HOW TO USE THIS MANUAL

SCOPE OF MAINTENANCE, REPAIR AND SERVICING EXPLANATIONS

This manual provides explanations, etc. concerning procedures for the inspection, maintenance, repair and servicing of the subject model. Note, however, that for engine and transmission-related component parts, this manual covers only on-vehicle inspections, adjustments, and the removal and installation procedures for major components.
For detailed information concerning the inspection, checking, adjustment, disassembly and reassembly of the engine, transmission and major components after they have been removed from the vehicle, please refer to separate manuals covering the engine and the transmission.

ON-VEHICLE SERVICE

"On-vehicle Service" is procedures for performing inspections and adjustments of particularly important locations with regard to the construction and for maintenance and servicing, but other inspection (for looseness, play, cracking, damage, etc.) must also be performed.

INSPECTION

Under this title are presented inspection and checking procedures to be performed by using special tools and measuring instruments and by feeling, but, for actual maintenance and servicing procedures, visual inspections should always be performed as well.

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.

REFERENCE VALUE

Indicates the adjustment value prior to starting the work (presented in order to facilitate assembly and adjustment procedures, and so they can be completed in a shorter time).

CAUTION

Indicates the presentation of information particularly vital to the worker during the performance of maintenance and servicing procedures in order to avoid the possibility of injury to the worker, or damage to component parts, or a reduction of component or vehicle function or performance, etc.

INDICATION OF TIGHTENING TORQUE

The tightening torque shown in this manual is a basic value with a tolerance of ±10% except the following cases when the upper and lower limits of tightening torque are given.
(1) The tolerance of the basic value is within ±10%.
(2) Special bolts or the like are in use.
(3) Special tightening methods are used.

Indicates the group title.

Indicates the section title.

Indicates the group number.

Indicates the page number.

STEERING – Power Steering Oil Pump 37A-29

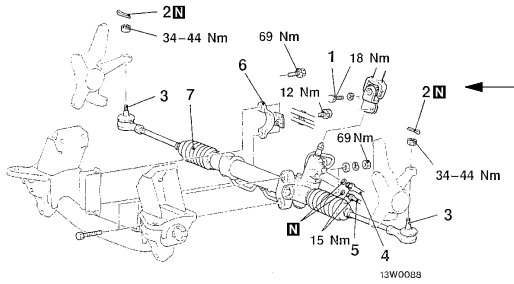
POWER STEERING GEAR BOX

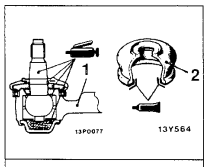
120000039

REMOVAL AND INSTALLATION

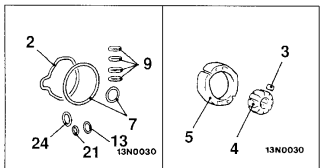
Pre-removal Operation
(1) Power Steering Fluid Draining (Refer to P. 37A-10.)
(2) Air Cleaner Assembly Removal
(3) Under Cover Removal (Refer to GROUP 42 – Under Cover.)

<2WD>





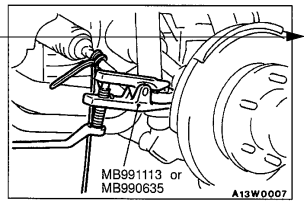
Sealant: 3M ATD Part No. 8661 or equivalent



Oil pump seal kit | Oil pump cartridge kit

Removal steps
1. Lower shaft assembly and gear box connecting bolt
2. Split pin
3. Connection for tie-rod end and knuckle
4. Connection for return tube
5. Connection for pressure tube
6. Clamp
7. Gear box assembly

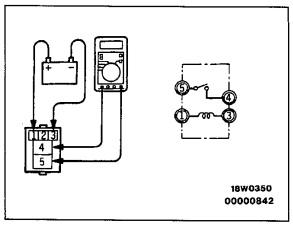
◀A▶ ◀B▶



REMOVAL SERVICE POINTS

◀A▶ TIE-ROD END DISCONNECTION

Caution
1. **Using the special tool, loosen the tie rod end mounting nut. Only loosen the nut; do not remove it from the ball joint.**
2. **Support the special tool with a cord, etc. to prevent it from coming off.**

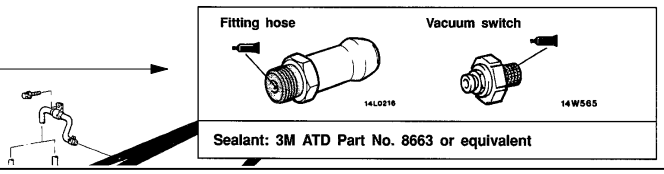


HEADLAMP RELAY CONTINUITY INSPECTION

Battery voltage	Terminal No.			
	1	3	4	5
Power is not supplied	○	○		
Power is supplied	⊕	⊖	○	○

35A-26 BASIC BRAKE SYSTEM – Master Cylinder and Brake Booster

Lubrication and sealing points



Sealant: 3M ATD Part No. 8663 or equivalent

00002471

Denotes non-reusable part.

Denotes tightening torque.
For bolts and nuts which do not have a tightening torque listed, refer to the “Tightening torque”.

Repair kit or set parts are shown. (Only very frequently used parts are shown.)

Operating procedures, cautions, etc. on removal, installation, disassembly and reassembly are described.

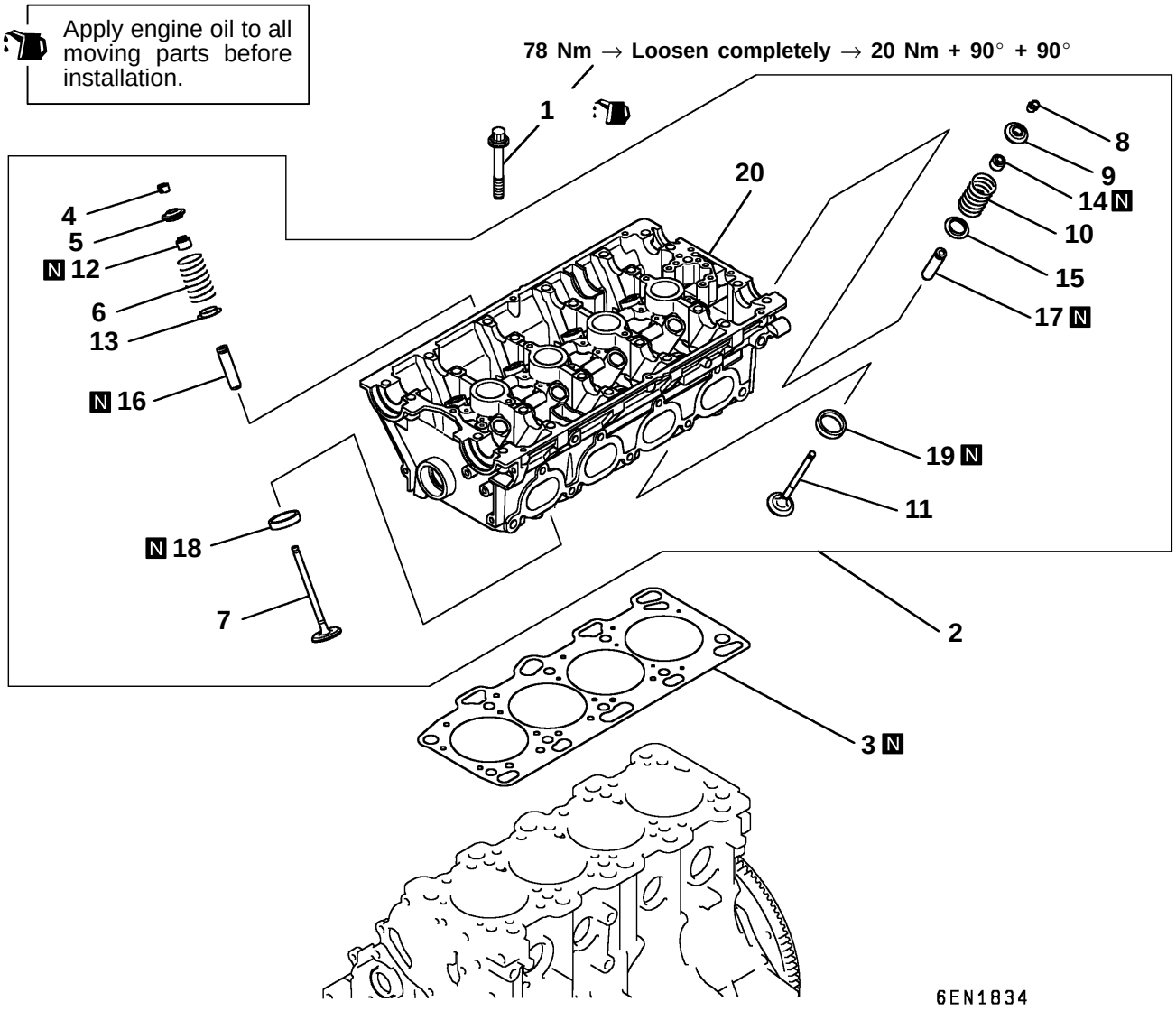
○——○ indicates that there is a continuity between the terminals.
⊕——⊖ indicates terminals to which battery voltage is applied.

The title of the page (following the page on which the diagram of component parts is presented) indicating the locations of lubrication and sealing procedures.

Items	Nm
Rocker cover	3.5
Engine support bracket	49
Camshaft sprocket bolt	88
Timing belt rear right cover	11
Timing belt rear left upper cover	11
Fuel and emission control parts	
Throttle body	18
Fuel pressure regulator	9
Delivery pipe	11
Vacuum tank bracket	9
Solenoid valve bracket	9
Solenoid valve	9
Vacuum hose and vacuum pipe	11
Secondary air intake manifold	
Heat protector	13
Vacuum hose and vacuum pipe	11
Air pipe (Heat protector side)	13
Air pipe (Cam position sensor side)	11
Air pipe (Eye bolt)	49
Air pipe (Control valve side)	24
Air control valve	21
Air control valve bracket	24
Intake manifold stay	30
Intake manifold (M8)	19
Intake manifold (M10)	35
Exhaust manifold	
Engine hanger	12
Heat protector (Turbocharger side)	14
Oxygen sensor	54
Exhaust fitting bolt	59
Exhaust fitting nut	59
Air outlet fitting	19

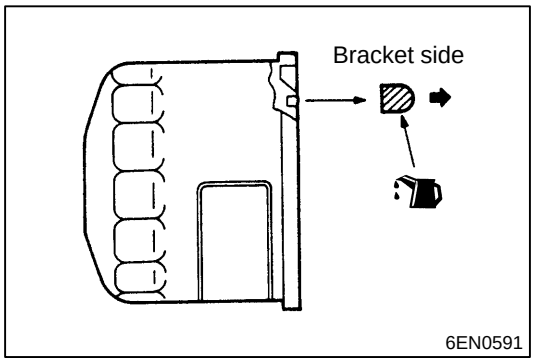
CYLINDER HEAD AND VALVES

REMOVAL AND INSTALLATION



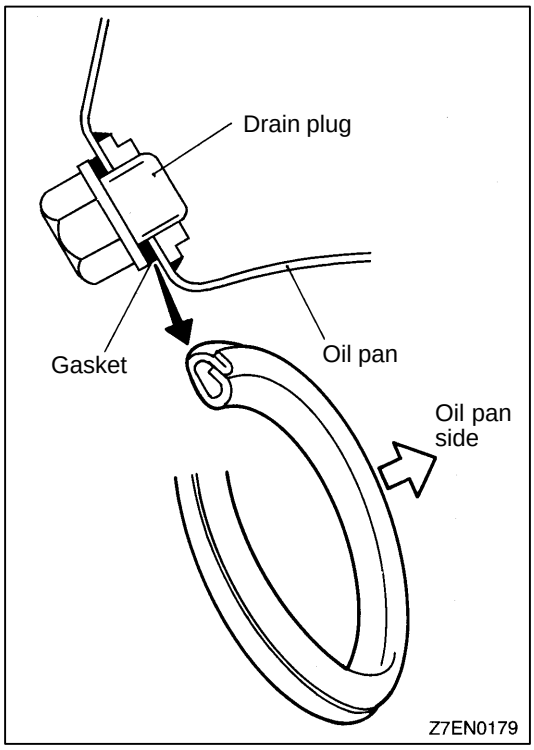
Removal steps

◀A▶ ▶D◀ 1. Cylinder head bolt
2. Cylinder head assembly
3. Cylinder head gasket
◀B▶ ▶C◀ 4. Retainer lock
5. Valve spring retainer
▶B◀ 6. Valve spring
7. Intake valve
◀B▶ ▶C◀ 8. Retainer lock
9. Valve spring retainer
▶B◀ 10. Valve spring
◀C▶ 11. Exhaust valve
▶A◀ 12. Valve stem seal
13. Valve spring seat
▶A◀ 14. Valve stem seal
15. Valve spring seat
16. Intake valve guide
17. Exhaust valve guide
18. Intake valve seat
19. Exhaust valve seat
20. Cylinder head



▶M◀OIL FILTER INSTALLATION

(1) Clean the installation surfaces of the filter bracket.
(2) Apply engine oil to the O-ring of the oil filter.
(3) Screw the oil filter in until the O-ring contacts the bracket. Then tighten 3/4 turn (tightening torque: 16 Nm).



▶N◀DRAIN PLUG GASKET INSTALLATION

Caution
Fitting the gasket in a wrong way will result in oil leakage.

Install the drain plug gasket in the direction shown.

INSPECTION

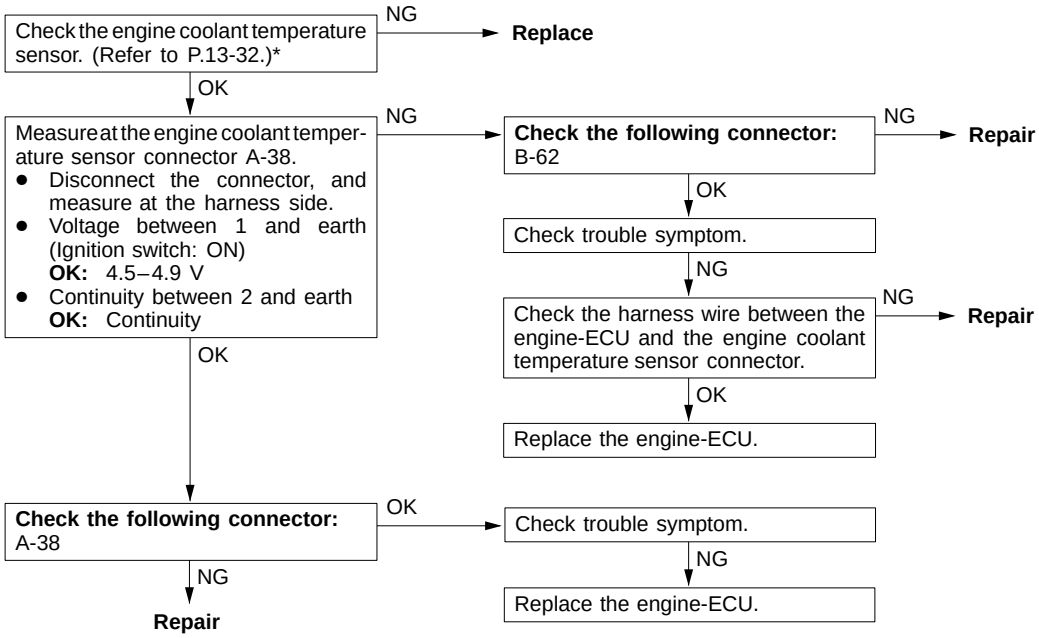
FRONT CASE

(1) Check oil holes for clogging and clean if necessary.
(2) Check the left counterbalance 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

(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.

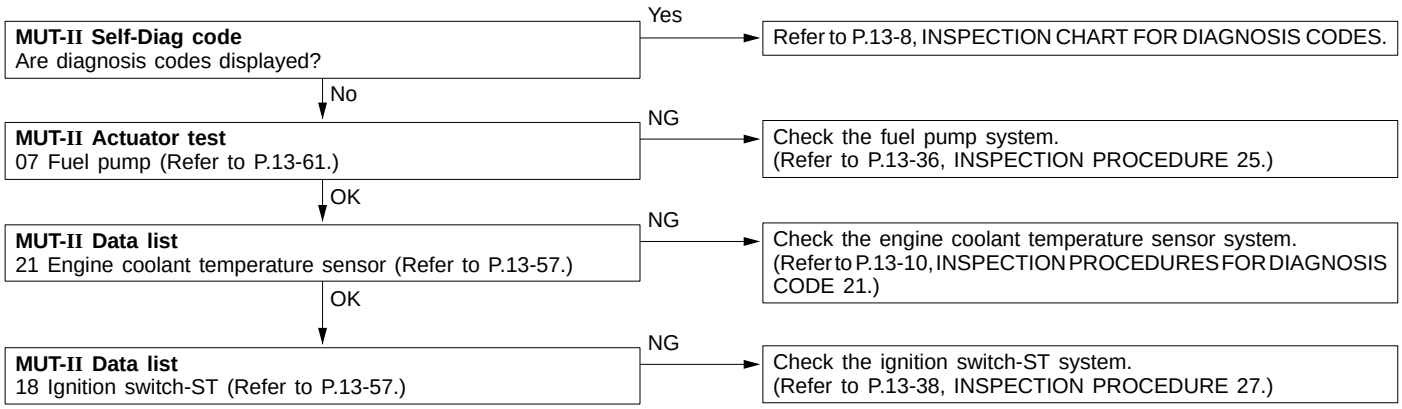
Code No. 21 Engine coolant temperature sensor system	Probable cause
Range of Check ● Ignition switch: ON ● Excluding 60 seconds after the ignition switch is turned to ON or immediately after the engine starts. Set conditions ● Sensor output voltage is 4.6 V or more (corresponding to an engine coolant temperature of –45°C or less) for 4 seconds. or ● Sensor output voltage is 0.1 V or less (corresponding to an engine coolant temperature of 140°C or more) for 4 seconds.	● Malfunction of the engine coolant temperature sensor ● Improper connector contact, open or short-circuited harness wire of the engine coolant temperature sensor circuit ● Malfunction of the engine-ECU
Range of Check ● Ignition switch: ON ● Engine speed is approx. 50 r/min or more Set conditions ● The sensor output voltage increases from 1.6 V or less (corresponding to an engine coolant temperature of 40°C or more) to 1.6 V or more (corresponding to an engine coolant temperature of 40°C or less). ● After this, the sensor output voltage is 1.6 V or more for 5 minutes.	



NOTE
*: Refer to Workshop Manual for LANCER EVOLUTION-IV and EVOLUTION-V (Pub. No. S9806CNCP9).

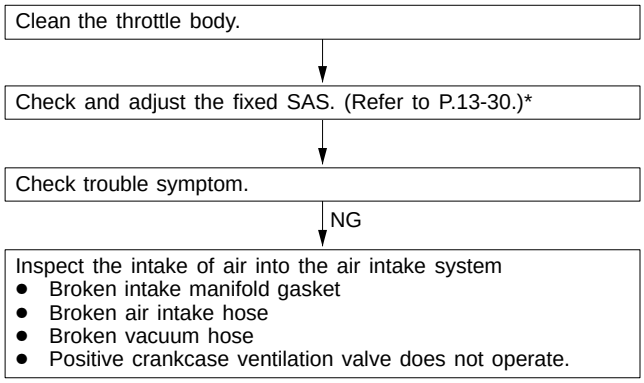
INSPECTION PROCEDURE 39

MUT-II: Check if uncomplete combustion occurs.



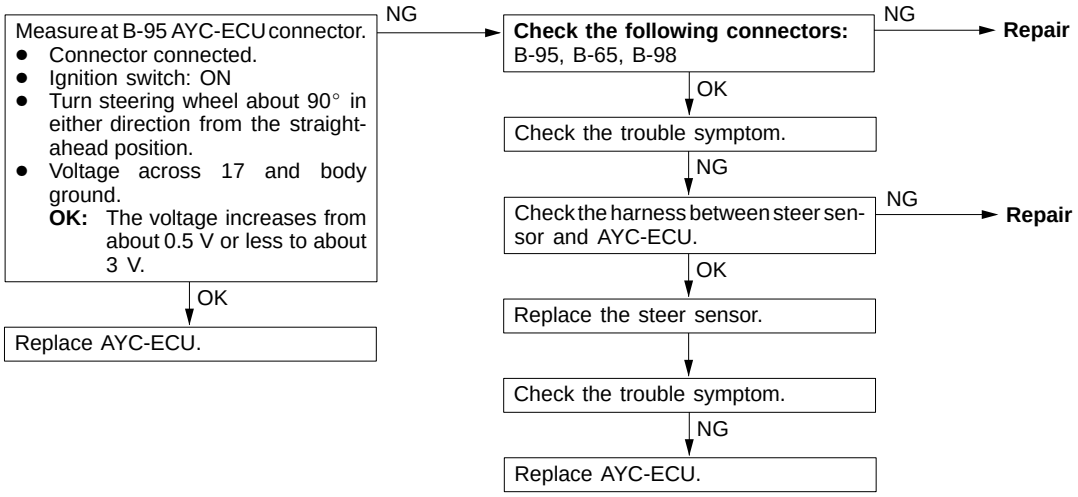
INSPECTION PROCEDURE 40

Check if hunting occurs.

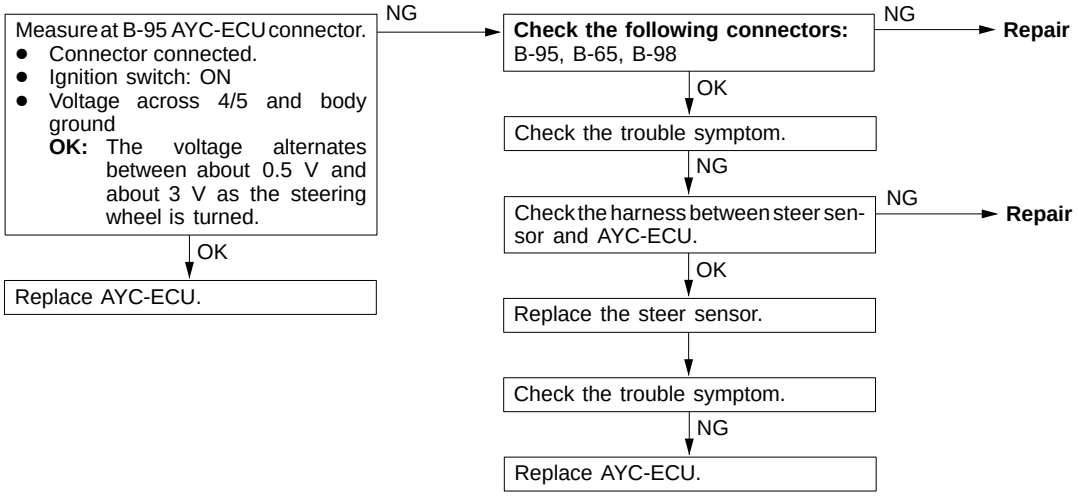


NOTE
*: Refer to Workshop Manual for LANCER EVOLUTION-IV and EVOLUTION-V (Pub. No. S9806CNCP9).

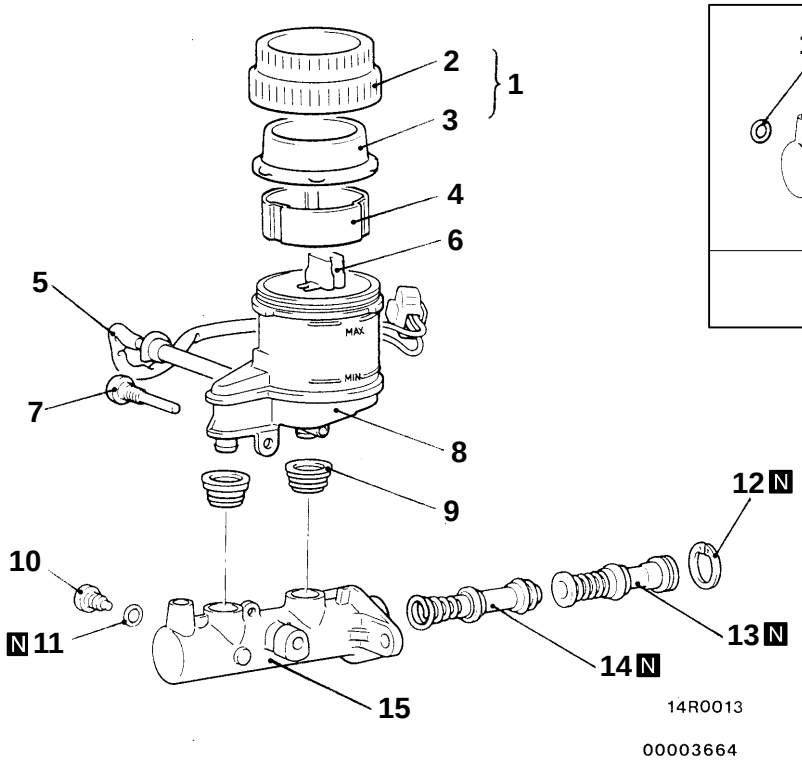
Code No. 33: Steer sensor (ST-N) system	Probable cause
This code is output when the steering wheel is turned 400° or more in the same direction with ST-N OFF (HIGH voltage).	• Defective steer sensor • Defective harness or connector • Defective AYC-ECU

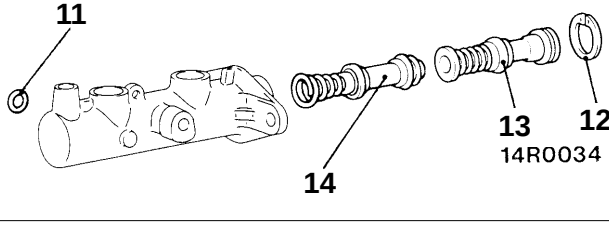


Code No. 34: Steer sensor (ST-1, ST-2) system	Probable cause
This code is output if a turning condition is detected for a cumulative period of time of 15 min. or more, during which there is no change in the steer sensor (ST-1, ST-2) signals with the wheel speed 15 km/h or more.	• Defective steer sensor • Defective harness or connector • Defective AYC-ECU

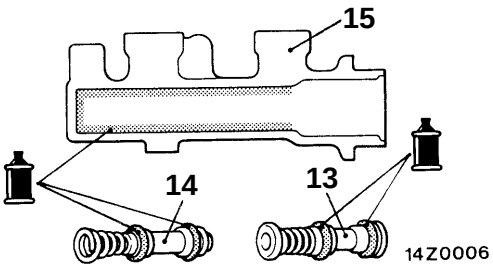


MASTER CYLINDER
DISASSEMBLY AND REASSEMBLY





Master cylinder kit



Brake fluid: DOT3 or DOT4

Disassembly steps

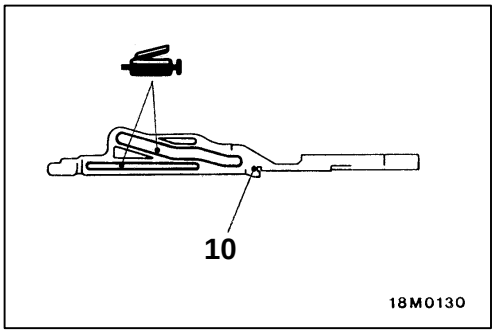
1. Reservoir cap assembly
2. Reservoir cap
3. Diaphragm
4. Filter
5. Brake fluid level sensor
6. Float
7. Reservoir stopper bolt

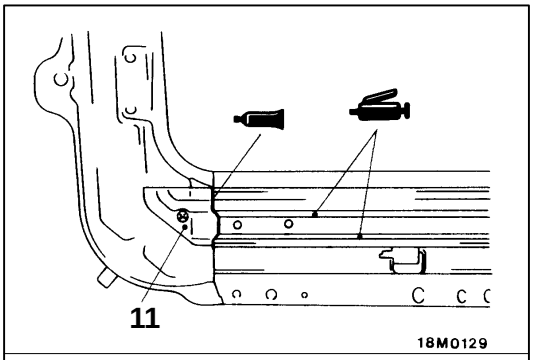
◀A▶

◀B▶

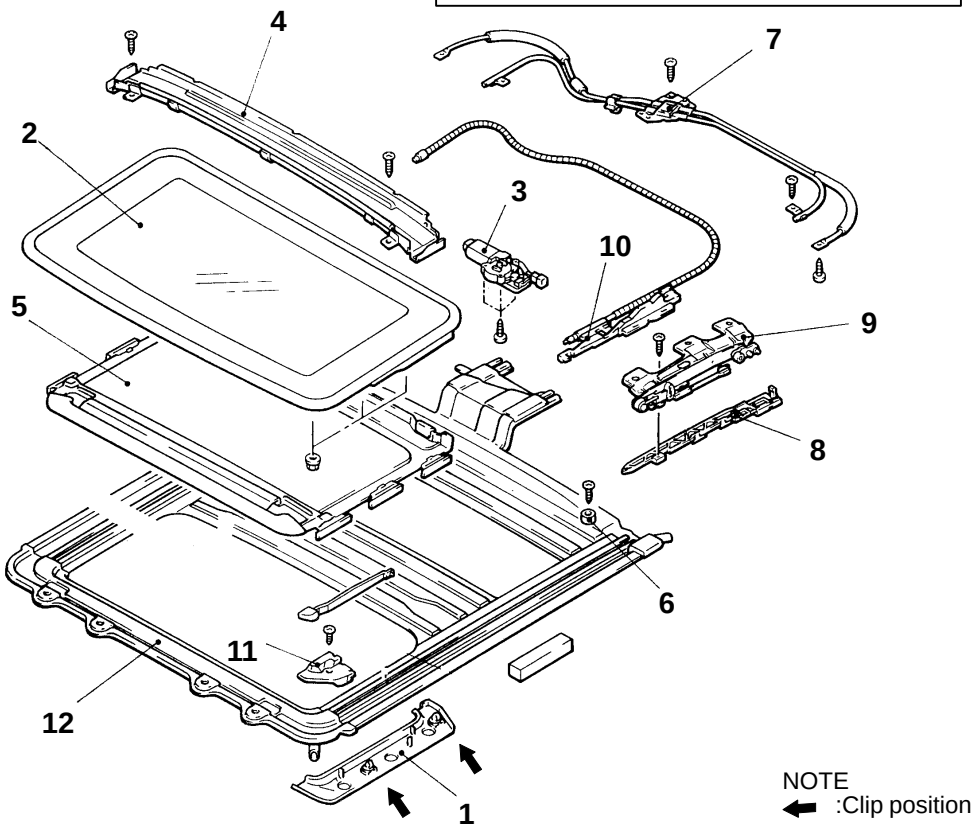
8. Reservoir tank
9. Reservoir seal
10. Piston stopper bolt
11. Gasket
12. Piston stopper ring
13. Primary piston assembly
14. Secondary piston assembly
15. Master cylinder body

DISASSEMBLY AND REASSEMBLY





Sealant:
3M ATD Part No.8531 or 3M Part No.8646, or equivalent



Disassembly steps

1. Side decoration cover (Refer to P.42-15.)
2. Roof lid glass assembly
3. Sunroof motor
4. Drip rail assembly
5. Sunshade assembly
6. Cushion (B) assembly
7. Drive unit assembly
8. Decoration link
9. Guide (A) assembly
10. Slider assembly
11. Rail cover assembly
12. Frame sub assembly

REPAIR PROCEDURE

WHEN AIR BAG DEPLOYS IN A COLLISION.

1. Replace the following parts with new ones.
   - SRS-ECU (Refer to P.52B-24.)
   - Air bag module (Refer to P.52B-25.)

2. Check the following parts and replace if there are any malfunctions.
   - Clock spring (Refer to P.52B-25.)
   - Steering wheel, steering column and intermediate joint
     (1) Check wiring harness (built into steering wheel) and connectors for damage, and terminals for deformation.
     (2) Install air bag module to check fit or alignment with steering wheel.
     (3) Check steering wheel for noise, binds or difficult operation and excessive free play.

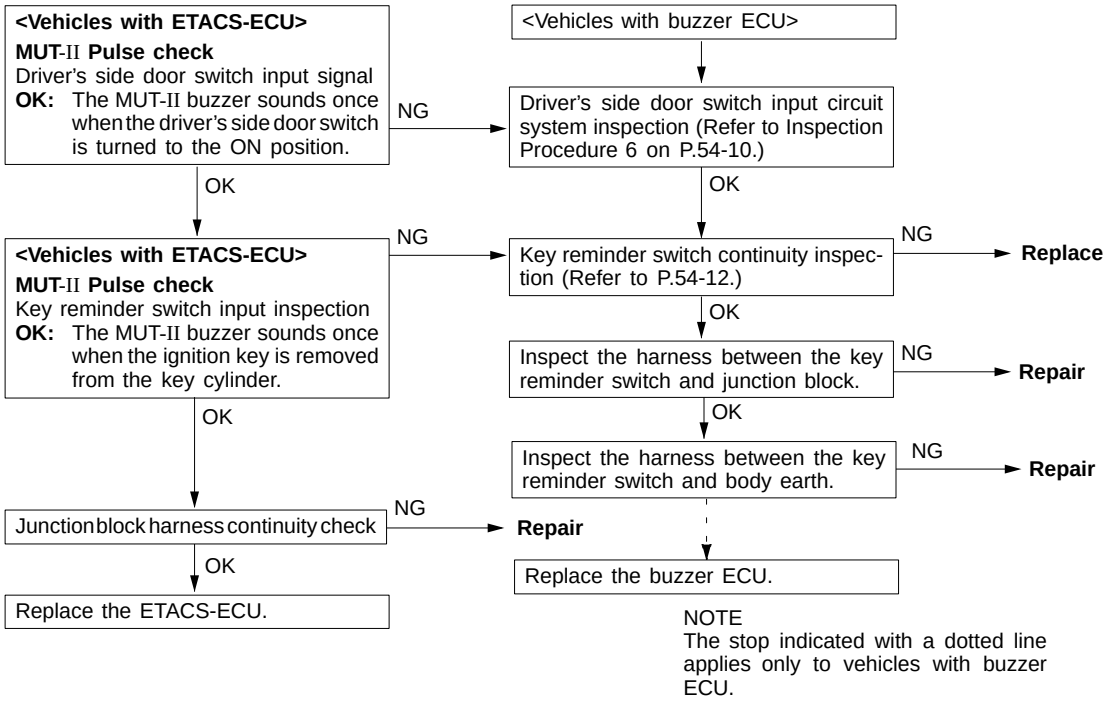
3. Check harnesses for binding, connectors for damage, poor connections, and terminals for deformation. (Refer to P.52B-18.)

WHEN AIR BAG DOES NOT DEPLOY IN LOW-SPEED COLLISION.

Check the SRS components. If the SRS components are showing any visible damage such as dents, cracks, or deformation, replace them with new ones. Concerning parts removed for inspection, replacement with new parts and cautionary points for working, refer to appropriate INDIVIDUAL COMPONENT SERVICE, P.52B-22.

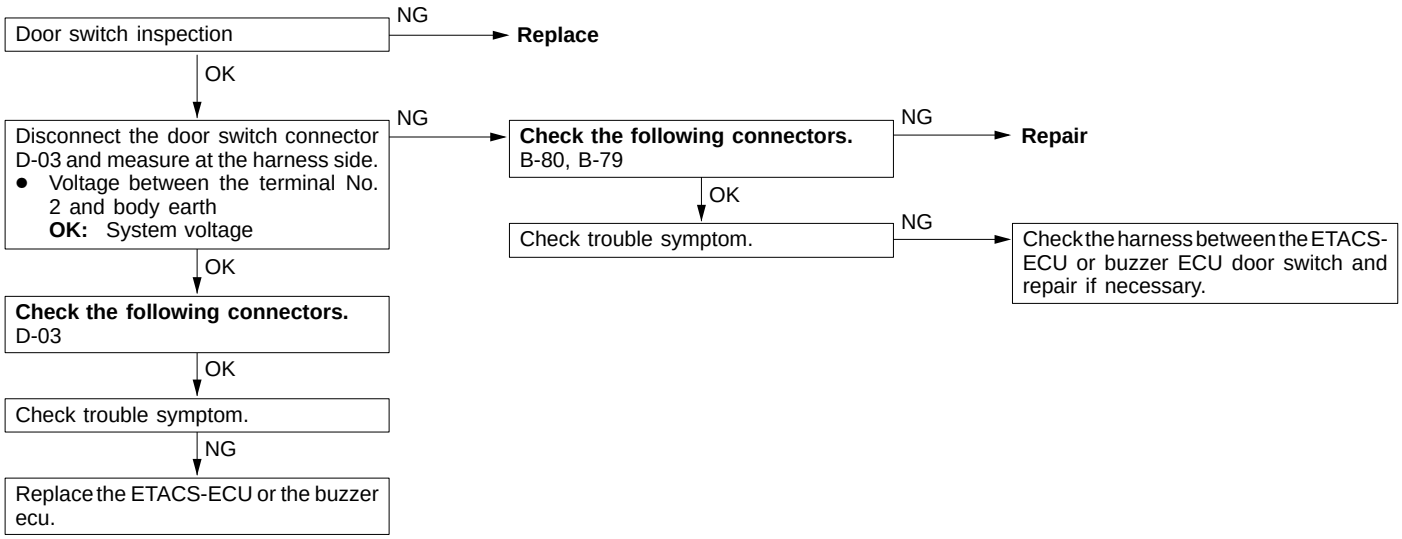
Inspection Procedure 5

The key reminder warning buzzer dose not sound even if the driver's side door is opened while the key is still inserted. (However, the ignition key should be in the OFF position.)	Probable cause
The cause is probably a malfunction of the door switch input circuit system, if the key hole illumination lamp is also faulty. A malfunction of the key reminder switch input circuit system is also suspected.	• Malfunction of door switch • Malfunction of key reminder switch • Malfunction of connector • Malfunction of harness • Malfunction of ETACS-ECU • Malfunction of buzzer ECU



Inspection Procedure 6

Driver's side door switch input circuit system inspection

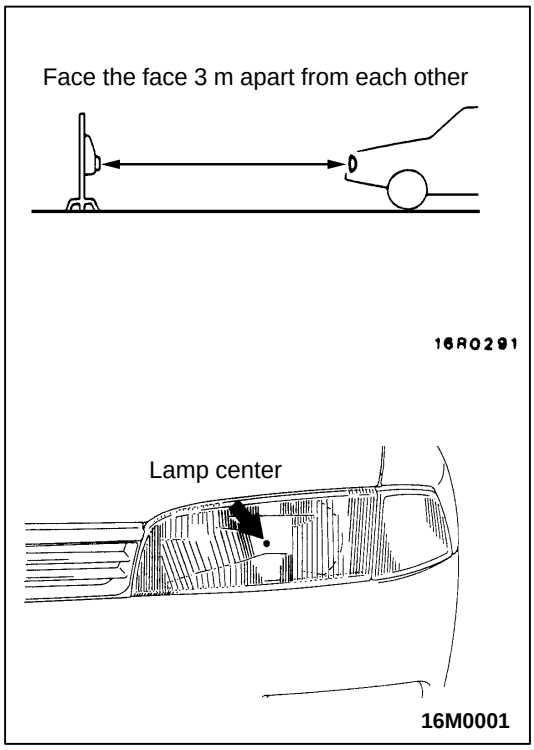


ON-VEHICLE SERVICE

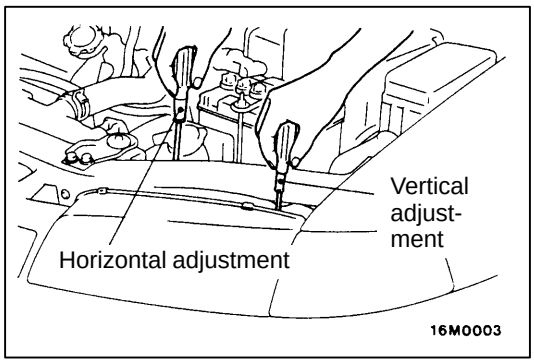
HEADLAMP AIMING

Bring the vehicle in the following conditions before aiming the headlamp.

- Check the tires for inflation pressure. Pump them up if necessary to the labeled pressure level.
- Set the vehicle unladen on a level floor.
- Place one person (approximately 55 kg) on the driver's seat.

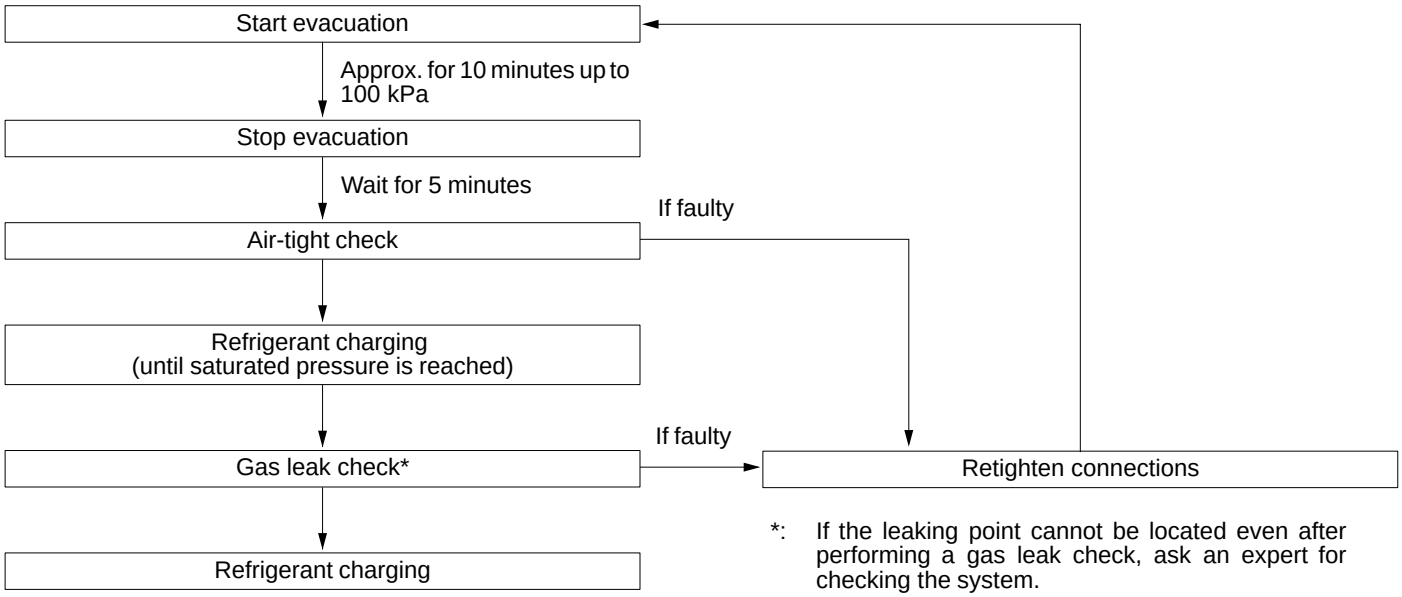


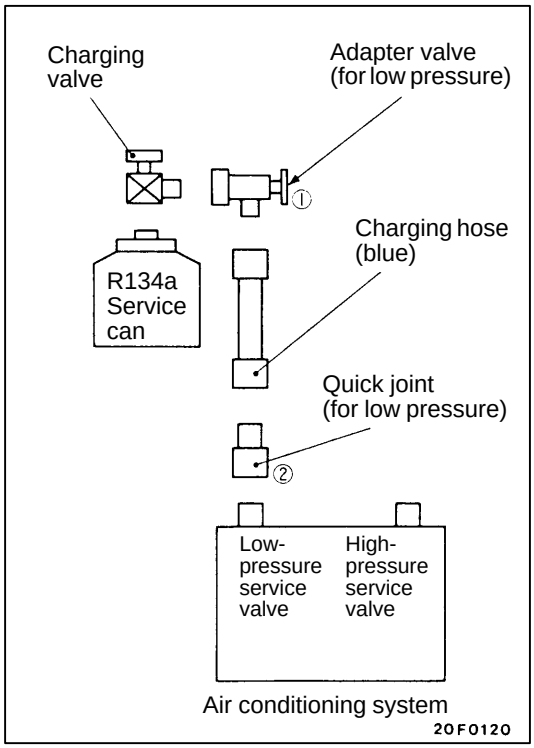
1. Position the tester so that its converging lens faces the high-beam lamp (○ marked) center to center at a distance of 3 m from each other.



2. Aim the headlamps to appropriate standard values using the aiming adjustment screw.

12. Evacuate to a vacuum reading of 100 kPa or higher (takes approx. 10 minutes).





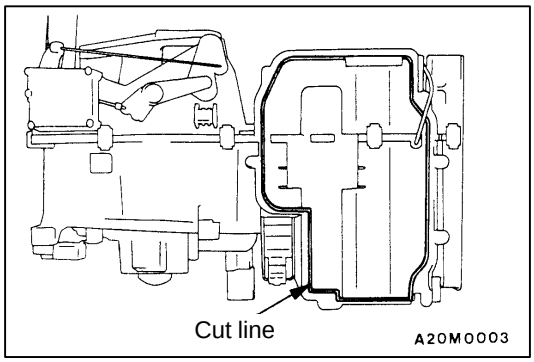
13. Return the handle of the adapter valve 1 to the original position (valve closed), turn off the vacuum pump adapter switch and leave as it is for 5 minutes.
14. Carry out a leak test. (Good if the negative pressure does not drop.)
15. With the handle turned back all the way (valve open), install the charging valve to the service can.
16. Remove the adaptor valve 1 from the gauge manifold and install the service can.
17. Tighten the handle of the charging valve (valve closed) and puncture the service can.
18. Turn the handle of the charging valve back (valve open) and tighten the handle of the adaptor valve 1 (valve open) to charge the system with refrigerant.
19. If the refrigerant is not drawn in, turn the handle of the adaptor valve 1 back all the way (valve closed).
20. Check for gas leaks using a leak detector.

    Caution
    The leak detector for R134a should be used.

21. Start the engine.
22. Operate the A/C and set to the lowest temperature (MAX. COOL).
23. Fix the engine speed at 1,500 r/min.
24. Tighten the handle of the adaptor valve 1 (valve open) to charge the required volume of refrigerant.

    Caution
    If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

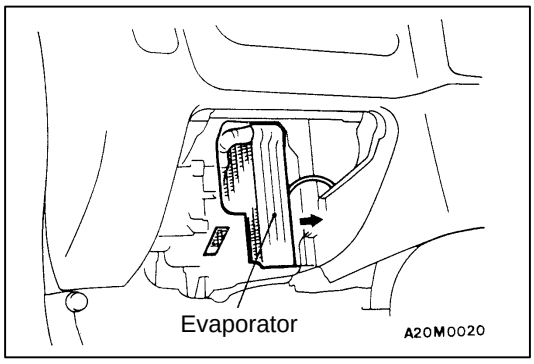
25. After charging with refrigerant, turn the handle of the adaptor valve 1 back all the way (valve closed).
26. Tighten the charging valve handle (valve closed).



◀B▶ CASE COVER, EVAPORATOR REMOVAL

The evaporator, which has been installed in a factory, has no case cover. Follow the steps below to remove that evaporator.

1. Cut the case along the shown line to remove the cooling and blower unit.

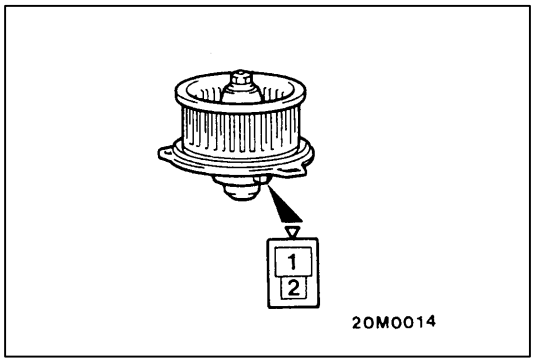


2. Remove the air thermo sensor from the evaporator, and then remove the evaporator towards you, being careful not to damage its core.

INSPECTION

BLOWER MOTOR CHECK

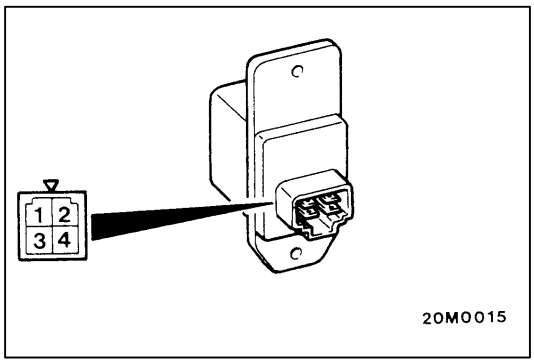
When battery voltage is applied between the terminals, check that the motor operates. Also, check that there is no abnormal noise.



RESISTOR CHECK

Use a circuit tester to measure the resistance between the terminals as indicated below. Check that the measured value is at the standard value.

Standard value:



Measurement terminal	Standard value Ω
Between terminals 3 and 2	2.81 ± 10%
Between terminals 3 and 4	1.28 ± 10%
Between terminals 3 and 1	0.33 ± 10%