

HEATER, AIR CONDITIONER AND VENTILATION

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HEATER AND MANUAL AIR CONDITIONER

GENERAL

OUTLINE OF CHANGE

- The following service procedures have been established.

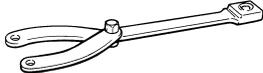
SERVICE SPECIFICATIONS

Items	Standard value	
Idle speed r/min	700 ± 50	
Idle up speed r/min	850 ± 50	
Resistor (for blower motor) Ω	HI – LO (between terminals 3 and 2)	2.81 ± 10%
	HI – ML (between terminals 3 and 4)	1.28 ± 10%
	HI – MH (between terminals 3 and 1)	0.33 ± 10%
Air gap (Compressor) mm	0.4 – 0.6	

LUBRICANTS

Items	Specified lubricants	Quantity
Compressor oil ml	SUN PAG 56	120 – 140
Pipe joint	SUN PAG 56	As required
Refrigerant g	R134a (HFC-134a)	555 – 595

SPECIAL TOOLS

Tool	Number	Name	Use
	MB991367	Special spanner	Removal and installation of armature mounting nut of compressor
	MB991386	Pin	

TROUBLESHOOTING

TROUBLESHOOTING PROCEDURES

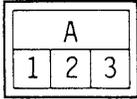
1. Check air ducts, control rods, etc. for improper connection.
2. Check that the electrical connectors of the relevant components are connected securely and the fuse is not blown.
3. Perform the troubleshooting as follows; first understand the items to be inspected and the the procedures comprehensively using Trouble Symptom/Failed Component Cross-Reference Table and then inspect the appropriate items sequentially.
4. Be sure to perform each component check after disconnecting the relevant connector.

Trouble Symptom/Failed Component Cross-Reference Table

Items to be checked	1. When the ignition switch is "ON", the A/C does not operate.	2. When the A/C is operating, temperature inside the passenger compartment does not decrease (cool air is not emitted).	3. Blower fan motor does not turn.	4. Blower fan motor does not stop turning.	5. When A/C is operating, radiator fan and condenser fan do not run.
Fuse	1		1		1
Harness, connector	2		2	1	2
Amount of refrigerant	3	1			
A/C compressor relay	4				
A/C compressor magnet clutch	5				
Dual pressure switch	6	2			3
A/C switch	7				
Blower switch	8		3	2	
Blower relay			4		
Resistor			5	3	
Blower motor			6		
Air thermo-sensor	9	3			
Condenser fan relay		4			4
Condenser fan motor		5			5
Radiator fan relay (HI, LO)		6			6
Radiator fan motor		7			7
Refrigerant temperature switch	10	8			
Auto compressor control unit	11	9			
Engine-ECU	12	10			8

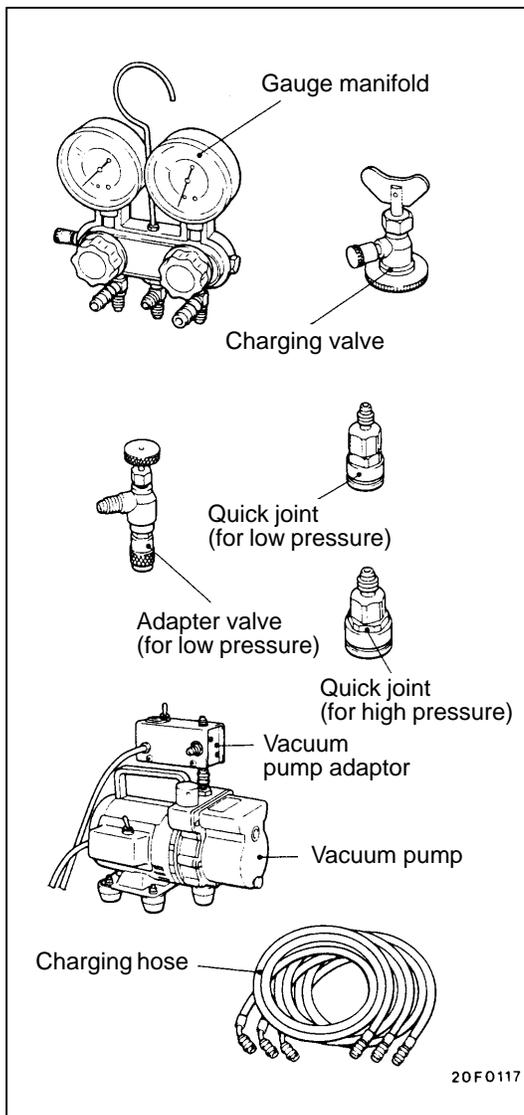
No.	Trouble symptom	Problem cause	Remedy	Reference page
1	When the ignition switch is "ON", the A/C does not operate.	Refrigerant leak or overfilling of refrigerant	Replenish the refrigerant, repair the leak or take out some of the refrigerant	55-6
		A/C compressor relay is defective	Replace the A/C compressor relay	55-14
		A/C compressor magnetic clutch is defective	Replace the A/C compressor magnet clutch	55-26
		Dual pressure switch is defective	Replace the dual pressure switch	55-13
		A/C switch is defective	Replace the A/C switch	55-17
		Blower switch is defective	Replace the blower switch	55-17
		Air thermo-sensor is defective	Replace the air thermo-sensor	55-22
		Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-25
		Automatic compressor-ECU is defective	Replace the automatic compressor-ECU	–
2	When the A/C is operating, temperature inside the passenger compartment doesn't decrease (cool air is not emitted).	Refrigerant leak	Replenish the refrigerant and repair the leak	55-6
		Dual pressure switch is defective	Replace the dual pressure switch	55-13
		Air thermo-sensor is defective	Replace the air thermo-sensor	–
		Condenser fan relay is defective	Replace the condenser fan relay	55-14
		Condenser fan motor is defective	Replace the condenser fan motor	55-29
		Radiator fan relay (HI, LO) is defective	Replace the radiator fan relay (HI, LO)	55-14
		Radiator fan motor is defective	Replace the radiator fan motor	–
		Refrigerant temperature switch is defective	Replace the refrigerant temperature switch	55-25
		Automatic compressor-ECU is defective	Replace the automatic compressor-ECU	–
3	Blower fan motor doesn't turn.	Blower switch is defective	Replace the blower switch	55-17
		Blower relay is defective	Replace the blower relay	55-13
		Resistor is defective	Replace the resistor	55-21
		Blower fan motor is defective	Replace the blower fan motor	55-21
4	Blower fan motor doesn't stop turning.	Defective harness between the blower fan motor and the blower switch	Repair the harness	–
		Blower switch is defective	Replace the blower switch	55-17
		Resistor is defective	Replace the resistor	55-21
5	When the A/C is operating condenser fan or radiator fan does not run.	Condenser fan relay is defective	Replace the condenser fan relay	55-14
		Condenser fan motor is defective	Replace the condenser fan motor	55-29
		Radiator fan relay (HI, LO) is defective	Replace the radiator fan relay (HI, LO)	55-14
		Radiator fan motor is defective	Replace the radiator fan motor	–
		Dual pressure switch is defective	Replace the dual pressure switch	55-13
		Engine-ECU is defective	Replace the engine-ECU	–

INSPECTION AT THE AUTOMATIC COMPRESSOR-ECU TERMINAL



20M0065

Terminal No.	Check item	Checking requirements	Normal condition
1	Output from ECU to A/C compressor relay	A/C compressor relay: OFF	System voltage
		A/C compressor relay: ON	0 V
2	Input from A/C switch to ECU	A/C switch: OFF	0 V
		A/C switch: ON	System voltage
3	Earth	Always	0 V



ON-VEHICLE SERVICE

REFRIGERANT CHARGING

Caution

The refrigerant generates toxic gases when it is exposed to a heat source such as fire. Keep flames away from the refrigerant. Perform refrigerant charging at a well-ventilated place.

1. Recommended charging tools

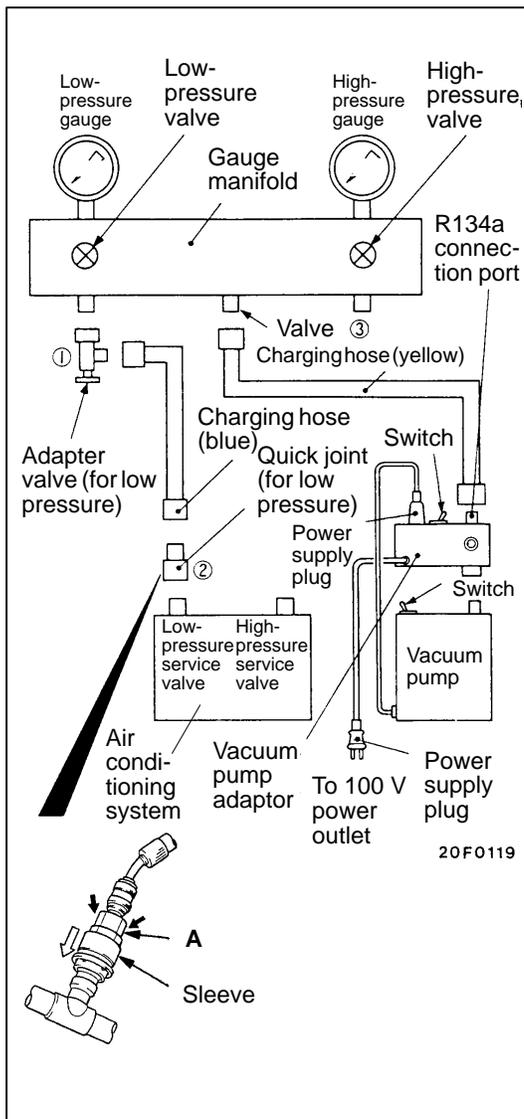
The following commercially available tools are recommended for discharging and charging refrigerant.

- Gas charging set [No. EA95 (R134a)]
- Gas charging set case [No. EA101CS-2]
- Gauge manifold [No. EA101N-1]
- Charging valve [No. EA108N]
- Adapter valve [No. EA104AD-3]

NOTE

The adapter valve opens when the handle is turned clockwise and closes when it is turned counter-clockwise.

- Quick joint (for low pressure) [No. EA413L]
- Quick joint (for high pressure) [No. EA413H]
- Charging hose (red) [No. EA104N-1]
- Charging hose (blue) [No. EA104N-2]
- Charging hose (yellow) [No. EA104N-3]
- Vacuum pump [No. EA112A]
- Vacuum pump adaptor [No. EA112X]



2. Charging

1. Open the low-pressure valve of the gauge manifold. Keep the high-pressure valve closed.
2. With the handles turned back all the way (valve closed), install the adaptor valve to the low-pressure side of the gauge manifold.
3. Connect the charging hose (blue) to the adaptor valve 1.
4. Connect the quick joint 2 to the charging hose (blue).
5. Connect the quick joint 2 to the low pressure service valve.

NOTE

The low-pressure service valve is provided on the suction pipe.

Caution

- (1) To install the quick joint, press section "A" firmly against the service valve until a click is heard.
- (2) When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

6. Connect the charging hose (yellow) to the valve 3 of the gauge manifold.
7. Install the vacuum pump adaptor to the vacuum pump.

Caution

To supply the power, connect the power supply plug of the vacuum pump to the vacuum pump adaptor and then the power supply plug of the vacuum pump adaptor to a 100 V power outlet.

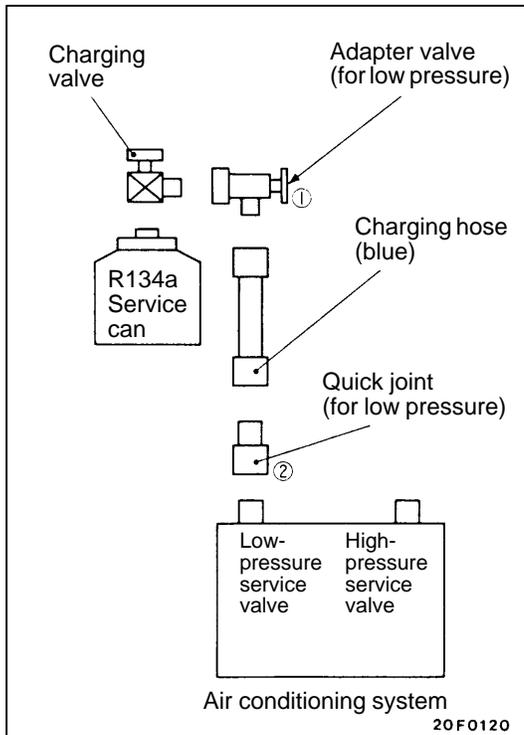
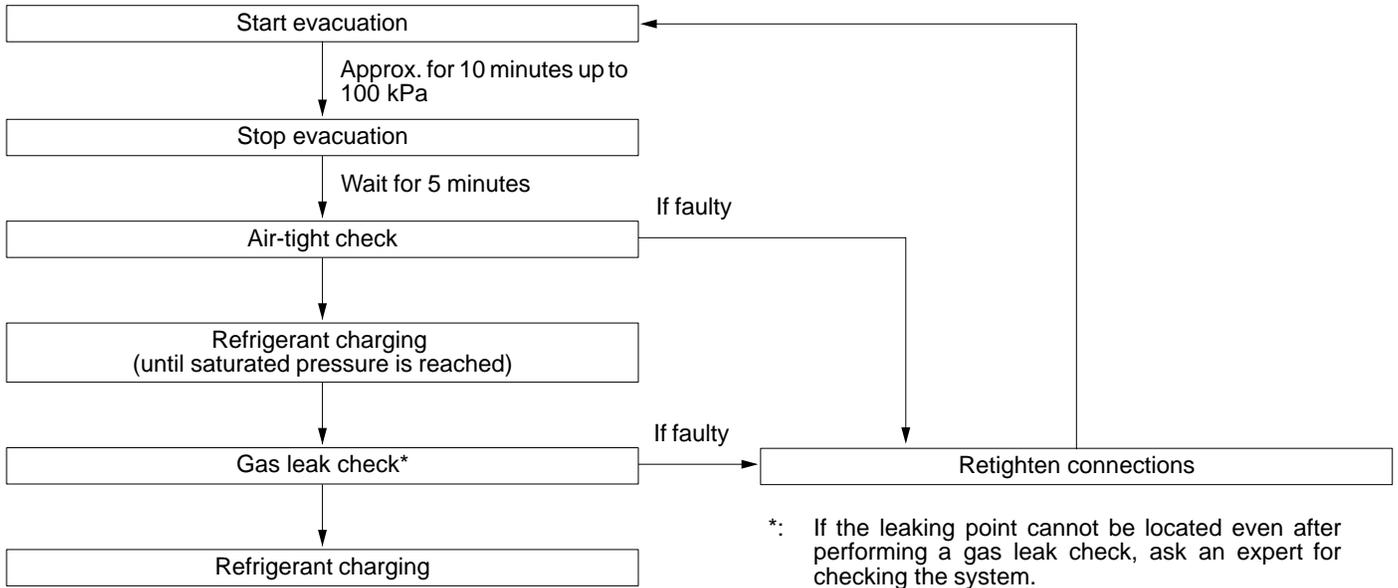
8. Connect the charging hose (yellow) to the R134a connection port of the vacuum pump adaptor.
9. Tighten the adaptor valve 1 handle (valve closed).
10. Turn the power switch of the vacuum pump to the ON position.

NOTE

Even if the vacuum pump power switch is turned ON, the vacuum pump will not operate because of the power supply connection in step (7).

11. Turn the vacuum pump adaptor switch to the R134a side to start the vacuum pump.

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



- 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.
- Carry out a leak test. (Good if the negative pressure does not drop.)
- With the handle turned back all the way (valve open), install the charging valve to the service can.
- Remove the adaptor valve 1 from the gauge manifold and install the service can.
- Tighten the handle of the charging valve (valve closed) and puncture the service can.
- 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.
- If the refrigerant is not drawn in, turn the handle of the adaptor valve 1 back all the way (valve closed).
- Check for gas leaks using a leak detector.

Caution
The leak detector for R134a should be used.

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

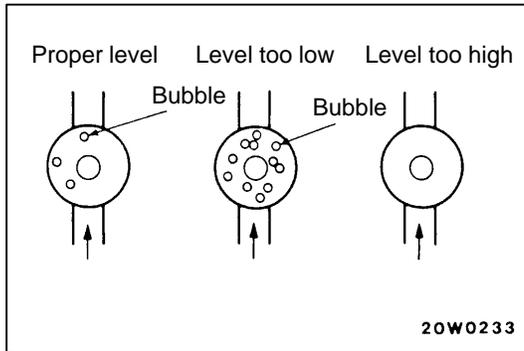
Caution
If the service can is inverted, liquid refrigerant may be drawn into the compressor damaging it by liquid compression. Keep the service can upright to ensure that refrigerant is charged in gas state.

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

27. Remove the quick joint 2 from the low-pressure service valve.
28. Remove the service can.

NOTE

If the service can is not emptied completely, keep the handles of the charging valve and adaptor valve 1 closed for the next charging.



REFRIGERANT CHARGING AMOUNT CHECK

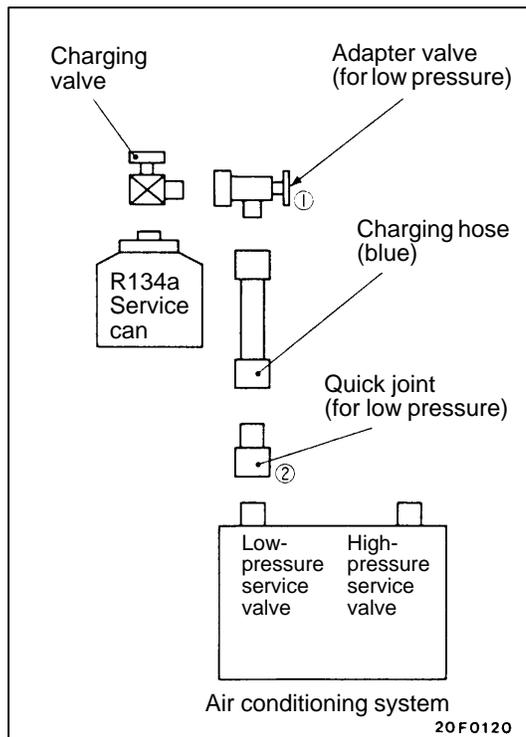
1. Start the engine.
2. Operate A/C and set the temperature control to MAX COOL.
3. Fix the engine speed at 1,500 r/min.
4. Check the refrigerant level (bubble generation) through the sight glass of the receiver.

Item	Condition
Proper level	Bubbles are generated some times. No bubbles appear when the engine speed is slightly increased.
Level too low	A large amount of air bubbles are generated. If it looks milky white, the level is excessively lowered.
Level too high	No air bubbles appear.

5. If the level is too low, add the refrigerant, and if the level is too high, drain the refrigerant as necessary.

Caution

Be sure to work at the low-pressure side service valve.



REPLENISHING SYSTEM

1. Connect the charging hose (blue) to the adapter valve 1 with the handle fully turned back (valve closed).
2. Connect the charging hose (blue) to the quick joint 2 and to the low pressure service valve.

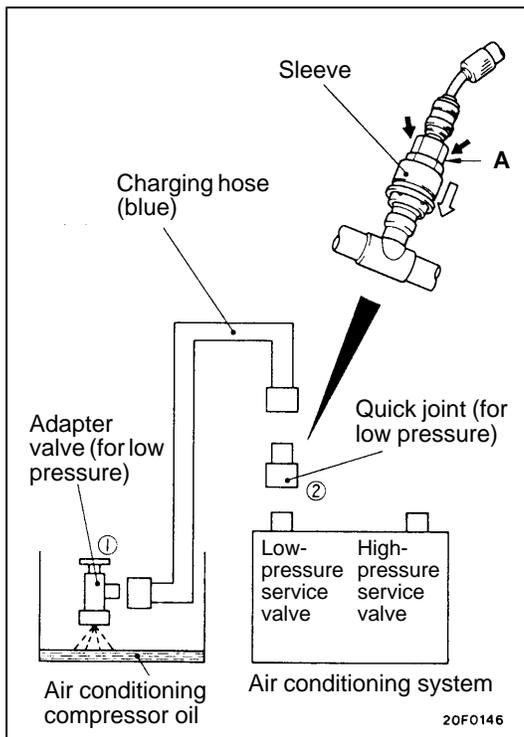
Caution

Never connect to the high-pressure side since otherwise the refrigerant could flow back.

3. Open and close the valve by operating the handle of the adapter valve 1 to bleed air from inside the charging hose.
4. With the handle turned back all the way (valve open), install the charging valve to the service van.
5. Tighten the handle of the charging valve (valve closed) and puncture the service can.
6. Install the charging valve to the adapter valve 1 and turn back the handle all the way (valve open).
7. Start the engine.
8. Operate the A/C and set to the lowest temperature (MAX. COOL).
9. Fix the engine speed at 1,500 r/min.
10. Tighten the handle of the adapter valve 1 (valve open). Replenish the system with refrigerant while checking the level through the sight glass.
After charging with refrigerant, turn the handles of the charging valve and the adapter valve 1 all the way back (valve closed), then remove the quick joint 2.

NOTE

If the service can is not emptied completely, keep the handles of the charging valve and adaptor valve closed for the next charging.



DISCHARGING SYSTEM

1. Run the engine at an engine speed of 1,200–1,500 r/min for approximately 5 minutes with the A/C operating to return to the oil.

NOTE

Returning the oil will be more effective if it is done while driving.

2. Stop the engine.
3. Connect the charging hose (blue) to the adaptor valve 1 with its handle turned back all the way (valve closed).
4. Connect the quick joint 2 to the charging hose (blue), and install the quick joint to the low-pressure service valve.

NOTE

The low-pressure service valve is provided on the suction pipe.

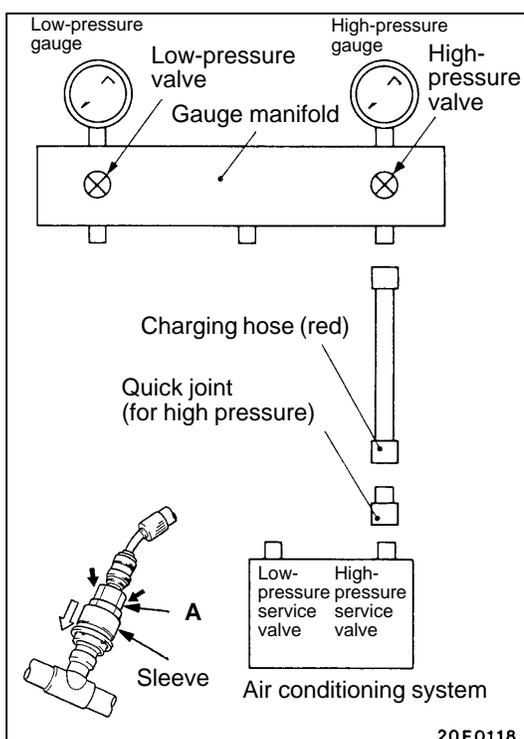
Caution

- (1) To connect the quick joint, press section “A” firmly against the service valve until a click is heard.
- (2) When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

5. Place the adaptor valve 1 inside the container and discharge the refrigerant by opening the handle gradually so that oil does not gush out.

NOTE

Any oil remaining in the container should be returned to the A/C system.



PERFORMANCE TEST

1. The vehicle to be tested should be placed in a place that is not exposed to direct sunlight.
2. The ambient condition should be 16 – 30 °C in temperature and 60 – 100 % in relative humidity.
3. Open all the doors so that the air condition inside the passenger compartment may be identical to that of the outside.
4. With the high-pressure side of the gauge manifold closed, connect the charging hose (red) to the gauge manifold high-pressure side. Attach the quick joint for high-pressure to the charging hose (red) and install it to the high-pressure service valve on the vehicle side.

NOTE

The high-pressure service valve is found on liquid pipe B.

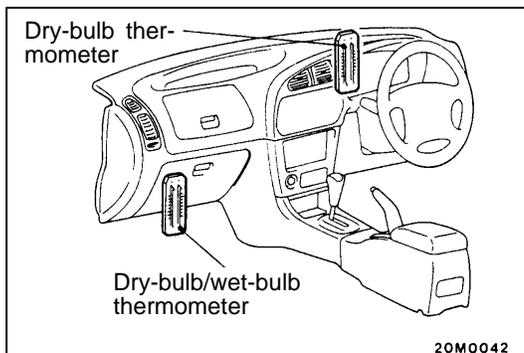
Caution

- (1) To connect the quick joint, press section “A” firmly against the service valve until a click is heard.
- (2) When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.

5. Start the engine.
6. Set the blower switch to HI (Fast) position
7. Set the A/C switch to ON position
8. Set the temperature control to Max. cooling position
9. Set the mode selection to Face position
10. Set the air selection to Recirculation position
11. Fix engine speed to 1,500 r/min.
12. Check that the high-pressure side pressure is 1,667 – 1,765 kPa.

NOTE

If the pressure is not within this range, adjust it as follows; cool down the condenser using a cooling fan if the pressure is higher, and cover the condenser to protect it from ventilation air if it is lower.

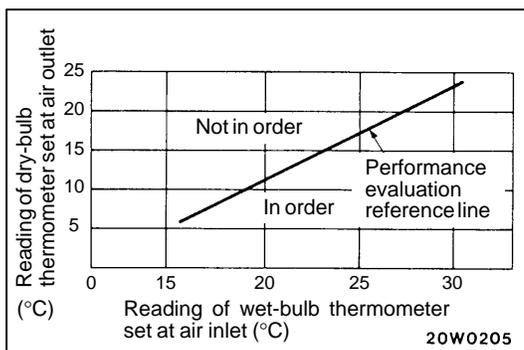


13. Set a dry-bulb/wet-bulb thermometer at the air inlet, and set a dry-bulb thermometer at the air outlet.

Caution

- (1) Set the dry-bulb thermometer at a position where the temperature sensing section can be directly blown with cooled air.
- (2) Place the dry-bulb/wet-bulb thermometer at a position where it is not exposed to cooled air blown out.

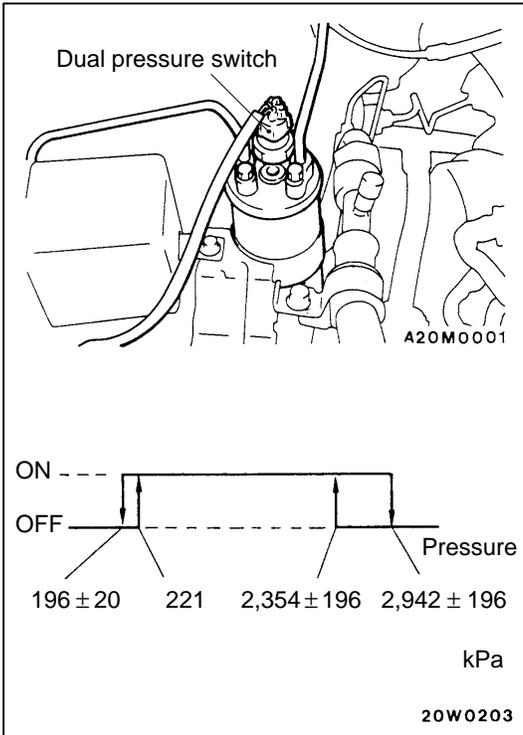
14. After the temperature of the air blown out from the air outlet has been stabilized (10 – 15 minutes after starting), read the dry-bulb thermometer set at the air outlet and the wet-bulb thermometer set at the air inlet.



15. The air conditioning system is considered in good condition if the intersecting point of the measurements obtained in Step (14) is below the performance evaluation reference line on the graph.

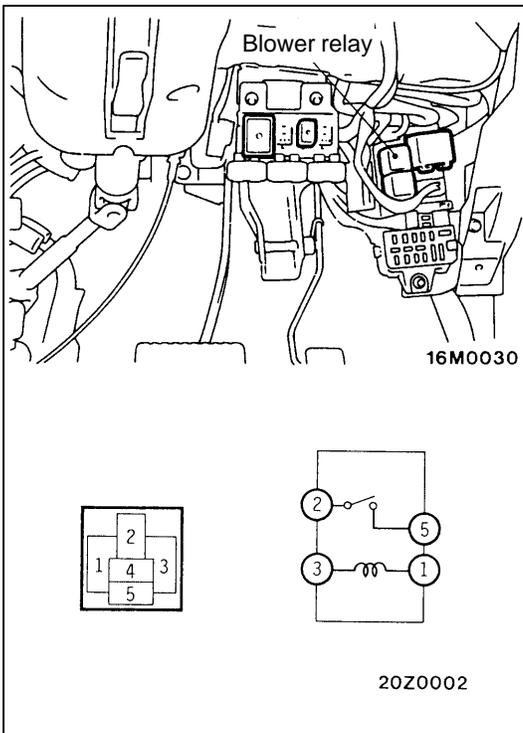
Caution

Do not remove the quick joint immediately after the performance test has been completed. Stop the engine and wait until the high-pressure side pressure of the gauge manifold has been lowered sufficiently.



DUAL PRESSURE SWITCH SIMPLE CHECK

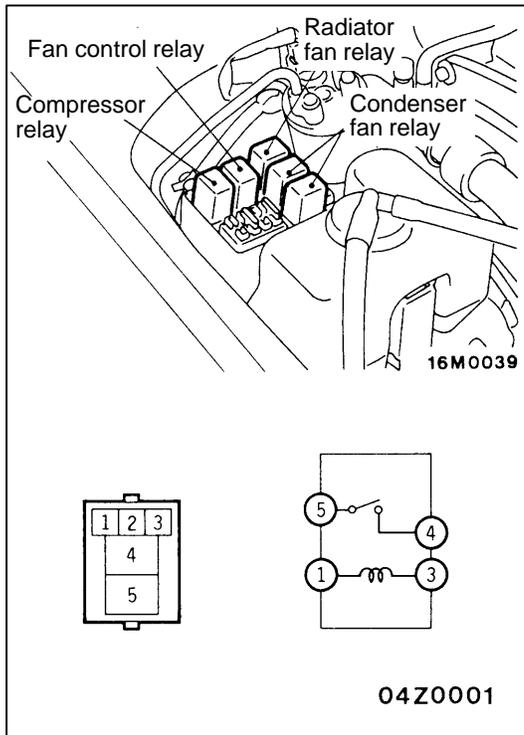
Measure the high-pressure side pressure. If there is a continuity between the dual pressure switch terminals with the dual pressure switch in ON condition as shown in the graph at left, the switch is in good condition. If not, it is faulty. Replace the switch.



POWER RELAY CHECK

BLOWER RELAY

Battery voltage	Terminal No.			
	1	3	2	5
Power is not supplied	○	○		
Power is supplied	⊕	⊖	○	○



A/C COMPRESSOR RELAY, CONDENSER FAN RELAY

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

IDLE-UP OPERATION CHECK

1. Before inspection and adjustment, set vehicle in the pre-inspection condition:
2. Check whether or not the idle speed is the standard value.

Standard value: 700 ± 50 r/min

NOTE

There is no necessity to make an adjustment, because the idle speed is automatically adjusted by the ISC system. If, however, there occurs a deviation from the standard value for some reason, check the fuel control system.

3. When the A/C is running after turning the A/C switch to ON, check to be sure that the idle speed is at the standard value.

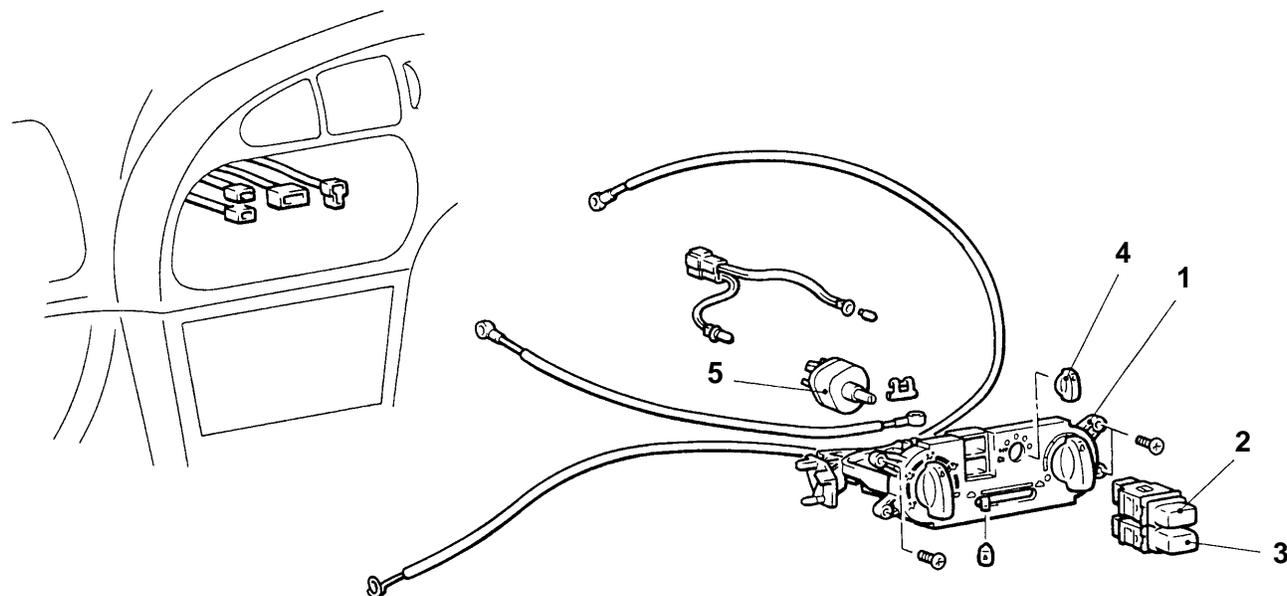
Standard value: 850 ± 50 r/min

HEATER CONTROL ASSEMBLY AND A/C SWITCH

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

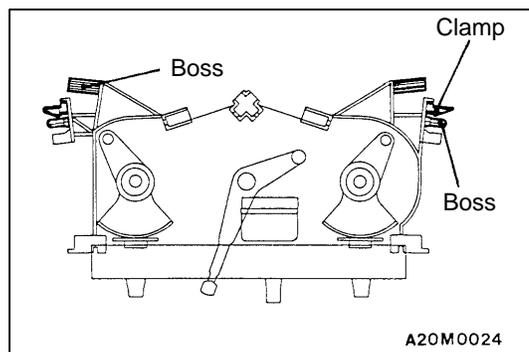
- Instrument Lower Panel and Heater Control Panel Removal and Installation
- Floor Console Assembly Removal and Installation
- Foot Duct Removal and Installation (Refer to P.55-31.)



20M0044

Removal steps

- ◀A▶ ▶A◀
1. Heater control assembly
 2. Rear window defogger switch
 3. A/C switch
 4. Knob
 5. Blower switch

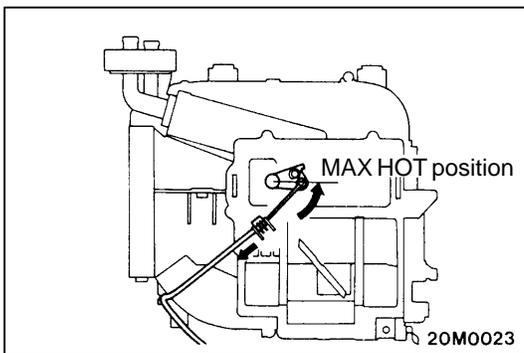
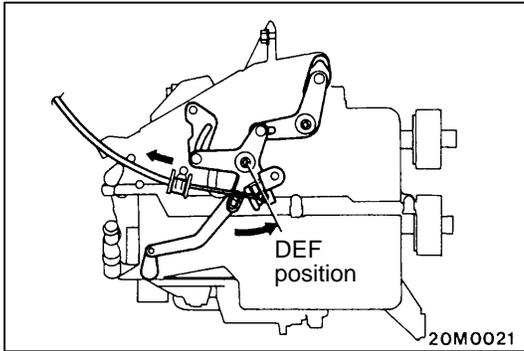
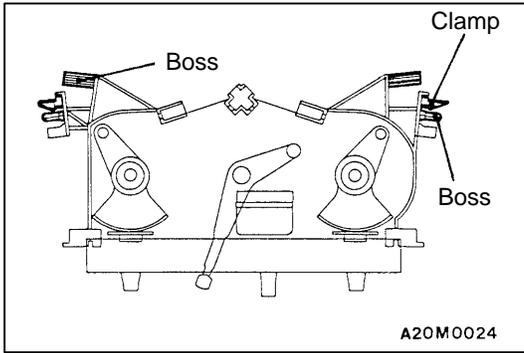


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REMOVAL SERVICE POINT

◀A▶ HEATER CONTROL ASSEMBLY REMOVAL

1. Remove the heater control assembly mounting screws.
2. Bend the clamp and the bosses (2 each side), which are inserted into the centre reinforcement.
3. Remove the heater control assembly.



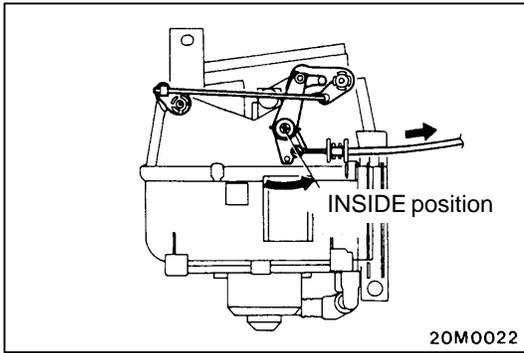
INSTALLATION SERVICE POINT

►A◄ HEATER CONTROL ASSEMBLY INSTALLATION

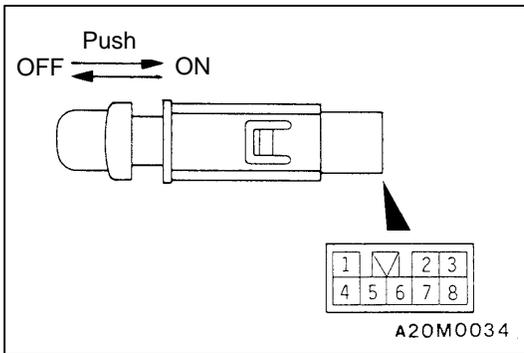
1. Cut off the bosses and clamp shown before installing a new heater control assembly.
2. Install the heater control assembly mounting screws.

3. Follow the steps below to install the air outlet changeover damper lever cable.
 - (1) Set the air outlet changeover link of the heater unit to the DEF position.
 - (2) Set the air outlet changeover control knob on the heater control assembly to the DEF position.
 - (3) After inserting the inner cable into the link, pull the outer cable to the heater control assembly side and then fasten the outer cable to the clip of the heater unit.
 - (4) After installation, operate the heater control knob to check if the mode changeover can be accomplished smoothly.

4. Follow the steps below to install the air mix damper lever cable.
 - (1) Set the air mix damper link on the heater unit to the MAX HOT position.
 - (2) Set the air mix damper knob of the heater control assembly to the MAX HOT position.
 - (3) After inserting the inner cable into the link, pull the outer cable to the heater control assembly side and then fasten the outer cable to the clip of the heater unit.
 - (4) After installation, operate the heater control knob to check if the air mix damper can be actuated smoothly.



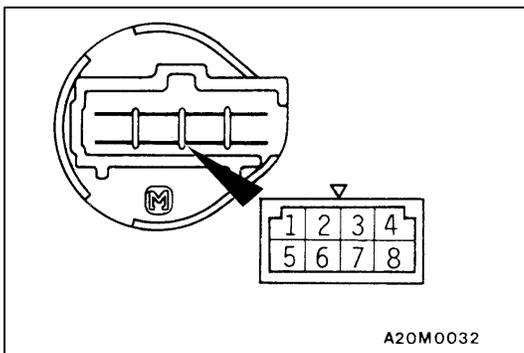
5. Follow the steps below to install the inside/outside air changeover damper lever cable.
 - (1) Set the inside/outside air changeover damper link on the blower unit to the INSIDE position.
 - (2) Set the inside/outside air changeover damper knob of the heater control assembly to the INSIDE position.
 - (3) After inserting the inner cable into the link, pull the outer cable to the heater control assembly side and then fasten the outer cable to the clip of the blower unit.
 - (4) After installation, ensure that inside/outside air changeover damper operates smoothly by operating the heater control assembly knob.



INSPECTION

A/C SWITCH CONTINUITY CHECK

Switch position	Terminal No.						
	1	ILL	2	IND	4	5	7
OFF	○	⊕			○		
ON	○	⊕			○		
			○	⊕		○	○



BLOWER SWITCH CONTINUITY CHECK

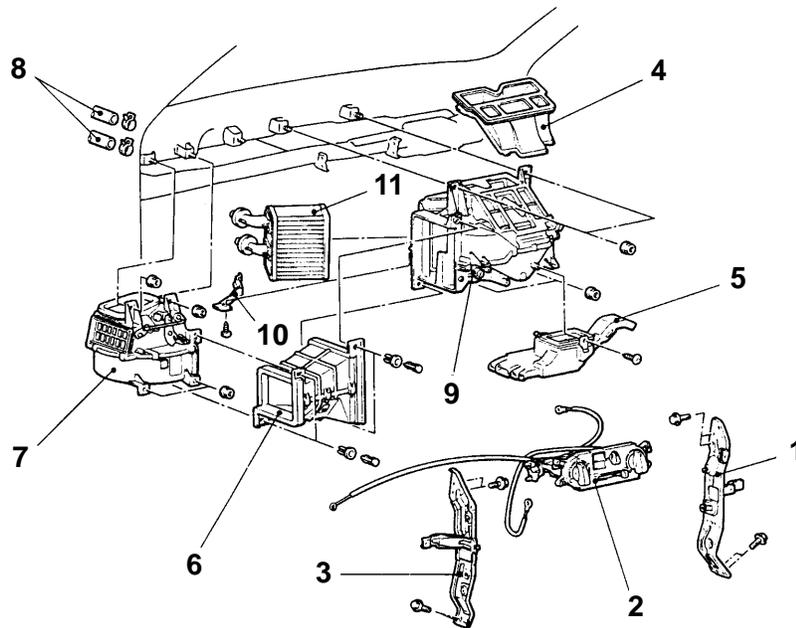
Switch position	Terminal No.							
	1	2	3	5	6	7	8	
OFF								
● (LO)	○		○	○			○	
● (ML)	○			○	○		○	
● (MH)	○	○		○			○	
● (HI)	○			○		○	○	

HEATER UNIT AND BLOWER UNIT <VEHICLES WITHOUT AIR CONDITIONER>

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Engine Coolant Draining and Refilling
- Air Cleaner Cover and Hose Removal and Installation
- Floor Console and Instrument Panel Removal and Installation
- Rear Seat Heater Duct Removal and Installation
<Vehicles for cold regions> (Refer to P.55-31.)



20M0011

Removal steps

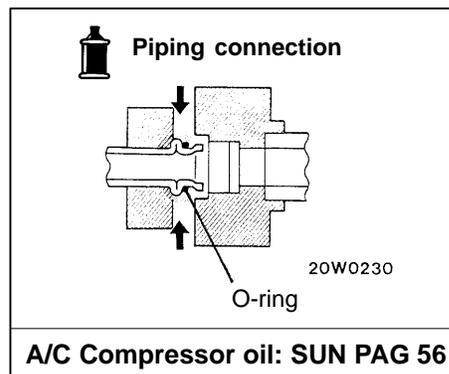
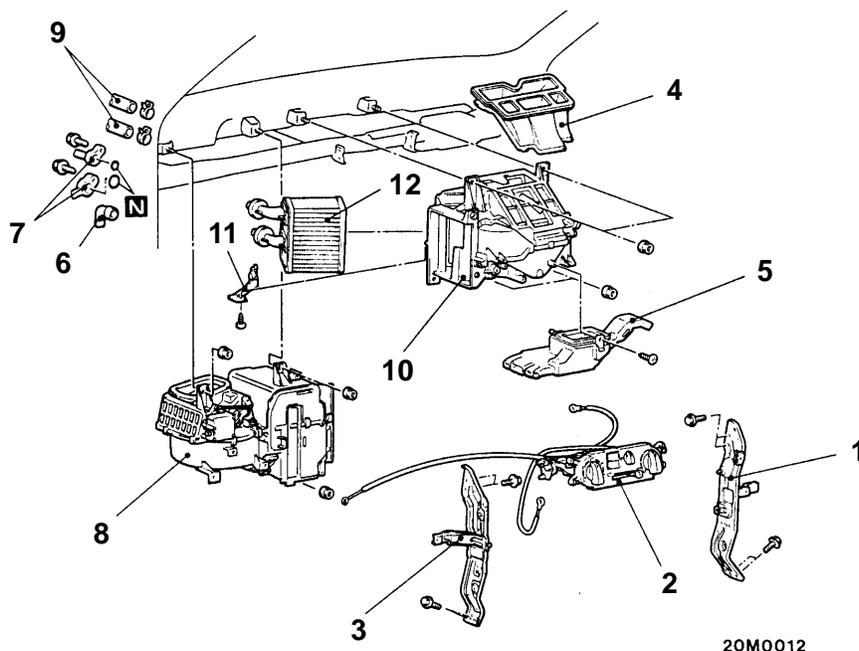
- | | |
|----------------------------|-------------------------|
| 1. Center reinforcement RH | 7. Blower unit |
| 2. Heater control assembly | 8. Heater hose |
| 3. Center reinforcement LH | 9. Heater unit |
| 4. Center ventilation duct | 10. Heater core support |
| 5. Foot distribution duct | 11. Heater core |
| 6. Joint duct | |

HEATER UNIT, COOLING AND BLOWER UNIT <VEHICLES WITH AIR CONDITIONER>

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Engine Coolant Draining and Refilling
- Discharging and Charging of Refrigerant (Refer to P.55-6.)
- Air Cleaner Cover and Hose Removal and Installation
- Floor Console and Instrument Panel Removal and Installation
- Rear Seat Heater Duct Removal and Installation <Vehicles for cold regions> (Refer to P.55-31.)



Removal steps

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Center reinforcement RH 2. Heater control assembly 3. Center reinforcement LH 4. Center ventilation duct 5. Foot distribution duct 6. Drain hose 7. Connection between cooling unit and refrigerant line | <ol style="list-style-type: none"> 8. Cooling and blower unit 9. Heater hose 10. Heater unit 11. Heater core support 12. Heater core |
|---|---|



REMOVAL SERVICE POINT

◀A▶ REMOVAL OF REFRIGERANT LINE FROM COOLING UNIT

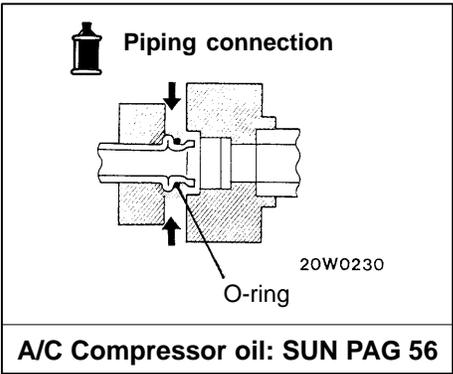
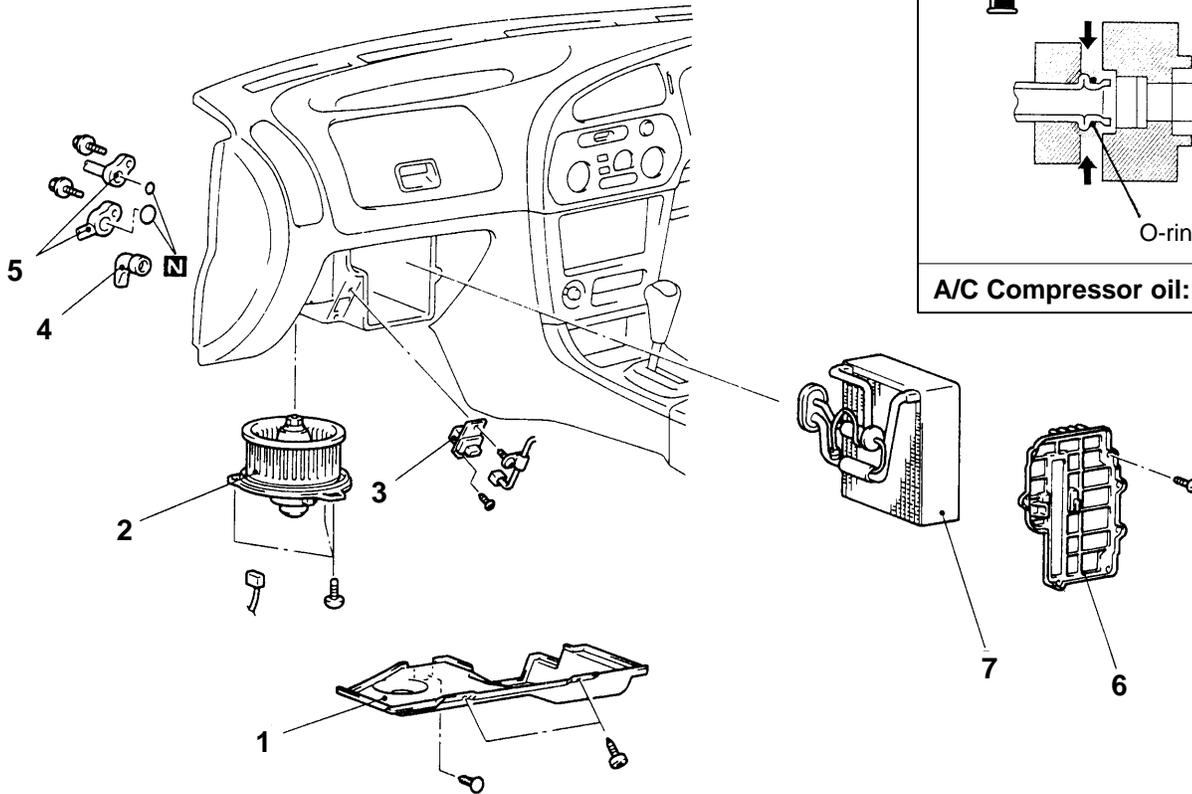
Plug the open end of the removed hose and the opening in the cooling unit to prevent entry of dust and foreign substances.

Caution

Compressor oil and the receiver are highly moisture-absorptive.

Do not use plugs allowing ventilation.

BLOWER MOTOR ASSEMBLY, RESISTOR AND EVAPORATOR REMOVAL AND INSTALLATION



20M0013

Blower motor assembly removal steps

1. Under cover
<Vehicles for cold regions>
2. Blower motor assembly

Resistor removal steps

1. Under cover
<Vehicles for cold regions>
- Glove box, glove box frame
3. Resistor



Evaporator removal steps <Vehicles with A/C>

- Discharging and Charging of refrigerant (Refer to P.55-6.)
- Glove box, glove box frame
- 4. Drain hose
- 5. Connection between evaporator and refrigerant line
- 6. Case cover
- 7. Evaporator

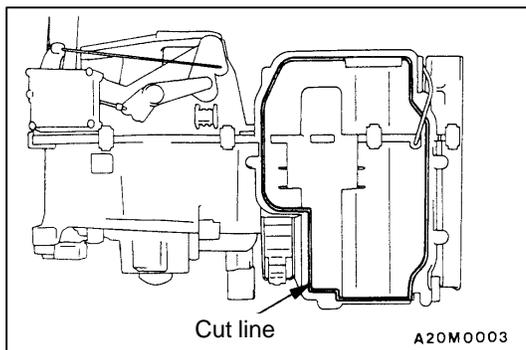
REMOVAL SERVICE POINT

◀A▶ REMOVAL OF REFRIGERANT LINE FROM EVAPORATOR

Plug the open end of the removed hose and the opening in the evaporator to prevent entry of dust and foreign substances.

Caution

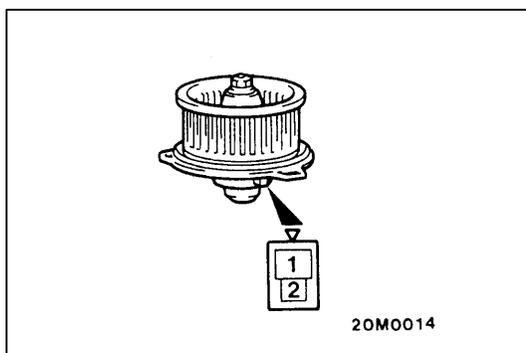
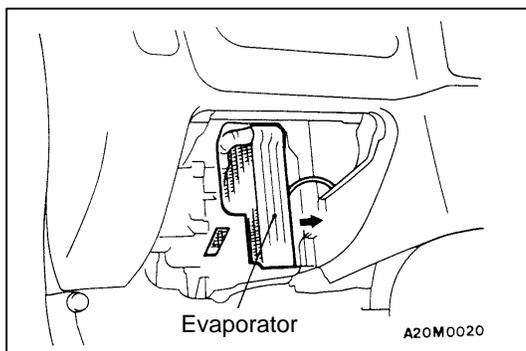
Compressor oil and the receiver are highly moisture-absorptive.
Do not use plugs allowing ventilation.



◀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.

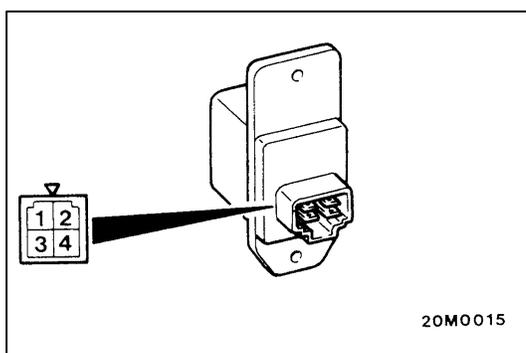
1. Cut the case along the shown line to remove the cooling and blower unit.
2. Remove the air thermo sensor from the evaporator, and then remove the evaporator towards you, being careful not to damage its core.



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.

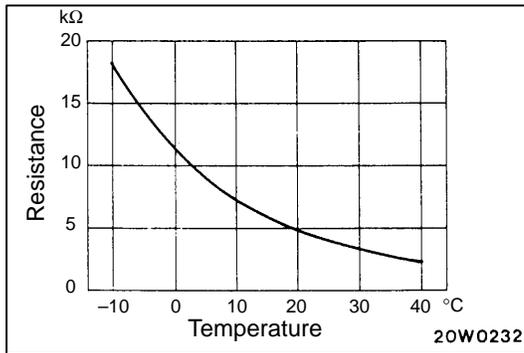


RESISTOR CHECK

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	$2.81 \pm 10\%$
Between terminals 3 and 4	$1.28 \pm 10\%$
Between terminals 3 and 1	$0.33 \pm 10\%$



AIR THERMO-SENSOR CHECK

Measure the resistance between the sensor terminals in two or more different temperature conditions. The resistance values must conform to the values shown in the graph.

NOTE

The temperatures at checking must be within the range shown in the characteristic curve.

COMPRESSOR AND TENSION PULLEY

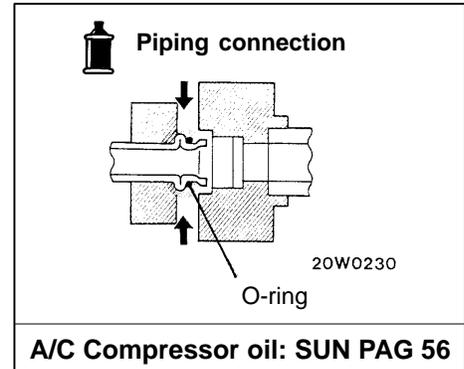
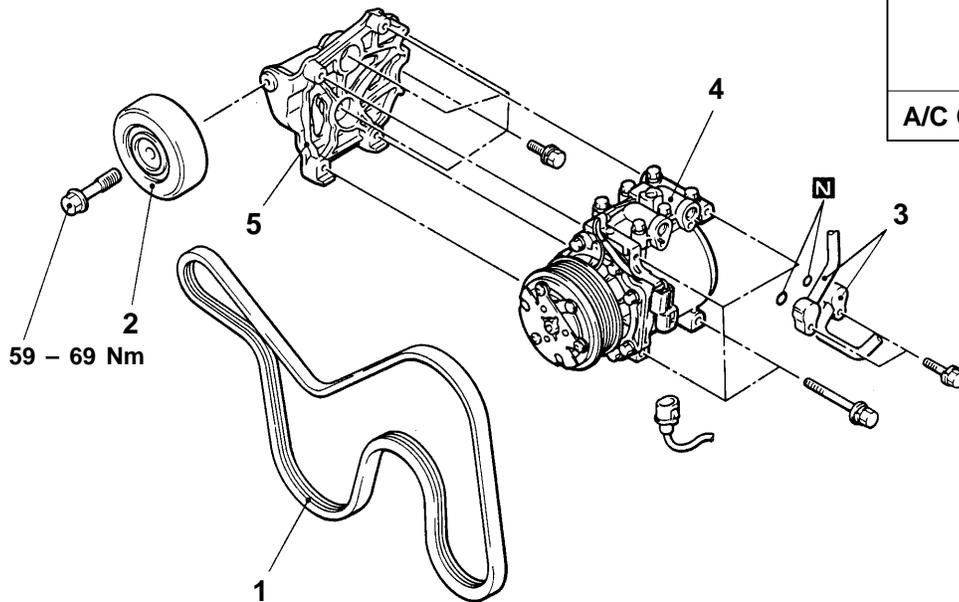
REMOVAL AND INSTALLATION

Pre-removal Operation

- Discharging of Refrigerant (Refer to P.55-6.)

Post-installation Operation

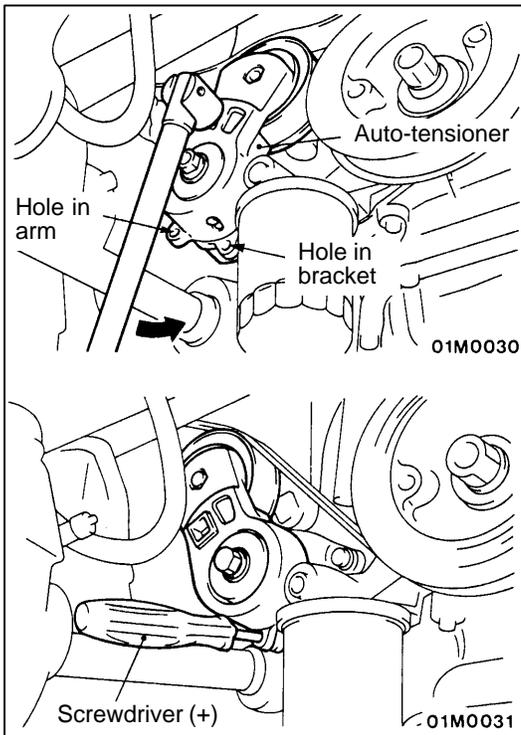
- Drive Belt Tension Adjustment
- Charging of Refrigerant (Refer to P.55-6.)



20M0017

Removal steps

- ◀A▶ 1. Drive belt
- ◀B▶ 2. Idler pulley
- ◀C▶ ▶A▶ 3. Suction hose and discharge hose connection
- 4. Compressor
- 5. Compressor bracket

**REMOVAL SERVICE POINTS****◀A▶ DRIVE BELT REMOVAL**

1. Align the hole in the auto-tensioner bracket with that in the arm and insert a screwdriver into the holes.
2. Remove the drive belt.

◀B▶ SUCTION HOSE, DISCHARGE HOSE DISCONNECTION

Plug the disconnected hose and the compressor nipple not to let foreign matter get into them.

Caution

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapour easily.

◀C▶ COMPRESSOR REMOVAL

When doing this work, be careful not to spill the compressor oil.

INSTALLATION SERVICE POINT

▶A◀ COMPRESSOR INSTALLATION

If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

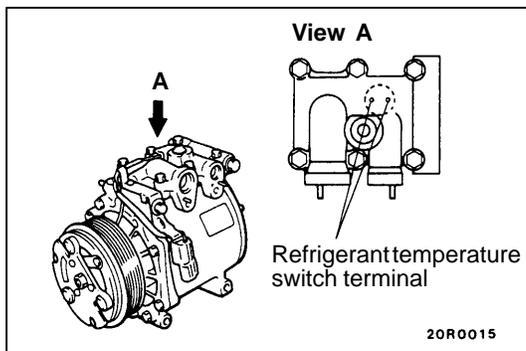
1. Measure the amount (X ml) of oil within the removed compressor.
2. Drain (from the new compressor) the amount of oil calculated according to the following formula, and then install the new compressor.

New compressor oil amount

$$120 \text{ to } 140 \text{ ml} - X \text{ ml} = Y \text{ ml}$$

NOTE

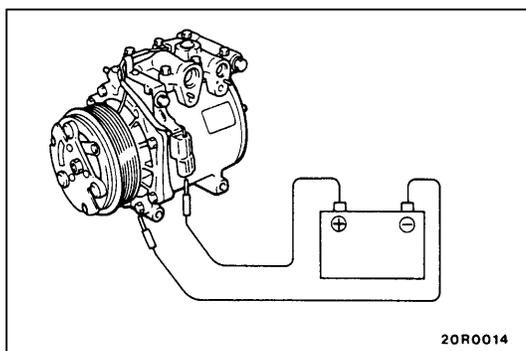
- (1) "120 to 140 ml" is the amount of oil filled in a new compressor.
- (2) Y ml indicates the amount of oil in the refrigerant line, the condenser, the cooling unit etc.



INSPECTION

REFRIGERANT-TEMPERATURE SWITCH SIMPLE CHECK

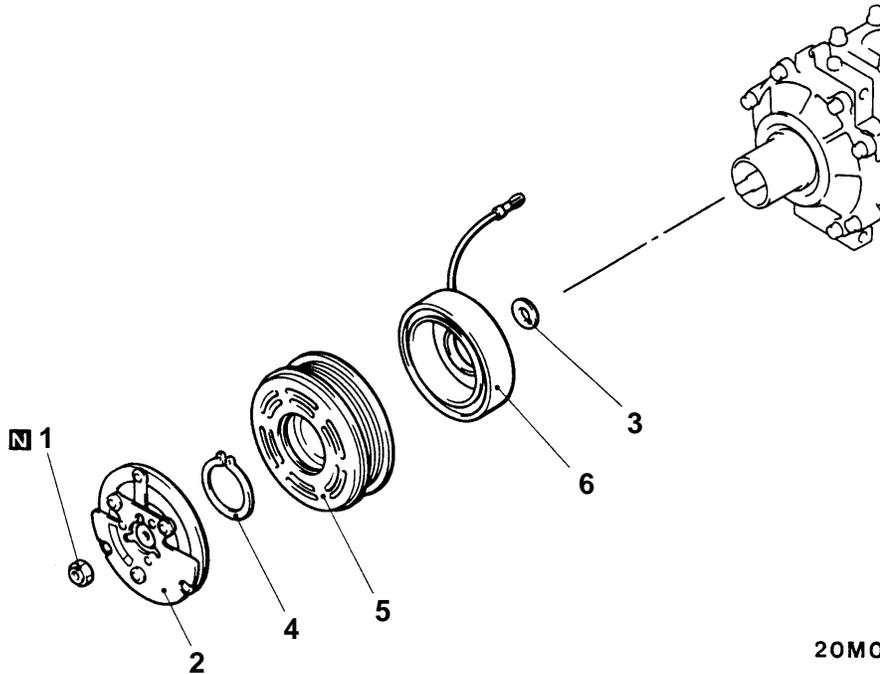
When the A/C is off, check that there is continuity between the refrigerant-temperature switch terminals. If no, replace the compressor assembly.



COMPRESSOR MAGNETIC CLUTCH OPERATION INSPECTION

Connect the battery (+) terminal to the compressor side terminal, and earth the battery (-) terminal to the body of the compressor. The condition is normal if the sound of the magnetic clutch (click) can be heard.

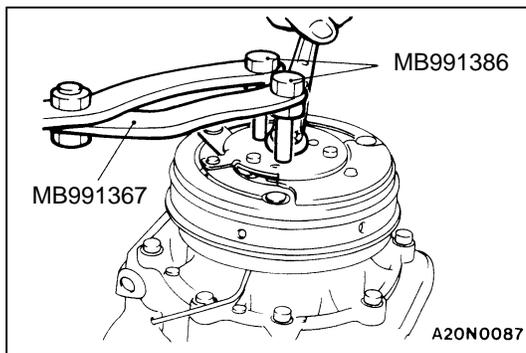
**MAGNETIC CLUTCH
DISASSEMBLY AND REASSEMBLY**



20M0025

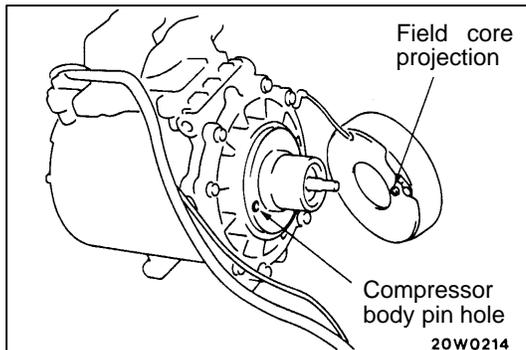
Disassembly steps

- ▶E◀ ● Air gap adjustment
- ▶D◀ 1. Self-locking nut
- ▶C◀ 2. Armature
- ▶B◀ 4. Snap ring
- ▶A◀ 5. Rotor
- ▶A◀ 6. Field core



DISASSEMBLY SERVICE POINT

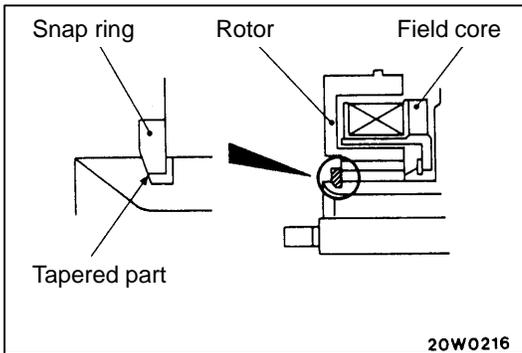
▶A◀ SELF-LOCKING NUT REMOVAL



REASSEMBLY SERVICE POINTS

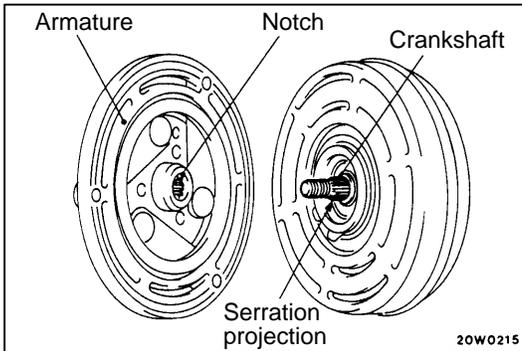
▶A◀ FIELD CORE INSTALLATION

When installing the field core to the compressor body, install so that the pin hole of the compressor body and the field core projection are aligned.



▶B◀ SNAP RING INSTALLATION

Install the snap ring using a pair of snap ring pliers so that the tapered surface is at the outer side.

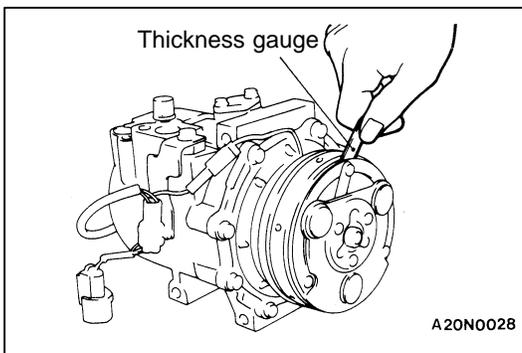


▶C◀ ARMATURE INSTALLATION

Align the serration projection of the crankshaft with the notch in the armature, and then fit them together.

▶D◀ SELF-LOCKING NUT INSTALLATION

Use the special tool to hold the magnet clutch, and tighten the self-locking nut in the same manner as removal.



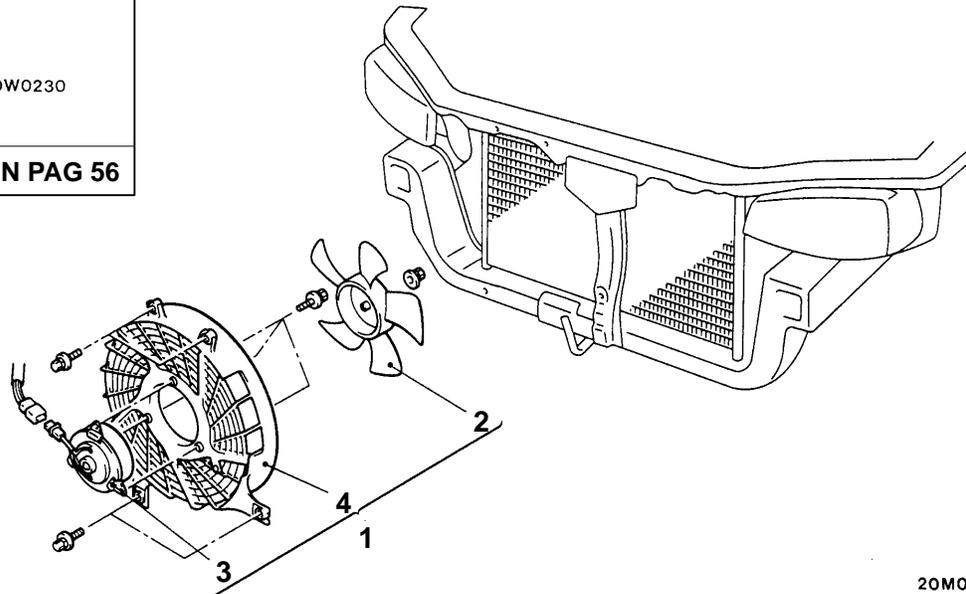
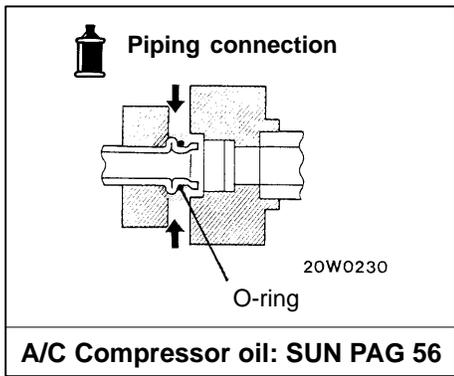
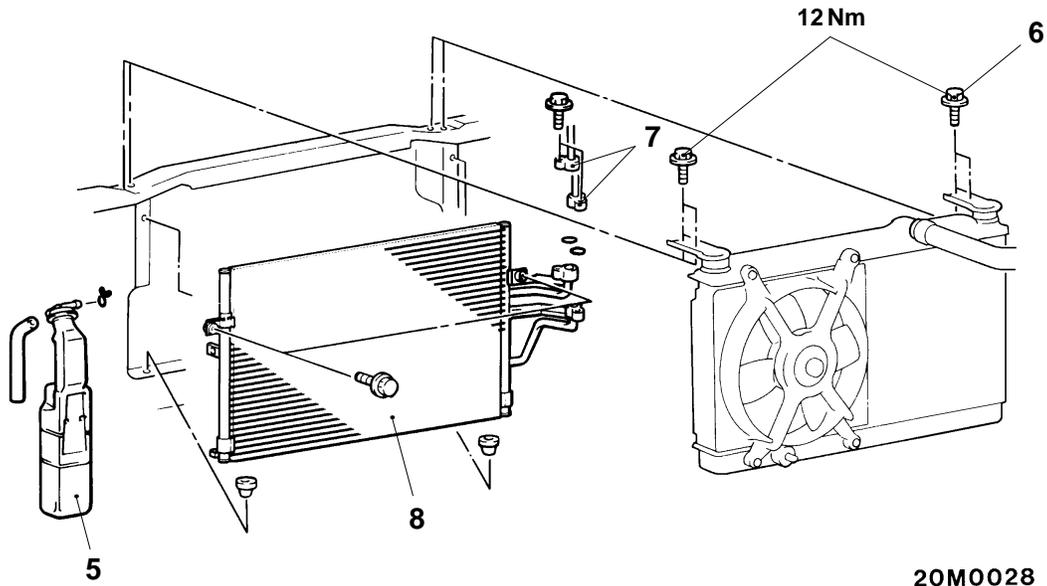
▶E◀ AIR GAP ADJUSTMENT

Check whether or not the air gap of the clutch is within the standard value. If there is a deviation of the air gap from the standard value, make the necessary adjustment by adjusting the number of shims.

Standard value: 0.4 – 0.6 mm

CONDENSER AND CONDENSER FAN

REMOVAL AND INSTALLATION



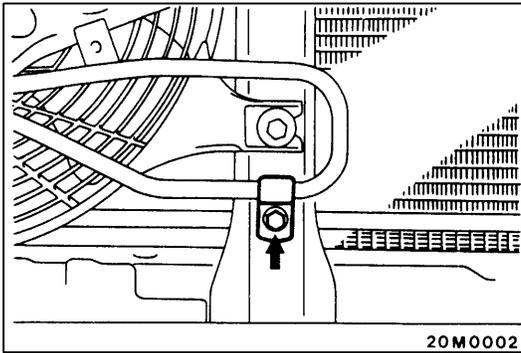
Condenser fan removal steps

- Front bumper
- 1. Condenser fan motor and shroud assembly
- 2. Fan
- 3. Motor assembly
- 4. Shroud



Condenser removal steps

- Discharging and charging of refrigerant (Refer to P.55-6.)
- 5. Reserve tank
- 6. Radiator mounting bolt
- 7. Discharge hose, liquid pipe A connection
- 8. Condenser



REMOVAL SERVICE POINTS

◀A▶ FAN MOTOR AND SHROUD ASSEMBLY REMOVAL

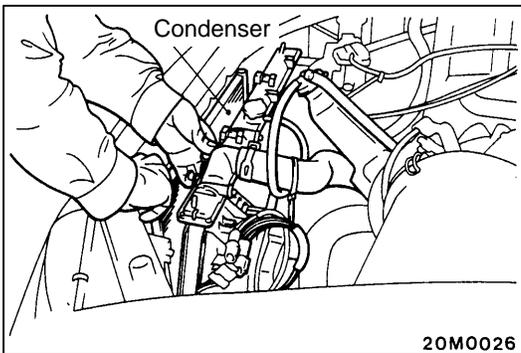
Remove the clamp bolt of the power steering oil cooler pipe. Remove the fan motor and shroud assembly while pulling the power steering oil cooler pipe toward you.

◀B▶ DISCHARGE HOSE / LIQUID PIPE A DISCONNECTION

Plug the open end of the disconnected hose and the opening in the cooling unit not to let foreign matter get into them.

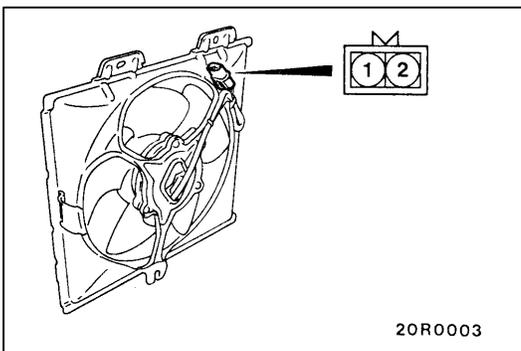
Caution

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapour easily.



◀C▶ CONDENSER REMOVAL

Move the radiator to the engine side and then lift up the condenser to remove it.



INSPECTION

CONDENSER FAN MOTOR CHECK

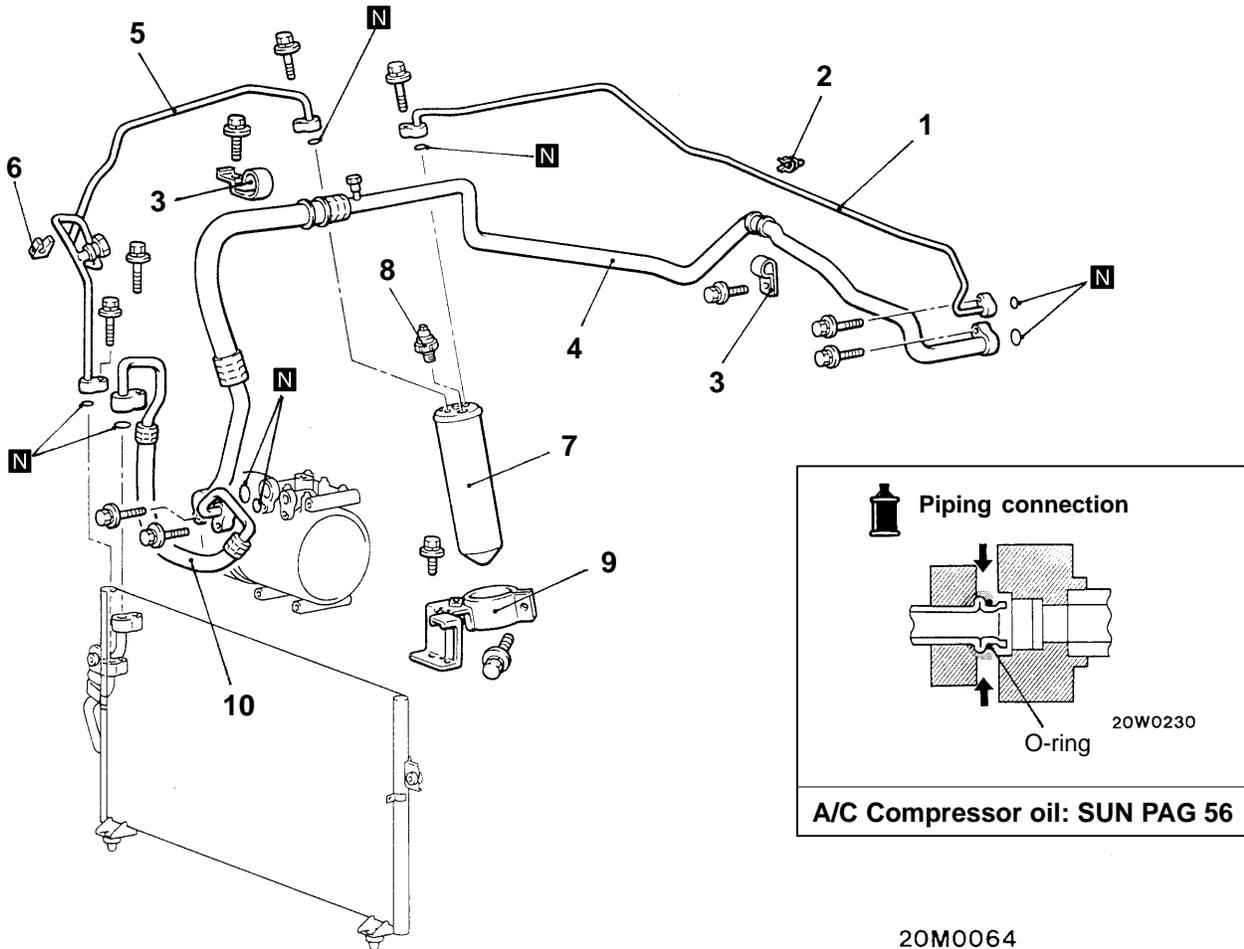
Battery connection terminal		Condenser fan operation
1	2	
⊕	⊖	Rotate

REFRIGERANT LINE

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Discharging and Charging of Refrigerant (Refer to P.55-6.)
- Air Cleaner Case and Hose Removal and Installation



20M0064

00004595



1. Liquid pipe B



- 2. Clip
- 3. Clamp
- 4. Suction hose assembly
- 5. Liquid pipe A



- 6. Clip
- 7. Receiver
- 8. Dual pressure switch
- 9. Receiver bracket



10. Discharge hose

HOSE / PIPE DISCONNECTION

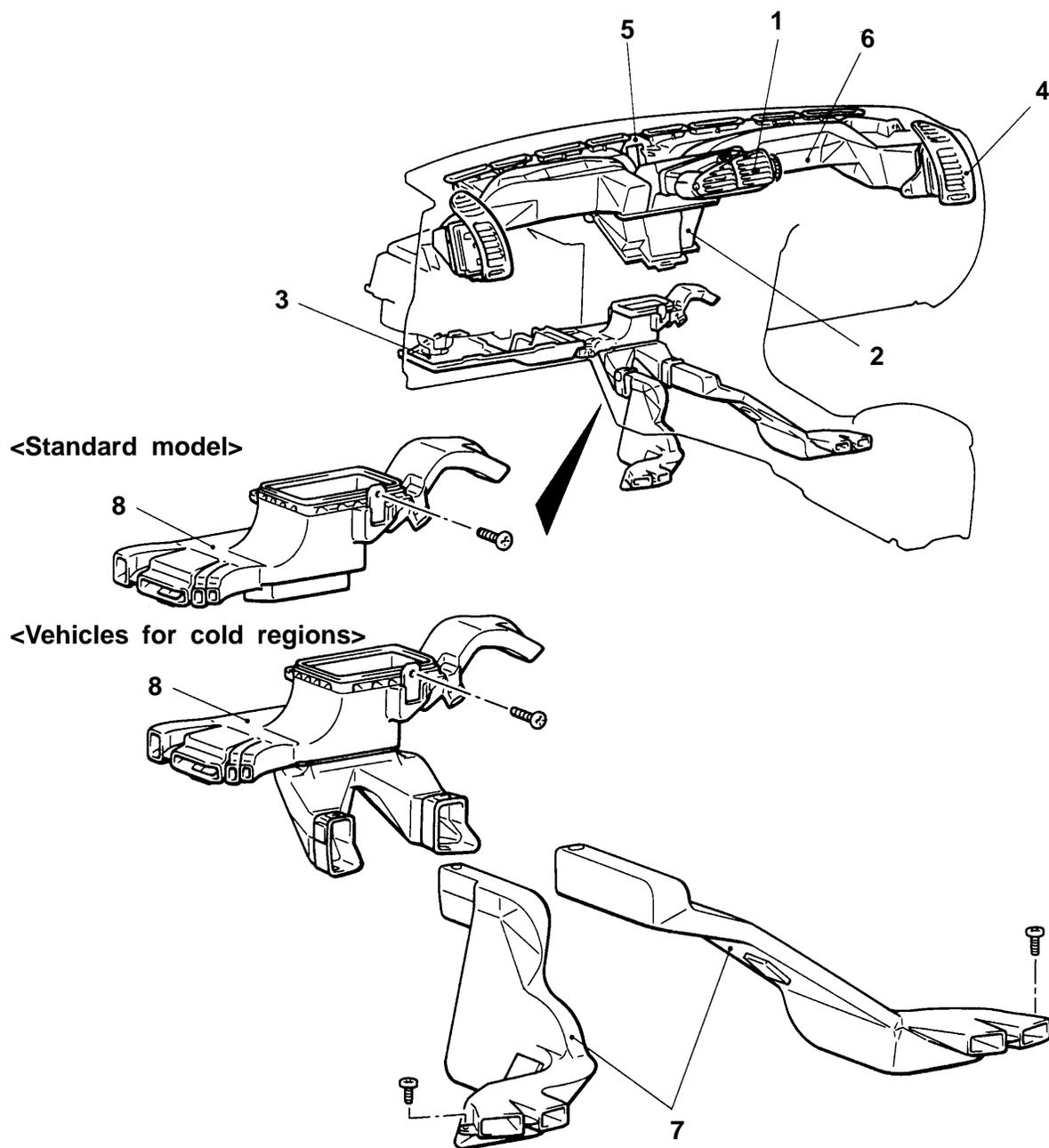
Plug the open end of the disconnected hose and the opening in the cooling unit not to let foreign matter get into them.

Caution

Seal the hoses completely, otherwise the compressor oil and receiver will absorb water vapour easily.

DUCTS

REMOVAL AND INSTALLATION

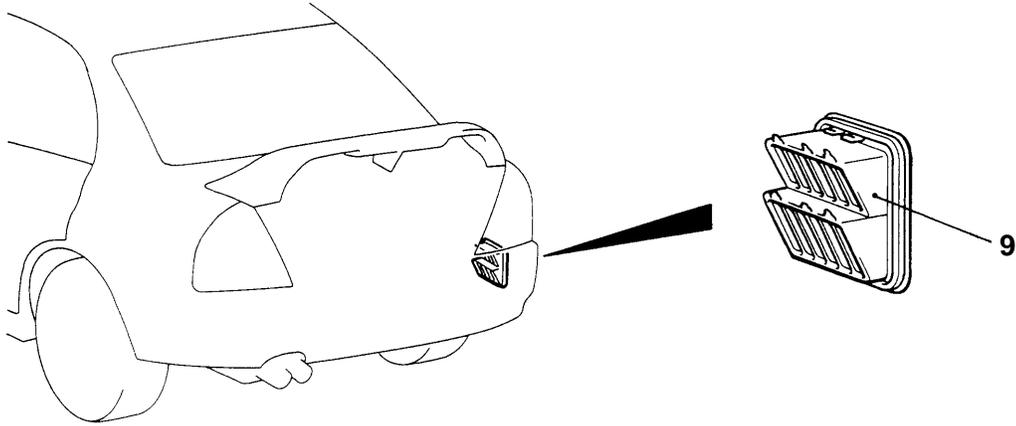


20M0043

1. Center air outlet assembly
2. Center ventilation duct
(Refer to P.55-18, 19.)
3. Undercover
<Vehicles for cold regions>
(Refer to P.55-20.)
4. Side air outlet assembly
5. Defroster nozzle
6. Distribution duct

Rear heater duct removal steps

- Front seat assembly
- Floor console assembly
- 7. Rear heater duct <Vehicles for cold regions>
- Radio and tape player
- 8. Foot duct



20M0039

Rear ventilation duct removal steps

- Rear bumper assembly
 - Trunk side trim
9. Rear ventilation duct

FULL-AUTOMATIC AIR CONDITIONER

GENERAL

OUTLINE OF CHANGE

- The following service procedures have been established.

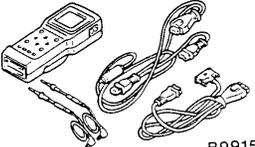
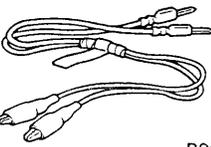
SERVICE SPECIFICATIONS

Items	Standard value	
Idle speed r/min	750 ± 50	
Idle-up speed r/min	850 ± 50	
Air gap (Compressor) mm	0.4 – 0.6	
Air mix damper potentiometer resistance kΩ	MAX. HOT position	4.82
	MAX. COOL position	0.18
Outlet air changeover damper potentiometer resistance kΩ	DEF position	0.18
	FACE position	4.82

LUBRICANTS

Items	Specified lubricants	Quantity
Compressor oil ml	SUN PAG 56	120 – 140
Each connection of refrigerant line	SUN PAG 56	As required
Refrigerant g	R134a (HFC-134a)	555 – 595

SPECIAL TOOLS

Tool	Number	Name	Use
 <p>B991502</p>	MB991502	MUT-II sub-assembly	Inspection of full-automatic air conditioner
 <p>B991529</p>	MB991529	Diagnosis code check harness	Inspection of full-automatic air conditioner using a voltmeter

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points.

DIAGNOSIS FUNCTION

DIAGNOSIS CODES CHECK

Connect the MUT-II or a voltmeter to the diagnosis connector (16-pin), then check diagnosis codes. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points.)

ERASING DIAGNOSIS CODES

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points.

INSPECTION CHART FOR DIAGNOSIS CODES

Code No.	Diagnosis item	Reference page
11	Inside air temperature sensor system (open circuit)	55-34
12	Inside air temperature sensor system (short circuit)	55-34
13	Outside air temperature sensor system (open circuit)	55-35
14	Outside air temperature sensor system (short circuit)	55-35
15	Heater water temperature sensor system (open circuit)	55-36
16	Heater water temperature sensor system (short circuit)	55-36
21	Air thermo sensor system (open circuit)	55-37
22	Air thermo sensor system (short circuit)	55-37
31	Potentiometer system of air mix damper assembly	55-38
32	Potentiometer system of air outlet changeover damper assembly	55-39
41	Drive system of air mix damper motor assembly	55-40
42	Drive system of air outlet changeover damper motor assembly	55-40

INSPECTION PROCEDURES FOR DIAGNOSIS CODES

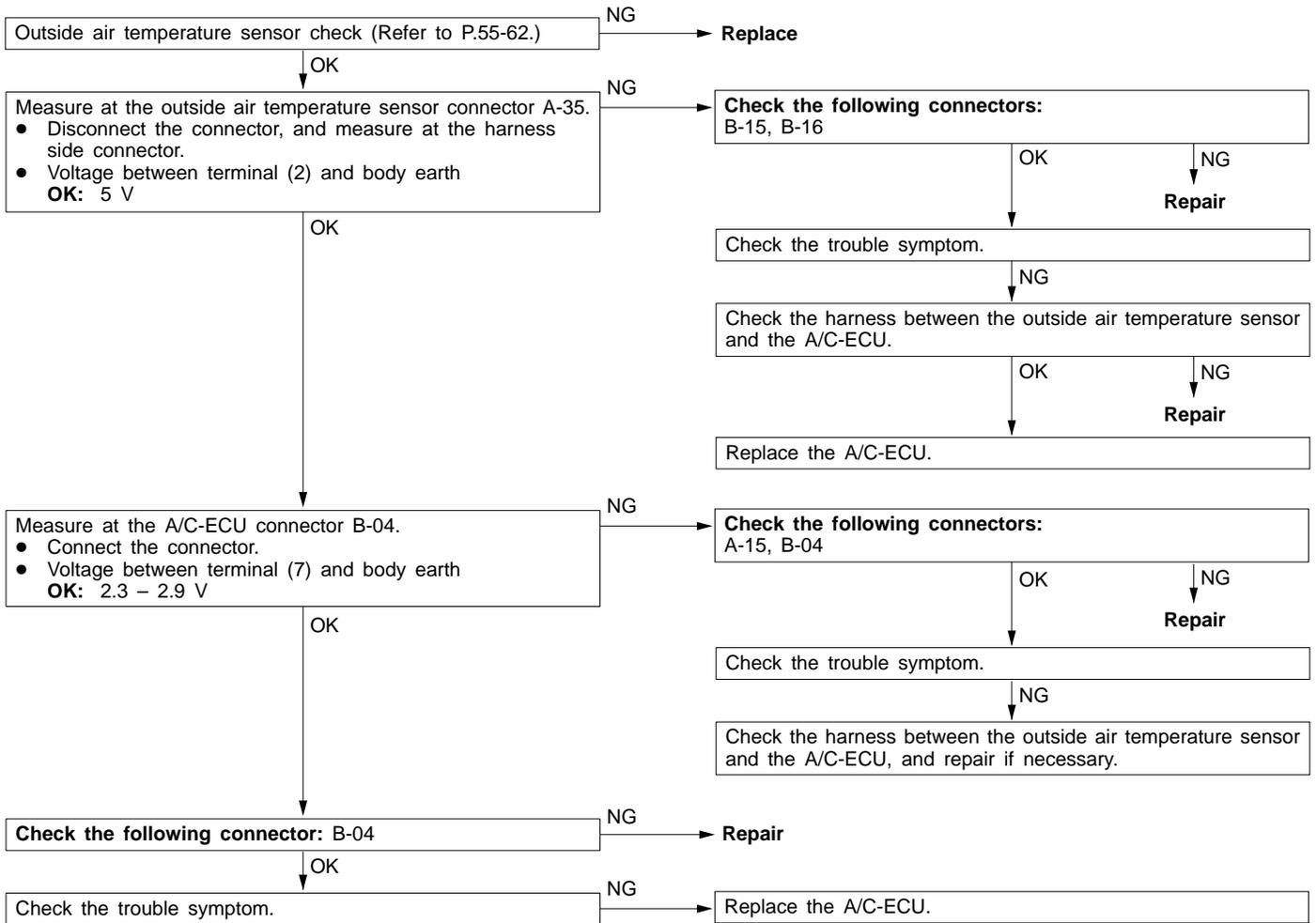
Code No.11 Inside air temperature sensor system (open circuit)	Probable cause
This diagnosis code is output if the power supply line or input line of the inside air temperature sensor inside A/C-ECU is open-circuited and no signal is input from the inside air temperature sensor to A/C-ECU.	<ul style="list-style-type: none"> Malfunction of the A/C-ECU

Replace the A/C-ECU.

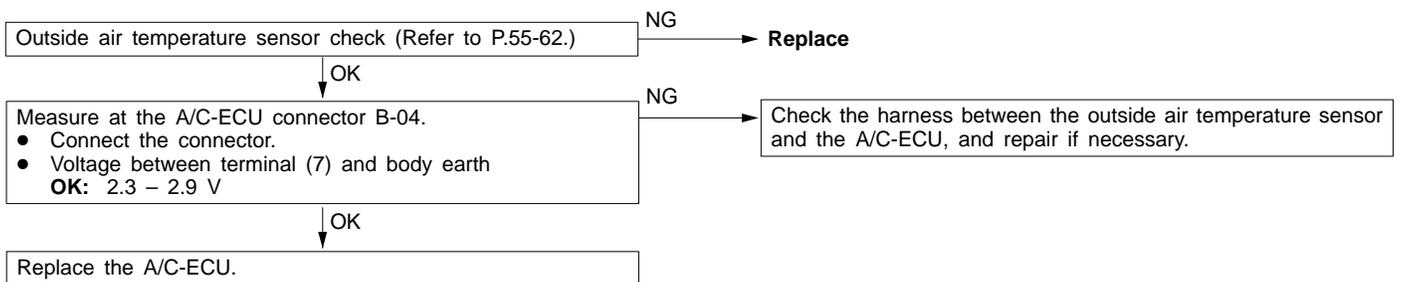
Code No.12 Inside air temperature sensor system (short circuit)	Probable cause
This diagnosis code is output if the power supply line or input line of the inside air temperature sensor inside A/C-ECU is short-circuited and inside air temperature sensor power supply voltage signals are input to A/C-ECU.	<ul style="list-style-type: none"> Malfunction of the A/C-ECU

Replace the A/C-ECU.

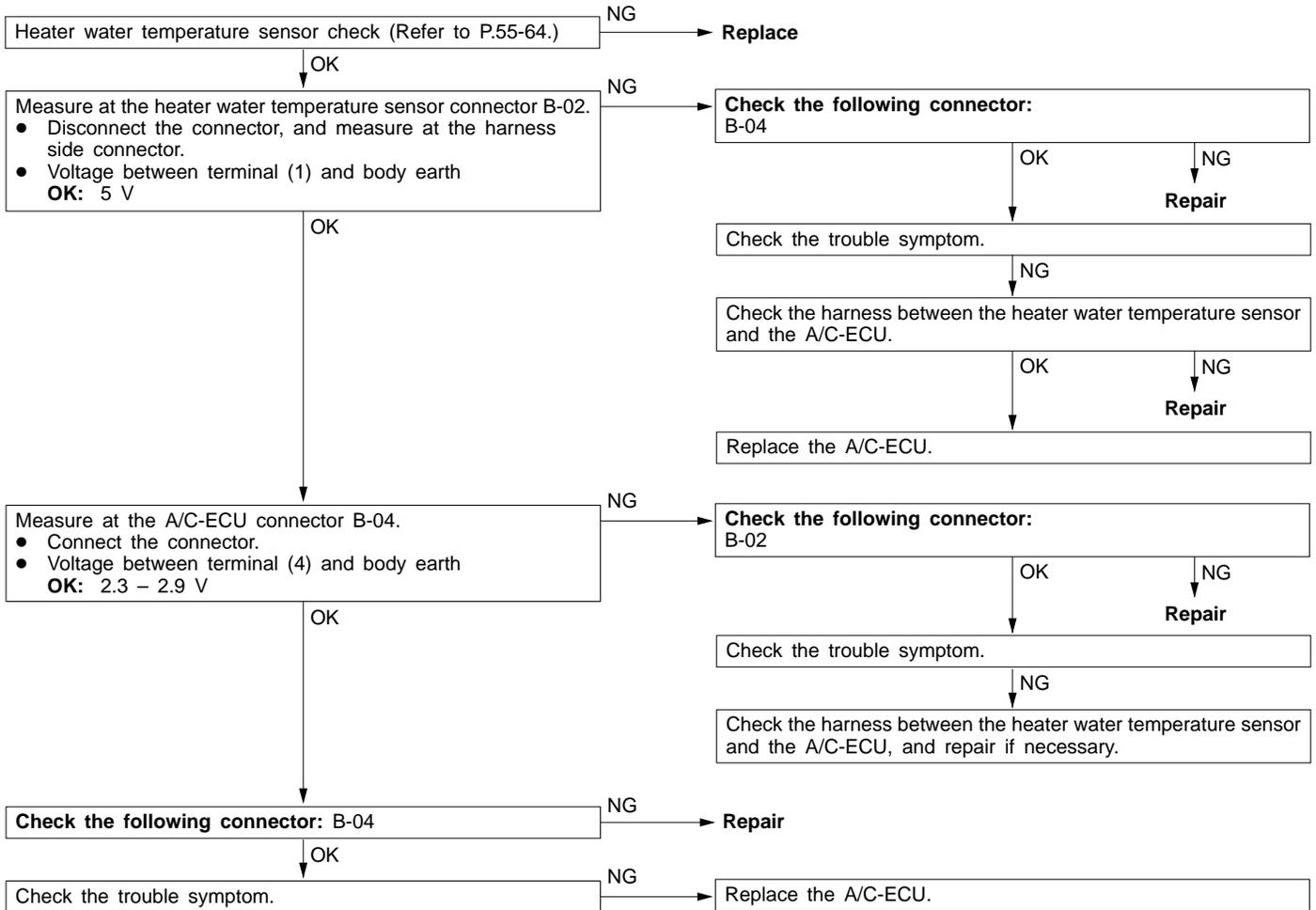
Code No.13 Outside air temperature sensor system (open circuit)	Probable cause
This diagnosis code is output if the power supply line or input line of the outside air temperature sensor is open-circuited and no signal is input from the outside air temperature sensor to A/C-ECU.	<ul style="list-style-type: none"> ● Malfunction of the outside air temperature sensor ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



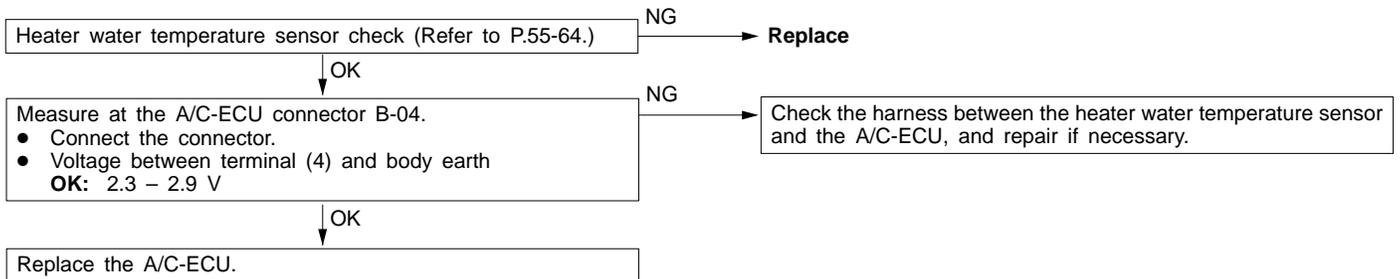
Code No.14 Outside air temperature sensor system (short circuit)	Probable cause
This diagnosis code is output if the power supply line or input line of the outside air temperature sensor is short-circuited and outside air temperature sensor power supply voltage signals are input to A/C-ECU.	<ul style="list-style-type: none"> ● Malfunction of the outside air temperature sensor ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



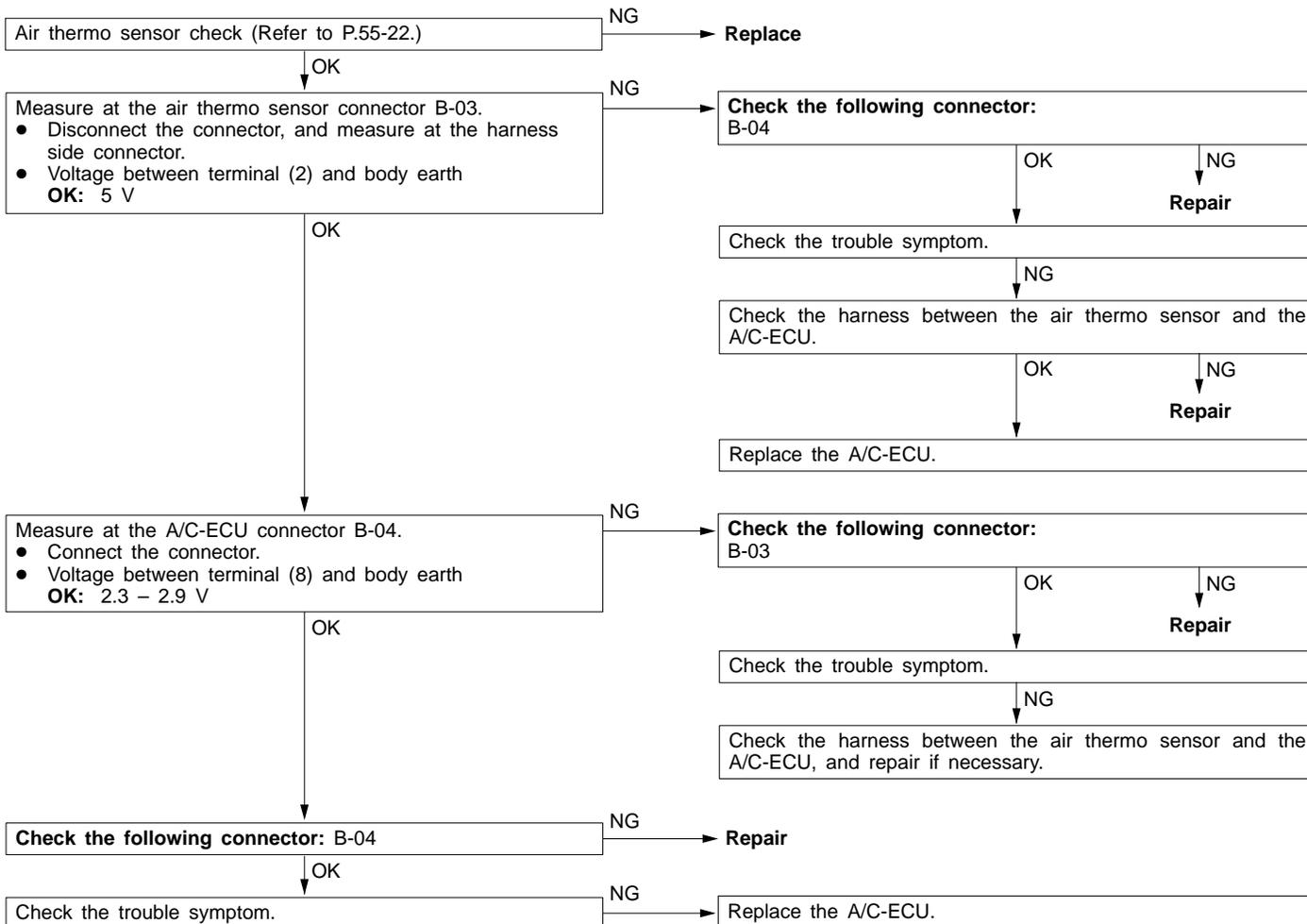
Code No.15 Heater water temperature sensor system (open circuit)	Probable cause
This diagnosis code is output if the power supply line or input line of the heater water temperature sensor is open-circuited and no heater water temperature sensor signals are input to A/C-ECU.	<ul style="list-style-type: none"> ● Malfunction of the heater water temperature sensor ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



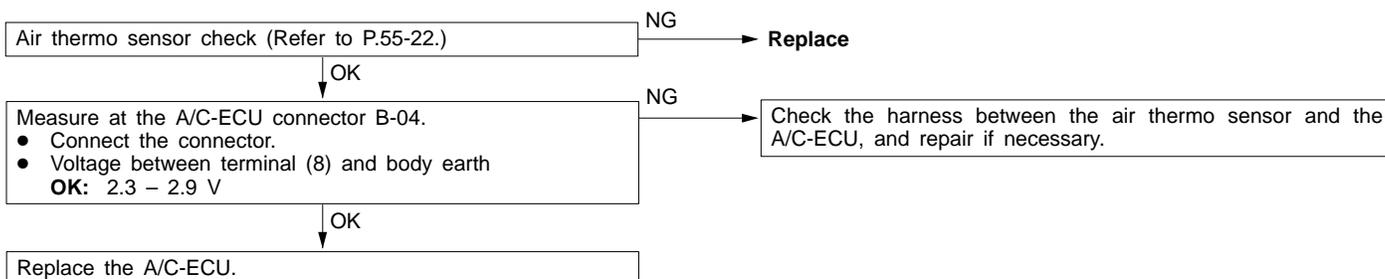
Code No.16 Heater water temperature sensor system (short circuit)	Probable cause
This diagnosis code is output if the power supply line or output line of the heater water temperature sensor is short-circuited and heater water temperature sensor power supply voltage signals are input to A/C-ECU.	<ul style="list-style-type: none"> ● Malfunction of the heater water temperature sensor ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



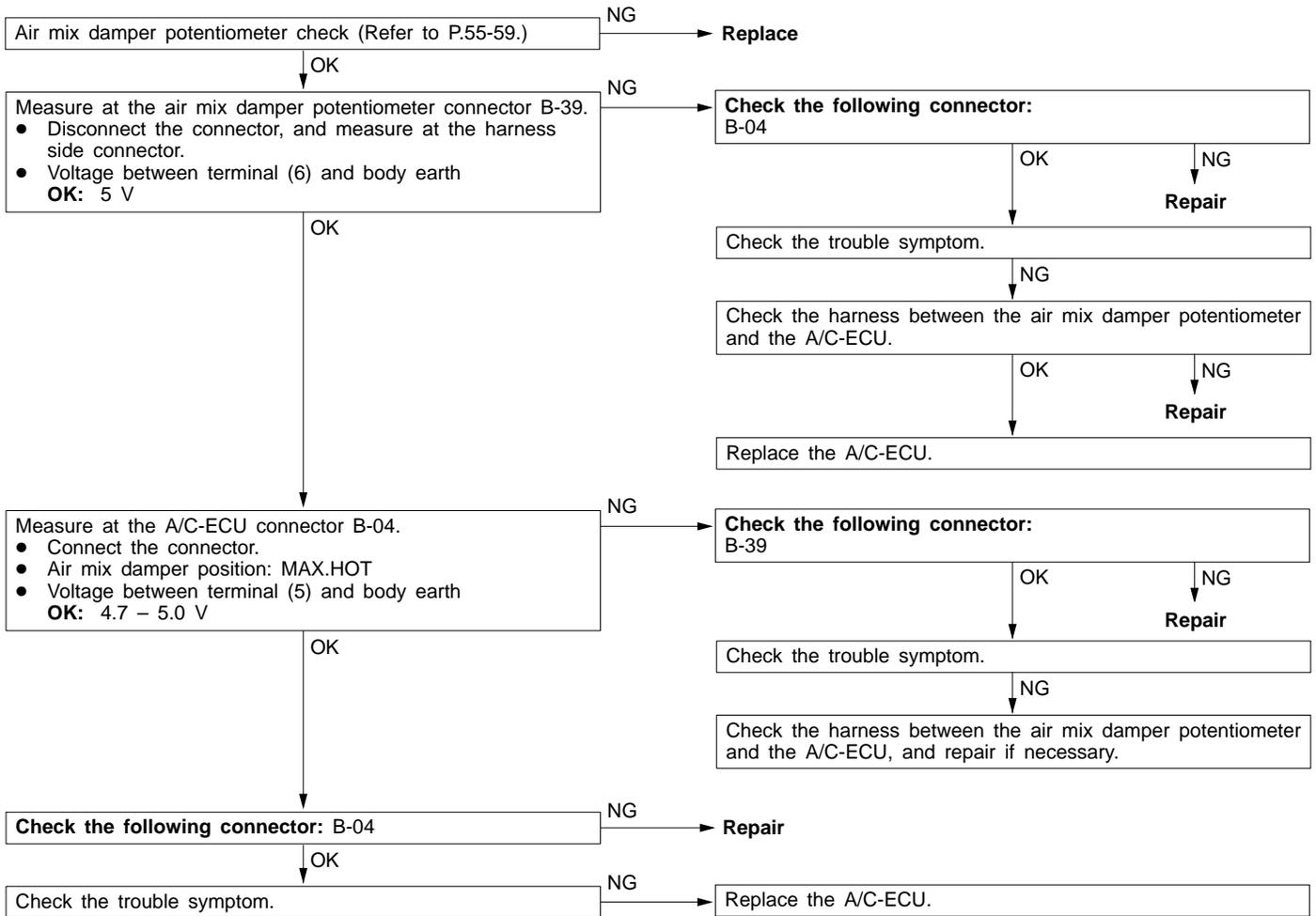
Code No.21 Air thermo sensor system (open circuit)	Probable cause
This diagnosis code is output if the power supply line or input line of the air thermo sensor is open-circuited and no air thermo sensor signals are input to A/C-ECU.	<ul style="list-style-type: none"> ● Malfunction of the air thermo sensor ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



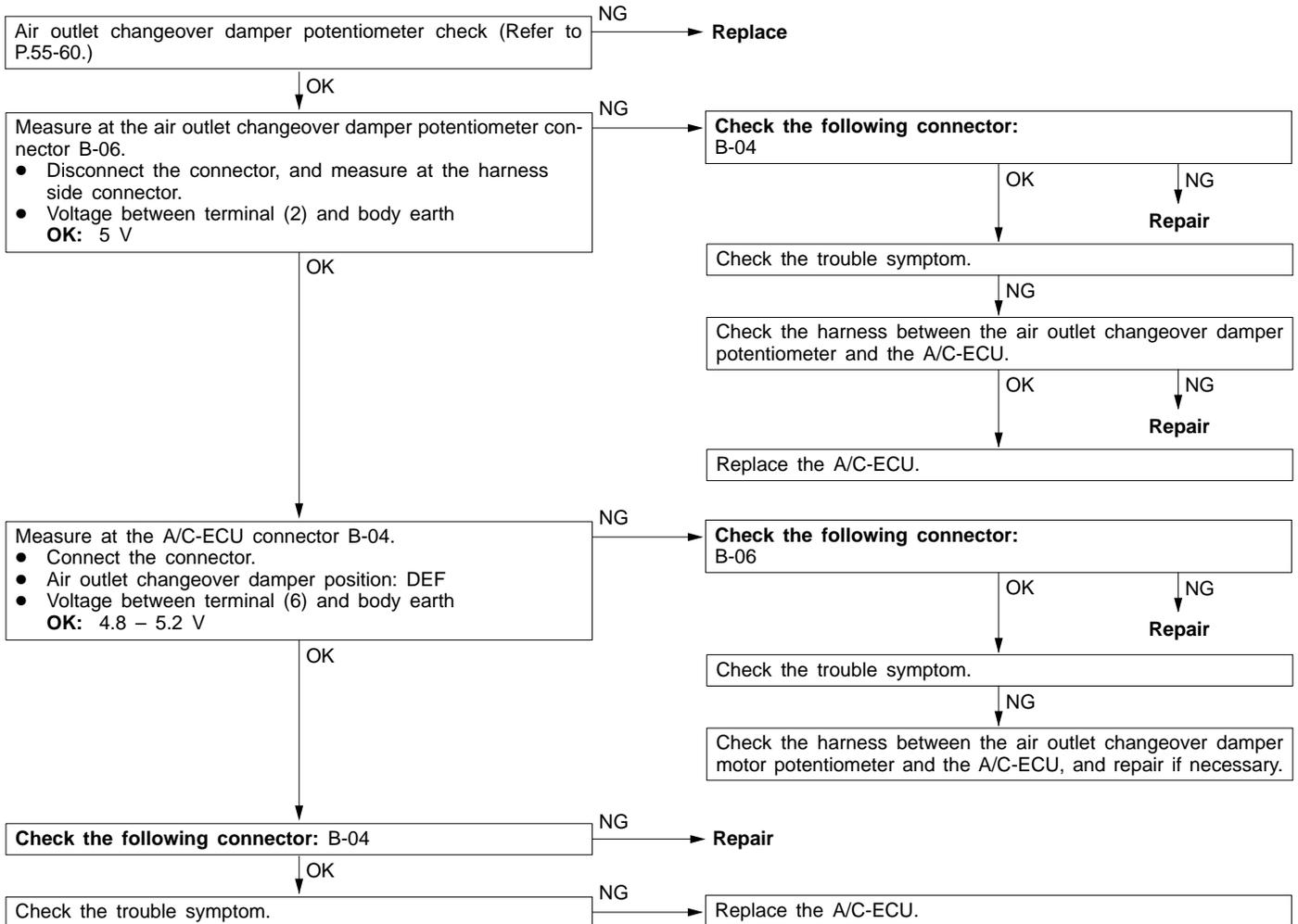
Code No.22 Air thermo sensor system (short circuit)	Probable cause
This diagnosis code is output if the power supply line or output line of the air thermo sensor is short-circuited and air thermo sensor power supply voltage signals are input to A/C-ECU.	<ul style="list-style-type: none"> ● Malfunction of the air thermo sensor ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



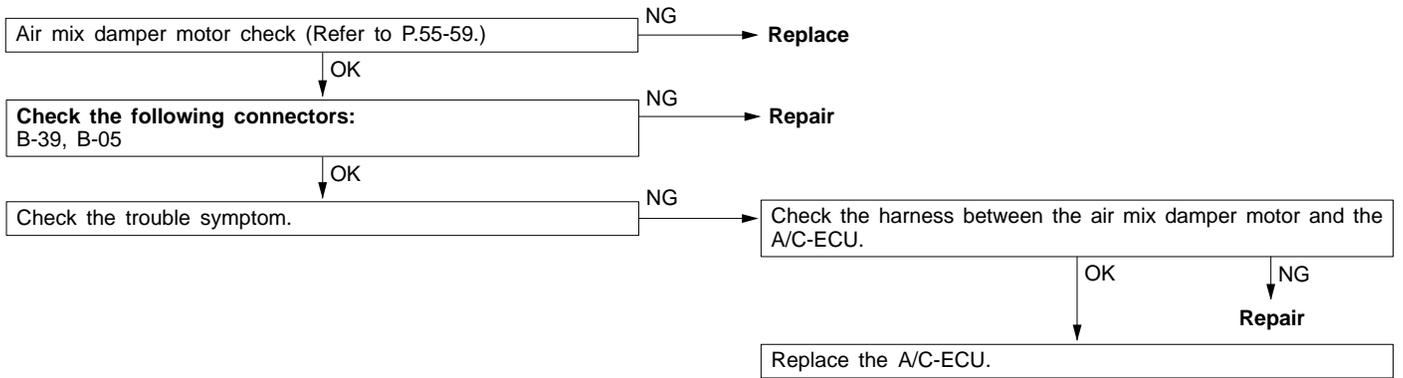
Code No.31 Potentiometer system of air mix damper motor assembly	Probable cause
This diagnosis code is output if no signals are input from air mix damper potentiometer to A/C-ECU because of short-circuit or open-circuit in the harness.	<ul style="list-style-type: none"> ● Malfunction of the air mix damper potentiometer ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



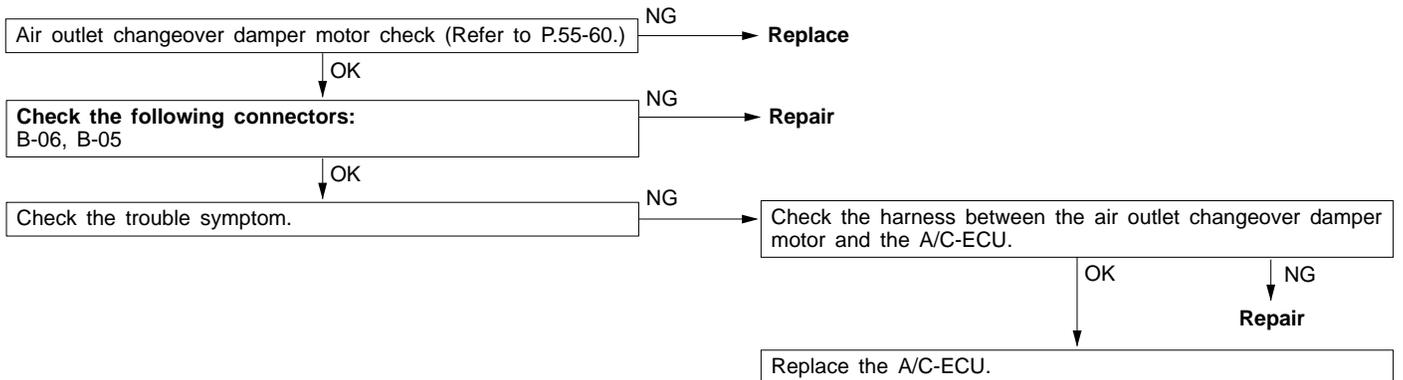
Code No.32 Potentiometer system of air outlet changeover damper motor assembly	Probable cause
This diagnosis code is output if no signals are input from air outlet changeover damper potentiometer to A/C-ECU because of short-circuit or open-circuit in the harness.	<ul style="list-style-type: none"> • Malfunction of the air outlet changeover damper potentiometer • Malfunction of connector, harness • Malfunction of the A/C-ECU



Code No.41 Drive system of air mix damper motor assembly	Probable cause
This diagnosis code is output if the air mix damper fails to be turned to the preset opening.	<ul style="list-style-type: none"> ● Malfunction of the air mix damper motor assembly ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



Code No.42 Drive system of air outlet changeover damper motor assembly	Probable cause
This diagnosis code is output if the air outlet changeover damper fails to be turned to the preset opening.	<ul style="list-style-type: none"> ● Malfunction of the air outlet changeover damper motor assembly ● Malfunction of connector, harness ● Malfunction of the A/C-ECU



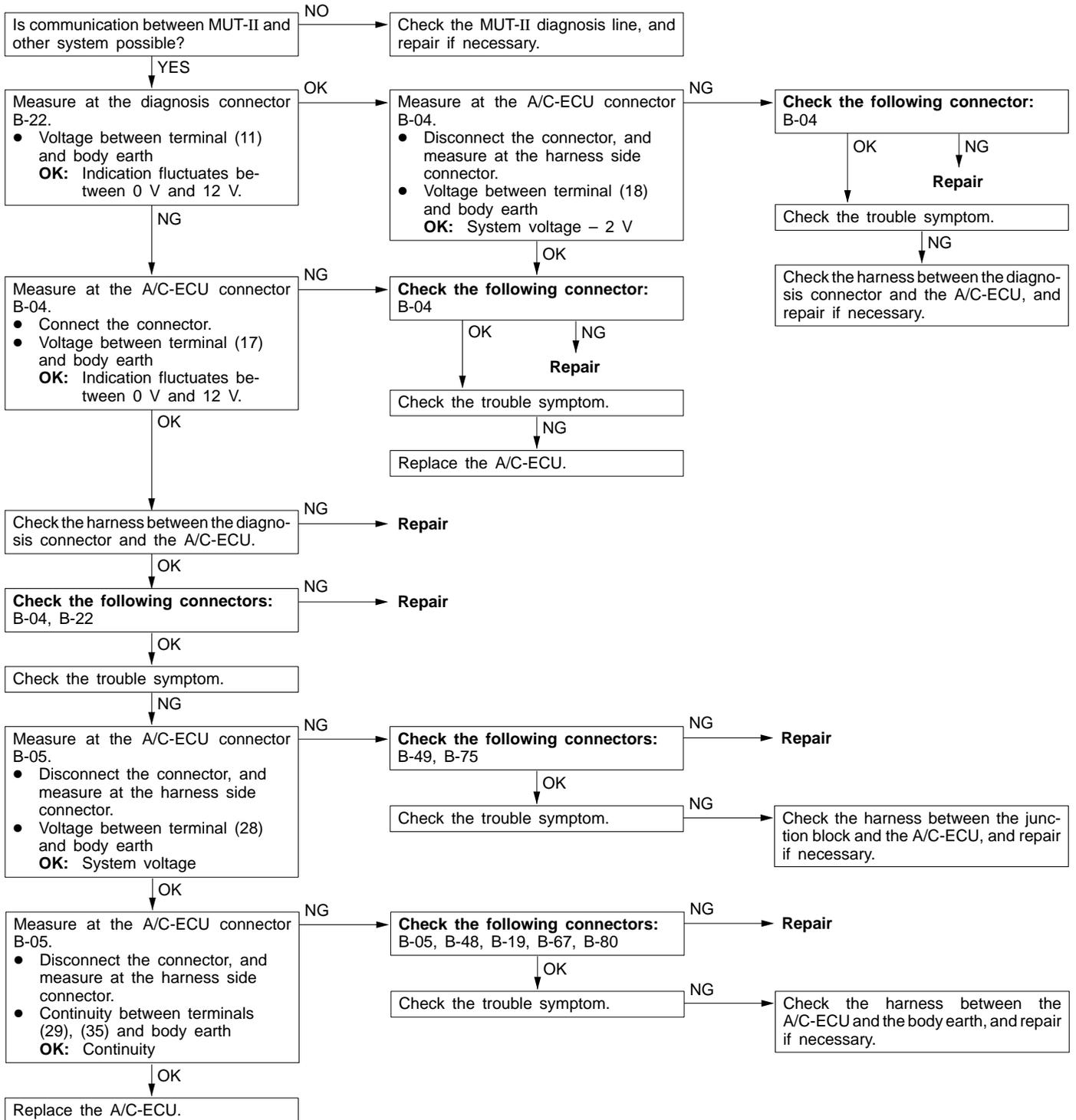
INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.	Reference page
Communication with the MUT-II is not possible.	1	55-42
Air conditioner does not operate.	2	55-43
A/C graphic display on control panel is blank.	3	55-44
Temperature cannot be set.	4	55-44
A/C outlet air temperature does not increase.	5	55-44
A/C outlet air temperature does not decrease.	6	55-44
Blower does not operate.	7	55-45
Blower does not operate in HI mode.	8	55-46
Blower air amount cannot be changed.	9	55-47
Air outlet port cannot be changed.	10	55-47
Inside/outside air changeover is not possible.	11	55-48
Defroster function does not operate.	12	55-49
Condenser fan does not operate.	13	55-50
Rear defogger does not operate.	14	55-51
A/C-ECU power supply circuit check	15	55-52
A/C compressor control circuit check	16	55-53

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

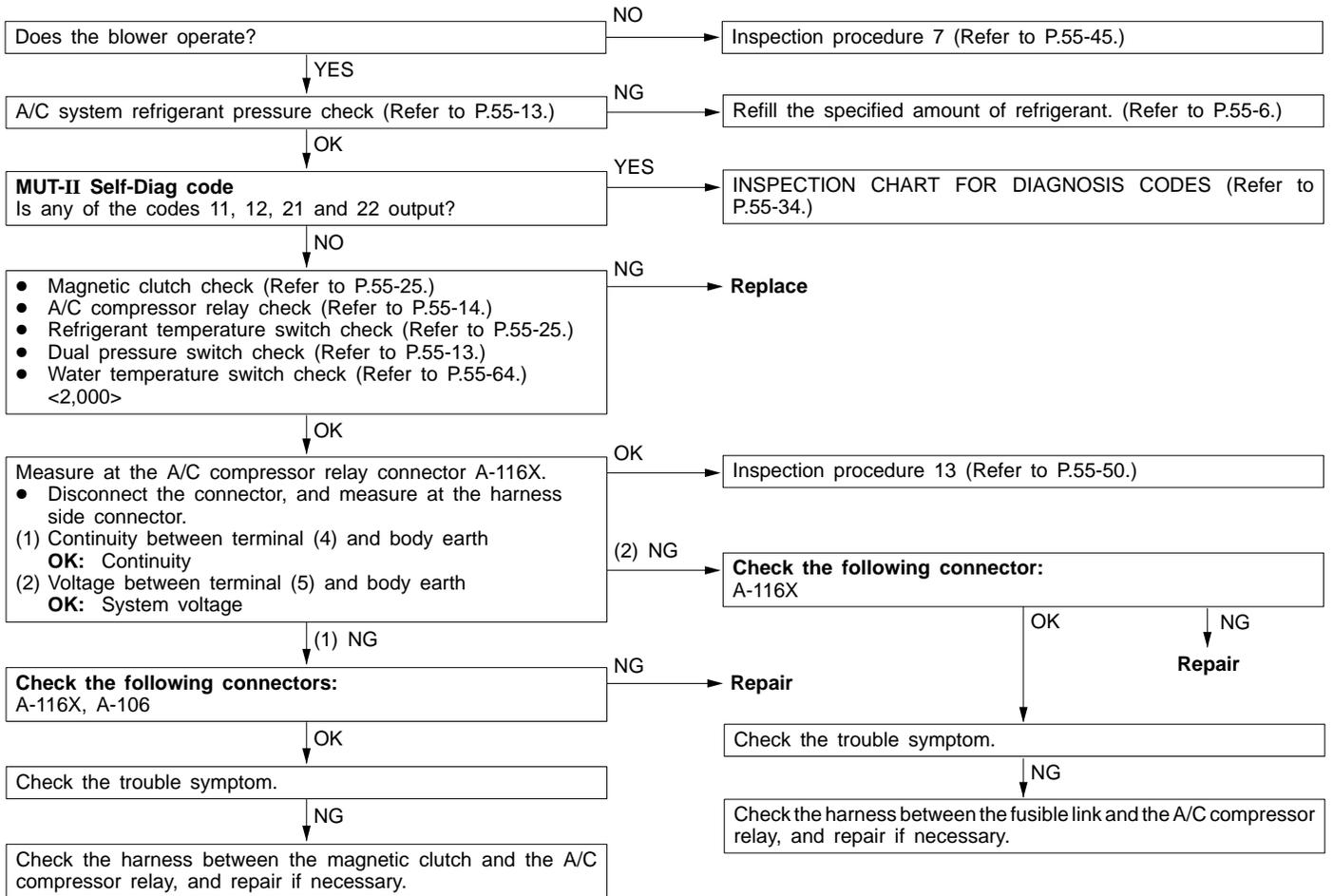
Inspection procedure 1

Communication with the MUT-II is not possible.	Probable cause
If communication with all other systems is not possible, there is a high possibility that there is a malfunction of the diagnosis line. If communication with only the A/C is not possible, the cause is probably a malfunction of the diagnosis line or of the A/C-ECU power supply system (earth).	<ul style="list-style-type: none"> • Malfunction of connector or harness • Malfunction of A/C-ECU



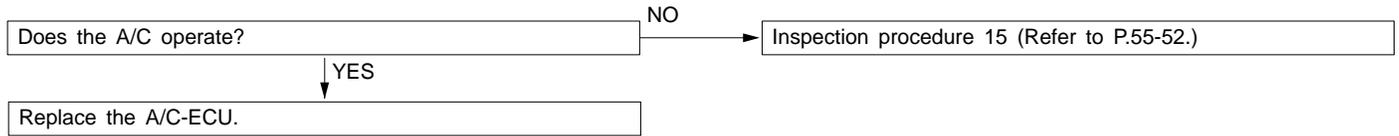
Inspection procedure 2

Air conditioner does not operate.	Probable cause
If the A/C does not operate when the A/C switch is on and the temperature setting is at 17°C, the cause is probably insufficient refrigerant, or a malfunction of the blower or of the magnet clutch power supply.	<ul style="list-style-type: none"> ● Malfunction of blower ● Insufficient refrigerant ● Malfunction of magnetic clutch ● Malfunction of air thermo sensor ● Malfunction of A/C compressor relay ● Malfunction of refrigerant temperature switch ● Malfunction of dual pressure switch ● Malfunction of water temperature switch ● Malfunction of connector or harness ● Malfunction of engine-ECU ● Malfunction of A/C-ECU



Inspection procedure 3

A/C graphic display on control panel is blank.	Probable cause
The cause is probably a malfunction of the A/C-ECU power supply system (earth).	<ul style="list-style-type: none"> • Malfunction of connector or harness • Malfunction of A/C-ECU



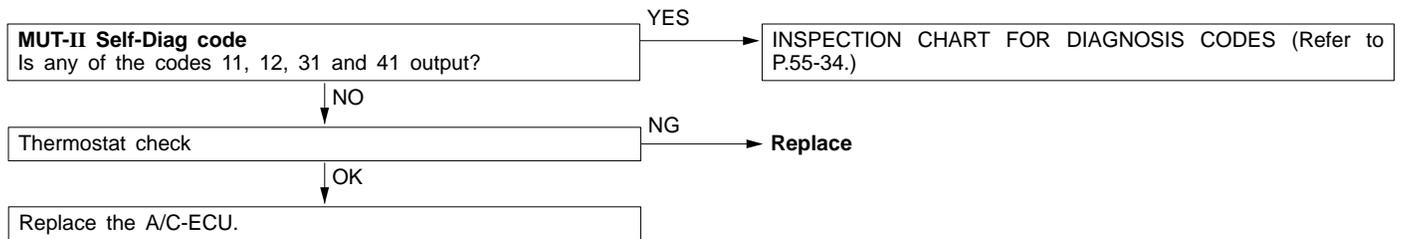
Inspection procedure 4

Temperature cannot be set.	Probable cause
The cause is probably a malfunction of the temperature setting signal input system or output system.	<ul style="list-style-type: none"> • Malfunction of connector or harness • Malfunction of A/C-ECU

Inspection procedure 15 (Refer to P.55-52.)

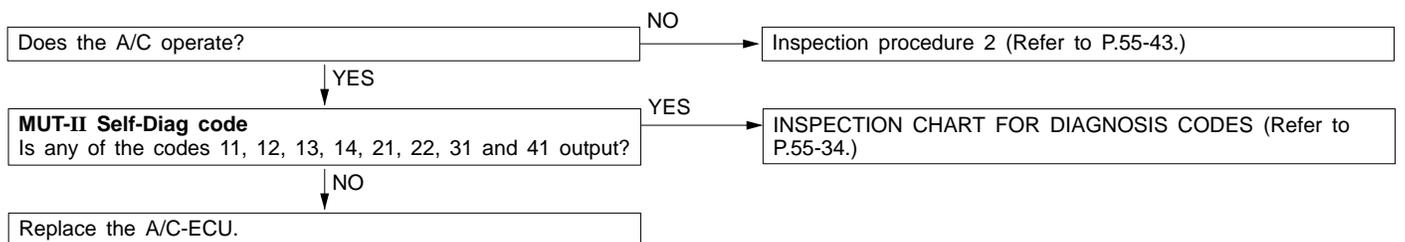
Inspection procedure 5

A/C outlet air temperature does not increase.	Probable cause
If the outlet air temperature does not increase when the temperature setting is increased, the cause is probably a sensor malfunction or a problem with operation of the air mix damper. The MUT-II can be used to check the diagnosis codes in order to check the cause of the problem for each separate system.	<ul style="list-style-type: none"> • Malfunction of air mix damper potentiometer • Malfunction of air mix damper motor • Malfunction of air mix damper • Malfunction of connector or harness • Malfunction of thermostat • Malfunction of A/C-ECU



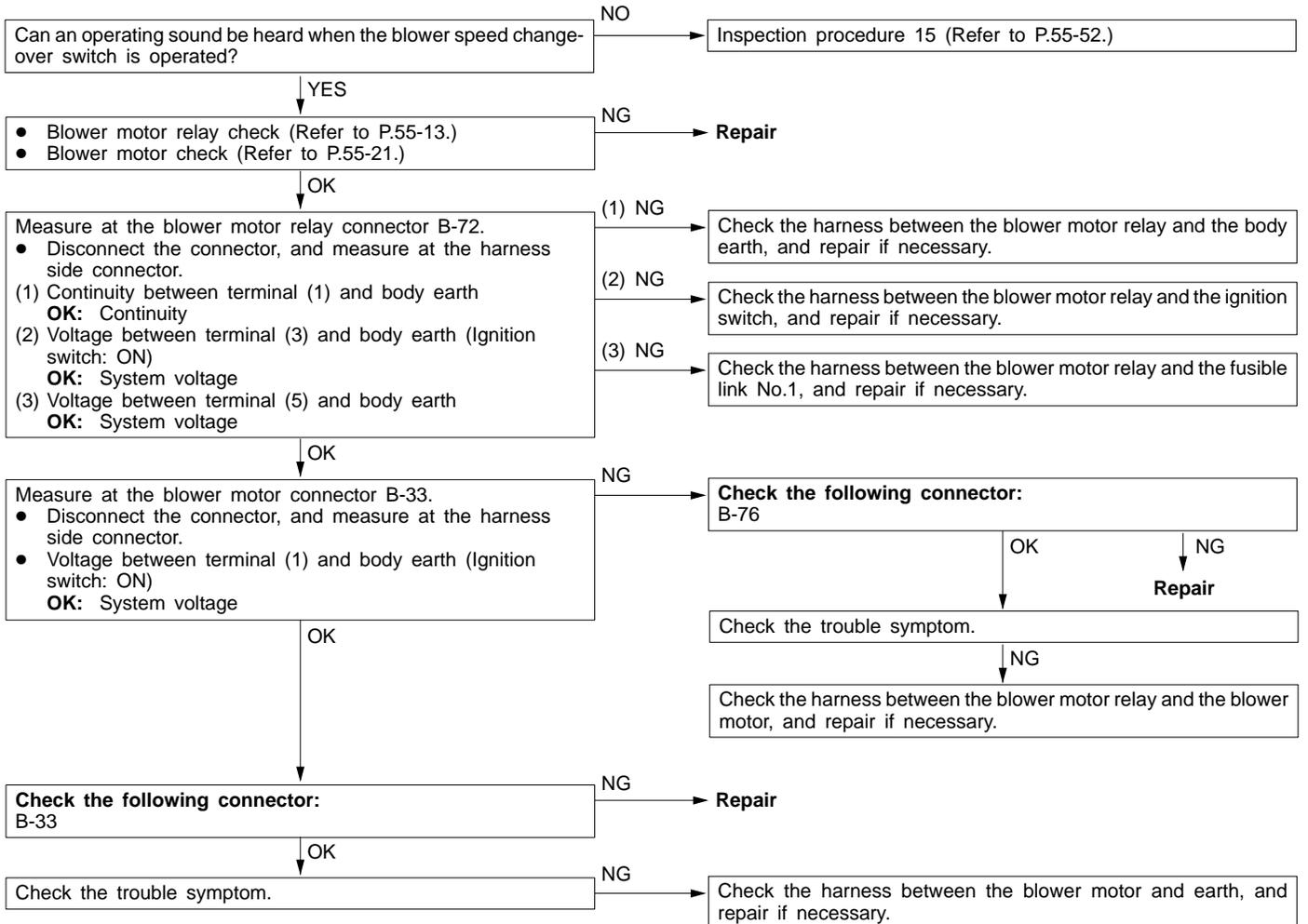
Inspection procedure 6

A/C outlet air temperature does not decrease.	Probable cause
If the outlet air temperature does not decrease when the temperature setting is decreased, the cause is probably a problem in A/C system operation due to a sensor error, or a problem with operation of the air mix damper. The MUT-II can be used to check the diagnosis codes in order to check the cause of the problem for each separate system.	<ul style="list-style-type: none"> • Malfunction of outside air temperature sensor • Malfunction of air mix damper potentiometer • Malfunction of air mix damper motor • Malfunction of air thermo sensor • Malfunction of connector or harness • Malfunction of air mix damper • Malfunction of A/C-ECU



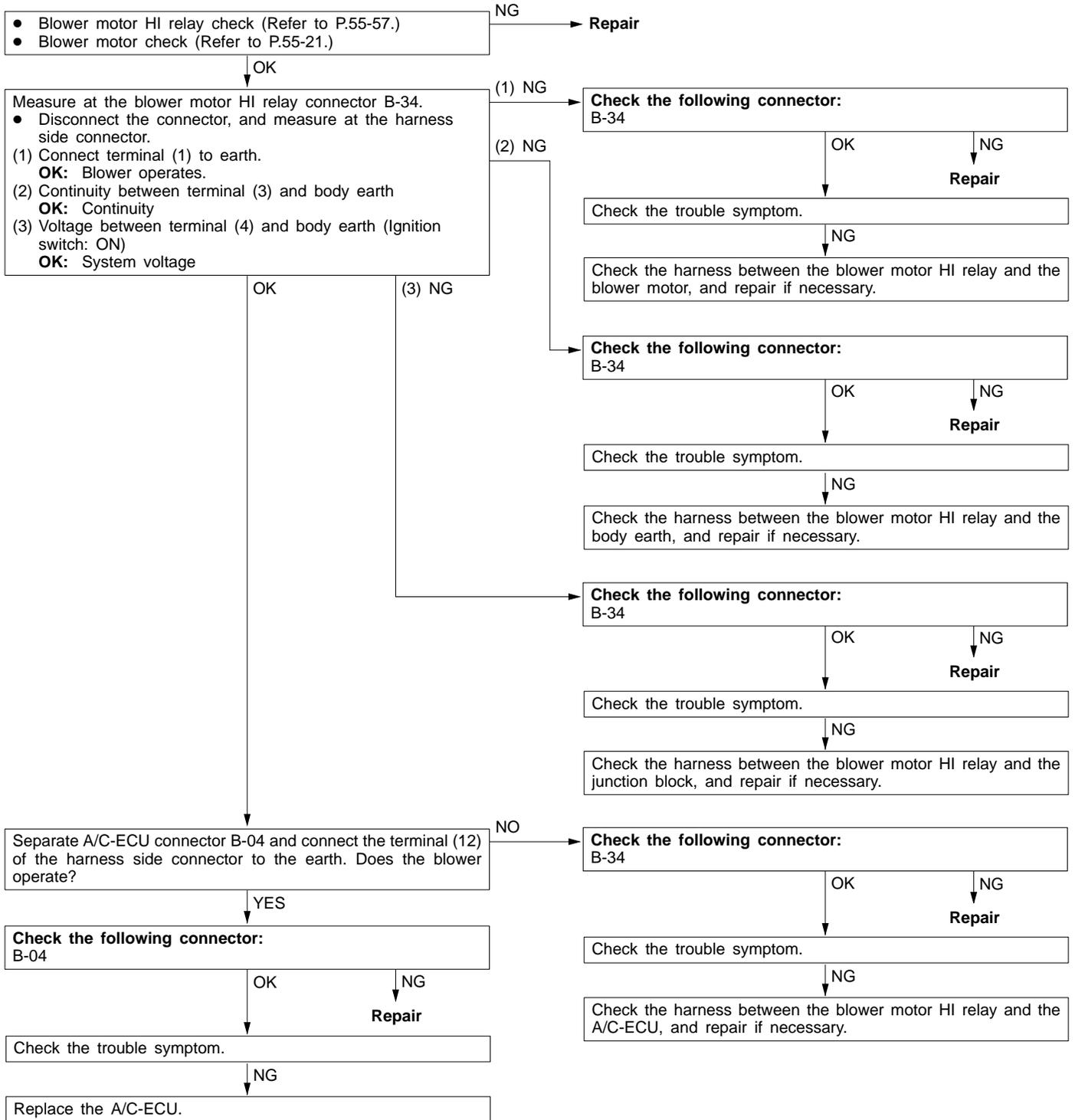
Inspection procedure 7

Blower does not operate.	Probable cause
If no air comes out of the blower even though the blower switch is on, the cause is probably a malfunction of the blower motor relay circuit.	<ul style="list-style-type: none"> • Malfunction of blower motor relay • Malfunction of blower motor • Malfunction of connector or harness • Malfunction of A/C-ECU



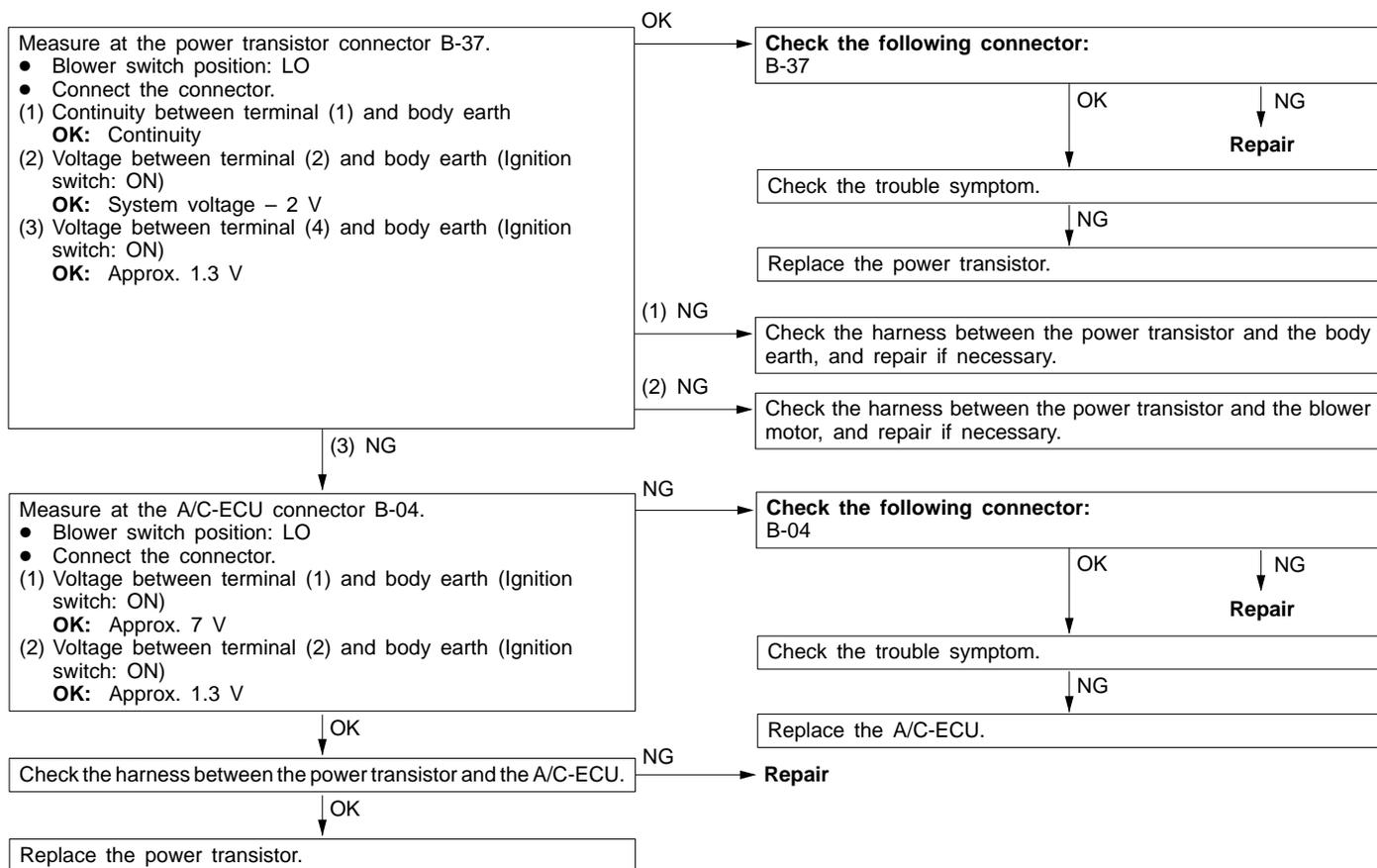
Inspection procedure 8

Blower does not operate in HI mode.	Probable cause
If the blower does not operate in HI mode when the temperature is set to 17 or 32, the cause is probably a malfunction of the blower motor HI relay circuit system.	<ul style="list-style-type: none"> ● Malfunction of blower motor HI relay ● Malfunction of blower motor ● Malfunction of connector or harness ● Malfunction of A/C-ECU



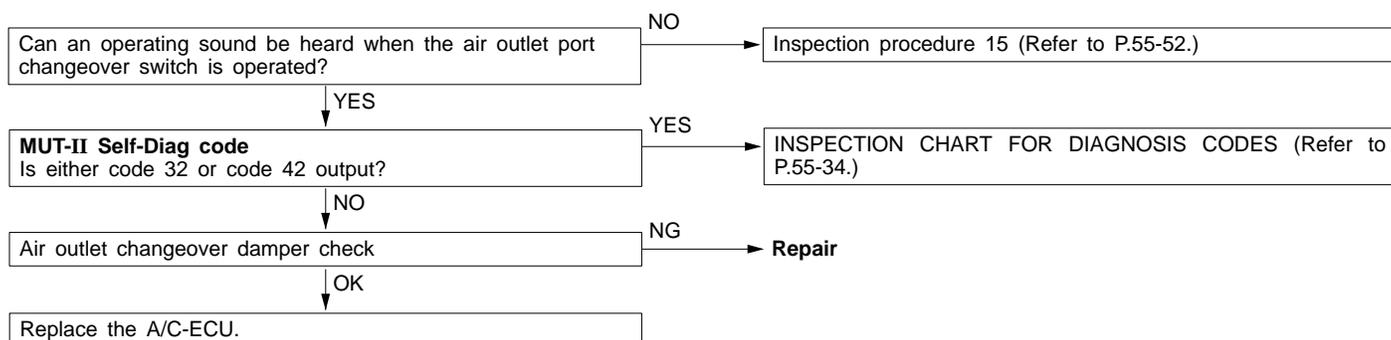
Inspection procedure 9

Blower air amount cannot be changed.	Probable cause
If the blower does not operate in any mode other than HI setting, the cause is probably a malfunction of the power transistor system.	<ul style="list-style-type: none"> • Malfunction of power transistor • Malfunction of connector or harness • Malfunction of A/C-ECU



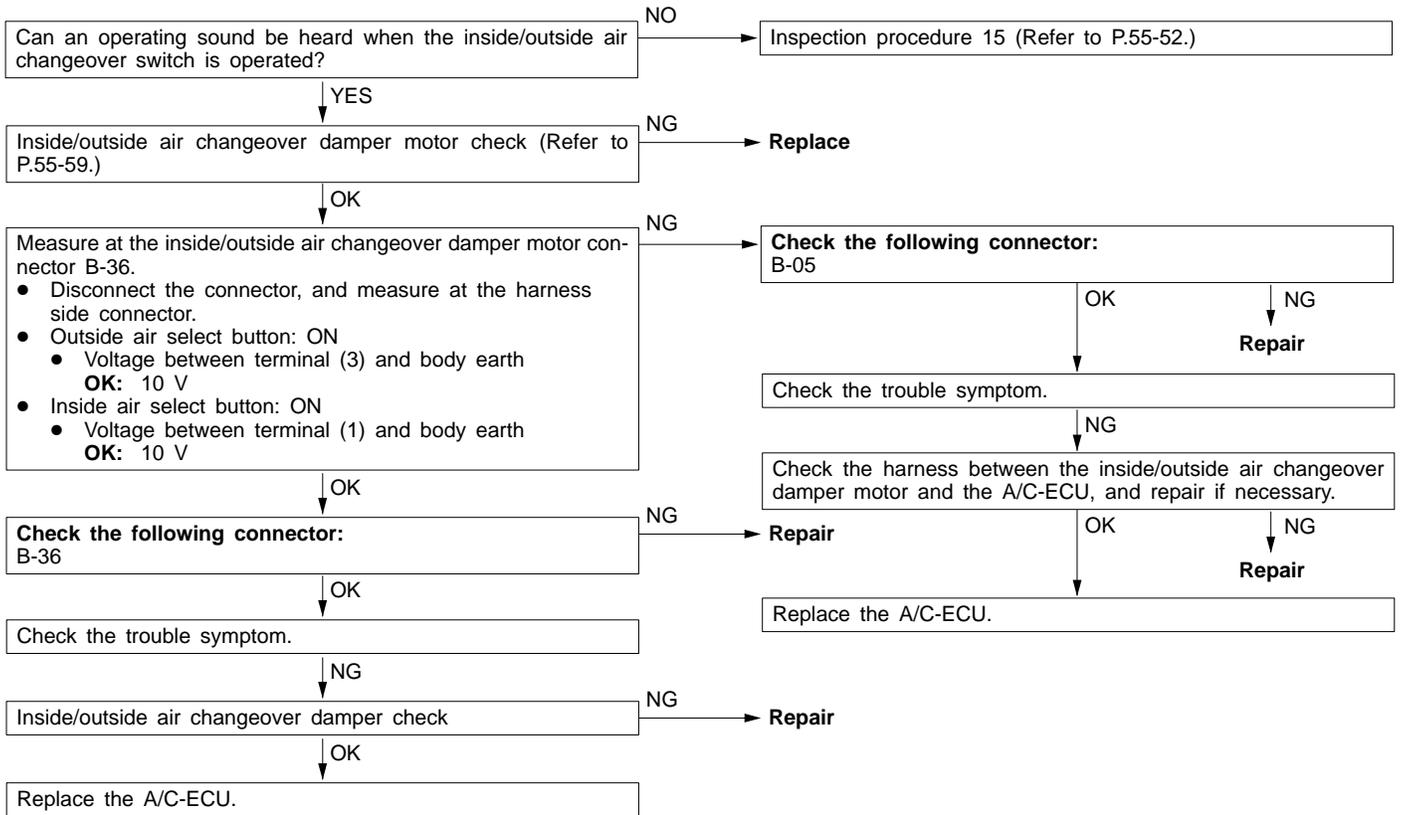
Inspection procedure 10

Air outlet port cannot be changed.	Probable cause
The cause is probably a malfunction of the air outlet port changeover signal input system or output system. The MUT-II can be used to check the diagnosis codes in order to check the cause of the problem for each separate system.	<ul style="list-style-type: none"> • Malfunction of air outlet changeover damper potentiometer • Malfunction of air outlet changeover damper motor • Malfunction of air outlet changeover damper • Malfunction of connector or harness • Malfunction of A/C-ECU



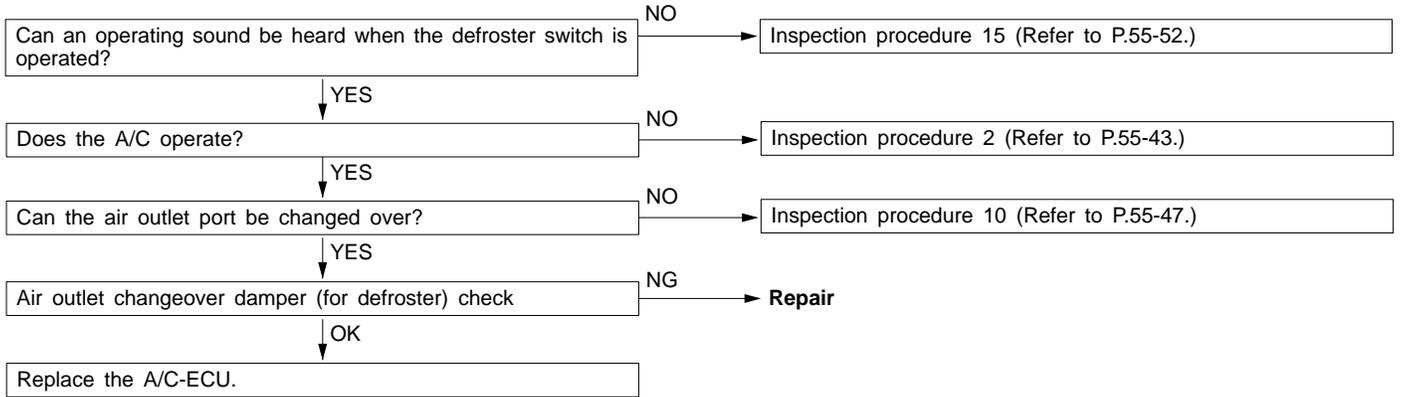
Inspection procedure 11

Inside/outside air changeover is not possible.	Probable cause
If inside/outside air changeover is not possible even when the inside/outside air changeover switch is on, the cause is probably a malfunction of the inside/outside air changeover damper motor.	<ul style="list-style-type: none"> ● Malfunction of inside/outside air changeover damper motor ● Malfunction of inside/outside air changeover damper ● Malfunction of connector or harness ● Malfunction of A/C-ECU



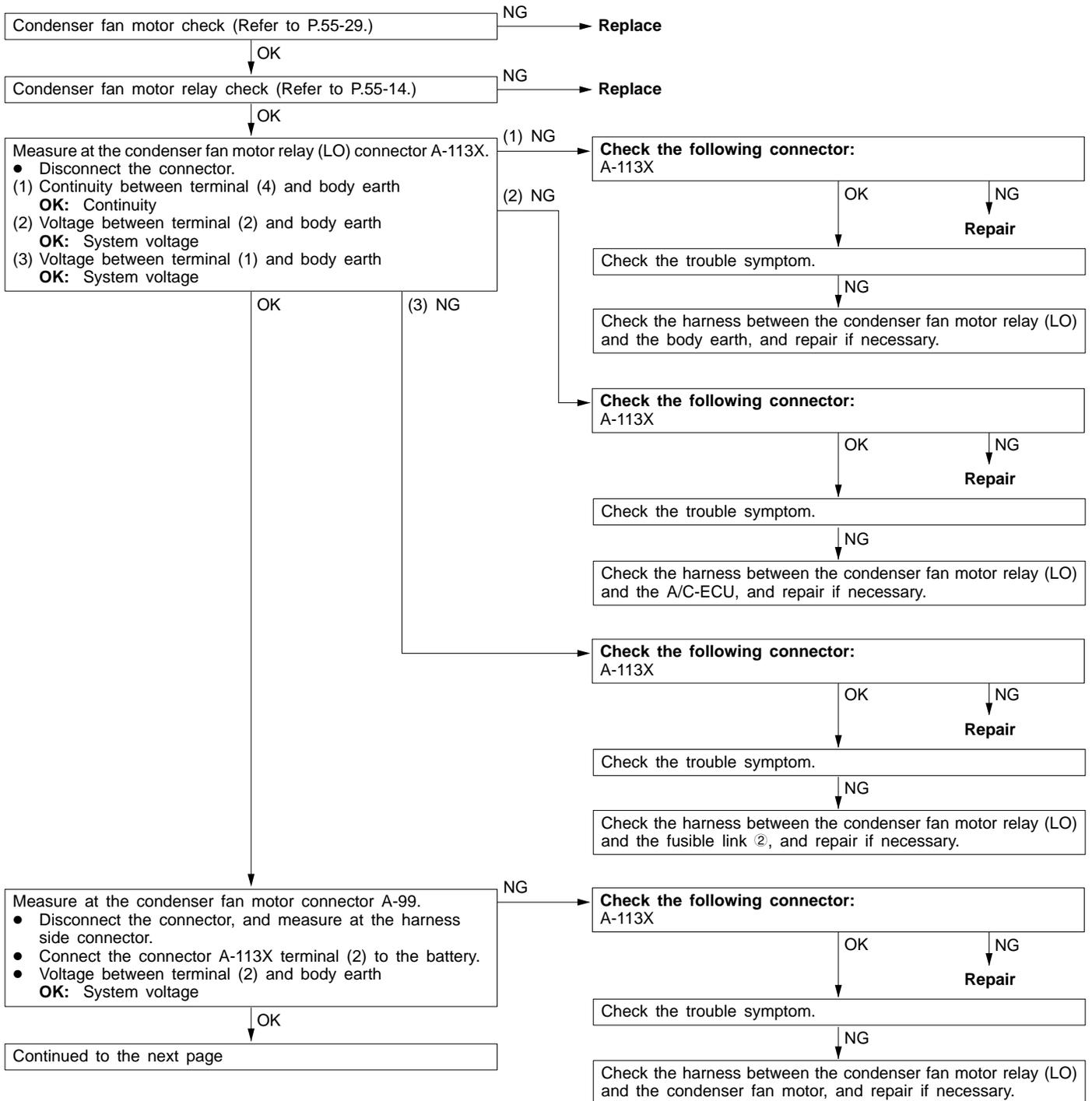
Inspection procedure 12

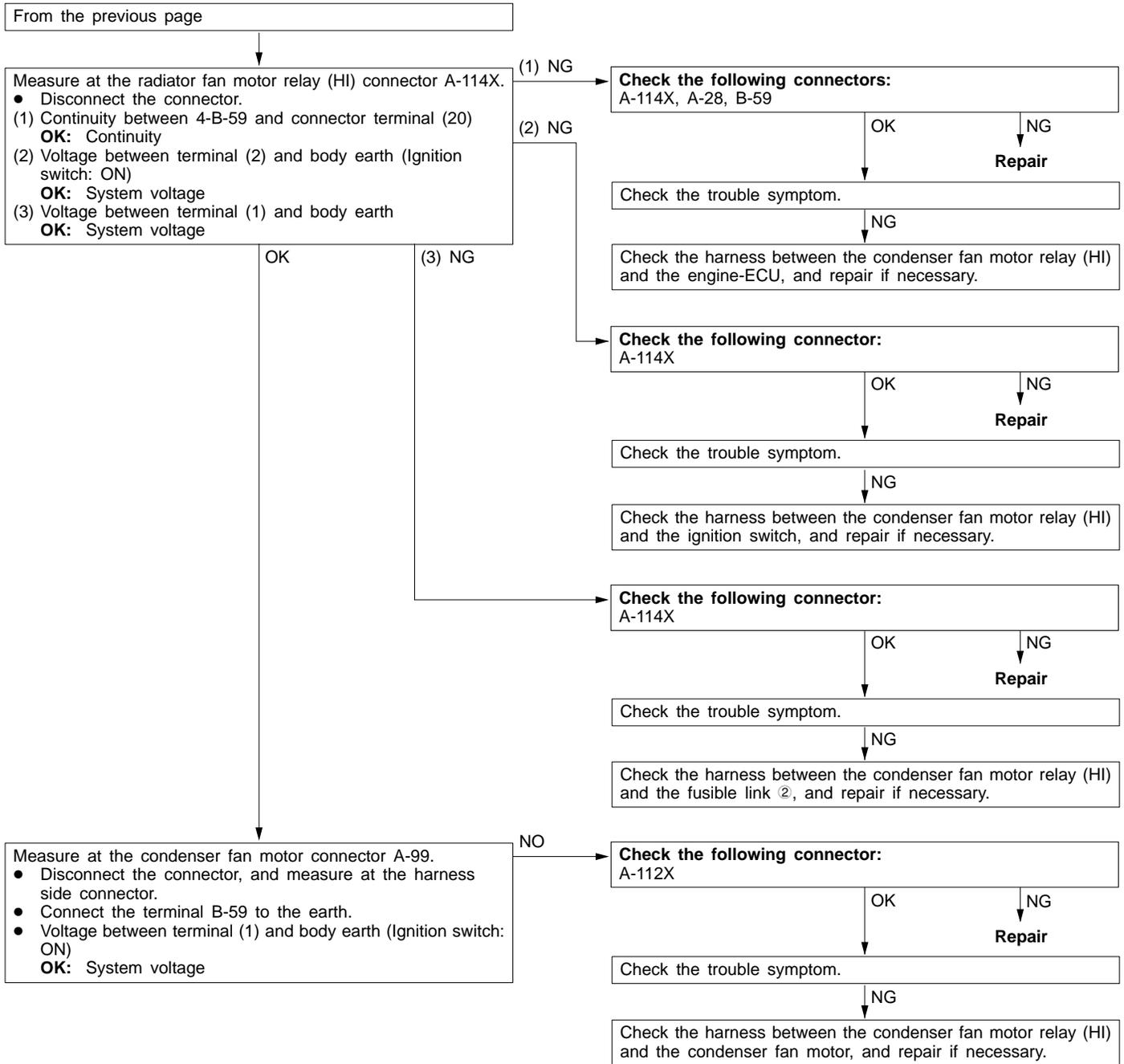
Defroster function does not operate.	Probable cause
If the defroster function does not operate when the defroster switch is turned on, the cause is probably a malfunction of the A/C or of the air outlet port changeover circuit.	<ul style="list-style-type: none"> ● Malfunction of air conditioner drive system ● Malfunction of air outlet changeover damper drive system ● Malfunction of connector or harness ● Malfunction of A/C-ECU



Inspection procedure 13

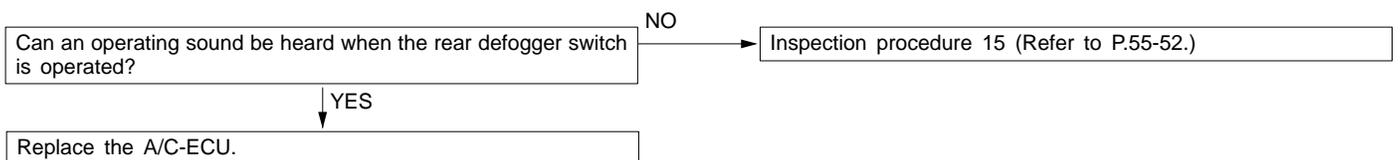
Condenser fan does not operate.	Probable cause
If the condenser fan does not turn when the A/C is ON, the cause is probably a malfunction of the condenser fan motor activation circuit. In this case, reduced cooling performance will be caused if the vehicle is not running.	<ul style="list-style-type: none"> ● Malfunction of condenser fan motor ● Malfunction of condenser fan motor relay (HI, LO) ● Malfunction of wiring harness or connector





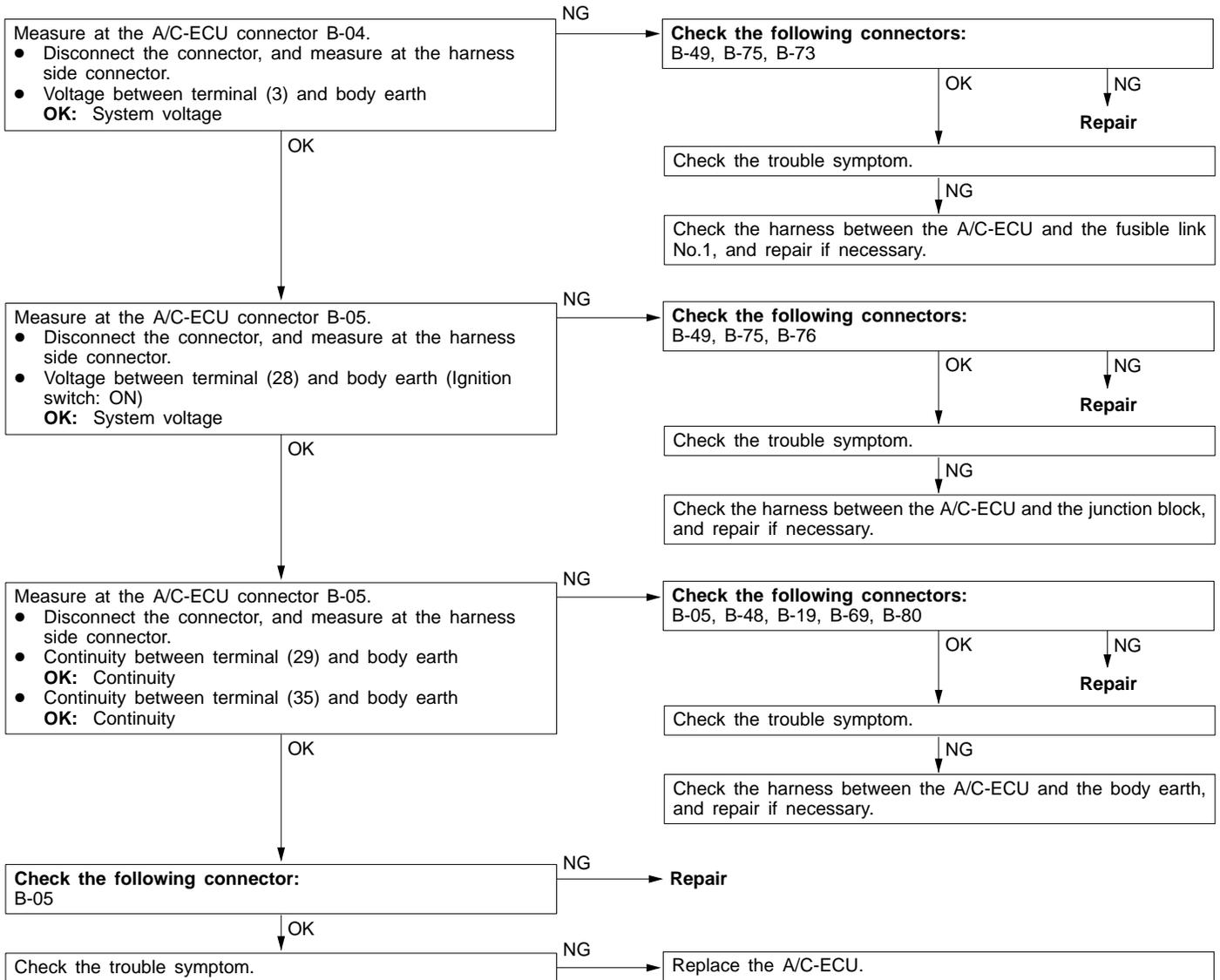
Inspection procedure 14

Rear defogger does not operate.	Probable cause
If the rear defogger does not operate when the rear defogger switch is turned on (timer operates for 20 minutes), the cause is probably a malfunction of the A/C-ECU power supply system (earth).	<ul style="list-style-type: none"> Malfunction of connector or harness Malfunction of A/C-ECU



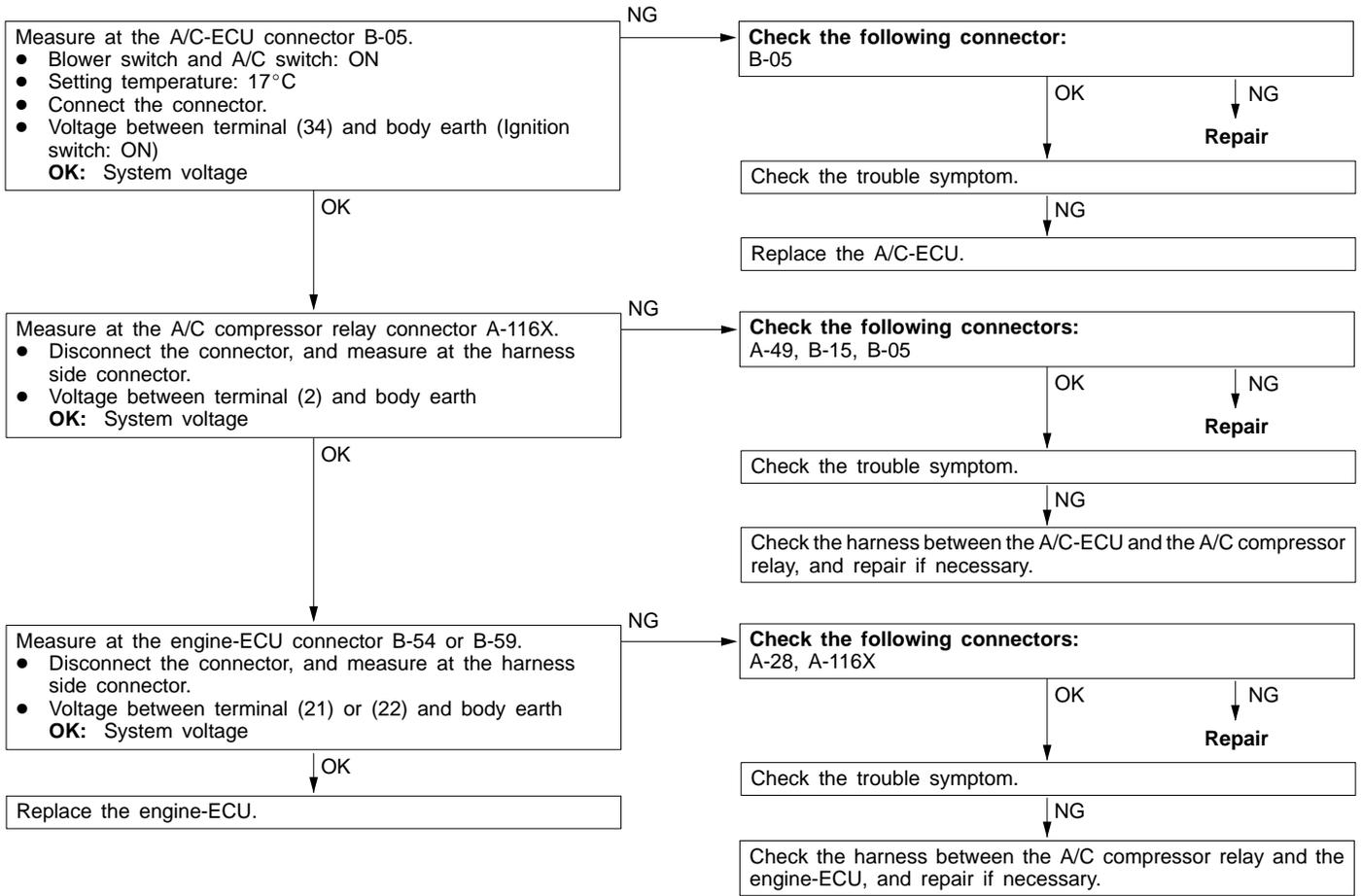
Inspection procedure 15

A/C-ECU power supply circuit check



Inspection procedure 16

A/C compressor control circuit check



DATA LIST REFERENCE TABLE

Check item	Check condition	Normal condition	
Inside air temperature sensor ● MUT-II (11)	Ignition switch: ON	Inside air temperature and temperature displayed on the MUT-II are identical.	
Outside air temperature sensor ● MUT-II (13)	Ignition switch: ON	Outside air temperature and temperature displayed on the MUT-II are identical.	
Heater water temperature sensor ● MUT-II (15)	Ignition switch: ON	Heater core surface temperature and temperature displayed on the MUT-II are identical.	
Air thermo sensor ● MUT-II (21)	Ignition switch: ON	Evaporator surface temperature and temperature displayed on the MUT-II are identical.	
Photo sensor ● MUT-II (25)	Ignition switch: ON	Amount of incident light is proportional to voltage displayed on the MUT-II.	
Air mix damper potentiometer ● MUT-II (31)	Ignition switch: ON	Damper position	Opening degree (%)
		MAX. HOT	Approx. 100
		MAX. COOL	Approx. 0
Air outlet changeover damper potentiometer ● MUT-II (32)	Ignition switch: ON	Damper position	Opening degree (%)
		FACE	Approx. 0
		FOOT	Approx. 50
		FOOT/DEF.	Approx. 75
		DEF.	Approx. 100

CHECK AT THE A/C-ECU TERMINALS

A/C-ECU

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

The parenthesized values in “Normal condition” column are for your reference.

Terminal No.	Check item	Check condition	Normal condition
1	Front power transistor collector output	When blower switch is at OFF	System voltage
		When blower switch is at LO	Approx. 7 V
		When blower switch is at HI	Almost no voltage (0 V)
2	Front power transistor base output	When blower switch is at OFF	0 V
		When blower switch is at LO	Approx. 1.3 V
		When blower switch is at HI	Approx. 2.5 V
3	Backup	At all times	System voltage

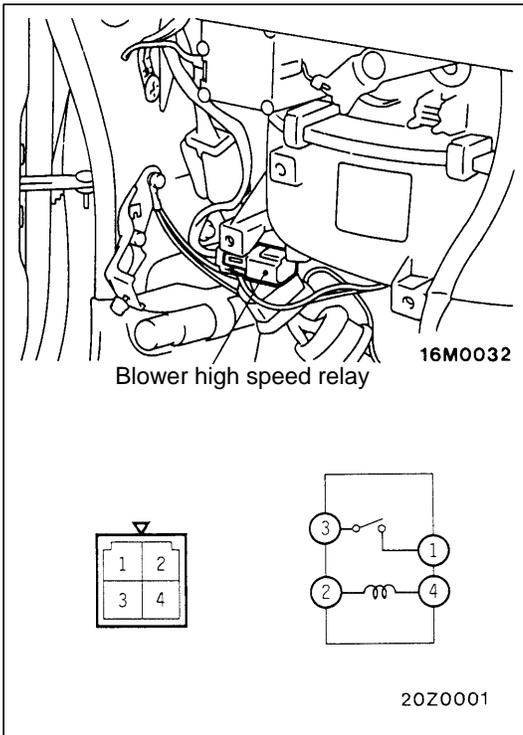
Terminal No.	Check item	Check condition	Normal condition
4	Heater water temperature sensor input	When sensor section temperature is 25°C (4 kΩ)	2.3 – 2.9 V
5	Air mix damper potentiometer input	When damper is moved to MAX. HOT position	4.7 – 5.0 V
6	Air outlet changeover damper potentiometer input	When damper is moved to DEF. position	4.8 – 5.2 V
7	Outside air temperature sensor input	When sensor section temperature is 25°C (4 kΩ)	2.3 – 2.9 V
8	Air thermo sensor input	When sensor section temperature is 25°C (4 kΩ)	2.3 – 2.9 V
9	Photo sensor (–)	At luminous intensity of 0 lux	0 V
		At luminous intensity of 100,000 lux or more	–0.1 – 0.2 V
10	Sensor power supply	At all times	4.8 – 5.2 V
12	Blower motor HI relay (Exciting circuit)	When blower switch is in HI	1.5 V or less
		When blower switch is in a position other than HI	System voltage
16	Rear defogger	When rear defogger switch is ON	1.5 V or less
		When rear defogger switch is OFF	System voltage
17	Diagnosis date output	When ignition switch is ON	0 V ↔ 12 V
18	Diagnosis control output	When ignition switch is ON	System voltage – 2 V
19	Photo sensor (+)	At all times	0 V
20	Sensor earth	At all times	0 V
21	Air outlet changeover damper motor (FACE)	When damper is moved to FACE position	10 V
		When damper is moved to DEF. position	Almost no voltage (0.5 V)
22	Air mix damper motor (MAX. COOL)	When damper is moved to MAX. COOL position	10 V
		When damper is moved to MAX. HOT position	Almost no voltage (0.5 V)
23	Inside/outside air changeover damper motor (Inside)	When switch is set to inside air position	Almost no voltage (0.5 V)
		When switch is set to outside air position	10 V
24	Air outlet changeover damper motor (DEF.)	When damper is moved to FACE position	Almost no voltage (0.5 V)
		When damper is moved to DEF. position	10 V

Terminal No.	Check item	Check condition	Normal condition
25	Air mix damper motor (MAX. HOT)	When damper is moved to MAX. COOL position	Almost no voltage (0.5 V)
		When damper is moved to MAX. HOT position	10 V
26	Inside/outside air changeover damper motor (Outside)	When switch is set to inside air position	10 V
		When switch is set to outside air position	Almost no voltage (0.5 V)
28	IG ₂ power supply	When ignition switch is ON	System voltage
29	Earth	At all times	Continuity
30	ILL power supply	When lighting switch is at ON	System voltage
34	A/C output	When A/C is OFF	0 V
		When A/C is ON	System voltage
35	Earth	At all times	Continuity

ON-VEHICLE SERVICE

REFRIGERANT CHARGING, LEVEL CHECK, ADDITION AND REMOVAL, PERFORMANCE TEST, DUAL PRESSURE SWITCH SIMPLE CHECK

Follow the same procedures as for the heater and manual air conditioner. (Refer to P.55-6.)



POWER RELAY CHECK

Follow the same procedures as for the heater and manual air conditioner except for the following. (Refer to P.55-13.)

BLOWER HIGH SPEED RELAY

Battery voltage	Terminal No.			
	1	2	3	4
Power is not supplied		○	—	○
Power is supplied	○	⊕	○	⊖

IDLE-UP OPERATION CHECK

The idle-up inspection procedures are the same as for the heater and manual air conditioner. (Refer to P.55-14.)

<Idle speed>

Standard value: 750 ± 50 r/min

<Idle-up speed>

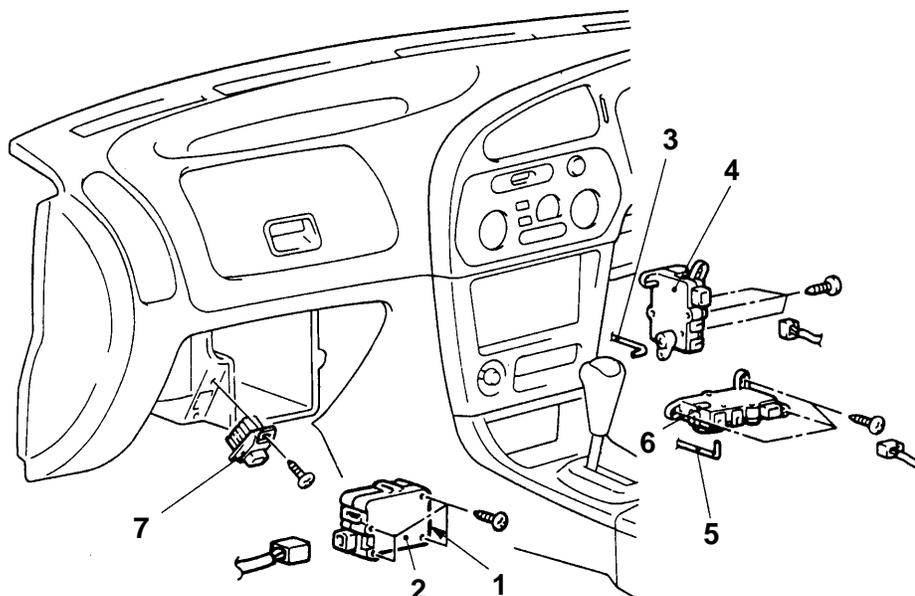
Standard value: 850 ± 50 r/min

NOTE

If the idling speed is not within the standard value range, adjust it.

DAMPER CONTROL MOTOR ASSEMBLY AND POWER TRANSISTOR

REMOVAL AND INSTALLATION



20M0047

Inside/outside air changeover damper motor removal steps

- Glove box, glove box frame
1. Linkage connection
 2. Inside/outside air changeover damper motor

Air outlet port changeover damper motor removal steps

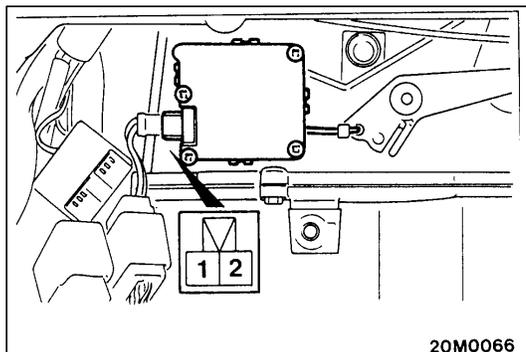
- Instrument lower panel
3. Linkage connection
 4. Air outlet port changeover damper motor

Air mix damper motor removal steps

- Front floor console, console side cover
5. Linkage connection
 6. Air mix damper motor

Power transistor removal steps

- Glove box, glove box frame
7. Power transistor



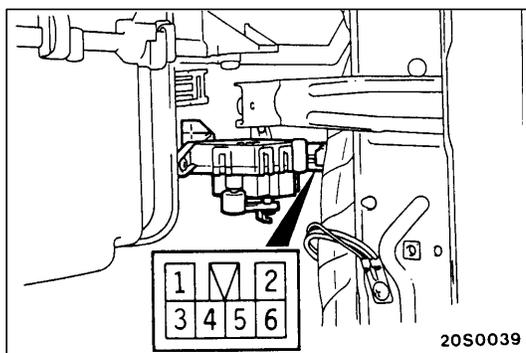
INSPECTION

INSIDE/OUTSIDE CHANGEOVER DAMPER MOTOR CHECK

Battery connection terminal		Lever operation
1	2	
⊖	⊕	Moves to the outside air position
⊕	⊖	Moves to the inside air position

Caution

Cut off the battery voltage when the lever is in the stop position.



AIR MIX DAMPER MOTOR CHECK

Motor

Battery connection terminal		Lever operation
1	3	
⊕	⊖	Moves to COOL position
⊖	⊕	Moves to HOT position

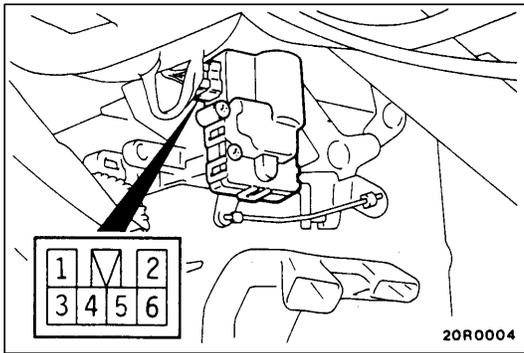
Caution

Cut off the battery voltage when the lever is in the stop position.

Potentiometer

Check to ensure that the resistance value changes gradually within the standard value range when the resistance value is measured between connector terminals 2 and 5 or between 5 and 6 with the above inspection condition unchanged.

Standard value: Approx. 0.18 – 4.82 kΩ



**AIR OUTLET CHANGEOVER DAMPER MOTOR CHECK
Motor**

Battery connection terminal		Lever operation
1	3	
⊕	⊖	Moves to DEF. position
⊖	⊕	Moves to FACE position

Caution
Cut off the battery voltage when the lever is in the stop position.

Potentiometer

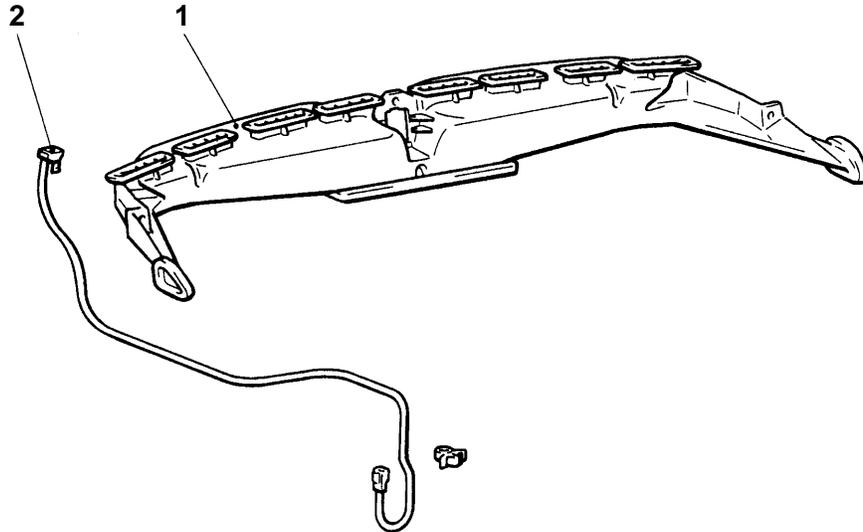
Check to ensure that the resistance value changes within the standard value range when the resistance value is measured between connector terminals 2 and 5 or between 5 and 6 with the above inspection condition unchanged.

Standard value: Approx. 0.18 – 4.82 kΩ

PHOTO SENSOR

REMOVAL AND INSTALLATION

- Pre-removal and Post-installation Operation**
- Instrument Panel Removal and Installation



20M0045

Removal step

1. Defroster nozzle
2. Photo sensor

INSPECTION

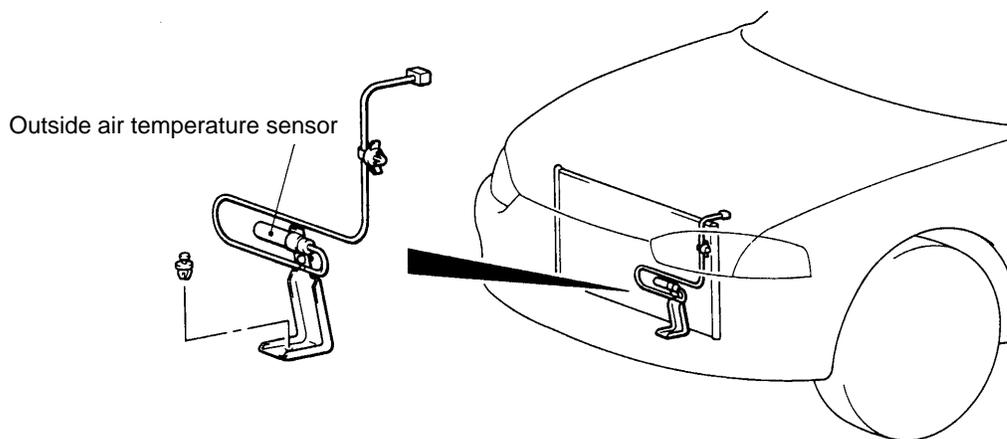
If the blower speed drops when the receiver section of the photo sensor is covered with your hand, then the photo sensor is normal. If the speed does not drop, replace the photo sensor.

OUTSIDE AIR TEMPERATURE SENSOR

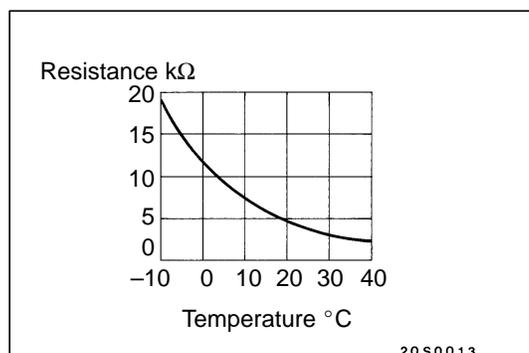
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Radiator Grille Removal and Installation



20M0041



20S0013

INSPECTION

When the resistance value between the sensor terminals is measured under two or more temperature conditions, the resistance value should be close to the values shown in the graph.

NOTE

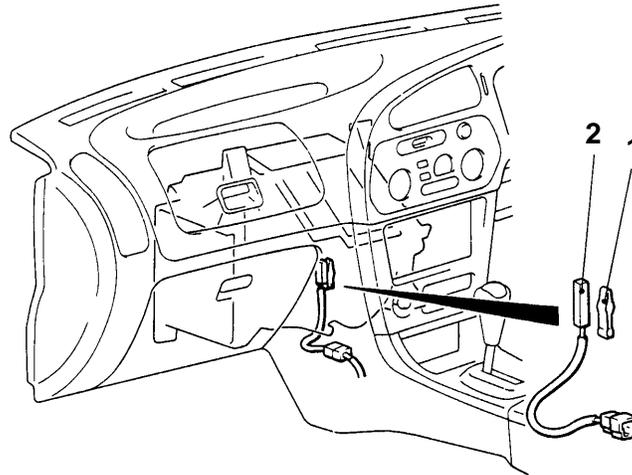
The temperature conditions when testing should not exceed the range of the characteristic curve in the graph.

HEATER WATER TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Floor Console Removal and Installation
- Glove Box Removal and Installation
- Foot Duct Removal and Installation
(Refer to P55-31.)

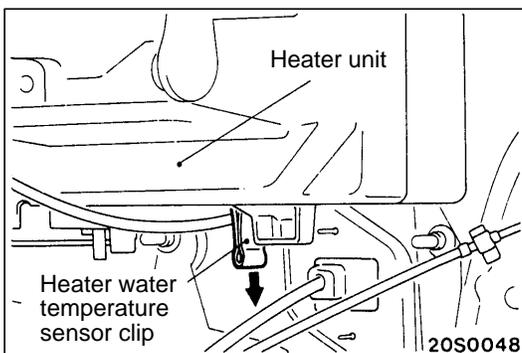


20M0046

Removal steps



1. Heater water temperature sensor clip
2. Heater water temperature sensor



REMOVAL SERVICE POINT

◀A▶ HEATER WATER TEMPERATURE SENSOR CLIP AND HEATER WATER TEMPERATURE SENSOR REMOVAL

Pull out the heater water temperature sensor clip which is at the bottom of the heater unit, and then remove the heater water temperature sensor from the heater unit.

INSTALLATION SERVICE POINT

▶A◀ HEATER WATER TEMPERATURE SENSOR AND HEATER WATER TEMPERATURE SENSOR CLIP INSTALLATION

Insert the heater water temperature sensor into its mounting hole at the bottom of the heater unit, and then fix it by inserting the heater water temperature sensor clip.

INSPECTION

Follow the same procedure as for the inspection of the outside temperature sensor. (Refer to P55-62.)

OTHER MAINTENANCE SERVICE POINTS

The following maintenance service points are the same as for the manual A/C.

Items	Reference page
Dual Pressure Switch	55-13
Blower Relay, A/C Compressor Relay, Condenser Fan Relay, Radiator Fan Relay	55-13, 14
Idle-up System	55-14
Heater Unit, Cooling and Blower Unit	55-15
Blower Motor Assembly, Evaporator	55-19
Compressor, Tension Pulley	55-23
Condenser, Condenser Fan	55-28
Ducts	55-31