## EXPLANATION OF MANUAL CONTENTS

Indicates procedures to be performed before the work in that section is started, and procedures to be performed after the work in that section is finished.

**Component Diagram**
A diagram of the component parts is provided near the front of each section in order to give a reader a better understanding of the installed condition of component parts.

Indicates (by symbols) where lubrication is necessary.

**Maintenance and Servicing Procedures**
The numbers provided within the diagram indicate the sequence for maintenance and servicing procedures.

- Removal steps:
  The part designation number corresponds to the number in the illustration to indicate removal steps.
- Disassembly steps:
  The part designation number corresponds to the number in the illustration to indicate disassembly steps.
- Installation steps:
  Specified in case installation is impossible in reverse order of removal steps. Omitted if installation is possible in reverse order of removal steps.
- Reassembly steps:
  Specified in case reassembly is impossible in reverse order of disassembly steps. Omitted if reassemby is possible in reverse order of disassembly steps.

**Classifications of Major Maintenance/Service Points**

When there are major points relative to maintenance and servicing procedures (such as essential maintenance and service points, maintenance and service standard values, information regarding the use of special tools, etc.), these are arranged together as major maintenance and service points and explained in detail.

◀A▶ : Indicates that there are essential points for removal or disassembly.
▶A◀ : Indicates that there are essential points for installation or reassembly.

**Symbols for Lubrication, Sealants and Adhesives**

Information concerning the locations for lubrication and for application of sealants and adhesives is provided, by using symbols, in the diagram of component parts or on the page following the component parts page, and explained.

 : Grease
(multipurpose grease unless there is a brand or type specified)

 : Sealant or adhesive

 : Brake fluid or automatic transmission fluid

 : Engine oil, gear oil or air conditioner compressor oil

 : Adhesive tape or butyl rubber tape

# SUPPLEMENTAL RESTRAINT SYSTEM (SRS) AND SEAT BELT WITH PRE-TENSIONER

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To improve safety, the SRS and seat belt with pre-tensioner are available as optional parts. These systems enhance a collision safety by restraining the front passengers in case of an accident. The SRS works with the pre-tensioner simultaneously when a collision is detected.

## SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

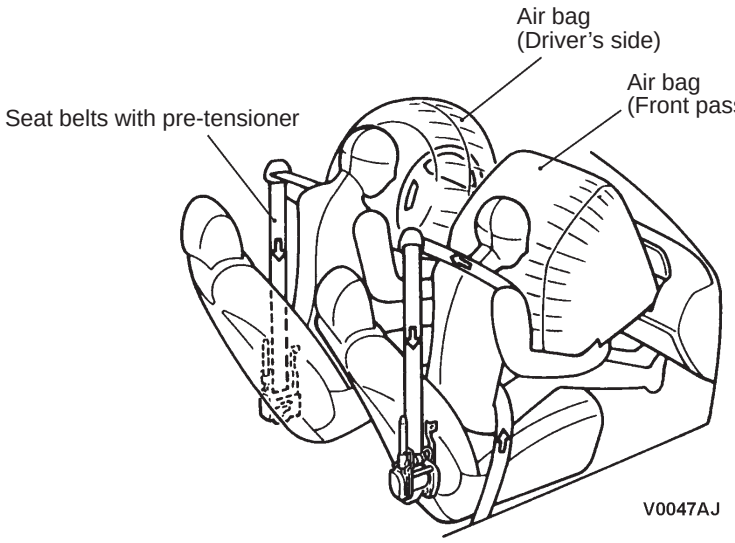
The SRS is designed to supplement the front seat belts. It eliminates or reduces an injury to the front passengers by deploying two air bags in case of a head-on collision.

## SEAT BELT WITH PRE-TENSIONER

The seat belt with pre-tensioner work simultaneously with the SRS. The pre-tensioner takes up seat belt slack immediately at a collision, by that restraining the front passengers sooner than the SRS. This prevents the passengers from moving forwards.

**CAUTION**

1. Even if there is no passenger, the air bag and pre-tensioner will work by detecting a bigger head-on collision than a specific value.
2. The specific value is an equivalent impact when a vehicle collides against a concrete (fixed) wall at approx. 25 km/h or more.
3. The SRS and pre-tensioner may not work under the following conditions:
   - A head-on collision is smaller than the specific value.
   - A vehicle collides on its side or rear end.
   - A vehicle rolls over or upsets.





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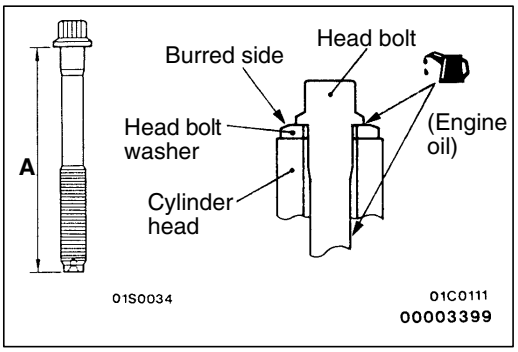
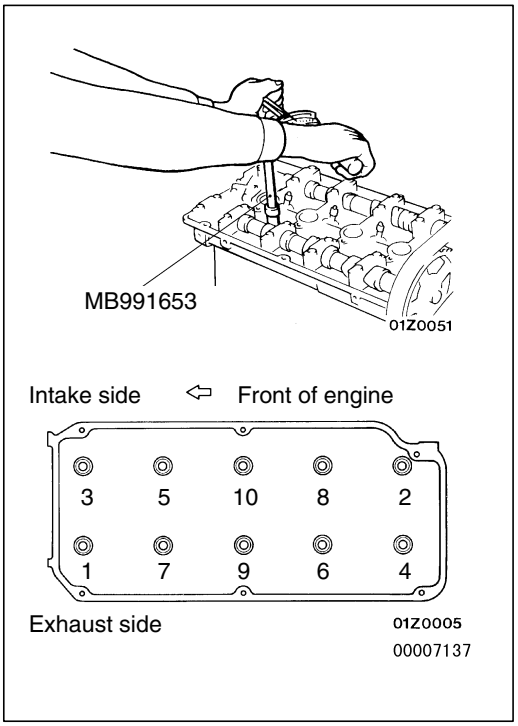
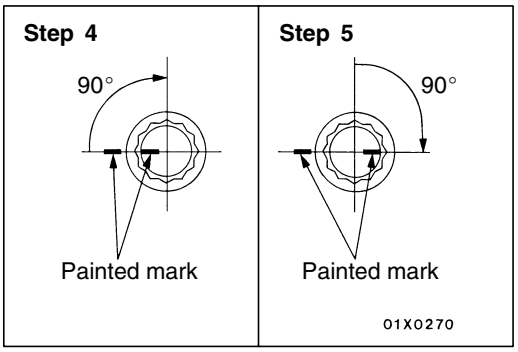



## ▶B◀ CYLINDER HEAD BOLT INSTALLATION

1. When installing the cylinder head bolts, the length below the head of the bolts should be within the limit. If it is outside the limit, replace the bolts.

   **Limit (A): 96.4 mm**

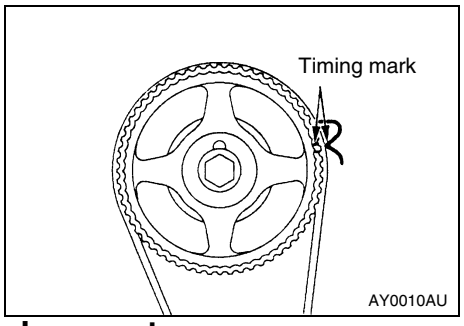
2. The head bolt washer should be installed with the burred side caused by tapping out facing upwards.
3. Apply a small amount of engine oil to the thread section and the washer of the cylinder head bolt.
4. Tighten the bolts by the following procedure.

| Step | Operation | Remarks |
|---|---|---|
| 1 | Tighten to 74 Nm. | Carry out in the order shown in the illustration. |
| 2 | Fully loosen. | Carry out in the reverse order of that shown in the illustration. |
| 3 | Tighten to 20 Nm. | Carry out in the order shown in the illustration. |
| 4 | Tighten 90° of a turn. | In the order shown in the illustration. Mark the head of the cylinder head bolt and cylinder head by paint. |
| 5 | Tighten 90° of a turn. | In the order shown in the illustration. Check that the painted mark of the head bolt is lined up with that of the cylinder head. |

**Caution**

**(1) Always make a tightening angle just 90°. If it is less than 90°, the head bolt will be loosened.**

**(2) If it is more than 90°, remove the head bolt and repeat the procedure from step 1.**



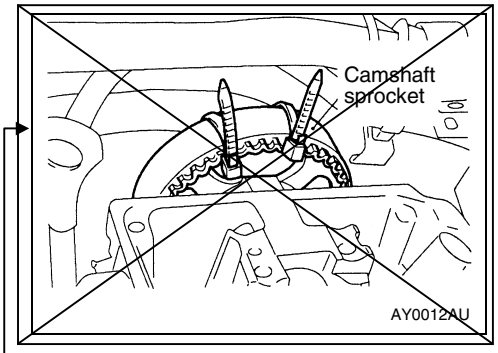

# REMOVAL SERVICE POINTS

## ◄A► CAMSHAFT SPROCKET REMOVAL

1. Turn the crankshaft in the forward direction (clockwise) to align the timing mark so that No. 1 cylinder is at the compression TDC.

**Caution**
**Always turn the crankshaft in the forward direction (clockwise).**

**<Incorrect>**

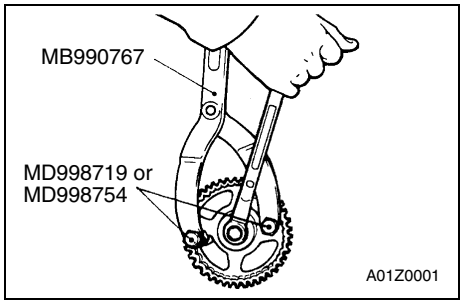



**<Incorrect>**

2. ~~Secure the camshaft sprocket and the timing belt with band cables to prevent deviation from the relative positions between the camshaft sprocket and the timing belt.~~

**<Correct>**

Put matchmarks on the camshaft sprocket and the timing belt.



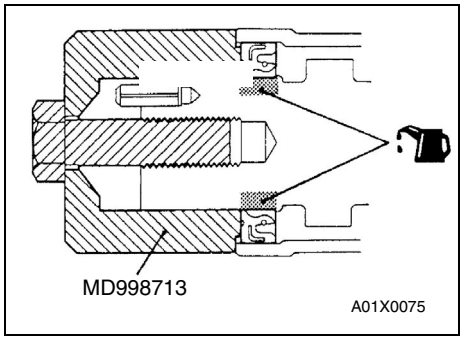

3. Use the special tool to stop the camshaft sprocket from turning.
4. Remove the camshaft sprocket with the timing belt attached.

**Caution**
**Do not turn the crankshaft after the camshaft sprocket is removed.**

# INSTALLATION SERVICE POINTS

## ►A◄ CAMSHAFT OIL SEAL INSTALLATION

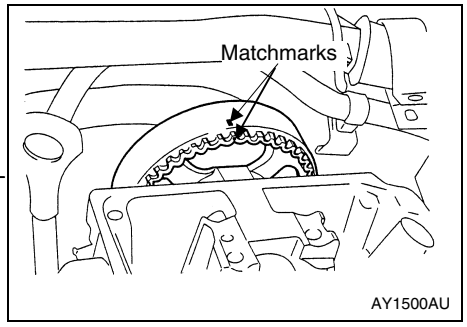
1. Apply engine oil to the camshaft oil seal lip.
2. Use the special tool to press-fit the camshaft oil seal.




**<Added>**

1. Align matchmarks on the camshaft sprocket and the timing belt that have been put during removal, and install the camshaft sprocket.

**<Correct>**



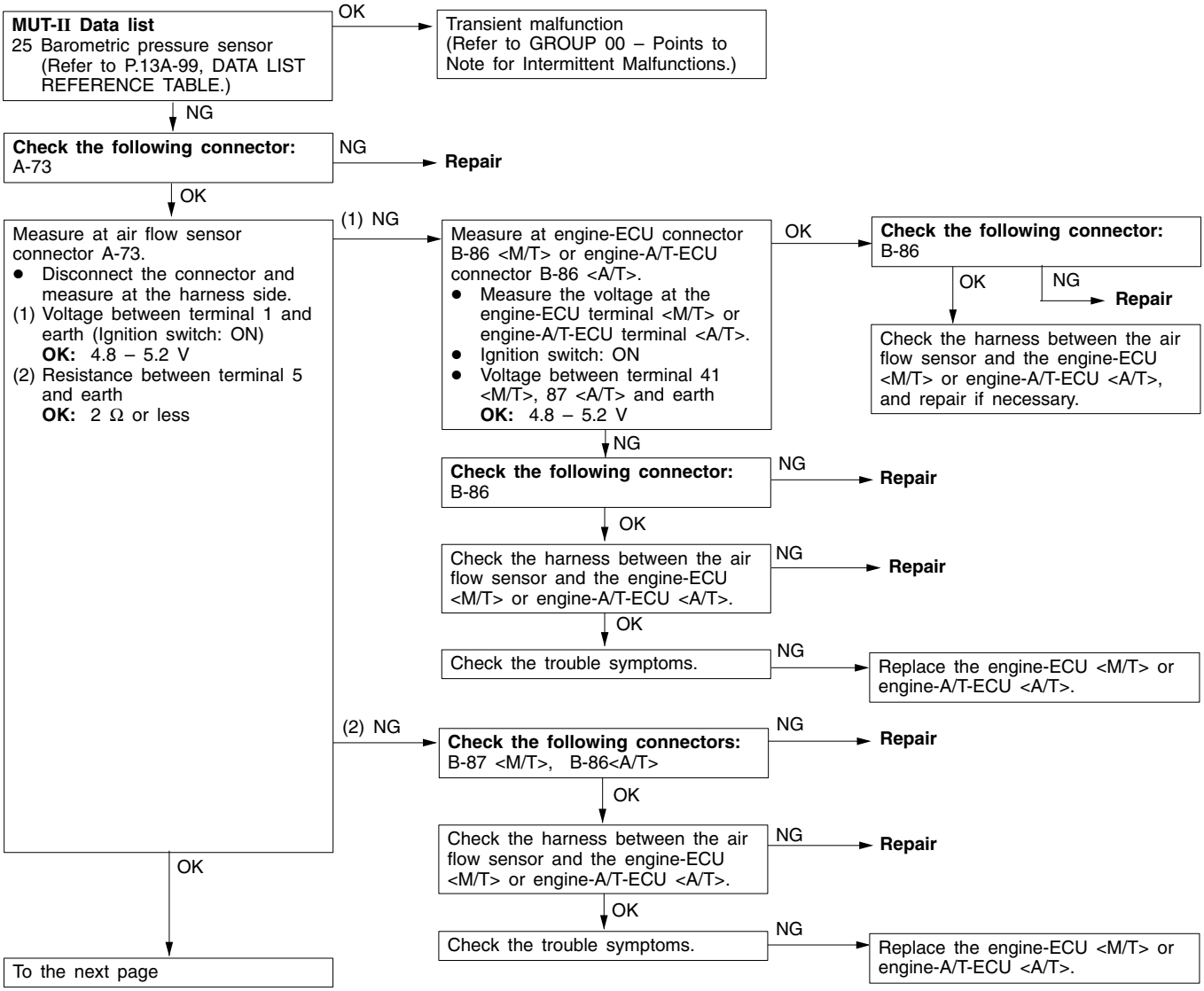

## ►B◄ CAMSHAFT SPROCKET INSTALLATION

2. Use the special tool to stop the camshaft sprocket from turning in the same way as was done during removal, and then tighten the bolts to the specified torque.

**Tightening torque: 88 Nm**

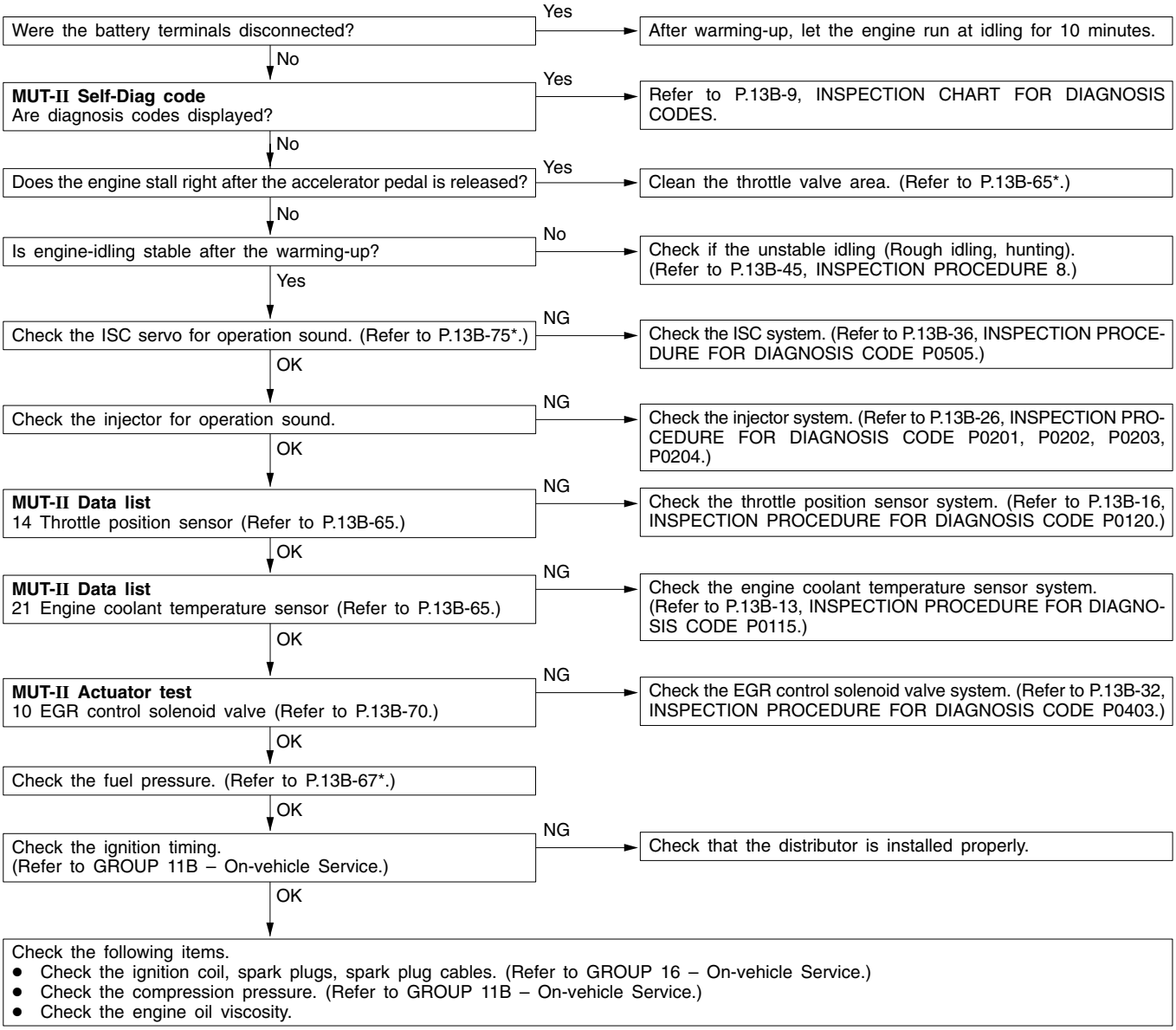
**<Added>**

| Code No. P0105 Barometric pressure sensor system | Probable cause |
|---|---|
| Range of Check<br>• Two seconds have passed since the ignition switch is turned ON or the engine starting process is completed.<br>• Battery voltage: 8 V or more<br>Set Conditions<br>• The sensor output voltage is 4.5 V or more for four seconds (equivalent to 114 kPa of barometric pressure)<br>or<br>• The sensor output voltage is 0.2 V or less (equivalent to 53 kPa of barometric pressure) | • Malfunction of barometric pressure sensor<br>• Open or short circuit in barometric pressure sensor circuit or loose connector contact<br>• Malfunction of engine-ECU <M/T><br>• Malfunction of engine-A/T-ECU <A/T> |



## INSPECTION PROCEDURE 11

| When the engine is cold, it stalls at idling. (Die out) | Probable cause |
|---|---|
| In such cases as the above, the cause is probably that the air/fuel mixture is inappropriate when the engine is cold, or that the intake air volume is insufficient. | • Malfunction of the ISC system<br>• Malfunction of the throttle body<br>• Malfunction of the injector system<br>• Malfunction of the ignition system |




NOTE:
*: Refer to the '99 SPACE STAR Workshop Manual (Pub. No. CMXE99E1)

# EXHAUST PIPE AND MAIN MUFFLER

## REMOVAL AND INSTALLATION

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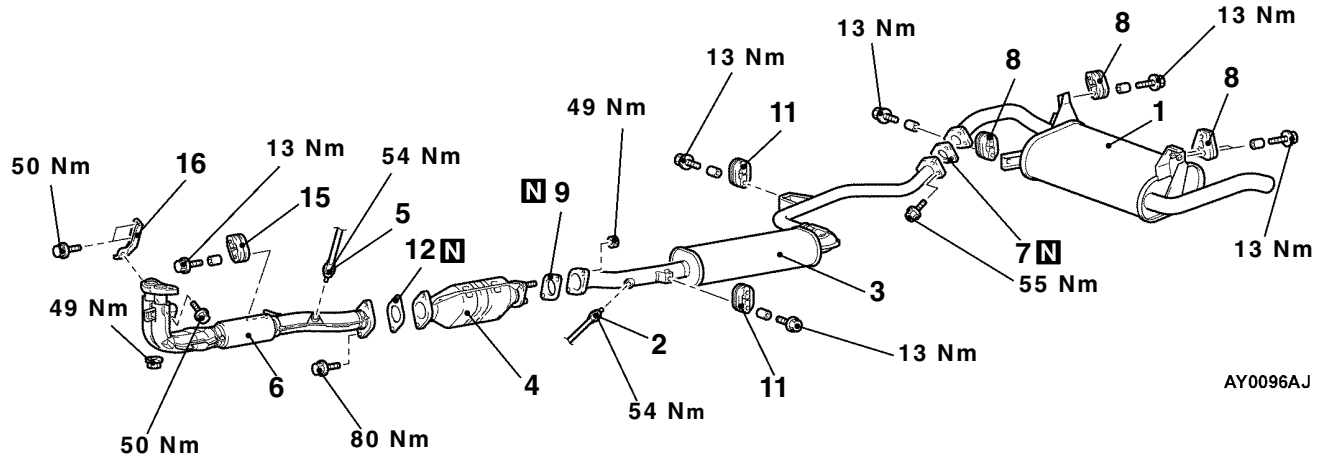
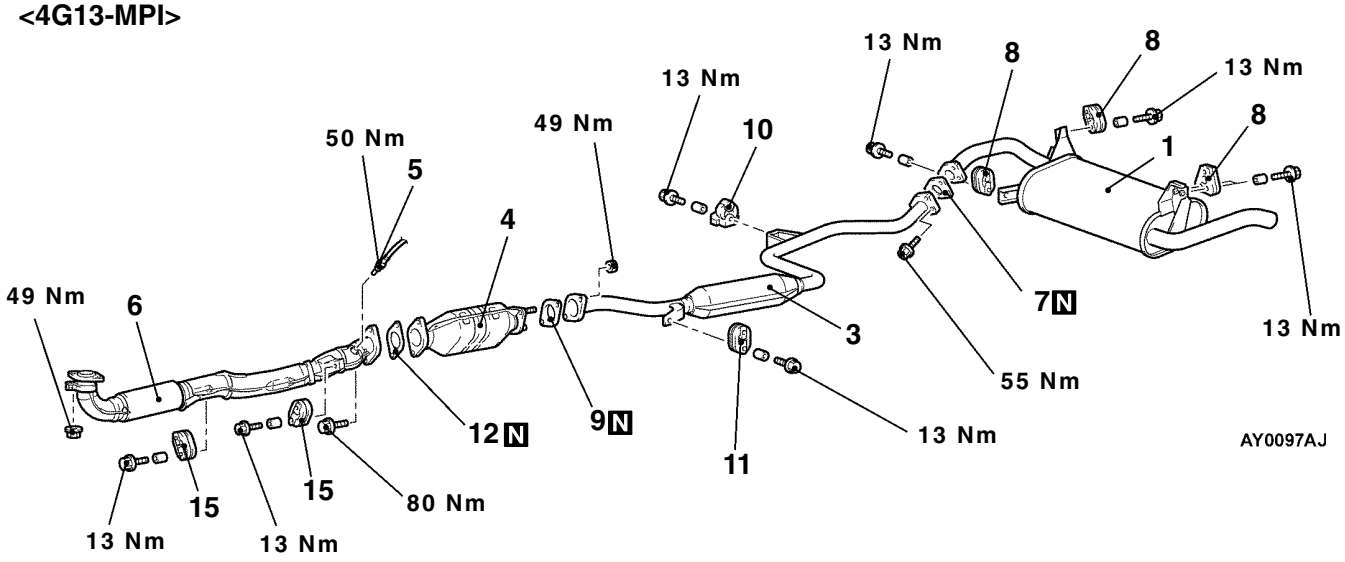



**<4G13-MPI>**

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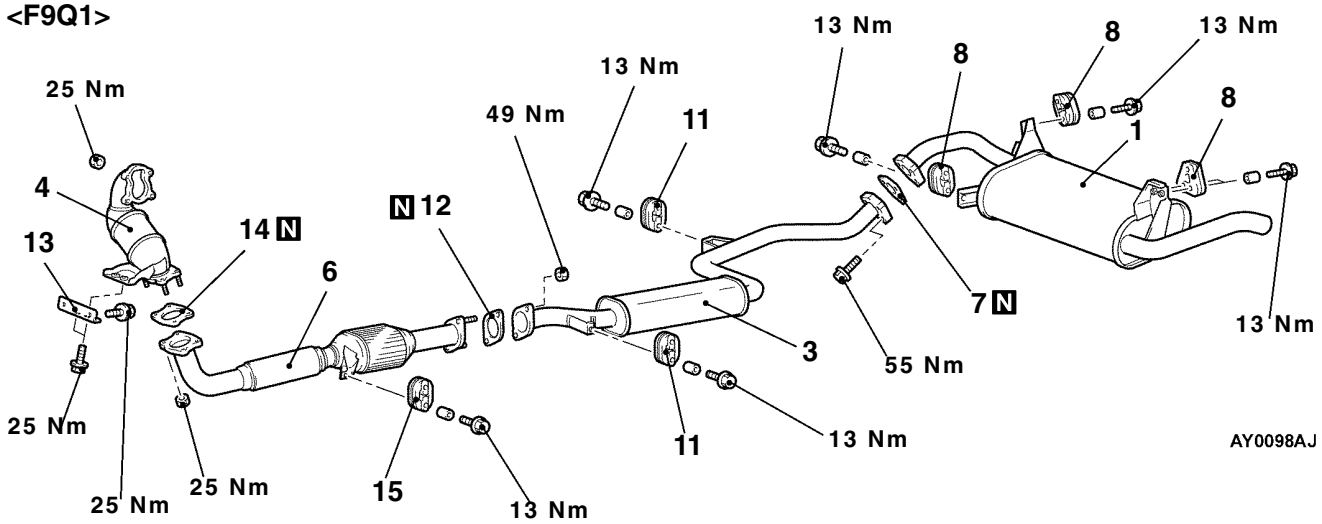

## DISASSEMBLY AND REASSEMBLY

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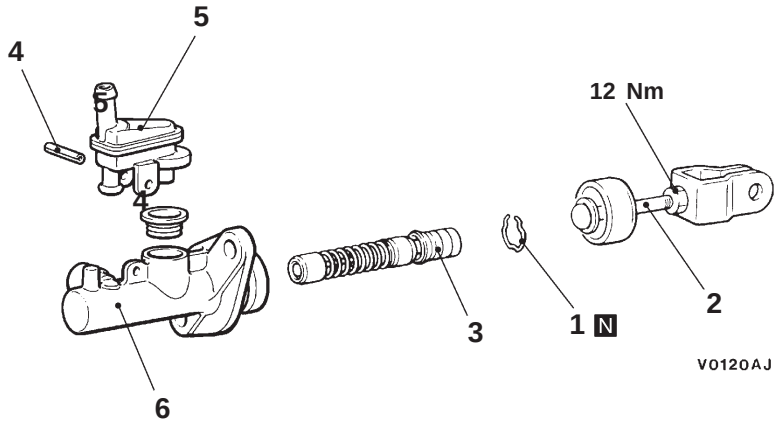
### CLUTCH MASTER CYLINDER

**Caution**
**Do not disassemble piston assembly. The piston assembly can not be reassembled.**

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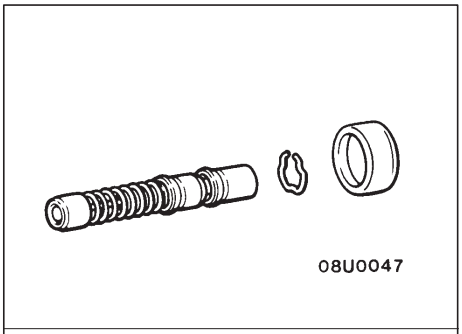
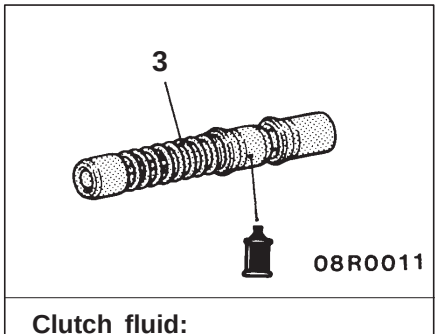
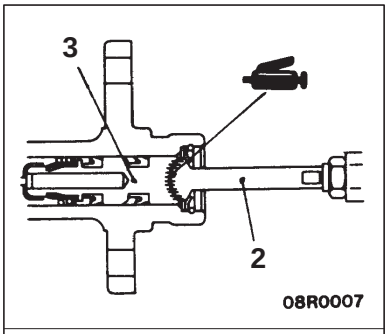



**Piston repair kit**



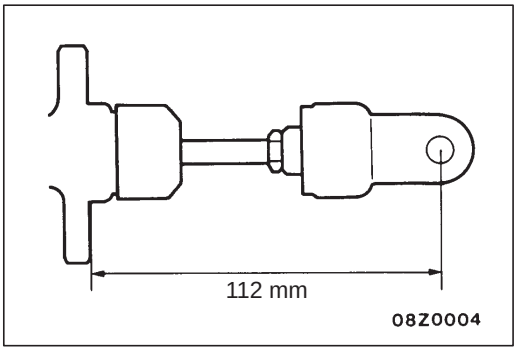

**Clutch fluid:**
**Brake fluid DOT3 or DOT4**




**Grease: Rubber grease**

**Disassembly steps**

1. Piston stopper ring
▶A◀ 2. Push rod assembly
3. Piston assembly
4. Spring pin
5. Nipple
6. Clutch master cylinder body



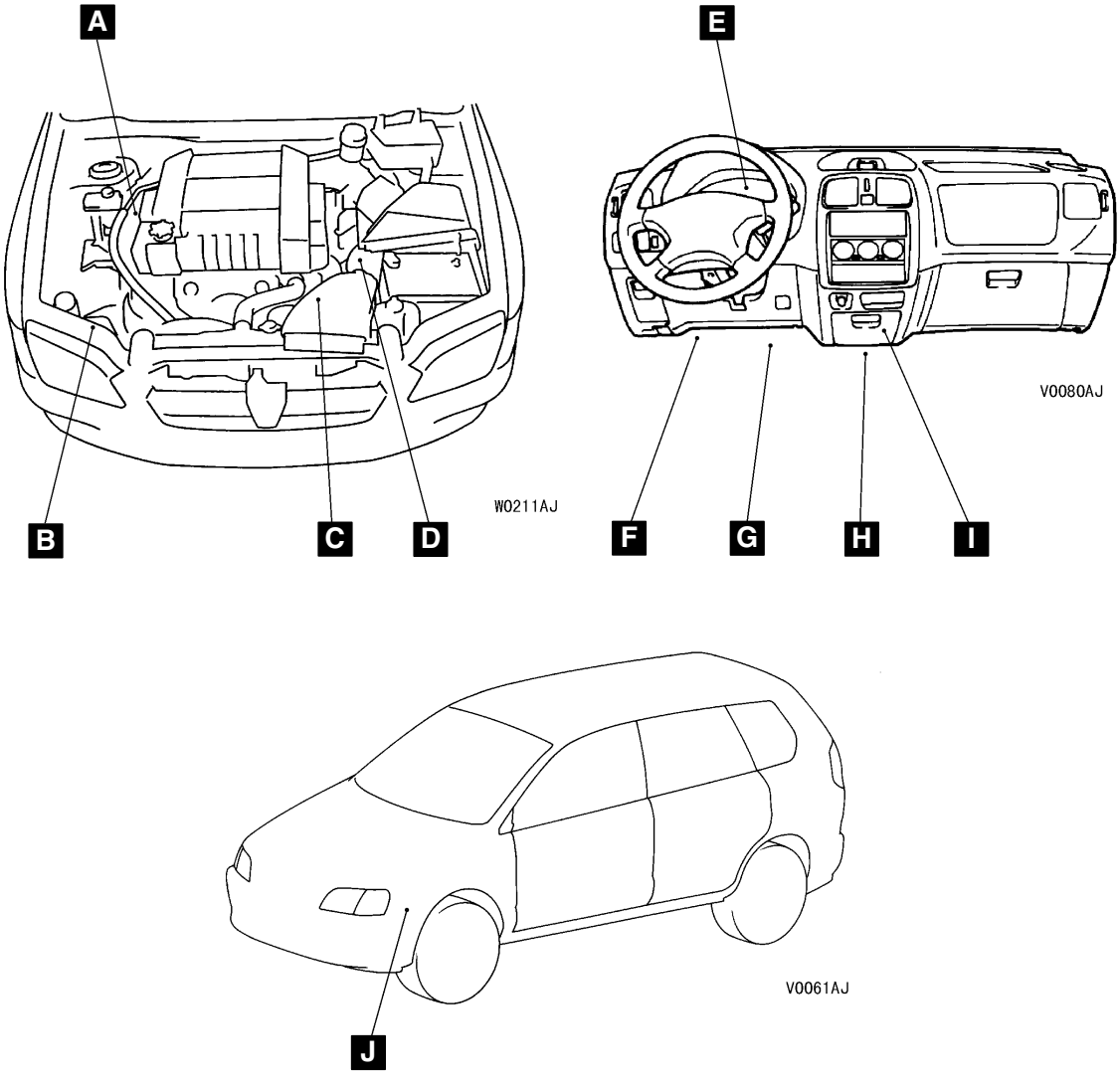

## INSTALLATION SERVICE POINT

### ▶A◀ PUSH ROD ASSEMBLY INSTALLATION

Set the length of the push rod assembly to the shown dimension to make the adjustment of clutch pedal easier.

## A/T CONTROL COMPONENT LOCATION

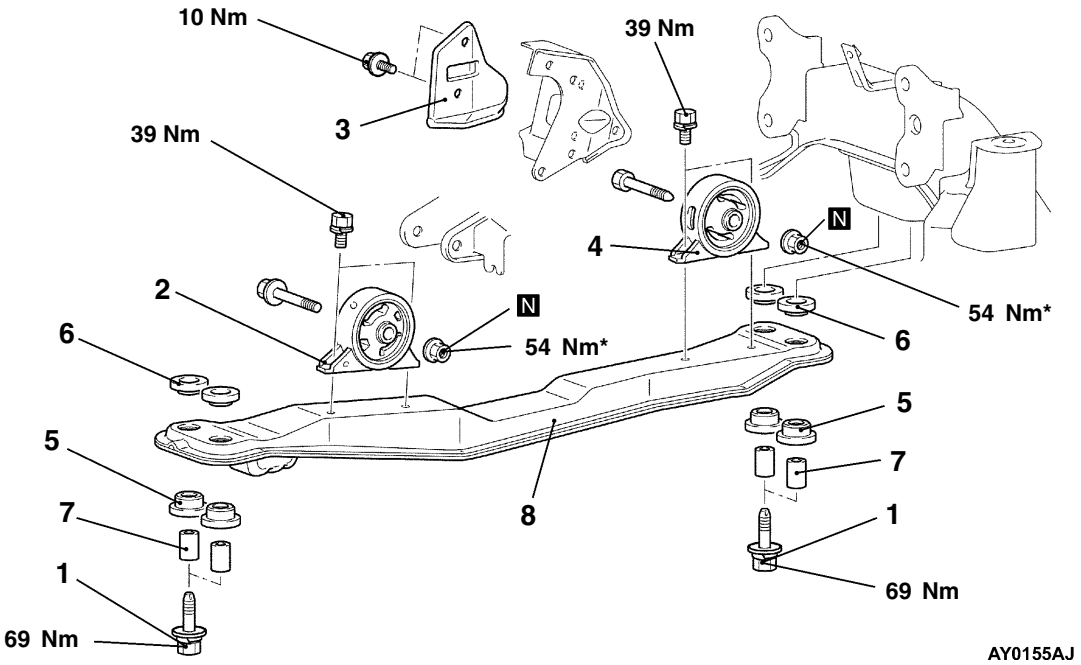
| Name | Symbol | Name | Symbol |
|---|---|---|---|
| Accelerator position sensor | J | Input shaft speed sensor | D |
| A/T control relay | I | A/T fluid temperature sensor | D |
| A/T control solenoid valve assembly | D | Output shaft speed sensor | D |
| Crank angle sensor | A | Shift indicator lamp | E |
| Diagnosis connector | H | Stop lamp switch | F |
| Dual pressure switch | B | Vehicle speed sensor | D |
| Engine-A/T-ECU | I | Wide open throttle switch | G |
| Inhibitor switch | C | | |



# ENGINE ROLL STOPPER, CENTERMEMBER

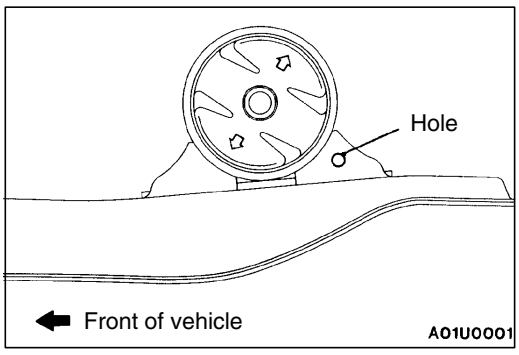
## REMOVAL AND INSTALLATION

**Caution**
**Mounting locations marked by * should be provisionally tightened, and then fully tightened when the body is supporting the full weight of the engine.**




**Removal steps**

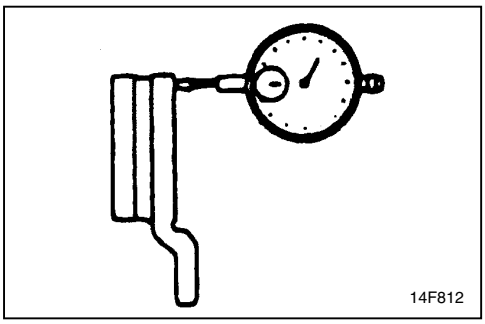
1. Bolt
▶B◀ 2. Front roll stopper bracket assembly
3. Rear roll stopper heat protector
▶A◀ 4. Rear roll stopper bracket assembly
5. Bushing (lower)
6. Bushing (upper)
7. Collar
8. Centermember




## INSTALLATION SERVICE POINTS

### ▶A◀ REAR ROLL STOPPER BRACKET ASSEMBLY INSTALLATION

Install so that the hole in the rear roll stopper bracket is facing towards the rear of the vehicle.

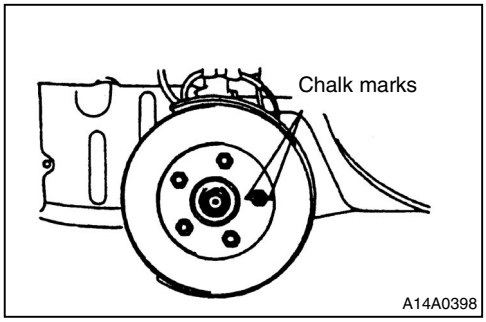


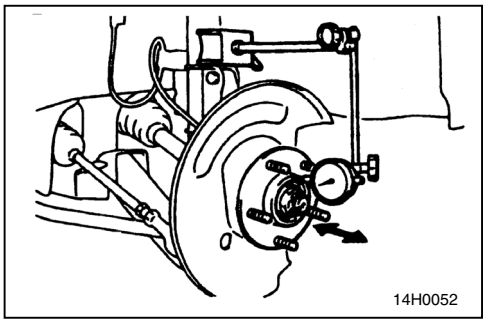

## BRAKE DISC RUN-OUT CHECK AND CORRECTION

1. Remove the brake assembly, and then hold it with wire.
2. Place a dial gauge approximately 5 mm from the outer circumference of the brake disc, and measure the run-out of the disc.

   **Limit: <Front> 0.06 mm or less,**
   **<Rear> 0.08 mm or less**
3. If the brake disc run-out exceeds the limit, correct it as follows:

   (1) Chalk phase marks on the wheel stud and the brake disc, which run-out is excessive as show



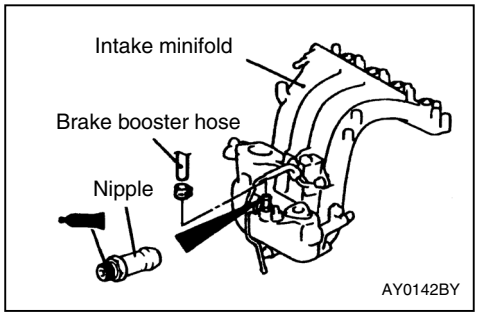

   (2) Remove the brake disc. Then place a dial gauge as shown, and measure the end play by pushing and pulling the wheel hub.

   **Limit: <Front> 0.2 mm, <Rear> 0.025 mm**

   (3) If the end play exceeds the limit, disassemble the hub and knuckle assembly to check each part.

   (4) If the end play does not exceed the limit, dephase the brake disc and secure it. Then recheck the brake disc run-out.
4. If the run-out cannot be corrected by changing the phase of the brake disc, replace the brake disc or grind it with the on-the-car type brake lathe ("MAD, DL-8700PF" or equivalent.

**<Added>**

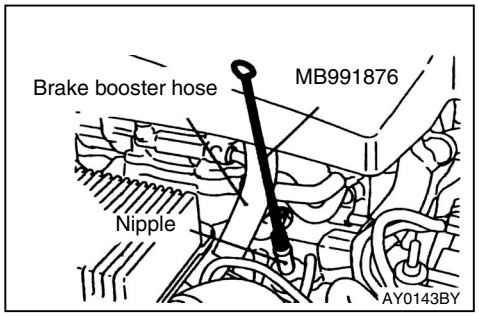



## BRAKE BOOSTER VACUUM NIPPLE REPLACEMENT <SCREW TYPE NIPPLE>

1. Remove the brake booster hose from the intake manifold.
2. Replace the nipple with a new one, using a sealing agent and tighten to 15 – 18 N.m.

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

   **Caution**
   **Take care when applying the thread sealant as too much could block the nipple.**
3. After replacement, re-install the brake booster hose.




## BRAKE BOOSTER VACUUM NIPPLE CLEANING <PRESS FIT TYPE NIPPLE>

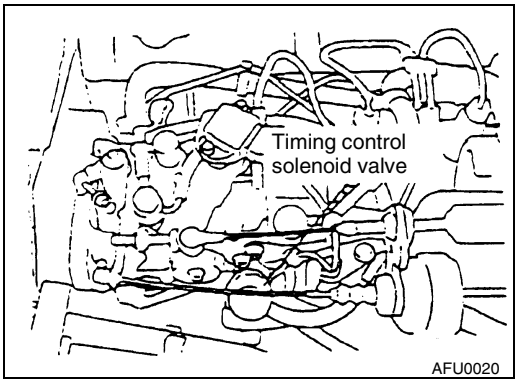
1. Remove the brake booster hose from the intake manifold.
2. Insert special tool into the nipple and remove the carbon deposit by rotating and reciprocating of the special tool.

   **Caution**
   **The special tool should be inserted more than 50 mm and confirm that it goes through into the intake manifold.**
3. Make sure that no parts of the special tool remain in the manifold.
4. After cleaning, re-install the brake booster hose.

## ON-VEHICLE SERVICE

### BLEEDING

1. Jack up the front wheels and support them by using a rigid rack.
2. Manually turn the oil pump pulley a few times.
3. Turn the steering wheel all the way to the left and to the right five or six times.
4. Disconnect the timing control solenoid valve connector.

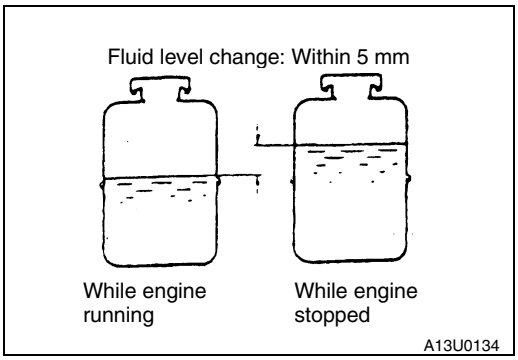



5. While operating the starting motor intermittently, turn the steering wheel all the way to the left and right five or six times (for 15 to 20 seconds).

**Caution**

1. **During air bleeding, replenish the fluid supply so that the level never falls below the lower position 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.**

6. Connect the timing control solenoid valve connector and run the engine at idle.
7. Turn the steering wheel to the left and right until there are no air bubbles in the oil reservoir.
8. Confirm that the fluid is not milky, and that the level is up to the specified position on the level gauge.
9. Confirm that there is very little change in the fluid level when the steering wheel is turned left and right.




10. Check whether or not the change in the fluid level is within 5 mm when the engine is stopped and when it is running.
11. If the change of the fluid level is 5 mm or more, the air has not been completely bled from the system, and thus must be bled completely.

**Caution**

1. **If the fluid level rises suddenly after the engine is stopped, the air has not been completely bled.**
2. **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.**

# GROUP 42
# BODY

## GENERAL

### OUTLINE OF CHANGES

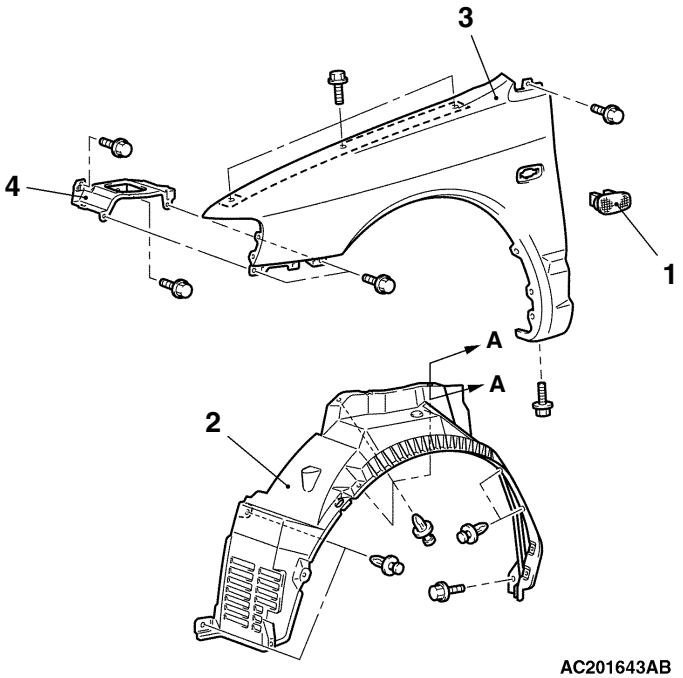
The following service procedures have been established due to the following changes and the abolishment. The other service procedures are the same as before.

- The shape of the fender has been changed.
- The central door locking function has been discontinued for the key cylinder switches other than the driver's door main switch.
- The sunroof delay-off timer function has been discontinued.

## FENDER

### REMOVAL AND INSTALLATION

**Pre-removal and Post-installation Operation**
- Front Bumper Removal and Installation (Refer to GROUP 51.)
- Headlamp Removal and Installation (Refer to GROUP 54.)
- Delta Garnish Removal and Installation (Refer to Basic Manual Pub. No. CMXE99E1 GROUP 51 – Door Mirror.)

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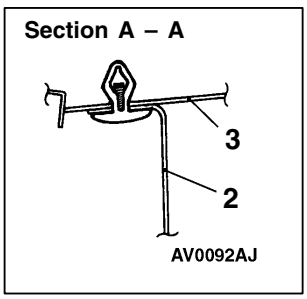


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**Removal steps**

▶A◀ 1. Side turn signal lamp
2. Splash shield
- Front fender protector moulding (Refer to Basic Manual Pub. No. CMXE99E1 GROUP 51 Moulding and Garnish.)

3. Fender
4. Fender bracket

# IGNITION SWITCH AND IMMOBILIZER SYSTEM

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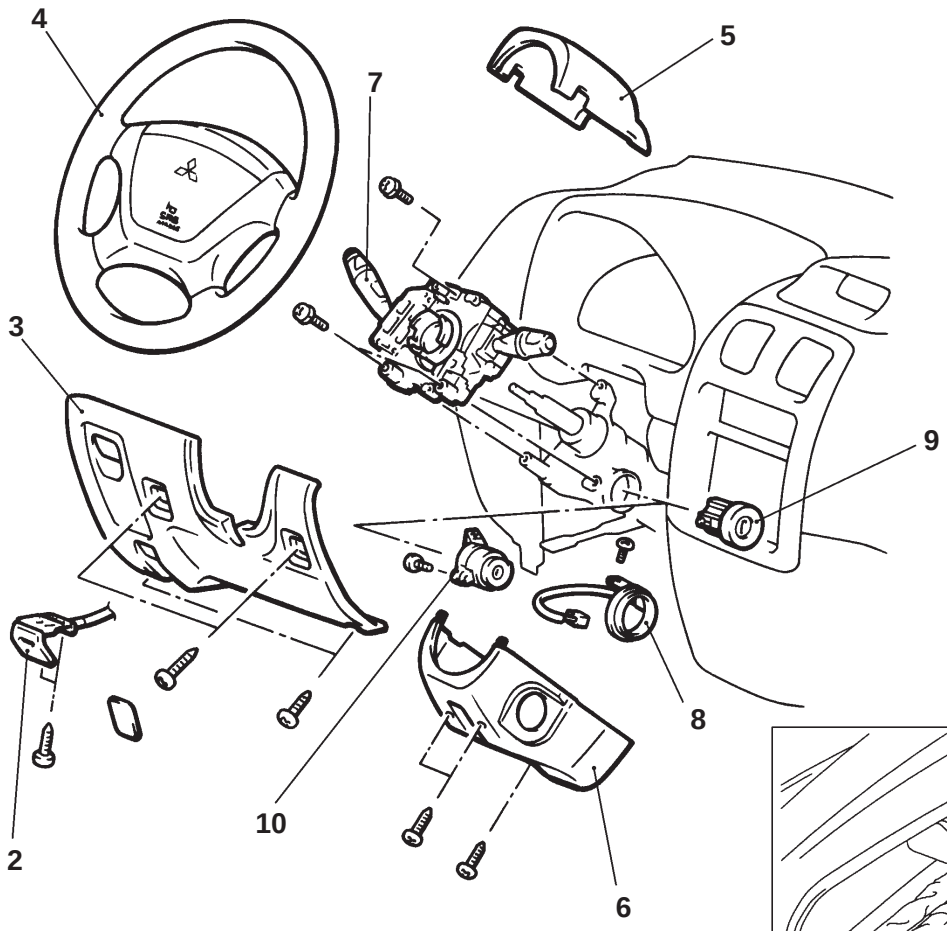
## REMOVAL AND INSTALLATION

**Caution: SRS**

**Before removal of air bag module and clock spring, refer to GROUP 52B – Service Precautions and Air Bag Module and Clock Spring.**

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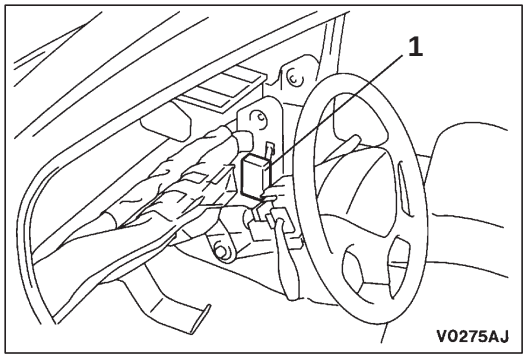


**Immobilizer-ECU removal steps**

- Instrument panel (Refer to GROUP 52A.)

1. Immobilizer-ECU

**Ignition switch and ignition key ring antenna removal steps**

2. Hood lock release handle
3. Instrument under cover (Refer to GROUP 52A – Instrument Panel.)
4. Steering wheel (Refer to GROUP 37A.)
5. Column cover, upper
6. Column cover, lower
7. Column switch (Refer to GROUP 37A – Steering Wheel and Shaft.)
8. Ignition key ring antenna
9. Steering lock cylinder
10. Ignition switch

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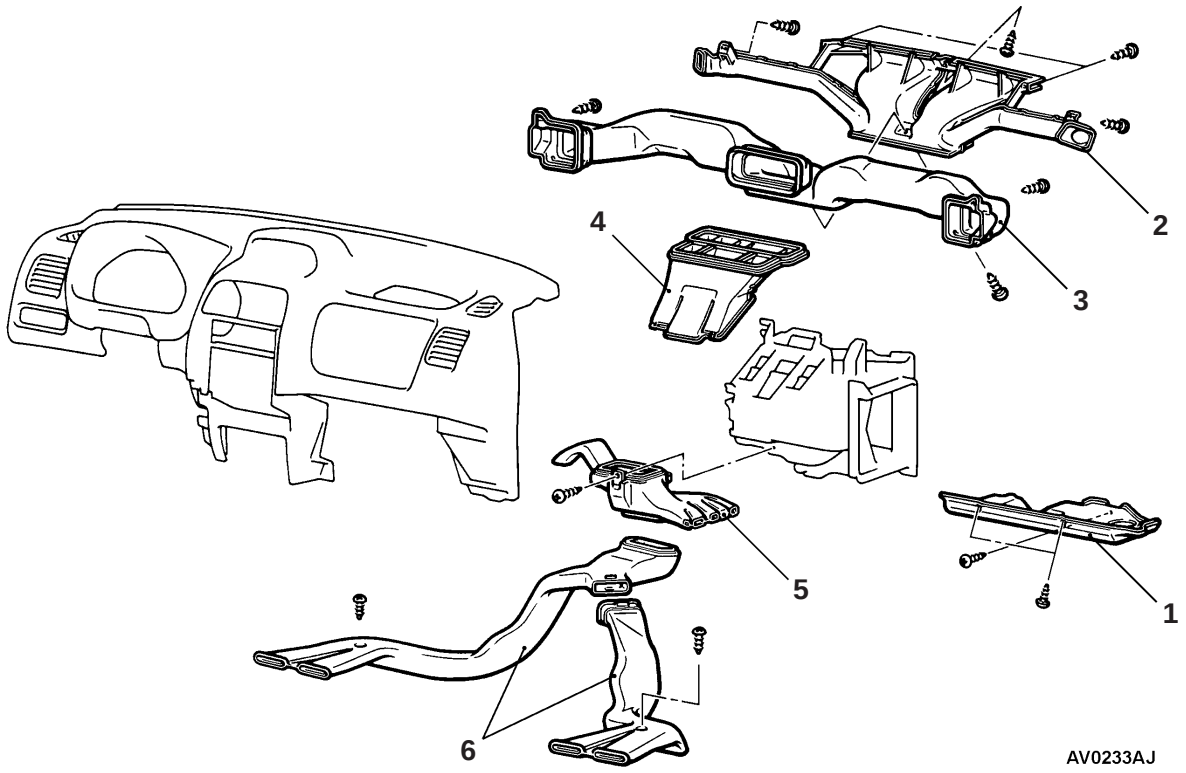
# VENTILATORS

55300160201

## REMOVAL AND INSTALLATION

**Caution: SRS**
**When removing and installing the floor console assembly from vehicles equipped with SRS, do not let it bump against the SRS-ECU or the components.**




**Under cover removal**

1. Under cover

**Defroster nozzle and distribution duct removal steps**

- Instrument panel (Refer to GROUP 52A.)

2. Defroster nozzle assembly
3. Distribution duct
4. Center ventilation duct

**Foot distribution duct removal steps**

- Glove box, under cover, driver's side lower panel and passenger's side lower panel (Refer to GROUP 52A – Instrument panel.)

5. Foot distribution duct

**Rear heater duct removal steps**

- Front seat(Refer to GROUP 52A.)
- Floor console assembly (Refer to GROUP 52A.)

6. Rear heater duct

NOTE
For the center air outlet assembly and the side air outlet assembly, refer to GROUP 52A – Instrument panel.