

GROUP 55A

HEATER, AIR CONDITIONING AND VENTILATION

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GENERAL DESCRIPTION

M1552000101332

The blower, heater, and evaporator have been integrated with the heater and A/C system to achieve greater fan power and noise reduction.

ITEM	SPECIFICATION
Heater control assembly	Slide lever and rotary knob type
A/C switch	Push-button type
Compressor mode	VCR-08
Compressor type	Two vane type
Refrigerant and quantity g (oz)	R-134a (HFC-134a), 250 – 290 (8.8 – 10.2)

SAFETY PRECAUTIONS

WARNING

Wear safety goggles and gloves when servicing the refrigeration system to prevent severe damage to eyes and hands.

Because R-134a refrigerant is a hydro fluorocarbon (HFC) which contains hydrogen atoms in place of chlorine atoms, it will not cause damage to the ozone layer.

Ozone filters out harmful radiation from the sun. To assist in protecting the ozone layer, Mitsubishi Motors Corporation recommends an R-134a refrigerant recycling device.

Refrigerant R-134a is transparent and colorless in both the liquid and vapor state. Since it has a boiling point of -29.8°C (-21.64°F) at atmospheric pressure, it will be a vapor at all normal temperatures and pressures. The vapor is heavier than air, non-flammable, and non-explosive. The following precautions must be observed when handling R-134a.

WARNING

Do not heat R-134a above 40°C (104.0°F) or it may catch fire and explode.

R-134a evaporates so rapidly at normal atmospheric pressures and temperatures that it tends to freeze anything it contacts. For this reason, extreme care must be taken to prevent any liquid refrigerant from contacting the skin and especially the eyes. Always wear safety goggles when servicing the refrigeration part of the A/C system. Keep a bottle of sterile mineral oil handy when working on the refrigeration system.

1. Should any liquid refrigerant get into your eyes, use a few drops of mineral oil to wash them out. R-134a is rapidly absorbed by the oil.
2. Next, splash your eyes with plenty of cold water.
3. Call your doctor immediately even if irritation has ceased.

CAUTION

Keep R-134a containers upright when charging the system.

In most instances, moderate heat is required to bring the pressure of the refrigerant in its container above the pressure of the system when charging or adding refrigerant.

A bucket or large pan of hot water not over 40°C (104.0°F) is all the heat required for this purpose. Do not heat the refrigerant container with a blow torch or any other means that would raise temperature and pressure above this temperature. Do not weld or steam-clean on or near the system components or refrigerant lines.

WARNING

A leak detector for R-134a should be used to check for refrigerant gas leaks.

CAUTION

Do not allow liquid refrigerant to touch bright metal or it will be stained.

When metering R-134a into the refrigeration system, keep the supply tank or cans in an upright position. If the refrigerant container is on its side or upside down, liquid refrigerant will enter the system and damage the compressor.

Refrigerant will tarnish bright metal and chrome surfaces, and in combination with moisture can severely corrode all metal surfaces.

OPERATION

COOLING FAN CONTROL

The ECM judges the required revolution speed of cooling fan motor using the input signals transmitted from A/C switch, secondary pulley speed sensor <CVT> or vehicle speed sensor (VSS) <M/T> and engine coolant temperature sensor.

COMPRESSOR CONTROL**When operating the A/C switch**

- The air thermo sensor, which senses the temperature of the air flowing out of the evaporator, deactivates the compressor at 1°C (33.8°F) or below.
- A/C-ECU detect refrigerant pressure by A/C pressure sensor and turns OFF when the refrigerant pressure becomes excessively high or low, thus protecting the compressor circuit (See Table below).

- When the air thermo sensor is activated, and the ignition switch, blower switch, and A/C switch are ON, the A/C compressor clutch relay is energized.

When operating the mode selection dial

- The A/C will work when the mode selection dial is set to the "Defroster" or "Defroster/foot" position, or the temperature control dial is set to the "MAX A/C" position. In other dial positions, when the A/C switch is turned on, the A/C will work.

A/C Compressor Clutch Relay ON Conditions

Ignition switch (IG2)	ON	<i>NOTE: A/C compressor clutch relay is de-energized when any one switch, sensor or control unit shown on the left turns off.</i> <i>NOTE: The components marked by * communicate with the ECU. If the air thermo sensor detects a temperature of 1 °C (33.8 °F), the A/C-ECU will turn off the A/C compressor clutch relay.</i>
Blower switch	ON	
A/C switch, mode selection dial defroster, defroster/foot position or temperature control MAX A/C	ON	
Air thermo sensor	*	
Pressure detected by A/C pressure sensor	ON	
2.94 MPa (427psi) or less [If the refrigerant pressure exceeds 2.94 MPa (427psi), A/C compressor clutch relay is not ON condition until the refrigerant pressure has been measured up to 2.35 MPa (341psi) or less.]	ON	
0.19 MPa (27psi) or more [If the refrigerant pressure falls short of 0.19 MPa (27psi), A/C compressor clutch relay is not ON condition until the refrigerant pressure has been measured up to 0.22 MPa (32psi) or more.]		
A/C compressor clutch relay driving transistor (within powertrain control module)	ON	

SERVICE SPECIFICATIONS

M1551000301720

Item	Standard value
Idle speed r/min (N or P range)	700 ± 50
Idle-up speed r/min (N or P range)	850 ± 100
Air gap (magnetic clutch) mm (in)	0.3 – 0.6 (0.01 - 0.02)

LUBRICANTS

M1551000401501

Item	Specified lubricant	Quantity
Compressor refrigerant unit lubricant mL (fl.oz)	ZXL 200PG	60 + 10 (2.0 + 0.3) [target value: 60 (2.0)]
Each connection of refrigerant line	ZXL 200PG	As required
Refrigerant g (oz)	R134a	270 ± 20 (9.5 ± 0.7)

TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

M1554004701149

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Contents of Troubleshooting [P.00-6](#).

DIAGNOSTIC TROUBLE CODE CHART

M1554004902298

<ENGINE CONTROL MODULE>

For details, refer to GROUP 13A, Diagnostic Trouble Code Inspection Procedure.

NOTE: Diagnostic trouble codes regarding the A/C pressure sensor and the fin thermo sensor will be set in the engine control module.

Code No.	Diagnosis item	Reference page
P0532	A/C pressure sensor circuit low	(Refer to GROUP 13A – P.13A-361)
P0533	A/C pressure sensor circuit high	(Refer to GROUP 13A – P.13A-365)
P0537	A/C EVAP. TEMP. SNSR. circuit low <Cooler>	(Refer to GROUP 13A – P.13A-367)
P0538	A/C EVAP. TEMP. SNSR. circuit high <Cooler>	(Refer to GROUP 13A – P.13A-369)

TROUBLE SYMPTOM CHART

M1554005002823

Trouble symptom	Inspection procedure No.	Reference page
Cool air does not come	1	P.55A-6
The blower does not work	2	P.55A-8
The blower air volume cannot be changed	3	P.55A-10
The A/C compressor and clutch assembly does not work	4	P.55A-12
The PTC heater does not work	5	P.55A-13
A/C Compressor Relay System	-	(Refer to GROUP 13A P.13A-582)
Fan Control Relay System	-	(Refer to GROUP 13A P.13A-584)

SYMPTOM PROCEDURES

Inspection Procedure 1: Cool air does not come

CIRCUIT OPERATION

If cool air does not exit from the air outlets when the blower switch is on with the engine running, the A/C compressor and the A/C pressure sensor circuits may be defective.

PROBABLE CAUSES

- The refrigerant quantity is inadequate.
- Damaged harness wires and connectors
- Malfunction of the fin thermo sensor
- engine control module malfunction
- Malfunction of the A/C pressure sensor
- Malfunction of the A/C compressor relay
- Malfunction of the A/C compressor and clutch

DIAGNOSIS

STEP 1. Check the refrigerant level.

Refer to [P.55A-17](#).

Q: Is the check result normal?

YES : Go to Step 2.

NO : Correct the refrigerant amount.

STEP 2. Check the fin thermo sensor.

Refer to [P.55A-39](#).

Q: Is the fin thermo sensor in good condition?

YES : Go to Step 3.

NO : Replace the fin thermo sensor.

STEP 3. Check open circuit in AC/T and ACYE line between fin thermo sensor, temperature controller connector and engine control module connector.**Q: Is the check result normal?**

YES : Go to Step 4.

NO : Repair the connector(s) or wiring harness.

STEP 4. Perform the simple inspection of the A/C pressure sensor.

Refer to [P.55A-17](#).

Q: Is the A/C pressure sensor in good condition?

YES : Go to Step 5.

NO : Replace the A/C pressure sensor.

STEP 5. Check open circuit in AC/P, BVSE&ACPE and BVS5&ACPS line between A/C pressure sensor connector and engine control module connector.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the connector(s) or wiring harness.

STEP 6. Voltage measurement at A/C compressor and clutch assembly and connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Disconnect engine control module connector and body ground.
- (4) Voltage between terminal 1 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 9.

NO : Go to Step 7.

STEP 7. Check the A/C compressor.

Refer to [P.55A-46](#).

Q: Is the A/C compressor in good condition?

YES : Go to Step 8.

NO : Replace the A/C compressor.

STEP 8. Trouble symptom recheck

Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Replace the engine control module.

STEP 9. Check the A/C compressor relay.

Refer to [P.55A-21](#).

Q: Is the A/C compressor relay in good condition?

YES : Go to Step 10.

NO : Replace the A/C compressor relay.

STEP 10. Voltage measurement at A/C compressor relay connector.

- (1) Remove the relay and measure at the relay box side.
- (2) Turn the ignition switch to the ON position.
- (3) Voltage between terminal 1, 4 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 12.

NO : Go to Step 11.

STEP 11. Check open circuit in A/C compressor relay line between ignition switch <Vehicles without one touch start system> or IG2 relay <Vehicles with one touch start system>, fusible link (6), and A/C compressor relay connector.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 12. Check open circuit in AC/R line between A/C compressor relay, A/C compressor and clutch assembly and engine control module connector.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

Inspection Procedure 2: The blower does not work

COMMENTS ON TROUBLE SYMPTOM

If the blower motor does not operate, the blower motor circuit system may be defective.

PROBABLE CAUSES

- Malfunction of the blower relay
- Malfunction of the blower motor
- Malfunction of the heater resistor
- Malfunction of the blower switch
- Damaged wiring harness or connector

DIAGNOSIS

STEP 1. Check the blower relay.

Refer to [P.55A-21](#).

Q: Is the blower relay in good condition?

YES : Go to Step 2.

NO : Replace the blower relay.

STEP 2. Voltage measurement at blower relay connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Voltage between terminal 2, 4 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 3.

NO : Go to Step 4.

STEP 3. Check open circuit in blower relay line between ignition switch <Vehicles without one touch start system> or IG2 relay <Vehicles with one touch start system>, fusible link (6), blower relay connector and body ground.

NOTE: Before the wiring harness check, check the junction block connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 4. Check the blower motor.

Refer to [P.55A-42](#).

Q: Is the blower motor in good condition?

YES : Go to Step 5.

NO : Replace the blower motor.

STEP 5. Voltage measurement at blower motor connector.

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Voltage between terminal 1 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Check open circuit in blower motor line between blower relay and blower motor connector.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 7. Check the heater resister.

Refer to [P.55A-42](#).

Q: Is the heater resister in good condition?

YES : Go to Step 8.

NO : Replace the heater resistor.

STEP 8. Check open circuit in heater resister line between blower motor connector and heater resister connector.**Q: Is the check result normal?**

YES : Go to Step 9.

NO : Repair the connector(s) or wiring harness.

STEP 9. Resistance measurement at the blower switch connector.

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Continuity between terminal 4 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Go to Step 10.

STEP 10. Check the blower switch.

Refer to [P.55A-32](#).

Q: Is the blower switch in good condition?

YES : Go to Step 11.

NO : Replace the heater control panel.

STEP 11. Check open circuit in blower switch line between blower motor connector, heater resister connector blower switch connector, and body ground.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

Inspection Procedure 3: The blower air volume cannot be changed

COMMENTS ON TROUBLE SYMPTOM

If the blower air volume is not changed by operating the blower switch, the blower switch may be defective.

PROBABLE CAUSES

- Malfunction of the heater resister
- Malfunction of the blower switch
- Damaged wiring harness or connector

DIAGNOSIS

STEP 1. Check the heater resister.

Refer to [P.55A-42](#).

Q: Is the heater resister in good condition?

YES : Go to Step 2.

NO : Replace the heater resistor.

STEP 2. Check open circuit in heater resister line between blower motor connector and heater resister connector.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the connector(s) or wiring harness.

STEP 3. Resistance measurement at the blower switch connector.

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Continuity between terminal 4 and body ground.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Go to Step 4.

STEP 4. Check the blower switch.

Refer to [P.55A-32](#).

Q: Is the blower switch in good condition?

YES : Go to Step 5.

NO : Replace the heater control panel.

STEP 5. Check open circuit in blower switch line between blower motor connector, heater resister connector blower switch connector, and body ground.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

Inspection Procedure 4: The A/C compressor and clutch assembly does not work

COMMENTS ON TROUBLE SYMPTOM

If the power is not supplied to the A/C compressor and clutch assembly, the A/C compressor and clutch assembly circuits may be defective.

PROBABLE CAUSES

- The refrigerant quantity is inadequate.
- Malfunction of A/C compressor and clutch assembly
- Malfunction of A/C compressor relay
- Damaged harness wires and connectors

DIAGNOSIS

STEP 1. Check the refrigerant level.

Refer to [P.55A-17](#).

Q: Is the check result normal?

YES : Go to Step 2.

NO : Correct the refrigerant amount.

STEP 2. Voltage measurement at A/C compressor and clutch assembly and connector.

- (1) Remove the relay and measure at the relay box side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Voltage between terminal 1 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 3.

STEP 3. Check the A/C compressor.

Refer to [P.55A-46](#).

Q: Is the A/C compressor in good condition?

YES : Go to Step 4.

NO : Replace the A/C compressor.

STEP 4. Trouble symptom recheck**Q: Is the check result normal?**

YES : This diagnosis is complete.

NO : Replace the engine control module.

STEP 5. Check the A/C compressor relay.

Refer to [P.55A-21](#).

Q: Is the A/C compressor relay in good condition?

YES : Go to Step 6.

NO : Replace the A/C compressor relay.

STEP 6. Voltage measurement at A/C compressor relay connector.

- (1) Remove the relay and measure at the relay box side.
- (2) Turn the ignition switch to the "ON" position.
- (3) Voltage between terminal 1,4 and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 8.

NO : Go to Step 7.

STEP 7. Check open circuit in A/C compressor line between ignition switch <Vehicles without one touch start system> or IG2 relay <Vehicles with one touch start system>, fusible link (6), and A/C compressor relay connector.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 8. Check open circuit in AC/R and A/C compressor and clutch assembly line between A/C compressor relay, A/C compressor and clutch assembly and engine control module connector.

NOTE: Before the wiring harness check, check the junction block connector and joint connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

Inspection Procedure 5: The PTC heater does not work

COMMENTS ON TROUBLE SYMPTOM

When the PTC heater does not work under the following conditions, the PTC heater circuit system may be defective.

PTC heater operating conditions

- Coolant temperature: 75 degrees Celsius or less
- Ambient temperature: 15 degrees Celsius or less
- The rate of operation of the generator, which is transmitted over the CAN, is 70% or less

PROBABLE CAUSES

- Malfunction of the PTC heater

- Malfunction of the PTC heater relay
- Malfunction of the heater control unit (PTC-ECU)
- Damaged the wiring harness or connectors

DIAGNOSIS

STEP 1. Check the PTC heater relay 1, 2 and 3.

Refer to [P.55A-21](#).

Q: Is the check result normal?

YES : Go to Step 2.

NO : Replace the PTC heater relay.

STEP 2. Measure the voltage at the PTC heater relay connectors (1, 2 and 3).

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Ignition switch: "ON"
- (3) Voltage between terminal No. 4 of each PTC heater relay and body ground.

OK: Battery voltage

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to Step 3.

STEP 3. Check the wiring harness wires between terminal No. 4 of each PTC heater relay connector (1, 2 and 3) and fusible link (7) for open or short circuit.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 4. Measure the resistance at the PTC heater relay connectors (1, 2 and 3).

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Resistance between terminal No. 3 of each PTC heater relay and body ground.

OK: Continuity exists (2 Ω or less).

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 7.

STEP 5. Check the wiring harness wires between each PTC heater relay connector (1, 2 and 3) and body ground for open or short circuit.

NOTE: Before the wiring harness check, check the junction block connector, and repair if necessary.

Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the connector(s) or wiring harness.

STEP 6. Check the wiring harness wires between each PTC heater relay connector (1, 2 and 3) and the heater control unit (PTC-ECU) terminals "E" and "COME" for open or short circuit.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction [P.00-13](#)).

NO : Repair the connector(s) or wiring harness.

STEP 7. Measure the voltage at the PTC heater relay connectors (1, 2 and 3).

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Ignition switch: "ON"

(3) Voltage between terminal No. 1 of each PTC heater relay and body ground.

OK: Battery voltage

Q: Is the check result normal?

YES : Go to Step 9.

NO : Go to Step 8.

STEP 8. Check the wiring harness wires between each PTC heater relay connector (1, 2 and 3) and the PTC heater control unit (PTC-ECU) connector terminals "HTR1", "HTR2" and "HTR3" for open or short circuit.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points, How to Cope with Intermittent Malfunctions [P.00-13](#).)

NO : Repair the wiring harness.

STEP 9. Measure the resistance at the PTC heater relay connectors (1, 2 and 3).

- (1) Disconnect the connector, and measure at the wiring harness side.
- (2) Resistance between terminal No. 2 and body ground.

OK: Continuity exists (2 Ω or less).

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points, How to Cope with Intermittent Malfunctions [P.00-13.](#))

NO : Go to Step 10.

STEP 10. Check the wiring harness wires between each PTC heater relay connector (1, 2 and 3) and body ground for open or short circuit.

NOTE: Before the wiring harness check, check the PTC heater connectors, and then repair if necessary.

Q: Is the check result normal?

YES : Replace the PTC heater.

NO : Repair the wiring harness.

CHECK AT ENGINE CONTROL MODULE TERMINAL

M1552010303214

71	72	73	74	JAE	75	76	77
78	79	80	81	82	83	84	85
86	87	88	89	90	91	92	93
94	95	96	97	98			

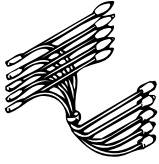
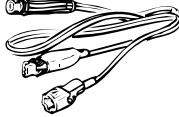
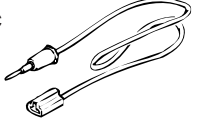
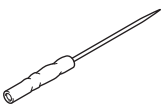
41	42	43	JAE	44	45	46
47	48	49	50	51	52	53
54	55	56	57	58	59	60
61	62	63	64	65	66	

ACB05651

Terminal No.	Terminal code	Check item	Inspection conditions	Normal conditions
50	BFAN	Blower fan signal	Blower fan switch position: "OFF"	System voltage
			Blower fan switch position: "1" or "2"	3 – 9 V
			Blower fan switch position: "3" or "4"	1 V or less
54	ACYE	Earth to the air thermo sensor	Always	1 V or less
63	AC/T	Input from the air thermo sensor	Sensor probe temperature: 0°C	2.5 to 2.6 V (temperature adjustment dial is at MAX COOL position)
74	AC/R	A/C compressor relay	A/C compressor: "ON"	0 to 4.7 V
			A/C compressor: "OFF"	System voltage
84	AC/P	A/C pressure sensor	Refer to P.55A-17.	Refer to P.55A-17.
86	BVSE& ACPE	Earth for A/C pressure sensor	Always	1 V or less
87	BVS5& ACP5			

SPECIAL TOOLS

M1551000601389

Tool	Tool number and name	Supersession	Application
 MB991658	MB991658 Test harness	Tool not available	Inspection of the A/C pressure sensor
     	MB991223 a. MB991219 b. MB991220 c. MB991221 d. MB991222 Harness set a. Test harness b. LED harness c. LED harness adapter d. Probe	General service tool (jumper wires)	Making voltage and resistance measurements during troubleshooting a. Connect pin contact pressure inspection b. Power circuit inspection c. Power circuit inspection d. Commercial tester connection
 MB992006	MB992006 Extra fine probe	General service tool	Continuity check and voltage measurement at harness wire or connector

ON-VEHICLE SERVICE

REFRIGERANT LEVEL CHECK, DRAINING AND CHARGING

M1559200100345

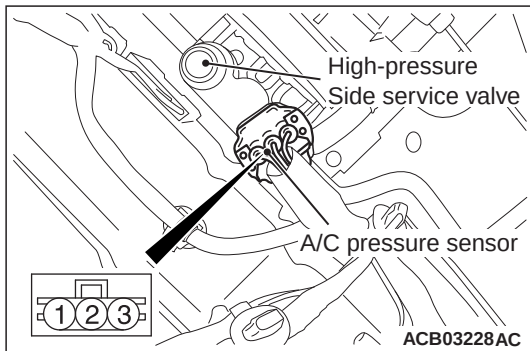
Drain the entire refrigerant system with a refrigerant recovery and recycling unit, and then refill the specified quantity of refrigerant.

NOTE: Refer to the Refrigerant Recovery and Recycling Unit instruction Manual for operation of the unit.

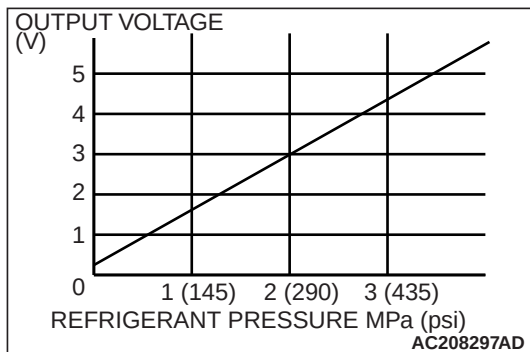
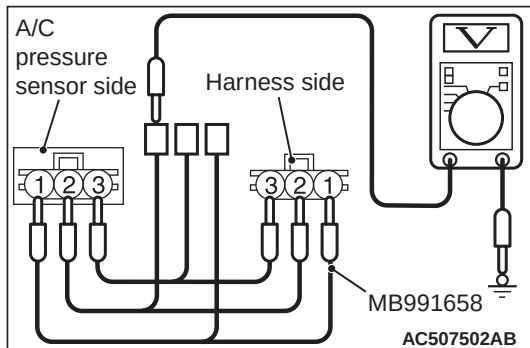
SIMPLE INSPECTION OF THE A/C PRESSURE SENSOR

M1552014700679

1. Assemble a gauge manifold on the high pressure service valve.



2. Disconnect the A/C pressure sensor connector and connect the special tool test harness (MB991658) as shown.
3. Start the engine and then turn "ON" the air conditioning switch.



4. At this time, check to see that the voltage of the A/C pressure sensor connector terminal No. 2 reflects the specifications of the figure.

NOTE:

- The allowance shall be defined as $\pm 5\%$.
- The A/C pressure sensor is incorporated in the discharge flexible hose, and the high-pressure service valve is incorporated in liquid pipe B. Therefore, the pressure at the A/C pressure sensor is 0.1 to 0.3 MPa (15 to 44 psi) higher than that at the gauge manifold.

DRIVE BELT INSPECTION

M1552001001695

Refer to GROUP 11A – Engine Adjustment, Drive Belt Tension Check [P.11A-8](#).

REFILLING OF OIL IN THE A/C SYSTEM

M1552020000367

Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature.

When a compressor is installed at the factory, it contains 60 mL of compressor oil. While the A/C system is in operation, the oil is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in various parts of the system.

When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: ZXL 200PG

Quantity

Evaporator: 15 mL (0.5 fl.oz)

Condenser: 10 mL (0.3 fl.oz)

A/C hose and pipe: 5 mL (0.2 fl.oz)

PERFORMANCE TEST

M1552001401411

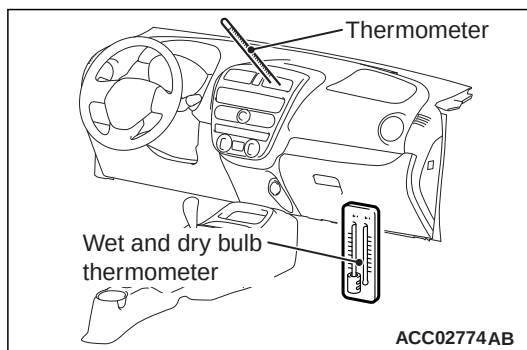
TEST CONDITION

Item		Settings
Environmental condition	Measurement location	In a shade or indoors
	Temperature	20°C – 50°C (68°F – 122°F)
	Humidity	Relative humidity 30 – 80% RH
Vehicle body condition	Hood	Fully opened
	Door	Fully open for door, window, and liftgate
Air conditioning condition	Air conditioning switch	ON
	Air volume	Maximum air volume
	Temperature control	MAX COOL
	Air outlet	FACE
	Outside/inside air selection	Air recirculation position
Engine speed		Specified idle speed after warming up
Transmission		N or P

TEST CONDITION SETTING

Check that the temperature/humidity of measurement location satisfies the test conditions, and then set the vehicle body conditions to the designated status according to the test conditions. If the temperature/humidity is not within the test conditions, an accurate judgment cannot be made. Therefore, postpone the performance test.

COOLING PERFORMANCE CHECK



1. Insert a thermometer into the air outlet located at the center of instrument panel.
NOTE: Set a thermometer so that cool air from the air outlet blows directly against the sensing part.
2. Set a wet and dry bulb thermometer in the air intake of the front passenger's foot area (below the glove box).
NOTE: Set a wet and dry bulb thermometer so that cool air does not blow against it.
3. Start the engine to warm up. Confirm that the engine speed of the test condition is satisfied.
4. Set the A/C control panel to the mode instructed in the test conditions.
5. Wait until the air outlet temperature is stable (approximately 10 minutes after the A/C starts), and measure dry-bulb/wet-bulb temperatures at the air outlet and the air intake.
6. If the air outlet temperature is in the range specified by the table below, it is judged normal. If the temperature is outside the permissible range in the table below, refer to the refrigerant gas pressure inspection result, and check each section according to the diagnosis chart of refrigerant system.

Garage ambient temperature °C (°F)	20 (68)	25 (77)	30 (86)	35(95)	40 (104)	45 (113)	50 (122)
Discharge air temperature °C (°F)	3.0 – 15.7 (37.0 - 60.3)	7.5 – 20.2 (45.5 - 68.4)	12.0 – 24.6 (54.0 - 76.3)	16.5 – 29.1 (61.7 - 84.4)	21.0 – 33.6 (70.0 - 92.5)	25.4 – 38.1 (77.7 - 100.6)	29.9 – 42.6 (85.8 - 108.7)

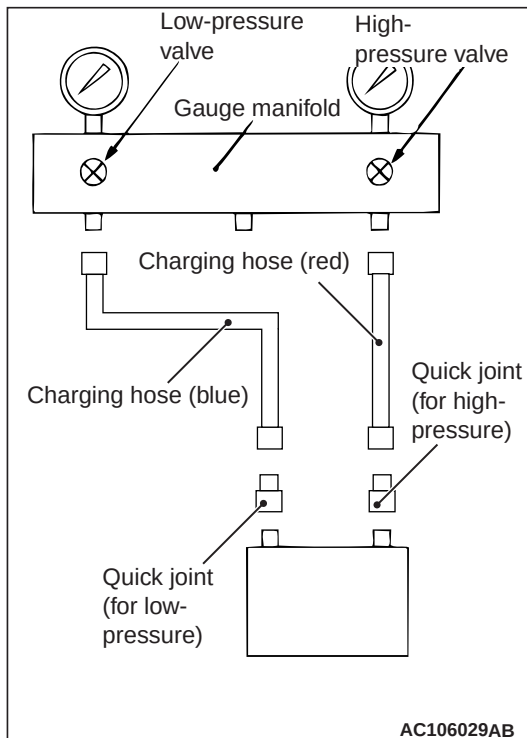
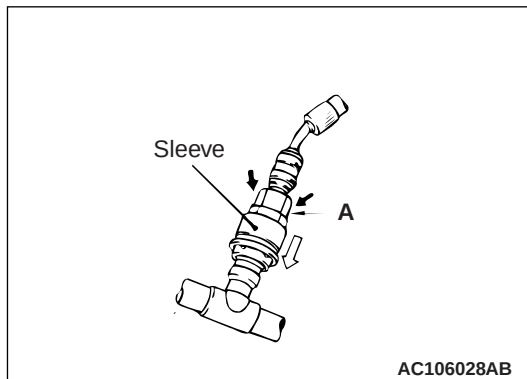
REFRIGERANT GAS PRESSURE CHECK

⚠ CAUTION

- The temperature of equipment in the engine room is high and the refrigerant gas pressure is also high immediately after the engine and A/C operation are stopped, thus leave the vehicle for a while, and then perform the refrigerant gas pressure check.
- On completion, stop the engine and wait until the high-pressure side of the gauge manifold is depressurized. Then remove the quick joints and the others.

⚠ CAUTION

- Place the quick joint onto the service valve, and press to fit the part A securely until the sleeve clicks into place.
- When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.



1. Check that the engine and A/C are stopped.
2. Close the high-pressure valve of the gauge manifold.
3. Connect the charging hose (red) to the hi-pressure side of the gauge manifold.
4. Connect the quick joint (for high pressure) to the charging hose (red).
5. Install the quick joint (for high pressure) to the high-pressure side service valve of the vehicle.
6. Close the low-pressure valve of the gauge manifold.
7. Connect the charging hose (blue) to the low-pressure side of the gauge manifold.
8. Connect the quick joint (for low pressure) to the charging hose (blue).
9. Install the quick joint (for low pressure) to the low-pressure side service valve of the vehicle.
10. Start and fully warm up the engine, and then check that the engine speed of the test condition is satisfied.
11. Set the A/C control panel to the mode instructed in the test conditions.

12. Measure the high pressure/low pressure, and check that the measurement is within the permissible range of the table below. If the value is outside the permissible range, refer to the cooling performance check result, and perform a check according to the diagnosis chart of refrigerant system.

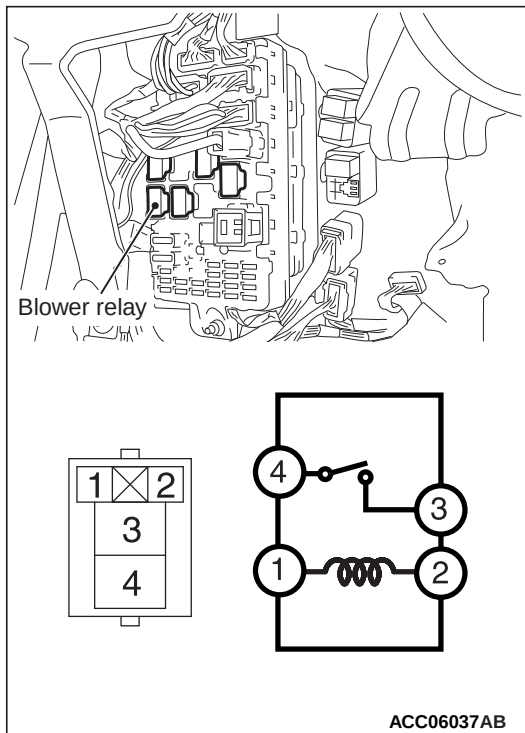
NOTE: Prior to the measurement, wait until the refrigerant pressure is stable (Approximately 10 minutes after A/C operation start).

Garage ambient temperature °C (°F)	20 (68)	25 (77)	30 (86)	35 (95)	40 (104)	45 (113)	50 (122)
Compressor high pressure kPa (psi)	660 – 1,190 (95.7 - 172.6)	880 – 1,400 (127.6 - 203.0)	1,100 – 1,620 (159.5 - 235.0)	1,310 – 1,840 (190.0 - 266.9)	1,530 – 2,060 (221.9 - 298.8)	1,750 – 2,270 (253.8 - 329.2)	1,970 – 2,490 (285.7 - 361.1)
Compressor low pressure kPa (psi)	110 – 290 (16.0 - 42.1)	160 – 340 (23.2 - 49.3)	210 – 390 (30.5 - 56.6)	260 – 440 (37.7 - 63.8)	310 – 480 (45.0 - 69.6)	360 – 530 (52.2 - 76.9)	410 – 580 (59.5 - 84.1)

RELAY CHECK

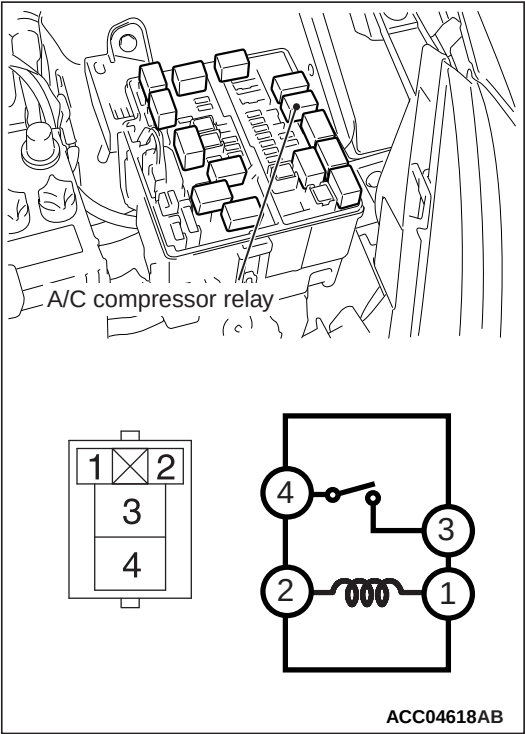
M1552008801584

BLOWER RELAY CONTINUITY CHECK



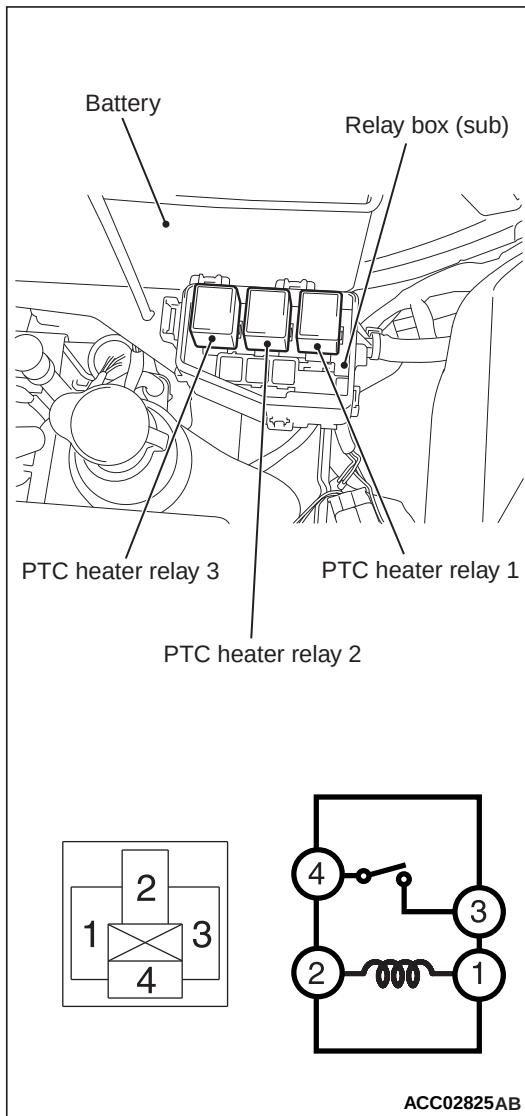
Battery voltage	Checking terminal	Normal condition
Not applied	3 – 4	No continuity
- Connect terminal 1 to the positive battery terminal - Connect terminal 2 to the negative battery terminal		Continuity exists (2 ohms or less)

A/C COMPRESSOR RELAY CONTINUITY CHECK



Battery voltage	Checking terminal	Normal condition
Not applied	3 – 4	No continuity
• Connect terminal 2 to the positive battery terminal • Connect terminal 1 to the negative battery terminal		Continuity exists (2 ohms or less)

PTC HEATER RELAY 1, 2 and 3 CONTINUITY CHECK



Battery voltage	Checking terminal	Normal condition
Not applied	3 – 4	No continuity
- Connect terminal 1 to the positive battery terminal - Connect terminal 2 to the negative battery terminal		Continuity exists (2 ohms or less)

IDLE-UP INSPECTION

M1552001602098

- Before inspection, set the vehicle to the pre-inspection condition.
- Check that the idling speed is within the standard value range.

Standard value:
700 ± 50 r/min

NOTE: The idling speed is controlled by the ISC system automatically, so does not require adjustment.

- Operate the air conditioning by turning on the A/C switch. Then check that the idling speed is within the standard value range.

Standard value:
850 ± 100 r/min

DIAGNOSIS BY REFRIGERANT PRESSURE

M1552023000247

A/C system symptom	Measurement circumstance				Cause	Measures
	High pressure	Low pressure	Air outlet temperature	Note		
Cooler is not effective.	Low	High	High	- Pressure for low pressure side is high, and high pressure side is low. - When the A/C operation is stopped, the pressures of low pressure side and high pressure side immediately become identical.	- Leakage inside compressor - Faulty compression of compressor	- Check according to the compressor check. - When no foreign object is present to the oil, and when the color is light grey, replace only the compressor. - When foreign objects are mixed to the oil, and the color is black, replace the compressor and receiver. - Perform the evacuation sufficiently to remove the foreign objects and moisture in the cycle. - Fill the new gas to the specified amount.
	High	High	High	- Low pressure side/high pressure side pressure is too high. - Low pressure side piping is too hot to touch.	- Air is mixed to the refrigerant cycle. - Evacuation is insufficient.	- Perform the evacuation sufficiently, and remove the foreign objects and moisture in the cycle. - Fill the new gas to the specified amount.
Sufficient cooling and insufficient cooling occur periodically.	Fluctuation	Fluctuation	Fluctuation	During the air conditioning operation, the low pressure side pressure alternates between the negative pressure and normal. (also in the high pressure side, the abnormal and normal statuses are alternated).	The moisture in the refrigerant cycle becomes frozen in the expansion valve, then the circulation of refrigerant is stopped temporarily. Subsequently, the status recovers to normal by the melting of ice.	- Replace the receiver (drier). - Perform the evacuation sufficiently, and remove the moisture in the cycle. - Fill the new refrigerant to the specified amount.

A/C system symptom	Measurement circumstance				Cause	Measures
	High pressure	Low pressure	Air outlet temperature	Note		
Cooler is sometimes not effective (works occasionally).	Low	Vacuum	Fluctuation	- The low pressure side pressure indicates the vacuum, and the high pressure side indicates the low pressure. - To the piping before and after the expansion valve, frost or dew is observed.	- The foreign objects or moisture inside the refrigerant cycle deposits or freezes inside the expansion valve, and the refrigerant flow is disturbed. - Because of the expansion valve operation failure, the refrigerant flow is disturbed.	- Check the expansion valve. - If foreign objects are present inside the expansion valve, remove them by using an air gun or others. - When no foreign object is present, the expansion valve operation failure is suspected. Therefore, replace the expansion valve. - Perform the evacuation sufficiently, and remove the foreign objects and moisture in the cycle. - Fill the new refrigerant to the specified amount.

A/C system symptom	Measurement circumstance				Cause	Measures
	High pressure	Low pressure	Air outlet temperature	Note		
Cooling effectiveness is bad.	Low	Low	Slightly high	- Low pressure side/high pressure side pressure is low. - Outlet air temperature is high.	- Gas leakage is present to somewhere in the refrigerant cycle. - Refrigerant gas amount is insufficient.	- When the pressure gauge indication is close to zero, check the leak position, and then repair the leakage. Also, when the value is lower than the standard pressure, check if the gas leakage is present, and repair if necessary. - After checking the leak position, sufficiently perform the evacuation, then fill the new gas to the specified amount.
	High	High	Slightly high	Low pressure side/high pressure side pressure is too high.	- Refrigerant amount is excessive. - Condenser cooling is insufficient.	- Clean the condenser fin (fouling, fin clogging) - Check the condenser fan motor (radiator fan) operation. - When 1 and 2 are normal, recover all the refrigerant. Then, perform a sufficient evacuation again, and fill the new gas to the specified amount.
	High	High	High	- Low pressure side/high pressure side pressure is too high. - Frost or dew is formed to the low pressure side.	Expansion valve trouble (valve opened excessively)	Replace the expansion valve.
	Normal	Normal	Slightly high	-	Because of the slight difference of measurement environment, secular change of vehicle, or others, it is possible that the outlet temperature fluctuation has occurred.	Check the status for a while, and if the status does not improve, recover all the refrigerant, then fill to the appropriate amount.

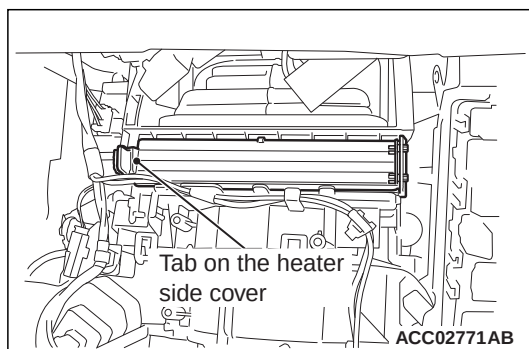
COMPRESSOR CHECK

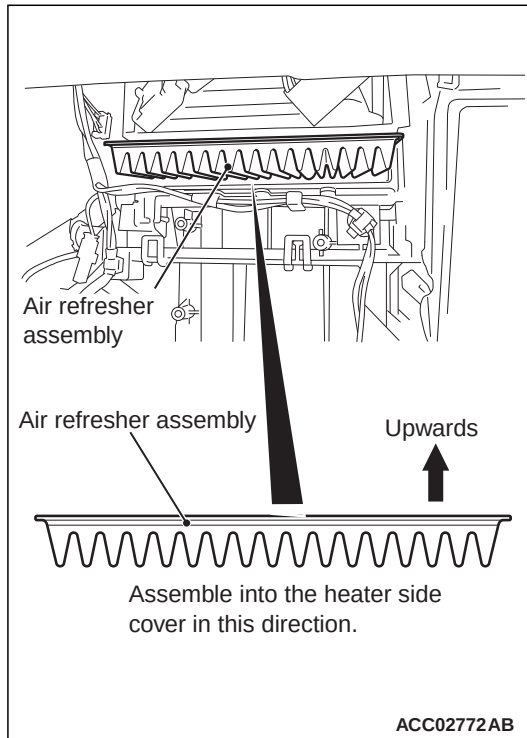
Trouble symptom	Check method/circumstance	Cause	Measures
Abnormal noise from compressor main body at A/C operation (rattling noise)	- Refrigerant cycle gauge pressure check - Low pressure side/high pressure side pressure is high. - Pressure hunting occurs.	Abnormal noise due to excessive refrigerant charging	Fill an appropriate amount of refrigerant.
	Check the refrigerant cycle gauge pressure. When the pressure difference between the low pressure side and high pressure side is small, remove the compressor oil, and perform the oil judgment.	Damage to inside the compressor	Compressor oil judgment result: Between transparent and grey/ No contamination with foreign materials  Measures: Replace only the compressor. Compressor oil judgment result: Between grey and black/ Contaminated with foreign materials  Measures: Replace the compressor and the receiver/drier. AC610320AB
Compressor malfunction (belt slip)	Check the compressor rotation, and if a seizure or sticking is present, remove the compressor oil, then perform a judgment.		

REPLACE THE AIR REFRESHER

M1550000300025

1. Remove the glove box (Refer to GROUP 52A – Instrumental Pane [P.52A-4](#)).
2. Grasp the tab to remove the heater side cover.





3. Install the air refresher assembly in the direction shown.
4. Install the glove box.

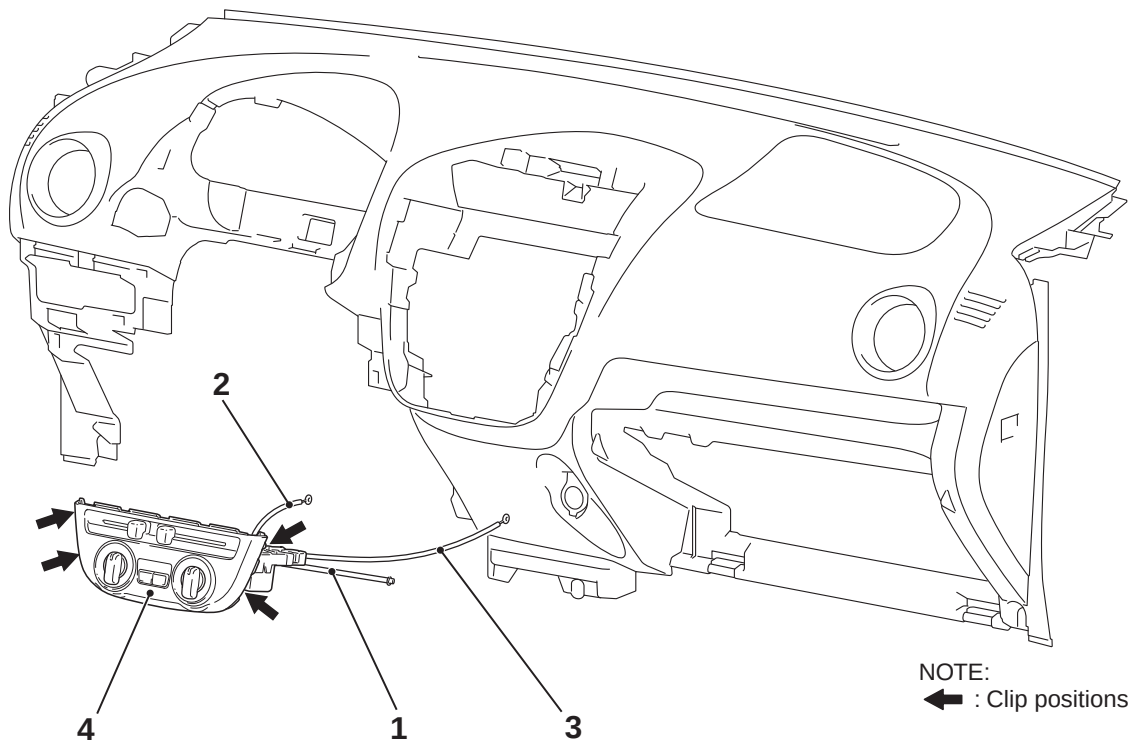
HEATER CONTROL UNIT

REMOVAL AND INSTALLATION

M1554014700987

Pre-removal and Post-installation Operation

- Removal and Installation of Instrument Lower Panel (Refer to GROUP 52A, Instrument Lower Panel [P.52A-6](#)).
- Removal and Installation of Glove Box (Refer to GROUP 52A, Glove Box [P.52A-4](#)).
- Removal and Installation of Instrument center panel (Refer to GROUP 52A, Instrument Center Panel [P.52A-5](#)).
- Removal and Installation of Floor console (Refer to GROUP 52A, Floor Console [P.52A-7](#)).
- Removal and Installation of Radio and CD player bracket (Refer to GROUP 54A, Radio and CD Player [P.54A-163](#)).



ACC02773AB

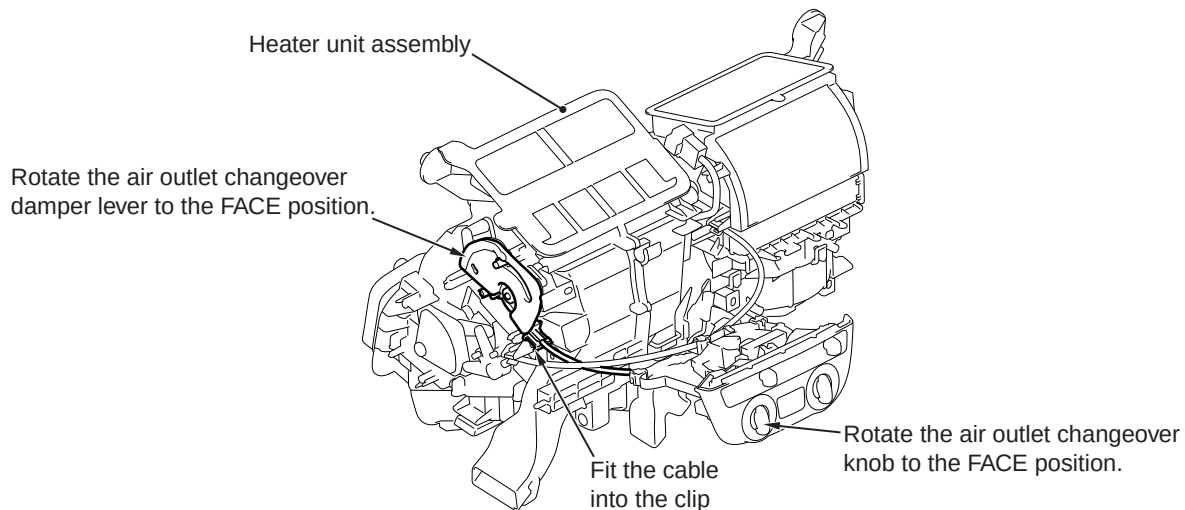
Heater controller assembly removal steps

- >>C<< 1. Outside/Inside air selection damper control cable connection
- >>B<< 2. Air mixing damper control cable connection

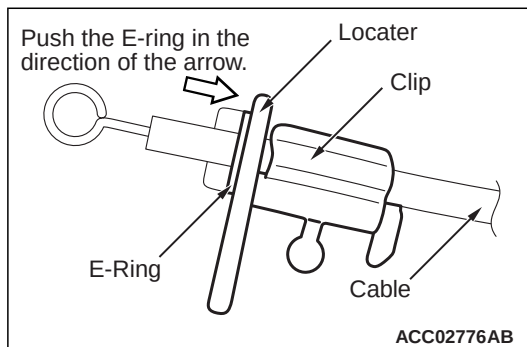
Heater controller assembly removal steps (Continued)

- >>A<< 3. Mode selection damper control cable connection
4. Heater controller assembly

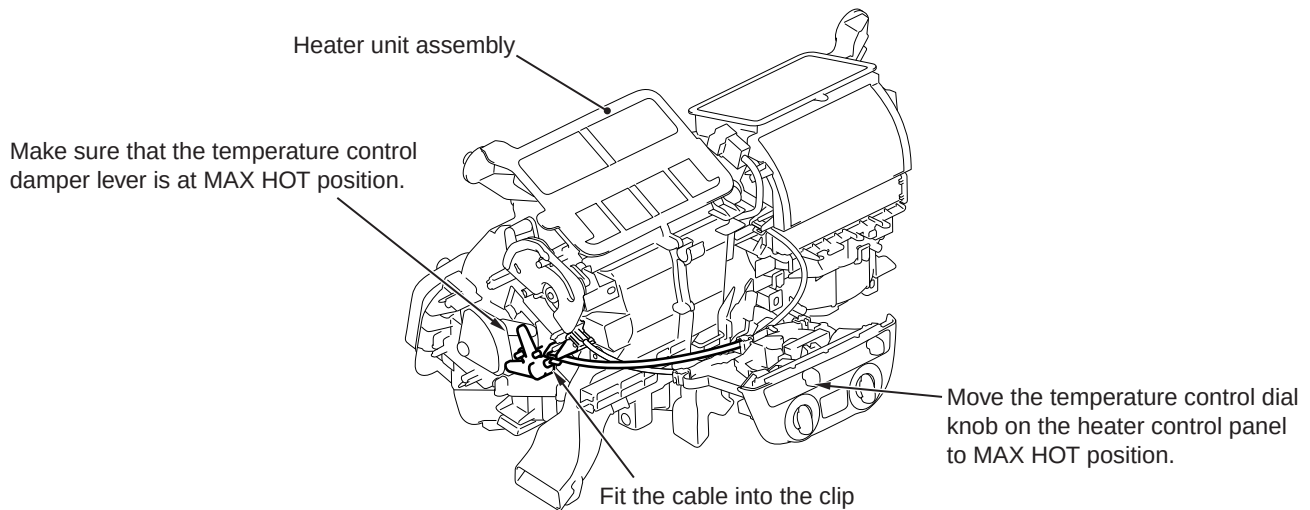
INSTALLATION SERVICE POINTS

>>A<< MODE SELECTION DAMPER CONTROL
CABLE CONNECTION

1. Check that the air outlet changeover damper lever is at the FACE position.
2. Set the air outlet changeover knob on the heater control panel to the FACE position.
3. Engage the cable end into the mode link pin of the heater unit assembly.
4. Engage the cable E-ring into the locator of the heater unit assembly to fit the cable into the clip.
5. Operate the air outlet changeover knob to check that it rotates from the FACE to the FOOT, and from the FOOT to the FACE positions smoothly.
6. When the blower unit is running at high speed with the knob set to the FACE position, check that no extra air leaks from the footwell outlet (or duct) of the heater unit assembly.

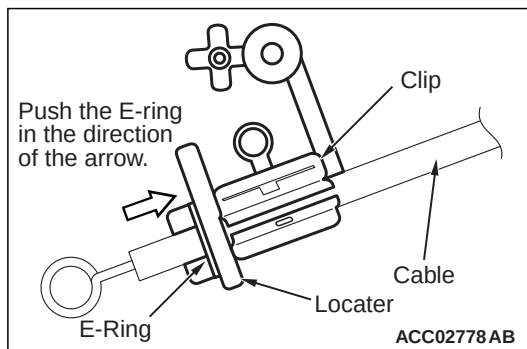


>>B<< AIR MIXING DAMPER CONTROL CABLE CONNECTION

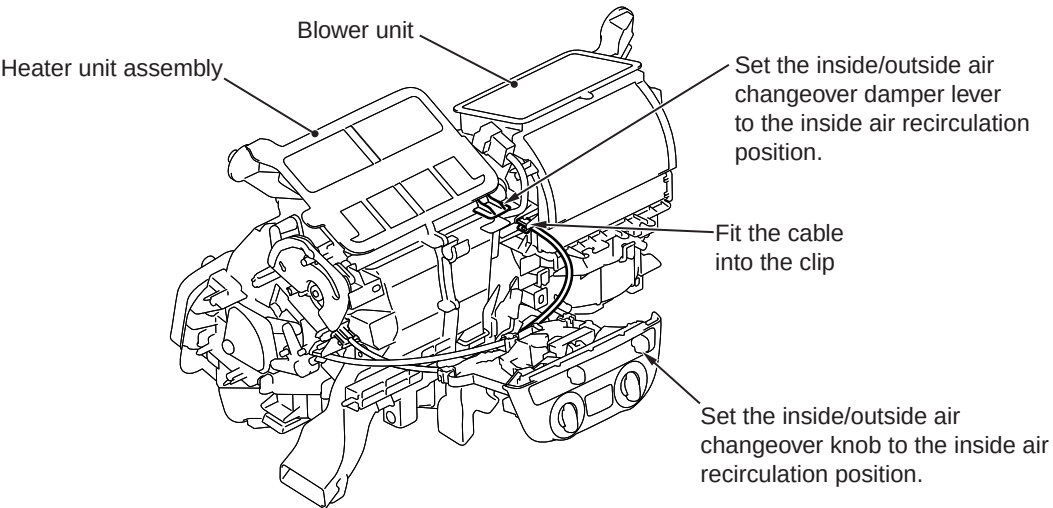


ACC02777AB

1. Set the Temperature control dial of the heater control assembly to MAX HOT position.
2. Turn the air mixing damper lever of heater unit to the MAX HOT position (Turn the damper lever to the left until it stops) and then install the cable.
3. Insert the cable end into the temperature adjusting linkage pin of the heater unit assembly.
4. Insert the cable into the clip while engaging the E ring of the temperature adjusting cable into the locator of the heater unit assembly in direction of arrow.
5. After all of the components have been installed, operate the temperature adjusting knob from HOT to COOL and vice versa. The temperature adjusting linkages of the heater unit assembly should move smoothly from end position to end position.

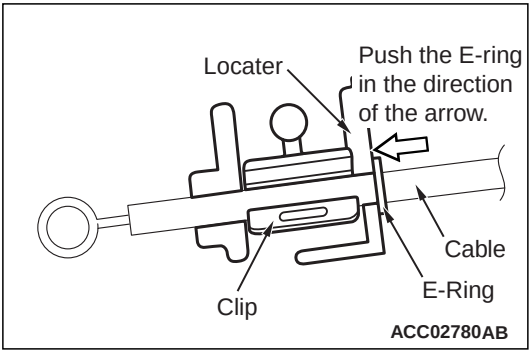


>>C<< OUTSIDE/INSIDE AIR SELECTION
DAMPER CONTROL CABLE CONNECTION



ACC02779AB

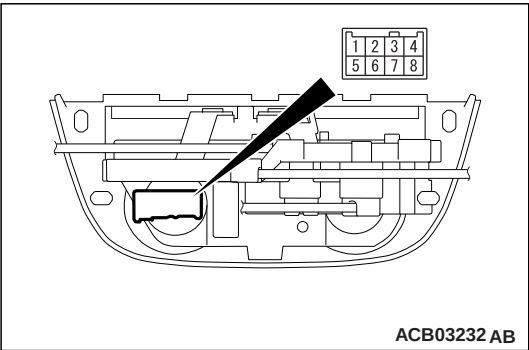
1. Set the inside/outside air changeover damper to the inside air recirculation position.
2. Se the inside/outside air changeover lever on the heater control panel to the inside air recirculation position.
3. Engage the cable end into the inside/outside air changeover link pin at the blower unit side of the heater unit assembly.
4. Engage the cable E-ring into the locator of the heater unit assembly to fit the cable into the clip.
5. Operate the inside/outside air changeover lever on the heater control panel from the inside air recirculation to the outside air positions and vice versa to check that the knob and its linkage run smoothly all the way.



INSPECTION

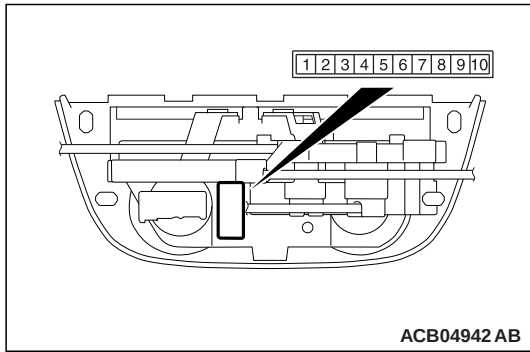
M1552002500407

BLOWER SWITCH CONTINUITY CHECK



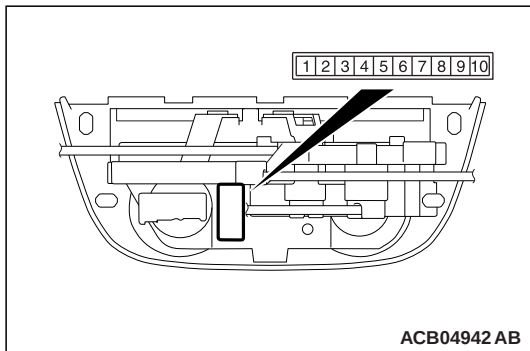
Switch position	Tester connection	Specified condition
OFF	1 – 4, 2 – 4, 4 – 5, 4 – 6	Open circuit
1	2 – 4	Continuity (2 ohms or less)
2	1 – 4	
3	4 – 5	
4	4 – 6	

AIR CONDITIONING SWITCH CONTINUITY CHECK



Switch position	Terminal number	Normal condition
OFF	9 – 10	Open circuit
ON		Continuity exists (2 ohms or less)

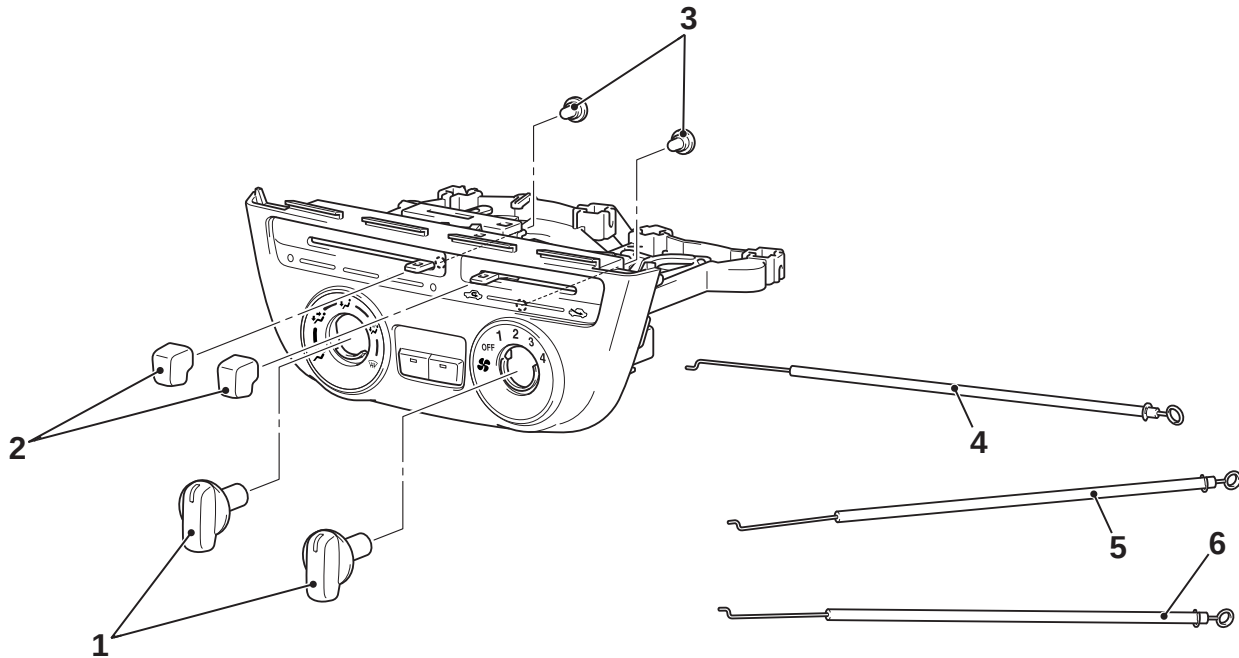
DEF DETECTION SWITCH CONTINUITY CHECK



Switch position	Terminal number	Normal condition
OFF (Air outlet changeover knob is not DEF position)	4 – 10	Open circuit
ON (Air outlet changeover knob is DEF position)		Continuity exists (2 ohms or less)

DISASSEMBLY AND REASSEMBLY

M1552014200618



ACC00171AB

Disassembly steps

1. Heater control lever knob (Mode selection dial, blower speed selection dial)
2. Heater control lever knob (Cooler switch, air selection lever)
3. Heater control bulb

Disassembly steps (Continued)

4. Heater control wire (Outside/Inside air selection damper control)
5. Heater control wire (Air mixing damper control)
6. Heater control wire (Mode selection damper control)

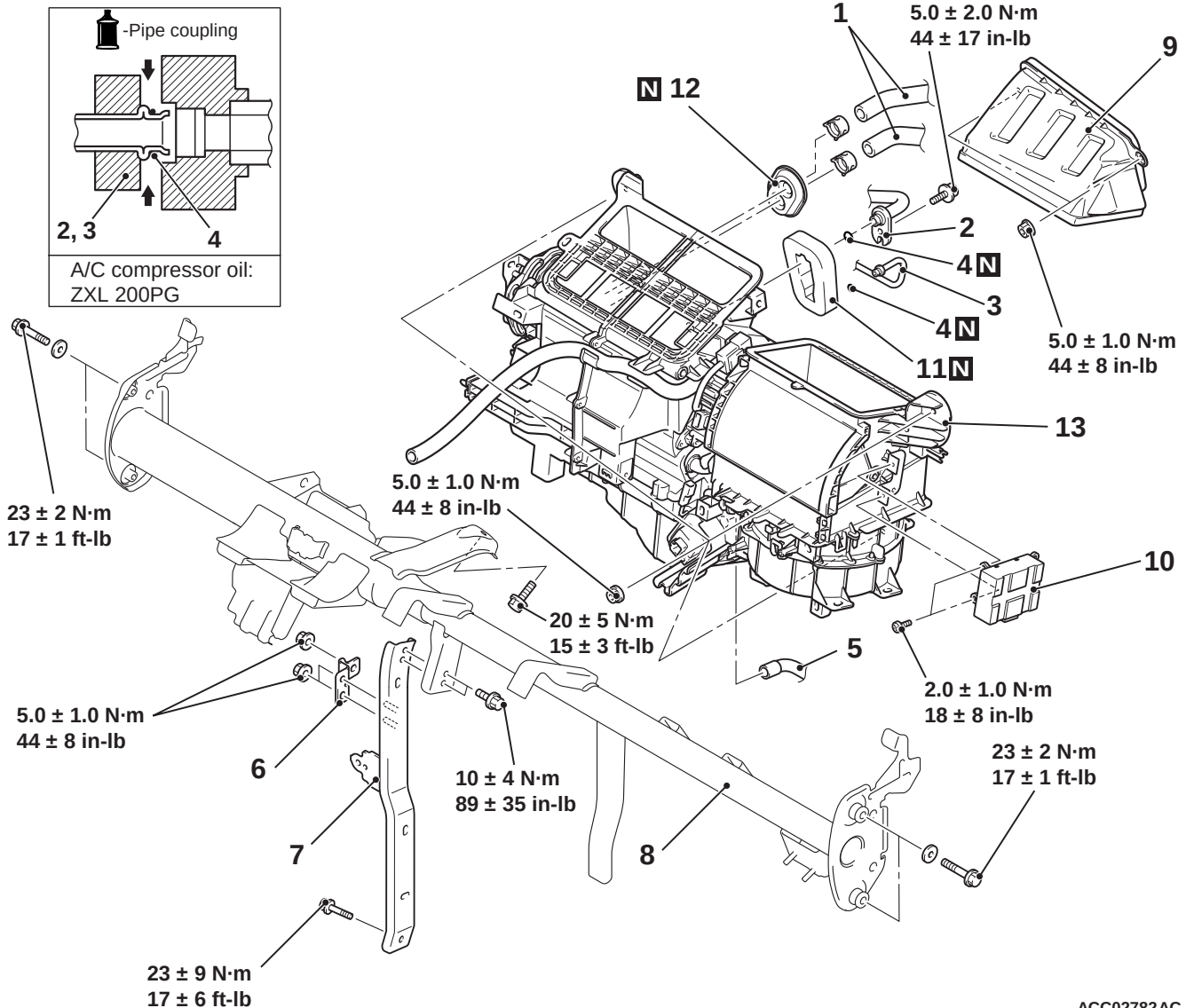
HEATER UNIT AND BLOWER ASSEMBLY

REMOVAL AND INSTALLATION

M1552020801151

Pre-removal and Post-installation Operation

- Refrigerant draining and refilling (Refer to charging and discharging [P.55A-17](#)).
- Engine coolant replacement (Refer to GROUP 14, on-vehicle Service [P.14-6](#)).
- Air Cleaner assembly Removal and Installation (Refer to GROUP 15, air cleaner [P.15-5](#)).



ACC02782AC

Removal steps

<<A>>

<<A>>

1. Heater piping hose connection
<Automatic A/C> (Refer to [P.55A-40](#))
2. A/C compressor suction hose connection
3. A/C condenser outlet pipe connection
4. O-ring
5. A/C evaporator drain hose

Removal steps (Continued)

- Instrument panel removal and Installation (Refer to GROUP 52A, Instrument Panel [P.52A-2](#))
- Instrument panel wiring harness connector disconnection
- 6. Heater bracket
- 7. Front deck lower crossmember
- 8. Front deck crossmember
- 9. Heater air intake duct

<> >>A<<

Removal steps (Continued)

10. Heater control unit <Vehicles with PTC heater>
11. Packing
12. Grommet
13. Heater unit

REMOVAL SERVICE POINTS**<<A>> A/C COMPRESSOR SUCTION HOSE, A/C CONDENSER OUTLET PIPE DISCONNECTION****⚠ CAUTION**

As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

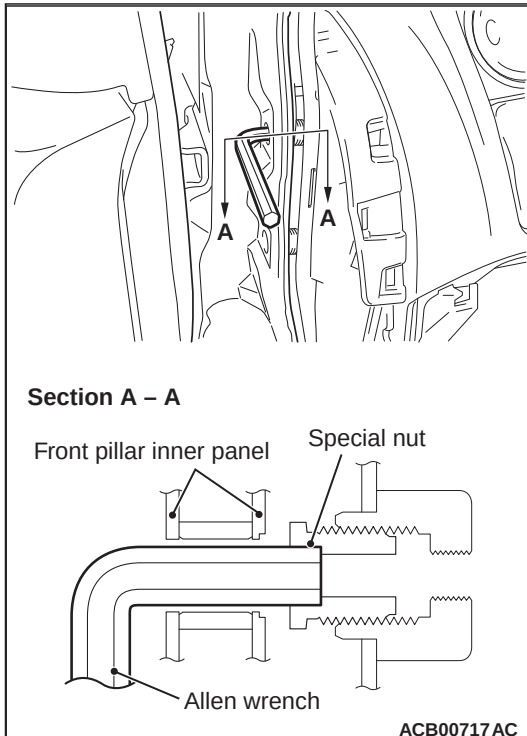
To prevent the entry of dust or other foreign bodies, plug the dismantled hose and the nipples of the expansion valves.

<> FRONT DECK CROSSMEMBER REMOVAL

1. Tighten the special nut from the instrument panel assembly mounting bolt hole in the direction of the arrow shown in the figure to create a clearance between the instrument panel assembly and the front pillar inner panel.

NOTE: The special nut is a left-hand thread.

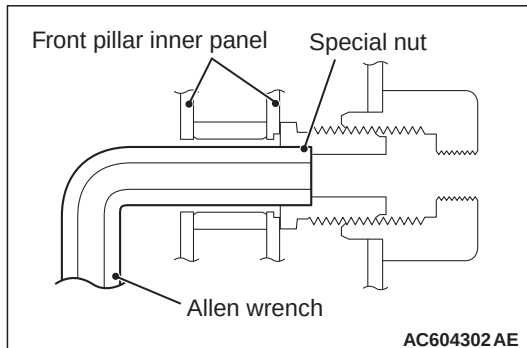
2. Remove the instrument panel assembly.



INSTALLATION SERVICE POINT

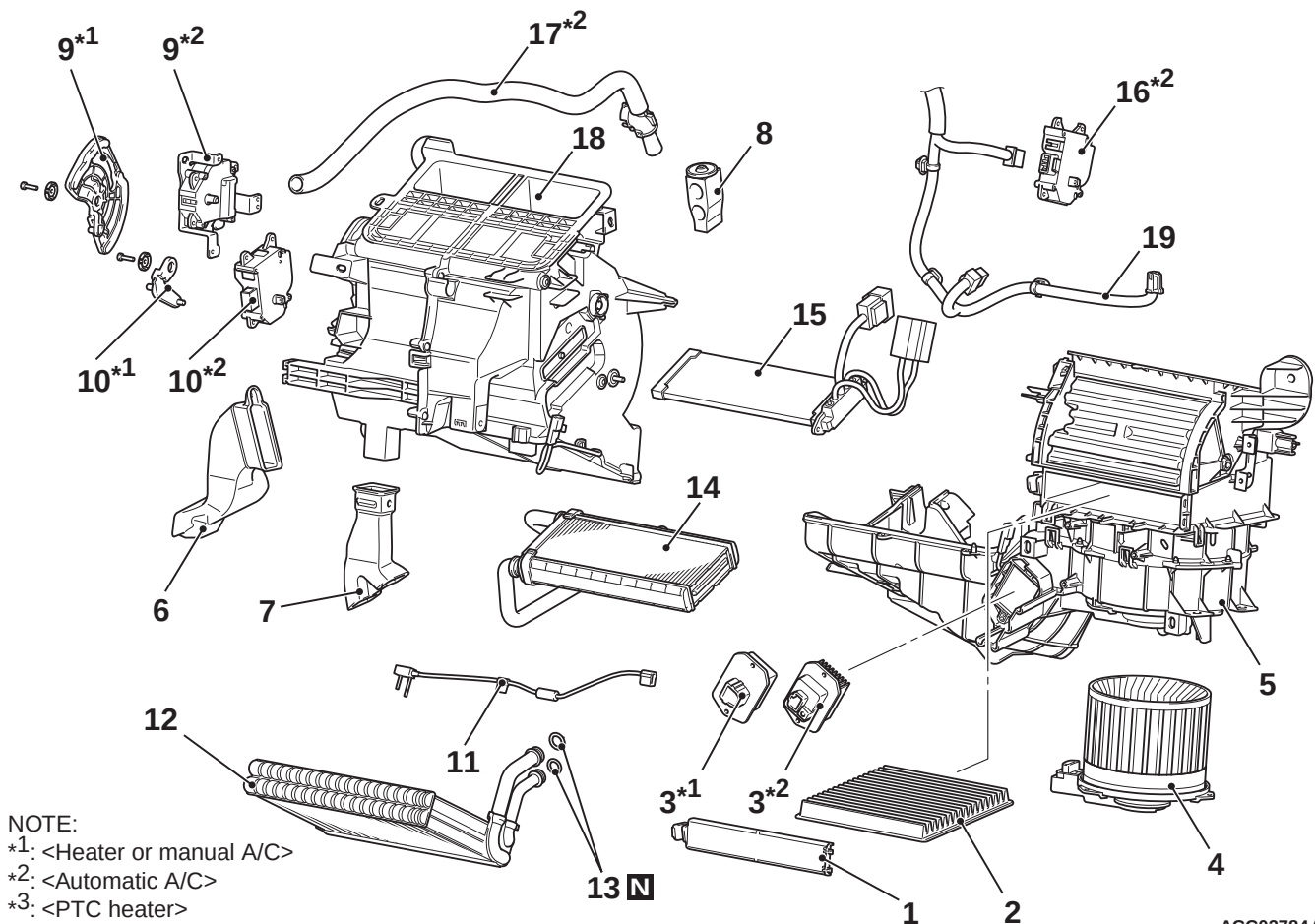
>>A<< INSTRUMENT PANEL ASSEMBLY INSTALLATION

Turn the special nut until it touches the front pillar inner panel, and fix the instrument panel assembly.



DISASSEMBLY AND REASSEMBLY

M1552020900962



Disassembly steps

>>B<<

1. Heater side cover
2. Air refresher assembly
3. Resistor <Heater or manual A/C> or power transistor <Automatic A/C>
4. Blower motor
5. Case (Blower side)
6. Foot duct LH

Disassembly steps (Continued)

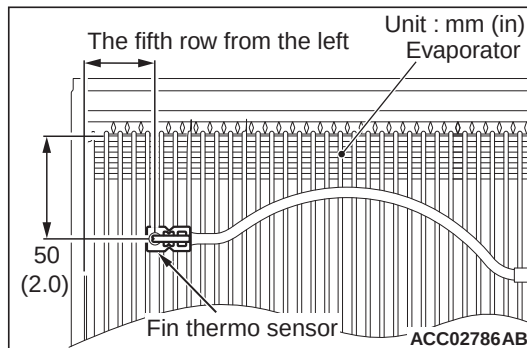
7. Foot duct RH
8. Expansion valve
9. Mode selection damper control lever <Heater or manual A/C> or mode selection damper control motor <Automatic A/C>

Disassembly steps (Continued)

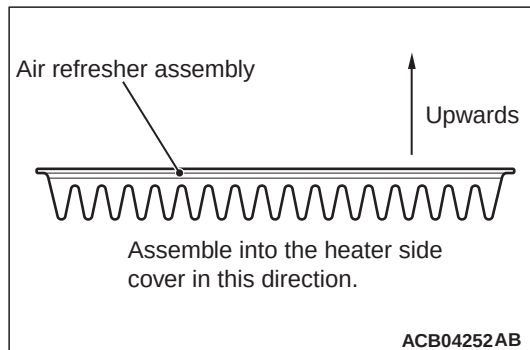
10. Air mixing damper control lever
<Heater or manual A/C> or air
mixing damper control motor
<Automatic A/C>
- >>A<< 11. Fin thermo sensor
12. Evaporator
13. O-ring
14. Heater core
15. PTC heater
16. Outside/inside air selection damper
control motor <Automatic A/C>
17. Heater control vacuum aspirator
<Automatic A/C>
18. Case (Heater side)
19. Wiring harness

REASSEMBLY SERVICE POINTS**>>A<< FIN THERMO SENSOR INSTALLATION**

Install the fin thermo sensor at the position shown in the figure.

**>>B<< AIR REFRESHER ASSEMBLY INSTALLATION**

Install the air refresher in the direction shown.



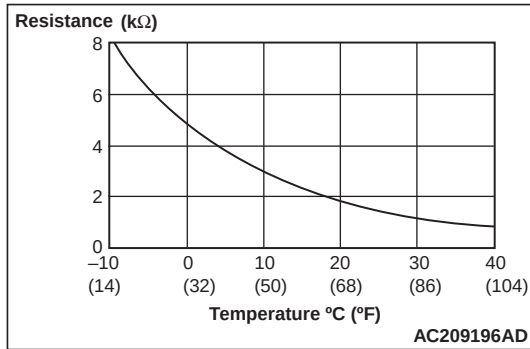
INSPECTION

M1552014305267

FIN THERMO SENSOR CHECK

Check that the resistance shown in the graph is almost satisfied when measuring the resistance between the terminals under two or more different temperature conditions.

NOTE: The temperature condition in checking should be within the range shown.



PTC HEATER CONTINUITY CHECK

Switch position	Terminal number	Normal condition
Allway	3 – 4	Continuity exists (2 ohms or less)
	5 – 6	

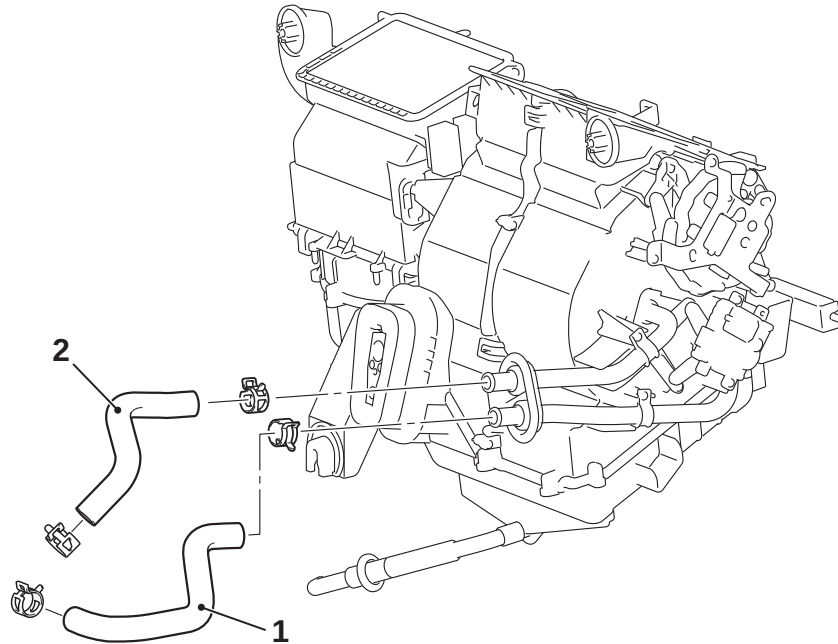
HEATER HOSE

REMOVAL AND INSTALLATION

M1551007700254

Pre-removal and Post-installation Operation

- Canister removal and installation (Refer to GROUP 17, evaporative emission control system Panel [P.17-57](#)).



ACC02787AB

Heater hose removal steps

1. Heater piping hose A
2. Heater piping hose B

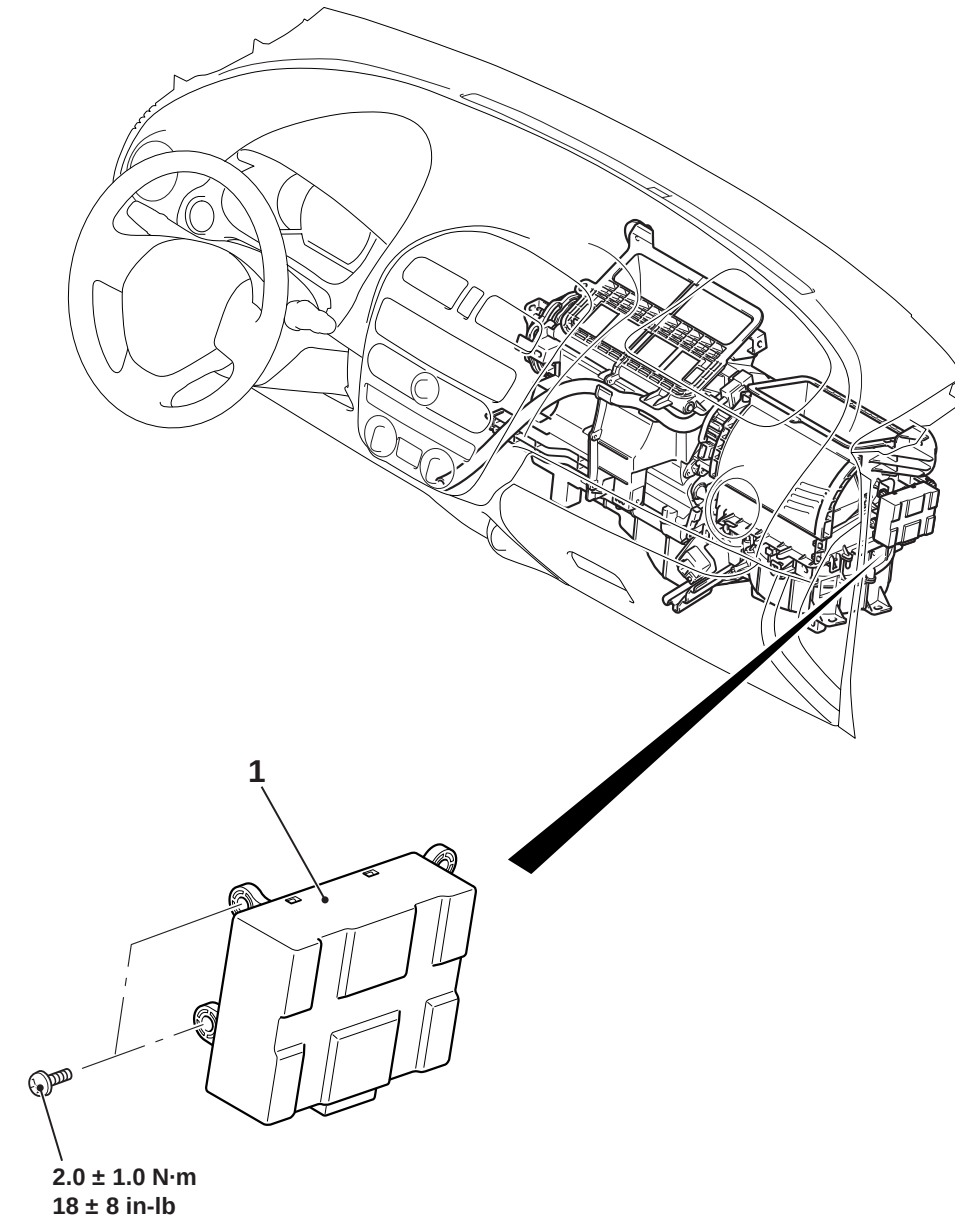
PTC HEATER CONTROL UNIT

REMOVAL AND INSTALLATION

M1550001600030

Pre-removal and Post-installation Operation

- Removal and Installation of Passenger's (front) air bag module (Refer to GROUP 52B, Air Bag Module(s) and Clock Spring [P.52B-240](#)).



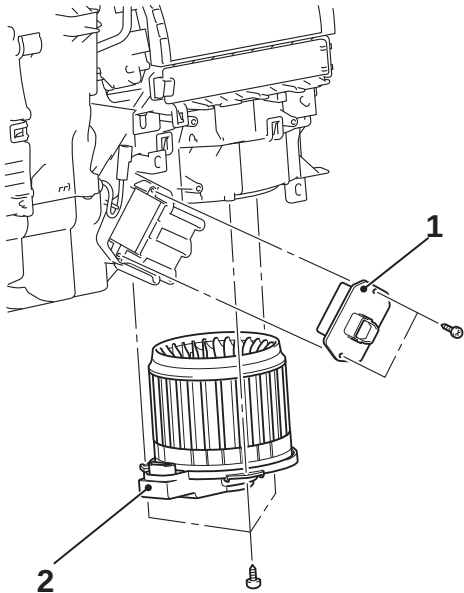
Removal step

1. PTC-ECU

ACC02788AB

BLOWER ASSEMBLY AND RESISTOR
REMOVAL AND INSTALLATION

M1551002800762



ACC02789AB

Resistor removal step

- Glove box (Refer to GROUP 52A, Glove Box [P.52A-4](#))
- 1. Resistor <Heater or manual air conditioning> or power transistor <Auto air conditioning>

Blower motor removal step

- 2. Blower motor

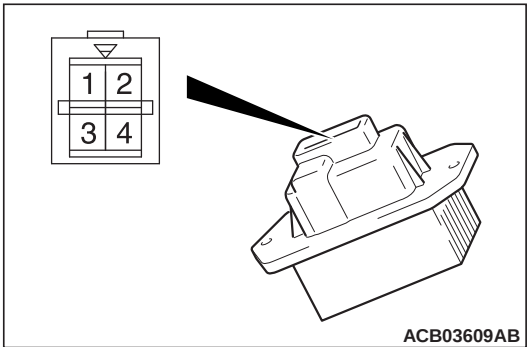
INSPECTION

M1551006301041

RESISTOR CHECK

Standard value:

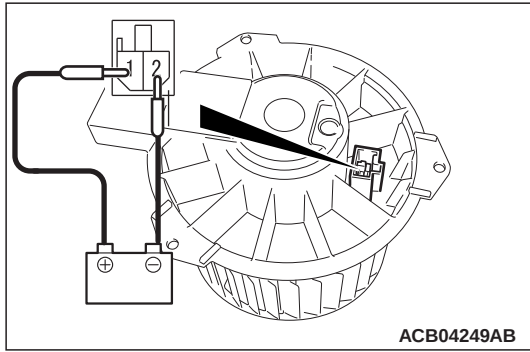
Measured terminals	Standard value Ω
Hi – Lo (between Nos.2 and 3)	3.36
Hi – M1 (between Nos.1 and 2)	1.56
Hi – M2 (between Nos.2 and 4)	0.56



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BLOWER FAN AND MOTOR CHECK

Check that the motor turns when applying battery power between the connector terminals. Also check to see that there is no abnormal sound emitted from the motor at this time.



COMPRESSOR ASSEMBLY

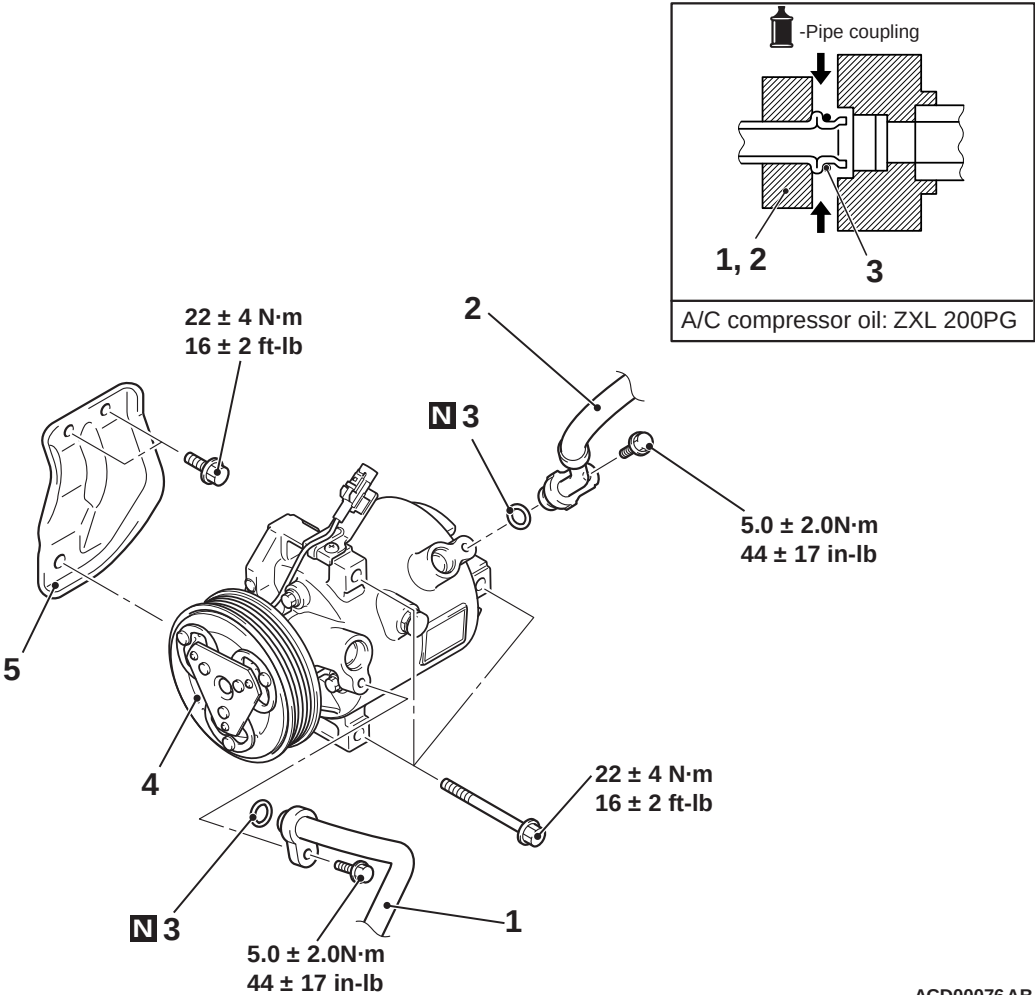
REMOVAL AND INSTALLATION

M1552004403870

CAUTION

- When removing the compressor, be careful not to subject the pulley and the clutch to impact.

Pre-removal operation - Discharging refrigerant (Refer to P.55A-17). - Engine room under cover (Refer to GROUP 51, Under Cover P.51-15). - Drive belt removal (Refer to GROUP 11A, Crankshaft Pulley P.11A-18).	Post-installation Operation - Drive belt installation (Refer to GROUP 11A, Crankshaft Pulley P.11A-18). - Engine room under cover (Refer to GROUP 51, Under Cover P.51-15). - Charging refrigerant (Refer to P.55A-17).
--	--



ACD00076 AB

- <<A>>
- <<A>>
- <> >>A<<
- Removal steps**
- A/C compressor discharge hose
 - A/C compressor suction hose
 - O-ring
 - A/C compressor and clutch assembly
 - A/C compressor bracket

NOTE: The service points which are not described are the same as before.

REMOVAL SERVICE POINTS

<<A>> DISCHARGE FLEXIBLE HOSE/SUCTION FLEXIBLE HOSE DISCONNECTION

CAUTION

Use the plug which is not breathable because A/C compressor oil or receiver have high hygroscopicity.

Plug the hose nipple removed to prevent the entry of dust and dirt.

<> A/C COMPRESSOR AND CLUTCH ASSEMBLY REMOVAL

Be careful not to spill the A/C compressor oil and remove the A/C compressor.

INSTALLATION SERVICE POINT

>>A<< A/C COMPRESSOR AND CLUTCH ASSEMBLY 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 (x fl.oz) 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.

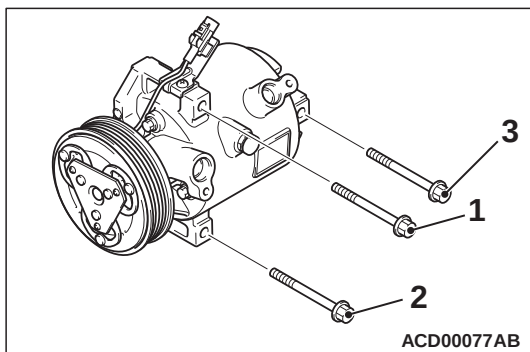
New compressor oil amount = 60mL (2.0 fl.oz)

$$60 \text{ mL (2.0 fl.oz)} - X \text{ mL (x fl.oz)} = Y \text{ mL (y fl.oz)}$$

NOTE: Y mL indicates the amount of oil in the refrigerant line, the condenser, the evaporator, etc.

3. Tighten A/C compressor assembly mounting bolts to the specified torque in the order of number shown in the figure.

Tightening torque: $22 \pm 4 \text{ N}\cdot\text{m}$ ($16 \pm 2 \text{ ft}\cdot\text{lb}$)

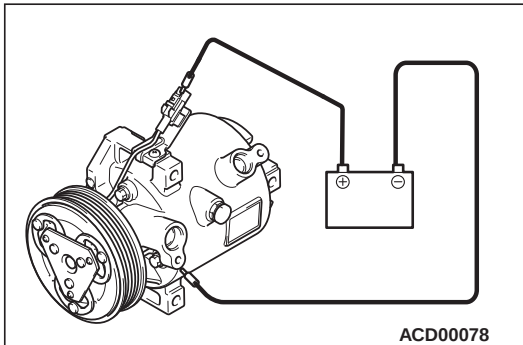


INSPECTION

M1552004501462

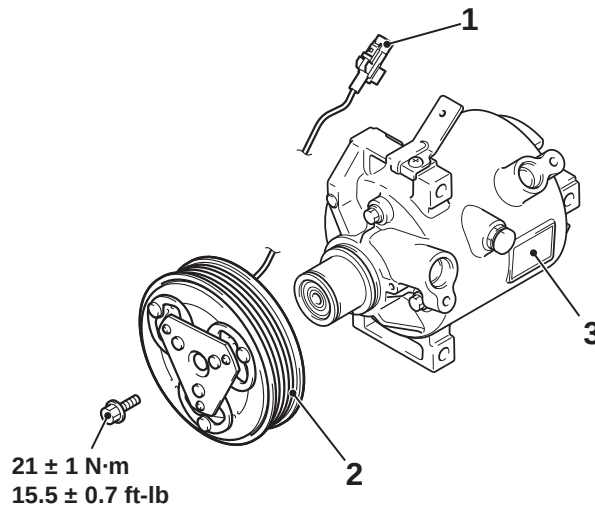
CHECK THE MAGNETIC CLUTCH FOR A/C
COMPRESSOR

Connect the connector battery to positive battery terminal in the A/C compressor, and then ground the battery (–) terminal to the A/C compressor itself. At this time, check that the magnetic clutch operating sound can be heard.



DISASSEMBLY AND REASSEMBLY

M1552004603830



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>>A<<

Disassembly steps

- Air gap adjustment
- 1. Connector

<<A>>

Disassembly steps (Continued)

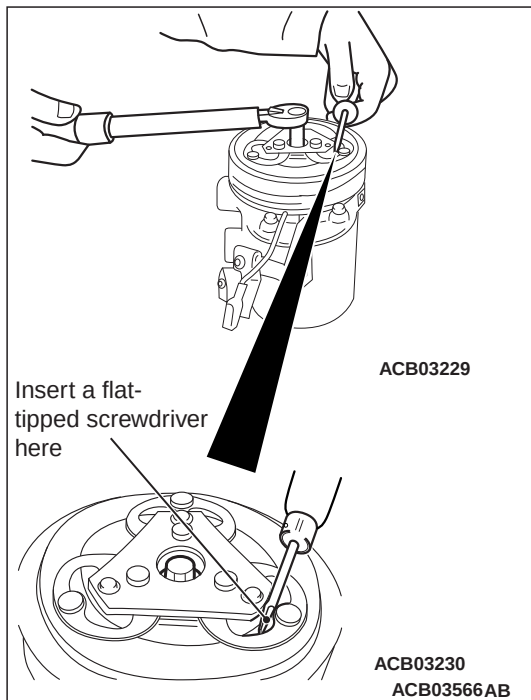
- 2. A/C compressor clutch assembly
- 3. A/C compressor

DISASSEMBLY SERVICE POINTS

<<A>> A/C COMPRESSOR CLUTCH ASSEMBLY REMOVAL

Insert a flat-tipped screwdriver as shown to counterhold the tool, and then remove the bolt.

NOTE: Make sure the flat-tipped screwdriver does not contact the spring, which will cause it to be damaged.



REASSEMBLY SERVICE POINTS

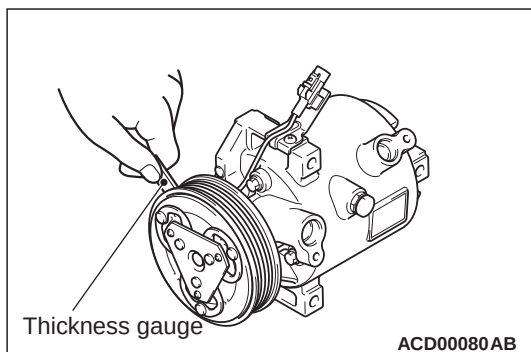
>>A<< AIR GAP ADJUSTMENT

Check whether or not the air gap of the clutch is within the standard value.

Standard value:

0.3 – 0.6 mm (0.01 - 0.02 in)

NOTE: If there is a deviation of the air gap from the standard value, replace the A/C compressor clutch assembly and then adjust the air gap by using shims.



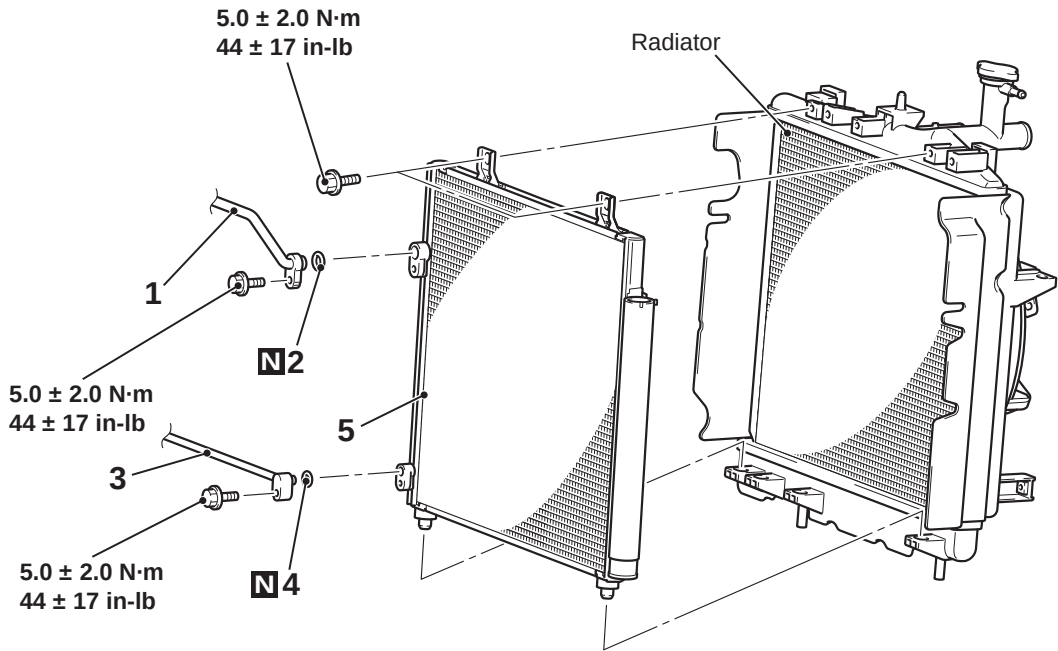
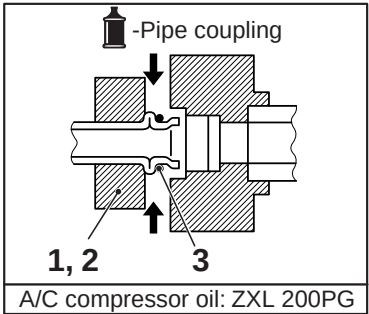
CONDENSER ASSEMBLY

REMOVAL AND INSTALLATION

M1552015401629

Pre-removal and Post-installation Operation

- Discharging and Recharging refrigerant (Refer to [P.55A-17](#)).
- Front bumper removal and installation (Refer to GROUP 51 – Front Bumper [P.51-3](#)).



ACB01935AF

<<A>>

Removal steps

- A/C compressor discharge hose connection
- O-ring
- A/C condenser outlet pipe connection

<<A>>

Removal steps (Continued)

- O-ring
- A/C refrigerant condenser assembly

NOTE: Condenser fan removal and installation Refer to GROUP 14 – Radiator [P.14-16](#).

REMOVAL SERVICE POINT

<<A>> A/C COMPRESSOR DISCHARGE HOSE, A/C CONDENSER OUTLET PIPE DISCONNECTION

⚠ CAUTION

Use the plug which is not breathable because A/C compressor oil or receiver have high hygroscopicity.
Plug the removed nipple of the pipe, hose and condenser to prevent the entry of dust and dirt.

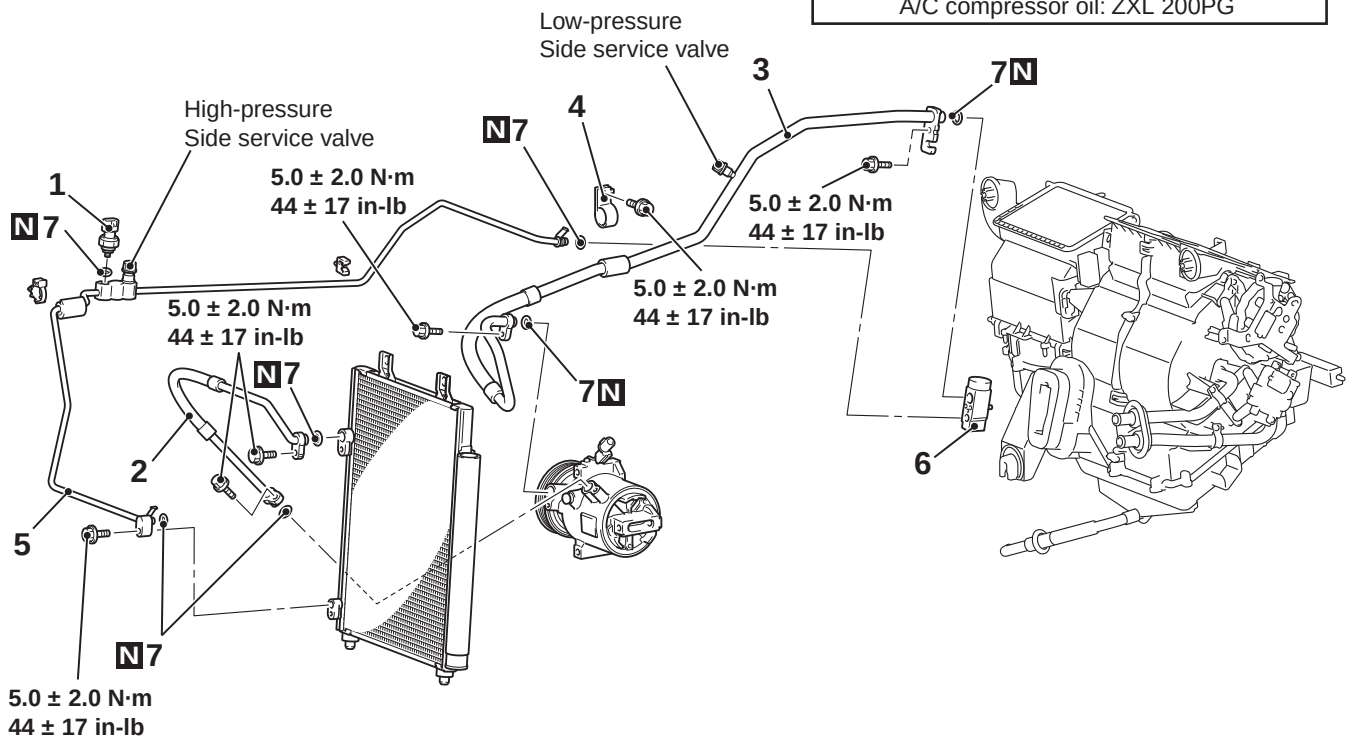
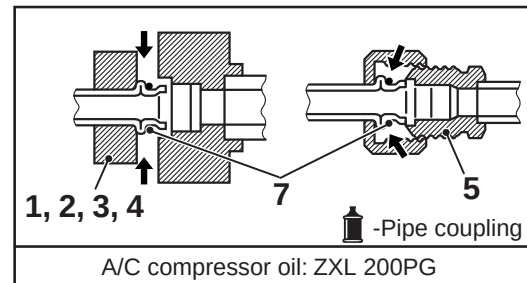
REFRIGERANT LINE

REMOVAL AND INSTALLATION

M1552006402970

Pre-removal and Post-installation Operation

- Discharging and Recharging refrigerant (Refer to P.55A-17).



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	A/C pressure sensor removal steps		A/C condenser outlet pipe removal steps
	1. A/C pressure sensor		• Air cleaner case removal and installation (Refer to GROUP 15 – Air Cleaner P.15-5)
	7. O-ring		• Front bumper removal and installation (Refer to GROUP 51 – Front Bumper P.51-3)
	A/C compressor discharge hose removal steps		• Air guide side panel removal and installation (Refer to GROUP 42A – Loose Panel P.42A-101)
<<A>>	• Front bumper removal and installation (Refer to GROUP 51 – Front Bumper P.51-3)		• Front wheelhouse splash shield removal and installation (Refer to GROUP 42A, Splash Shield P.42A-10)
	• Air guide side panel removal and installation (Refer to GROUP 42A – Loose Panel P.42A-101)		
	2. A/C compressor discharge hose		4. Clip securing the A/C compressor suction hose to the side member
	7. O-ring	<>	5. A/C condenser outlet pipe
	A/C compressor suction hose removal steps		7. O-ring
	• Air cleaner case removal and installation (Refer to GROUP 15 – Air Cleaner P.15-5)	<<A>>	Expansion valve removal steps
	• Front wheelhouse splash shield removal and installation (Refer to GROUP 42A, Splash Shield P.42A-10)		• Air cleaner case removal and installation (Refer to GROUP 15 – Air Cleaner P.15-5)
<<A>>	3. A/C compressor suction hose	<<A>>	3. A/C compressor suction hose (heater side)
	7. O-ring		7. O-ring
		<<A>>	5. A/C condenser outlet pipe (heater side)
			7. O-ring
		<<A>>	6. Expansion valve
			7. O-ring

REMOVAL SERVICE POINT

<<A>> HOSE, PIPE AND EXPANSION VALVE
REMOVAL



Use the plug which is not breathable because A/C compressor oil or receiver have high hygroscopicity.
Plug the nipple of condenser, compressor, and expansion valve to prevent the entry of dust and dirt.

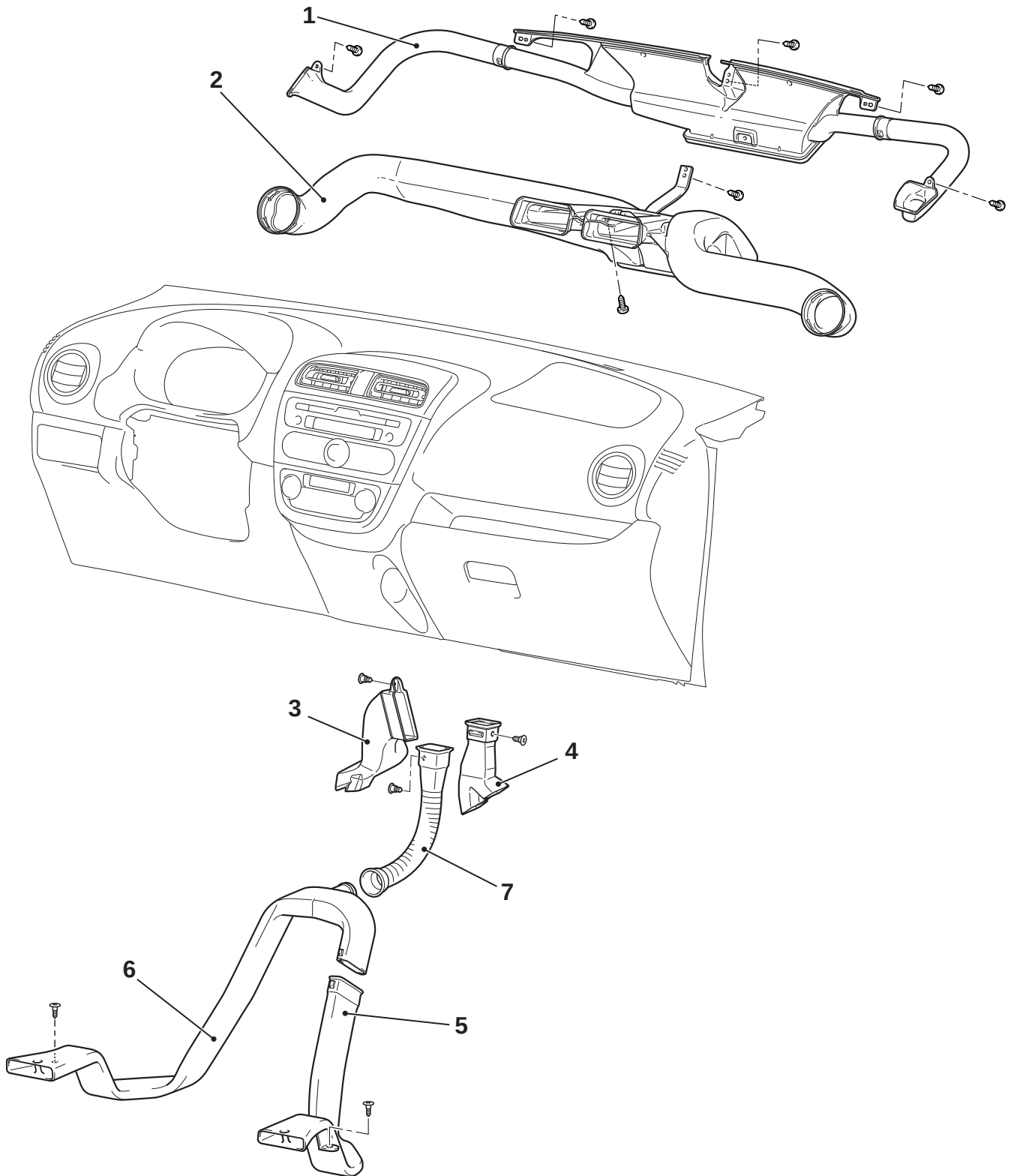
<> CLIP SECURING A/C CONDENSER
SUCTION HOSE TO SIDEMEMBER REMOVAL

If the A/C condenser outlet pipe must be removed individually, remove the clip securing the A/C compressor suction hose to the side member in order to create sufficient clearance.

DUCTS

REMOVAL AND INSTALLATION

M1553001001461



ACC02792AB

**Defroster nozzle, and ventilator
air distribution duct removal
steps**

- Instrument panel removal and
Installation (Refer to GROUP 52A,
Instrument panel [P.52A-2](#))
 - 1. Defroster nozzle
 - 2. Ventilator air distribution duct
- Foot duct removal steps**
- 3. Foot duct A
 - 4. Foot duct B

**Rear heater duct removal
steps**

- Instrument lower panel removal
and Installation (Refer to GROUP
52A, Instrument lower panel
[P.52A-6](#))
- Floor console removal and
installation (Refer to GROUP
52A, Floor console [P.52A-7](#))
- Front seat assembly removal and
installation (Refer to GROUP
52A, Front seat assembly
[P.52A-17](#))
- 5. Rear heater duct B
- 6. Rear heater duct C
- 7. Rear heater duct A

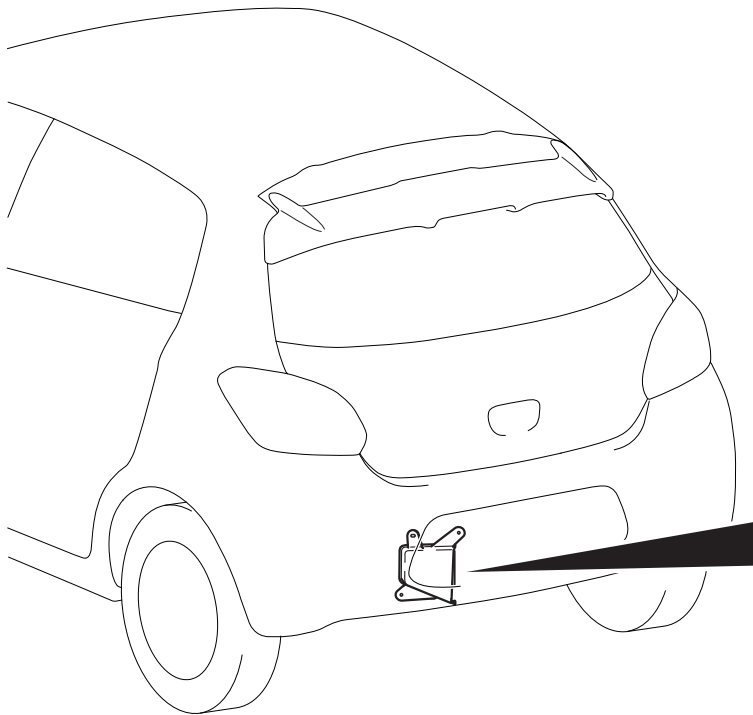
VENTILATORS

REMOVAL AND INSTALLATION

M1553002800780

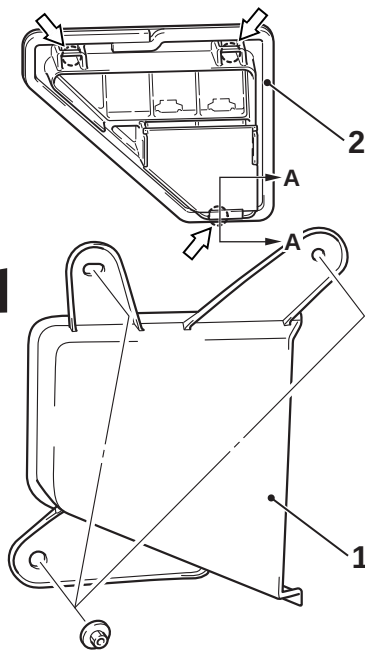
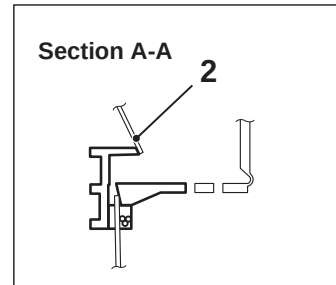
Pre-removal and Post-installation Operation

- Rear Bumper Removal and Installation (Refer to GROUP 51 – Rear Bumper P.51-6).



Note

↔ : Claw positions



Removal steps

1. Rear ventilation duct cover
2. Rear ventilation duct

ACD00082AB

NOTES