refer to “Service Points of Installation”.
(3) N : Non-reusable parts

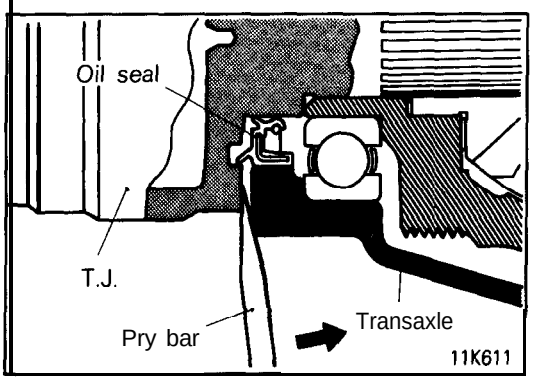


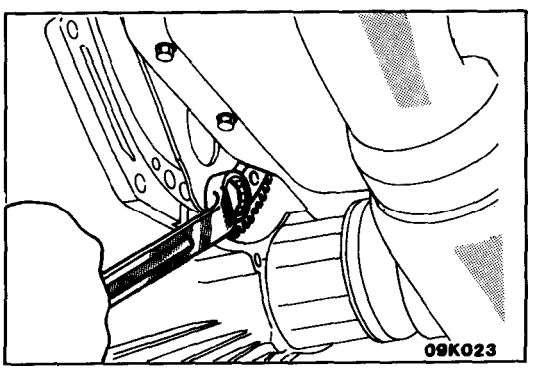

13. Under guard
14. Cotter pins
◆◆ 15. Connection for tie rod end
◆◆ 16. Connection for lower arm ball joint
◆◆ 17. Connection for drive shaft
18. Circlip
19. Bell housing cover
◆◆ 20. Special bolts
21. Lower coupling bolt for transaxle assembly and engine assembly
22. Transaxle assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) N : Non-reusable parts




## SERVICE POINTS OF REMOVAL N21LBAK

### 15. DISCONNECTION OF TIE ROD END

Using the special tool, disconnect the tie rod end from the knuckle.

**Caution**

**1. Be sure to tie the cord of the special tool to the nearby part.**

**2. Loose the nut but do not remove it.**

### 16. DISCONNECTION OF LOWER ARM BALL JOINT

Using the special tool, disconnect the lower arm ball joint from the knuckle.

**Caution**

**1. Be sure to tie the cord of the special tool to the nearby part.**

**2. Loose the nut but do not remove it.**

### 17. DISCONNECTION OF DRIVE SHAFT

(1) Insert a pry bar between the transaxle case and the drive shaft, and then pry the drive shaft from the transaxle.

**Caution**

**1. Do not pull on the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.**

**2. Do not insert the pry bar so deep as to damaged the oil seal.**

(2) Keep the removed drive shaft as far away from the transaxle case as possible, and secure (by using rope, etc.) the T.J. to the body so that it does not fall.

### 20. REMOVAL OF SPECIAL BOLTS

(1) Remove the three special bolts connecting the converter to the drive plate.

NOTE

To remove the special bolts of torque converter, turn engine crankshaft with a box wrench to bring one of the bolts to the position appropriate for removal. After removing the bolt, turn the crankshaft in the same manner as above and remove all remaining bolts one after another.

(2) After removing the special bolts, push the torque converter toward transaxle so that it does not remain on the engine side.

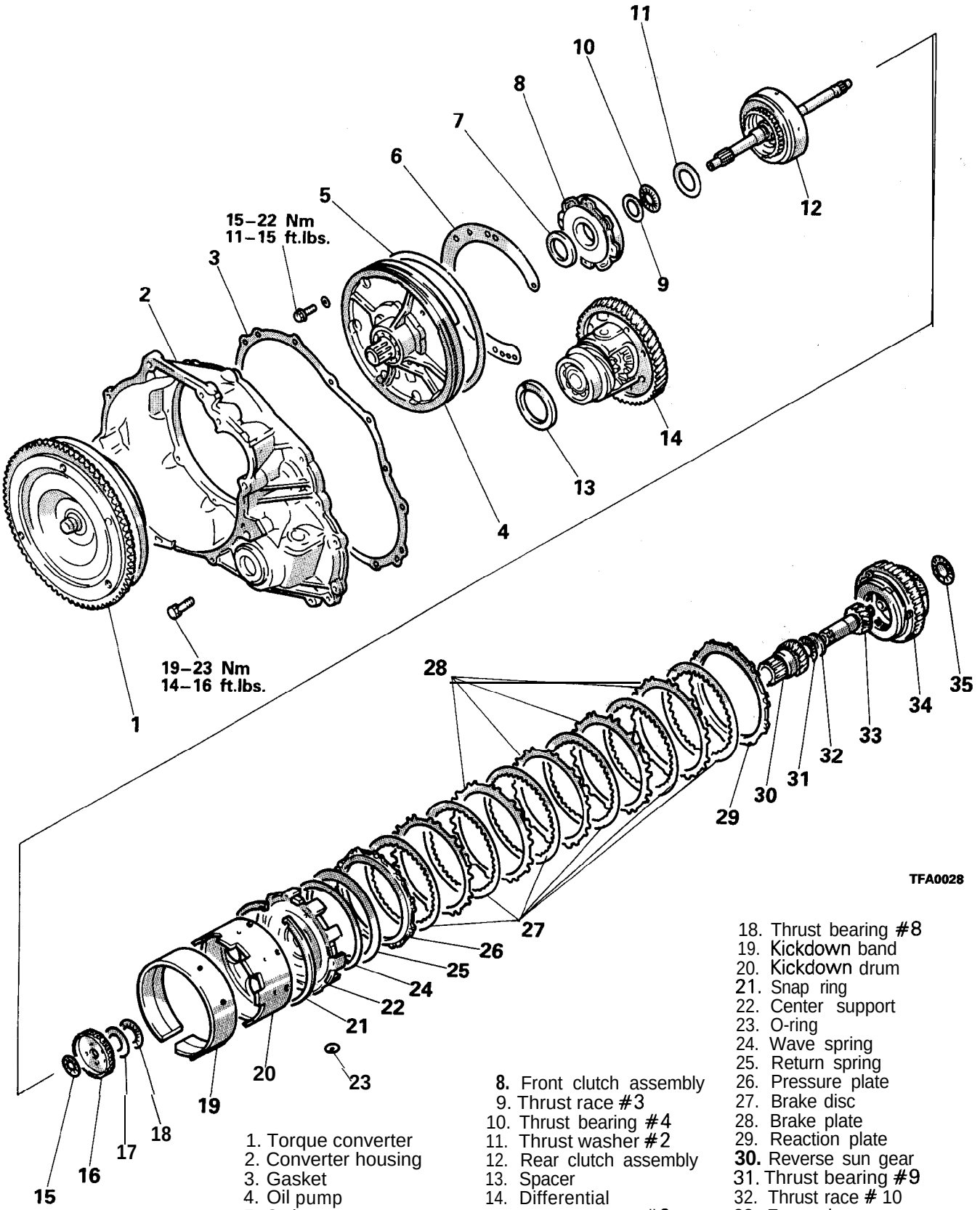
## SERVICE POINTS OF INSTALLATION N21LDAY

### 2. CONNECTION OF TRANSAXLE CONTROL CABLE

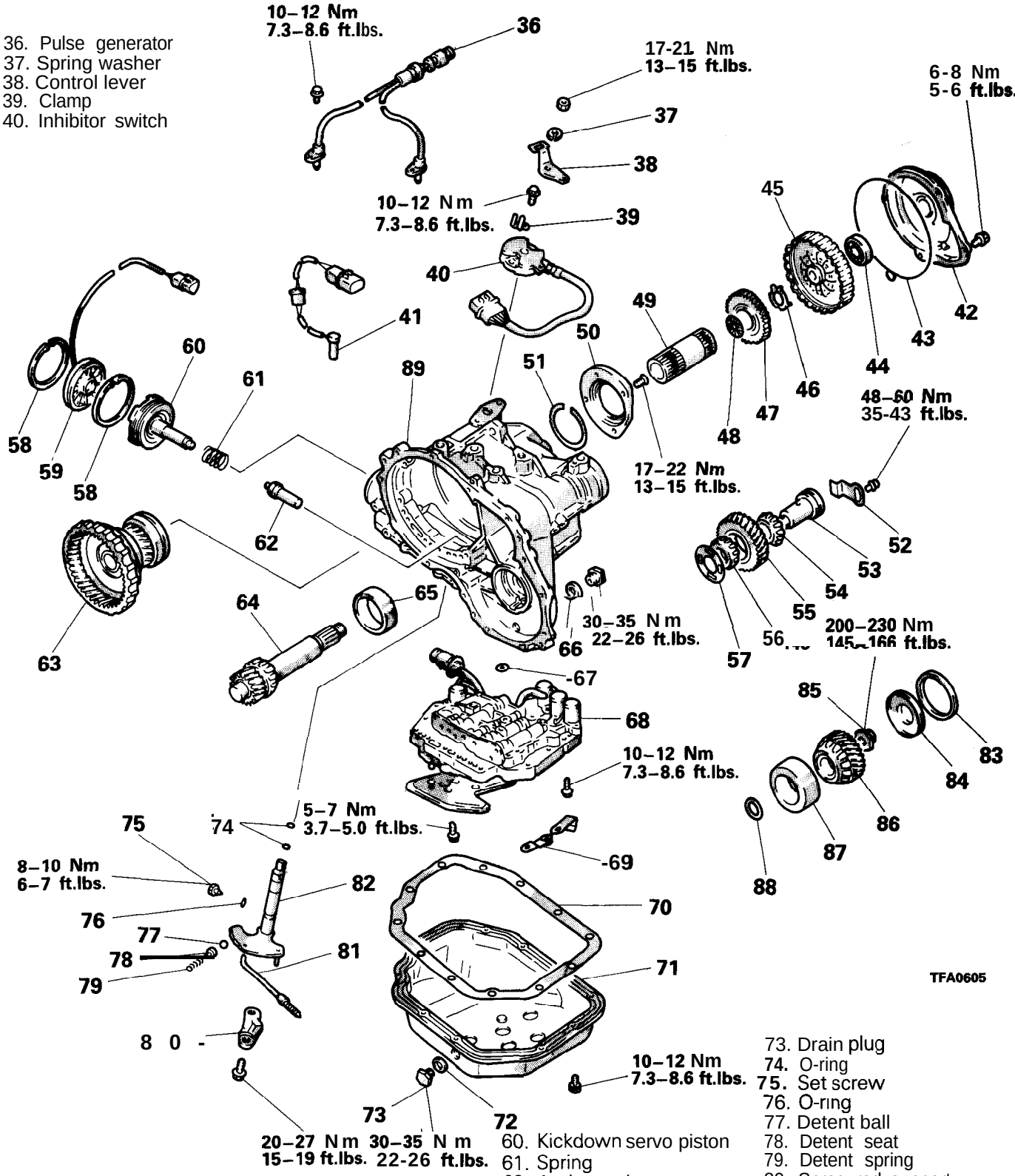
Refer to P.21-211.

## DISASSEMBLY AND REASSEMBLY <F4A22>

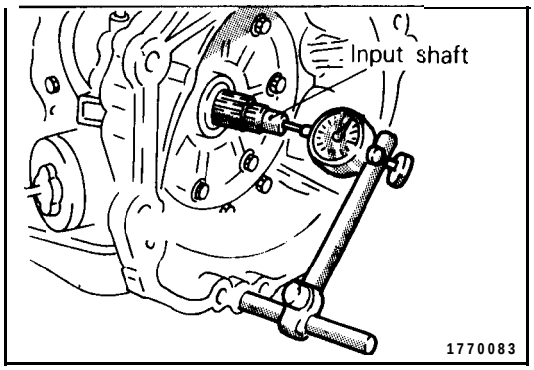
N21LEBB




1. Torque converter
2. Converter housing
3. Gasket
4. Oil pump
5. O-ring
6. Gasket
7. Thrust washer #1
8. Front clutch assembly
9. Thrust race #3
10. Thrust bearing #4
11. Thrust washer #2
12. Rear clutch assembly
13. Spacer
14. Differential
15. Thrust bearing #6
16. Clutch hub
17. Thrust race #7
18. Thrust bearing #8
19. Kickdown band
20. Kickdown drum
21. Snap ring
22. Center support
23. O-ring
24. Wave spring
25. Return spring
26. Pressure plate
27. Brake disc
28. Brake plate
29. Reaction plate
30. Reverse sun gear
31. Thrust bearing #9
32. Thrust race # 10
33. Forward sun gear
34. Planetary carrier
35. Thrust bearing # 12



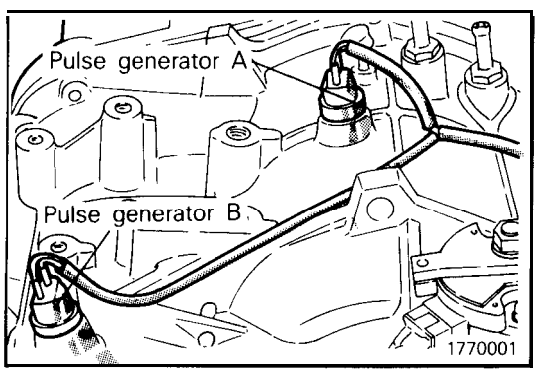

36. Pulse generator
37. Spring washer
38. Control lever
39. Clamp
40. Inhibitor switch
41. Oil temperature sensor I
42. End clutch cover
43. O-ring
44. Bearing
45. End clutch
46. Thrust washer
47. End clutch hub
48. Thrust bearing # 13
49. End clutch shaft
50. Bearing retainer
51. Snap ring
52. Lock plate
53. Idler gear shaft
54. Bearing inner race
55. Idler gear
56. Bearing inner race
57. Spacer
58. Snap ring
59. Kickdown servo switch
60. Kickdown servo piston
61. Spring
62. Anchor rod
63. Output flange
64. Transfer shaft
65. Outer race
66. Gasket
68. Valve body assembly
69. Clamp
70. Gasket
71. Oil pan
72. Gasket
73. Drain plug
74. O-ring
75. Set screw
76. O-ring
77. Detent ball
78. Detent seat
79. Detent spring
80. Sprag rod support
81. Parking sprag rod
82. Control shaft
83. D-ring
84. Transfer shaft cover
85. Lock nut
86. Driven gear
87. Outer race
88. Spacer
89. Transaxle case



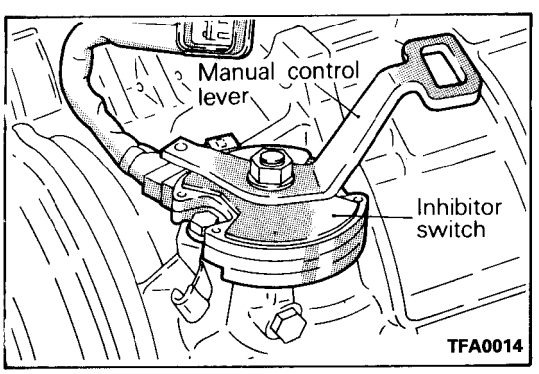

## DISASSEMBLY

N21LEAI

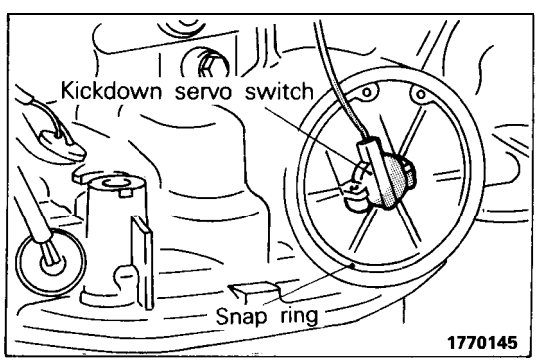
1. Clean away any sand, mud, etc. adhered around the transaxle.
2. Place the transaxle assembly on the workbench with the oil pan down.
3. Remove the torque converter.
4. Measuring input shaft end play before disassembly will usually indicate when a thrust washer change is required (except when major parts are replaced). Thrust washers are located between reaction shaft support and rear clutch retainer, and between reaction shaft support and front clutch retainer.
   Mount a dial indicator to converter housing with the Dial Indicator Support. Make sure that the indicator plunger is seated against end of input shaft.
   When checking end play, pull out or push in the input shaft with pliers. Be careful not to scratch the input shaft. Record indicator reading for reference when reassembling transaxle.



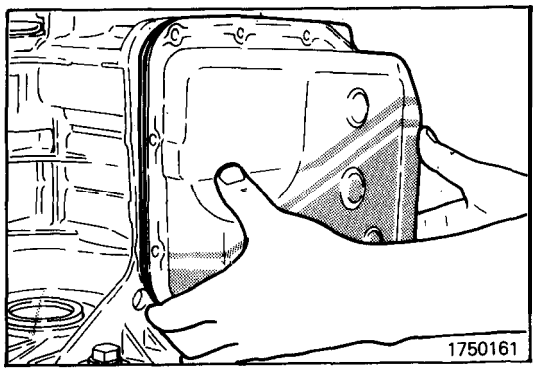

5. Remove the pulse generator “A” and “B”



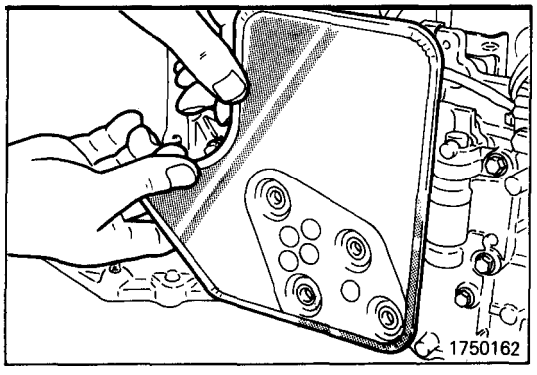

6. Remove manual control lever, then remove inhibitor switch.



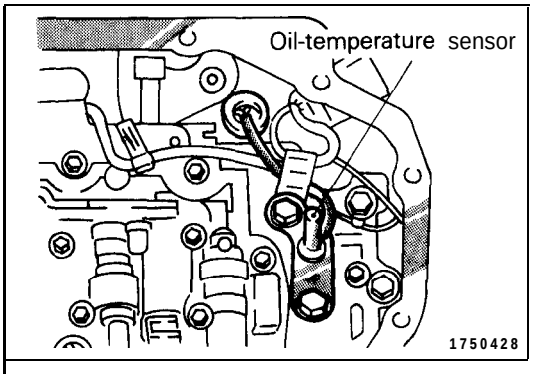

7. Remove snap ring then remove kickdown servo switch.



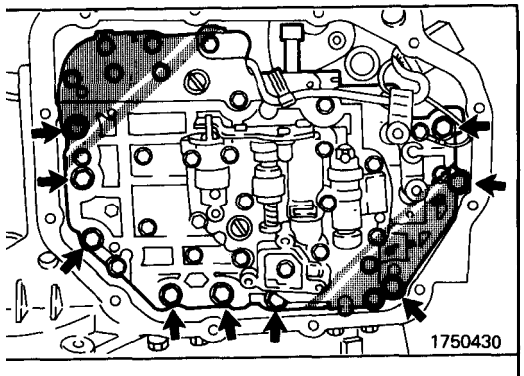

8. Remove the oil pan and gasket.



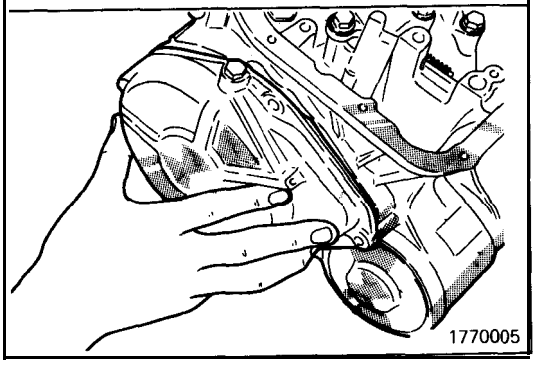

9. Remove the oil filter from the valve body.



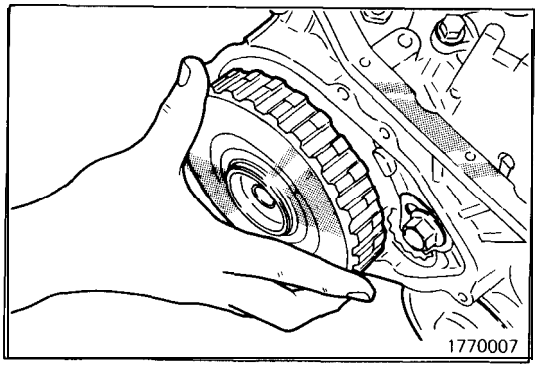

10. Remove the oil-temperature sensor installation bolt; then, after removal from the bracket, pull out from the connector side.
11. Insert the solenoid valve harness grommet and connector into the transaxle case.



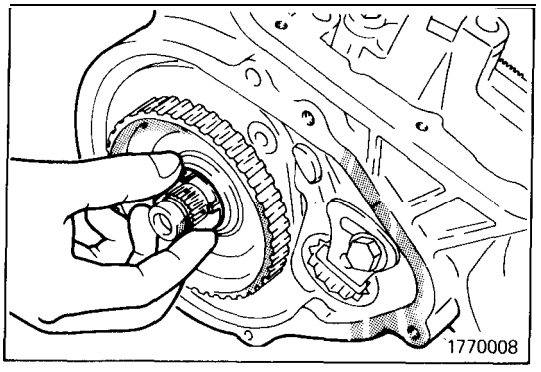

12. Remove 10 bolts and remove valve body.



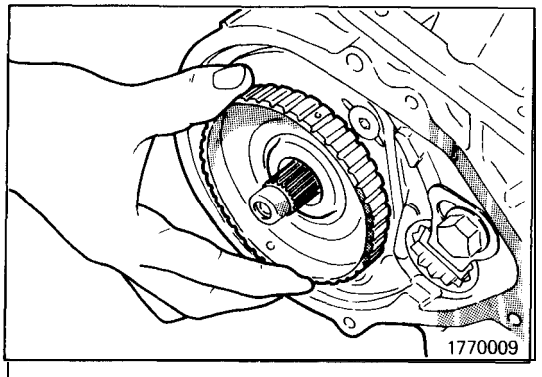

13. Remove the end clutch cover mounting bolt the cover holder, and the end clutch cover.



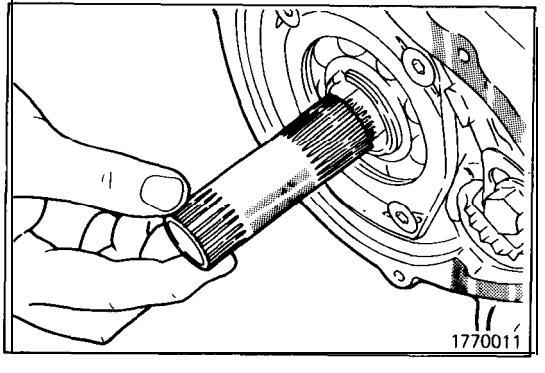

14. Remove the end clutch assembly.



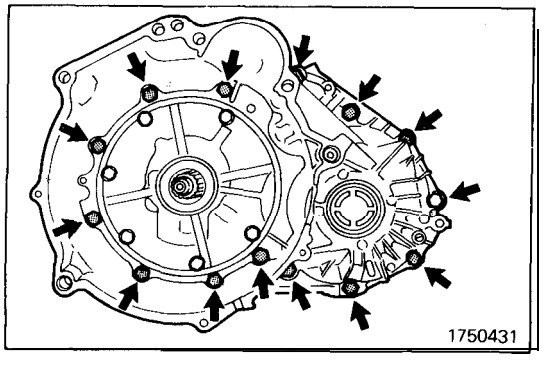

15. Remove the thrust plate.



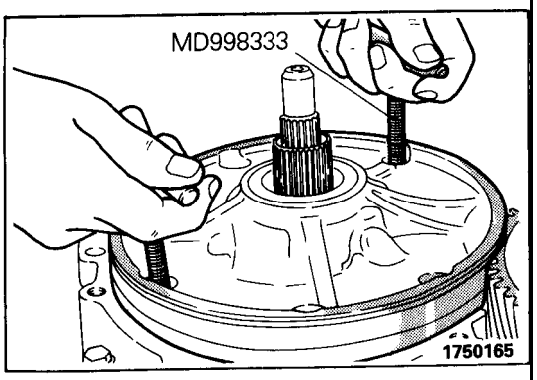

16. Remove the end clutch hub and thrust bearing.



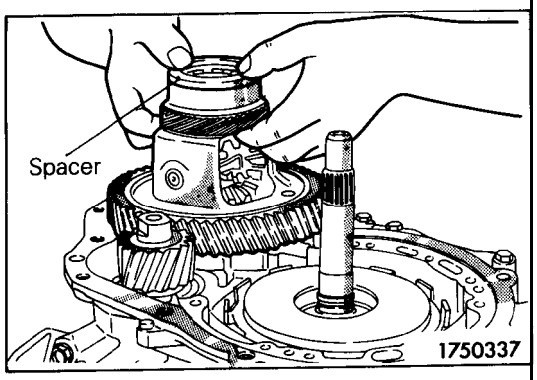

17. Pull out the end clutch shaft.



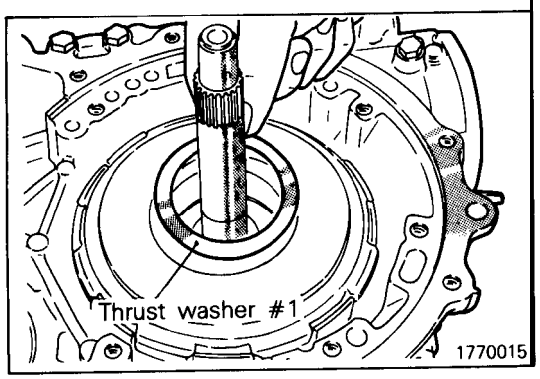

18. Remove 13 bolts and remove converter housing.



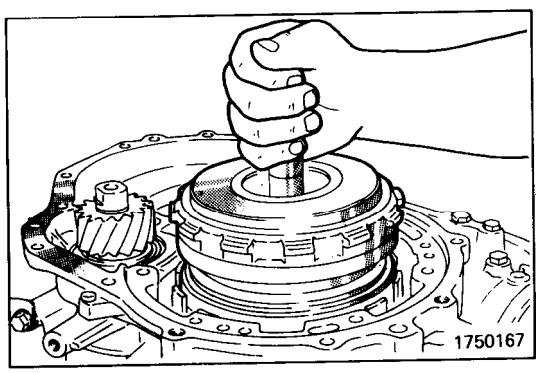

19. Remove 6 bolts, and attach the special tools and remove oil pump assembly.



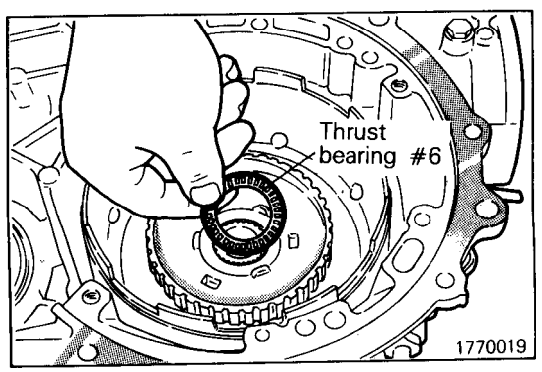

20. Remove the spacer and the differential assembly.



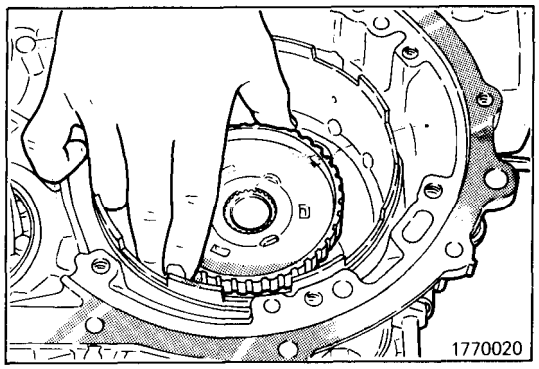

21. Remove the thrust washer #1



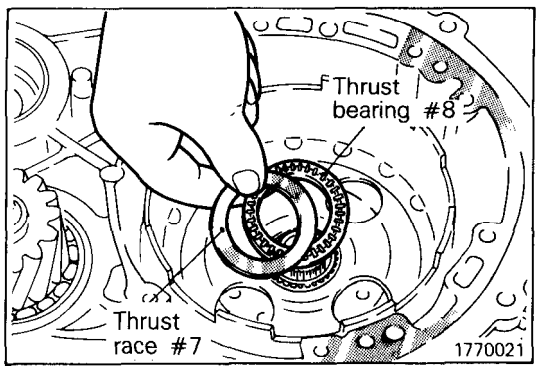

22. Pull up the input shaft, and then remove the front clutch assembly and the rear clutch assembly together.



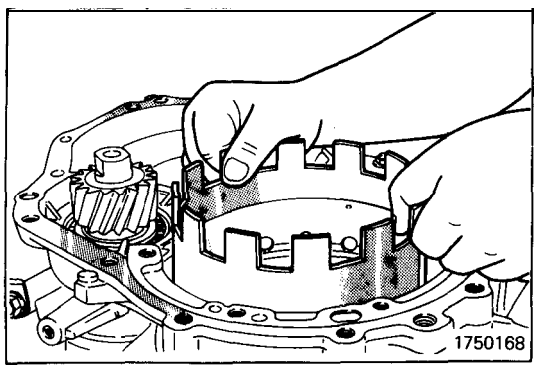

23. Remove the thrust bearing #6.



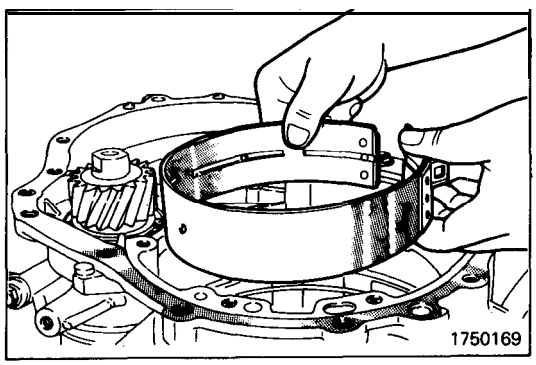

24. Remove the clutch hub.



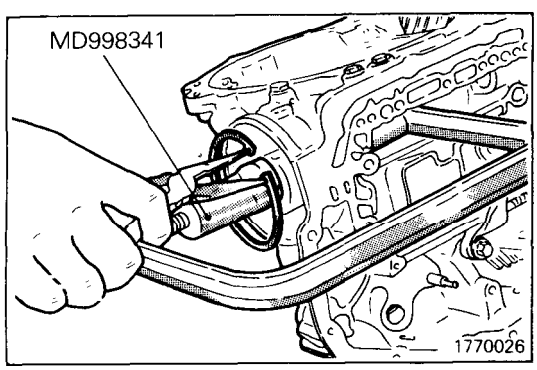

25. Remove the thrust race #7 and bearing #8.



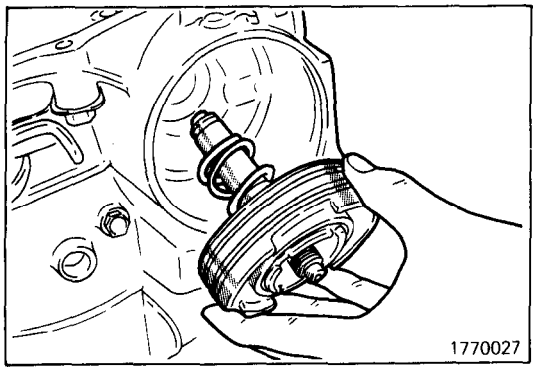

26. Remove the kickdown drum.



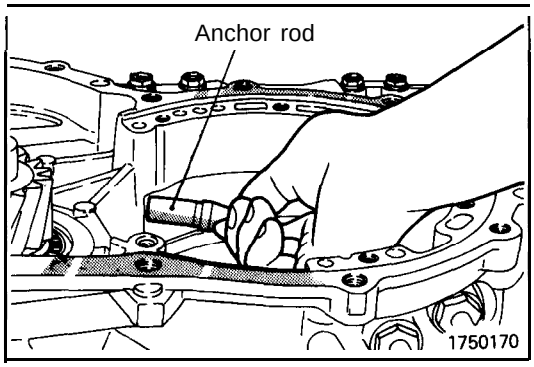

27. Remove the kickdown band.



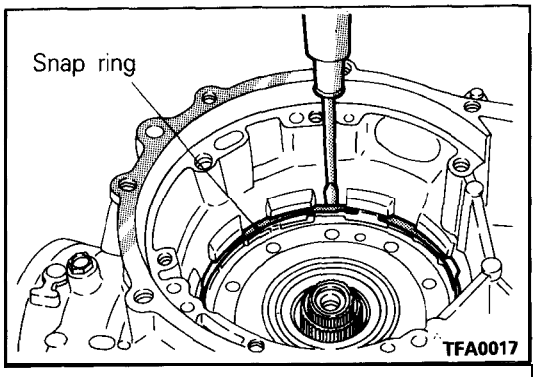

28. Using the valve spring compressor and special tool, push in the kickdown servo and remove the snap ring.



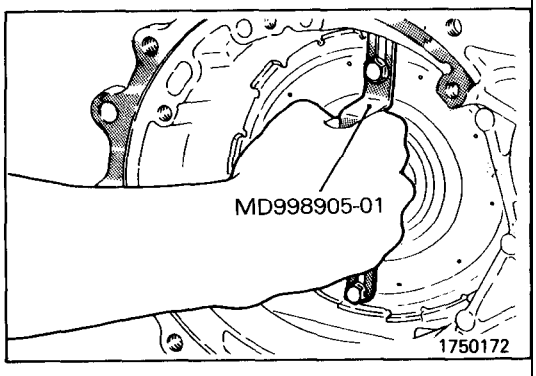

29. Remove the kickdown servo piston and spring.



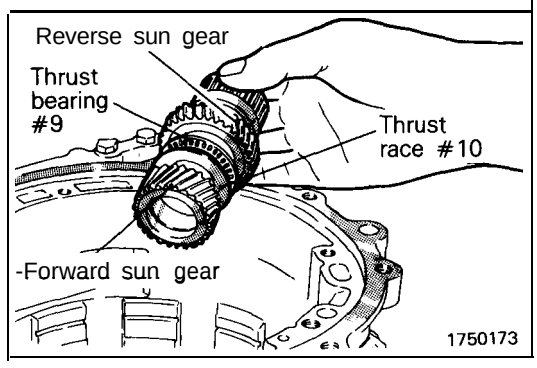

30. Remove the anchor rod.



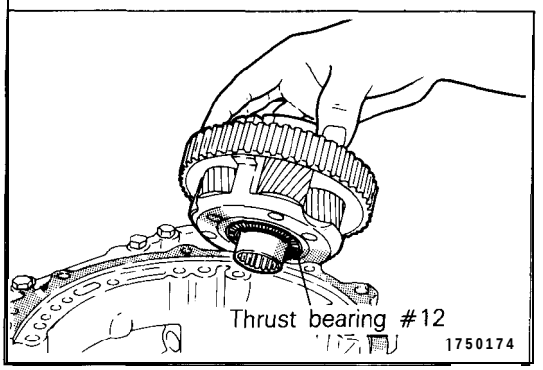

31. Remove the snap ring.



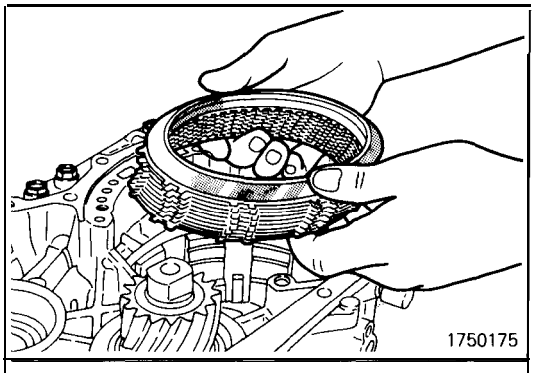

32. Mount the special tool on the center support and remove the center support from the case.



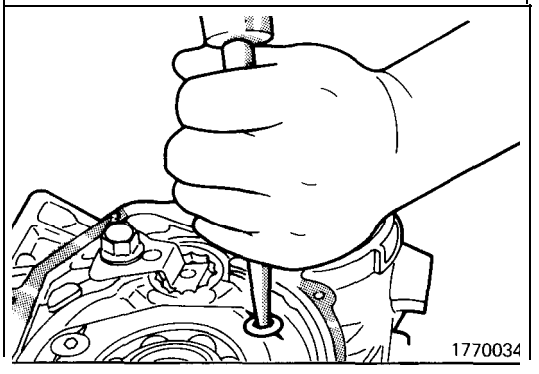

33. Remove reverse sun gear thrust bearing #9, thrust race #10 and forward sun gear together.



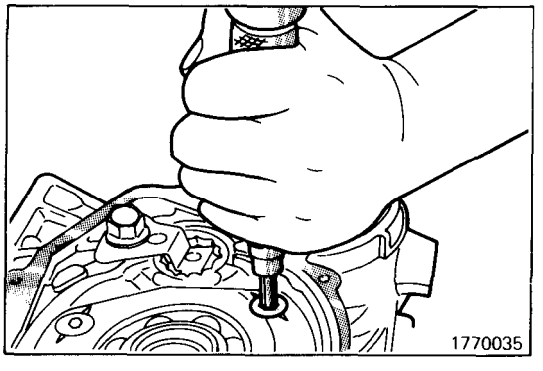

34. Remove planet carrier assembly and thrust bearing #12.



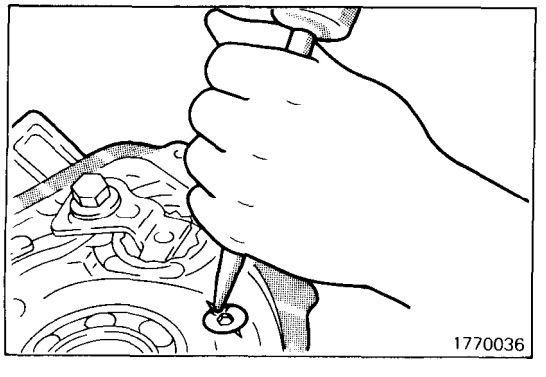

35. Remove the wave spring, return spring, reaction plate, brake discs, and brake plates.



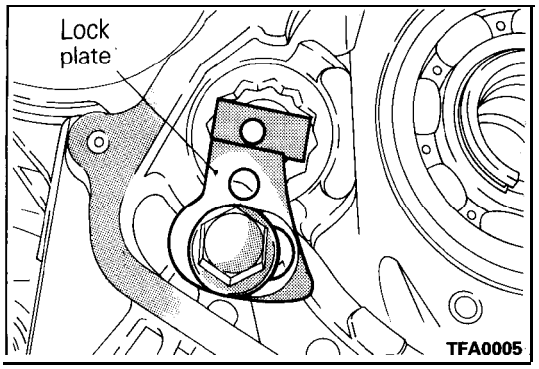

36. Since screw lock paste is coated on the screw threads, **tap** the screw head for easier removal.



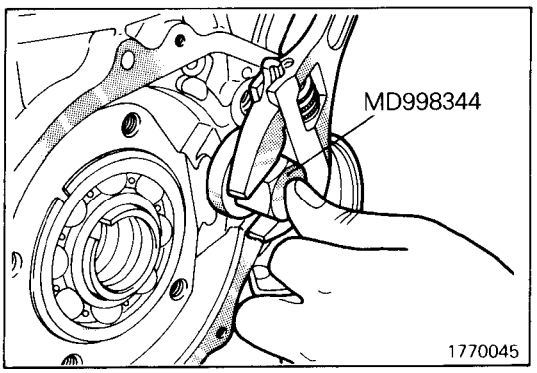

37. Using an impact driver, loosen the screw.



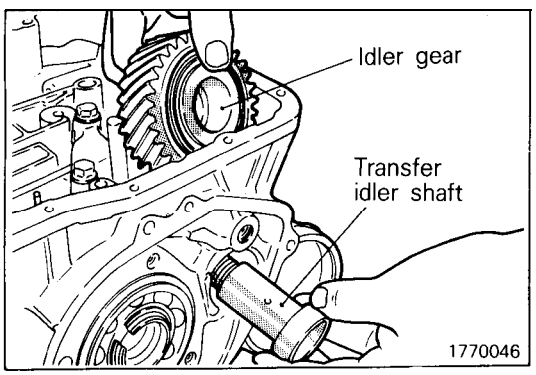

If an impact driver is not available, use a punch or something similar.



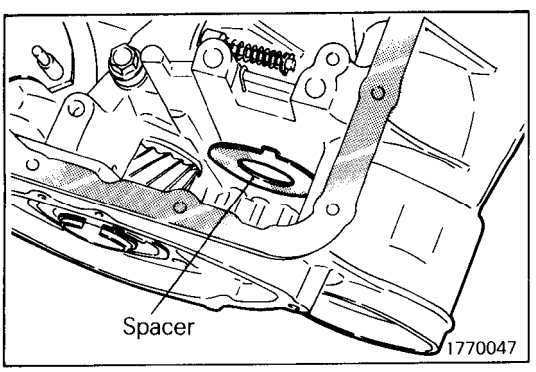

38. Remove idler shaft lock plate.



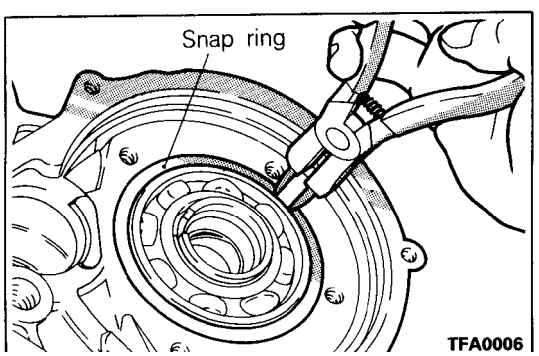

39. Loosen transfer idler shaft with special tool.



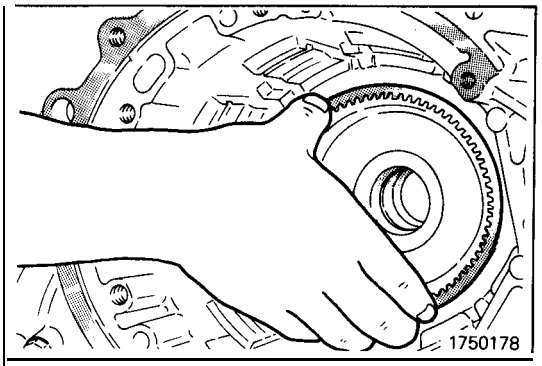

40. Pull out transfer idler shaft. Remove transfer idle gear bearing inner races (2 pieces) from inside of case.



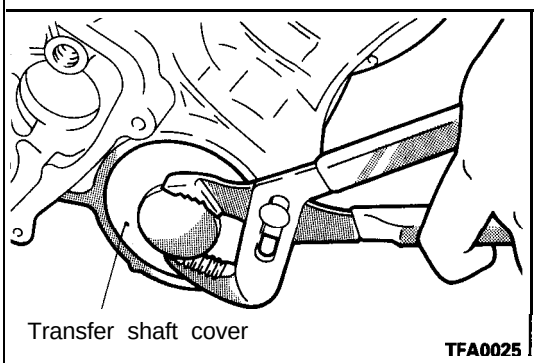

41. Remove the spacer.



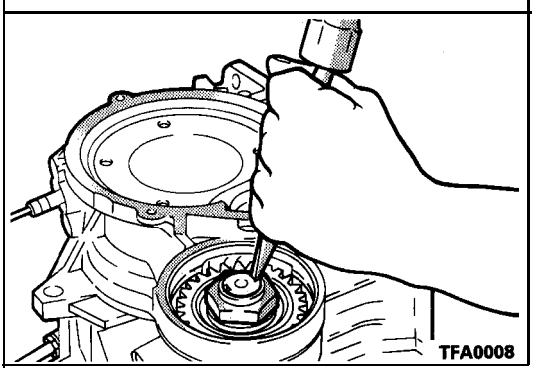

42. Remove snap ring from bearing.



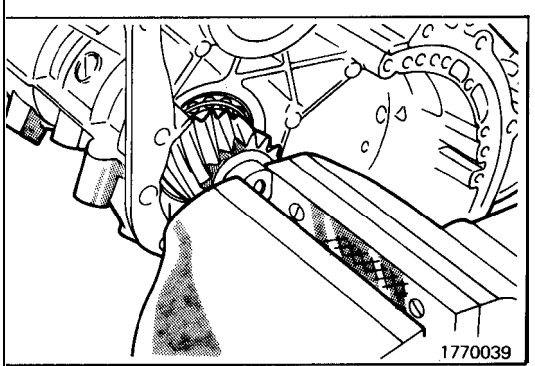

43. Remove internal gear, output flange, transfer drive gear and bearing as assembly from case.



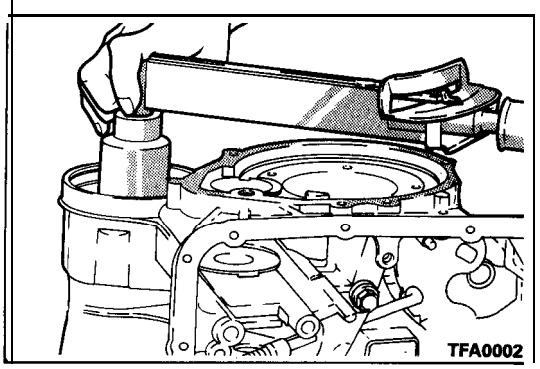

44. Remove the transfer shaft cover




45. Stand the transfer shaft lock nut rotation stopper up.

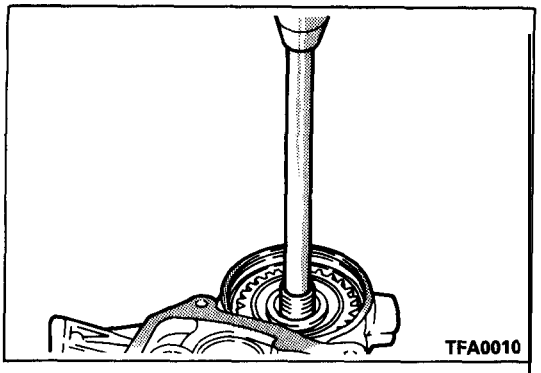



46. Fix the transfer shaft converter housing side.

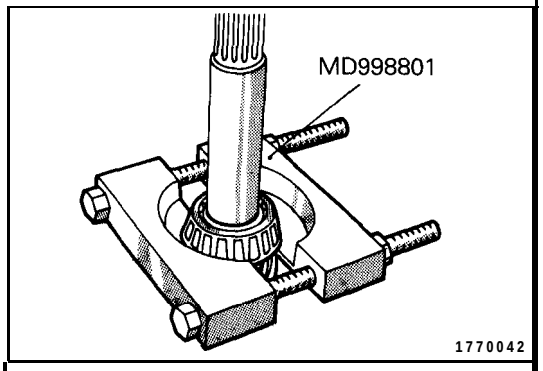



47. Remove the locking nut.

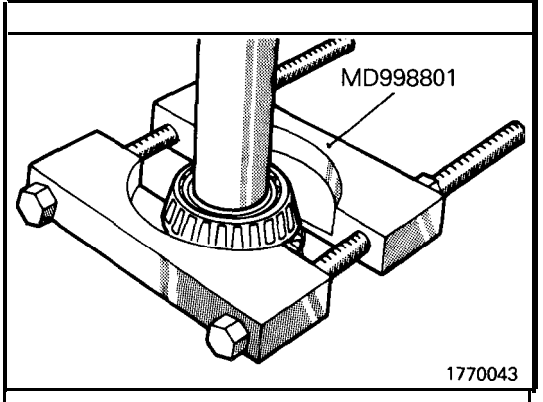
NOTE
The lock nut is left-hand threaded.



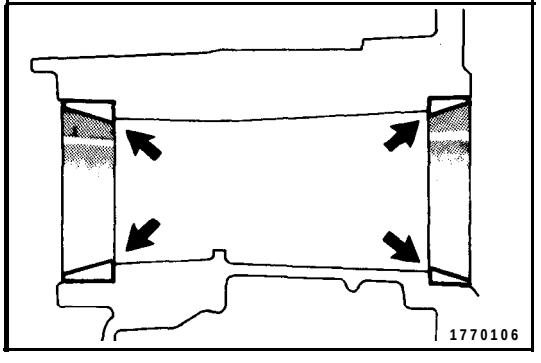

48. Press out the transfer shaft to the converter housing side.



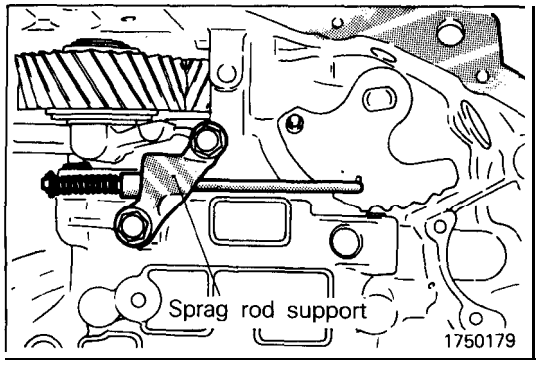

49. Using the special tool, pull the bearing from the transfer shaft.



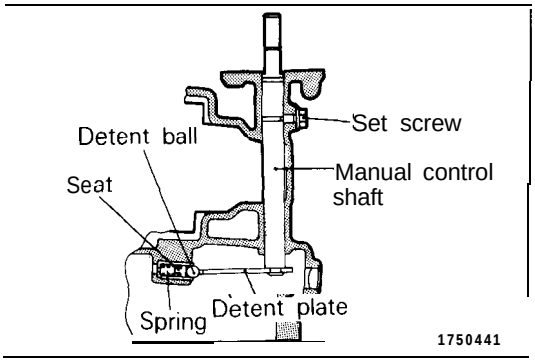

50. Using the special tool, pull the bearing from the transfer driven gear.




51. Using a screwdriver, remove the outer race.



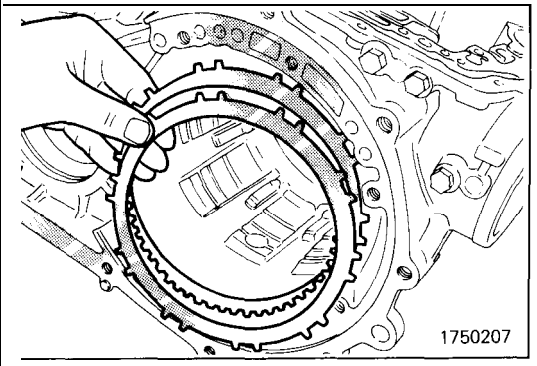

52. Remove two bolts and sprag rod support.



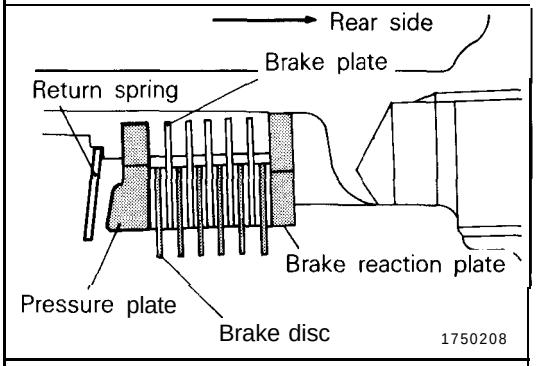

53. Remove the set screw and the manual control shaft assembly. Remove the steel ball, the seat and the spring together at this time.

## REASSEMBLY N21LFAJ

1. Before assembly of the transaxle, measure the end play of the low-reverse brake, and select a pressure plate to be used so that the end play will be the standard value.
   (1) Install the brake reaction plate, brake plate and brake disc to the transaxle case.

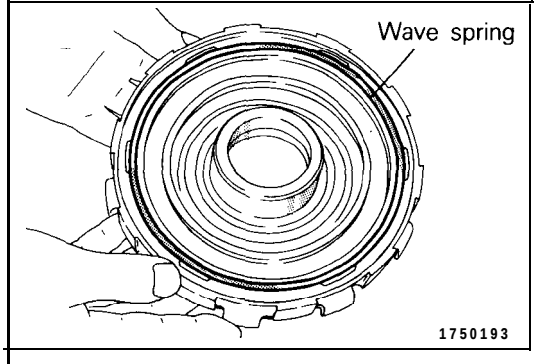



**Caution**
**If new brake discs are used, be sure to immerse them in ATF for two hours or longer.**

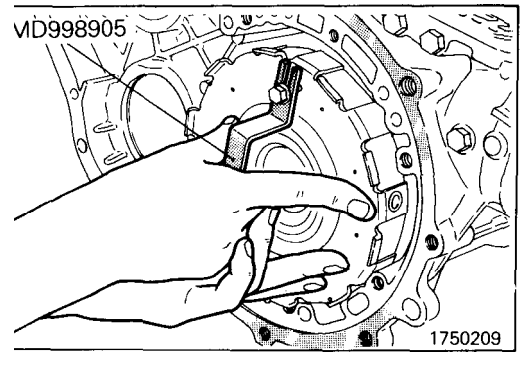



   (2) Install the appropriate pressure plate and then install the return spring.

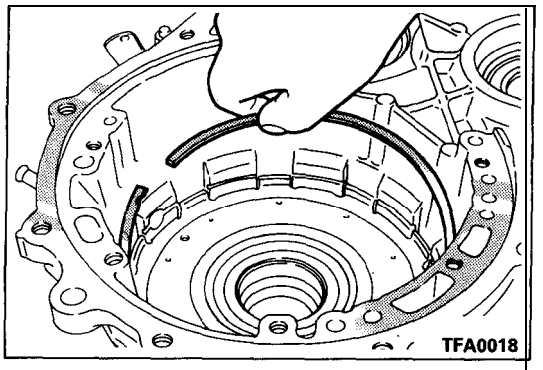
**Caution**
**Be sure that the return spring is installed so that it faces in the correct direction.**



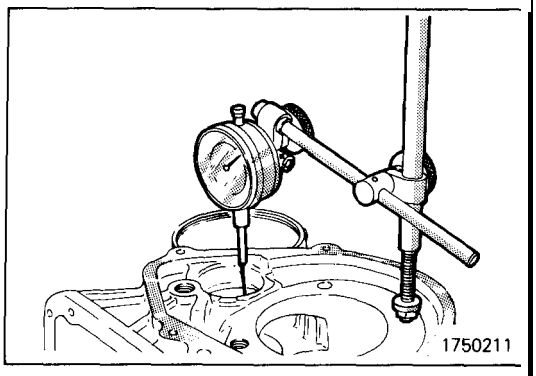

   (3) Apply a coating of petrolatum to the wave spring and attach it to the center support.




   (4) Install the special tool to the center support.

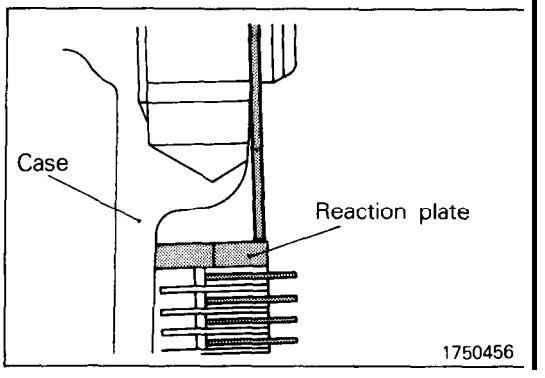


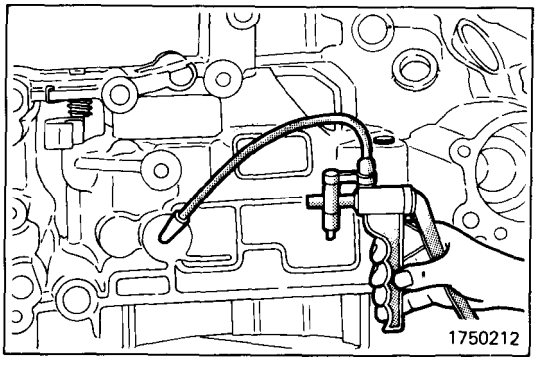

(5) Install the snap ring.




(6) Install the special tool and a dial gauge at the rear side of the transaxle case.

**Caution**
**Install the dial gauge so that it contacts the brake reaction plate at a right angle from the transfer idler shaft hole.**

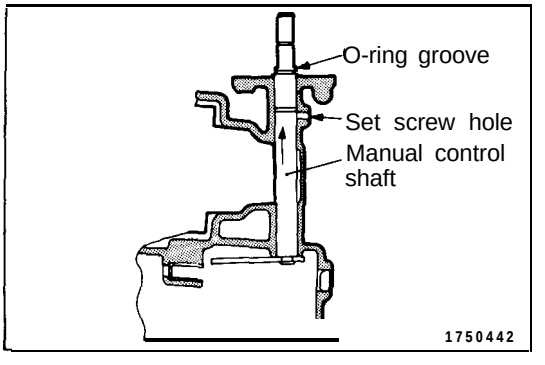



(7) Using a manual pump, pump air in from the position shown in the illustration; then read the indication of the dial gauge, and select the pressure plate that will provide the standard value.

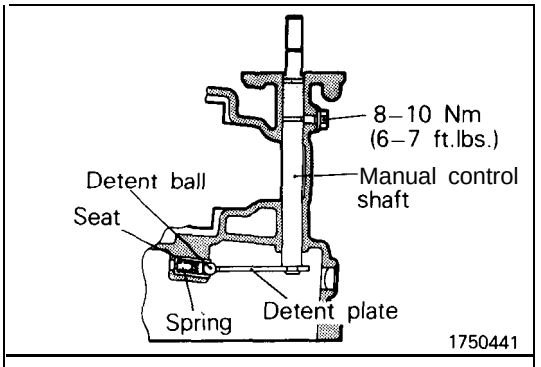
**Standard value: 1.0–1.2 mm (.039–.047 in.)**

(8) When the pressure plate is completely selected, remove the assembled part.

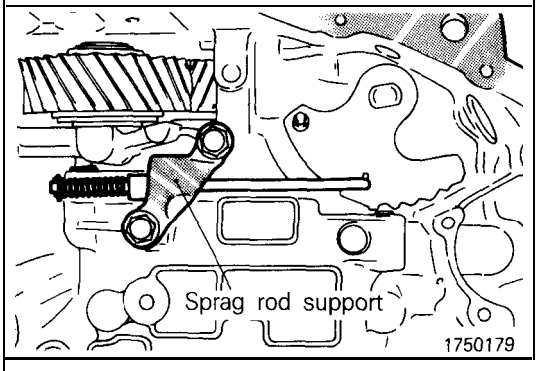



2. Install the parking sprag rod to the manual control shaft. Then, as shown in the figure, press into the transaxle case. At this time, do not install O-ring (larger one of two O-rings) on manual control shaft.

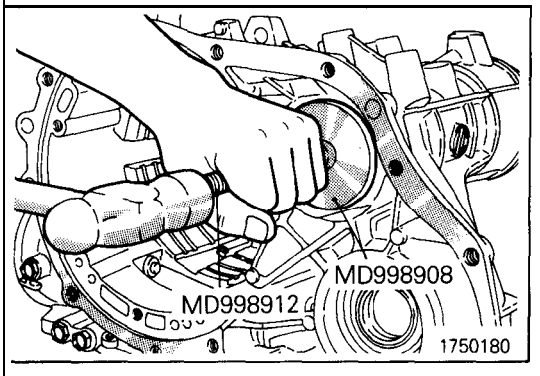
NOTE
If installed before inserting shaft, the O-ring will interface with shaft set screw hole.



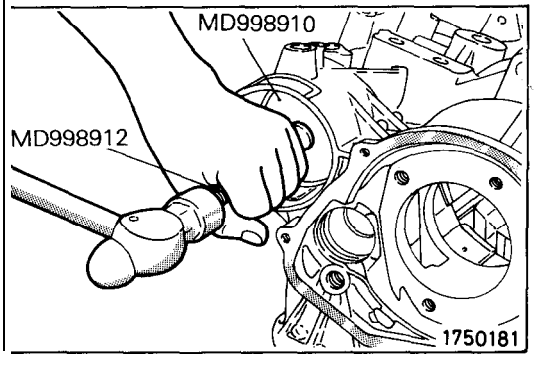

3. After installing new O-ring on manual control shaft, draw shaft back into case, then install set screw and gasket. Also install detent steel ball, seat and spring at the same time.

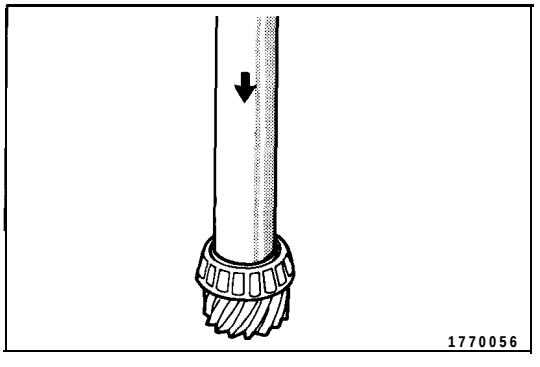



4. Install sprag rod support and tighten two bolts.
**Sprag rod support bolts: 20–27 Nm (15-19 ft.lbs.)**

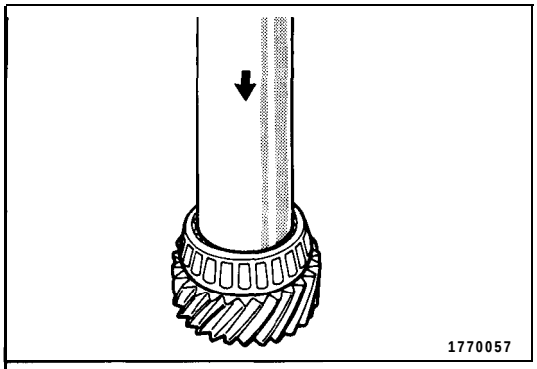



5. Using the special tool, tap in the bearing outer race.

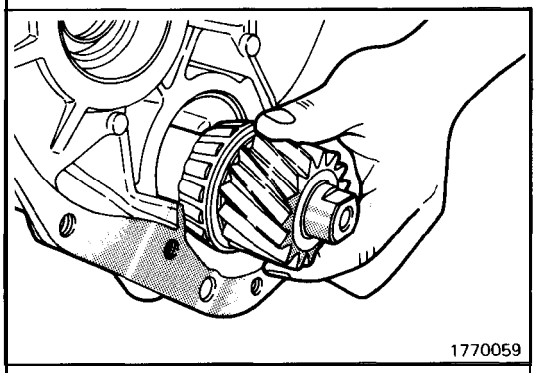


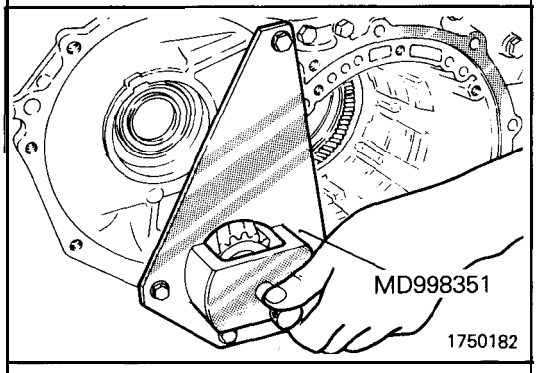

6. Press-fit the bearing inner race to the transfer dirven gear and press-fit the bearing outer race to the transaxle end clutch side.



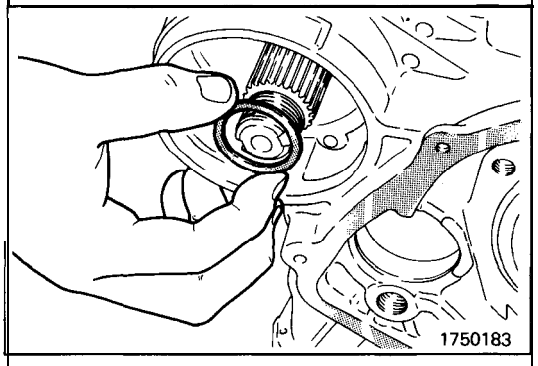

7. Press-fit the bearing inner race to the transfer shaft, and press-fit the bearing outer race to the transaxle case converter housing side.



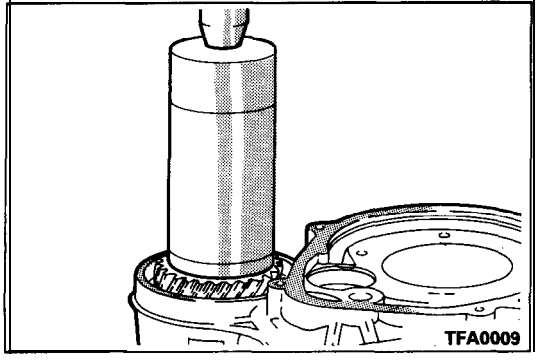

8. Attach the transfer shaft to the transaxle case.



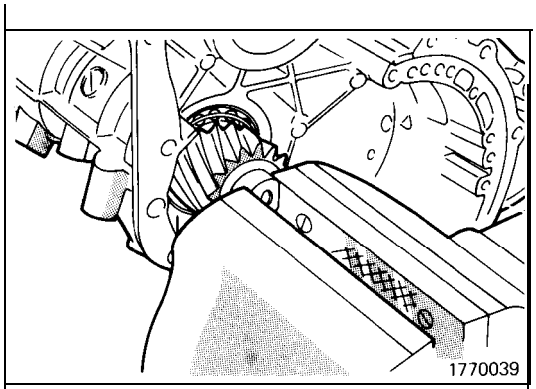

9. Install the special tool to the transaxle case to support the transfer shaft.



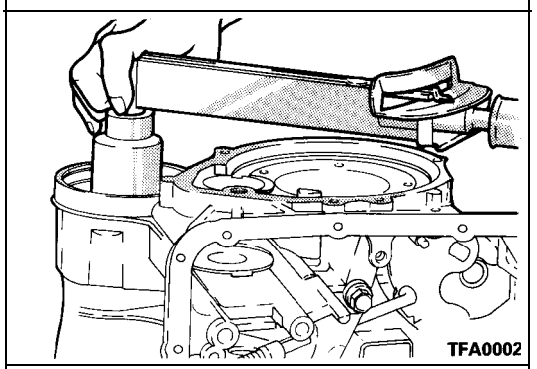

10. Insert the thickest 1.80 mm (.0709 in.) spacer.




11. Using a press, press-in the transfer driven gear.

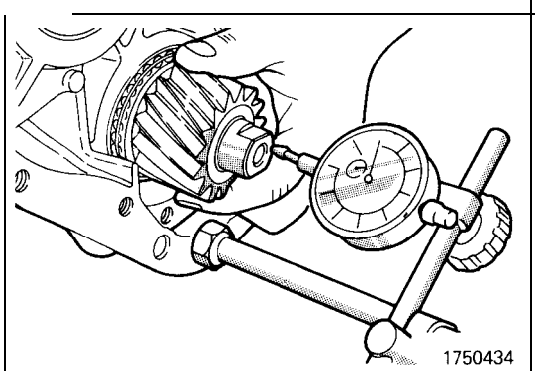



12. After removing the special tool, affix the converter housing side of the transfer shaft.



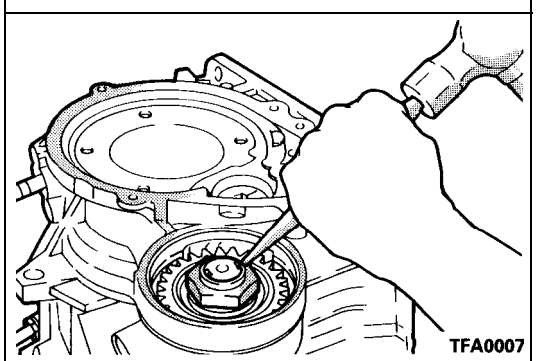

13. Tighten the lock nut to the specified torque.

**Transfer lock nut: 200–230 Nm (145-166 ft.lbs.)**



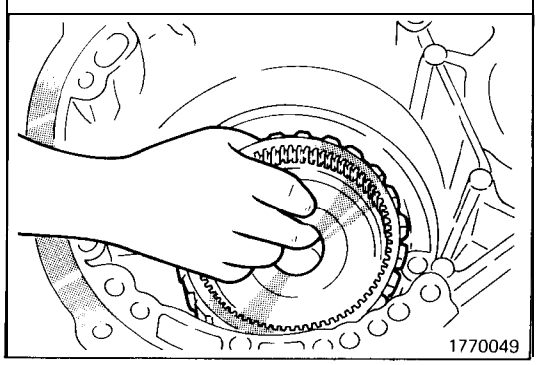

14. Measure the transfer shaft end play and select and reinstall the spacer which provides the specified end play.

**Transfer shaft end play: 0–0.025 mm (0–.0010 in.)**

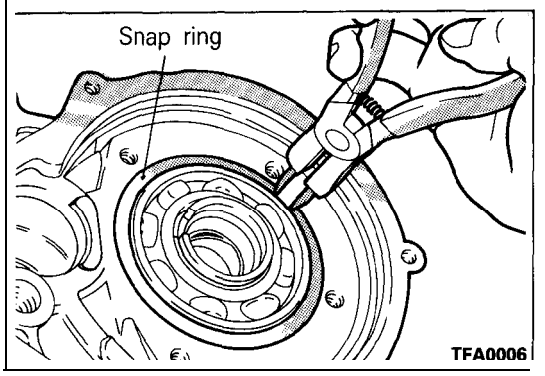



15. Using a punch, lock the lock nut to prevent rotation.

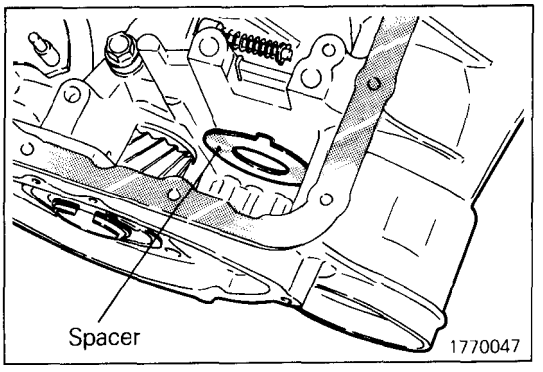
Attach the transfer cover.



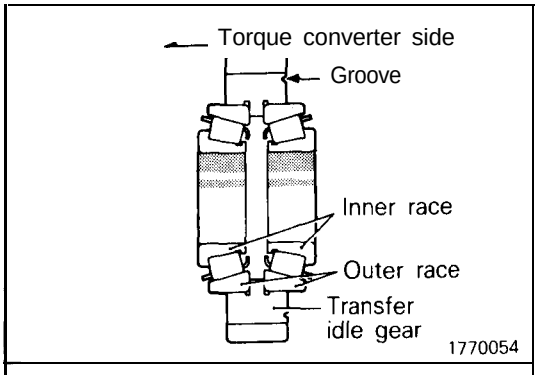

16. Insert an assembly of the annular gear, output flange, transfer drive gear and bearing into the case.



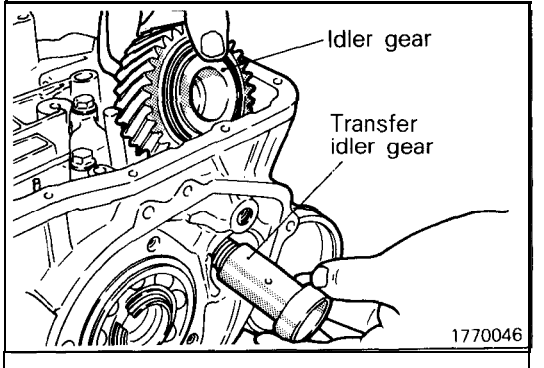

17. Install snap ring on output flange bearing.



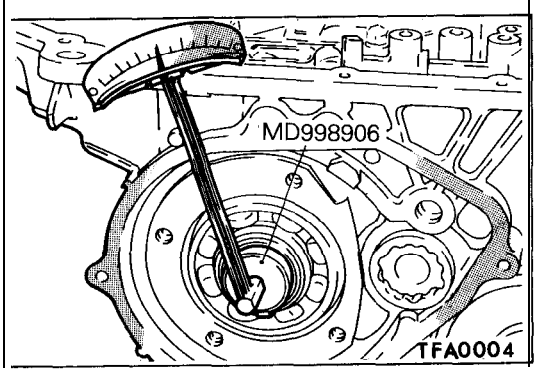

18. Coat petroleum jelly on the spacer and attach it to the transaxle case.



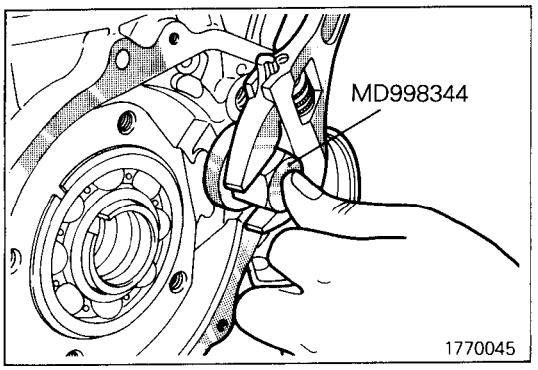

19. Install two taper roller bearings to transfer idler gear.



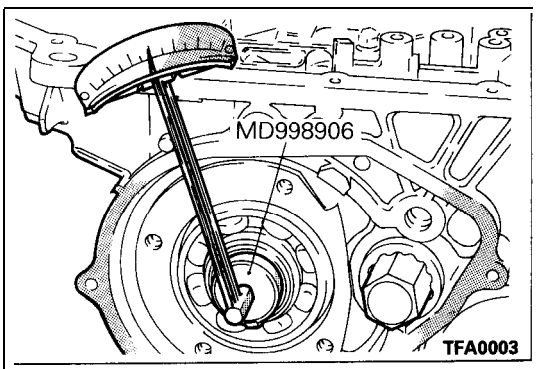

20. Place the transfer idler gear (assembled in the preceding section) into the case, and-then insert the idler shaft from the outer side of the case and screw it in.




21. In this condition, attach the special tool to the output shaft flange, and check to be sure that the output flange turns easily.

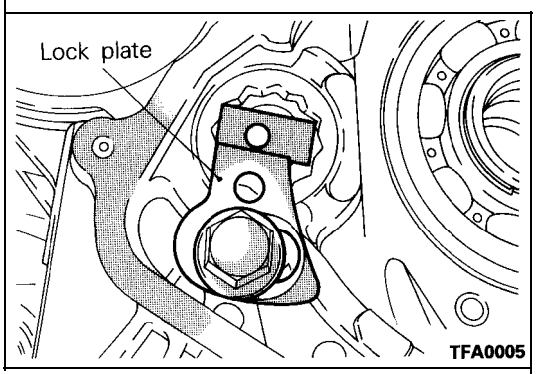



22. Tighten the idler shaft by using special tool.



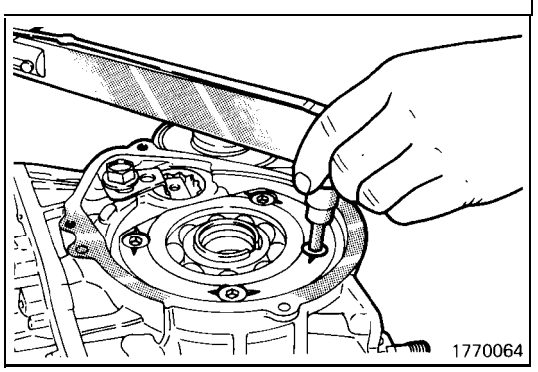

23. Insert special tool into output flange and measure preload using a low reading torque wrench.
Adjust preload by tightening or loosening transfer idler shaft.

**Preload: 0.6 Nm (0.6 ft.lbs.)**



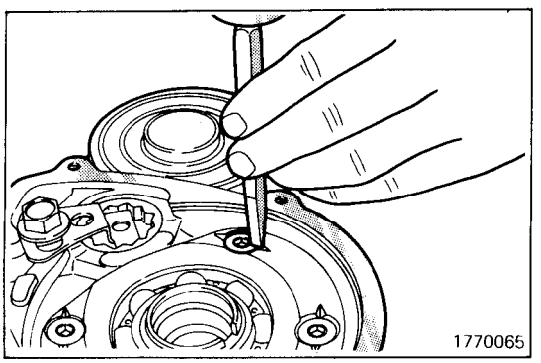

24. After the preload adjustment is completed, eliminate the backlash between the idler shaft and the lock plate by moving the idler shaft in the loosening direction. Attach the lock plate and tighten the lock plate bolt.

**Lock plate bolt : 48–60 Nm (35-43 ft.lbs.)**

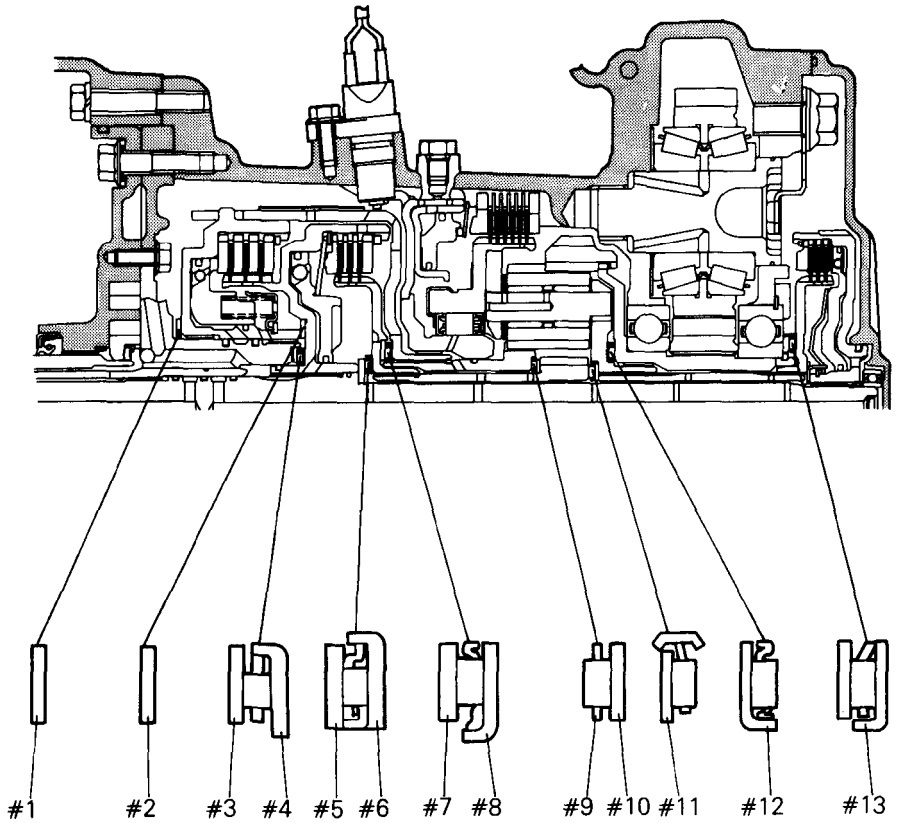



25. Install bearing retainer, and tighten screws to specified torque, apply a 5 mm (.2 in.) width of sealant (3M Stud Locking No. 4176) the top. Sealant should not stick out of screw head.

**Screw: 17-22 Nm (13-15 ft.lbs.)**




26. Using a punch, lock the flush head screw to prevent rotation.



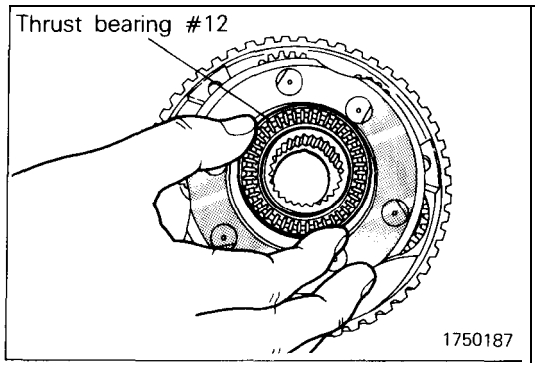

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**Identification of thrust bearings, thrust races and thrust washers**

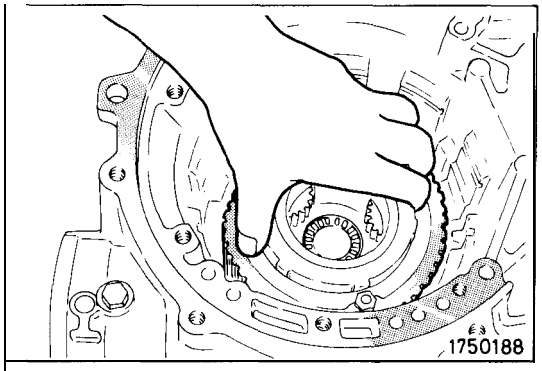
Unit: mm (in.)

| Outer diameter | Inner diameter | Thickness | Part No. | Code No. |
|---|---|---|---|---|
| 70 (2.756) | 55.7 (2.193) | 1.4 (.055) | *1 | #1 |
| 70 (2.756) | 55.7 (2.193) | 1.8 (.071) | *2 | |
| 70 (2.756) | 55.7 (2.193) | 2.2 (.087) | *3 | |
| 70 (2.756) | 55.7 (2.193) | 2.6 (.102) | *4 | |
| 70 (2.756) | 55.7 (2.193) | 1.8 (.071) | MD707290 | #2 |
| 48.9 (1.925) | 37 (1.457) | 1.0 (.039) | MD997854 (incl *1) | #3 |
| 48.9 (1.925) | 37 (1.457) | 1.2 (.047) | MD997847 (incl *1) | |
| 48.9 (1.925) | 37 (1.457) | 1.4 (.055) | MD997848 (incl *2) | |
| 48.9 (1.925) | 37 (1.457) | 1.6 (.063) | MD997849 (incl *2) | |
| 48.9 (1.925) | 37 (1.457) | 1.8 (.071) | MD997850 (incl *3) | |
| 48.9 (1.925) | 37 (1.457) | 2.0 (.079) | MD997851 (incl *3) | |
| 48.9 (1.925) | 37 (1.457) | 2.2 (.087) | MD997852 (incl *4) | |
| 48.9 (1.925) | 37 (1.457) | 2.4 (.094) | MD997853 (incl *4) | |

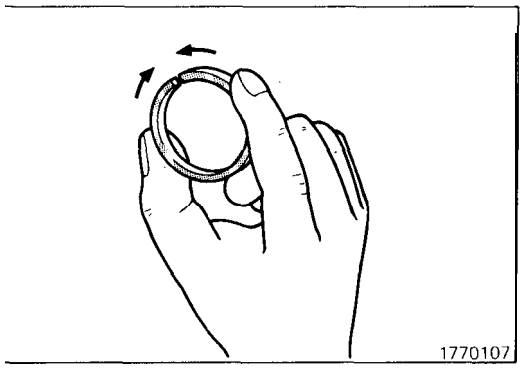
| Outer diameter | Inner diameter | Thickness | Part No. | Code No. |
|---|---|---|---|---|
| 48.1 (1.906) | 34.4 (1.354) | — | MD707271 | #4 |
| 40 (1.575) | 21 (.827) | 2.4 (.094) | MD722552 | #5 |
| 42.6 (1.677) | 28 (1.102) | | MD720753 | #6 |
| 54 (2.126) | 38.7 (1.524) | 1.6 (.063) | MD704936 | #7 |
| 52 (2.047) | 36.4 (1.433) | — | MD72001 0 | #8 |
| 41 (1.614) | 28 (1.102) | — | MD728763 | #9 |
| 39 (1.535) | 28 (1.102) | 1.2 (.047) | MD728764 | #10 |
| 38 (1.496) | 22.2 (.874) | — | MD727787 | #11 |
| 52 (2.047) | 36.4 (1.433) | — | MD720010 | #12 |
| 58 (2.283) | 44 (1.732) | — | MD724206 | #13 |



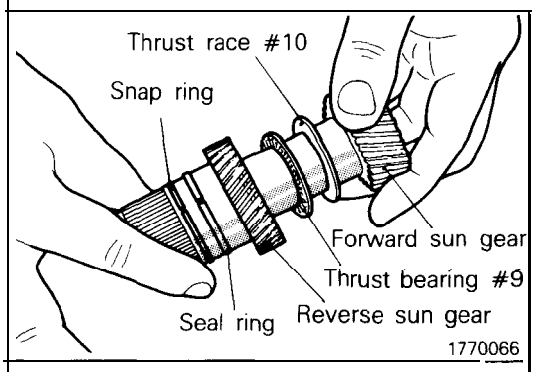

27. Apply a coating of petrolatum to thrust bearing #12 and attach to the planetary carrier.



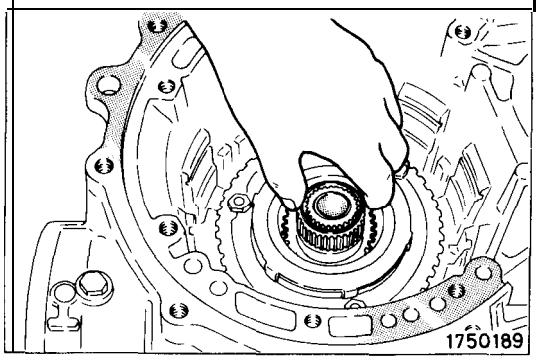

28. Install the planetary carrier to the case.



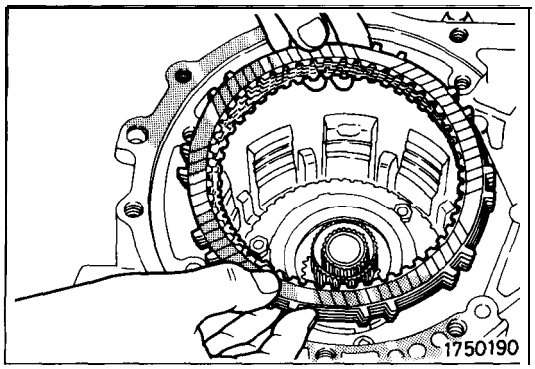

29. Assemble the reverse sun gear and the forward sun gear in the following order:
(1) Attach the seal ring and the snap ring to the reverse sun gear. When attaching, squeeze the seal ring as shown in the figure.
(2) Attach the thrust race #9 to the forward sun gear.
(3) Attach the thrust race #10 to the forward sun gear.



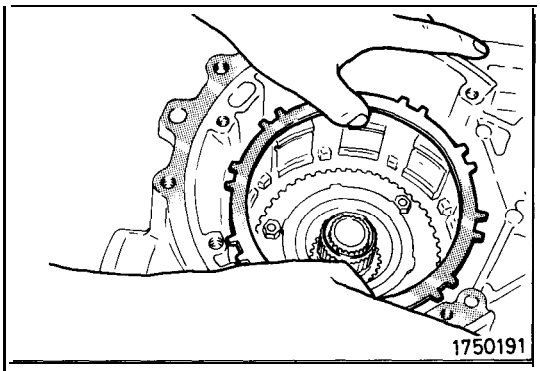

(4) Assemble the reverse sun gear and the forward sun gear.



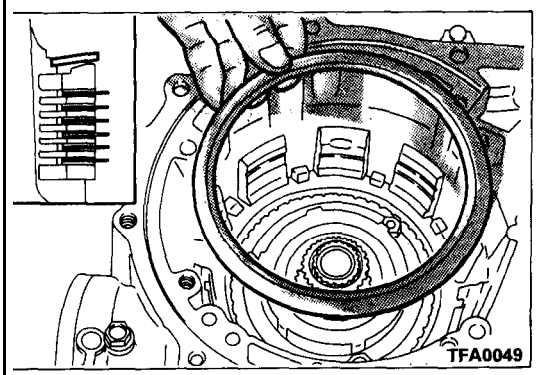

30. Install both of the previously assembled sun gears inside the planetary carrier.



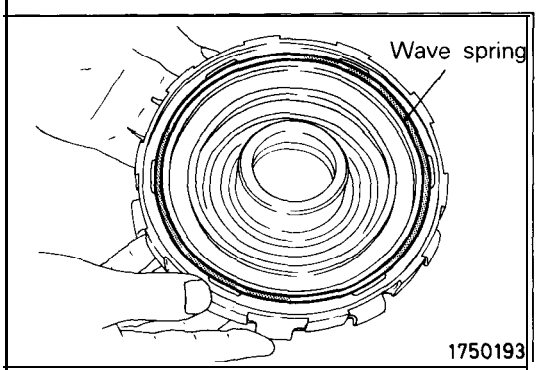

31. Install the brake disc and brake plate.



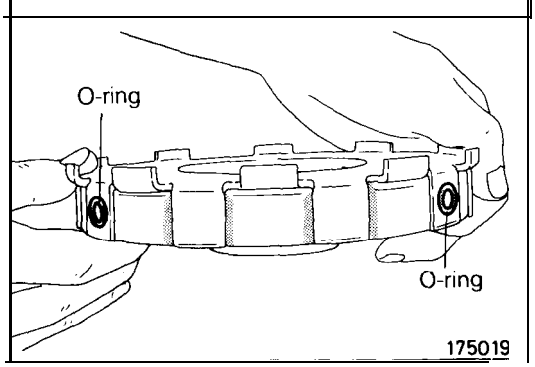

32. Mount the pressure plate which was selected in Step 1.



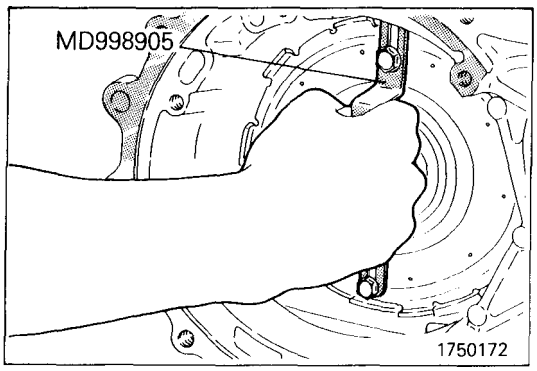

33. Install the return spring.




34. Apply a coating of petrolatum to the wave spring and attach it to the center support.



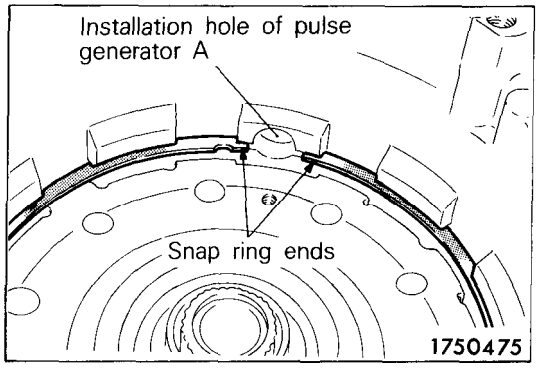

35. Install two new O-rings to hydraulic holes of the center support.
36. Apply automatic transaxle fluid to the O-rings.



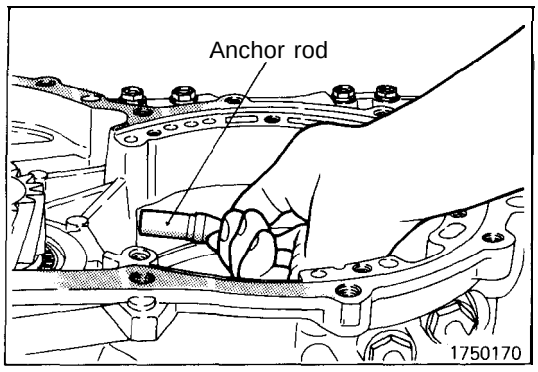

37. Attach the special tool to the center support, and holding the tool, slowly insert the center support into the case.

**Caution**
**Be sure that the wave spring is not out of position.**

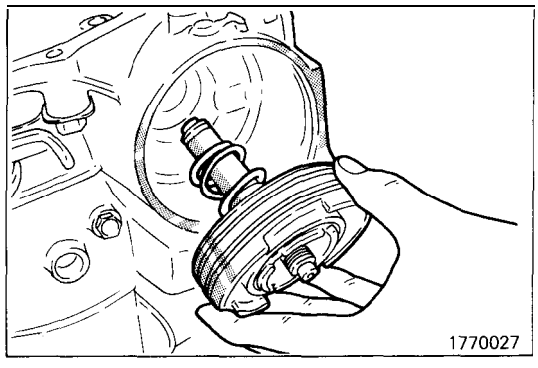
38. Remove the special tool from center support.



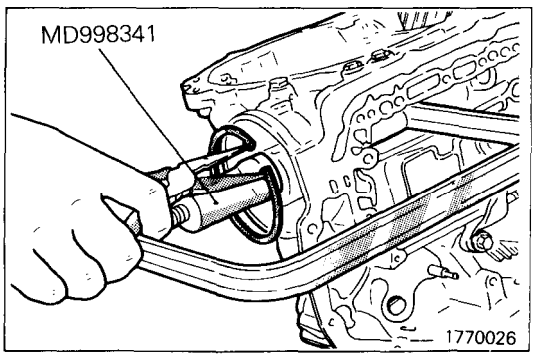

39. Fit the snap ring which retains the center support.
At this time, take care to prevent the end of the snap ring from interfering with the pulse generator mounting hole.



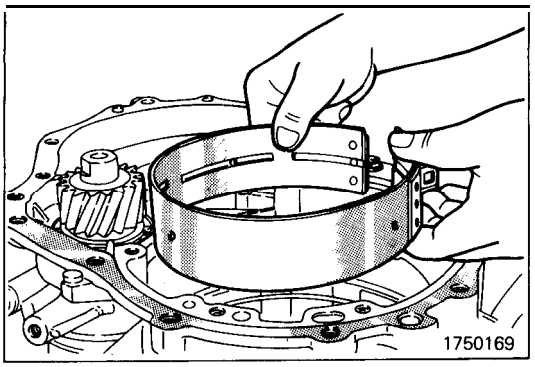

40. Install the anchor rod to transaxle case.



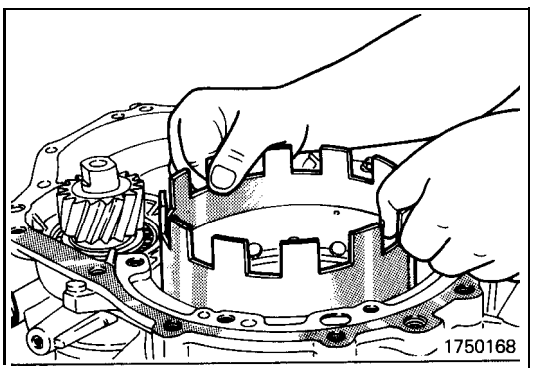

41. Assemble a new seal ring (large diameter) and D-ring (small diameter) to the kickdown servo piston, and install a new O-ring in the groove around the sleeve; then assemble the kickdown servo spring, piston and sleeve in the transaxle case.



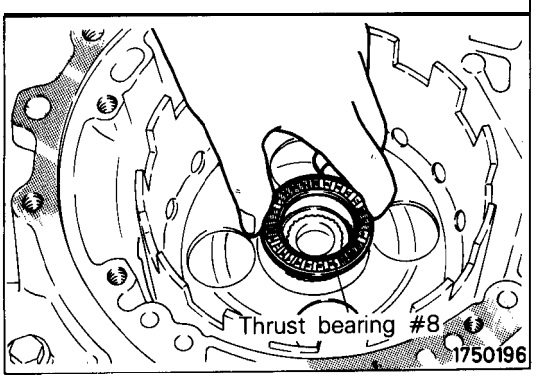

42. Press the kickdown servo and sleeve in by using the valve spring compressor and special tool, and then install the snap ring.



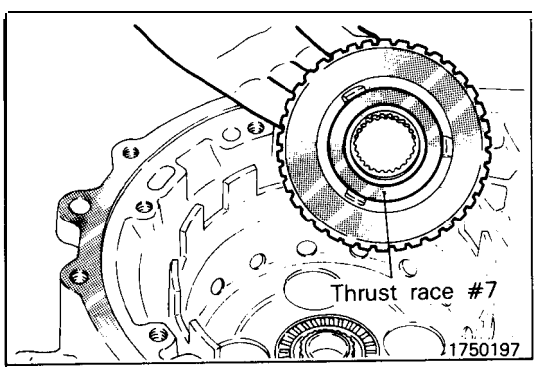

43. Install kickdown band; attach the ends of band to the ends of anchor rod and servo piston rod.



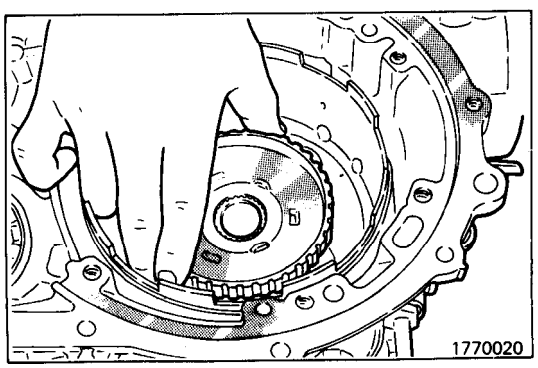

44. Putting the kickdown drum into the kickdown band, align the spline of the drum to that of the reverse sun gear. Place kickdown band on kickdown drum and tighten kickdown servo adjusting screw to keep band in position.



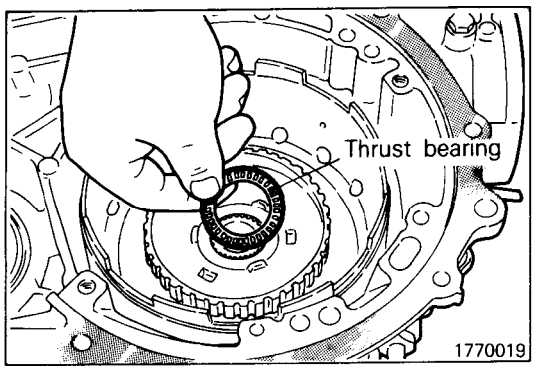

45. Apply a coating of petrolatum to thrust bearing #8, and then attach to the kickdown drum.



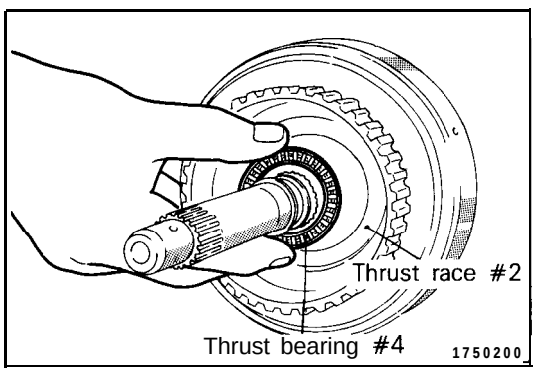

46. Apply a coating of petrolatum to thrust race #7, and then attach to the rear clutch hub.



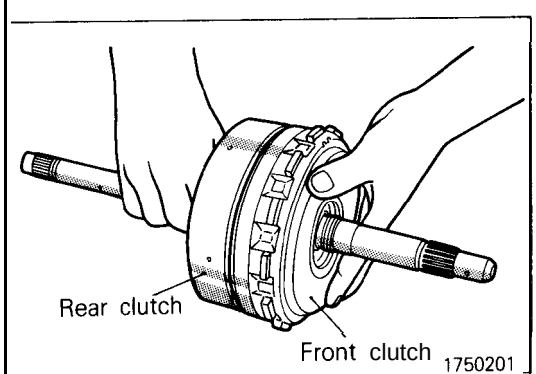

47. Install clutch hub to sun gear splines.



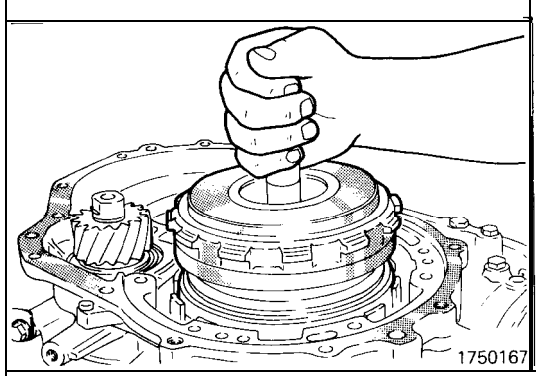

48. Attach thrust bearing #6 onto the hub with petrolatum.



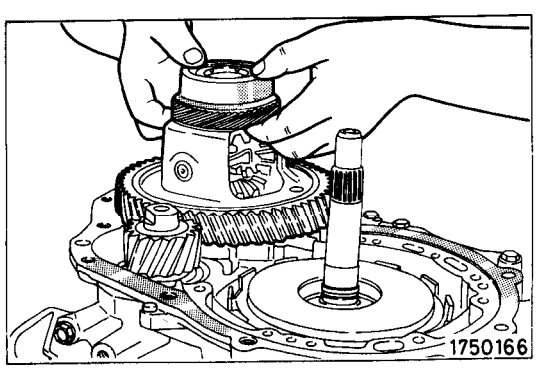

49. Apply a coating of petrolatum to thrust washer #2 and thrust bearing #4, and then attach to the rear clutch assembly.




50. Combine the rear clutch assembly and the front clutch assembly.



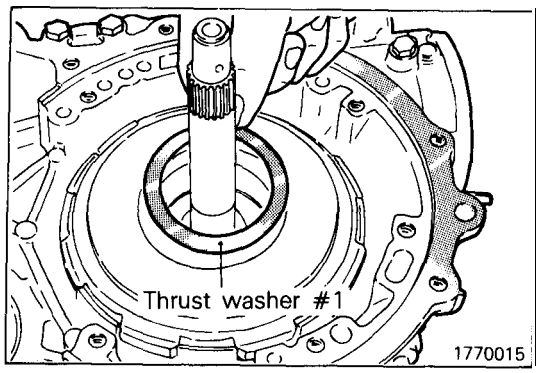

51. Install the clutch assembly.



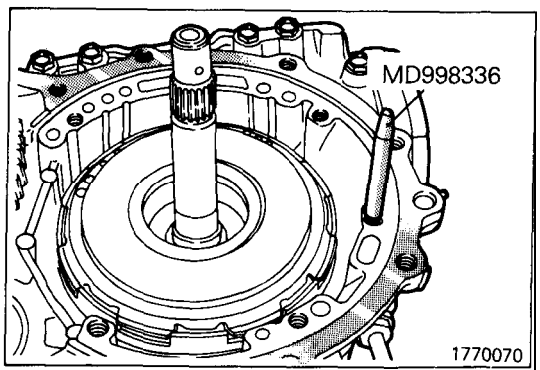

52. Install the differential assembly.

53. If end play which was measured and recorded at disassembly is not standard value, adjust end play to specification by selecting thrust race #3.

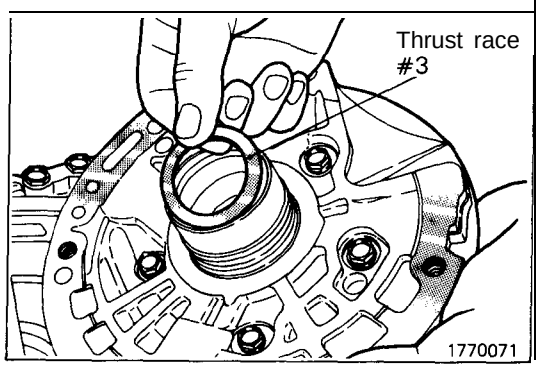
**Standard value : 0.3–1.0 mm (.012–.040 in.)**



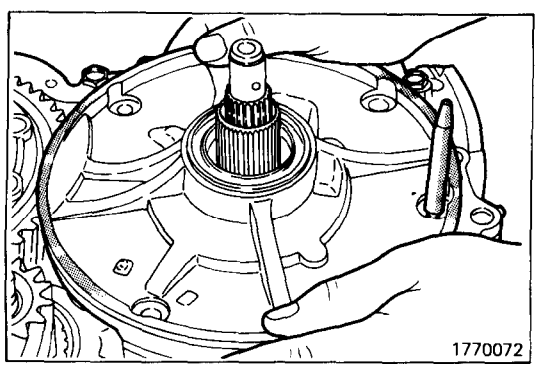

54. Attach the reused thrust washer #1, or the one selected in step 51 to the front clutch by using petrolatum.



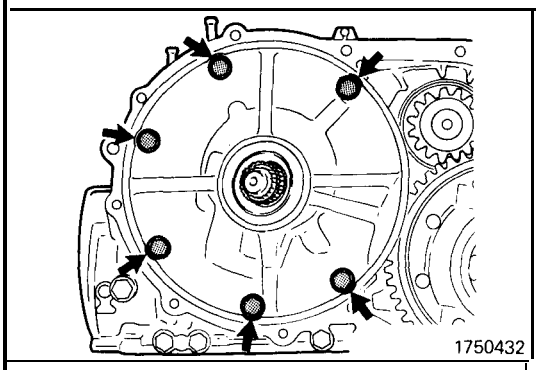

55. Install special tool to the case.



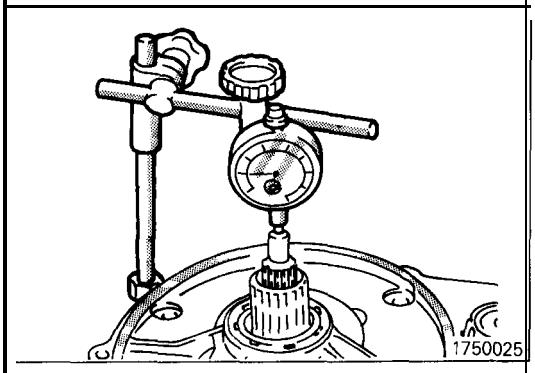

56. Attach the reused thrust race #3 or the one selected in step 53 to the oil pump by using petrolatum.




57. Install new oil pump gasket and the oil pump assembly.

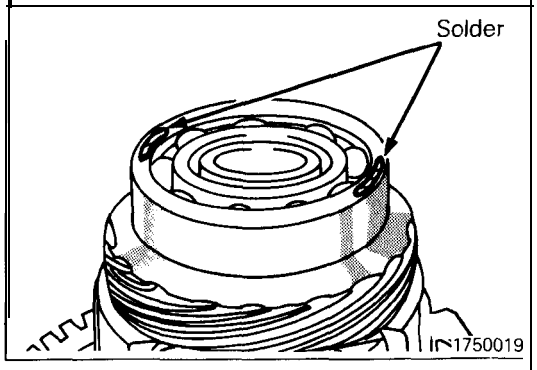



58. Install new O-ring in groove of oil pump housing and apply automatic transmission fluid lightly to outside surface of O-ring.
59. Install oil pump assembly by tightening six bolts evenly. When installing this oil pump assembly, be careful that thrust washer will not drop.

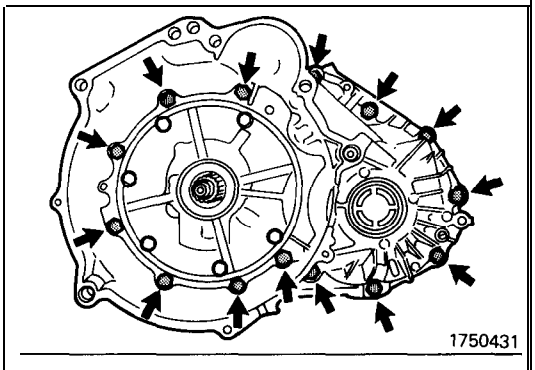



60. Check input shaft end play. Readjust if necessary (see step **53).**

**Standard value : 0.3–1.0 mm (.012–.040 in.)**



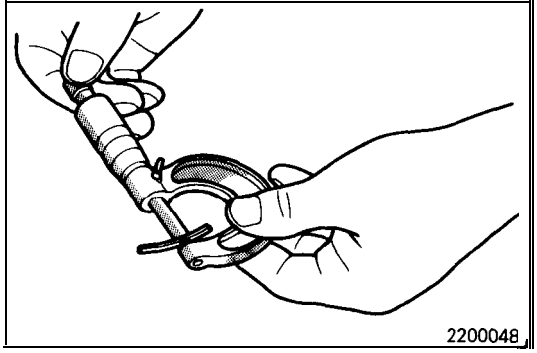

61. Apply solder [length approx. 10 mm (.40 in.) and diameter 1.6 mm (.06 in.) to the differential assembly at **the** locations shown in the illustration.



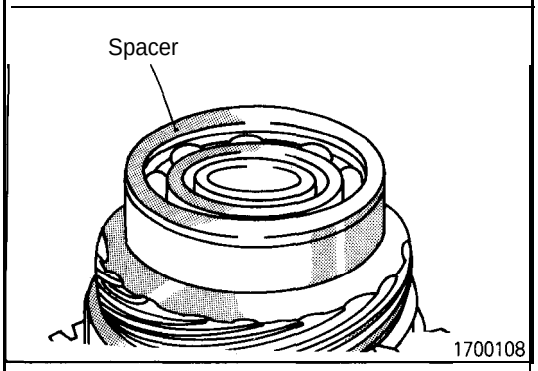

62. Install the converter housing without gasket.

**Caution**
**Don't reuse the rubber coated metal gasket which has been used once.**

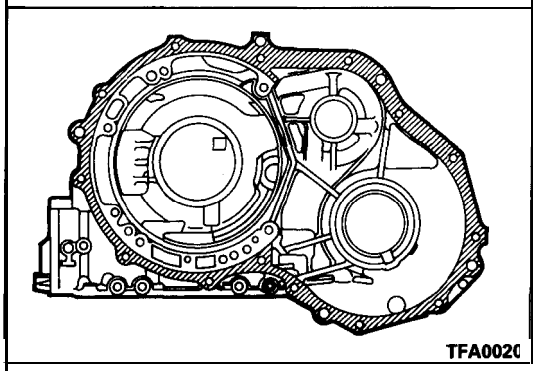
63. Tighten bolts to specification.
64. Loosen the bolts and remove the converter housing in order to remove the pieces of solder. If the solder is not broken, carry out the work in steps (61) to (64) with large diameter solder.



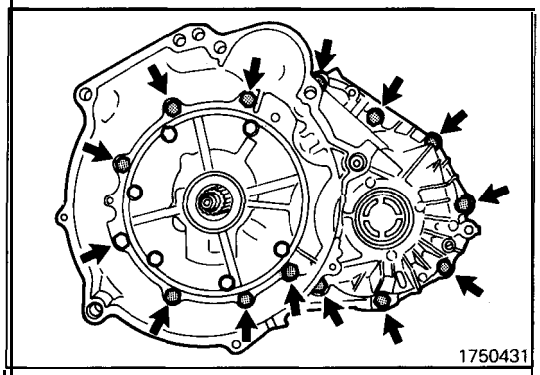

65. Using a micrometer, measure the thickness of the flattned solder.
Select the spacer in the following manner according to measurement.
Add the thickness [0.38 mm (.015 in.)] of the rubber coated metal gasket and the end play [0–0.15 mm (0–.006 in.)] of the differential case to the measurement (T). Select a spacer which is in the calculated range, In other words, select a spacer whose thickness is in the range of [T + 0.38 mm (.015 in.)] to [T + 0.38 mm (.015 in.) – 0.15 mm (.006 in.)].



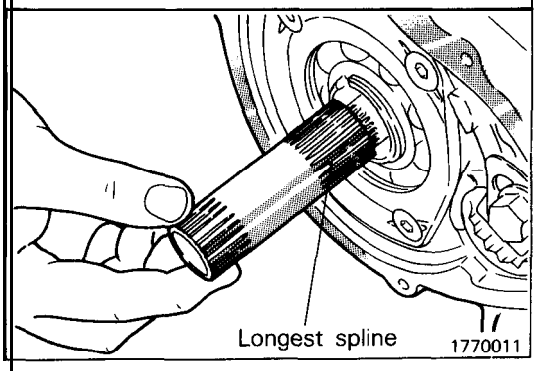

66. Place the spacer selected in Step 65 on the outer race of the differential bearing.



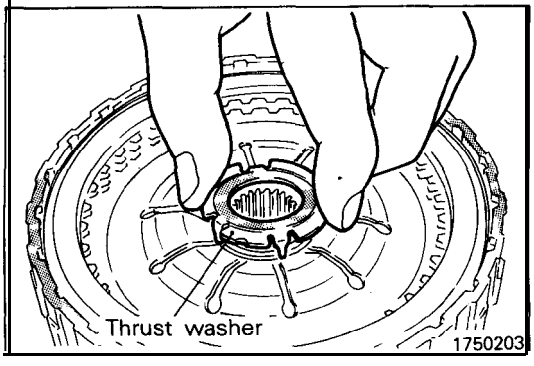

67. Apply silicone grease to hatched area (all gasket surface) of transaxle case.
68. Install new case gasket on transaxle case.



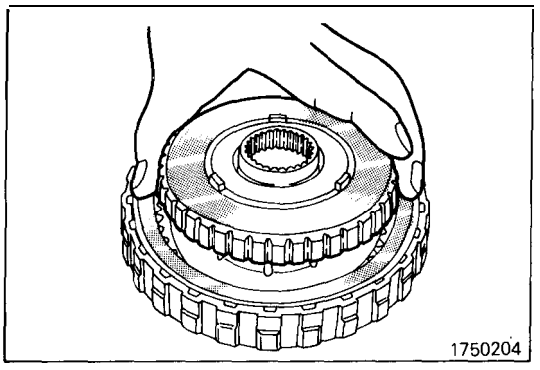

69. Install converter housing and tighten 14 bolts to 19–23 Nm (14–16 ft.lbs.).



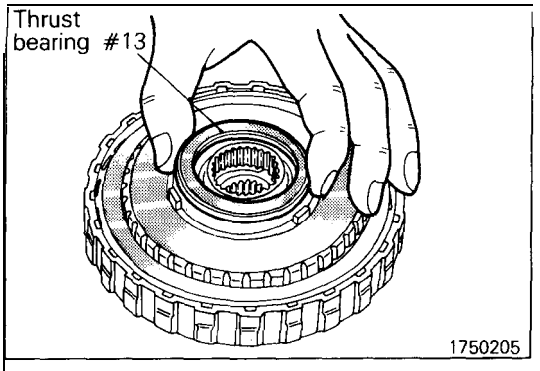

70. Install end clutch shaft. Be sure to install the longest spline toward the front as shown.



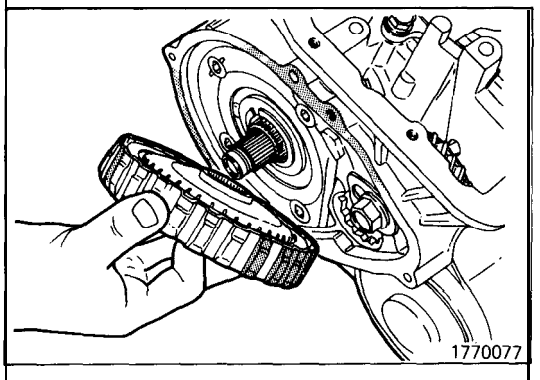

71. Fit the thrust washer to the return spring at the end clutch side.



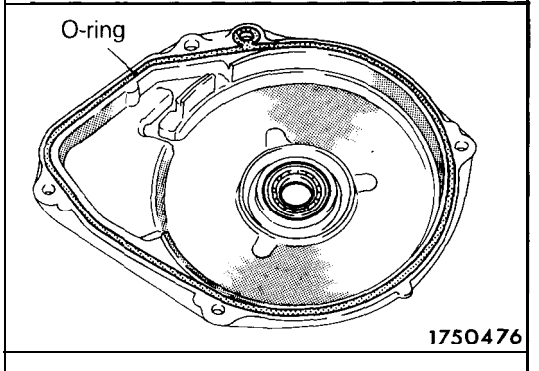

72. Install the end clutch hub to end clutch.




73. Attach, by petrolatum, thrust bearing # 13 to the end clutch hub.

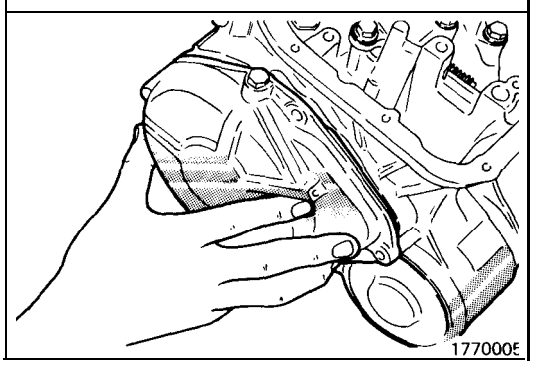



74. Install end clutch assembly.



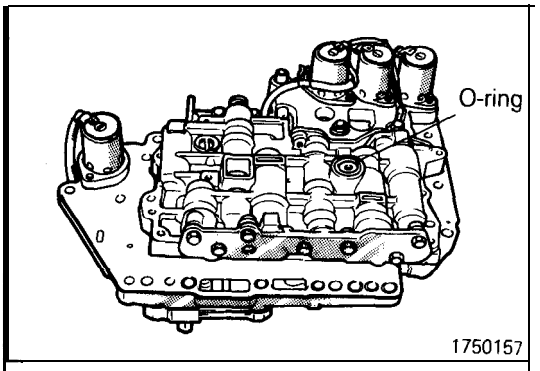

75. Install a new O-ring in the grooves of the end clutch cover.

**Caution**
**1. Install so that the O-ring is not twisted.**
**2. Apply a sufficient amount of automatic transmission fluid to the bearing.**

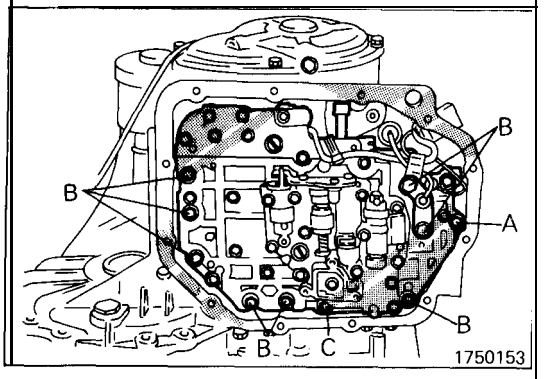



76. Attach the end cover and fasten it with four bolts.

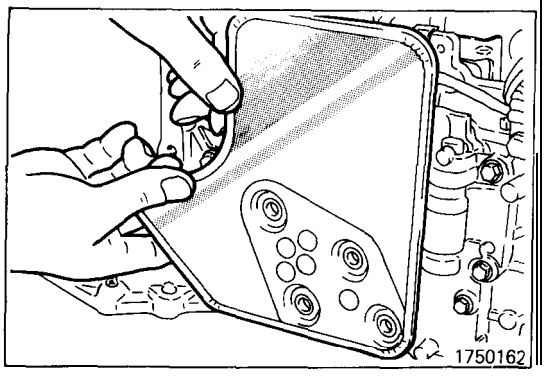
**Caution**
**When installing the end cover, be sure the screw hole is correctly aligned. If the end cover is turned (after it is installed) in order to align with the screw hole, the O-ring may be twisted as a result.**



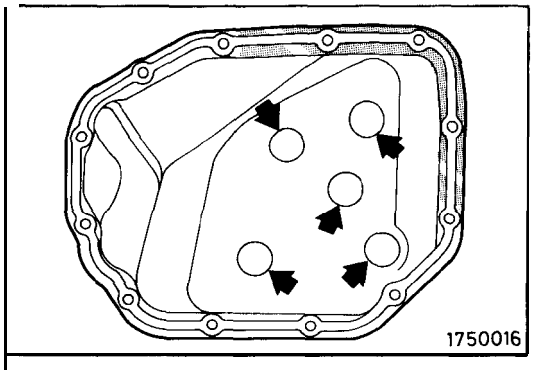

77. Install O-ring at center of top of valve body assembly (brake oil pressure passage).
78. Replace the O-ring of the solenoid valve harness grommet with a new one.
79. Insert the solenoid valve connector into the case.
80. Insert the harness grommet into the case.
81. Inserting the pin of the detent plate into the groove of the manual valve, install the valve body assembly on the case.



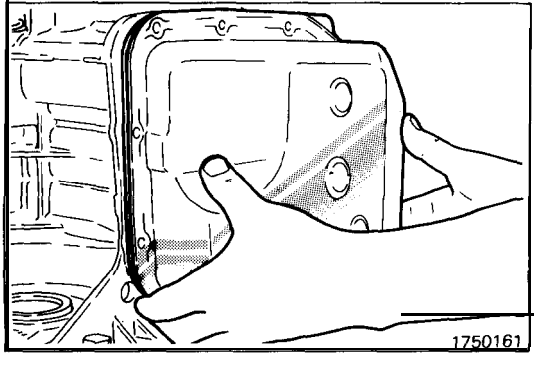

82. First insert the oil temperature sensor inside the case and install to the case. Then install to the valve body. Tighten valve body assembly mounting bolts (10 pieces) to IO- 12 Nm (7.5-8.5 ft.lbs.).
    A : 18 mm (.709 in.) long
    B : 25 mm (.984 in.) long
    C : 40 mm (1.575 in.) long



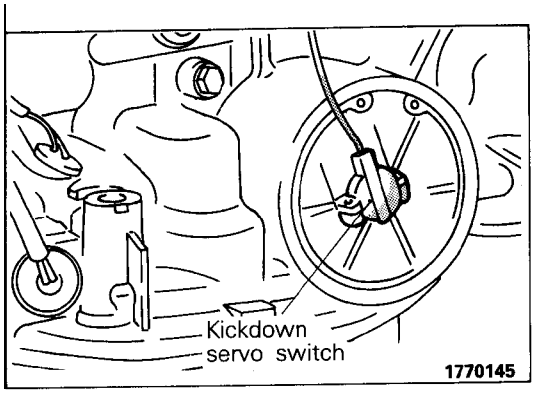

83. Install oil filter. Tighten four oil filter mounting bolts to 5-7 Nm (4-5 ft.lbs.).



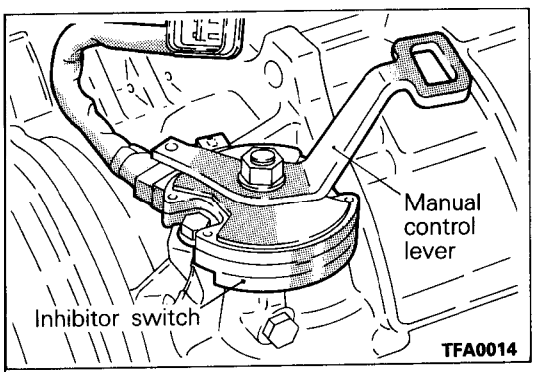

84. Install five magnets in the five depressions provided on the oil pan.
    Remove metal particles from the magnets and clean the inside of oil pan then.



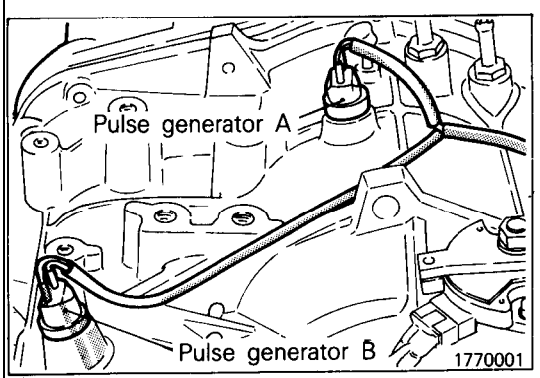

85. Install new oil pan gasket and oil pan by tightening 12 bolts to 10–12 Nm (7.5-8.5 ft.lbs.)



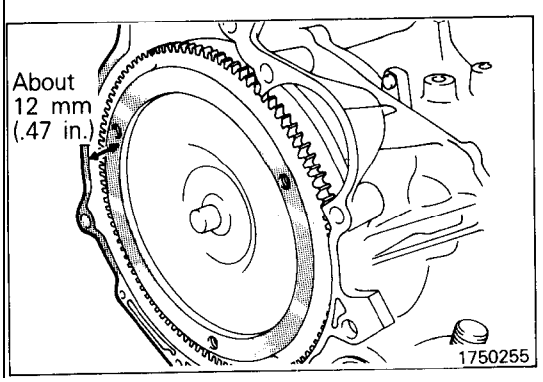

86. Install a new D-ring to the kickdown servo switch; then press into the case and secure it by using a snap ring.



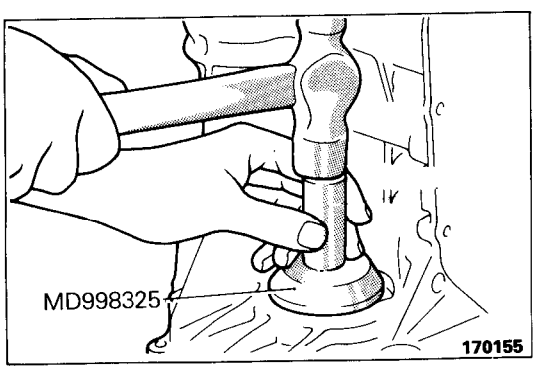

87. Install inhibitor switch and manual lever.
Adjust inhibitor switch. (Refer to P.21-211.)




88. Install the pulse generator A and B.




89. After applying automatic transaxle fluid to outside surface of oil pump-side cylindrical portion of torque converter, install torque converter carefully so as not to damage oil seal lip. Make certain that torque converter is in mesh with oil pump drive gear.
90. Measure distance between ring gear end and converter housing end. Torque converter has been properly installed when measurement is about 12 mm (.47 in.).




91. Using special tools, drive two drive shaft oil seals into transaxle case.

# TRANSAXLE ASSEMBLY <F4A33·W4A33>

N21LA-B

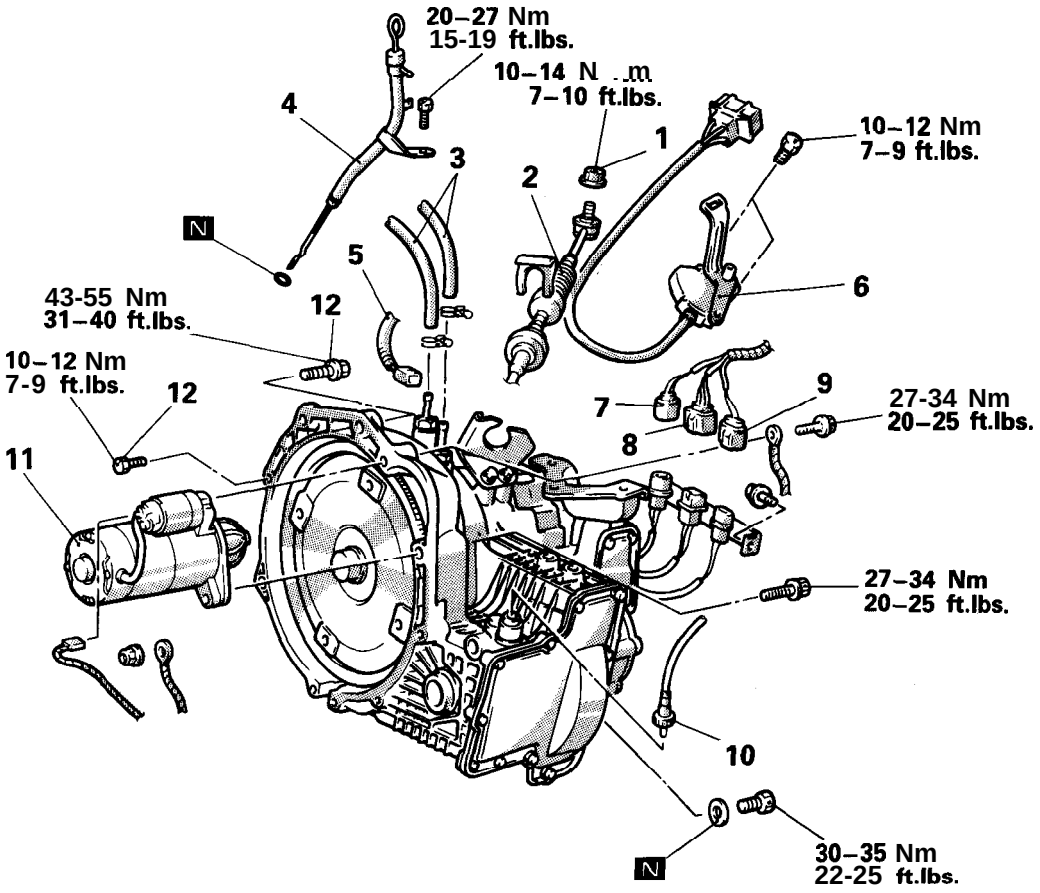
## REMOVAL AND INSTALLATION <F4A33>

**Pre-removal Operation**
- Removal of Battery

@Draining of Transaxle Fluid
(Refer to GROUP O-Maintenance Service.)
@Removal of Air Cleaner, Intercooler and Air Hose A
(Refer to GROUP 11–Intercooler.)

**Post-installation Operation**
- Installation of Air Cleaner, Intercooler and Air Hose A (Refer to GROUP 11–Intercooler.)
- Supplying of Transaxle Fluid
(Refer to GROUP O-Maintenance Service.)

*Installation of Battery

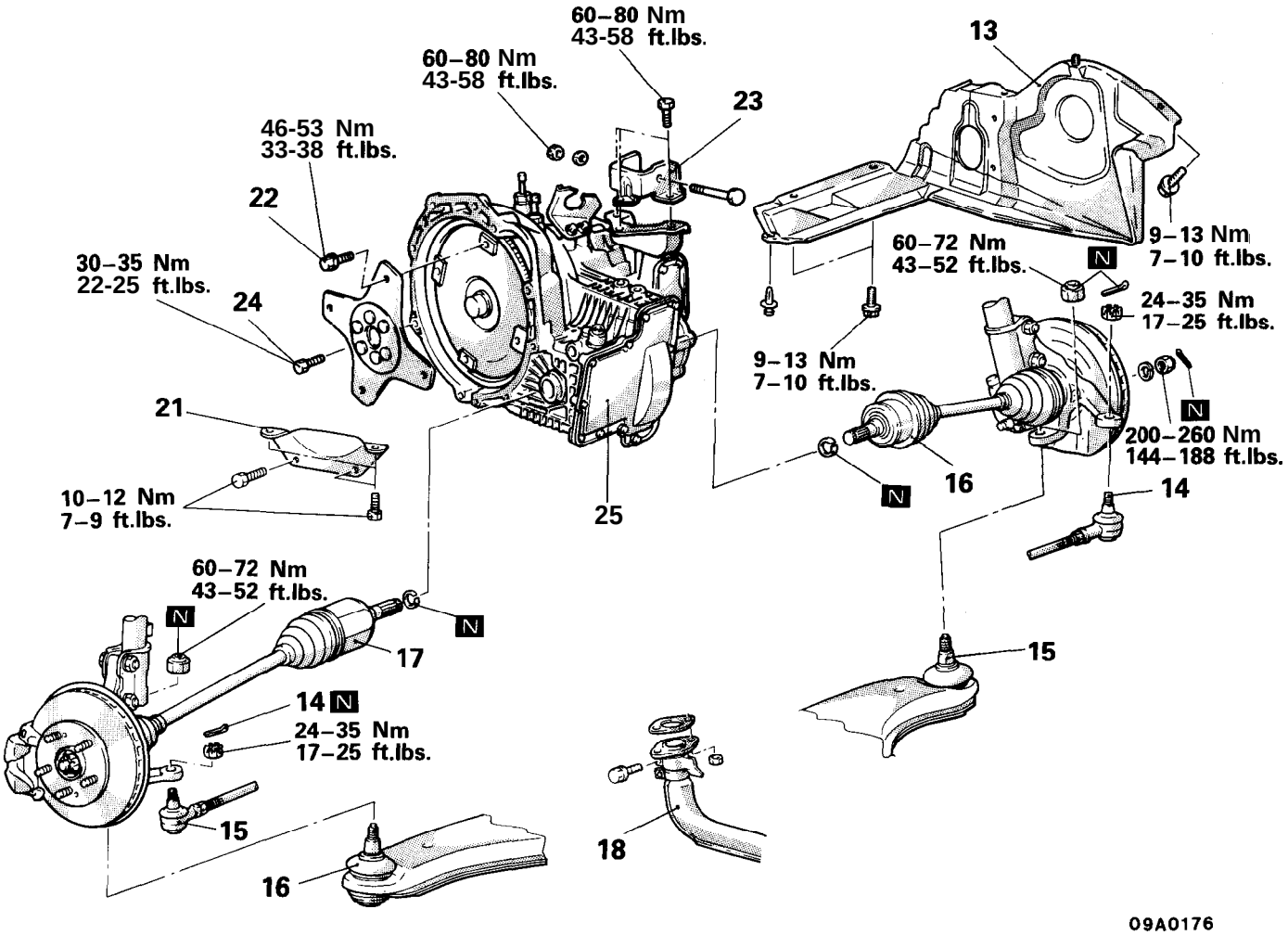



09A0175

**Removal steps**

1. Adjusting nut
2. ◆◆ Connection for transaxle control cable
3. Connection for oil cooler hose
4. Transaxle fluid level gauge
5. Connection for solenoid connector
6. ◆◆ Inhibitor switch
7. Connection for pulse generator connector
8. Connection for kickdown servo switch connector
9. Connection for oil temperature sensor connector
10. Connection for speedometer cable
11. Starter motor
12. Upper coupling bolt for transaxle assembly and engine assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".
(3) N: Non-reusable parts




13. Under cover
14. Connection for tie rod end
15. Connection for lower arm ball joint
16. Connection for drive shaft (R.H.)
17. Connection for drive shaft (L.H.)
18. Front exhaust pipe
21. Bell housing cover
22. Special bolt
23. Transaxle mount bracket
24. Transaxle assembly lower part coupling bolt
25. Transaxle assembly

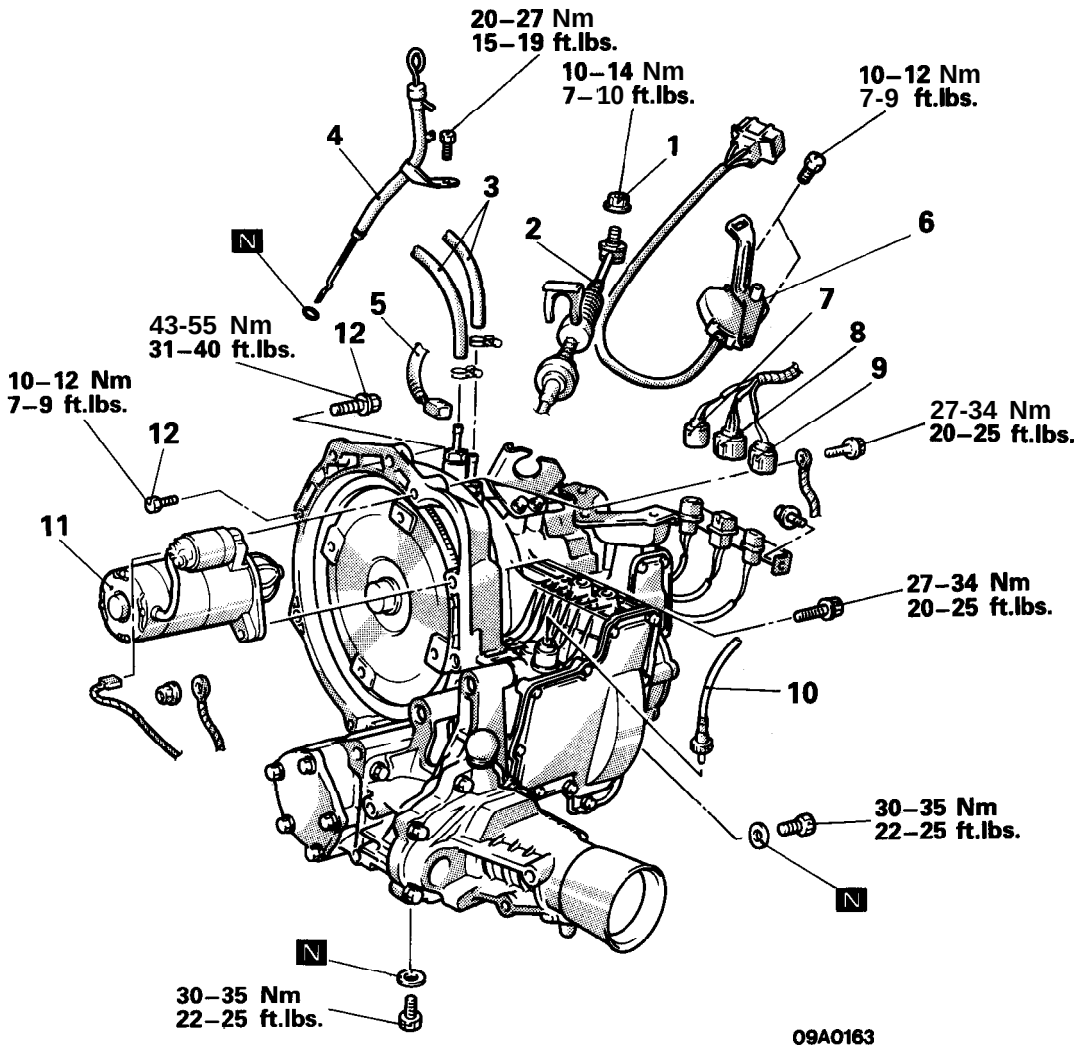
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) N: Non-reusable parts

## REMOVAL AND INSTALLATION <W4A33>

N21LA-C

**Pre-removal Operation**
- Removal of Battery
- Draining of Transaxle Fluid (Refer to GROUP 0–Maintenance Service.)
- Removal of Air Cleaner, Intercooler and Air Hose A (Refer to GROUP 11–Intercooler.)

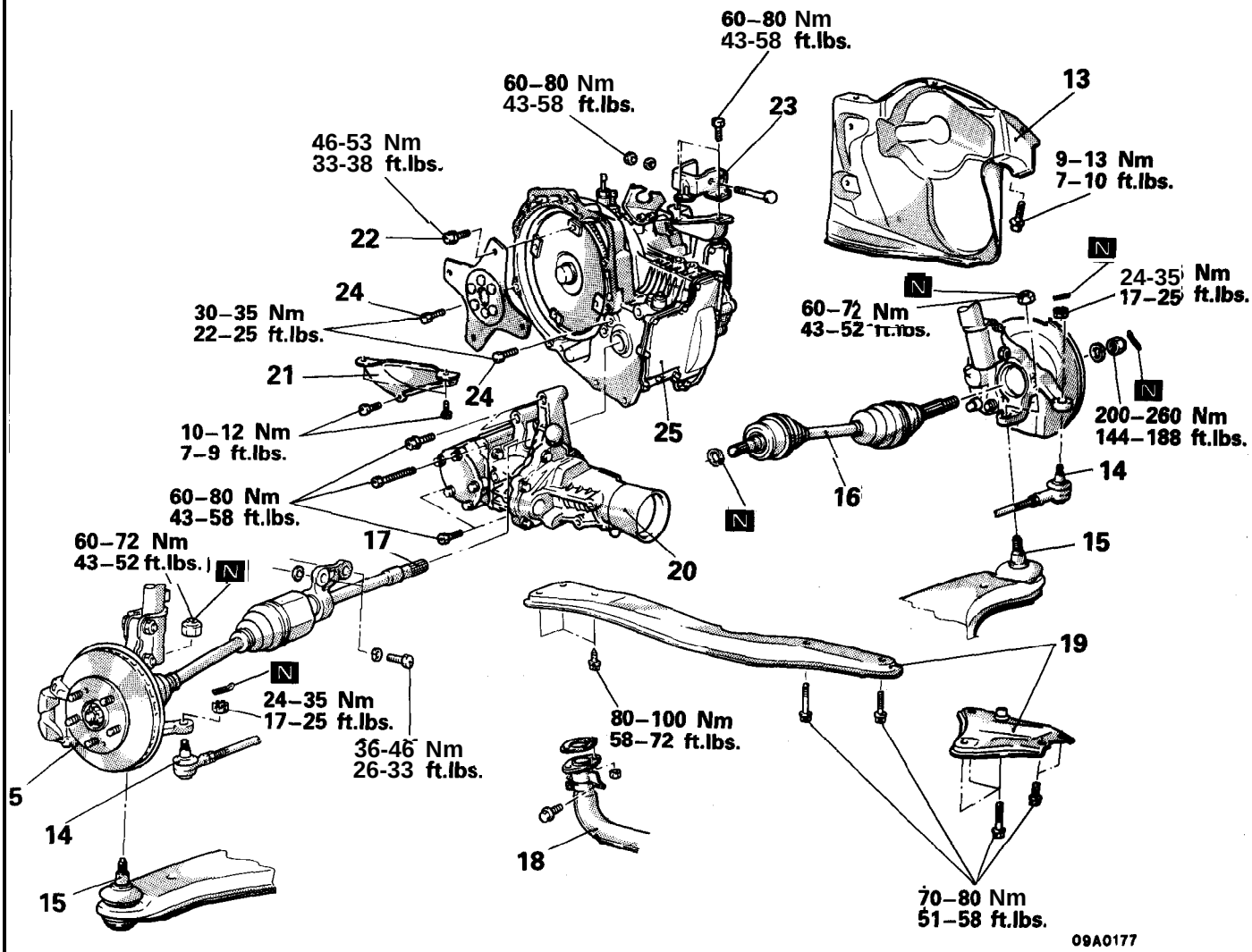
**Post-installation Operation**
- Installation of Air Cleaner, Intercooler and Air Hose A (Refer to GROUP 11–Intercooler.)
- Supplying of Transaxle Fluid (Refer to GROUP 0–Maintenance Service.)
- Installation of Battery




**Removal steps**

1. Adjusting nut
- ◆ 4 2. Connection for transaxle control cable
3. Connection for oil cooler hose
4. Transaxle fluid level gauge
5. Connection for solenoid connector
- ◆ + 6. Connection for inhibitor switch connector
7. Connection for pulse generator connector
8. Connection for kickdown servo switch connector
9. Connection for oil temperature sensor connector
10. Connection for speedometer cable
11. Starter motor
12. Upper coupling bolt for transaxle assembly and engine assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation"
(3) N: Non-reusable parts




13. Under cover
14. Connection for tie rod end
15. Connection for lower arm ball joint
16. Connection for drive shaft (R.H.)
17. Connection for drive shaft (L.H.)
18. Front exhaust pipe
19. Right member and gusset
20. Transfer assembly
21. Bell housing cover
22. Special bolt
23. Transaxle mount bracket
24. Transaxle assembly lower part coupling bolt
25. Transaxle assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ☐ : Non-reusable parts

## SERVICE POINTS OF REMOVAL

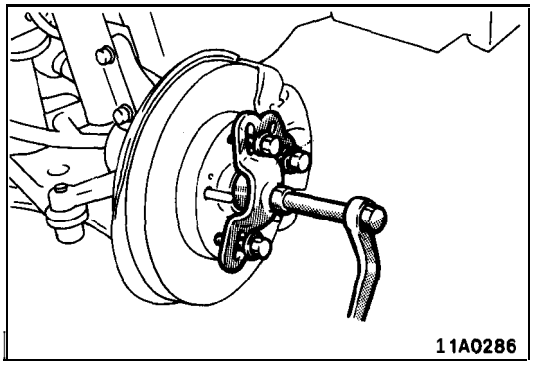
N21LBAU

**14. DISCONNECTION OF TIE ROD END / 15. LOWER ARM BALL JOINT**

Refer to P.21-227.

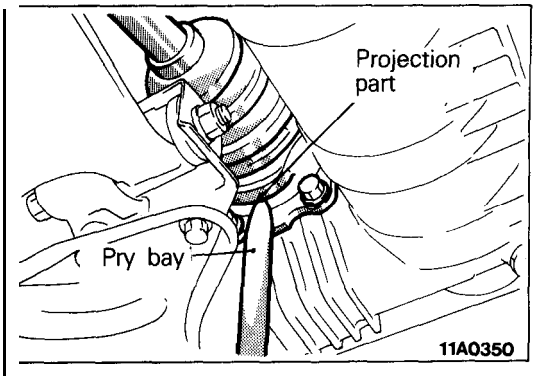
**16. REMOVAL OF DRIVE SHAFT (R.H.) / 17. DRIVE SHAFT (L.H.) <FWD>**

Refer to P.21-227.


11A0286

**16. REMOVAL OF DRIVE SHAFT (R.H.) <AWD>**

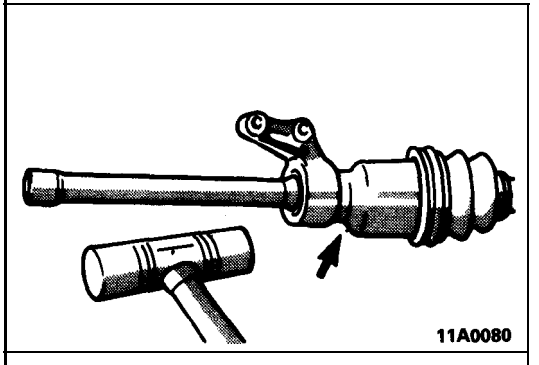
(1) Use the suitable tool to push out the drive shaft (R.H.) from the front hub.



11A0350

(2) Insert a pry bar at the projection part and remove the drive shaft (R.H.) from the transaxle.

**Caution**
**Do not pull out the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.**

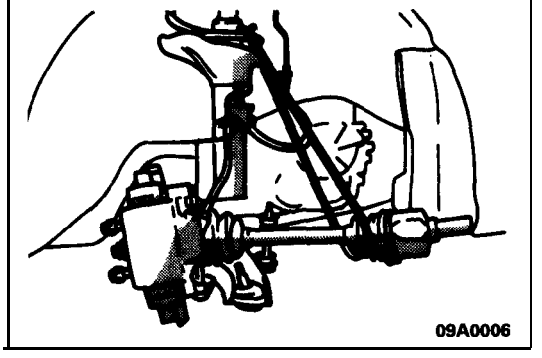

11A0080

**17. DISCONNECTION OF DRIVE SHAFT (L.H.) <AWD>**

(1) Take out the drive shaft by lightly tapping the drive shaft T.J. case with a plastic hammer.

NOTE
Remove the drive shaft with the hub and knuckle, etc., as an assembly.

**Caution**
1. **Removing the drive shaft from the outboard joint side can cause damage to the inboard joint. Always use a plastic hammer, etc., to remove the drive shaft.**
2. **Tapping on the center bearing can damage it. Never tap on the bearing.**


09A0006

(2) Keep the removed drive shaft as far away from the transaxle case as possible, and secure (by using rope, etc.) the joints to the body so that it does not fall.

**18. REMOVAL OF FRONT EXHAUST PIPE**

Refer to GROUP 1 l-Exhaust Pipe and Main Muffler.

**20. REMOVAL OF TRANSFER ASSEMBLY**

Refer to P.21-265.

**22. REMOVAL OF SPECIAL BOLT**

Refer to P.21-227.

## SERVICE POINTS OF INSTALLATION

**6. INSTALLATION OF INHIBITOR SWITCH**

Refer to P.22-211.

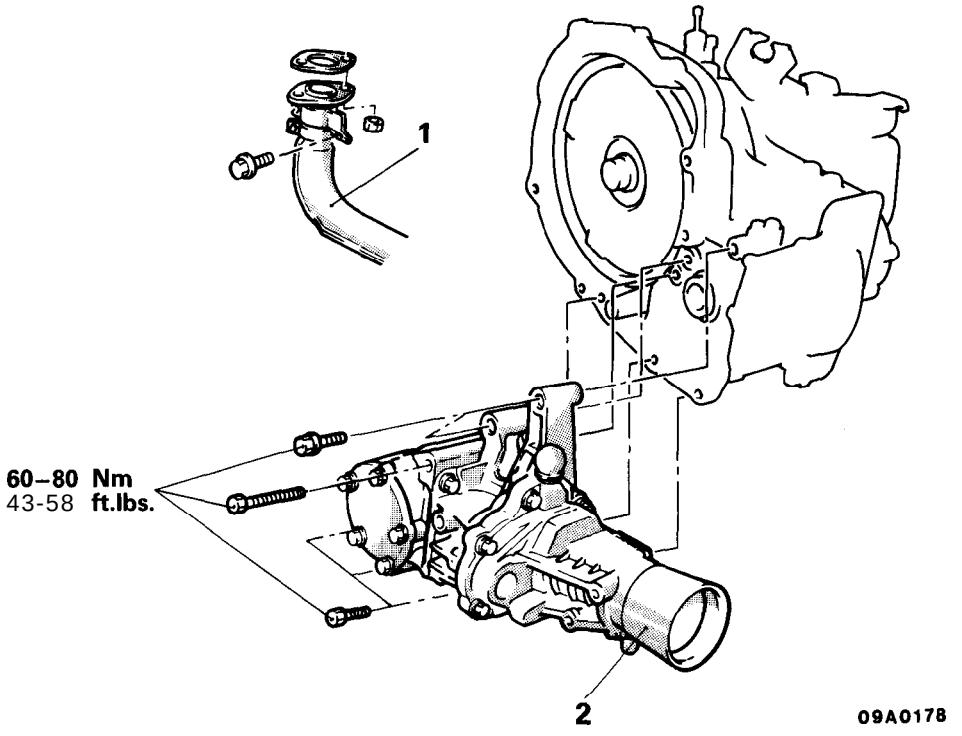
**2. CONNECTION OF TRANSAXLE CONTROL CABLE**

Refer to P.22-211.

# TRANSFER

N21VA--

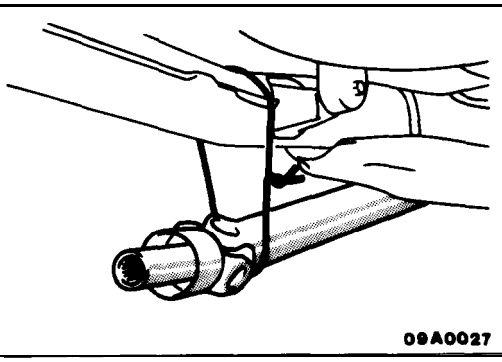
## REMOVAL AND INSTALLATION

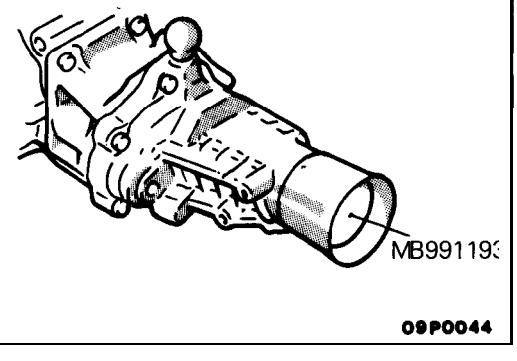



**Removal steps**

◆◆ 1. Front exhaust pipe
◆◆ 2. Transfer assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ❑ : Non-reusable parts


09A0027



09P0044

## SERVICE POINTS OF REMOVAL

N21VBAB

**1. REMOVAL OF FRONT EXHAUST PIPE**

Refer to GROUP II-Exhaust Pipe and Main Muffler

**2. REMOVAL OF TRANSFER ASSEMBLY**

After moving the transfer assembly to the left and lowering the front side, then remove it from the propeller shaft.

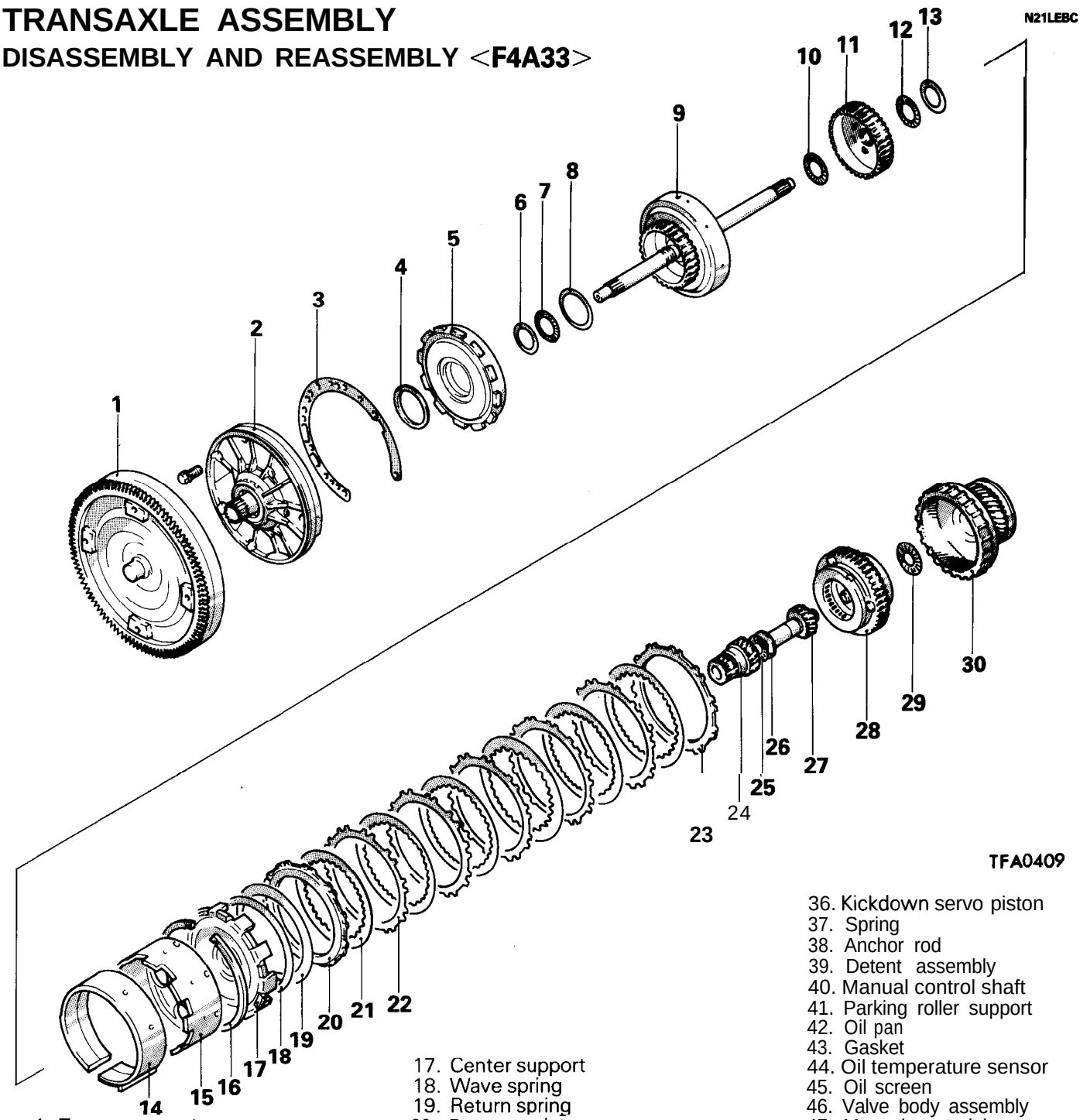
**Caution**

1. **Be cautious to avoid damaging the transfer oil seal lip.**
2. **The propeller shaft should be suspended so that it is not sharply bent.**
3. **Cover the transfer opening with the special tool to prevent transaxle oil discharge and the entry of foreign objects.**

# TRANSAXLE ASSEMBLY

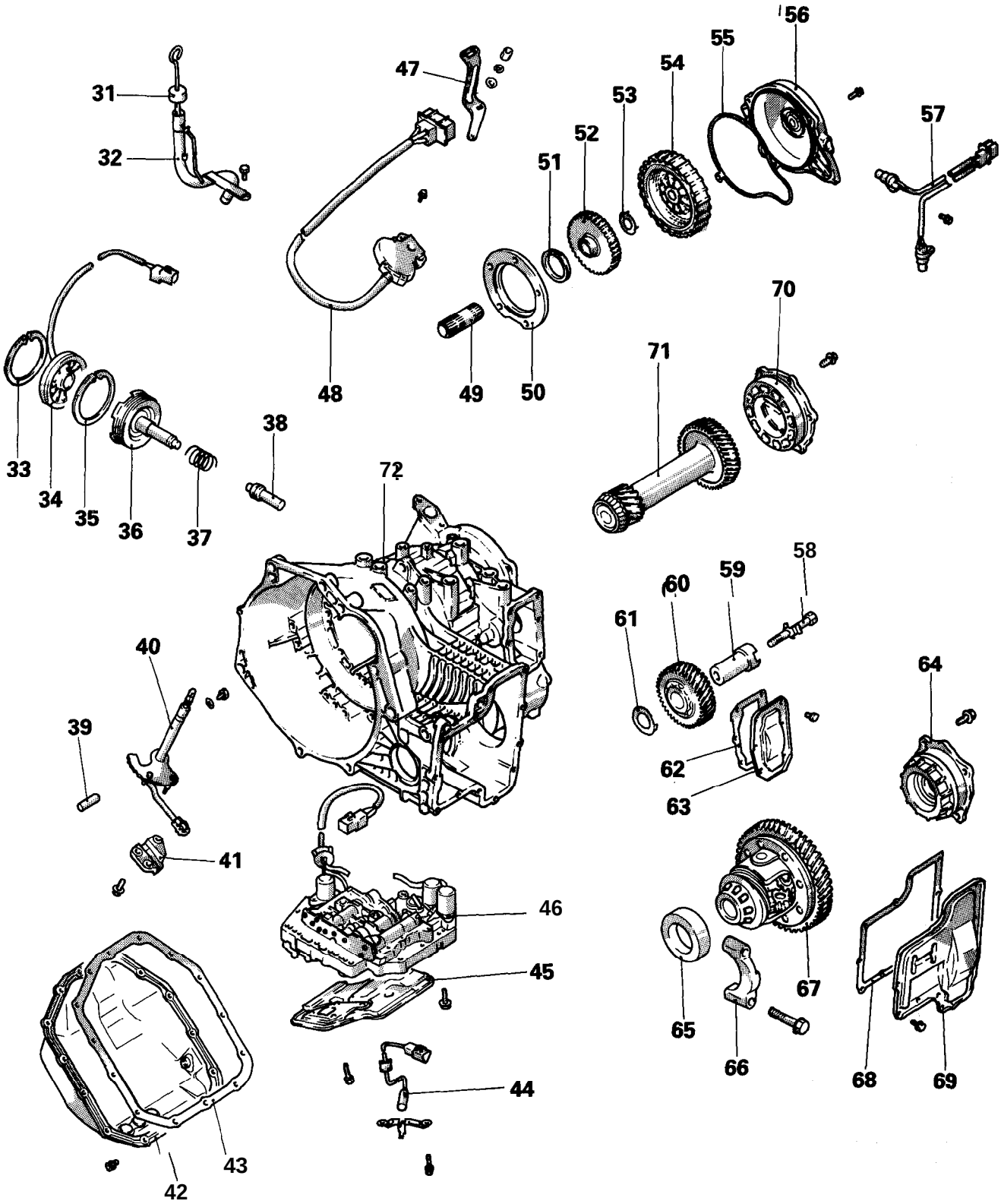
## DISASSEMBLY AND REASSEMBLY <F4A33>

N21LEBC




TFA0409

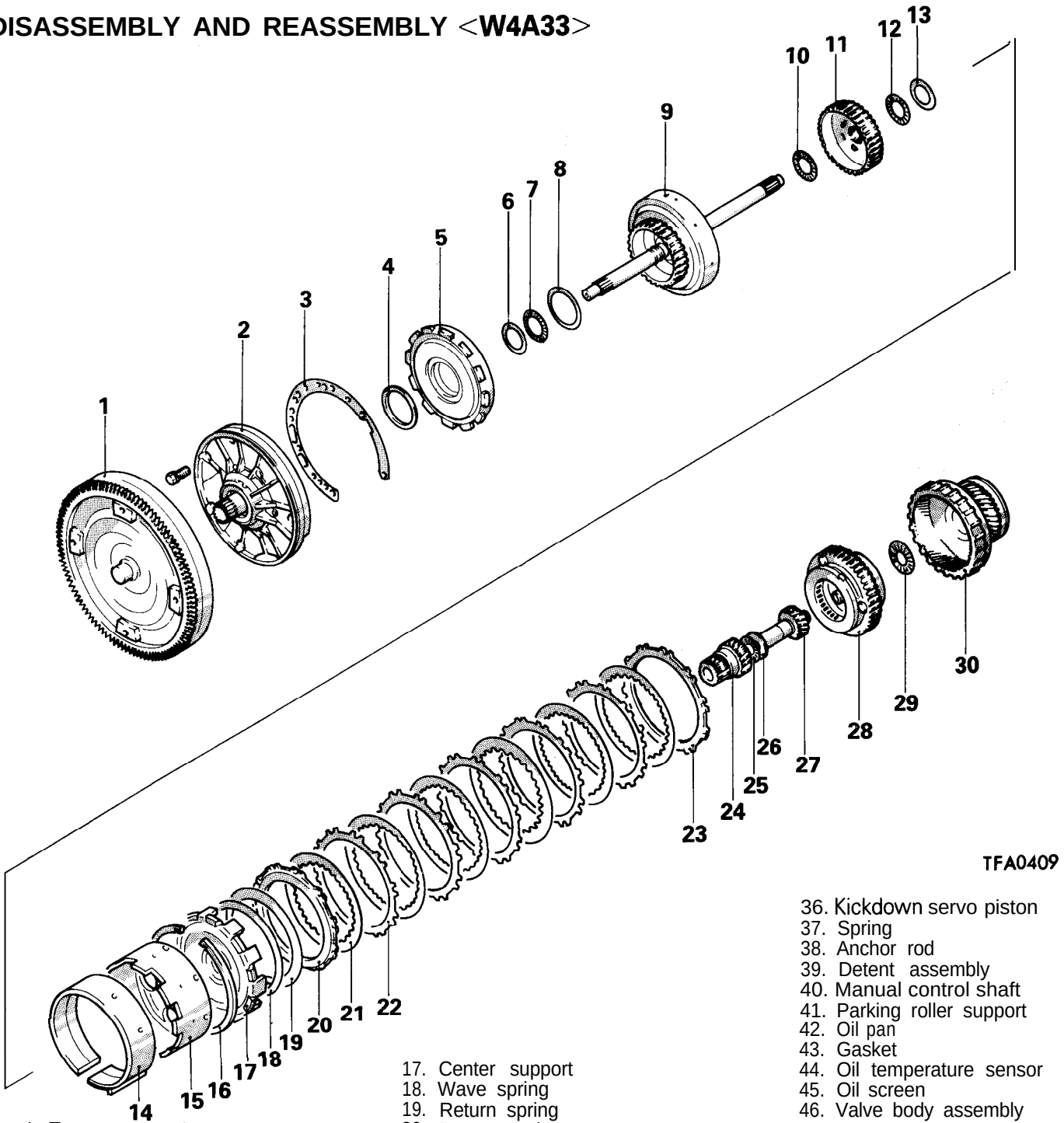
1. Torque converter
2. Oil pump assembly
3. Gasket
4. Thrust washer #1
5. Front clutch assembly
6. Thrust race #3
7. Thrust bearing #4
8. Thrust washer #2
9. Rear clutch assembly
10. Thrust bearing #5
11. Rear clutch hub
12. Thrust race #6
13. Thrust bearing #7
14. Kickdown band
15. Kickdown drum
16. Snap ring
17. Center support
18. Wave spring
19. Return spring
20. Pressure plate
21. Brake disc
22. Brake plate
23. Reaction plate
24. Reverse sun gear
25. Thrust bearing #8
26. Thrust race #9
27. For-ward sun gear
28. Planetary carrier assembly
29. Thrust bearing #10
30. Output flange
31. Oil level gauge
32. Oil filler tube
33. Snap ring
34. Kickdown servo switch
35. Snap ring
36. Kickdown servo piston
37. Spring
38. Anchor rod
39. Detent assembly
40. Manual control shaft
41. Parking roller support
42. Oil pan
43. Gasket
44. Oil temperature sensor
45. Oil screen
46. Valve body assembly
47. Manual control lever
48. Inhibitor switch
49. End clutch shaft
50. Bearing retainer
51. Thrust bearing #11
52. End clutch hub
53. Thrust washer
54. End clutch assembly
55. O-ring
56. End clutch cover
57. Pulse generator
58. Lock bolt
59. Idler shaft
60. Idler gear
61. Spacer
62. Gasket



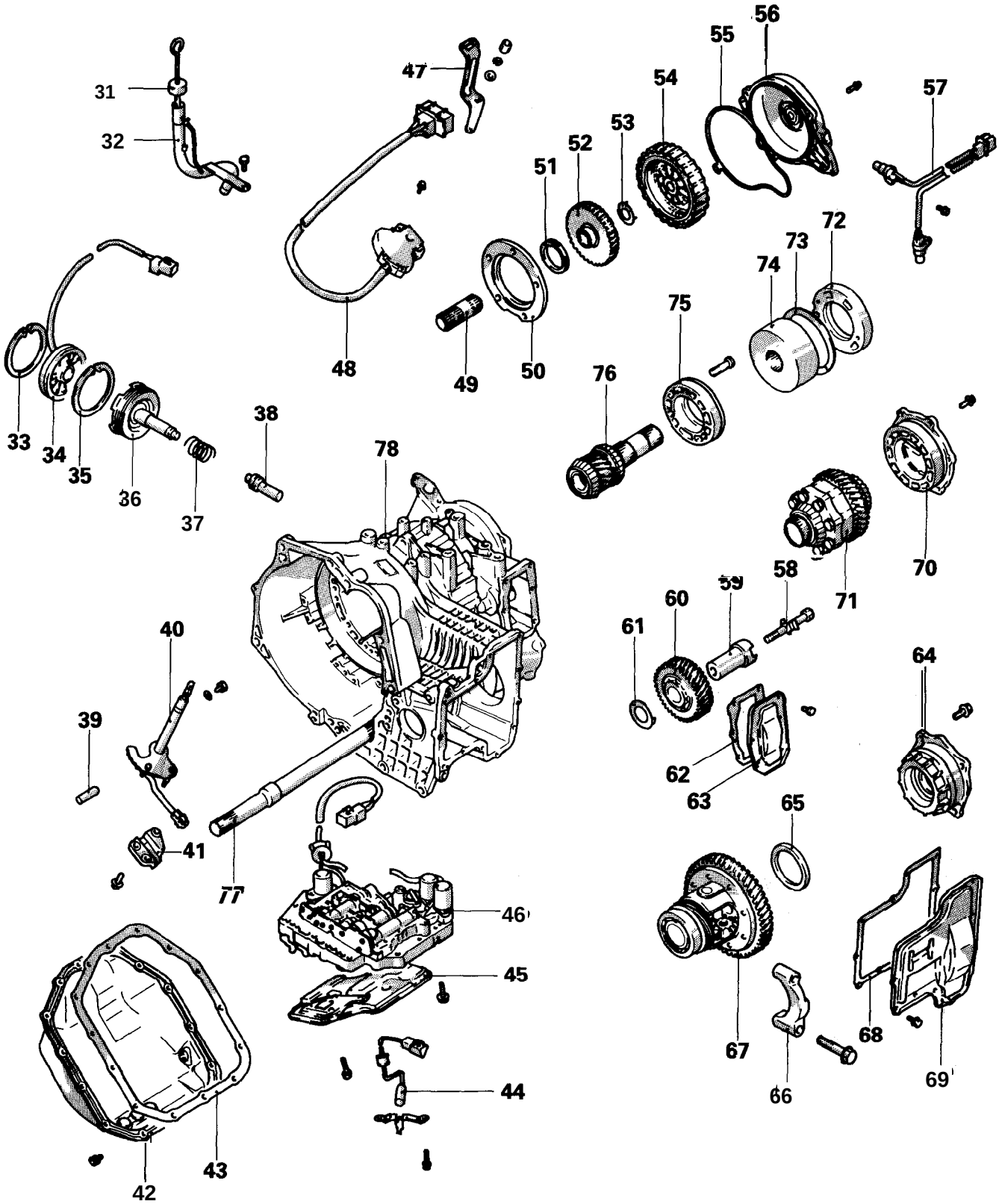

63. Idler gear cover
64. Differential bearing retainer
65. Outer race
66. Differential front bearing cap
67. Differential assembly
68. Gasket
69. Differential cover
70. Output bearing retainer
71. Transfer shaft
72. Transaxle case

TFA0410

## DISASSEMBLY AND REASSEMBLY <W4A33>




1. Torque converter
2. Oil pump assembly
3. Gasket
4. Thrust washer #1
5. Front clutch assembly
6. Thrust race #3
7. Thrust bearing #4
8. Thrust washer #2
9. Rear clutch assembly
10. Thrust bearing #5
11. Rear clutch hub
12. Thrust race #6
13. Thrust bearing #7
14. Kickdown band
15. Kickdown drum
16. Snap ring
17. Center support
18. Wave spring
19. Return spring
20. Pressure plate
21. Brake disc
22. Brake plate
23. Reaction plate
24. Reverse sun gear
25. Thrust bearing #8
26. Thrust race #9
27. Forward sun gear
28. Planetary carrier assembly
29. Thrust bearing #10
30. Output flange
31. Oil level gauge
32. Oil filler tube
33. Snap ring
34. Kickdown servo switch
35. Snap ring
36. Kickdown servo piston
37. Spring
38. Anchor rod
39. Detent assembly
40. Manual control shaft
41. Parking roller support
42. Oil pan
43. Gasket
44. Oil temperature sensor
45. Oil screen
46. Valve body assembly
47. Manual control lever
48. Inhibitor switch
49. End clutch shaft
50. Bearing retainer
51. Thrust bearing #11
52. End clutch hub
53. Thrust washer
54. End clutch assembly
55. O-ring
56. End clutch cover
57. Pulse generator
58. Lock bolt
59. Idler shaft
60. Idler gear
61. Spacer
62. Gasket




TFA0411

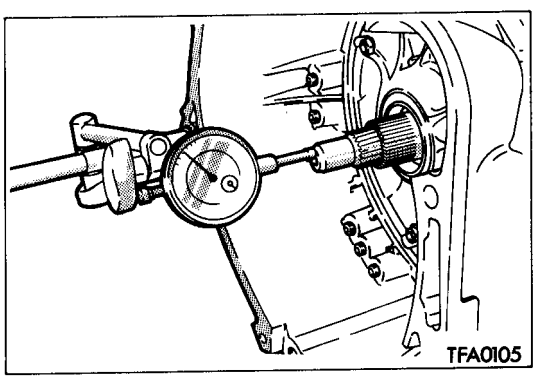
63. idler gear cover
64. Differential bearing retainer
65. Spacer
66. Differential front bearing cap
67. Differential assembly
68. Gasket
69. Differential cover
70. Output bearing retainer
71. Center differential assembly
72. Center bearing retainer
73. Stopper ring
74. Viscous coupling unit
75. Center bearing retainer
76. Front output shaft
77. Rear output shaft
78. Transaxle case

## DISASSEMBLY

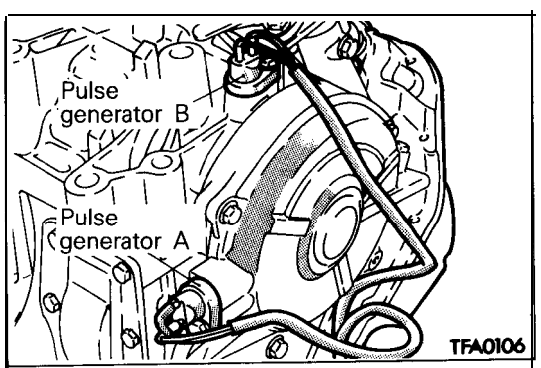
N21LEAM

**Caution**

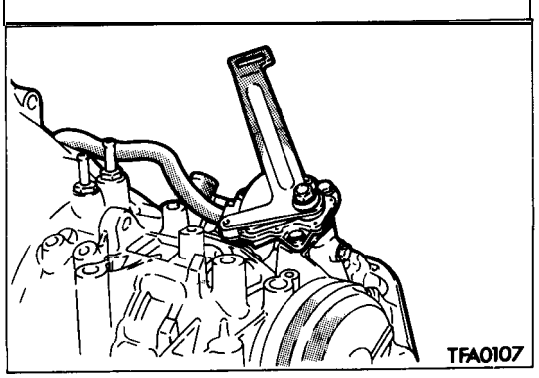
1. **Since the automatic transaxle is made of particularly high precision parts, be very careful when handling them during disassembly and reassembly so that they are not scratched.**
2. **Spread a rubber mat on the workbench and keep it clean.**
3. **Do not use cotton gloves or cloth rags during disassembly. If they are needed, use nylon cloth or paper towels.**
4. **Clean all disassembled parts. Clean metal parts with normal cleanser and completely dry with air.**
5. **Clean the clutch disc, resin thrust plate and rubber parts with ATF (automatic transmission fluid) and do not get any dirt on them.**
6. **If the transaxle itself is damaged, disassemble and clean the cooler system also.**



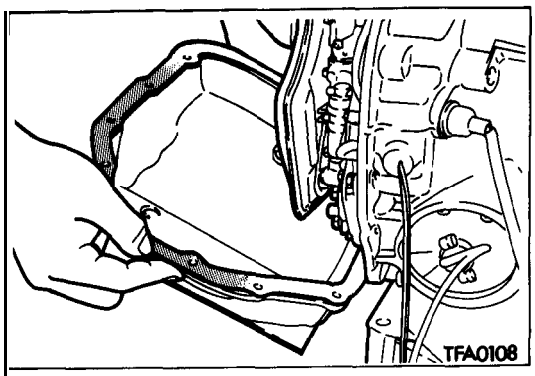

1. Remove the torque converter.
2. Mount the dial gauge on the transaxle case and measure the end play of the input shaft.
3. Remove the brackets.
4. Remove the oil level gauge and oil level gauge guide.



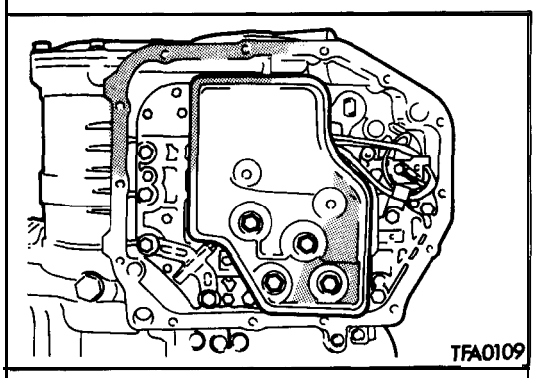

5. Remove the pulse generator A and B.



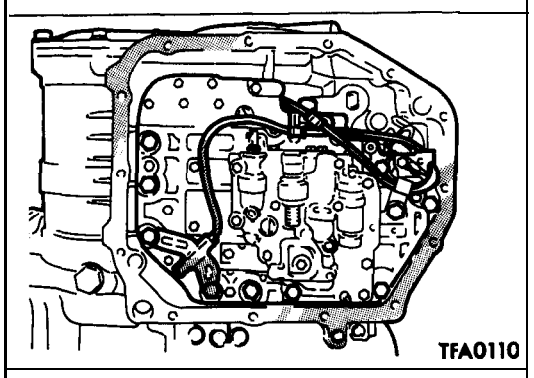

6. First remove the manual control lever and then remove the inhibitor switch.
7. Remove the speedometer driven gear assembly.



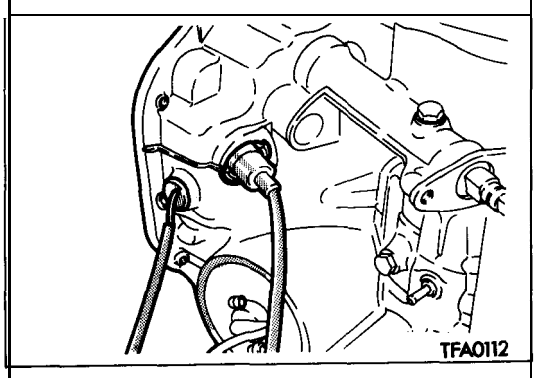

8. Remove the oil pan, magnet and gasket.



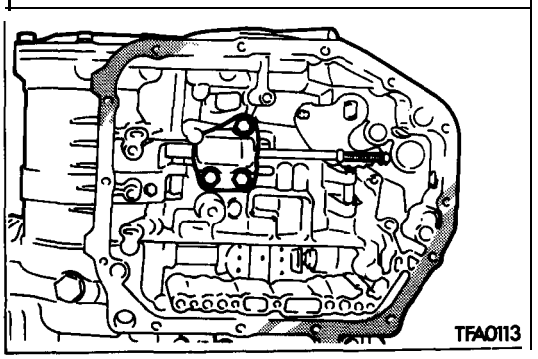

9. Remove the oil screen.



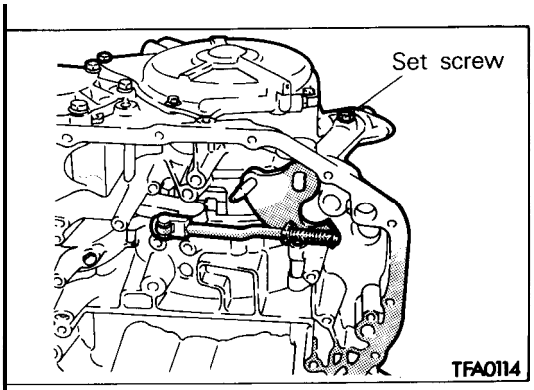

10. Remove the valve body mounting bolts (10).
11. Remove the oil temperature sensor holder and then remove the oil temperature sensor harness from the clamp.



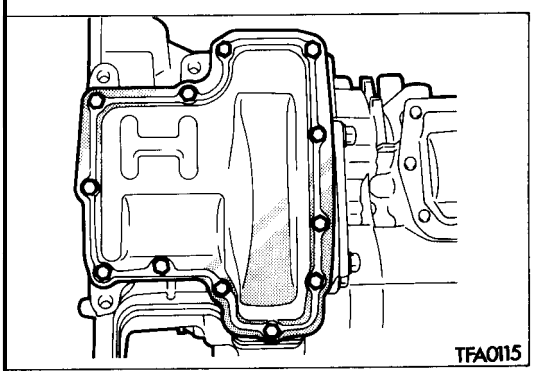

12. Press the clips of the solenoid valve harness grommet, push the grommet inside the case and remove the valve body assembly.
13. Pull out the oil temperature sensor.



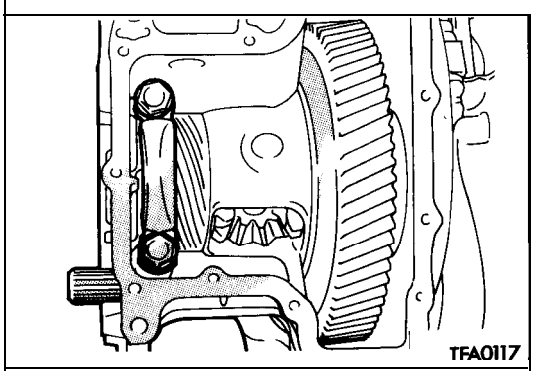

14. Remove the parking roller support.



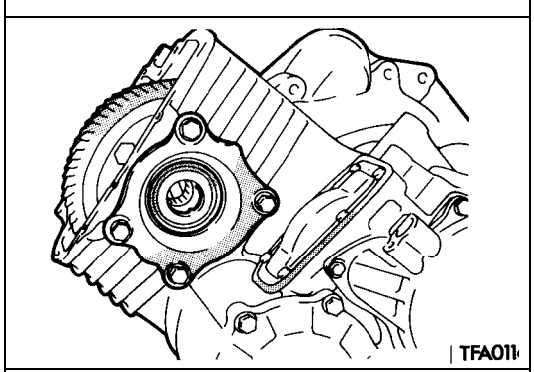

15. Remove the set screw in the manual control shaft and pull out the manual control shaft assembly.
16. Remove the detent assembly.



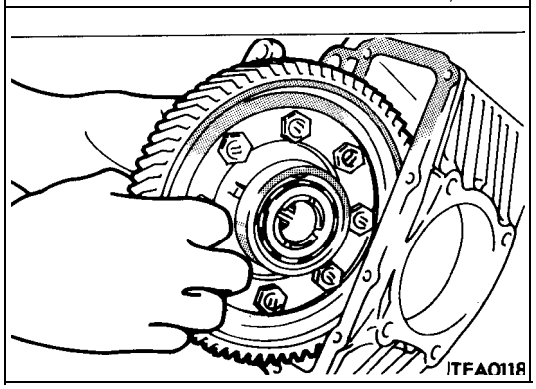

17. Remove the differential cover and gasket.



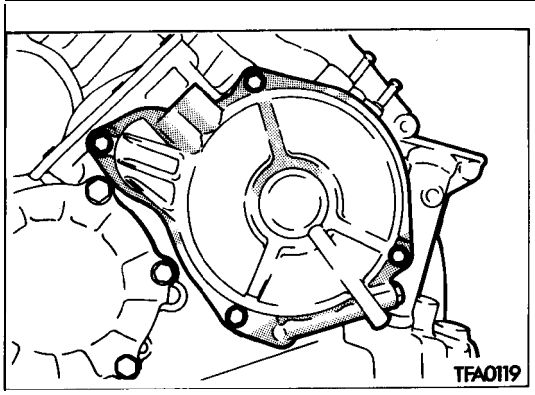

18. Remove the differential front bearing cap.



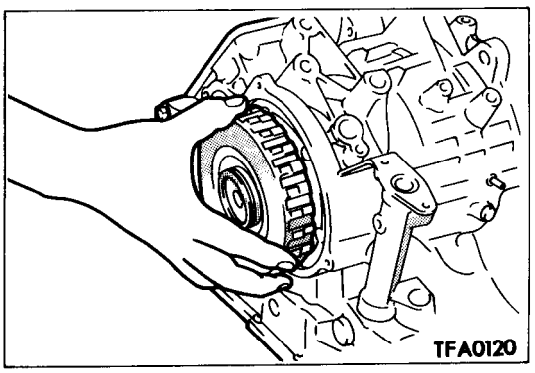

19. Remove the differential bearing retainer, spacer and outer race (FWD only).



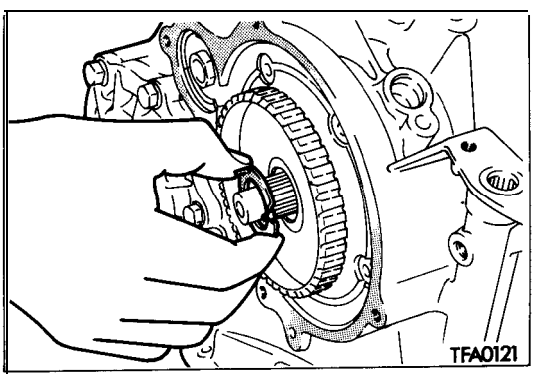

20. Remove the differential assembly.



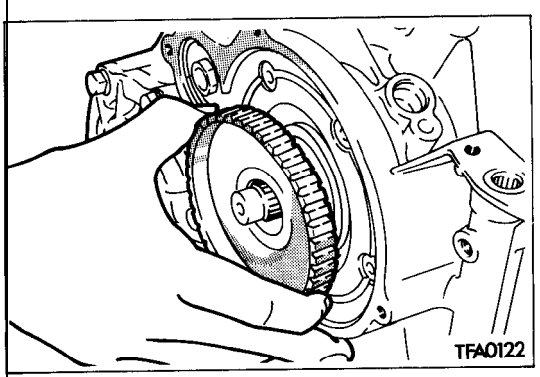

21. Remove the end clutch cover mounting bolts and then remove the end clutch cover.




22. Remove the end clutch assembly.

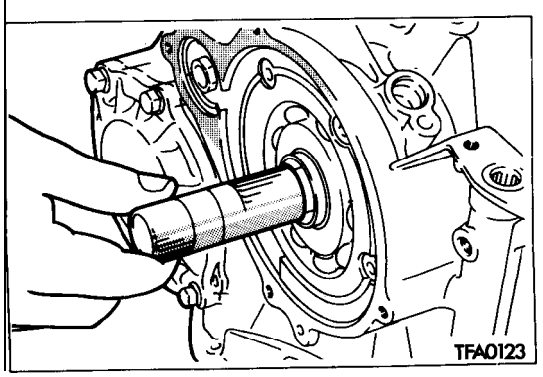



23. Remove the thrust plate.

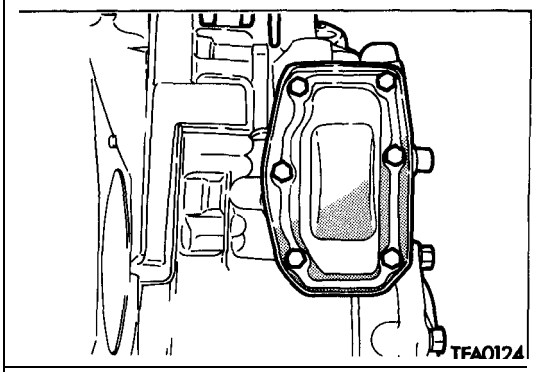



24. Remove the end clutch hub.
25. Remove the thrust bearing.

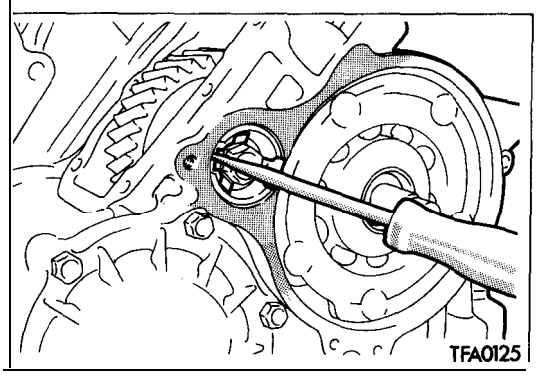
NOTE
Sometimes it sticks to the end clutch hub.



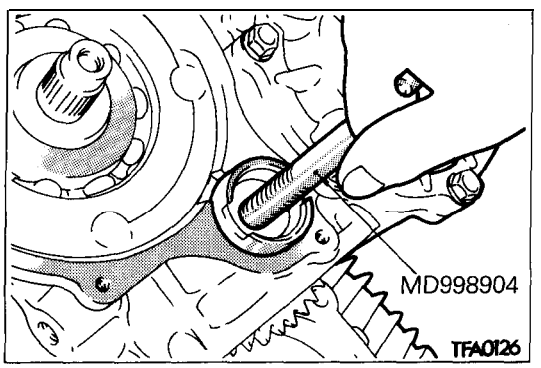

26. Pull out the end clutch shaft.



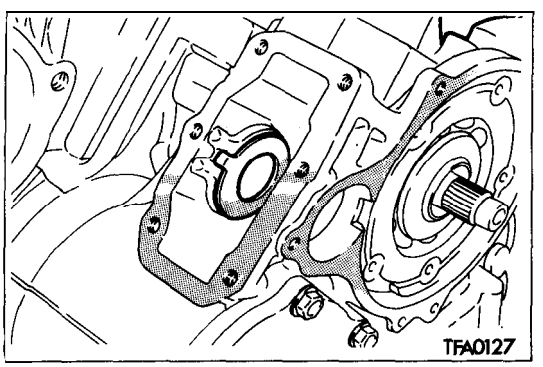

27. Remove the idler gear cover mounting bolts and then remove the idler gear cover and gasket.



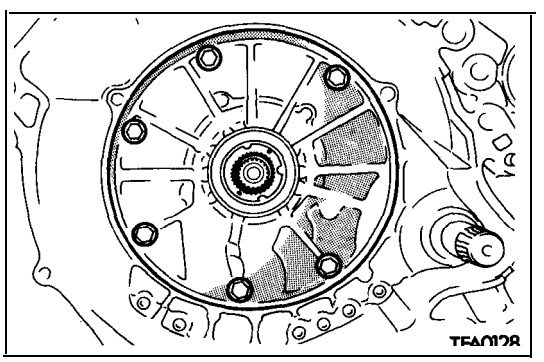

28. Release the bolt stopper and then remove the bolt.



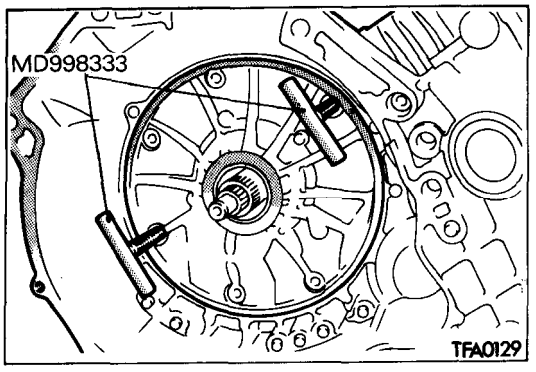

29. Using the special tool, pull out the idler shaft and then remove the idler gear and bearing inner race.



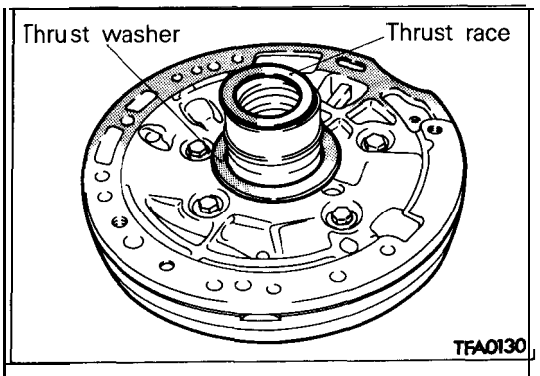

30. Remove the spacer.



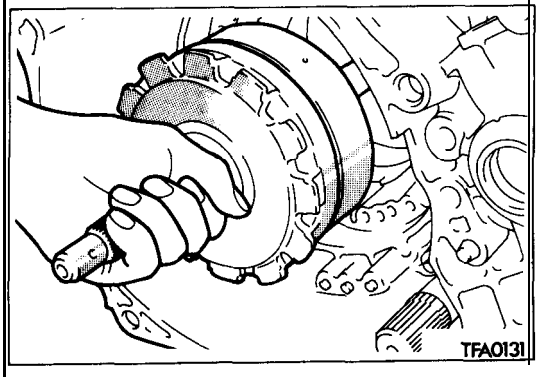
31. Remove the oil pump bolts.



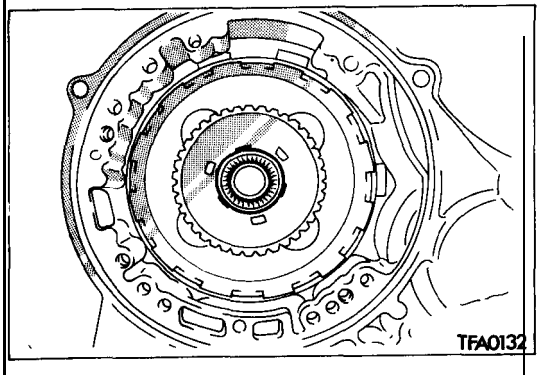

32. Using the special tool, remove the oil pump.



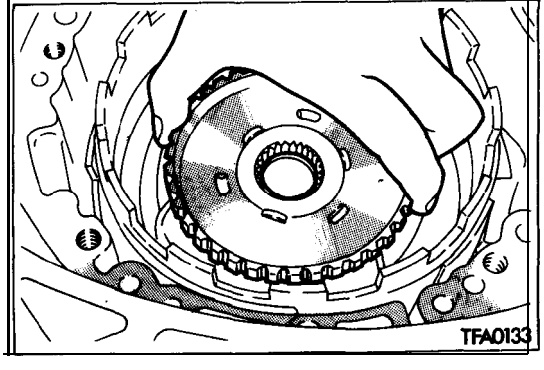

33. Remove the thrust washer and thrust race.




34. Holding the input shaft, remove the front clutch assembly and rear clutch assembly together.

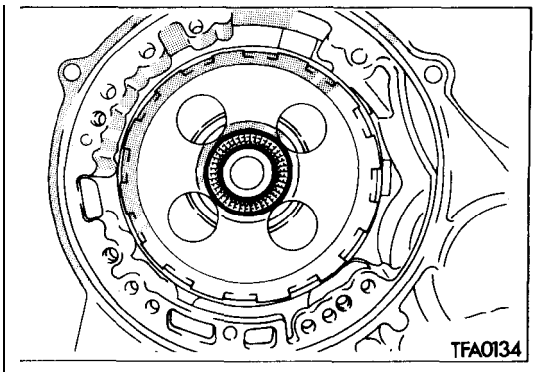



35. Remove the thrust bearing.

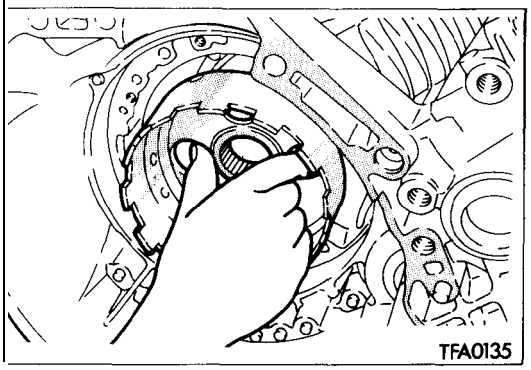



36. Remove the rear clutch hub.

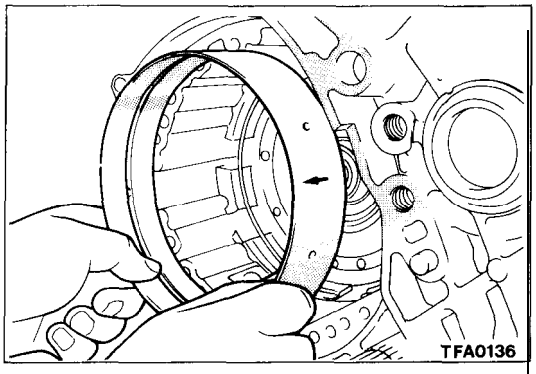
NOTE
Sometimes the thrust race sticks to the clutch hub.



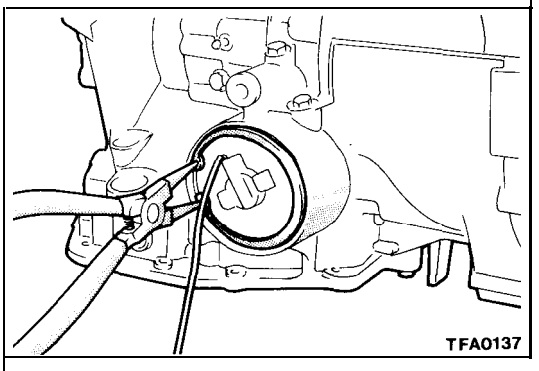

37. Remove the thrust bearing.



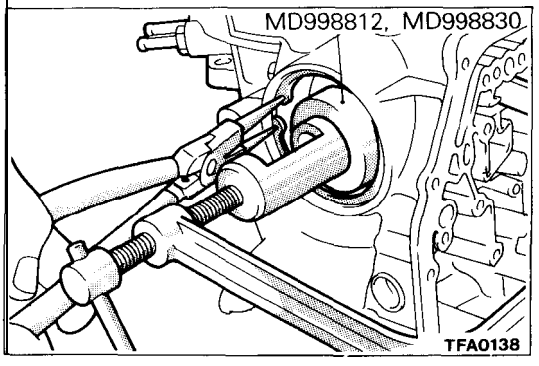

38. Remove the kickdown drum.



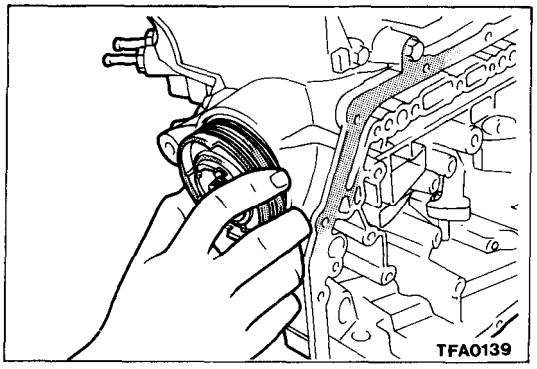

39. Remove the kickdown band.



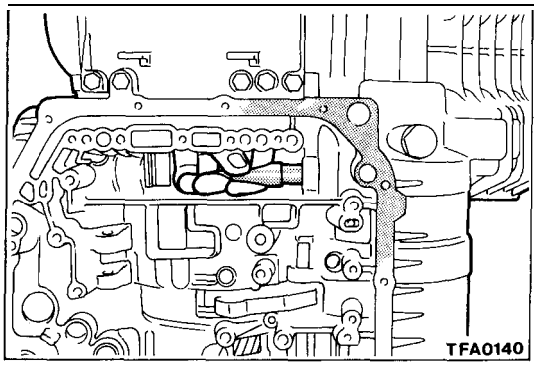

40. Remove the snap ring and then remove the kickdown servo switch.



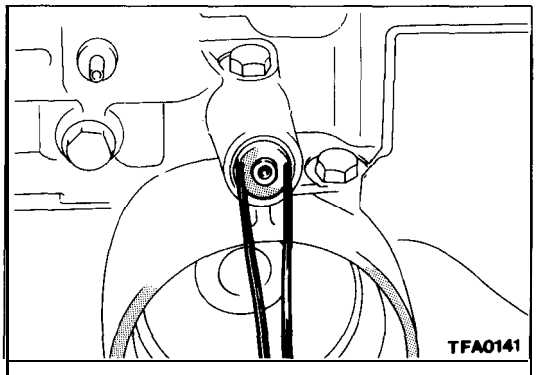

41. Using the special tool, push in the kickdown servo piston and remove the snap ring.



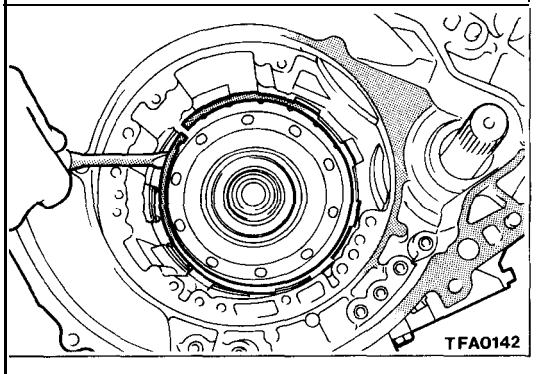

42. Remove the kickdown servo piston.



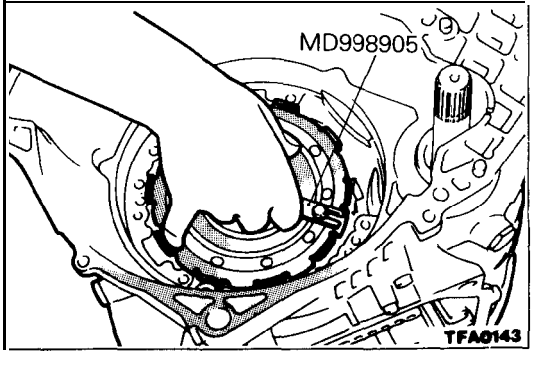

43. Remove the anchor rod.



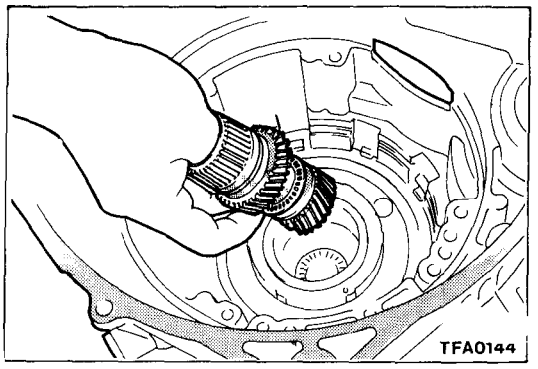

44. Remove the plug and then remove the air exhaust plug.



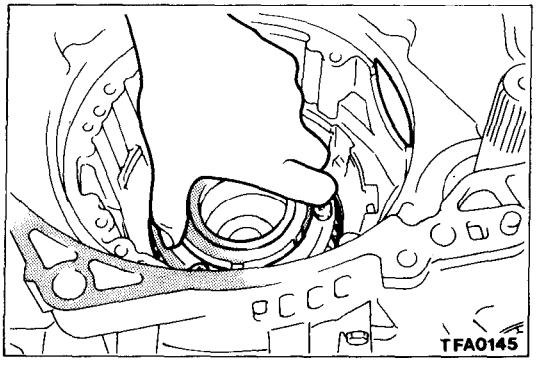

45. Remove the snap ring.



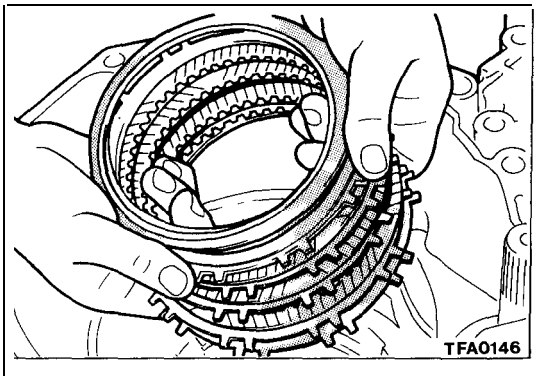

46. Using the special tool, remove the center support.



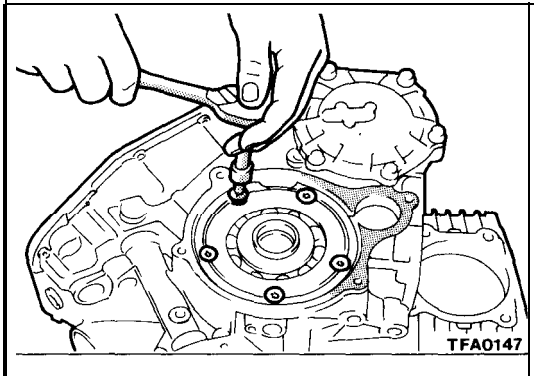

47. Remove the reverse sun gear and forward sun gear.



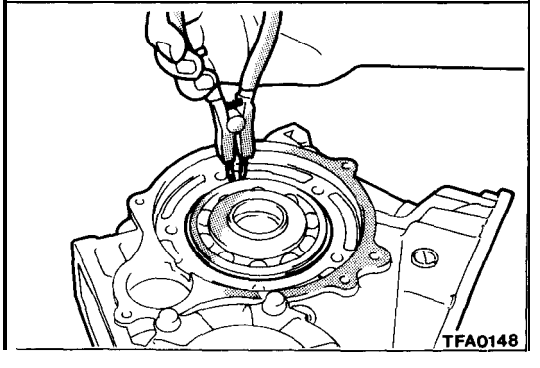

48. Remove the planetary carrier assembly.



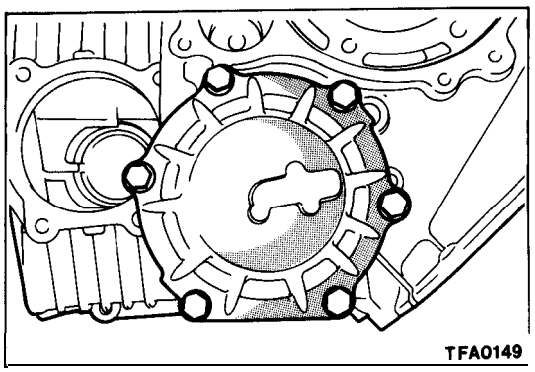

49. Remove the waved spring, return spring, reaction plate, brake disc and brake plate.



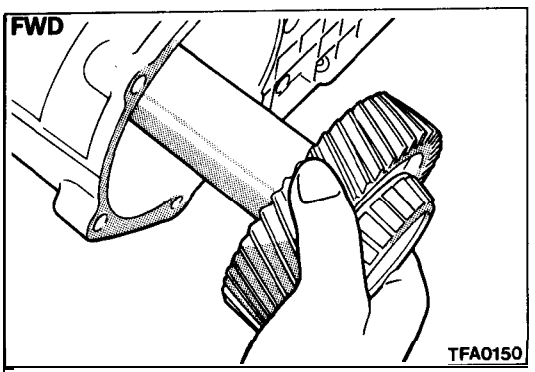

50. Remove the screw and then remove the rear bearing retainer.




51. Remove the snap ring and then remove the output flange assembly.

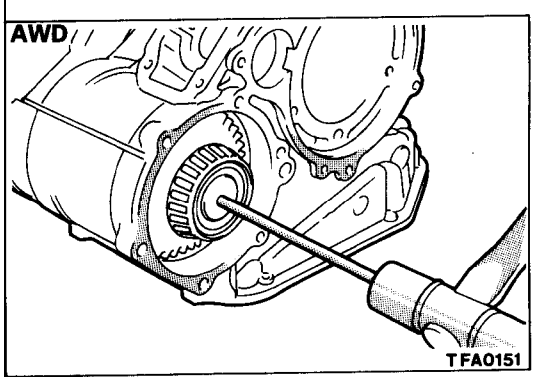

TFA0149

52. Remove the output bearing retainer mounting bolts and then remove the output bearing retainer and outer race.



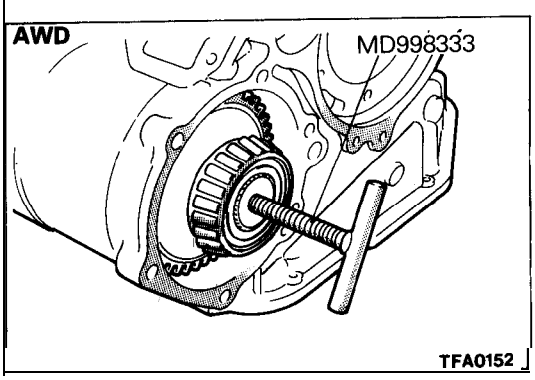
TFA0150

53. Remove the transfer shaft <FWD only>.



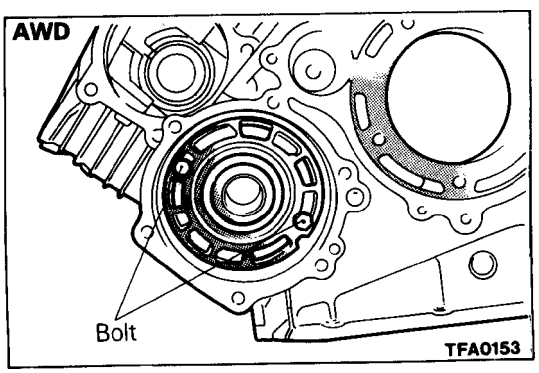
TFA0151

54. Insert a rod 8mm (.31 in.) in diameter and 200mm (7.87 in.) in length from the hole shown in the figure and punch out the rear output shaft <AWD only>.



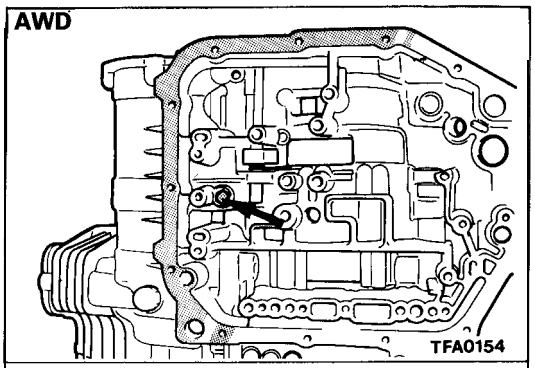
TFA0152

55. Using the special tool, remove the center differential <AWD only>.

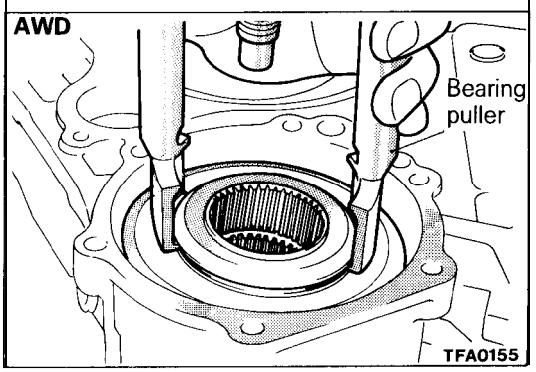


TFA0153

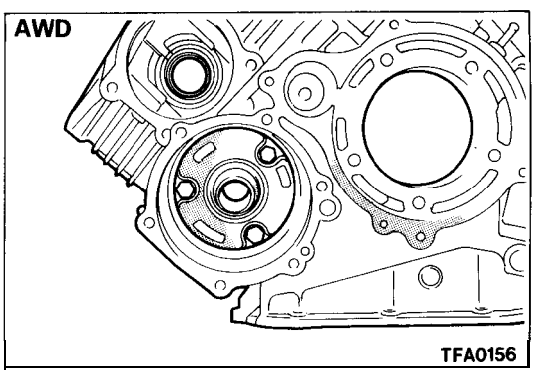
56. Put a bolt (M6) into the center bearing retainer and, holding that bolt, remove the center bearing retainer and outer race <AWD only>.



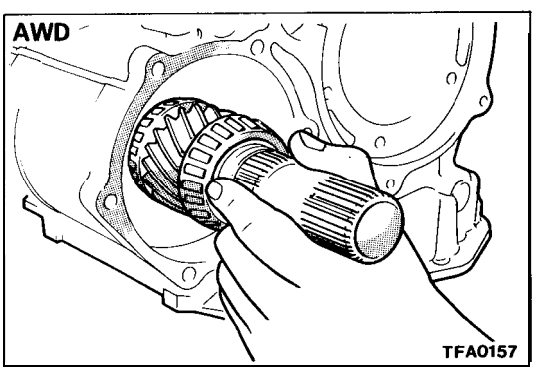

57. Remove the center bearing retainer stopper bolt <AWD only>.



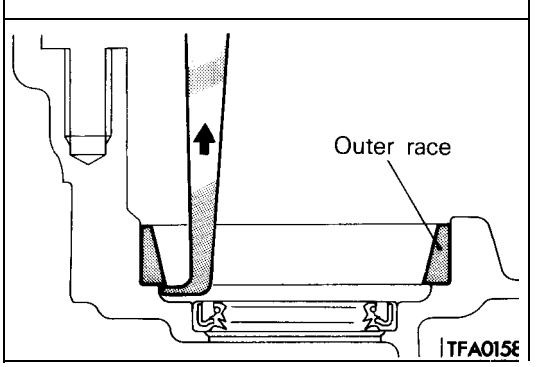

58. First remove the stopper ring and then put a bearing puller or similar tool in the viscous coupling groove and pull out the viscous coupling <AWD only>.




59. Remove the front bearing retainer mounting bolt (M10). Then, screw a bolt (Ml 2) into the threaded hole of the front bearing retainer and, holding that bolt, remove the front bearing retainer and outer race <AWD only>.




60. Remove the front output shaft <AWD only>.



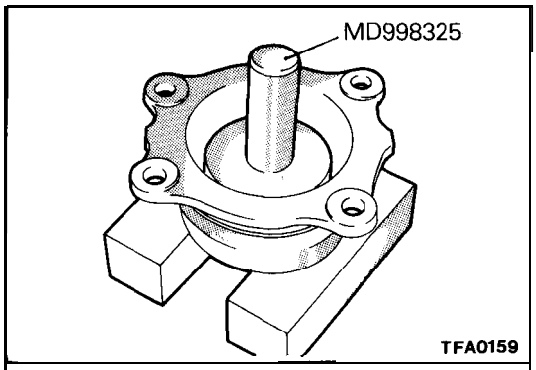

61. Using a sliding hammer or similar tool, remove the outer race.
62. Remove the oil seals.

## REASSEMBLY

N21LFAO

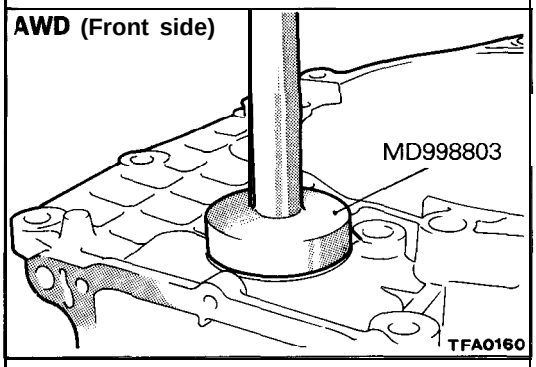
**Caution**

1. **Do not reuse the gasket, O-ring, oil seal, etc. When assembling, replace with new parts. (Note: The oil level gauge rubber need not be replaced.)**
2. **Do NOT use any grease except petrolatum.**
3. **First apply ATF to the friction elements, the rotating parts and sliding parts and then assemble. Soak new clutch disc and brake disc in ATF for over 2 hours before using.**
4. **Do not use a sealing agent or adhesive agent on the gaskets.**
5. **When replacing the bushing, replace the assembly that includes the bushing.**
6. **Do not use cotton gloves or rags (cloth) when assembling. If required, use nylon cloth or paper towels.**
7. **Also replace the oil in the cooler.**



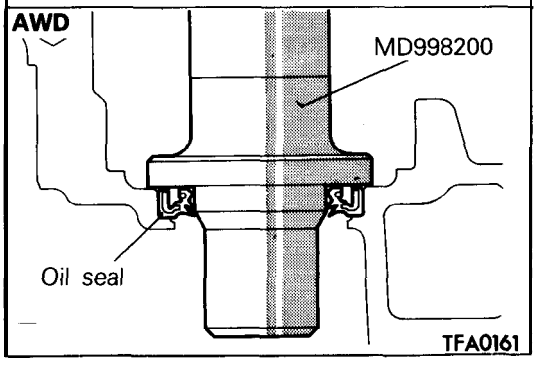

1. Using the special tool, press-fit the drive shaft oil seal.

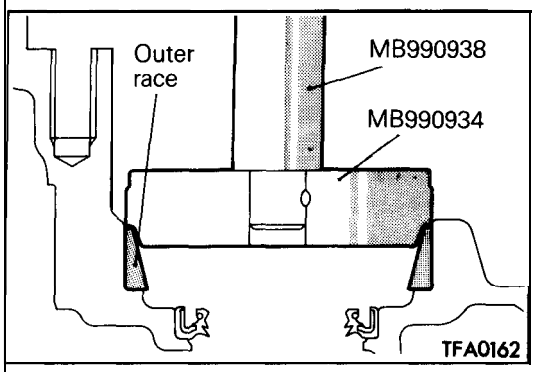
| | | Special tools |
|---|---|---|
| FWD | Front | MD998325 |
| | Rear | MD998325 |
| AWD | Front | MD998803 |
| | Rear | MD998325 |



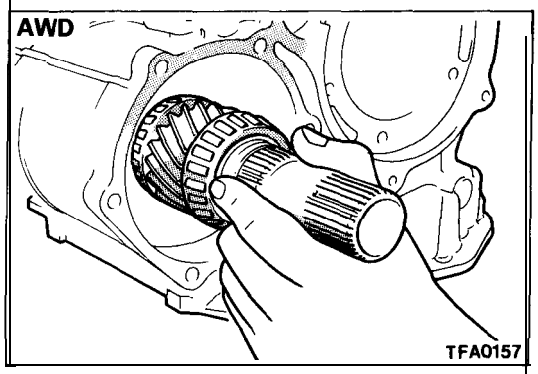

**Caution**

**Align with the case positioning boss and assemble so the oil seal flange pieces are on top when put in the car.**

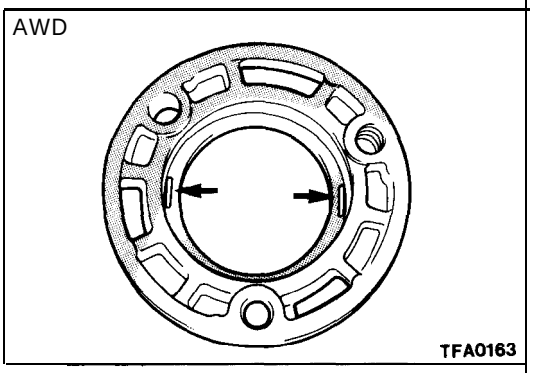




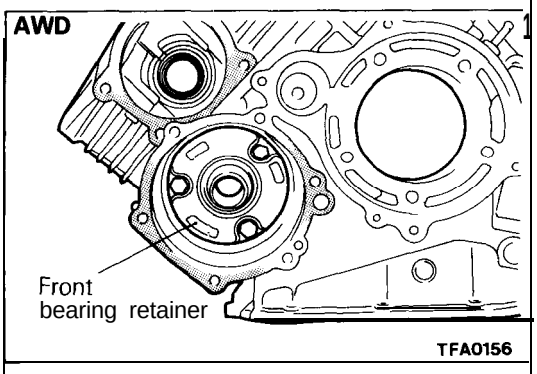

3. Using the special tool, press-fit the outer race in the transaxle case.




4. Install the front output shaft assembly <AWD only>.




5. Position the solder approx. 10 mm (.40 in.) long by 1.6 mm (.06 in.) in diameter in the front bearing retainer in the position shown in the figure and then install the outer race <AWD only>.




6. Install the front bearing retainer and tighten the bolt with the specified torque <AWD only>.

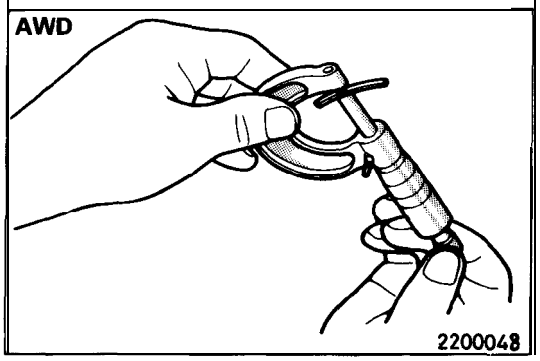
**Front bearing retainer mounting bolts:**
**43-55 Nm (32-39 ft.lbs.)**

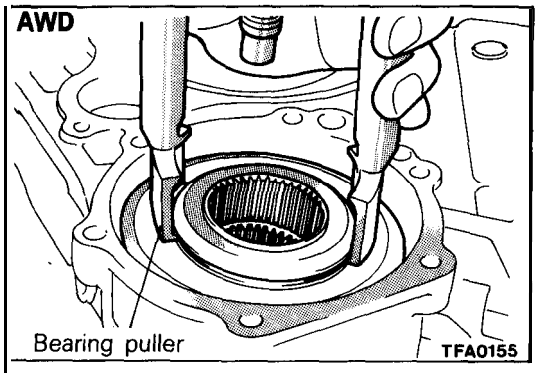
7. Loosen the bolts and remove the front bearing retainer <AWD only>.
8. Remove the outer race from the front bearing retainer and remove the solder. If the solder does not break, perform the work in steps 5–8 with large diameter solder. Measure the thickness of the crushed solder with a micrometer and select a spacer with the correct thickness so the pre-load reaches the standard value <AWD only>.

**Standard value: 0.055–0.115 mm (.002–.005 in.)**

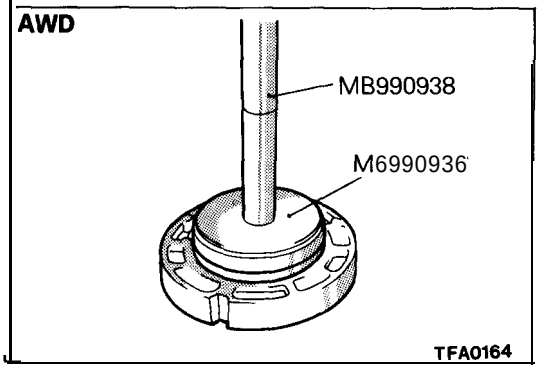
9. Install the spacer selected in the previous step and the outer race in the front bearing retainer <AWD only>.
10. First install the front bearing retainer and apply sealant to the bolts and then tighten with the specified torque <AWD only>.

**Specified sealant: 3M Stud Locking Part No.4170 or equivalent**
**Front bearing retainer mounting bolts:**
**43-55 Nm (32-39 ft.lbs.)**

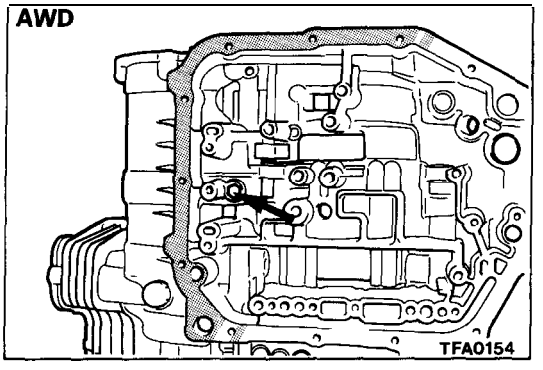





11. Using a bearing puller, support the viscous coupling and insert in the case. Then, install the stopper ring <AWD only>.

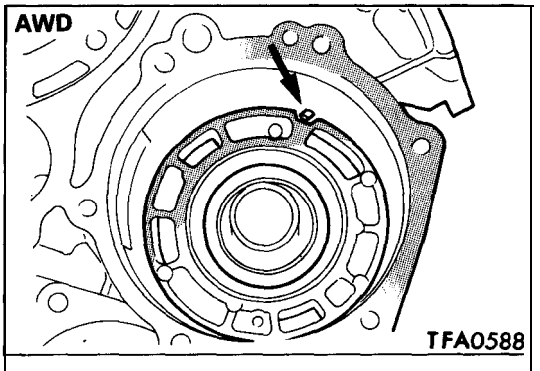



12. Using the special tool, install the outer race in the center bearing retainer. <AWD only>.

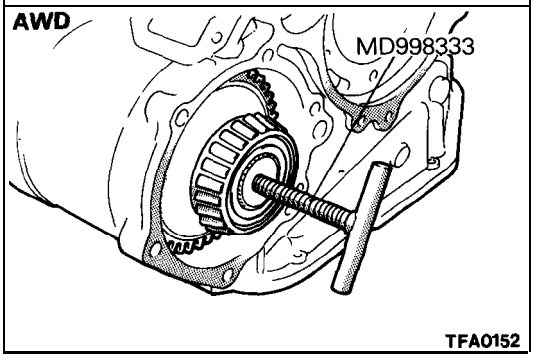



13. Install the center bearing retainer stopper bolt <AWD only>.

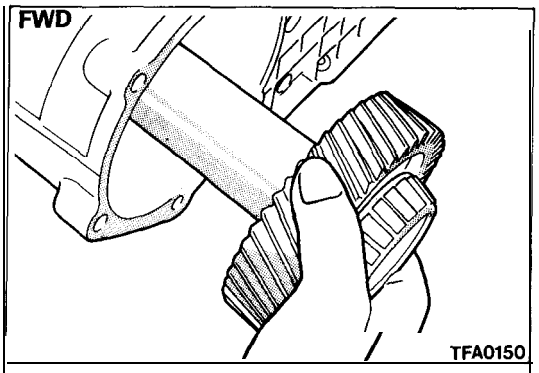
**Center bearing retainer stopper bolt:**
**4-6 Nm (3-4 ft.lbs.)**



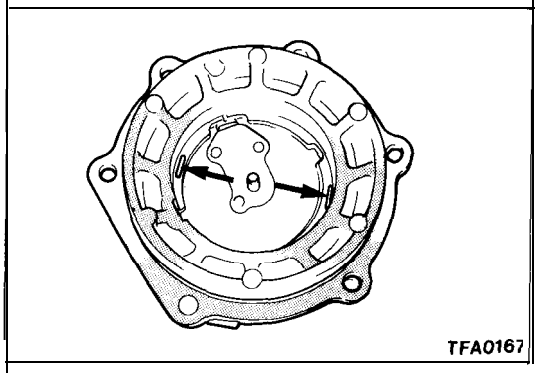

14. Install the center bearing retainer so the projection of the stopper bolt fits in the groove of the center bearing retainer <AWD only>.



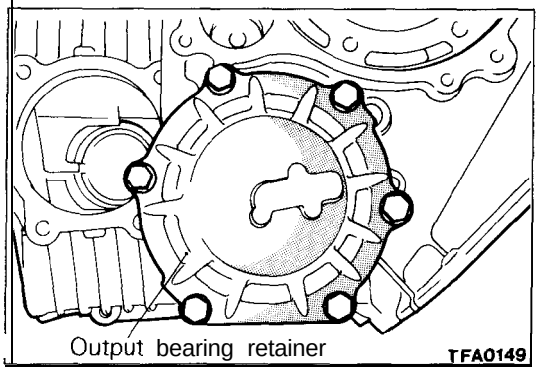

15. Install the special tool in the center differential and install the center differential in the transaxle case <AWD only>.




16. Install the transfer shaft <FWD only>.



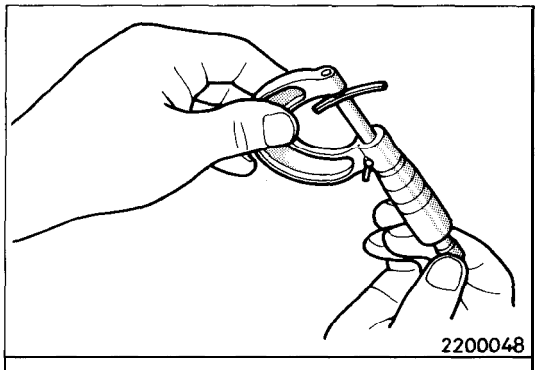

17. Position solder approx. 10 mm. (.40 in,) in length and 1.6 mm (.06 in.) in diameter in the output bearing retainer as shown in the figure and then install the outer race.




18. Install the output bearing retainer and tighten the bolts with the specified torque.

**Output bearing retainer mounting bolts:**
**20–27 Nm (15-19 ft.lbs.)**

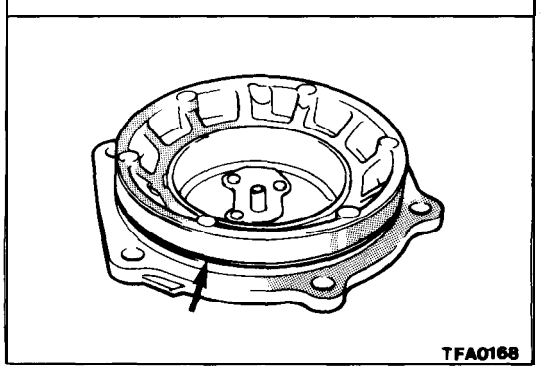
19. Loosen the bolts and remove the output bearing retainer.




20. Remove the outer race from the output bearing retainer and remove the solder. If the solder does not break, perform the work in steps 17–20 with large diameter solder. Measure the thickness of the crushed solder with a micrometer and select a spacer with the correct thickness so that the pre-load reaches the standard value.

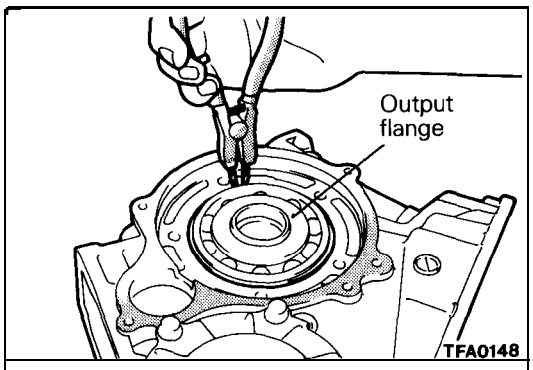
**Standard value: 0.075–0.135 mm (.0030–.0053 in.)**

21. Install the spacer and the outer race selected in the previous step in the output bearing retainer.

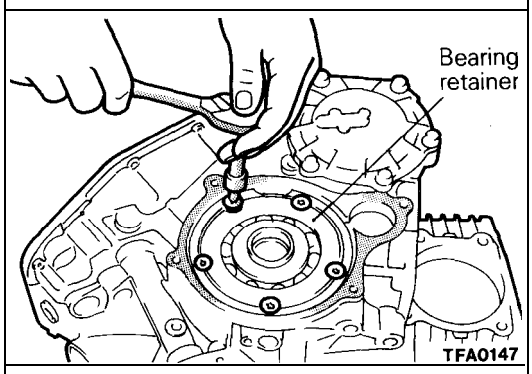



22. Install a new O-ring in the outer circumference of the output bearing retainer.
23. Apply ATF to the O-ring, install the output bearing retainer and tighten the bolts with the specified torque.

**Output bearing retainer mounting bolts:**
**20–27 Nm (15-19 ft.lbs.)**

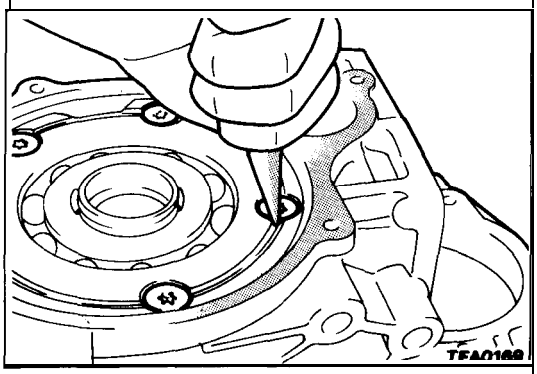



24. Insert the output flange in the case and install the snap ring on the outside circumference of the bearing.

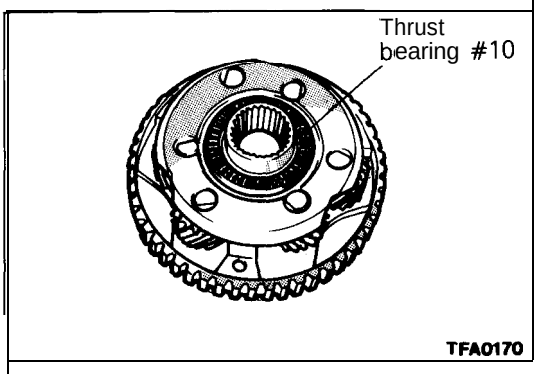



25. Use new bolts when installing the bearing retainer.

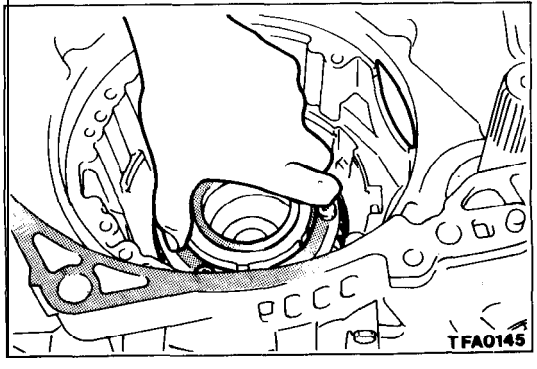
**Bearing retainer mounting bolts:**
**17-22 Nm (13-14 ft.lbs.)**



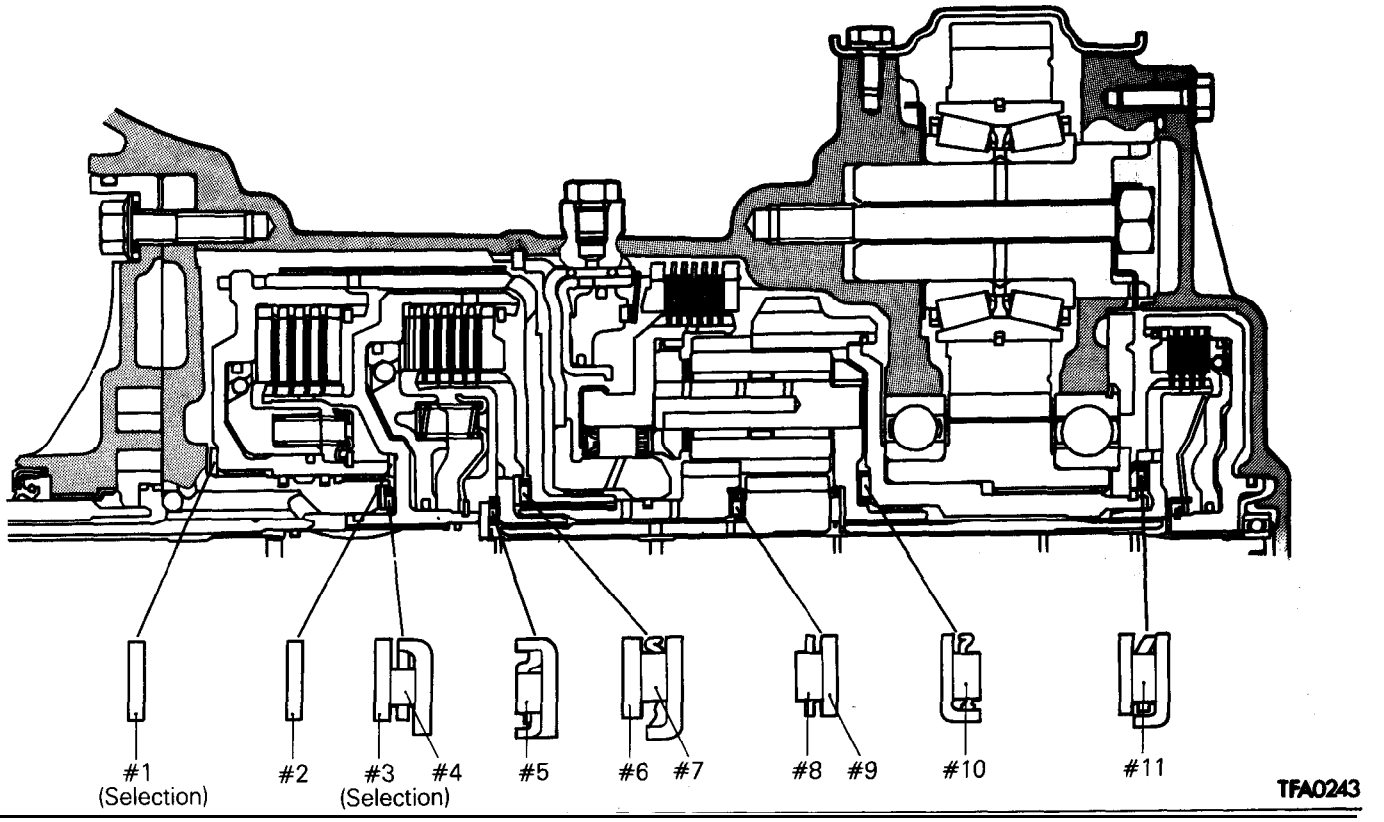
26. Caulk the bolt heads.




27. Apply petrolatum to thrust bearing #10 and stick in the planetary carrier.




28. Install the planetary carrier.

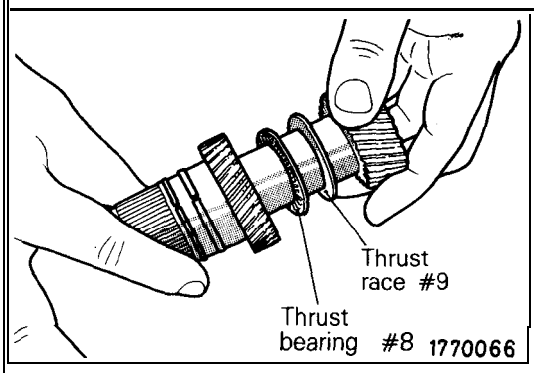



**Identification of thrust bearings, thrust races and washers**

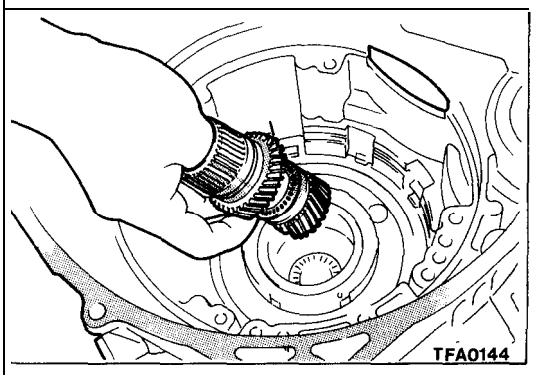
Unit: mm (in.)

| Outer diameter | Inner diameter | Thickness | Part No. | Code No. |
|---|---|---|---|---|
| 70 (2.76) | 55.7 (2.193) | 1.4 (.055) | *1 | #1 |
| 70 (2.76) | 55.7 (2.193) | 1.8 (.071) | *2 | |
| 70 (2.76) | 55.7 (2.193) | 2.2 (.087) | *3 | |
| 70 (2.76) | 55.7 (2.193) | 2.6 (.102) | *4 | |
| 66 (2.60) | 54 (23) | 1.8 (.071) | MD731 2 1 2 | #2 |
| 48.9 (1.925) | 37 (1.46) | 1.0 (.039) | MD997854 (incl. *1) | #3 |
| 48.9 (1.925) | 37 (1.46) | 1.2 (.047) | MD997847 (incl. *1) | |
| 48.9 (1.925) | 37 (1.46) | 1.4 (.055) | MD997848 (incl. *2) | |
| 48.9 (1.925) | 37 (1.46) | 1.6 (.063) | MD997849 (incl. *2) | |
| 48.9 (1.925) | 37 (1.46) | 1.8 (.071) | MD997850 (incl. *3) | |
| 48.9 (1.925) | 37 (1.46) | 2.0 (.079) | MD997851 (incl. *3) | |
| 48.9 (1.925) | 37 (1.46) | 2.2 (.087) | MD997852 (incl. *4) | |
| 48.9 (1.925) | 37 (1.46) | 2.4 (.094) | MD997853 (incl. *4) | |

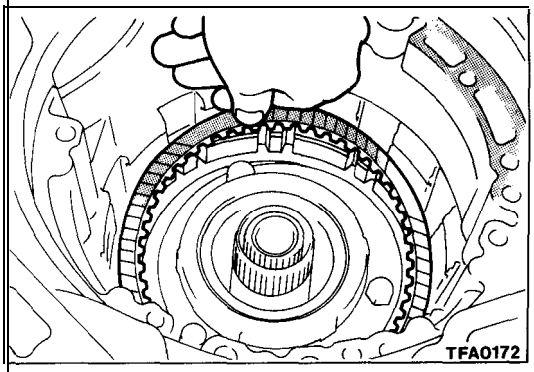
| Outer diameter | Inner diameter | Thickness | Part No. | Code No. |
|---|---|---|---|---|
| 48.1 (1.906) | 34.4 (1.354) | – | MD707271 | #4 |
| 42.6 (1.677) | 28 (1.10) | – | MD720753 | #5 |
| 54 (2.13) | 38.7 (1.524) | 1.6 (.063) | MD704936 | #6 |
| 52 (2.05) | 36.4 (1 .433) | – | MD72001 0 | #7 |
| 45 (1.77) | 28 (1.10) | – | MD735062 | #8 |
| 46 (1.81) | 31 (1.22) | 0 . 8 (.031) | MD735063 | #9 |
| 52 (2.05) | 36.4 (1.433) | – | MD720010 | #10 |
| 58 (2.29) | 44 (1.73) | – | MD724206 | #1 1 |




29. Assemble the forward sun gear, thrust race #9, thrust bearing #8 and reverse sun gear.

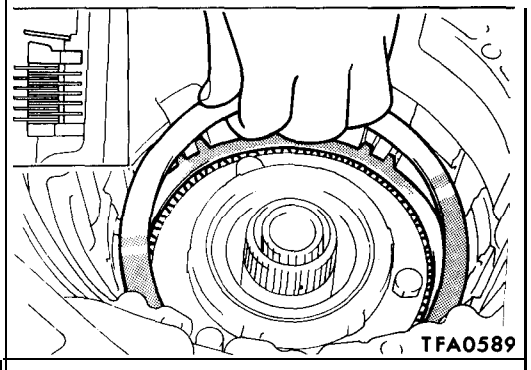



30. Install the two sun gears assembled in the previous step in the planetary carrier.



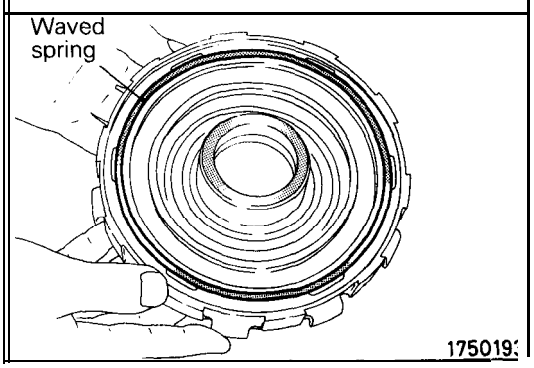

31. Install the reaction plate, brake disc and brake plate.

**Caution**
**When using a new brake disc, first soak it for over 2 hours in ATF.**

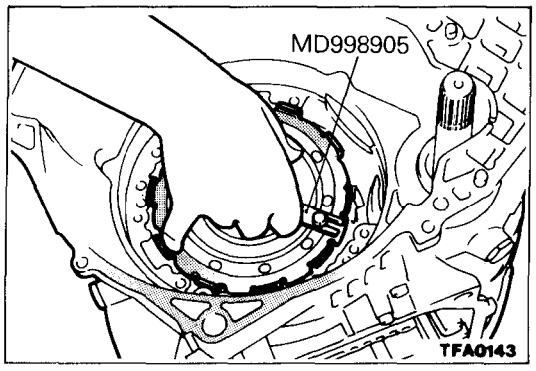



32. Install the pressure plate used during disassembly and then install the return spring.

**Caution**
**Be sure to install the return spring in the correct direction.**

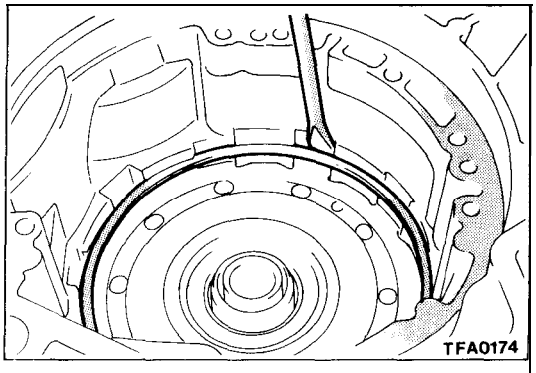



33. Apply a coating of petrolatum to the waved spring and attach it to the center support.

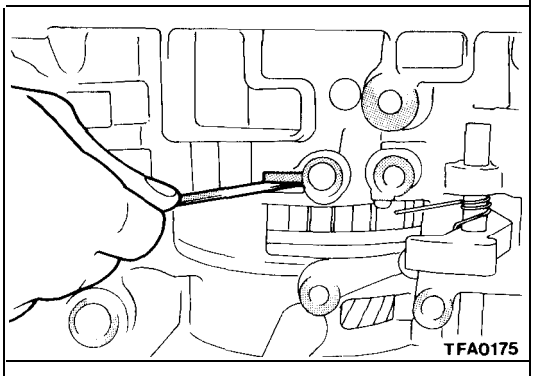



34. Install the special tool on the center support, install new O-rings (2 locations) pressing them into the transaxle case.

**Caution**
**1. Apply ATF to the O-ring and align the oil hole.**
**2. Install so the waved spring is aligned.**

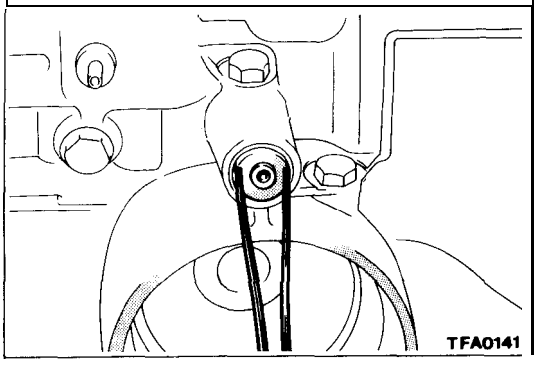



35. Install the snap ring.



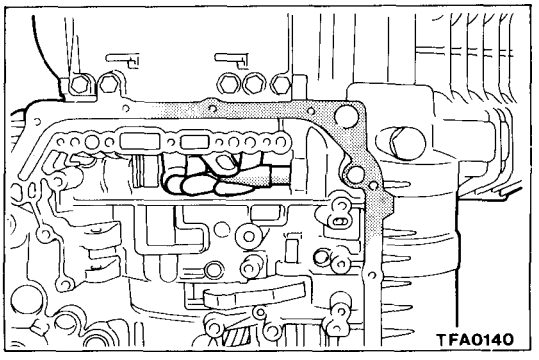

36. Measure the end play of the low reverse brake with a thickness gauge and select and adjust the pressure plate so it is within the standard value.

**Standard value: 1.0– 1.2 mm (.039–.047 in.)**

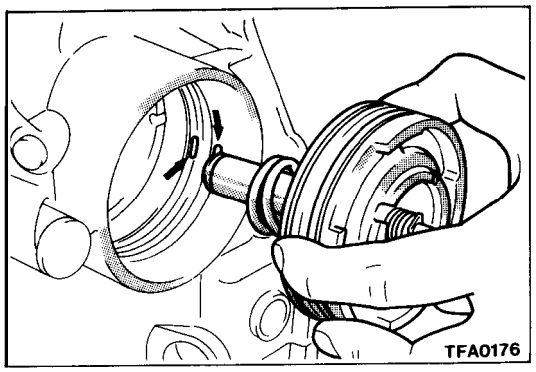



37. Install the air exhaust plug and then install the plug.

**Air exhaust plug: 30–35 Nm (22-25 ft.lbs.)**

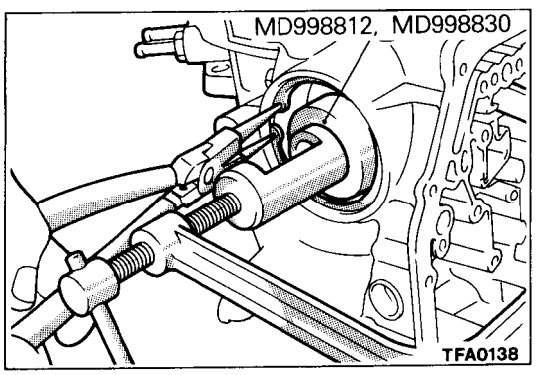



38. Install the anchor rod.

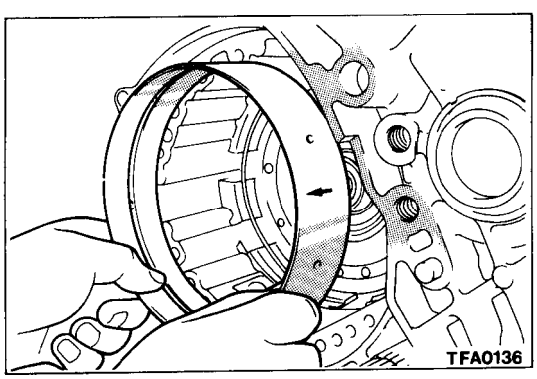



39. Install the kickdown servo spring, piston and sleeve.

**Caution**
**The kickdown servo piston seal ring end should not coincide with the oil supply ports (arrows in figure on left).**

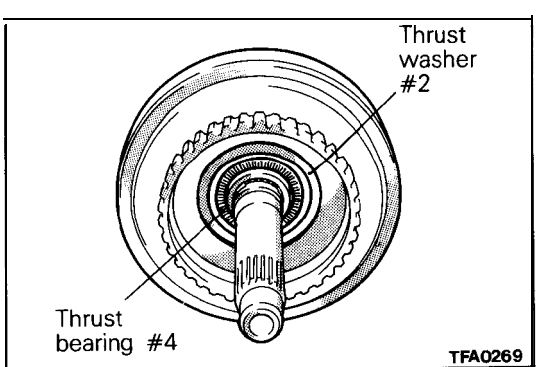



40. Using the special tool, press in the kickdown servo piston and sleeve and install the snap ring.

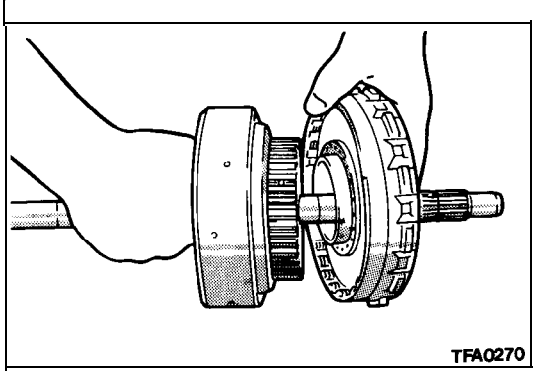



41. Install the kickdown band.

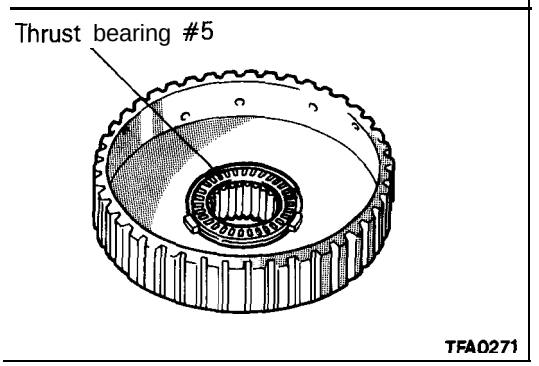
**Caution**
**Install so the direction indicated by the arrow is to the front.**



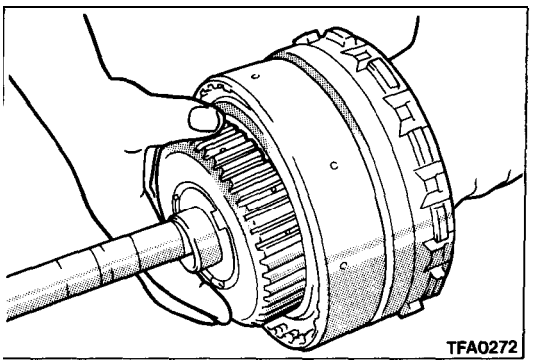

42. Install thrust bearing #4 and thrust washer #2 in the rear clutch.



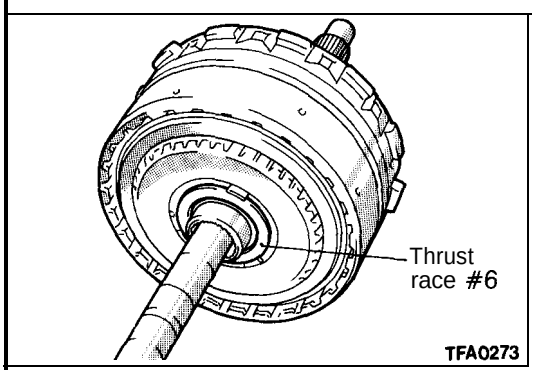

43. Assemble the rear clutch and front clutch.



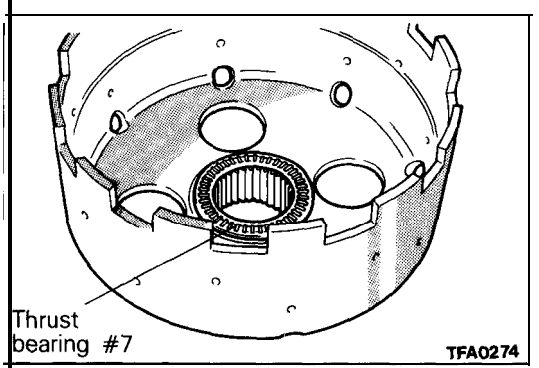

44. Install thrust bearing #5 in the rear clutch hub.



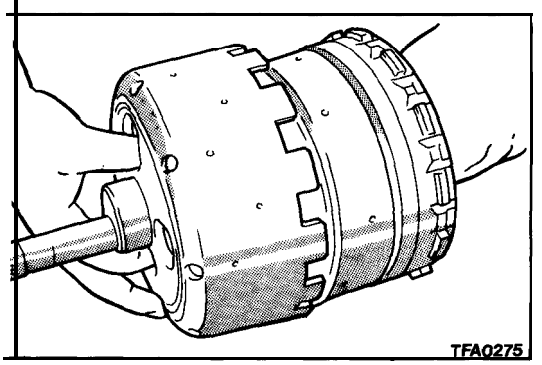

45. Install the rear clutch hub in the rear clutch.



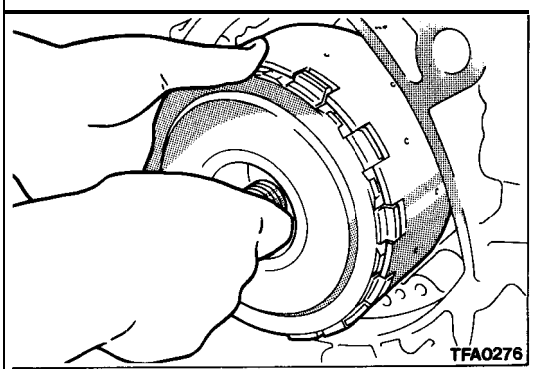

46. Install thrust race #6 on the end of the rear clutch hub.



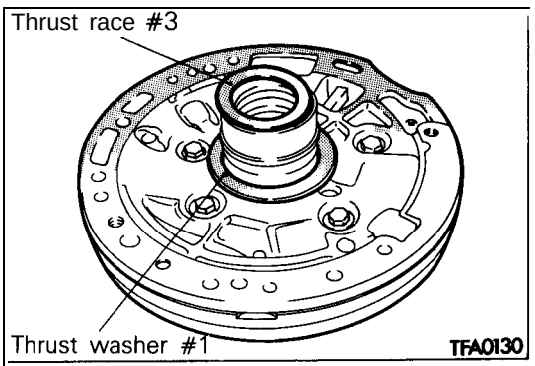

47. Install thrust bearing #7 in the kickdown drum.



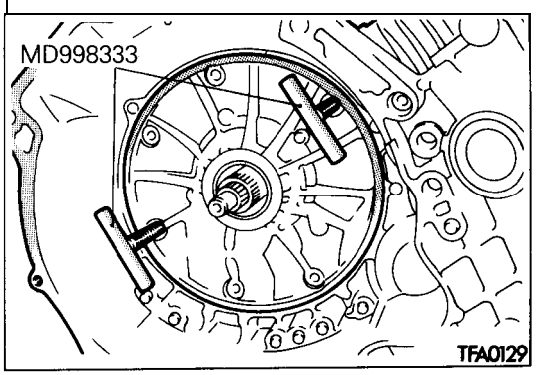

48. Assemble the clutch assembly and kickdown drum.




49. Install the clutch assembly and kickdown drum at the same time in the transaxle case.

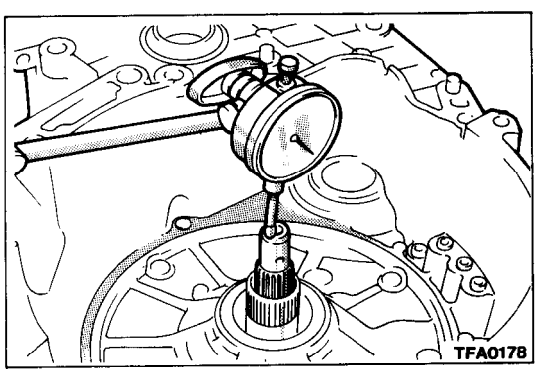



50. Stick thrust race #3 and thrust washer #1 to the rear end of the oil pump with petrolatum.



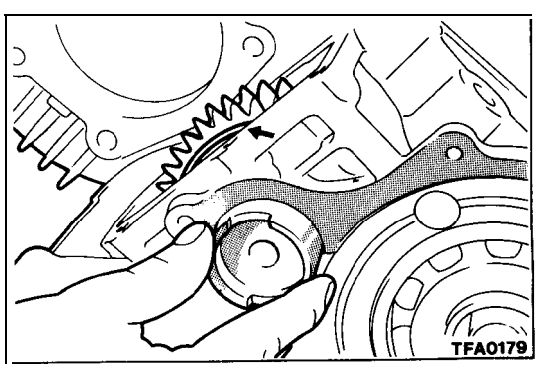

51. Using the special tool, install a new oil pump gasket and oil pump assembly.

**Oil pump assembly mounting bolts:**
**19-23 Nm (14-16 ft.lbs.)**



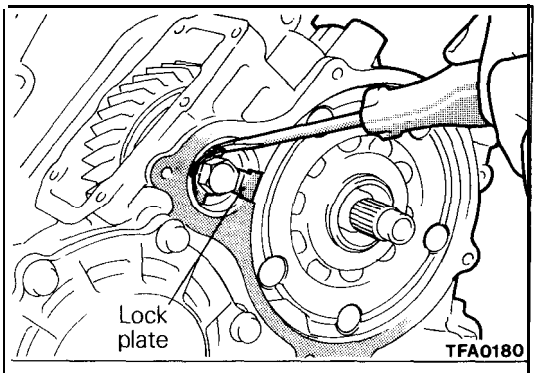

52. Measure the input shaft end play and, if it is outside the standard value, replace thrust race #3 and thrust washer #1 and adjust so it reaches the standard value.

**Standard value: 0.3–1.0 mm (.012–.039 in.)**

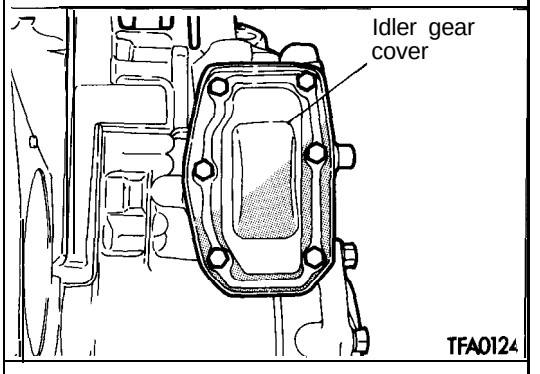



53. Install the spacer, idler gear and bearing and then insert the idler shaft.

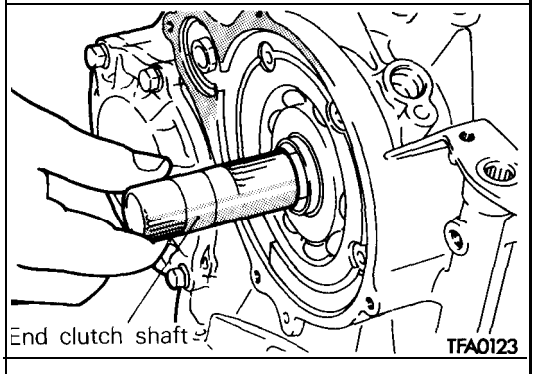
**Caution**
**Install so the identification groove on the end of the idler gear is toward the back side.**



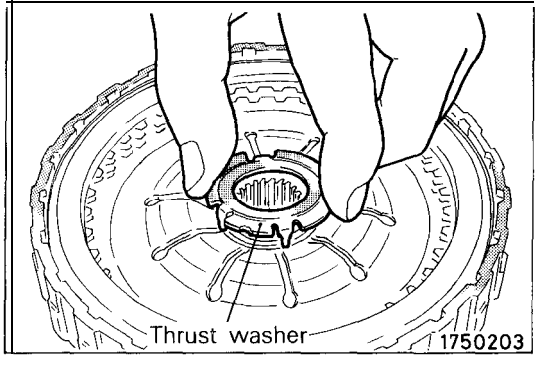

54. Tighten the idler shaft lock bolt to the specified torque and use a new lock plate so it doesn't turn.
**Idler shaft lock bolt: 31–44 Nm (23–31 ft.lbs.)**



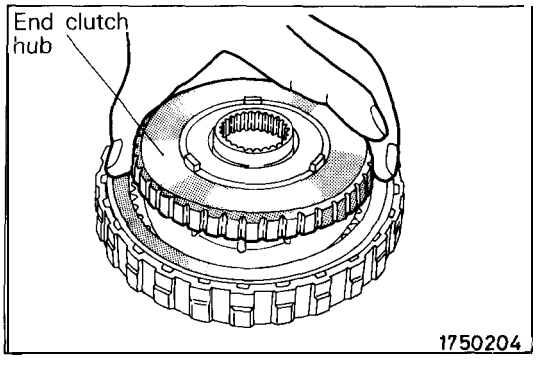

55. Install the idler gear cover and a new gasket.
**Idler gear cover mounting bolts:**
**10–12 Nm (7.5-6.5 ft.lbs.)**



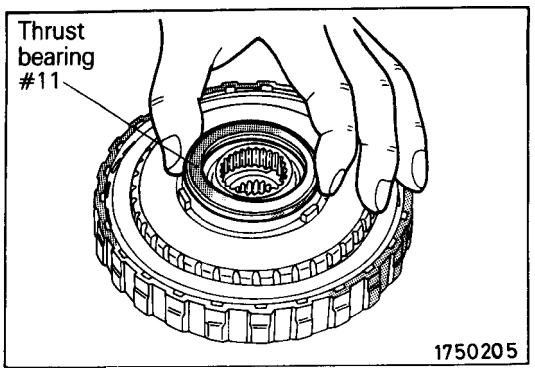

56. Insert the end clutch shaft from the long direction of the spline.



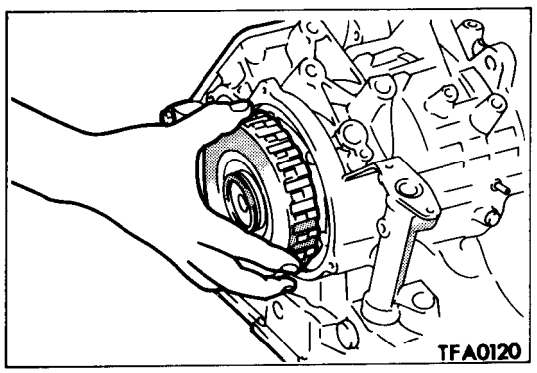

57. Insert the thrust washer in the end clutch return spring.



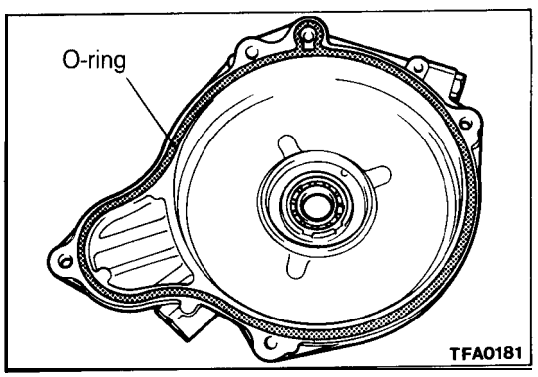

58. Install the end clutch hub in the end clutch assembly.



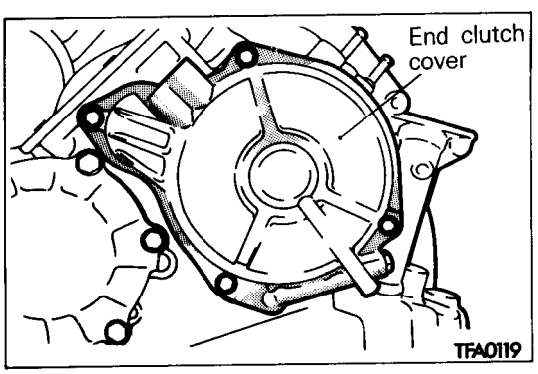

59. Stick thrust bearing #1 1 to the end clutch hub with petrolatum.




60. Install the end clutch assembly.

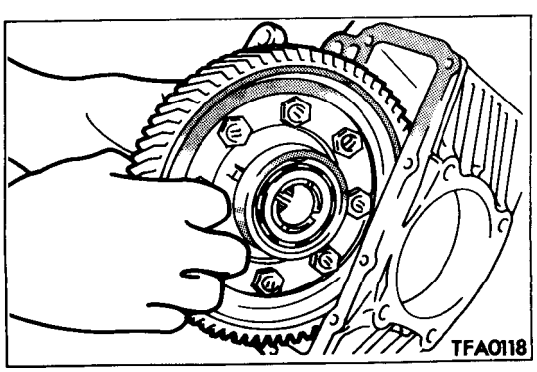



61. Install a new O-ring in the end clutch cover.

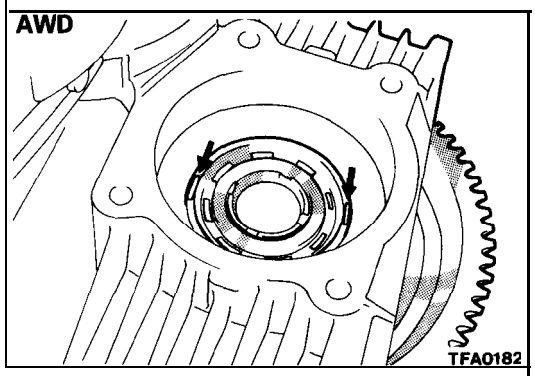



62. Install the end clutch cover and tighten the bolts with the specified torque.

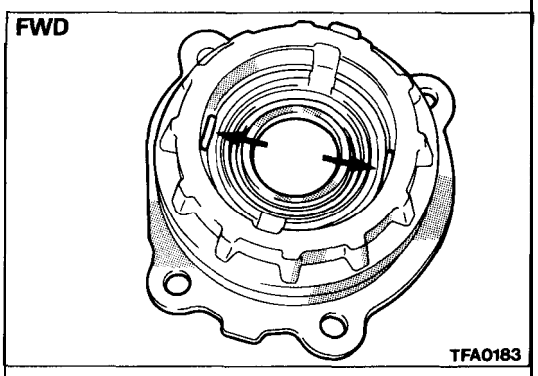
**End clutch cover mounting bolts:**
**10–12 Nm (7.5-6.5 ft.lbs.)**



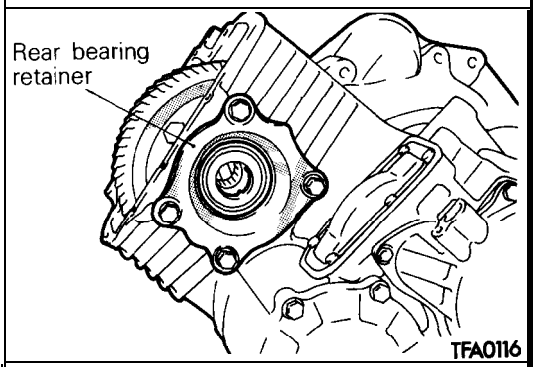

63. Install the differential assembly.




64. Position solder approximately 10 mm (.39 in.) in length and 1.6 mm (.06 in.) in diameter in the bearing outer race in the position shown in the figure <AWD only>.



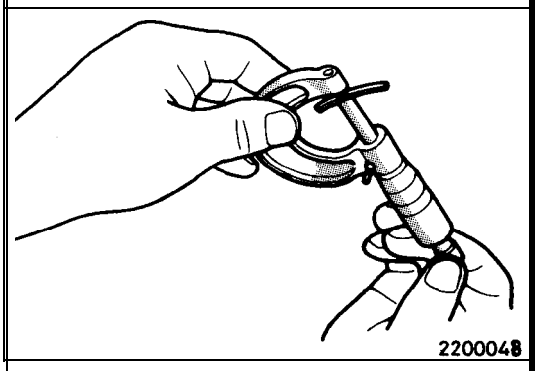

65. Position solder approximately 10 mm (.39 in.) in length and 1.6 mm (.06 in.) in diameter in the differential rear bearing retainer in the position shown in the figure and then install the outer race <FWD only>.




66. Install the differential rear bearing retainer and tighten the bolts with the specified torque.

**Differential rear bearing retainer mounting bolts: 30–40 Nm (22-28 ft.lbs.)**

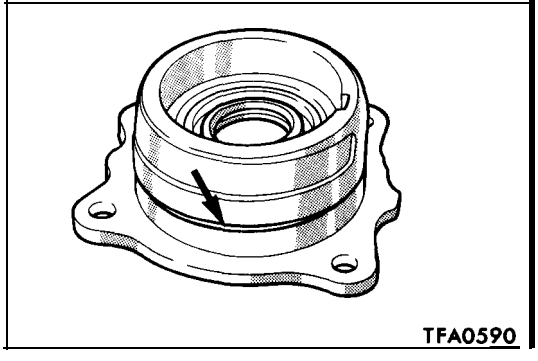
67. Loosen the bolts, remove the differential rear bearing retainer and then remove the solder. If the solder does not crush, perform the work in steps 64-68 with large diameter solder.




68. Measure the thickness of the crushed solder with a micrometer and then select and install a spacer so the end play and pre-load reach the standard value.

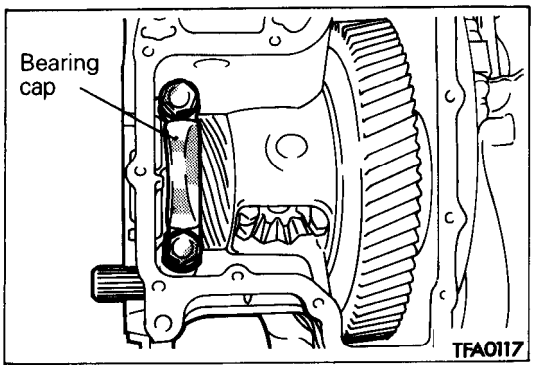
**Standard value**

**Front differential case end play:**
**0.045–0.165 mm (.0017–.0064 in.) <AWD only>**
**Front differential case preload:**
**0.075–0.135 mm (.0030–.0053 in.) <FWD only>**



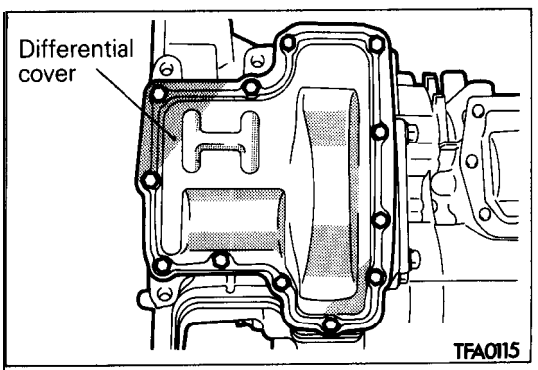

69. Install a new O-ring in the differential rear bearing retainer, apply ATF and then install in the transaxle case. Tighten the bolts with the specified torque.

**Differential rear bearing retainer mounting bolts: 30–40 Nm (22-28 ft.lbs.)**



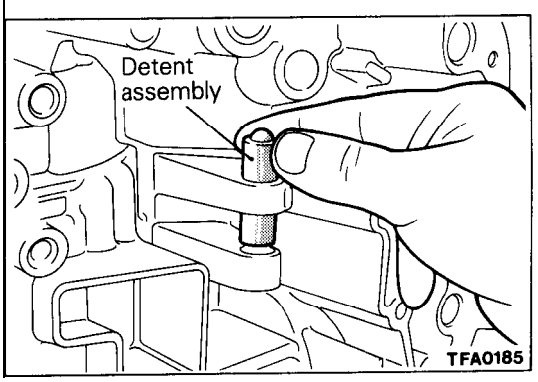

70. Install the front bearing cap and tighten the bolts with the specified torque.

**Differential front bearing cap mounting bolts:**
**60–80 Nm (44–57 ft.lbs.)**

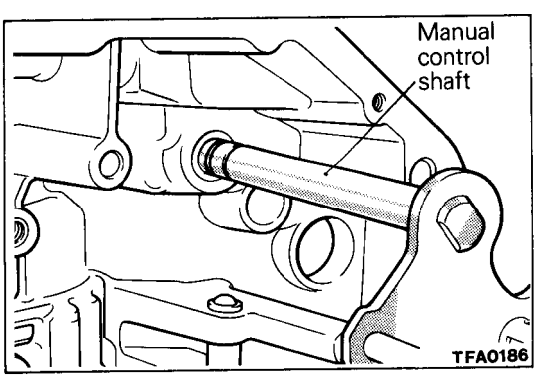



71. Install the differential cover and a new gasket.

**Differential cover mounting bolts:**
**10–12 Nm (7.5-8.5 ft.lbs.)**

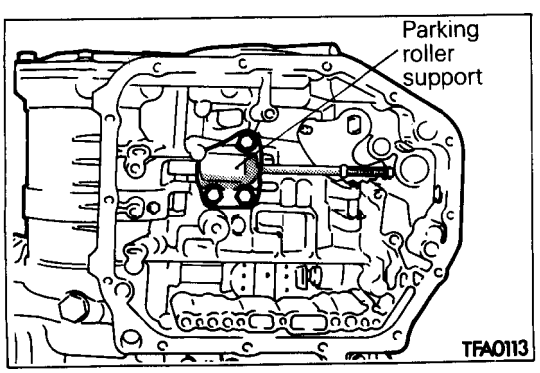



72. Install the detent assembly.



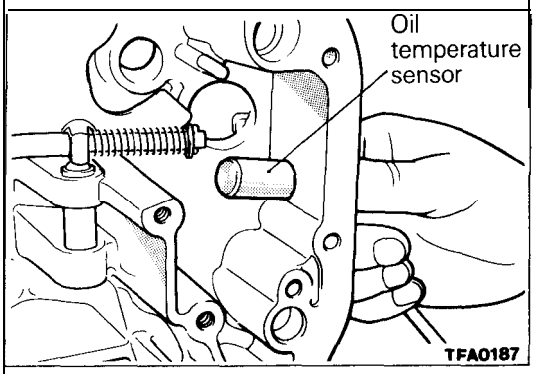

73. First install a new O-ring in the manual control shaft assembly and apply ATF. Then insert it in the transmission case.
74. Align the manual control shaft groove and set screw hole and install the set screw.

**Manual control shaft set screw:**
**8–10 Nm (6-7 ft.lbs.)**

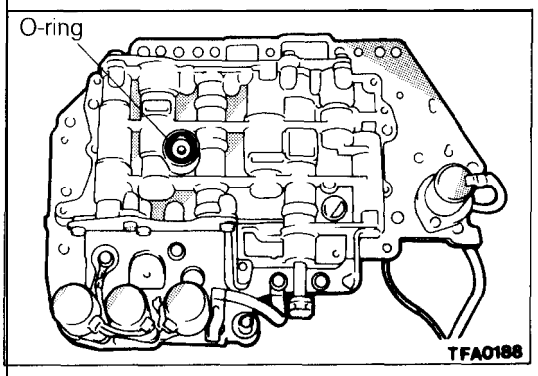



75. Install the parking roller support.

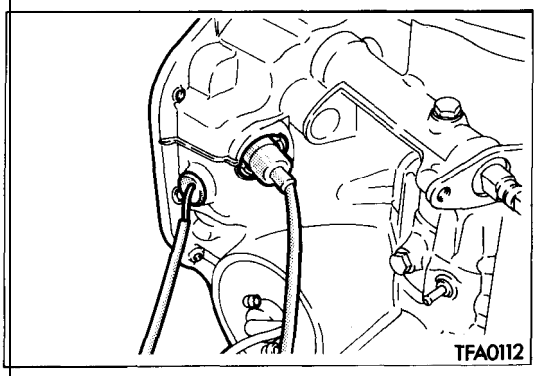
**Parking roller support mounting bolts:**
**20–27 Nm (15-19 ft.lbs.)**



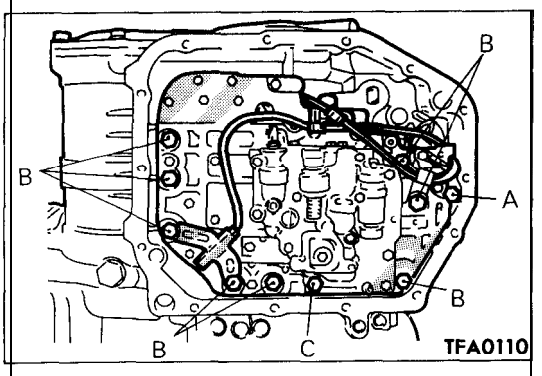

76. Put the oil temperature sensor in the case.




77. Install an O-ring in the O-ring groove on top of the valve body assembly.




78. Replace the solenoid valve harness grommet O-ring with a new O-ring.
79. Pass the solenoid valve connector through from the inside of the transaxle case hole.
80. Insert the solenoid valve harness grommet in the case hole.

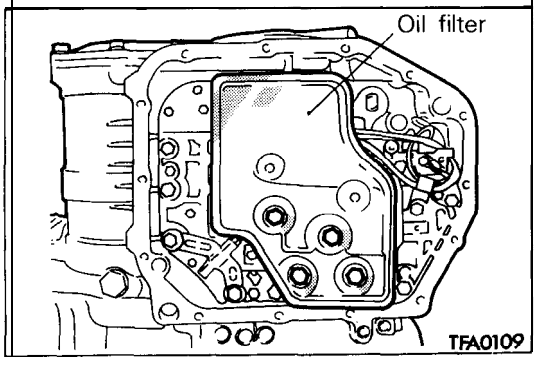



81. Temporarily install the valve body while inserting the detent plate pin in the manual valve groove. Then install the oil temperature sensor and holder and tighten the bolts with the specified torque.

    A bolt = 18 mm (.71 in.)
    B bolt = 25 mm (.98 in.)
    C bolt = 40 mm (1.57 in.)

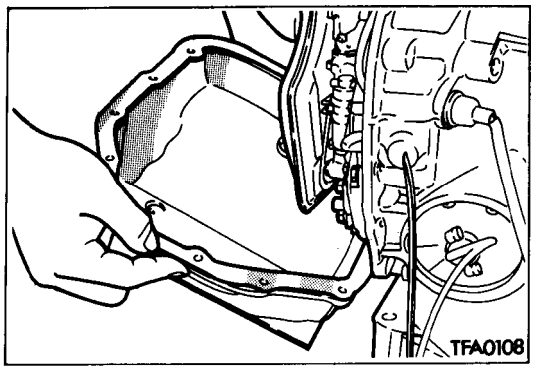
    **Valve body assembly mounting bolts:**
    **10–12 Nm (7.5-8.5 ft.lbs.)**

    **Caution**
    **Fix the solenoid valve and oil temperature sensor harness securely in the position shown.**

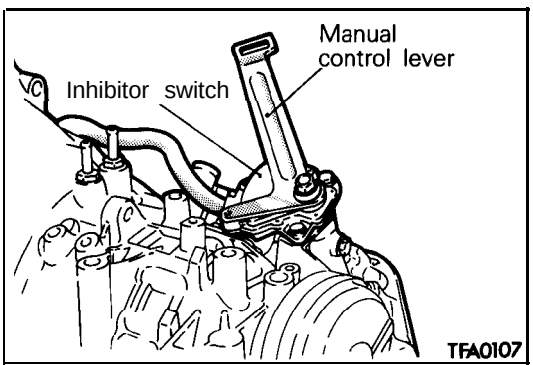



82. Install the oil filter.

    **Oil filter mounting bolts: 5-7 Nm (4-5 ft.lbs.)**

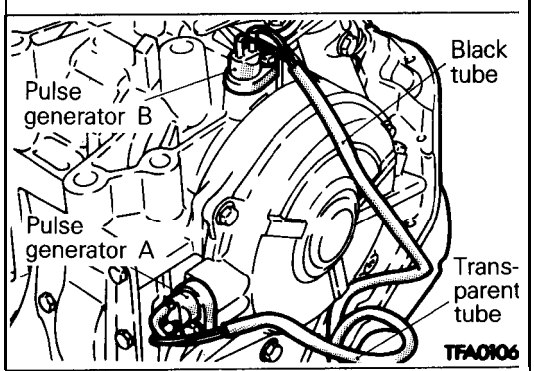



83. Install the magnet in the oil pan and then install the oil pan.
**Oil pan mounting bolts: 10–12 Nm (7.5-8.5 ft.lbs.)**




84. Install the inhibitor switch and manual control lever.
**Inhibitor switch mounting bolts:**
**10–12 Nm (7.5-8.5 ft.lbs.)**
**Manual control lever mounting bolts:**
**17-21 Nm (13-15 ft.lbs.)**

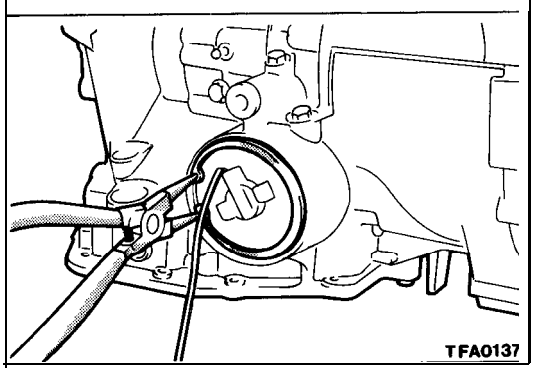
85. Install the speedometer gear assembly.
**Speedometer gear locking plate mounting bolts:**
4-6 **Nm (3-4 ft.lbs.)**
**Pulse generator mounting bolts:**
**10–12 Nm (7.5-8.5 ft.lbs.)**



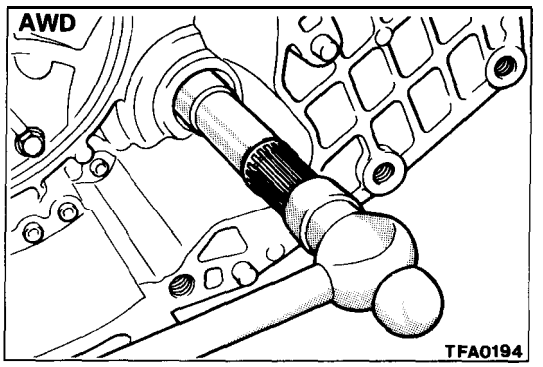

86. Install pulse generator A and B.
**Caution**
**Install pulse generator A (with transparent tube) to the end clutch side and pulse generator B (with black tube) to the output gear side.**

87. Install the oil filler tube and insert the level gauge.
**Oil filler tube mounting bolts:**
**20–27 Nm (15-19 ft.lbs.)**

88. Install the brackets.
**Transaxle mounting bracket bolts:**
**60–80 Nm (44–57 ft.lbs.)**

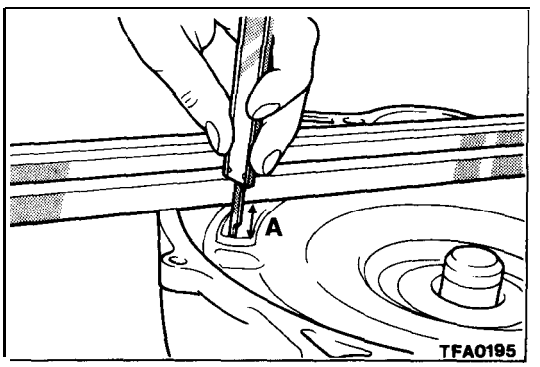



89. Adjust the kickdown servo.
90. Install the kickdown servo switch and fix the snap ring.




91. Insert the center shaft and hit it with a plastic hammer or similar instrument to install it securely <AWD only>.

NOTE
Apply ATF to the oil seal lip and do not scratch it.




92. Apply ATF to the oil pump drive hub, install the torque converter and push it in securely so dimension A shown in the figure reaches the standard value.

**Standard value: Approximately 16.3 mm (.642 in.)**

## CAUTIONS DURING COMPONENT DISASSEMBLY AND REASSEMBLY

### General cautions when cleaning

1. Clean each part, blow out oil passages and oil holes, etc. with air and check that nothing is clogged.
2. For cleaning fluid, use the designated ATF (automatic transmission fluid) or kerosene.
3. When drying parts with air, be careful not to get ATF or kerosene on your face.

### Cautions when handling parts

1. After washing the parts, arrange them in order so inspection, repairs and assembly can be performed properly.
2. When disassembling the valve body, store each valve, making a group of the various springs.
3. Soak the new brake and clutch discs used for replacement in ATF for more than 2 hours before assembly.

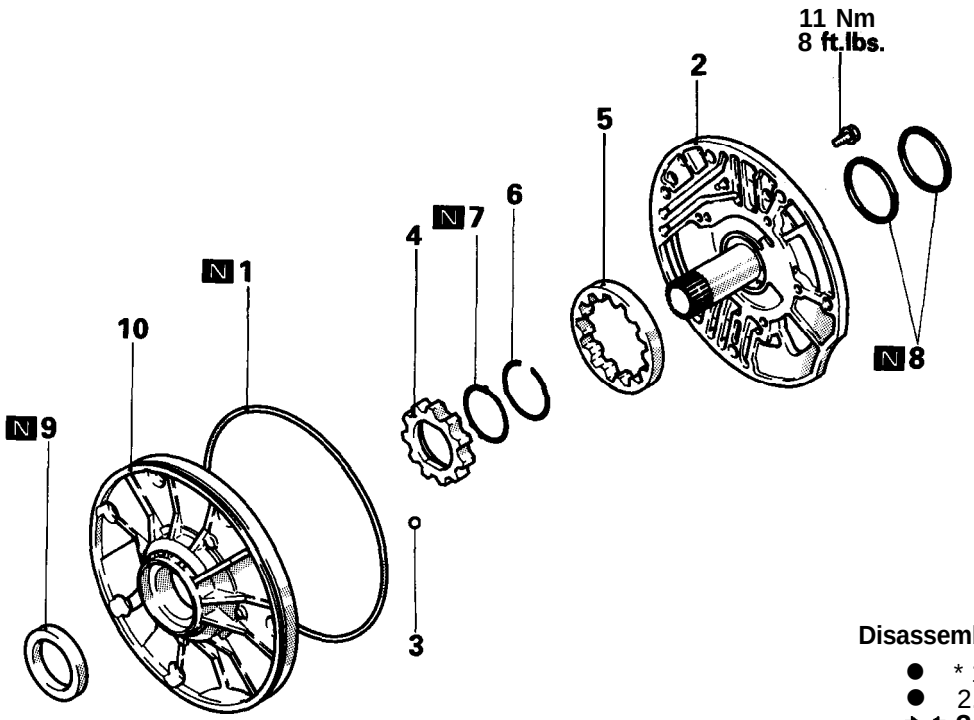
### General cautions during reassembly

1. Be sure to apply ATF to seal rings, clutch disc, clutch plate and rotating parts and sliding parts and then install.
2. Replace all gaskets and O-ring with new ones and do not reuse the old ones.
3. Use petrolatum to hold the parts in their specified places.

# OIL PUMP

N21LGAK

## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

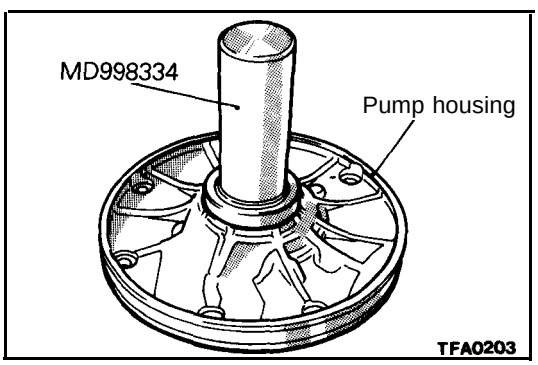
- * 1. O-ring
- 2. Reaction shaft support
- **3.** Steel ball
- 4. Drivegear
- 5. Driven gear
- 6. Snap ring (F4A22)
- **7.** Oil seal (F4A22)
- 8. Seal ring
- * 9. Oil seal
- 10. Oil pump housing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Pojnts of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly .
(4) N : Non-reusable parts

## SERVICE POINTS OF DISASSEMBLY

### 4. REMOVAL OF DRIVE GEAR/5. DRIVEN GEAR

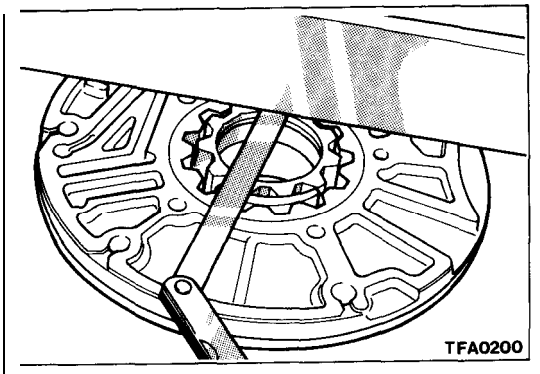
Make reassembly alignment marks on the drive and driven gears.




## SERVICE POINTS OF REASSEMBLY

### 9. INSTALLATION Of OIL SEAL

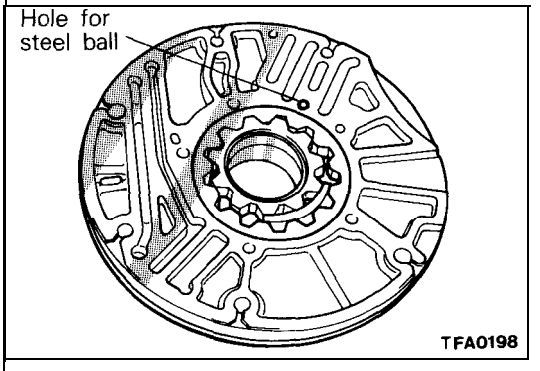
Using the special tool, install the oil seal in the pump housing.




**5. MEASUREMENT SIDE CLEARANCE OF DRIVEN GEAR/ 4. DRIVE GEAR**

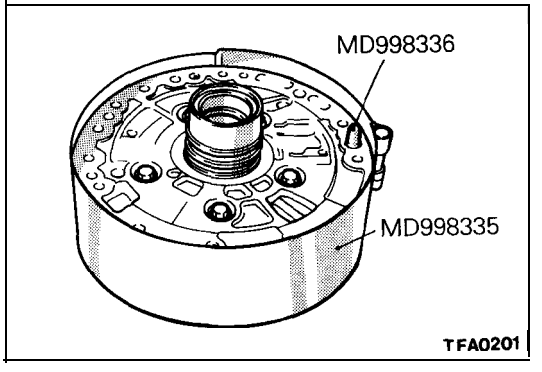
Measure the side clearance of the oil pump gear and replace the gear or oil pump assembly if it exceeds the standard value.

**Standard value: 0.03–0.05 mm (.001–.002 in.)**




**3. LOCATION OF STEEL BALL**

Install a steel ball in the position shown in the figure.




**2. INSTALLATION OF REACTION SHAFT SUPPORT**

(1) Assemble the reaction shaft support and pump housing and tighten the bolts by hand.
(2) Insert the special tool (guide pin MD998336) in the oil pump mounting bolt hole and tighten the outside circumference using the special tool (band MD998335) to position the support and housing.
(3) Tighten the five bolts to the specified torque.
(4) Make sure that the oil pump gear turns freely.

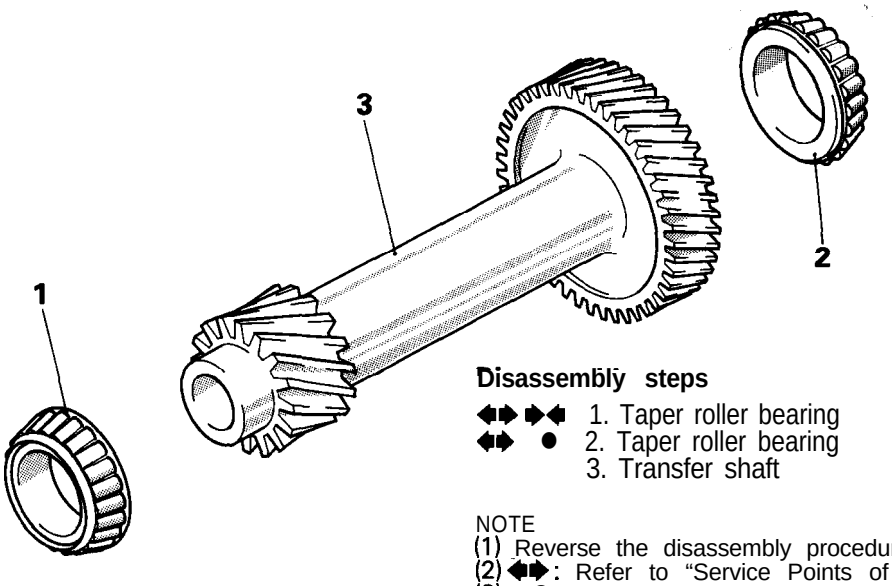
**1. INSTALLATION OF O-RING**

Install a new O-ring in the groove of the pump housing and apply petrolatum to the O-ring.

# TRANSFER SHAFT <F4A33>

N21LVAA

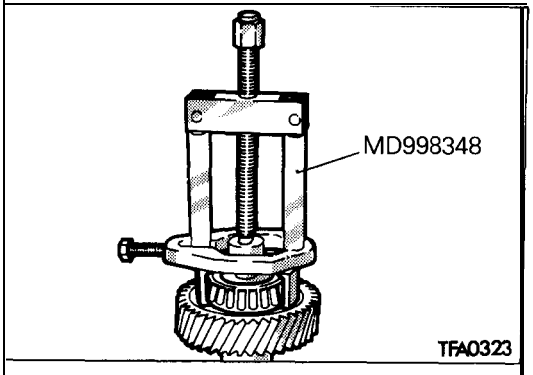
## DISASSEMBLY AND REASSEMBLY

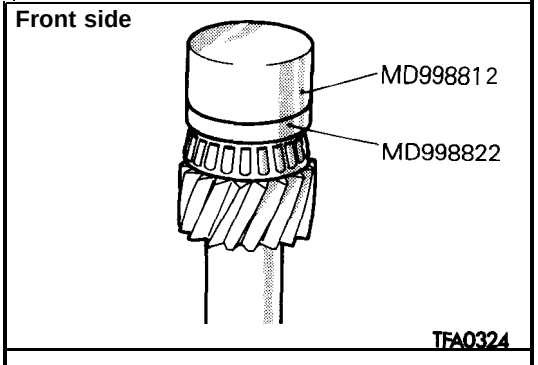


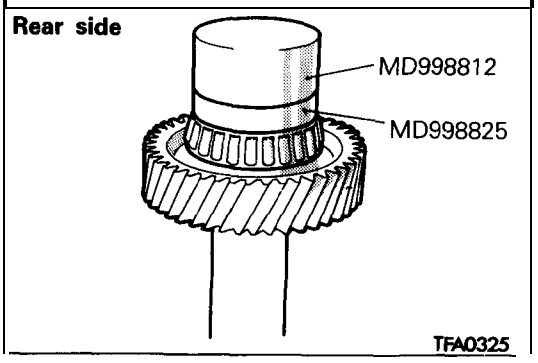

**Disassembly steps**

◆◆ ▶◀ 1. Taper roller bearing
◆◆ ● 2. Taper roller bearing
3. Transfer shaft

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".




## SERVICE POINTS OF DISASSEMBLY

### 1./2. REMOVAL OF TAPER ROLLER BEARINGS

Using the special tool, remove the bearings on both ends of the transfer shaft.

## SERVICE POINTS OF REASSEMBLY

### 1./2. INSTALLATION OF TAPER ROLLER BEARINGS

Using the special tool, install the bearings on the transfer shaft.

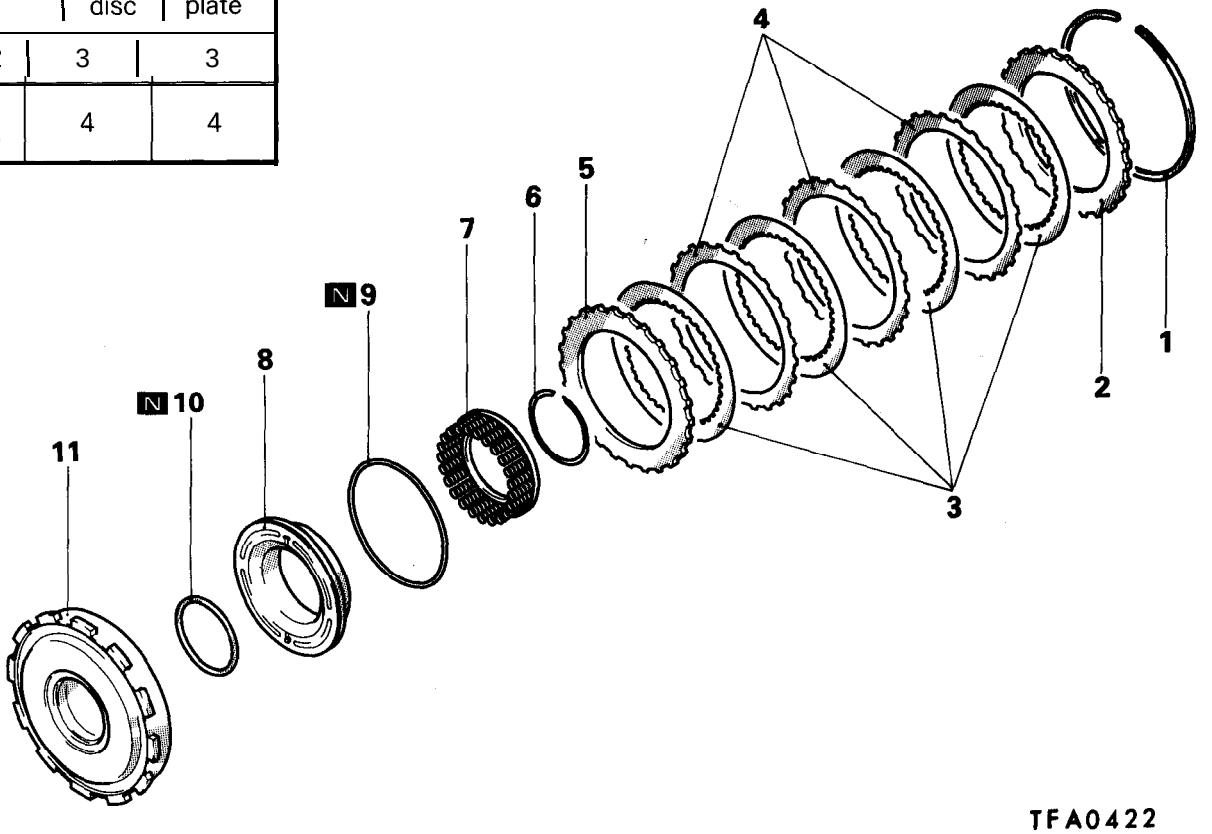
# FRONT CLUTCH ASSEMBLY

N21LHAF

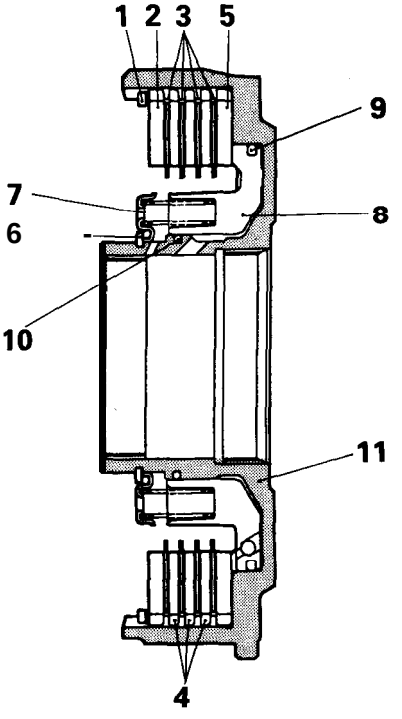
## DISASSEMBLY AND REASSEMBLY

**No. of clutch discs and plates**

| Model | Clutch disc | Clutch plate |
|---|---|---|
| F4A22 | 3 | 3 |
| F4A33<br>W4A33 | 4 | 4 |




TFA0422

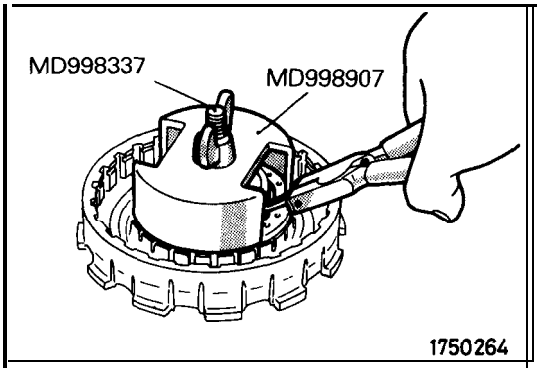



TFA0423

**Disassembly steps**

- ⬮ 4 1. Snap ring
- ● * 2. Clutch reaction plate
- ⬮ 4 3. Clutch disc
- 4. Clutch plate
- ◆◆ 5. Clutch pressure plate
- ◆◆ 6. Snap ring
- 7. Return spring
- 8. Front clutch piston
- 9. D-ring
- 10. D-ring
- 11. Front clutch retainer

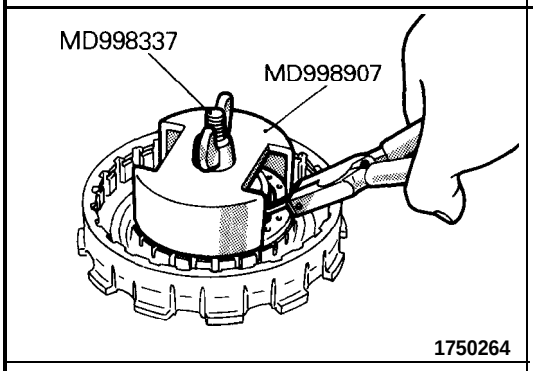
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N : Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY

**6. REMOVAL OF SNAP RING**

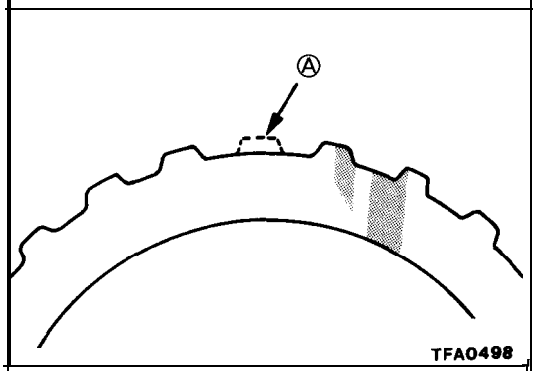
(1) Compress the return spring with the special tool.
(2) Remove the snap ring.




## SERVICE POINTS OF REASSEMBLY

**6. INSTALLATION OF SNAP RING**

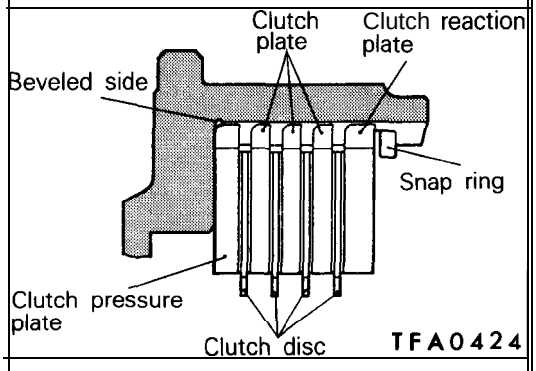
(1) Compress the return spring with the special tool.
(2) Install the snap ring.



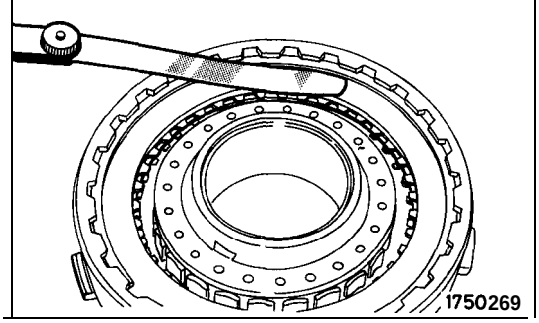

**5. INSTALLATION OF CLUTCH PRESSURE PLATE/3. CLUTCH DISC/2. CLUTCH REACTION PLATE**

(1) Assemble the clutch pressure plate, clutch plate and clutch reaction plate, arranging them by the missing tooth [See figure Ⓐ].

NOTE
This is so the automatic transmission fluid escapes easily and there is good cooling of the plate and disc.




(2) Assembly the plates so the beveled side is as shown in the figure.
(3) Assemble so the thickest plate (clutch reaction plate) is on the snap ring side.




**1. SELECTION OF SNAP RING**

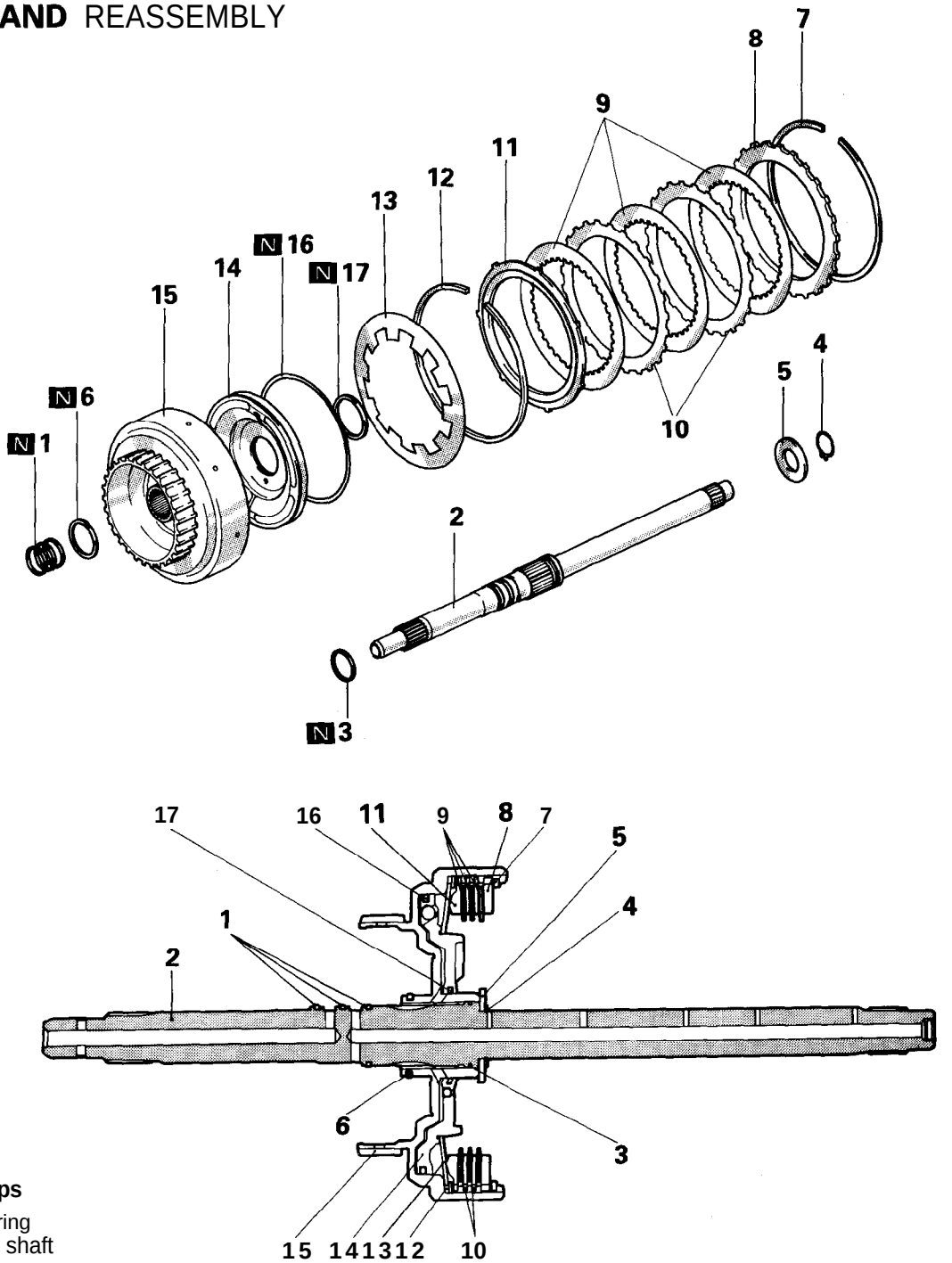
Check clearance between the snap ring and clutch reaction plate. To check the clearance, hold entire circumference of the clutch reaction plate down with 50 N (11 lbs.) force. If clearance is out of standard value, select a snap ring to obtain the standard value.

**Standard value:**
**0.7–0.9 mm (.028–.035 in.) <F4A22>**
**0.8–1.0 mm (.032–.039 in.) <F4A33·W4A33>**

# REAR CLUTCH ASSEMBLY <F4A22>

N21LHBG

## DISASSEMBLY AND REASSEMBLY

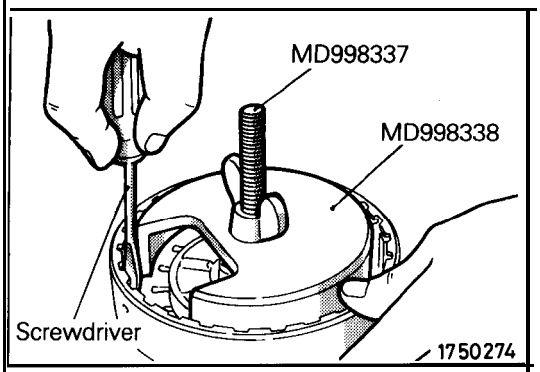



1750215

**Disassembly steps**

- 1. Seal ring
- ● + 2. Input shaft
- 3. O-ring
- 4. Snap ring
- 5. Thrust race
- 6. Seal ring
- ◆◆ 7. Snap ring
- ● + 8. Clutch reaction plate
- 9. Clutch disc
- ◆◆ 10. Clutch plate
- ● + 11. Clutch pressure plate
- ◆◆ ◆◆ 12. Wave spring
- 13. Return spring
- 14. Rear clutch piston
- 15. Rear clutch retainer
- 16. D-ring
- 17. D-ring

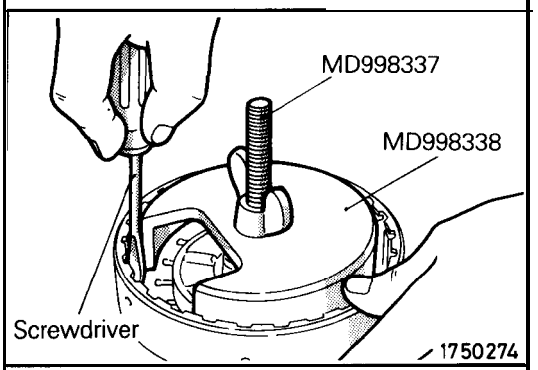
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to “Service Points of Disassembly”.
(3) ◆◆: Refer to “Service Points of Reassembly”.
(4) N: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY

### 12. REMOVAL OF WAVE SPRING

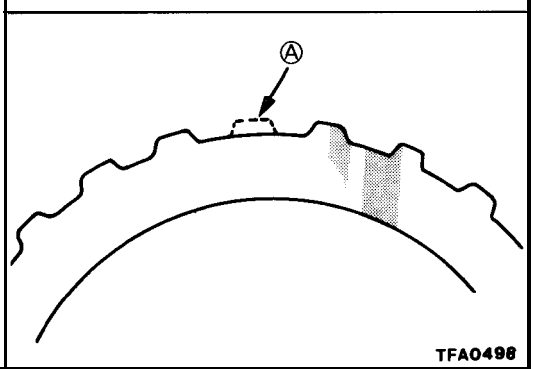
(1) Compress the return spring with the special tool.
(2) Using a screwdriver, remove the wave spring.




## SERVICE POINTS OF REASSEMBLY

### 12. INSTALLATION OF WAVE SPRING

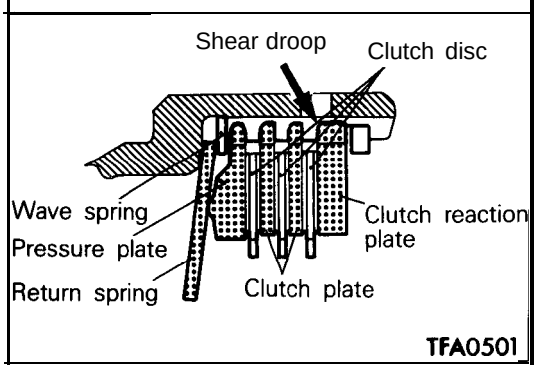
(1) Compress return spring with the special tool.
(2) Install the wave spring.



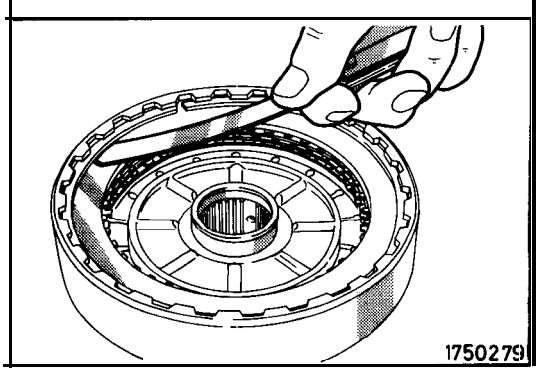

### 11. INSTALLATION OF CLUTCH PRESSURE PLATE/10. CLUTCH PLATE/8. CLUTCH REACTION PLATE

(1) Install the clutch pressure plate, clutch plates and clutch reaction plate with their missing tooth portions (Ⓐ in the illustration) in alignment.

NOTE
This design is to facilitate escape of automatic transmission fluid and improve the cooling efficiency of the plates and disc.



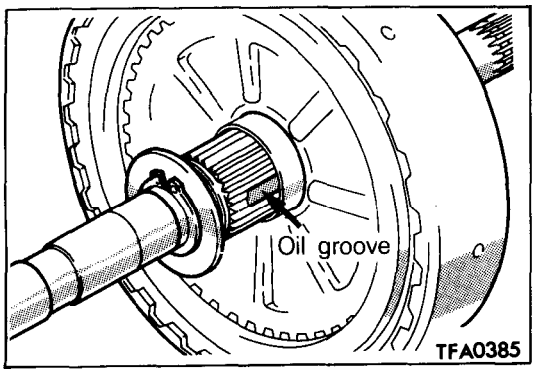

(2) Install the clutch reaction plate with its shear droop directed as shown in the illustration.




### 7. SELECTION OF SNAP RING

Check clearance between the snap ring and clutch reaction plate. To check the clearance, hold entire circumference of the clutch reaction plate down with 50 N (11 lbs.) force. If clearance is out of standard value, select a snap ring to obtain the standard value.

**Standard value: 0.3–0.5 mm (.012–.020 in.)**

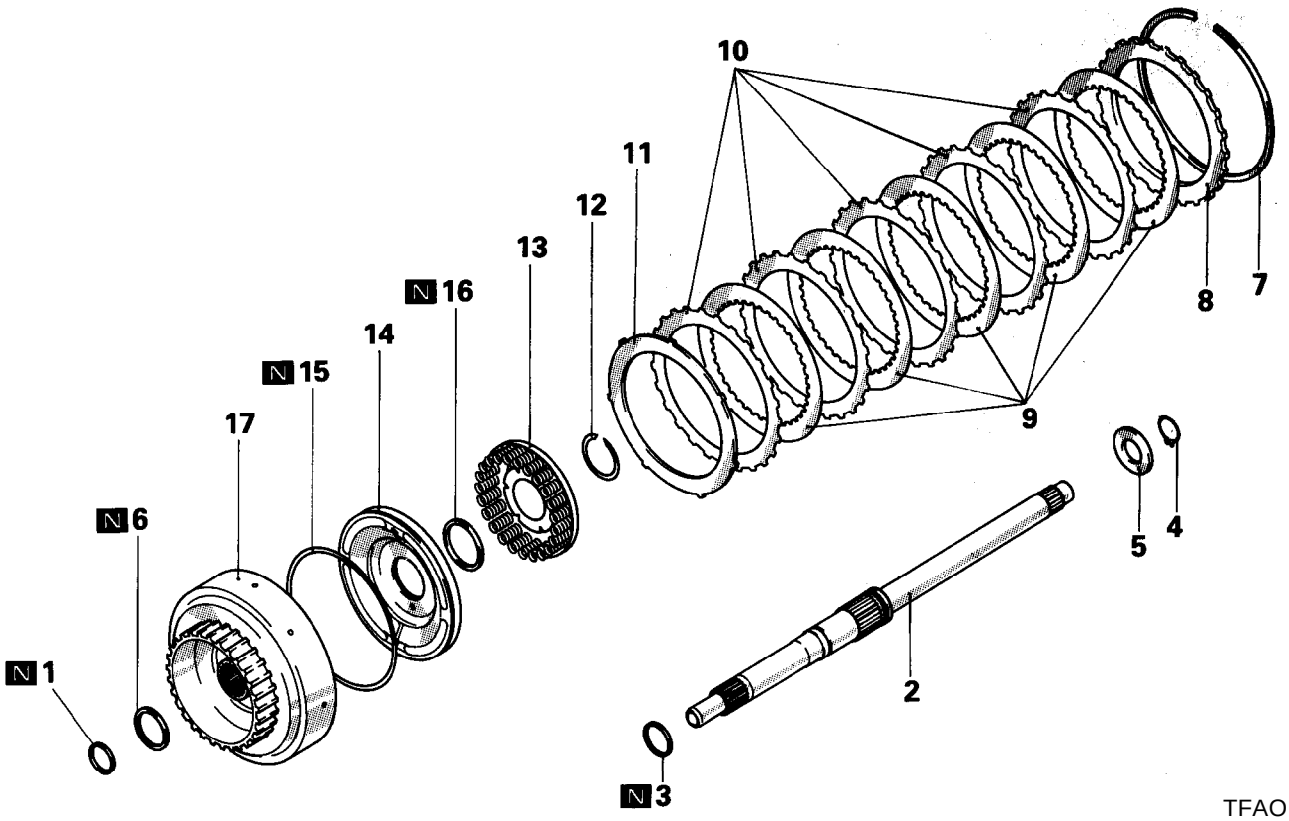



**1. INSTALLATION OF INPUT SHAFT**

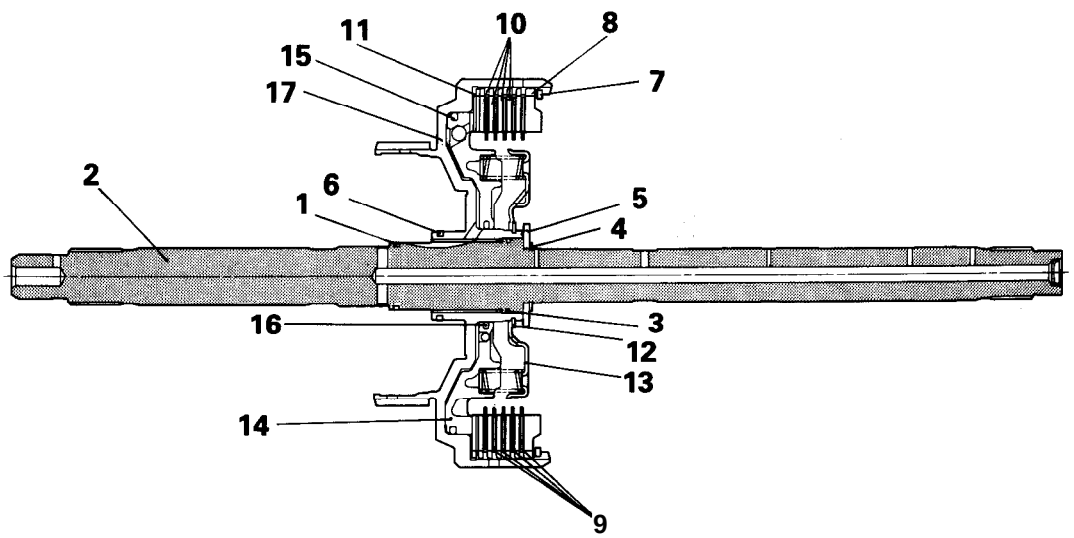
Install the input shaft with its oil groove aligned with the oil hole in the rear clutch retainer.

# REAR CLUTCH ASSEMBLY <F4A33·W4A33>

## DISASSEMBLY AND REASSEMBLY




TFAO 606

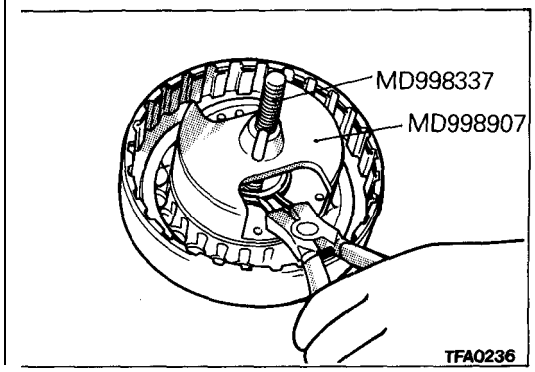



TFA0265

**Disassembly steps**

- 1. Seal ring
- ● 2. Input shaft
- 3. O-ring
- 4. Snap ring
- 5. Thrust race
- 6. Seal ring
- ● + 7. Snap ring
- ◆◆ 8. Clutch reaction plate
- 9. Clutch disc
- ● + 10. Clutch plate
- 11. Wave spring
- ◆◆ ◆◆ 12. Snap ring
- 13. Return spring
- 14. Rear clutch piston
- 15. D-ring
- 16. D-ring
- 17. Rear clutch retainer

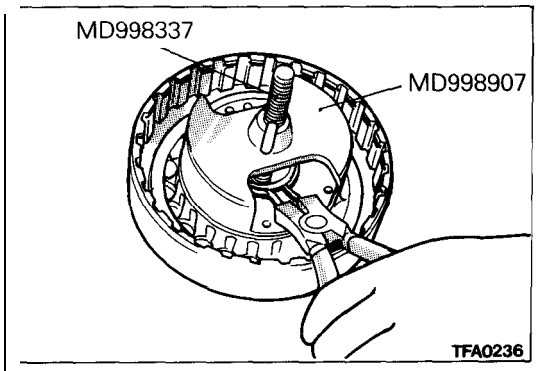
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts




## SERVICE POINTS OF DISASSEMBLY

**12. REMOVAL OF SNAP RING**

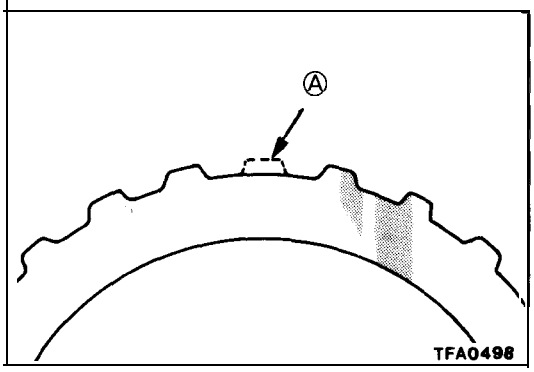
(1) Using the special tool, compress the return spring.
(2) Using the snap ring pliers, remove the snap ring.




## SERVICE POINTS OF REASSEMBLY

**12. INSTALLATION OF SNAP RING**

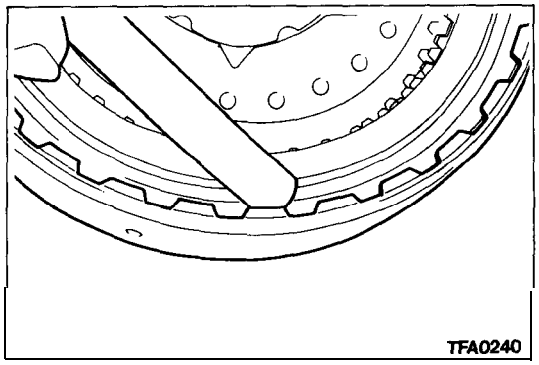
(1) Using the special tool, compress the return spring.
(2) Using the snap ring pliers, install the snap ring.




**10. INSTALLATION OF CLUTCH PLATE/8. CLUTCH REACTION PLATE**

Assemble the clutch plate and reaction plate, arranging them by the missing tooth [See figure Ⓐ].

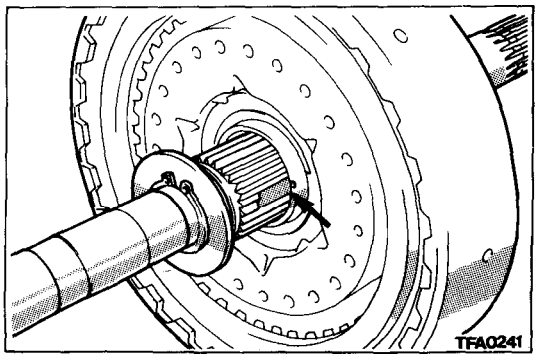
NOTE
This is so the automatic transmission fluid escapes easily and there is good cooling of the plate and disc.




**7. SELECTION OF SNAP RING**

Check clearance between the snap ring and clutch reaction plate. To check the clearance, hold entire circumference of the clutch reaction plate down with 50 N (11 lbs.) force. If clearance is out of standard value, select a snap ring to obtain the standard value.

**Standard value: 1.0–1.2 mm (.034–.047 in.)**




**2. INSTALLATION OF INPUT SHAFT**

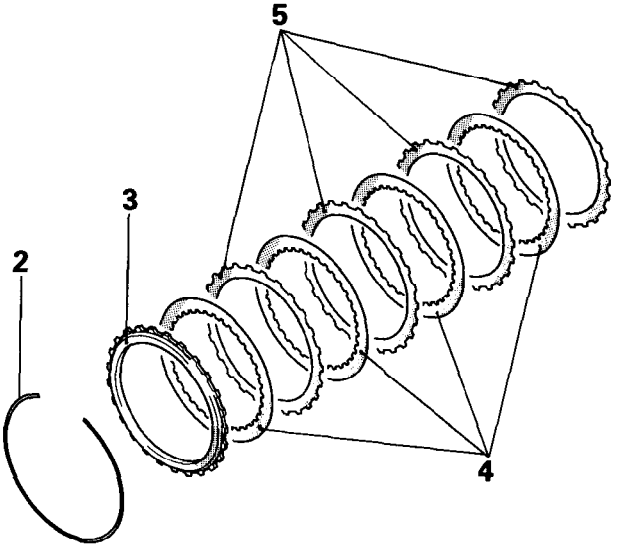
Align the input shaft oil groove and rear clutch retainer matching mark and assemble.

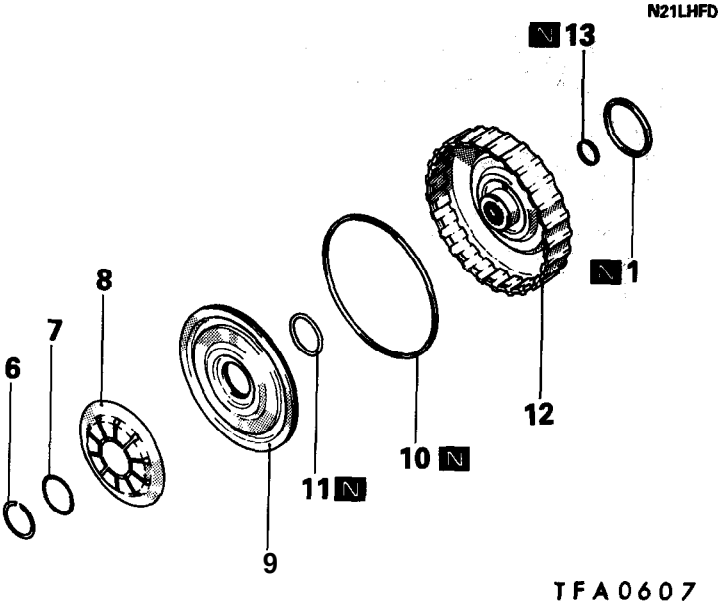
# END CLUTCH ASSEMBLY

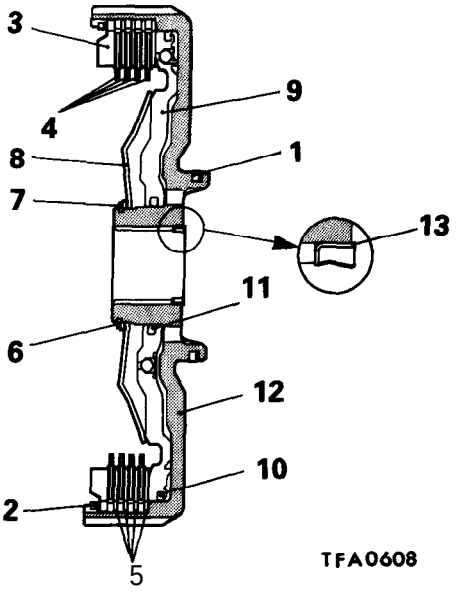
## DISASSEMBLY AND REASSEMBLY

**No. of clutch discs and plates**

| Model | Clutch disc | Clutch plate |
|---|---|---|
| F4A22 | 3 | 3 |
| F4A33 W4A33 | 4 | 4 |



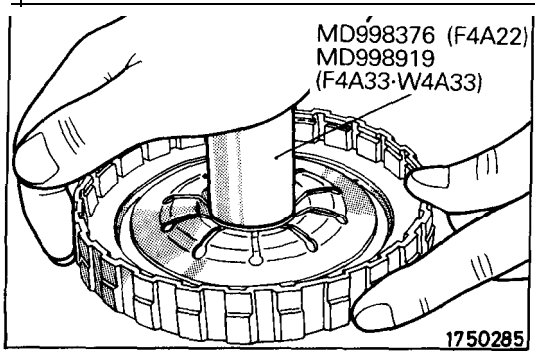




**Disassembly steps**

1. Seal ring
- * 2. Snap ring
3. Clutch reaction plate
4. Clutch disc
5. Clutch plate
- + 6. Snap ring
7. Washer
8. Return spring
9. End clutch piston
10. Oil seal
11. D-ring
12. End clutch retainer
13. Oil seal

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● e : Refer to "Service Points of Disassembly".
(3) ◆◆ : Refer to "Service Points of Reassembly".
(4) ☐ : Non-reusable parts

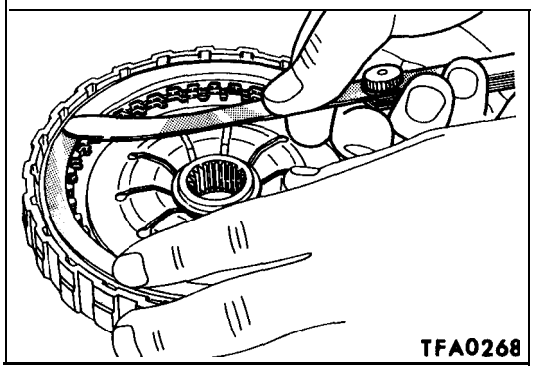



## SERVICE POINTS OF REASSEMBLY

**6. INSTALLATION OF SNAP RING**

Using the special tool, install the snap ring.

**Caution**
**Check that the snap ring is seated firmly in the groove.**




**2. SELECTION OF SNAP RING**

First install the snap ring and then check if the gap between the snap ring and clutch reaction plate reaches the standard value. When measuring the gap, press the circumference of the clutch reaction plate firmly with a force of 50 Nm (11 lbs.). If the gap is outside the standard value, select a snap ring and adjust until it reaches the standard value.

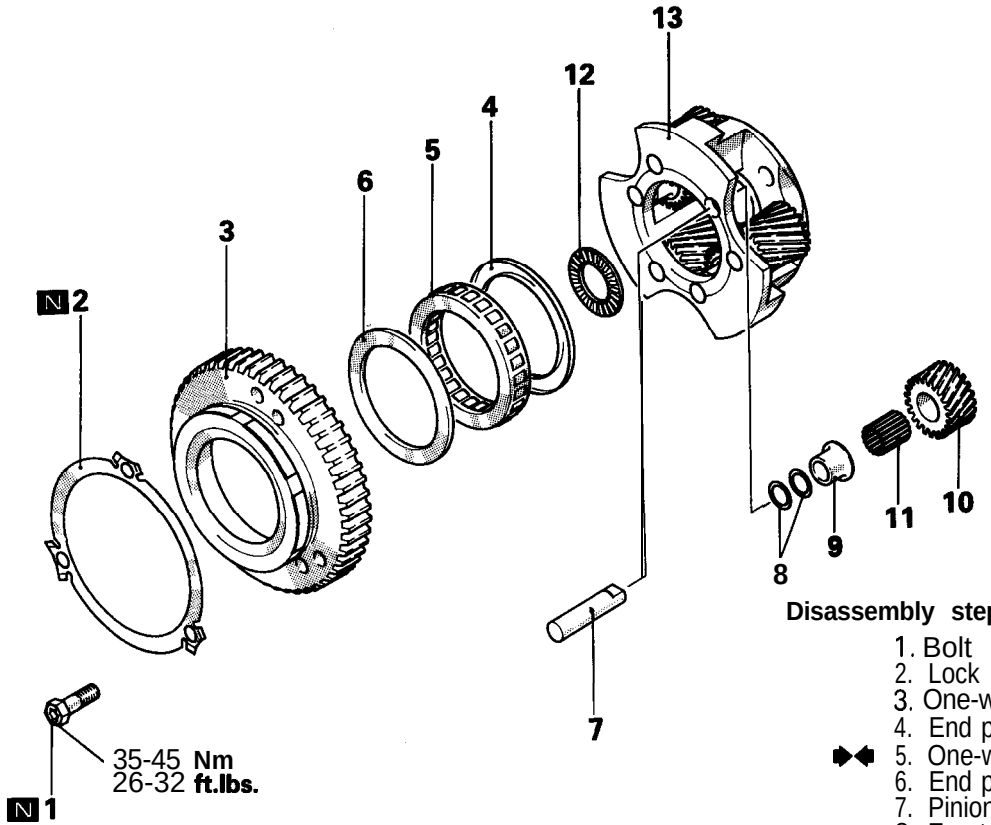
**Standard value:**

**0.4–0.65 mm (.016–.026 in.) <F4A22>**
**0.6–0.85 mm (.024–.033 in.) <F4A33·W4A33>**

# PLANETARY GEAR <F4A22>

N21LKAJ

## DISASSEMBLY AND REASSEMBLY

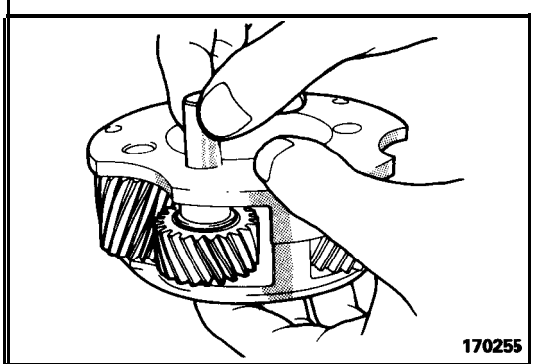


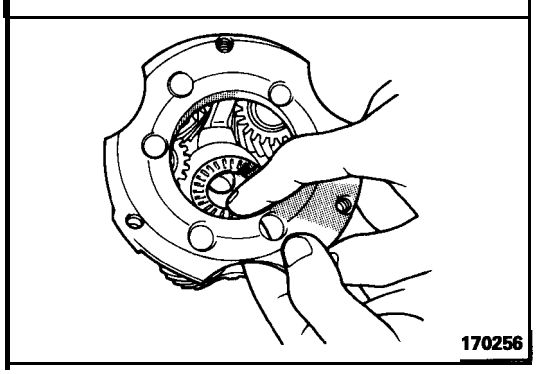

TFA0522

**Disassembly steps**

1. Bolt
2. Lock plate
3. One-way clutch outer race
4. End plate
◆◆ 5. One-way clutch
6. End plate
7. Pinion shaft
8. Front thrust washer
9. Spacer bushing
10. Short pinion
11. Roller
◆◆ ● + 12. Thrust bearing
13. Planet carrier

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to Service Points of Reassembly .
(4) N : Non-reusable parts



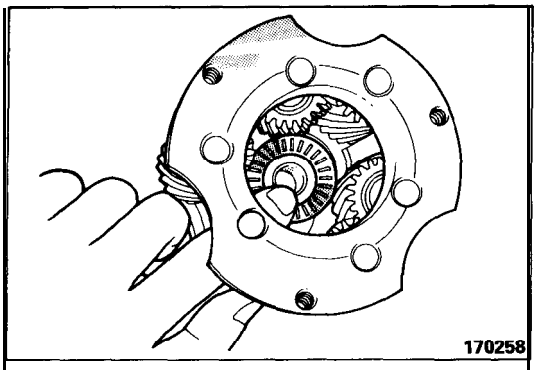




## SERVICE POINTS OF DISASSEMBLY

### 12. REMOVAL OF THRUST BEARING

(1) Remove the only one short pinion. Use care not to drop and lose the 17 rollers in the short pinion. Do not remove the other short pinions.

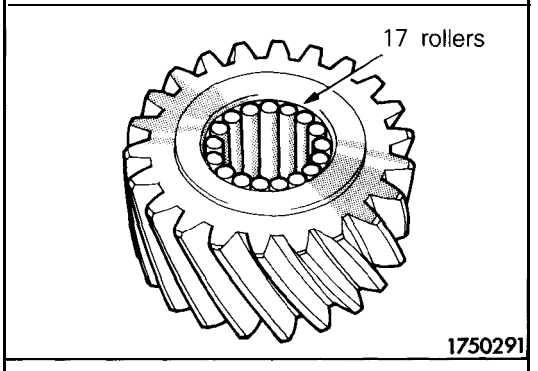
(2) Remove the thrust bearing.



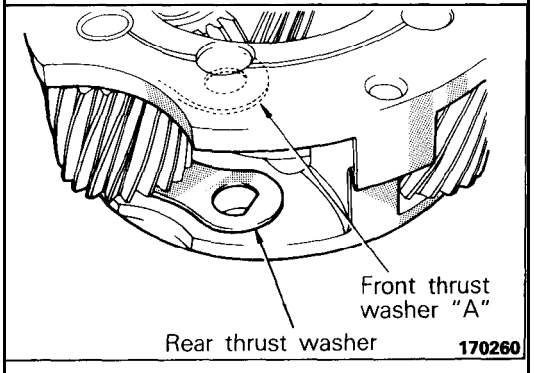

## SERVICE POINTS OF REASSEMBLY

### 12. INSTALLATION OF THRUST BEARING

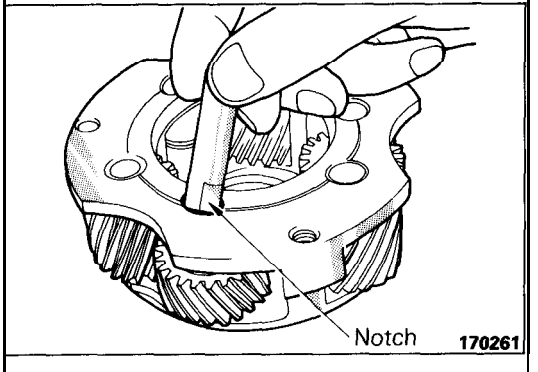
(1) Install a thrust bearing on the carrier. Make sure that it fits correctly in the spot faced portion of the carrier.




(2) Apply vaseline unsparingly to the inside surface of the short pinion and attach the 17 rollers on the surface.



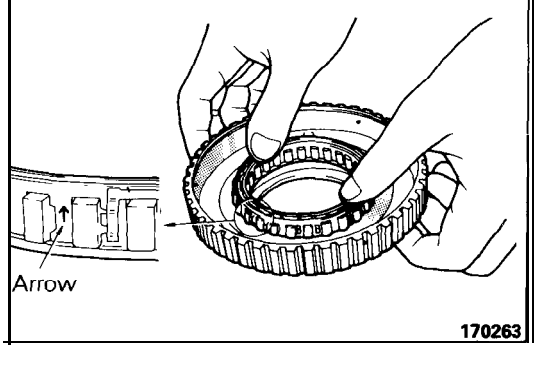

(3) Line up the holes of the rear thrust washer and front thrust washer "A" with the shaft hole of the carrier.
(4) Install the short pinion, spacer bushing and front thrust washer and align the holes. Use care not to allow the rollers to get out of position.




(5) Insert the pinion shaft. Make sure that the flattened end of pinion shaft is correctly fitted in the hole of the rear thrust plate when the pinion shafts is inserted.

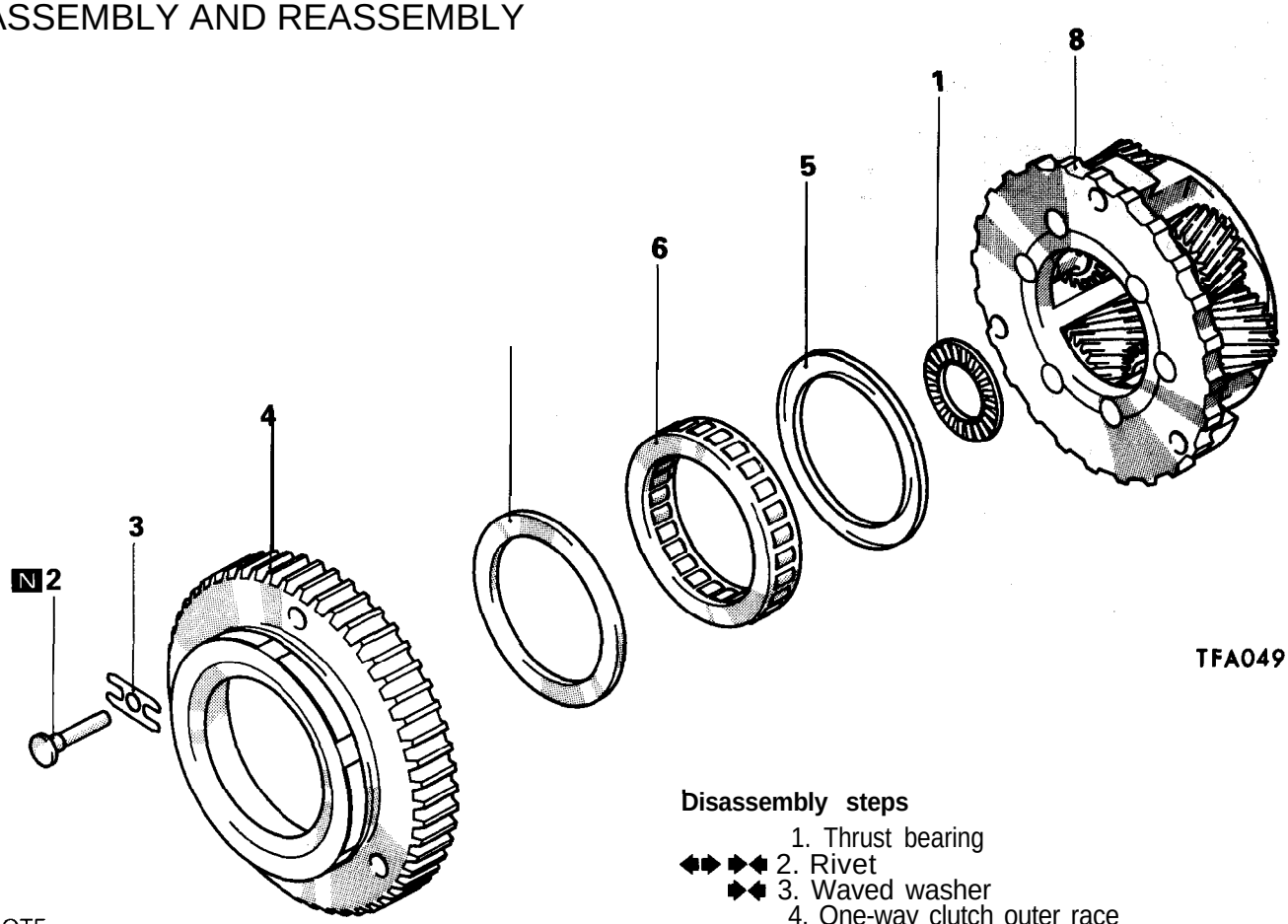
### 5. INSTALLATION OF ONE-WAY CLUTCH

Push the one-way clutch into the outer race. Make sure that arrow on the outside circumference of cage is directed upward as shown in the illustration when the one-way clutch is pushed in.



# PLANETARY GEAR <F4A33·W4A33>

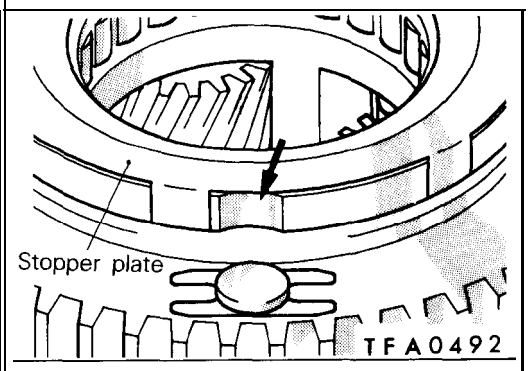
## -- DISASSEMBLY AND REASSEMBLY

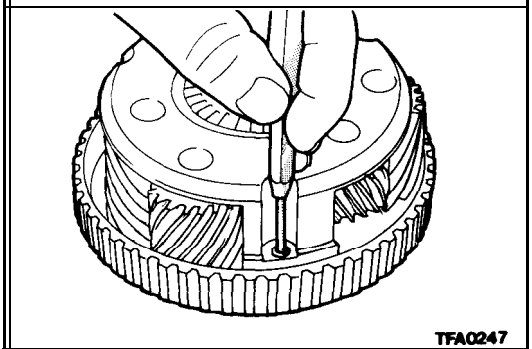



**Disassembly steps**

1. Thrust bearing
◆◆ ◆◆ 2. Rivet
◆◆ 3. Waved washer
4. One-way clutch outer race
5. End plate
◆◆ 6. One-way clutch
7. End plate
8. Planet carrier

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ●: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts



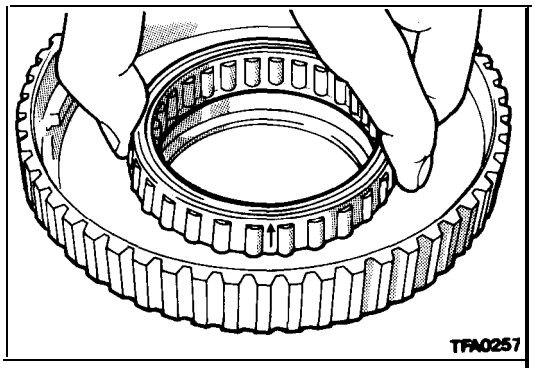

## SERVICE POINTS OF DISASSEMBLY

### 2. REMOVAL OF RIVET

(1) Move the stopper plate so it does not hit the rivet head.

NOTE
The catch of the stopper plate should not catch in the one-way clutch outer race groove.

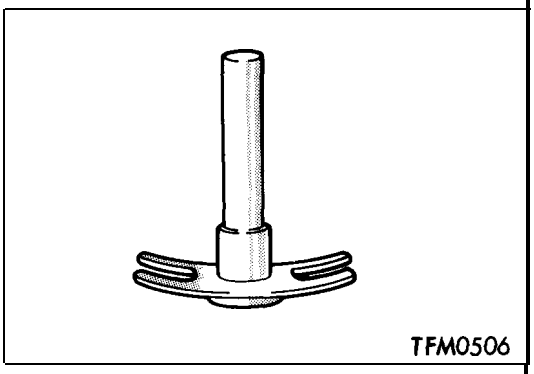
(2) Use a pin punch or similar tool and drive out the rivet.




## SERVICE POINTS OF REASSEMBLY

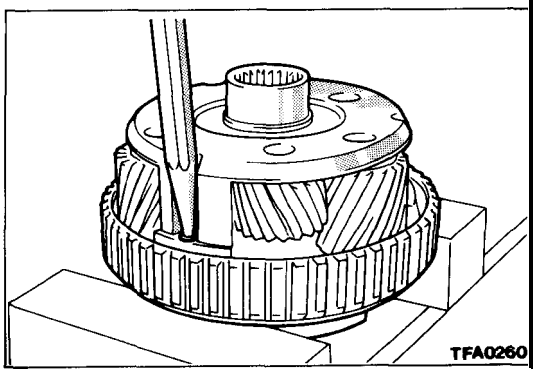
### 6. INSTALLATION OF ONE-WAY CLUTCH

Press in the one-way clutch so the gauge part of the one-way clutch is in the direction shown by the arrow in the figure.




### 3. INSTALLATION OF WAVED WASHER

Install so the concave (indented) part of the waved washer is on the outer race side.




### 2. INSTALLATION OF RIVET

Using a punch, caulk the rivet by pressing.

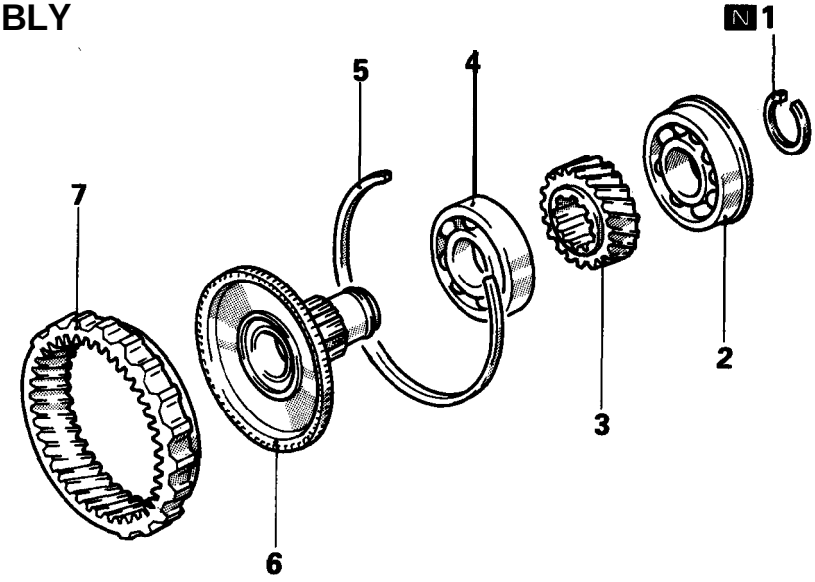
NOTE

Use a punch with a tip with a 60" angle.

Caulk the rivet surely with a load of 1 1,000–13,000 N (2,425–2,866 lbs.).

# ANNULUS GEAR AND TRANSFER DRIVE GEAR SET <F4A22> N21LLAE

## DISASSEMBLY AND REASSEMBLY

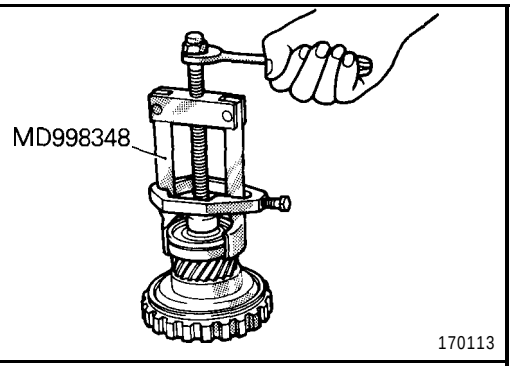



**Disassembly steps**

- ⬮ + 1. Snap ring
- ◆◆ ◆◆ 2. Bearing
- ◆◆ ● 3. Transfer drive gear
- ◆◆ ◆◆ 4. Bearing
- 5. Snap ring
- 6. Output flange
- 7. Annulus gear

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".

170178

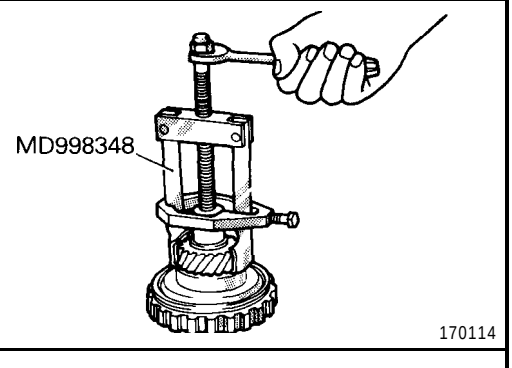



170113

### SERVICE POINTS OF DISASSEMBLY

#### 2. REMOVAL OF BEARING

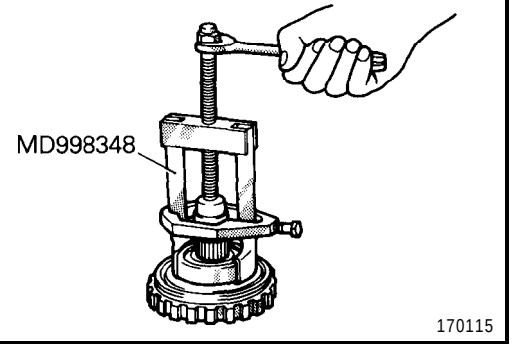
Using the special tool, remove the bearing from the output flange.




170114

#### 3. REMOVAL OF TRANSFER DRIVE GEAR

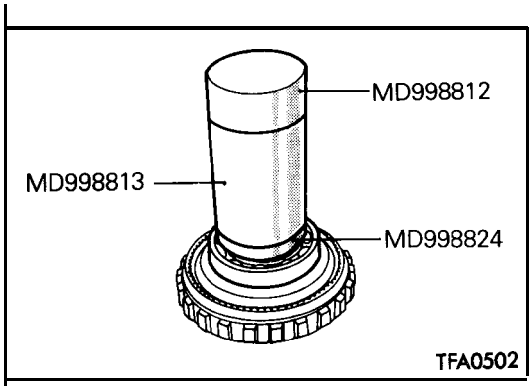
Using the special tool, remove the transfer drive gear from the output flange.




170115

#### 4. REMOVAL OF BEARING

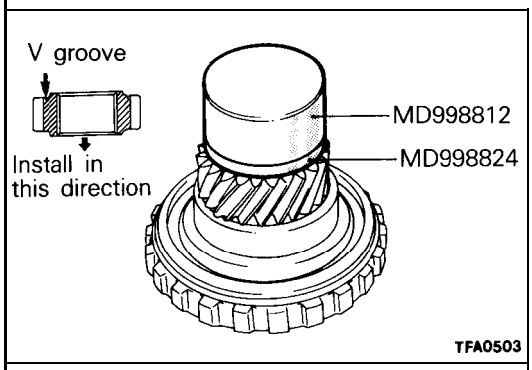
Using the special tool, remove the bearing from the output flange.




## SERVICE POINTS OF REASSEMBLY

### 4. INSTALLATION OF BEARING

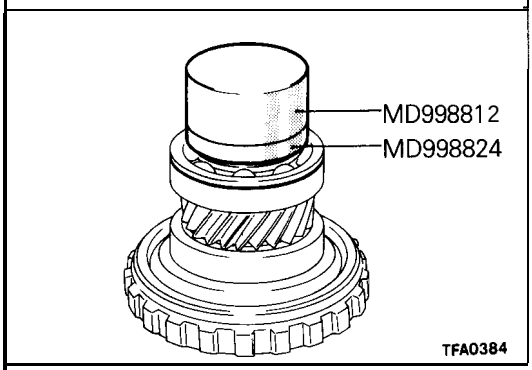
Using the special tool, install the bearing on the output flange.




### 3. INSTALLATION OF TRANSFER DRIVE GEAR

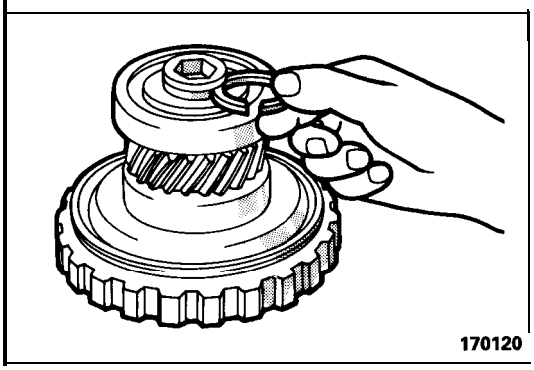
Using the special tool, install the transfer drive gear in proper direction. The direction can be identified by the groove provided in one of the pinion side surfaces.

**Caution**
**Replace the output flange and transfer drive gear as a set.**




### 2. INSTALLATION OF BEARING

Using the special tool, install the bearing on the output flange.



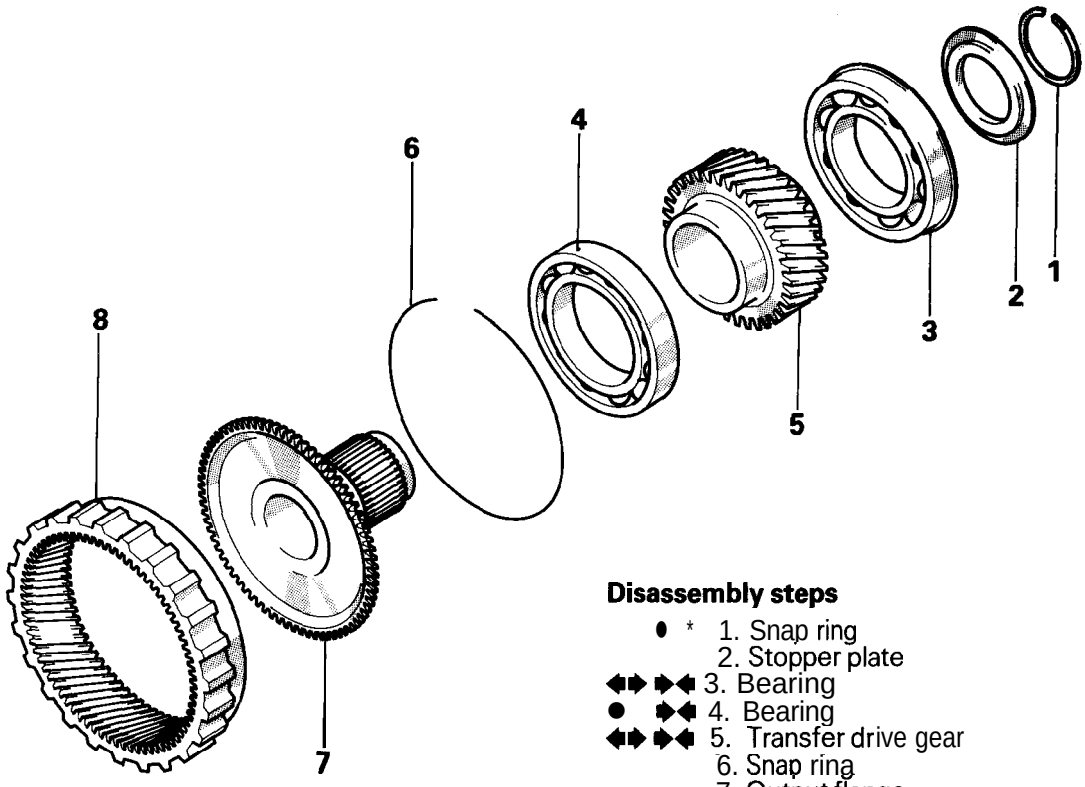

### 1. SELECTION OF SNAP RING

Select a snap ring, which should be the thickest one that can be installed in groove.

**Standard value: 0–0.06 mm (0–.0024 in.)**

# ANNULUS GEAR AND TRANSFER DRIVE GEAR SET <F4A33·W4A33>

## DISASSEMBLY AND REASSEMBLY

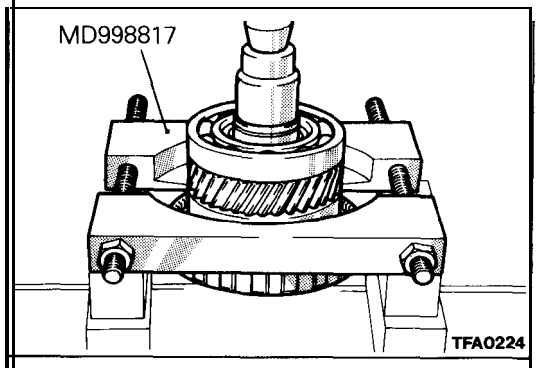


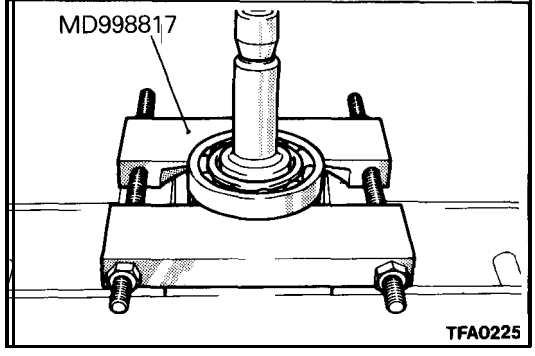

TFA0262

**Disassembly steps**

- ● * 1. Snap ring
- 2. Stopper plate
- ◆◆ 3. Bearing
- ● ◆◆ 4. Bearing
- ◆◆ ◆◆ 5. Transfer drive gear
- 6. Snap ring
- 7. Output flange
- 8. Annulus gear

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".



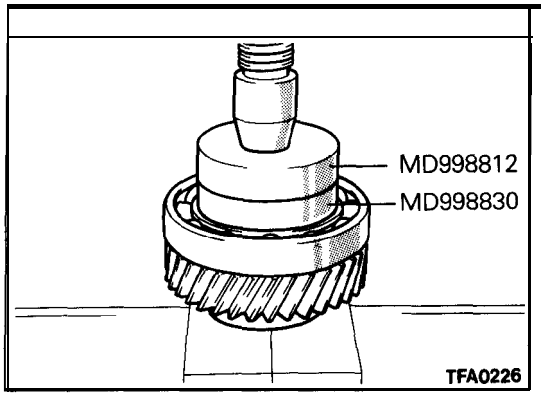

## SERVICE POINTS OF DISASSEMBLY

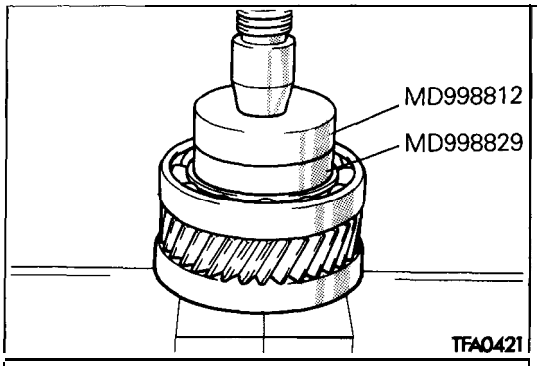
### 3./4. REMOVAL OF BEARINGS/5. TRANSFER DRIVE GEAR

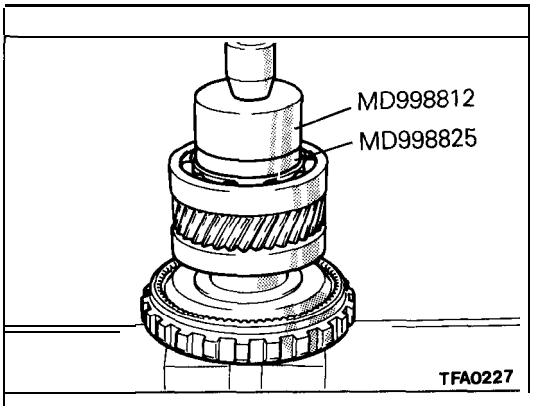
(1) Using the special tool, remove the transfer drive gear and bearings (2) as a set from the output flange.

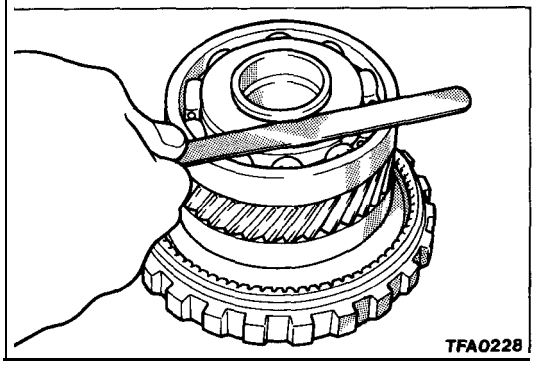
**Caution**
**Install the special tool securely between the output flange and bearings.**

(2) Using the special tool, remove the bearings on both ends of the transfer drive gear.




## SERVICE POINTS OF REASSEMBLY

### 5. INSTALLATION OF TRANSFER DRIVE GEAR/4./3. BEARINGS

(1) Using the special tool, press-fit the bearings on both ends of the transfer drive gear.

(2) Using the special tool, install the transfer drive gear on the output flange.

### 1. SELECTION OF SNAP RING

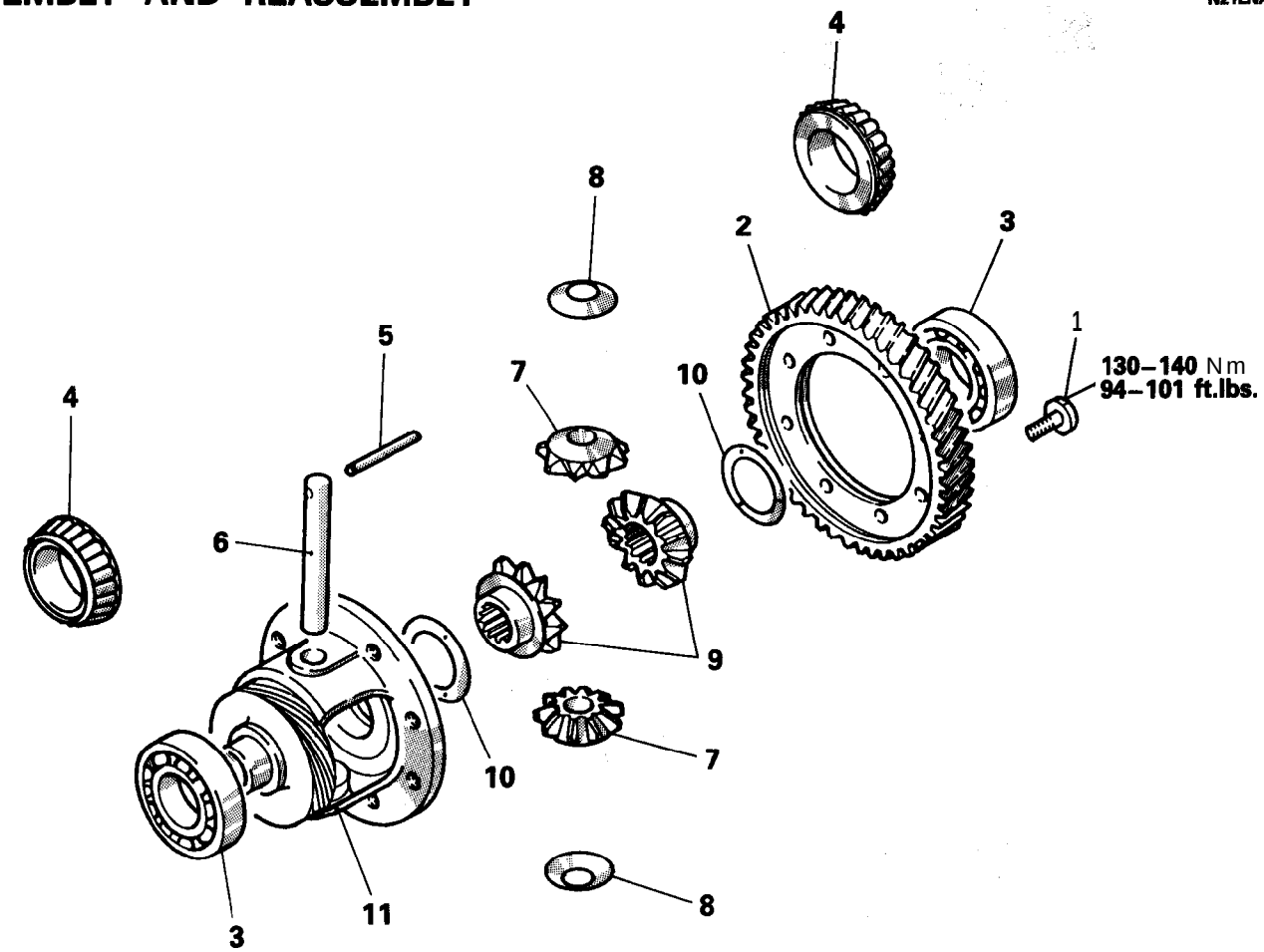
Measure the snap ring groove, select and install a spacer so the end play reaches the standard value.

**Standard value: 0–0.09 mm (0–.0035 in.)**

# DIFFERENTIAL

## DISASSEMBLY AND REASSEMBLY

N21LNAF

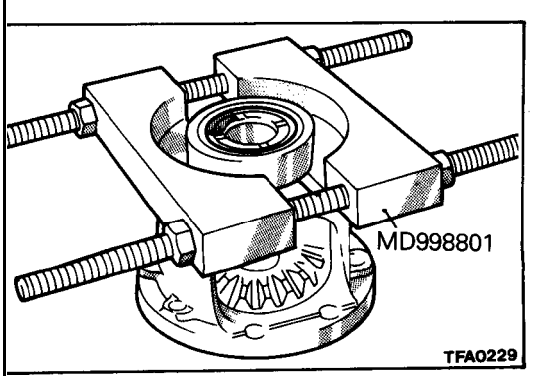



TFA0263

**Disassembly steps**

- ● 1. Bolt
- 2. Differential drive gear
- ◆◆ 3. Ball bearing <F4A22·W4A33>
- ◆◆ ● a 4. Taper roller bearing <F4A33>
- ◆◆ 5. Lock pin
- ● + 6. Pinion shaft
- ● + 7. Pinion
- ● 8. Washer
- ◆◆ 9. Side gear
- ● + 10. Spacer
- 11. Differential case

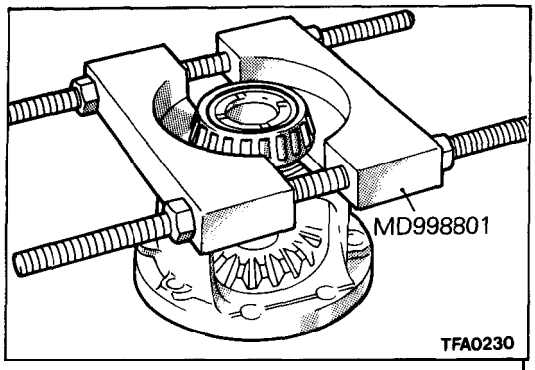
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".




## SERVICE POINTS OF DISASSEMBLY

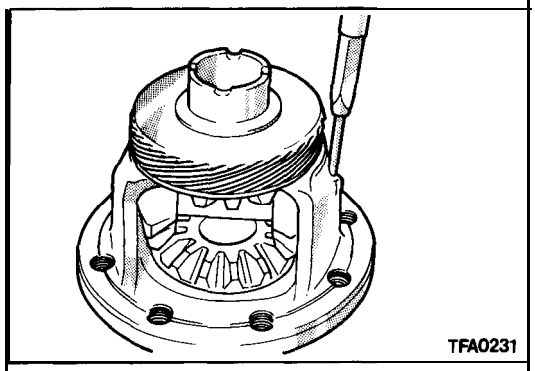
### 3. REMOVAL OF BALL BEARING

Using the special tool, remove the ball bearing.




### 4. REMOVAL OF TAPER ROLLER BEARING

Using the special tool, remove the taper roller bearing.




### 5. REMOVAL OF LOCK PIN

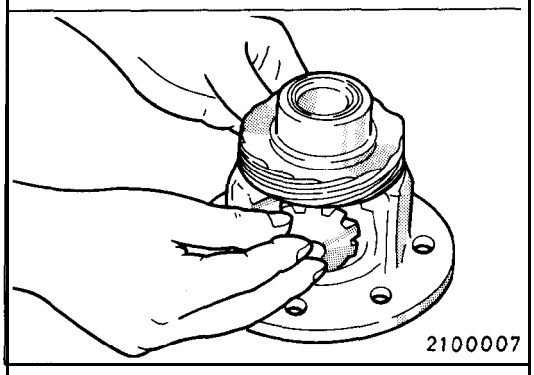
Using a pin punch, drive out the lock pin.

NOTE
Sometimes the lock pin is removed with a light punch. (F4A33)

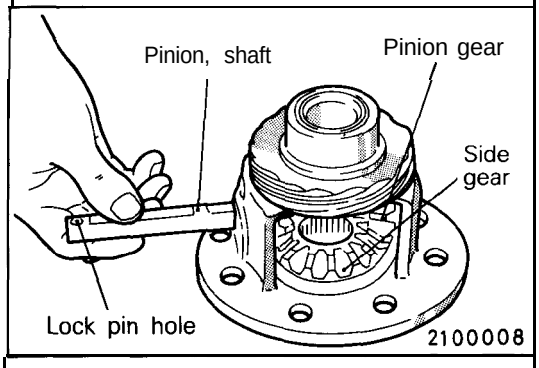
## SERVICE POINTS OF REASSEMBLY

### 10. INSTALLATION OF SPACER/9. SIDE GEAR/8. WASHER/7. PINION/6. PINION SHAFT

(1) First assemble the spacer on the rear of the side gear and then assemble the gear in the differential case.
(2) Assemble the washer on the rear of the pinion, and position in the designated place by rotating the two side gears at the same time so they mesh.




(3) Insert the pinion shaft.

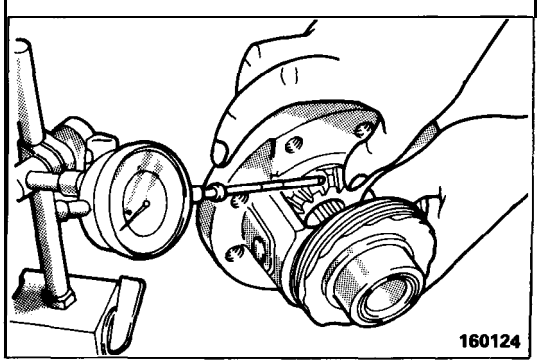


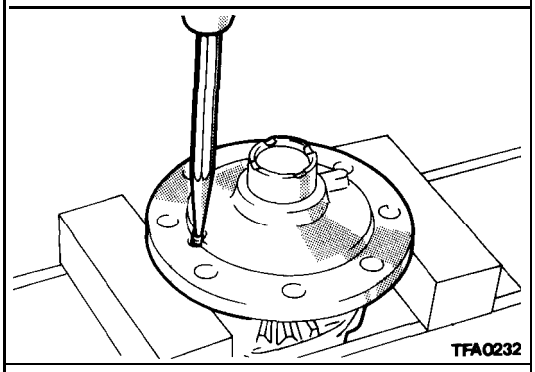

(4) Measure the backlash between the side gear and pinion.

**Standard value: 0.025–0.150 mm (.001–.0059 in.)**

(5) If backlash is outside the standard value, select a spacer, disassemble the gear again, reassemble and adjust.

NOTE
Adjust so backlash in both side gears is the same.

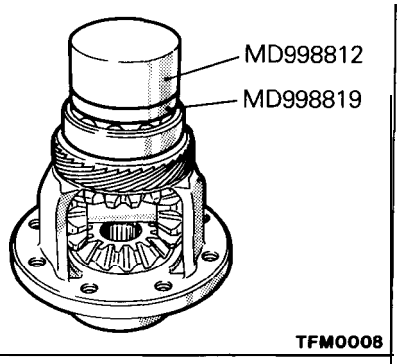



TFA0232

### 5. INSTALLATION OF LOCK PIN

Align the lock pin hole in the pinion shaft and the lock pin hole in the case and then install the lock pins.

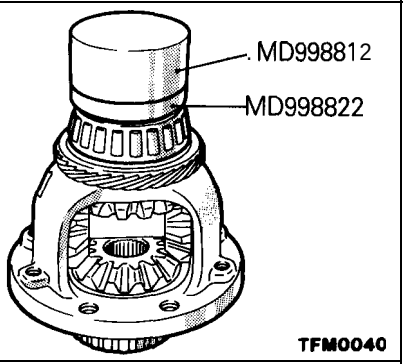
**Caution**
**1. Do not reuse lock pins (F4A22·W4A33).**
**2. Make the lock pin lower than the surface of the *differential case flange.***
**3. Press-fitting load is over 5,000 N (1,100 lbs.) (F4A22·W4A33).**



TFM0008

### 4. INSTALLATION OF TAPER ROLLER BEARING

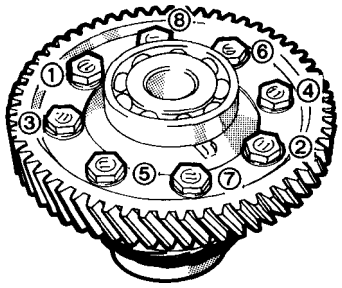
Using the special tool, press-fit the taper roller bearing in the differential case.



TFM0040

### 3. INSTALLATION OF BALL BEARING

Using the special tool, press-fit the ball bearing in the differential case.



166630

### 1. INSTALLATION OF BOLTS

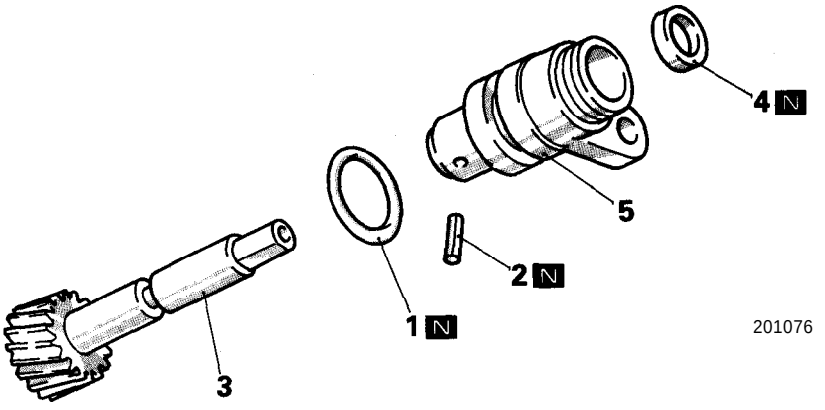
Apply ATF to the differential drive gear bolts, install and tighten with specified torque in the order shown in the figure.

**Differential drive gear bolt:**
**130–140 Nm (94–101 ft.lbs.)**

# SPEEDOMETER GEAR ASSEMBLY

N21LQAE

## DISASSEMBLY AND REASSEMBLY

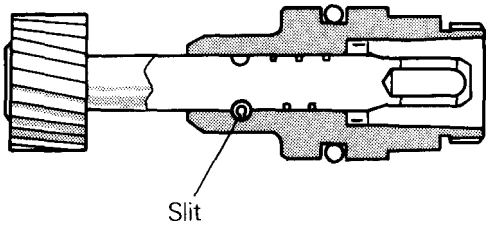



201076

**Disassembly steps**

1. O-ring
● + 2. Spring pin
◆◆ 3. Speedometer driven gear
4. Oil seal
5. Sleeve

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● : Refer to "Service Points of Reassembly".
(3) ❑ : Non-reusable parts




201079

## SERVICE POINTS OF REASSEMBLY

### 3. INSTALLATION OF SPEEDOMETER DRIVEN GEAR

Apply gear oil sparingly to the speedometer driven gear shaft and insert the shaft.

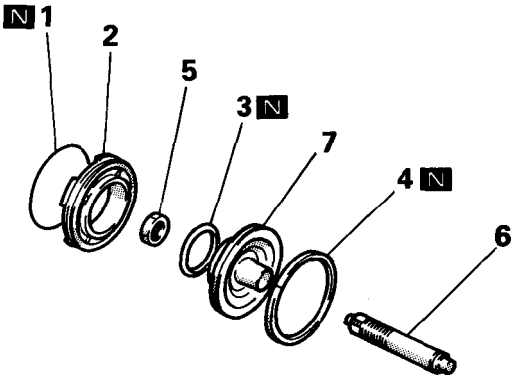
### 2. INSTALLATION OF SPRING PIN

Install the spring pin in such a way that its slit does not face the gear shaft.

# KICKDOWN SERVO

N21LPAE

## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

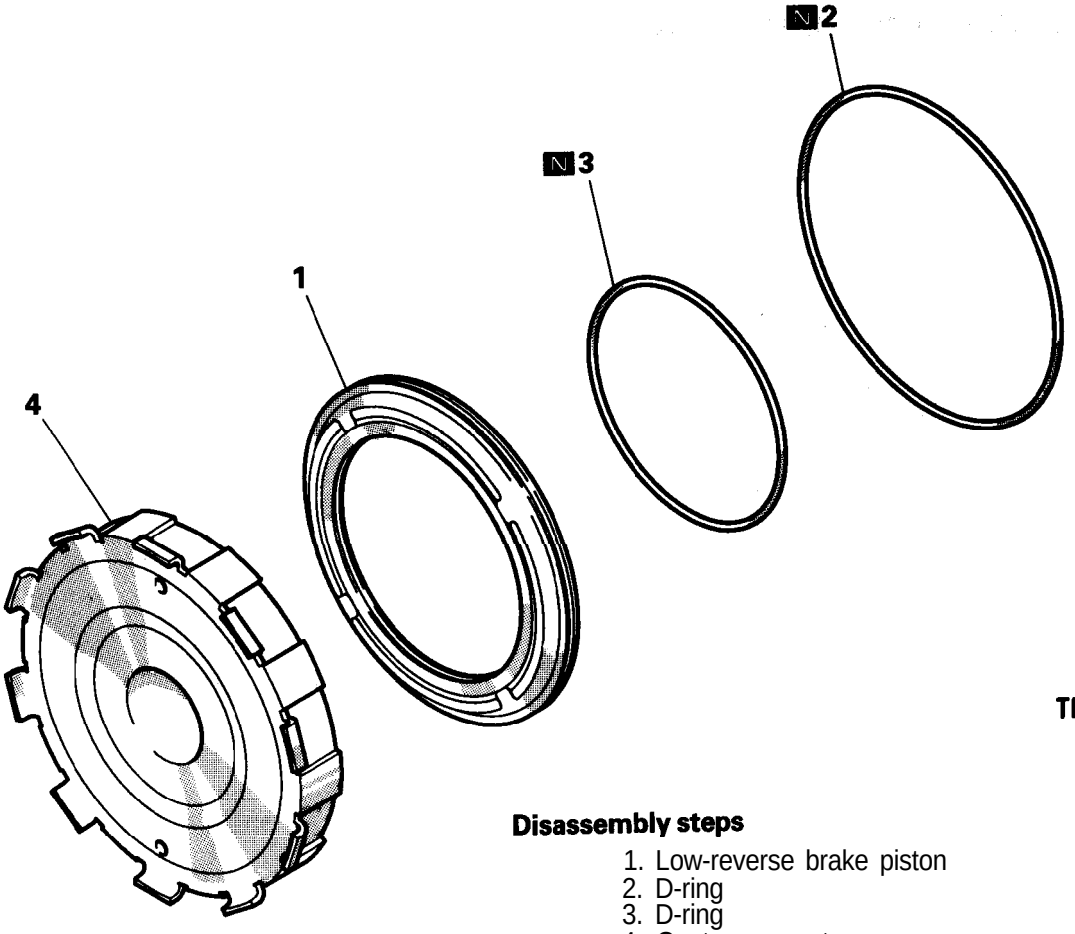
1. O-ring
2. Kickdown servo
3. D-ring
4. Seal ring
5. Lock nut
6. Kickdown servo rod
7. Kickdown servo piston

1750299

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) N : Non-reusable parts

# LOW-REVERSE BRAKE

N21LSAA




TFA0386

**Disassembly steps**

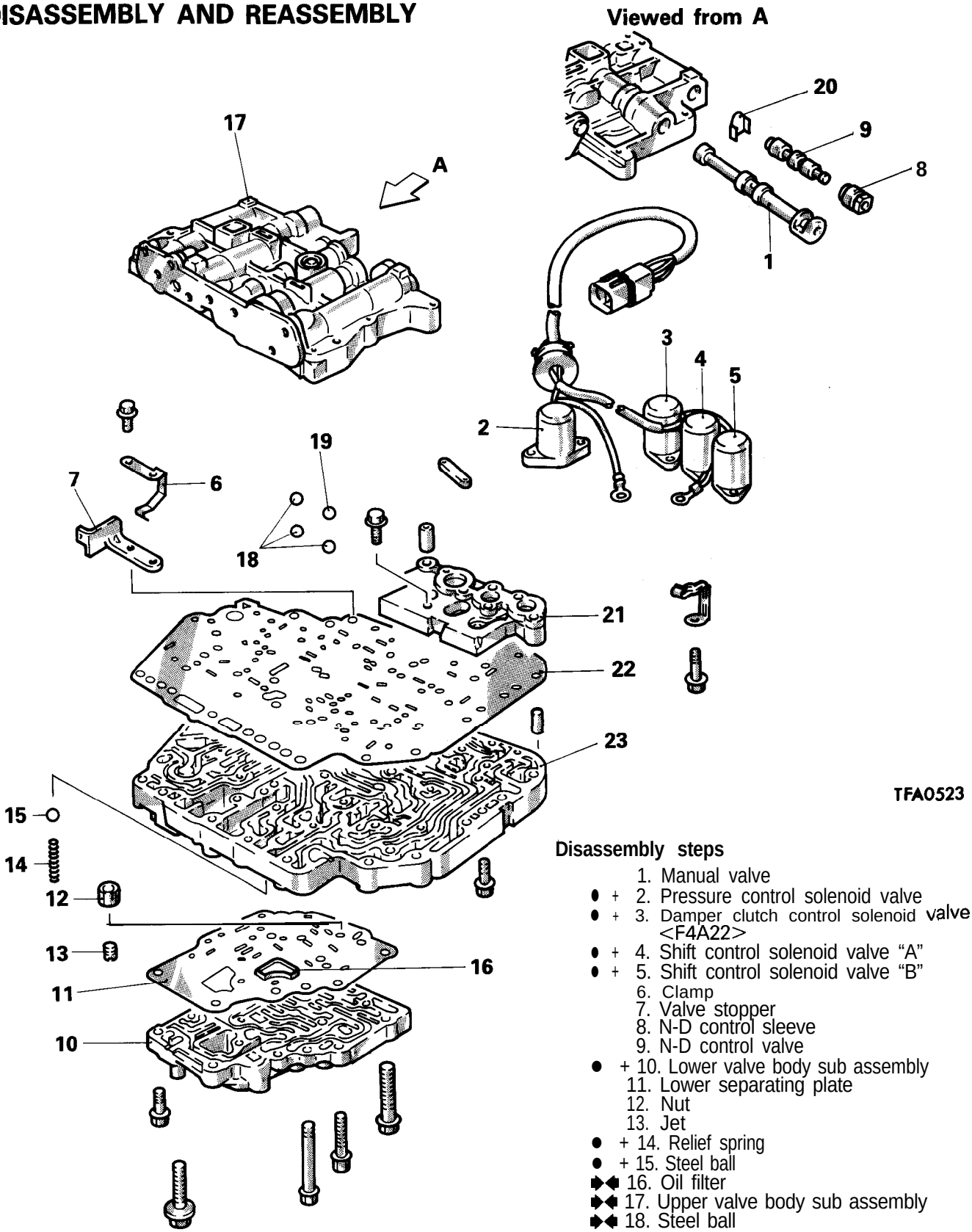
1. Low-reverse brake piston
2. D-ring
3. D-ring
4. Center support

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ❑ : Non-reusable parts

# VALVE BODY

N21LOAK

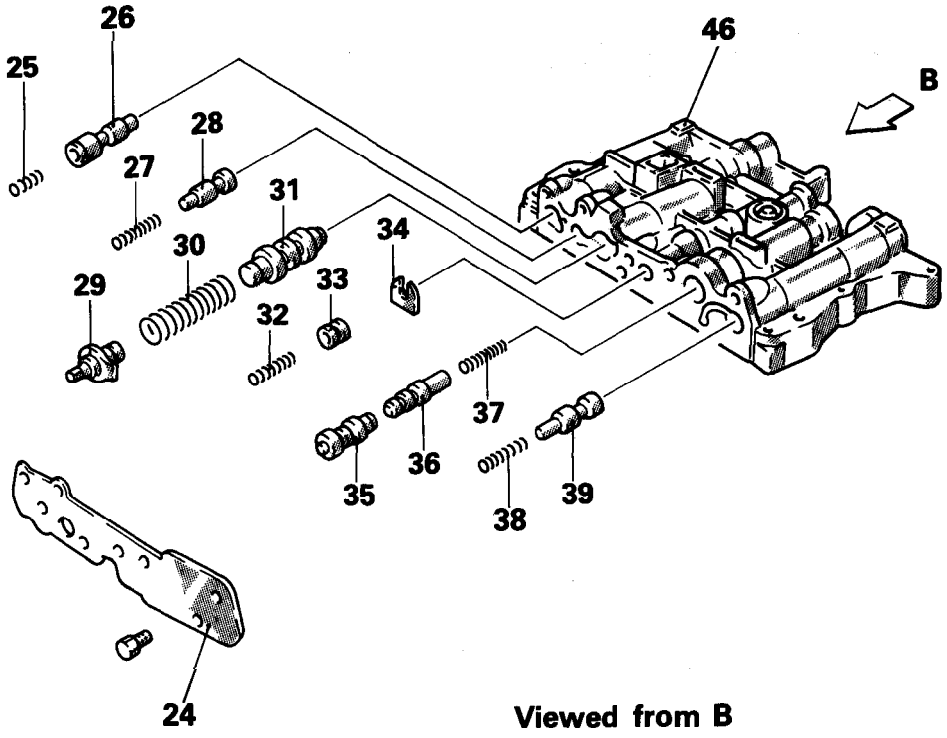
## DISASSEMBLY AND REASSEMBLY



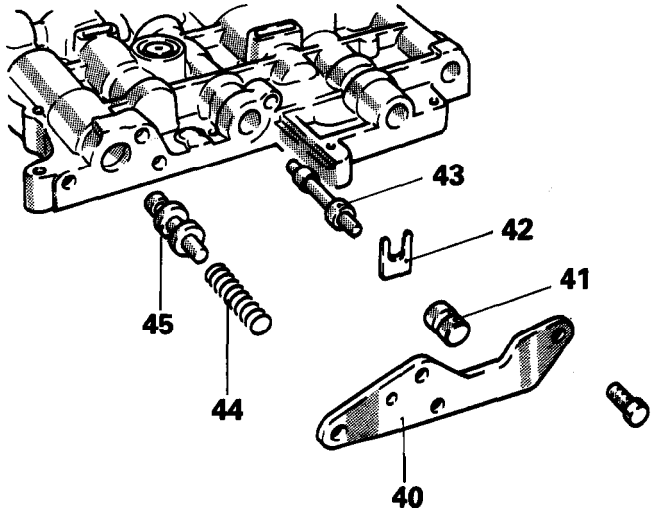

**Disassembly steps**

1. Manual valve
- ● + 2. Pressure control solenoid valve
- ● + 3. Damper clutch control solenoid valve <F4A22>
- ● + 4. Shift control solenoid valve "A"
- ● + 5. Shift control solenoid valve "B"
6. Clamp
7. Valve stopper
8. N-D control sleeve
9. N-D control valve
- ● + 10. Lower valve body sub assembly
11. Lower separating plate
12. Nut
13. Jet
- ● + 14. Relief spring
- ● + 15. Steel ball
- ◆◆ 16. Oil filter
- ◆◆ 17. Upper valve body sub assembly
- ◆◆ 18. Steel ball
- ◆◆ 19. Teflon ball
- ● 4 20. N-D plate
21. Block
22. Upper separating plate
23. Intermediate plate

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● 4 : Refer to "Service Points of Reassembly".



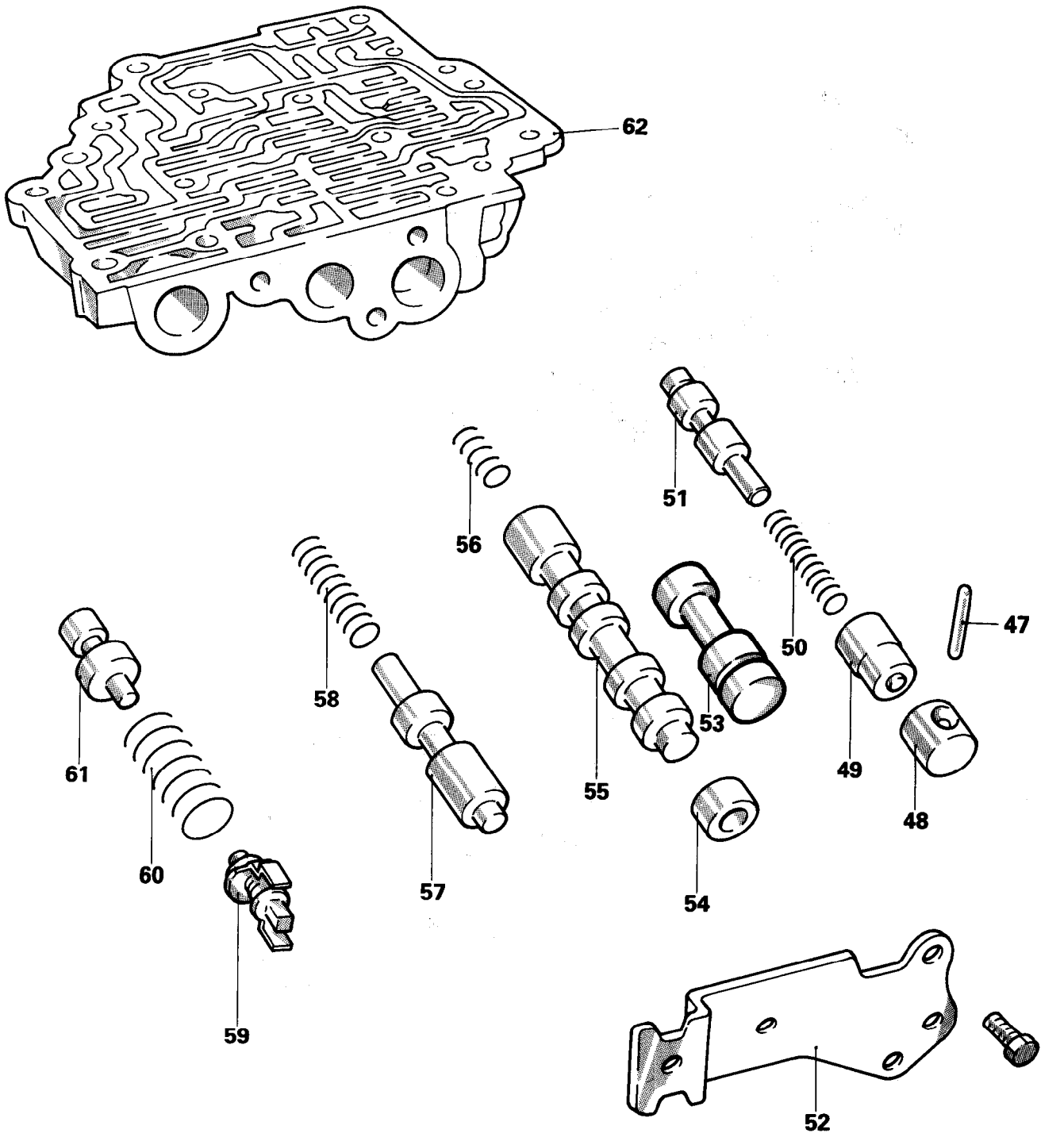

Viewed from B




TFA0518

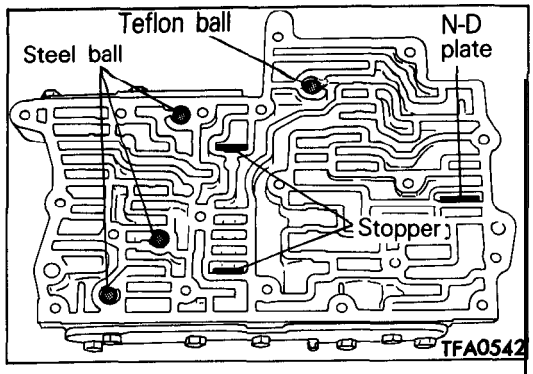
24. Fornt end cover
25. Pressure control spring
26. Pressure control valve
27. Torque converter control spring
28. Torque converter control valve
29. Adjusting screw
30. Regulator spring
31. Regulator valve
32. Shift control spring
◆◆ 33. Stopper plate
34. Shift control plug
35. Rear clutch exhaust valve A
36. Rear clutch exhaust valve B
37. Rear clutch exhaust spring
38. 2-3/4-3 shift spring
39. 2-3/4-3 shift valve
40. Rear end cover
41. Shift control plug B
● + 42. Stopper plate
43. Shift control valve
44. 1-2 shift spring
45. 1-2 shift valve
46. Upper valve body

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Reassembly".




47. Pin
48. Stopper
49. End clutch plug
50. End clutch spring
51. End clutch valve
52. End cover
53. Plug <F4A33·W4A33>
54. Damper clutch control sleeve <F4A22>
55. Damper clutch control valve <F4A22>
56. Damper clutch control spring <F4A22>
57. N-R control valve
58. N-R control spring
59. Adjusting screw
60. Reducing spring
61. Reducing valve
62. Lower valve body

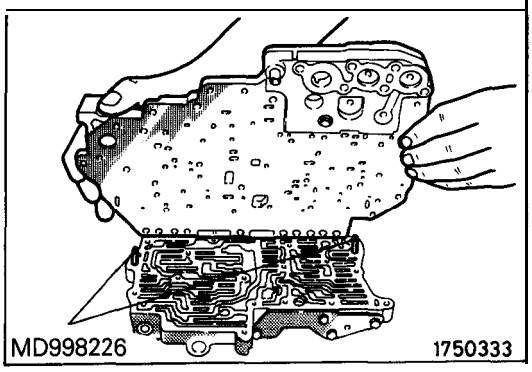
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● 4 : Refer to "Service Points of Reassembly".




## SERVICE POINTS OF REASSEMBLY

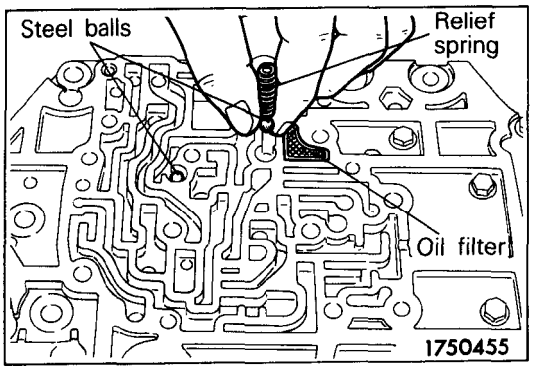
### 42./33. LOCATION OF STOPPER PLATES/20. N-D PLATE/19. TEFLON BALL/18. STEEL BALL

Install the stopper plates, N-D plate, teflon ball and steel ball in the upper valve body in the positions shown in the figure.



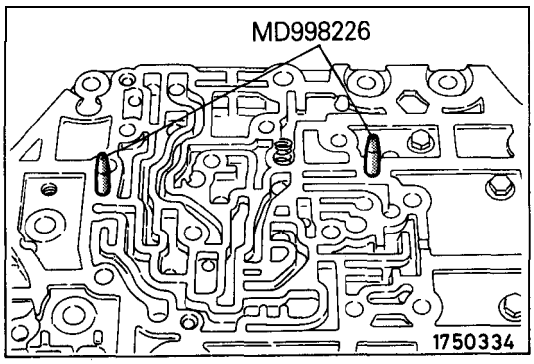

### 17. INSTALLATION OF UPPER VALVE BODY SUB ASSEMBLY

Install the special tool, then, after securing the upper separating plate and the intermediate plate by the eight installation bolts, remove the special tool.



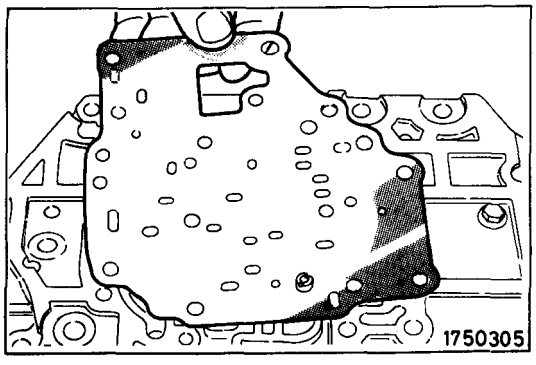

### 16. INSTALLATION OF OIL FILTER/15. STEEL BALL/14. RELIEF SPRING

Install, to the intermediate plate, the oil filter, the two steel balls, and the spring.

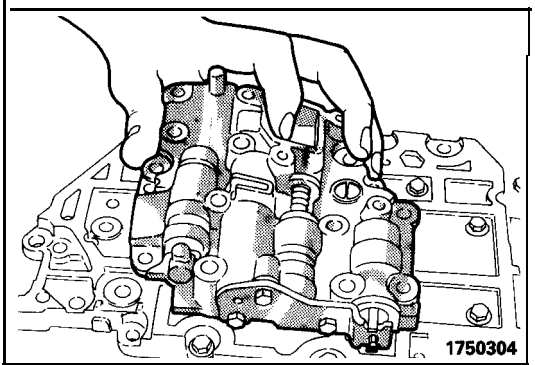



### 10. INSTALLATION OF LOWER VALVE BODY SUB ASSEMBLY

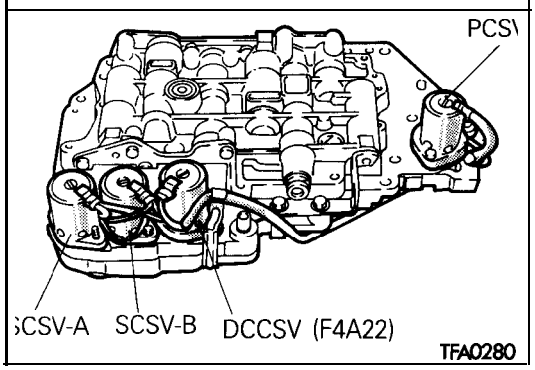
(1) Install the special tool to the intermediate plate.




(2) Install the separating plate.




(3) After securing the lower valve body by the installation bolt, remove the special tool.




### 5./4./3./2. INSTALLATION OF SOLENOID VALVE ASSEMBLY

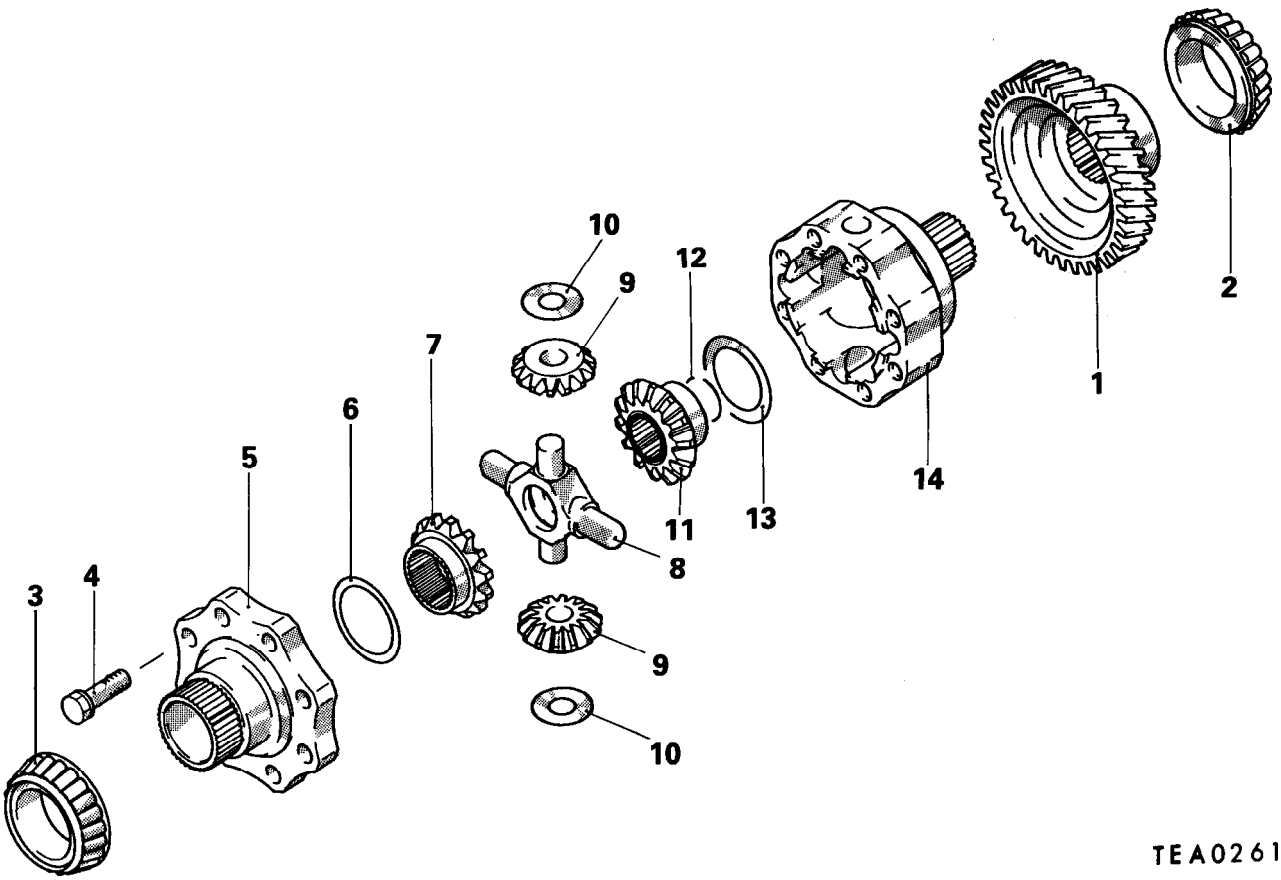
Install each solenoid valve in the position shown in the figure.

| Solenoid valve | Wiring color |
|---|---|
| Shift control solenoid valve “A” | Orange |
| Shift control solenoid valve “B” | Yellow |
| Damper clutch control solenoid valve | Red |
| Pressure control solenoid valve | Blue |

# CENTER DIFFERENTIAL <W4A33>

N21LWAA

## DISASSEMBLY AND REASSEMBLY

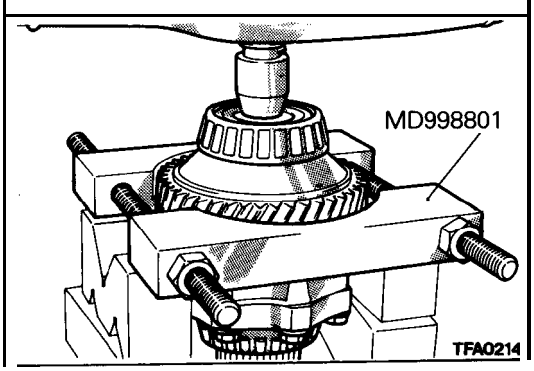



TEA0261

**Disassembly steps**

- ⬮ ☒ 1. Transfer driven gear
- ◆◆ ● 2. Taper roller bearing
- ● * ◆◆ 3. Taper roller bearing
- ◆◆ 4. Bolt
- 5. Center differential flange
- ● + 6. Spacer
- 7. Side gear (front)
- 8. Pinion shaft
- 9. Pinion
- 10. Washer
- 11. Side gear (rear)
- 12. Clip
- ● * 13. Spacer
- 14. Center differential case

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to Service Points of Reassembly
(4) N : Non-reusable parts

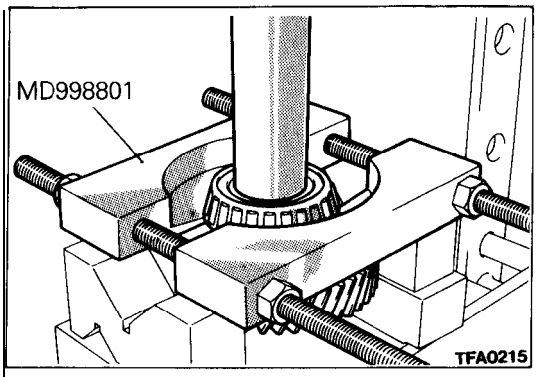



## SERVICE POINTS OF DISASSEMBLY

### 1. REMOVAL OF TRANSFER DRIVEN GEAR

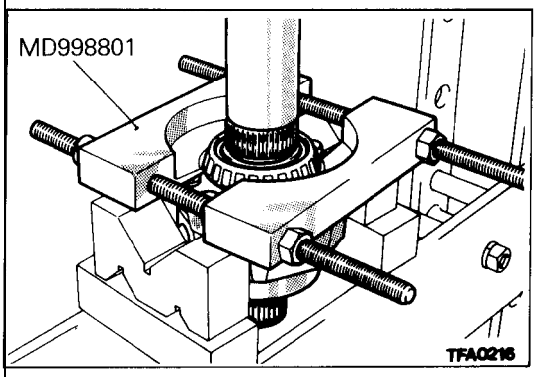
Remove the transfer driven gear.

NOTE
If it is hard to remove, use the special tool to remove it.




### 2. REMOVAL OF TAPER ROLLER BEARING

Using the special tool, remove the taper roller bearing from the transfer driven gear.



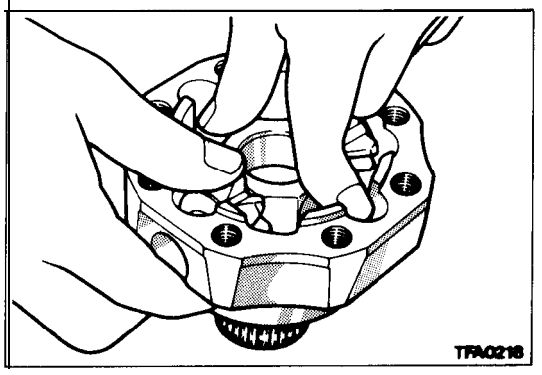

### 3. REMOVAL OF TAPER ROLLER BEARING

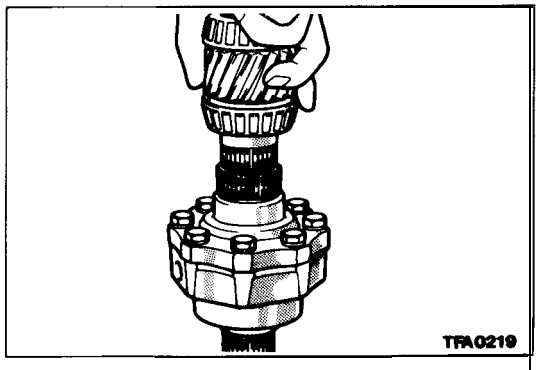
Using the special tool, remove the taper roller bearing from the center differential flange.

## SERVICE POINTS OF REASSEMBLY

### 13./6. SELECTION OF SPACERS

(1) Install the spacer, side gear (rear), pinion, washer and pinion shaft in the center differential case.
(2) While pressing the pinion shaft, select the thickest spacer to gently rotate the pinion.

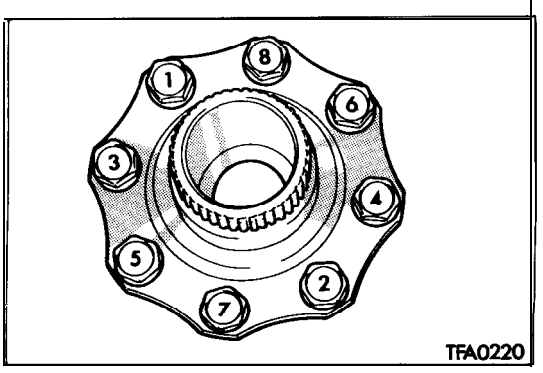



(3) Install the side gear (front), spacer and center differential flange and tighten the bolts with the specified torque.

**Center differential drive gear bolt:**
**70–80** Nm (51-57 **ft.lbs.)**

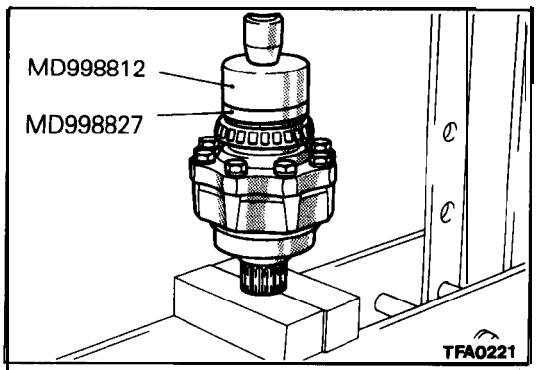
(4) Using the front output shaft, rotate the side gear front and select the thickest spacer to gently rotate the side gear front.




### 4. INSTALLATION OF BOLT

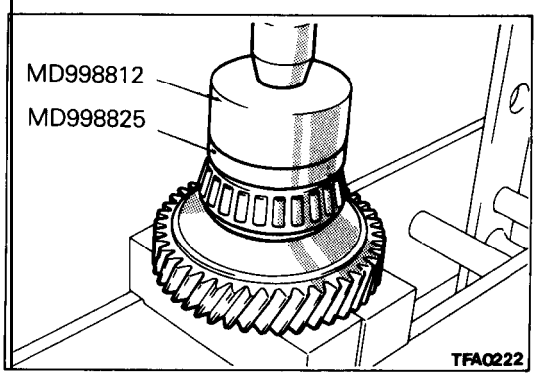
First apply sealant to the end [5 mm (.2 in.)] of the bolt threads and then tighten to the specified torque in the order shown in the figure.

**Center differential drive gear bolt:**
**70–80 Nm (51–57 ft.lbs.)**
**Specified adhesive: MOPAR Part No.4318031 or MOPAR Part No.4318032 or equivalent**




### 3. INSTALLATION OF TAPER ROLLER BEARING

Using the special tool, install the taper roller bearing on the center differential flange.



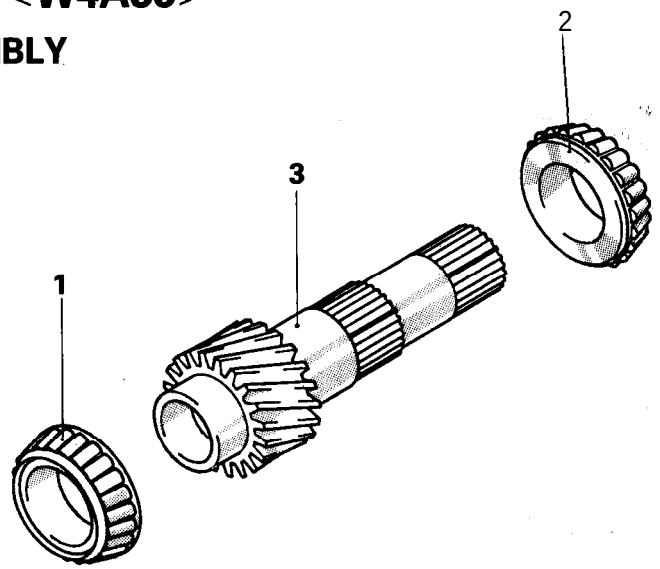

### 2. INSTALLATION OF TAPER ROLLER BEARING

Using the special tool, install the taper roller bearing on the transfer driven gear.

# FRONT OUTPUT SHAFT <W4A33>

N21LXAA

## DISASSEMBLY AND REASSEMBLY

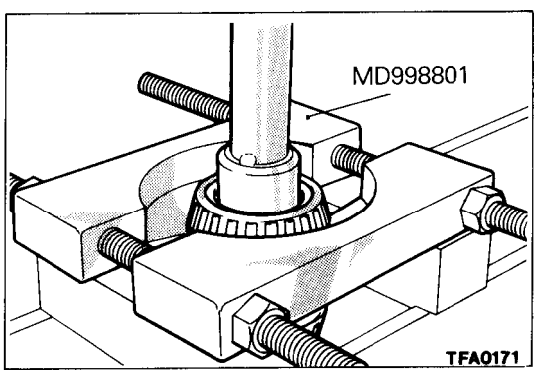



TFA0244

**Disassembly steps**

◆◆ ● 1. Taper roller bearing
◆◆ ● 4 2. Taper roller bearing
3. Front output shaft

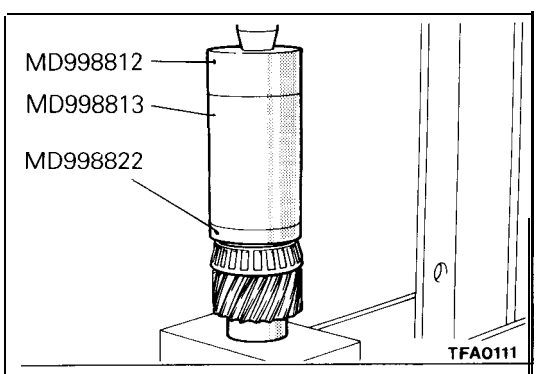
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● 4 : Refer to "Service Points of Reassembly".

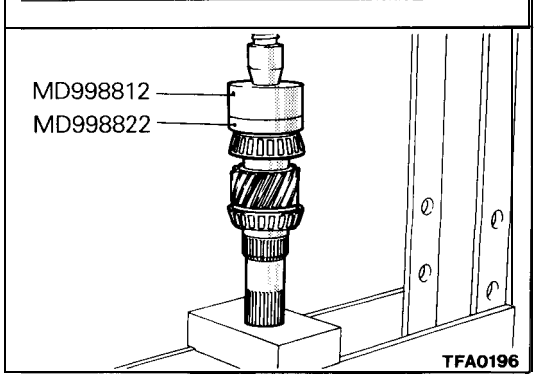



## SERVICE POINTS OF DISASSEMBLY

### 1./2. REMOVAL OF TAPER ROLLER BEARINGS

Using the special tool, remove the taper roller bearings on both ends of the front output shaft.




## SERVICE POINTS OF REASSEMBLY

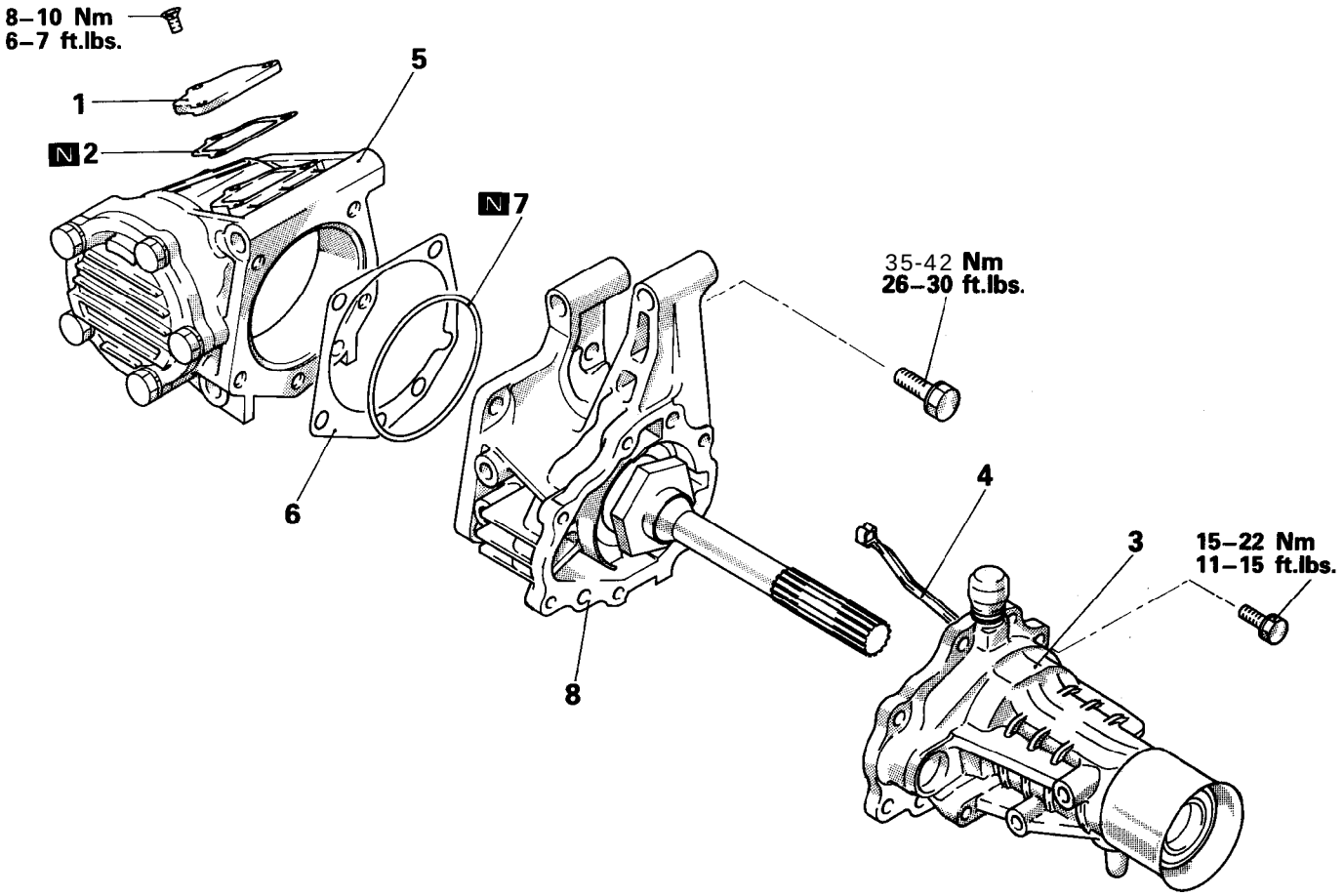
### 2./1. INSTALLATION OF TAPER ROLLER BEARINGS

Using the special tool, press-fit the taper roller bearings on both ends of the front output shaft.

# TRANSFER ASSEMBLY

N21VE--

## DISASSEMBLY AND REASSEMBLY

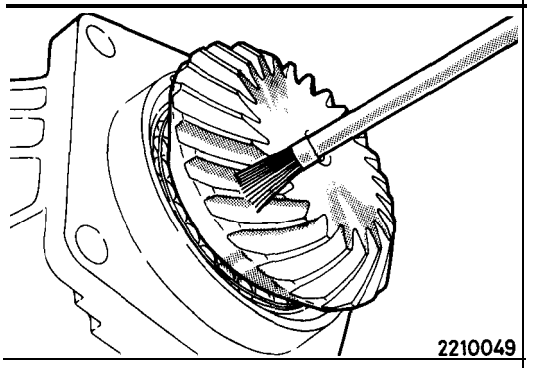



TFA0601

**Disassembly steps**

1. Cover
2. Cover gasket
3. Extension housing assembly
4. Oil guide
- ◖ | 5. Transfer case sub assembly
- ● 6. Spacer
7. O-ring
- ◖ + 8. Transfer case adapter sub assembly

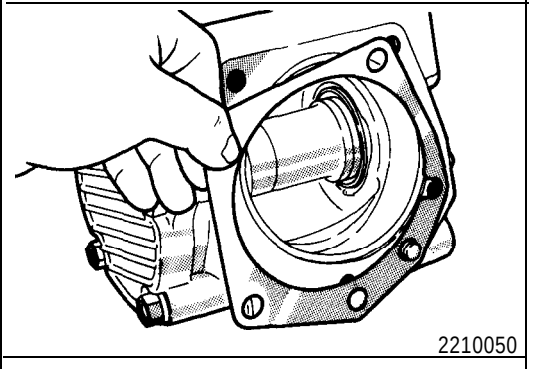
NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ● 4 : Refer to "Service Points of Reassembly".
(3) N : Non-reusable parts


2210049

## SERVICE POINTS OF REASSEMBLY N21VHAB

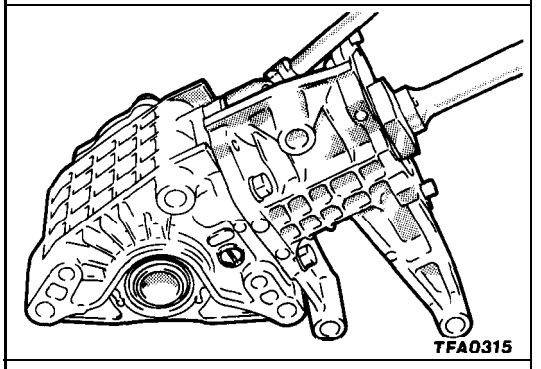
### 8. INSTALLATION OF TRANSFER CASE ADAPTER SUB ASSEMBLY

Using a brush, apply a thin even coat of machine blue or minium to both tooth surfaces of the driven bevel gear.


2210050

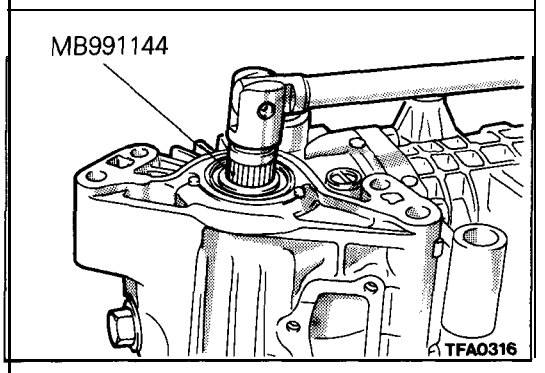
### 6. INSTALLATION OF SPACER

Install the spacer which has been used so far.


TFA0315

### 5. INSTALLATION OF TRANSFER CASE SUB ASSEMBLY

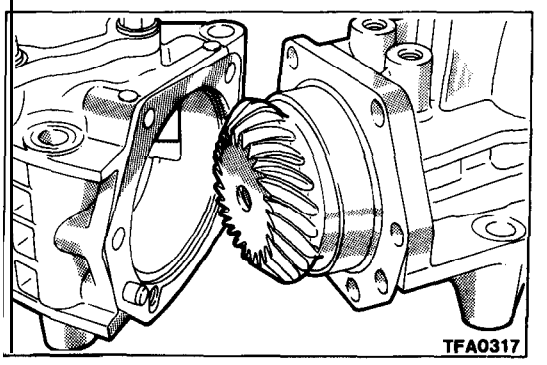
(1) Tighten the transfer case adapter sub assembly on the transfer case sub assembly to the specified torque.



TFA0316

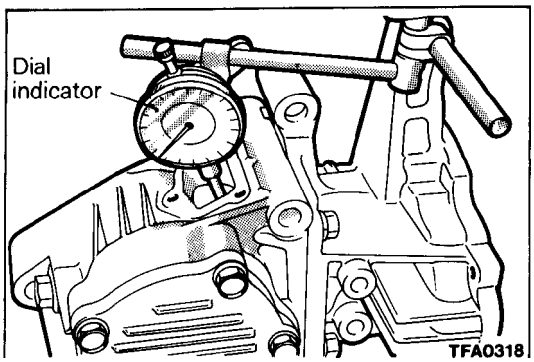
(2) Using the special tool, turn the drive bevel gear shaft one turn each in the direction of normal and reverse rotation.

**Caution**
**Do not rotate the drive bevel gear shaft more than one turn as it cause a blurred tooth contact pattern.**


TFA0317

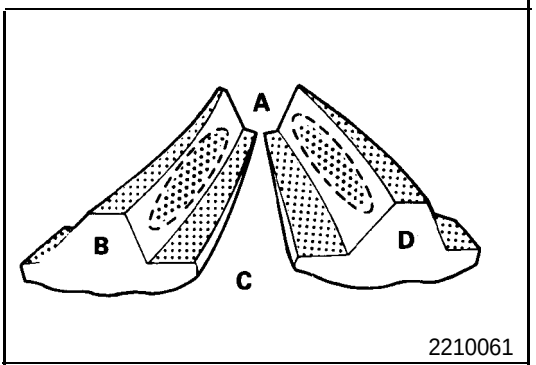
(3) Make sure that the contact pattern of the driven bevel gear teeth is correct.

NOTE
See Tooth Contact Adjustment Procedure on next page for the standard tooth contact pattern.




(4) Check to see if the backlash between the drive and driven bevel gears is up to specification.

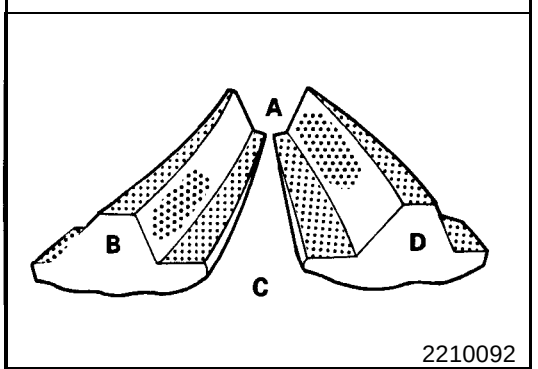
**Standard value**
**Bevel gear set backlash:**
**0.08–0.13 mm (.0031–.005 in.)**




## TOOTH CONTACT ADJUSTMENT PROCEDURE

### 1. Standard tooth contact pattern

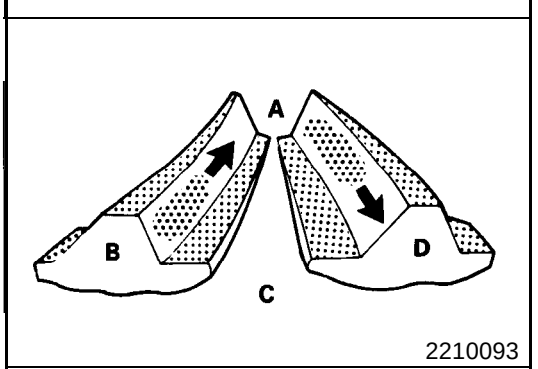
A: Small end
B: Drive side tooth surface
(The side receiving force in forward motion)
C: Big end
D: Coast side tooth surface
(The side receiving force in reverse motion)

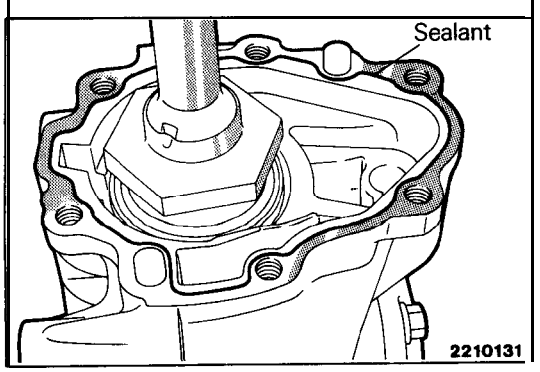



### 2. Tooth contact pattern when driven bevel gear is too high

Possible cause:
The driven bevel gear is too close to the drive bevel gear.

Remedy:
Use a thicker spacer for the driven bevel gear mount adjustment so that the driven bevel gear is further away from the drive bevel gear.



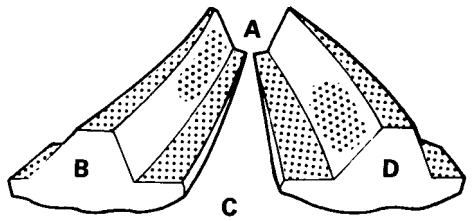




### 3. INSTALLATION OF EXTENSION HOUSING ASSEMBLY

Apply sealant to the flange surface of the adapter and install the housing.

**Specified sealant: Mitsubishi genuine Part No.997740 or equivalent**

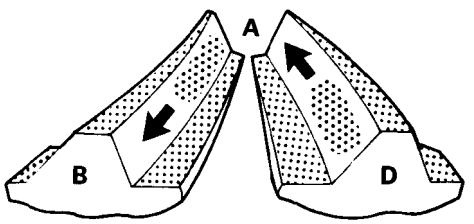
**Caution**
**Squeeze out the sealant from the tube uniformly without excess or discontinuities.**



2210094

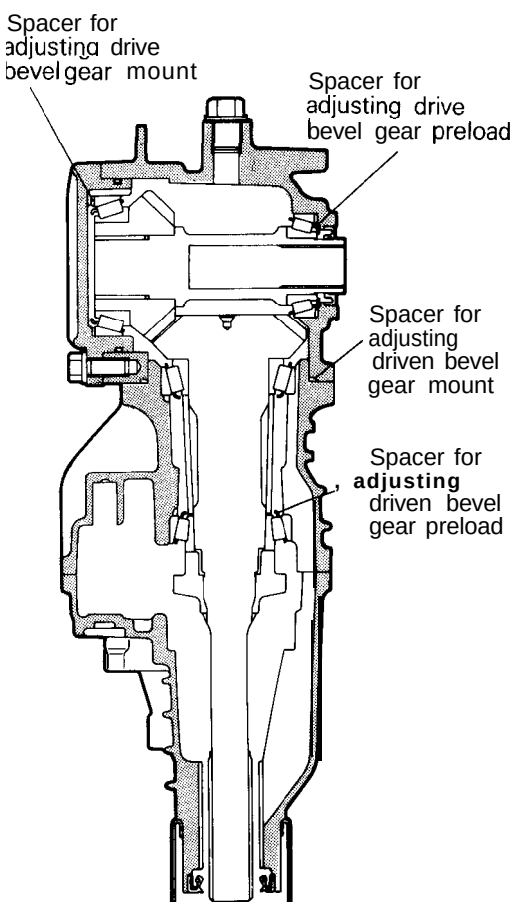
**3. Tooth contact pattern when driven bevel gear is too low**

Possible cause:
The driven bevel gear is further away from the drive bevel gear than necessary.



2210095

Remedy:
Use a thinner spacer for the driven bevel gear mount adjustment so that the driven bevel gear is closer to the drive bevel gear.



2210129

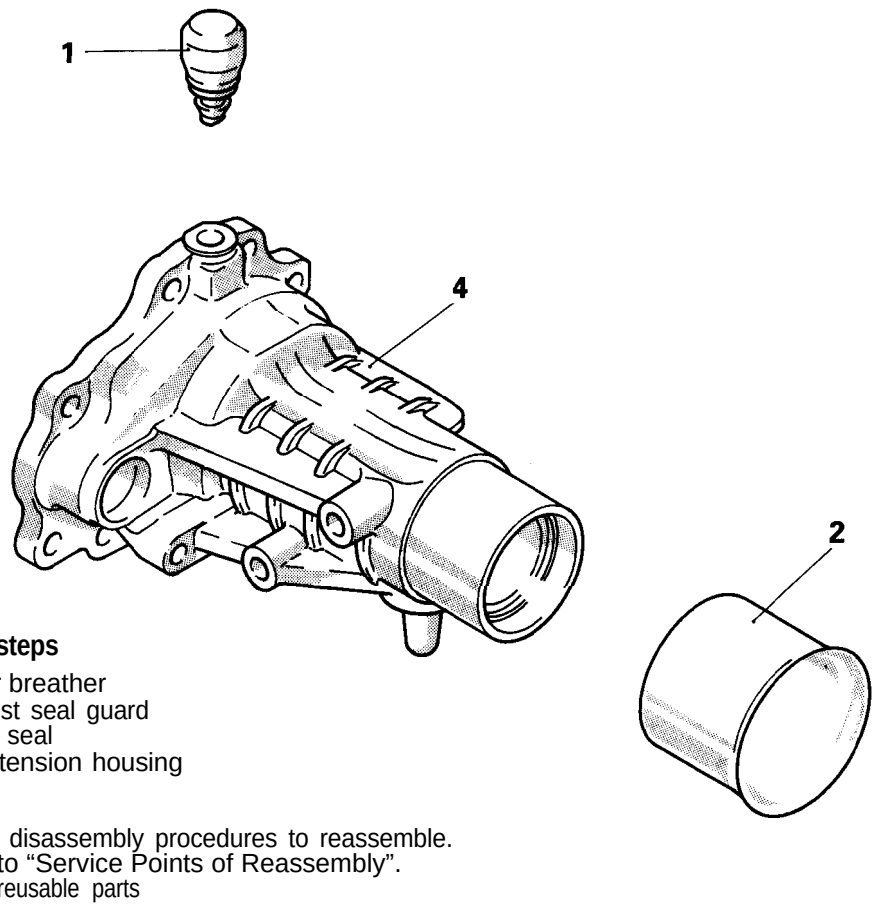
NOTE
(1) If correct tooth contact cannot be obtained by replacement of spacer for adjusting driven bevel gear mount, change the spacers for adjustment of drive bevel gear preload and drive bevel gear mount adjustment to those of appropriate thickness as described below and adjust the tooth contact again.
- If the driven bevel gear height is still too small when the thinnest spacer for driven bevel gear mount adjustment [0.13 mm (.005 in.)] is used;
  Change the spacer for drive bevel gear mount adjustment to the next thicker one and change the spacer for drive bevel gear preload adjustment to the next thinner one.
- If the driven bevel gear height is still too large when the thickest spacer for driven bevel gear mount adjustment [0.52 mm (.021 in.)] is used;
  Change the spacer for drive bevel gear mount adjustment to the next thinner one and change the spacer for drive bevel gear preload adjustment to the next thicker one.
  Repeat above steps until standard tooth contact pattern is obtained.

(2) If the tooth contact pattern cannot be brought close to the standard pattern by the adjustment described above, replace the drive bevel gear and driven bevel gear as a set and adjust the tooth contact again.

# EXTENSION HOUSING ASSEMBLY

N21VGAA

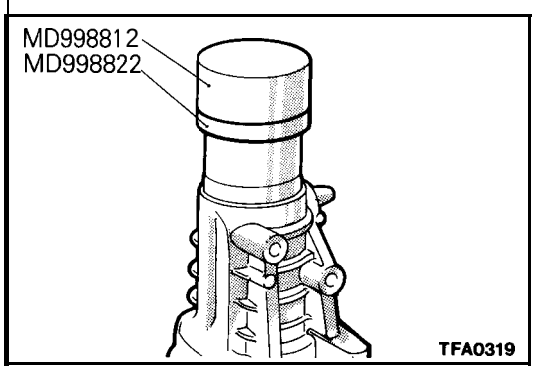
## DISASSEMBLY AND REASSEMBLY

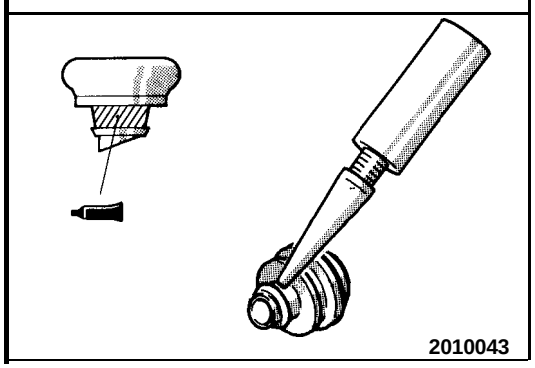



**Disassembly steps**

- ⬮ + 1. Air breather
  2. Dust seal guard
- ● * 3. Oil seal
  4. Extension housing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Reassembly".
(3) ❑ : Non-reusable parts




## SERVICE POINTS OF REASSEMBLY

### 3. INSTALLATION OF OIL SEAL

Using the special tool, install the oil seal.

### 1. INSTALLATION OF AIR BREATHER

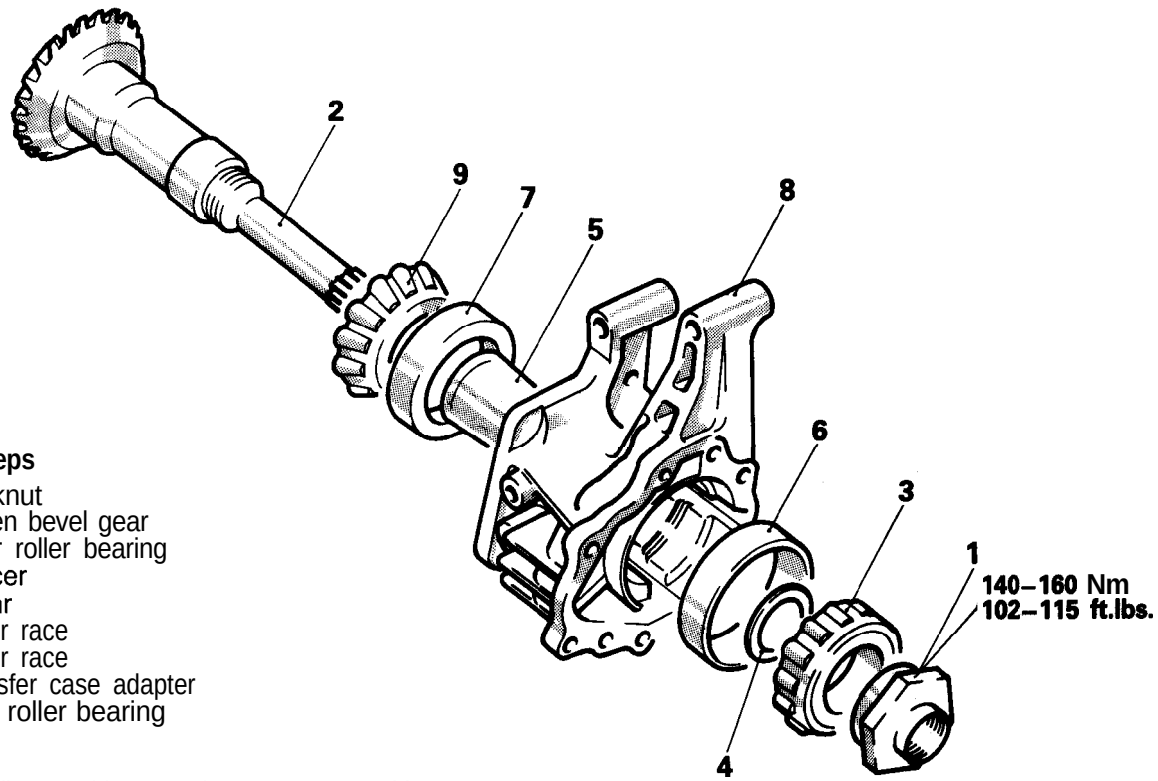
Apply sealant to the air breather port and fit the air breather in position.

**Specified sealant: MOPAR Part No.4318025 or equivalent**

# TRANSFER CASE ADAPTER SUB ASSEMBLY <W4A33>

N21VLAA

## DISASSEMBLY AND REASSEMBLY

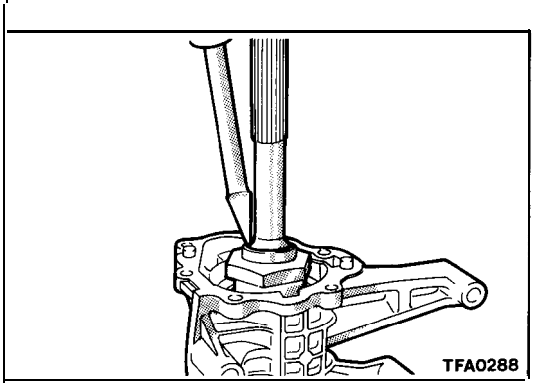


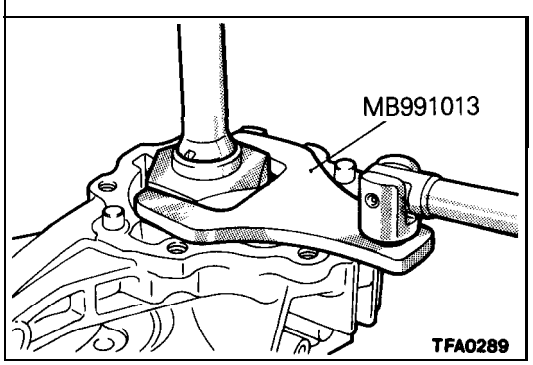

**Disassembly steps**

◆◆ ◆◆ 1. Locknut
◆◆ 2. Driven bevel gear
◆◆ 3. Taper roller bearing
◆◆ 4. Spacer
5. Collar
6. Outer race
7. Outer race
8. Transfer case adapter
◆◆ ◆◆ 9. Taper roller bearing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly:'.
(3) ◆◆: Refer to "Service Points of Reassembly
(4) N : Non-reusable parts

TEA0 604



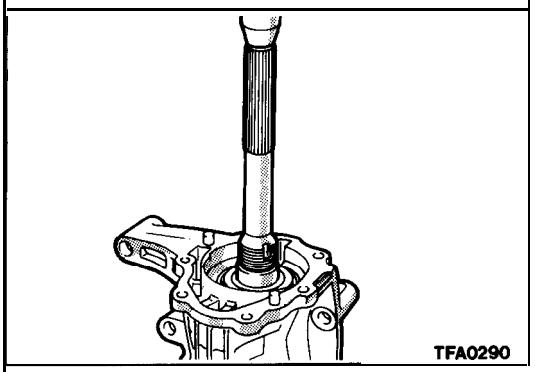




## SERVICE POINTS OF DISASSEMBLY

### 1. REMOVAL OF LOCK NUT

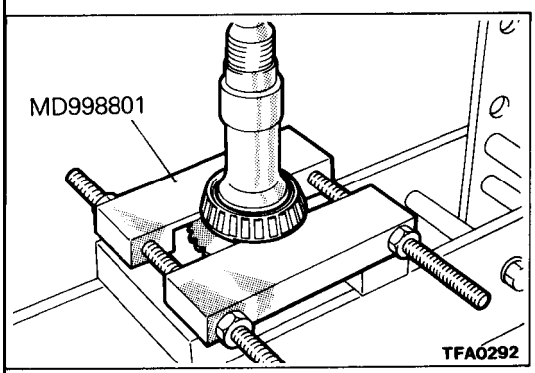
(1) Unstake the lock nut.

(2) Remove the driven bevel gear's lock nut by using the special tool.




### 2. REMOVAL OF DRIVEN BEVEL GEAR ASSEMBLY

Using a press, remove the driven bevel gear assembly.



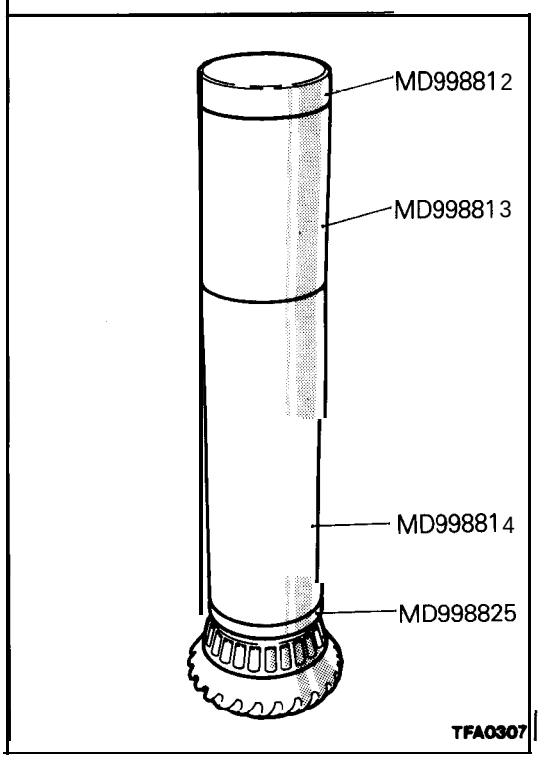

### 9. REMOVAL OF TAPER ROLLER BEARING

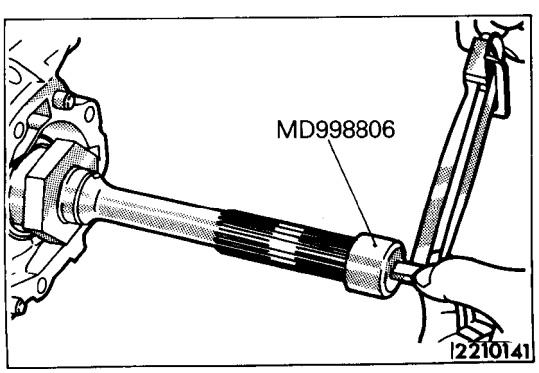
Using the special tool, remove the taper roller bearing.

## SERVICE POINTS OF REASSEMBLY

### 9. INSTALLATION OF TAPER ROLLER BEARING

Using the collar, install the taper roller bearing.

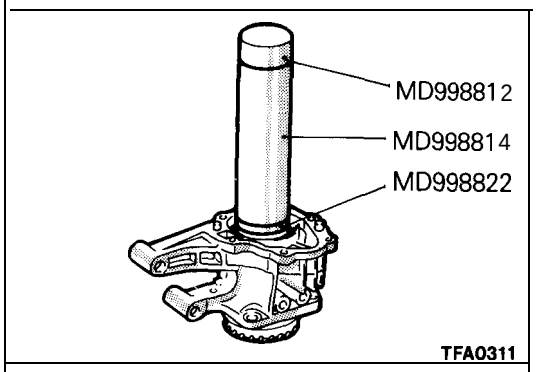



### 4. SPACER SELECTION

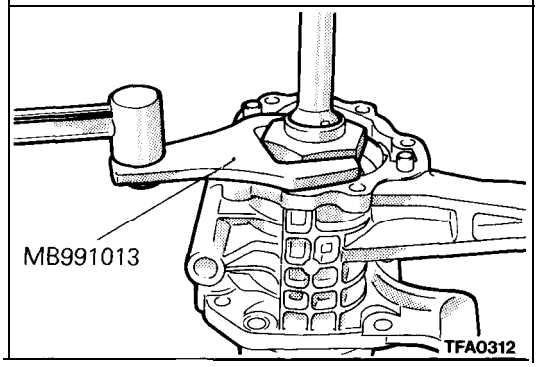
(1) First install the spacers used up to this time, and then assemble the transfer case adapter sub-assembly.
(2) Using the special tool, measure the rotating drive torque of the driven bevel gear and select spacer(s) so it reaches within the standard value.

**Standard value: 1.0–1.7 Nm (0.72–1.23 ft.lbs.)**



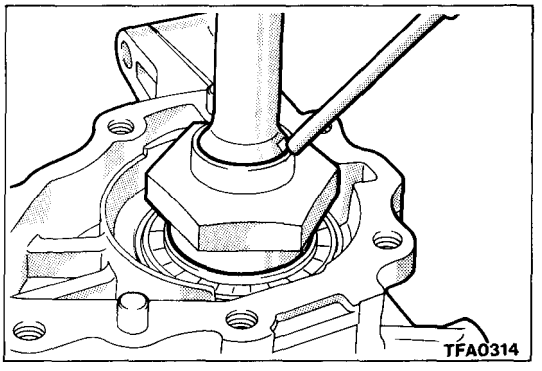

### 3. INSTALLATION OF TAPER ROLLER BEARING

Using the special tool, install the taper roller bearing.




### 1. INSTALLATION OF LOCK NUT

(1) Tighten the driven bevel gear's lock nut at the specified torque by using the special tool.

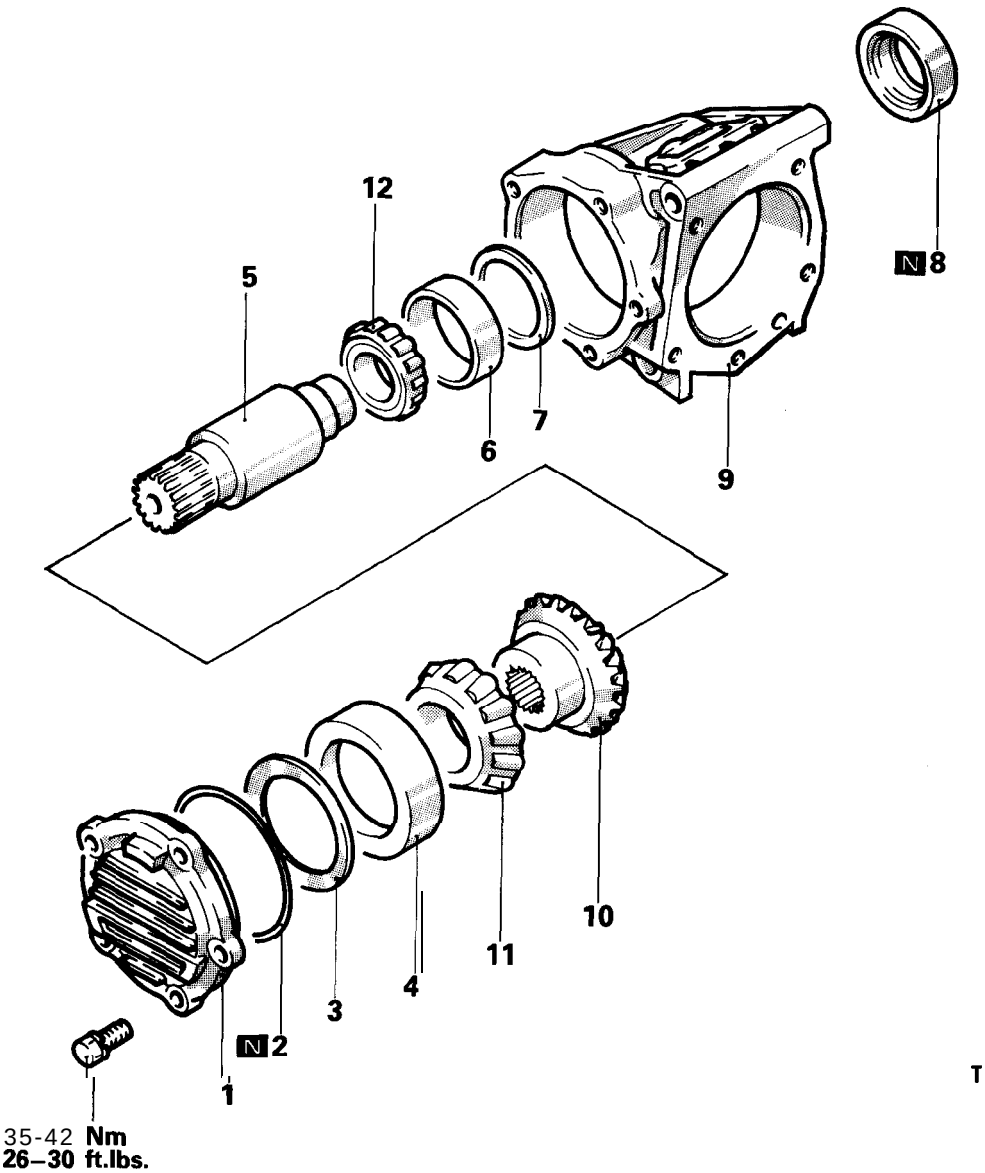



(2) Stake the lock nut at two places for locking.

# TRANSFER CASE SUB ASSEMBLY

N21VJAA

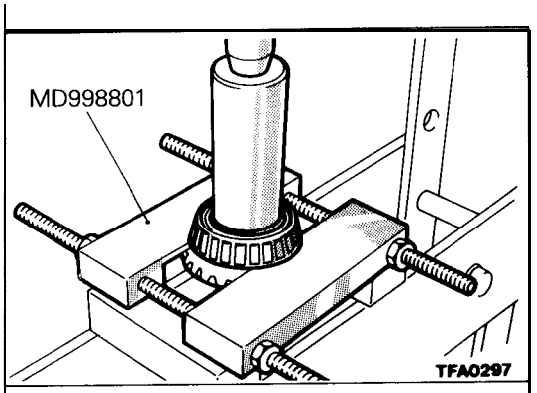
## DISASSEMBLY AND REASSEMBLY

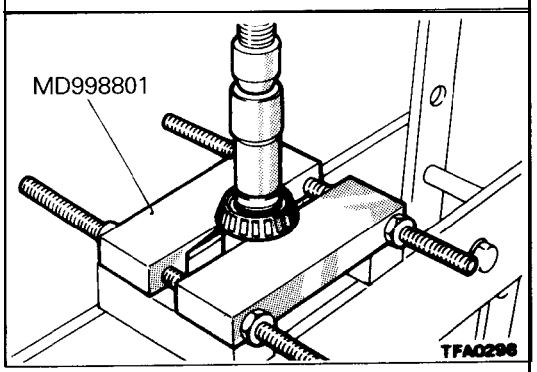



**Disassembly steps**

1. Transfer cover
2. O-ring
3. Spacer
4. Outer race
5. Drive bevel gear shaft
6. Outer race
7. Spacer
8. Oil seal
9. Transfer case
10. Drive bevel gear
11. Taper roller bearing
12. Taper roller bearing

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts

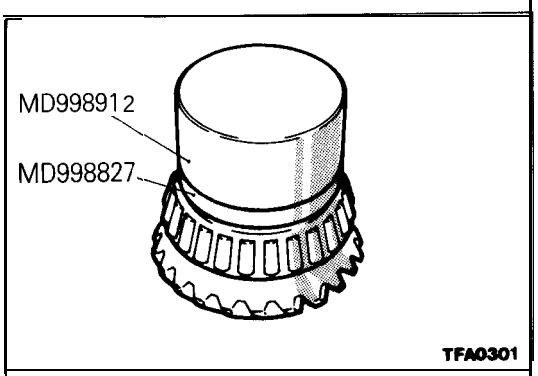



## SERVICE POINTS OF DISASSEMBLY

### 11./12. REMOVAL OF TAPER ROLLER BEARINGS

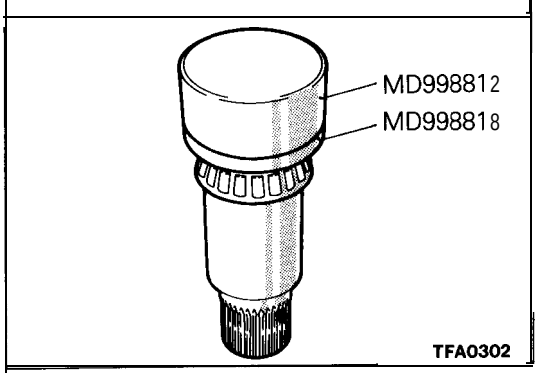
Using the special tool, remove the taper roller bearing.

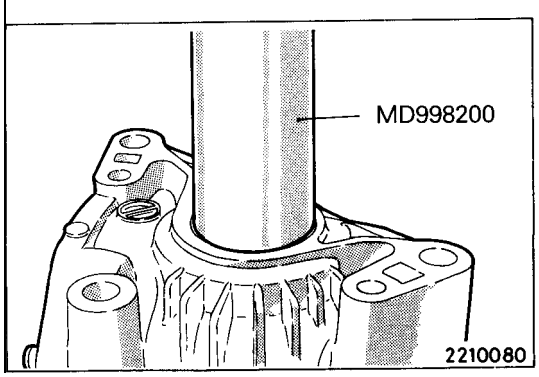



## SERVICE POINTS OF REASSEMBLY

### 12./1 1. INSTALLATION OF TAPER ROLLER BEARINGS

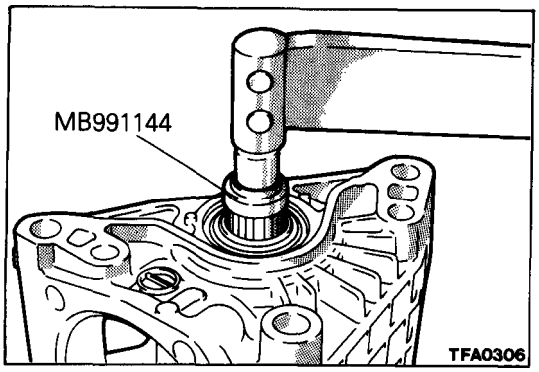
Using the special tool, install the taper roller bearing.




### 8. INSTALLATION OF OIL SEAL

Using the special tool, install the oil seal.




### 7./3. SPACER(S) SELECTION

(1) First install the spacers used up to this time and then assemble the transfer case sub-assembly.
(2) Using the special tool, measure the rotating drive torque of the drive bevel gear and select spacer(s) so it reaches the standard value.

**Standard value: 1.7–2.5 Nm (1.23–1.81 ft.lbs.)**

**Caution**
**Select spacers of nearly same thickness on both sides.**

## NOTES

# WHEELS AND TIRES

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N22AA--


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- Bald Spots
- Cracked Treads
- Feathered Edge
- Rapid Wear at Center
- Rapid Wear at Shoulders
- Scalloped Wear
- Wear on One Side

**WHEEL AND TIRE ..... 5**

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N22CA--

| Items | Vehicles with 1.8L Engine | Vehicles with 2.0L DOHC Engine <Non-Turbo> | Vehicles with 2.0L DOHC Engine <Turbo>-FWD | Vehicles with 2.0L DOHC Engine <Turbo>-AWD |
|---|---|---|---|---|
| Wheel | | | | |
| Tire size | PI 85/70R14 | P205/55R16 89H<br>P205/55R16 89V<br>205/55R16 88V | P205/55R16 89V<br>205/55R 16 88V | P205/55R 16 89V<br>205/55R16 88V |
| Wheel type | Steel type | Steel/Aluminium type | Aluminium type | Aluminium type |
| Wheel size | 14 × 5½JJ | 16 × 6JJ | 16 × 6JJ | 16 × 6JJ |
| Amount of wheel offset mm (in.) | 46 (1.8) | 46 (1.8) | 46 (1.8) | 46 (1.8) |
| Tire inflation pressure kPa (psi) | | | | |
| Front | 200 (29) | 200 (29) | 200 (29) | 220 (32) |
| Rear | 180 (26) | 180 (26) | 180 (26) | 200 (29) |
| Spare wheel | | | | |
| Tire size | T125/70D15 | T125/70D15<br>T125/80D16* | | T125/90D16 |
| Wheel size | 4T × 15 | 4T × 15<br>4T × 16* | | 4T × 16 |
| Amount of wheel offset mm (in.) | 46 (1.8) | 46 (1.8) | | 46 (1.8) |
| Tire inflation pressure kPa (psi) | 420 (60) | 420 (60) | | 420 (60) |

NOTE
*: <ABS>

## SERVICE SPECIFICATIONS

N22CB--

| Iterns | Specifications |
|---|---|
| Limit | |
| Wheel runout | |
| Radial mm (in.) | 2.0 (.08) |
| Lateral mm (in.) | 2.0 (.08) |
| Tread depth of tire mm (in.) | 1.6 (.06) |

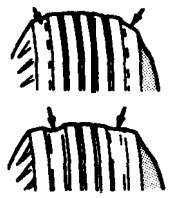
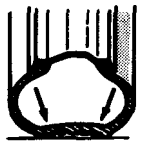
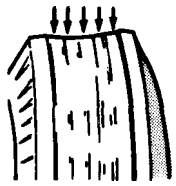
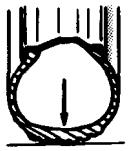
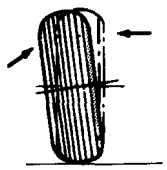
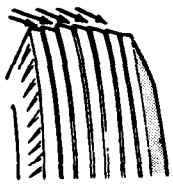
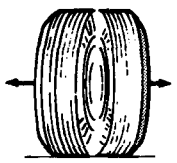
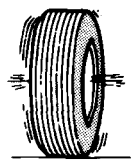
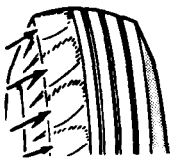
## TORQUE SPECIFICATIONS

N22CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Hub nuts | 120–140 | 87–101 |

# TROUBLESHOOTING

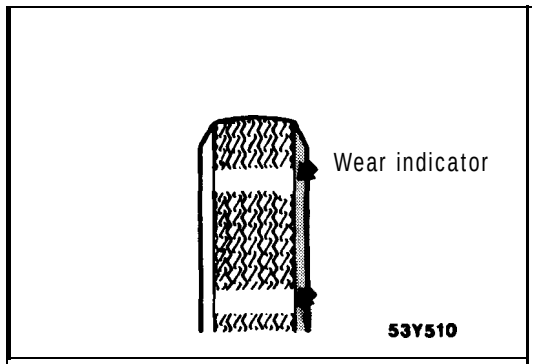
N22EA--

| Symptom | Probable cause | Remedy |
|---|---|---|
| Rapid wear at shoulders  | Under-inflation or lack of rotation  | Adjust the tire pressure |
| Rapid wear at center  | Over-inflation or lack of rotation  | |
| Cracked treads  | Under-inflation | |
| Wear on one side  | Excessive camber  | Inspect the camber |
| Feathered edge  | Incorrect toe-in  | Adjust the toe-in |
| Bald spots  | Unbalanced wheel  | Adjust the imbalanced wheels |
| Scalloped wear  11U0047 | Lack of rotation of tires or worn or out-of-alignment suspension | Rotate the tires Inspect the front suspension alignment |

# SERVICE ADJUSTMENT PROCEDURES

## TIRE INFLATION PRESSURE CHECK N22FDAC

Check the inflation pressure of the tires. If it is not within the standard value, make the necessary adjustment.



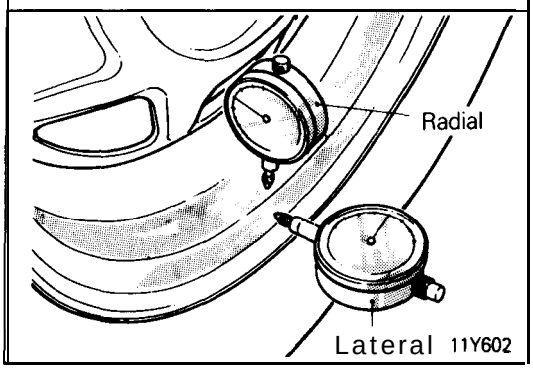

## TIRE WEAR CHECK N22FBAB

Measure the tread depth of tires.

**Limit: 1.6 mm (.06 in.)**

If the remaining tread depth is less than the limit, replace the tire.

NOTE
When the tread depth of tires is reduced to 1.6 mm (.06 in.) or less, wear indicators will appear.




## WHEEL RUNOUT CHECK N22FCAB

Jack up the vehicle so that the wheels are clear of the floor. While slowly turning the wheel, measure wheel runout with a dial indicator.

**Limit:**

| | |
|---|---|
| **Radial** | **2.0 mm (.08 in.)** |
| **Lateral** | **2.0 mm (.08 in.)** |

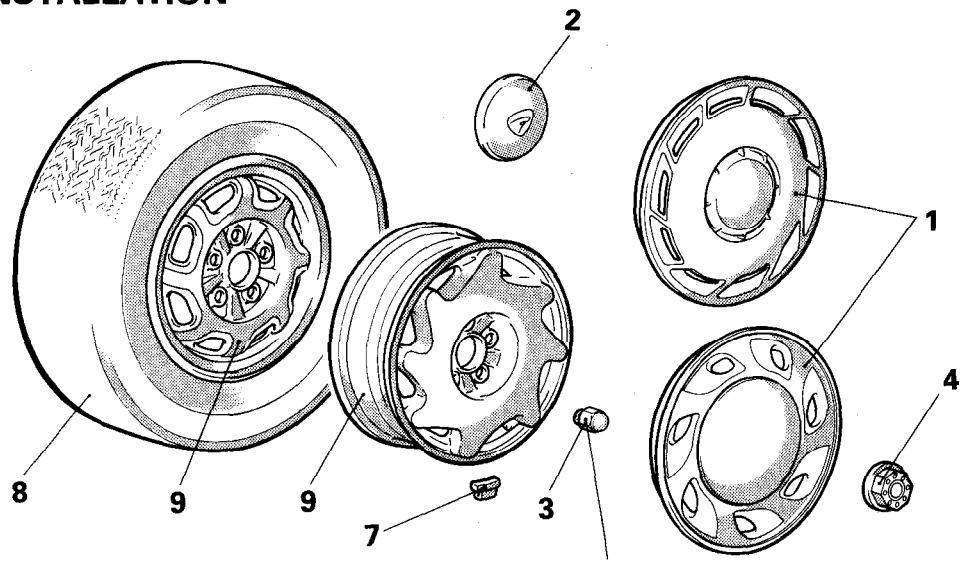
If wheel runout exceeds the limit, replace the wheel.

# WHEEL AND TIRE

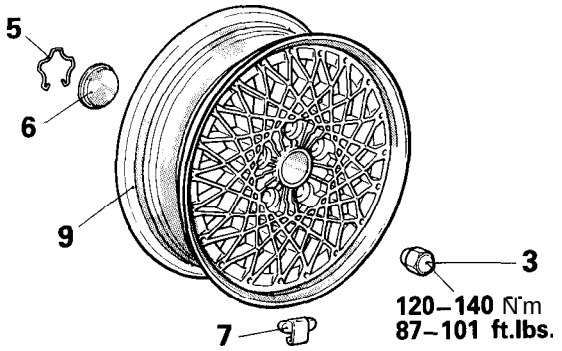
N22GA--

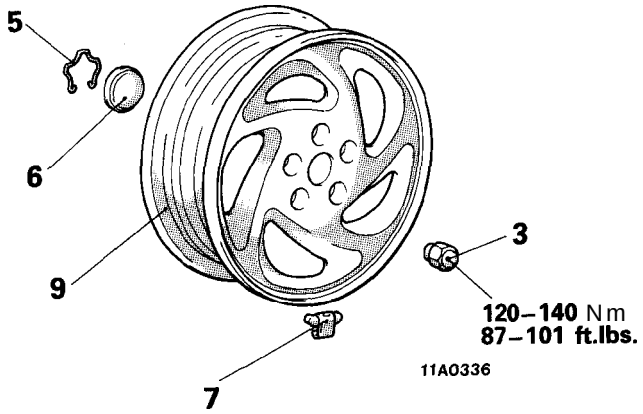
## REMOVAL AND INSTALLATION

**Steel type**




**Aluminium type**

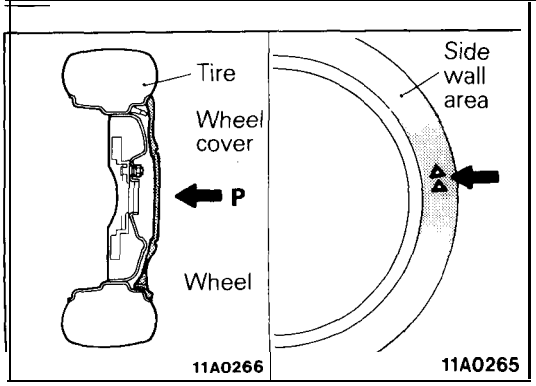



Removal steps

1. Wheel cover <Vehicles with wheel cover>
2. Center cover <Vehicles with center cover>
◆◆ 3. Hub nuts
4. Center cap <Vehicles with center cap>
5. Spring
6. Ornament
7. Balance weight
8. Tire
9. Wheel

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● ◆: Refer to "Service Points of Installation"




## SERVICE POINT OF INSTALLATION

N22GDABa

### 2. INSTALLATION OF HUB NUTS

On the high speed tire (205/55R16 88V) vehicle, the left and right tires are respectively specified. Attach the tires as follows :

Observe the wheel in the P direction as illustrated, and the direction characters will be found.

Attach the (◁◁ ROTATION LEFT SIDE) tire on the left wheel, and the (ROTATION RIGHT SIDE ▷▷) tire on the right wheel.

## INSTRUCTIONS FOR ALUMINUM TYPE WHEELS N22GFAA

1. Aluminum is vulnerable to alkalies. If a vehicle washing detergent has been used, or salt from sea water or road chemicals has adhered, wash the vehicle as soon as possible. After washing the vehicle, apply body or wheel wax to the aluminum type wheels to prevent corrosion.
2. When cleaning the vehicle with steam, do not direct steam onto the aluminum type wheels. When tightening nuts for aluminum type wheels, particularly observe the following:
   (1) Clean the hub surface of aluminum type wheels.
   (2) After finger-tightening wheel nuts, tighten them to specifications.
   (3) Do not use an impact wrench or push the wrench by foot to tighten the wheel nuts.
   (4) Do not apply oil to the threaded portions.

## INSTRUCTIONS FOR TIRE CHAINS AND SNOW TIRES N22GGAA

1. Use tire chains only on front wheels. Do not use tire chains on rear wheels.
2. When using snow tires, use them on all four wheels for maneuverability and safety.

## INSTRUCTIONS FOR COMPACT SPARE TIRE N22GHAA

1. The compact spare tire is designed to save space in the luggage compartment, and its lighter weight makes it easier to use if a fiat tire occurs.
2. The following instructions for the compact spare tire should be observed.
   (1) Check the inflation pressure after installing the spare, and adjust to the specified pressure.
   (2) Avoid driving through automatic car washes and over obstacles that could possibly damage the vehicle's undercarriage. Because the tire is smaller than the original tire, car ground clearance is slightly reduced.
   (3) The compact spare tire should not be used on any other wheels, nor should standard tires, snow tires, wheel covers or trim rings be used with the compact spare wheel. If such use is attempted, damage to these items or other vehicle components may occur.

# BODY

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# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N23CA--

| Items | Specifications |
|---|---|
| Hood | |
| Type | Rear hinged, front opening type |
| Door | |
| Construction | Front-hinged, sash construction |
| Regulator system | Wire type |
| Locking system | Pin-fork type |
| Liftgate | |
| Type | Inner-hinged, with gas damper |
| Glass installation method | |
| Windshield glass | Adhesive type |
| Quarter window glass | Adhesive type |
| Liftgate window glass | Adhesive type |
| Glass thickness mm (in.) | |
| Windshield glass | 5.3 (.21) |
| Liftgate window glass | 3.5 (.14) |
| Door glass | 3.5 (.14) |
| Quarter window glass | 3.5 (.14) |
| Power window motor | |
| Type | Permanent magnet type (Built-in circuit breaker) |
| Revolutions under no load rpm | 75 or more |
| Revolutions under load rpm | |
| At 1 Nm (.72 ft.lbs.) | 65-95 |
| At 2 Nm (1.45 ft.lbs.) | 50–80 |
| Bound current A | 34 or less |
| Direction of rotation | Clockwise and counter-clockwise |
| Power window main switch | |
| Type | Automatic reset type |
| Rated load current A | |
| Lock switch | 10 |
| Power window switch | 10 |
| Power window sub switch | |
| Type | Automatic reset type |
| Rated load current A | 10 |
| Power window relay | |
| Maximum contact current A | 20 |
| Rated coil current A | Max. 0.2 |
| Voltage drop between terminals V (At 12 V and the rated load current) | 0.2 or less |

| Items | Specifications |
|---|---|
| Door lock control unit | |
| Effective voltage V | 10–16 |
| Current consumption (when not in operation) mA | 3 or less |
| Door lock power relay | |
| Range of voltage used V | 8-16 |
| Rated load current (at 13.5 V) A | 10 |
| Rated coil current A | 0.2 or less |
| Voltage drop between terminals V | 0.2 or less |
| Door lock actuator | |
| Bound current (at 12 V) A | 2.5-4.5 |
| Operating voltage range V | 9-15 |
| • Tripping time (at 12 V) second | 5–30 |
| Remote control mirror | |
| Remote control mirror motor | |
| Bound current mA | 500 or less |
| Operating voltage range V | 9.5–15 |
| Door mirror control switch | |
| Rated load mA | 50 |
| Automatic seat belt motor | |
| Type | Ferrite magnet motor |
| Rated voltage V | 12 |
| No-load speed rpm | 140 |
| No-load current A | 4 |

NOTE
•: Tripping time is the time consumed until current reaches 0.5 A after power connection.

## SERVICE SPECIFICATIONS

N23CB--

| Items | Specifications |
|---|---|
| Standard value | |
| Door inside handle play mm (in.) | 2.5–8.5 (.09–.33) |
| Door outside handle play mm (in.) | 2.5-6.5 (.09–.25) |

## TORQUE SPECIFICATIONS

N23CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Hood hinge to hood | 9-14 | 7–10 |
| Hood hinge to body (bolt) | 17–26 | 12-19 |
| Hood hinge to body (nut) | 9-14 | 7–10 |
| Hood latch to body | 7-11 | 5-8 |

| Items | | Nm | ft.lbs. |
|---|---|---|---|
| Liftgate hinge to liftgate | | 9-14 | 7–10 |
| Liftgate hinge to body | | 11–16 | 8–12 |
| Liftgate latch to body | | 7–11 | 5-8 |
| Liftgate striker to liftgate | | 9-14 | 7–10 |
| Front bumper absorber mounting nuts | | 35-55 | 25–40 |
| Front bumper absorber mounting bolts | | 17-26 | 12-19 |
| Rear bumper absorber mounting nuts | | 35-55 | 25-39 |
| Rear bumper absorber mounting bolts | | 17–26 | 12–19 |
| Fender mounting bolts | | 4-6 | 3-4 |
| Splash shield mounting screws | | 2.0–2.2 | 1.4–1.6 |
| Splash shield mounting bolts | | 4-6 | 3-4 |
| Battery tray to body | | 9-14 | 7–10 |
| Hood lock support to body | | 4-6 | 3-4 |
| Deck crossmember stay to deck crossmember | | 4-6 | 3-4 |
| Door hinge to door | | 17–26 | 12–19 |
| Door hinge to body | | 17–26 | 12-19 |
| Door striker mounting screws | | 9-14 | 7–10 |
| Front door window regulator to door window glass | | 2.0–4.0 | 1.5–3.0 |
| Door latch assembly mounting screws | | 5-7 | 4-5 |
| Steering shaft mounting bolt | | 8-12 | 6-9 |
| Front seat slider rail mounting bolt | | 35-55 | 25–40 |
| Front seat mounting bolt | | 35-55 | 25–40 |
| Front seat mounting nut | | 24-36 | 17–26 |
| Front seat slider bracket mounting bolt | | 35-55 | 25–40 |
| Front seat frame mounting bolt (inner) | | 10–15 | 7–11 |
| Front seat frame mounting bolt (outer) | | 35-55 | 25–40 |
| Front seat adjuster mounting bolt | | 9-14 | 7–10 |
| Rear seatback mounting bolt | | 17-26 | 12-19 |
| Rear seat striker mounting bolt | | 4-6 | 3-4 |
| Automatic seat belt motor mounting bolt | for U.S. Vehicles | 4-6 | 3-4 |
| Automatic seat belt guide rail mounting bolt (A), (B) | | 4-6 | 3-4 |
| Automatic seat belt guide rail mounting bolt (C) | | 17-26 | 12–19 |
| Automatic seat belt guide ring attaching bolt | | 17–26 | 12–19 |
| Retractor assembly (for shoulder belt) mounting bolt (Front) | | 9-14 | 7–10 |
| Retractor assembly (for shoulder belt) mounting bolt (Rear) | | 35–55 | 25–40 |
| Retractor (for lap belt) mounting bolt (8 × 20 mm bolt) | | 9-14 | 7–10 |
| Retractor (for lap belt) mounting bolt (7/16 in. × 25 mm bolt) | | 35-55 | 25–40 |
| Guide ring bracket mounting bolt | | 9-14 | 7–10 |
| Automatic seat belt buckle mounting bolt | | 35-55 | 25–40 |
| Slide bar mounting bolt | | 35-55 | 25–40 |
| Front seat belt sash guide mounting bolt | for Canada Vehicles | 35-55 | 25–40 |
| Front seat belt retractor bracket mounting bolt | | 35-55 | 25–40 |
| Cover plate mounting bolt | | 9-14 | 7–10 |
| Rear inner seat belt bracket mounting bolt | | 35-55 | 25–40 |
| Rear seat belt anchor plate attaching bolt | | 35-55 | 25–40 |
| Rear seat belt retractor bracket mounting bolt (Front) | | 4-6 | 3-4 |
| Rear seat belt retractor bracket mounting bolt (Rear) | | 35-55 | 25–40 |

## LUBRICANTS

N23CD--

| Items | Specified lubricant | Quantity |
|---|---|---|
| The sliding portions of the following parts: Hood latch, hood lock release handle, hood hinge, liftgate latch, liftgate lock release handle, liftgate hinge, fuel filler door, fuel filler door lock release handle, door check strap, door hinge, door window regulator, door outside handle, door latch, door inside handle | MOPAR Multipurpose Grease Part No. 2932524 or equivalent | As required |

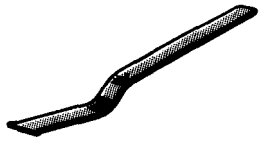
## SEALANTS AND ADHESIVES

N23CD--

| Items | Specified sealant |
|---|---|
| Side air dam | 3M ATD Part No. 6383 or equivalent |
| Fender to body panel | MOPAR Silicone Rubber Sealer Part No. 4026070 or equivalent |
| Fender to splash shield<br>Quarter window glass to body | MOPAR Silicone Rubber Sealer Part No. 4026070 or Auto Glass Adhesive and Sealer Part No. 2298825 or equivalent |
| Windshield glass and liftgate window glass to body | 3M Super Fast Urethan Part No. 8609 or equivalent,<br>3M Super Fast Urethan Primer Part No. 8608 or equivalent |
| Door inner panel waterproof film fitting portion | MOPAR Rope Caulk Sealer 3/16 × 80" roll Part No. 4026044 or equivalent |

## SPECIAL TOOLS

N23DA--

| Tool | Number | Name | Use |
|---|---|---|---|
|  | MB990834 | Door adjusting wrench | Adjustment of door fit |
|  | MB990449 | Window moulding remover | Removal of window moulding |

# TROUBLESHOOTING

N23EABA

## HOOD, LIFTGATE, GLASS AND DOORS

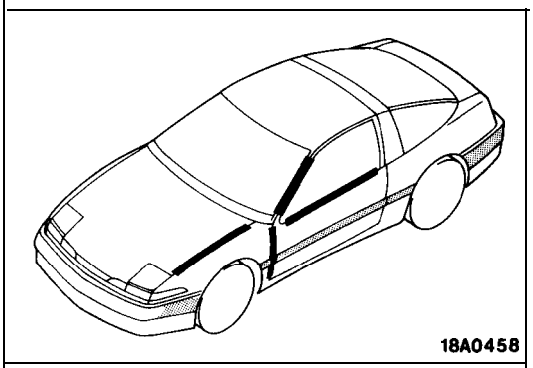
| Symptom | | Probable cause | Remedy |
|---|---|---|---|
| Hood/ Liftgate | Improper closure | Striker and latch not properly aligned | Adjust the alignment |
| | Difficult locking and unlocking | | |
| | Uneven body clearance | Incorrectly installed hood or liftgate | Adjust the installation of hood, deck lid or liftgate |
| | Uneven height | Incorrect hood bumper height | Adjust the hood bumper, deck lid bumper or liftgate bumper height |
| Window glass | Water leak through windshield | Defective seal | Fill sealant |
| | | Defective body flange | Correct |
| | Water leak through door window glass | Incorrect window glass installation | Adjust position |
| | | Gap at upper window glass | Adjust position |
| | Water leak through liftgate window | Defective seal | Fill sealant |
| | | Defective body flange | Correct |
| Doors | Door window malfunction | Incorrect window glass installation | Adjust position |
| | | Damaged or faulty regulator | Correct or replace |
| | Water leak through door edge | Cracked or faulty weatherstrip | Replace |
| | Water leak from door center | Drain hole clogged | Remove foreign objects |
| | | Inadequate waterproof film contact or damage | Correct or replace |
| | Door hard to open | Incorrect latch or striker adjustment | Adjust |
| | Door does not open or close completely | Incorrect door installation | Adjust position |
| | | Defective door check strap | Correct or replace |
| | | Door check strap and hinge required grease | Apply grease |
| | Uneven gap between body | Incorrect door installation | Adjust position |
| | Wind noise around door | Weatherstrip not holding firmly | Adjust fit of door |
| | | Improperly installed weatherstrip or setting of weatherstrip | Repair or replace |
| | | Improperly closed door | Adjust |
| | | Improperly fit door | Adjust |
| | | Improper clearance between door glass and door weatherstrip holder | Adjust |
| | | Deformed door | Repair or replace |

## SUNROOF

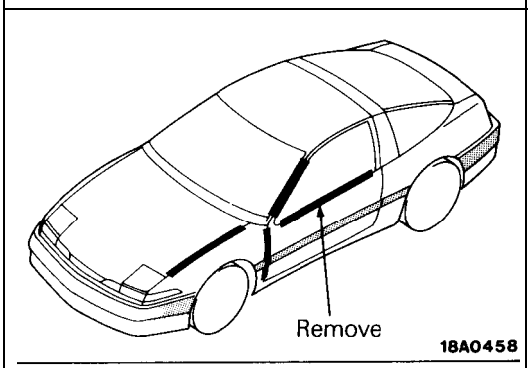
| Symptom | Probable cause | Remedy |
|---|---|---|
| Water leaks | Dust accumulated in drainage of housing assembly | Keep off dust from inside of drain hose |
| | Clogged drain hose | Blow air into drain hose to remove dust |
| | Broken or dislocated drain hose, failed or cracked clip | Check hose installation and flange contact |
| | Worm roof lid weatherstrip | Replace |
| | Excessive roof lid-to-body clearance and improperly fitted weatherstrip | Adjust |
| Wind noise | Loose or deformed deflector | Retighten or replace |

## HOW TO LOCATE WIND NOISES

(1) Attach cloth tape to every place which might conceivably be the source of wind noise, such as panel seams, projections, moulding seams, glass and body seams, etc.
(2) Then make a road test in order to determine that the places not covered by tape are not sources of wind noise.

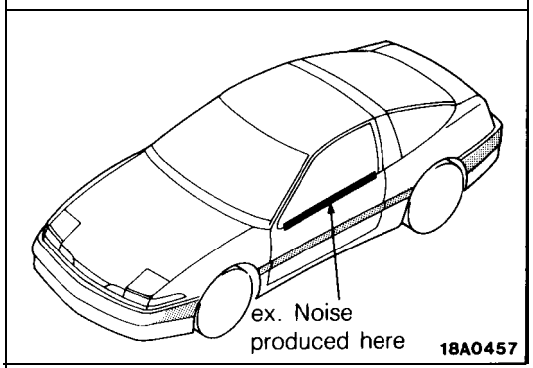

18A0458

(3) Then remove the strips of tape one by one, making a road test after each is removed, until a wind noise source is discovered.



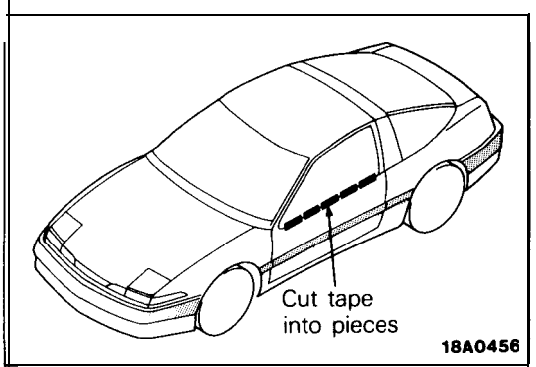
18A0458

(4) When such a place is found, cover it again and continue with the procedure so as to determine if there are any other noise sources.
(5) If no others are found, the last remaining tape is the only source.



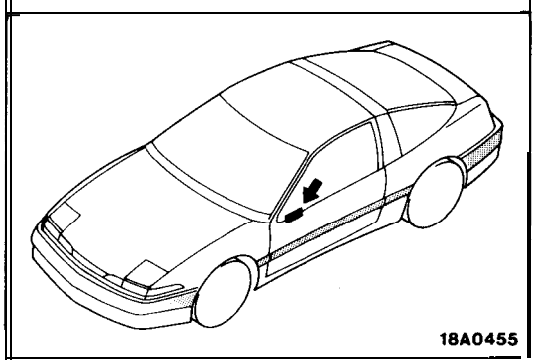
18A0457

(6) Cut the remaining piece of tape into smaller pieces, attach it again as it was before, and then remove the pieces one by one in the same way so as to narrow down the source.



18A0456

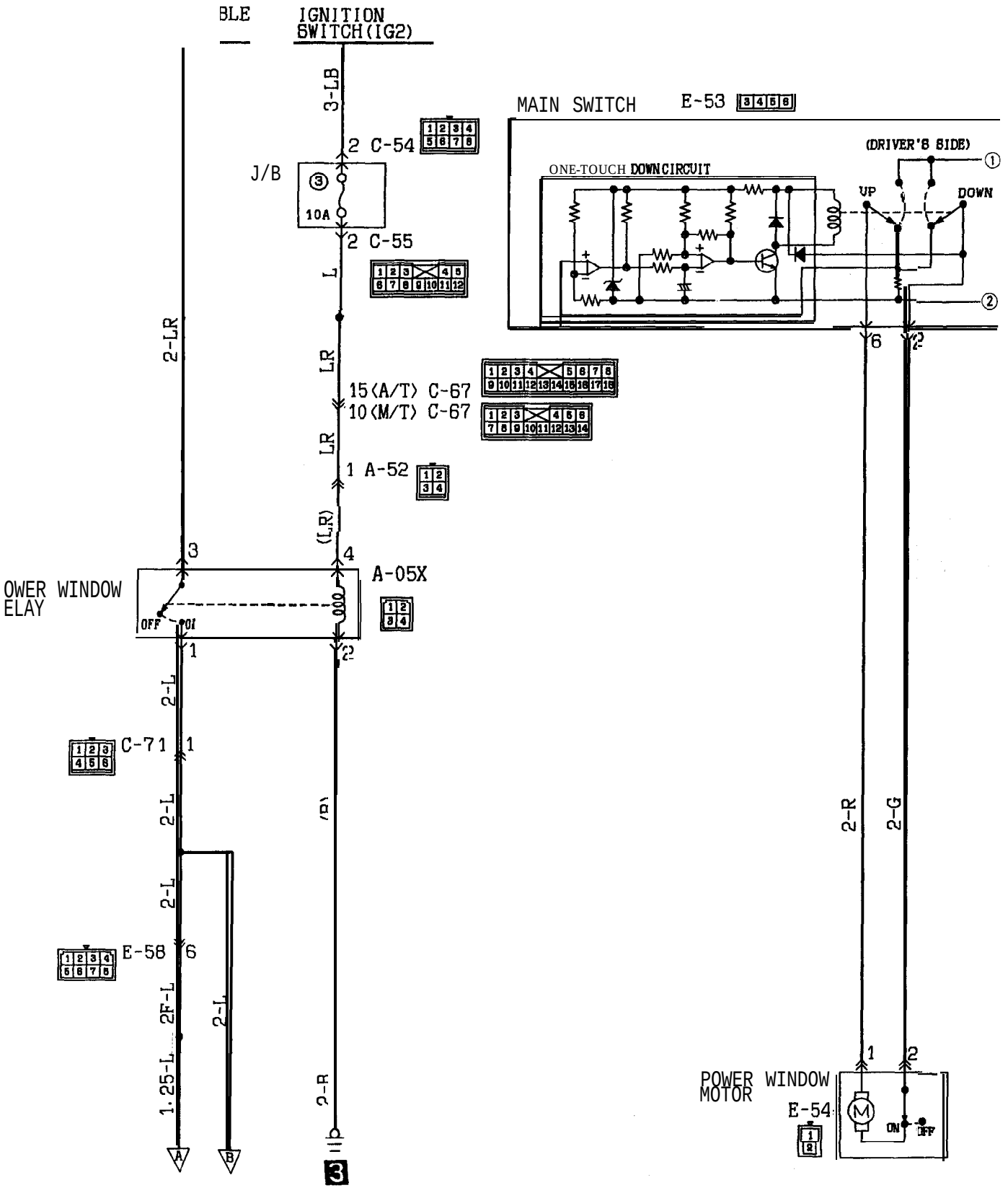
(7) Check to confirm that wind noise occurs when the last remaining tape is removed, and that noise does not occur when it is re-attached.
(8) When the source(s) of the wind noise is finally located, attach butyl tape, body sealer or similar material to obstruct this source as much as possible.

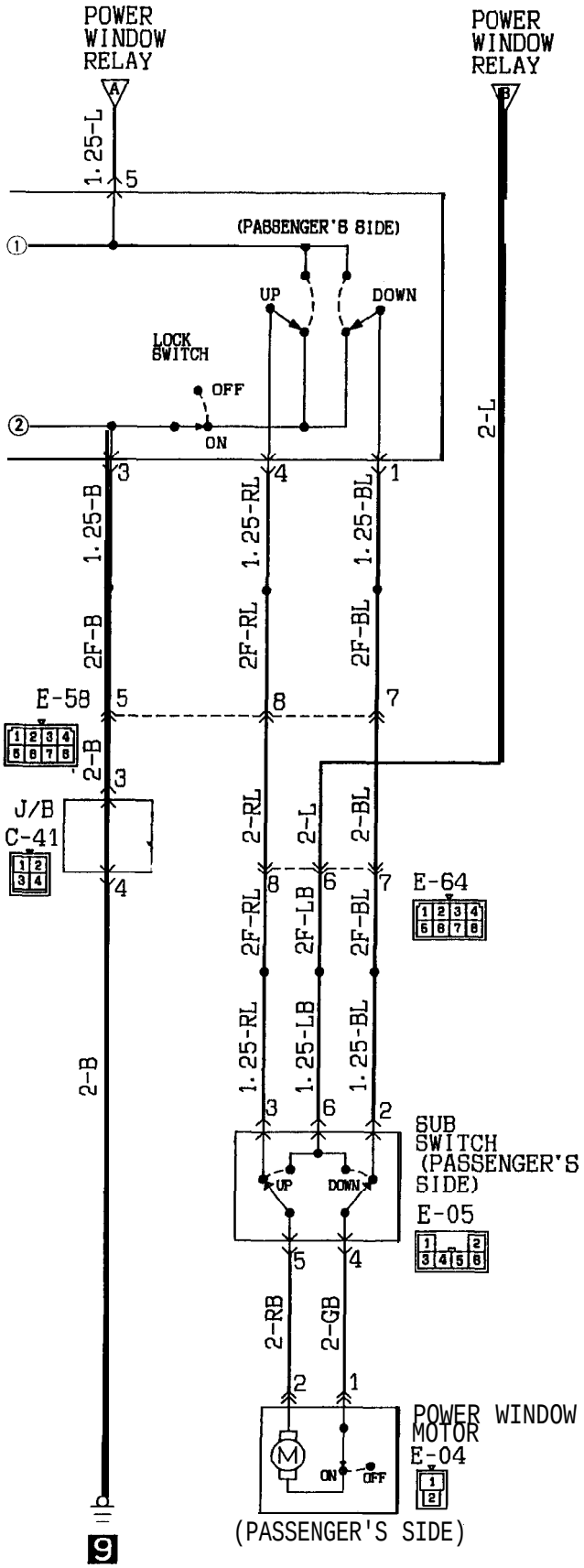

18A0455

## POWER WINDOW

N23EBEE

### CIRCUIT DIAGRAM






## OPERATION

- With the ignition switch in the "ON" position, press either the "UP" or "DOWN" side of the power window (main or sub) switch. Electric current will then flow through sub fusible link No. 5 to the power window motor and will operate the power window motor to open or close the power window glass.
- Press the DOWN side of the power window main switch located on the driver's seat side all the way. Then the switch will lock and the power window motor will continue to operate until the window glass is fully open.

  NOTE
  For detailed information on the operation of the one-touch down (open) mechanism, refer to the Technical Information Manual.
- To disable both the main and sub switches except the one located at the driver's seat, place the power window lock switch in the "LOCK (ON)" position. With the switch in this position, the power window motor will no longer operate even if the switches are operated.
- The power window motor has a circuit breaker to prevent damage to the motor due to overcurrent.

  Reference: Characteristics of Circuit Breaker
  At normal temperatures [20–25°C (68–77°F)], bind the motor. Supply current, then the circuit breaker will cut off the current in the first 4 to 40 seconds. The circuit breaker, if left alone, will reset in less than 60 seconds.

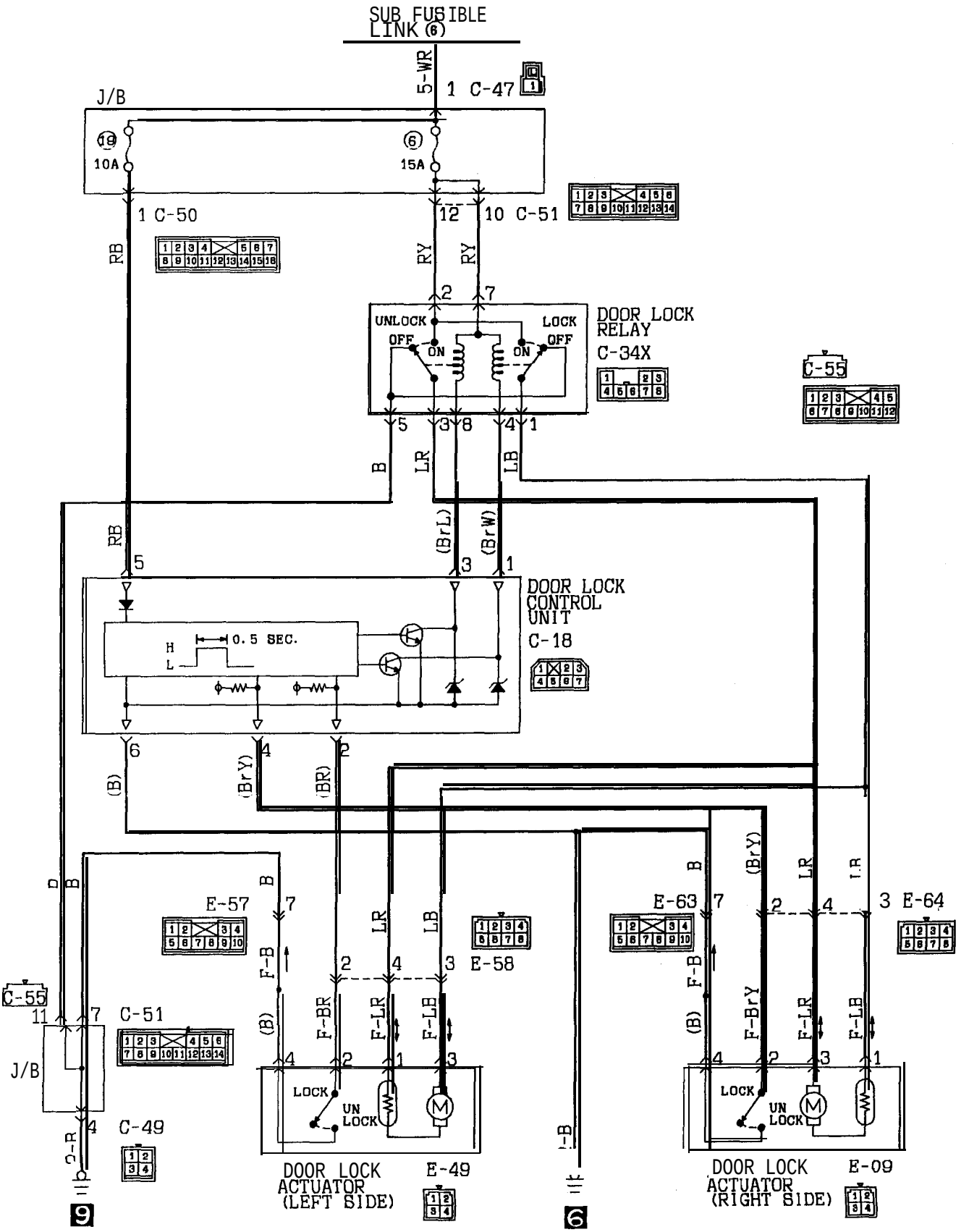
## TROUBLESHOOTING HINTS

1. None of the door glasses can be opened or closed.
   - Check sub fusible link No. 5.
   - Check the power window relays.
   - Check the power window main switches.
2. Some, but not all, of the door glasses cannot be opened or closed.
   (1) Do not operate even if both the power window main and sub switches are pressed.
   - Check power window main switch.
   - Check the power window motor which does not operate.

   (2) Do not operate only when either the main or sub switch is pressed, but do operate when both are pressed.
   - Check power window switch which does not operate.
3. The one-touch switch function only does not work.
   - Replace the power window main switch.

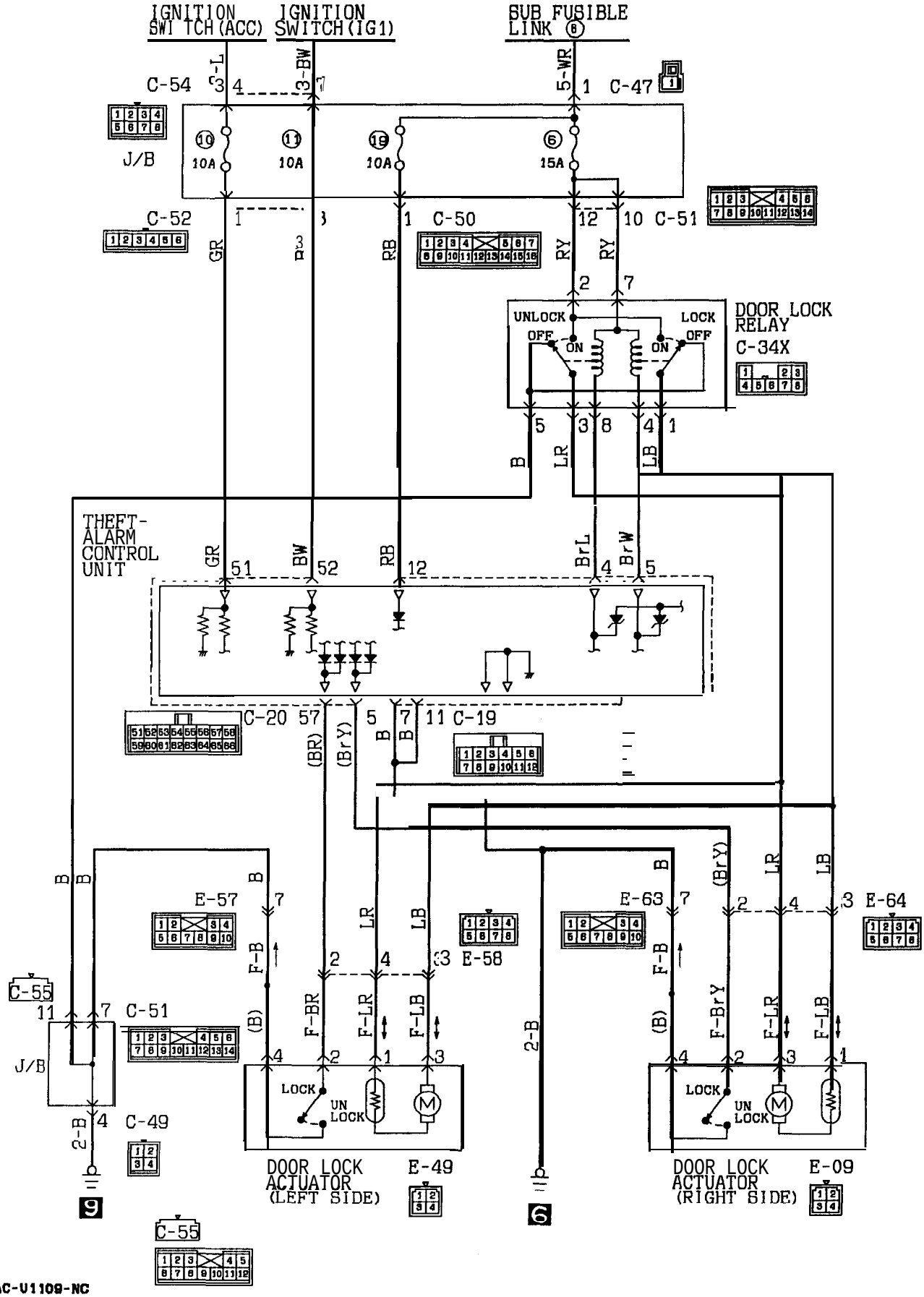
## CENTRAL DOOR LOCKING SYSTEM <Vehicles without Theft-Alarm System> N23EBFF

### CIRCUIT DIAGRAM



## CENTRAL DOOR LOCKING SYSTEM <Vehicles with Theft-Alarm System>

### CIRCUIT DIAGRAM




X35-AC-U1109-NC

## OPERATION

- If the inside lock knobs of the doors are placed in the LOCK (or UNLOCK) position, the switch in the door lock actuator will be "OFF" (or "ON"), and the output transistor will be "ON" for 0.5 second according to the timer function in the door lock control unit (or theft-alarm control unit). As a result, the LOCK side (or UNLOCK side) of the door lock relay will be "ON", operating the actuators of all of the doors.

NOTE
The door lock actuator contains a PTC thermistor to prevent damage caused by overheating of the motor. If the central door lock is frequently used, the actuator may temporarily fail to operate. If it returns to normal in a few minutes, it is not defective.

## TROUBLESHOOTING HINTS

1. One of the door lock actuators fails to operate.
   - Check the door actuator which fails to operate.
2. Cannot be placed in the LOCK or UNLOCK position by the inside lock knob on either driver's or front passenger's seat side.
   - Check the switch in the actuator.
   - Check the door lock control unit (or theft-alarm control unit).

## DOOR LOCK CONTROL UNIT (OR THEFT-ALARM CONTROL UNIT) TERMINAL VOLTAGE (Connector Connected)

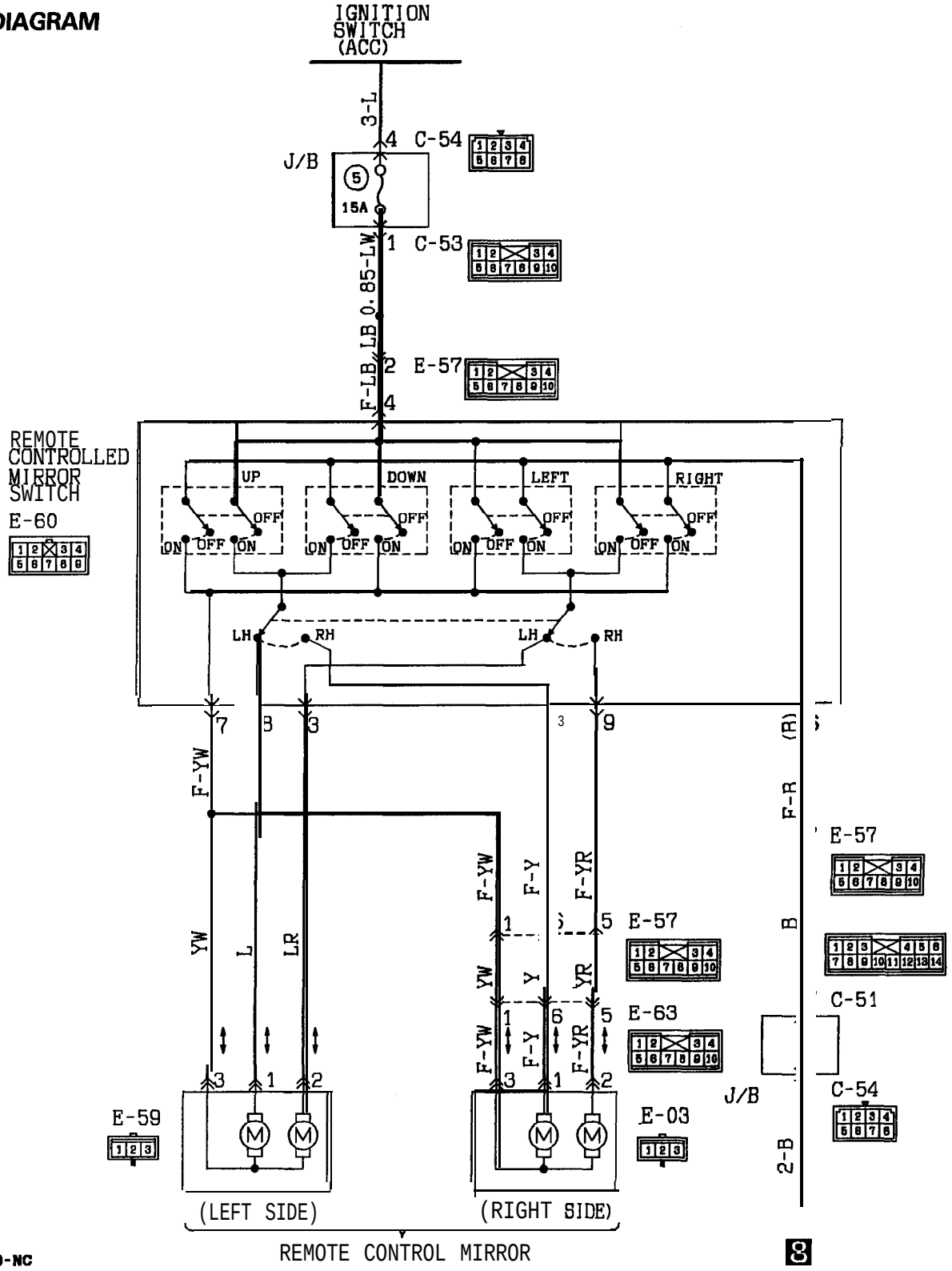
| Terminal No. | Signal name | Condition | Terminal voltage |
|---|---|---|---|
| 1 or 5*1 | Door lock relay activation signal | The moment the inside lock knob is pressed down (approx. 0.5 sec.) | 0.5 V*2 |
| | | Normally | System voltage |
| 2 or 19*1 | (Driver's seat side) inside door lock knob signal | When the inside lock knob is placed in the "LOCK" position | System voltage |
| | | When the inside lock knob is placed in the "UNLOCK" position | 0 V |
| 3 or 4*1 | Door lock relay activation signal | The moment the inside lock knob is pulled up (approx. 0.5 sec.) | 0.5 V*2 |
| | | Normally | System voltage |
| 4 or 20*1 | (Passenger's seat side) inside door lock knob signal | When the inside lock knob is placed in the "LOCK" position | System voltage |
| | | When the inside lock knob is placed in the "UNLOCK" position | 0 V |
| 5 or 12*1 | Power supply | Always | System voltage |
| 6 or 7(11)*1 | Ground | Always | 0 V |

NOTE
*1: Vehicles with theft-alarm system.
*2: Because of the internal resistance of the output transistor, the normal terminal voltage is 0.5 V. If it is 0 V, an open or short circuit in the harness is suspected.

## ELECTRIC REMOTE CONTROLLED MIRROR

N23EB8D

### CIRCUIT DIAGRAM




### OPERATION

- When the remote controlled mirror switch is operated while the ignition key is in ''ACC'' or "ON" position, current flows through fuse No. ⑤ remote controlled mirror switch, remote controlled mirror, remote controlled mirror switch, and ground, causing the mirror to move.

### TROUBLESHOOTING HINTS

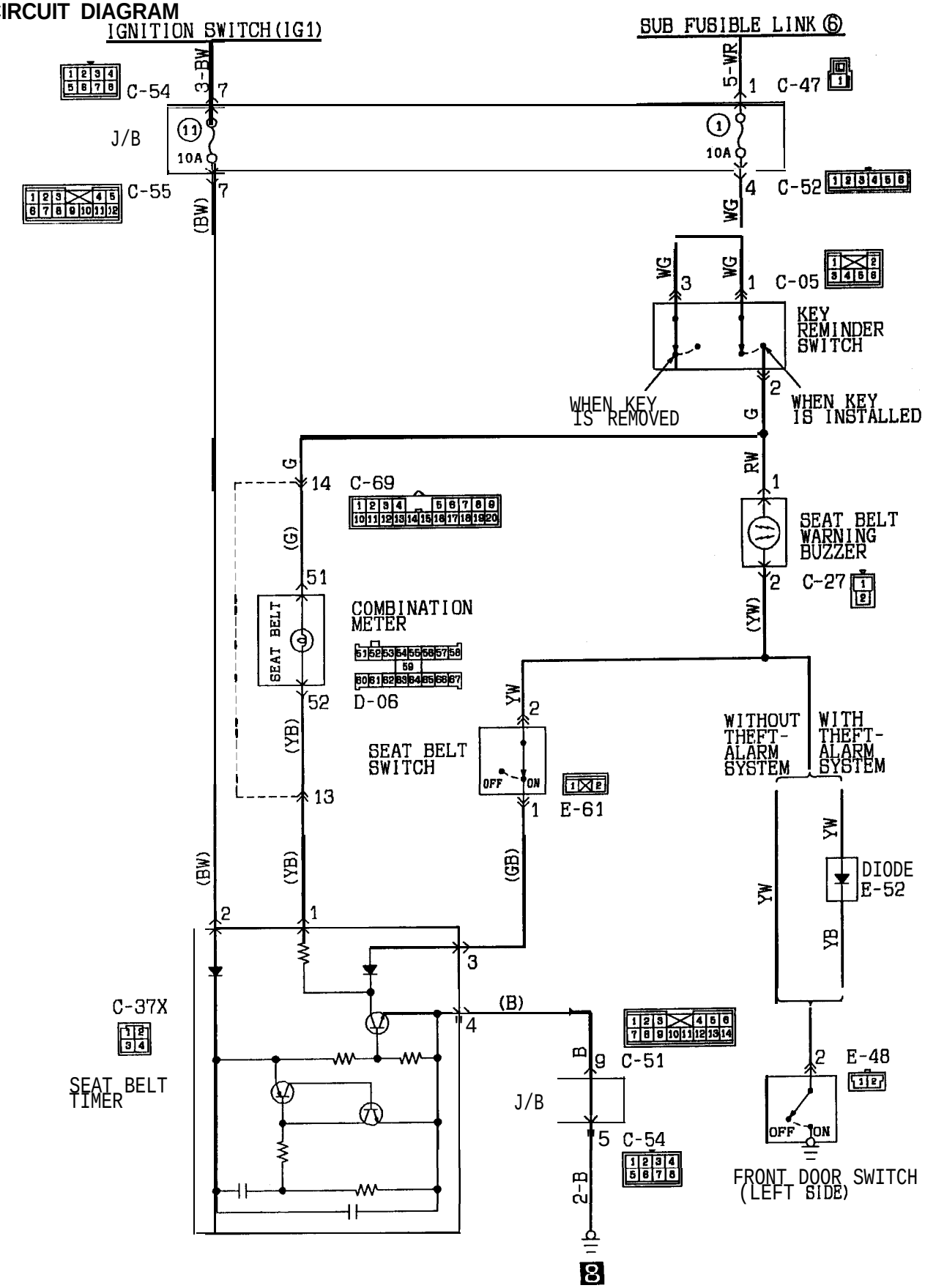
Neither right nor left mirror operates

1) Also cigarette lighter does not operate
   - Check fuse.
2) Cigarette lighter operates
   - Check remote controlled mirror switch.

## BUZZER < Vechicles for Canada >

N23EBABa

### CIRCUIT DIAGRAM



## OPERATION

### Key-reminder warning

- Battery voltage is always supplied, through sub fusible link No. ⑥, to the key-reminder switch.
- When the driver's seat door is opened while the ignition key is still in the key cylinder, the door switch is switched ON, electricity flows to sub fusible link No. ⑥, the key-reminder switch, the buzzer, the door switch, and ground, and the buzzer sounds.

### Seat belt warning

- Battery voltage is applied, through fuse No. ⑪, to the seat belt timer when the ignition key is at the "ON" position.
- Electricity flows to sub fusible link No. ⑥, the key-reminder switch, the seat belt warning light, the seat belt timer, and ground, and the seat belt warning light illuminates for approx. 6 seconds.
- If the driver does not buckle the seat belt, the seat belt switch is switched ON, electricity flows to sub fusible link No. ⑥, the key-reminder switch, the buzzer, the seat belt switch, the seat belt warning timer, and ground, and the buzzer sounds for approx. 6 seconds.
- When the driver buckles the seat belt, the seat belt switch is switched OFF and the buzzer stops.

## TROUBLESHOOTING HINTS

### Key-reminder warning

The key-reminder warning doesn't sound.

(1) The seat belt warning function is OK.
- Check the door switch.

(2) The seat belt warning also doesn't function.
- Check the buzzer.

### Seat belt warning

1. The seat belt warning doesn't function.
   (1) The seat belt warning light illuminates.
   - Check the seat belt switch.

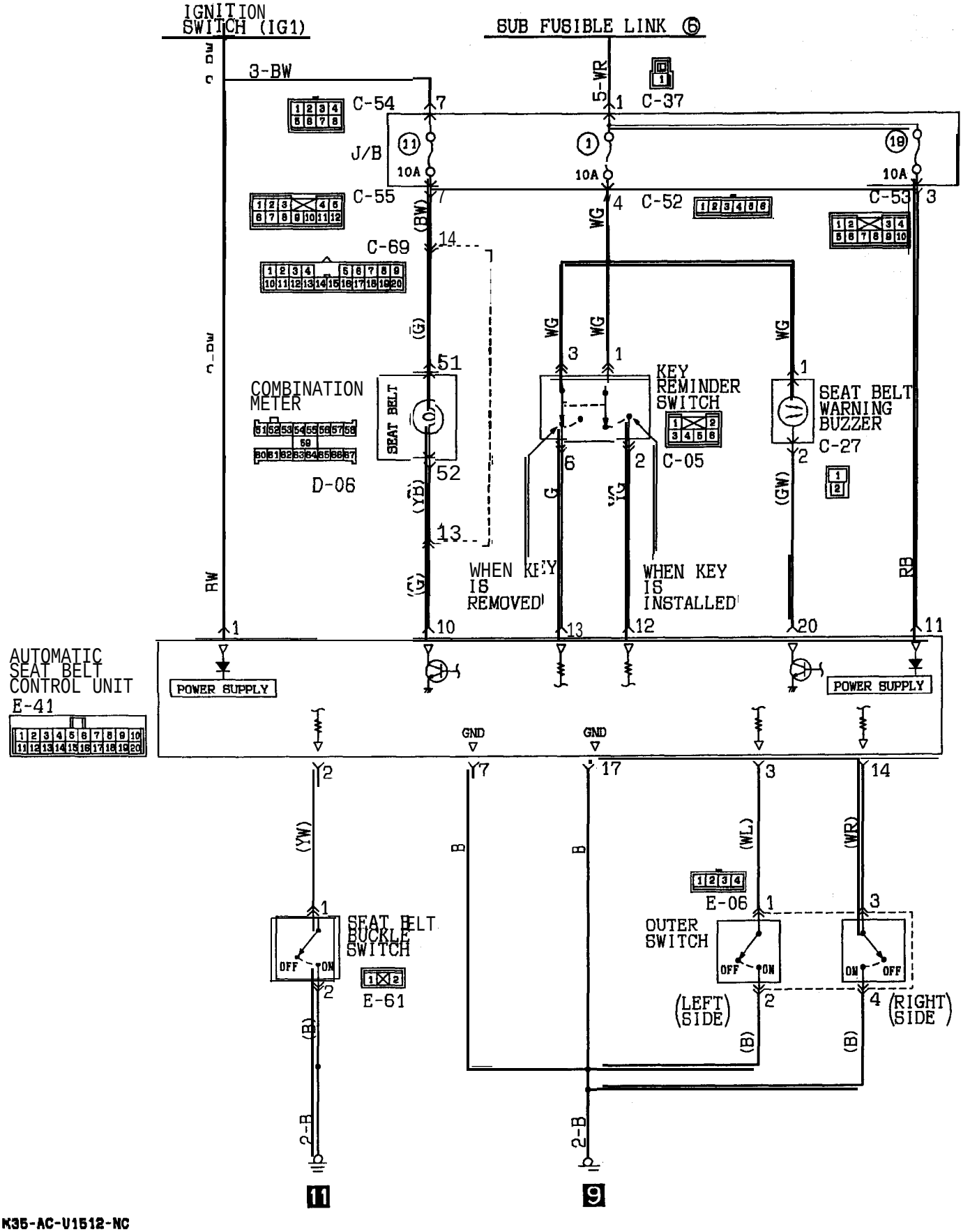
   (2) The seat belt warning light also does not function (but the key-reminder warning functions normally. )
   - Check the seat belt timer.

   (3) The seat belt warning light also does not function (and the key-reminder warning also does not function).
   - Check the key-reminder switch.
2. The buzzer doesn't stop even though the driver's seat belt has been buckled.
   - Check the seat belt switch.
3. The seat belt warning light doesn't illuminate (but the buzzer sounds).
   - Check the light bulb.

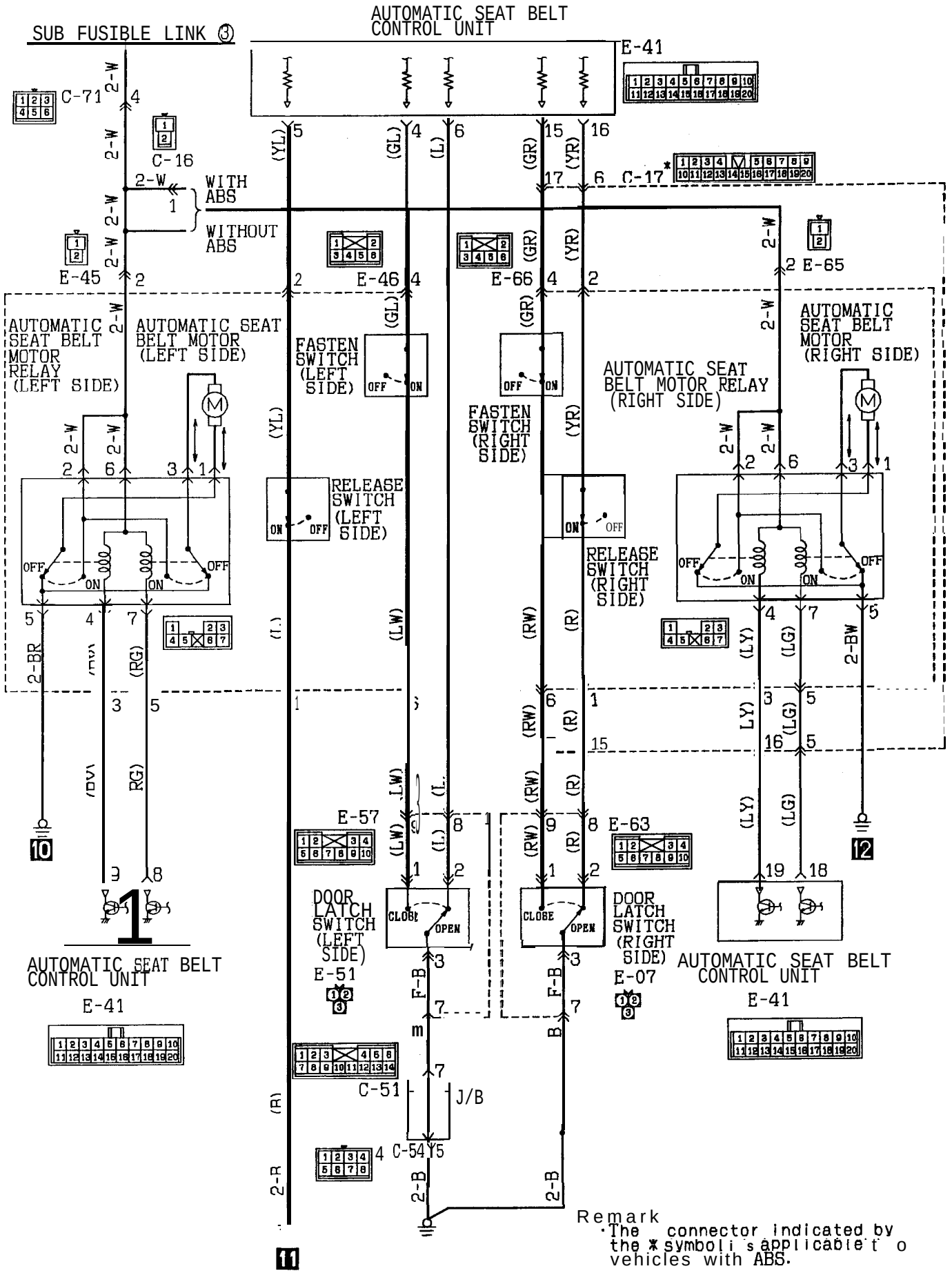
## AUTOMATIC SEAT BELT <Vehicles for U.S. >

N23EBGD

### CIRCUIT DIAGRAM




K35-AC-U1512-NC


SUB FUSIBLE LINK ③
AUTOMATIC SEAT BELT CONTROL UNIT
E-41
C-71
C-16
WITH ABS
WITHOUT ABS
E-45
E-46
E-66
C-17*
E-65
AUTOMATIC SEAT BELT MOTOR RELAY (LEFT SIDE)
AUTOMATIC SEAT BELT MOTOR (LEFT SIDE)
FASTEN SWITCH (LEFT SIDE)
FASTEN SWITCH (RIGHT SIDE)
AUTOMATIC SEAT BELT MOTOR RELAY (RIGHT SIDE)
AUTOMATIC SEAT BELT MOTOR (RIGHT SIDE)
RELEASE SWITCH (LEFT SIDE)
RELEASE SWITCH (RIGHT SIDE)
ON
OFF
E-57
E-63
DOOR LATCH SWITCH (LEFT SIDE)
DOOR LATCH SWITCH (RIGHT SIDE)
CLOSE
OPEN
E-51
E-07
C-51
J/B
C-54
AUTOMATIC SEAT BELT CONTROL UNIT
E-41
10
11
12
Remark
·The * connector indicated by the * symbol is applicable to vehicles with ABS.

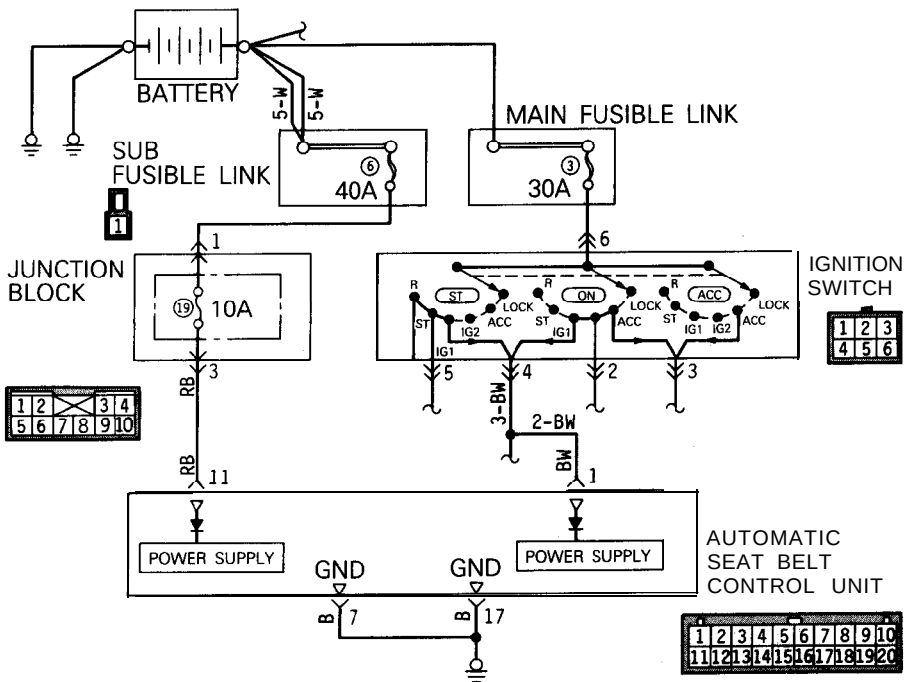
| Trouble symptom | Cause | Check method | Remedy |
|---|---|---|---|
| Driver's and/or front passenger's system does not function | Fuse blown or disconnected | Check fuse ⑲ | Replace or reconnect the fuse |
| | Open harness wire or disconnected connector | Check using check charts No. 1, 3 and 5 | |
| | Defective switch | Check using check chart No. 5 | |
| | Defective motor | Check using check chart No. 3 | |
| | Defective relay | Check using check chart No. 3 | |
| | Defective control unit | — | Replace the control unit |
| | Defective driving device | — | Replace the driving device assembly |
| Warning light does not illuminate or flash | Fuse blown or disconnected | Check fuse ⑪ | Replace or reconnect the fuse |
| | Open harness wire or disconnected connector | Check using check charts No. 1, 2, 4 and 5 | |
| | Defective switch | Check using check charts No. 2, 4 and 5 | |
| | Warning light bulb blown or in poor contact | Check using check chart No. 2 | |
| | Defective control unit | — | Replace the control unit |
| Buzzer does not sound | Fuse blown or disconnected | Check fuse ① | Replace or reconnect the fuse |
| | Defective buzzer | Refer to Inspection section (P.23-97.) | Replace the buzzer |
| | Open harness wire or disconnected connector | Check using check chart No. 2 | |
| | Defective control unit | — | Replace the control unit |
| The slide anchor does not move from the "fasten" range into "release" range, or from the "release" range into the "fasten" range | Defective driving device, or problem in electrical circuit | Try to move the slide anchor in both directions by hand | If the slide anchor does not move: Replace the driving device assembly |
| | | | If the slide anchor moves: Check using check charts No. 1, 2, 3 and 5 |
| Slide anchor moves too slowly | Foreign matter in guide rail | — | Clean or replace the driving device assembly |
| Slide anchor stops halfway | Defective retractor (remains in locked state) | Check retractor operation when both pulling out and retracting belt | Replace the retractor (for shoulder belt) |
| | Defective driving device or problem in electrical circuit | Try to move the slide anchor in both directions by hand | If the slide anchor does not move: Replace the driving device assembly |
| | | | If the slide anchor moves: Check using check charts No. 1, 3 and 5 |

## CHECKING CIRCUIT

### Index of Check Chart


| Chart No. | Circuit name | Page No. |
|---|---|---|
| 1 | Control unit power supply and ground circuit | 23-20 |
| 2 | Warning light, key reminder switch, buzzer circuit | 23-2 1 |
| 3 | Release switch (driver's side), buckle switch, outer switch circuit | 23-23 |
| 4 | Door latch switch, fasten switch, release switch (passenger's side) circuit | 23-25 |
| 5 | Motor power supply and drive circuit | 23-28 |

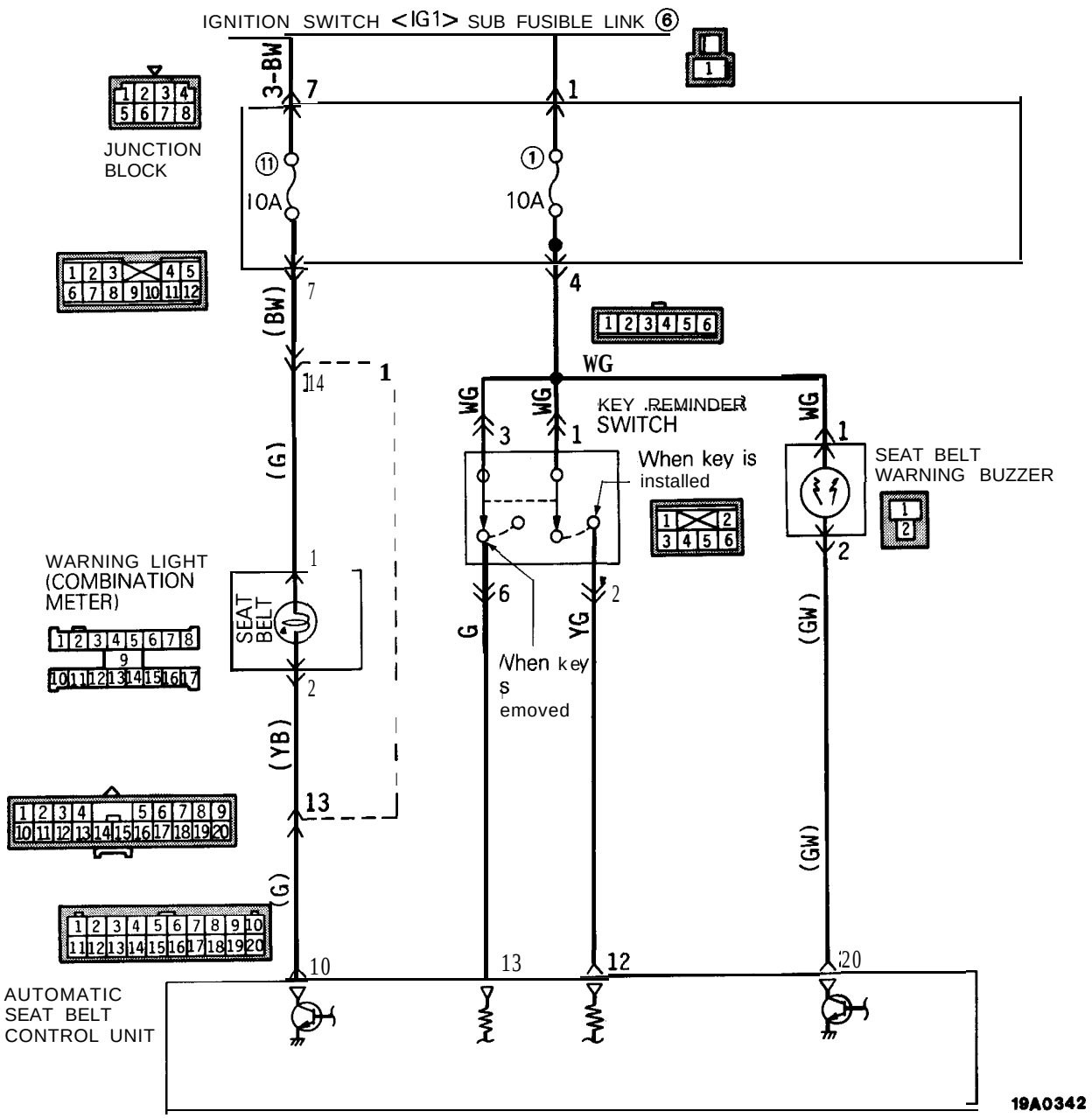

### 1. Control Unit Power Supply and Ground Circuit




19A0341

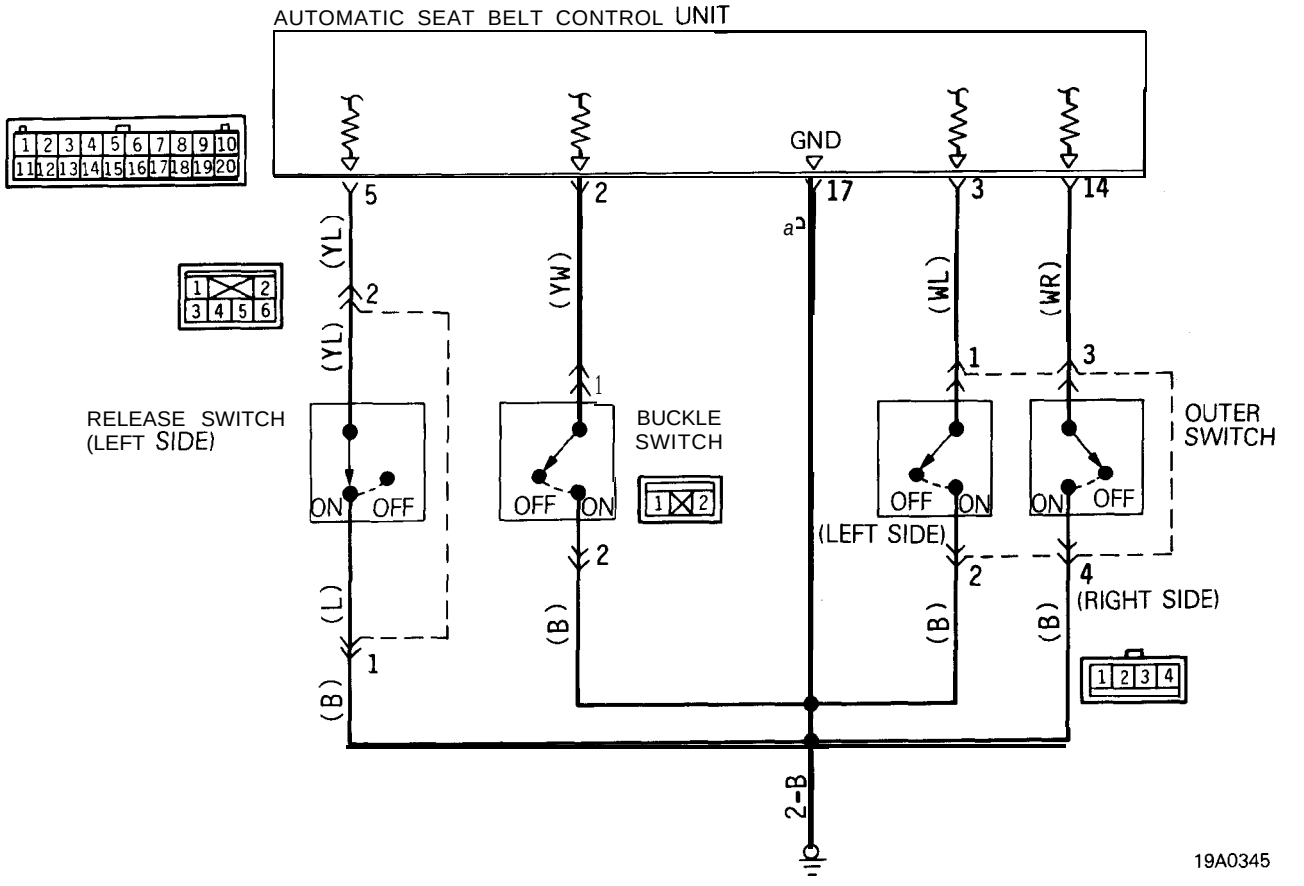
| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| 1 | Unplug the connector from the control unit | Harness side terminal voltage of control unit connector (11 -Ground) | System voltage | 0 V | Open harness wire or disconnected connector between junction block and control unit | Repair the harness or plug in the connector correctly |
| 2 | Ignition switch: ON | Harness side terminal voltage of control unit connector (1 -Ground) | System voltage | 0 V | Open harness wire or disconnected connector between junction block and control unit | Repair the harness or plug in the connector correctly |
| 3 | ignition switch: OFF | Terminal-to-ground continuity of control unit harness side connector (7–Ground, 17–Ground) | 0 Ω | ∞ Ω | Open harness wire between control unit and ground | Repair the harness |
| | | | | | Improper ground connection | Correctly connect to ground |

## 2. Warning Light, Key Reminder Switch, Buzzer Circuit



| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| Varning light | | | | | | |
| 1 | Unplug the warning light connector<br>Ignition switch: ON | Terminal voltage of warning light harness side connector (1–Ground) | System voltage | 0 V | Open harness wire or disconnected connector between junction block and combination meter | Repair the harness or plug in the connector correctly |
| 2 | Connect the warning light connector.<br>Unplug the connector from the control unit.<br>Ignition switch: ON | Terminal voltage of control unit harness side connector (1 -Ground) | System voltage | 0 V | Open harness wire or disconnected connector between combination meter and control unit | Repair the harness or plug in the connector correctly |
| | | | | | Warning light bulb blown or in poor contact | Replace or correctly install the warning light |
| ey reminder switch | | | | | | |
| 1 | Disconnect the key reminder switch connector. | Terminal voltage of key reminder switch harness side connector ( 1 -Ground, 3–Ground) | System voltage | 0 V | Open harness wire or disconnected connector between junction block and key reminder switch | Repair the harness or plug in the connector correctly |
| 2 | Plug the key reminder switch connector.<br>Unplug the connector from the control unit<br>Remove the key from the ignition switch. | Terminal voltage of control unit harness side connector (13–Ground, 12–Ground) | 13–Ground: System voltage | o v | Open harness wire or disconnected connector between key reminder switch and control unit | Repair the harness or plug in the connector correctly |
| | | | 12–Ground: o v | A voltage same as or lower than system voltage | Defective key reminder switch | Check the key reminder switch. (Refer to GROUP 8–Ignition Switch.) |
| 3 | Insert the key. | Terminal voltage of control unit harness side connector (13–Ground, 12–Ground) | 13–Ground: o v | A voltage same as or lower than system voltage | Defective key reminder switch | Check the key reminder switch. (Refer to GROUP 8–Ignition Switch.) |
| | | | 12–Ground: System voltage | o v | Open harness wire or disconnected connector between key reminder switch and control unit | Repair the harness or plug in the connector correctly |
| ızzer | | | | | | |
| 1 | Unplug the buzzer connector. | Terminal voltage of harness side connector ( 1 -Ground) | System voltage | 0 V | Open harness wire or disconnected connector between junction block and buzzer | Repair the harness or plug in the connector correctly |
| 2 | Plug in the buzzer connector.<br>Unplug the connector from the control unit | Terminal voltage of control unit harness side connector (20–Ground) | System voltage | 0 V | Open harness wire or disconnected connector between buzzer and control unit | Repair the harness or plug in the connector correctly |

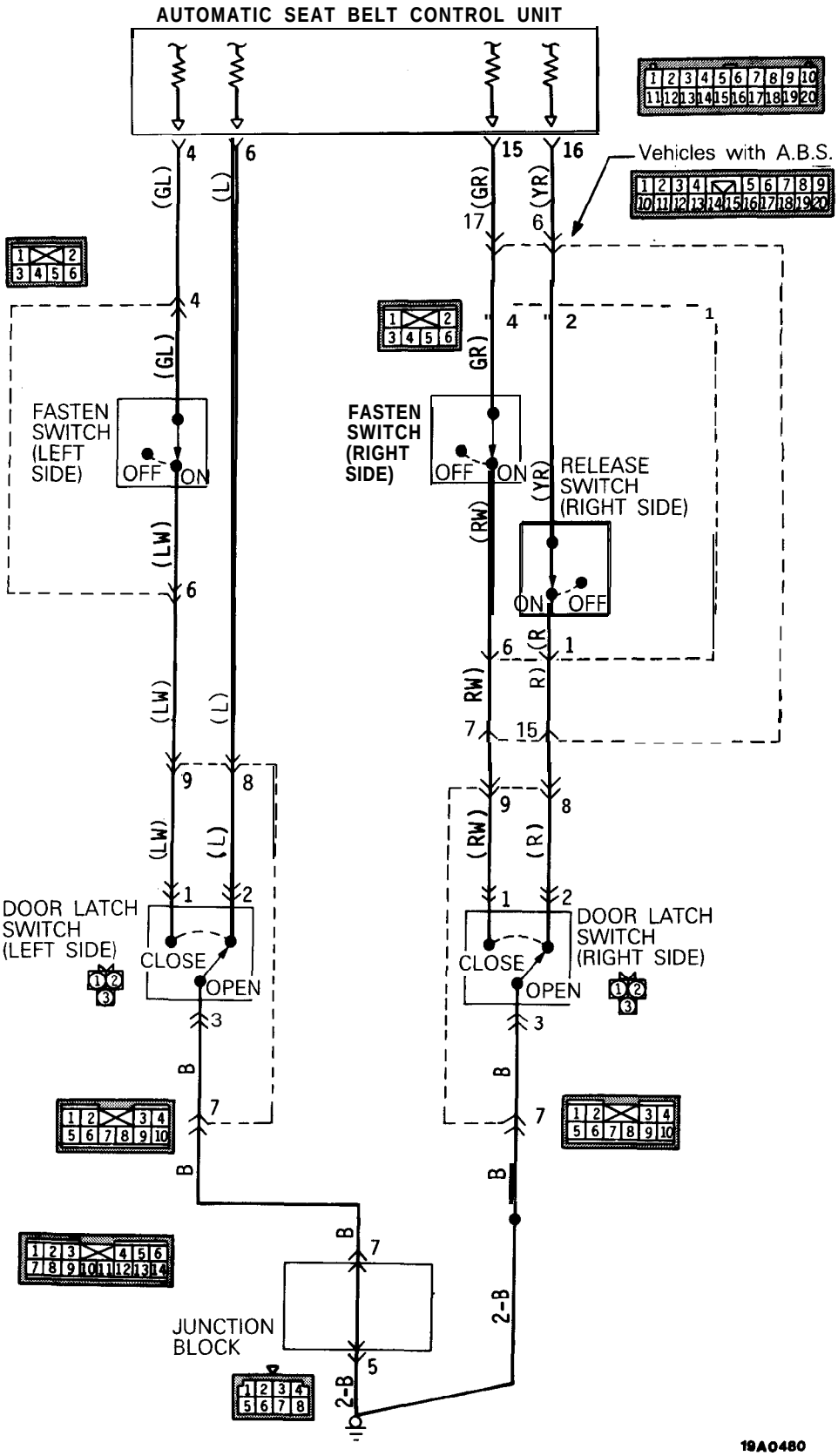
## 3. Release Switch (driver's side), Buckle Switch, Outer Switch Circuit




| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| Release switch (driver's side) | | | | | | |
| 1 | Unplug the "release" switch connector. | Terminal-to-ground continuity of "release" switch harness side connector (1 -Ground) | 0 Ω | ∞ Ω | Open harness wire or disconnected connector between "release" switch and ground | Repair the harness or plug in the connector correctly |
| | | | | | Improper ground connection | Correctly connect to ground |
| 2 | Plug in the "release" switch connector. Unplug the connector from the control unit. Move the slide anchor. | Terminal-to-ground continuity of control unit harness side connector (5–Ground) | 0 Ω when slide anchor is not in the "release" (switch ON) range. ∞ Ω when slide anchor is in the "release" (switch OFF) range. | Remains 0 Ω or ∞ Ω | Defective "release" switch | Replace the driving device assembly. (Refer to P.23-94.) |
| | | | | | Open harness wire or disconnected connector between control unit and "release" switch | Repair the harness or plug in the connector correctly. |

| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| Buckle switch | | | | | | |
| 1 | Unplug the connector from the buckle switch. | Terminal-to-ground continuity of buckle switch harness side connector (2–Ground) | 0 Ω | ∞ Ω | Open harness wire between buckle switch and ground | Repair the harness |
| | | | | | Improper ground connection | Correctly connect to ground |
| 2 | Plug in the buckle switch connector. Unplug the connector from the control unit. Leave the lap belt unfastened (buckle switch ON). | Terminal-to-ground continuity of control unit harness side connector (2–Ground) | 0 Ω | ∞ Ω | Open harness wire between control unit and buckle switch | Repair the harness |
| | | | | | Defective buckle switch | Replace th buckle. (Refer to P.23-94 |
| Outer switch | | | | | | |
| 1 | Unplug the connector from the outer switch. | Terminal-to-ground continuity of outer switch harness side connector L.H. (2–Ground) R.H. (4–Ground) | 0 Ω | ∞ Ω | Open harness wire between outer switch and ground | Repair the harness |
| | | | | | Improper ground connection | Correctly connect to ground |
| 2 | Pull out and retract the shoulder belt. | Terminal-to-ground continuity of outer switch side connector L.H. (1–2) R.L. (3–4) | ∞ Ω from the belt's fully retracted position until belt is pulled out approx. midway (outer switch OFF) 0 Ω from the approx. midway pulled out position until belt is pulled out fully (outer switch ON) | Resistance remains 0 Ω or ∞ Ω or changes from 0 Ω to ∞ Ω or from ∞ Ω to 0 Ω at points other than the approx. midway pulled out position | Defective outer switch | Replace th retractor (for shoulder belt) (Refer to F |
| 3 | Attach the shoulder belt to the slide anchor (outer switch ON). Plug in the connector to the outer switch. Unplug the connector from the control unit. | Terminal-to-ground continuity of control unit harness side connector L.H. (3–Ground) R.H. (14–Ground) | 0 Ω | ∞ Ω | Open harness wire between control unit and outer switch | Repair the harness |

## 4. Door Latch Switch, Fasten Switch, Release Switch (passenger's side) Circuit



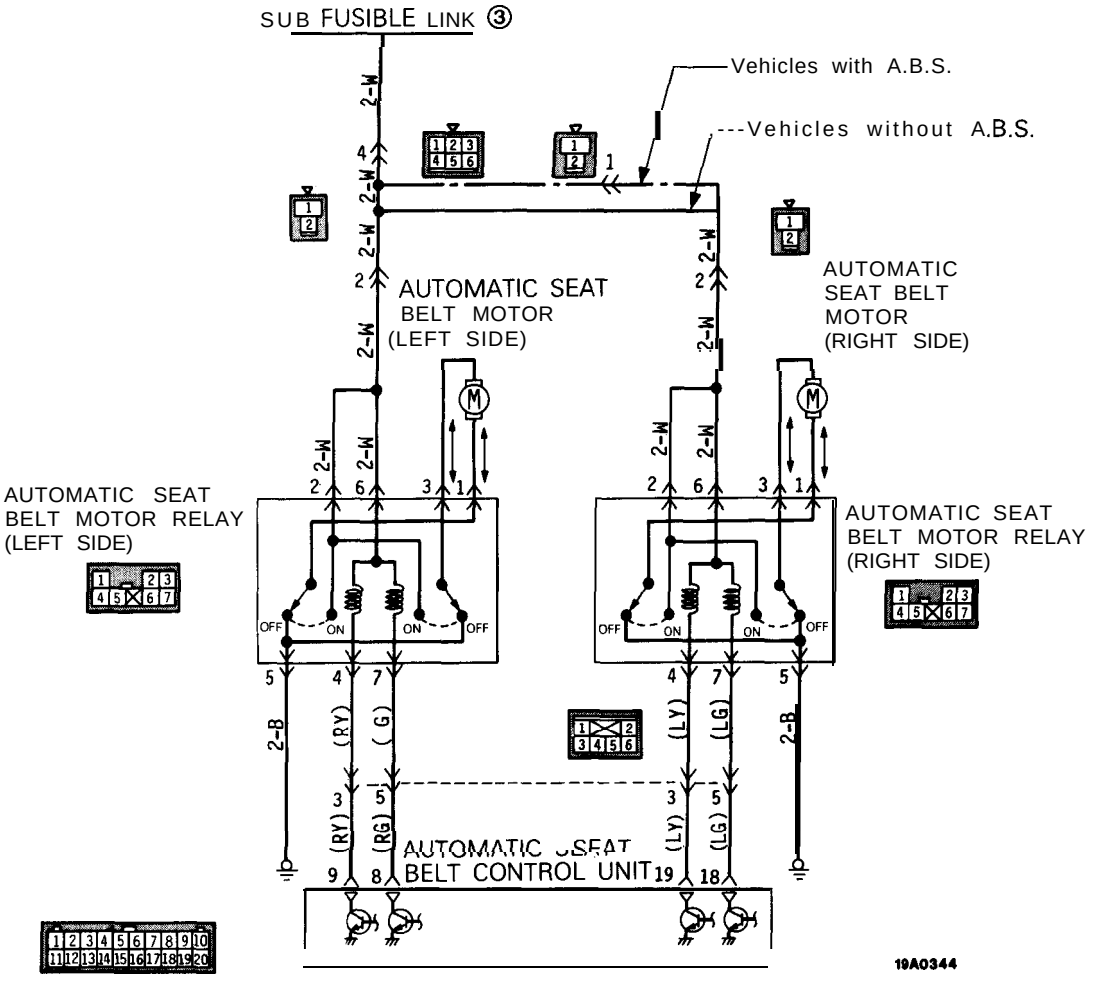
(1) Driver's side

| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| 1 | Unplug the door latch switch connector.<br>Open and close the door | Continuity of door latch switch (2–3, 1–3) | Between terminals 2 and 3<br>0 Ω when door is open<br>∞ Ω when door is closed<br>Between terminals 1 and 3<br>∞ Ω when door is open<br>0 Ω when door is closed | Remains 0 Ω or ∞ Ω | Door latch switch damaged | Replace the door latch switch (Refer to P.23-94.) |
| 2 | — | Terminal-to-ground continuity of door latch switch harness side connector (3–Ground) | 0 Ω | ∞ Ω | Open harness wire or disconnected connector between door latch switch and ground | Repair the harness or plug in the connector correctly |
| | | | | | improper ground connection | Correctly connect to ground |
| 3 | Connect the door latch switch connector.<br>Unplug the connector from the control unit.<br>Open and close the door. | Terminal-to-ground continuity of control unit harness side connector (6–Ground) | 0 Ω when door is open<br>∞ Ω when door is closed | Remains 0 Ω or ∞ Ω | Open harness wire or disconnected connector between control unit and door latch switch | Replace the harness or plug in the connector correctly. |
| 4 | Unplug the "fasten" switch connector.<br>Open and close the door. | Terminal-to-ground continuity of the "fasten" switch harness side connector (6–Ground) | ∞ Ω when door is open<br>0 Ω when door is closed | Remains 0 Ω or ∞ Ω | Open harness wire or disconnected connector between "fasten" switch and door latch switch | Repair the harness or plug in the connector correctly |
| 5 | Plug in the "fasten" switch connector.<br>Close the door. | Terminal-to-ground continuity of control unit harness side connector (4–Ground) | ∞ Ω when slide anchor is in the "fasten" range ("fasten" switch OFF)<br>0 Ω when slide anchor is not in the "fasten" range ("fasten" switch ON) | Remains 0 Ω or ∞ Ω | Defective "fasten" switch | Replace the driving device assembly |

(2) Passenger's side

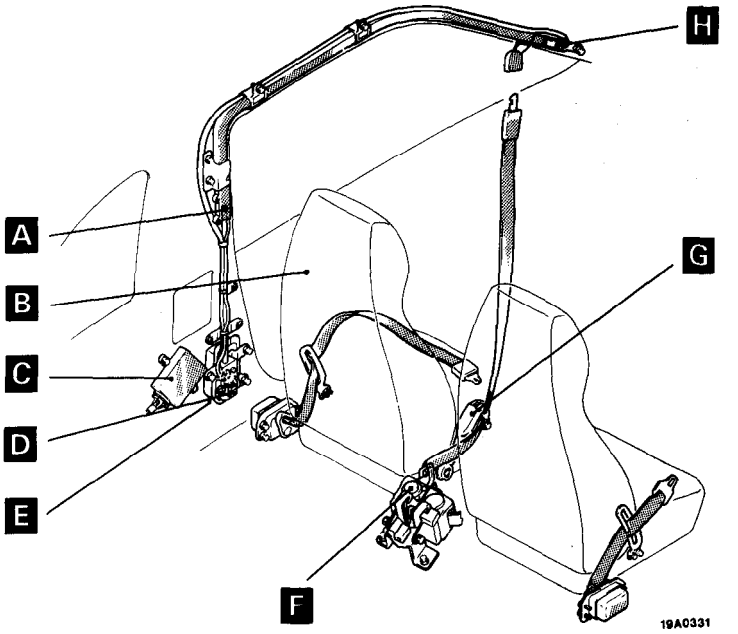
| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| 1 | Unplug the door latch switch connector.<br>Open and close the door | Continuity of door latch switch (2–3, 1–3) | Between terminals 2 and 3<br>0 Ω when door is open<br>∞ Ω when door is closed<br>Between terminals 1 and 3<br>∞ Ω when door is open<br>0 Ω when door is closed | Remains 0 Ω or ∞ Ω | Door latch switch damaged | Replace the door latch switch (Refer to P.23-94.) |
| 2 | — | Terminal-to-ground continuity of the door latch switch harness side connector (3–Ground) | 0 Ω | ∞ Ω | Open harness wire or disconnected connector between door latch switch and ground | Repair the harness or plug in the connector correctly |
| | | | | | Improper ground connection | Correctly connect to ground |
| 3 | Connect the door latch switch connector.<br>Unplug the connector from the "release" switch.<br>Open and close the door. | Terminal-to-ground continuity of the "release" switch harness side connector (1 -Ground) | 0 Ω when door is open<br>∞ Ω when door is closed | Remains 0 Ω or ∞ Ω | Open harness wire or disconnected connector between "release" switch and door latch switch | Repair the harness or plug in the connector correctly |
| 4 | Connect the "release" switch connector.<br>Unplug the connector from the control unit.<br>Open and close the door. | Terminal-to-ground continuity of control unit harness side connector (16–Ground) | 0 Ω when door is open and slide anchor is not in the "release" range ("release" switch ON)<br>∞ Ω when door is closed and slide anchor in the "release" range ("release" switch OFF) | Remains 0 Ω or ∞ Ω | Defective "release" switch | Replace the driving device assembly. (Refer to P.23-94.) |
| | | | | | Open harness wire or disconnected connector between control unit and "release" switch | Repair the harness or plug in the connector correctly. |
| 5 | Unplug the "fasten" switch connector.<br>Open and close the door. | Terminal-to-ground continuity of the "fasten" switch harness side connector (6–Ground) | ∞ Ω when door is open<br>0 Ω when door is closed | Remains 0 Ω or ∞ Ω | Open harness wire or disconnected connector between "fasten" switch and door latch switch | Repair the harness or plug in the connector correctly. |
| 6 | Connect the "fasten" switch connector.<br>Open and close the door. | Terminal-to-ground continuity of control unit harness side connector (15–Ground) | 0 Ω when door is closed and slide anchor is not in the "fasten" range ("fasten" switch ON)<br>∞ Ω when door is closed and slide anchor is in the "fasten" range ("fasten" switch OFF) | Remains 0 Ω or ∞ Ω | Defective "fasten" switch | Replace the driving device assembly (Refer to P.23-94.) |
| | | | | | Open harness wire or disconnected connector between control unit and "fasten" switch | Repair the harness or plug in the connector correctly. |

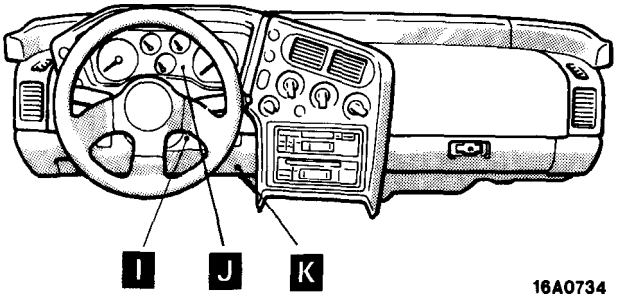
## 5. Motor Power Supply and Drive Circuit




| Step | Check method | | Judgement | | Cause | Remedy |
|---|---|---|---|---|---|---|
| | Operation | Check object | Normal | Malfunction | | |
| 1 | Unplug the motor relay connector. | Terminal-to-ground continuity of harness side connector (5—Ground) | 0 Ω | ∞ Ω | Open harness wire between motor relay and ground | Repair the harness |
| | | | | | Improper ground connection | Correctly connect to ground |
| 2 | | Harness side terminal voltage of motor relay (Z-Ground, 6—Ground) | System voltage | **OV** | Open harness wire or disconnected connector between fusible link and motor relay | Repair the harness or plug in the connector correctly |
| 3 | Plug in the motor relay connector. Unplug the connector from control unit. | Terminal voltage of control unit harness side connector L.H. (8—Ground, 9—Ground) R.H. (18—Ground, 19—Ground) | System voltage | **OV** | Open harness wire or disconnected connector between motor relay and control unit | Repair the harness or plug in the connector correctly |
| | | | | | Defective motor relay | Replace the driving device assembly. (Refer to P.23-94.) |

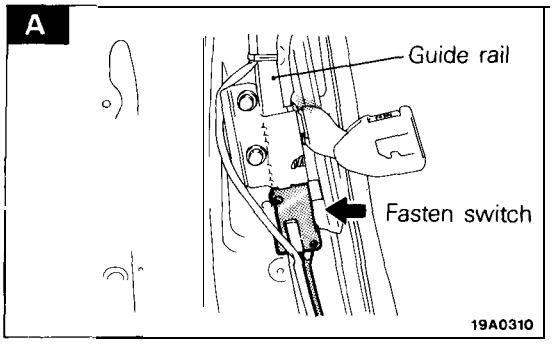
## AUTOMATIC SEAT BELT COMPONENTS LOCATION



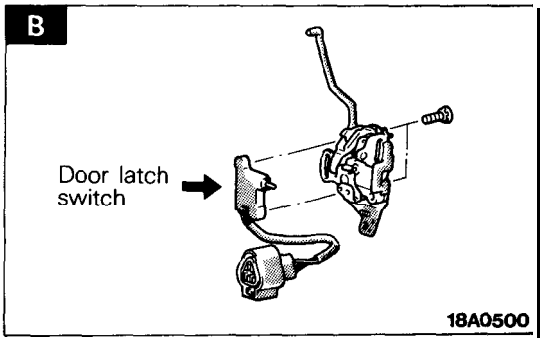




| Name | Symbol | Name | Symbol |
|---|---|---|---|
| Automatic seat belt control unit | C | Fasten switch | A |
| Automatic seat belt motor | E | Key reminder switch | I |
| Automatic seat belt motor relay | D | Outer switch | F |
| Buckle switch | G | Seat belt warning light | J |
| Buzzer | K | Release switch | H |
| Door latch switch | B | — | — |

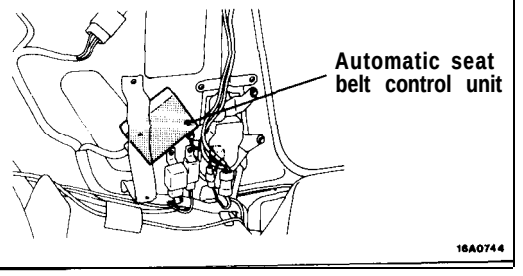
A



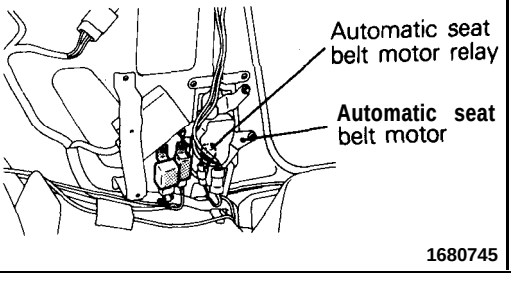

B



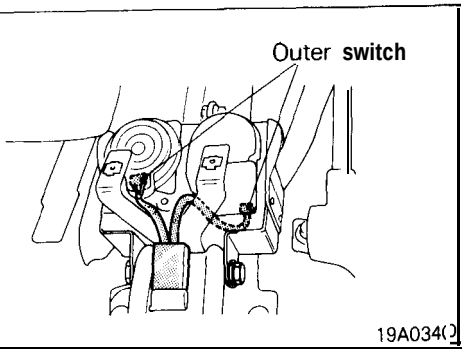
C


Automatic seat
belt control unit
16A0744

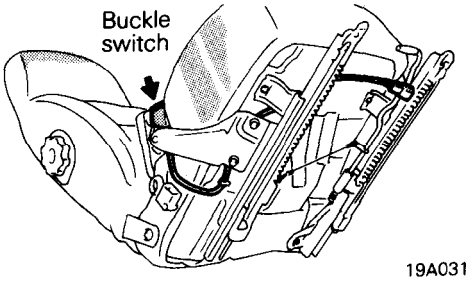
D, E


Automatic seat
belt motor relay
Automatic seat
belt motor
1680745

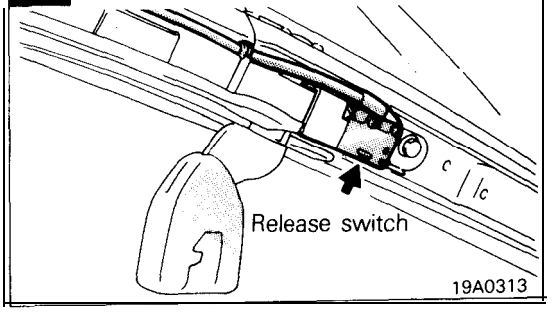
F


Outer switch
19A0340

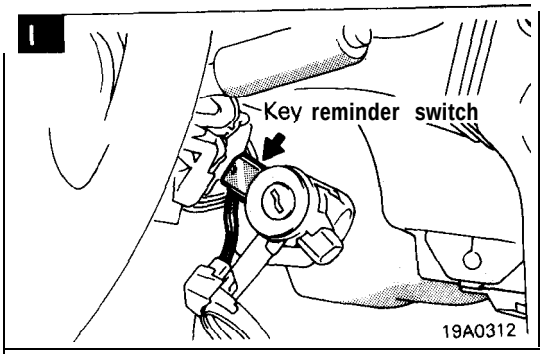
G


Buckle
switch
19A0311

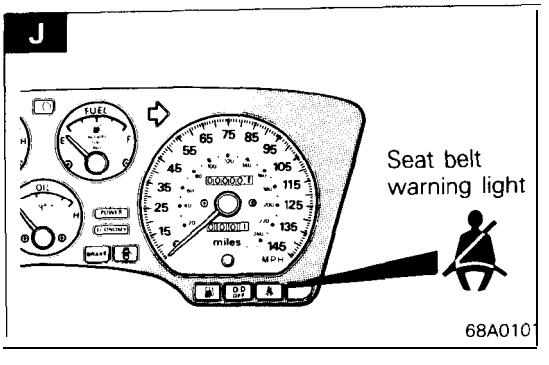
H


Release switch
19A0313

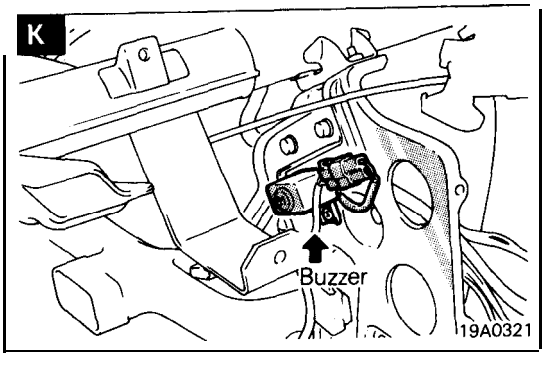
I

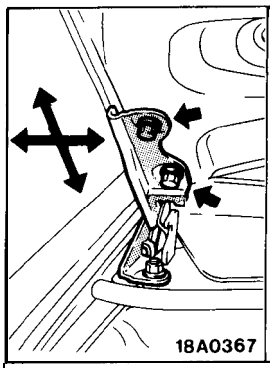

Key reminder switch
19A0312

J


Seat belt
warning light
68A0107

K


Buzzer
19A0321



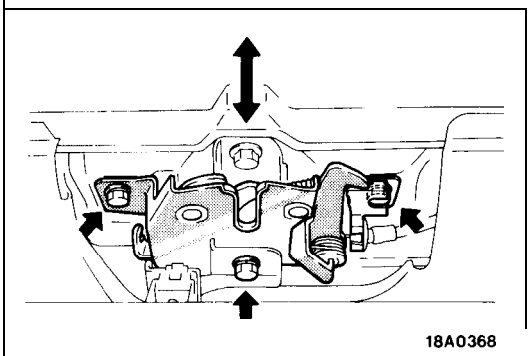




# SERVICE ADJUSTMENT PROCEDURES

## HOOD ADJUSTMENT N23FAAK

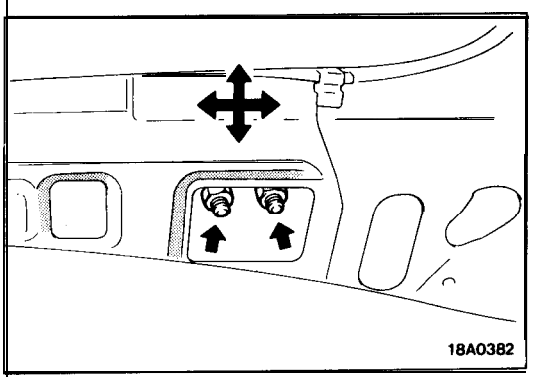
1. Loosen the hood mounting bolts, and then adjust the hood by moving it so that the clearance is equal on all sides.
2. Turn the hood bumpers, adjust the height of the hood.

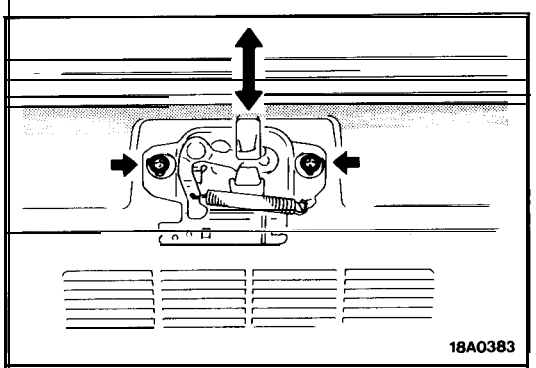



3. Loosen the food latch mounting bolts, and move the food switch to adjust the attachment between the food switch and food striker.

## LIFTGATE ADJUSTMENT N23FCAE

1. Loosen the liftgate hinges mounting bolts, and then adjust the liftgate by moving it so that the clearance is equal on all sides.

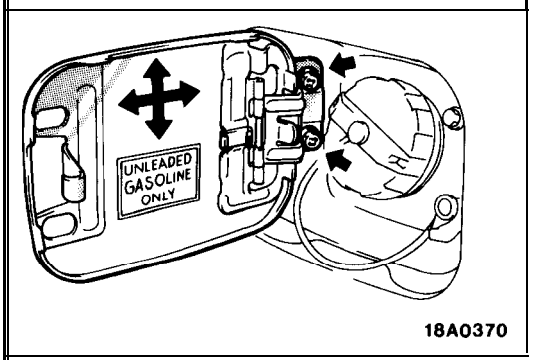


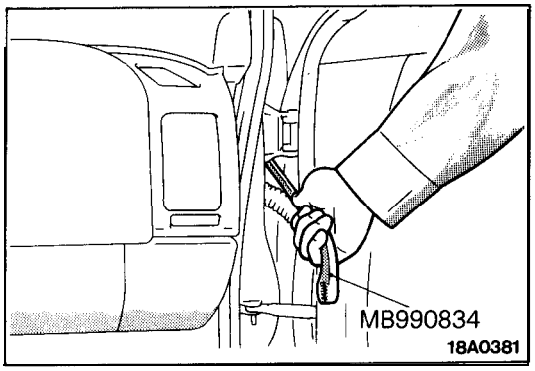




2. Loosen the liftgate latch mounting bolts, and move the liftgate latch to adjust the attachment between the liftgate latch and liftgate striker.

## FUEL FILLER DOOR ADJUSTMENT N23FDAE

Loosen the fuel filler door mounting screw and adjust the fuel filler door so that the clearance around the fuel filler door is even without any height differences.

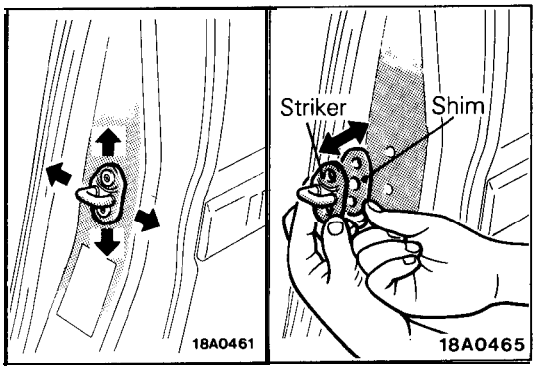




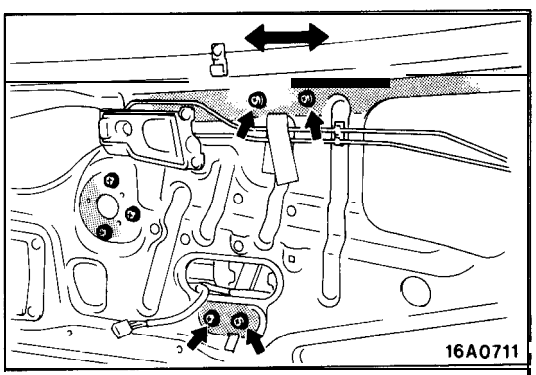

## DOOR ADJUSTMENT N23FEAF

1. Use the special tool to loosen the hinge mounting bolts on the body side, and then adjust the clearance around the door so that it is uniform on all sides.

**Caution**
**Attach protection tape to the fender edges where the hinge is installed.**

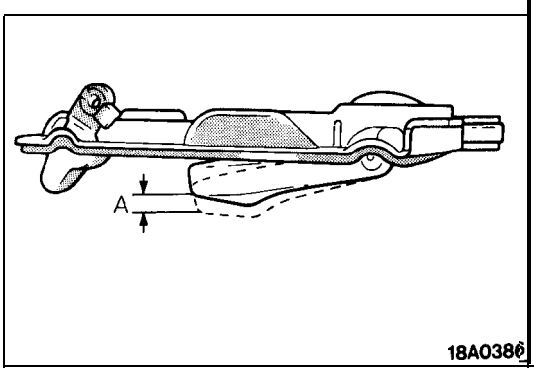



2. When the hinge is replaced, loosen hinge mounting bolts on door side and adjust alignment of fender panel with front door panel.
3. Loosen door striker mounting screws to adjust alignment of door panel.
4. Increase or decrease the number of shims and move striker to adjust engagement of striker with door latch.




## DOOR GLASS ADJUSTMENT N23FFAK

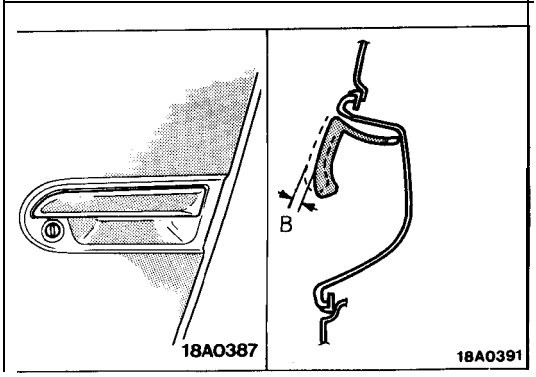
1. Remove the door trim and waterproof film. (Refer to P.23 **-65.)**
2. Loosen the installation bolt of the window regulator assembly; then move the upper installation back and forth and adjust the tilted angle of the glass.




## DOOR INSIDE HANDLE PLAY CHECK N23FGAH

If the door inside handle play does not conform to the standard value, check the door inside handle or door latch assembly, and replace if necessary.

**Standard value (A): 2.5-8.5 mm (.09–.33 in.)**

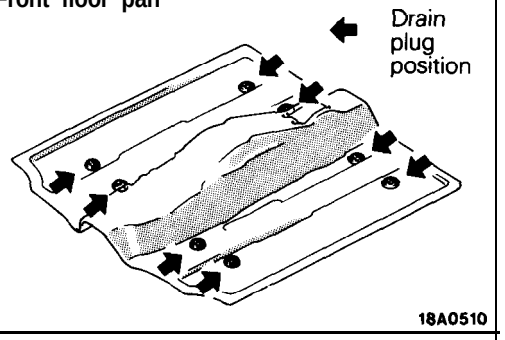



## DOOR OUTSIDE HANDLE PLAY CHECK N23FHAH

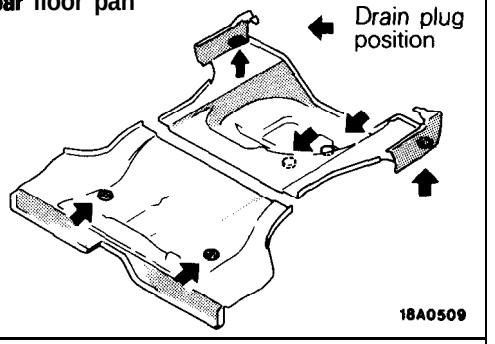
If the door outside handle play does not conform to the standard value check the door outside handle or door latch assembly, and replace if necessary.

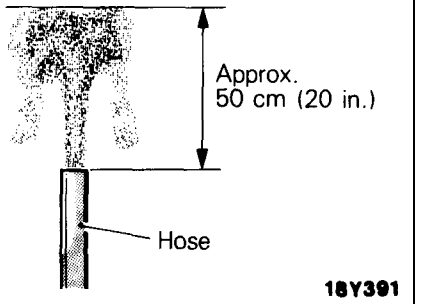
**Standard value (B): 2.5-6.5 mm (.09–.25 in.)**

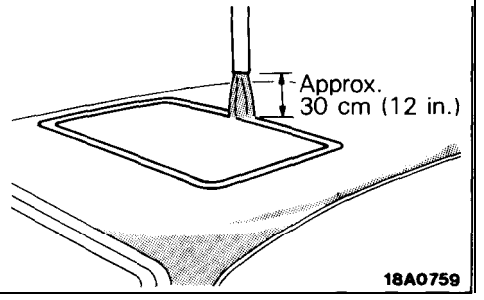
Front floor pan




Rear floor pan




## FLOOR PAN INSPECTION N23FIAC

A common result of body leaks is a soaked floor mat pad or carpet, and it's not unusual to find that the water is getting in through the floor pan to some other low point in the body. It is possible however, for water to enter higher up and run downward to soak the mat.

Since a soaked mat should be removed for drying, it's a good way to start your check. Of course, mat removal means you'll have to take off door sill plates and pull out seats or seat cushion. But, this gives you a clear field for action so you can check body seam sealing and the plugs in the floor pan.

It's usually not practical to water test for floor pan or wheelhousing leaks unless a special underbody water spray arrangement is available. As an alternate, the best way to locate these leak points is to look for rusty seam edges or other traces of leaks after the mats and cushions are removed. Traces of mud are an indication that the water is coming in from below.

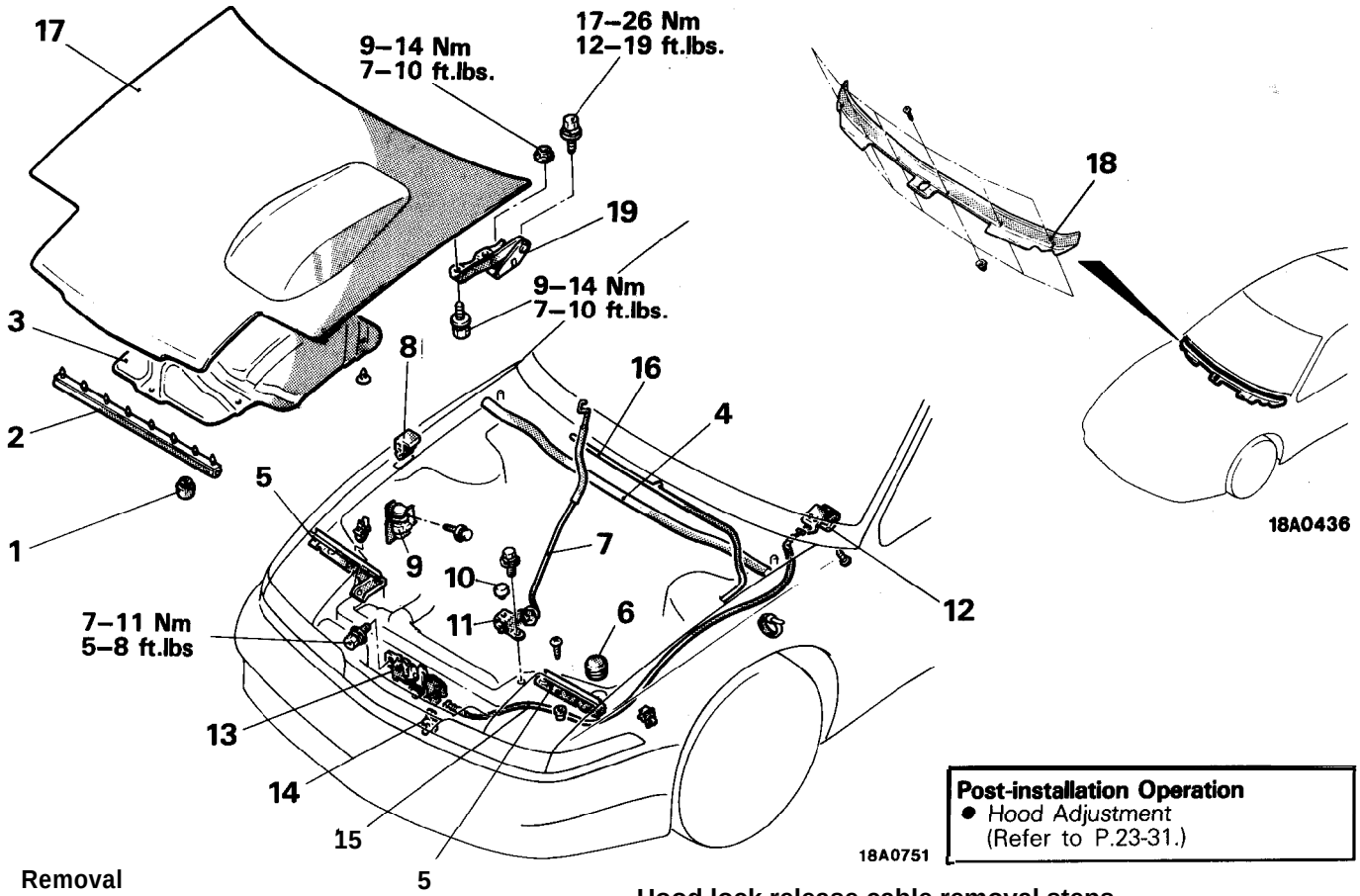
## WATER TEST N23FPABa

1. Close roof lid tightly.
2. Hold hose upward and adjust water fountain to about 50 cm (20 in.) high.
3. Pour water over the roof from about 30 cm(12 in.) above roof for more than 5 minutes.
4. While pouring water, check for leak around roof lid.
5. In the event of leakage, check drain hose, weatherstrip contact and others.

# HOOD

N23HAAS

## REMOVAL AND INSTALLATION




**Post-installation Operation**
- *Hood Adjustment*
(Refer to P.23-31.)

**Removal**

1. Bumper
2. Hood weatherstrip
3. Heat protector
4. Hood weatherstrip
5. Headlight hood protector
- ◆◆ 6. Bumper
7. Hood support rod
8. Bumper
9. Hood switch <Vehicles with theft-alarm system >
10. Bumper
11. Bumper bracket
- *I 12. Hood lock release handle
- 13. Hood latch

**NOTE**
(1) **Reverse the removal procedures to reinstall.**
(2) ● **4: Refer to "Service Points of Installation".**

**Hood lock release cable removal steps**

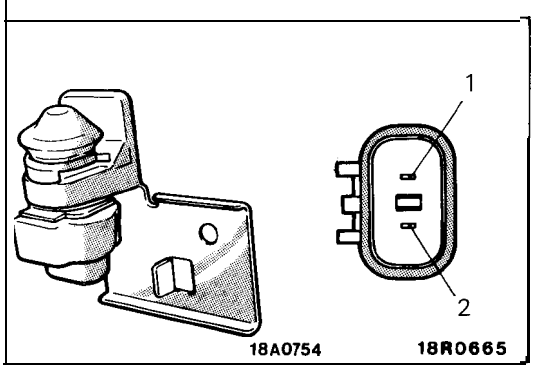
- 12. Hood lock release handle
- ◆◆ 13. Hood latch
14. Protector
15. Hood lock release cable

**Hood removal steps**

16. Connection for washer tube and nozzle
17. Hood

**Hood hinge removal steps**

16. Connection **for washer tube and nozzle**
17. Hood
Windshield wiper arms (Refer to GROUP 8–Windshield Wiper.)
18. Front deck garnish
- ◆◆ 19. Hood hinge




## INSPECTION

### HOOD SWITCH

(1) Disconnect the hood switch connector.
(2) Check the continuity between the terminal.

| Terminal | 1 | 2 |
|---|---|---|
| Hood switch unpressed | ○ | ○ |
| Hood switch depressed | | |

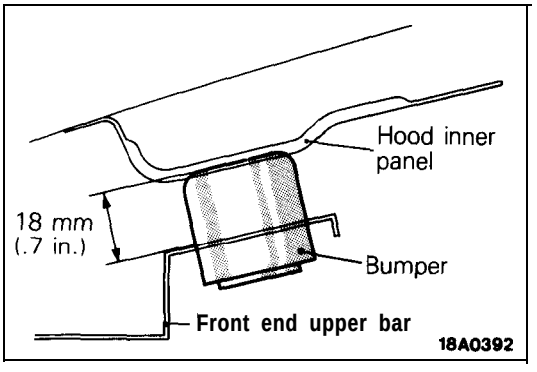
NOTE
○–○ indicates that there is continuity between the terminals.

## SERVICE POINTS OF INSTALLATION

**19. APPLICATION OF GREASE TO HOOD HINGE/13. HOOD LATCH/12. HOOD LOCK RELEASE HANDLE**

Apply multipurpose grease to all moving parts.

**Grease: MOPAR Multipurpose Grease Part No. 2932524 or equivalent**



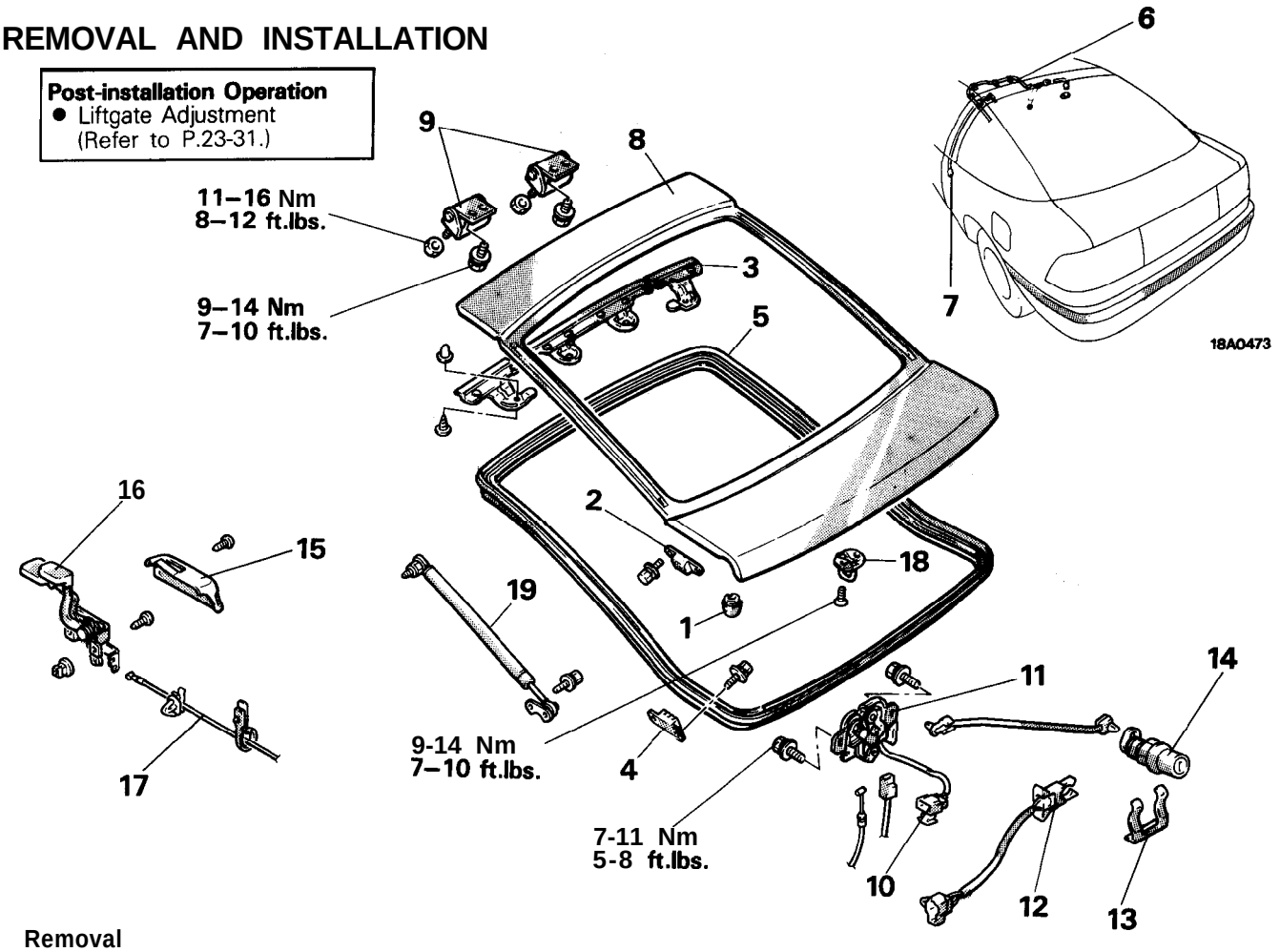

**6. INSTALLATION OF BUMPER**

Install the bumper so that the amount of projection from the front end upper bar is as shown in the illustration.

# LIFTGATE

N230AAT

## REMOVAL AND INSTALLATION




**Removal**

1. Bumper
2. Liftgate damper (upper)
3. Liftgate outer weatherstrip
4. Liftgate damper (lower)
5. Liftgate opening weatherstrip

**Liftgate hinge removal steps**

Headlining (Refer to P.23-89.)
6. Connection for rear washer tube
Center pillar trim (driver's side) } (Refer to
Quarter trim (driver's side) } P.23-85.)
7. Connection for liftgate wiring harness
8. Liftgate
9. Liftgate hinge

**Liftgate removal steps**

6. Connection for rear washer tube
Center pillar trim (driver's side) } (Refer to
Quarter trim (driver's side) } P.23-85.)
7. Connection for liftgate wiring harness
8. Liftgate

**Liftgate lock release cable removal steps**

Rear seat (Refer to P.23-93.)
Scuff plate (driver's side) }
Quarter trim (driver's side) } (Refer to
Rear end trim } P.23-85.)
Rear side trim }

- a 11. Liftgate latch
15. Release handle cover
- + 16. Liftgate lock release handle
17. Liftaate lock release cable

**Liftgate lock release handle removal steps**

Scuff plate (driver's side)
(Refer to P.23-85.)
15. Release handle cover
◆◆ 16. Liftgate lock release handle

**Liftgate latch removal steps**

Rear end trim (Refer to P.23-85.)
10. Liftgate switch connector <Vehicles with theft-alarm system >
◆◆ 1 1. Liftgate latch

**Liftgate lock cylinder removal steps**

Rear end trim (Refer to P.23-85.)
12. Liftgate unlock switch <Vehicles with theft-alarm system >
13. Retainer
14. Liftgate lock cylinder

**Liftgate striker removal steps**

Liftgate trim (Refer to P.23-86.)
18. Liftgate striker

**Liftgate stopper removal steps**

Rear side trim (Refer to P.23-85.)
◆◆ 19. Liftgate stopper

**NOTE**
**(1) Reverse the removal procedures to reinstall.**
**(2) ◆◆: Refer to "Service Points of Removal".**
**(3) ● *: Refer to "Service Points of Installation".**

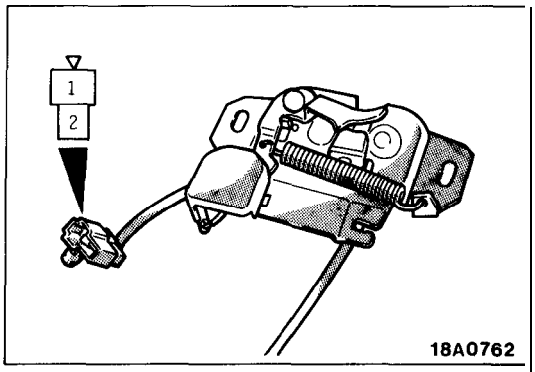
## SERVICE POINTS OF REMOVAL

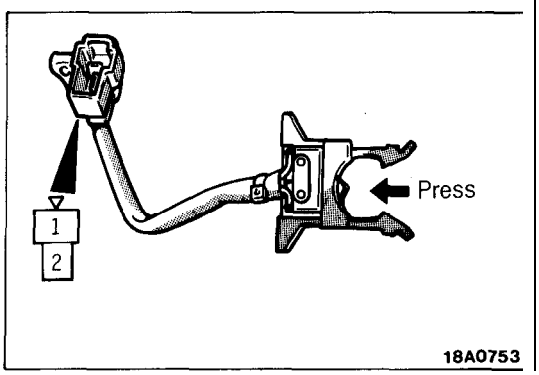
### 19. REMOVAL OF LIFTGATE STOPPER

**Caution**

**1. Never try to disassemble the liftgate gas spring or bum it.**

**2. Always bore a hole in the gas spring to release the interior gas before the spring is discarded.**




## INSPECTION

### LIFTGATE SWITCH

(1) Unlock the liftgate latch.
(2) Check the continuity between the terminals.

| Terminal | 1 | 2 |
|---|---|---|
| Liftgate latch locked | | |
| Liftgate latch unlocked | 0 | 0 |

NOTE
O–O indicates that there is continuity between the terminals.

### LIFTGATE LOCK CYLINDER SWITCH

Check to be sure that there is continuity between connector terminals 1 and 2 when the switch part shown in the illustration is not pressed, and that there is no longer continuity when it is pressed.

## SERVICE POINTS OF INSTALLATION

### 16. APPLICATION OF GREASE TO LIFTGATE LOCK RELEASE HANDLE/ 11. LIFTGATE LATCH

Apply multipurpose grease to all moving parts.

**Grease: MOPAR Multipurpose Grease Part No. 2932524 or equivalent**

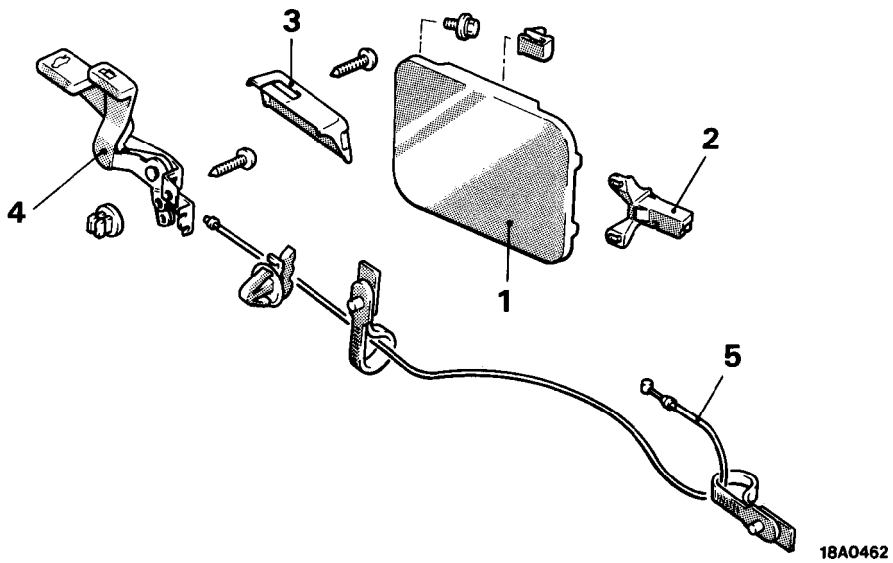
# FUEL TANK FILLER DOOR

N23JAAQ

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Rear Seat (Refer to P.23-93.)
- Removal of Rear Side Trim, Quarter Trim and Scuff Plate. (Refer to P.23-85.)

**Post-installation Operation**
- Installation of Rear Side Trim, Quarter Trim and Scuff Plate (Refer to P.23-85.)
- Installation of Rear Seat (Refer to P.23-93.)
- Fuel Filler Door Adjustment (Refer to P.23-31.)




**Removal steps**
- C 1. Fuel filler door
  2. Fuel filler door hook
  3. Release handle cover
- \+ 4. Fuel filler door lock release handle
  5. Fuel filler door lock release cable

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Installation".

## SERVICE POINTS OF INSTALLATION

### 4. APPLICATION OF GREASE TO FUEL FILLER DOOR LOCK RELEASE HANDLE/I. FUEL FILLER DOOR

Apply multipurpose grease to all moving parts.

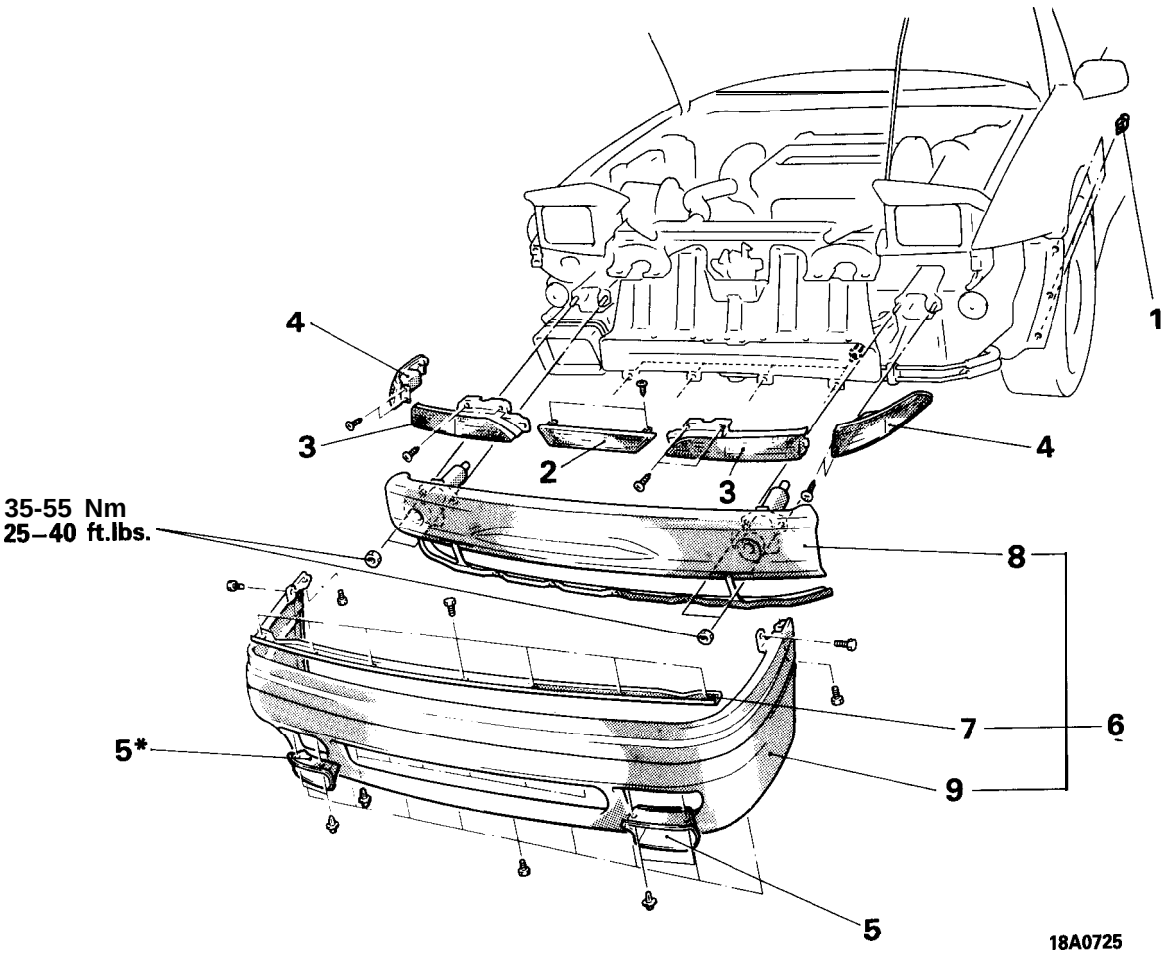
**Grease: MOPAR Multipurpose Grease Part No. 2932524 or equivalent**

# FRONT BUMPER

N23ZAAU

## REMOVAL AND INSTALLATION

< Normal type >




**Front bumper assembly removal steps**

- 1. Splash shield mounting clip
- ◆◆ 2. Front garnish
- 3. Front turn signal light
- 4. Front combination light
- 5. Air intake cover
- 6. Front bumper assembly
- 7. Fascia upper plate
- 8. Front bumper reinforcement assembly
- 9. Front bumper fascia

**Front bumper fascia removal steps**

- 1. Splash shield mounting clip
- ◆◆ 2. Front garnish
- 3. Front turn signal light
- 4. Front combination light
- 5. Air intake cover
- 7. Fascia upper plate
- 9. Front bumper fascia

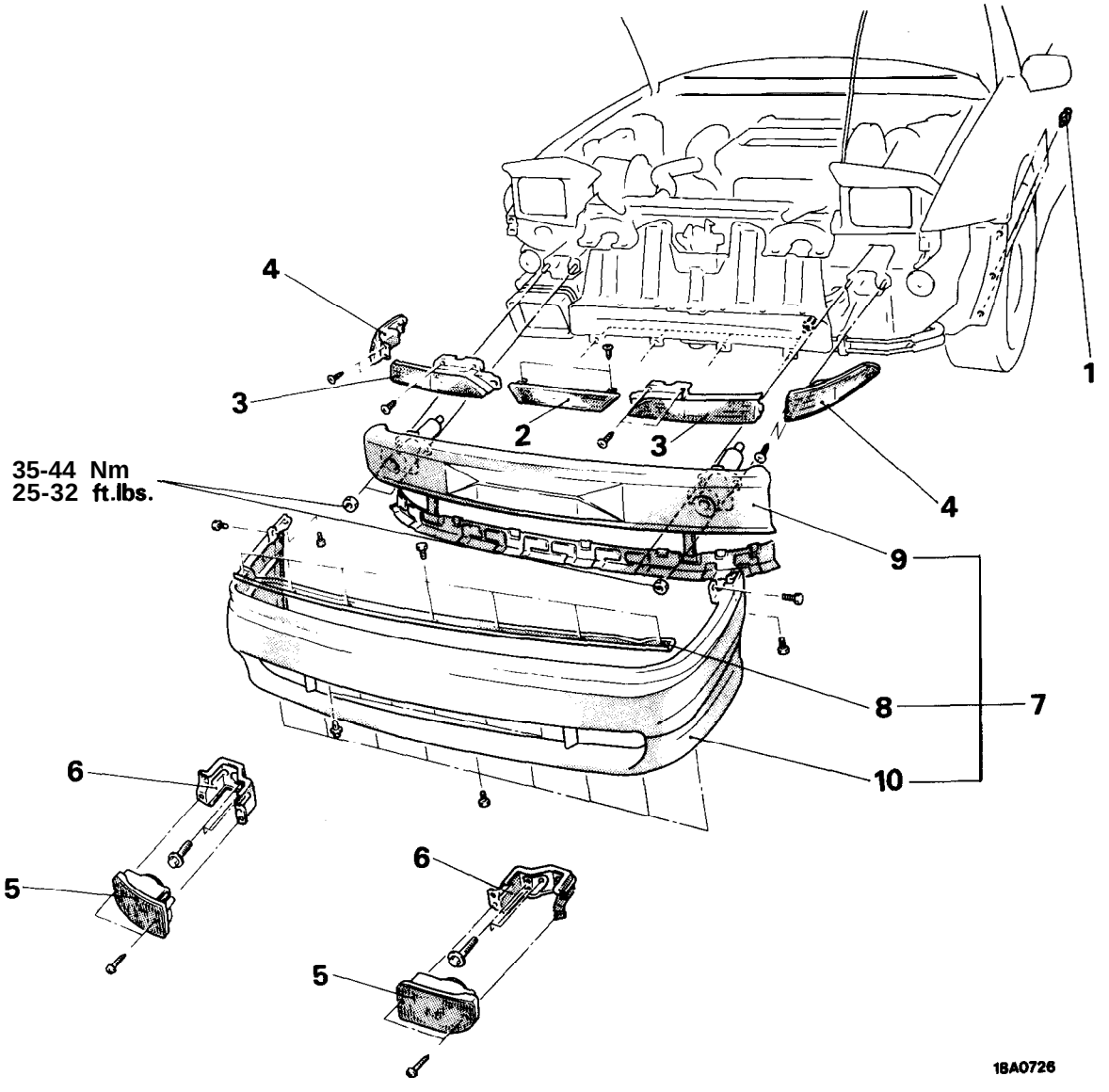
**NOTE**
(1) **Reverse the removal procedures to reinstall.**
(2) ◆◆: **Refer to "Service Points of Removal".**
(3) . : **<Non-turbo>**

## SERVICE POINTS OF REMOVAL

### 2. REMOVAL OF FRONT GARNISH

Refer to P.23-47.

< Large type >




**Front bumper assembly removal steps**

◆◆ 1. Splash shield mounting clip
◆◆ 2. Front garnish
3. Front turn signal light
4. Front combination light
5. Front fog light
6. Fog light bracket
7. Front bumper assembly
8. Fascia upper plate
9. Front bumper reinforcement assembly
10. Front bumper fascia

**Front bumper fascia removal steps**

◆◆ 1. Splash shield mounting clip
◆◆ 2. Front garnish
3. Front turn signal light
4. Front combination light
5. Front fog light
8. Fascia upper plate
10. Front bumper fascia

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to “Service Points of Removal”.

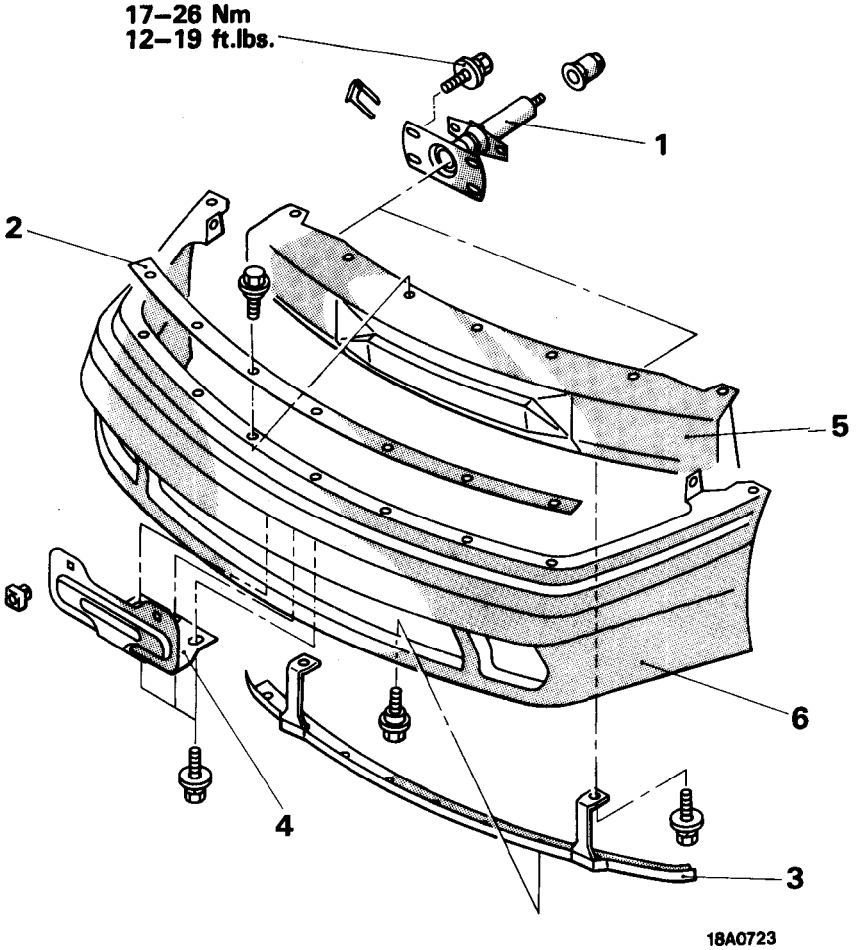
## SERVICE POINTS OF REMOVAL

### 2. REMOVAL OF FRONT GARNISH

Refer to P.23-47.

## DISASSEMBLY AND REASSEMBLY

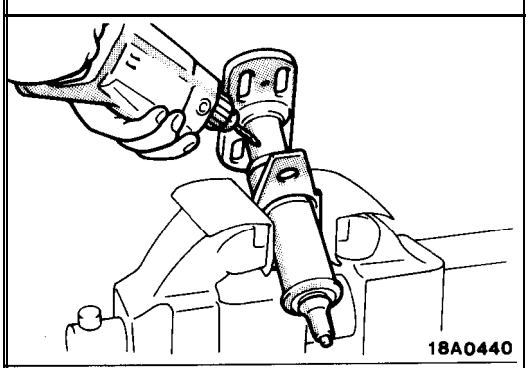
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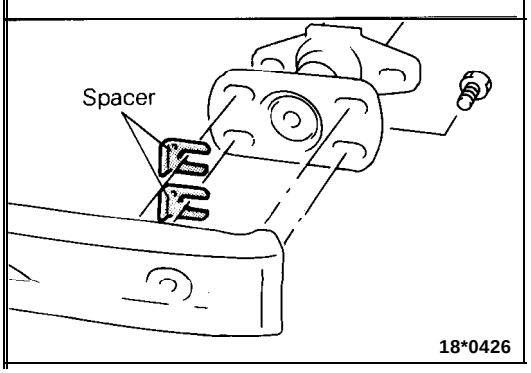



**Disassembly steps**

◆◆ ● C **1. Bumper absorber**
2. Fascia upper plate
3. Lower plate
4. License plate bracket
5. Front bumper reinforcement
**6. Front bumper fascia**

**NOTE**
(1) **Reverse the disassembly procedures to reassemble.**
(2) ◆◆: **Refer to "Service Points of Disassembly".**
(3) ● : **Refer to "Service Points of Reassembly".**




## SERVICE POINTS OF DISASSEMBLY

### 1. REMOVAL OF BUMPER ABSORBER

**Caution**

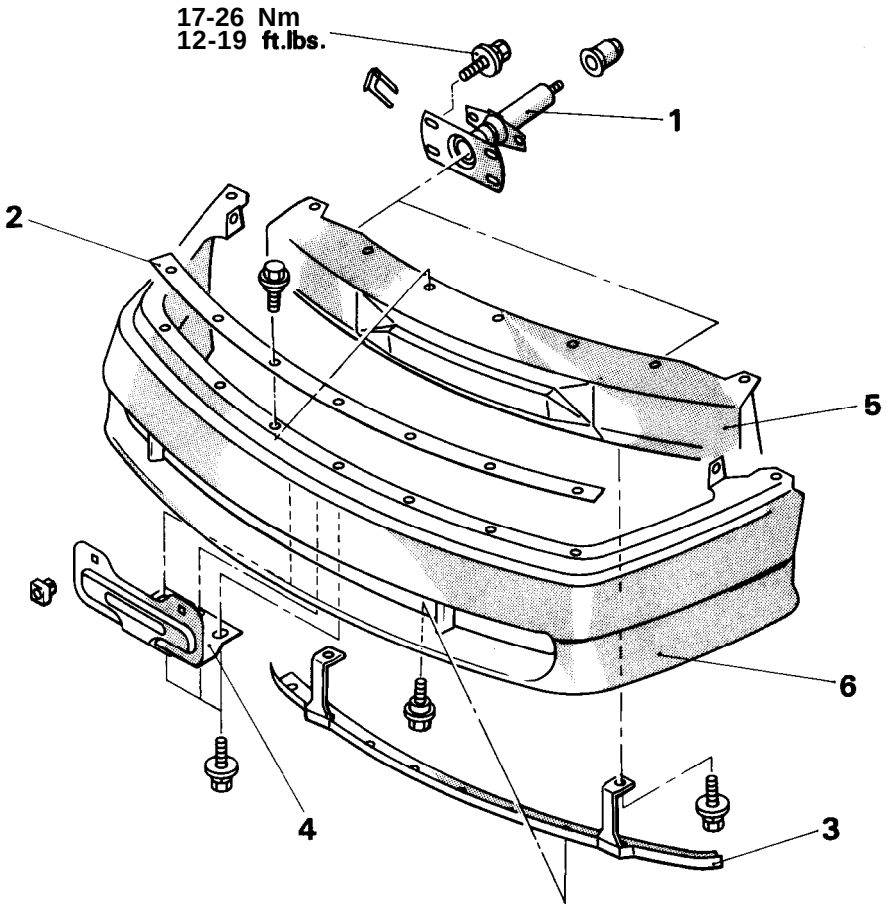
1. **Do not attempt to repair a bumper absorber that has been compressed in an accident; replace it with a new one.**
2. **Before discarding the bumper absorber, drill a 3 mm (. 13 in.) diameter hole to discharge the gas contained in the unit.**
3. **If the bumper absorber is to be discarded, do not burn it.**

## SERVICE POINTS OF REASSEMBLY

### 1. INSTALLATION OF BUMPER ABSORBER

If the squareness between the front bumper reinforcement and the bumper absorber is improper, adjust it by putting a spacer between them.

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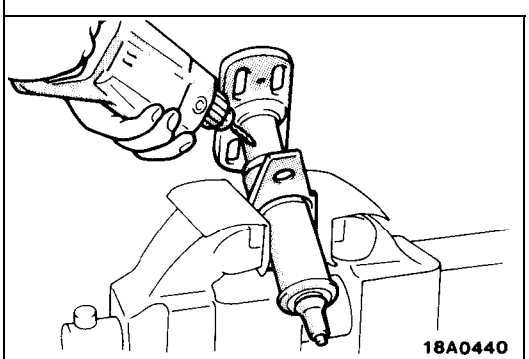


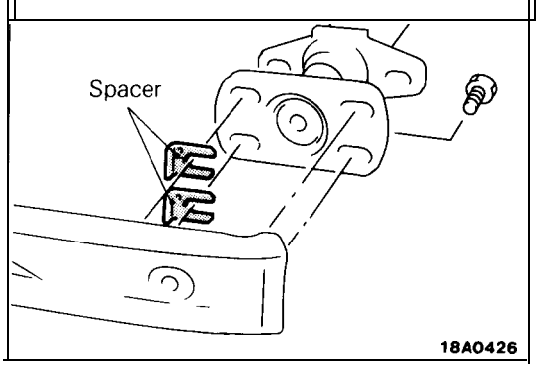

18A0724

**Disassembly steps**

◆◆ ● 4 1. Bumper absorber
2. Fascia upper plate
3. Lower plate
4. License plate bracket
5. Front bumper reinforcement
6. Front bumper fascia

NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ● +: Refer to "Service Points of Reassembly".




## SERVICE POINTS OF DISASSEMBLY

### 1. REMOVAL OF BUMPER ABSORBER

**Caution**

**1. Do not attempt to repair a bumper absorber that has been compressed in an accident; replace it with a new one.**
**2. Before discarding the bumper absorber, drill a 3 mm (. 13 in.) diameter hole to discharge the gas contained in the unit.**
**3. If the bumper absorber is to be discarded, do not bum it.**

## SERVICE POINTS OF REASSEMBLY

### 1. INSTALLATION OF BUMPER ABSORBER

If the squareness between the front bumper reinforcement and the bumper absorber is improper, adjust it by putting a spacer between them.

# REAR BUMPER

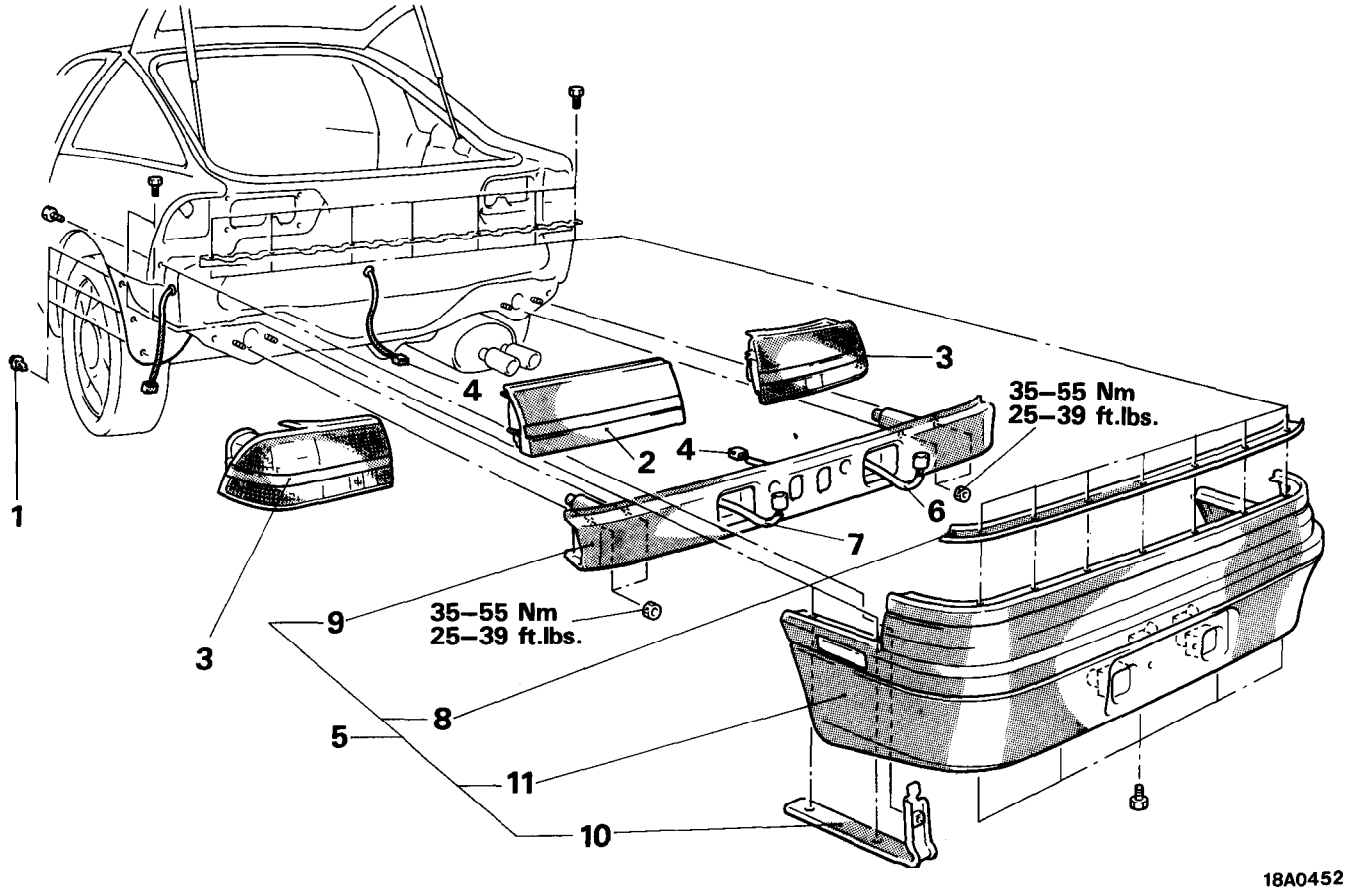
N23ZAAV

## REMOVAL AND INSTALLATION

< Normal type >

**Pre-removal Operation**
- Removal of Rear End Trim
  (Refer to P.23-85.)

***Post-installation Operation***
- Installation of Rear End Trim
  (Refer to P.23-85.)




18A0452

**Rear bumper assembly removal steps**

1. Splash shield mounting clip
2. Rear panel garnish
3. Rear combination light
4. Connection for license plate light wiring harness and body wiring harness
5. Rear bumper assembly
8. Fascia plate upper
9. Rear bumper reinforcement assembly
10. Fascia plate lower
11. Rear bumper fascia

**Rear bumper fascia removal steps**

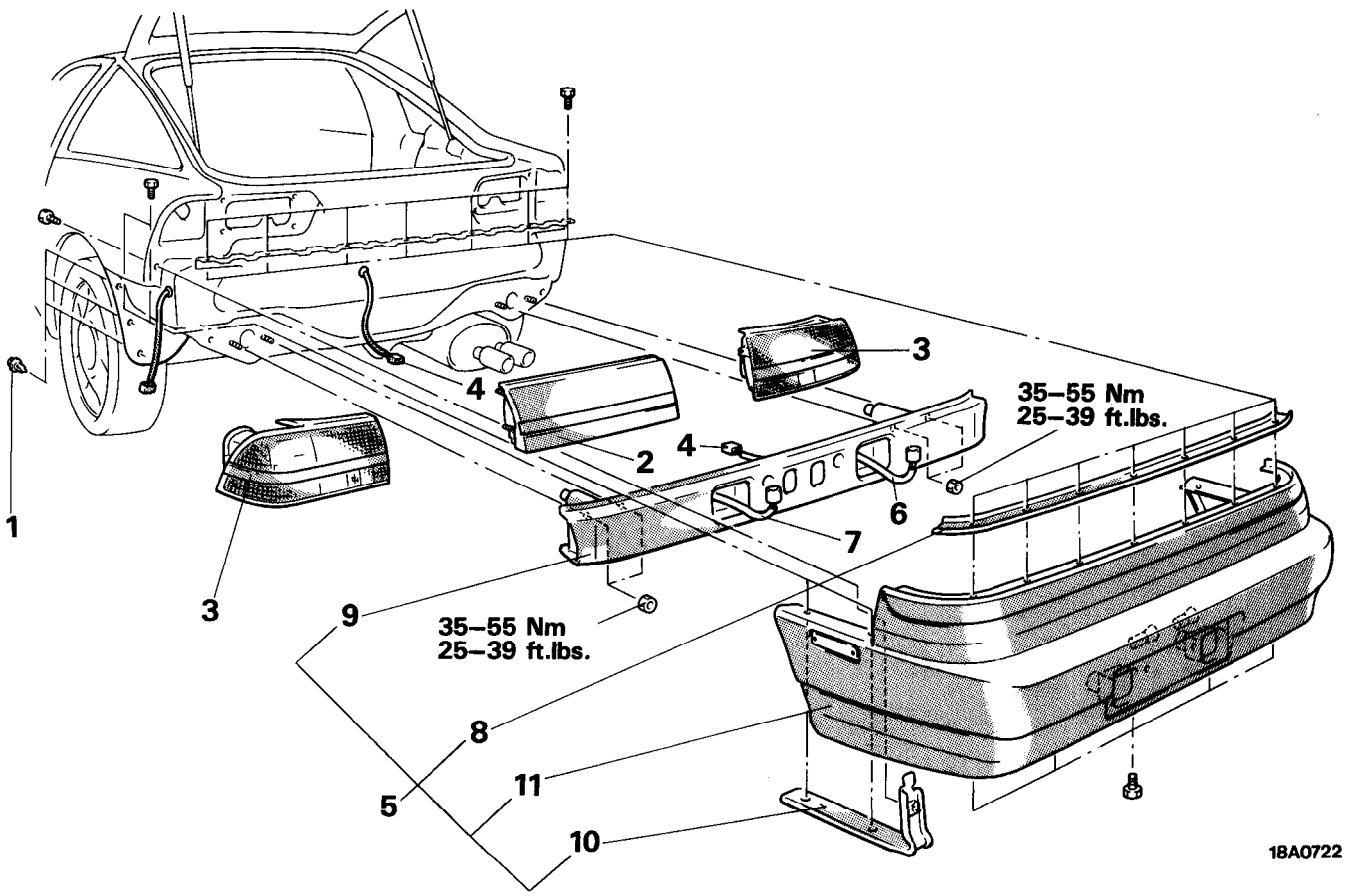
1. Splash shield mounting clip
2. Rear panel garnish
3. Rear combination light
6. License plate light harness connector
7. Back-up light harness connector
8. Fascia plate upper
10. Fascia plate lower
11. Rear bumper fascia

NOTE
Reverse the removal procedures to reinstall.

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**Pre-removal Operation**
- Removal of Rear End Trim (Refer to P.23-85.)

**Post-installation Operation**
- Installation of Rear End Trim (Refer to P.23-85.)




**Rear bumper assembly removal steps**

1. Splash shield mounting clip
2. Rear panel garnish
3. Rear combination light
4. Connection for license plate light wiring harness and body wiring harness
5. Rear bumper assembly
8. Fascia plate upper
9. Rear bumper reinforcement assembly
10. Fascia plate lower
11. Rear bumper fascia

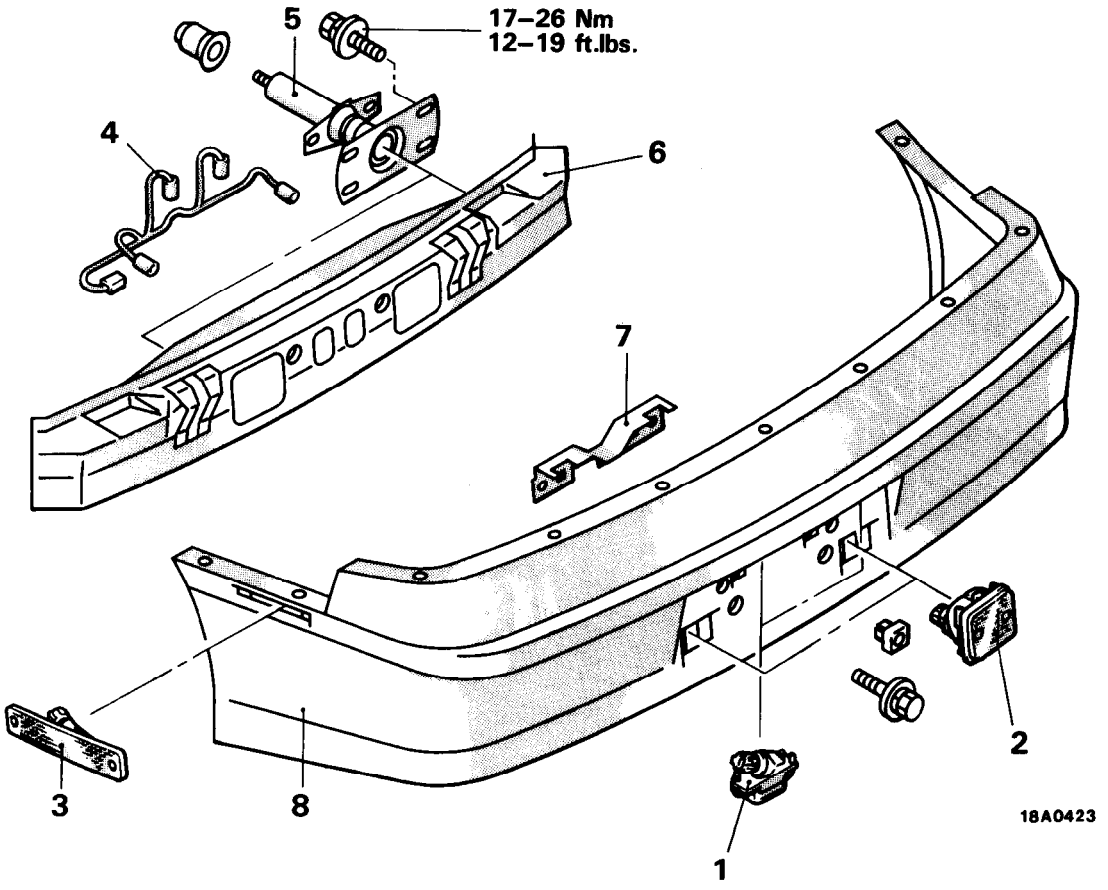
**Rear bumper fascia removal steps**

1. Splash shield mounting clip
2. Rear panel garnish
3. Rear combination light
6. License plate light harness connector
7. Back-up light harness connector
8. Fascia plate upper
10. Fascia plate lower
11. Rear bumper fascia

NOTE
Reverse the removal procedures to reinstall.

## DISASSEMBLY AND REASSEMBLY

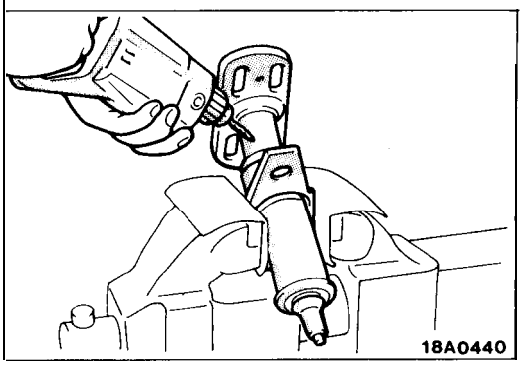
< Normal type >




**Disassembly steps**

1. License plate light
2. Back-up light
3. **Rear side marker light**
4. **License plate light wiring harness**
◆◆ 5. **Bumper absorber**
6. **Rear bumper reinforcement**
7. **License plate bracket**
8. **Rear bumper fascia**

**NOTE**
(1) **Reverse the disassembly procedures to reassemble.**
(2) ◆◆: **Refer to "Service Points of Disassembly".**



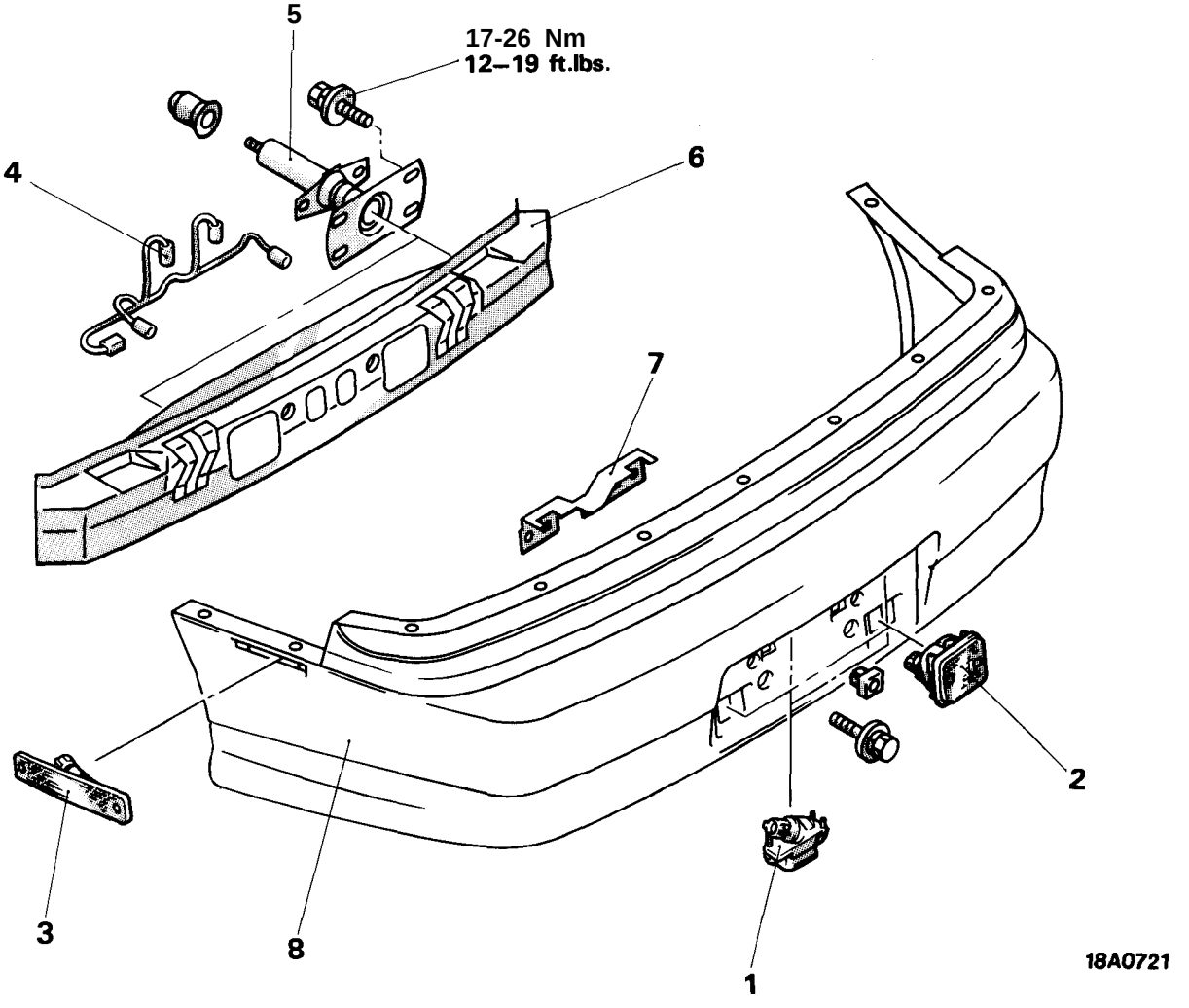

## SERVICE POINTS OF DISASSEMBLY

### 5. REMOVAL OF BUMPER ABSORBER

**Caution**

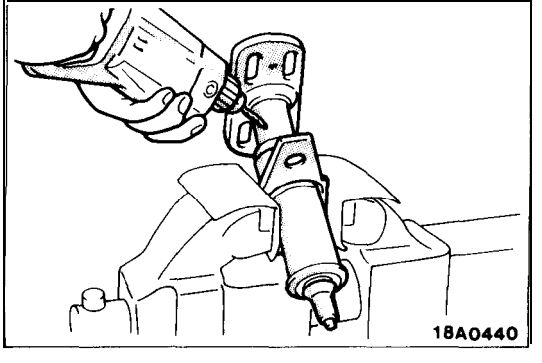
1. **Do not attempt to repair a bumper absorber that has been compressed in an accident; replace it with a new one.**
2. **Before discarding the bumper absorber, drill a 3 mm (. 13 in.) diameter hole to discharge the gas contained in the unit.**
3. **If the bumper absorber is to be discarded, do not burn it.**

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**Disassembly steps**

1 License plate light
2. Back-up light
3. Rear side marker light
4. License plate light wiring harness
◆◆ 5. Bumper absorber
6. Rear bumper reinforcement
7. License plate bracket
8. Rear bumper fascia




## SERVICE POINTS OF DISASSEMBLY

### 5. REMOVAL OF BUMPER ABSORBER

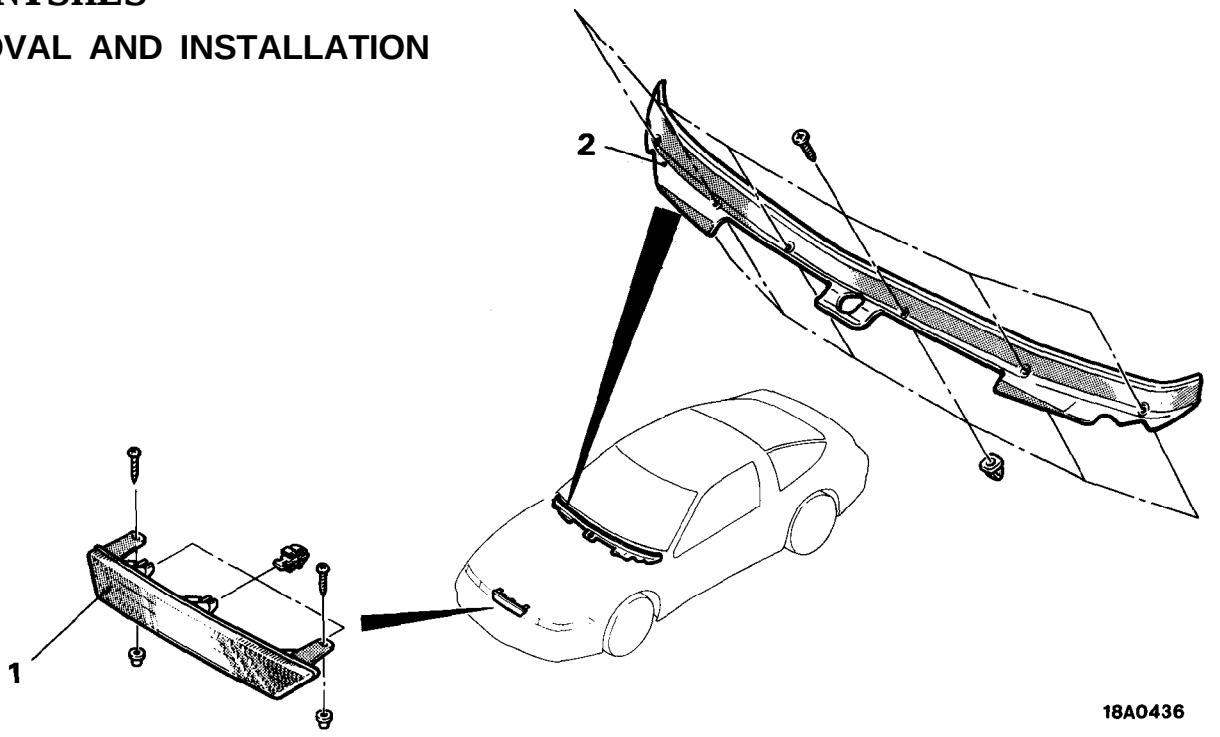
**Caution**

**1. Do not attempt to repair a bumper absorber that has been compressed in an accident; replace it with a new one.**
**2. Before discarding the bumper absorber, drill a 3 mm (. 13 in.) diameter hole to discharge the gas contained in the unit.**
**3. If the bumper absorber is to be discarded, do not burn it.**

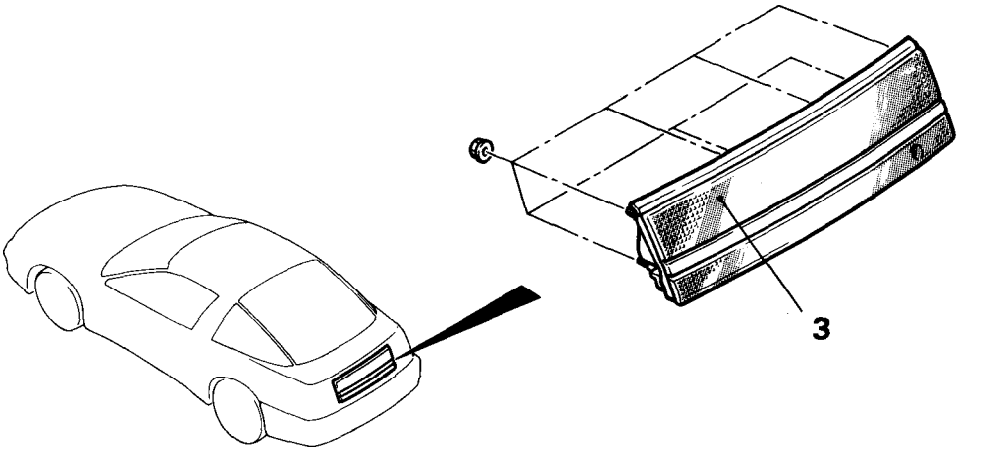
N23RDAD

# GARNISHES

## REMOVAL AND INSTALLATION




18A0436




18A0435

**Front garnish removal**

◆◆ 1. Front garnish

**Front deck garnish removal steps**

Windshield wiper arms
(Refer to GROUP 8–Windshield Wiper.)

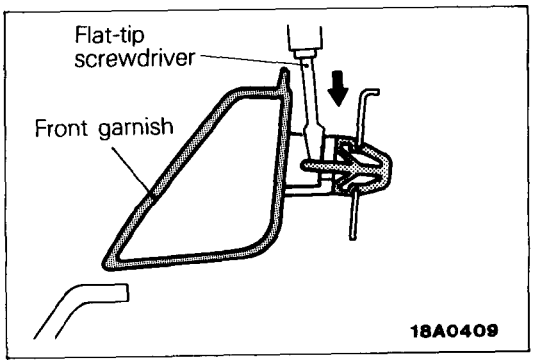
2. Front deck garnish

**Rear panel garnish removal steps**

Rear end trim
(Refer to P.23-85.)

3. Rear panel garnish

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● I): Refer to "Service Points of Removal".




18A0409

## SERVICE POINTS OF REMOVAL

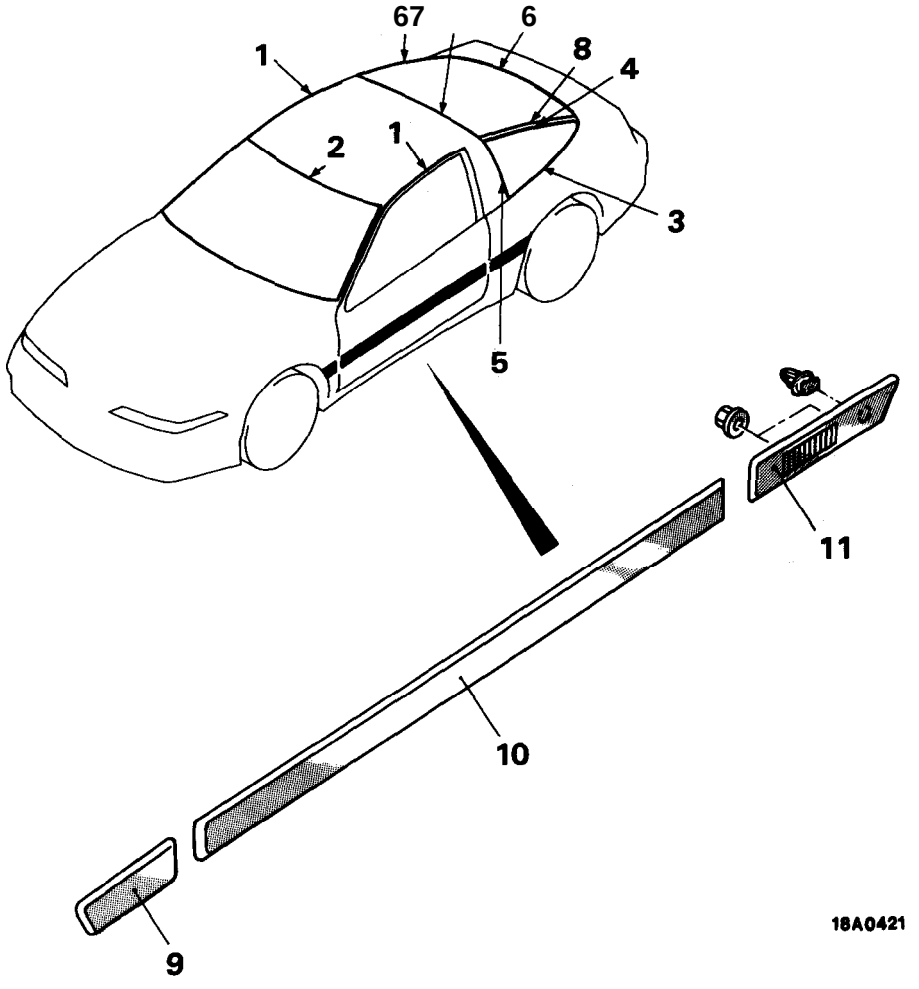
### 1. REMOVAL OF FRONT GARNISH

Remove the mounting screws, and pressing downward the claws of the clips, remove the front garnish.

# MOULDING

N23REAEa

## REMOVAL AND INSTALLATION




◆■◆ 1. Drip moulding
◆■◆ 2. Windshield upper moulding
● ☒ 3. Quarter window moulding lower
◆■◆ 4. Quarter window moulding upper
◆■◆ 5. Quarter window moulding front
● ☒ 6. Liftgate moulding lower
● ☒ 7. Liftgate moulding upper
◆■◆ 8. Liftgate moulding side
◆■◆ ● + 9. Side protect moulding fender
◆■◆ ◆■◆ 10. Side protect moulding front door
◆■◆ 11. Side protect moulding quarter

NOTE
(1) ◆■◆: Refer to "Service Points of Removal".
(2) ◆■◆: Refer to "Service Points of Installation".

## SERVICE POINTS OF REMOVAL

### 1. REMOVAL OF DRIP MOULDING

Refer to P.23-72.

### 2. REMOVAL OF WINDSHIELD UPPER MOULDING

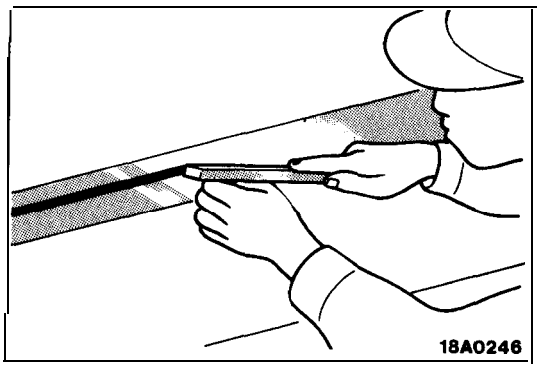
Refer to P.23-58.

**3. REMOVAL OF QUARTER WINDOW MOULDING LOWER/ 4. QUARTER WINDOW MOULDING UPPER/B. QUARTER WINDOW MOULDING FRONT**

Refer to P.23-61.

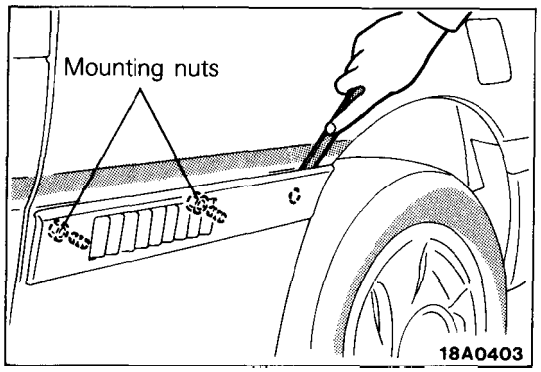
**6. REMOVAL OF LIFTGATE MOULDING LOWER/7. LIFTGATE MOULDING UPPER/8. LIFTGATE MOULDING SIDE**

Refer to P.23-62.




**9. REMOVAL OF SIDE PROTECT MOULDING FENDER/10. SIDE PROTECT MOULDING FRONT DOOR**

(1) Using the plastic trim tool, pry off the side protect moulding.
(2) Using the plastic trim tool, scale off the both-side adhesive tape which sticks to the body.




**11. REMOVAL OF SIDE PROTECT MOULDING QUARTER**

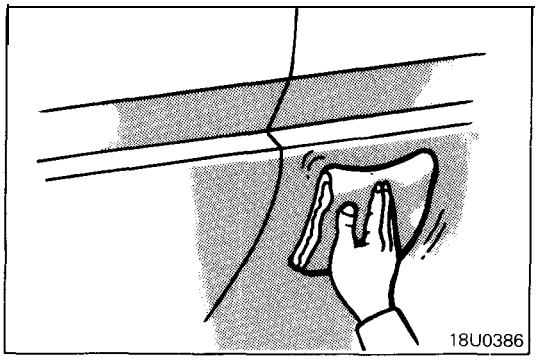
(1) Remove the rear side trim. (Refer to P.23-85.)
(2) Remove the motor section of the driving device assembly. (Refer to P.23-94.)
(3) After removing the mounting nuts, pry off the side protect moulding quarter with the plastic trim remover.

## SERVICE POINTS OF INSTALLATION

**9. INSTALLATION OF SIDE PROTECT MOULDING FENDER/10. SIDE PROTECT MOULDING FRONT DOOR**

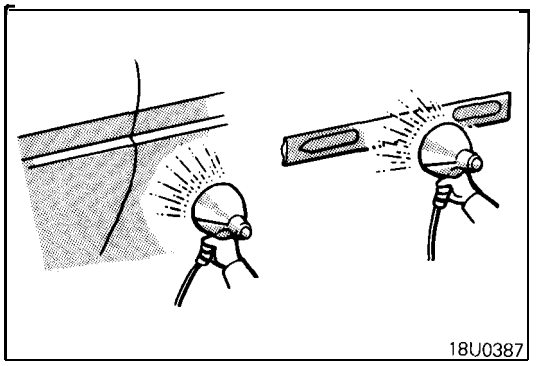
(1) Wipe off application surface of body with clean cloth dampened with degreaser (MOPAR SUPER KLEEN or equivalent).

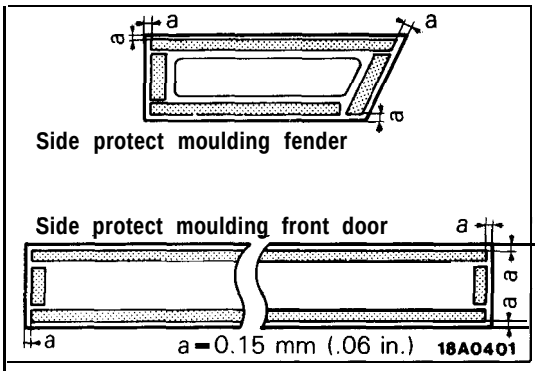
NOTE
After wiping surface, leave surface as it is to volatilize degreaser.




(2) Using an infrared light or similar instrument, heat the body painted surface and the side protect moulding.

**Heating temperature**
**Body painted surface..... 25–55°C (77-131 °F)**
**Side protect moulding . . . . 25–40°C (77–104°F)**






(3) Remove backing paper from adhesive tape, and apply adhesive tape as shown in the illustration.

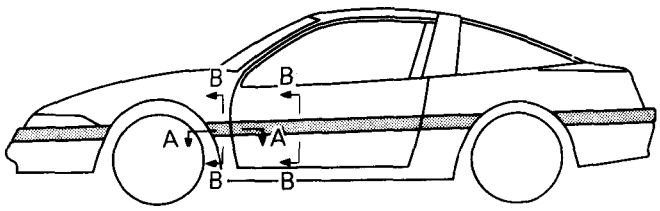
**Side protect moulding adhesive tape:**
**3M ATD Part No. 6383 or equivalent**

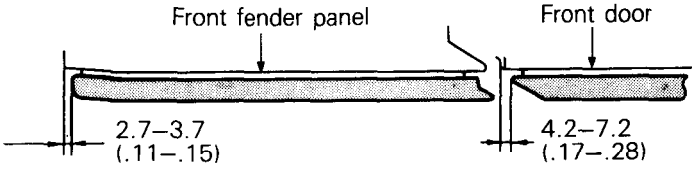
(4) Attach the side protect mouldings at the places shown in the illustration.

(5) Use hand roller or similar tool to apply even pressure to entire surface of moulding.

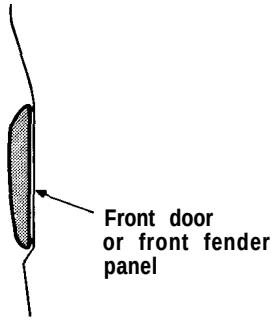
NOTE
Press moulding ends firmly against the body surface.

**Side protect moulding mounting positions**




**Section A-A**




**Section B-B**

mm
(in.)

18A0400

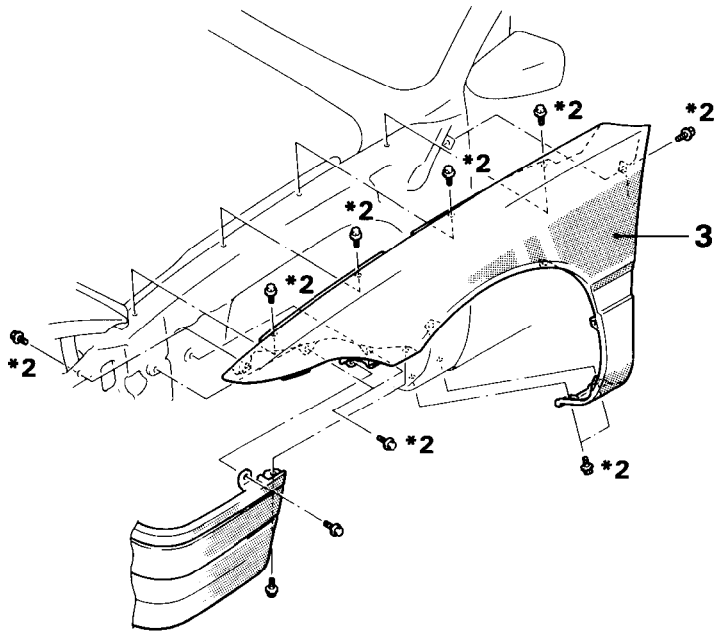
# FENDER

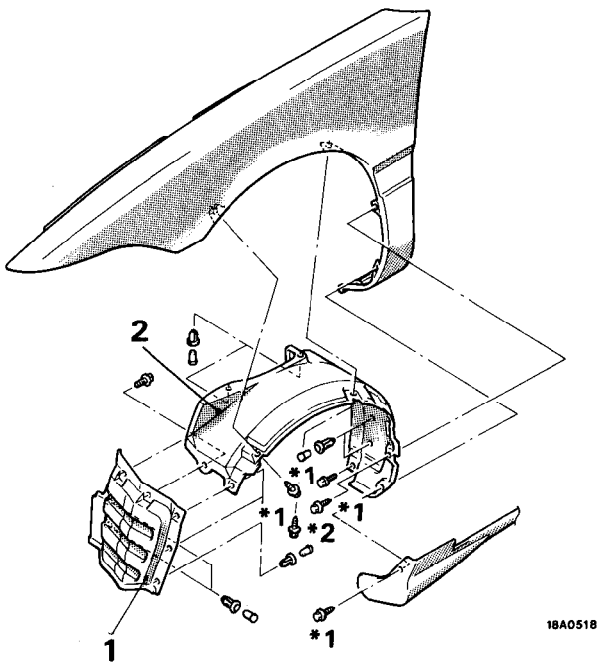
N23KAAT

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Front Garnish (Refer to P.23-47.)
- Removal of Front Turn Signal Light and Front Combination Light (Refer to GROUP 8–Front Combination Light)
- Removal of Headlight Lower Bezel (Refer to GROUP 8–Headlights)
- Removal of Side Air Dam (Refer to P.23-74.)

**Post-installation Operation**
- Installation of Side Air Dam (Refer to P.23-74.)
- Installation of Headlight Lower Bezel (Refer to GROUP 8–Headlight)
- Installation of Front Turn Signal Light and Front Combination Light (Refer to GROUP 8–Front Combination Light)
- Installation of Front Garnish (Refer to P.23-47.)

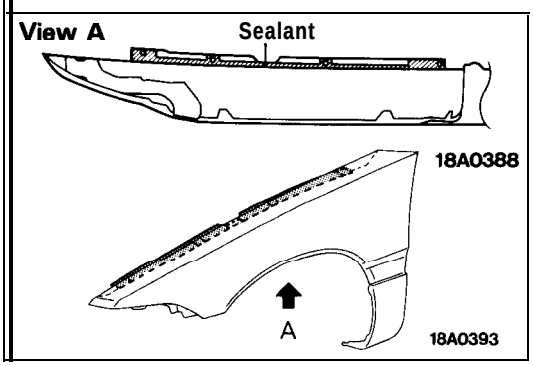



**Removal steps**

1. Front splash shield extension
- 2. Front splash shield
- C 3. Front fender panel

**NOTE**
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".
(3) . 1: This shows a tightening torque of 2.0–2.2 Nm (1.4–1.6 ft.lbs.).
(4) . 2 : This shows a tightening torque of 4-6 Nm (2-4 ft.lbs.).

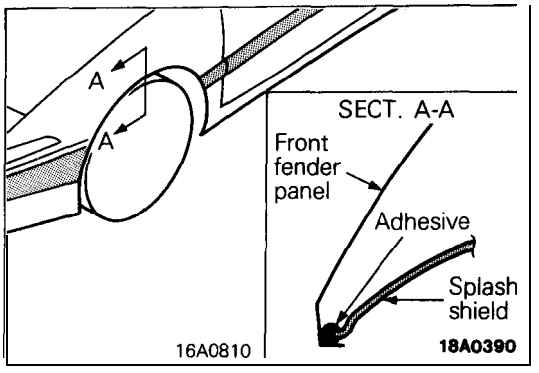



## SERVICE POINTS OF INSTALLATION

### 3. APPLICATION OF SEALANT TO FRONT FENDER PANEL

When installing the fenders, apply specified sealant between the fenders and the body panels, so that there are no gaps when the fenders are mounted.

**Specified sealant: MOPAR Silicone Rubber Sealer Part No.4026070 or equivalent**




**2. APPLICATION OF ADHESIVE TO SPLASH SHIELD**

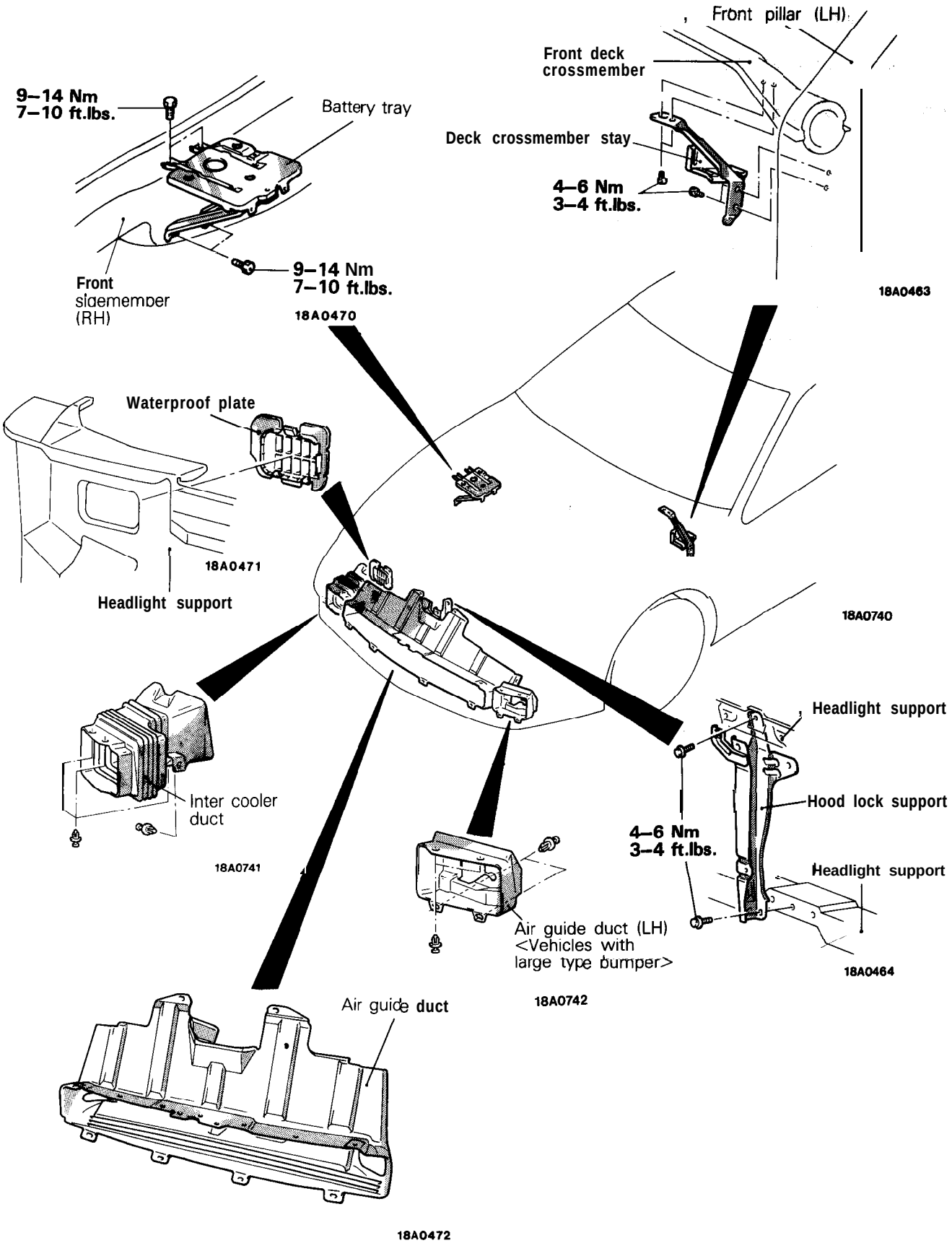
When installing the splash shield, apply specified adhesive to the flange part of the fender.

**Specified adhesive: MOPAR Silicone Rubber Sealer Part No. 4026070 or Auto Glass Adhesive and Sealer Part No. 2298825 or equivalent**

# LOOSE PANEL

N238AAK

## REMOVAL AND INSTALLATION



# WINDOW GLASS

N23LAAB

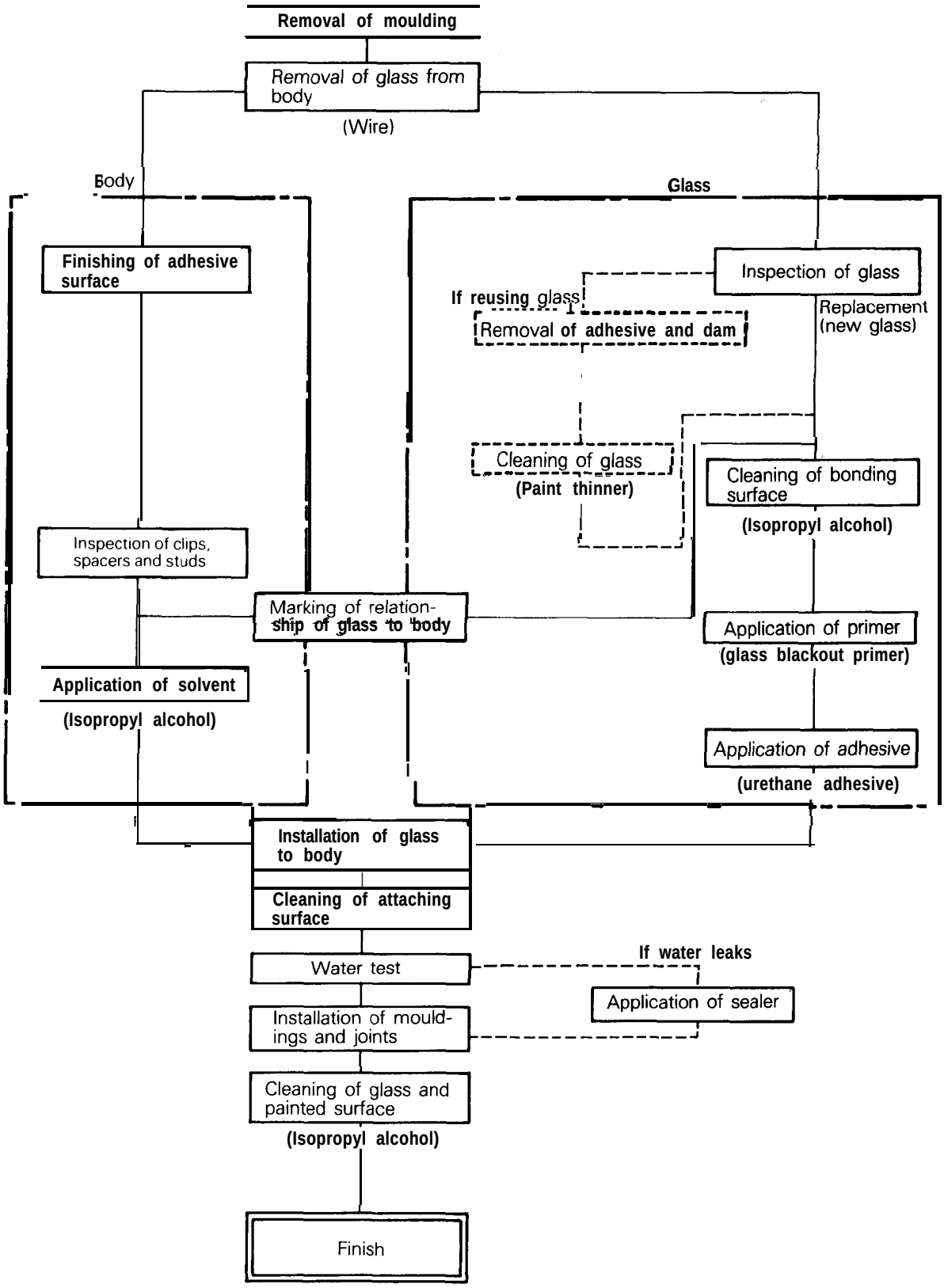
## GENERAL

The windshield and liftgate window glass are attached by an urethane-base adhesive to the window frame. This adhesive not only provides improved glass holding and sealing, but also permits use of body openings having a greater structural strength.

### ADHESIVE, PRIMER AND RESERVE ITEMS

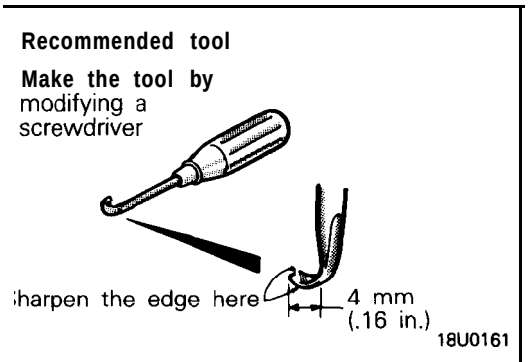
| Items | Applications | Quantity |
|---|---|---|
| **Adhesive, Primer** | | |
| Adhesive: 3M Super Fast Urethan Part No. 8609 or equivalent | | As required |
| Primer: 3M Super Fast Urethan Primer Part No. 8608 or equivalent | | As required |
| **Reserve items** | | |
| Dispensing nozzle | | One |
| Wire (dia. × length) | for cutting adhesive | Five pieces of wire 0.6 mm × 1 m (.02 in. × 3.3 ft.) |
| Adhesive gun | for adhesive application | One |
| Isopropyl alcohol | for cleaning jointing surfaces | As required |
| Wiping rags | | As required |
| Sealer | for prevention of water leaks and gathering after adhesive application | As required |
| Isopropyl alcohol | for cleaning | As required |
| Glass holder | | Two |
| Spacers (Service Part) | | As required |
| Window moulding assembly (Service part) | | One |
| Tectyl 506T (Valvoline Oil Company) | | As required |

## WINDSHIELD INSTALLATION PROCEDURE



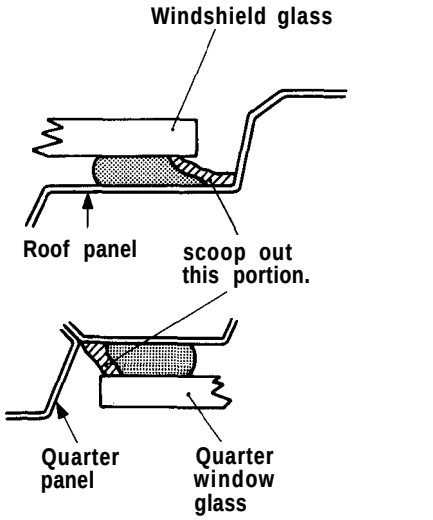
## REPLACEMENT OF MOULDING (WINDSHIELD UPPER MOULDING AND QUARTER WINDOW MOULDING FRONT) N23LABC

1. Remove the mouldings. (Refer to P.23-58, 61.)
2. To cut the existing adhesive, make a tool such as the one shown.




3. Using the tool, scoop out the existing adhesive.

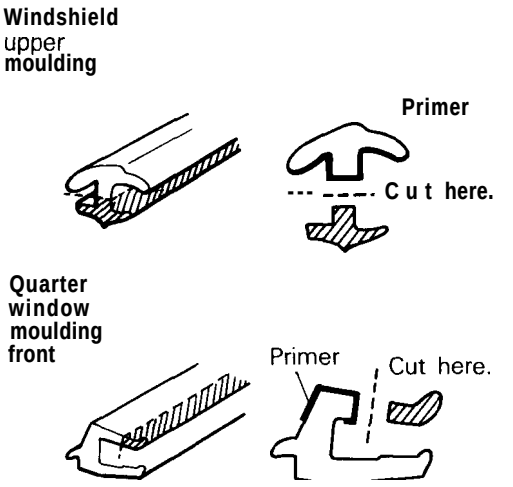
**Caution**
**Take care not to remove more adhesive than necessary, and not to scratch the glass or body.**

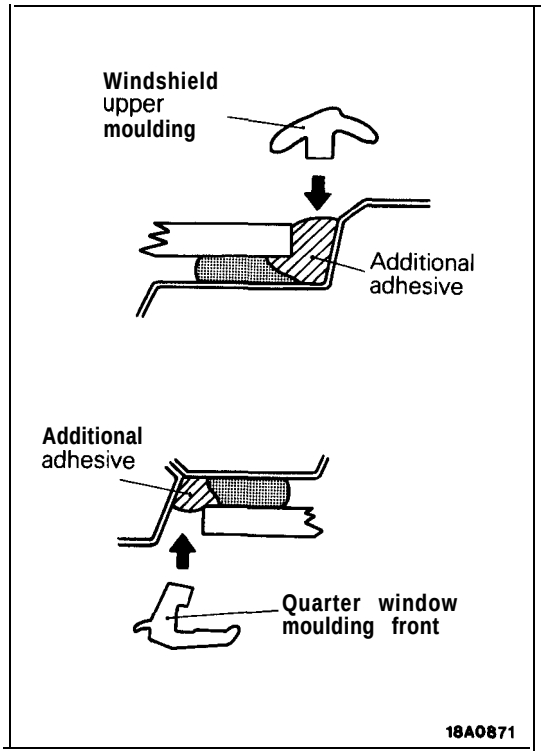



4. Cut away part of the new moulding and provisionally attach the moulding. Check to be sure that it fits closely to the surface.
5. A coating of the specified primer should be applied to the moulding.

**Specified primer: 3M Super Fast Urethan Primer Part No. 8808 or equivalent**

**Caution**
**Do not touch the surfaces that are coated with primer.**






6. Apply a coating of the specified adhesive where shown in the illustration, and then install the moulding before the adhesive hardens.

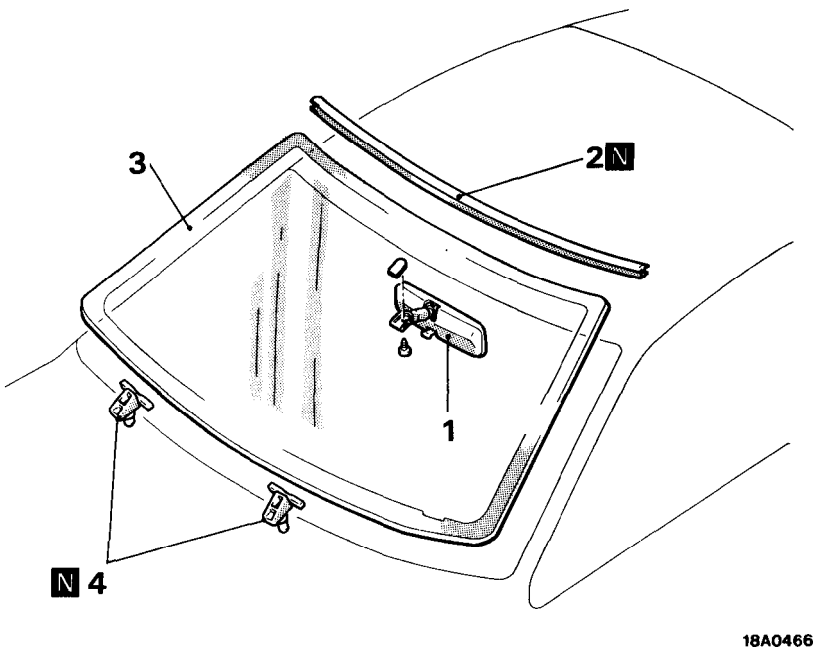
   **Specified adhesive: 3M Super Fast Urethan Part No. 8609 or equivalent**

7. Scrape away excessive sealant forced out during installation of the moulding from the glass or body and wipe the surfaces clean with MOPAR SUPER KLEEN or equivalent.
8. After completion of installation, leave the moulding undisturbed until the adhesive hardens.

# WINDSHIELD

N23LBAR

## REMOVAL AND INSTALLATION




**Pre-removal Operation**
- Removal of Hood (Refer to P.23-34.)
- Removal of Wiper Arm (Refer to GROUP 8–Windshield Wiper)
- Removal of Front Deck Garnish (Refer to P.23-47.)
- Removal of Front Headlining Trim (Refer to P.23-89.)
- Removal of Drip Moulding (Refer to P.23-72.)

**Post-installation Operation**
- Installation of Drip Moulding (Refer to P.23-72.)
- Installation of Front Headlining Trim (Refer to P.23-89.)
- Installation of Front Deck Garnish (Refer to P.23-47.)
- installation of Front Wiper Arm (Refer to GROUP 8–Windshield Wiper)
- Installation of Hood (Refer to P.23-34.)

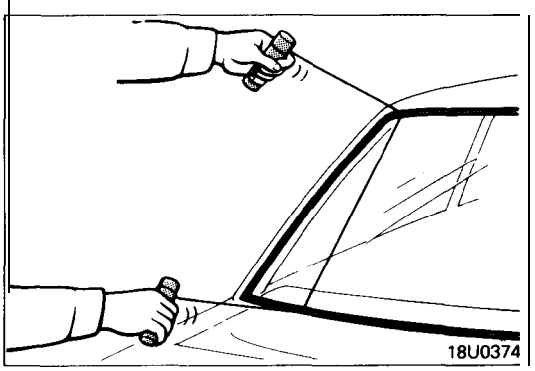
**Removal steps**

1. Inside rear view mirror
2. Windshield upper moulding
3. Windshield glass
4. Windshield glass spacer

**Installation steps**

4. Windshield glass spacer
2. Windshield upper moulding
3. Windshield glass
1. Inside rear view mirror

**NOTE**
**(1) Reverse the removal procedures to reinstall.**
**(2) ◆◆: Refer to "Service Points of Removal".**
**(3) ● +: Refer to "Service Points of Installation".**
**(4) N: Non-reusable parts**

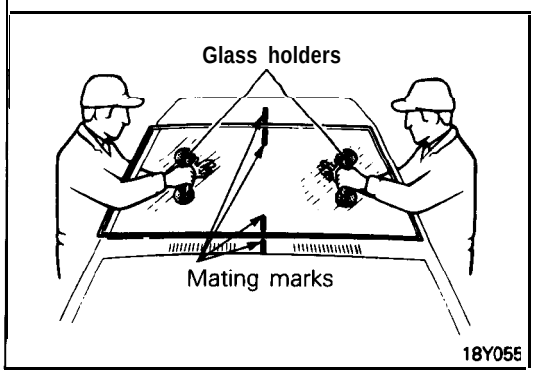



## SERVICE POINTS OF REMOVAL

### 3. REMOVAL OF WINDSHIELD GLASS

(1) Using a sharp-pointed drill, make a hold in the adhesive area of the windshield.
From inside the vehicle, insert one end of wire through adhesive material applied to the upper edge of windshield.
(2) Insert the other end of wire from inside the vehicle through adhesive material applied to the lower edge of windshield.
(3) Secure each end of wire to a piece of wood or similar object.
(4) Carefully cut through adhesive by pulling wire along the windshield from outside the vehicle in a sawing motion.

**Caution**
**In order to protect the body from damage, apply cloth tape to all body areas around the installed glass before cutting the adhesive.**




(5) Make mating marks on the glass and body if the glass is to be reinstalled.

NOTE
Use chalk or equivalent to make mating marks on the glass and body.

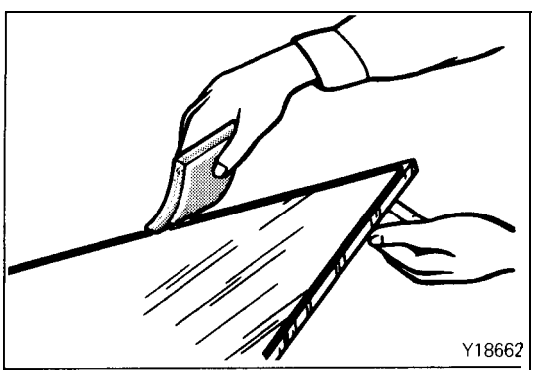
(6) Take out the glass with glass holders.

NOTE
If the glass being removed is to be reinstalled, place it on a protected bench or holding fixture.

## SERVICE POINTS OF INSTALLATION

### 2. INSTALLATION OF WINDSHIELD UPPER MOULDING/ 3. WINDSHIELD GLASS

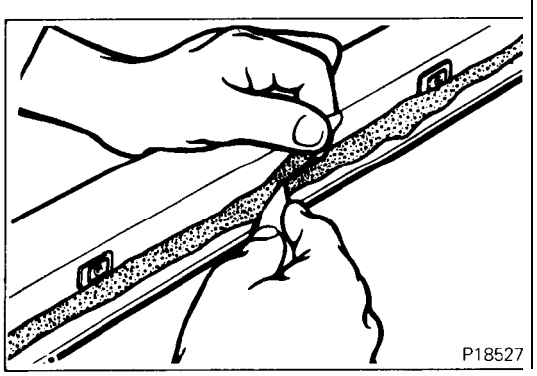
(1) Thoroughly remove the adhesive deposited on the windshield glass and clean applying surface with isopropyl alcohol.
Allow to dry for at least three minutes.




(2) Apply the specified primer to the entire bonding surface of the glass, both to the inside surface and the edge of the glass.
Allow to dry for five minutes.

**Specified primer: 3M Super Fast Urethan Primer Part No.8608 or equivalent**

**Caution**
**Use care to avoid spilling primer solution on trim or a painted surface. Wipe away any spilled solution immediately, because the primer will damage trim or painted surfaces. Do not touch the primer coated surface.**

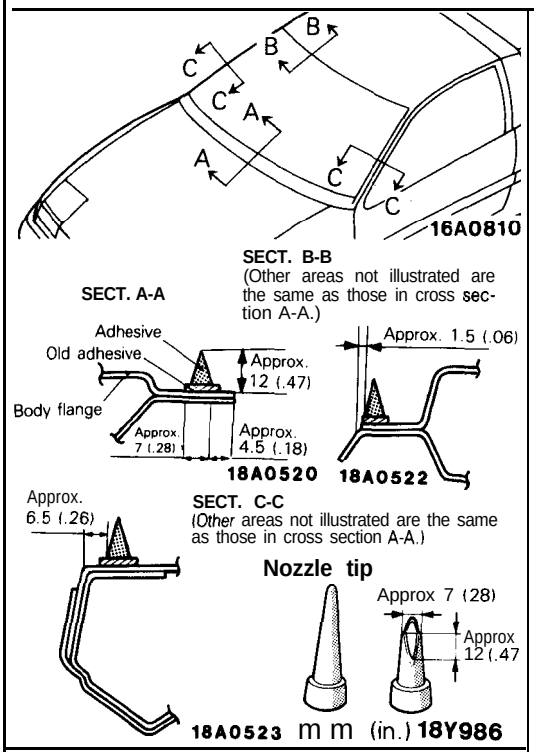


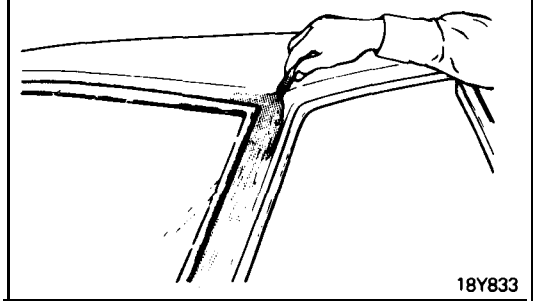

(3) Use a cutter knife to cut away adhesive so that the thickness is within 2 mm (.08 in.) around the entire circumference of the body flange.
Finish the flange surfaces so that they are smooth.

Caution
**Be careful not to remove more adhesive than necessary, and also not to damage the paintwork on the body surface with the knife. If the paintwork is damaged, repair the damaged area with touch-up paint or Tectyl.**

(4) Degrease the bonding surface of the body with isopropyl alcohol.
Allow to dry for at least three minutes.

(5) Attach the windshield upper moulding to the windshield glass.




(6) Using the adhesive gun, coat the specified adhesive on the windshield glass mounting surface of the body flange.

**Specified adhesive: 3M Super Fast Urethan Part No. 8609 or equivalent**

NOTE
Cut the nozzle tip into a V shape to facilitate adhesive application. Adhesive material begins to cure after fifteen minutes' when exposure to air.

(7) Using a glass holder, place the glass on the body opening.

(8) Press the glass gently so that no adhesive appears.

**Caution**
**1. Do not move the glass after installing them to the body.**
**2. Place the glass in the previously marked position.**
**3. Use care not to close the water groove (in the lower corner of the pinch weld flange) with adhesive.**
**4. Wipe off any excessive adhesive that overflows.**

(9) Perform the water-test for the windshield.
Use cold water spray, being careful not to direct a powerful stream of water on the new adhesive material. Allow water to spill over the edges of the glass. If there are leaks, apply sealant at the leak point(s).

**Caution**
**If it is necessary to move the vehicle, move it slowly.**

(10) Using a clean, lint-free cloth liberally dampened isopropyl alcohol, wipe away dirt from the glass perimeter and the body.

**INSTALLATION OF WINDSHIELD WITH NEW ADHESIVE ONLY**

This method is recommended if there is a considerable loss of adhesion between the old adhesive material and the body opening, or body opening requires repair. All adhesive material must be removed from the pinch-weld flanges.

1. Using a knife or similar tool, remove the old adhesive material from the pinch weld flanges.
2. Using tape or some other suitable means, mark the bonded areas of the body and the glass at several positions.
3. Using a clean, lint-free cloth liberally dampened with isopropyl alcohol, prime the pinch-weld flange.
4. If the pinch-weld flange has been repainted, prime it with a paint finish primer.

**Caution**
**1. Do not use blackout glass primer on the pinch-weld flange.**
**2. If the pinch-weld flanges require painting, use a bake-on type paint.**

5. For the rest of the service procedure, refer to Installation of WINDSHIELD on P.23-59.

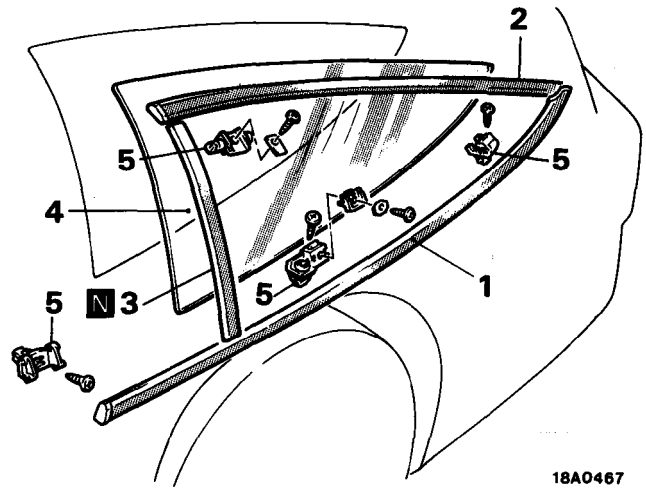
# QUARTER WINDOW GLASS

N23LEAK

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
@Removal of Rear Side Trim, Quarter Trim. Center Pillar Trim and Rear Pillar' Trim
(Refer to P.23-85.)
● kemoval of Side Air Spoiler
(Refer to P.23-74.)

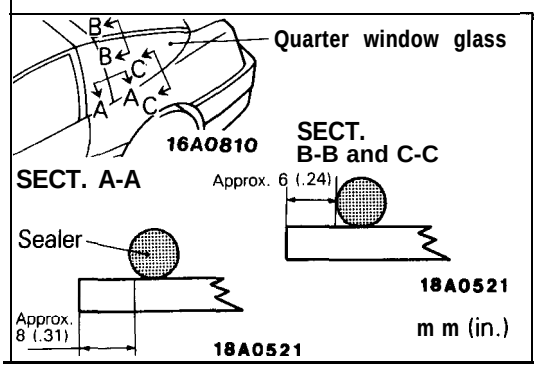
**Post-installation Operation**
- Installation of Side Air Spoiler (Refer to P.23-74.)
- Installation of Rear Side Trim, Quarter Trim, Center Pillar Trim and Rear Pillar Trim (Refer to P.23-85.)




**Removal steps**
1. Quarter window moulding lower
2. Quarter window moulding upper
3. Quarter window moulding front
4. Quarter window glass
5. Quarter window moulding clip

**Installation steps**
5. Quarter window moulding clip
● + 3. Quarter window moulding front
● * 4. Quarter window glass
2. Quarter window moulding upper
1. Quarter window moulding lower

NOTE
(1) ● +: Refer to "Service Points of Installation".
(2) N: Non-reusable parts




## SERVICE POINTS OF INSTALLATION

### 3. INSTALLATION OF QUARTER WINDOW MOULDING FRONT/4. QUARTER WINDOW GLASS

(1) Remove residual-sealant from the body and glass.
(2) Degrease the body and glass, and coat primer. (Refer to P.23-59.)
(3) Coat specified sealant on the indicated position of the glass.

**Specified sealant: MOPAR Silicone Rubber Sealer Part No.4026070 or Auto Glass Adhesive and Sealer Part No.2298825 or equivalent**

(4) Mount the glass on the body.

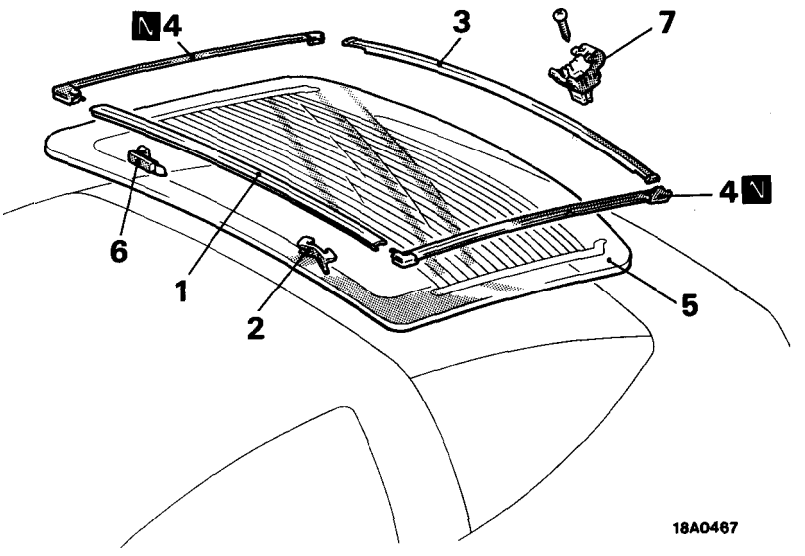
# LIFTGATE WINDOW GLASS

N23LDAK

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
*Removal of Liftgate Trim and Flange Trim (Refer to P.23-86.)
●Removal of Air Spoiler (Refer to P.23-74.)

**Post-installation Operation**
*Installation of Air Spoiler (Refer to P.23-74.)
●Installation of Liftgate Trim and Flange Trim (Refer to P.23-86.)

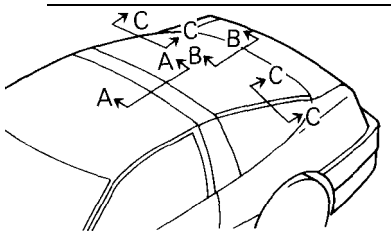


18A0467

**Removal steps**
1. Liftgate moulding upper
2. Liftgate moulding clip
3. Liftgate moulding lower
4. Liftgate moulding side
◆◆ 5. Liftgate window glass
6. Liftgate moulding fastener
7. Liftgate moulding clip

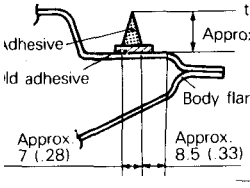
**Installation steps**
7. Liftgate moulding clip
6. Liftgate moulding fastener
◆◆ 4. Liftgate moulding side
◆◆ 5. Liftgate window glass
3. Liftgate moulding lower
2. Liftgate moulding clip
1. Liftgate moulding upper

NOTE
(1) ● *: Refer to "Service Points of Removal".
(2) ◆◆: Refer to "Service Points of Installation".
(3) ❑ : Non-reusable parts

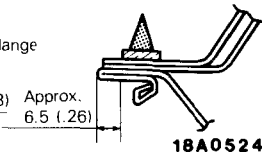


16A0810

SECT. A-A



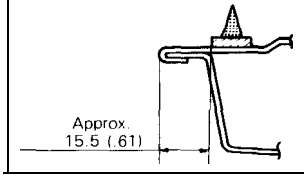

SECT. B-B
(Other areas not illustrated are the same as those in cross section A-A.)



18A0524

SECT. C-C
(Other areas not illustrated are the same as those in crosssection A-A.)

18A0525



18A0526

mm (in.)

## SERVICE POINTS OF REMOVAL

### 5. REMOVAL OF LIFTGATE WINDOW GLASS

Remove the quarter window glass in the same procedure as the windshield glass. (Refer to P.23-58.)

## SERVICE POINTS OF INSTALLATION

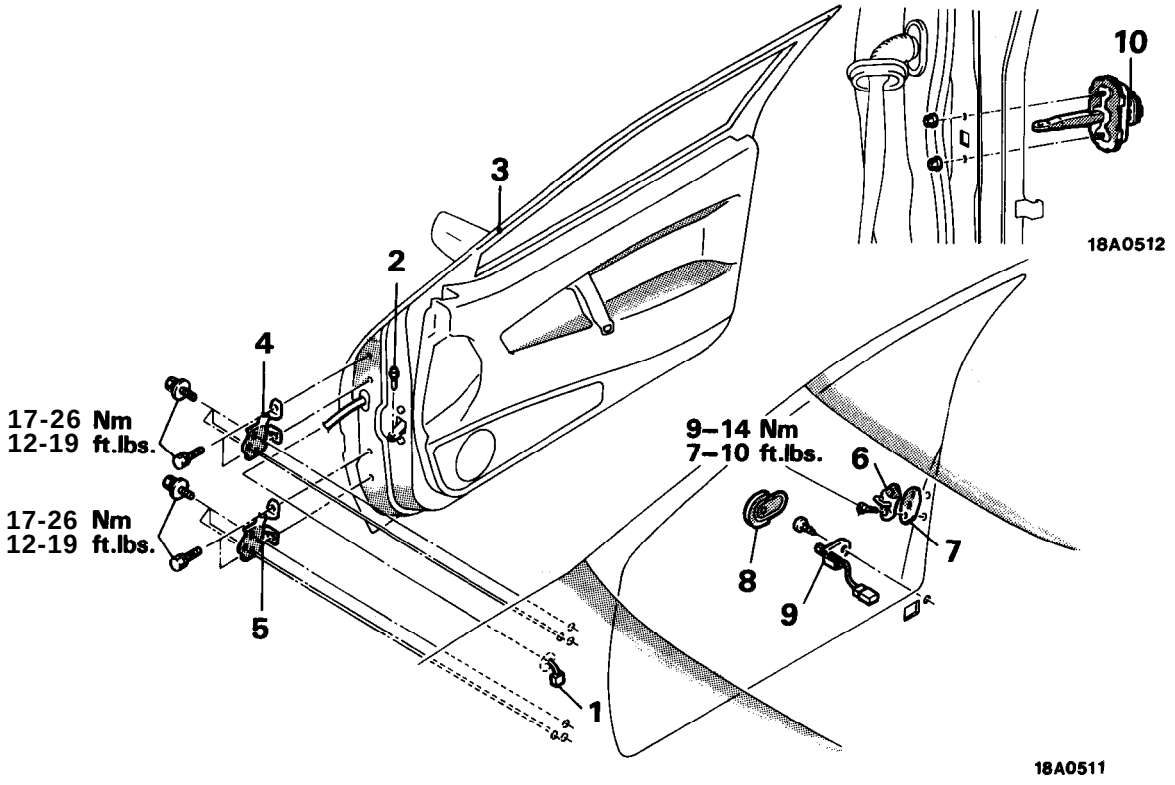
### 4. INSTALLATION OF LIFTGATE WINDOW MOULDING SIDE/5. LIFTGATE WINDOW GLASS

Compared with the windshield glass, adhesive is coated on the different position but the working procedure is same. (Refer to P.23-59.)

# DOOR ASSEMBLY

N23MAAV

## – REMOVAL AND INSTALLATION



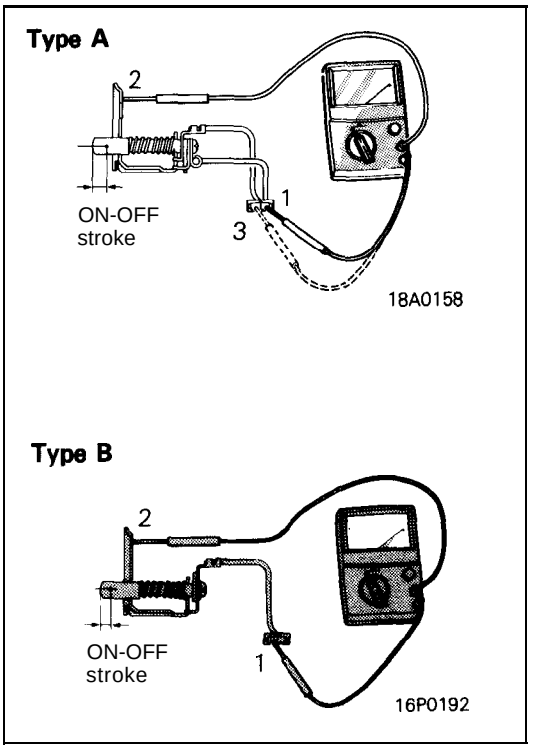

Removal steps

1. Connection for door wiring harness connector
◆◆ 2. Spring pin
3. Door assembly
● 4. Upper hinge
◆◆ 5. Lower hinge
6. Striker
7. Striker shim
8. Door switch cap
9. Door switch
● * 10. Door check strap

**Pre-removal Operation**
● Removal of Cowl Side Trim (Refer to P.23-85.)

**Post-installation Operation**
• Installation of Cowl Side Trim (Refer to P.23-85.)
● Door Adjustment (Refer to P.23-32.)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".




## INSPECTION

### DOOR SWITCH

Operate the switch, and check the continuity between the terminals.

**TYPE A**

| Switch position | Terminal | 1 | 2 | 3 |
|---|---|---|---|---|
| Switch | Open (ON) | 0 | A | 0 |
| | Depressed (OFF) | | | |

NOTE
O-O indicates that there is continuity between the terminals.

**TYPE B**

| Switch position | Terminal | 1 | 2 |
|---|---|---|---|
| Switch | Open (ON) | 0 | 0 |
| | Depressed (OFF) | | |

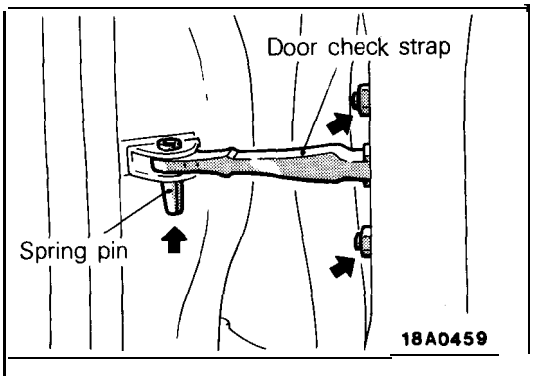
NOTE
O-O indicates that there is continuity between the terminals.

## SERVICE POINTS OF INSTALLATION

**10. APPLICATION OF GREASE TO DOOR CHECK STRAP/ 5. LOWER HINGE/A UPPER HINGE/2. SPRING PIN**

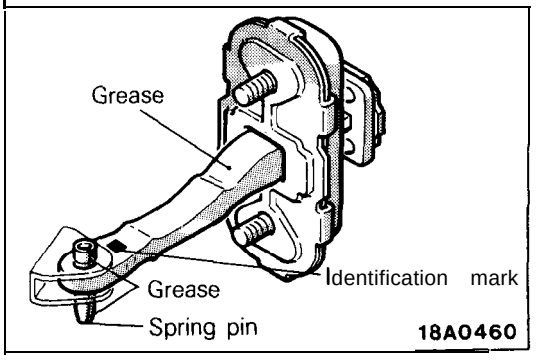
Apply multipurpose grease to all moving parts.

**Grease: MOPAR Multipurpose Grease Part No. 2932524 or equivalent**




### DOOR CHECK STRAP REPLACEMENT

1. Remove the door trim and waterproof film.
2. Press upward and remove spring pin.
3. Remove door check strap nuts. Remove door check strap.

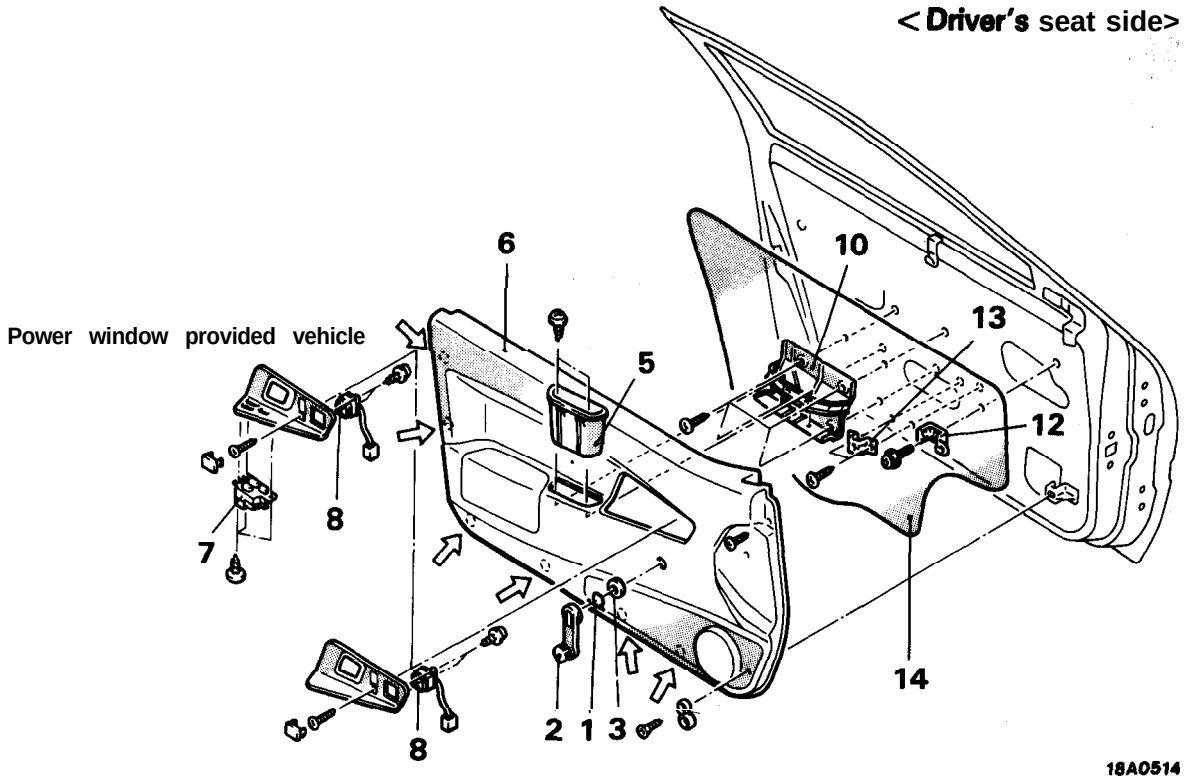


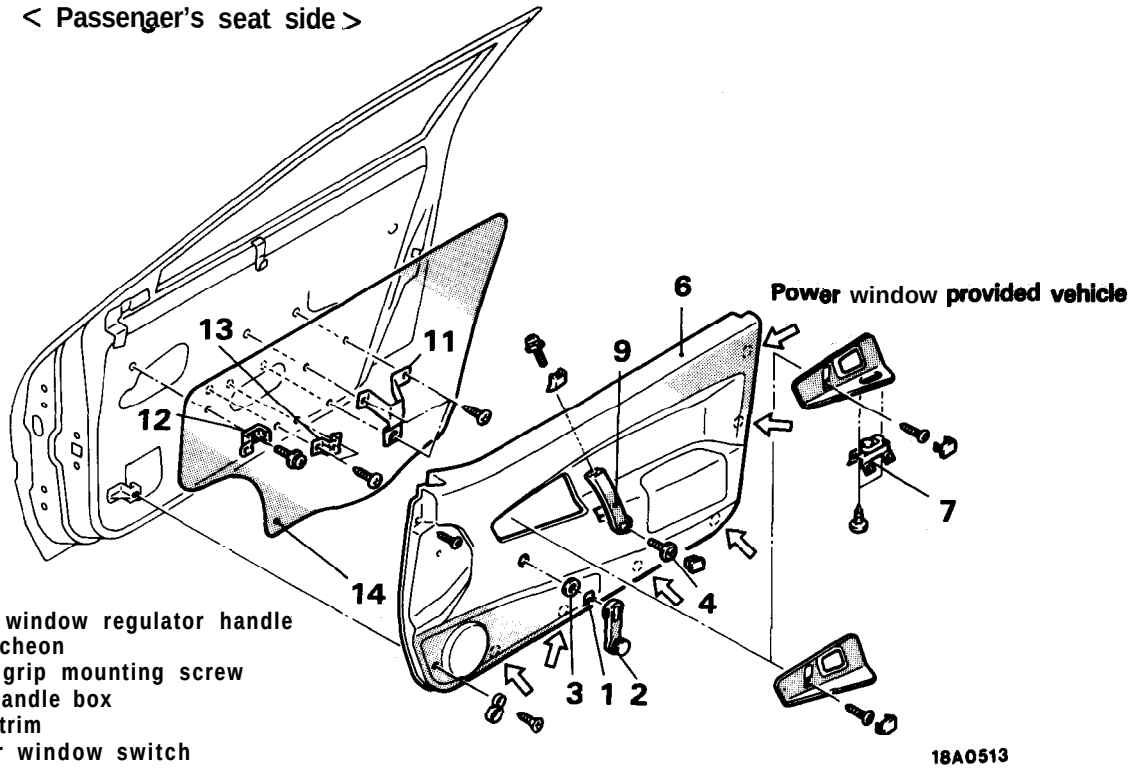

4. With the identification mark upward, install door check strap.
5. After installation of the door check strap, apply a coating of multipurpose grease to the door check strap slide surface and the spring pin (at the places shown in the figure).

# DOOR TRIM AND WATERPROOF FILM

N23MBAW

## REMOVAL AND INSTALLATION



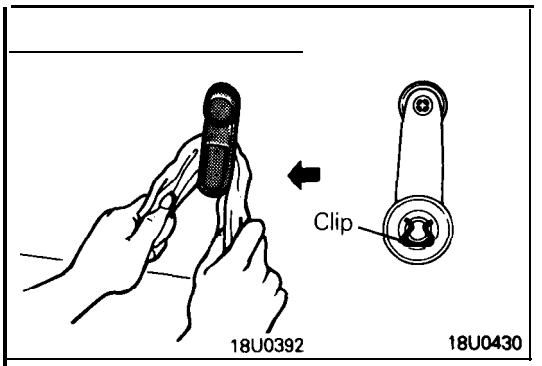




**Removal steps**

- 1. Clip
- 2. Door window regulator handle
- 3. Escutcheon
- 4. Door grip mounting screw
- 5. Pull handle box
- 6. Door trim
- 7. Power window switch
- 8. Electrical remote control mirror switch
- 9. Door grip
- 10. Pull handle bracket
- 11. Door grip lower bracket
- 12. Door trim bracket B
- 13. Door trim bracket C
- 14. Waterproof film

**NOTE**

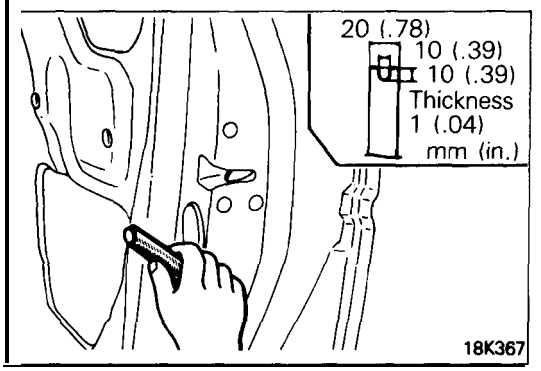
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) ⇦ shows the installation position of trim clip.




## SERVICE POINTS OF REMOVAL

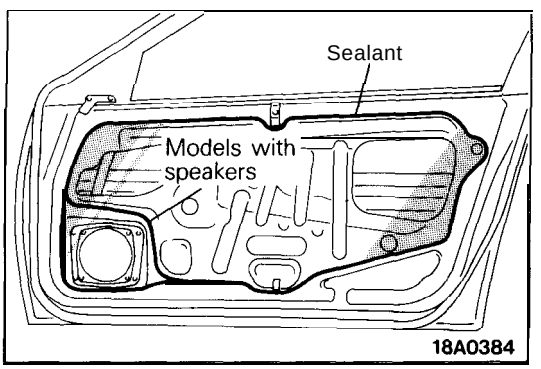
### 1. REMOVAL OF CUP

Use a shop towel to remove the clip; and remove door window regulator handle.




### 6. REMOVAL OF DOOR TRIM

If clip remains in mounting hole provided in door, remove it by using tool manufactured as illustrated.




## SERVICE POINTS OF INSTALLATION

### 14. APPLICATION OF SEALANT TO WATERPROOF FILM

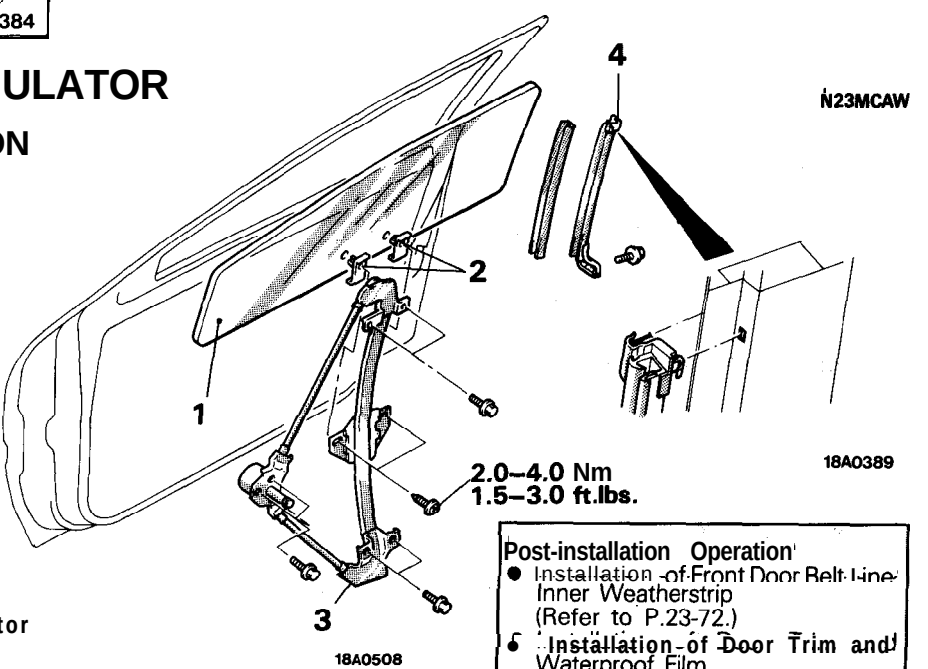
Apply specified sealant at the position shown in the illustration, and then attach the waterproof film.

**Specified sealant: MOPAR Rope Caulk Sealer 3/16 × 80" roll Part No.4026044 or equivalent**

# DOOR GLASS AND REGULATOR

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Door Trim and Waterproof Film (Refer to P.23-65.)
- Removal of Front Door Belt Line Inner Weatherstrip (Refer to P.23-72.)




**Removal steps**

1. Door window glass
2. **Door glass holder**
3. **Front door window regulator**
4. Front door rear sash

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● +: Refer to "Service Points of Installation"

**Post-installation Operation**
- Installation of Front Door Belt Line Inner Weatherstrip (Refer to P.23-72.)
- Installation of Door Trim and Waterproof Film (Refer to P.23-65.)
- Door Window Glass Adjustment (Refer to P.23-32.)

## SERVICE POINTS OF INSTALLATION

### 3. APPLICATION OF GREASE TO FRONT DOOR WINDOW REGULATOR

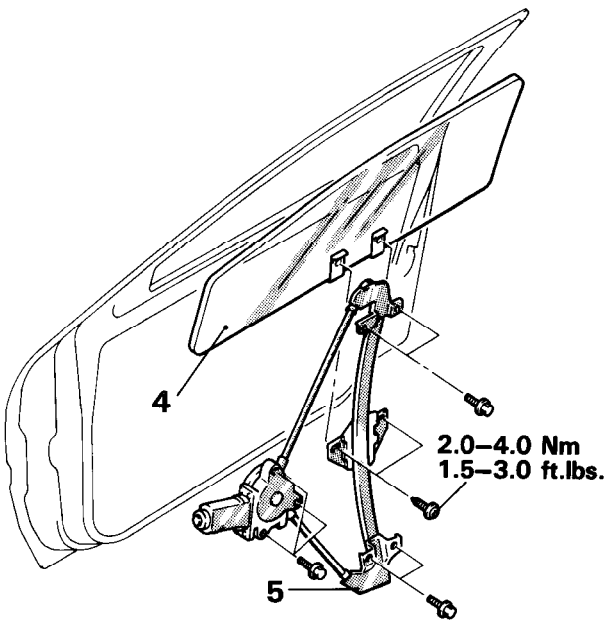
Apply multipurpose grease to all moving parts.

**Grease: MOPAR Multipurpose Grease Part No. 2932524 or equivalent**

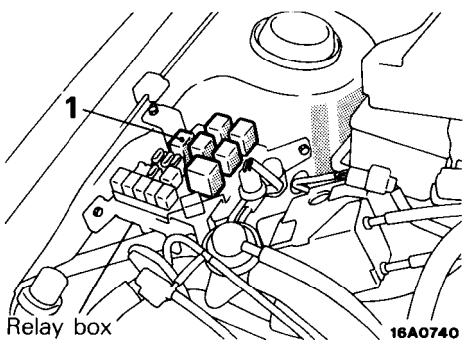
N23MHAEa

# POWER WINDOW

## REMOVAL AND INSTALLATION



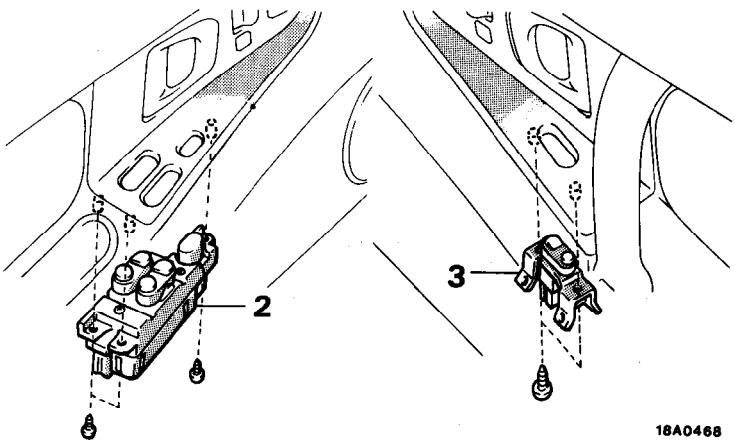

18A0507




16A0740

**Post-installation Operation**
- Door Window Glass Adjustment (Refer to P.23-32.)

**<Driver's seat side>** **< Passenger's seat side >**




18A0468

18A0469

**Power window relay removal**
1. Power window relay

**Power window switch removal steps**
Door trim (Refer to P.23-65.)
2. Power window main switch
3. Power window sub switch

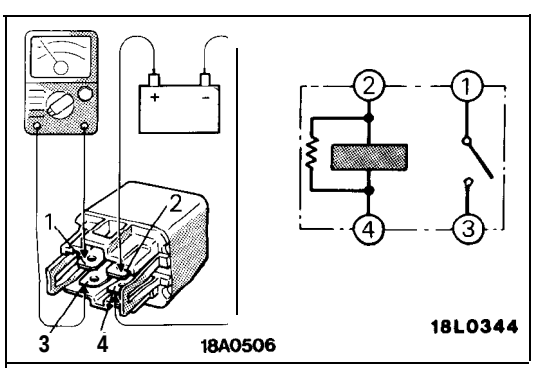
**Power window motor removal steps**
**Door trim and waterproof film (Refer to P.23-65.)**
4. Door window glass
- \+ 5. Front door window regulator

**NOTE**
(1) **Reverse the removal procedures to** reinstall.
(2) ● **+: Refer to "Service Points of Installation".**

## INSPECTION

### POWER WINDOW RELAY

Apply battery voltage to terminal 2, and check for continuity when terminal 4 is grounded.

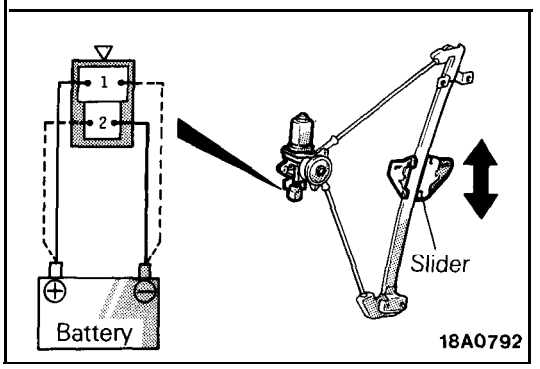



18A0506

18L0344

| Terminal / Battery voltage | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Continuity no voltage | | ○ | | ○ |
| Continuity with voltage | ○ | | ○ | |

NOTE
**O-O indicates that there is continuity between the terminals.**

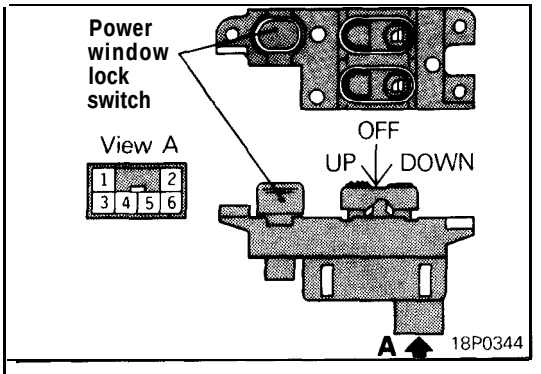



### POWER WINDOW MOTOR

(1) Connect the motor terminal directly to the battery and check to be sure that the slider moves smoothly.
(2) Also check to be sure that the slider moves in the opposite direction when the battery polarity connections are changed.

### CIRCUIT BREAKER (INCORPORATED IN THE POWER WINDOW MOTOR)

(1) Press the UP switch to fully close the window glass, and continue to press the switch for 10 seconds.
(2) At the moment that the UP switch is released, press the DOWN switch. The circuit breaker can be considered good if at this time the door window glass begins to open within **60** seconds.

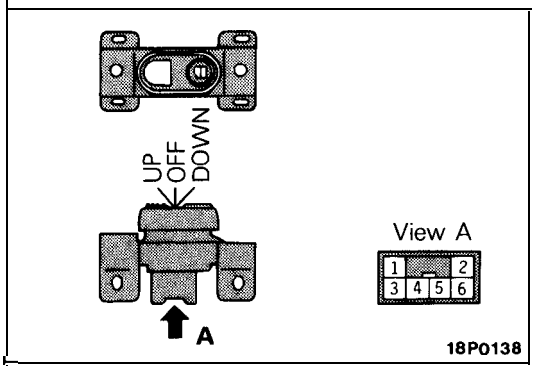



### POWER WINDOW MAIN SWITCH

Check for continuity in accordance to the following connection table.

| Switch position / Terminal | | Power window switch (normal) | | | Power window switch (lock) | | |
|---|---|---|---|---|---|---|---|
| | | UP | OFF | DOWN | UP | OFF | DOWN |
| Driver's side switch | 5 | ○ | | ○ | ○ | | ○ |
| | 6 | ○ | ○ | ○ | ○ | ○ | ○ |
| | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| | 3 | ○ | ○ | ○ | ○ | ○ | ○ |
| Passenger's side switch | 5 | ○ | | ○ | ○ | | ○ |
| | 4 | ○ | ○ | ○ | ○ | ○ | |
| | 1 | ○ | ○ | ○ | | ○ | ○ |
| | 3 | ○ | ○ | ○ | | | |

NOTE
**O-O indicates that there is continuity between the terminals.**




### POWER WINDOW SUB SWITCH

Check for continuity in accordance to the following connection table.

| Terminal \ Switch position | | Sub switch | | |
|---|---|---|---|---|
| | | UP | OFF | DOWN |
| Sub switch | 6 | O-O | | O-O |
| | 5 | O-O | O-O | O-O |
| | 3 | | O-O | O-O |
| | 4 | O-O | O-O | O-O |
| | 2 | O-O | O-O | |

NOTE
O-O indicates that there is continuity between the terminals.

## SERVICE POINTS OF INSTALLATION

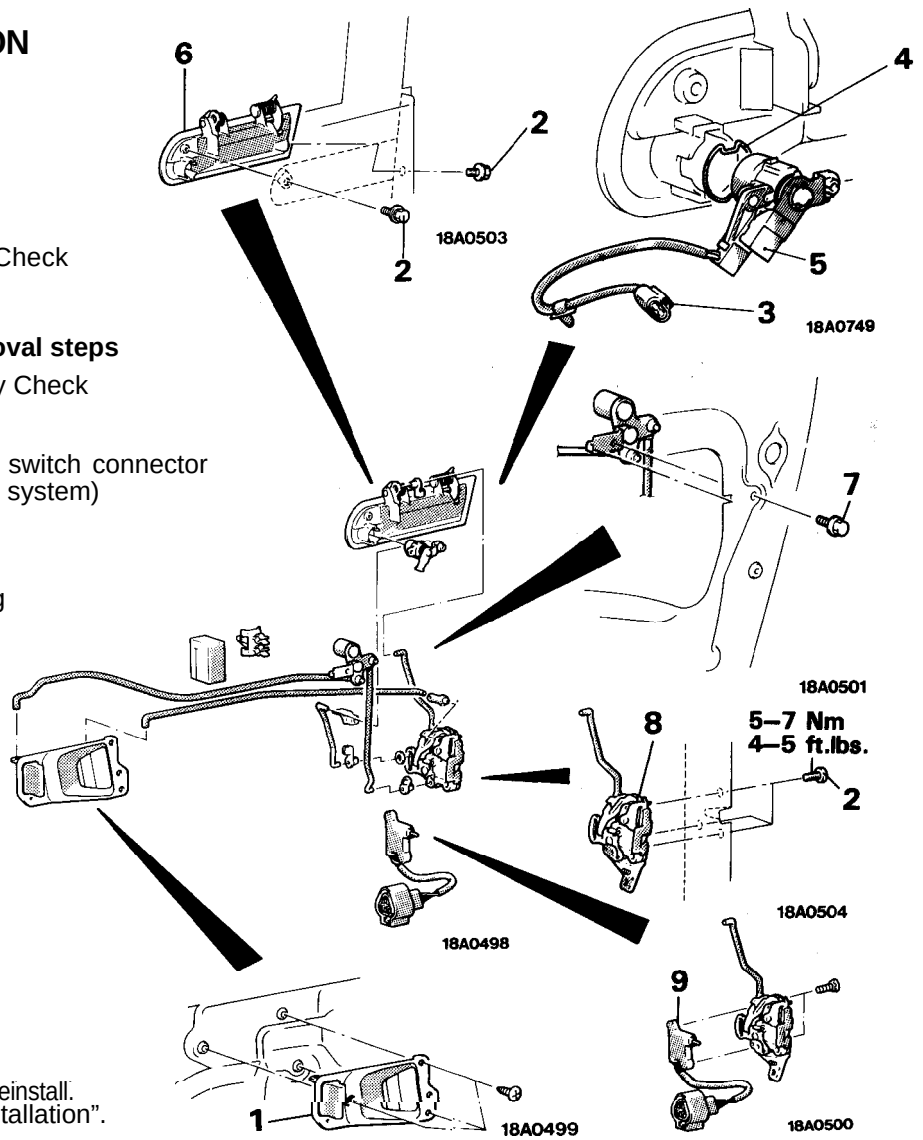
### 5. APPLICATION OF GREASE TO FRONT DOOR WINDOW REGULATOR

Refer to P.23-67.

# DOOR HANDLE AND LATCH

## REMOVAL AND INSTALLATION

N23MDAY




**Door inside handle removal**

Door Inside Handle Play Check (Refer to P.23-32.)
- + 1. Door inside handle

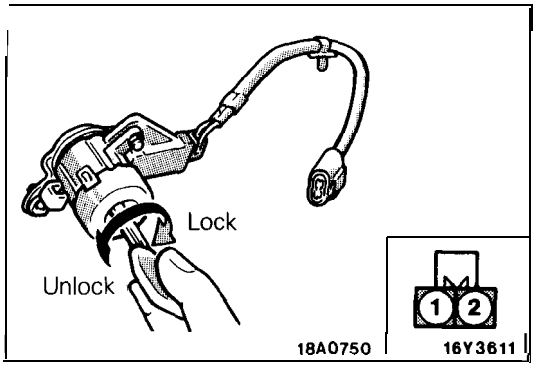
**Door outside handle and latch removal steps**

Door Outside Handle Play Check (Refer to P.23-32.)
2. Bolt
3. Door key cylinder unlock switch connector (Vehicles with theft-alarm system)
4. Ring
5. Door lock key cylinder
- + 6. Door outside handle
7. Bellcrank holder mounting bolt
- ◆◆ 8. Door latch assembly
9. Door latch switch (Vehicles for U.S.)

**Pm-removal Operation**
- Removal of Door Trim and Waterproof Film (Refer to P.23-65.)

**Post-installation Operation**
- Installation of Door Trim and Waterproof Film (Refer to P.23-65.)

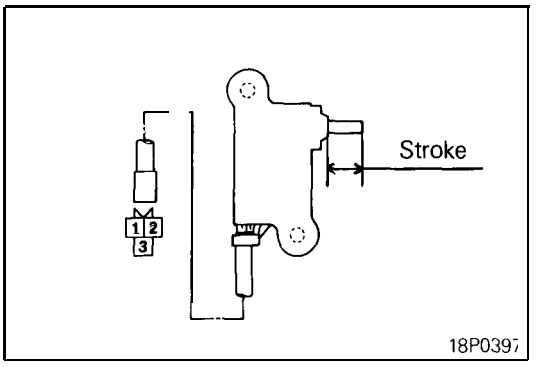
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".




## INSPECTION

### DOOR KEY CYLINDER UNLOCK SWITCH

The key cylinder unlock switch is normal if there is not continuity between terminals 1 and 2 when the key is turned approx. 20° clockwise or counterclockwise from the neutral position, and there is continuity when it is turned further.




## INSPECTION

### DOOR LATCH SWITCH

Operate the switch, and check the continuity between the terminals.

| Switch position \ Terminal | | 1 | 2 | 3 |
|---|---|---|---|---|
| Switch | Open (door open) | | O | O |
| | Depressed (door close) | O | | O |

NOTE
O-O indicates that there is continuity between the terminals.

## SERVICE POINTS OF INSTALLATION

**7. APPLICATION OF GREASE TO DOOR LATCH ASSEMBLY/5. DOOR OUTSIDE HANDLE/I. DOOR INSIDE HANDLE**

Apply multipurpose grease to all moving parts.

**Grease: MOPAR Multipurpose Grease Part No. 2932524 or equivalent**

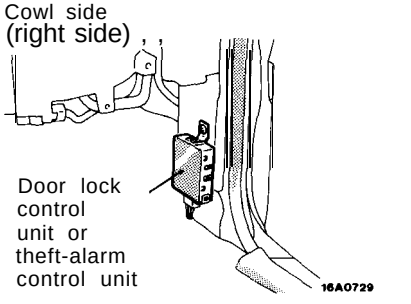
# CENTRAL DOOR LOCKING SYSTEM

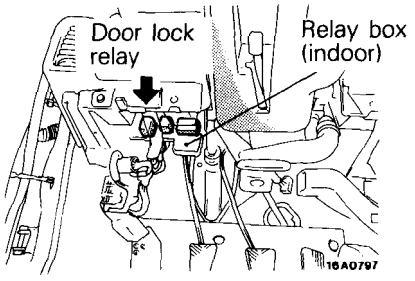
N23ZDAH

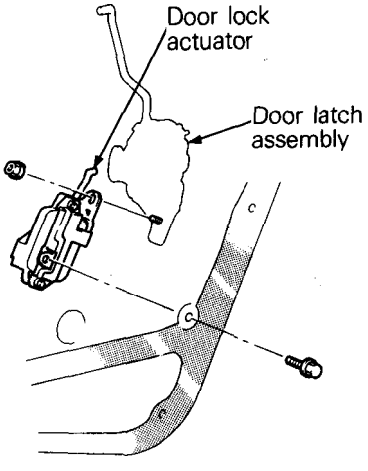
## REMOVAL AND INSTALLATION

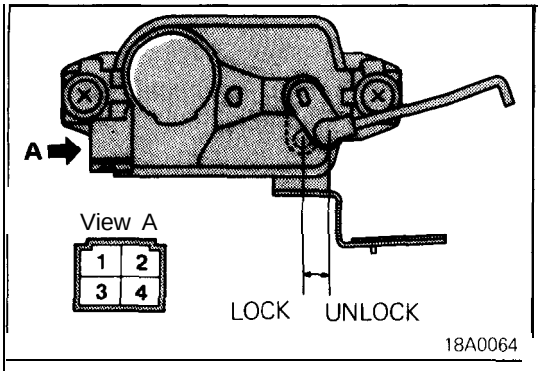
**Pre-removal Operation**
- Removal of Door Trim and Waterproof Film (Refer to P.23-65.)
- Removal of Cowl Side Trim (Refer to P.23-85.)
- Removal of Knee Protector (Refer to P.23-80.)

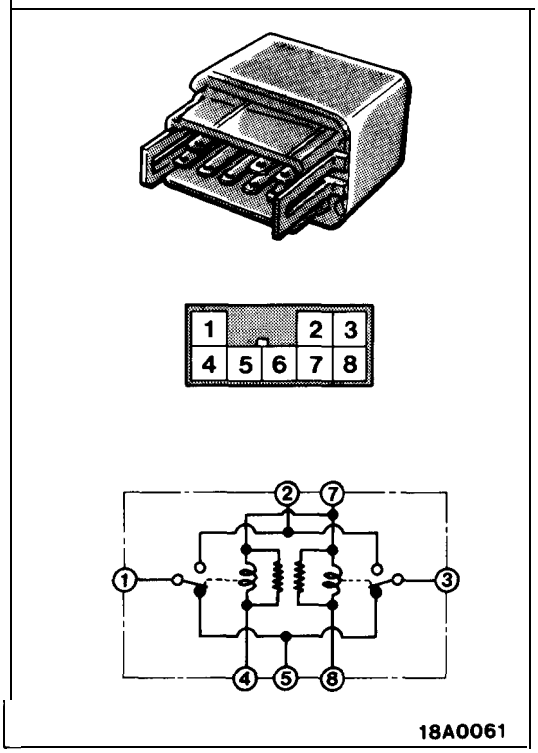
**Post-installation Operation**
- Installation of Door Trim and Waterproof Film (Refer to P.23-65.)
- Installation of Cowl Side Trim (Refer to P.23-85.)
- Installation of Knee Protector (Refer to P.23-80.)






## INSPECTION

### DOOR LOCK ACTUATOR

(1) Place the rod in the LOCK position, apply the battery power to the terminal [(1) for left or (3) for right] and check to see that when the terminal [(3) for left or (1) for right] is grounded, the rod moves to the UNLOCK position.
(2) Then place the rod in the UNLOCK position, apply the battery power to the terminal [(3) for left or (1) for right], and check to see that when the terminal [(1) for left or (3) for right] is grounded, the rod moves to the LOCK position.
(3) Check to ensure that when the rod is placed in the UNLOCK position, there is a continuity between the terminals (2) and (4), and that when the rod is placed in the LOCK position, there is no continuity.

### DOOR LOCK RELAY

Check for continuity between terminals under the conditions described below.

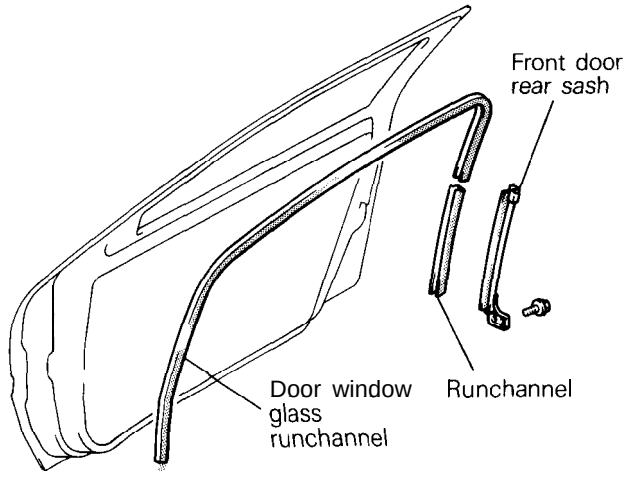
| Terminal / Battery voltage | 1 | 2 | 3 | 4 | 5 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Continuity no voltage | 0 | | 0 | 0 | 0 | o - - o | |
| Continuity with voltage | | | ⊖ | ⊖ | | ⊕ ⊕ | ⊖ |

NOTE
(1) O-O indicates that there is continuity between the terminals.
(2) ⊕---⊖ indicates terminals to which battery voltage is applied.

# DOOR RUNCHANNEL

N23MEAN

## REMOVAL AND INSTALLATION




**Pre-removal Operation**
- Removal of Door Trim and Waterproof Film (Refer to P.23-65.)
- Removal of Door Window Glass and Front Door Rear Sash (Refer to P.23-66.)

**Post-installation Operation**
- Installation of Door Window Glass and Front Door Rear Sash (Refer to P.23-66.)
- Installation of Door Trim and Waterproof Film (Refer to P.23-65.)

# DOOR MOULDING AND DRIP LINE WEATHERSTRIP

N23MFAK

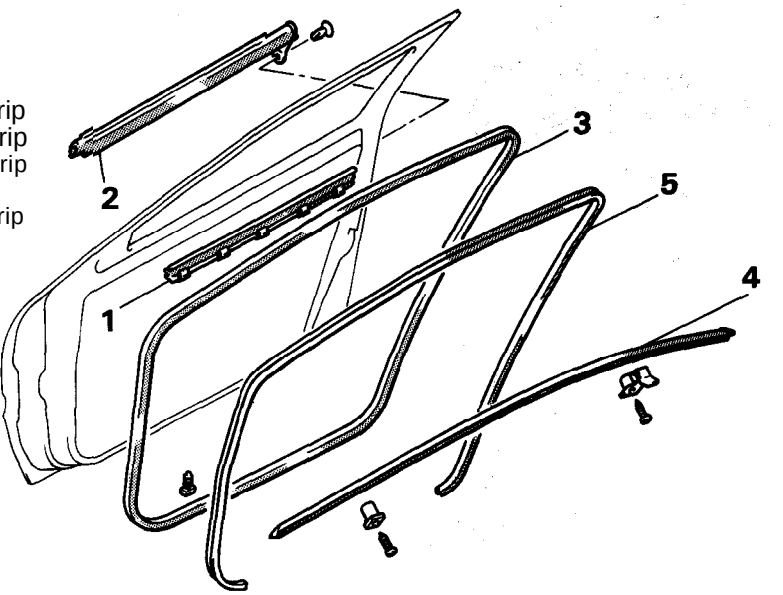
## REMOVAL AND INSTALLATION

**Removal steps**

1. Front door belt line inner weatherstrip
2. Front door belt line outer weatherstrip
3. ◆◆ Front door outer opening weatherstrip
4. Drip moulding
5. Front door inner opening weatherstrip

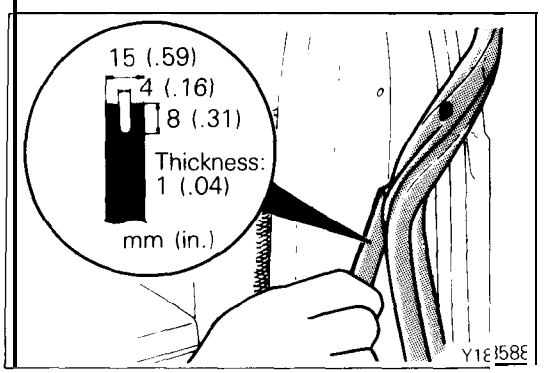
**Pre-removal Operation**
- Removal of Door Trim and Waterproof Film (Refer to P.23-65.)
- Removal of Door Mirror

**Post-installation Operation**
- Installation of Door Mirror
- Installation of Door Trim and Waterproof Film (Refer to P.23-65.)




18A0474

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".




## SERVICE POINTS OF REMOVAL

### 3. REMOVAL OF DOOR OUTER OPENING WEATHERSTRIP

Make a tool as shown in the illustration to remove the door opening weatherstrip.

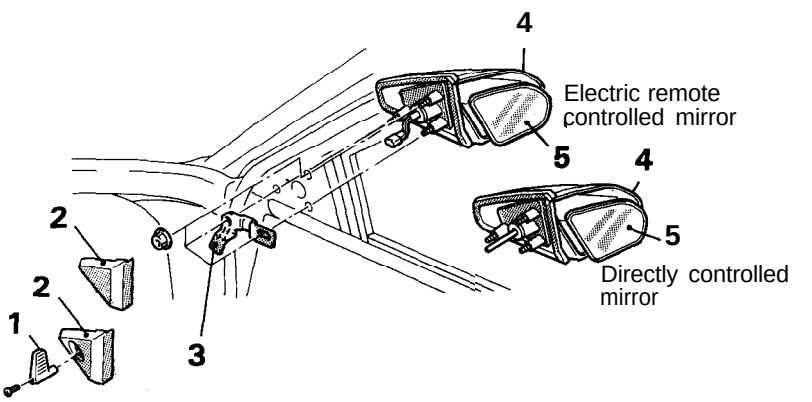
# DOOR MIRROR

N23QAAM

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Door Trim (Refer to P.23-65.)

**Post-installation Operation**
- Installation of Door Trim (Refer to P.23-65.)

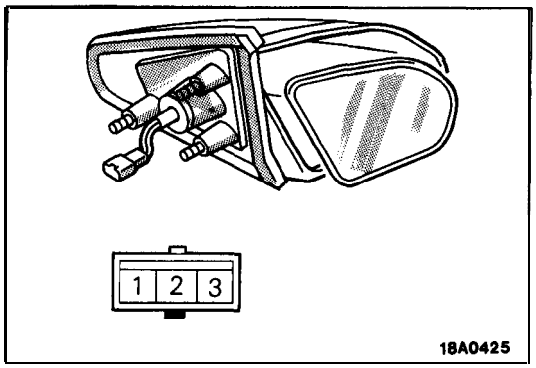



18A0424

**Removal steps**

1. Knob (directly controlled mirror)
2. Inner delta cover
3. Door trim bracket
4. Door mirror
5. Mirror sub assembly

NOTE
Reverse the removal procedures to reinstall.

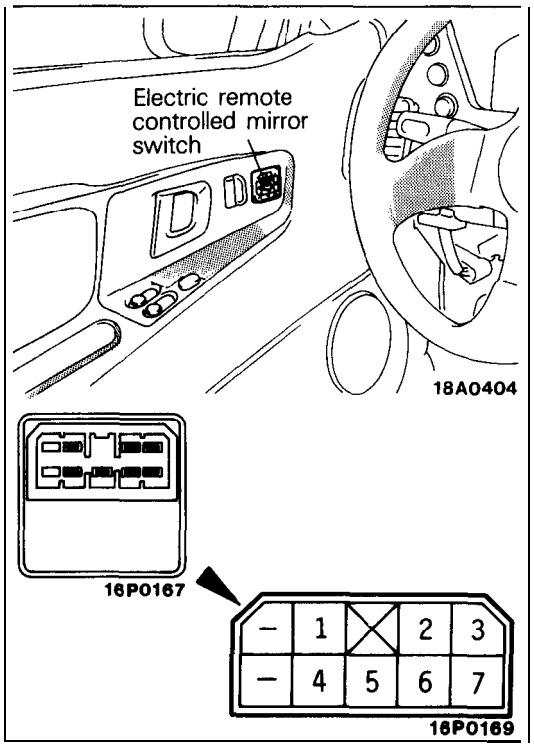



## INSPECTION

### ELECTRIC REMOTE CONTROLLED MIRROR ASSEMBLY

Check to be sure that the mirror moves as described in the table when each terminal is connected to the battery.

| Connection / Direction | Battery (+) | Battery (−) | Terminal 1 | Terminal 2 | Terminal 3 |
|---|---|---|---|---|---|
| UP | ○ | ○ | ○ | | ○ |
| DOWN | 0 | 0 | ○ | | 0 |
| RIGHT | 0 | 0 | | 0 | 0 |
| LEFT | ○ | ○ | | ○ | ○ |




# ELECTRIC REMOTE CONTROLLED MIRROR SWITCH

N23QAAN

## INSPECTION

### ELECTRIC REMOTE CONTROLLED MIRROR SWITCH

Operate switches and check the continuity between terminals.

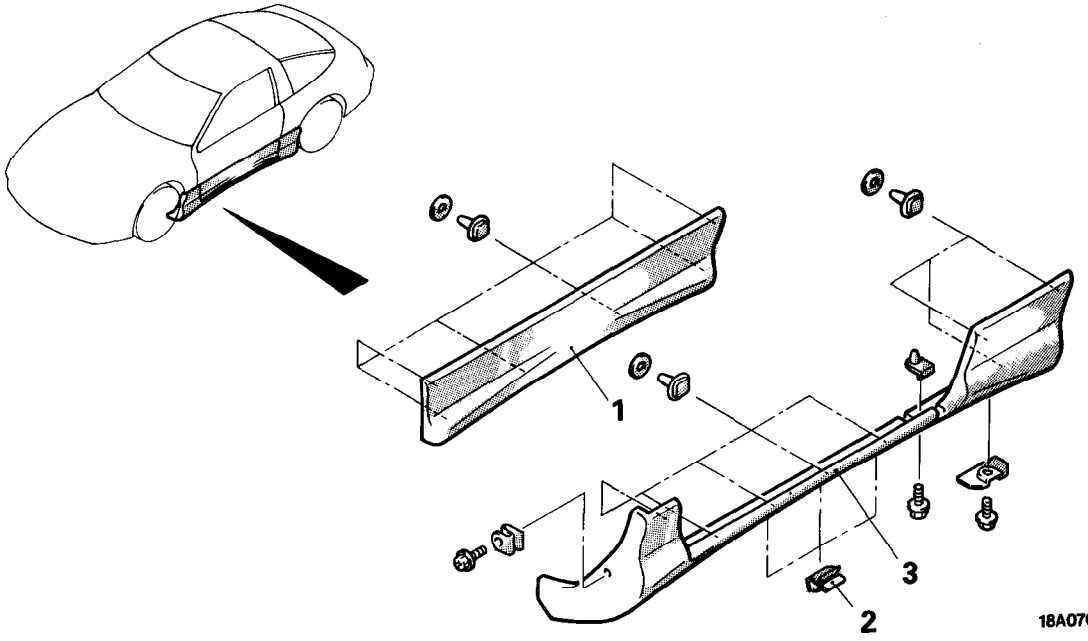
| Terminal / Direction | Left side 2 | 3 | 4 | 5 | 6 | Right side 1 | 3 | 4 | 5 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| UP | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| DOWN | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| LEFT | 0 | 0 | | 0 | | | 0 | | 0 | |
| RIGHT | | | ○ | ○ | | | 0 | ○ | ○ | 0 |

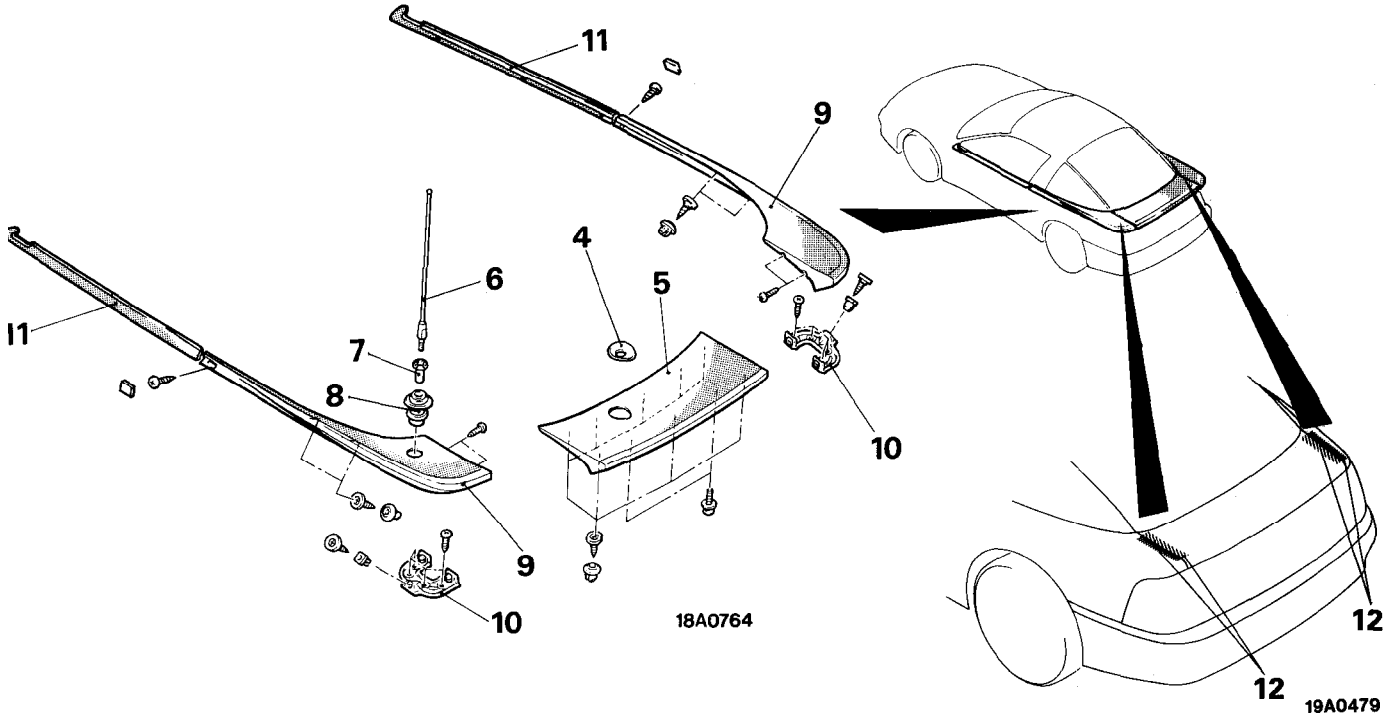
NOTE
O-O indicates that there is continuity between the terminals.

# AERO PARTS

N23XAAH

## REMOVAL AND INSTALLATION




**Side air dam removal**

- ● *● * 1. Side air dam (door)
  2. Air dam clip
- ◆◆ ● + 3. Side air dam (side sill)

**Rear air spoiler assembly (center) removal steps**

  Rear wiper
  (Refer to GROUP 8–Rear Wiper.)
  Liftgate trim (Refer to P.23-86.)
  High mounted stop light
  (Refer to GROUP 8–Lighting System.)
  4. Rear wiper grommet
- ◆◆ ● c 5. Rear air spoiler assembly (center)
  12. Spoiler tape

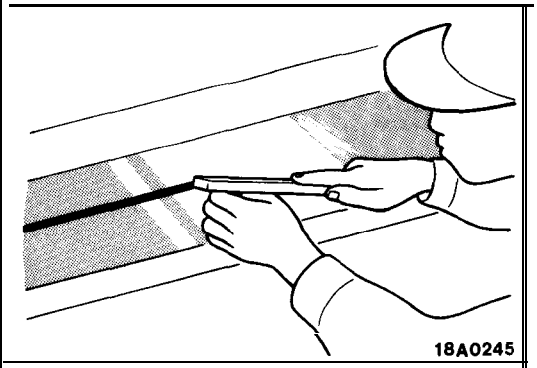
**Rear air spoiler assembly (side) removal steps**

  6. Mast antenna
  7. Mounting nut
  8. Mounting insulator
- ● *● a 9. Rear air spoiler assembly (side)
  10. Air spoiler bracket assembly

**Door air spoiler removal**

- ◆◆ 11. Door air spoiler

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● + : Refer to “Service Points of Removal”.
(3) ● + : Refer to “Service Points of Installation”.

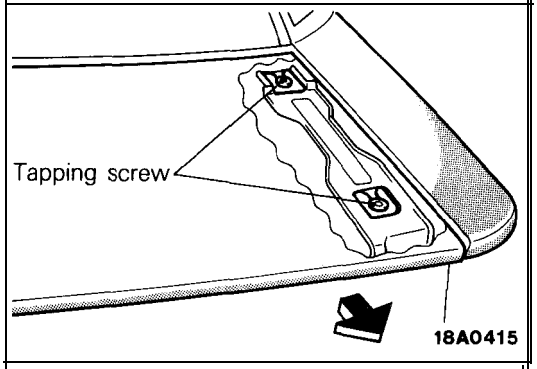

18A0245

## SERVICE POINTS OF REMOVAL

**1. REMOVAL OF SIDE AIR DAM (DOOR)/3. SIDE AIR DAM (SIDE SILL)**

(1) After the mounting screws are removed, apply the plastic trim tool to the bonding and clipped areas to remove the side air dam.

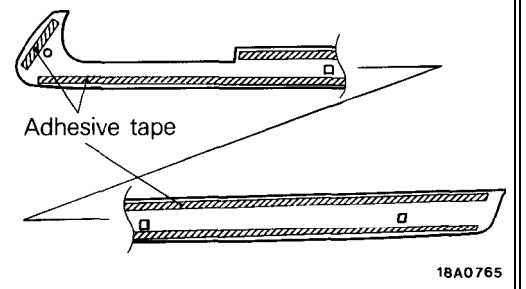
(2) Scale off the both-side adhesive tape with the plastic trim tool.



18A0415

**5. REMOVAL OF REAR AIR SPOILER ASSEMBLY (CENTER)/ 9. REAR AIR SPOILER ASSEMBLY (SIDE)**

After the rear air spoiler mounting bolts or screws have been removed, move the rear air spoiler to the rear of the vehicle, remove the rear air spoiler from the tapping screws, and pull off the rear air spoiler.



18A0765

## SERVICE POINTS OF INSTALLATION

**11. INSTALLATION OF DOOR AIR SPOILER**

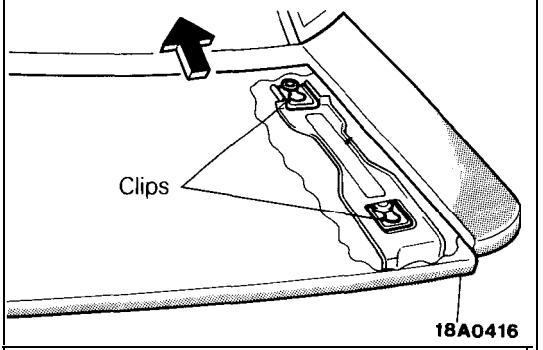
(1) After removal of oils and greases from the body side and the door air spoiler side, warm the adhesive surface. (Refer to the section concerning installation of the side air dam.)

(2) Remove backing paper from adhesive tape, and apply adhesive tape as shown in the illustration.

**Specified adhesive tape:**
**3M ATD Part No. 6383 or equivalent**

(3) Use hand roller or similar tool to apply even pressure to entire surface of door air spoiler.

NOTE
Press door air spoiler ends firmly against the body surface.

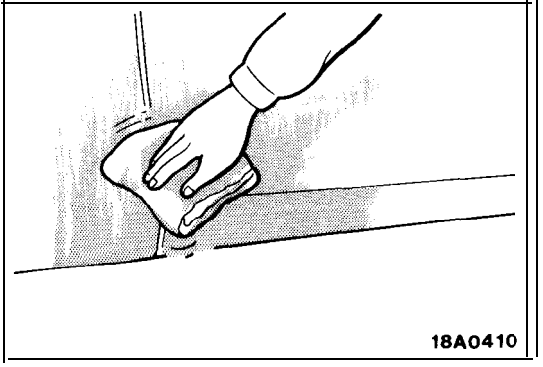


18A0416

**9. INSTALLATION OF REAR AIR SPOILER ASSEMBLY (SIDE)/5. REAR AIR SPOILER ASSEMBLY (CENTER)**

Install the rear air spoiler in position so that its clips are held by the tapping screws.

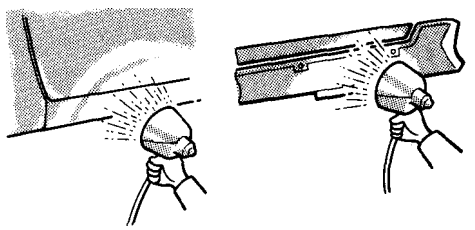
NOTE
When the clip remains on the body side, securely attach the clip to the rear air spoiler, and mount them.


18A0410

**3. INSTALLATION OF SIDE AIR DAM (SIDE SILL)/1. SIDE AIR DAM (DOOR)**

(1) Wipe off application surface of body with clean cloth dampened with degreaser (MOPAR SUPER KLEEN or equivalent).

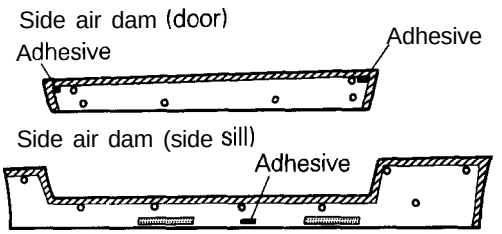
NOTE
After wiping surface, leave surface as it is to volatilize degreaser.



18A0411

(2) Using an infrared light or similar instrument, heat the body painted surface and the side air dam.

**Heating temperature**
**Body painted surface . . . . . 25–55°C (77–131°F)**
**Side air dam . . . . . 25–40°C (77–104°F)**




▨ Adhesive tape <Thickness: 1.2mm .047 in.>
▤ Adhesive tape <Thickness: 3 mm (.118 in.)>
18A0766

(3) Peel off the paper from the adhesive tape, apply specified adhesive and sealant at the places shown in the figure, and attach to the body adhesive surface.

**Specified adhesive tape: 3M ATD Part No.6383 or equivalent**

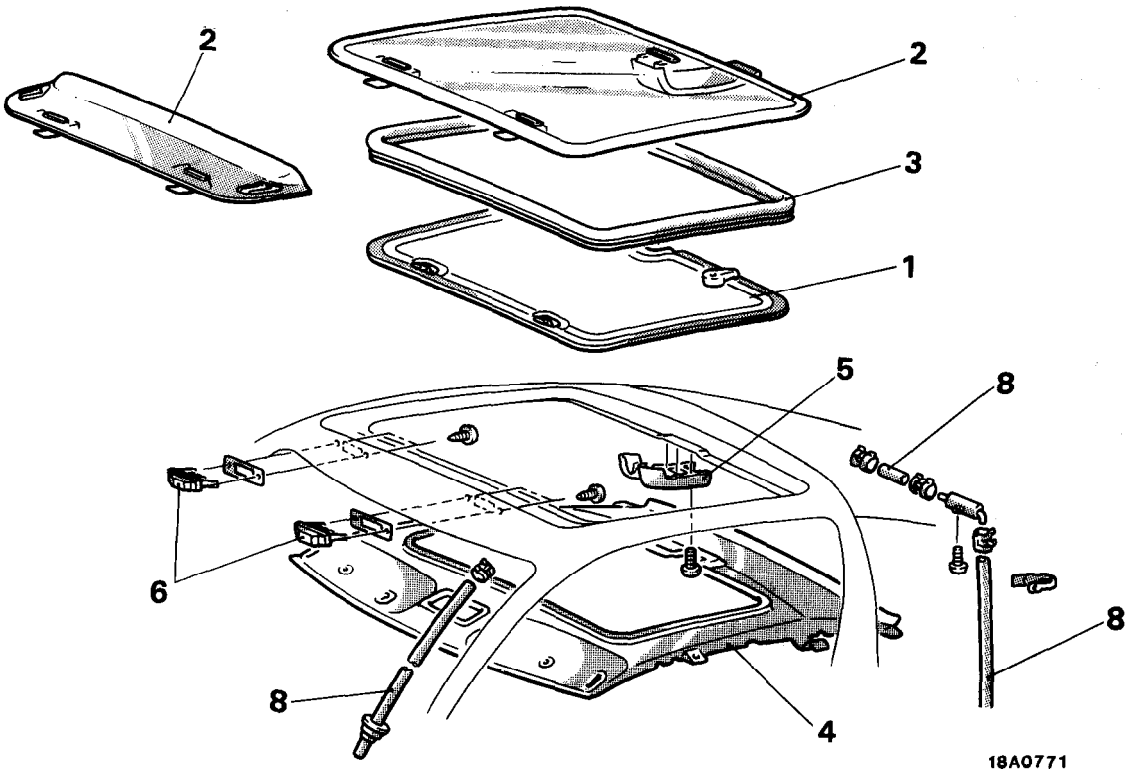
(4) Using a hand roller or similar tool, apply pressure to the entire surface of the side air dam.

NOTE
The ends of the side air dam tend to loosen easily, so apply manual pressure again.

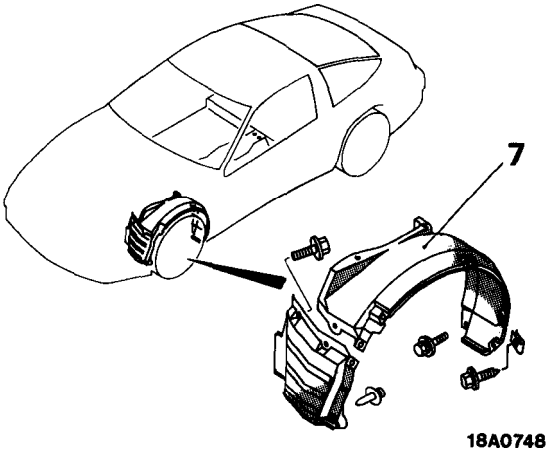
# SUNROOF

N23TBAD

## -- REMOVAL AND INSTALLATION




18A0771

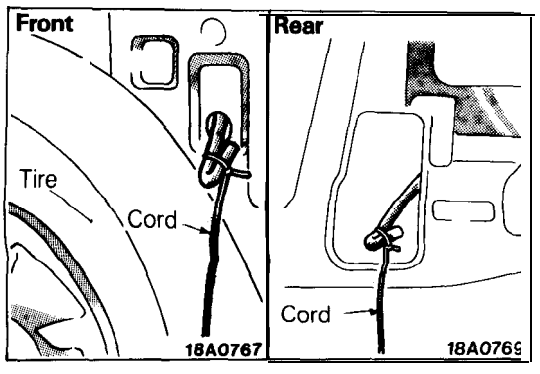



18A0748

**Removal steps**

1. Sunshade
2. Roof lid glass or deflector
3. Weatherstrip
- ◆◆ ◆◆ 4. Headlining
5. Base plate assembly
6. Hinge female assembly
- ◆◆ 7. Splash shield
  Quarter trim (Refer to P.23-85.)
  Center pillar trim (Refer to P.23-85.)
- ● ◆◆ 8. Drain hose

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● *: Refer to "Service Points of Installation".
(4) N: Non-reusable parts.



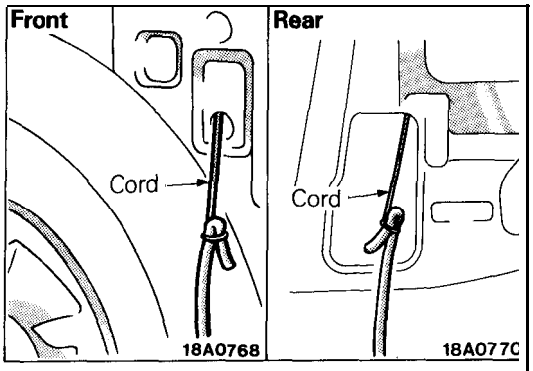

## SERVICE POINTS OF REMOVAL

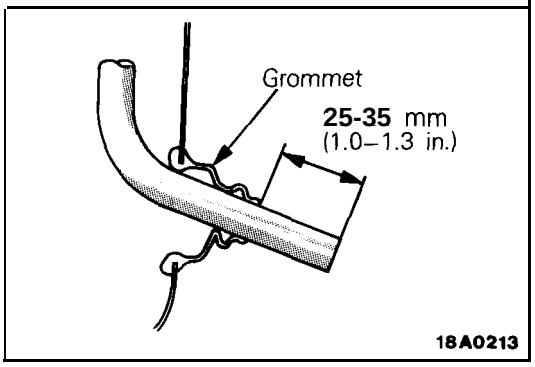
### 4. REMOVAL OF HEADLINING

Refer to P.23-89.

### 8. REMOVAL OF DRAIN HOSE

Tie a cord at the end of the drain hose and pull out the drain hose toward the vehicle interior.




## SERVICE POINTS OF INSTALLATION

**8. INSTALLATION OF DRAIN HOSE**

(1) Tie the cord (passed through at the time of removal) to the end of the drain hose.
(2) Pull the cord and pass the drain hose through.

(3) Install the grommet at the front side, and install so that the amount of projection of the drain hose is as shown in the figure.

**7. INSTALLATION OF SPLASH SHIELD**

Refer to P.23-51.

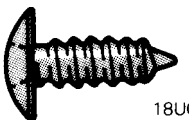
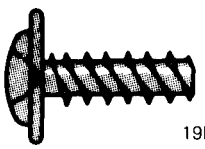
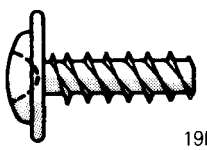
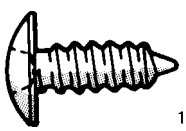
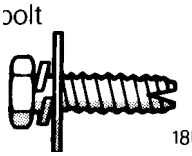
**4. INSTALLATION OF HEADLINING**

Refer to P.23-89.

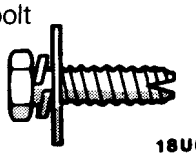
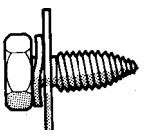
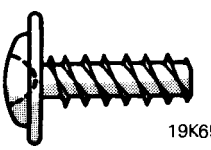
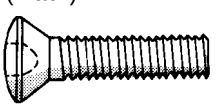
# INSTRUMENT PANEL

N23UAAP

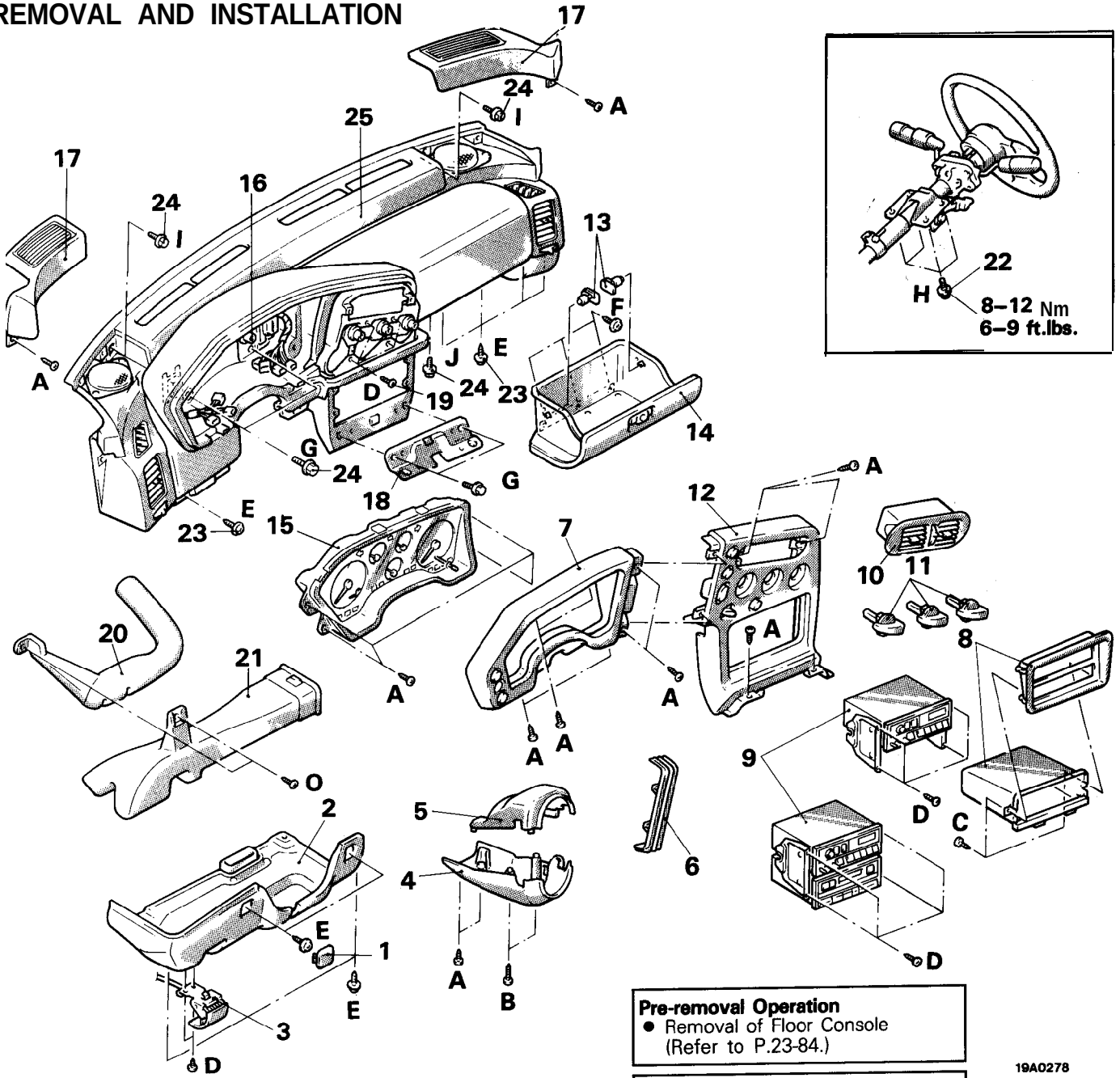
For installation of the instrument panel, the bolts and screws described below are used. They are indicated by symbols in the illustration.

| Symbo | Part name and shape | Size mm (in.) |
|---|---|---|
| A | Tapping screw (Black)  18U0418 | D=5 (.20) L=20 (.79) |
| B | Tapping screw  19K653 | D=5 (.20) L=25 (.98) |
| C | Tapping screw  19K653 | D=4 (.16) L=10 (.39) |
| D | Tapping screw  18U0418 | D=5 (.20) L=16 (.63) |
| E | Washer assembled screw (Black)  18110419 | D=6 (.24) L=20 (.79) |
| F | Washer assembled screw ( Black)  18U0419 | D=5 (.20) L=20 (.79) |
| G | Washer assembled bolt  18U0420 | D=6 (.24) L=16 (.63) |

D= Thread diameter
L= Effective thread length

| Symbol | Part name and shape | Size mm (in.) |
|---|---|---|
| H | Washer assembled bolt  18U042( | D=8 (.31) L=25 (.98) |
| I | Washer assembled bolt  19A027( | D=6 (.24) L=16 (.63) |
| J | Washer assembled bolt  19W65! | D=6 (.24) L=16 (.63) |
| K | Tapping screw  19K653 | D=5 (.20) L=16 (.63) |
| L | Machine screw (Black)  19L012( | D=4 (.16) L=10 (.39) |
| M | Machine screw (Black)  19A0275 | D=4 (.16) L=10 (.39) |
| N | Washer assembled screw  19A0165 | D=5 (.20) L=16 (.63) |
| 0 | Trapping screw  18U0418 | D=5 (.20) L=12 (.47) |

## REMOVAL AND INSTALLATION




**Pre-removal Operation**
- Removal of Floor Console (Refer to P.23-84.)

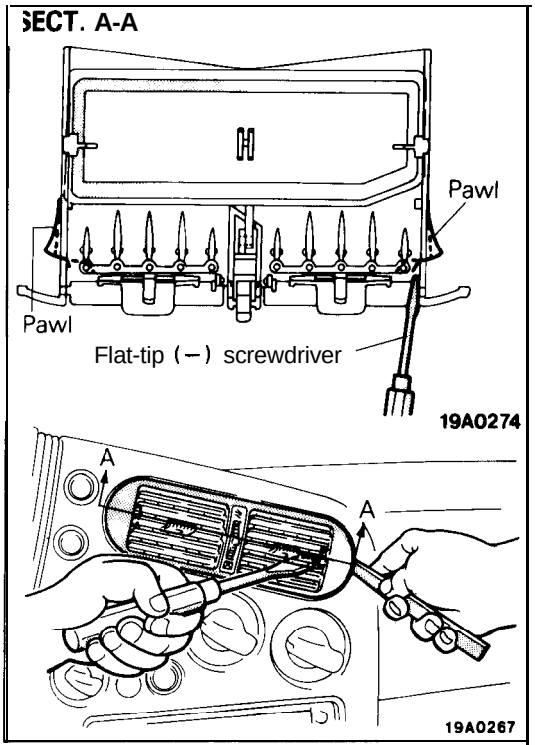
**Post-installation Operation**
- Installation of Floor Console (Refer to P.23-84.)

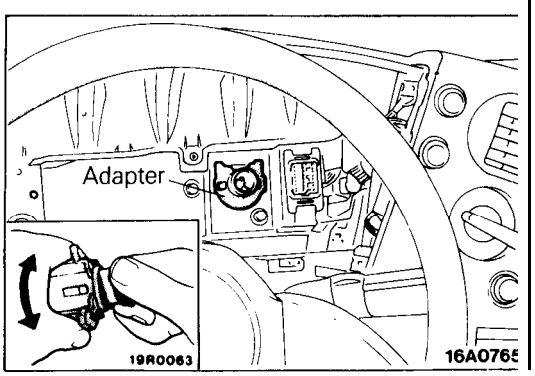
19A0278

**Removal steps**

1. Plug
2. Knee protecter assembly
3. Hood lock release handle
4. Column cover lower
5. Column cover upper
6. Cover (A)
7. Cluster panel assembly (A)
8. Radio panel
9. Radio or radio and tape player
10. Center air outlet assembly
11. Dial knob (A)
12. Cluster panel assembly (B)
13. Stopper
14. Glove box assembly
15. Combination meter
16. Speedometer cable adapter
17. Speaker garnishes
18. Bracket
19. Heater control assembly installation screws
20. Lap cooler duct
21. Shower duct (L.H.)
22. Steering shaft mounting bolt(s)
23. Instrument panel mounting screws
24. Instrument panel mounting bolts
25. Instrument panel assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal"




## SERVICE POINTS OF REMOVAL

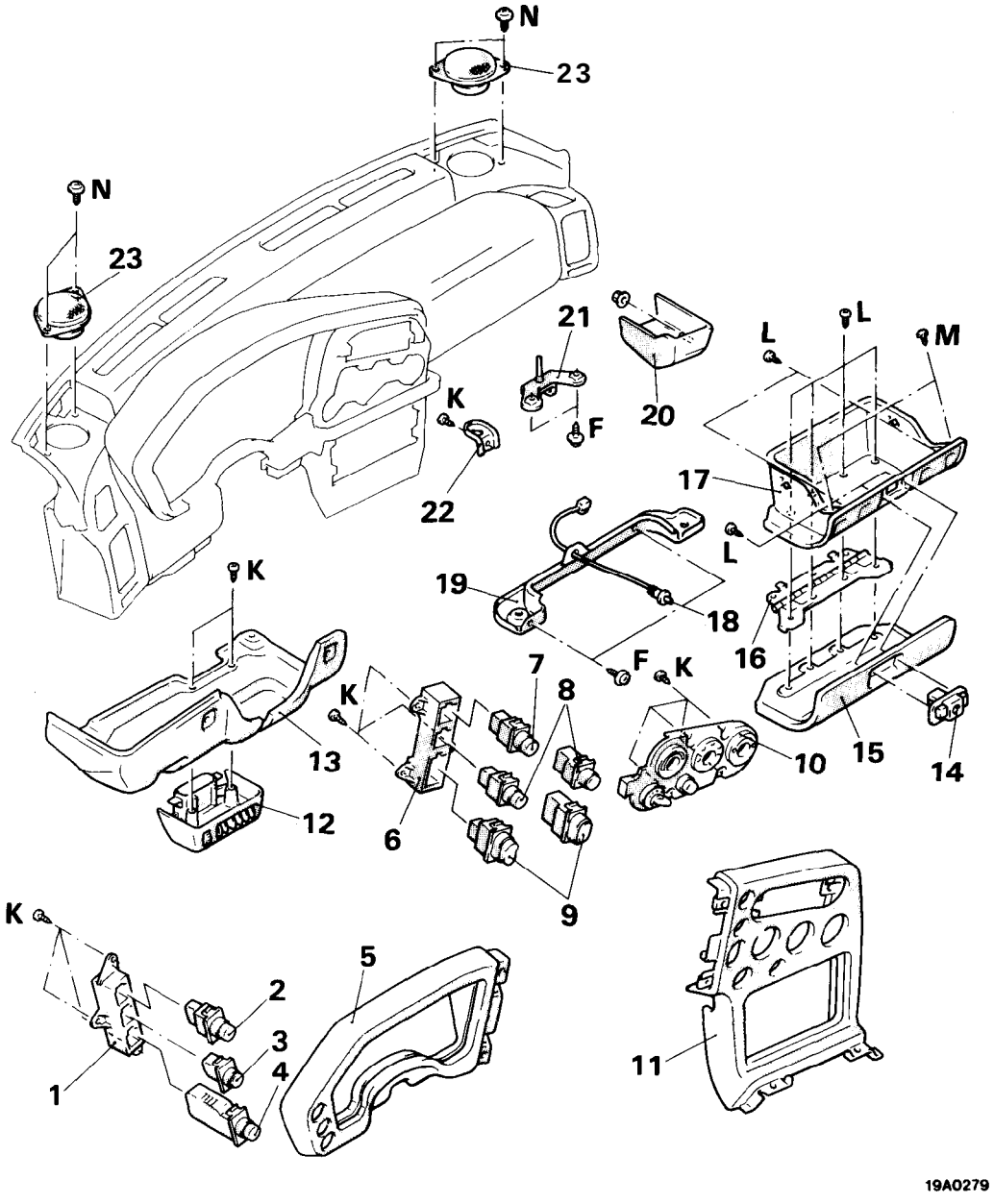
### 10. REMOVAL OF CENTER AIR OUTLET ASSEMBLY

Removing the pawl of the center air outlet assembly with a flat-tip (–) screwdriver, remove the center air outlet assembly with the plastic trim tool.

### 16. REMOVAL OF SPEEDOMETER CABLE ADAPTER

(1) Disconnect the speedometer cable at the transaxle end of the cable.
(2) Pull the speedometer cable slightly toward the vehicle interior, release the lock by turning the adapter to the left or right, and then remove the adapter.

## DISASSEMBLY AND REASSEMBLY




**Cluster panel (A) disassembly steps**

1. Switch holder (A)
2. Headlight pop-up switch
3. Plug (A)
4. Rheostat
5. Cluster panel (A)

**Cluster panel (B) disassembly steps**

6. Switch holder (B)
7. Hazard switch
8. Rear window defogger switch or plug (A)
9. Rear wiper and washer switch or plug (B)
10. Heater control panel assembly
11. Cluster panel (B)

**Knee protector disassembly steps**

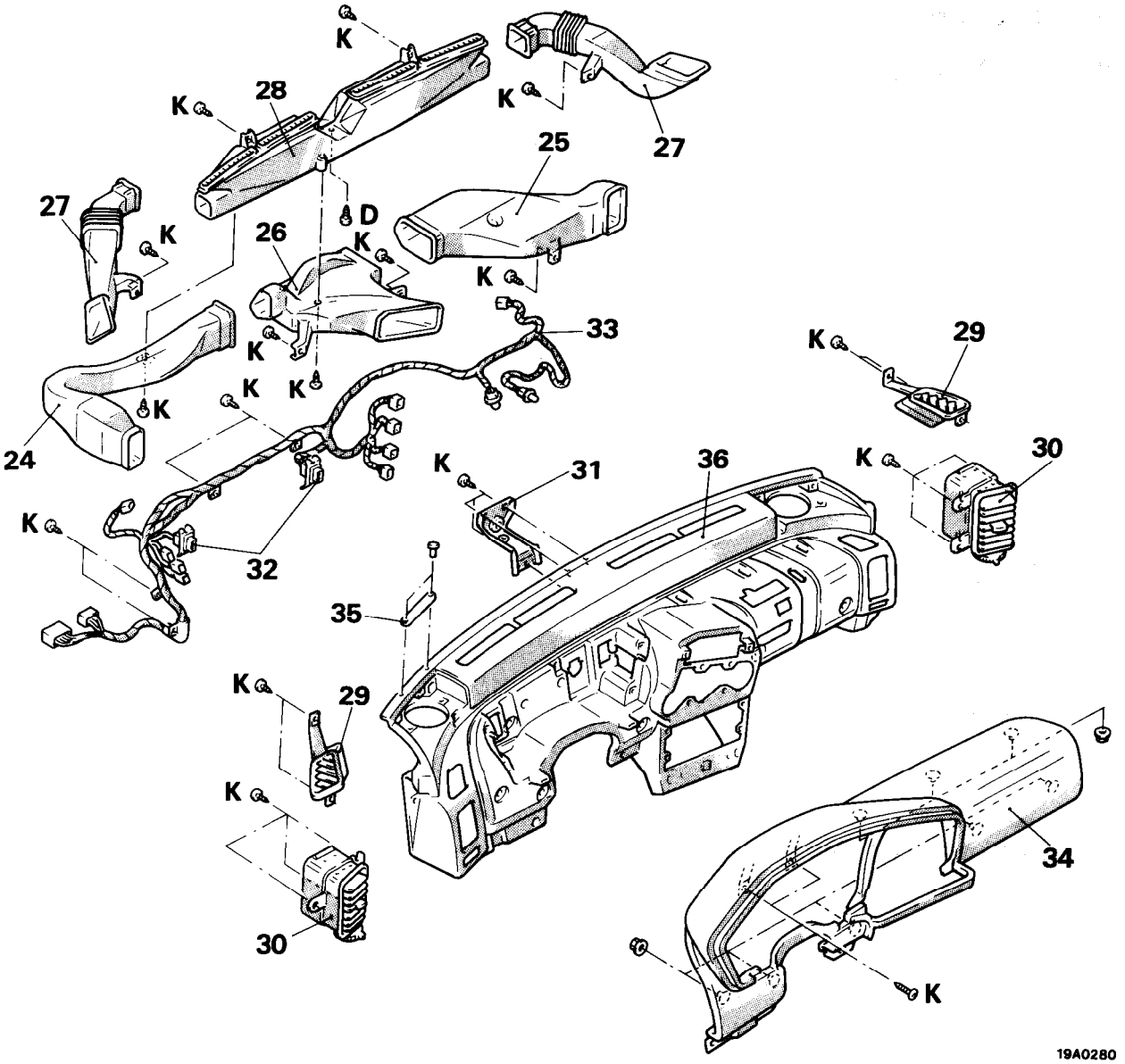
12. Lap cooler grill assembly
13. Knee protector

**Glove box disassembly steps**

14. Glove box lock assembly
15. Glove box pad
16. Glove box hinge
17. Glove box

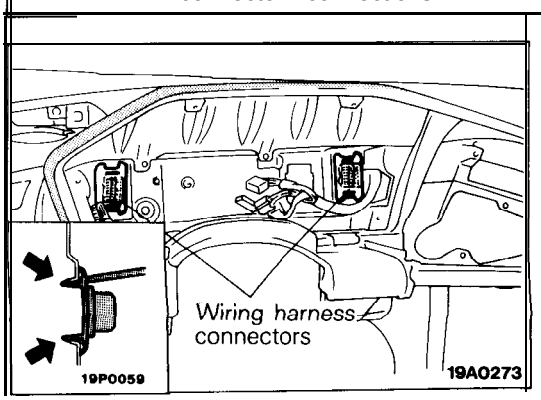
**Instrument panel disassembly steps**

18. Glove box light switch
19. Lower frame
20. Corner pad
21. Glove box striker
22. Glove box light bracket
23. Speakers




24. Air duct (A)
25. Air duct (B)
26. Distribution duct
27. Side defroster hoses
28. Defroster nozzle assembly
29. Side defroster grilles
30. Side air outlet assembly
31. Bracket
◆◆ 32. Combination meter wiring harness connector connections
33. Instrument panel wiring harness
34. Instrument panel pad
35. Vin plate
36. Instrument panel

NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ◆◆: Refer to "Service Points of Disassembly".




## SERVICE POINTS OF DISASSEMBLY

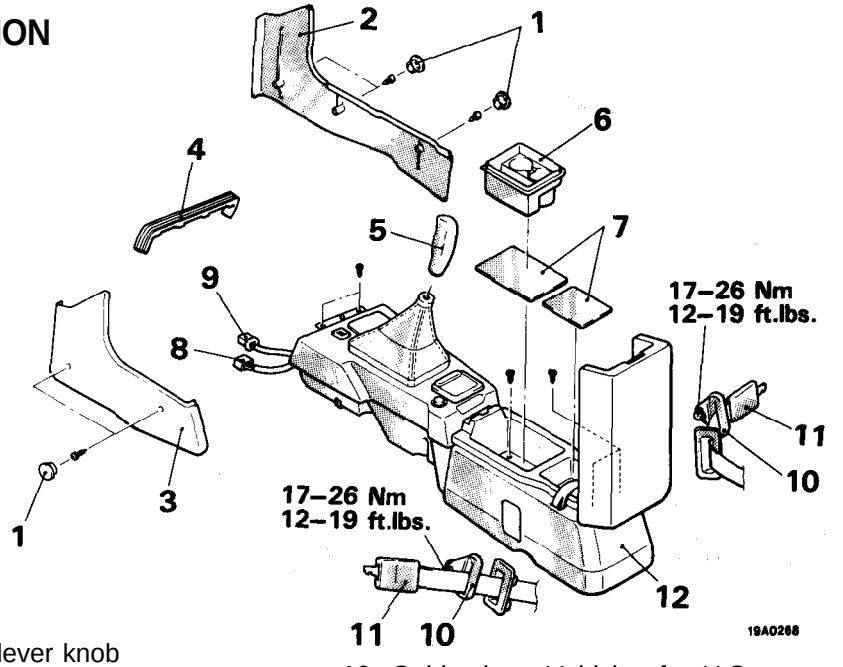
### 32. DISCONNECTION OF COMBINATION METER WIRING HARNESS CONNECTORS

Insert a flat-tip (–) screwdriver and open the tab of the connector, and then remove the harness connectors.

# FLOOR CONSOLE

N23UBAP

## REMOVAL AND INSTALLATION

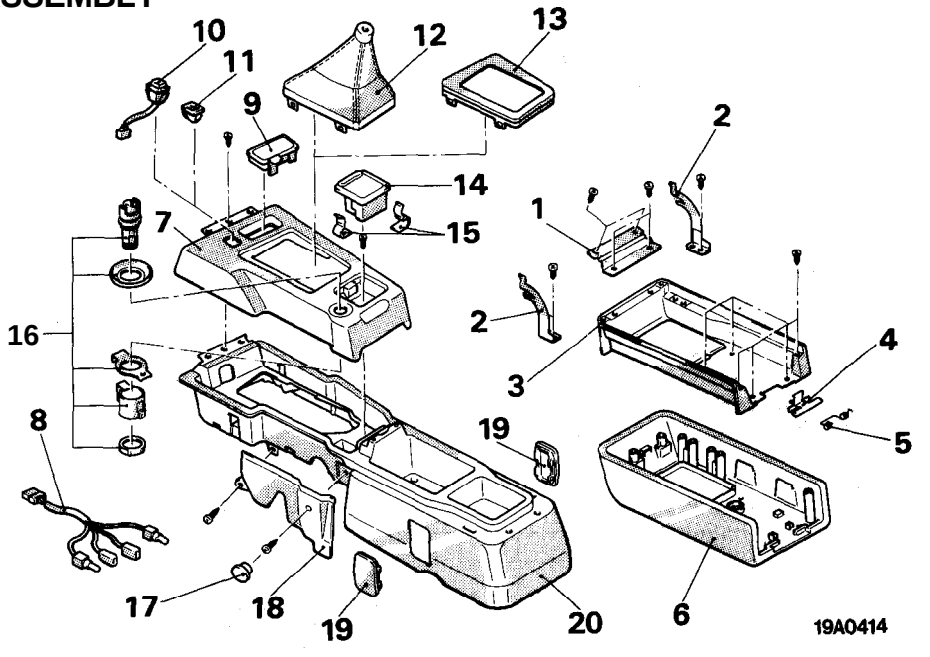



**Removal steps**

1 Plug
2. Side cover (A)
3. Side cover (B)
4. Cover (B)
5. Manual transaxle shift lever knob
6. Cup holder
7. Carpet
8. Connection for floor console wiring harness
9. POWER (PWR)/ECONOMY (ECO) changeover switch connector <A/T>
10. Guide ring <Vehicles for U.S.>
11. Shoulder belt <Vehicles for U.S. >
12. Floor console assembly

NOTE
Reverse the removal procedures to reinstall.

## DISASSEMBLY AND REASSEMBLY




**Disassembly steps**

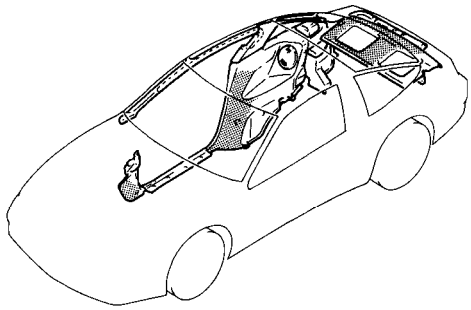
1. Hinge
2. Stoppers
3. Lid inner
4. Lock lever
5. Lock lever spring
6. Accessory box lid
7. Floor console garnish assembly
8. Floor console wiring harness
9. Coin box
10. POWER (PWR)/ECONOMY (ECO) changeover switch <A/T>
11. Coin holder <M/T>
12. Shift lever boot <M/T>
13. Panel <A/T>
14. Ashtray
15. Ashtray spring
16. Cigarette lighter
17. Plug
18. Side cover (C)
19. Console cover <Vehicles for Canada >
20. Floor console

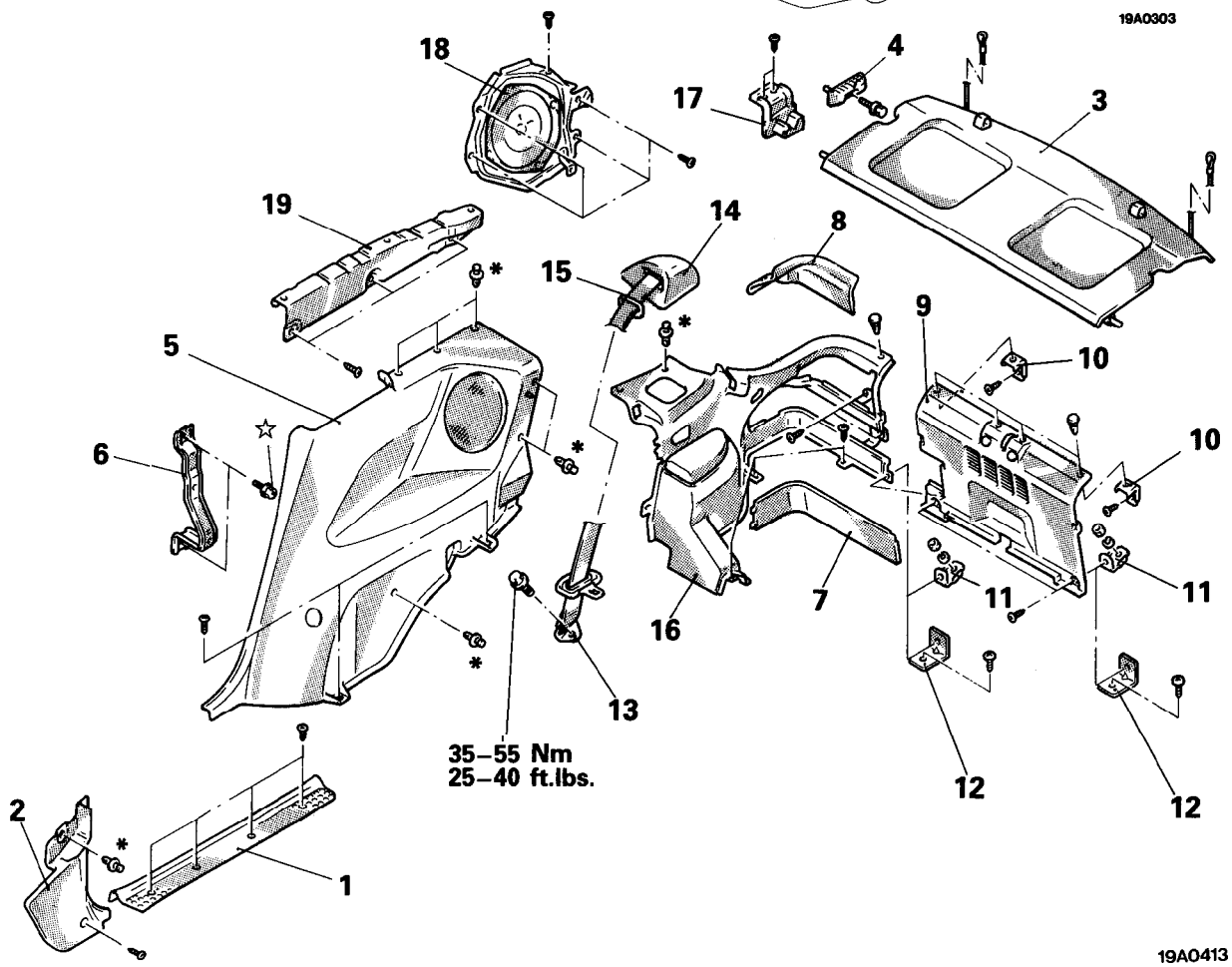
NOTE
Reverse the disassembly procedures to reassemble.

# TRIMS

N23UCBH

## REMOVAL AND INSTALLATION






**Cowl side trim removal steps**

1. Scuff plate
2. Cowl side trim

**Quarter trim removal steps**

Rear seat (Refer to P.23-93.)
1. Scuff plate
◆◆ 5. Quarter trim
6. Quarter trim lower bracket

**Center shelf removal steps**

3. Center shelf
4. Shelf holder

**Rear end trim removal steps**

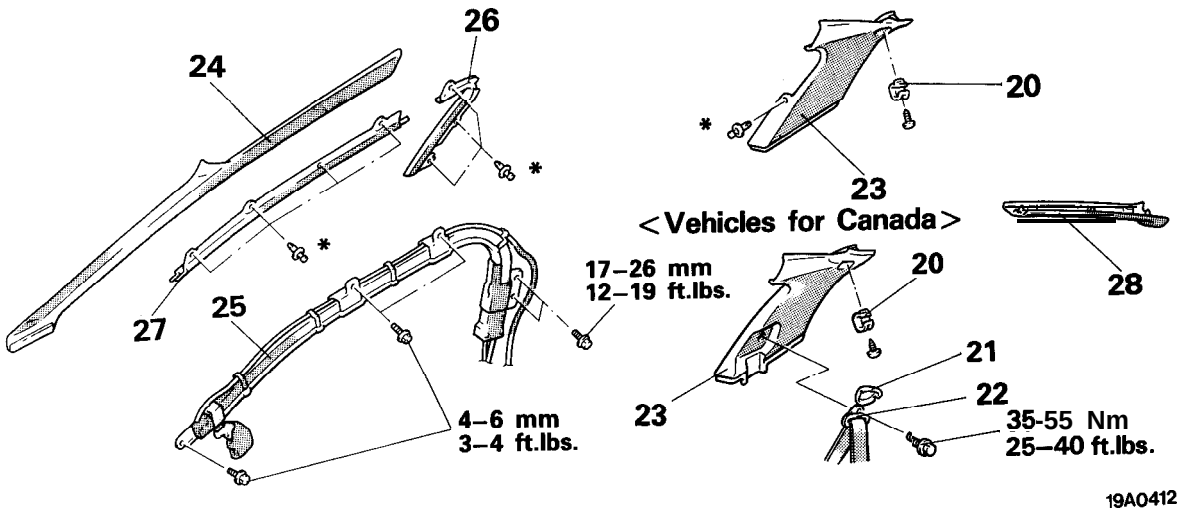
7. Lid (B)
8. Lid (D)
◆◆ 9. Rear end trim
10. Bracket
11. FWD bracket <FWD>
12. AWD trim bracket <AWD>

**Rear side trim removal steps**

Rear seat (Refer to P.23-93.)
1. Scuff plate
3. Center shelf
4. Shelf holder
◆◆ 5. Quarter trim
7. Lid (B)
8. Lid (D)
◆◆ 9. Rear end trim
13. Rear seat belt anchor plate
14. Retractor cover
15. Rear seat belt protector
◆◆ 16. Rear side trim
17. Shelf catcher
18. Rear speaker bracket assembly
19. Quarter trim upper bracket

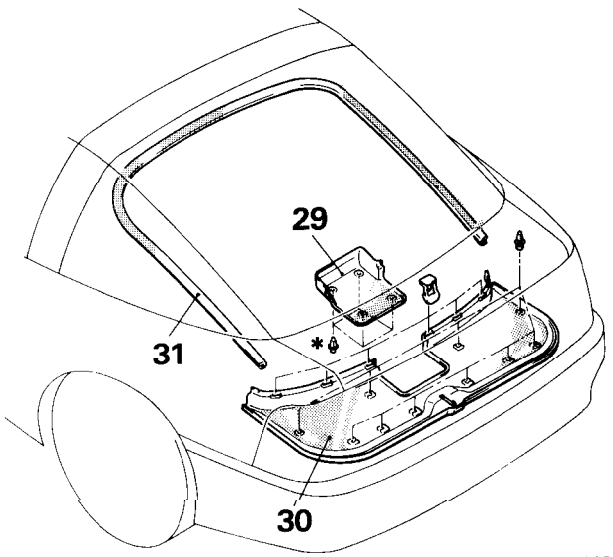
NOTE
For the bolts indicated by the ☆, screws are used for the left side.

<Vehicles for U.S.>



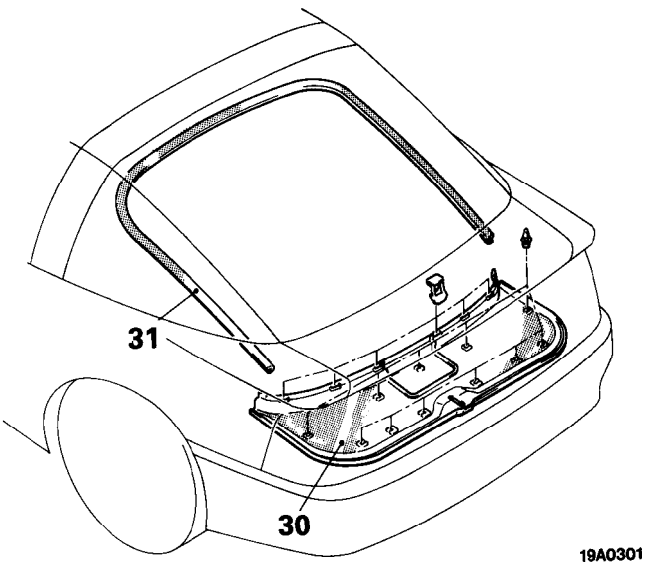

19A0412

<Vehicles without rear air spoiler>




19A0300

<Vehicles with rear air spoiler>




19A0301

**Center pillar trim and front pillar trim removal steps**

Rear seat (Refer to P.23-93.)
1 Scuff plate
◆◆ 5. Quarter trim
◆◆ 21. Sash guide cover <Vehicles for Canada>
22. Front seat belt sash guide <Vehicles for Canada>
20. Coat hanger
◆◆ 23. Center pillar trim
◆◆ 24. Front pillar trim

**Front belt rail trim and rear belt rail trim removal steps**

Rear seat (Refer to P.23-93.)
1 Scuff plate
◆◆ 5. Quarter trim
20. Coat hanger
◆◆ 23. Center pillar trim
◆◆ 24. Front pillar trim
◆◆ 25. Guide rail <Vehicles for U.S.>
26. Rear belt rail trim <Vehicles for U.S.>
27. Front belt rail trim <Vehicles for U.S.>

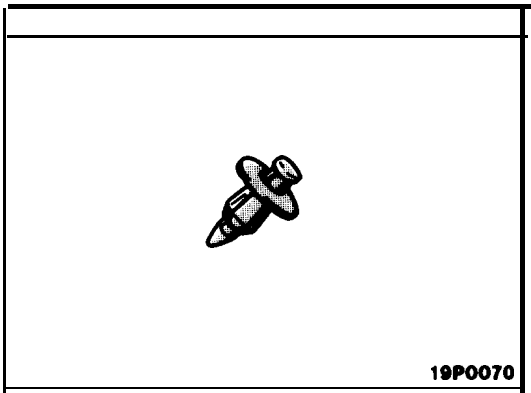
**Rear pillar trim removal steps**

Rear seat (Refer to P.23-93.)
1 Scuff plate
◆◆ 5. Quarter trim
20. Coat hanger
◆◆ 23. Center pillar trim
◆◆ 28. Rear pillar trim

**Liftgate trim and flange trim removal steps**

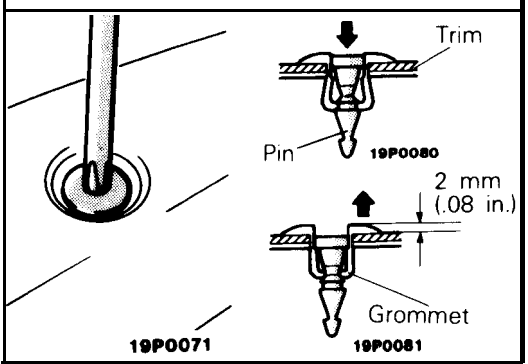
29. High mounted stop light cover
◆◆ 30. Liftgate trim
31. Flange trim

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal"
(3) The • symbol indicates the trim clip.
(Refer to P.23-87.)


19P0070

## TRIM CLIP REMOVAL/INSTALLATION PROCEDURES

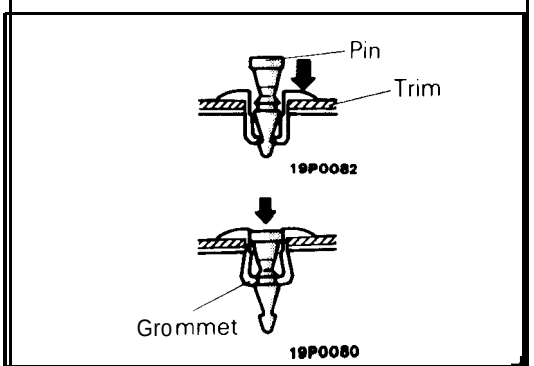
The type of clip shown in the illustration, which is used for the installation of. instrument panel, should be removed and installed by the following procedures described below.




### REMOVAL

(1) Use a cross-tip (+) screwdriver to push inward the pin (at the centre of the trim clip) to a depth of about 2 mm (.08 in.).
(2) Pull the trim clip outward to remove it.

**Caution**
**Do not push the pin inward more than necessary because it may damage the grommet, or the pin may fall in, if pushed too far.**



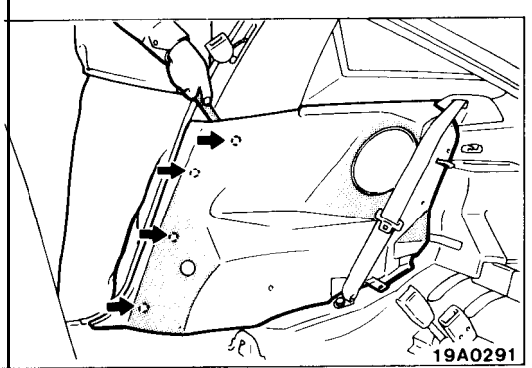

### INSTALLATION

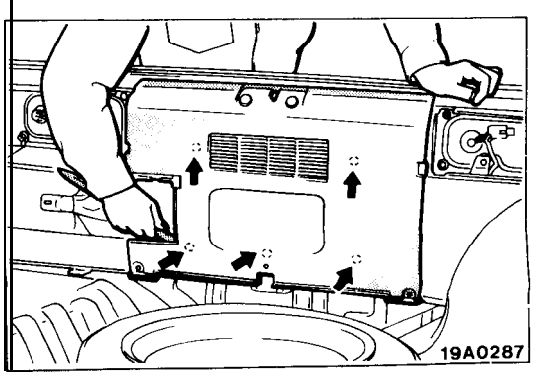
(1) With the pin pulled out, insert the trim clip into the hole in the trim.
(2) Push the pin inward until the pin's head is flush with the grommet.
(3) Check whether the trim is secure.

## SERVICE POINTS OF REMOVAL

### 5. REMOVAL OF QUARTER TRIM

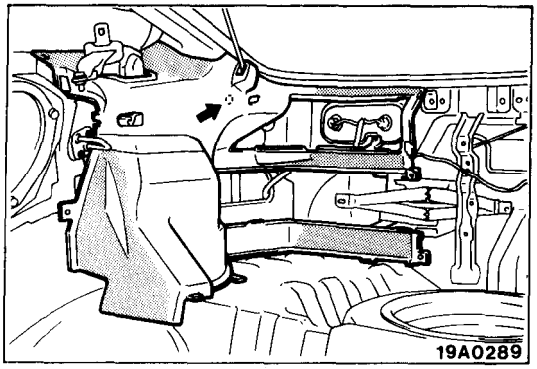
(1) Remove the quarter trim mounting screws and trim clip.
(2) Using the plastic trim tool, remove the clip mounting area on the back of the quarter trim, and remove the quarter trim.


19A0291


19A0287

### 9. REMOVAL OF REAR END TRIM

(1) Remove the rear end trim mounting screws and clips.
(2) Using the plastic trim tool, remove the clip mounting area on the back of the rear end trim, and remove the rear end trim.

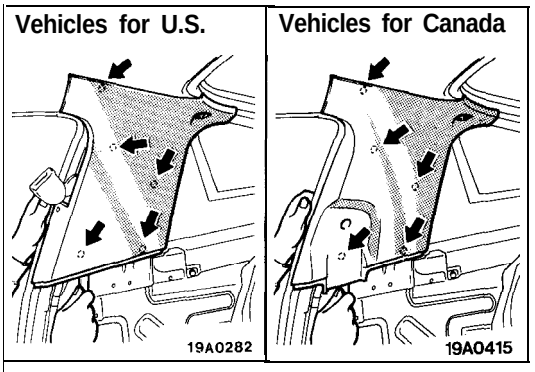



**16. REMOVAL OF REAR SIDE TRIM**

(1) Remove the cargo room light on the rear side trim (L.H.).
(2) Remove the rear side trim mounting screws and clips.
(3) Slowly pulling the rear side trim toward you, remove the clip mounting area on the back of the rear side trim, and remove the rear side trim.

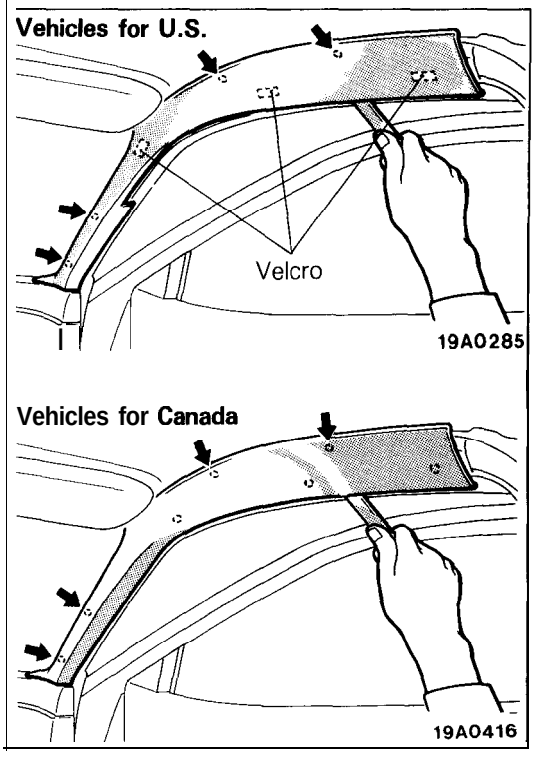
**21. REMOVAL OF SASH GUIDE COVER**

Refer to P.23-98.




**23. REMOVAL OF CENTER PILLAR TRIM**

Using the plastic trim tool, remove the clip mounting areas on the back of the center pillar trim, and remove the center pillar trim.

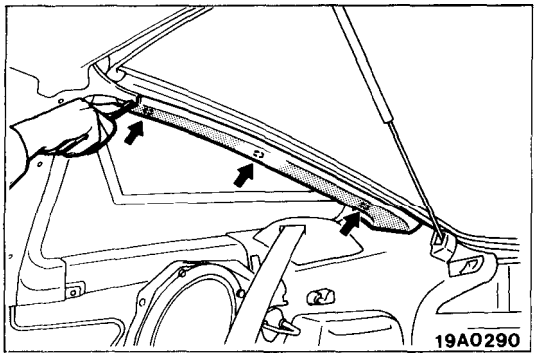



**24. REMOVAL OF FRONT PILLAR TRIM**

Using the plastic trim tool, remove the clip mounting areas and Velcro areas <Vehicles for U.S. > on the back of the front pillar trim, and remove the front pillar trim.

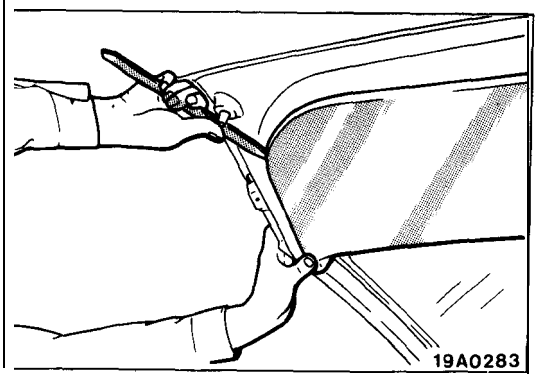
**25. REMOVAL OF GUIDE RAIL**

Refer to P.23-94.




**28. REMOVAL OF REAR PILLAR TRIM**

Using the plastic trim tool, remove the clip mounting areas on the back of the rear pillar trim, and remove the rear pillar trim.




### 30. REMOVAL OF LIFTGATE TRIM

Using the plastic trim tool, remove the clip mounting areas on the back of the liftgate, and remove the liftgate.

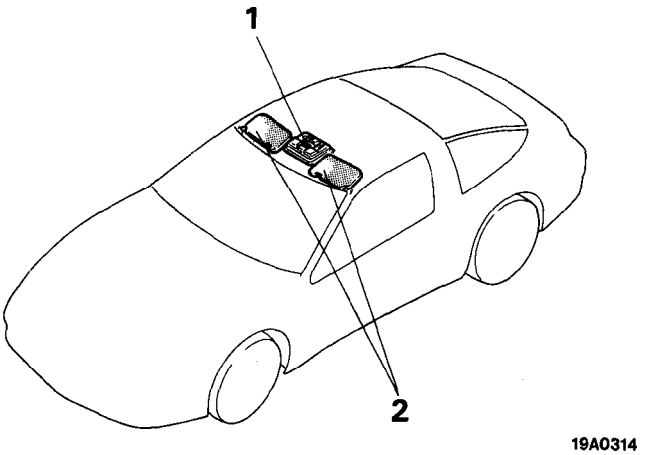
# HEADLINING

N23UDAX

## REMOVAL AND INSTALLATION

**Pre-removal Operation**
- Removal of Center Pillar Trim (Refer to P.23-85.)
- Removal of Front Pillar Trim (Refer to P.23-85.)
- Removal of Guide Rail (Refer to P.23-94.)

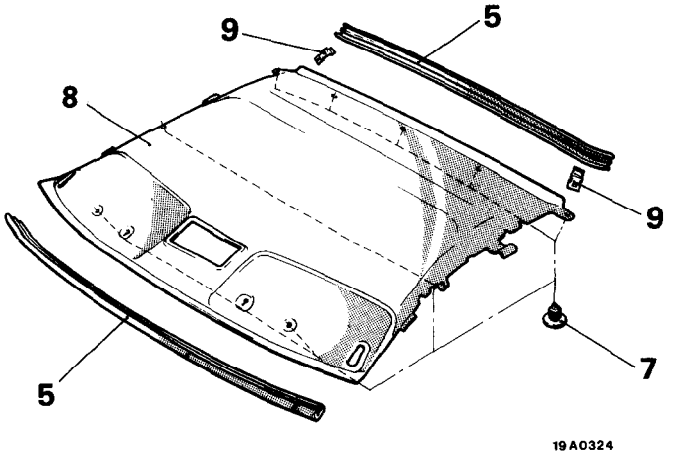
**Post-installation Operation**
- Installation of Guide Rail (Refer to P.23-94.)
- Installation of Front Pillar Trim (Refer to P.23-85.)
- Installation of Center Pillar Trim (Refer to P.23-85.)



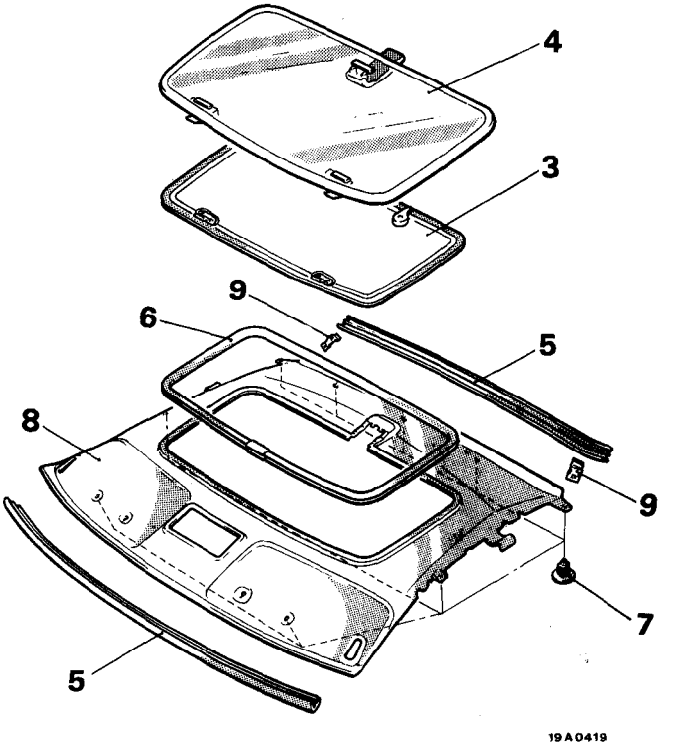

19A0314

**Vehicles with sunroof**

**Vehicles without sunroof**




19A0324

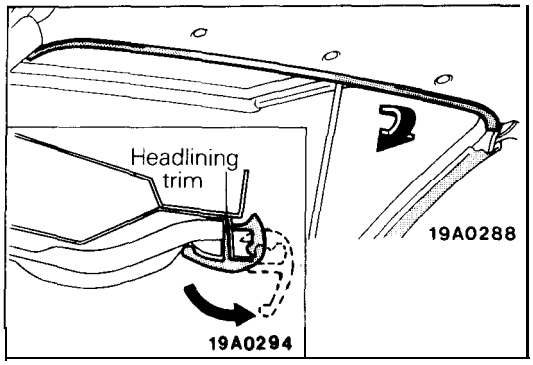



19A0419

**Removal steps**

1. Dome light
2. Sunvisor
3. Sunshade
4. Roof lid glass
◆◆ 5. Headlining trim
6. Sunroof headlining trim
7. Clips
8. Headlining
9. Trim retainer

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal




## SERVICE POINTS OF REMOVAL

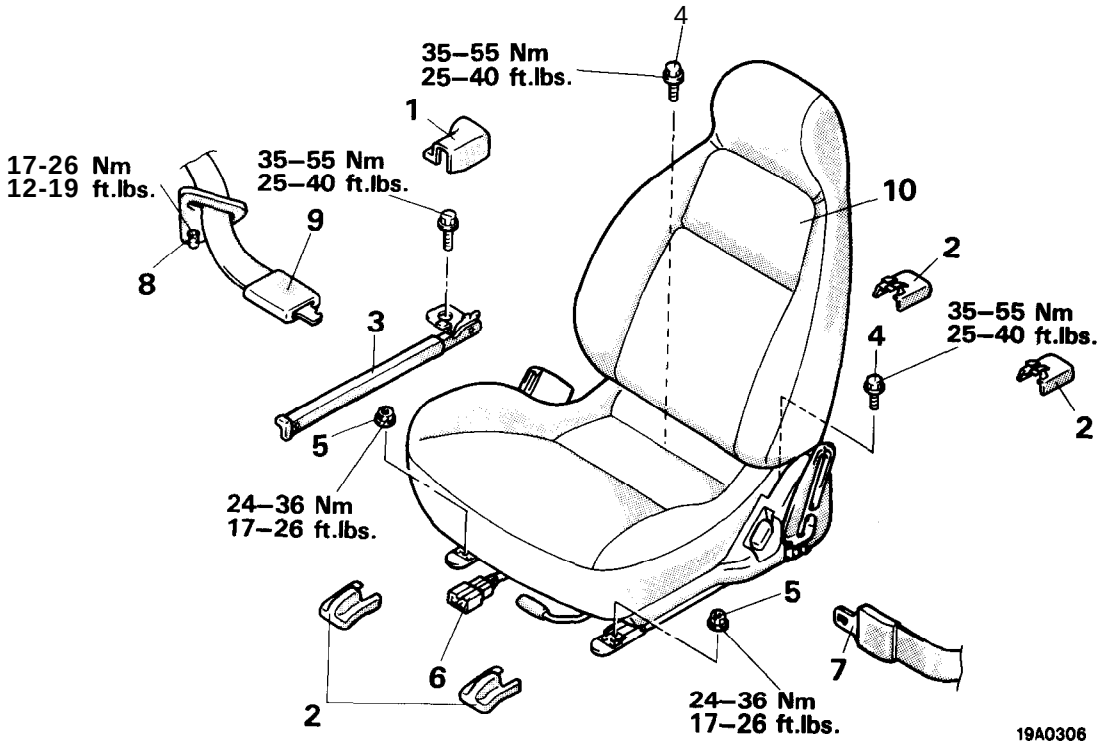
### 5. REMOVAL OF HEADLINING TRIM

Remove the headlining trim like turning it outward.

# FRONT SEAT

N23UEAP

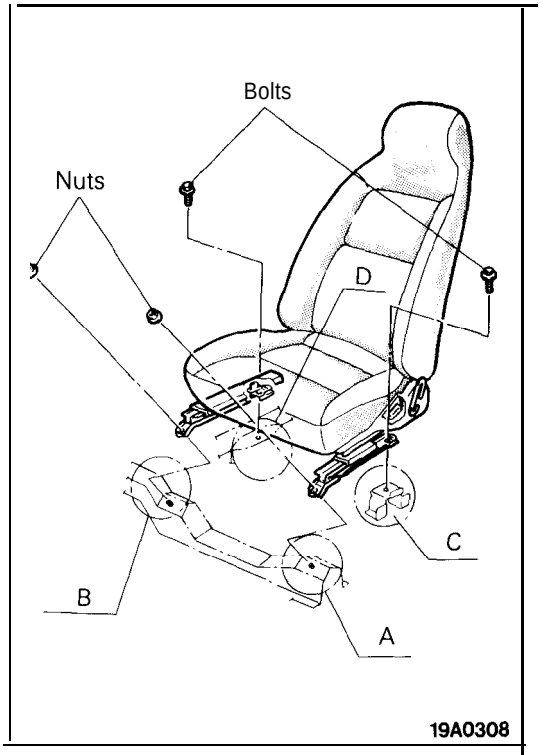
## REMOVAL AND INSTALLATION




**Removal steps**

- + 1. Slider rail anchor cover
- + 2. Seat anchor covers
- 3. Slider rail
- * 4. Seat mounting bolts
- * 5. Seat mounting nuts
- 6. Seat belt switch connector (L.H. only)
- 7. Lap belt <Vehicles for U.S.>
- 8. Guide ring <Vehicles for U.S.>
- 9. Shoulder belt <Vehicles for U.S.>
- 10. Front seat assembly

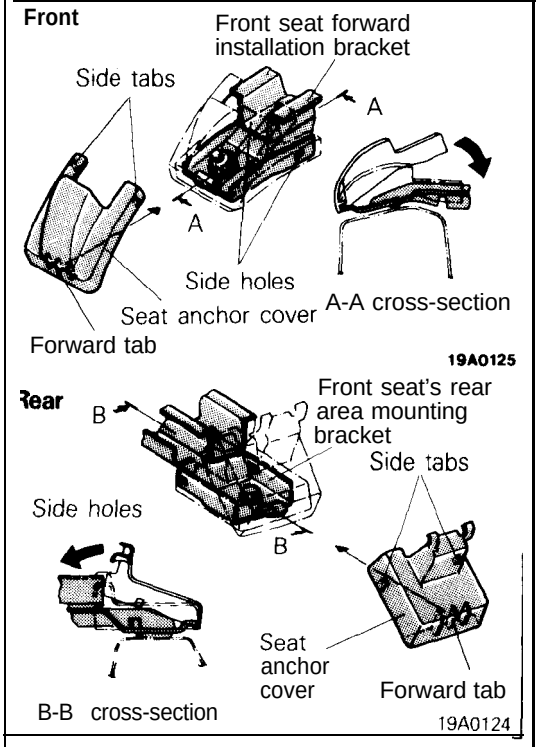
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".




## SERVICE POINTS OF INSTALLATION

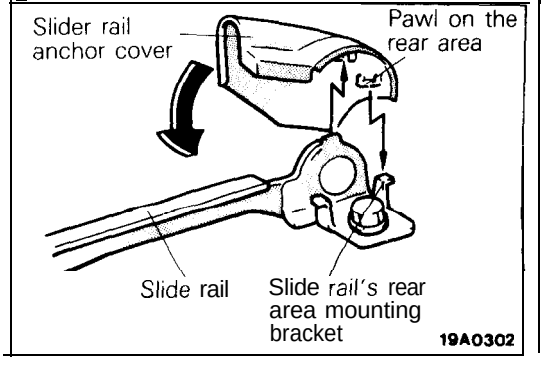
### 5. INSTALLATION OF SEAT MOUNTING NUTS/4. SEAT MOUNTING BOLTS

After checking that the seat adjuster is locked at both sides, provisionally tighten (in the A,B,C and D sequence) the seat mounting nuts and the seat mounting bolts; then fully tighten at the specified torque.




### 2. INSTALLATION OF SEAT ANCHOR COVERS

(1) Securely install the front side seat anchor forward tab to the front seat forward installation bracket.
(2) Turn the seat anchor cover in the direction indicated by the arrow, and install the tab at the side part to the hole in the bracket side part.
(3) Securely install the rear side seat anchor cover rearward tab to the front seat rearward installation bracket.
(4) Turn the seat anchor cover in the direction indicated by the arrow and insert the side tabs into the holes in the front seat rearward installation bracket side part.

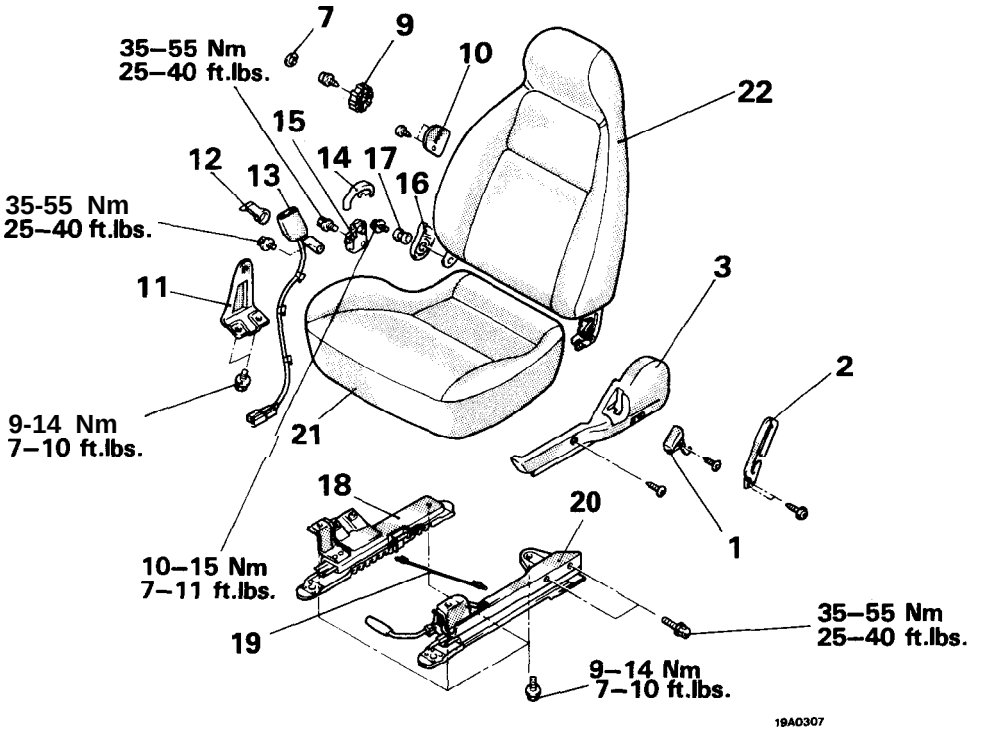



### 1. INSTALLATION OF SLIDER RAIL ANCHOR COVERS

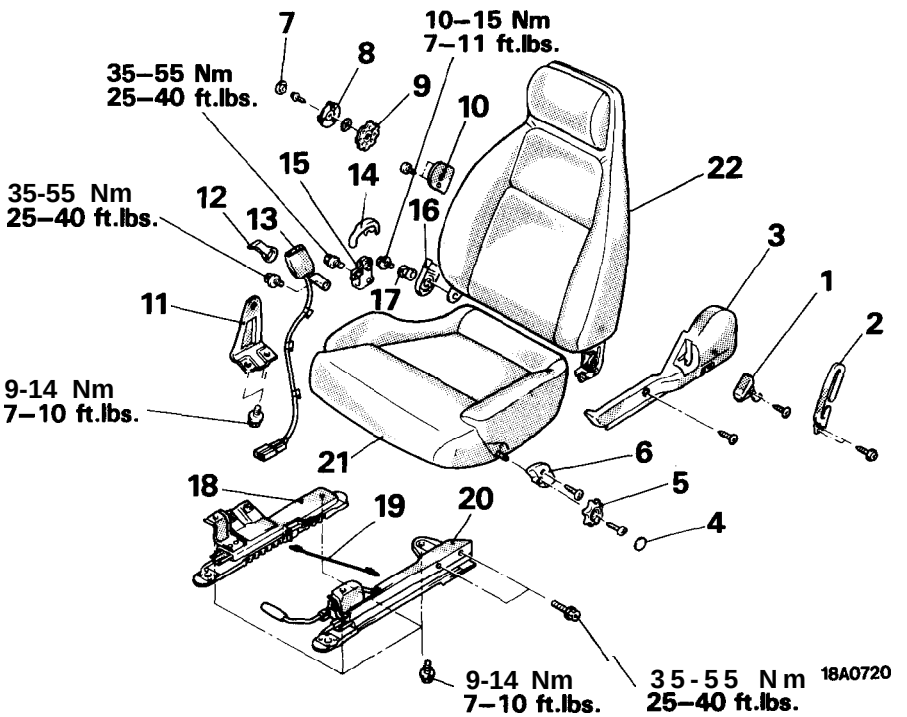
Securely the rear pawl of the slider rail anchor cover to the mounting bracket on the rear of the slider rail, and mount the slider rail anchor cover, turning its front area.

## DISASSEMBLY AND REASSEMBLY

Type 1




Type 2




**Disassembly steps**

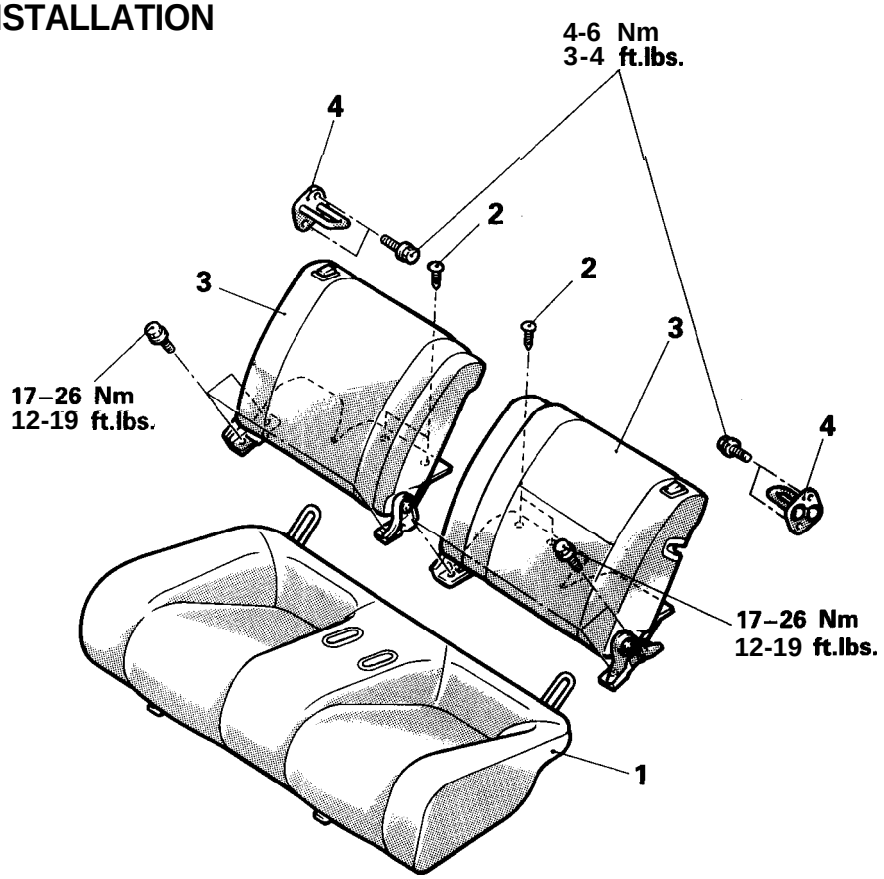
1. Reclining knob
2. Belt holder <Vehicles for U.S. >
3. Shield cover
4. Thigh support cap
5. Thigh support lever
6. Thigh support lever garnish
7. Lumber support cap
8. Side support lever
9. Lumber support lever
10. Lumber support lever garnish
11. Guide ring bracket <Vehicles for U.S. >
12. Buckle cover
13. Buckle
14. Slider bracket cover
15. Slider bracket
16. Seat frame protector
17. Bushing
18. Seat adjuster, inner
19. Pull wire
20. Seat adjuster, outer
21. Seat cushion
22. Seatback

NOTE
Reverse the disassembly procedures to reassemble.

# REAR SEAT

N23UFAN

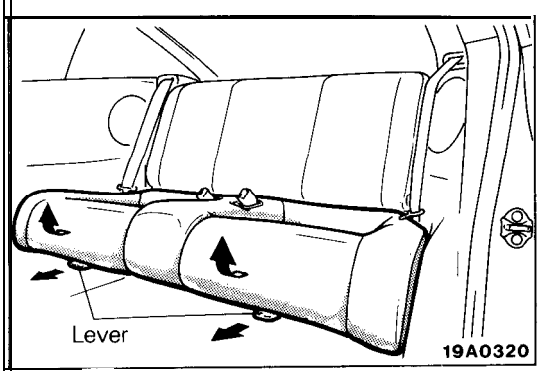
## REMOVAL AND INSTALLATION




**Removal steps**

◆◆ ◆◆ 1. Seat cushion
2. Clips
3. Seatback
4. Striker

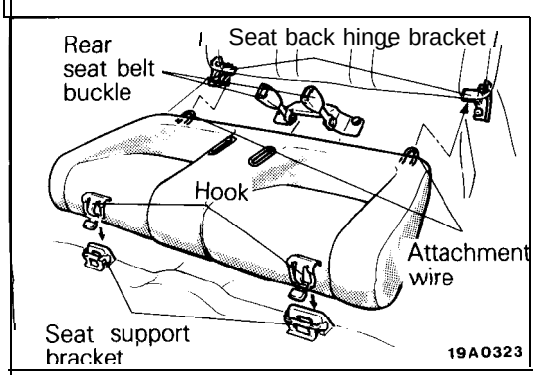
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4 : Refer to "Service Points of Installation".




## SERVICE POINTS OF REMOVAL

### 1. REMOVAL OF SEAT CUSHION

Pulling the lever, raise the front of the seat cushion and remove the seat cushion.




## SERVICE POINTS OF INSTALLATION

### 1. INSTALLATION OF SEAT CUSHION

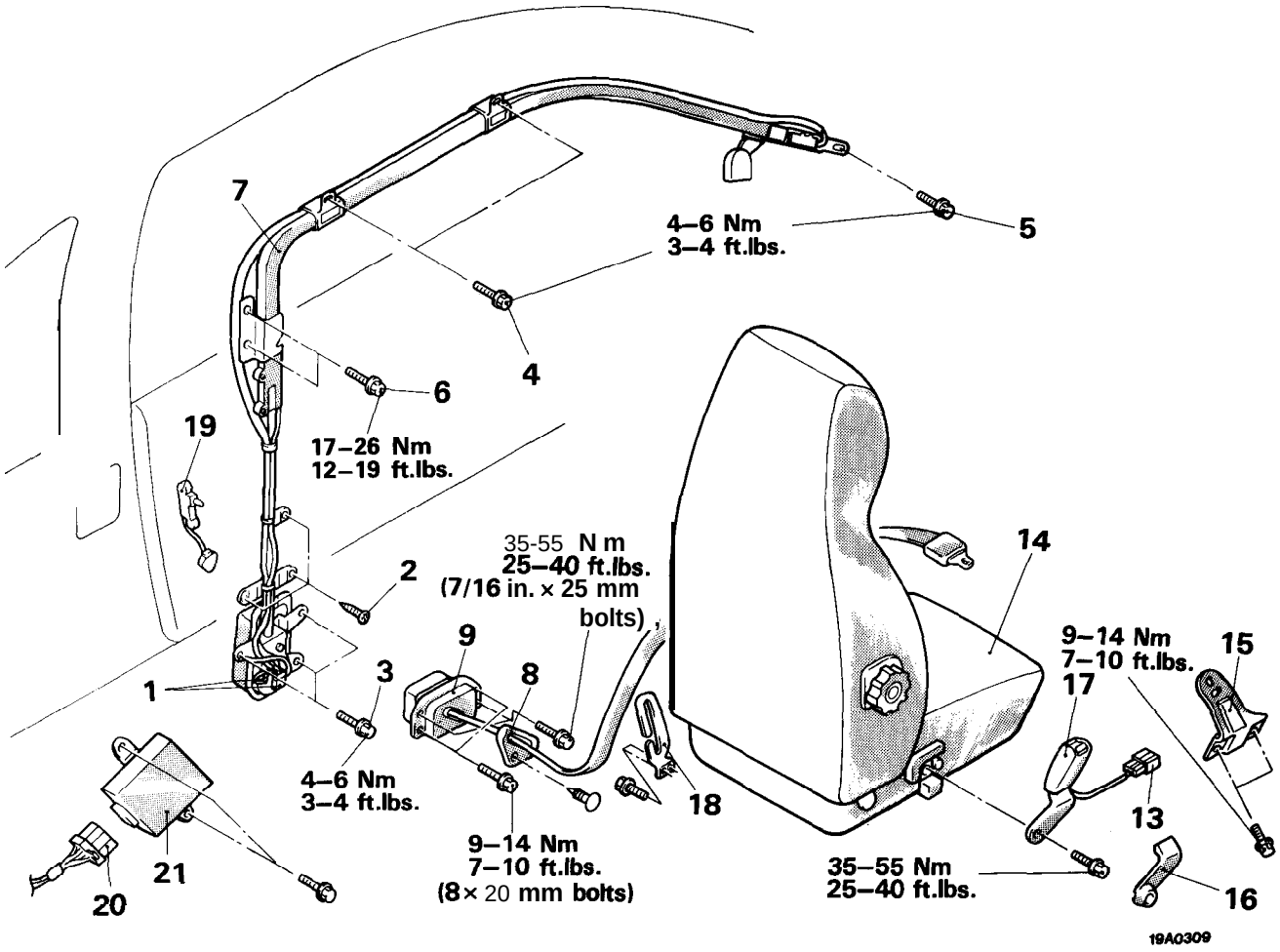
(1) Securely insert the attachment wire of the rear cushion into under the hinge bracket of the seat back.
(2) Pass the rear seat belt buckle.
(3) Securely insert the hook of the seat cushion into the seat support bracket.

# SEAT BELT

N23UGBF

## REMOVAL AND INSTALLATION

**<Front Seat Belt for U.S.-Automatic Seat Belt>**




**Driving device assembly removal steps**

Scuff plate (Refer to P.23-85.)
Quarter trim (Refer to P.23-85.)
Center pillar trim (Refer to P.23-86.)
Front pillar trim (Refer to P.23-86.)

1. Automatic seat belt wiring harness connector connection
2. Outer casing mounting screws
3. Motor mounting bolts
4. Guide rail mounting bolts (A)
5. Guide rail mounting bolt (B)
6. Guide rail mounting bolts (C)
7. Driving device assembly

**Lap belt removal steps**

Scuff plate (Refer to P.23-85.)
Quarter trim (Refer to P.23-85.)

8. Bezzel
9. Retractor (for lap belt)

**Buckle and belt holder removal steps**

10. Guide ring
11. Shoulder belt
12. Floor console assembly
13. Seat belt switch connector connection (L.H. only)
14. Front seat assembly
15. Guide ring bracket
16. Buckle cover
17. Buckle
18. Belt holder

**Door latch switch removal**

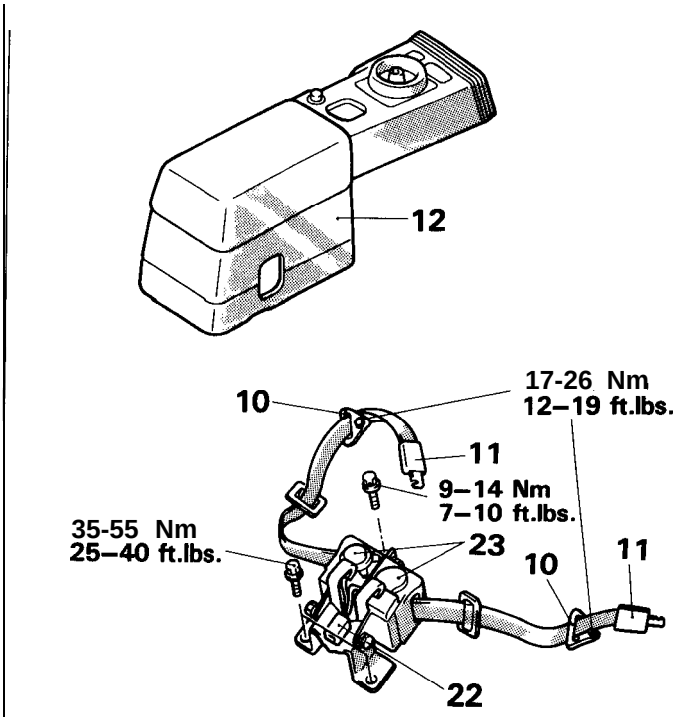
- * 19. Door latch switch

**Automatic seat belt control unit removal steps**

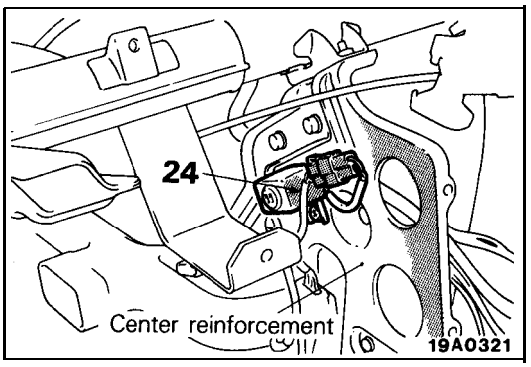
Scuff plate (Refer to P.23-85.)
Quarter trim (Refer to P.23-85.)

20. Automatic seat belt control unit connector connection
21. Automatic seat belt control unit

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to “Service Points of Removal”




19A0309




**Shoulder belt removal steps**

10. Guide ring
11. Shoulder belt
◆◆ 12. Floor console assembly
22. Outer switch connector connection
23. Retractor assembly (for shoulder belt)

**Buzzer removal steps**

Instrument panel assembly (Refer to P.23-80.)
24 Buzzer

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal"

## SERVICE POINTS OF REMOVAL

**12. REMOVAL OF FLOOR CONSOLE ASSEMBLY**

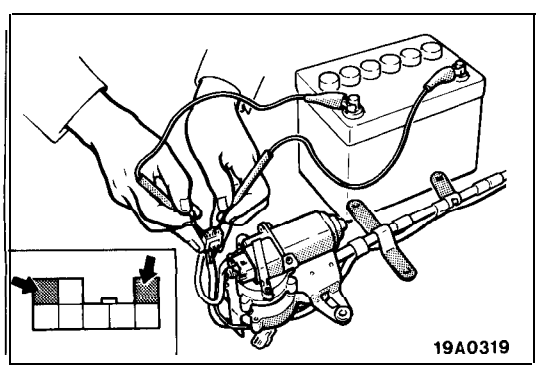
Refer to P.23-84.

**14. REMOVAL OF FRONT SEAT ASSEMBLY**

Refer to P.23-90.

**19. REMOVAL OF DOOR LATCH SWITCH**

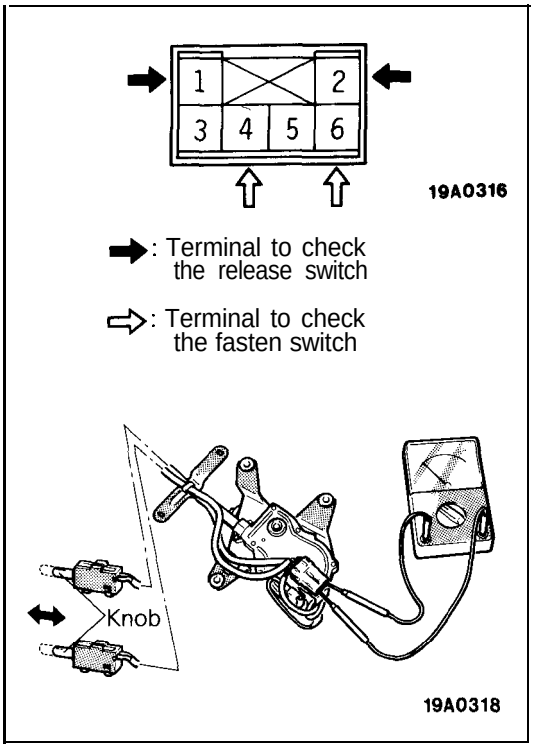
Refer to P.23-69.




## INSPECTION

**MOTOR**

(1) Unplug the automatic seat belt motor relay connector.
(2) Connect the terminals (indicated in the illustration) of the automatic seat belt wiring harness connector directly to the battery, and check that the motor operates smoothly. Next, reverse the polarity and check that the motor operates smoothly in the reverse direction.




### RELEASE SWITCH AND FASTEN SWITCH

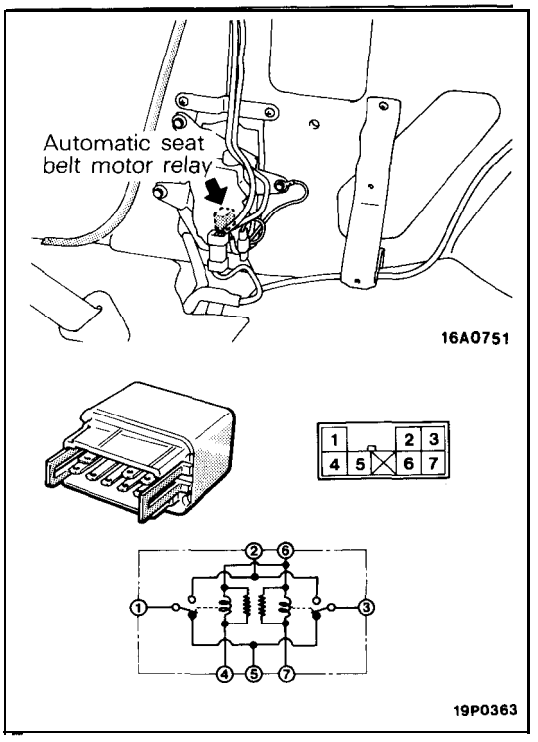
(1) Remove the release switch and fasten switch.
(2) Connect the tester to the terminals (see the illustration) on the automatic seat belt wiring harness connector located on the motor.
(3) Check the continuity between the terminals.

| | Release switch | | Fasten switch | |
|---|---|---|---|---|
| Terminal / Condition | 1 | 2 | 4 | 6 |
| Release the switch knob | O | O | O | O |
| Push the switch knob | | | | |

NOTE
O-O indicates that there is continuity between the terminals.

### DOOR LATCH SWITCH

Refer to P.23-70.

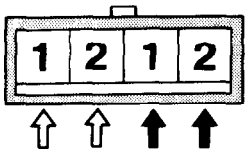



### AUTOMATIC SEAT BELT MOTOR RELAY

(1) Remove the automatic seat belt motor relay.
(2) Check for continuity between terminals under the conditions described below.

| Terminal / Battery voltage | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Continuity no voltage | 0 | | | | | | |
| Continuity with voltage | | | | ⊖ | | ⊕ | |
| | | | | | | ⊕ | ⊖ |

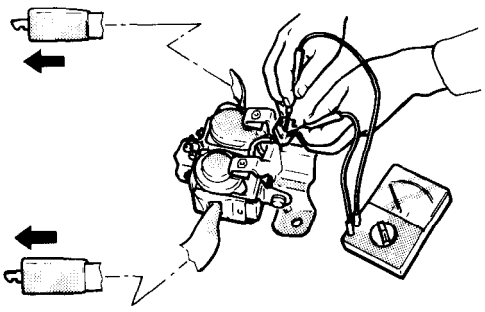
NOTE
(1) O-O indicates that there is continuity between the terminals.
(2) ⊕---⊖ indicates terminals to which battery voltage is applied.



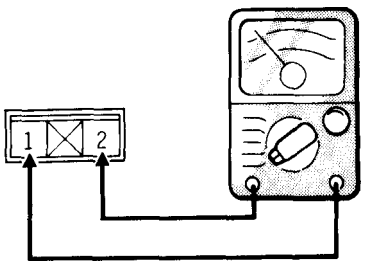

⇨: Terminal to check outer switch (L.H.)

➡: Terminal to check outer switch (R.H.)

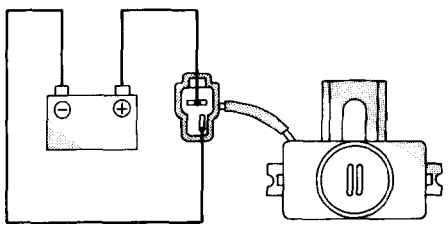
19P0361



19A0322




19A0317



16R1456

**OUTER SWITCH**

(1) Disconnect the outer switch connector.
(2) Pull out the shoulder belt farther than its midpoint and check the continuity between the terminals.

| Condition \ Terminal | 1 | 2 |
|---|---|---|
| When the belt is pulled out farther than approx. the midpoint | O | O |
| When the belt is not pulled out as far as approx. the midpoint | | |

NOTE
(1) The above inspection permits verification that the outer switch turns on when the shoulder belt is properly engaged with the slide anchor. The "midpoint" in the above procedure refers to the center of the belt length between the retractor and slide anchor.
(2) O-O indicates that there is continuity between the terminals.

**BUCKLE SWITCH**

(1) Disconnect the buckle switch connector (L.H. only).
(2) Check the continuity between the terminals.

| Terminal | 1 | 2 |
|---|---|---|
| Buckle unlock | O | O |
| Buckle lock | | |

NOTE
O-O indicates that there is continuity between the terminal.

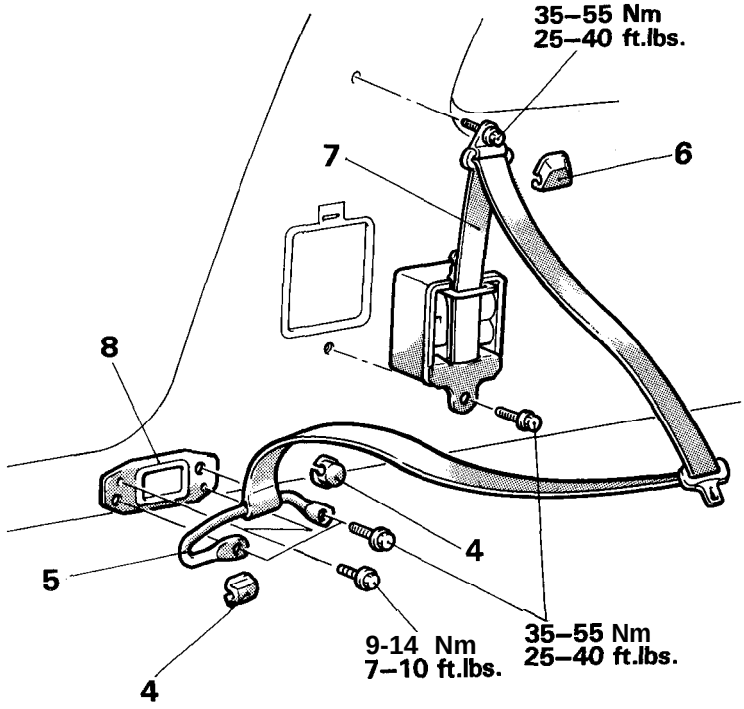
**BUZZER**

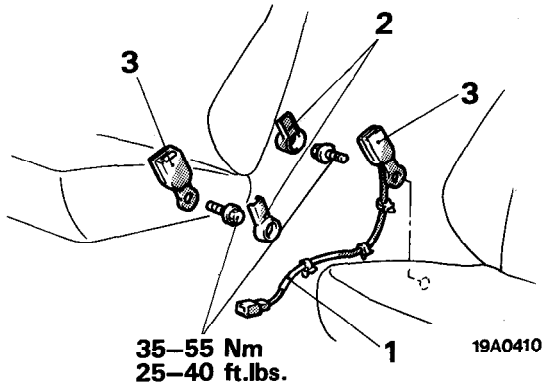
Check that buzzer sounds when battery voltage is applied to the buzzer terminal.

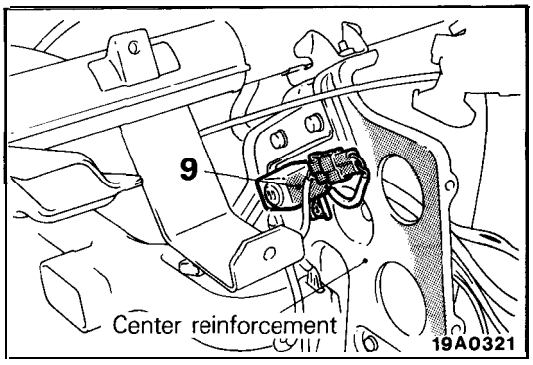
**<Front Seat Belt for Canada>**

**Pre-removal Operation**
- Removal of Front Seat (Refer to P.23-90.)
- Removal of Quarter Trim (Refer to P.23-85.)

**Post-installation Operation**
- Installation of Quarter Trim (Refer to P.23-85.)
- Installation of Front Seat (Refer to P.23-90.)



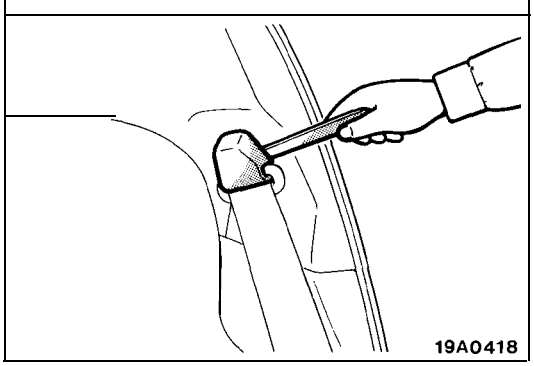

**Buckle removal steps**
1. Seat belt switch harness
2. Buckle cover
3. Buckle

**Front seat belt removal steps**
4. Bolt cap
5. Slide bar
- ◆◆ 6. Sash guide cover
- ● + 7. Front seat belt
8. Cover plate

**Buzzer removal steps**

Instrument panel assembly (Refer to P.23-80.)
9. Buzzer

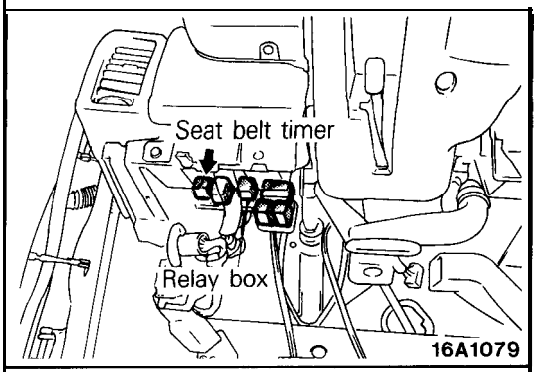
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation"
(4) N: Non-reusable parts




## SERVICE POINTS OF REMOVAL

### 6. REMOVAL OF SASH GUIDE COVER

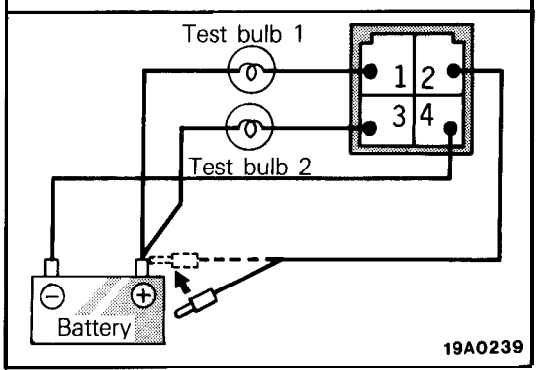
Insert a plastic trim tool from the lower part and open the sash guide cover.




## INSPECTION

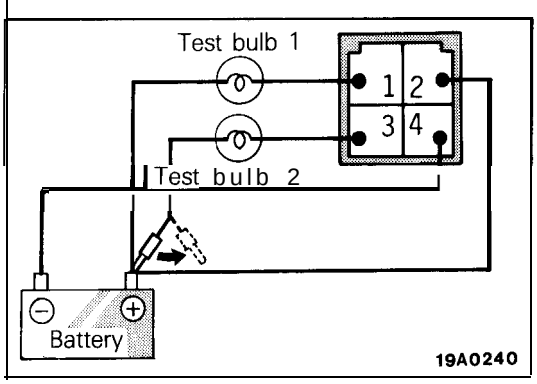
### SEAT BELT TIMER

Remove the seat belt timer from the relay box (indoor).




TIMER OPERATION CHECK

(1) Connect the battery and the test bulb to the timer, as shown in the illustration.
(2) Make sure that when terminal 2 is connected to the positive (+) terminal of the battery, test bulbs 1 and 2 are lighted for approx. 6 seconds.



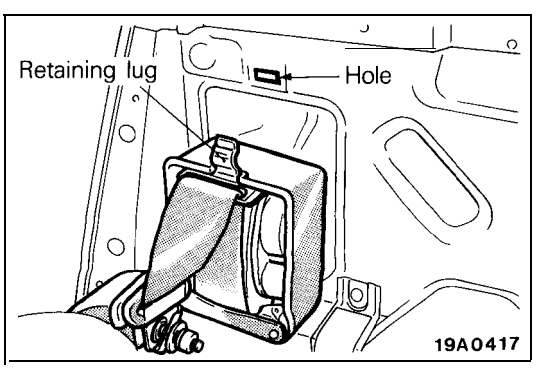

(3) Make sure that even when terminal 3 is disconnect while test bulbs 1 and 2 and lighted in (2) above, test bulb 1 remains lighted.

### BUCKLE SWITCH

Refer to P.23-97.

### BUZZER

Refer to P.23-97.

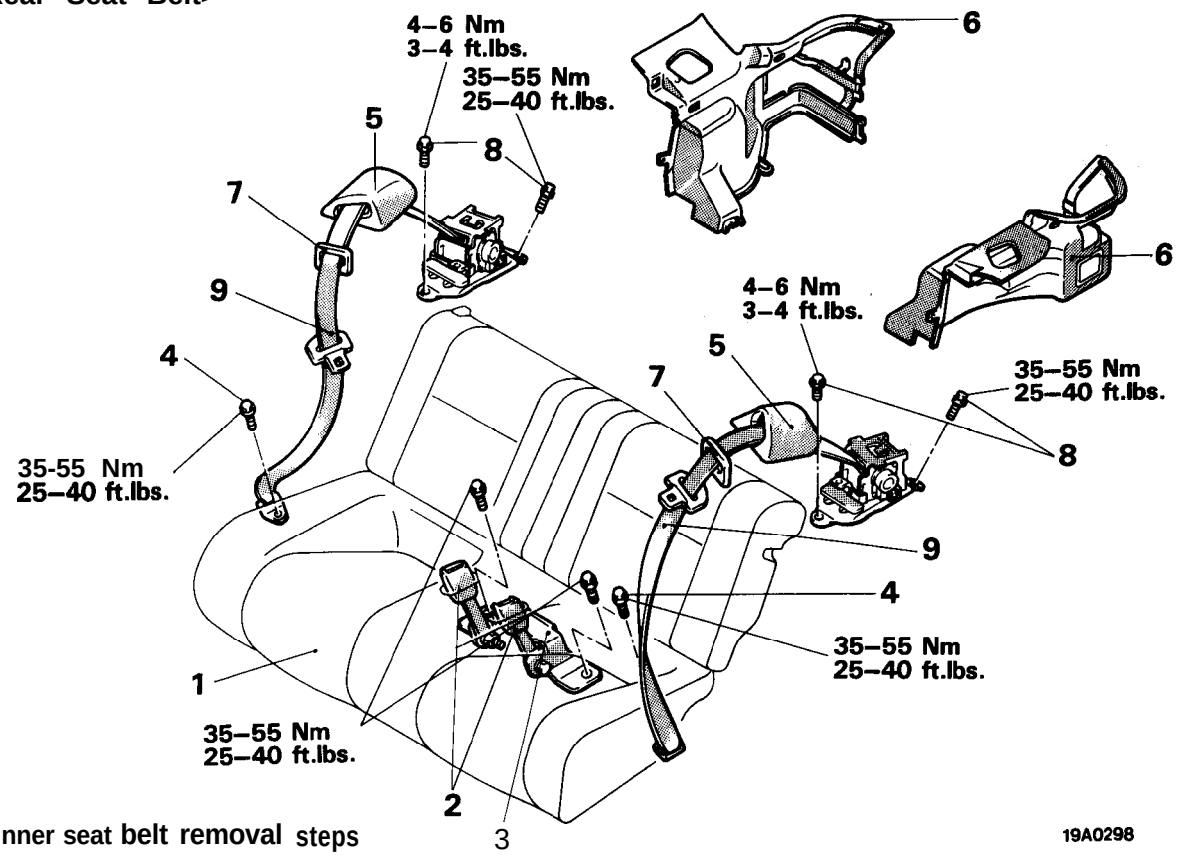



## SERVICE POINTS OF INSTALLATION

### 7. INSTALLATION OF FRONT SEAT BELT

Fit the retractor retaining lug in the slot provided in the vehicle body, and secure the retractor with the bolt by tightening it to the specified torque.

<Rear Seat Belt>




**Inner seat belt removal steps**

◆◆ ● 1. Rear seat cushion
2. Inner seat belt
3. Bracket

**Outer seat belt removal steps**

◆◆ ◆◆ 1. Rear seat cushion
● + 4. Seat belt anchor plate attaching bolts
5. Retractor cover
◆◆ 6. Rear side trim
7. Seat belt protector
8. Retractor bracket mounting bolts
9. Outer seat belt

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".

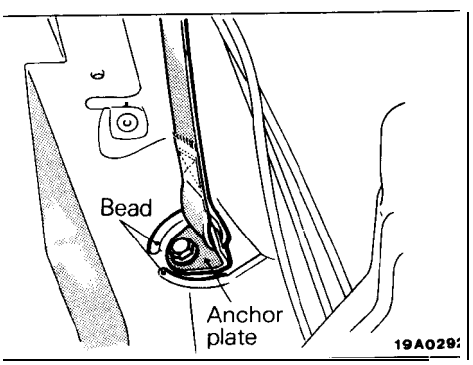
## SERVICE POINTS OF REMOVAL

**1. REMOVAL OF REAR SEAT CUSHION**

Refer to P.23-93.

**6. REMOVAL OF REAR SIDE TRIM**

Refer to P.23-85.




## SERVICE POINTS OF INSTALLATION

**4. INSTALLATION OF SEAT BELT ANCHOR PLATE ATTACHING BOLTS**

Install the anchor plate so that it conforms to the floor bead.

**1. INSTALLATION OF REAR SEAT CUSHION**

Refer to P.23-93.

# HEATERS AND AIR CONDITIONING

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N24AA--


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**VENTILATORS (INSTRUMENT PANEL)** ..... **49**

# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N24CA--

| Items | Specifications |
|---|---|
| Heater unit | |
| Type | Three-way-flow full-air-mix system |
| Heater control switch | Dial type |
| Compressor | |
| Model | 10PA17 |
| Refrigerant unit lubricant cc (cu.in.) | DENSO OIL 6 or SUNISO 5GS 80±20 (4.9±1.2) |
| V belt size mm (in.) | <1.8L Engine> 920 (36.2) <2.0L DOHC Engine> 940 (37.0) |
| Dual pressure switch | |
| High pressure switch kPa (psi) | OFF: 2,700 (384) ON: 2,100 (299) |
| Low pressure switch kPa (psi) | OFF: 210 (30) ON: 235 (33) |
| Freezer prevention °C (°F) | Air temperature thermostat OFF: 3 (37.4) ON: 4 (39.2) |
| Refrigerant and quantity g (oz) | R-12 MAX 935 (33) |

## SERVICE SPECIFICATIONS

N24CB--

| Items | Specifications |
|---|---|
| Standard value | |
| Air thermo sensor and air inlet sensor standard resistance value Ω | |
| 0°C (32°F) | 4,852±243 |
| 15°C (59°F) | 2,341 ±234 |
| 25°C (77°F) | 1,500±150 |
| Engine coolant temperature switch | |
| Switch-OFF temperature °C (°F) | 112-118 (233–244) |
| Amount of V belt deflection mm (in.) | |
| When new belt installed | 4-5 (.16–.2) |
| When used belt installed | 5.5-6 (.22–.24) |
| Amount of V-ribbed belt deflection mm (in.) | |
| When new belt installed | 4.5-5 (.18–.2) |
| When used belt installed | 5.5-6 (.22–.24) |
| Clutch clearance mm (in.) | 0.35–0.65 (.014–.026) |
| Condenser fan motor resistor resistance value Ω | 0.26–0.32 |

## TORQUE SPECIFICATIONS

N24CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Front housing installation bolt | 24-28 | 18-21 |
| Compressor bracket tightening bolt | 45-55 | 33-39 |
| Compressor tightening bolt | 23-27 | 17-19 |
| Tension pulley center nut (bolt) | 32-48 | 24-36 |
| Dual pressure switch | 9-11 | 7-8 |
| Engine coolant temperature switch | 30–40 | 22-28 |

## LUBRICANTS

N24CD--

| Items | Specified lubricants | Quantity |
|---|---|---|
| **Each connection of refrigerant line**<br>Shaft seal of the compressor | DENSO OIL 6 or SUNISO 5GS | As required |

## SEALANT AND ADHESIVES

N24CE--

| Items | Specified sealant and adhesive |
|---|---|
| Engine coolant temperature switch threaded part | MOPAR Part No. 4318034 or equivalent |

## TROUBLESHOOTING

N24EBAQ

| Symptom | Probable cause | Remedy |
|---|---|---|
| Heater insufficient heat | Obstructed heater outlets<br>Blend air dampers improperly adjusted or binding | Correct |
| | Thermostat malfunction<br>Obstructed heater hoses | Replace |
| | Improperly adjusted control cables | Adjust |
| | Plugged or partially plugged heater core | Clean or replace |
| No ventilation even when mode selection knob is operated | Incorrect adjustment of mode selection dampers<br>Incorrect installation of mode selection control wire | Adjust |
| | Ducts are incorrectly/incompletely connected, crushed, bent or clogged. | Repair or replace |
| Blower motor inoperative | Poor grounding | Correct |
| | Burnt-out fuse<br>Malfunction blower switch<br>Malfunction resister<br>**Malfunction blower motor**<br>Malfunction heater relay | Replace |

## TROUBLESHOOTING QUICK-REFERENCE TABLE

**Compressor doesn't operate.**

Ignition switch: ON
Blower switch: HI
Air conditioner switch: ON

Can the activation sound of the magnet clutch be heard when battery voltage is applied to the air conditioner compressor magnet clutch?

Yes → The compressor magnetic clutch is normal. The compressor body is abnormal.

No

Is the voltage Bv between ground and terminal (4) of the air conditioner switch equivalent to battery voltage when'the air conditioner switch is pressed in one step?
Is the voltage Bv between ground and terminal (2) of the air conditioner switch equivalent to batten/ voltage when the air conditioner switch is pressed in two steps?

No → Malfunction of the air conditioner switch. → Refer to P.24–6.

Yes

Is there continuity between terminals (2) and (4) of the magnetic clutch relay?
Is there continuity between terminals (1) and (3) when Bv is applied between terminals (2) and (4)?

No → Malfunction of the magnetic clutch relay.

Yes

Is the high-pressure side refrigerant pressure within the range of 21 0–2,700 kPa (29.9–384 psi) when a gauge manifold is connected to the service valve and the high-pressure side refrigerant pressure is measured?

No → Gas leakage or excess refrigerant.

Yes

Is there continuity between the dual-pressure switch terminals?

No → Malfunction of the dual-pressure switch.

Yes

Continue to next page.

From previous page.

When the resistance of the air-thermo sensor is measured [with the air conditioner switch OFF and when the ambient temperature of the air-thermo sensor is 25°C (77°F)], is the measured resistance approx. 1.5±0.15 kΩ?

No → Malfunction of tha air-thermo sensor. → Refer to P.24–6.

↓ Yes

When the resistance of the air-inlet sensor is measured [with the air conditioner switch OFF and when the ambient temperature of the air-inlet sensor is 25°C (77°F)] is the measured resistance approx. 1.5±0.15 kΩ?

No → Malfunction of the air-inlet sensor. → Refer to P.24–6.

↓ Yes

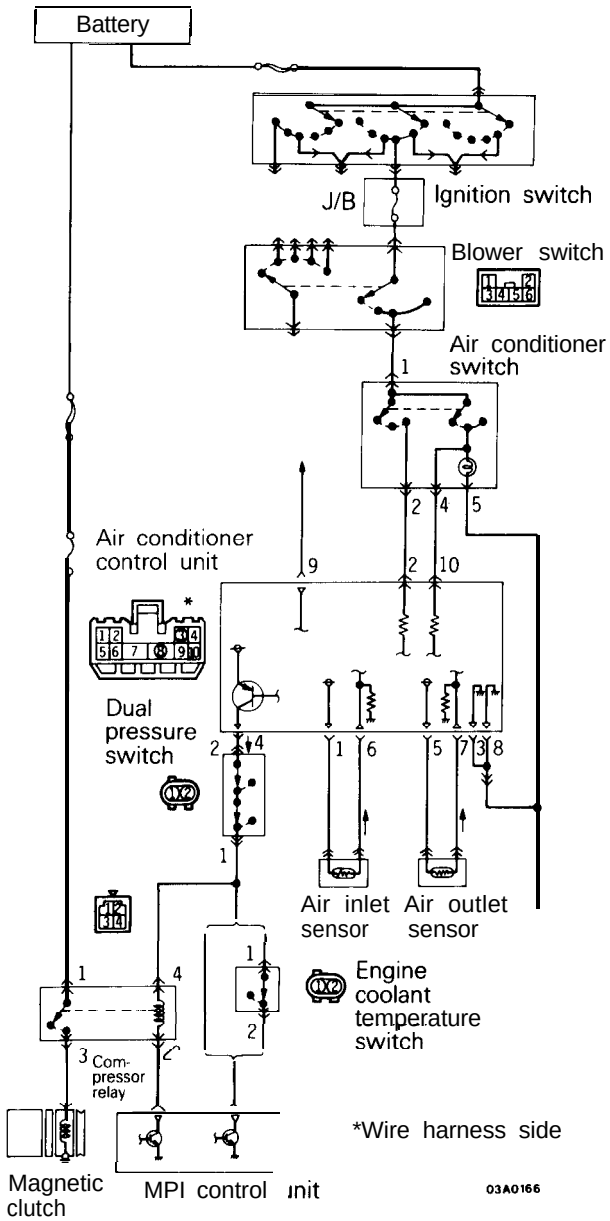
Does idle-up occur immediately after the air conditioner switch is switched ON?

No → Malfunction of the DC motor
<1800 Engine>
Malfunction of the stepper motor
<2000 DOHC Engine>
Malfunction of the MPI control unit

Yes →

Malfunction of the air conditioner control unit. → Refer to P.24–6.

## AIR CONDITIONER CONTROL UNIT CIRCUIT



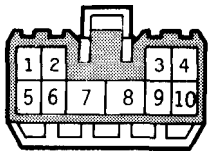

### Description of Operation

(1) A negative-characteristic thermistor is employed for the air-thermo sensor and the air-inlet sensor in order to convert the ambient temperature at the sensor part to resistance.
The sensor power-supply voltage (5V) of the air conditioner control unit is applied to each sensor.

(2) The compressor operation mode changes (from OFF to ECONO to A/C...) each time the air conditioner switch is pressed. When the air conditioner switch is pressed in to the first step, the mode is changed to the ECONO mode (the indicator illuminates in orange, and the voltage at terminal 4 of the air conditioner switch becomes Bv.
When pressed in to the second step, the mode is changed to the air conditioner mode (the indicator illuminates in green), and the voltage at terminal 2 of the air conditioner switch becomes Bv.
Bv: Battery voltage

(3) The output (terminal 4) of the air conditioner control unit is output when all of the following conditions are satisfied.
① The air conditioner switch is ON (ECONO or A/C mode).
② The air-thermo sensor ambient temperature (evaporator outlet air temperature) is 4°C (39°F) or higher.
③ The air-inlet sensor ambient temperature (evaporator intake air temperature) is 4°C (39°F) or higher.

Wire harness side




20A0405

## TROUBLESHOOTING HINTS

### Inspection of Air Conditioner Control Unit

Disconnect the amplifier and inspect the connector on the wire harness side as shown in the chart below.

**Test Conditions:**

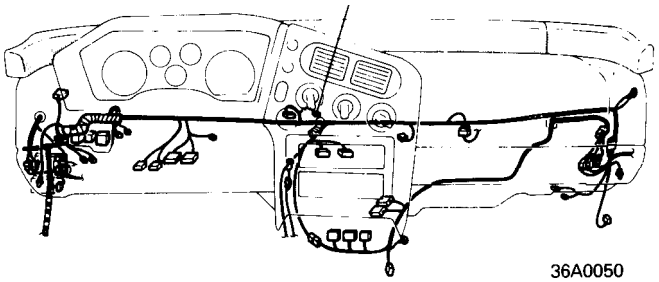
(1) Ignition switch: ON
(2) Air conditioner switch: ON
(3) Temperature control lever: MAX COOL
(4) Blower switch: HI

| Terminal | Measurement item | Tester connection | Conditions | | Specified value |
|---|---|---|---|---|---|
| 1 | Resistance | 1–6 | — | | 1,500±150 Ω at 25°C (77°F) |
| 2 | Voltage | 2-3<br>2-8 | Air conditioner switch | ON | System voltage |
| | | | | OFF | 0 V |
| 3 | Continuity | 3-Ground | — | | Continuity |
| 4 | Continuity | 4-Ground | — | | Continuity |
| 5 | Resistance | 5-7 | — | | 1,500± 150 Ω at 25°C (77°F) |
| 8 | Continuity | 8-Ground | — | | Continuity |
| 9 | Voltage | 9-3<br>9-8 | Thermo sensor | OFF 78°C (172°F) | System voltage |
| | | | | ON 85°C (185°F) | **0V** |
| 10 | Voltage | 10–3<br>10–8 | ECONO switch | ON | System voltage |
| | | | | OFF | 0 V |

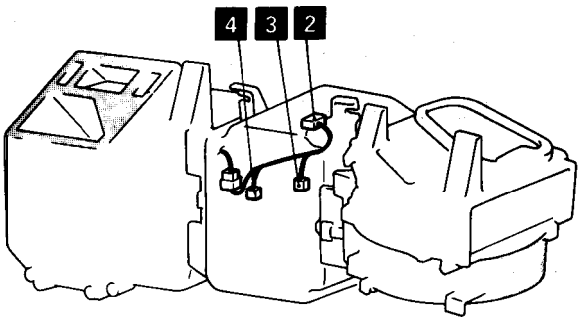
If the connector on the wire harness side is correct, replace the air conditioner control unit.

## HARNESSES AND COMPONENTS LAYOUT DIAGRAM

<Dash panel>



36A0050



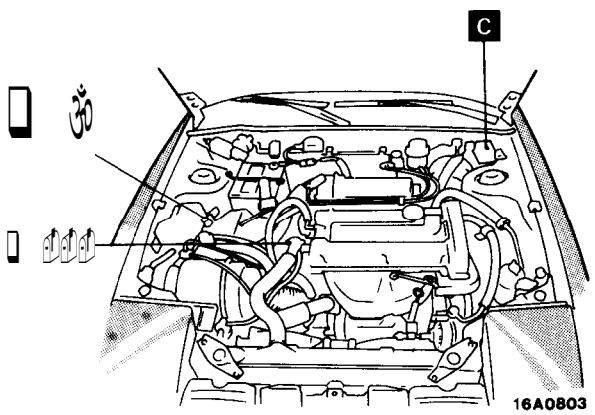

36A0051

1. Air conditioner switch
2. Air conditioner control unit
3. Air-inlet sensor
4. Air-thermo sensor

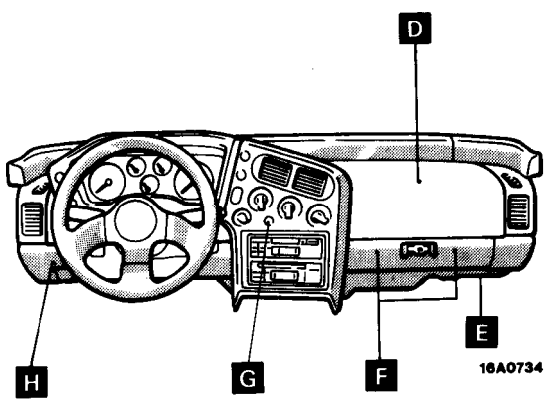
| Name | Symbol |
|---|---|
| Air conditioner control unit | D |
| Air conditioner switch | G |
| Air inlet sensor | F |
| Air thermo sensor | F |
| Blower motor High relay | E |
| Condenser fan motor High-Low selecting relay | C |

| Name | Symbol |
|---|---|
| Condenser fan motor relay | C |
| Dual pressure switch | B |
| Engine coolant temperature switch <2.0L DOHC Engine> | A |
| Heater relay | H |
| Magnetic clutch relay | C |

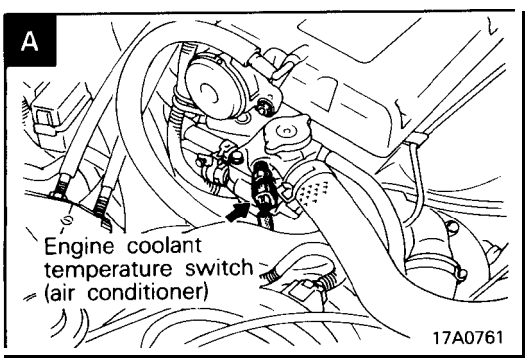
NOTE
The “Name” column is arranged in alphabetical order.



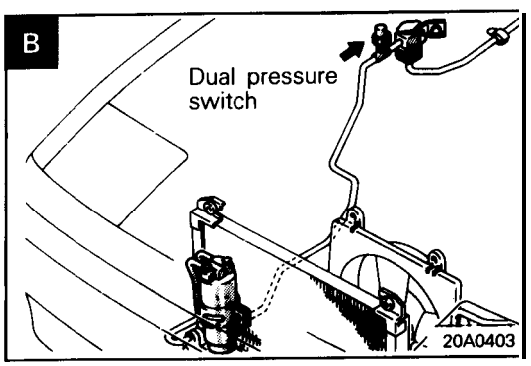

16A0803




16A0734

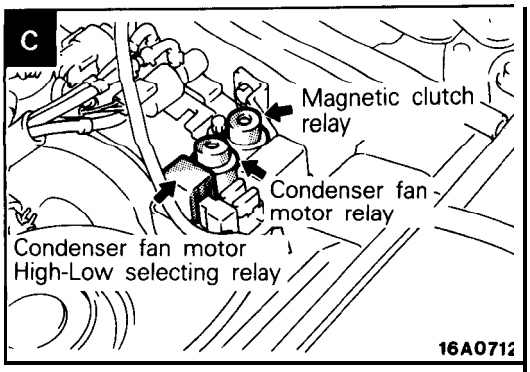



17A0761

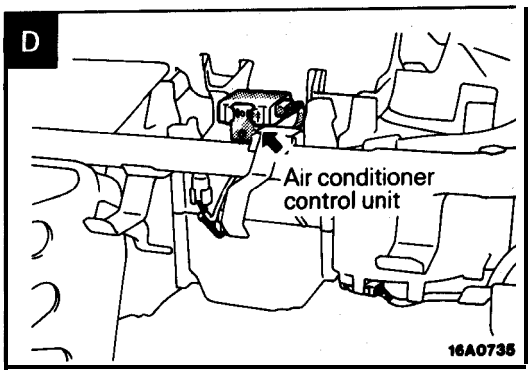



20A0403

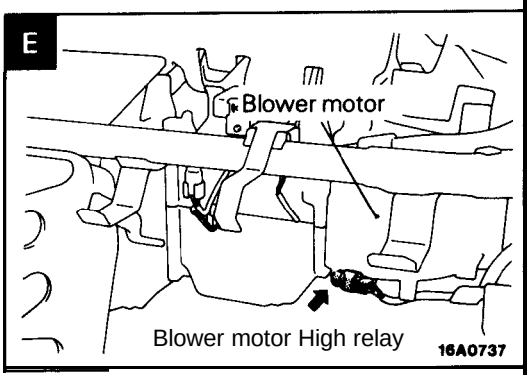
C


Magnetic clutch relay
Condenser fan motor relay
Condenser fan motor High-Low selecting relay
16A0712

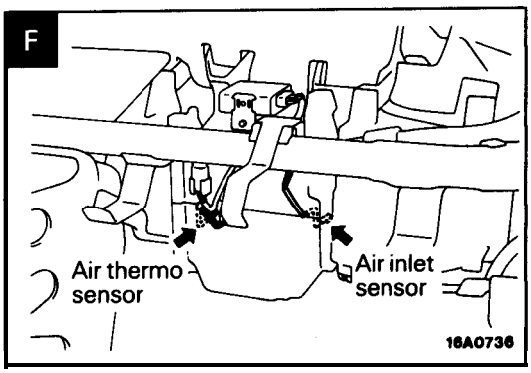
D


Air conditioner control unit
16A0735

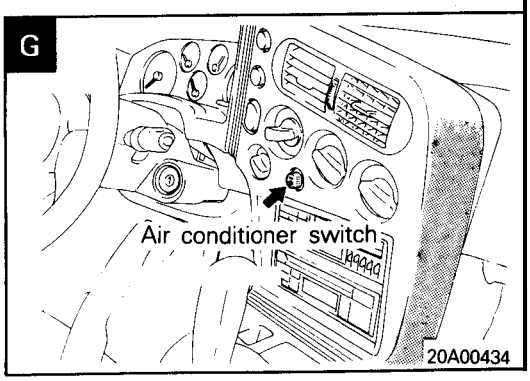
E


Blower motor
Blower motor High relay
16A0737

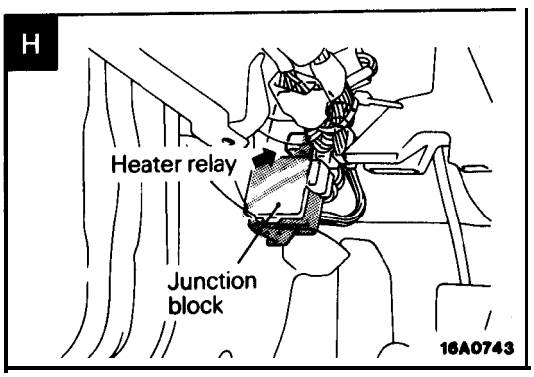
F


Air thermo sensor
Air inlet sensor
16A0736

G


Air conditioner switch
20A00434

H


Heater relay
Junction block
16A0743

# SAFETY PRECAUTIONS N24PAAD

The refrigerant used in all air conditioner is R-l 2. It is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of −29.8°C (−85.6°F), at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, and nonexplosive. It is nonpoisonous except when it is in direct contact with open flame. It ia noncorrosive except when combined with water. The following precautions must be observed when handling R-12.

**Caution**
**Wear safety goggles when servicing the refrigeration system.**

R-12 evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes. Always wear safety goggles when servicing the refrigeration part of the air conditioning system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system. Should any liquid refrigerant get into the eyes, use a few drops of mineral oil to wash them out. R-12 is rapidly absorbed by the oil. Next splash the eyes with plenty of cold water. Call your doctor immediately even though irritation has ceased after treatment.

**Caution**
**Do not heat R-12 above 40°C (104°F).**

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant. A bucket or large pan of hot water not over 40°C (104°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. Do not weld or steam clean on or near the system components or refrigerant lines.

**Caution**
**Keep R-12 containers upright when charging the system.**

When metering R-12 into the refrigeration system, keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

**Caution**
**Always work in a well-ventilated room.**

Good ventilation is vital in the working area. Always discharge the refrigerant into the service bay exhaust system or outside the building. Large quantities of refrigerant vapor in a small, poorly ventilated room can displace the air and cause suffocation. Although R-12 vapor is normally nonpoisonous, contact with an open flame can cause the vapor to become very poisonous. Do not discharge large quantities of refrigerant in an area having an open flame. A poisonous gas is produced when using the flame-type leak detector. Avoid inhaling the fumes from the leak detector.

**Caution**
**Do not allow liquid refrigerant to touch bright metal.**

Refrigerant will tarnish bright metal and chrome surfaces, and in combination with moisture can severely corrode all metal surfaces.

**R-12 Refrigerant Bundling Refrigerant Recycling**

R-12 refrigerant is a chloro-floro-carbon (CFC) that can contribute to the depletion of the ozone layer in the upper atmosphere.

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Corporation recomends that a R-12 refrigerant recycling device that meets SAE standard J1991 be used.

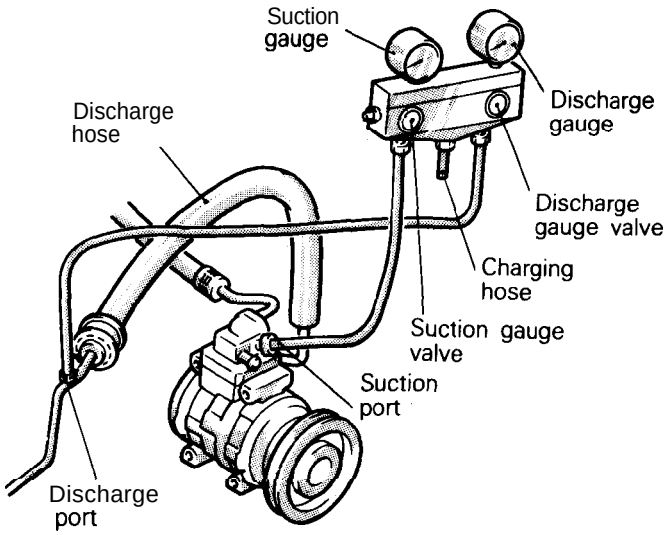
Contact an automotive service equipment supplier for refrigerant recycling equipment that is available in your area.

Refer to the operating instructions provided with the recycling equipment for proper operation.

# SERVICE ADJUSTMENT PROCEDURES

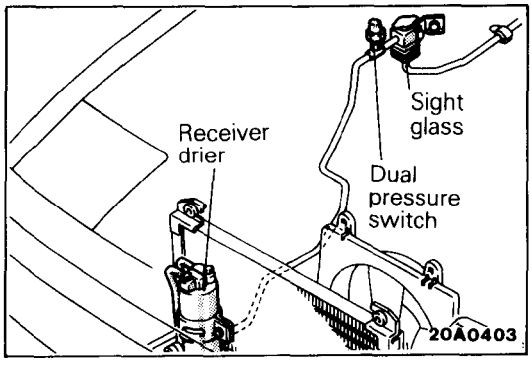
## MANIFOLD GAUGE SET INSTALLATION

N24FDAF




20A0460

**Manifold Gauge** Valves-should be closed when connecting the manifold gauge set to the service port of the compressor and the discharge hose. The suction gauge valve at the left is opened to provide a passage between the suction gauge and the center manifold outlet. The discharge gauge valve at the right is opened to provide a passage between the discharge pressure gauge and the center manifold outlet.
Detailed instructions for proper use of the gauge set manifold are contained in the text covering each test and service operation employing these gauges.
**Suction** Gauge-the left side of the manifold set is calibrated to register 0 to 100 kPa (0 to 15 psi) and 0 to 1,000 kPa (0 to 145 psi). This gauge is connected to the suction port of the compressor.
**Discharged** Gauge-the right of the manifold set is calibrated to register 0 to 2,100 kPa (0 to 305 psi). For all tests this gauge is connected to the discharge port of the system.
**Center Manifold Outlet-provides** the necessary connection for a long service hose used when discharging the system, using a vacuum pump to "pull a vacuum" before charging the system, and for connecting the supply of refrigerant when charging the system.




## TEST PROCEDURES

N24FEAS

### RECEIVER DRIER

### To Test the Receiver Drier

(1) Operate the unit and check the piping temperature by touching the receiver drier outlet and inlet.
(2) If there is a difference in the temperatures, the receiver drier is restricted.
Replace the receiver drier.

### SIGHT GLASS REFRIGERANT LEVEL TEST

The sight glass is a refrigerant level indicator. To check the refrigerant level, clean the sight glass and start the vehicle engine. Push the air conditioner button to operate the compressor, place the blower switch to high and move the temperature control lever to max cool. After operating for a few minutes in this manner, check the sight glass.
(1) If the sight glass is clear, the magnetic clutch is engaged, the compressor discharge line is warm and the compressor inlet line is cool; the system has a full charge.
(2) If the sight glass is clear, the magnetic clutch is engaged and there is no significant temperature difference between compressor inlet and discharge lines: the system has lost some refrigerant.

(3) If the sight glass is clear and the magnetic clutch is disengaged; the clutch is faulty or, the system is out of refrigerant. Perform low pressure switch test to determine condition. Check low pressure switch, and clutch coil for electrical continuity.

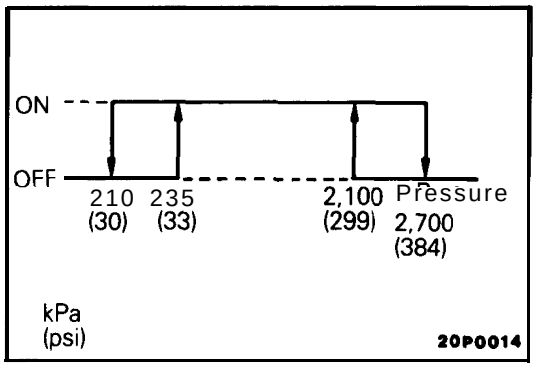
(4) If the sight glass shows foam or bubbles, the system could be low on charge. Occasional foam or bubbles are normal when the ambient temperature is above 43°C (110°F) or below 21°C (70°F).

Adjust the engine speed to 1,500 rpm. Block the air-flow thru the condenser to increase the compressor discharge pressure to 1,422 to 1,520 kPa (206 to 220 psi). If sight glass still shows bubbles or foam, system charge level is low.

The refrigerant system will not be low on charge unless there is a leak. Find and repair the leak. If the leak can be repaired without discharging the system an oil level check is not necessary. Use the procedure for correcting low refrigerant level found in the Refrigerant System Service Procedure Section.

**DUAL PRESSURE SWITCH**

The dual-pressure switch is a combination of the low-pressure switch (for checking the quantity of refrigerant) and the, high-pressure switch (for prevention of overheating); it is installed on the tube, and, when the pressure becomes approximately 210 kPa (30 psi) or lower, the compressor stops, thus preventing the compressor from being damaged by heat. When the pressure reaches 2,700 kPa (384 psi) or higher, the compressor stops, thus preventing overheating. There is generally no necessity for inspection; if, however, an unusual condition, such as non-operation of the compressor is encountered, check by following the procedures below.




(1) Check for continuity of the dual-pressure switch.

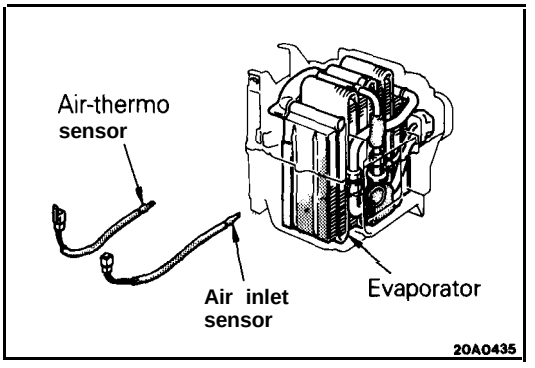
| Usual condition | Continuity |
|---|---|
| Insufficient refrigerant | No continuity |
| Unusually high temperature | |

NOTE
If the air temperature drops to 0°C (32°F) or lower during cold weather, the air conditioner will not operate (no continuity).

(2) If there is an insufficient amount of refrigerant, check the refrigerant amount by looking through the sight glass of the receiver; supply refrigerant if necessary.
(Refer to P.24–21.)

(3) Set the gauge manifold in place and check whether or not the pressure at the high-pressure side has become the dual-pressure switch activation pressure.
(4) Replace the switch if, under ordinary conditions, there is no continuity.

**Caution**
**The condition can be considered to be satisfactory if there is continuity.**
**Never increase the pressure in a deliberate attempt to obtain an abnormally high temperature, because to do so risks blowing the compressor relief valve.**




## AIR-THERMO SENSOR AND AIR-INLET SENSOR

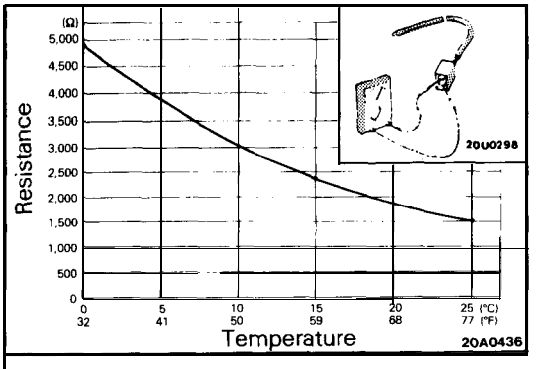
If frost forms on the surfaces of the evaporator fins, the cause might be a malfunction of air-thermo sensor.
The temperature of the air-flowing from the evaporator's outlet is sensed by the thermistor, and the signals conveying this data are input to the air conditioner control unit, thus switching the compressor's clutch ON or OFF.
This functions when the evaporator's air-flow is low, or the evaporator's fins are clogged by dust, etc., or when the amount of refrigerant is insufficient.
These sensors detect the temperature within the passenger compartment and the temperature at the cooling unit inlet, thus causing changes of the resistance value, and this data is provided to the air conditioner control unit as input.

### How to Test the Thermo Sensor and Air-Inlet Sensor

(1) Disconnect the sensor's connector at the evaporator case, and by using an ohmmeter, measure the resistance. The resistance is normal if it is within the range shown in the figure at the left; if the resistance is not normal, replace.
(2) If the sensor is normal, there is a malfunction of the air conditioner control unit, and it should be replaced.

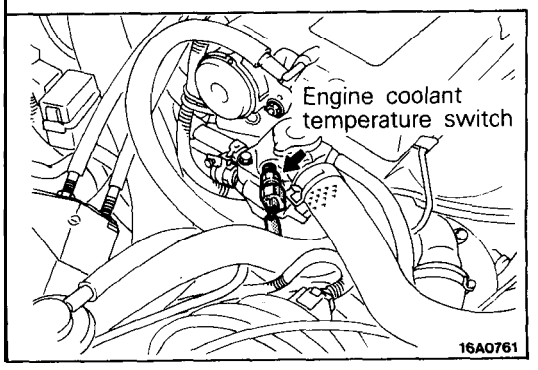
**Standard value:**
**Passenger compartment temperature sensor resistance value:**

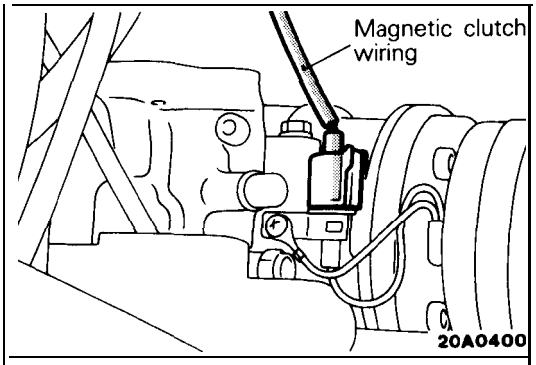
| | |
|---|---|
| **0°C (32°F)** | **4,852±243 (Ω)** |
| **15°C (59°F)** | **2,341±234 (Ω)** |
| **25°C (77°F)** | **1,500±150 (Ω)** |




## ENGINE COOLANT TEMPERATURE SWITCH <2.0L DOHC Engine>

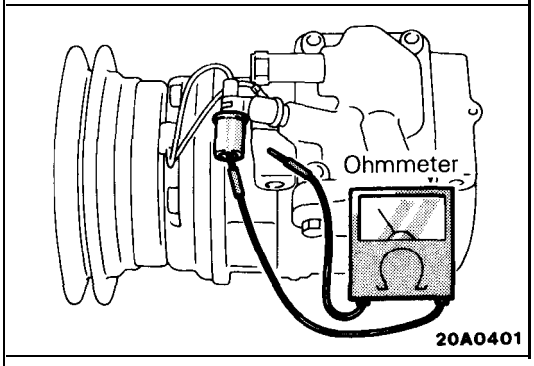
The engine coolant temperature switch is connected in series with the compressor magnetic clutch power relay.
It disengages the compressor when the temperature of engine coolant rises above 115°C (239°F).
This is designed to prevent engine overheating when cooling air is not sufficient for the condenser and radiator. If the engine coolant temperature switch operates to disengage the compressor, check for the condenser and radiator surface conditions, belt tension and engine coolant level and correct, if necessary.






## MAGNETIC CLUTCH

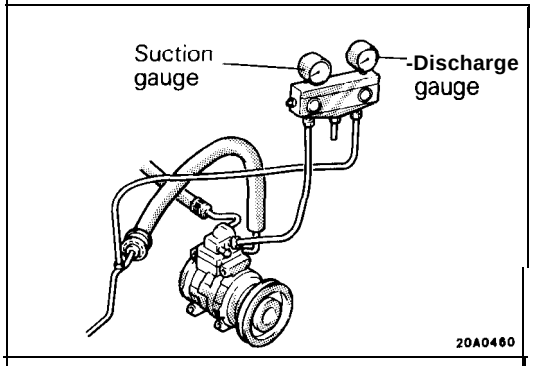
(1) Disconnect the wiring to the magnetic clutch.
(2) Connect battery (+) voltage directly to the wiring for the magnetic clutch.
(3) If the magnetic clutch is normal, there will be a "click". If the pulley and armature do not make contact ("click"), there is a malfunction.




Using an ohmmeter, measure the resistance of the clutch coil between the clutch lead wire and ground.

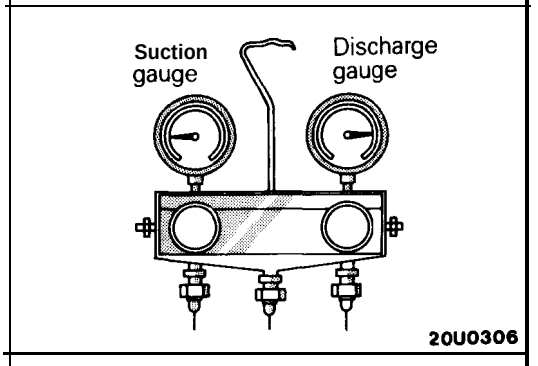
**Standard resistance: 3.4-3.8 Ω at 20°C (68°F)**

If resistance is not as specified, replace the coil.

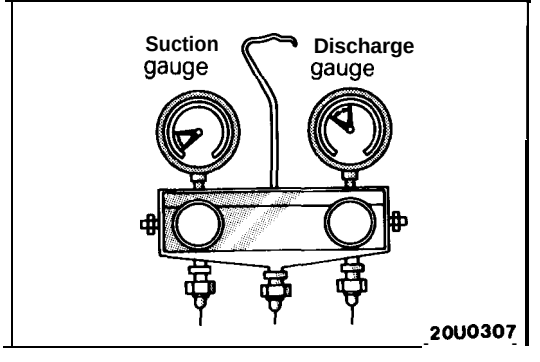



## COMPRESSOR

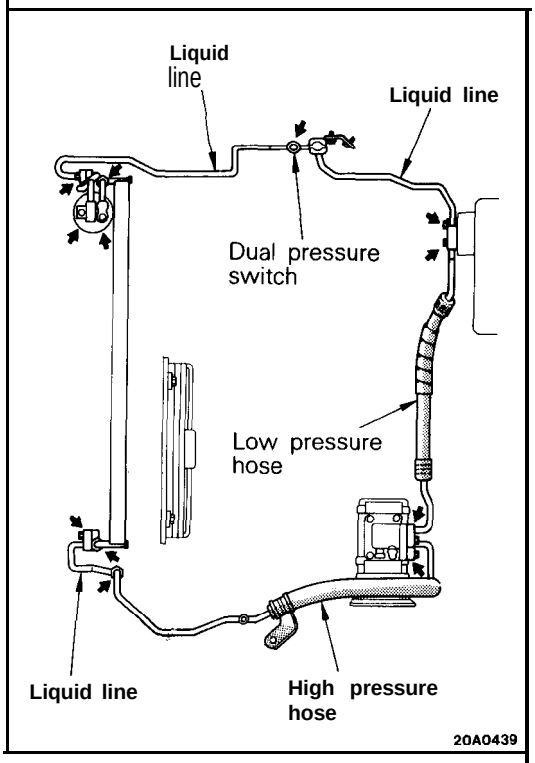
(1) Install the manifold gauge set, and run the air conditioner.
(2) If a pressure of approx. 490 kPa (71 psi) is indicated on the suction gauge side and a pressure of approx. 883 kPa (128 psi) is indicated on the discharge gauge side, the compressor has abnormal compression.
Replace the compressor.

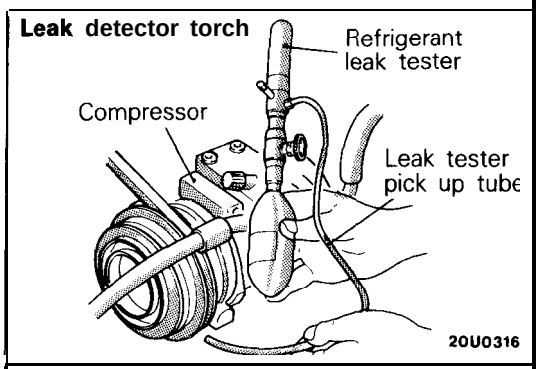


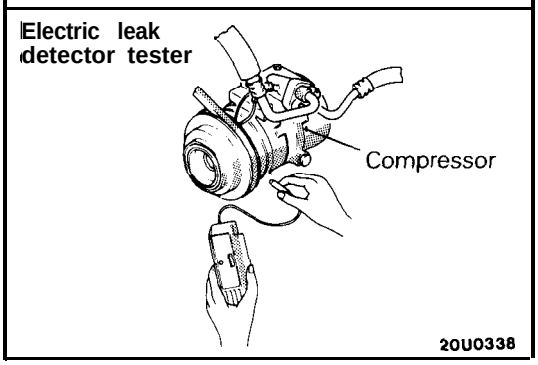

(3) If a pressure of 294 to 392 kPa (43 to 57 psi) is indicated on the suction gauge side and a pressure of approx. 1,961 kPa (284 psi) is indicated on the discharge gauge side, it is suspected that air is present in the air conditioning system. Discharge the system, evacuate and recharge with specified amount of refrigerant.




(4) During operation of the air conditioner, cold air may stop flowing after the elapse of time and this state is maintained before cold air flows out again. If cold air stops flowing out with negative pressure indicated on the suction gauge side and a pressure of 588 to 980 kPa (85 to 142 psi) indicated on the discharge gauge side, it is suspected that water is present in the air conditioning system.
Discharge the system. Replace receiver drier. Evacuate and check for leaks, and recharge with specified amount of refrigerant.




## TESTING SYSTEM FOR LEAKS N24FFAD

A leak is likely to occur where two components are connected together. See the illustration for possible locations.

The Leak Detector Torch is a butane gas-burning torch used to locate a leak in any part of the refrigeration system. Refrigerant gas drawn into the sampling or "sniffer" hose will cause the flame to change color in proportion to the size of the leak. A very small leak will produce a flame varying from yellowish-green to bright green. A large leak will produce a briliant blue flame.

**Caution**

**Do not use the lighted detector in any place where explosive gases, dust or vapors are present. Do not breathe the fumes that are produced by the burning of refrigerant gas. Large concentrations of refrigerant in the presence of a live flame become dangerously toxic.**

If the flame remains bright yellow when the tester is removed from a possible leak point, insufficient air is being drawn in through the sampling tube, or the copper reaction wire is dirty.

(1) Assemble leak detector as shown in the illustration, and be sure detector is seated tightly over torch gasket.
(2) Holding torch upright, screw-in butane charger (clockwise) until punctured. (Do not use force).
(3) Screw-out butane charger (anticlockwise) about 1/4 turn.
(4) Point torch away from body-then light escaping gas with match. Always keep torch in upright position.
(5) Adjust flame by turning cartridge in or out as required.
(6) Allow 30 seconds to heat copper reaction wire.

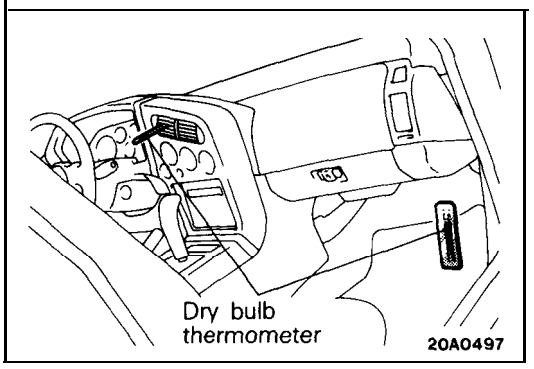
**Caution**

**Never remove butane charger while torch is lighted or in the presence of any open flame.**

(7) Examine all tube connectors and other possible leak points by moving the end of the sampling hose from point to point. Always keep torch in upright position. Since R-12 is heavier than air, it is good practice to place the open end of sampling hose directly below point being tested. Be careful not to pinch sampling tube since this will shut off air supply to flame and cause a color change.
(8) Watch for a change in the color of the flame. Small leaks will produce a green color and large leaks a bright blue color. If leaks are observed at tube fittings, tighten the connection, using the proper flare wrenches, and retest.

NOTE

A leakage of refrigerant can be detected by an electric leak detector that emits a warning sound.




## PERFORMANCE TEST

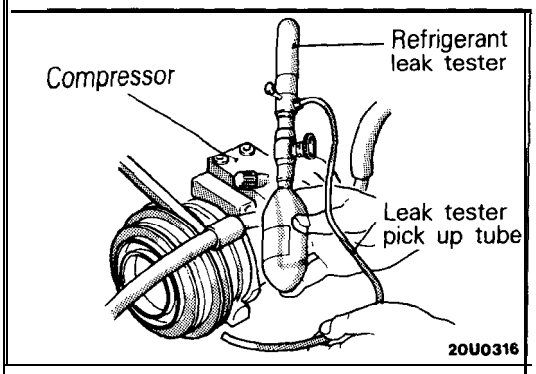
N24FWAFa

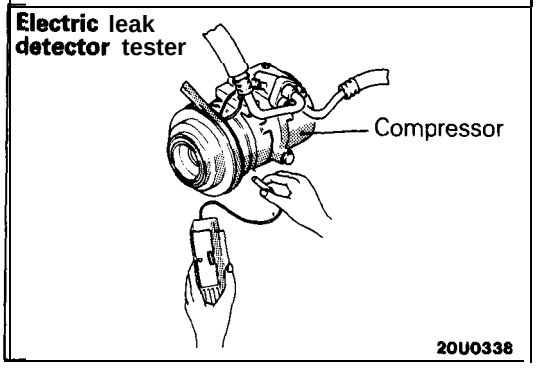
(1) Park the tested vehicle at the area which is not exposed to the direct sunlight.
(2) Connect a tachometer and manifold gauge set.
(3) Set the controls of the air conditioner as follows:
Air conditioning switch: A/C-ON position
Mode selection lever: Face position
Temperature control lever: Max. cooling position
Air selection lever: Recirculation position
Blower switch: HI (Fast) position
(4) Start engine and adjust rpm to 1,000 with air conditioner clutch engaged.
(5) Engine should be warmed up with doors, windows close and hood open.
(6) Insert a thermometer, to a depth of 20–30 mm (.8–1.2 in.), into the left center air conditioner outlet, and operate the engine for 20 minutes.
(7) Note the discharge air temperature.

NOTE
If the clutch cycles, take the reading before the clutch disengages.

### PERFORMANCE TEMPERATURE CHART

| Garage ambient temperature °C (°F) | 21 (70) | 26.7 (80) | 32.2 (90) | 37.8 (100) | 43.3 (110) |
|---|---|---|---|---|---|
| Discharge air temperature °C (°F) | 2.0–8.0 (35.6–46.4) | 2.0–8.0 (35.6–46.4) | 2.0–8.0 (35.6–46.4) | 4.0–11.0 (39.2–51.8) | 6.0–14.0 (42.8–57.2) |
| Compressor discharge pressure kPa (psi) | 900–1,300 (128–186) | 1,000–1,400 (142–199) | 1,100–1,500 (156–212) | 1,300–1,700 (186–242) | 1,500–1,900 (212–270) |
| Compressor suction pressure kPa (psi) | 50–150 (7.1–21.3) | 80–180 (11.4–25.6) | 100–200 (14.2–28.4) | 130–230 (18.5-32.7) | 150–250 (21.3–35.6) |




## REFRIGERANT LEAK REPAIR PROCEDURE N24FHAO

### Lost Charge

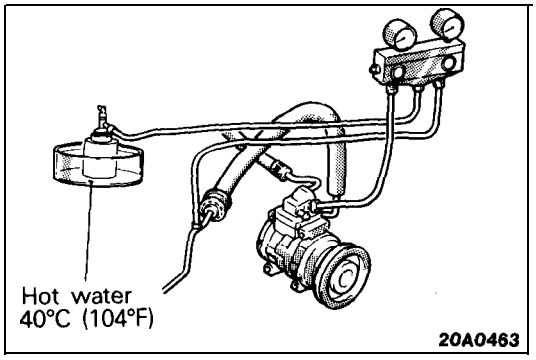
If the system has lost all charge due to a leak:
(1) Evacuate the system. (See procedure.)
(2) Charge the system with approximately one pound of refrigerant.
(3) Check for leaks.
(4) Discharge the system.
(5) Repair leaks.
(6) Replace receiver drier.

**Caution**
**Replacement filter-drier units must be sealed while in storage. The drier used in these units will saturate water quickly upon exposure to the atmosphere. When installing a drier, have all tools and supplies ready for quick reassembly to avoid keeping the system open any longer than necessary.**

(7) Evacuate and charge the system.

### Low Charge

If the system has not lost all of its refrigerant charge; locate and repair all leaks. If it is necessary to increase the system pressure to find the leak (because of an especially low charge) add of refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting low refrigerant level.




### CORRECTING LOW REFRIGERANT LEVEL

Since the refrigeration system is completely sealed, refrigerant level will not be low unless there is a leak in the system. Before adding refrigerant when the cause of low level is not known, the system should be tested for leaks. Assuming that leaks have been corrected without discharging the system, proceed with partial charge.
Install and connect manifold gauge set.
(1) Close both gauge set manifold valves.
(2) Connect the suction gauge test hose to the suction port of the compressor. Connect the discharge gauge test hose to the discharge port.
(3) Connect one end of long test hose to center manifold outlet, other end to refrigerant dispensing manifold.
(4) Close two dispensing manifold valves and open remaining dispensing manifold valve. Remove protective cap from opened valve.

(5) Screw a can of R-12 to the opened manifold valve. Be sure gasket is in place and in good condition. Tighten refrigerant can and manifold locking nut to insure a good seal. Do not overtighten 8 to 11Nm (6 to 8 ft.lbs.) is sufficient if gasket is in good condition.

(6) Turn manifold valve (above the refrigerant can) completely clockwise to puncture the can. This closes the valve and seals the refrigerant in the can.

**Caution**
**Never heat small cans of refrigerant over 40°C (104°F) as they may explode.**

(7) Place the refrigerant in a large pan of water heated to 52°C (104°F). Place pan of water containing the refrigerant can on an accurate scale so the amount of refrigerant added can be weighed. Open the refrigerant manifold valve.

(8) Purge all air from test hoses. Air in the system will be trapped in the condenser causing abnormally high discharge pressures and interfering with condensing of the refrigerant.

(9) Slightly loosen both test hoses at the gauge set manifold. Tighten the hoses as soon as the air is purged.

(10) Slightly loosen charging hose connection at gauge set manifold. This will purge air from the charging hose. Tighten connection as soon as air is purged.

(11) With vehicle windows open and hood up, operate engine at 1,500 rpm and jump the low pressure switch terminals located on the receiver drier so the clutch will remain engaged.

(12) Place air conditioner control on air conditioner and place the blower switch on high.

(13) If necessary, block the condenser to maintain a discharge pressure of 1,422 to 1,520 kPa (206 to 220 psi). System must be charged through the evaporator suction service ports as follows:

(a) Slowly open the suction service gauge valve.
Meter flow of refrigerant by adjusting, the suciton service gauge valve so that pressure registered at the suction service gauge does not exceed 345 kPa (50 psi). Keep refrigerant container upright.

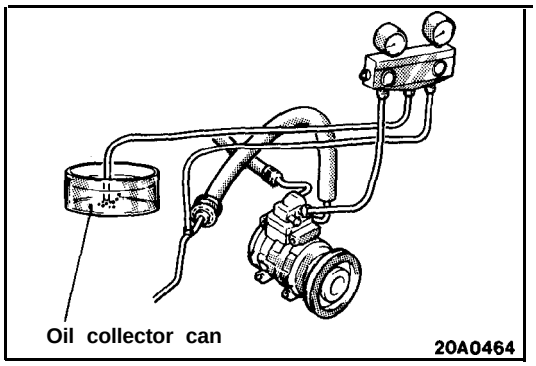
(b) Add refrigerant gas until there is no foam visible at the sight glass.
Add an additional 170 g (6 oz.)

(c) Close the suction gauge valve.

**Caution**
**Too much refrigerant in the system can cause abnormally high discharge pressures. Care must be used so that the exact recommended amount or refrigerant is added after foam clears in the sight glass.**

(d) Close dispensing manifold valve. Remove test hoses and adapters from the service ports of compressor, install protective caps at service ports and reconnect wiring.

(e) Check system performance. (P.24– 16.)




**DISCHARGING SYSTEM**

Since the air conditioning refrigerant system is pressurized, it will be necessary to completely discharge the system (in a well ventilated area) before replacing any refrigerant component. The procedure is as follows:

(1) Install manifold gauge set. Make sure the gauge set valves are closed before attaching the hoses to the refrigerant system.

(2) Install a long hose to the manifold gauge set connector. Run this hose to the oil collector can near a shop exhaust system.

A good oil collector can may be made from a large empty coffee can with a plastic top. Slit the plastic top in the form of a Y to make an entrance for the refrigerant hose and an exit for the gas.

(3) Open the compressor discharge and suction line pressure valves and blow the refrigerant into the oil collector can. Watch to make sure the hose does not blow out of the collector can.

(4) When the system has been completely discharged, measure the amount of oil collected in the can. The amount of oil measured should be added to the refrigerant system before it is re-charged. Add new oil-discard the used oil.

**Caution**
**It is important to have the correct amount of oil in the refrigerant system.**

Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature.

When a 10PA17 compressor is installed at the factory, it contains 80 cc (4.8 cu.in.) of refrigerant oil. While the air conditioning system is in operation, the oil is carried through the entire system by the refrigerant.

Some of this oil will be trapped and retained in various parts of the system.

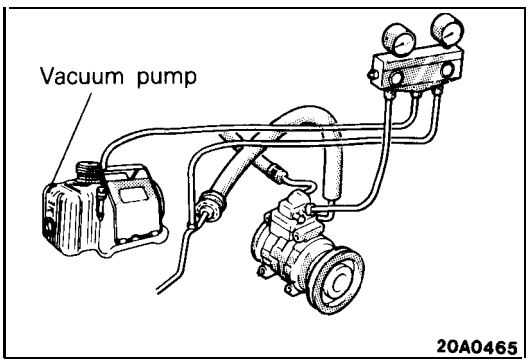
When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

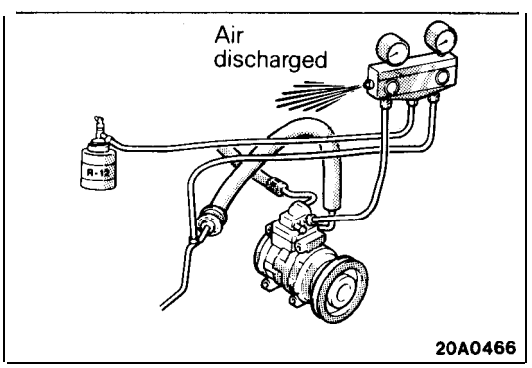
| | |
|---|---|
| **Compressor:** | **30 cc (1.8 cu.in.)** |
| **Condenser:** | **20 cc (1.2 cu.in.)** |
| **Evaporator:** | **30 cc (1.8 cu.in.)** |
| **Piping:** | **10 cc (.6 cu.in.)** |
| **Receiver drier:** | **10 cc (.6 cu.in.)** |

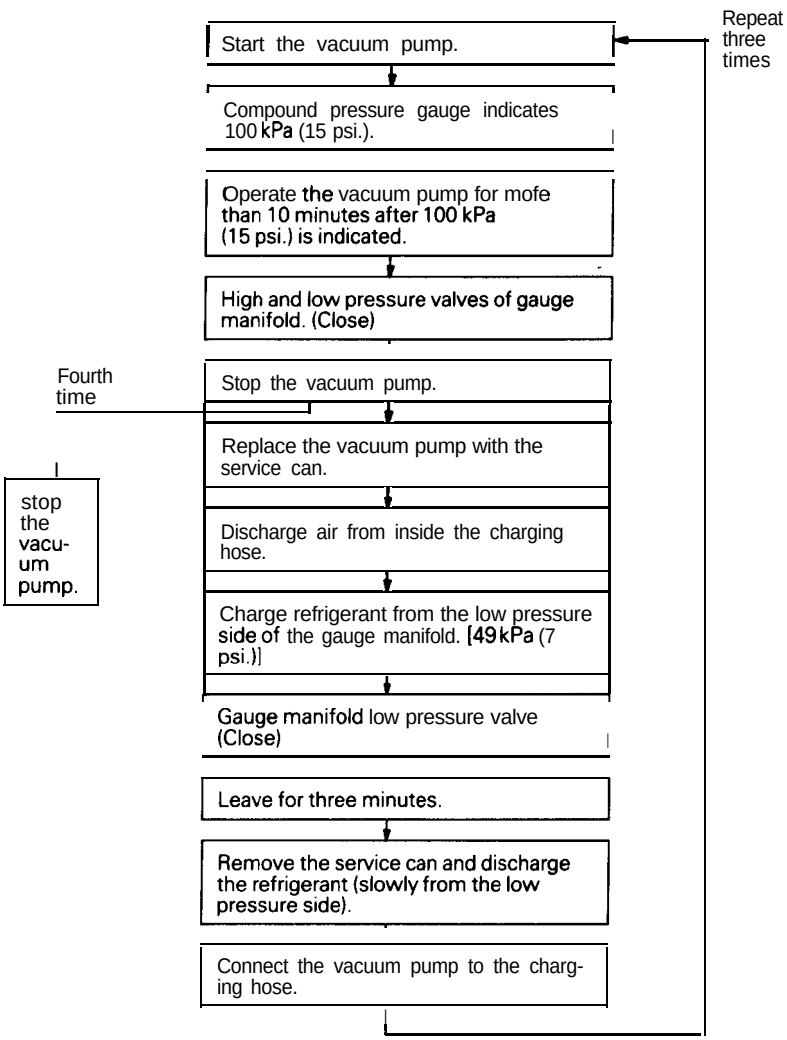
## EVACUATING SYSTEM

Whenever the system has been opened to the atmosphere, it is absolutely essential that the system be evacuated or "vacuumed" to remove all the air and moisture. Air in the refrigerant system causes high compressor discharge pressures, a loss in system performance, and oxidation of the compressor oil into gum and varnish. Moisture in the refrigerant system can cause the expansion valve to malfunction. Under certain conditions, water can react with the refrigerant to form destructive acids. It is necessary to adhere to following procedure to keep air and moisture out of the system.

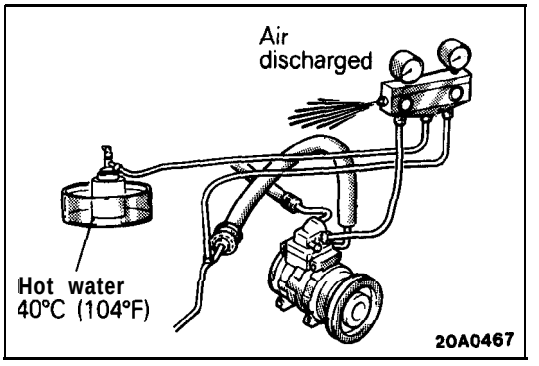
(1) Check to ensure that there is no internal pressure in the equipment. If there is an internal pressure, it should be relieved through the check valve.
(2) Connect the charging hoses of the gauge manifold to the inlet and outlet check valves of the compressor.
(3) Connect a vacuum pump to the charging hose. Repeat evacuation in the following sequence.




NOTE
(1) Do not use the refrigerant pressure to expel air.
(2) Do not use the compressor for evacuation.
(3) Do not operate the compressor In the vacuum condition; shaft seal leaks could occur.




## CHARGING SYSTEM

The refrigerant system must have been evacuated using the previous procedure before charging.
Charge using only R-I 2 refrigerant. R-12 is available in bulk tanks or small cans. Follow the safety precautions for handling R-12 as listed in this group.

### Charging with Small Cans

When using disposable cans of this type, follow carefully the can manufacturers instructions.

**Caution**
**Never use these cans to charge into the high pressure side of the system (compressor discharge port) or into a system that is at high temperature, because the high system pressures could be transferred into the charging can causing it to explode.**

Keep the refrigerant manifold valves capped when not in use. Keep a supply of extra refrigerant-can-to-refrigerant-manifold gaskets on hand so that gaskets can be replaced periodically. This will insure a good seal without excessive tightening of the can or the manifold nuts.

(1) Attach center hose from manifold gauge set to refrigerant dispensing manifold. Turn refrigerant manifold valves completely anticlockwise so they are fully open.
Remove protective caps from refrigerant manifold.
(2) Screw refrigerant cans into manifold. Be sure manifold-to-can gasket is in place and in good condition. Tighten can and manifold nuts to 8 to 11 Nm (6 to 8 ft.lbs.).
(3) Turn refrigerant manifold valves completely clockwise to puncture the cans and close the manifold valves.
(4) Purge the air from the charging line by loosening the charging hose at the gauge set manifold and turning one of the refrigerant valves anticlockwise to release refrigerant. When the refrigerant gas starts escaping from the **loose** connection, re-tighten the hose.

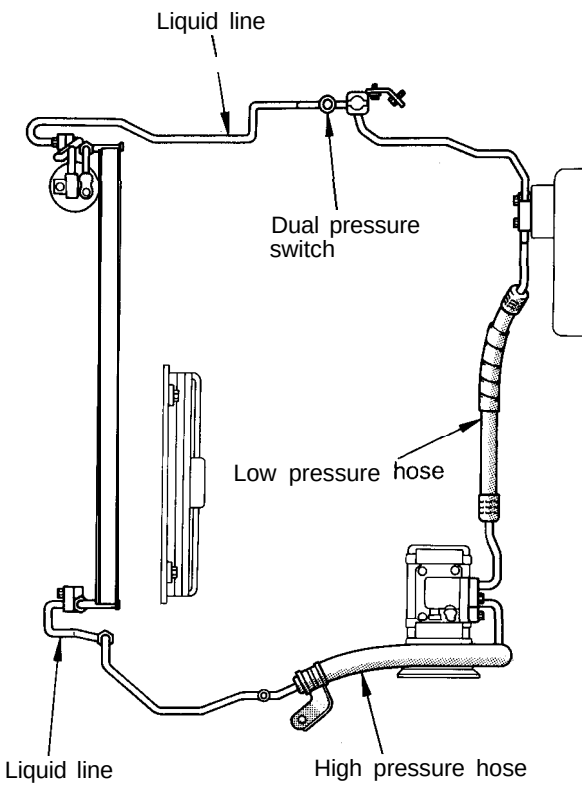
**Caution**
**Never heat small refrigerant cans over 40°C (104°F) as they may explode.**

(5) Fully open all refrigerant manifold valves being used and place the cans of refrigerant into a pan containing 40°C (104°F) water. The water will warm the charging can and aid in the transfer to the charge into the system. Place the water pan and refrigerant cans on a scale and note the weight.
(6) Place air conditioner control on air conditioner and place the blower switch on high.
(7) Open the discharge and suction gauge valves of the gauge manifold, and charge gas from the both.
Keep refrigerant container upright.
(8) When suction of refrigerant is saturated, close the discharge and suction gauge valves once, and start the engine. Fix the engine revolution speed at approx. 1,500 rpm.

(9) Charge through the suction side of the system by slowly opening the suction manifold valve. Adjust the valve as necessary so charging pressure does not exceed 345 kPa (50 psi). Maintain the temperature of the water in the pan by adding warm water as necessary.
Note the weight of water added, to ensure accuracy when determining amount of refrigerant added to system.
(IO)When specified refrigerant charge Max. 925 g (32 oz.) has entered the system, close the gauge set manifold valves, refrigerant manifold valves, and reconnnect wiring. Each can contains 397 g (14 oz.) of R-l 2. Use 2 1/2 cans.

## HANDLING TUBING AND FITTINGS

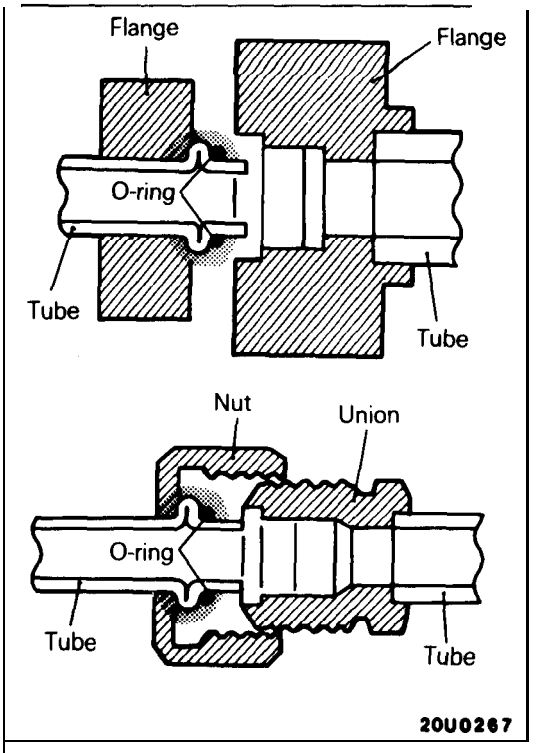
N24FIAE




20A0440

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed.
The system must be completely discharged before opening any fitting of connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.

Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.
Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm (3 in.) from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.
Unified plumbing connections with O-rings. These O-rings are not reusable.

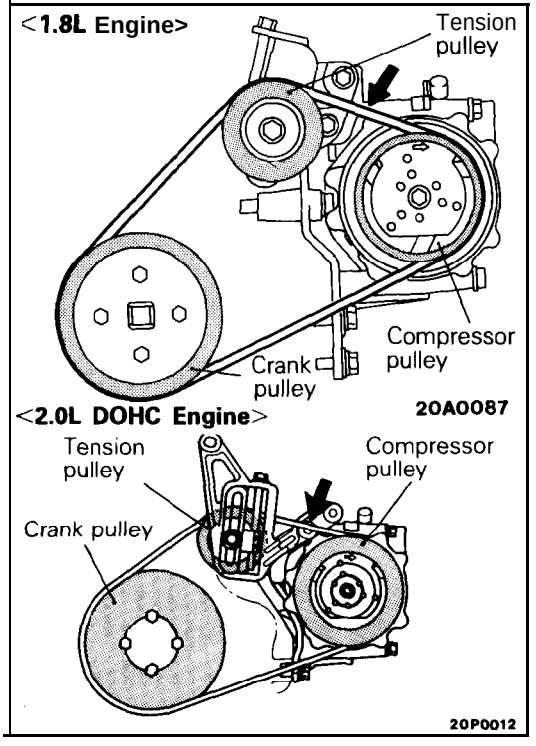



**O-RING INSTALLATION**

(1) Clean sealing surface.
(2) Make sure O-ring does not have any scratches.
(3) Connect fitting, install fastener, and torque to amount shown in the illustration.

The internal parts of the refrigeration system will remain in a state of chemical stability as long as pure-moisture-free R-12 and refrigerant oil is used. Abnormal amounts of dirt, moisture of air can upset the chemical stability and cause operational troubles or even serious damage if present in more than minute quantities.

When it is necessary to open the refrigeration system, have everything you will need to service the system ready so the system will not be left open any longer than necessary. Cap or plug all lines and fittings as soon as they are opened to prevent the entrance of dirt and moisture. All lines and components in parts stock should be capped or sealed until they are ready to be used. All tools, including the refrigerant dispensing manifold, the gauge set manifold and test hoses should be kept clean and dry.




## COMPRESSOR DRIVE BELT ADJUSTMENT N24FJAE

Satisfactory performance of the air conditioning system is dependent upon drive belt condition and tension. If the proper tensions are not maintained, belt slippage will greatly reduce air conditioning performance and drive belt life. To avoid such adverse effects, the following service procedure should be followed:

(1) Measure the deflection with a force of 100N (22 lbs.) applied to belt mid-point between tension pulley and compressor pulley.
(2) Any belt that has operated for a minimum of one half-hour is considered to be a "used" belt. Adjust air conditioning drive belt at the time of new-car preparation.
(3) Check drive belt tension at regular service intervals and adjust as needed.

**Standard value:**

| | |
|---|---|
| **When a new belt is installed** | |
| **<1.8L Engine>** | **4-5 mm (.16–.2 in.)** |
| **<2.0L DOHC Engine>** | **4.5-5 mm (.18–.2 in.)** |
| **When the used belt's tension is adjusted** | |
| | **5.5-6 mm (.22–.24 in.)** |

## COMPRESSOR NOISE

N24FLAB

When investigating an air conditioning related noise, you must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions.

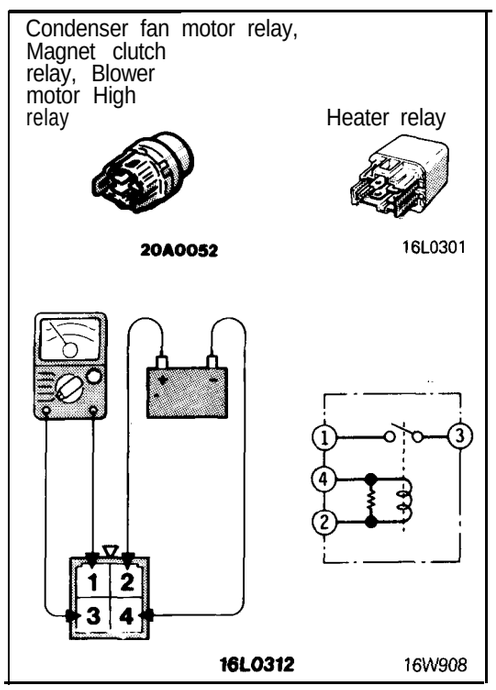
Noises that develop during air conditioning operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering, or alternator).

Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged.

Drive belts are speed sensitive. That is, at different engine speeds, and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems within the compressor.

**Adjustment Procedures**

(1) Select a quiet area for testing. Duplicate conditions as much as possible. Switch compressor on and off several times to clearly identify compressor noise.
To duplicate high ambient conditions (high head pressure), restrict air flow through condenser. Install manifold gauge set to make sure discharge pressure doesn't exceed 2,070 kPa (300 psi).
(2) Tighten all compressor mounting bolts, clutch mounting bolt, and compressor drive belt. Check to assure clutch coil is tight (no rotation or wobble).
(3) Check refrigerant hoses for rubbing or interference that can cause unusual noises.
(4) Check refrigerant charge (See "Charging the System").
(5) Recheck compressor noise as in Step 1.
(6) If noise still exists, loosen compressor mounting bolts and retorque. Repeat Step 1.
(7) If noise continues, replace compressor and repeat Step 1.




## POWER RELAY CHECK

N24FNAE

NOTE
For information concerning the installation position of each relay, refer to P.24-8.

**CONDENSER FAN MOTOR RELAY, MAGNET CLUTCH RELAY, BLOWER MOTOR HIGH RELAY, HEATER RELAY**

Check for continuity between the terminals when- the battery power-supply is applied to terminal (2). and terminal (4) is grounded.

| | | |
|---|---|---|
| When current flows | Between terminals 1–3 | Continuity |
| When no current flows | Between terminals 1–3 | No continuity |
| | Between terminals 2-4 | Continuity |

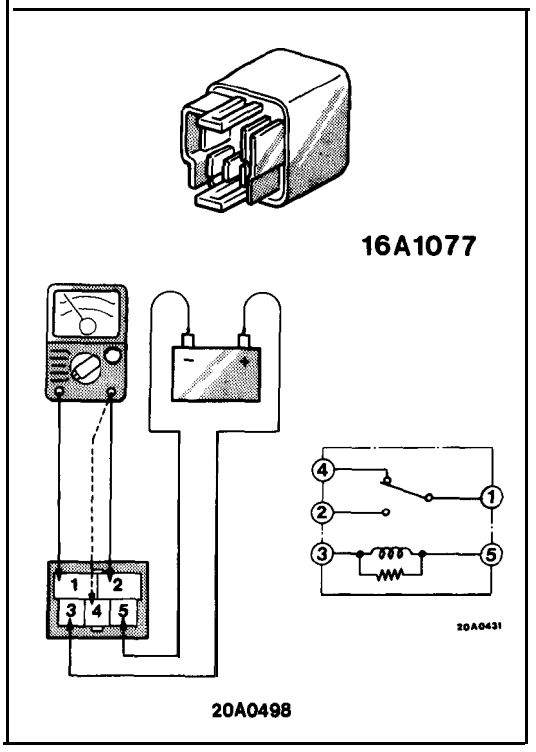
Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed.

The system must be completely discharged before opening any fitting of connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.

Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.

Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm (3 in.) from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.

Unified plumbing connections with O-rings. These O-rings are not reusable.




**CONDENSER FAN MOTOR HIGH-LOW SELECTING RELAY**

Check for continuity between the terminals when the battery power-supply is applied to terminal (5), and terminal (3) is grounded.

| When current flows | Between terminals 1–2 | Continuity |
|---|---|---|
| When no current flows | Between terminals 1–4, 3–5 | Continuity |
| | Between terminals 1–2 | No continuity |

## IDLE-UP OPERATION CHECK N24F0AA

(1) Before inspection and adjustment set vehicle in the following condition:
- Engine coolant temperature: 80–90°C (176–194°F)
- Lights, electric cooling fan and accessories: Set to OFF
- Transaxle: Neutral (N or P for vehicles with A/T)
- Steering wheel: Straightforward

(2) Check whether or not the idling speed is the standard value.

**Standard value: <1.8L Engine> 700 rpm**
**<2.0L DOHC Engine> 750 rpm**

NOTE
There is no necessity to make an adjustment, because the idling speed is automatically adjusted by the ISC* system. If, however, there occurs a deviation from the standard value for some reason, check the ISC* system.

(3) Check to be sure that the idlig speed becomes the standard value when the air conditioner switch is switched ON and the air conditioner is activated.

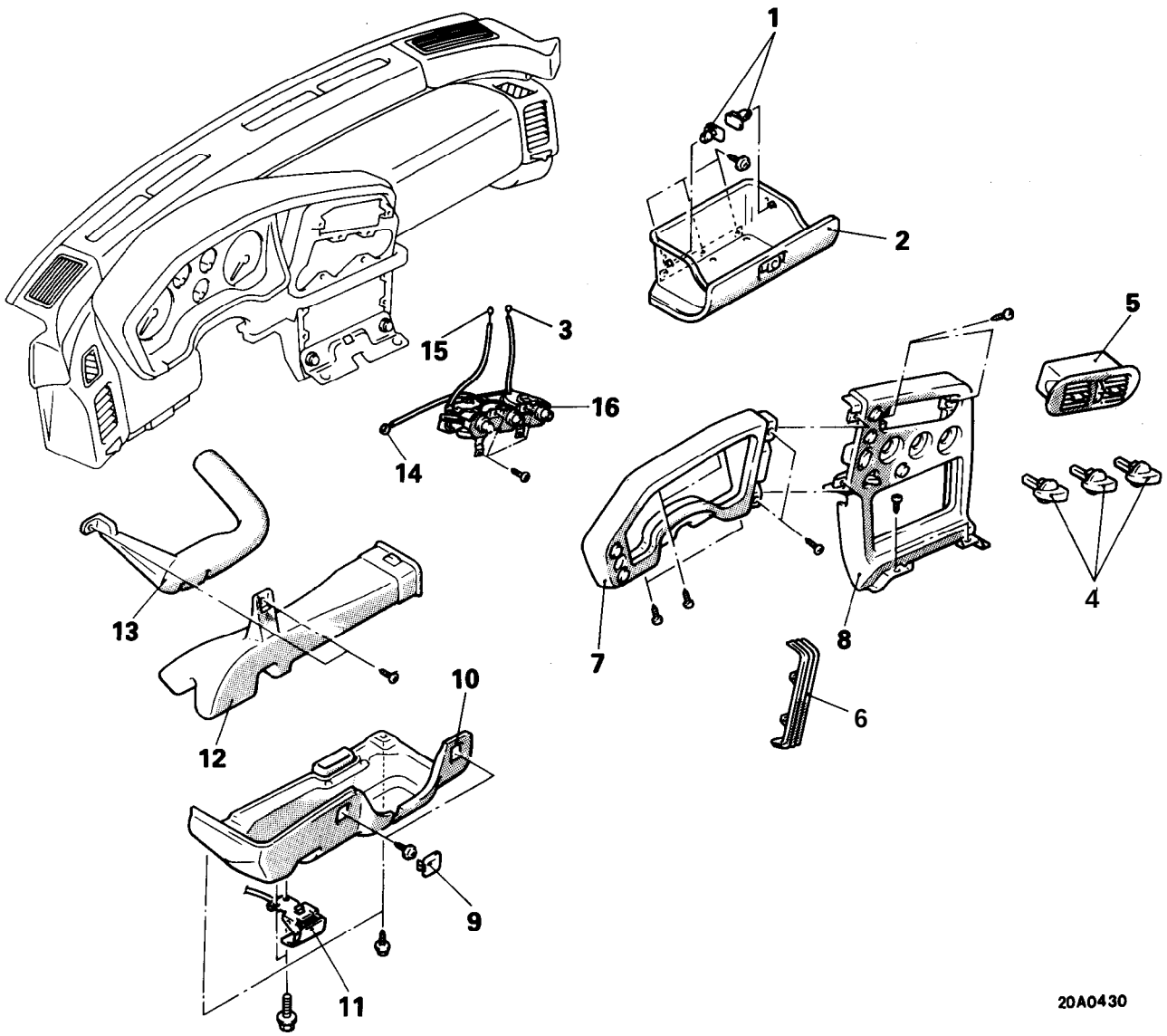
**Standard value: 850 rpm**

NOTE
There is no necessity to make an adjustment, because the idling speed is automatically adjusted by the ISC* system. If, however, there occurs a deviation from the standard value for some reason, check the ISC* system.
ISC: Idle Speed Control

# HEATER CONTROL ASSEMBLY

N24GA--

## REMOVAL AND INSTALLATION



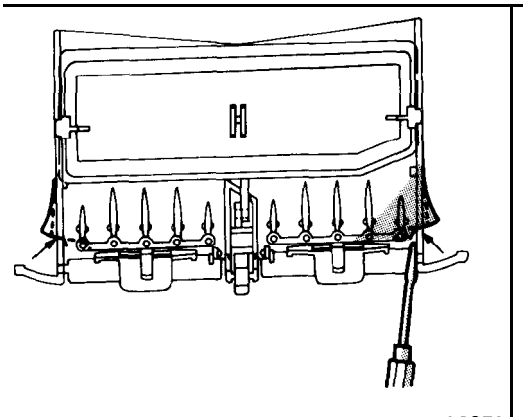

**Removal steps**

1. Stopper
2. Glove box assembly
- ◖ + 3. Connection for the air-selection control wire
4. Dial knob
- ◖ ☒ 5. Center air outlet assembly
6. Cover
7. Cluster panel assembly (A)
8. Cluster panel assembly(B)
9. Plug
10. Knee protecter
11. Hood lock release handle
12. Shower duct, LH
13. Lap cooler duct
- ● + 14. Connection for the mode control wire
- ● * 15. Connection for the temperature control wire
16. Heater control assembly

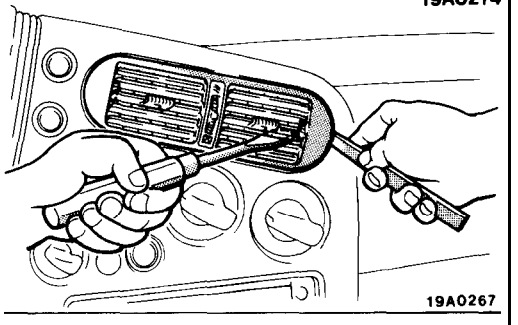
**Pre-removal Operation**
- Removal of Radio and Tape Player (Refer to GROUP 8–Audio System.)

**Post-installation Operation**
- Installation of Radio and Tape Player (Refer to GROUP 8–Audio System.)

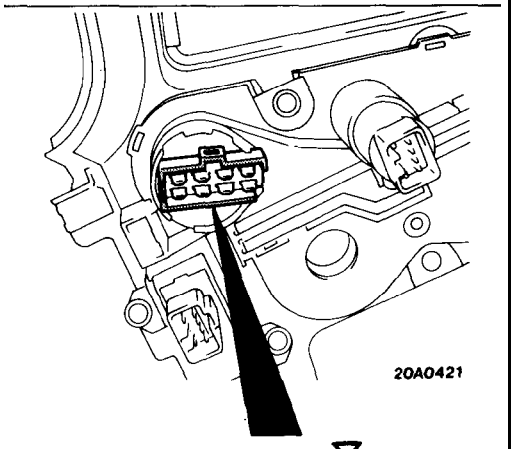
NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● 4: Refer to "Service Points of Installation".



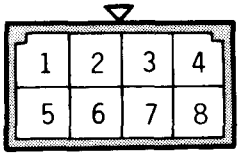
19A0274

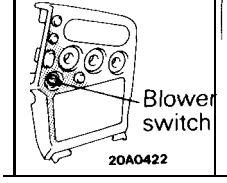


19A0267



20A0421




20A0422

20A0408

## SERVICE POINTS OF REMOVAL N24GBAL

### 5. REMOVAL OF CENTER AIR OUTLET ASSEMBLY

Disengaging the tabs of the center air outlet assembly with a flat tip (−) screwdriver, remove the center air outlet assembly with a plastic trim tool.

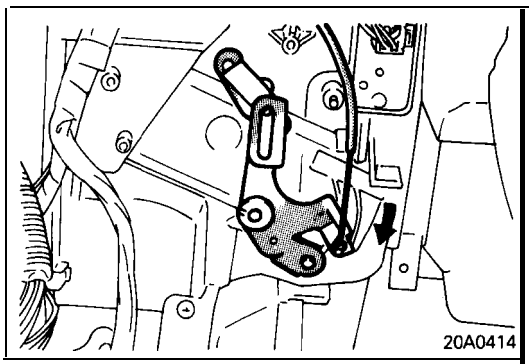
## INSPECTION N24GCAG

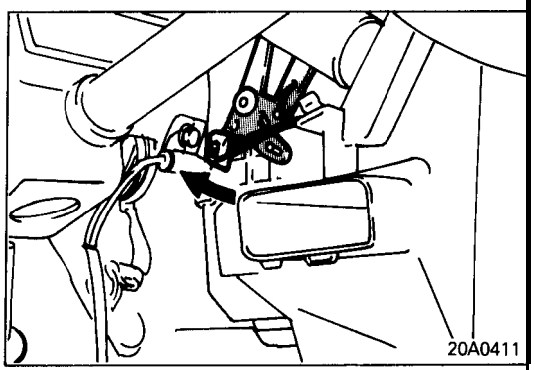
### BLOWER SWITCH

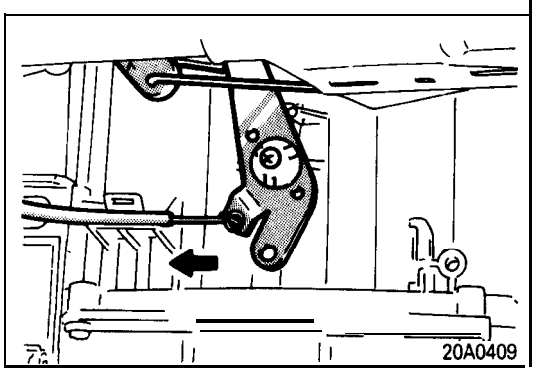
Operate the switch, and check the continuity between the terminals.

| Switch position \ Terminal | 5 | 3 | 6 | 2 | 7 | 8 | 1 | 4 |
|---|---|---|---|---|---|---|---|---|
| OFF | | | | | | | | |
| • (Low) | o - | - o | | | | o - | - o | |
| • (Medium first step) | 0 | | ○ | | | ○ | ○ | |
| ● (Medium second step) | ○ | | | ○ | | ○ | ○ | ○ |
| ● (High) | 0 | | | | ○ | ○ | ○ | ○ |

NOTE
○–○ indicates that there is continuity between the terminals.




## SERVICE POINTS OF INSTALLATION N24GDAO

### 15. INSTALLATION OF TEMPERATURE CONTROL WIRE

Connect the temperature control wire to the blend air damper lever by following the steps below.

(1) Move the temperature control lever to the rightmost position. ("HOT" position)

(2) With the blend air damper lever pressed completely downward in the direction indicated by the arrow, connect the inner cable of the temperature control wire to the end of the blend air damper lever, and then secure the outer cable by using a clip.

### 14. INSTALLATION OF MODE SELECTION CONTROL WIRE

Connect the mode selection control wire to the mode selection damper lever by following the steps below.

(1) Move the mode selection lever to the position.

(2) With the mode selection damper lever pressed inward in the direction indicated by the arrow, connect the inner cable of the mode selection control wire to the end of the mode selection lever, and then secure the outer cable by using a clip.

### 3. INSTALLATION OF AIR SELECTION CONTROL WIRE

Connect the air selection control wire to the air selection damper lever by following the steps below.

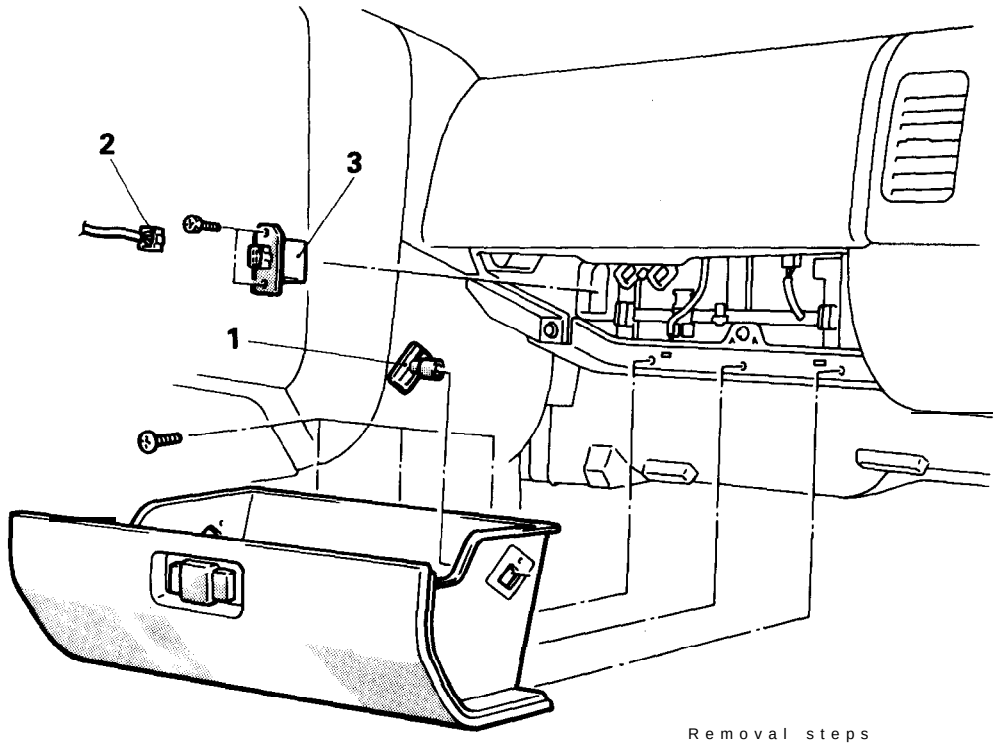
(1) Move the air selection control lever to the position.

(2) With the air selection damper lever pressed inward in the direction indicated by the arrow, connect the inner cable of the air selection control wire to the end of the air selection lever, and then secure the outer cable by using a clip.

# RESISTOR

N24JA--

## REMOVAL AND INSTALLATION

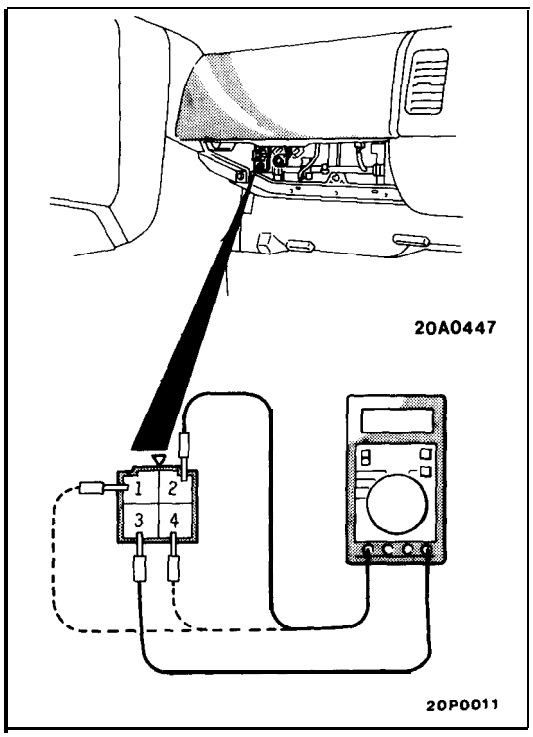



20A0448

Removal steps

1. Stopper
2. Connector for the resistor
3. Resistor

NOTE
Reverse the removal procedures to reinstall.




## INSPECTION

N24JCAC

### RESISTOR CHECK

(1) Remove the stopper and tilt the glove box downward and forward.
(2) Disconnect the connector for the resistor.
(3) Using a circuit tester, measure the resistance between the terminals indicated below.
The condition can be considered satisfactory if the value measured at this time is equivalent to the standard value.

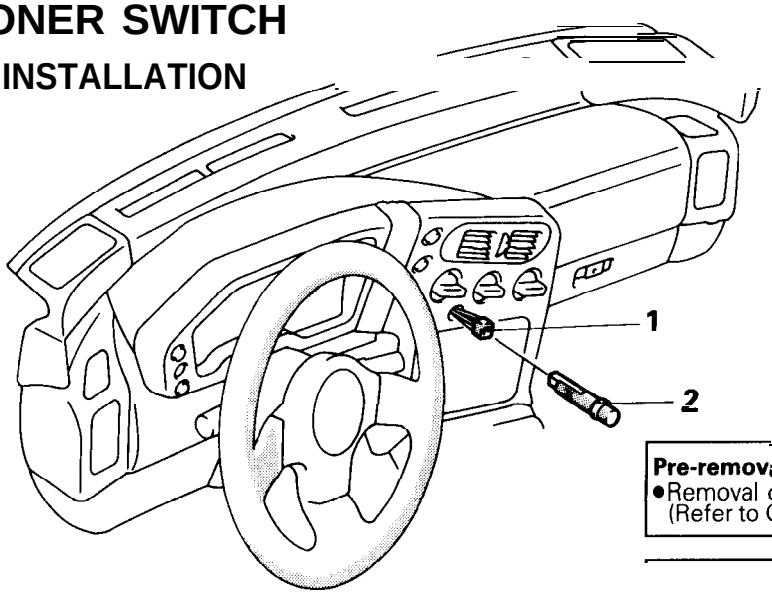
**Standard value**

| Terminals measured | Standard value Ω |
|---|---|
| Between terminals ③–② | Approx. 1.7–1.96 |
| Between terminals ③–④ | Approx. 0.81–0.93 |
| Between terminals ③–① | Approx. 0.29–0.33 |

# AIR CONDITIONER SWITCH

## REMOVAL AND INSTALLATION

N24OA--



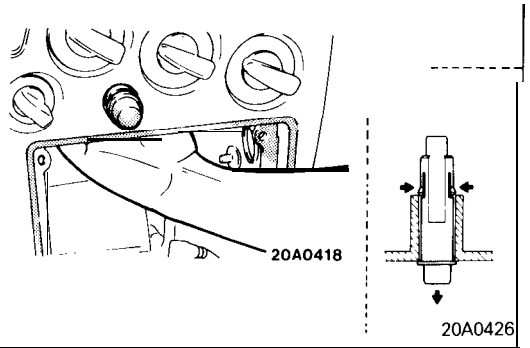

20A0419

**Pre-removal Operation**
- Removal of Radio and Tape Player (Refer to GROUP 8–Audio System.)

**Operation**
- Installation of Radio and Tape (Refer to GROUP 8–Audio System.)

Removal steps
1. Air conditioner switch connector
2. Air conditioner switch

NOTE
Reverse the removal procedures to reinstall.

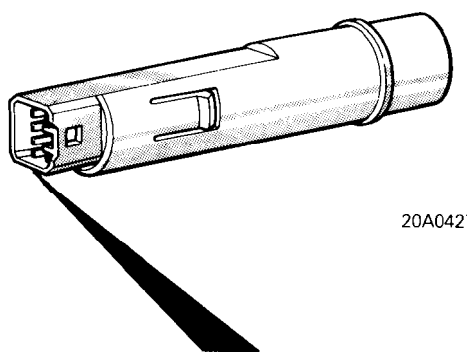


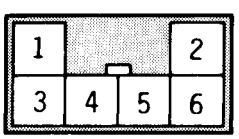

## SERVICE POINTS OF REMOVAL

N24QBAF

### 2. REMOVAL OF AIR CONDITIONER SWITCH

Remove the radio set, and insert hand to the back of the cluster panel assembly through the produced opening. Catching the air conditioner switch on the right and left sides, push it toward you for removal.




20A0189

## INSPECTION

N24OCACa

### AIR CONDITIONER SWITCH CHECK

(1) Remove the heater control panel.
(2) Remove the connector for the air conditioner switch, and then check for continuity as described below.

| Switch position \ Terminal No. | 1 | 2 | 4 | 5 | 3 | 6 |
|---|---|---|---|---|---|---|
| OFF | | | | | | |
| ECONOMY (If pressed 1 step) | ○ | | ○ | Indicator light | Illumination light | |
| A/C (If pressed 2 steps) | ○ | ○ | ○ | | | |

NOTE
(1) The ○–○ symbol indicates continuity.
(2) The broken line (– – – – –) indicates the connection during ECONOMY use.
(3) The chain line (— · — · —) indicates the connection during air conditioner use.

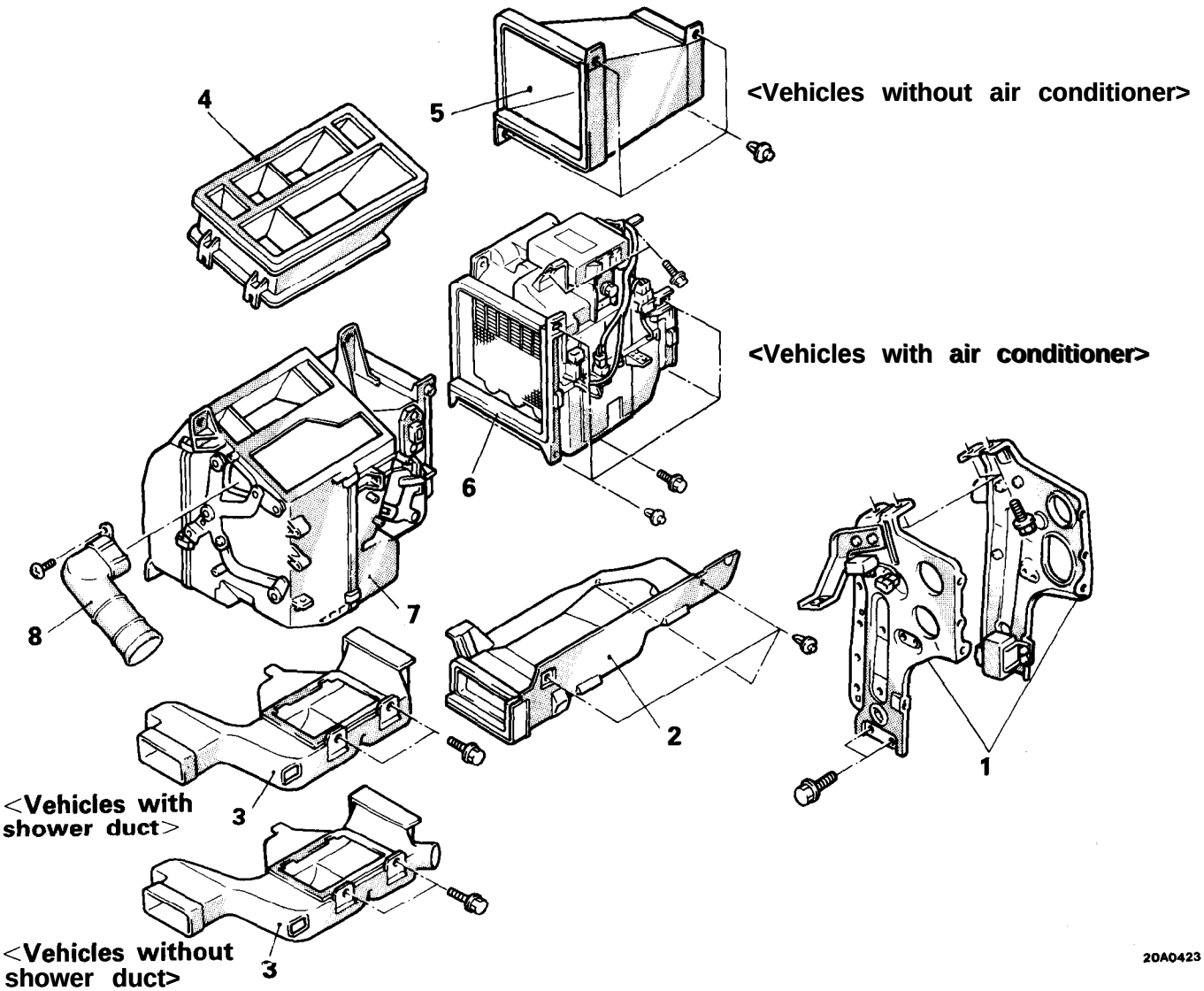
# HEATER UNIT

## REMOVAL AND INSTALLATION

N24IA--

**Pre-removal Operation**
- ●Draining of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)
- @Removal of Floor Console and Instrument Panel (Refer to GROUP 23–Floor Console and Instrument Panel.)

**Post-installation Operation**
- *Supplying of Coolant (Refer to GROUP 7–Service Adjustment Procedures.)
- ● installation of Floor Console and Instrument Panel (Refer to GROUP 23–Floor Console and Instrument Panel.)




**Removal steps**

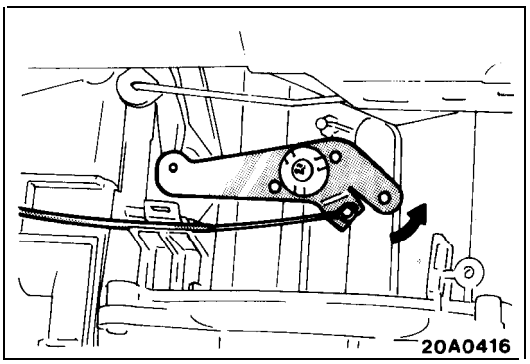
1. Center reinforcement
2. Shower duct (R.H.)
3. Distribution foot duct
4. Center duct assembly
5. Duct
- ◆■◆ 6. Evaporator
- ◆■◆ 7. Heater unit
8. Lap cooler duct (A)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆■◆: Refer to “Service Points of Removal”.

## SERVICE POINTS OF REMOVAL N24IBAO

### 6. REMOVAL OF EVAPORATER

Refer to GROUP 24-34.

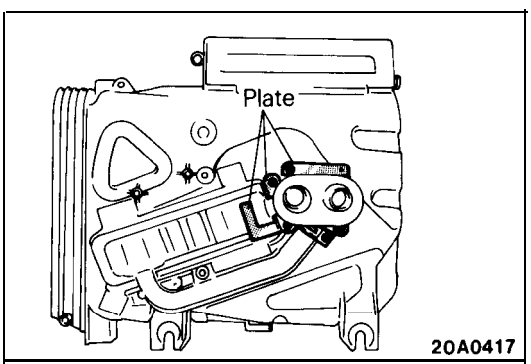


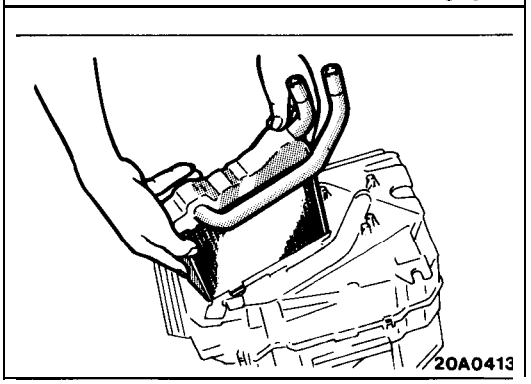

### 7. REMOVAL OF HEATER UNIT <Vehicles with air conditioner>

NOTE
In order to prevent bolts from falling into the blower assembly, set the inside/outside air-selection damper to the position that permits outside air introduction.

## INSPECTION N24ICAG

- Check the operation of dampers and link mechanism.
- Check the heater core for clogging and water leakage.




## HEATER CORE REPLACEMENT N24IDAH

(1) Remove the heater unit.
(2) Remove the plate.

(3) Pull out the heater core from the heater unit.
(4) Insert the heater core into the heater unit.

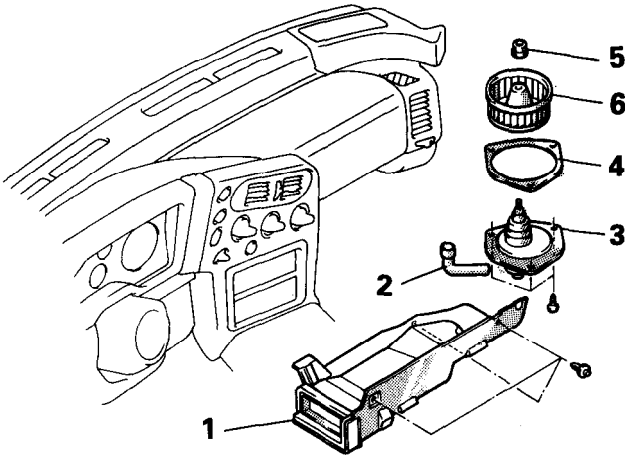
NOTE
This work must be done carefully so as not to damage the fin part or the pad part.

(5) Install the plate.
(6) Install the heater unit.

# BLOWER ASSEMBLY

## -- REMOVAL AND INSTALLATION

N24KA--




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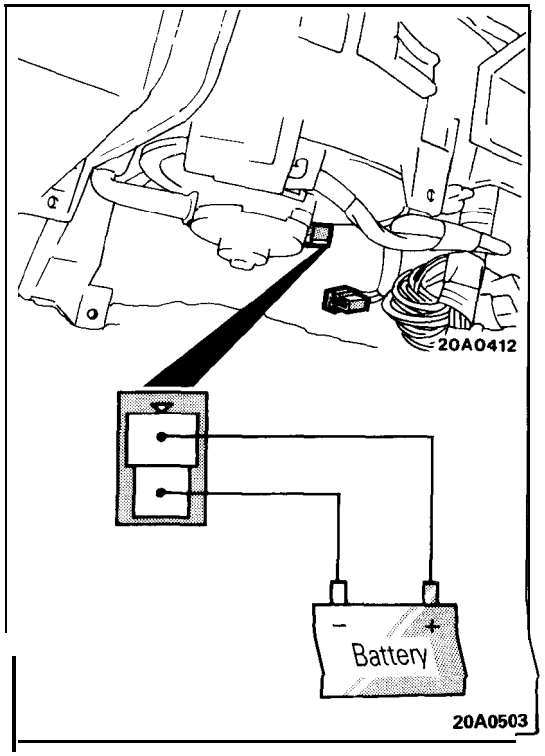
Removal steps
1. Shower duct R.H. <if so equipped>
2. Hose
◆◆ 3. Blower motor assembly
● 4. Packing
5. t-an installation nut
6. Fan

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● 4 : Refer to "Service Points of installation".

## INSPECTION

N24KCAL

- Check for bending or abnormal deflection of the rotating shaft of the blower motor assembly.
- Check for cracking or deterioration of the packing.
- Check for damage to the fan.
- Check for damage to the blower case.
- Check the operation of the inside/outside air-selection damper, and for damage.




### BLOWER MOTOR ASSEMBLY CHECK

(1) Disconnect the blower motor terminals.
(2) Connect the blower motor terminals directly to the battery and check that the blower motor operates smoothly.
(3) Next, reverse the polarity and check that the blower motor operates smoothly in the reverse direction.

## SERVICE POINTS OF INSTALLATION

N24KDAF

### 4. INSTALLATION OF PACKING

If the packing is cracked, replace with a new one.

### 3. INSTALLATION OF BLOWER MOTOR ASSEMBLY

Before installing the blower motor assembly, carefully clean away any dust, dirt, etc. adhering to the inner surface of the blower case.

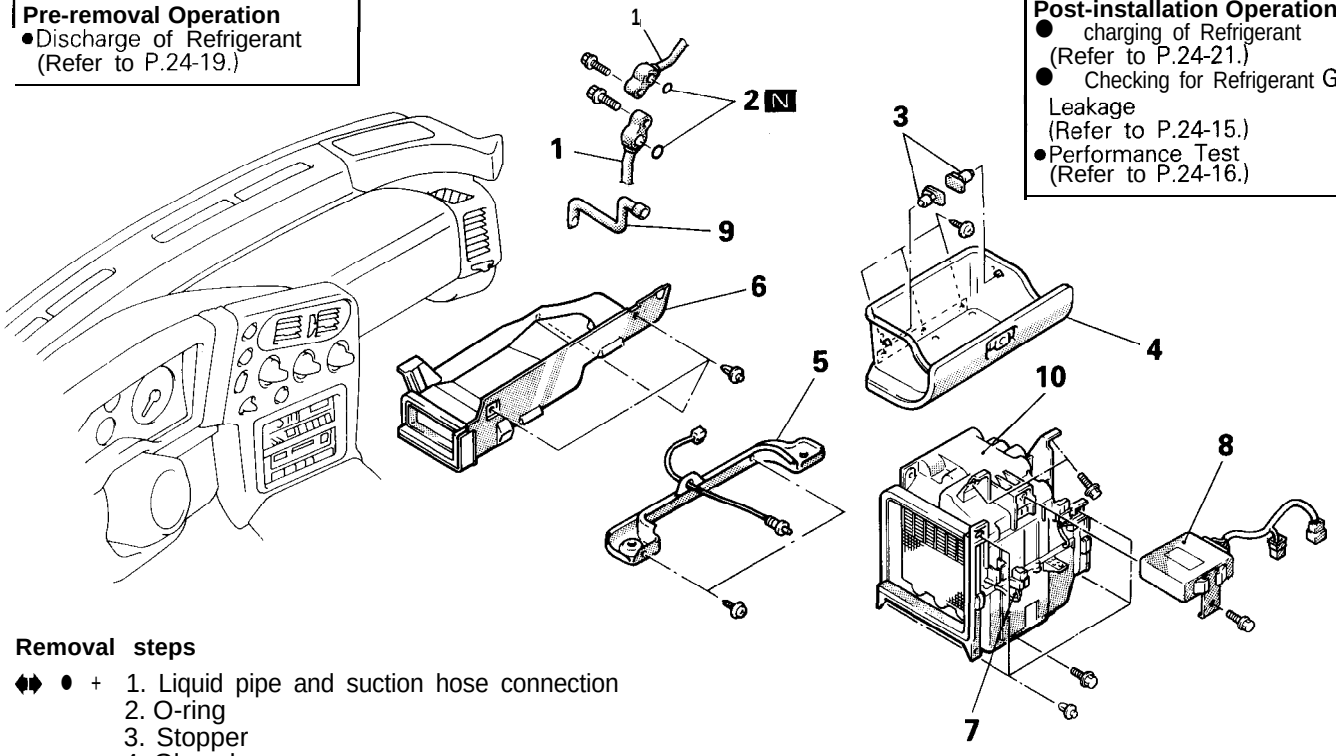
# EVAPORATOR

## REMOVAL AND INSTALLATION

N24RA--

**Pre-removal Operation**
- Discharge of Refrigerant (Refer to P.24-19.)

**Post-installation Operation**
- charging of Refrigerant (Refer to P.24-21.)
- Checking for Refrigerant Gas Leakage (Refer to P.24-15.)
- Performance Test (Refer to P.24-16.)




20A0424

**Removal steps**

◆◆ ● + 1. Liquid pipe and suction hose connection
2. O-ring
3. Stopper
4. Glove box
5. Lower frame
6. Shower duct R.H. <if so equipped>
7. Body wiring harness and air conditioner wiring harness connection
8. Air conditioner control unit
9. Drain hose
10. Evaporater

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● : Refer to "Service Points of Installation".

## SERVICE POINTS OF REMOVAL

N24RBAHa

### 1. DISCONNECTION OF LIQUID PIPE AND SUCTION HOSE

If the hoses or pipes are disconnected, cap the hoses or pipes with a blank plug to prevent entry of dust, dirt, and water.

## INSPECTION

N24RCAA

- Check for damage of the evaporator fin part.
- Check for damage or collapse of the drain hose.
- Check for peeling or cracking of the insulator.

**AIR-OUTLET SENSOR AND AIR-INLET SENSOR CHECK**

For information concerning the checking procedures, refer to P.24–13.

## SERVICE POINTS OF INSTALLATION

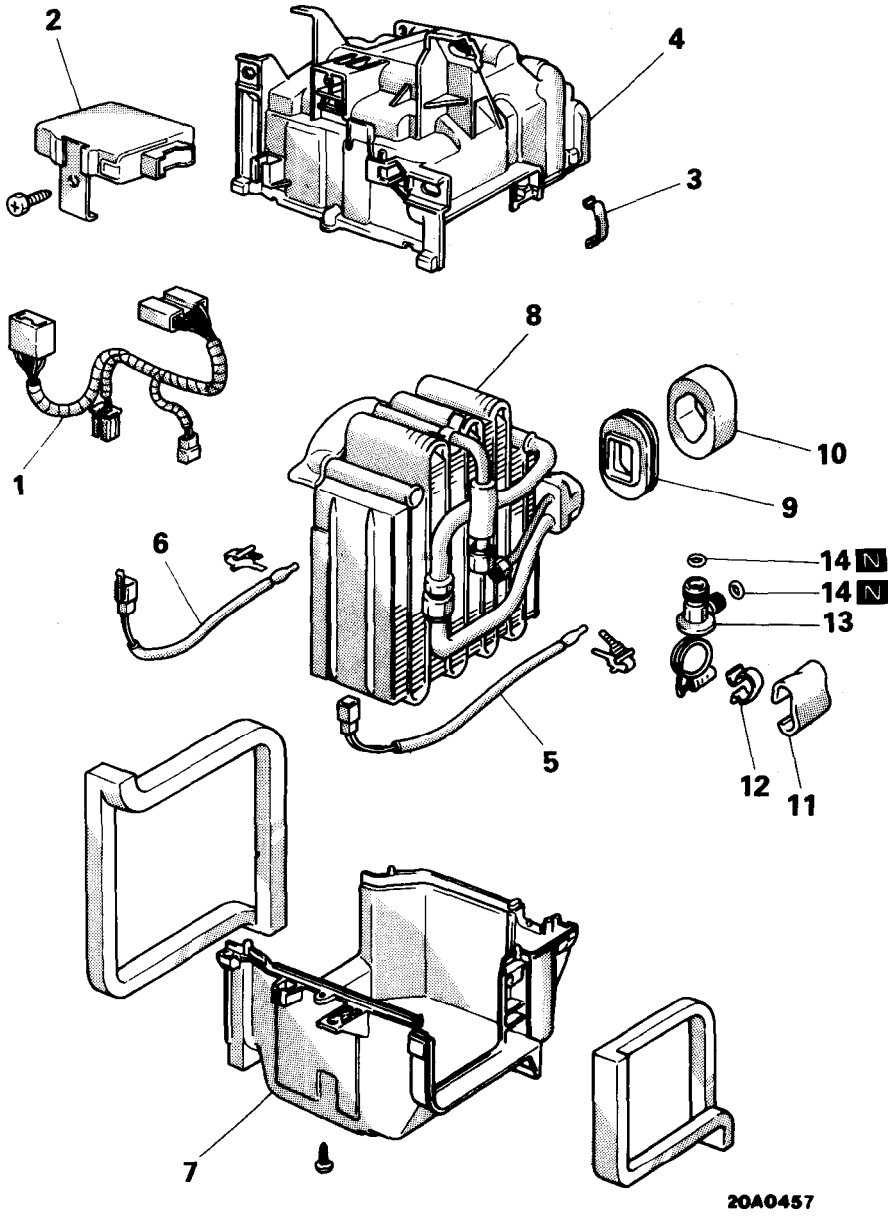
N24RDAK

### 1. CONNECTION OF LIQUID PIPE AND SUCTION HOSE

For information concerning the installation procedures, refer to P.24–23.

## DISASSEMBLY AND REASSEMBLY

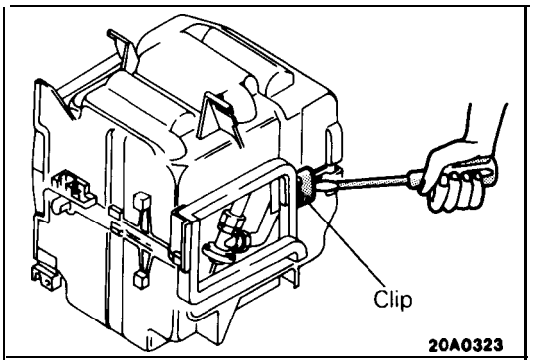
N24RE--

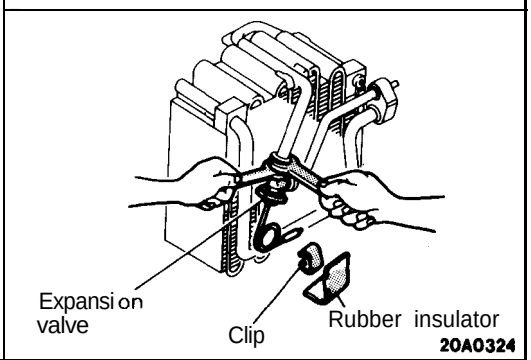


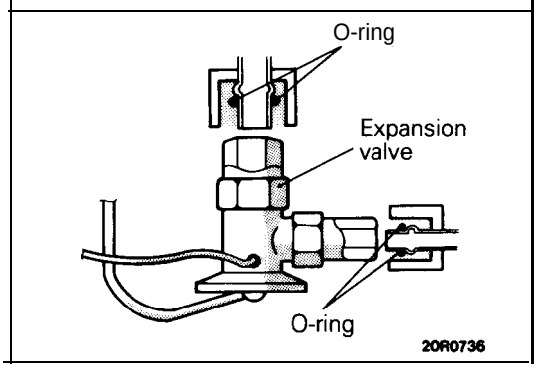

**Disassembly steps**

1. Wiring harness
2. Air conditioner control unit
◆◆ 3. Clips
4. Evaporater case (upper)
5. Air inlet sensor
6. Air thermo sensor
7. Evaporater case (lower)
8. Evaporater assembly
9. Grommet
10. Insulator
11. Rubber insulator
12. Clip
◆◆ ◆◆ 13. Expansion valve
14. O-ring

NOTE
(1) Reverse the disassembly procedures to reassemble
(2) ◆◆ : Refer to "Service Points of Disassembly"
(3) ◆◆ : Refer to "Service Points of Reassembly"
(4) N : Non-reusable parts.




## SERVICE POINTS OF DISASSEMBLY N24RFAE

### 3. REMOVAL OF CLIPS

Remove the clips with a flat-blade. screwdriver covered with a shop towel to prevent damage to case surfaces.

### 13. REMOVAL OF EXPANSION VALVE

Loosen the flare nut by using two wrenches. (for both the inlet and outlet.)

## SERVICE POINTS OF REASSEMBLY N24RHAJ

### 13. APPLICATION OF COMPRESSOR OIL TO EXPANSION VALVE AND O-RINGS

Apply compressor oil to the O-rings and expansion valve of the evaporator assembly.

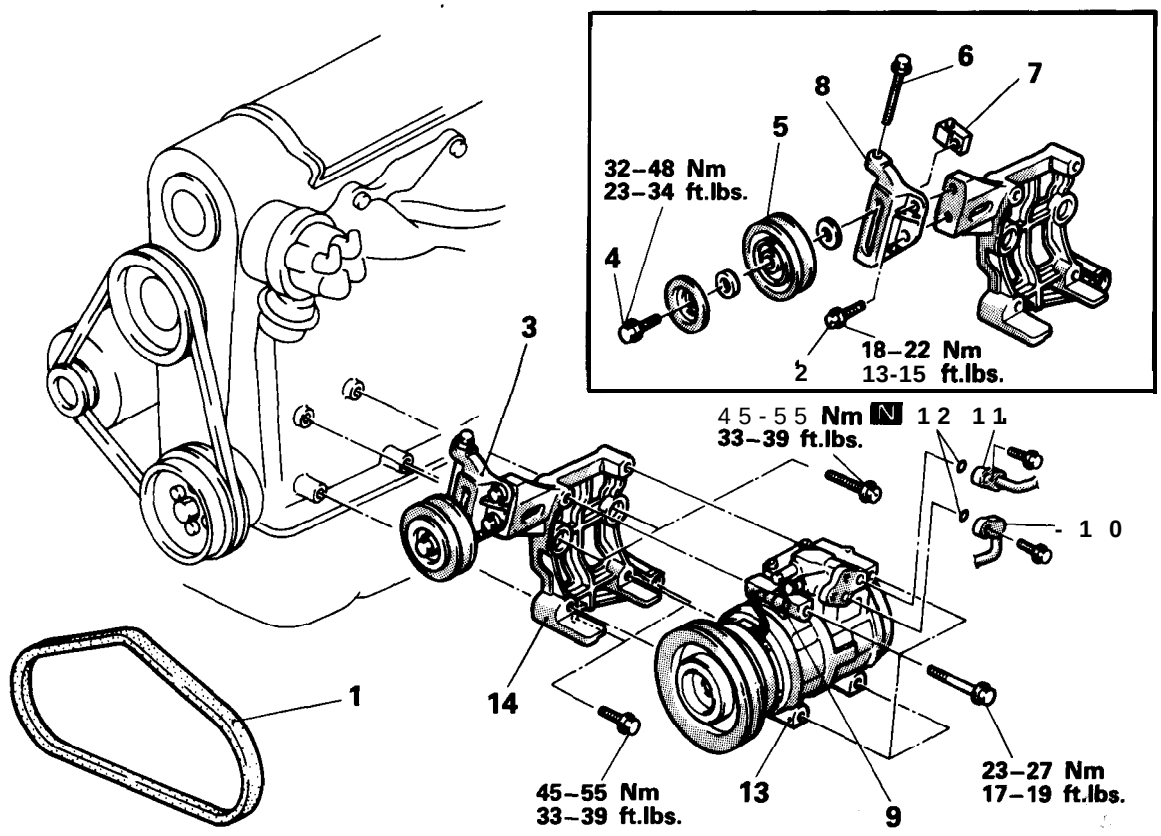
# COMPRESSOR <1.8L Engine>

## REMOVAL AND INSTALLATION

N24SA--

**Pre-removal Operation**
- Discharge of Refrigerant (Refer to P.24-19.)
- Removal of the Distributor Cap

**Post-installation Operation**
- Charging of Refrigerant (Refer to P.24-21.)
- @Adjustment of Compressor Drive Belt (Refer to P.24-23.)
- *Checking for Gas Leakage (Refer to P.24-15.)
- *Performance Test (Refer to P.24-16.)




20A0456

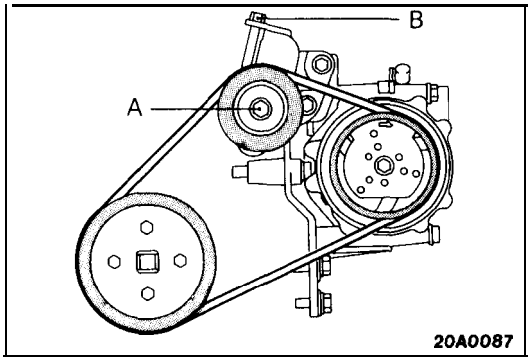
**Removal steps of compressor drive belt and tension pulley**

- ◆ ☒ 1. Compressor drive belt
  2. Tension pulley assembly installation bolt
  3. Tension pulley assembly
  4. Bolt
  5. Tension pulley
  6. Bolt
  7. Adjustment plate
  8. Tension pulley bracket

**Removal steps of compressor**

- ◆◆ 1. Compressor drive belt
  9. Magnetic clutch harness connector
- ◆◆ ● *10. Suction hose connection
- ◆◆ ◆◆ 11. Discharge hose connection
- ● a 12. O-rings
- ◆◆ ● + 13. Compressor
  14. Compressor bracket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ◆◆: Refer to "Service Points of Installation".
(4) N: Non-reusable parts.




## SERVICE POINTS OF REMOVAL N24SBACa

**1. REMOVAL OF COMPRESSOR DRIVE BELT**

(1) Loosen "A" for holding the tension pulley.
(2) Loosen bolt "B" for adjustment, and remove the compressor drive belt.

**10. DISCONNECTION OF SUCTION HOSE/ 11. DISCHARGE HOSE**

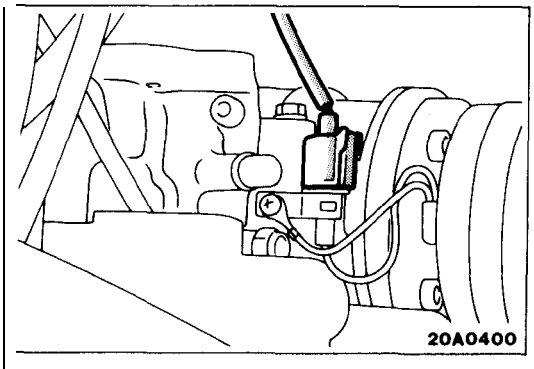
If the hoses are disconnected, cap the hoses with a blank plug to prevent entry of dust, dirt, and water.

**13. REMOVAL OF COMPRESSOR**

**Caution**
**Lay the towel on the brake tube to protect them. When install the compressor, do not damage the brake tubes. This work must be done carefully so as not to spill the compressor oil.**

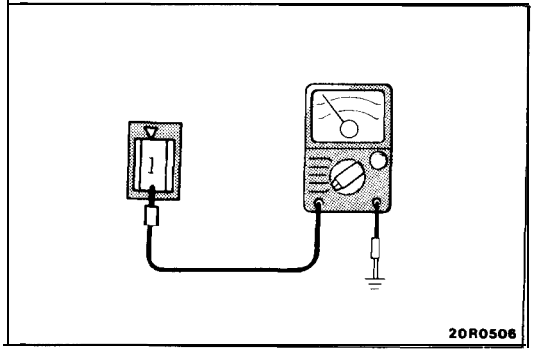
## INSPECTION N24SCAC

- Checking for heat damage of the tension pulley.
- Check for excessive play or deflection of the tension pulley.
- Check for unusual wear of the tension pulley.
- Check for hardening of the compressor drive belt.
- Check for unusual wear or abrasion of the compressor drive belt.

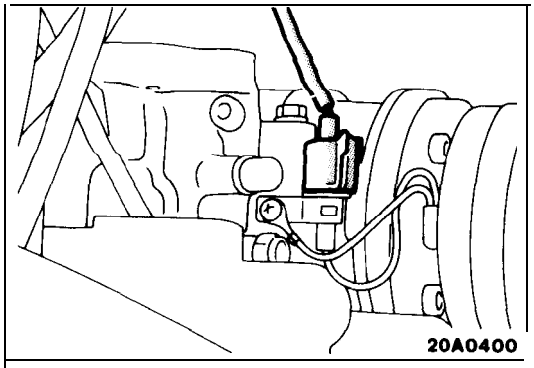



**CONTINUITY CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH**

(1) Disconnect the compressor's connector.

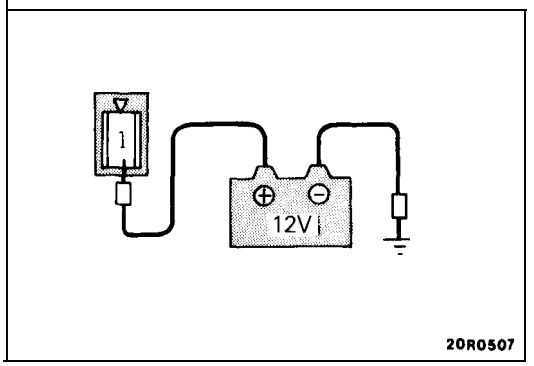



(2) Check to be sure that there is continuity between body ground and terminal ① at the compressor side.


20A0400

**OPERATION CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH**

(1) Disconnect the compressor's connector.



20R0507

(2) Connect terminal ① at the compressor side to the positive (+) terminal of the battery, and ground the negative (−) terminal of the battery to the compressor.
(3) The condition of the compressor's magnetic clutch can be considered satisfactory if the operation sound (a "click" sound) of the magnetic clutch can be heard when this check is made.

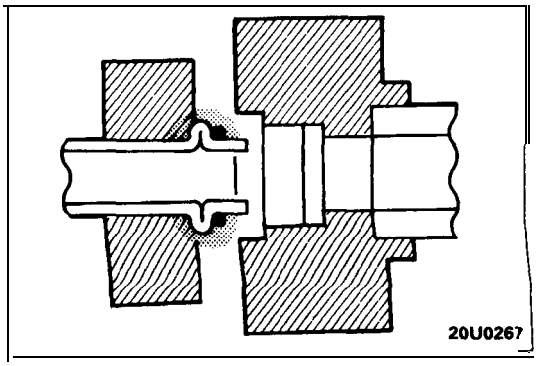
## SERVICE POINTS OF INSTALLATION N24SDADa

### 13. INSTALLATION OF COMPRESSOR

If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

(1) Measure the amount (X cc) of oil within the removed compressor.
(2) Wipe away (from the new compressor) the amount of oil calculated according to the following formula, and then install the new compressor.
New compressor oil amount 80 cc (4.9 cu.in.) – X cc = Y cc

NOTE
Y cc indicates the amount of oil in the refrigerant line, the condenser, the cooling unit, etc.


20U0267

### 12. CONNECTION OF O-RING/ 11. DISCHARGE HOSE/ 10. SUCTION HOSE

(1) Take care that the O-rings are not caught, crushed or cracked.
(2) Since the O-ring size of suction hose is different from that of discharge hose, be sure to connection correctly.

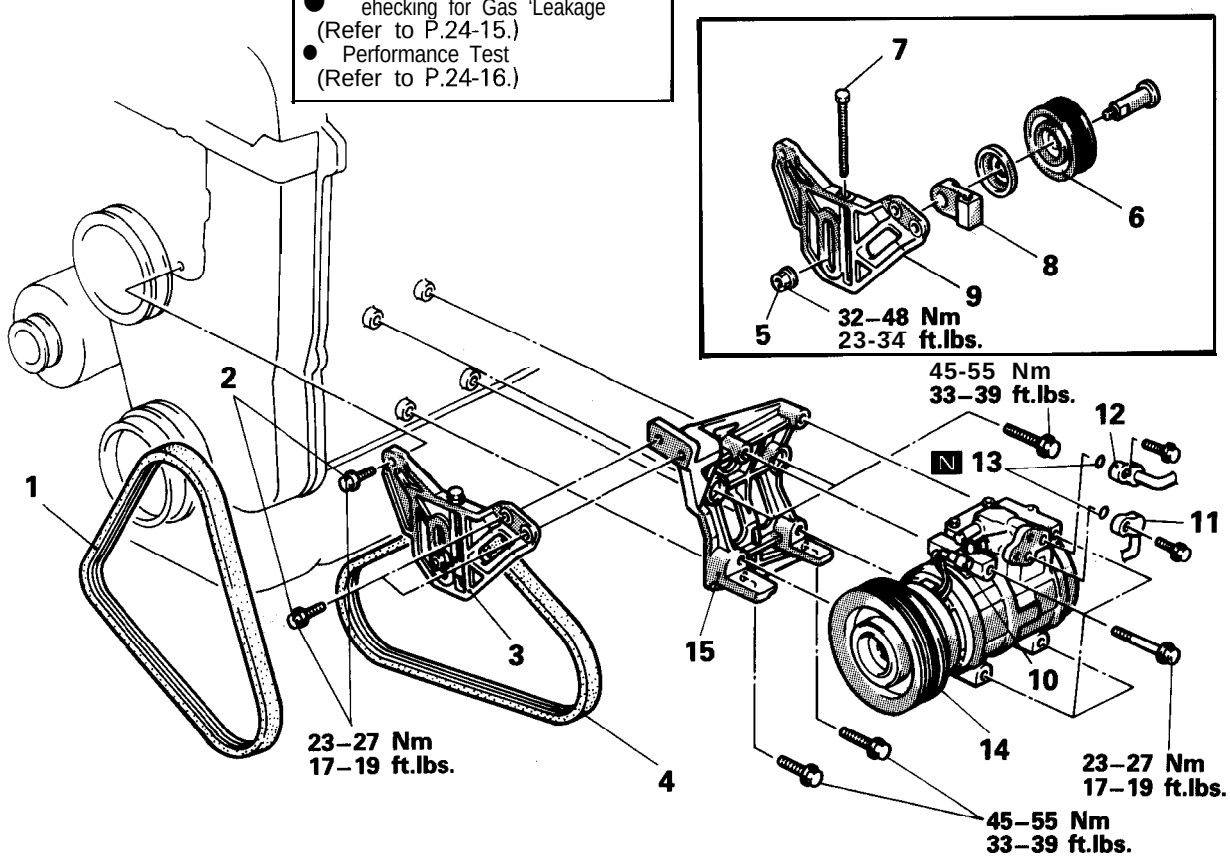
# COMPRESSOR <2.0L DOHC Engine>

## REMOVAL AND INSTALLATION

N24SA--

**Pre-removal Operation**
- ●Discharge of Refrigerant (Refer to P.24-19.)
- ● Removal of VSV Bracket on the Cowl Top <2.0L Turbo>
- *Disconnection of High-tension Cables and Connections for Ignition Coil etc.
- *Removal of Center Bearing Bracket Mounting Bolt <AWD> (Refer to GROUP 2–Drive Shaft.)

**Post-installation Operation**
- ●Installation of VSV Bracket <2.0L Turbo>
- *Installation of Center Bearing Bracket Mounting Bolt <AWD> (Refer to GROUP 2–Drive Shaft.)
- *Connection of High-tension Cables and Connections for Ignition Coil etc.
- ●Adjustment of Compressor Drive Belt (Refer to P.24-23.)
- ●Charging of Refrigerant (Refer to P.24-21.)
- ● ehecking for Gas 'Leakage (Refer to P.24-15.)
- ● Performance Test (Refer to P.24-16.)




20A0458

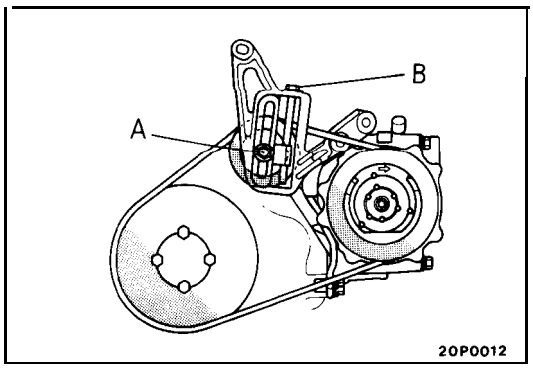
**Removal steps of compressor drive belt and tension pulley**

1. Alternator drive belt
◆◆ 2. Tension pulley assembly installation bolt
◆◆ 3. Tension pulley assembly
◆◆ 4. Compressor drive belt
5. Nut
6. Tension pulley
7. Bolt
8. Adjustment plate
9. Tension pulley bracket

**Removal steps of compressor**

1. Alternator drive belt
● ☒ 2. Tension pulley assembly installation bolt
● + 3. Tension pulley assembly
● + 4. Compressor drive belt
10. Magnetic clutch harness connector
◆◆ ● * 11. Suction hose connection
● + 12. Discharge hose connection
● + 13. O-rings
◆◆ ● * 14. Compressor
15. Compressor bracket

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Removal".
(3) ● +: Refer to "Service Points of Installation".
(4) N: Non-reusable parts.




## SERVICE POINTS OF REMOVAL N24SBAD

**2. REMOVAL OF TENSION PULLEY ASSEMBLY., INSTALLATION BOLTS**

(1) After loosening nut A (for holding the tension pulley), loosen bolt B (for adjustment) and reduce the tension of the compressor drive belt to zero.
(2) Remove the tension pulley assembly installation bolts, and then remove the tension pulley assembly together with the compressor drive belt.

**11. DISCONNECTION OF SUCTION HOSE / 12. DISCHARGE HOSE**

Refer to P.24-38.

**14. REMOVAL OF COMPRESSOR**

Refer to P.24-38.

## INSPECTION N24SCAD

Refer to P.24-38.

**CONTINUITY AND OPERATION CHECK OF THE COMPRESSOR'S MAGNETIC CLUTCH**

Refer to P.24-38.

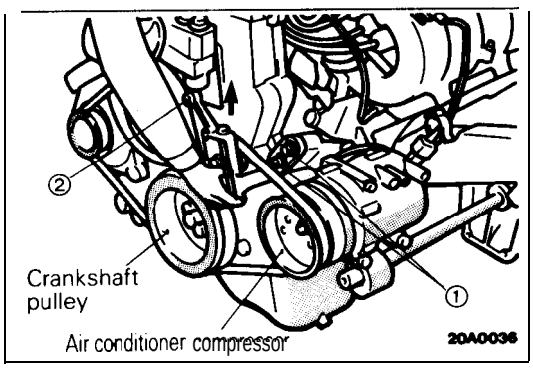
## SERVICE POINTS OF INSTALLATION N24SDAEa

**14. INSTALLATION OF COMPRESSOR**

Refer to P.24-39.

**13. CONNECTION OF O-RING / 12. DISCHARGE HOSE/ 11. SUCTION HOSE**

Refer to P.24-39.



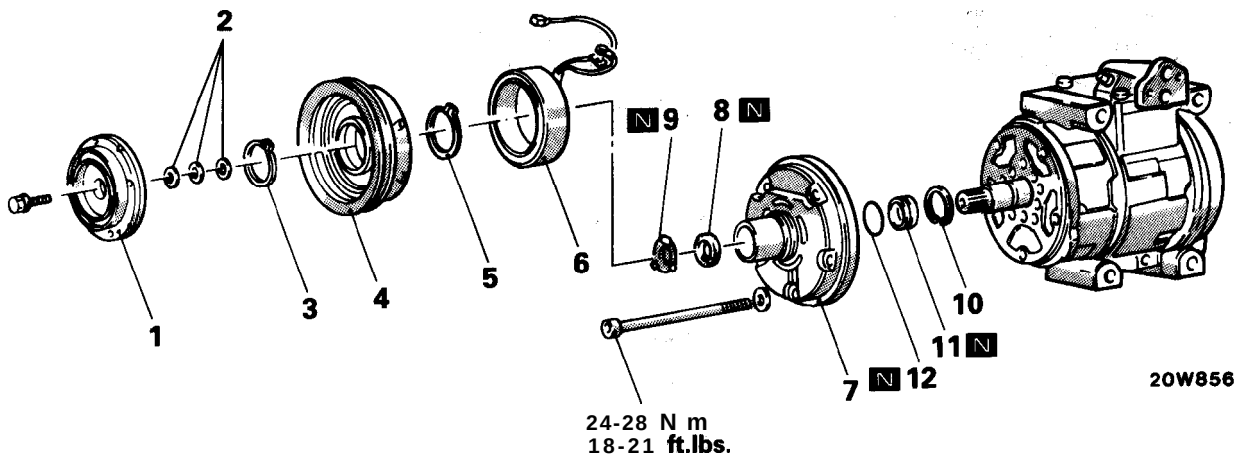

**4. INSTALLATION OF COMPRESSOR DRIVE BELT/3. TENSION PULLEY ASSEMBLY**

Attach the compressor drive belt to the crankshaft pulley and the compressor's pulley, and then install the tension pulley assembly.

NOTE
(1) Hold the tension pulley assembly so that the compressor drive belt does not slip out of place; and while doing so install the tension pulley assembly.
(2) Install the tension pulley assembly installation bolts in the ① → ② sequence.

# COMPRESSOR
## DISASSEMBLY AND REASSEMBLY

N24SE--



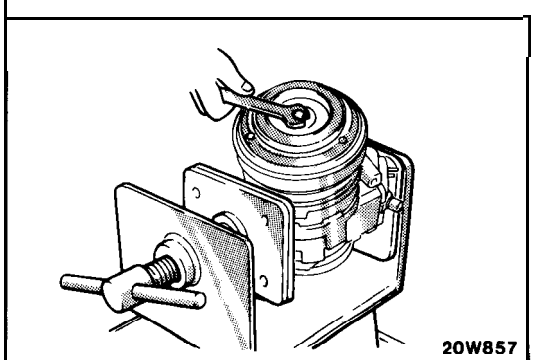

**Magnetic clutch disassembly steps**

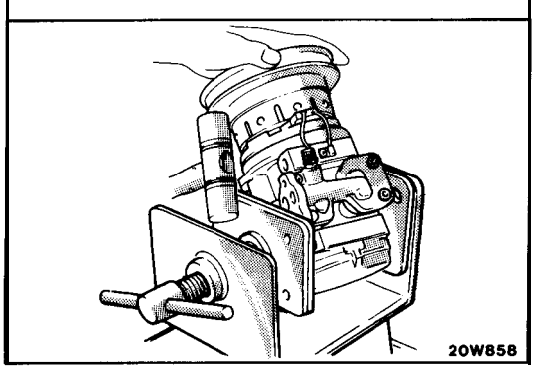
◆◆ ◆◆ 1. Clutch hub
2. Shim
3. Snap ring
◆◆ 4. Rotor
5. Snap ring
● 4 6. Clutch coil

**Shaft seal disassembly steps**

● + 7. Front housing
◆◆ 8. Felt
9. Felt holder
10. Snap ring
◆◆ ● + 11. Shaft seal
12. O-ring

NOTE
(1) Reverse the disassembly procedures to reassemble.
(2) ◆◆: Refer to "Service Points of Disassembly".
(3) ◆◆: Refer to "Service Points of Reassembly".
(4) N: Non-reusable parts.




## SERVICE POINTS OF DISASSEMBLY

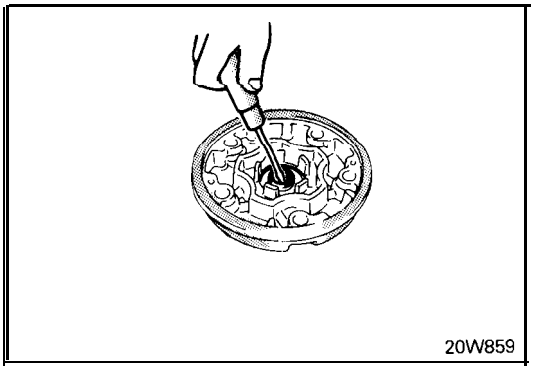
N24SFAC

1. REMOVAL OF CLUTCH HUB

(1) Fix the compressor with a vise. At this time, the rear housing of the compressor must be in contact with the vise.
(2) If the clutch hub cannot be pulled off by hand, screw in an 8 mm (.315 in.) completely threaded bolt so as to raise the clutch hub so it can be removed.

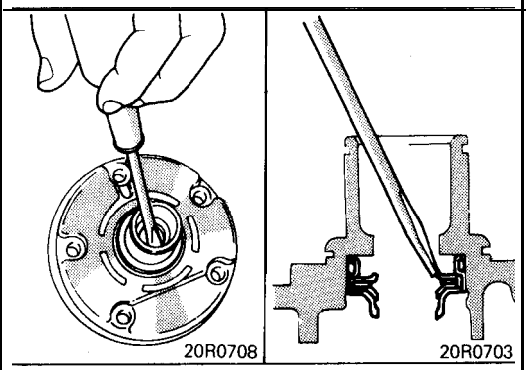
4. REMOVAL OF ROTOR

Using a plastic hammer, lightly tap the rotor off the shaft.


20W859

**8. REMOVAL OF FELT**

Using a flat-tip ⊖ screwdriver, remove the felt from the front housing.


20R0708 20R0703

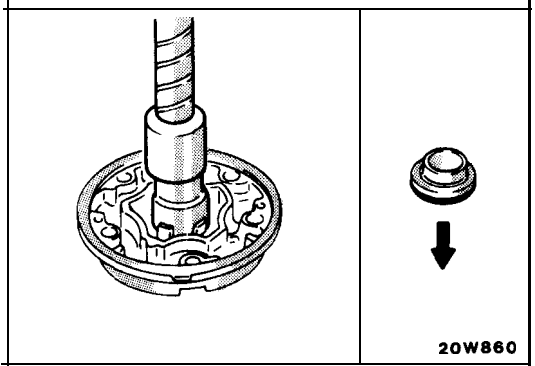
**11. REMOVAL OF SHAFT SEAL**

Using a flat-tip ⊖ screwdriver, remove the shaft seal from the front housing.

## INSPECTION N24TGAH

- Check the surface of the clutch hub for scoring or bluing.
- Check the surface of the rotor for scoring or bluing.
- Check the sealing surfaces for cracks, scratches and deformation.
- Check the front housing for cracks or scoring on the sealing surfaces.
- Check the compressor shaft for scoring.

## SERVICE POINTS OF REASSEMBLY N24SHAC


20W860

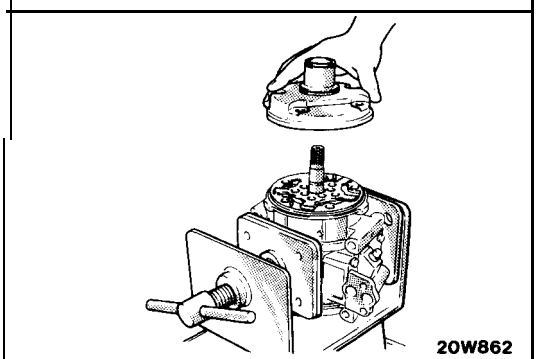
**11. INSTALLATION OF SHAFT SEAL**

(1) Lubricate the shaft seal with specified compressor oil.

**Specified compressor oil:**
**DENSO OIL 6 or SUNISO 5GS**

(2) Set the shaft seal to the front housing so that the projection side of the center ring is at the shaft seal side.

(3) Using a 21 mm (.83 in,) socket, install the shaft seal.

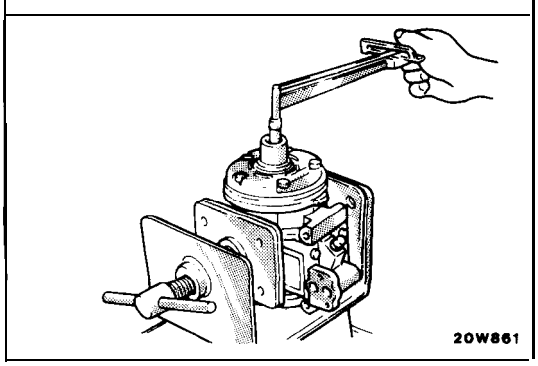

20W862

**7. INSTALLATION OF FRONT HOUSING**

(1) Apply the specified compressor oil on the shaft.

**Specified compressor oil:**
**DENSO OIL 6 or SUNISO 5GS**

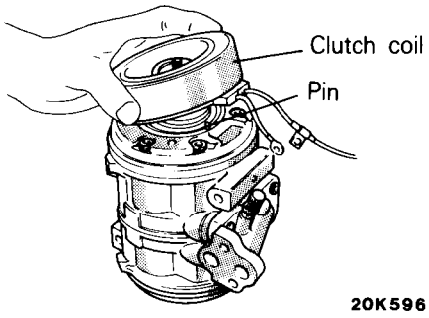
(2) Taking care to prevent injuring the lip area of the shaft tool, mount the front housing.

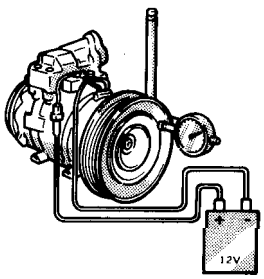

20W861

(3) Mount the bolt on the shaft, and then measure the shaft starting torque.

**Standard value: 5.0 Nm (43 in.lbs.) or less**

(4) Remove the bolt from the shaft.




### 6. INSTALLATION OF CLUTCH COIL

The clutch coil must be aligned with the pin in, the compression housing.

### 1. INSTALLATION OF CLUTCH HUB

(1) Connect the magnetic clutch to the battery.
(2) The clutch hub will be attracted to and fit closely to the rotor.
(3) Use a shim(s) to adjust so that the -amount of movement of the clutch hub is as described below.

**Standard value: 0.35–0.65 mm (.014–.026 in.)**

NOTE
Remove clearance adjusting shims to decrease clutch clearance. Add shims selected from the following table to increase clutch celarance.

**Clearance Adjustment Shims**

| Part No. | Thickness |
|---|---|
| 949013–7480 | 0.1 mm (.004 in.) |
| 949013–7680 | 0.2 mm (.008 in.) |
| 949013–7510 | 0.5 mm (.020 in.) |

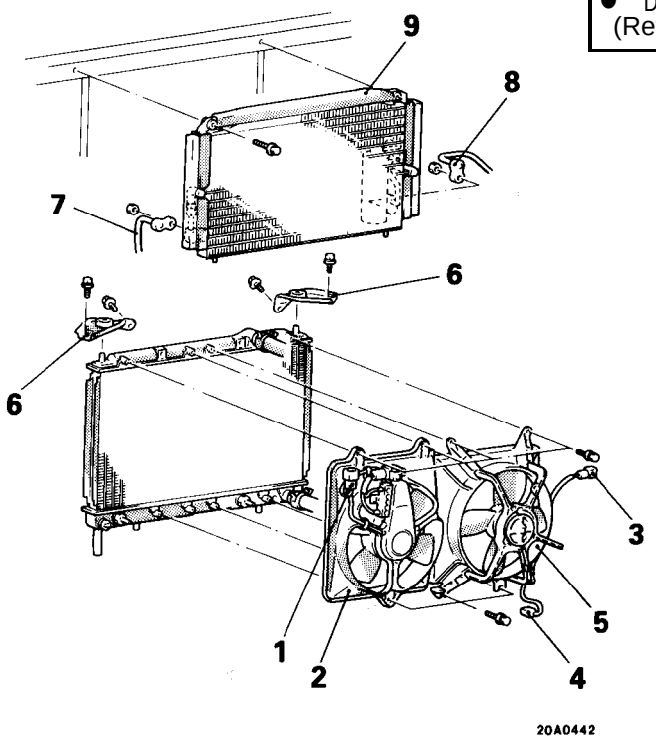
# CONDENSER AND CONDENSER FAN MOTOR

## REMOVAL AND INSTALLATION

N24TA--

**Pre-removal Operation of Condenser**
- Discharge of Refrigerant (Refer to P.24-19.)

**Post-installation Operation of Condenser**
- charging of Refrigerant (Refer to P.24-21.)
- *Checking for Gas Leakage (Refer to P.24-15.)
- Performance Test (Refer to P.24-16.)




**Removal of condenser**
1. Condenser fan motor connecter <Except 1.8L>
2. Condenser fan motor assembly <Except 1.8L>
3. Radiator fan motor connecter <2.0L·Turbo>
4. Thermo sensor connecter <2.0L·Turbo>
5. Radiator fan motor assembly <2.0L·Turbo>
6. Upper insulator
7. Discharge pipe connection
8. Liquid pipe connection
9. Condenser

**Removal of condenser fan motor**
1. Condenser fan motor connecter
2. Condenser fan motor assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) : Refer to "Service Points of Removal".
(3) 4 : Refer to "Service Points of Installation"

## SERVICE POINTS OF REMOVAL

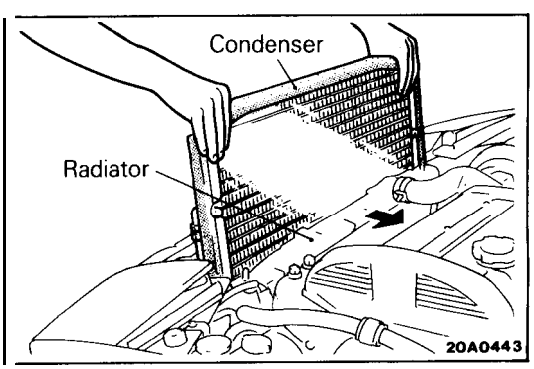
N24TBAF

### 5. REMOVAL OF RADIATOR FAN MOTOR ASSEMBLY

To remove the radiator fan motor assembly, pull it out, keeping the radiator lifted.

### 7. DISCONNECTION OF DISCHARGE PIPE/8. LIQUID PIPE

If the hoses are disconnected, cap the hoses with a blank plug to prevent entry of dust, dirt, and water.



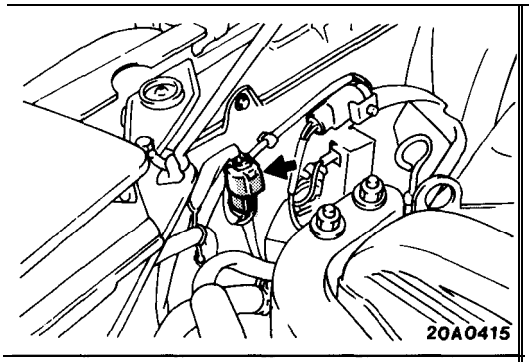

### 9. REMOVAL OF CONDENSER

Move the radiator toward the engine, and then remove the condenser upward.

## INSPECTION

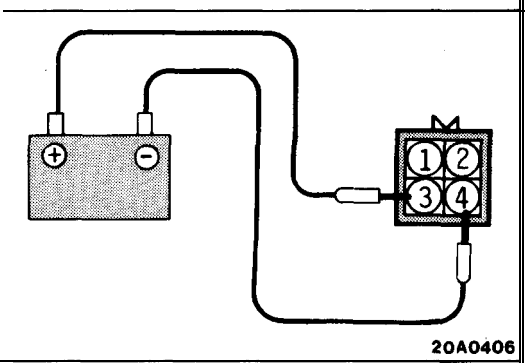
N24TCAG

- Check the condenser fin for crushing or other damage.,
- Check the condenser's high-pressure hose and pipe installation parts for damage or deformation.
- Check the condenser fan shroud for damage.

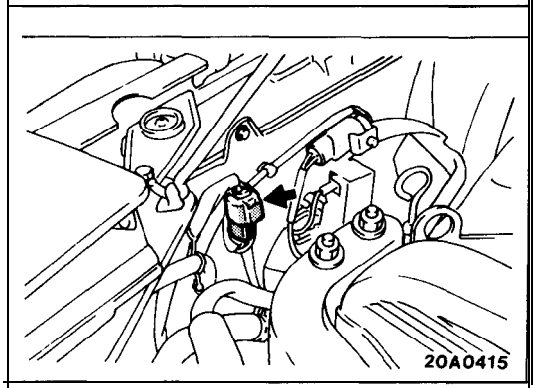



**CONDENSER FAN MOTOR CHECK**

(1) Disconnect the connection of the connector for the condenser fan motor.

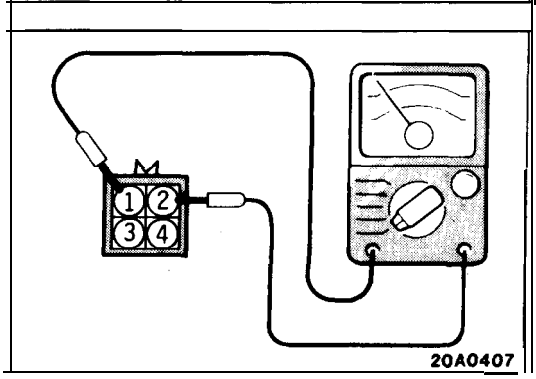



(2) Check to be sure that the condenser fan motor operates when battery voltage is applied to terminal ③ and terminal ④ is grounded.




**RESISTOR CHECK**

(1) Disconnect the connection of the connector for the resistor, and then measure the resistance between terminals.




(2) The condition can be considered satisfactory if the measured resistance is within the range noted below.

**Standard value: 0.26–0.32 Ω**

## SERVICE POINTS OF INSTALLATION

N24TDAE

**8. CONNECTION OF LIQUID PIPE/7. DISCHARGE PIPE**

Refer to P.24-23.

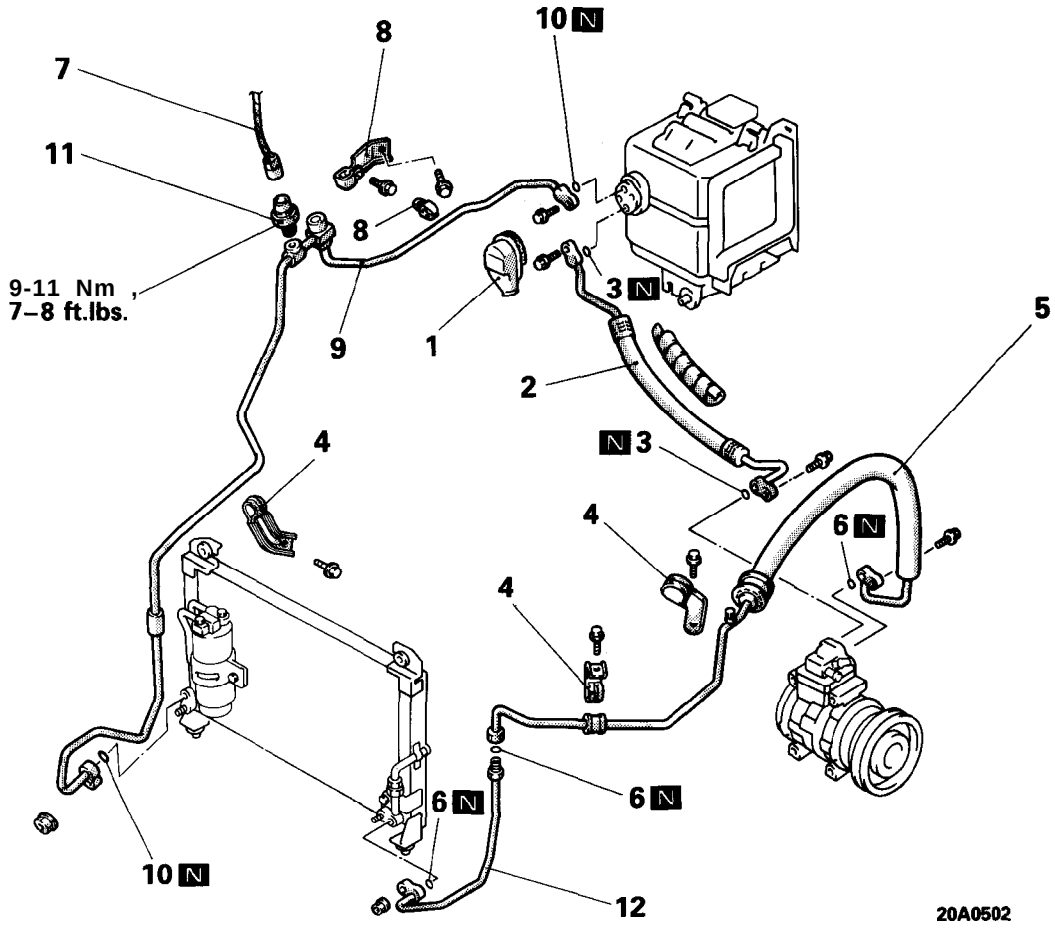
# REFRIGERANT LINE

## REMOVAL AND INSTALLATION

N24UA--

**Pre-removal Operation**
*Discharge of the Refrigerant (Refer to P.24-19.)
@Removal of Battery and Reserve Tank
@Removal of Air-cleaner and Air-cleaner Bracket (Refer to GROUF 1 1 -Air-cleaner.)

**Post-installation Operation**
●Installation of Air-cleaner Bracket and Air-cleaner (Refer to GROUP 11 -Air-cleaner.)
● installation of Battery and Reserve tank
●Charging of Refrigerant (Refer to P.24-21.)
@Checking for Gas Leakage (Refer to P.24-15.)
@Performance Test (Refer to P.24-16.)




**Removal steps**

1. Flange cover
◆◆ 2. Suction hose
3. O-ring
4. Clamp
◆◆ 5. Discharge hose
6. O-ring
7. Dual pressure switch connector
8. Clamp
◆◆ 9. Liquid pipe
10. O-ring
11. Dual pressure switch
12. Discharge pipe

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Points of Installation".
(3) N: Non-reusable parts.
(4) For information concerning the O-ring indicated by the * symbol, refer to P.24-23.
(5) Plug the disconnected hose, pipe, etc. to prevent dust, dirt, foreign material, etc. from entering the openings.

## SERVICE POINTS OF INSTALLATION N24UDADa

**9. INSTALLATION OF LIQUID PIPE**

**Caution**

**1. Keep the gap more than 5 mm (.2 in.) between liquid pipe and clutch tube.**

**2. Keep the gap more than 15 mm (.6 in.) between liquid pipe connected condenser and body.**

**5. INSTALLATION OF DISCHARGE HOSE**

**Caution**

**Keep the gap more than 25 mm (1 in.) between accelerator cable and discharge hose.**

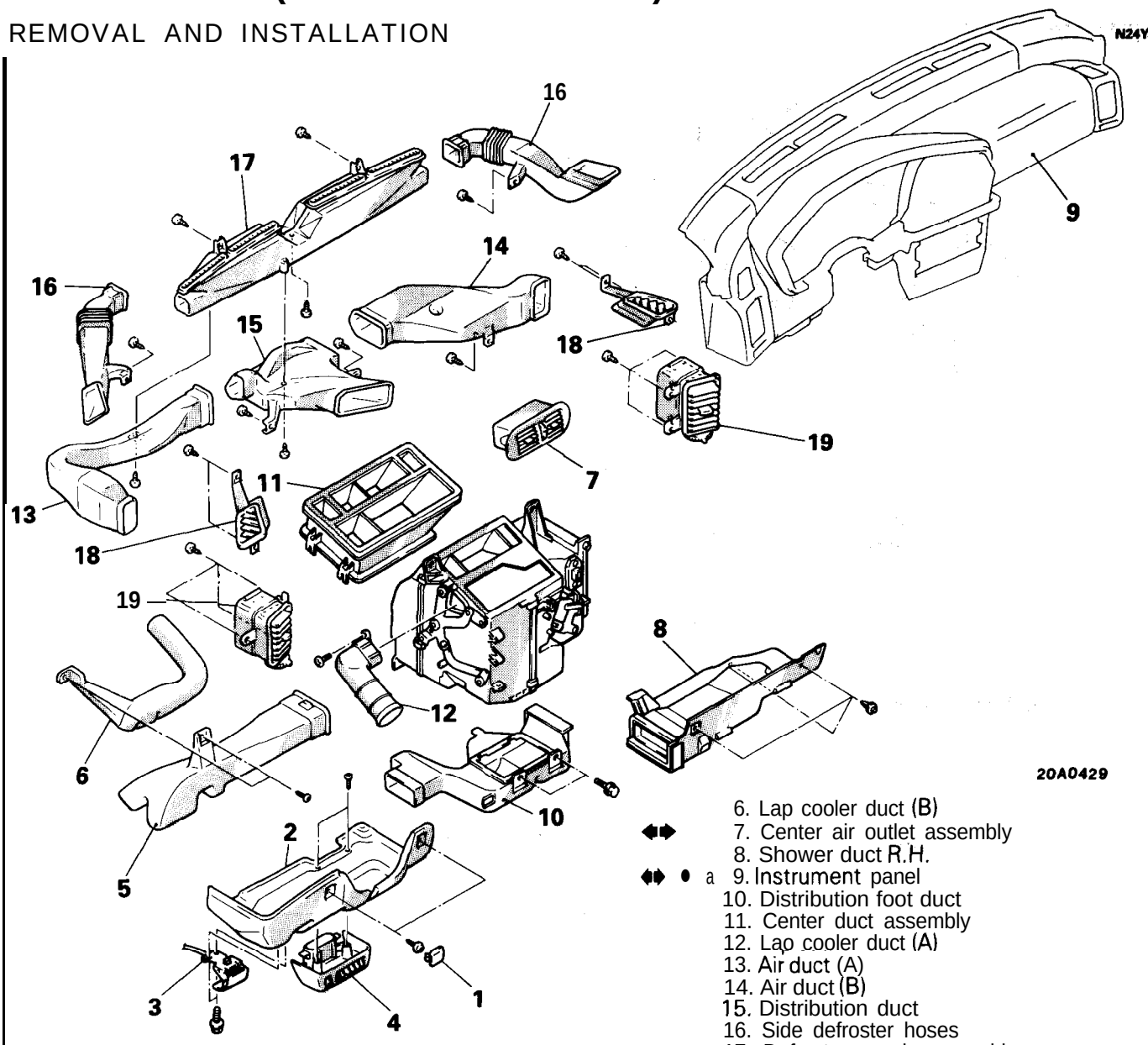
**2. INSTALLATION OF SUCTION HOSE**

**Caution**

**Make sure that suction hose does not interfere with heater hose and mission cable.**

# VENTILATORS (INSTRUMENT PANEL)

## REMOVAL AND INSTALLATION




**Removal steps**

1. Plug
2. Knee protecter
3. Hood lock release handle
4. Lap cooler grille
5. Shower duct L.H.
6. Lap cooler duct (B)
7. Center air outlet assembly
8. Shower duct R.H.
9. Instrument panel
10. Distribution foot duct
11. Center duct assembly
12. Lap cooler duct (A)
13. Air duct (A)
14. Air duct (B)
15. Distribution duct
16. Side defroster hoses
17. Defroster nozzle assembly
18. Side defroster grilles
19. Side air outlet assembly

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● *: Refer to "Service Points of Removal".
(3) ● a: Refer to "Service Points of Installation".

## SERVICE POINTS OF REMOVAL N24YBAG

### 7. REMOVAL OF CENTER AIR OUTLET ASSEMBLY/ 9. INSTRUMENT PANEL

Refer to GROUP 23–Instrument Panel.

## SERVICE POINTS OF INSTALLATION

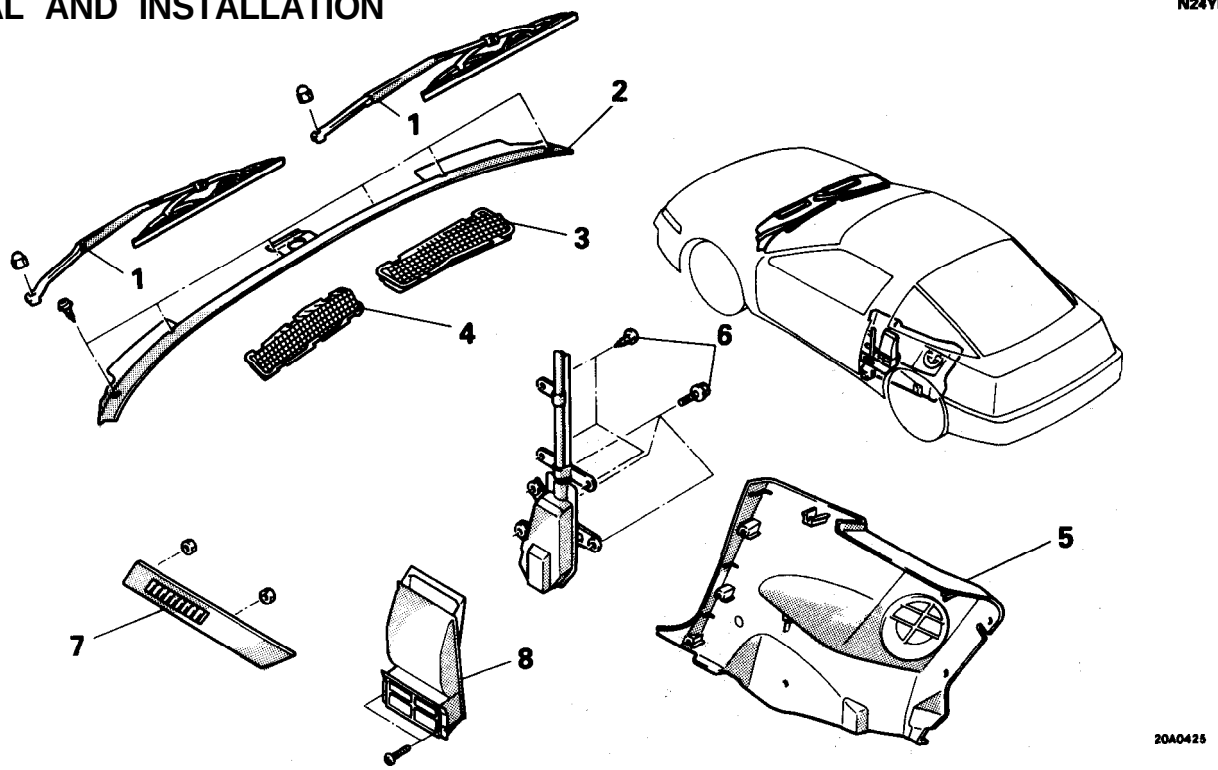
### 9. INSTALLATION OF INSTRUMENT PANEL

Refer to GROUP 23–Instrument Panel.

# VENTILATORS (AIR INLET AND AIR OUTLET)

## REMOVAL AND INSTALLATION

N24YD--



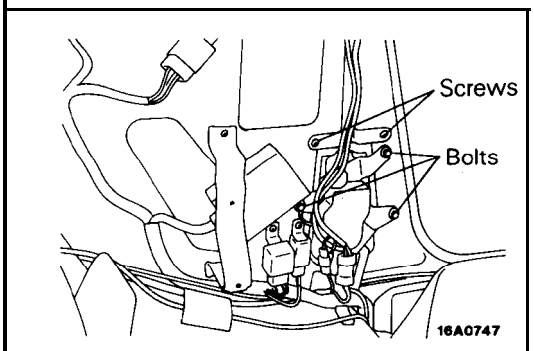

**Inlet garnish removal steps**

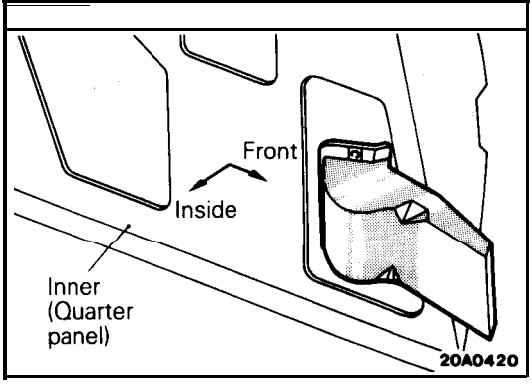
- ⬮ + 1. Windshield wiper arms
  2. Front deck garnish
  3. Inlet garnish (right)
  4. Inlet garnish (left)

**Rear ventilation removal steps**

- ⬮ ☒ 5. Quarter trim
- ◆◆ 6. Automatic seat belt motor fastening bolts and screws
  7. Side protect moulding quarter
- ⬮ ☒ 8. Rear ventilation duct

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ◆◆: Refer to "Service Point of Removal".
(3) ● *: Refer to "Service Points of Installation"




## SERVICE POINTS OF REMOVAL

N24YEAC

**5. REMOVAL OF QUARTER TRIM**

Refer to GROUP 23–Trims.

**6. REMOVAL OF AUTOMATIC SEAT BELT MOTOR FASTENING BOLTS AND SCREWS**

Remove the bolts and screws which fasten the automatic seat belt motor, and slide the motor for working.

**8. REMOVAL OF REAR VENTILATION DUCT**

For removal and installation, pass the rear ventilator duct through the opening of the automatic seat belt motor as illustrated.

## SERVICE POINTS OF INSTALLATION

**1. INSTALLATION OF WINDSHIELD WIPER ARMS**

Refer to GROUP 8–Windshield wipers.

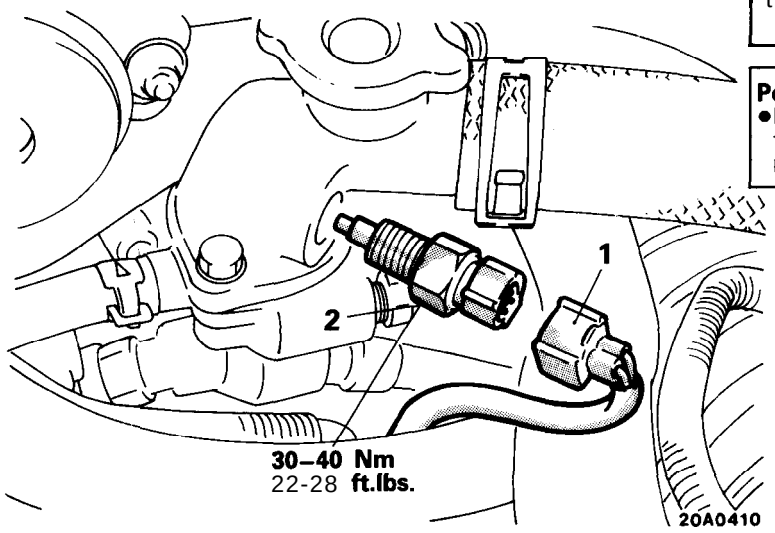
# ENGINE COOLANT TEMPERATURE SWITCH <2.0L DOHC Engine>

## REMOVAL AND INSTALLATION

N24XA--

**Pre-removal Operation**
- Draining of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)

**Post-installation Operation**
- Refilling of Engine Coolant (Refer to GROUP 7–Service Adjustment Procedures.)




**Removal steps**

1. Engine coolant temperature switch connector (2-pin)
◆◆ 2. Engine coolant temperature switch (always-closed type)

NOTE
(1) Reverse the removal procedures to reinstall.
(2) ● 4 : Refer to "Service Points of Installation".

## INSPECTION

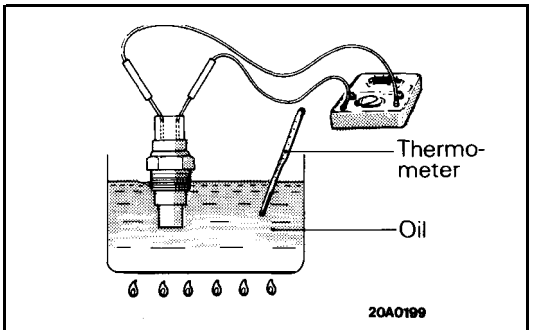
N24XCAA

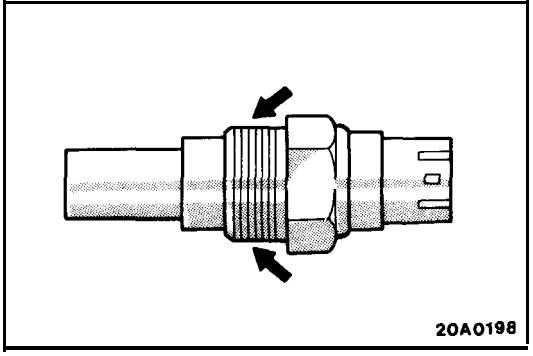
**ENGINE COOLANT TEMPERATURE SWITCH (ALWAYS-CLOSED TYPE CHECK)**

(1) Remove the engine coolant temperature switch from the water outlet fitting.
(2) Immerse the engine coolant temperature switch in oil and heat by a gas stove or similar method so as to increase the oil temperature.
(3) Check to be sure that the engine coolant temperature switch is switched OFF when the oil temperature reaches the standard value.

**Standard value: 112–118°C (233–244°F)**

**Caution**
**Use engine oil for this test; stir it well while heating, and do not heat more than necessary.**




## SERVICE POINTS OF INSTALLATION

N24XDAA

**2. INSTALLATION OF ENGINE COOLANT TEMPERATURE SWITCH (ALWAYS-CLOSED TYPE)**

Apply a coating of the specified sealant to the threaded parts and then install the engine coolant temperature switches.

**Specified sealant:** MOPAR **Part No. 4318034** or **equivalent**

**NOTES**

# EMISSION CONTROL SYSTEMS

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N25AA--


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# SPECIFICATIONS

## GENERAL SPECIFICATIONS

N25CA--

| Items | Specifications |
|---|---|
| Crankcase emission control system | Closed type with positive crankcase ventilation valve" |
| Evaporative emission control system<br>Canister | Canister storage type<br>Charcoal type |
| Exhaust emission control system<br>Exhaust gas recirculation system<br>EGR valve <Except Federal and Canada-l .8L Engine><br>Thermo valve <Federal and Canada–2.0L DOHC Engine><br>EGR temperature sensor <California><br>EGR control solenoid valve <California><br>Catalytic converter<br>Location | <br><br>Vacuum-activated diaphragm type<br>Bimetal type<br>Thermistor type<br>Duty cycle solenoid valve<br>Monolith type<br>Under floor |

## SERVICE SPECIFICATIONS

N25CB--

| Items | Specifications |
|---|---|
| Purge-control solenoid valve coil resistance Ω | 36-44 [at 20°C (68°F)] |
| Thermo valve closing temperature °C (°F) | 65 (149) |
| EGR temperature sensor resistance kΩ | 60–83 [at 50°C (122°F)]<br>11-14 [at 100°C (212°F)] |
| EGR control solenoid valve coil resistance Ω | 36-44 [at 20°C (68°F)] |

## TORQUE SPECIFICATIONS

N25CC--

| Items | Nm | ft.lbs. |
|---|---|---|
| Positive crankcase ventilation valve | 8-12 | 6-8.5 |
| EGR valve installation bolt | | |
| <Federal and Canada-l .8L Engine> | 10–15 | 7.2–10 |
| <2.0L DOHC Engine> | 15-22 | 10–15.5 |
| Thermo valve <Federal and Canada–2.0L DOHC Engine> | 20–40 | 15–30 |
| EGR temperature sensor | 10–12 | 7.3-8.6 |

## SEALANT

N25CE--

| Items | Specified sealant |
|---|---|
| Thermo valve thread portion | MOPAR Part No. 4318034 or equivalent |

# TROUBLESHOOTING

N25EA--

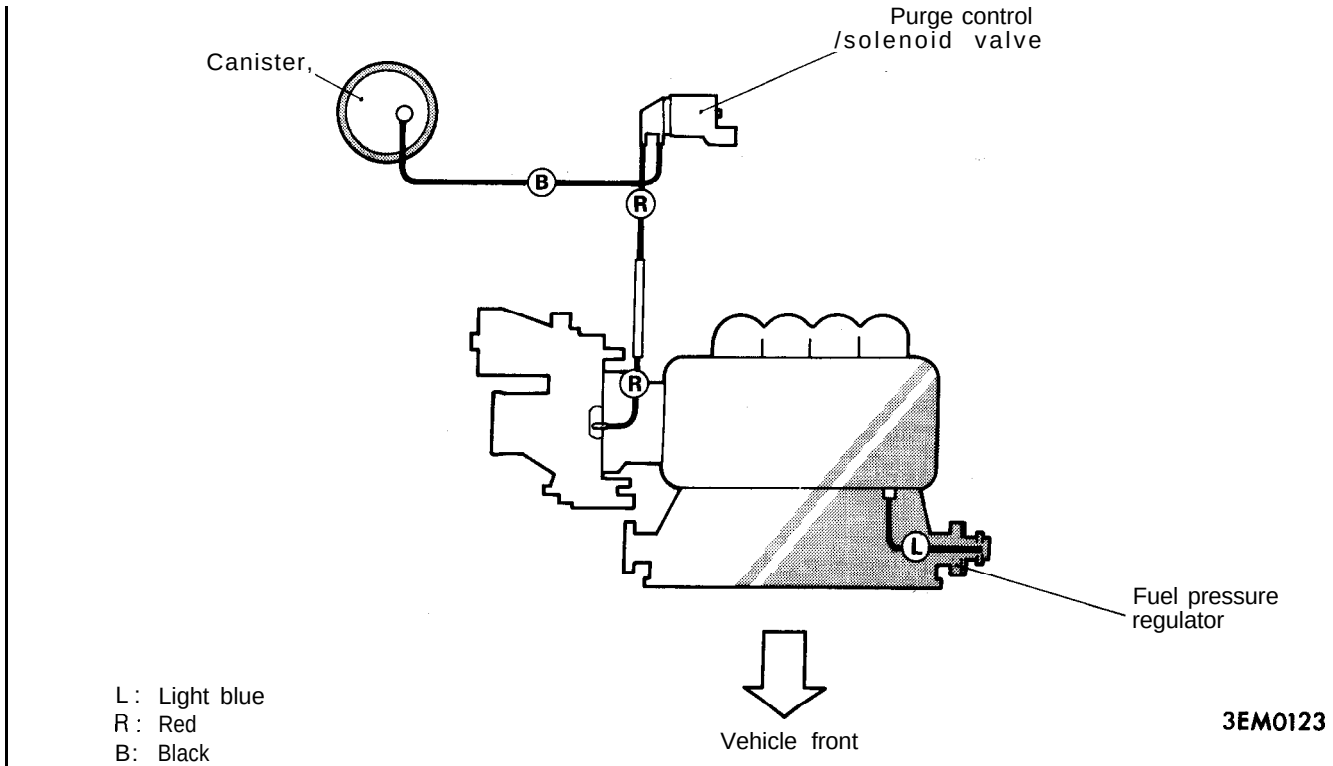
| Symptom | Probable cause | Remedy |
|---|---|---|
| Engine will not start or hard to start | Vacuum hose disconnected or damaged<br>The EGR valve is not closed<br>Malfunction of the purge control solenoid valve | Repair or replace |
| Rough idle or engine stalls | The EGR valve is not closed.<br>Vacuum hose disconnected or damaged | Repair or replace |
| | Malfunction of the positive crankcase ventilation valve | Replace |
| | Malfunction of the purge control system | Check the system; if there is a problem, check its component parts |
| Engine hesitates or poor acceleration | Malfunction of the exhaust gas recirculation system | Check the system; if there is a problem, check its component parts |
| Excessive oil consumption | Positive crankcase ventilation line clogged | Check positive crankcase ventilation system |
| Poor fuel mileage | Malfunction of the exhaust gas recirculation system | Check the system; if there is a problem, check its component parts |

# VACUUM HOSES

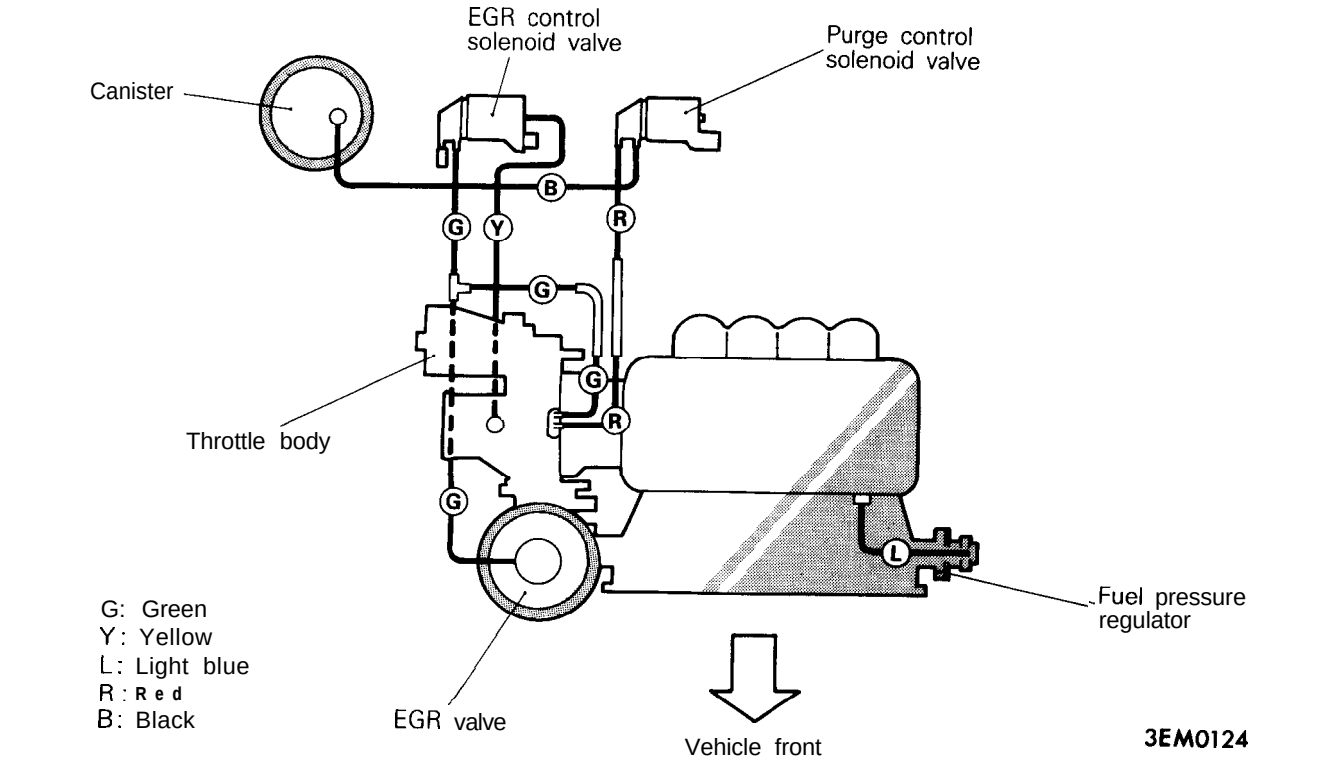
M17JA--

## VACUUM HOSES ROUTING

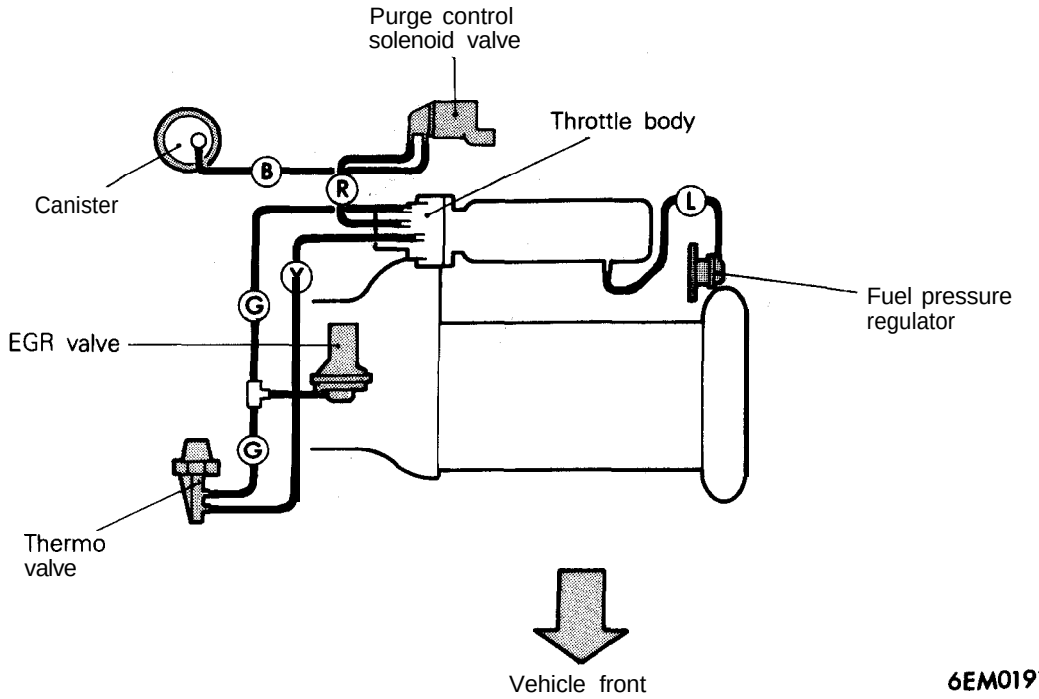
**<Federal and Canada- 1.8L Engine>**




**<California– 1.8L Engine>**

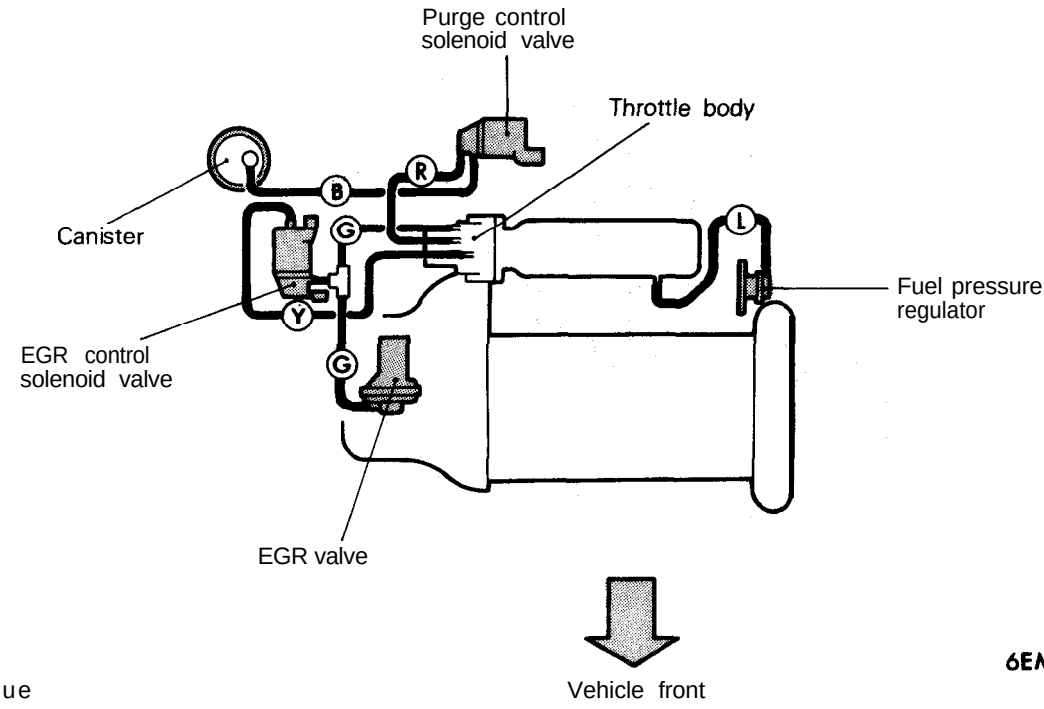


**<Federal and Canada–2.0L DOHC Engine Non-Turbo>**



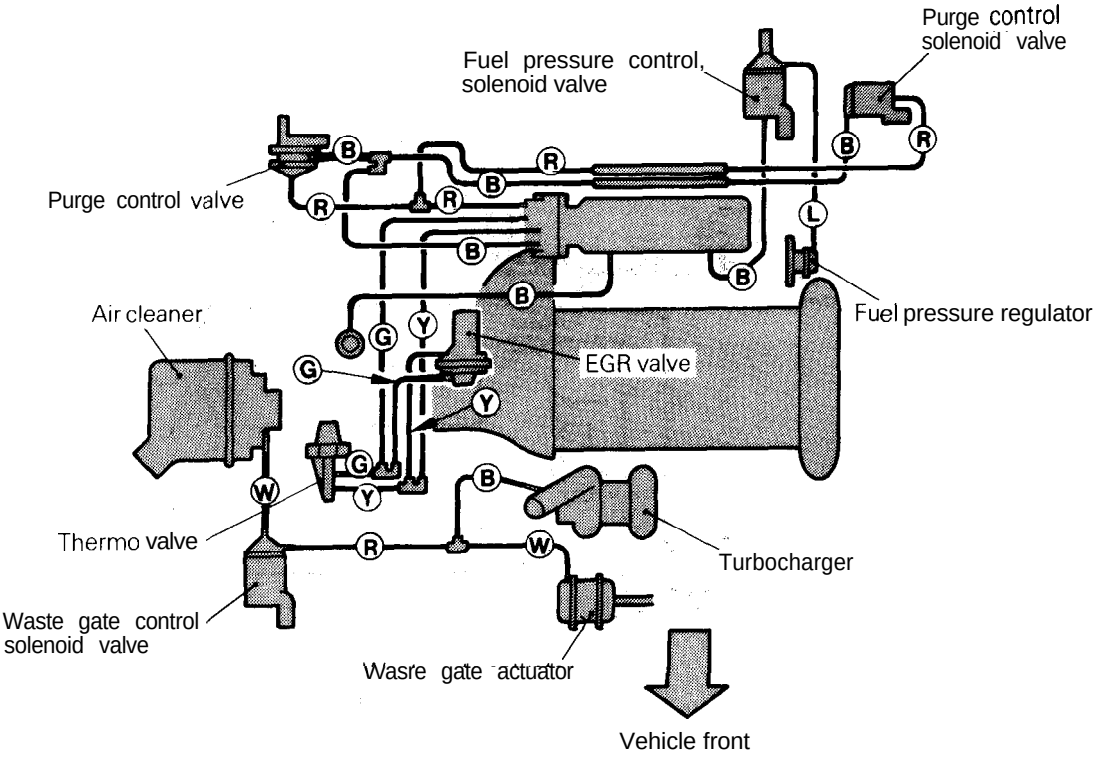

G: Green
Y: Yellow
L: Light blue
R: Red
B: Black

**<California–2.0L DOHC Engine Non-Turbo>**




G: Green
Y: Yellow
L: Light blue
R: Red
B: Black

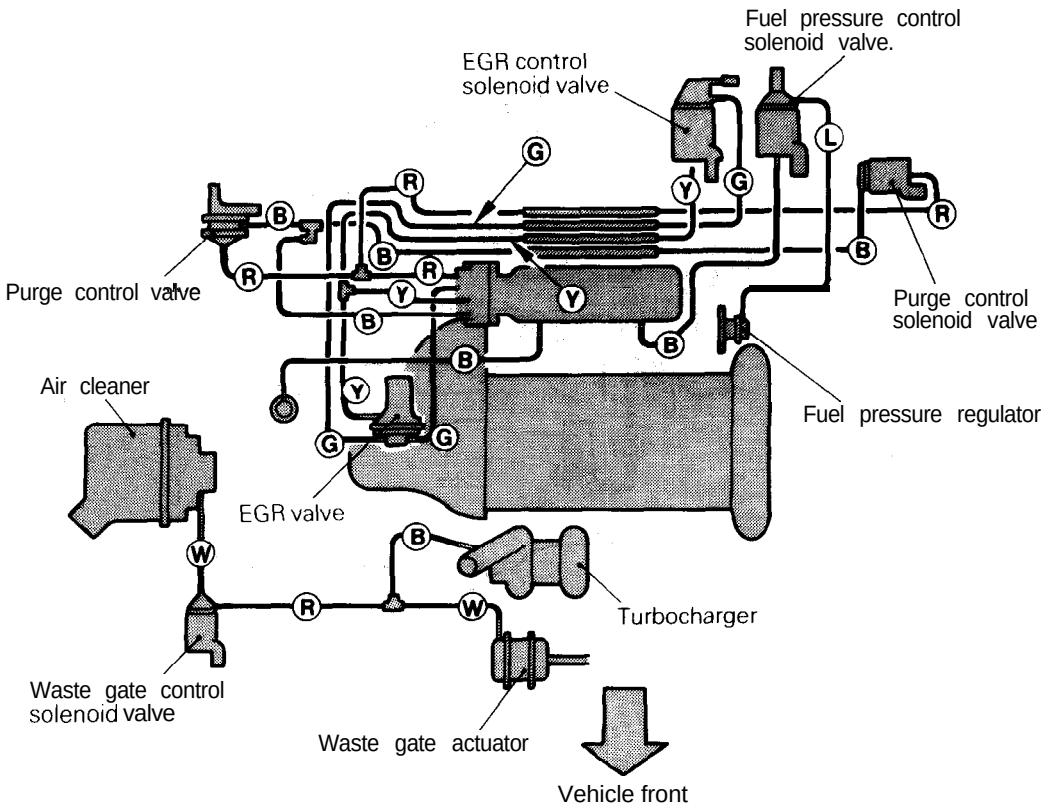
**<Federal and Canada–2.0L DOHC Engine Turbo>**




G: Green
Y: Yellow
L: Light blue
R: Red
B: Black
W: White

6EM0222

**<California–2.0L DOHC Engine Turbo>**




G: Green
Y: Yellow
L: Light blue
R: Red
B: Black
W: White

6EM0223

## INSPECTION N25JCAD

(1) Referring to the VACUUM HOSES ROUTING, confirm that the vacuum hoses are properly connected.
(2) Check the hoses for irregularities (disconnection, looseness, etc.) and confirm that there is no breakage or damage.

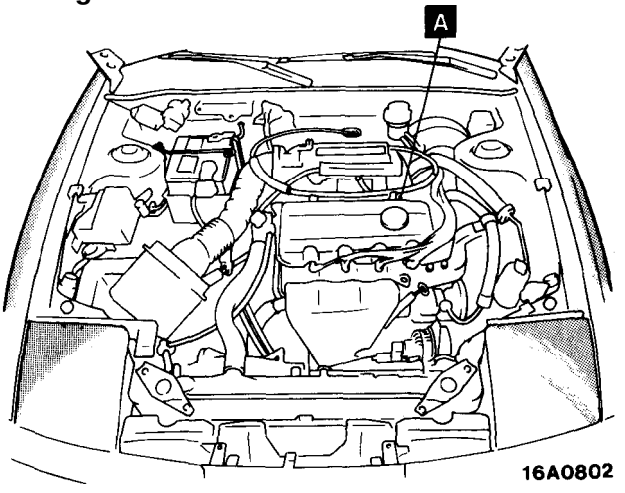
## INSTALLATION N25JDAD

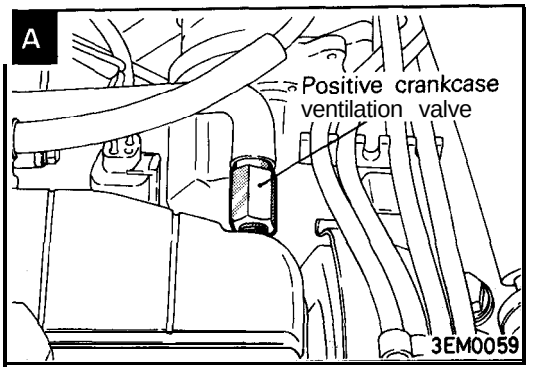
(1) When connecting a hose, firmly press it onto the nipple.
(2) Referring to the VACUUM HOSES ROUTING, connect the hoses correctly.

# CRANKCASE EMISSION CONTROL SYSTEM N25IA--

## COMPONENTS LOCATION

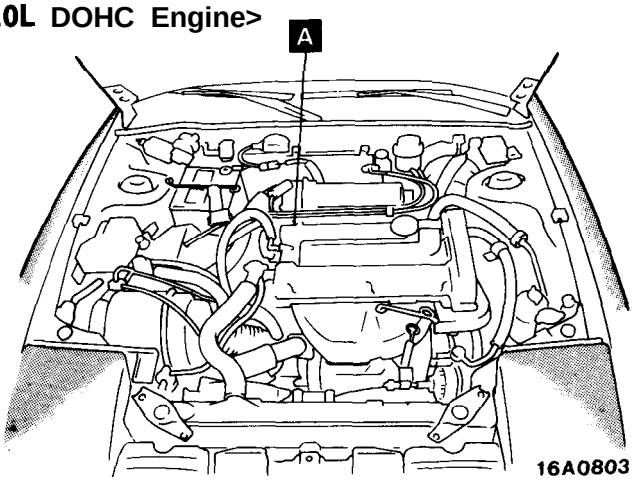
**<1.8L Engine>**

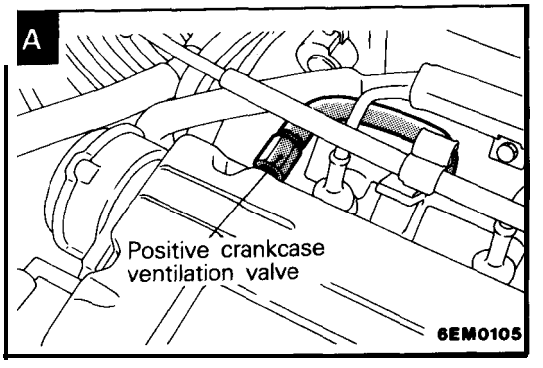


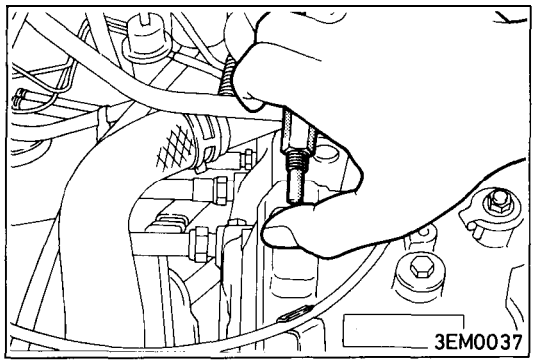

| Name | Symbol |
|---|---|
| Positive crankcase ventilation valve | A |

**<2.0L DOHC Engine>**




| Name | Symbol |
|---|---|
| Positive crankcase ventilation valve | A |



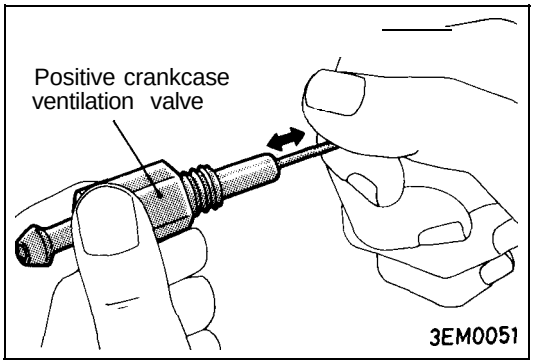

## CRANKCASE VENTILATION SYSTEM INSPECTION

N25IAAH

(1) After disconnecting the ventilation hose from the positive crankcase ventilation valve, disconnect the positive crankcase ventilation valve from the rocker cover, and reconnect the positive crankcase ventilation valve to the ventilation hose.
(2) Idle engine, put finger on the opening end of the positive crankcase ventilation valve, and check that the negative pressure of the intake manifold is felt with finger.

NOTE
At this time, the plunger in the positive crankcase ventilation valve moves back and forth.

(3) If negative pressure is not felt, clean or replace the positive crankcase ventilation valve.




## POSITIVE CRANKCASE VENTILATION VALVE

### INSPECTION

(1) Remove the positive crankcase ventilation valve.
(2) Insert a thin stick into the positive crankcase ventilation valve from the threaded side to check that the plunger moves.
(3) If the plunger does not move, the positive crankcase ventilation valve is clogged. Clean it or replace.

### INSTALLATION

Install the positive crankcase ventilation valve and tighten to specified torque.

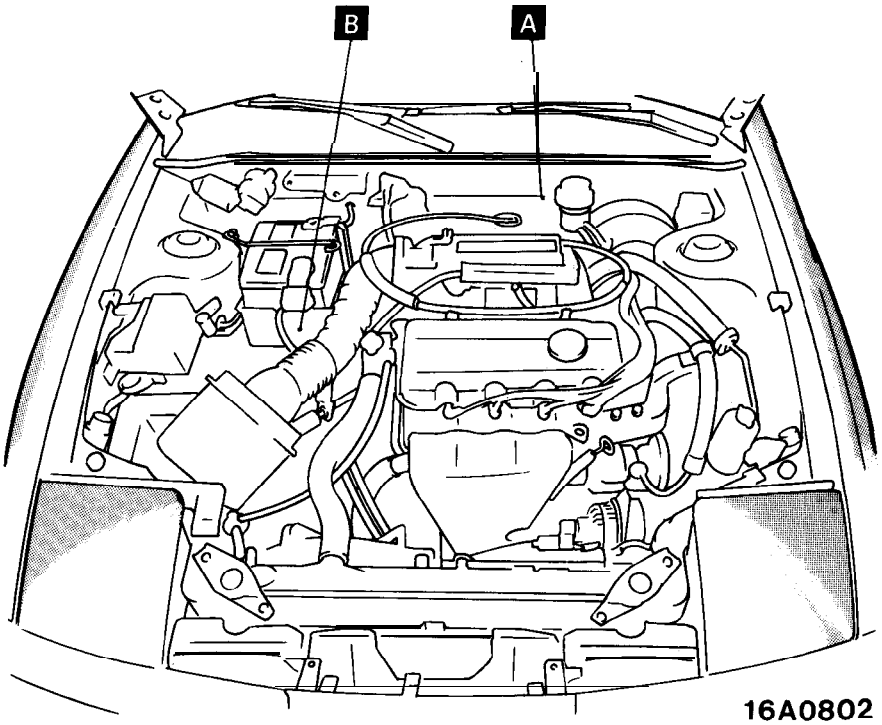
**Specified tightening torque: 8-12 Nm (6–8.5 ft.lbs.)**

# EVAPORATIVE EMISSION CONTROL SYSTEM

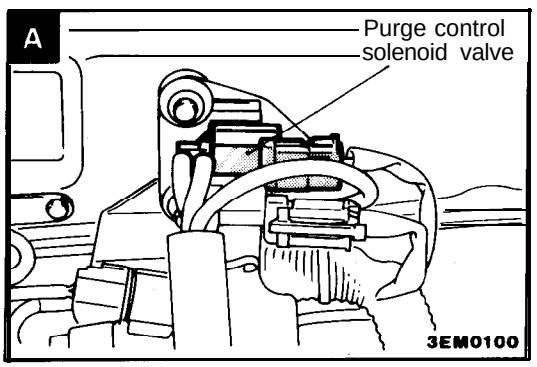
N25IB--

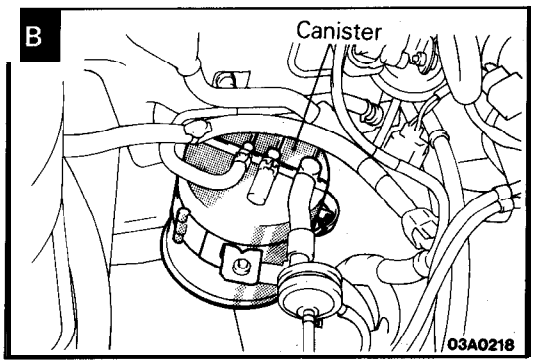
## COMPONENTS LOCATION

<1.8L Engine>

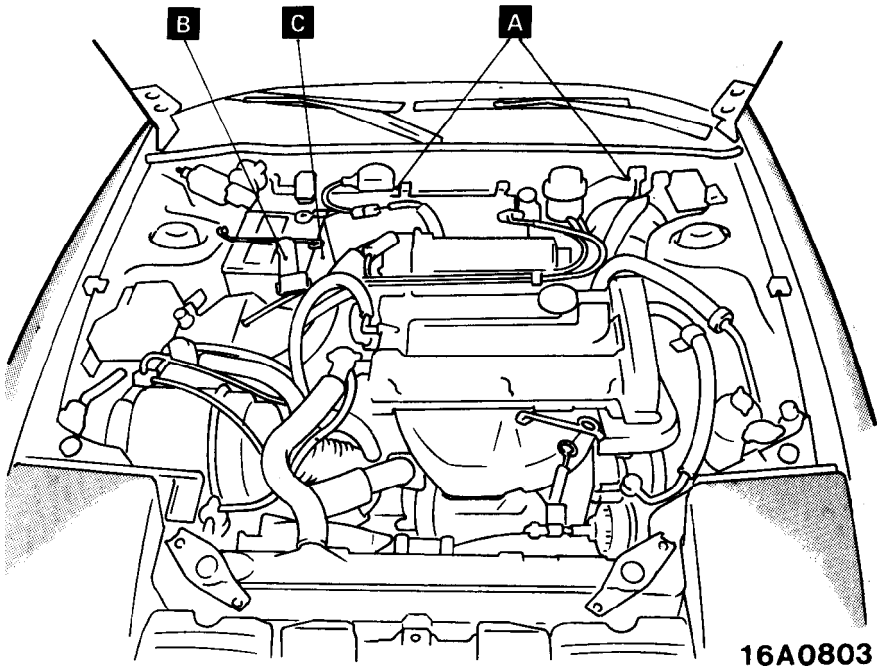



| Name | Symbol |
|---|---|
| Canister | B |
| Purge control solenoid valve | A |

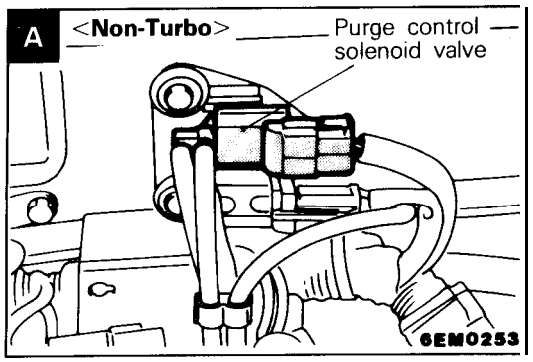


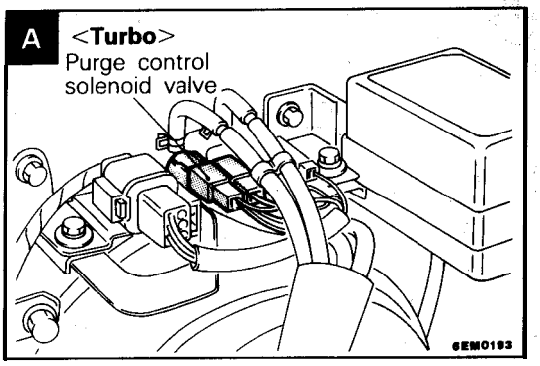



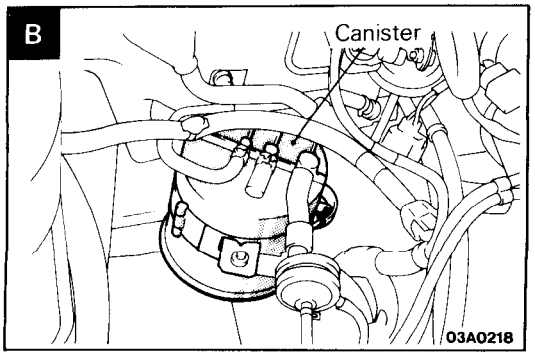
<2.0L DOHC Engine>

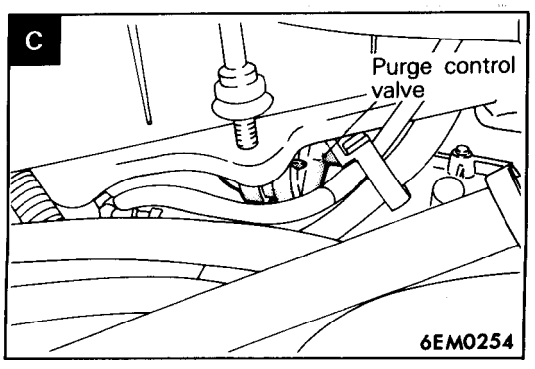



| Name | Symbol |
|---|---|
| Canister | B |
| Purge control solenoid valve | A |
| Purge control valve <Turbo> | C |



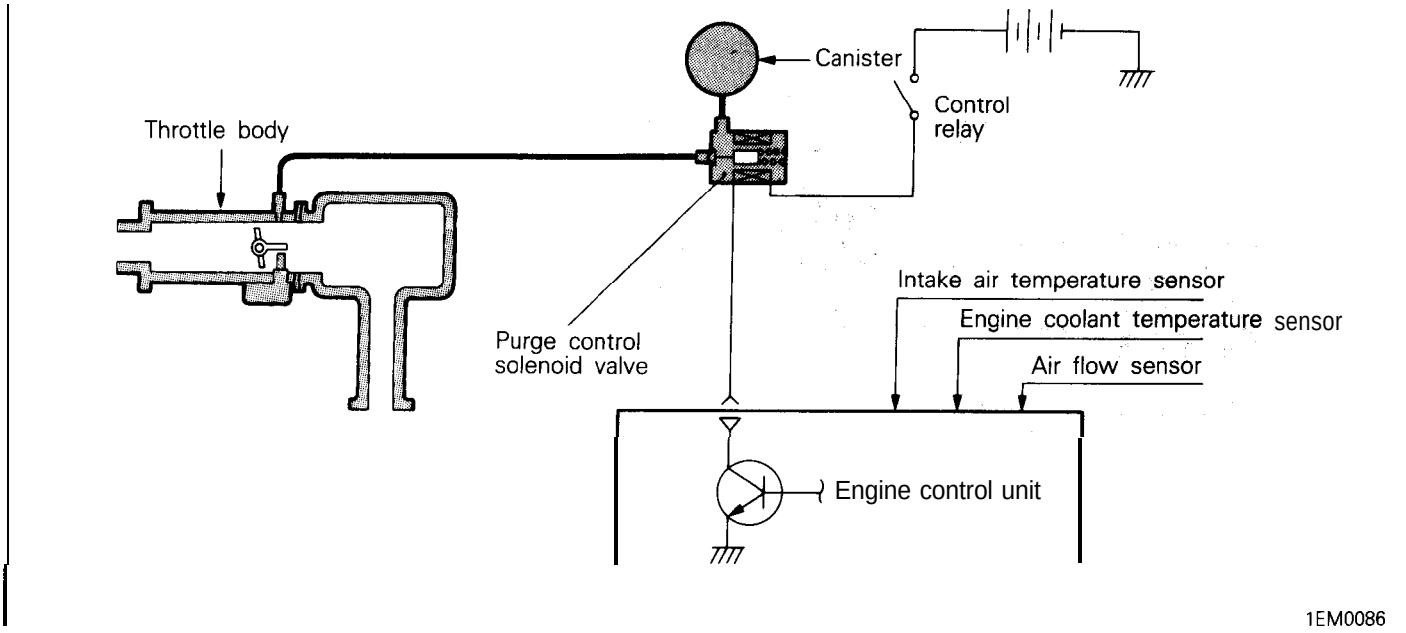



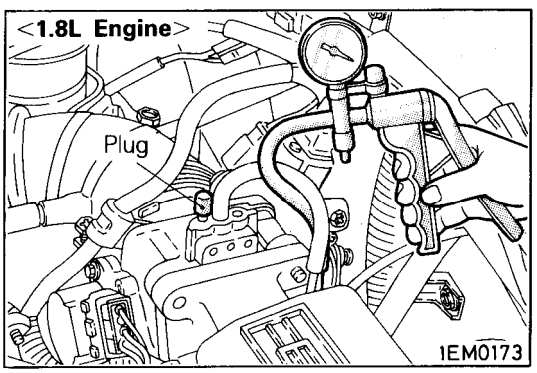



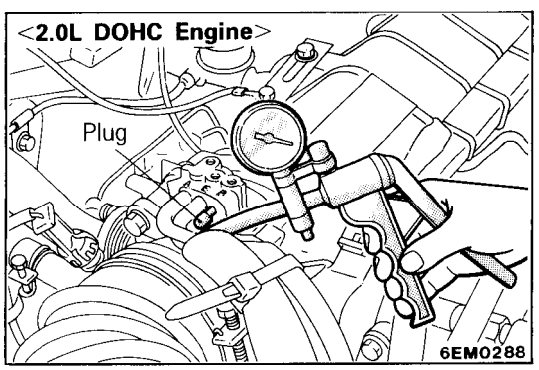



## PURGE CONTROL SYSTEM INSPECTION <Non-Turbo>

N25IBBK




(1) Disconnect the vacuum hose (red stripes) from the throttle body and connect it to a hand vacuum pump.
(2) Plug the nipple from which the vacuum hose is disconnected.
(3) Under the engine conditions shown below, check by applying vacuum from a hand vacuum pump.

**When engine is cold-engine coolant temperature: 60°C (140°F) or less**

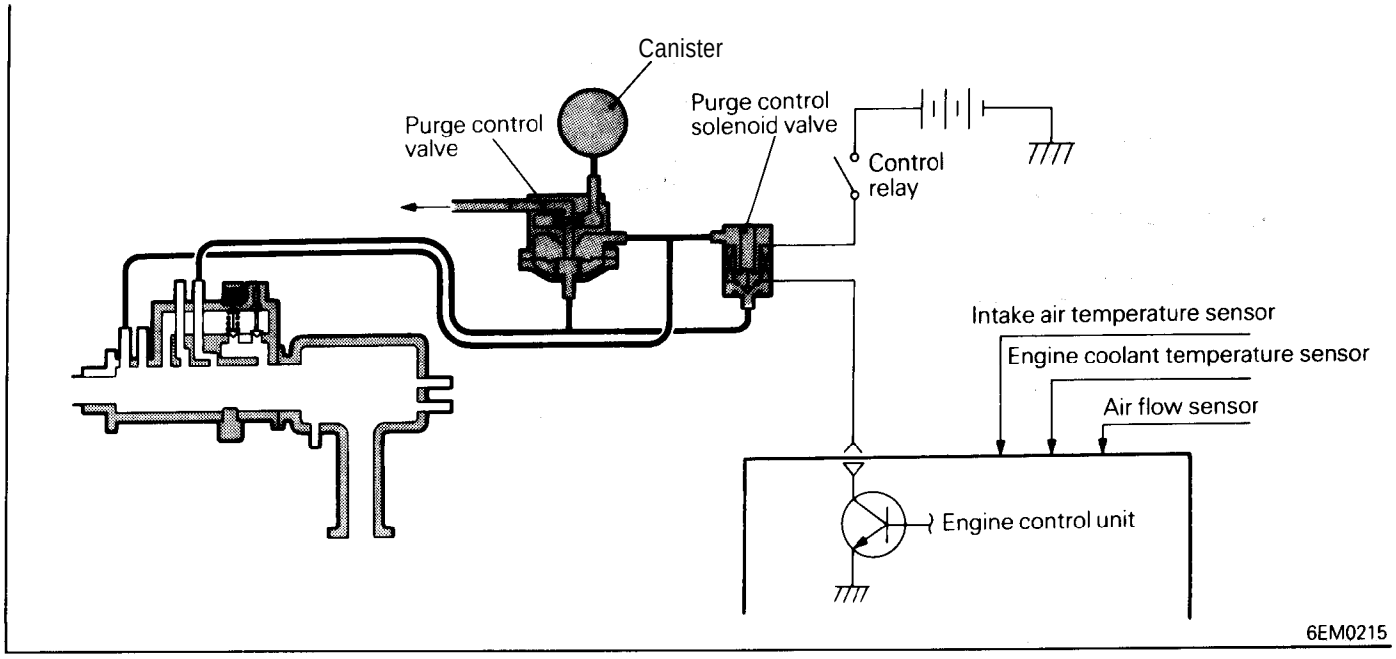
| Engine operating condition | Applying vacuum | Result |
|---|---|---|
| Idling | 375 mmHg (14.8 in.Hg.) | Vacuum is maintained |
| 3,000 rpm | | |

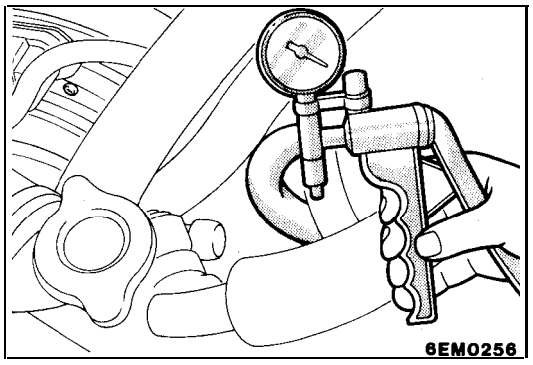
**When engine is hot-engine coolant temperature: 70°C (158°F) or higher**

| Engine operating condition | Applying vacuum | Result |
|---|---|---|
| Idling | 375 mmHg (14.8 in.Hg.) | Vacuum is maintained |
| 3,000 rpm within three minutes after starting engine | Try applying vacuum | Vacuum leaks |
| 3,000 rpm after three minutes have elapsed after starting engine | 375 mmHg (14.8 in.Hg.) | Vacuum will be maintained momentarily, after which it will leaks.<br>NOTE<br>The vacuum will leak continuously if the altitude is 2,200 m (7,200 ft.) or higher, or the intake air temperature is 50°C (122°F) or higher. |

## PURGE CONTROL SYSTEM INSPECTION <Turbo>

N25IBBL



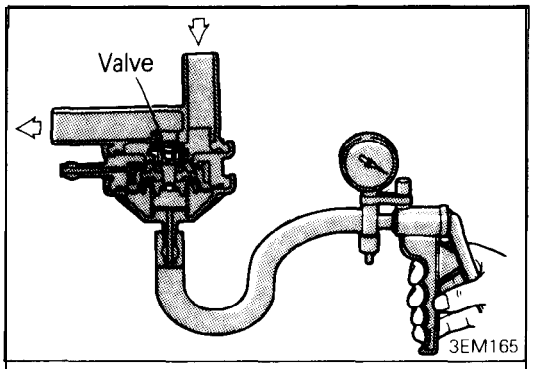

(1) Disconnect the purge air hose from the air intake hose, and plug the air intake hose. Then, connect the hand vacuum pump to the purge air hose.
(2) Under the engine conditions shown below, check by applying vacuum from a hand vacuum pump.

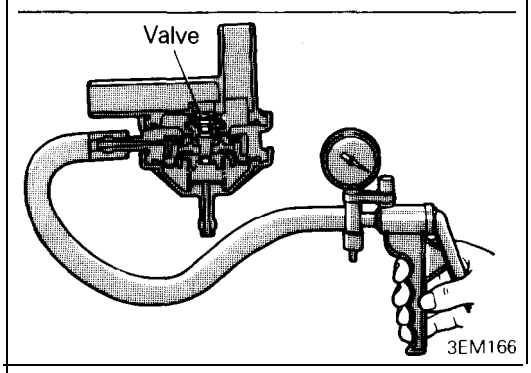
**When engine is cold-engine coolant temperature: 60°C (140°F) or less**

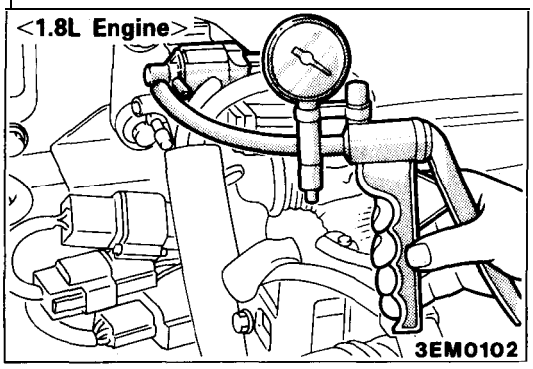
| Engine operating condition | Applying vacuum | Result |
|---|---|---|
| Idling | 375 mmHg (14.8 in.Hg.) | Vacuum is maintained |
| 3,000 rpm | | |

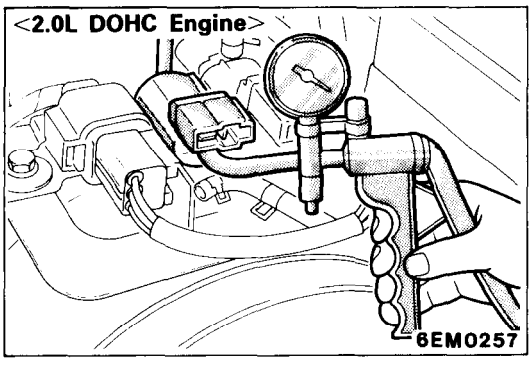
**When engine is hot-engine coolant temperature: 70°C (158°F) or higher**

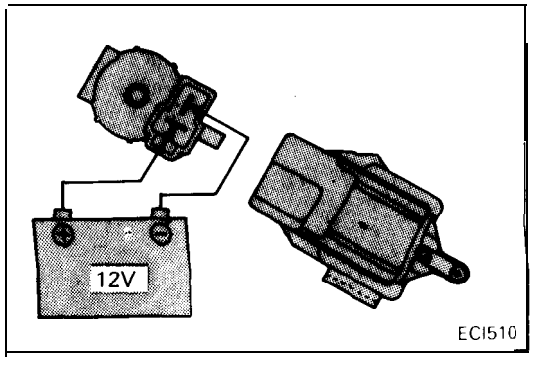
| Engine operating condition | Applying vacuum | Result |
|---|---|---|
| Idling | 375 mmHg (14.8 in.Hg.) | Vacuum is maintained |
| 3,000 rpm within three minutes after starting engine | Try applying vacuum | Vacuum leaks |
| 3,000 rpm after three minutes have elapsed after starting engine | 375 mmHg (14.8 in.Hg.) | Vacuum will be maintained momentarily, after which it will leaks.<br>NOTE<br>The vacuum will leak continuously if the altitude is 2,200 m (7,200 ft.) or higher, or the intake air temperature is 50°C (122°F) or higher. |




## PURGE CONTROL VALVE <Turbo> N25IBCC

### INSPECTION

(1) Remove the purge control valve.
(2) Connect a hand vacuum pump to, the vacuum nipple of the purge control valve.
(3) Apply a vacuum of 400 mmHg (15.7 in.Hg.) and check airtightness.
(4) Blow in air lightly from the canister side nipple and check conditions as follows.

| Hand vacuum pump vacuum | Normal condition |
|---|---|
| 0 mmHg (0 in.Hg.) (No vacuum is applied) | Air does not blow through |
| 200 mmHg (8.0 in.Hg.) or more | Air blow through |

(5) Connect a hand vacuum pump to the positive pressure nipple of the purge control valve.
(6) Apply a vacuum of 400 mmHg (15.7 in.Hg.) and check airtightness.

## PURGE CONTROL SOLENOID VALVE N25IBFH

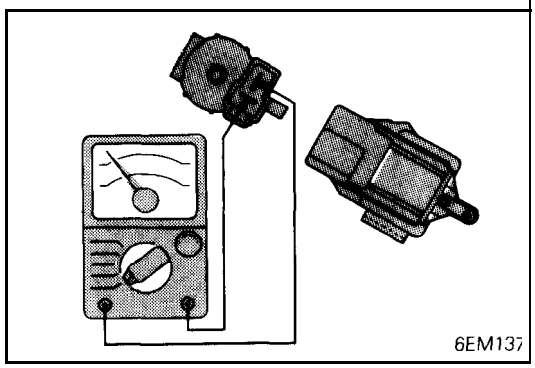
### INSPECTION

NOTE
When disconnecting the vacuum hose, make an identification mark on it so that it can be reconnected to the original position.

(1) Disconnect the vacuum hoses (non stripe and red stripe hose) from the solenoid valve
(2) Disconnect the harness connector from solenoid valve.
(3) Connect a hand vacuum pump to the nipple to which the red-striped vacuum hose was connected.

(4) Apply a vacuum and check for air-tightness when voltage applied directly to the purge control solenoid valve and when the voltage is discontinued.

| Battery voltage | | Result |
|---|---|---|
| Non-Turbo | When applied | Vacuum leaks |
| | When discontinued | Vacuum is maintained |
| Turbo | When applied | Vacuum is maintained |
| | When discontinued | Vacuum leaks |




(5) Measure the resistance between the terminals of the solenoid valve.

**Standard value: 36-44 Ω [at 20°C (68°F)]**

## AIR FLOW SENSOR, ENGINE COOLANT TEMPERATURE SENSOR AND INTAKE AIR TEMPERATURE SENSOR N25IBGBa

To inspect these parts, refer to GROUP 14–MPI System Components.

## AIR CONDITIONER SWITCH N25IBHBa

To inspect the air conditioner switch, refer to GROUP 24–Air Conditioner Switch.

## OVERFILL LIMITER (TWO-WAY VALVE) N25IBEBa

To inspect the overfill limiter (two-way valve), refer to GROUP 14–Fuel Tank.

## CANISTER N25IBIBa

To inspect the canister, refer to GROUP 14–Fuel Line and Vapor Line.

## FUEL FILLER CAP INSPECTION N25IBJA

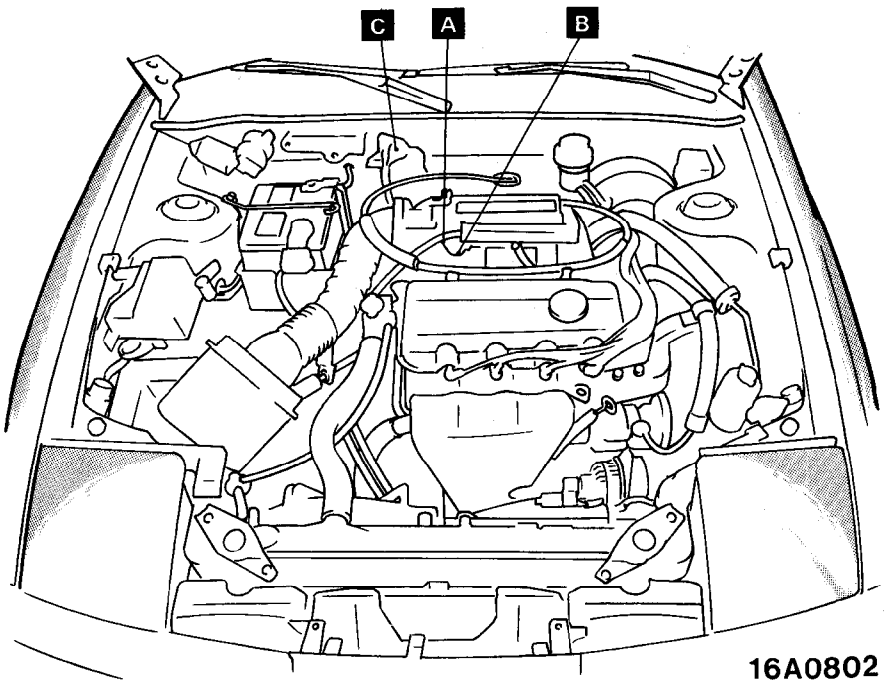
Check the gasket of the fuel filler cap, and, the filler cap itself, for damage or deformation; replace the cap if necessary.

# EXHAUST GAS RECIRCULATION (EGR) SYSTEM

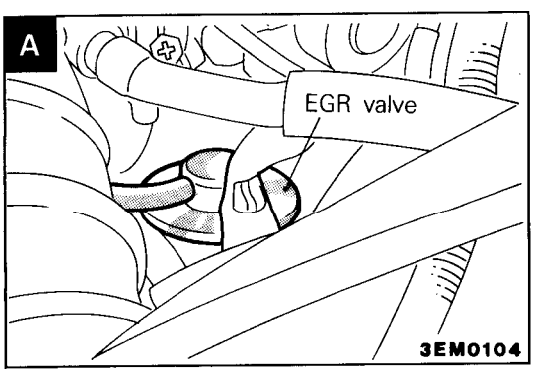
N25IC--

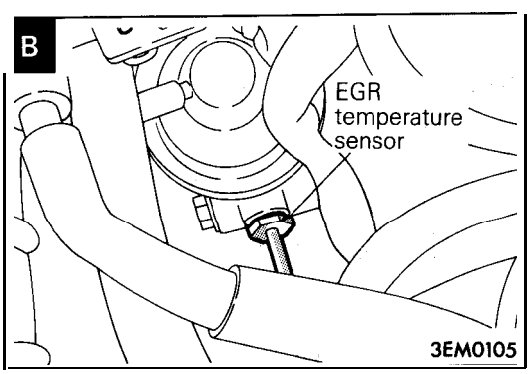
## COMPONENTS LOCATION

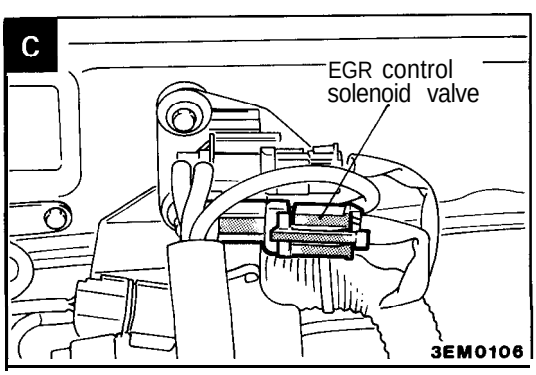
**<1.8L Engine>**



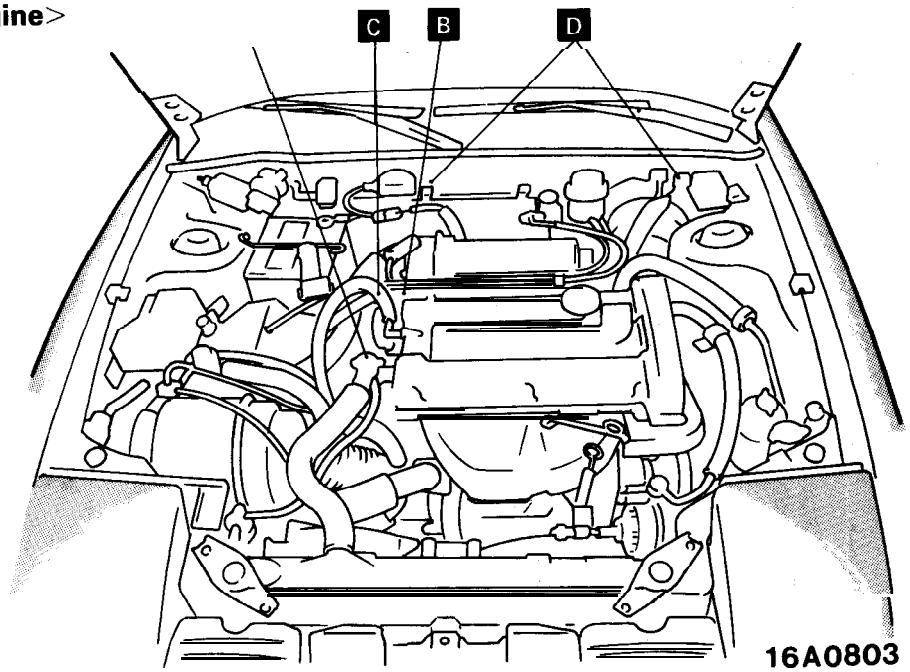

| Name | Symbol |
|---|---|
| EGR control solenoid valve <California> | C |
| EGR temperature sensor <California> | B |
| EGR valve <California> | A |

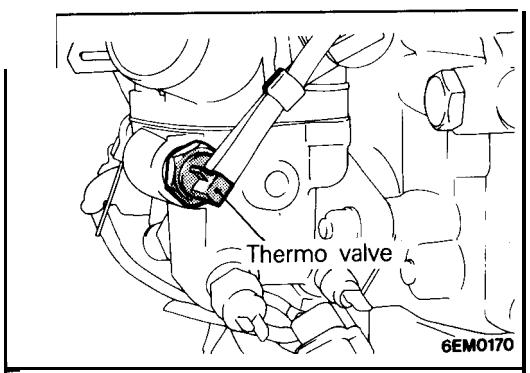


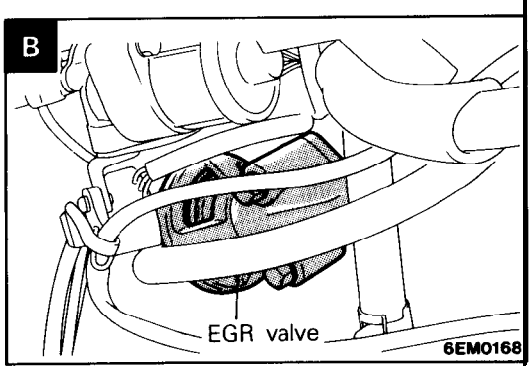



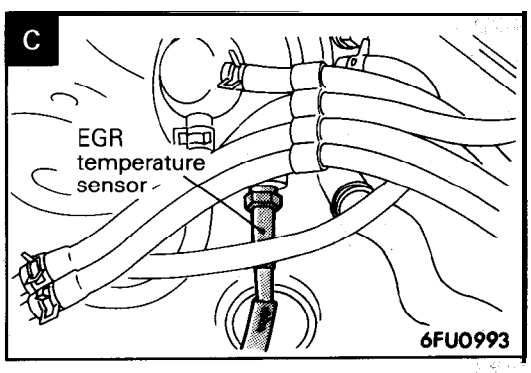
<2.0L DOHC Engine>

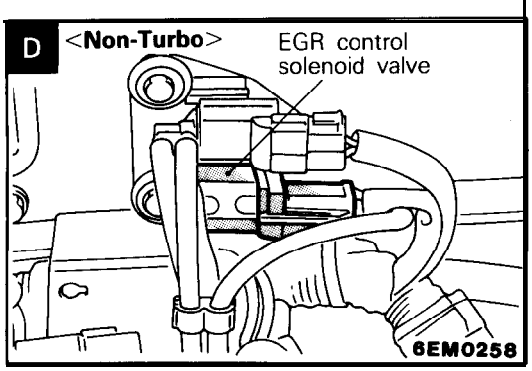


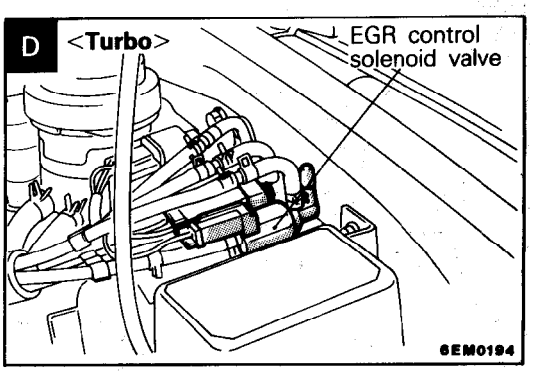



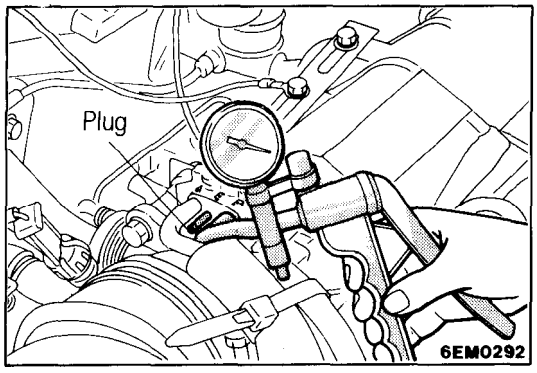

| Name | Symbol |
|---|---|
| EGR control solenoid valve <California> | D |
| EGR temperature sensor <California> | C |
| EGR valve | B |
| Thermo valve <Federal and Canada> | A |






## EGR SYSTEM INSPECTION <Federal and Canada–2.0L DOHC Engine> N25ICJMa

(1) Disconnect the vacuum hose (green stripe) from the throttle body, and connect a hand vacuum pump to the vacuum hose.
(2) Plug the nipple from which the vacuum hose is disconnected.
(3) Under the engine conditions shown below, check by applying vacuum from a hand vacuum pump.

**When Engine is Cold–**
**engine coolant temperature 40°C (104°F) or below**

| Engine operating condition | Applying vacuum | Result |
|---|---|---|
| Idling | Try applying vacuum | Vacuum leaks |

**When Engine is Hot–**
**engine coolant temperature 80°C (176°F) or higher**

| Engine operating condition | Applying vacuum | Result |
|---|---|---|
| Idling | 45 mmHg (1.8 in.Hg.) | Vacuum is maintained |
| Changes from idling to slightly unstable | 215 mmHg (8.5 in.Hg.) | Vacuum is maintained |

## EGR SYSTEM INSPECTION <California> N25ICJN

(1) Disconnect the vacuum hose (green-striped) from the EGR valve, and connect the hand vacuum pump through the three-way terminal.
(2) Regarding cold condition [coolant temperature: 20°C (68°F) or less] and warm condition [coolant temperature: 70°C (68°F) or more] of the engine, check the following two points:

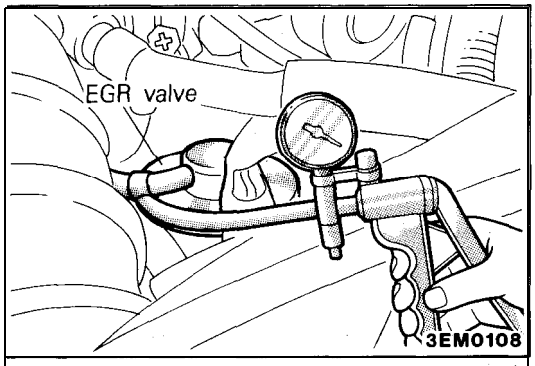
**<Cold condition of engine>**

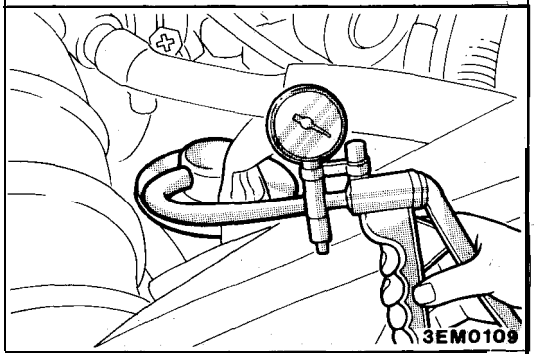
| Engine operation | Normal state |
|---|---|
| Race the engine by rapidly press in the accelerator pedal. | The negative pressure does not vary. (Atmospheric pressure) |

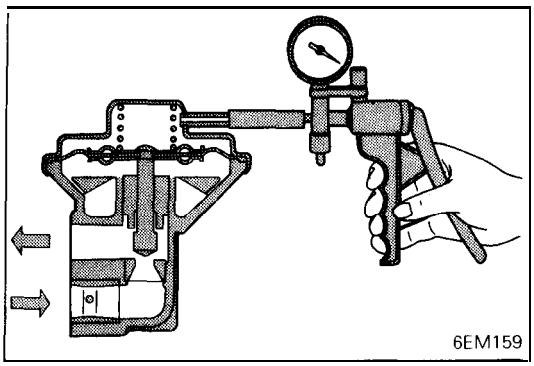
**<Warm condition of engine>**

| Engine operation | Normal state |
|---|---|
| Race the engine by rapidly press in the accelerator pedal. | The negative pressure rises to 100 mmHg (3.9 in.Hg.) or more. |

(3) Disconnect the three-way terminal, and connect the hand vacuum pump to the EGR valve.
(4) When a negative pressure of 215 mmHg (8.5 in.Hg.) is applied during idling, check that the engine stops or idles unstably.






## EGR VALVE <Except Federal and Canada-I .8L Engine>

N25ICKI

### INSPECTION

(1) Remove the EGR valve and check it for sticking, deposit of carbon, etc.
If such condition exists, clean with adequate solvent to ensure tight valve seat contact.
(2) Connect a hand vacuum pump to the EGR valve.
(3) Apply a vacuum of 500 mmHg (19.8 in.Hg.) and check air-tightness.
(4) Blow in air from one passage of the EGR to check condition as follows.

| Applying vacuum | Result |
|---|---|
| 45 mmHg (1.8 in.Hg.) or less | Air does not blow through |
| 215 mmHg (8.5 in.Hg.) or more | Air blows through |

### INSTALLATION

Install a new gasket and EGR valve, tighten bolts to specified torque.

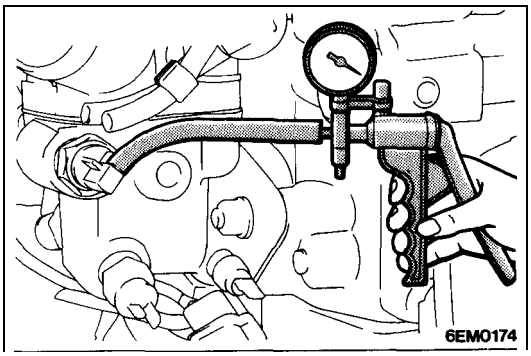
**Specified tightening torque:**
**<1.8L Engine> 10–15 Nm (7.2–10 ft.lbs.)**
**<2.0L DOHC Engine> 15-22 Nm (10–15.5 ft.lbs.)**

## THERMO VALVE <Federal and Canada–2.0L DOHC Engine>

N25ICNGb

### INSPECTION

(1) Disconnect the vacuum hoses from the thermo valve, and connect a hand vacuum pump to nipple of the thermo valve.
(2) Apply a vacuum and check the air passage through the thermo valve.



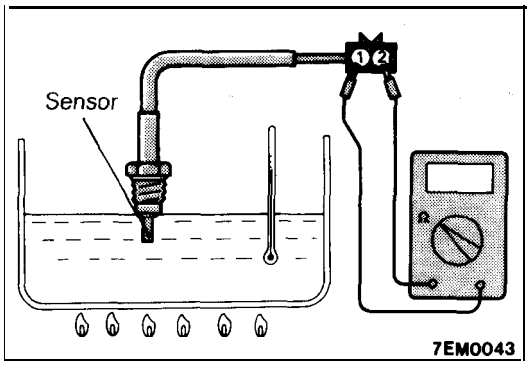

| Engine coolant temperature | Result |
|---|---|
| 50°C (122°F) or less | Vacuum leaks. |
| 80°C (176°F) or more | Vacuum is maintained. |

### REMOVAL

(1) When removing the thermo valve, do not use wrenches or other tools on the resin part.
(2) When disconnecting the vacuum hoses, put a mark on the hose so that it may be reconnected at original position.

### INSTALLATION

(1) Apply specified sealant to the threads of thermo valve and tighten to specified torque. When installing the thermo valve, do not use wrenches or other tools on the resin part.
**Specified sealant:**
**MOPAR Part No.4318034 or equivalent**
**Specified torque: 20–40 Nm (15–30 ft.lbs.)**
(2) Reconnect the vacuum hoses in position.




## EGR TEMPERATURE SENSOR <California> N25ICZB

### INSPECTION

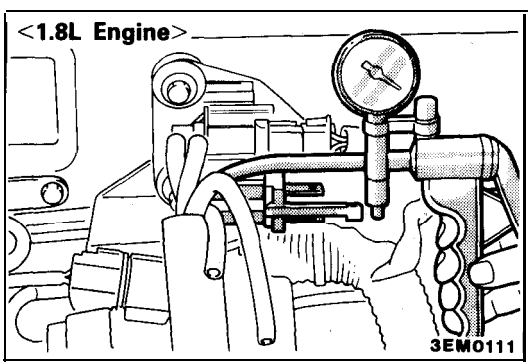
(1) Remove the EGR temperature sensor.
(2) Place the EGR temperature 'sensor in water, and then measure the resistance value between terminals 1 and 2' while increasing the water's temperature.
Replace the EGR temperature sensor if there is a significant deviation from the standard value.

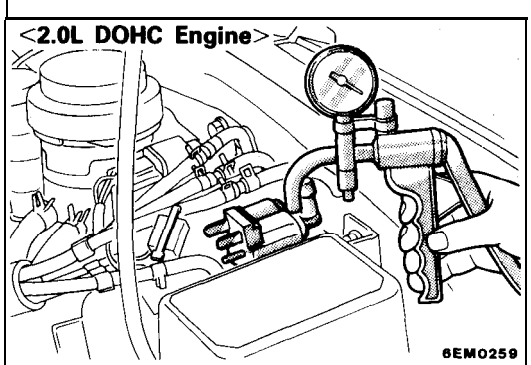
| Temperature °C(°F) | Resistance kΩ |
|---|---|
| 50 (122) | 60–83 |
| 100 (212) | 11-14 |

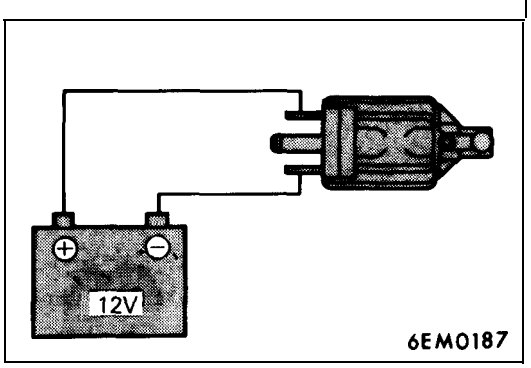
### INSTALLATION

Install the EGR temperature sensor tighten to specified torque.

**Specified tightening torque: 10–12 Nm (7.3-8.6 ft.lbs.)**



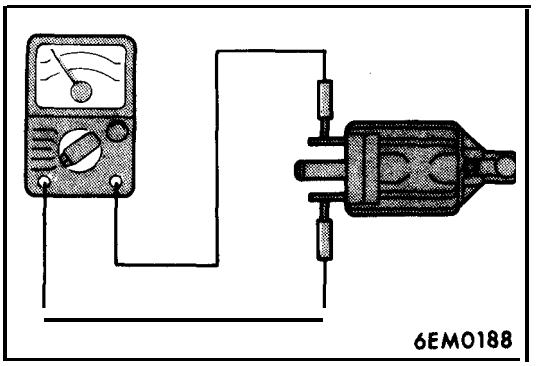

## EGR CONTROL SOLENOID VALVE <California> N25ICRD

### INSPECTION

NOTE
When disconnecting the vacuum hose, make an identification mark on it so'that it can be reconnected to the original position.

(1) Disconnect the vacuum hose (yellow and green stripe) from the solenoid valve.
(2) Disconnect the harness connector.
(3) Connect a hand vacuum pump to the nipple to which the green-striped vacuum hose was connected.
(4) Apply a vacuum and check for air-tightness when voltage applied directly to the EGR control solenoid valve and when the voltage is discontinued.

| Battery voltage | Result |
|---|---|
| When applied | Vacuum is maintained. |
| When discontinued | Vacuum leaks. |




(5) Measure the resistance between the terminals of the solenoid valve.

**Standard value: 36-44 Ω [at 20°C (68°F)]**

## AIR-FUEL RATIO CONTROL (MPI) SYSTEM N25ICAD

- To inspect the air-fuel ratio control (MPI) system, refer to GROUP 14 FUEL SYSTEM-Service Adjustment Procedures.
- For detailed information concerning the illumination pattern of the malfunction-indicator light and other aspects of the self-diagnosis function, refer to GROUP 14 FUEL SYSTEM-Self Diagnosis.

# CATALYTIC CONVERTER N25ICBHa

## INSPECTION.

Inspect for damage, cracking or deterioration. Replace if faulty.

**Caution**

1. **Operation of any type, including idling, should be avoided if engine misfiring occurs. Under this condition the exhaust system will operate at abnormally 'high temperature, which may cause damage to the catalyst or underbody parts of the vehicle.**
2. **Alteration or deterioration of ignition or fuel system, or any type of operating condition which results in engine misfiring must be corrected to avoid overheating the catalytic converters.**
3. **Proper maintenance and tune up according to manufacturer's specifications should be made to correct the conditions as soon as possible.**