GROUP 55A

HEATER, AIR CONDITIONER AND VENTILATION

CONTENTS

Continued on next page

SERVICE SPECIFICATIONS

M1552000300270

Item		Standard value
Idle speed r/min		750 ± 50
Idle-up speed r/min		850 ± 50
Resistor (for blower motor) Ω	LO	2.54
	ML	1.24
	MH	0.6
Air gap (magnetic clutch) mm		0.3 – 0.5

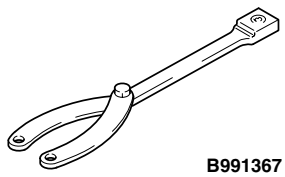
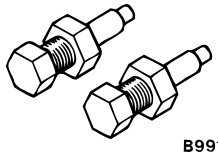
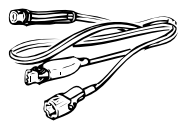
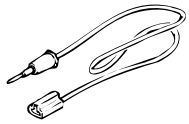
LUBRICANTS

M1552000400288

Item	Specified lubricant	Quantity
Compressor refrigerant unit lubricant	SUN PAG 56	120 mL
Each connection of refrigerant line	SUN PAG 56	As required
Refrigerant	R134a (HFC-134a)	550 ± 20 g

SPECIAL TOOLS

M1552000600301

Tool	Tool number	Name	Application
 B991367	MB991367	Special spanner	Armature mounting nut of compressor removal and installation
 B991386	MB991386	Pin	
A  B  C  D  MB991223AC	MB991223 A:MB991219 B:MB991220 C:MB991221 D:MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Continuity check and voltage measurement at harness wire or connector A: For checking connector pin contact pressure B: For checking power supply circuit C: For checking power supply circuit D: For connecting a locally sourced tester

TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

M1552009600353

Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points P.00-6.

SYMPTOM CHART

M1552009900439

NOTE: Refer to GROUP 14, Trouble shooting for the condenser fan.

Symptom	Inspection Procedure	Reference Page
When the ignition switch is "ON" the A/C does not operate.	1	P.55A-5
Inside/outside air selection is not possible.	2	P.55A-6
When the A/C is operating, temperature inside the passenger compartment does not decrease (cool air is not emitted).	3	P.55A-10
Blower fan and motor do not turn.	4	P.55A-25
Blower air amount cannot be changed.	5	P.55A-33
The A/C indicator flashes.	6	P.55A-36
Defogger function does not operate.	7	P.55A-37
Defogger Timer function does not operate.	8	P.55A-43
Malfunction of the A/C-ECU power supply system.	9	P.55A-44
Condenser Fan does not operate.	10	Refer to GROUP 14 P.14-3

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: When the Ignition Switch is "ON" the A/C does not Operate.

COMMENTS ON TROUBLE SYMPTOM

The blower system or the compressor system may be defective if there is no cool air coming from the spit hole.

TROUBLESHOOTING HINTS

- Malfunction of blower motor
- Malfunction of A/C compressor

DIAGNOSIS

Check that the blower motor operation when the blower switch is moved to the "HI" position.

(1) Turn the ignition switch to the "ON" position.
(2) Turn the blower switch to the "HI" position.

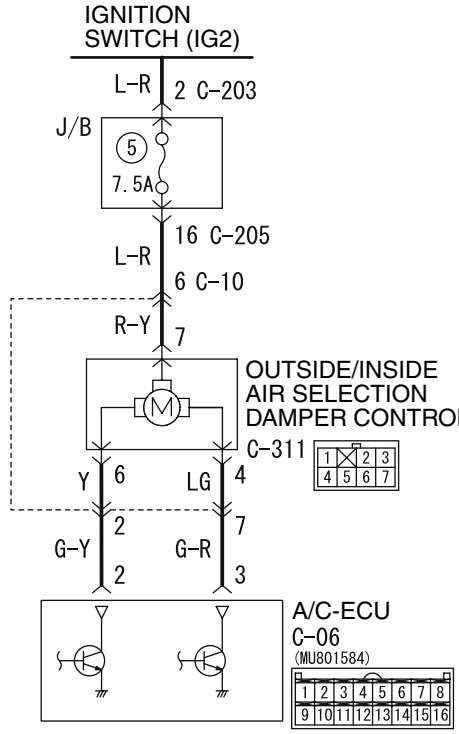
Q: Does the blower motor operate when the blower switch is moved to the "HI" position?

YES : Refer to Inspection procedure 3 "When the A/C is operating, temperature inside the passenger compartment does not decrease (cool air not emitted) P.55A-10."

NO : Refer to Inspection procedure 4 "Blower fan and motor do not turn P.55A-25."

INSPECTION PROCEDURE 2: Inside/Outside Air Selection is not possible.

Outside/Inside Air Selection Damper Control Motor Circit



Wire colour code
B : Black LG : Light green G : Green L : Blue
W : White Y : Yellow SB : Sky blue BR : Brown
O : Orange GR : Gray R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

If the inside/outside air selection damper motor does not operate normally, the inside/outside air selection damper motor system may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the inside/outside air selection damper motor
- Damaged the wiring harness or connectors
- Malfunction of the manual air conditioner control panel (A/C-ECU)

DIAGNOSIS

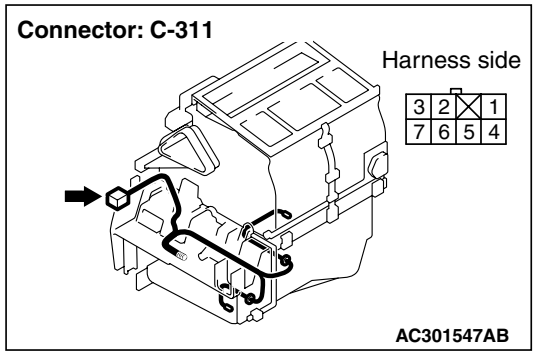
STEP 1. Check the defogger and A/C operations.

Q: Do the defogger and A/C work normally?

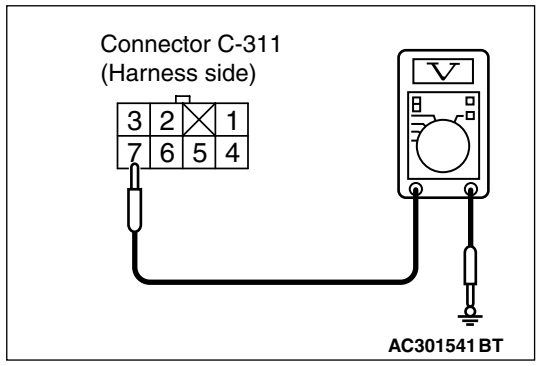
YES : Go to Step 2.

NO : Refer to Inspection procedure 9 "Malfunction of the A/C-ECU power supply system P.55A-44."

STEP 2. Measure the voltage at the C-311 outside/inside air selection damper control motor connector.



(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.

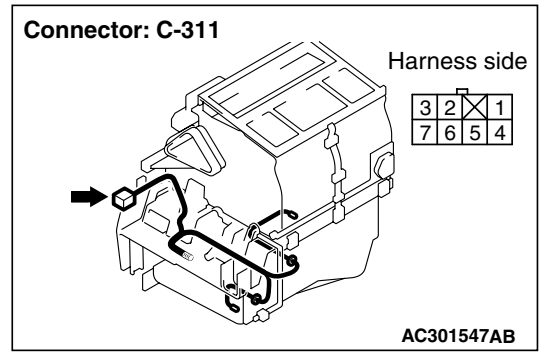


(3) Measure the voltage between terminal 7 and body earth.

OK: System voltage

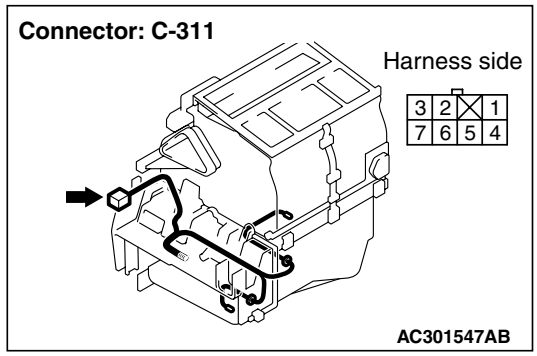
Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 3.

STEP 3. Connector check: C-311 outside/inside air selection damper control motor connector



Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector.

STEP 4. Check the wiring harness between C-311 outside/inside air selection damper control motor connector terminal No.7 and the ignition switch (IG2).



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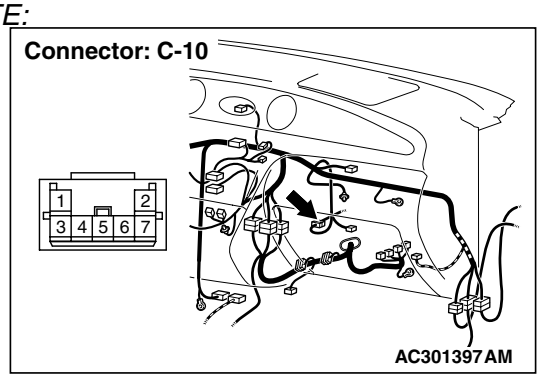
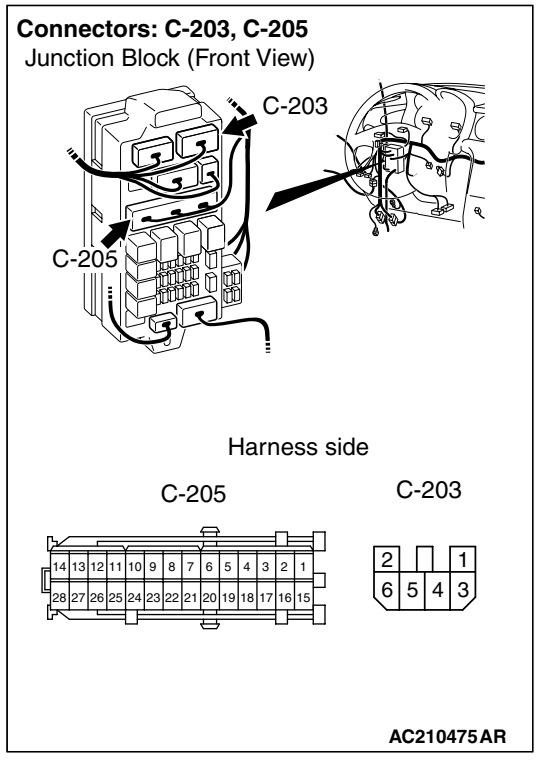




Prior to the wiring harness inspection, check intermediate connector C-10, junction block connectors C-205 and C-203, and repair if necessary.

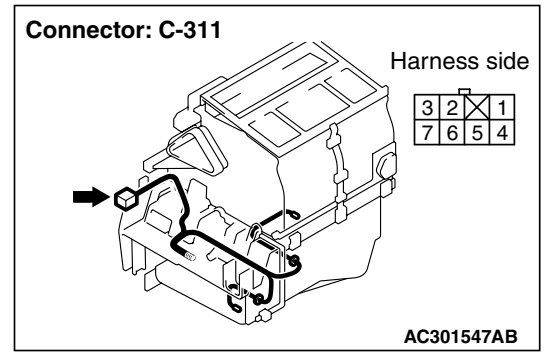
- Check the outside/inside air selection damper control motor power supply line for open circuit.

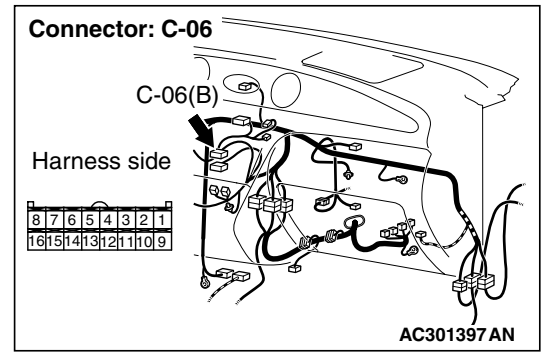
Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).
NO : Repair the wiring harness.

STEP 5. Check the outside/inside air selection damper control motor
Refer to P.55A-64.

Q: Does outside/inside air selection damper control motor work normally?
YES : Go to Step 6.
NO : Replace the outside/inside air selection damper control motor.

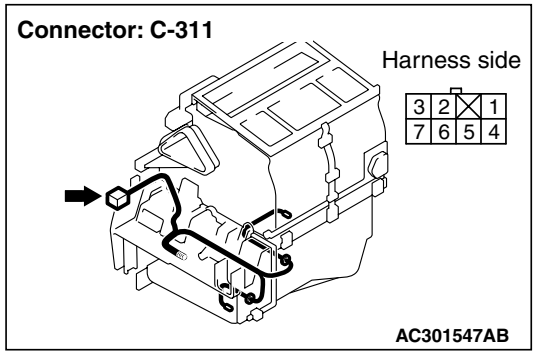
STEP 6. Connector check: C-311 outside/inside air selection damper control motor connector and C-06 A/C-ECU

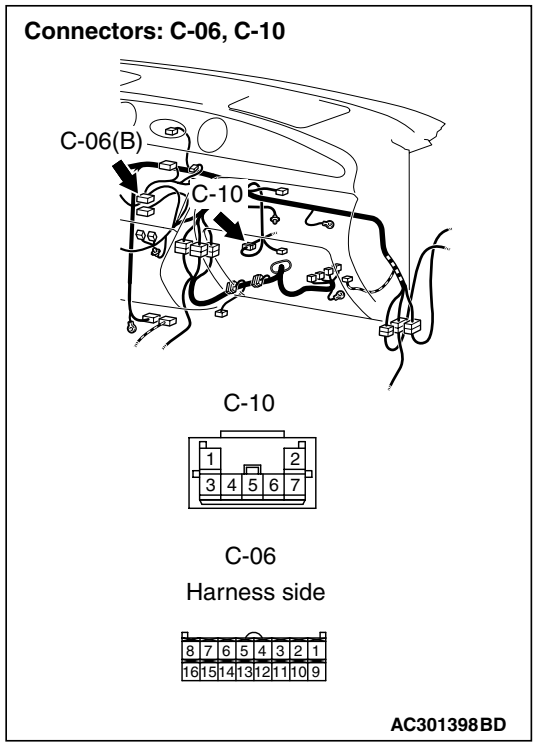




Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the connector.

STEP 7. Check the wiring harness between C-311 outside/inside air selection damper control motor connector (terminals 6 and 4) and A/C-ECU C-06 (terminals 2 and 3).





NOTE: Prior to the wiring harness inspection, check intermediate connector C-10, and repair if necessary.

- Check the outside/indside air selection damper control motor earth line for open or short circuit.

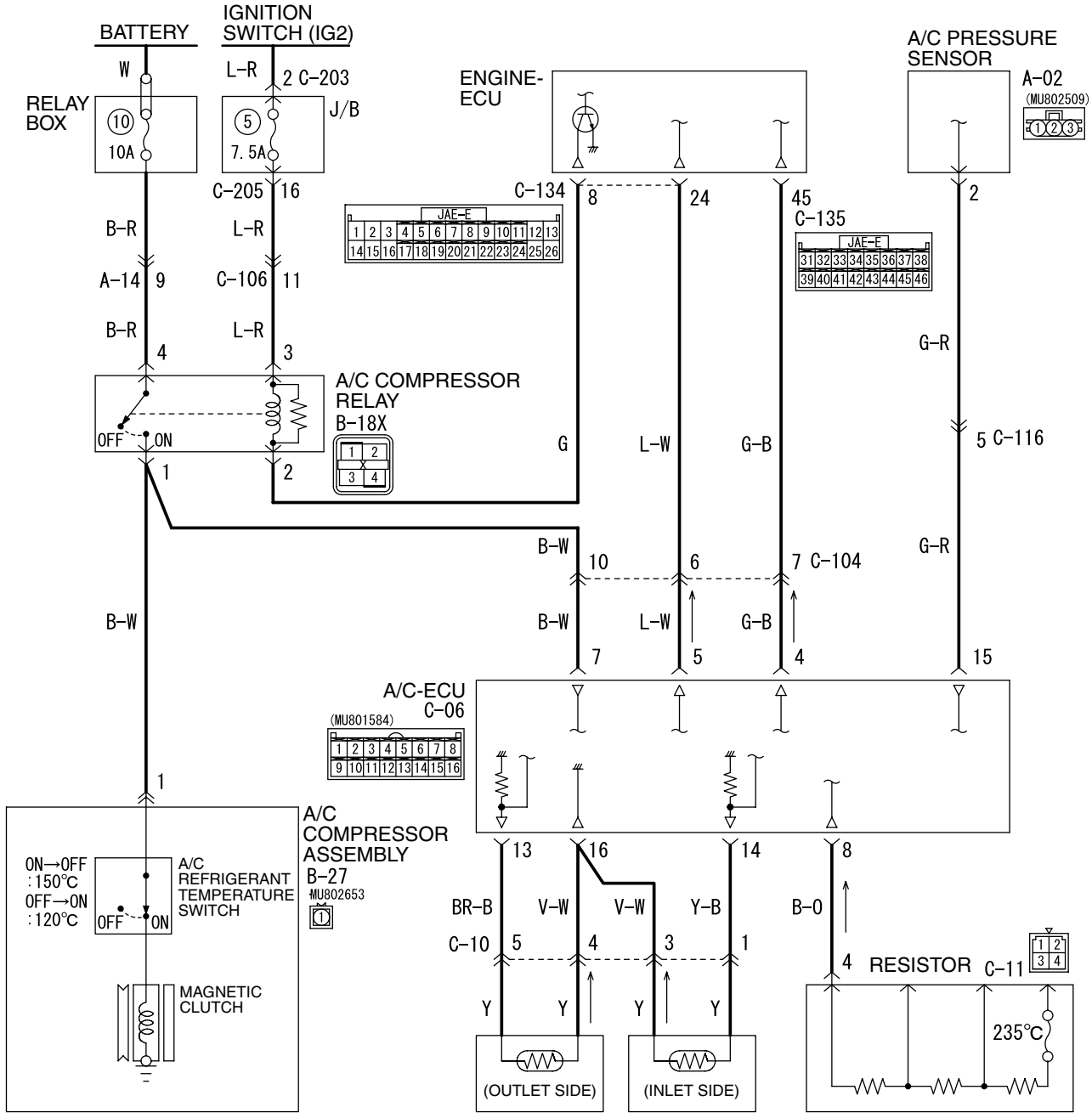
Q: Is the check result normal?

YES : Replace the manual air conditioner control panel (A/C-ECU).

NO : Repair the wiring harness.

INSPECTION PROCEDURE 3: When the A/C is Operating, Temperature Inside the Passenger Compartment does not Decrease (Cool Air is not Emitted).

A/C Compressor and Air Thermo Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

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COMMENTS ON TROUBLE SYMPTOM

If cool air is not distributed when the A/C switch is on, the air thermo sensor or the A/C compressor relay system may be defective.

TROUBLESHOOTING HINTS

- Improper amount of refrigerant
- Malfunction of the air thermo sensor
- Malfunction of the A/C pressure sensor
- Malfunction of the A/C compressor relay
- Malfunction of the A/C refrigerant temperature switch
- Malfunction of the magnetic clutch
- Malfunction of the manual air conditioner control panel (A/C-ECU)
- Damaged the wiring harness or connectors
- Malfunction of the engine-A/T-ECU

DIAGNOSIS

STEP 1. Check the defogger and outside/inside air selection damper control motor operation.

Q: Do the defogger and outside/inside air selection damper control motor work normally?
YES : Go to Step 2.
NO : Refer to Inspection procedure 9 "Malfunction of the A/C-ECU power supply system P.55A-44."

STEP 2. Check the blower motor operation.

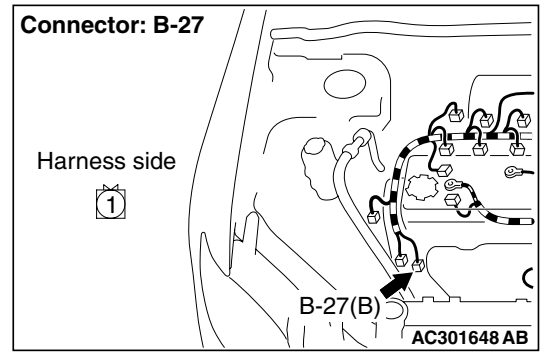
Q: Does the blower motor work normally?
YES : Go to Step 3.
NO : Refer to Inspection procedure 4 "Blower fan and motor do not turn P.55A-25."

STEP 3. Check the A/C compressor.

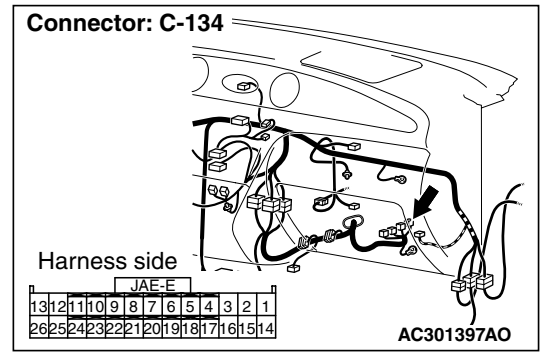
Check the A/C compressor for compressor oil leaks.

Q: Is the check result satisfactory?
YES : Go to Step 4.
NO : Replace the A/C compressor or the expansion valve.

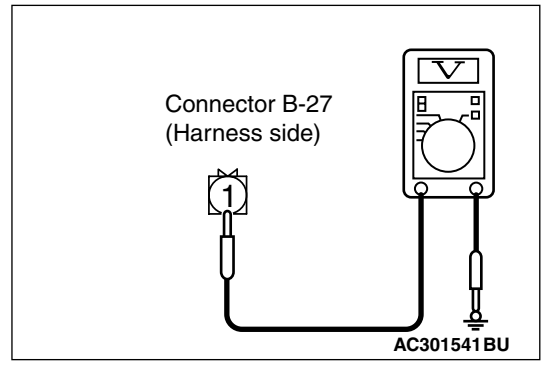
STEP 4. Measure the voltage at the B-27 A/C compressor connector.



(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.



(3) Disconnect engine-ECU connector C-134, and earth terminal 8.



(4) Measure the voltage between terminal 1 and body earth.

OK: System voltage

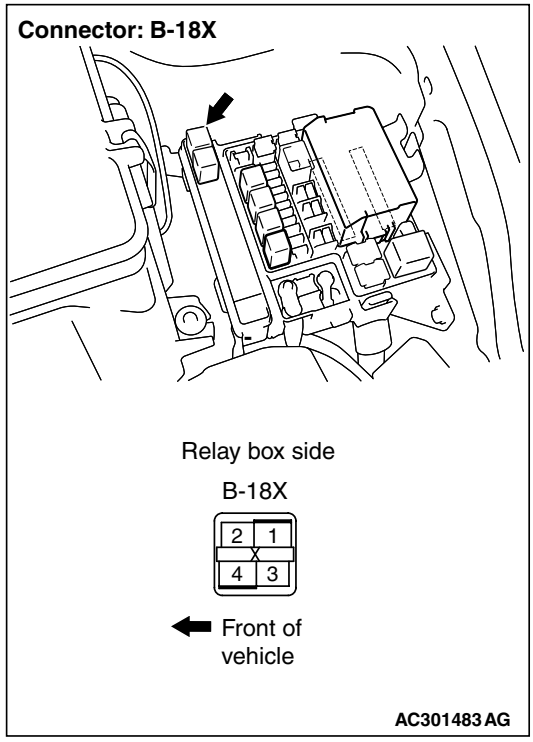
Q: Is the check result normal?
YES : Go to Step 16.
NO : Go to Step 5.

STEP 5. Check the A/C compressor relay continuity.

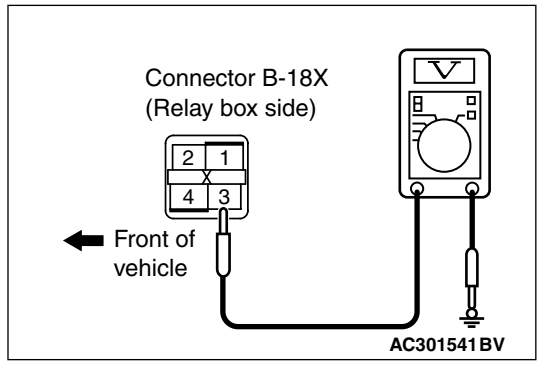
Refer to P.55A-54.

Q: Is the A/C compressor relay in good condition?
YES : Go to Step 6.
NO : Replace the A/C compressor relay.

STEP 6. Measure the voltage at B-18X 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.

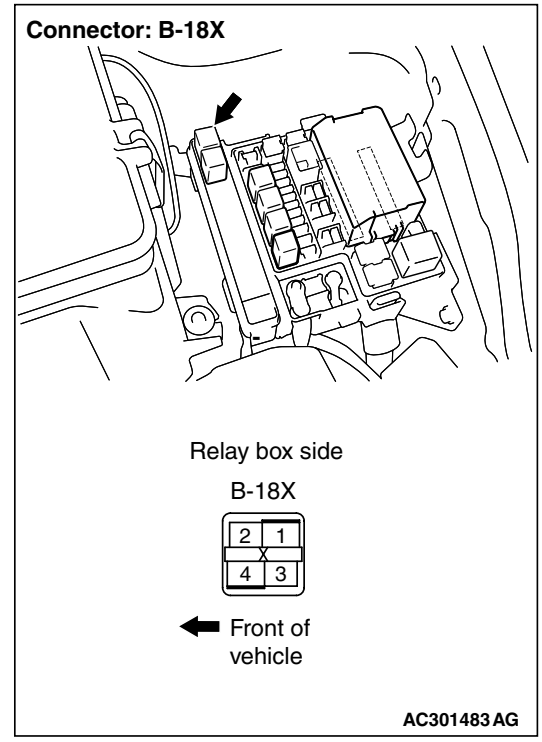


(3) Measure the voltage between terminal 3 and body earth.

OK: System voltage

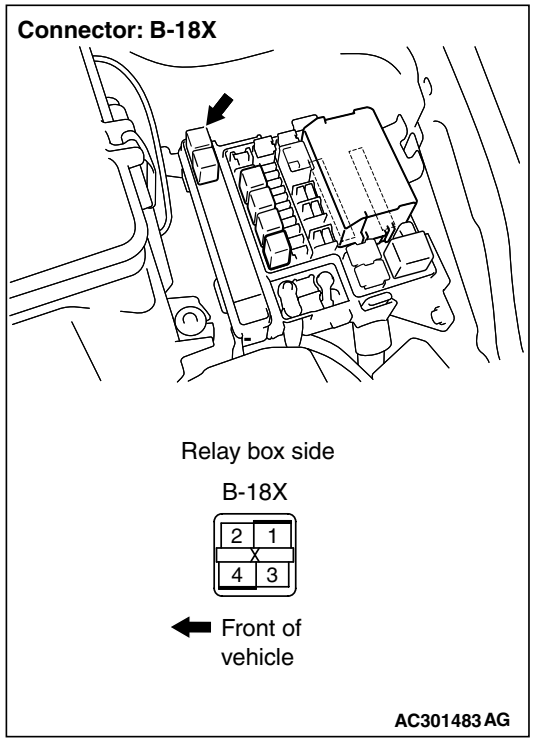
Q: Is the check result normal?
YES : Go to Step 9.
NO : Go to Step 7.

STEP 7. Connector check: B-18X A/C compressor relay connector



Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair or replace the connector.

STEP 8. Check the wiring harness between B-18X A/C compressor relay connector terminal No.3 and the ignition switch (IG2).



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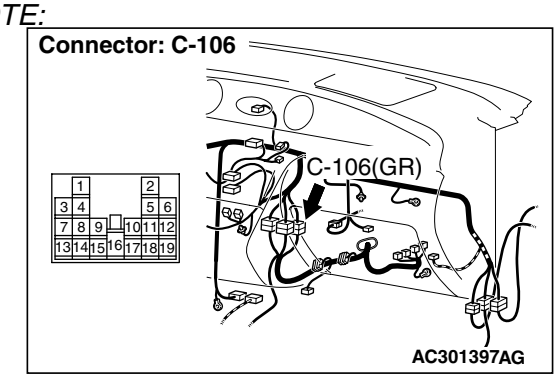
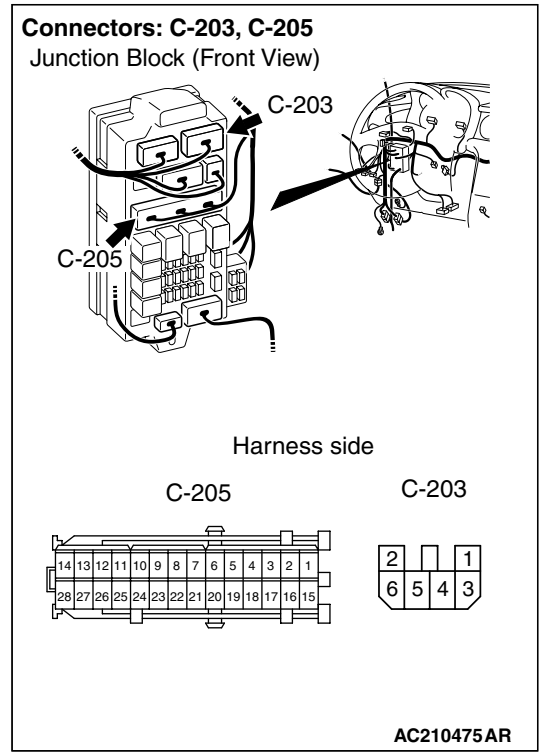




Prior to the wiring harness inspection, check intermediate connector C-106, junction block connectors C-203 and C-205, and repair if necessary.

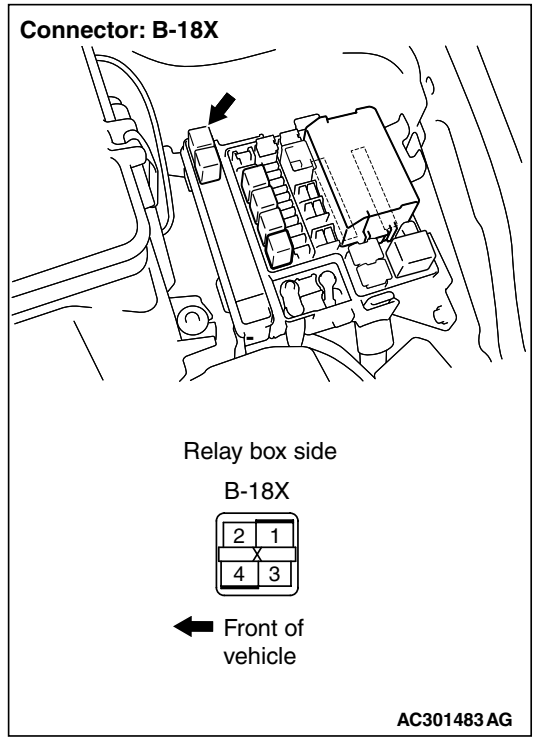
- Check the A/C compressor relay power supply line for open circuit.

Q: Is the check result normal?

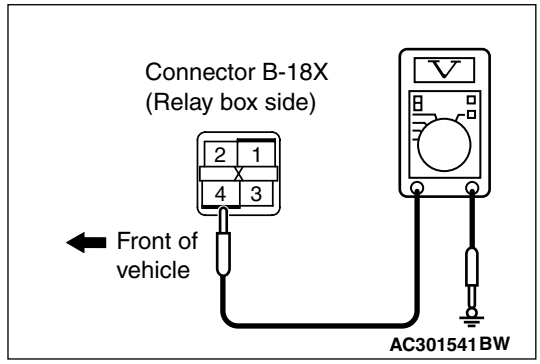
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).

NO : Repair the wiring harness.

STEP 9. Measure the voltage at B-18X A/C compressor relay connector.



(1) Remove the relay, and measure at the junction block side.

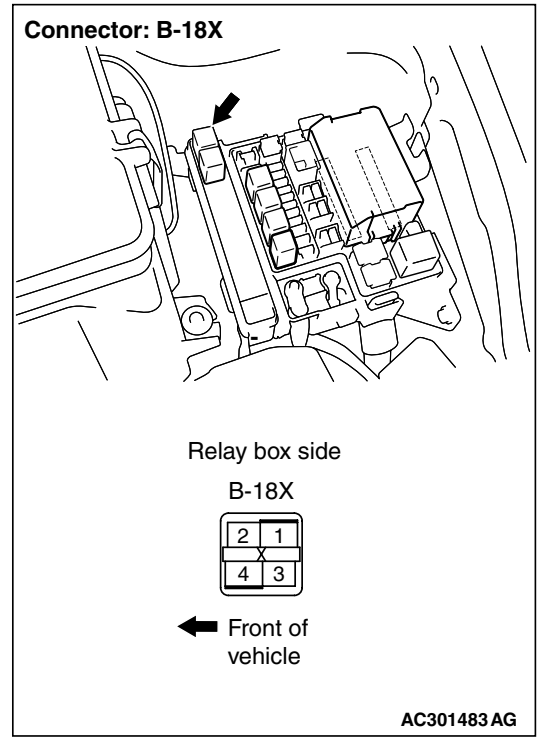


(2) Measure the voltage between terminal 4 and body earth.

OK: System voltage

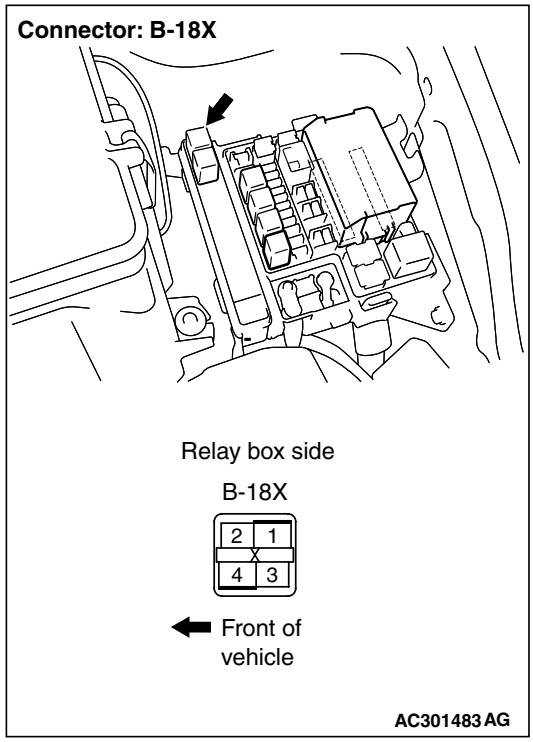
Q: Is the check result normal?
YES : Go to Step 12.
NO : Go to Step 10.

STEP 10. Connector check: B-18X A/C compressor relay connector



Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair or replace the connector.

STEP 11. Check the wiring harness between B-18X A/C compressor relay connector terminal No.4 and the battery.



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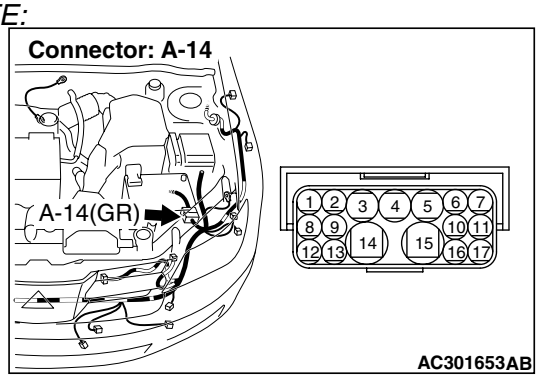


Prior to the wiring harness inspection, check intermediate connector A-14, and repair if necessary.

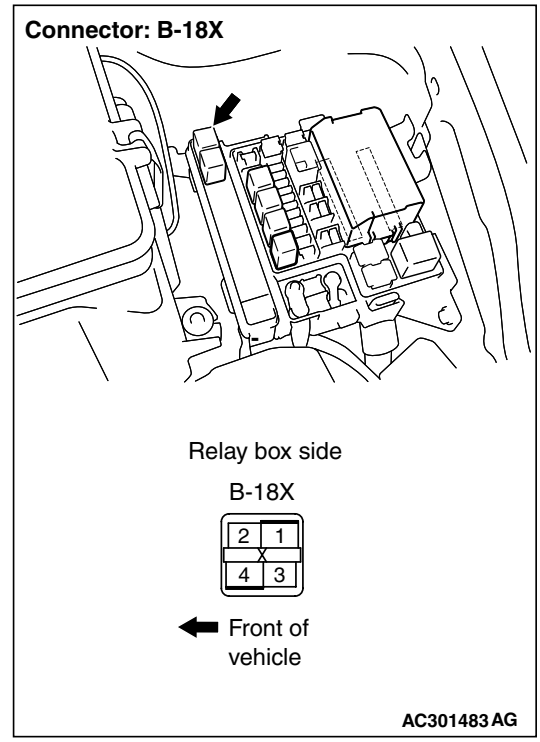
- Check the A/C compressor relay power supply line for open circuit.

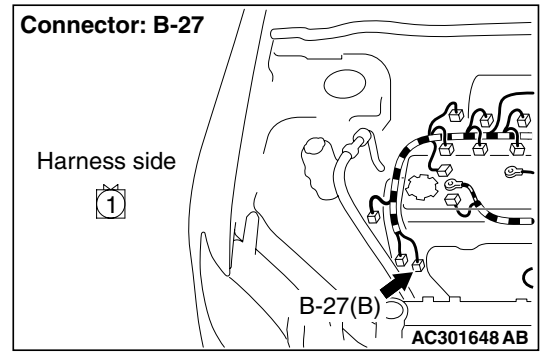
Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).

NO : Repair the wiring harness.

STEP 12. Connector check: B-18X A/C compressor relay connector and B-27 A/C compressor connector



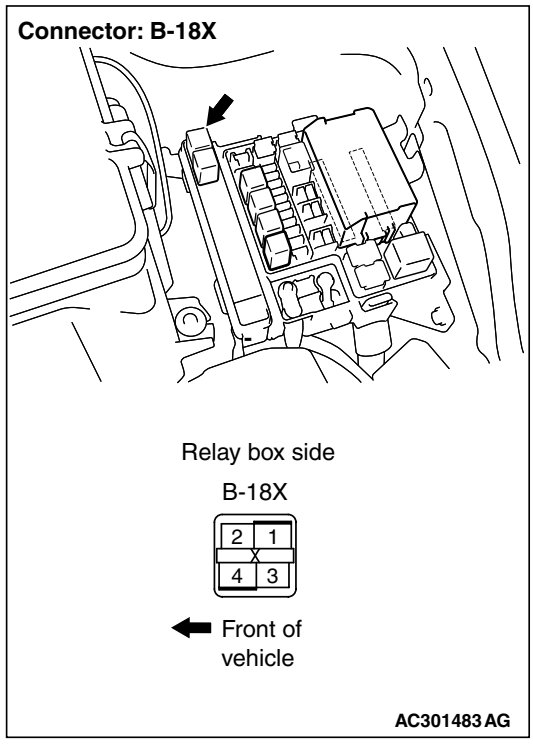


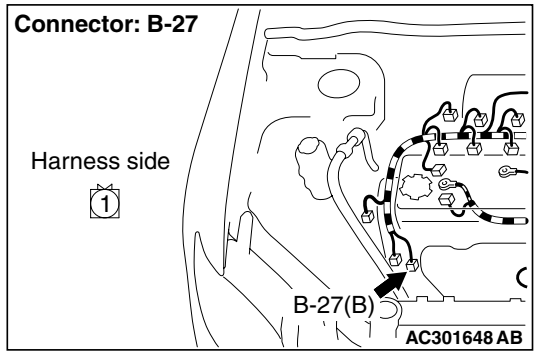
Q: Is the check result normal?

YES : Go to Step 13.

NO : Repair or replace the connector.

STEP 13. Check the wiring harness between B-18X A/C compressor relay connector terminal No.1 and B-27 A/C compressor connector terminal No.1.

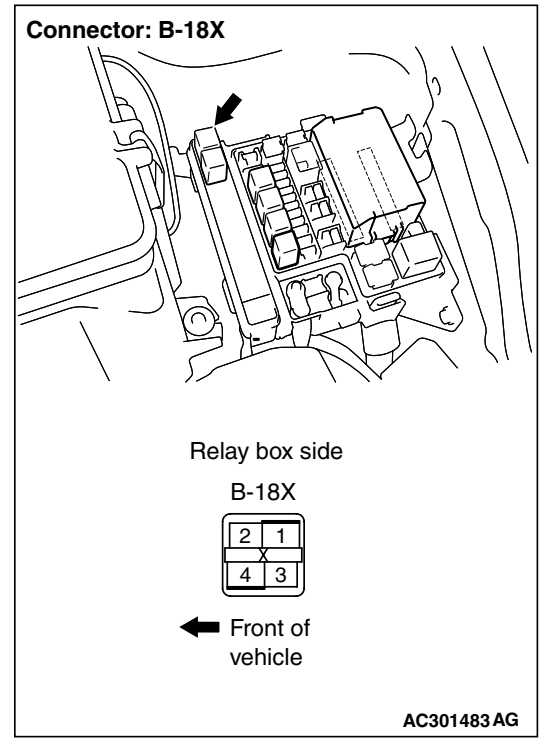


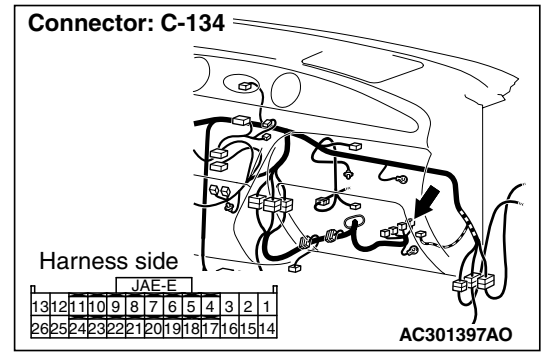


- Check the A/C compressor power supply line for open circuit.

Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the wiring harness.

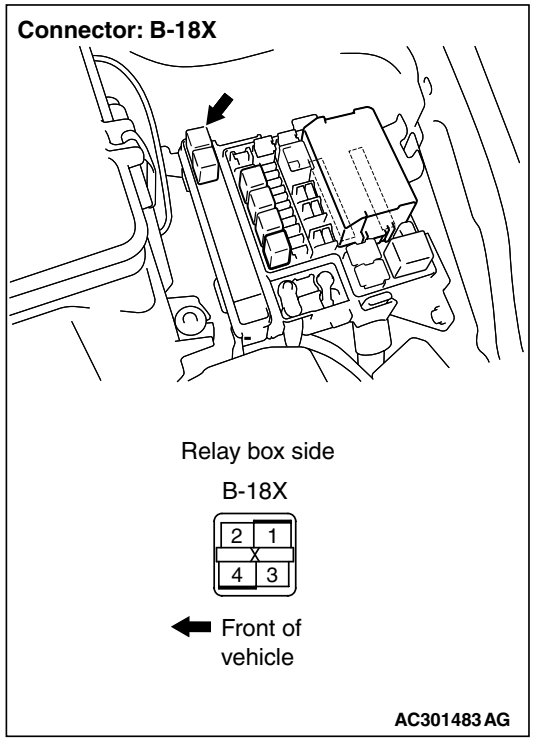
STEP 14. Connector check: C-134 engine-ECU connector and B-18X A/C compressor relay connector

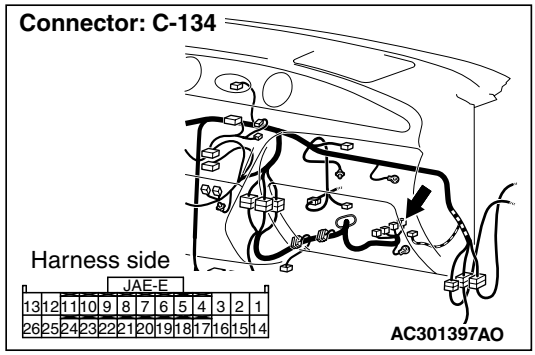




Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair or replace the connector.

STEP 15. Check the wiring harness between C-134 engine-ECU connector terminal No.8 and B-18X A/C compressor relay connector terminal No.2.





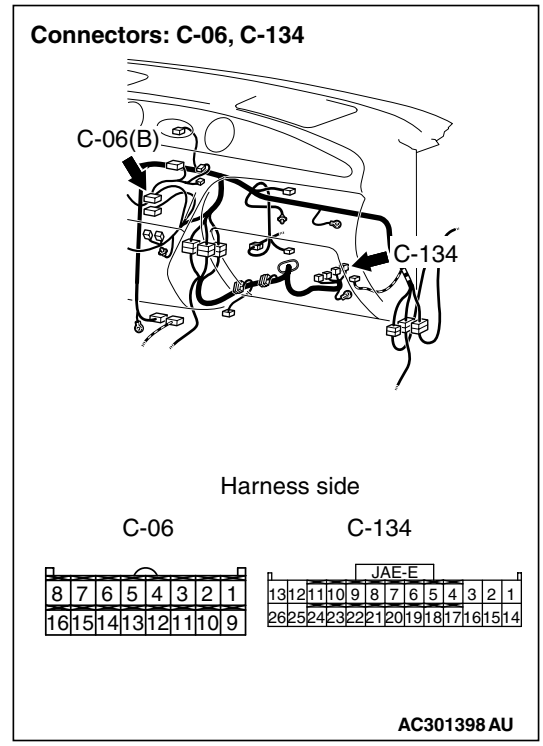
- Check the A/C compressor relay earth line for open or short circuit.

Q: Is the check result normal?

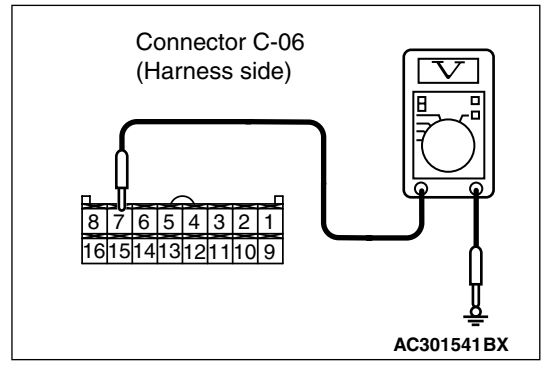
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).

NO : Repair the wiring harness.

STEP 16. Measure the voltage at C-06 A/C-ECU connector.



(1) Disconnect A/C-ECU connector C-06, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Disconnect engine-ECU connector C-134, and earth terminal 8.



(4) Measure the voltage between terminal 7 and body earth.

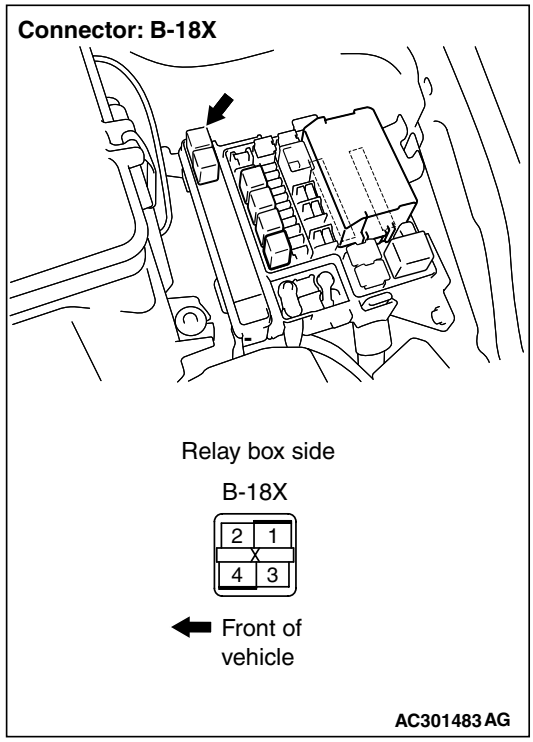
OK: System voltage

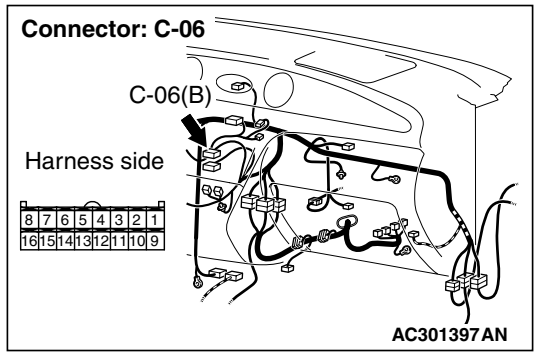
Q: Is the check result normal?

YES : Go to Step 19.

NO : Go to Step 17.

STEP 17. Connector check: B-18X A/C compressor relay connector and C-06 A/C-ECU connector



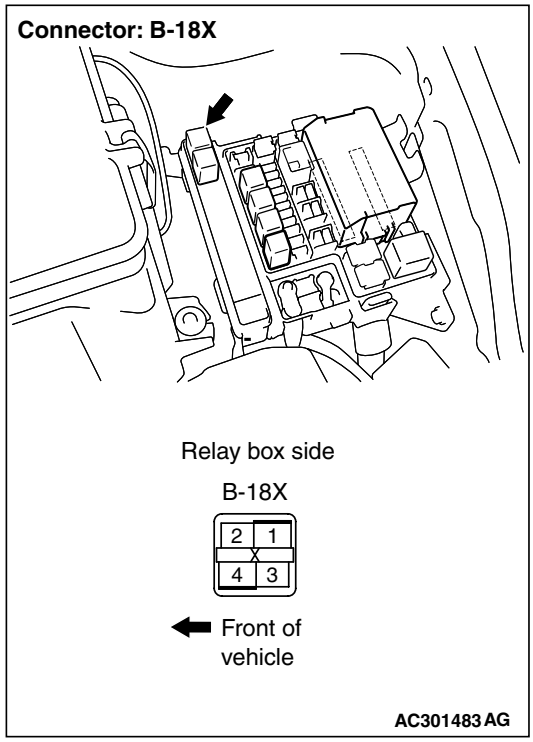


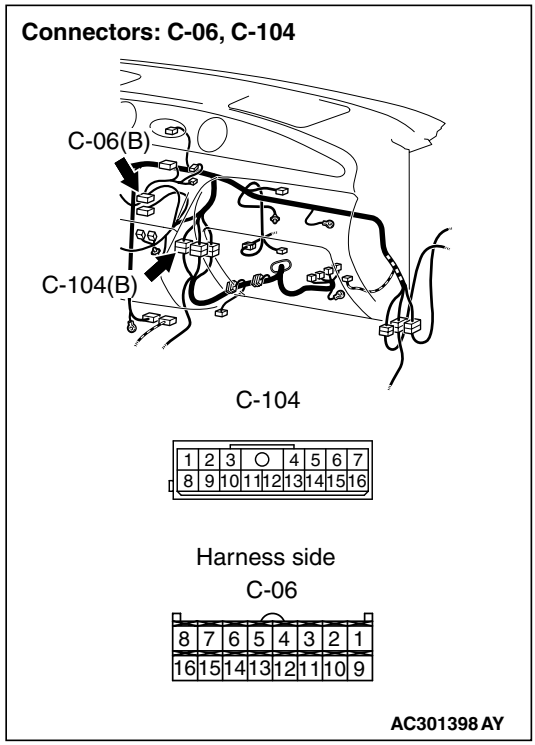
Q: Is the check result normal?

YES : Go to Step 18.

NO : Repair or replace the connector.

STEP 18. Check the wiring harness between B-18X A/C compressor relay connector terminal No.1 and C-06 A/C-ECU connector terminal No.7.



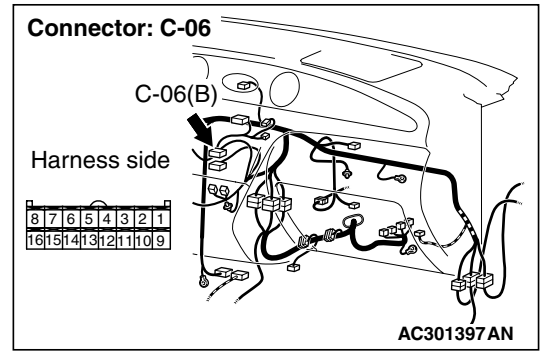


NOTE: Prior to the wiring harness inspection, check intermediate connector C-104, and repair if necessary.

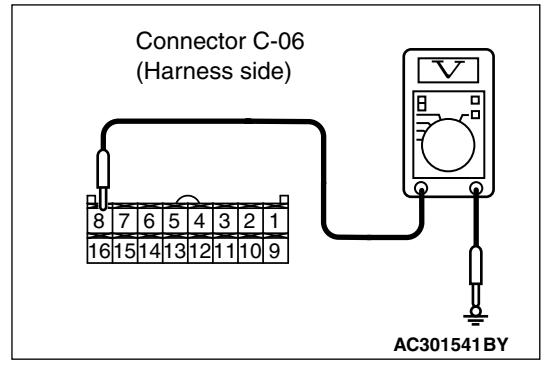
- Check the A/C compressor relay output line for open or short circuit.

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.00-6).
NO : Repair the wiring harness.

STEP 19. Measure the voltage at C-06 A/C-ECU connector.



(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Turn the blower switch to the "ON" position.

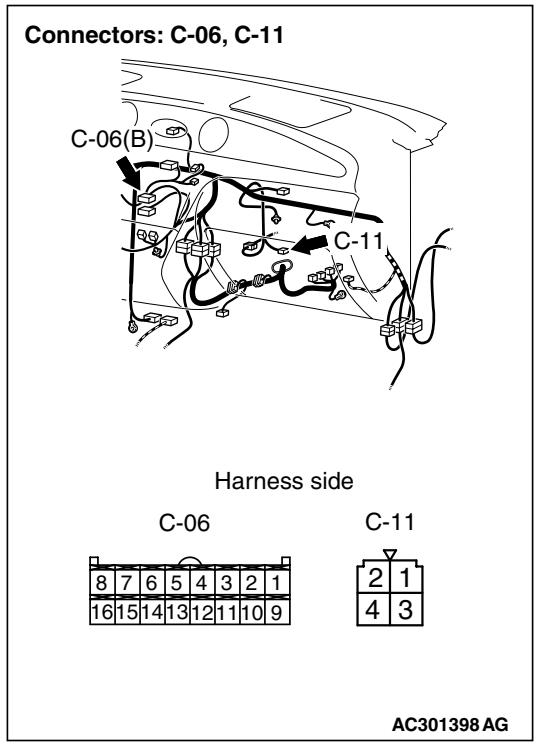


(4) Measure the voltage between terminal 8 and body earth.

OK: System voltage

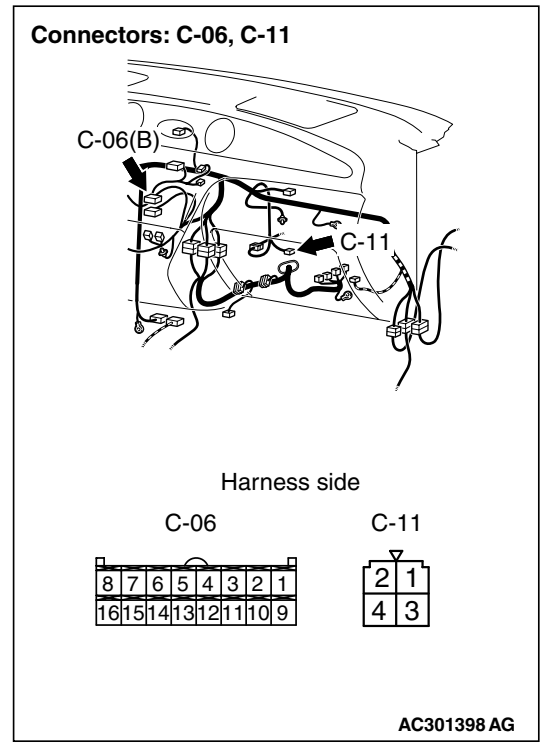
Q: Is the check result normal?
YES : Go to Step 22.
NO : Go to Step 20.

STEP 20. Connector check: C-11 resistor connector and C-06 A/C-ECU connector



Q: Is the check result normal?
YES : Go to Step 21.
NO : Repair or replace the connector.

STEP 21. Check the wiring harness between C-11 resistor connector terminal No.4 and C-06 A/C-ECU connector terminal No.8.



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.00-6)
NO : Repair the wiring harness.

STEP 22. Check the magnetic clutch operation.
Refer to P.55A-48.

Q: Can the sound of the magnetic clutch (click) be heard?
YES : Go to Step 23.
NO : Replace the compressor magnet clutch.

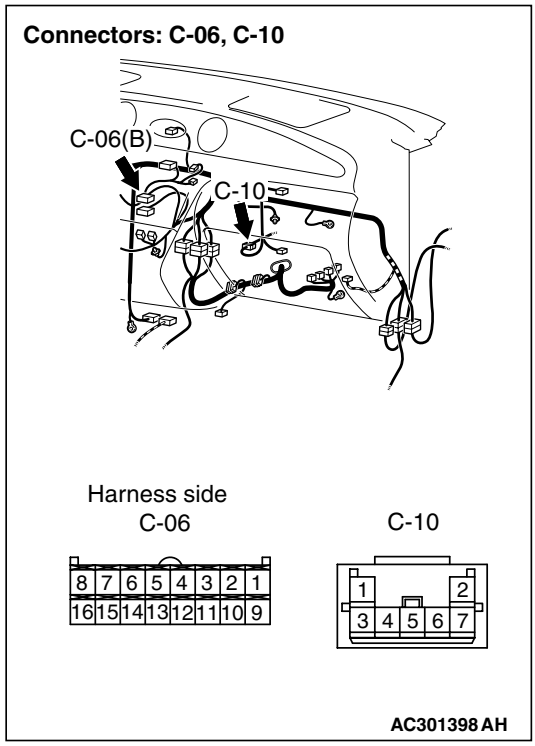
STEP 23. Check the refrigerant temperature switch.
Refer to P.55A-71.

Q: Is the refrigerant temperature switch operating properly?
YES : Go to Step 24.
NO : Replace the refrigerant temperature switch.

STEP 24. Check the air thermo sensor.
Refer to P.55A-67.

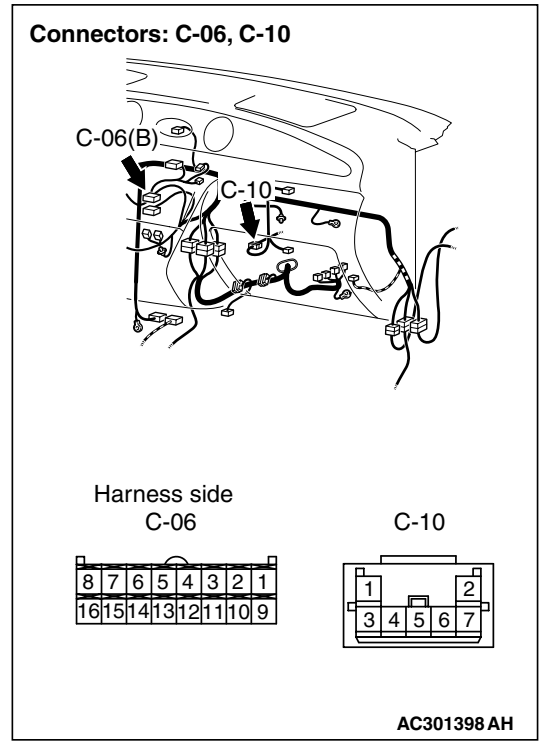
Q: Is the air thermo sensor in good condition?
YES : Go to Step 25.
NO : Replace the air thermo sensor.

STEP 25. Connector check: C-10 air thermo sensor connector and C-06 A/C-ECU connector



Q: Is the check result normal?
YES : Go to Step 26.
NO : Repair the connector.

STEP 26. Check the wiring harness between C-10 air thermo sensor connector (terminals 1, 3, 4 and 5) and C-06 A/C-ECU connector (terminals 14, 16 and 13).



- Check the air thermo sensor output and earth line for open or short circuit.

Q: Is the check result normal?
YES : Go to Step 27.
NO : Repair the wiring harness.

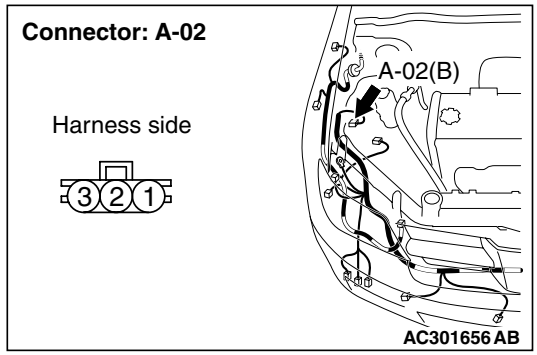
STEP 27. Check the refrigerant level.
Refer to P.55A-48.

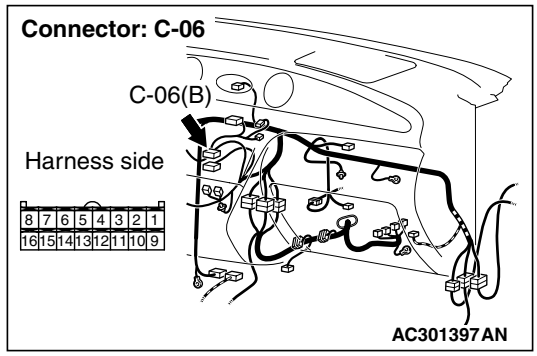
Q: Is the refrigerant level correct?
YES : Go to Step 28.
NO : Correct the refrigerant level (Refer to On-vehicle Service P.55A-49).

STEP 28. Check the A/C pressure sensor operation.
Refer to P.55A-48.

Q: Is the A/C pressure sensor operating properly?
YES : Go to Step 29.
NO : Replace the A/C pressure sensor.

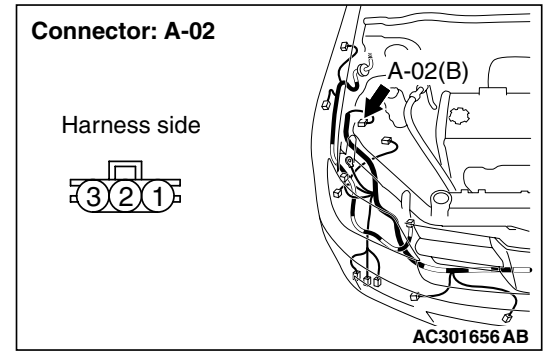
STEP 29. Connector check: A-02 A/C pressure sensor connector and C-06 A/C-ECU connector

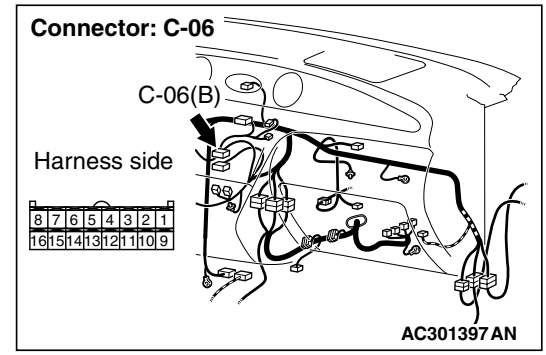




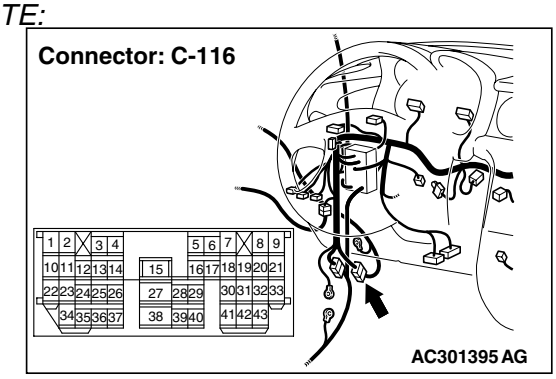
Q: Is the check result normal?
YES : Go to Step 30.
NO : Repair or replace the connector.

STEP 30. Check the wiring harness between A-02 A/C pressure sensor connector terminal No.2 and C-06 A/C-ECU connector terminal No.15.





NOTE:

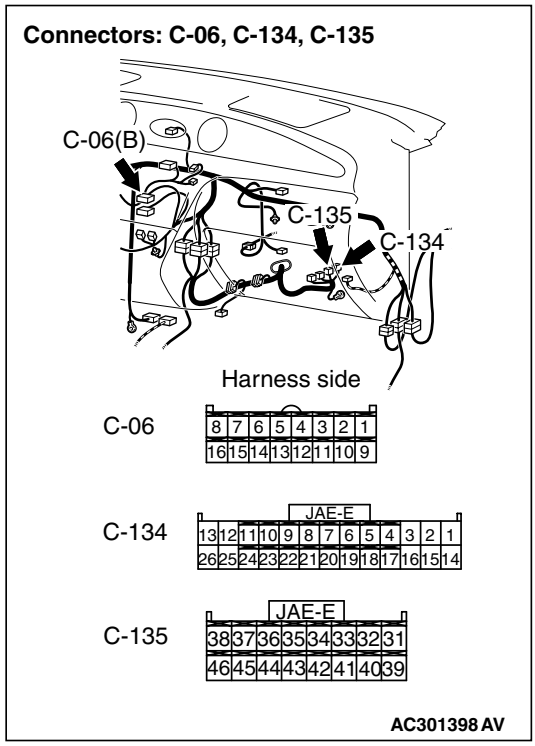


Prior to the wiring harness inspection, check intermediate connector C-116, and repair if necessary.

- Check the A/C pressure sensor output line for open or short circuit.

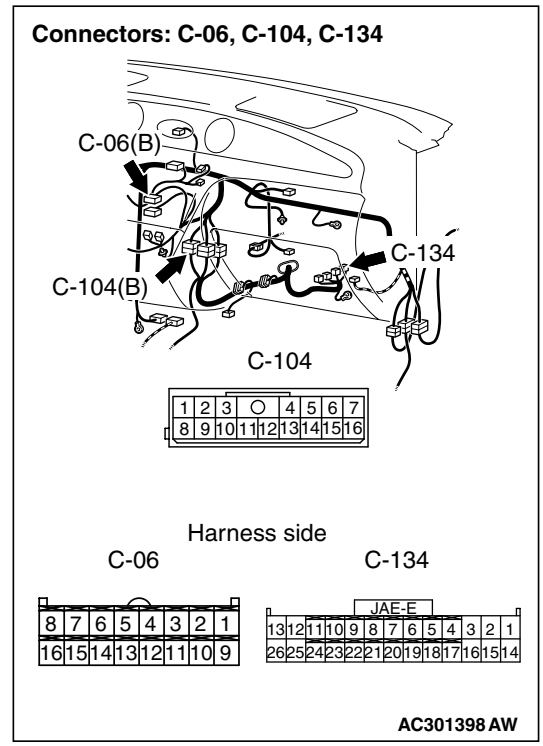
Q: Is the check result normal?
YES : Go to Step 31.
NO : Repair the wiring harness.

STEP 31. Connector check: C-134, C-135 engine-ECU connector and C-06 A/C-ECU connector



Q: Is the check result normal?
YES : Go to Step 32.
NO : Repair or replace the connector.

STEP 32. Check the wiring harness between C-134 engine-ECU connectors terminal No.24 and C-06 A/C-ECU connector terminal No.5.

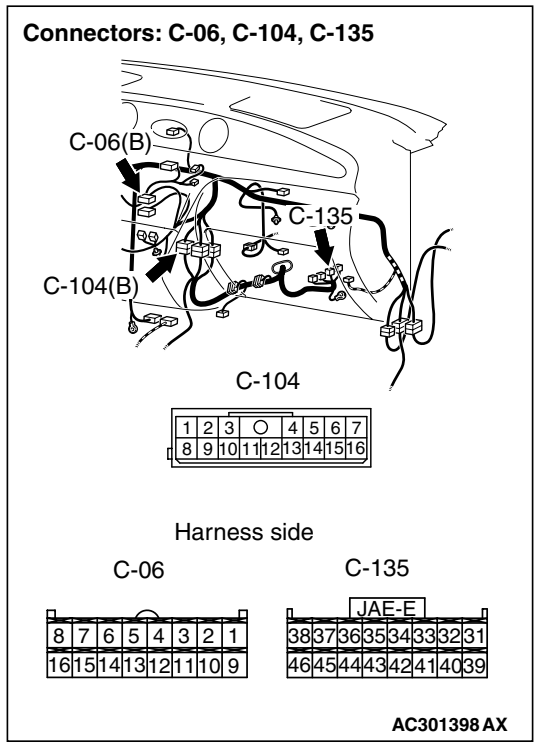


NOTE: Prior to the wiring harness inspection, check intermediate connector C-104, and repair if necessary.

- Check the communication line for open or short circuit.

Q: Is the check result normal?
YES : Go to Step 33.
NO : Repair the wiring harness.

STEP 33. Check the wiring harness between C-135 engine-ECU connectors terminal No.45 and C-06 A/C-ECU connector terminal No.4.



NOTE: Prior to the wiring harness inspection, check intermediate connector C-104, and repair if necessary.

- Check the communication line for open or short circuit.

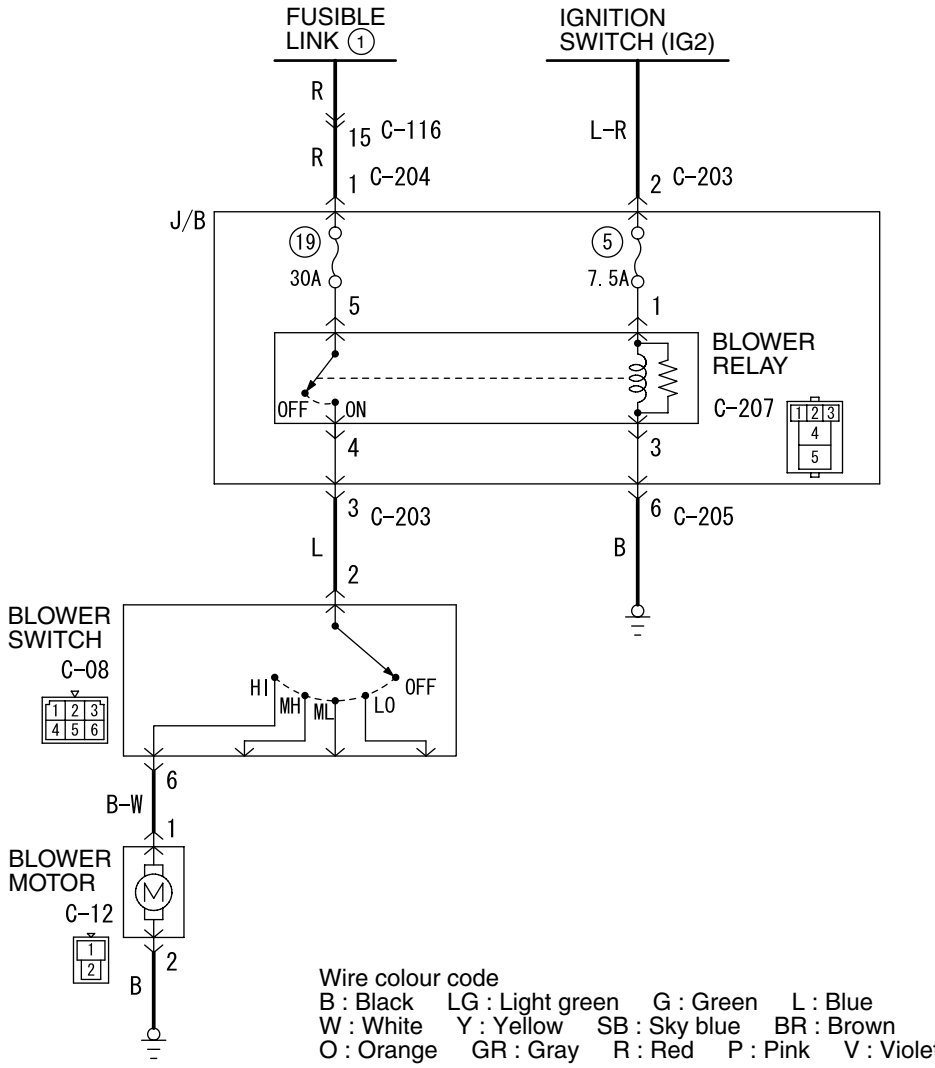
Q: Is the check result normal?

YES : Replace the manual air conditioner control panel (A/C-ECU) or engine-ECU.

NO : Repair the wiring harness.

INSPECTION PROCEDURE 4: Blower Fan and Motor do not Turn.

Blower Motor Circuit



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COMMENTS ON TROUBLE SYMPTOM

If the blower fan and motor does not turn when the blower switch is operated, the blower switch may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the blower relay
- Malfunction of the blower switch
- Damaged the wiring harness or connectors
- Malfunction of the blower motor

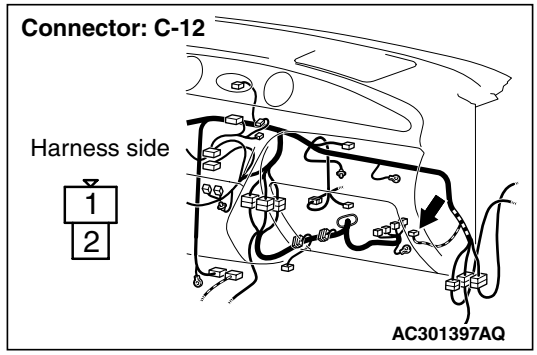
DIAGNOSIS

STEP 1. Check that the blower motor operates when the blower switch is moved to the "4 (HI) " position.

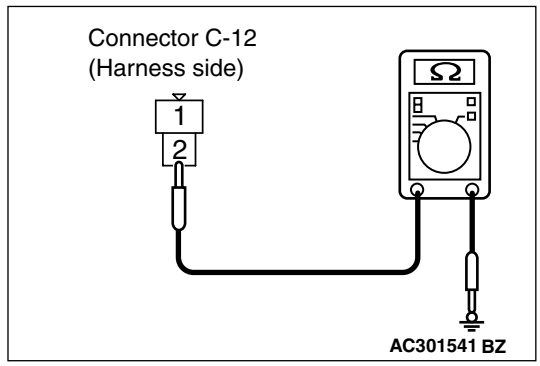
(1) Turn the ignition switch to the "ON" position.
(2) Turn the blower switch to the "4 (HI) " position.

Q: Does the blower motor operate when the blower switch is moved to the "4 (HI) " position?
YES : Refer to Inspection procedure 5 "Blower air amount cannot be changed P.55A-33."
NO : Go to Step 2.

STEP 2. Measure the resistance at the C-12 blower motor connector.



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

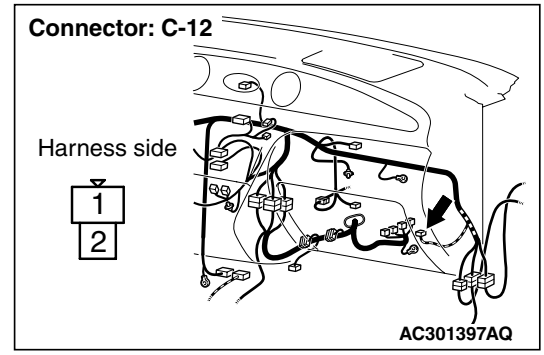


(2) Measure the resistance between terminal 2 and body earth.

OK: 2 ohm or less

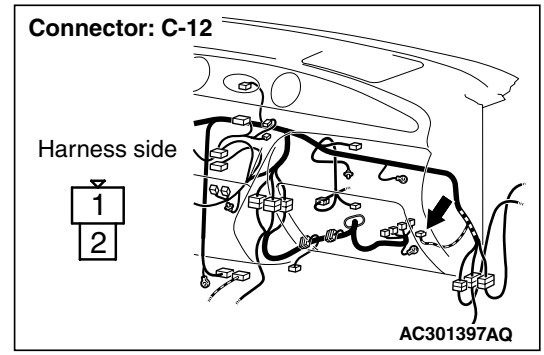
Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 3.

STEP 3. Connector check: C-12 blower motor connector



Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair or replace the connector.

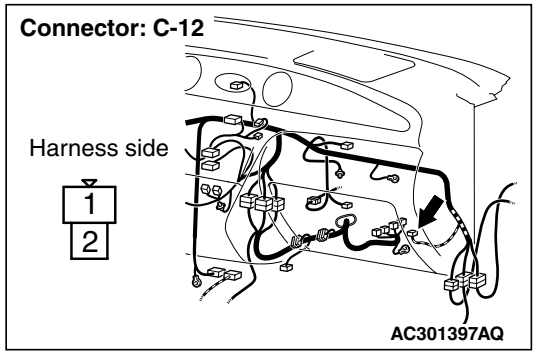
STEP 4. Check the wiring harness between C-12 blower motor connector terminal No.2 and body earth.



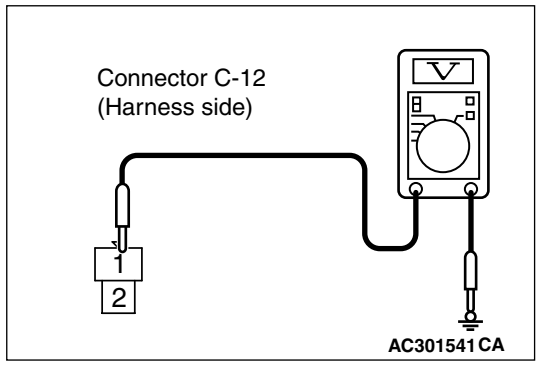
- Check the blower motor earth line for open circuit.

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.00-6).
NO : Repair the wiring harness.

STEP 5. Measure the voltage at C-12 blower motor connector.



(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Turn the blower switch to the "4 (HI) " position.



(4) Measure the voltage between terminal 1 and body earth.

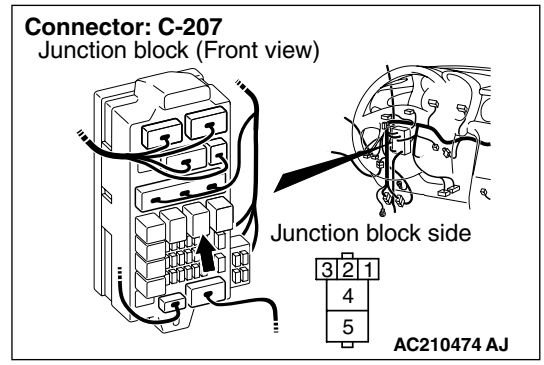
OK: System voltage

Q: Is the check result normal?
YES : Go to Step 21.
NO : Go to Step 6.

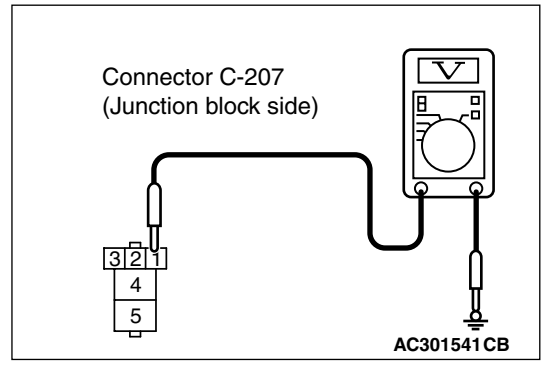
STEP 6. Check the blower relay continuity.
Refer to P.55A-54.

Q: Is the blower relay continuity in good condition?
YES : Go to Step 7.
NO : Replace the blower relay.

STEP 7. Measure the voltage at C-207 blower relay connector.



(1) Remove the relay, and measure at the junction block side.
(2) Turn the ignition switch to the "ON" position.

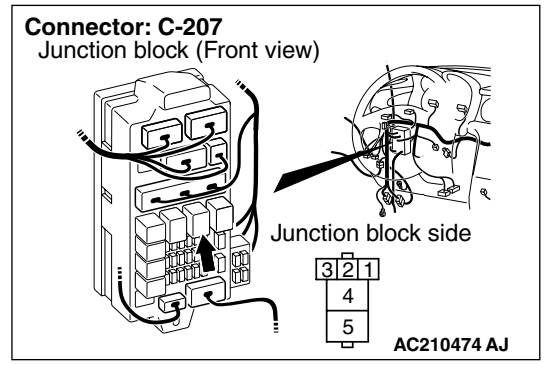


(3) Measure the voltage between terminal 1 and earth.

OK: System voltage

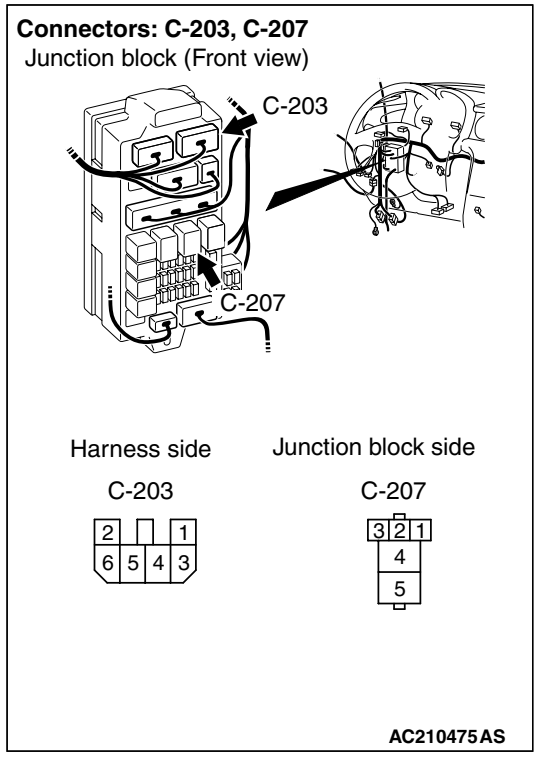
Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 8.

STEP 8. Connector check: C-207 blower relay connector



Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector.

STEP 9. Check the wiring harness between C-207 blower relay connector terminal No.1 and the ignition switch (IG2).



NOTE: Prior to the wiring harness inspection, check junction block connector C-203, and repair if necessary.

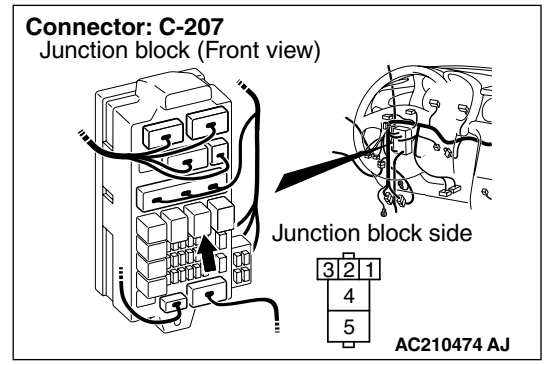
- Check the blower relay power supply line for open circuit.

Q: Is the check result normal?

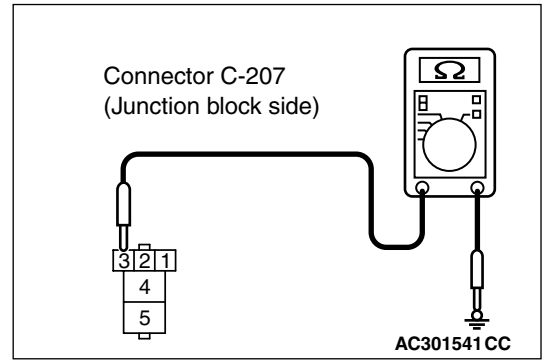
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).

NO : Repair the wiring harness.

STEP 10. Measure the resistance at C-207 blower relay connector.



(1) Remove the relay, and measure at the junction block side.



(2) Measure the resistance between terminal 3 and body earth.

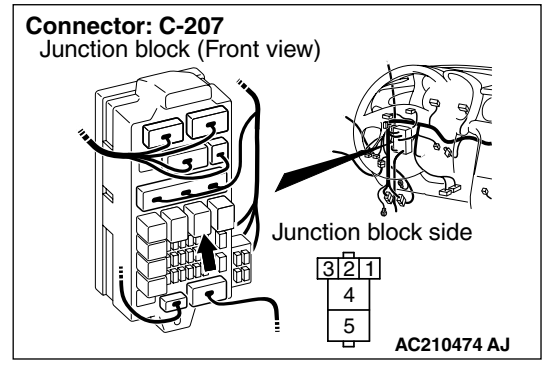
OK: 2 ohm or less

Q: Is the check result normal?

YES : Go to Step 13.

NO : Go to Step 11.

STEP 11. Connector check: C-207 blower relay connector.

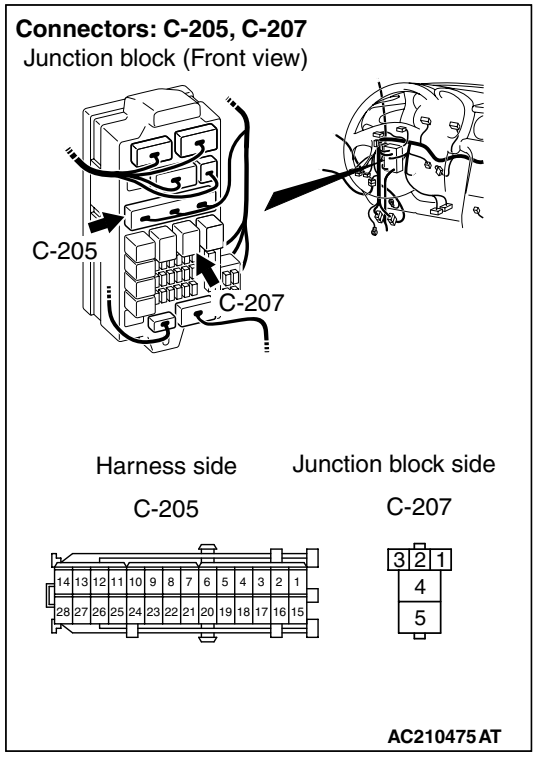


Q: Is the check result normal?

YES : Go to Step 12.

NO : Repair or replace the connector.

STEP 12. Check the wiring harness between C-207 blower relay connector terminal No.3 and earth.



NOTE: Prior to the wiring harness inspection, check junction block connectors C-205, and repair if necessary.

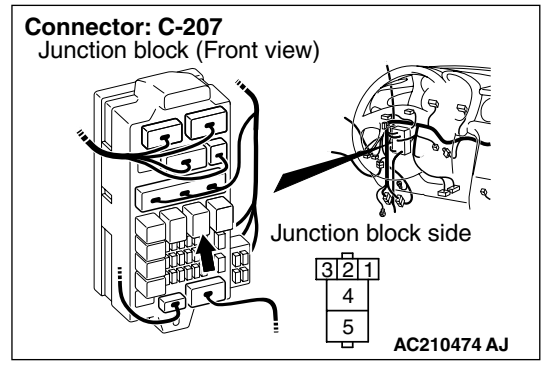
- Check the blower relay earth line for open circuit.

Q: Is the check result normal?

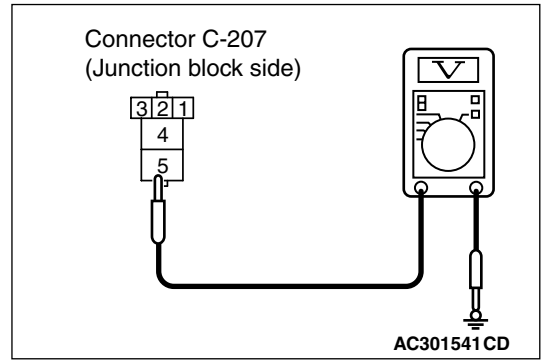
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).

NO : Repair the wiring harness.

STEP 13. Measure the voltage at C-207 blower relay connector.



(1) Remove the relay, and measure at the junction block side.



(2) Measure the voltage between terminal 5 and body earth.

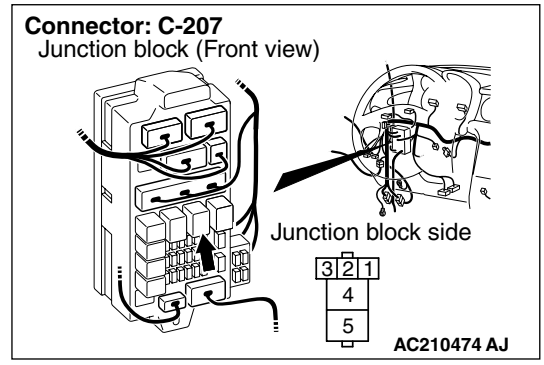
OK: System voltage

Q: Is the check result normal?

YES : Go to Step 16.

NO : Go to Step 14.

STEP 14. Connector check: C-207 blower relay connector

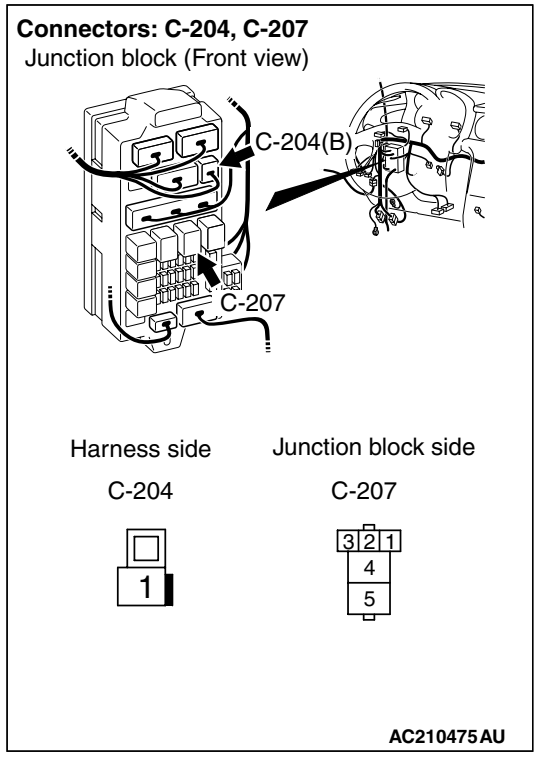


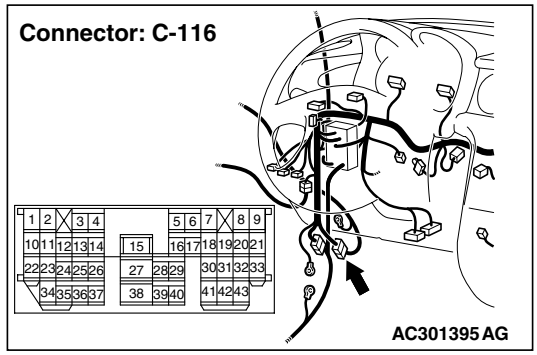
Q: Is the check result normal?

YES : Go to Step 15.

NO : Repair or replace the connector.

STEP 15. Check the wiring harness between C-207 blower relay connector terminal No.5 and fusible link (1).





NOTE: Prior to the wiring harness inspection, check intermediate connectors C-116 and junction block connector C-204, and repair if necessary.

- Check the blower relay power supply line for open 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.00-6).

NO : Repair the wiring harness.

STEP 16. Check the blower switch continuity.

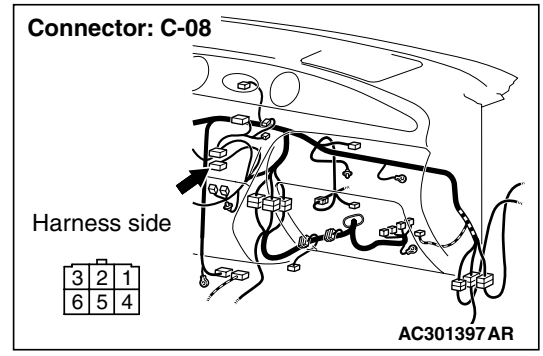
Refer to P.55A-58.

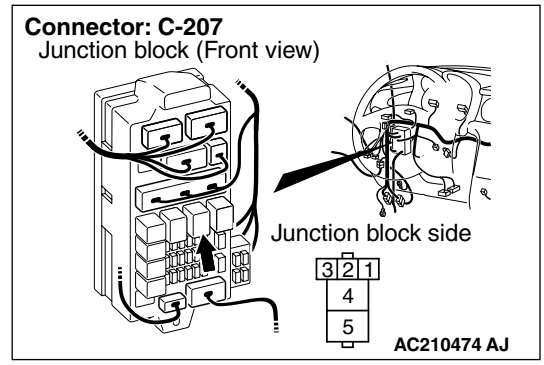
Q: Is the blower switch continuity in good condition?

YES : Go to Step 17.

NO : Replace the blower switch.

STEP 17. Connector check: C-08 blower switch connector and C-207 blower relay connector



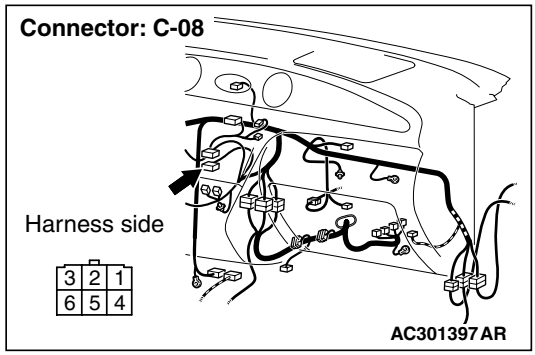


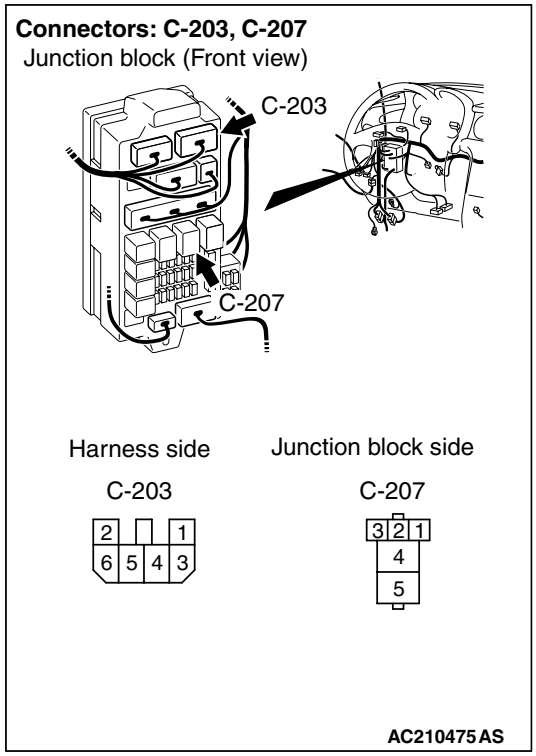
Q: Is the check result normal?

YES : Go to Step 18.

NO : Repair or replace the connector.

STEP 18. Check the wiring harness between C-08 blower switch connector terminal No.2 and C-207 blower relay connector terminal No.4.



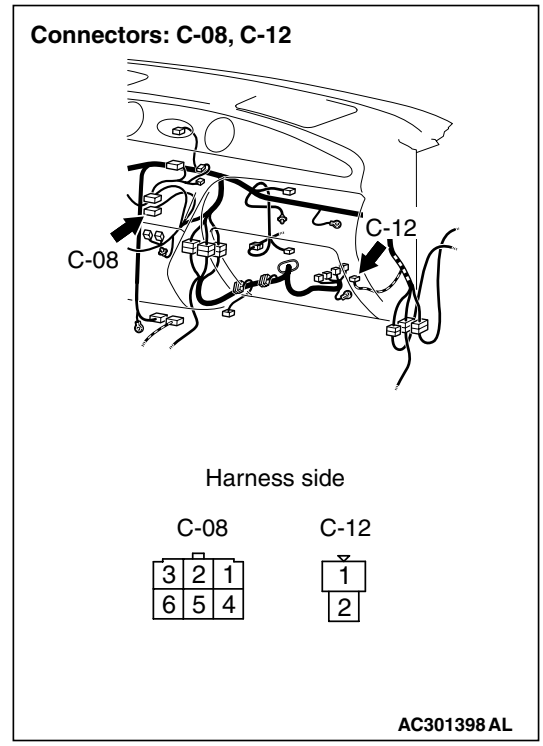


NOTE: Prior to the wiring harness inspection, check junction block connectors C-203, and repair if necessary.

- Check the blower relay output line for open circuit.

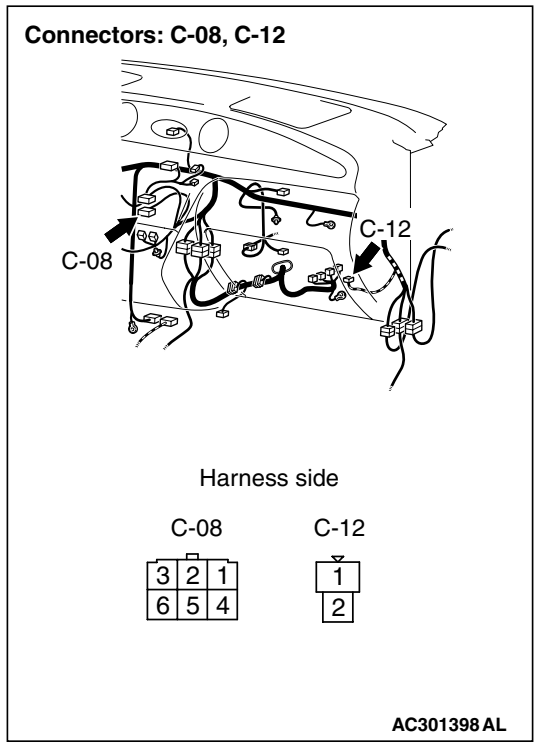
Q: Is the check result normal?
YES : Go to Step 19.
NO : Repair or replace the wiring harness.

STEP 19. Connector check: C-12 blower motor connector and C-08 blower switch connector



Q: Is the check result normal?
YES : Go to Step 20.
NO : Repair or replace the connector.

STEP 20. Check the wiring harness between C-12 blower motor connector terminal No.1 and C-08 blower switch connector terminal No.6.



- Check the blower motor power supply line for open 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.00-6).

NO : Repair the wiring harness.

STEP 21. Check the blower fan and motor operation.

Refer to P.55A-64.

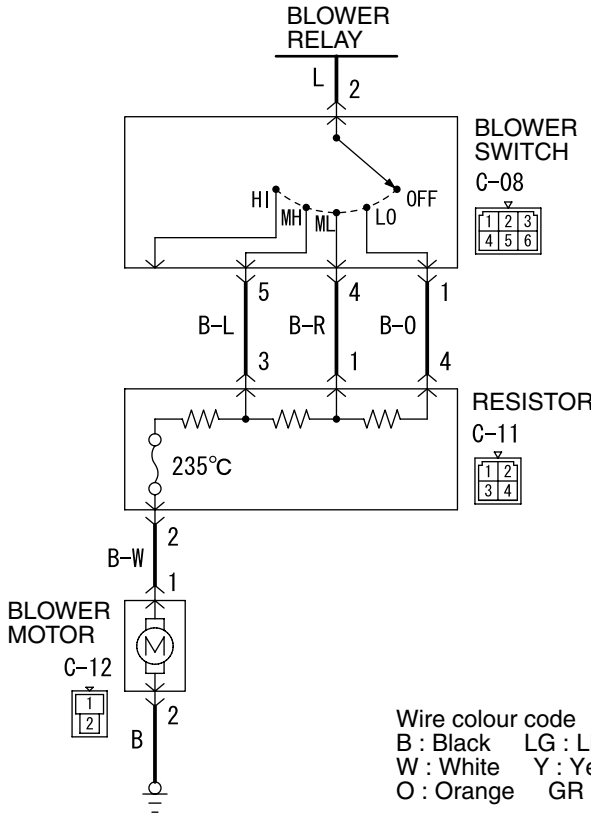
Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction P.00-6).

NO : Replace the blower motor.

INSPECTION PROCEDURE 5: Blower Air Amount cannot be Changed.

Blower Switch and Resistor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue
W : White Y : Yellow SB : Sky blue BR : Brown
O : Orange GR : Gray R : Red P : Pink V : Violet

W3Z03E04AA

COMMENTS ON TROUBLE SYMPTOM

If the blower air amount can not be changed when the blower switch is operated, the blower switch may be defective.

TROUBLESHOOTING HINTS

- Malfunction of the resistor
- Damaged the wiring harness or connectors
- Malfunction of the blower switch

DIAGNOSIS

STEP 1. Check that the blower motor operates when the blower switch is moved to the "4 (HI)" position.

(1) Turn the ignition switch to the "ON" position.
(2) Turn the blower switch to the "4 (HI) " position.

Q: Does the blower motor operate when the blower switch is moved to the "4 (HI)" position?
YES : Go to STEP 2.
NO : Refer to Inspection procedure 4 "Blower fan and motor do not turn P.55A-25."

STEP 2. Check the blower switch continuity.

Refer to P.55A-67.

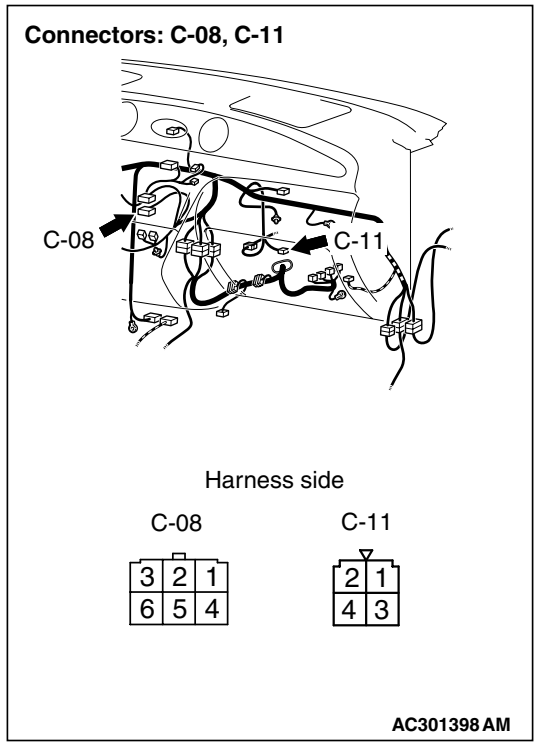
Q: Is the blower switch continuity in good condition?
YES : Go to Step 3.
NO : Replace the blower switch.

STEP 3. Check the resistor resistance value.

Refer to P.55A-64.

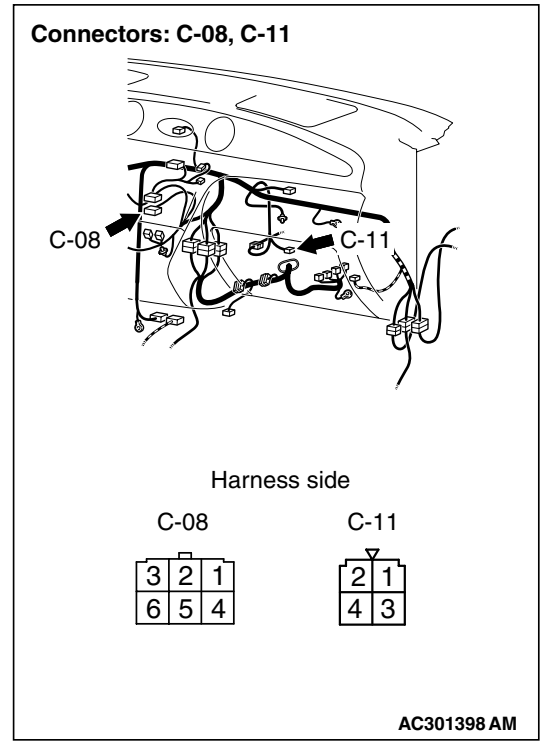
Q: Is the measured value at the standard value?
YES : Go to Step 4.
NO : Replace the resistor.

STEP 4. Connector check: C-08 blower switch connector and C-11 resistor connector



Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair or replace the connector.

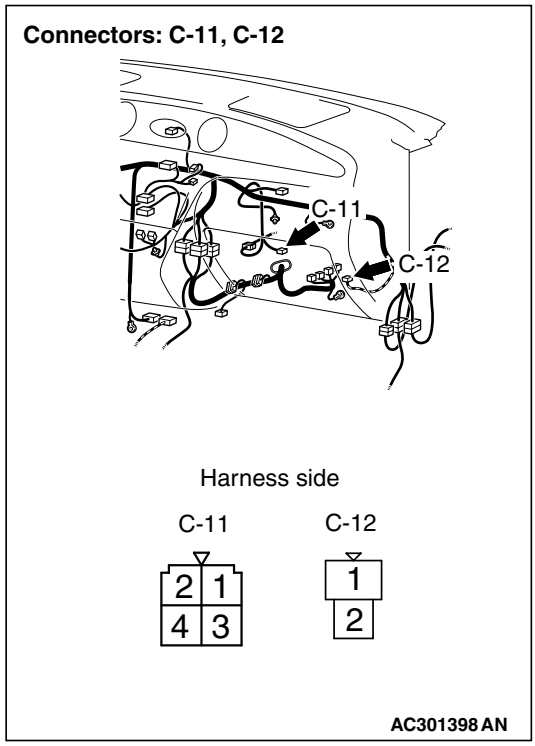
STEP 5. Check the wiring harness between C-08 blower switch connector (terminals 1, 4 and 5) and C-11 resistor connector (terminals 4, 1 and 3).



- Check the blower switch output line for open circuit.

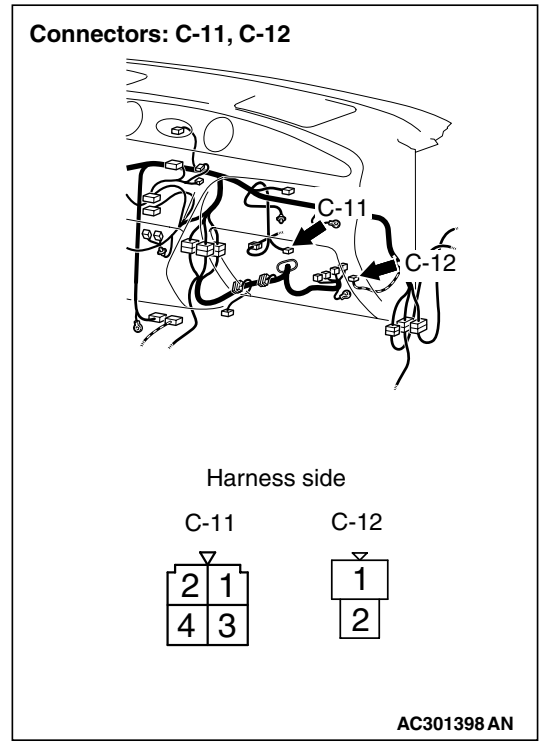
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

STEP 6. Connector check: C-11 resistor connector and C-12 blower motor connector



Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair or replace the connector.

STEP 7. Check the wiring harness between C-12 blower motor connector (terminal 1) and C-11 resistor connector (terminal 2).

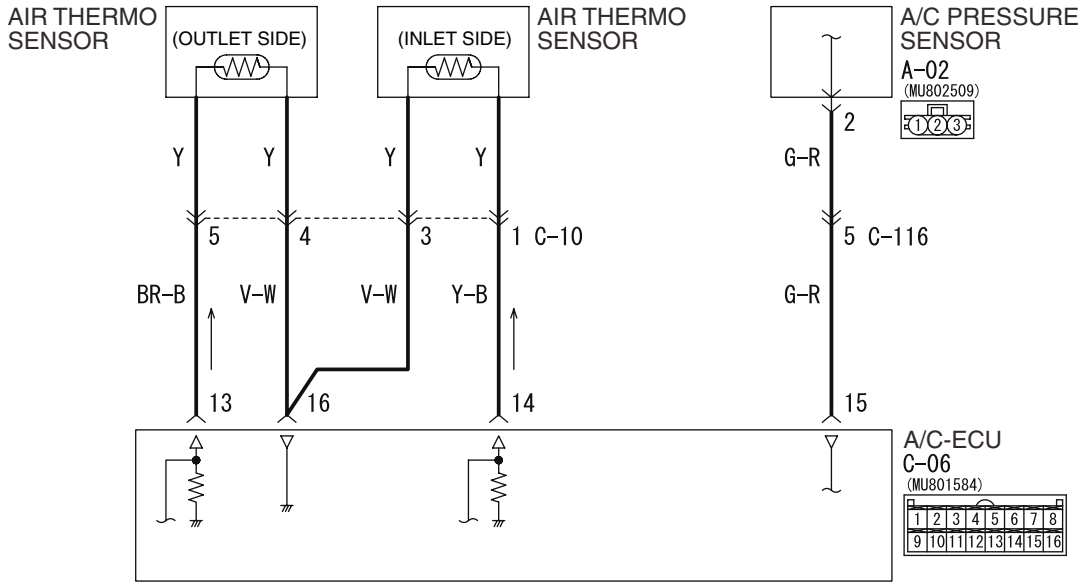


- Check the blower motor power supply line for open circuit.

Q: Is the check result normal?
YES : No action to be taken.
NO : Repair the wiring harness.

INSPECTION PROCEDURE 6: The A/C Indicator Flashes.

A/C Pressure Sensor and Air Thermo Sensor Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W3Z03E05AA

COMMENTS ON TROUBLE SYMPTOM

If the A/C indicator flashes then the possible causes may be due to a defective A/C pressure system or insufficient refrigerant gas.

TROUBLESHOOTING HINTS

- Malfunction of the A/C pressure sensor
- Malfunction of the air thermo sensor
- Malfunction of the manual air conditioner control panel (A/C-ECU)

DIAGNOSIS

STEP 1. Check the A/C pressure sensor operation.

Refer to P.55A-48.

Q: Is the A/C pressure sensor operating properly?

YES : Go to Step 2.

NO : Replace the A/C pressure sensor.

STEP 2. Check the air thermo sensor.

Refer to P.55A-67.

Q: Is the air thermo sensor in good condition?

YES : Go to Step 3.

NO : Replace the air thermo sensor.

STEP 3. Check the refrigerant level.

Refer to P.55A-48.

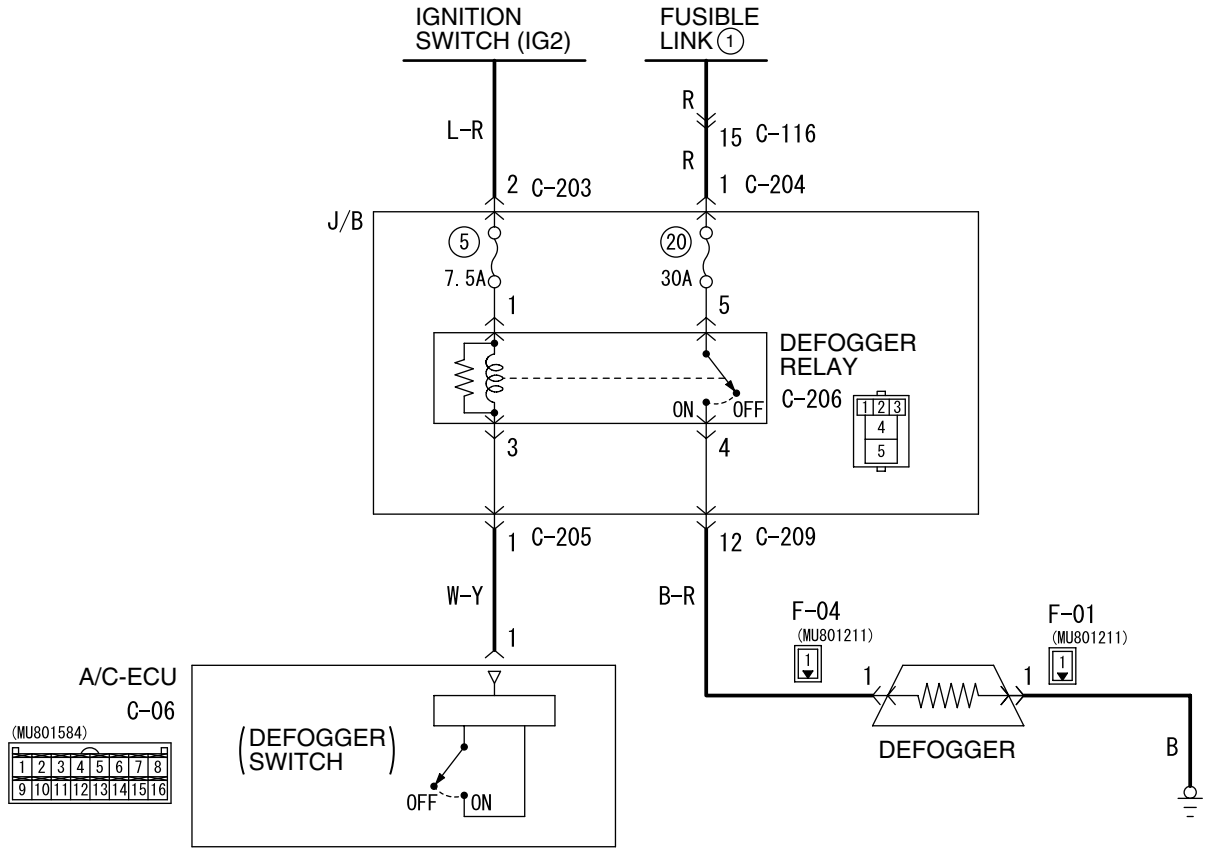
Q: Is the refrigerant level correct?

YES : Replace the manual air conditioner control panel (A/C-ECU).

NO : Correct the refrigerant level (Refer to P.55A-53).

INSPECTION PROCEDURE 7: Defogger Function does not Operate.

Defogger Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W3Z03E06AA

COMMENTS ON TROUBLE SYMPTOM

If the defogger does not operate when the defogger switch is turned on, the defogger relay system may be defective.

TROUBLESHOOTING HINTS

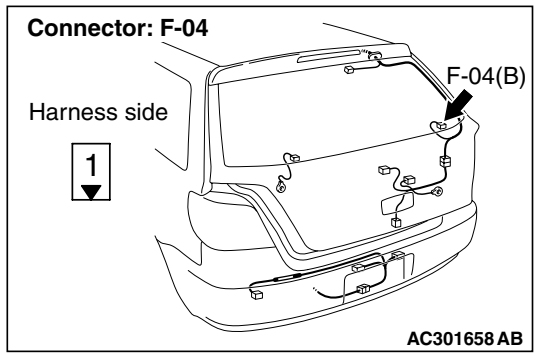
- Malfunction of the defogger relay
- Malfunction of the defogger
- Damaged the wiring harness or connectors
- Malfunction of the manual air conditioner control panel (A/C-ECU)

DIAGNOSIS

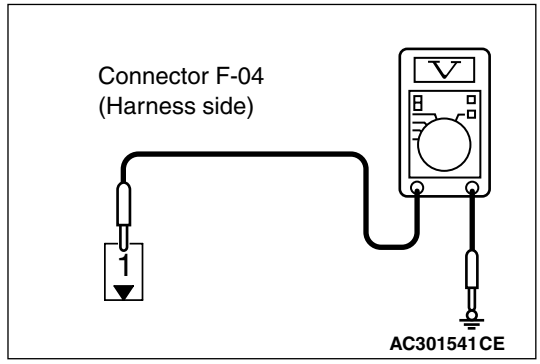
STEP 1. Check the A/C and outside/inside air selection damper control motor operation.

Q: Do the A/C and outside/inside air selection damper control motor work normally?
YES : Go to Step 2.
NO : Refer to Inspection procedure 9 "Malfunction of the A/C-ECU Power Supply system P.55A-44."

STEP 2. Measure the voltage at defogger connector F-04.



(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Turn the defogger switch to the "ON " position. (operate for approx. 11 minutes)



(4) Measure the voltage between terminal 1 and body earth.

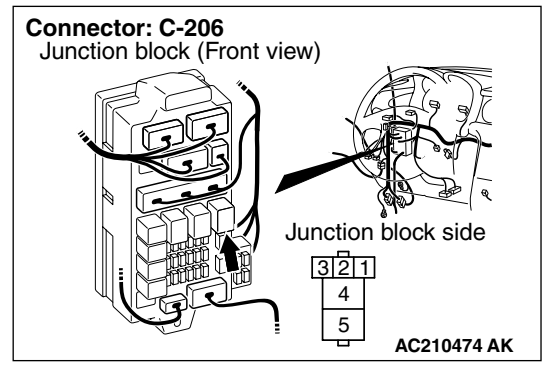
OK: System voltage

Q: Is the check result normal?
YES : Go to Step 14.
NO : Go to Step 3.

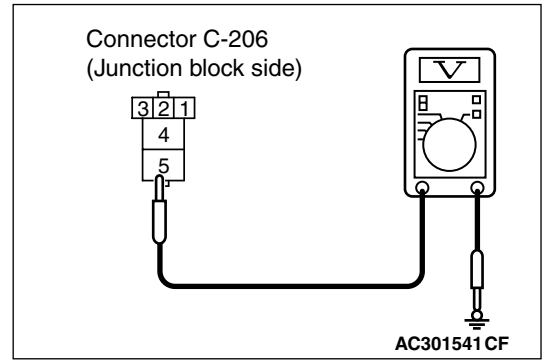
STEP 3. Check the defogger relay continuity.
Refer to P.55A-54.

Q: Is the Defogger relay continuity in good condition?
YES : Go to Step 4.
NO : Replace the defogger relay.

STEP 4. Measure the voltage at defogger relay connector C-206.



(1) Remove the relay, and measure at the junction block side.

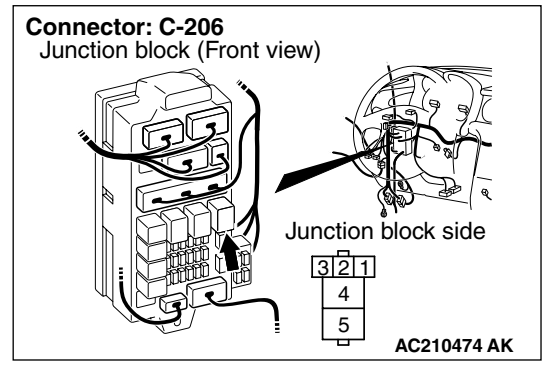


(2) Measure the voltage between terminal 5 and body earth.

OK: System voltage

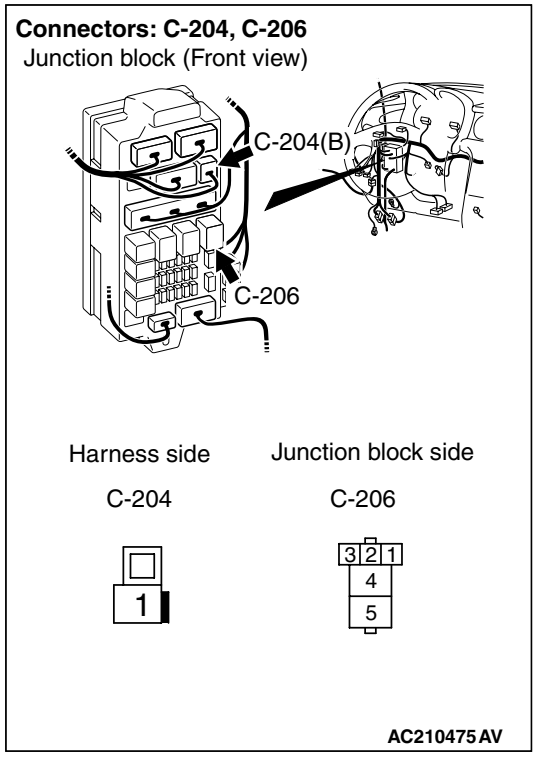
Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 5.

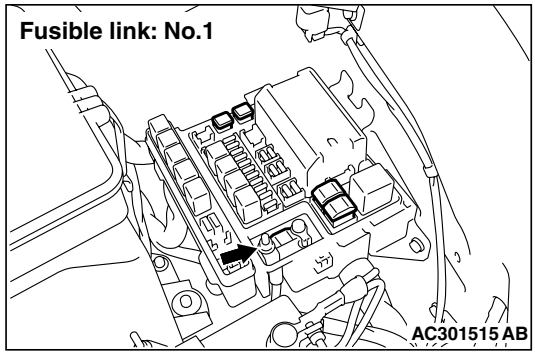
STEP 5. Connector check: C-206 defogger relay connector



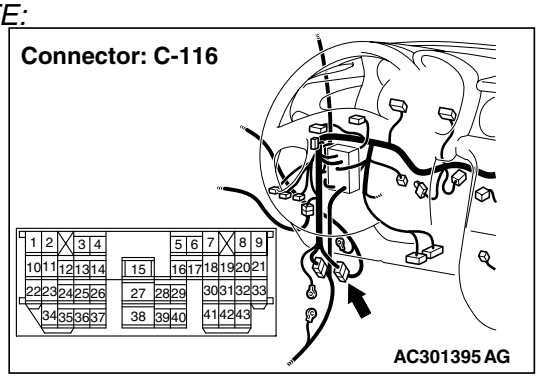
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair or replace the connector.

STEP 6. Check the wiring harness between C-206 defogger relay connector terminal No.5 and the fusible link (1).





NOTE:

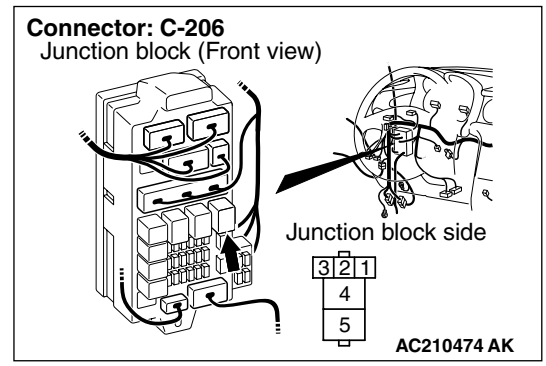


Prior to the wiring harness inspection, check intermediate connector C-116 and junction block connector C-204, and repair if necessary.

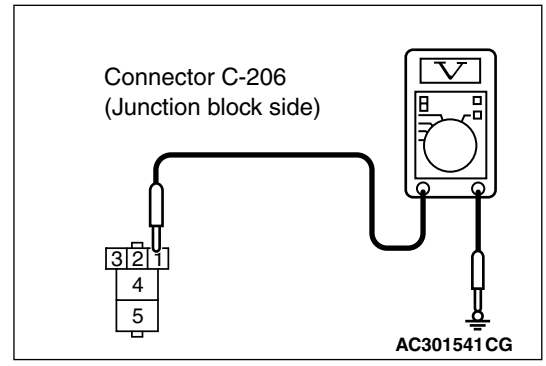
- Check the defogger relay power supply line for open circuit.

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.00-6).
NO : Repair the wiring harness.

STEP 7. Measure the voltage at defogger relay connector C-206.



(1) Remove the relay, and measure at the junction block side.
(2) Turn the ignition switch to the "ON" position.

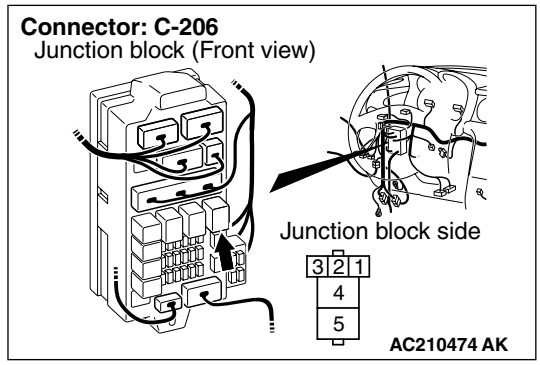


(3) Measure the voltage between terminal 1 and earth.

OK: System voltage

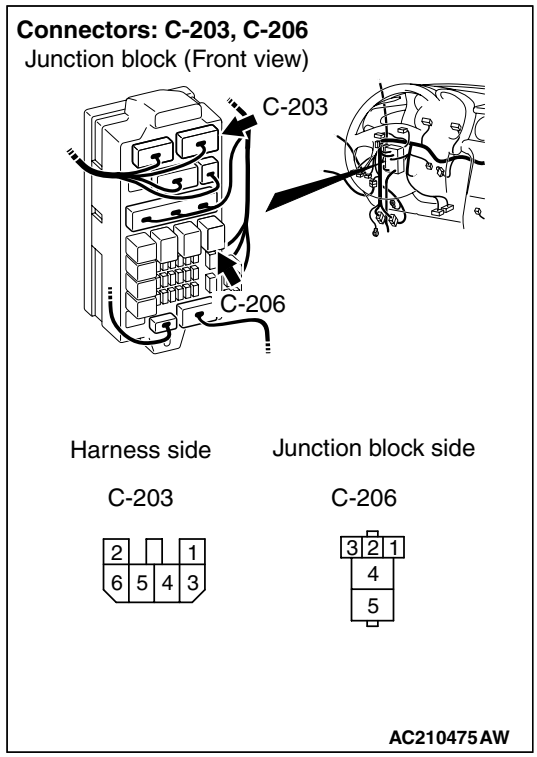
Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 8.

STEP 8. Connector check: C-206 defogger relay connector



Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair or replace the connector.

STEP 9. Check the wiring harness between C-206 defogger relay connector terminal No.1 and ignition switch (IG2).

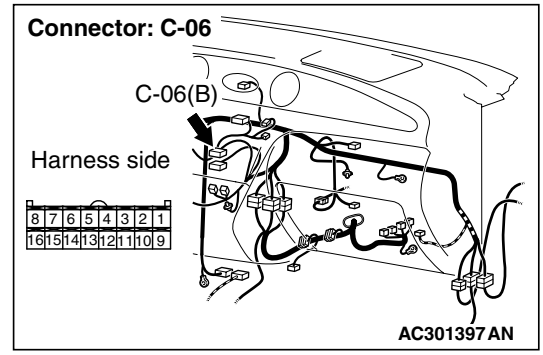


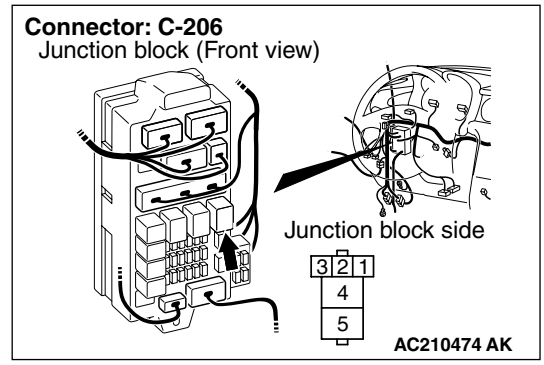
NOTE: Prior to the wiring harness inspection, check junction block connector C-203, and repair if necessary.

- Check the defogger relay power supply line for open 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.00-6).
NO : Repair the wiring harness.

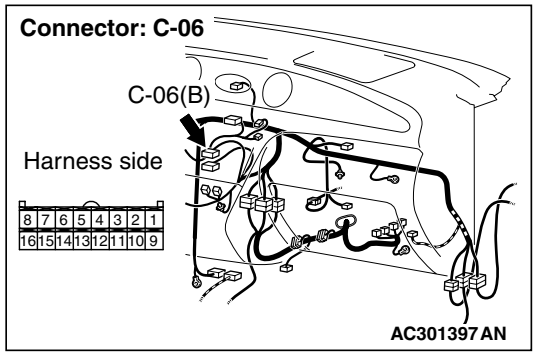
STEP 10. Connector check: C-206 defogger relay connector and C-06 A/C-ECU connector.

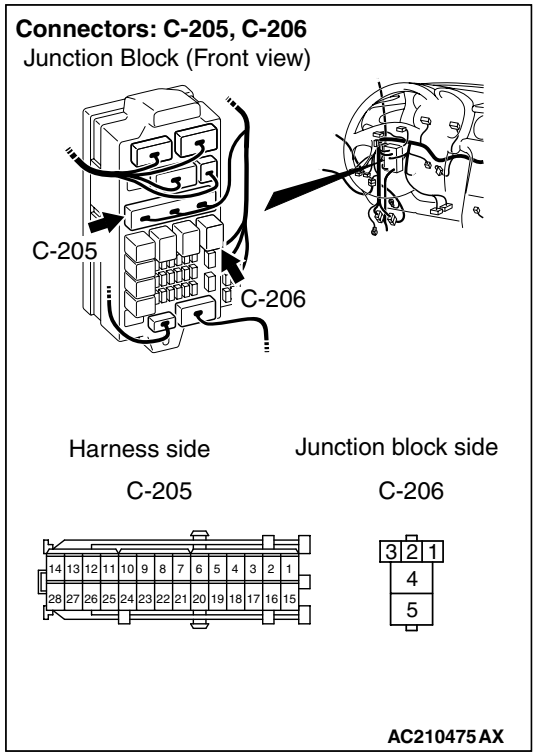




Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair or replace the connector.

STEP 11. Check the wiring harness between C-206 defogger relay connector terminal No.3 and C-06 A/C-ECU connector terminal No.1.



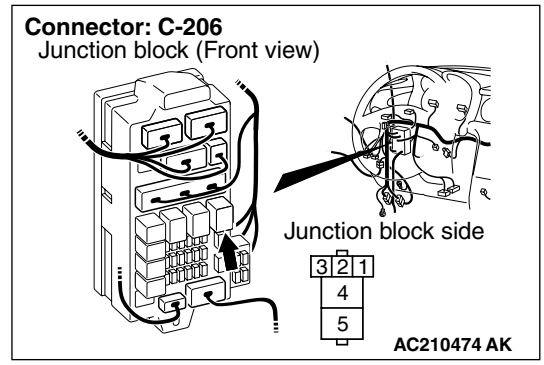


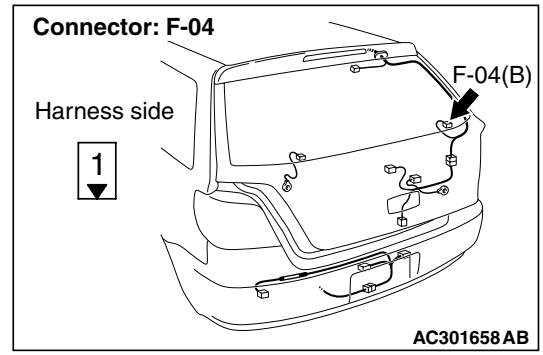
NOTE: Prior to the wiring harness inspection, check junction block connector C-205, and repair if necessary.

- Check the defogger relay earth line for open or short circuit.

Q: Is the check result normal?
YES : Go to Step 12.
NO : Repair the wiring harness.

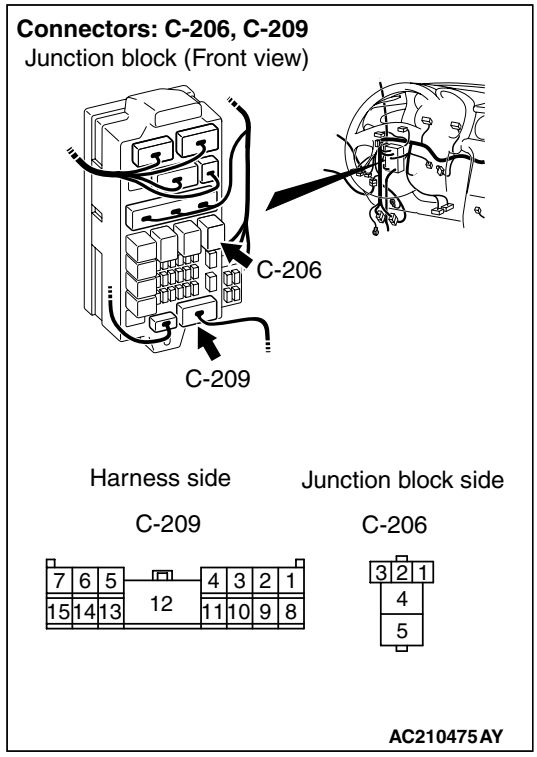
STEP 12. Connector check: C-206 defogger relay connector and F-04 defogger connector

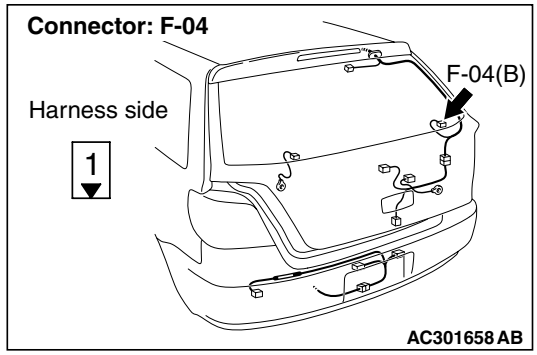




Q: Is the check result normal?
YES : Go to Step 13.
NO : Repair or replace the connector.

STEP 13. Check the wiring harness between C-206 defogger relay connector terminal No.4 and F-04 defogger connector terminal No.1.





NOTE: Prior to the wiring harness inspection, check junction block connector C-209, and repair if necessary.

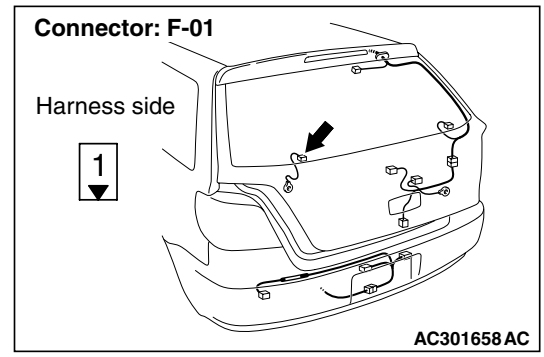
- Check the defogger relay output line for open circuit.

Q: Is the check result normal?

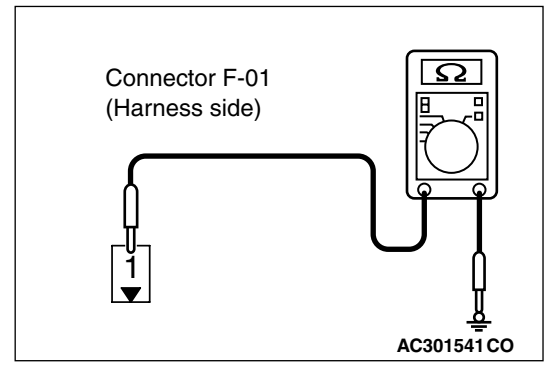
YES : Replace the manual air conditioner control panel (A/C-ECU).

NO : Repair the wiring harness.

STEP 14. Measure the resistance at defogger connector F-01.



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



(2) Measure the resistance value between terminal 1 and earth.

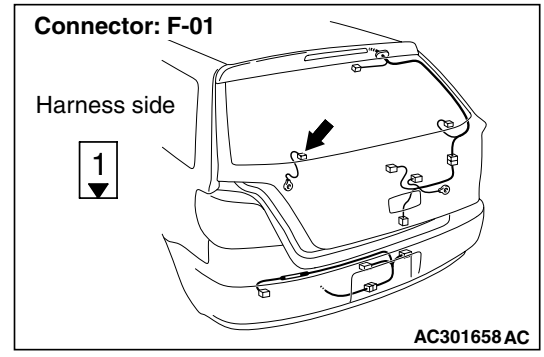
OK: 2 ohm or less

Q: Is the check result normal?

YES : Go to Step 17.

NO : Go to Step 15.

STEP 15. Connector check: F-01 defogger connector

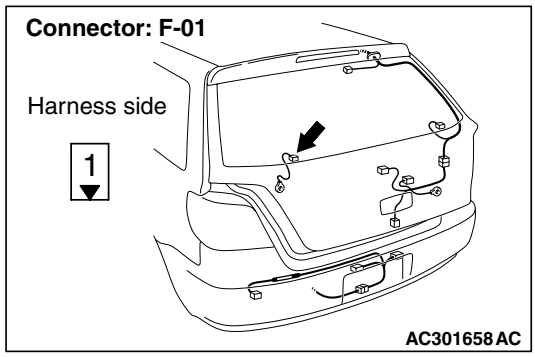


Q: Is the check result normal?

YES : Go to Step 16.

NO : Repair or replace the connector.

STEP 16. Check the wiring harness between F-01 defogger connector terminal No.1 and earth.



- Check the defogger earth line for open circuit.

Q: Is the check result normal?
YES : Check that the defogger system works normally.
NO : Repair the wiring harness.

STEP 17. Check the defogger.
Refer to GROUP 54A, Rear window defogger P.54A-77.

Q: Does the defogger work normally?
YES : Replace the manual air conditioner control panel (A/C-ECU).
NO : Repair the defogger.

INSPECTION PROCEDURE 8: Defogger Timer Function does not Operate.

COMMENTS ON TROUBLE SYMPTOM
Turn ON the defogger switch. If the defogger does not shut off after roughly 11 minutes then the defogger timer is malfunctioning.

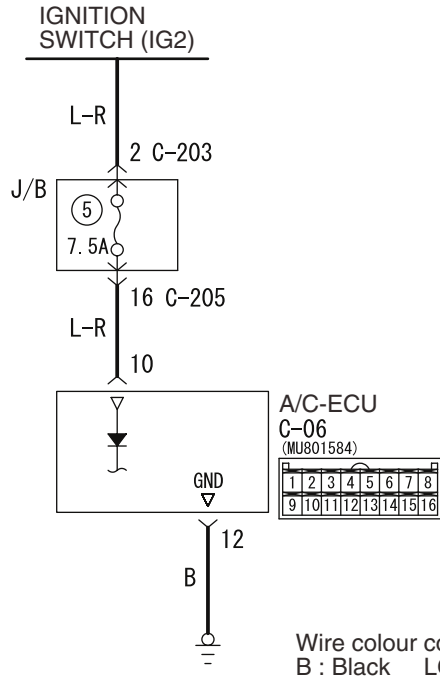
TROUBLESHOOTING HINTS
- Malfunction of the manual air conditioner control panel (A/C-ECU)

Check the performance of the defogger timer operations.
(1) Turn the ignition switch to the "ON" position.
(2) Turn the defogger switch to the "ON" position (operate for approx. 11 minutes)

Q: Does the defogger timer function work normally?
YES : Intermittent malfunction
NO : Replace the manual air conditioner control panel (A/C-ECU).

INSPECTION PROCEDURE 9: Malfunction of the A/C-ECU Power Supply System.

A/C-ECU Power Supply Circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue
W : White Y : Yellow SB : Sky blue BR : Brown
O : Orange GR : Gray R : Red P : Pink V : Violet

W3Z03E07AA

COMMENTS ON TROUBLE SYMPTOM

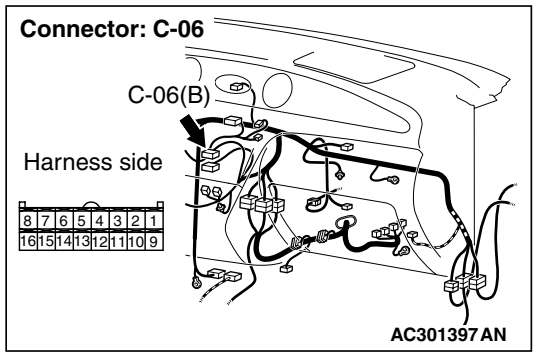
The A/C-ECU power system may be defective if the air conditioner, defogger, and outside/inside air selection damper motor all do not operate normally.

TROUBLESHOOTING HINTS

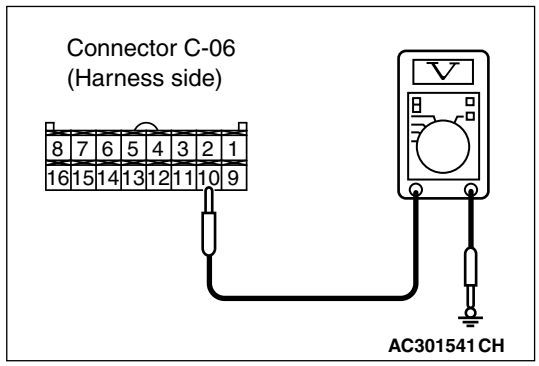
- Damaged the wiring harness or connectors
- Malfunction of the manual air conditioner control panel (A/C-ECU)

DIAGNOSIS

STEP 1. Measure the voltage at A/C-ECU connector C-06.



(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.

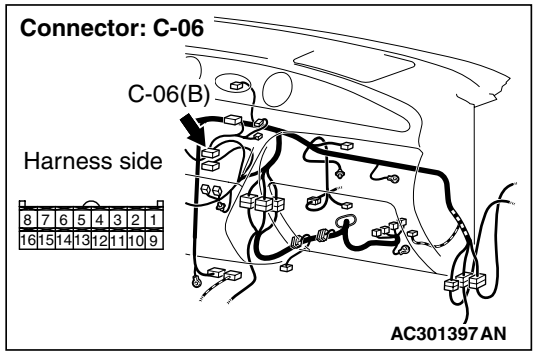


(3) Measure the voltage between terminal 10 and body earth.

OK: System voltage

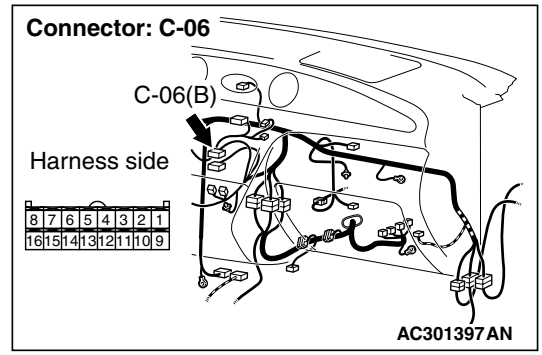
Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 2.

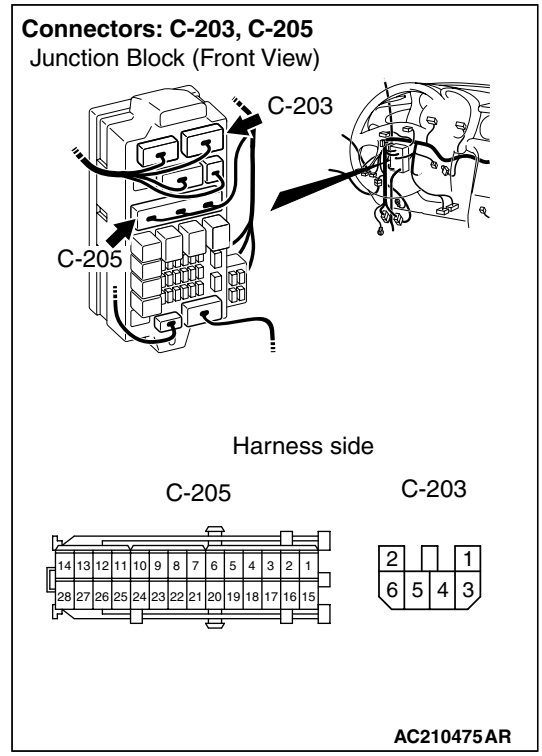
STEP 2. Connector check: C-06 A/C-ECU connector



Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair or replace the connector.

STEP 3. Check the wiring harness between C-06 A/C-ECU connector terminal No.10 and the ignition switch (IG2).



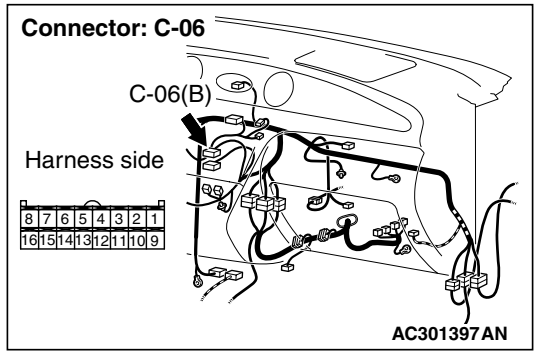


NOTE: Prior to the wiring harness inspection, check junction block connectors C-203 and C-205, and repair if necessary.

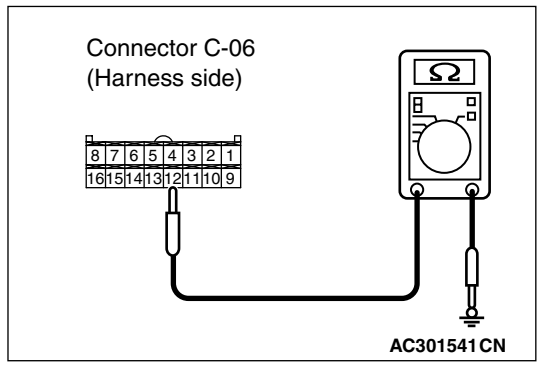
- Check the A/C-ECU power supply line for open circuit.

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.00-6).
NO : Repair the wiring harness.

STEP 4. Measure the resistance at the C-06 A/C-ECU connector.



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



(2) Measure the resistance between terminal 12 and body earth.

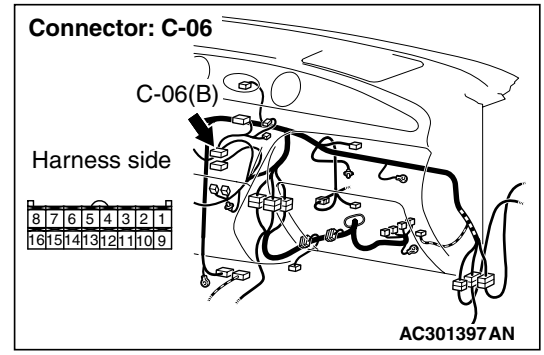
OK: 2 ohm or less

Q: Is the check result normal?

YES : Replace the manual air conditioner control panel (A/C-ECU).

NO : Go to Step 5.

STEP 5. Connector check: C-06 A/C-ECU connector

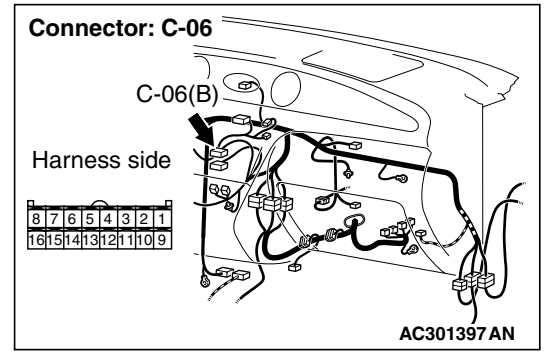


Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair or replace the connector.

STEP 6. Check the wiring harness between C-06 A/C-ECU connector terminal No.12 and the earth.



- Check the A/C-ECU earth line for open circuit.

Q: Is the check result normal?

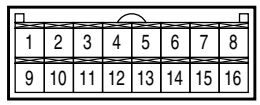
YES : Replace the manual air conditioner control panel (A/C-ECU).

NO : Repair the wiring harness.

CHECK AT ECU TERMINAL

M1552010300464

<C-06>



AC300861AB

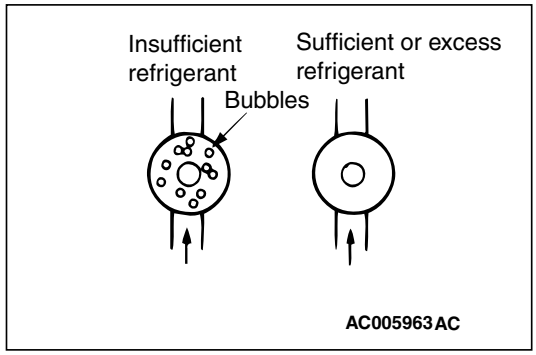
Terminal No.	Check item	Checking requirement	Normal condition
1	Rear defogger switch	Defogger switch: ON	0 V
		Defogger switch: OFF	System voltage
2	Inside/outside air changeover damper motor (outside air)	When the damper is moved to the inside air recirculation position	0 V
		When the damper is moved to the outside air inside air intake position	System voltage
3	Inside/outside air changeover damper motor (inside air)	When the damper is moved to the inside air recirculation position	System voltage
		When the damper is moved to the outside air inside air intake position	0 V
4	Output to the engine-A/T-ECU (A/C1)	A/C stopped	0 V
		• A/C switch: ON • Blower switch: ON	System voltage
5	Output to the engine-A/T-ECU (A/C2)	When the A/C is under low load	System voltage
		When the A/C is under high load	0 V
6	Power supply to the A/C illumination	Lighting switch: ON	System voltage
7	-	-	-
8	Blower switch (lo)	blower switch: lo	System voltage
9	-	-	-
10	Power supply to the ignition switch (IG2)	Ignition switch: ON	System voltage
11	Earth to the A/C illumination	Always	0 V
12	Earth	Always	0 V
13	Air thermo sensor (outlet side)	Sensor probe temperature 25°C (1.5k ohm)	2.2 V
14	Air thermo sensor (inlet side)	Sensor probe temperature 25°C (1.5k ohm)	2.2 V
15	-	-	-
16	Earth to the air thermo sensor	Always	0 V

ON-VEHICLE SERVICE

SIGHT GLASS REFRIGERANT LEVEL TEST

M1552008400345

1. Start the engine.
2. Operate the air-conditioner, and then set the temperature to maximum cooling.
3. Hold the engine speed at 1500 r/min.



4. Check the refrigerant level (bubble state) through the sight glass.

⚠ CAUTION
Use the low-pressure service valve.

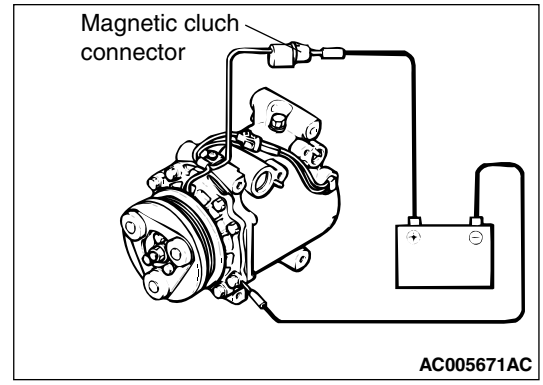
Items	State
Insufficient	Many bubbles are seen. If refrigerant is extremely low, it appears white.
Sufficient or excess refrigerant	No bubbles are seen.

NOTE:
(1) If insufficient, replenish the refrigerant as follows.
a. Replenish until bubbles disappear from the sight glass.
b. After the bubbles disappear from the sight glass, replenish 100 g of refrigerant.
(2) If excessive, replenish the refrigerant as follows.
a. Drain the refrigerant until bubbles can be seen through the sight glass.
b. Replenish until bubbles disappear from the sight glass.
c. After the bubbles disappear from the sight glass, replenish 100 g of refrigerant.

MAGNETIC CLUTCH TEST

M1552008500386

1. Disconnect the magnetic clutch connector to the magnetic clutch.



2. Connect positive battery voltage directly to the connector for the magnetic clutch.
3. If the magnetic clutch is normal, there will be a "click." If the pulley and armature do not make contact ("click"), there is a malfunction.

COMPRESSOR DRIVE BELT ADJUSTMENT

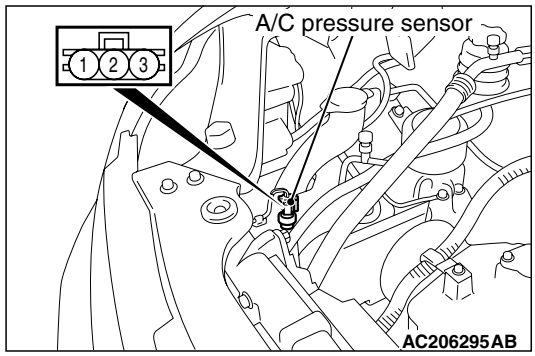
M1552001000313

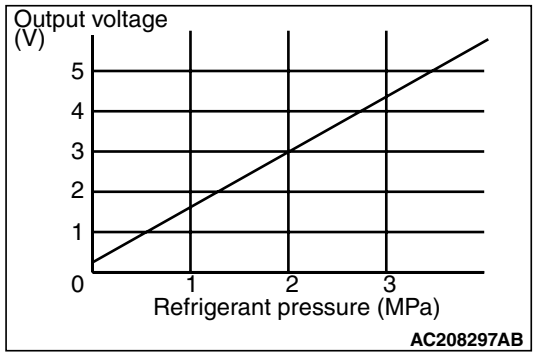
Refer to GROUP 11, On-vehicle Service – Drive Belt Tension Check P.11A-6.

SIMPLE INSPECTION OF THE A/C PRESSURE SENSOR

M1552014700088

1. Assemble a manifold gauge onto the high pressure service valve.
2. Turn ON the engine and then turn ON the air conditioner switch.



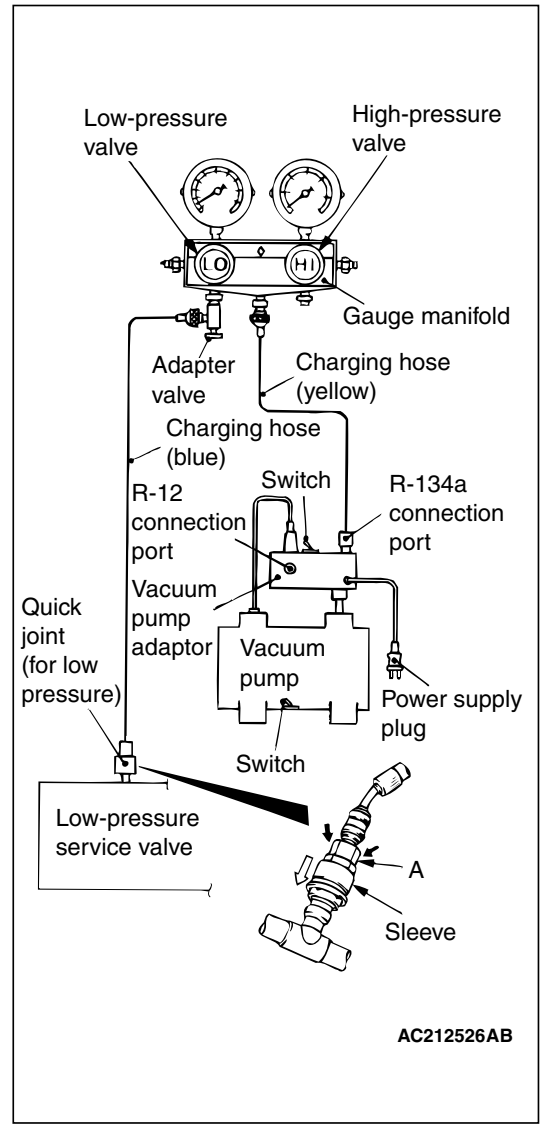


3. Check to see that the voltage between the A/C pressure sensor terminal No.2 and body earth reflects the specifications of the Figure.

   NOTE: The allowance shall be defined as ± five percents.

CHARGING

M1552001200340



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

⚠ CAUTION

- **Use tools that are suited to R134a.**
- **To install the quick joint, press section when connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.**

4. Connect the quick joint (for low-pressure) to the low- pressure service valve.

   NOTE: The low-pressure service valve should be connected to the flexible suction hose.

5. Close the high and low-pressure valves of the gauge manifold.

⚠ CAUTION

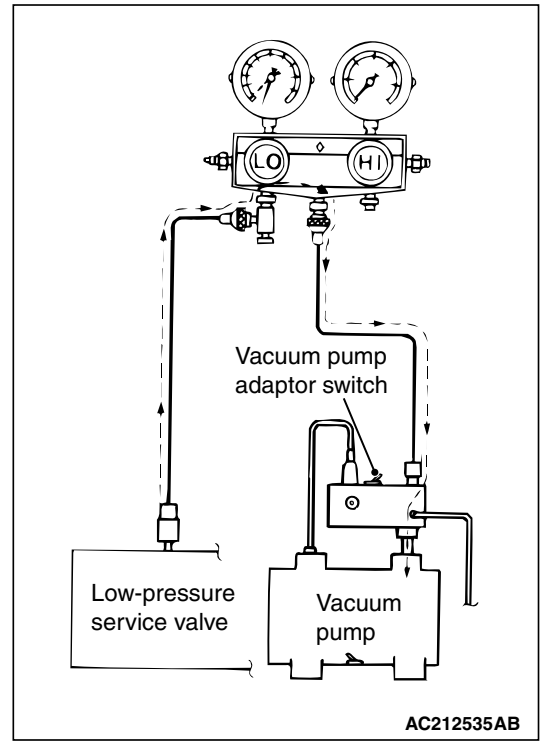
Be sure to connect the power plug of the vacuum pump to the vacuum pump adapter, and then connect the power plug of the adapter to a 100-V outlet.

6. Install the vacuum pump adaptor to the vacuum pump.
7. Connect the charging hose (yellow) to the R-134a connection port of the vacuum pump adaptor.
8. Tighten the adaptor valve handle (valve open).
9. Open the low-pressure valve of the gauge manifold.
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 (6).

⚠ CAUTION

Do not operate the compressor for evacuation.

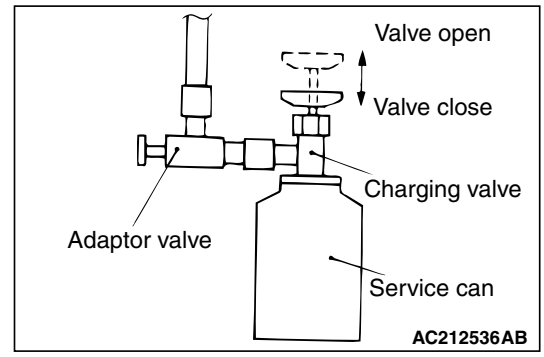


11. Turn the vacuum pump adaptor switch to the R134a side to start the vacuum pump.
12. Evacuate to a vacuum reading of 100 kPa or higher (takes approx. 10 minutes).

⚠ CAUTION

Do not operate the compressor in the vacuum condition; damage may occur.

13. Loosen the valve of the adapter valve fully (valve closed), and turn off the vacuum pump adapter switch. Then leave it for five minutes.
14. Check the system for proper sealing (negative pressure should not decrease).

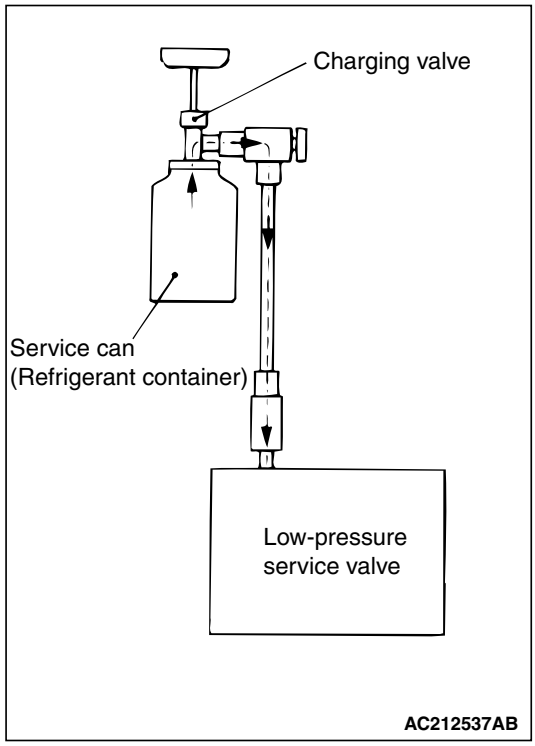


15. Connect the service can valve to the service can with the handle loosened fully (valve closed).
16. Turn the handle of the adaptor valve back all the way (valve closed), remove it from the gauge manifold and install the service can.

17.Tighten the handle of the charging valve (valve closed) to puncture the service can.

⚠ 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.



18.Turn the handle of the charging valve back (valve open) and tighten the handle of the adaptor valve (valve open) to charge the system with refrigerant.

19.If the refrigerant is not drawn in, turn the handle of the adaptor valve back all the way (valve closed).

20.Check for gas leaks using a leak detector. If a gas leak is detected, re-tighten the connections, and then repeat the charging procedure from evacuation in step (11).

⚠ CAUTION

The leak detector for R-134a should be used.

21.Start the engine.

22.Operate the A/C and set to the lowest temperature (MAX. COOL).

23.Fix the engine speed at 1,500 r/min.

⚠ 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.

24.Tighten the handle of the adaptor valve (valve open) to charge the required volume of refrigerant.

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

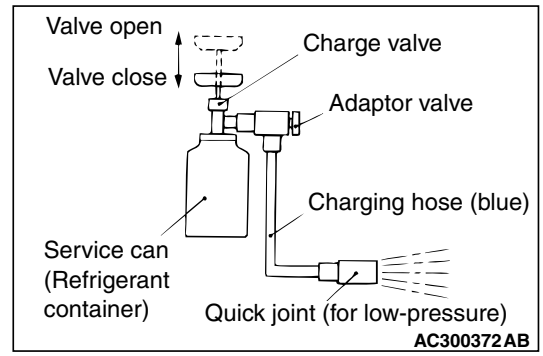
26.Tighten the charging valve handle (valve closed). Remove the quick joint (for low-pressure) from the low-pressure service valve.

27.Remove the service can.

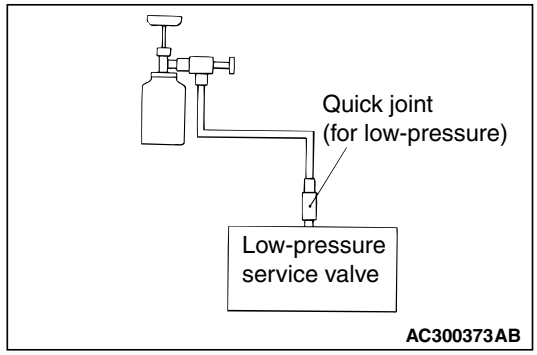
NOTE: If the service can is not emptied completely, keep the handles of the charging valve and adaptor valve closed for the next charging.

CORRECTING LOW REFRIGERANT LEVEL IN CASE THE SERVICE CAN IN USED

M1552014600081



1. Install the charge valve with the handle turned all the way back (valve open) to the service can.
2. Install the adaptor valve with the handle turned all the way back (valve close) to the charging valve.
3. Connect the charging hose (blue) to the adaptor valve.
4. Connect the charging hose (blue) to the quick joint (for low-pressure).
5. Tighten the handle of the charge valve (valve close), and pierce the service can.
6. Turn the handle of the adaptor valve to bleed the air.



7. Install the quick joint (for low-pressure) to the low-pressure service valve.

   NOTE: The low-pressure service valve should be connected to the suction hose.
8. Start the engine.
9. Operate the air conditioner and set at the lowest temperature (MAX. COOL).
10. Fix the engine speed at 1,500 r/min.
11. Tighten the handle of the adaptor valve (valve open), and replenish refrigerant while checking the quantity through the sight glass.
12. After replenishing is completed, turn the handle of the adaptor valve all the way back (valve close), and remove the quick joint.

    NOTE: When there is remainder of refrigerant in the service can, keep it for next use with the charge value and the valve of the adaptor valve being closed.

DISCHARGING SYSTEM

M1552013000086

Use the refrigerant recovery unit to discharge refrigerant gas front the system.

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

REFILLING OF OIL IN THE A/C SYSTEM

M1552020000022

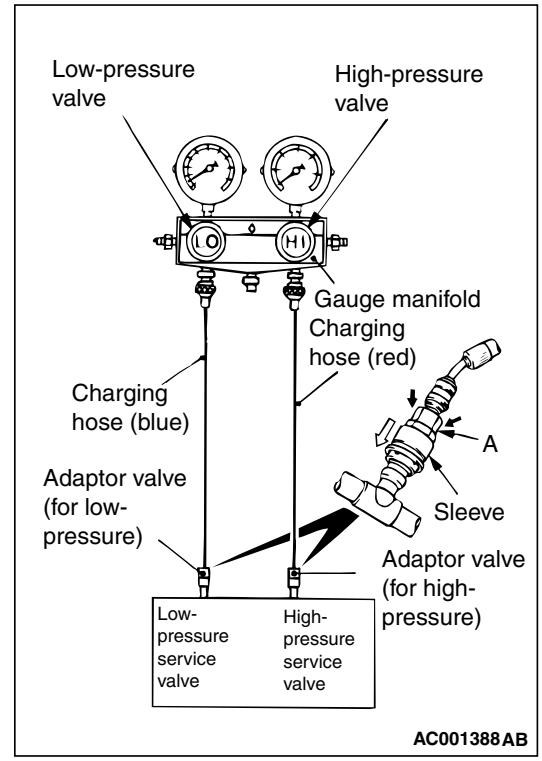
Too little oil will provide inadequate compressor lubrication and cause a compressor failure. Too much oil will increase discharge air temperature. When a compressor is installed at the factory, it contains 120 mL of compressor oil. While the A/C system is in operation, the oil is carried through the 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: SUN PAG 56
Quantity
Evaporator: 60 mL
Condenser: 15 mL
Flexible suction hose: 10 mL
Receiver: 10 mL

PERFORMANCE TEST

M1552001400333

1. The vehicles to be tested should be in a place that is not in direct sunlight.



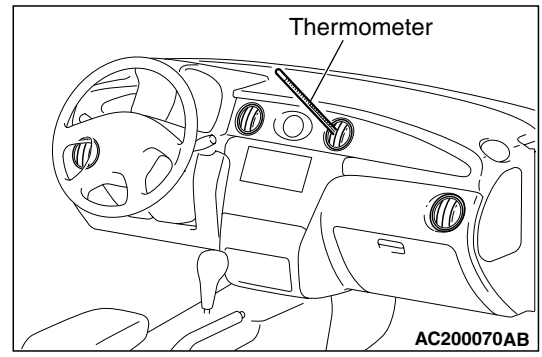
2. Close the high and low-pressure valve of the gauge manifold.
3. Connect the charging hose (blue) to the low-pressure valve and connect the charging hose (red) to the high-pressure valve of the gauge manifold.

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

4. Install the quick joint (for low-pressure) to the charging hose (blue), and connect the quick joint (for high-pressure) to the charging hose (red).

   NOTE: The high-pressure service valve is on the A/C pipe and the low-pressure service valve is on the suction hose.

5. Connect the quick joint (for low-pressure) to the low-pressure service valve and connect the quick joint (for high-pressure) to the high-pressure service valve.
6. Start the engine.
7. Set the A/C controls as follows:
   - A/C switch: A/C – ON position
   - Mode selection: FACE position
   - Temperature control: MAXIMUM COOLING position
   - Air selection: RECIRCULATION position
   - Blower switch: "4" (Fast) position
8. Adjust engine speed to 1,500 r/min with A/C clutch engaged.
9. Engine should be warmed up with doors and windows opened.



10. Insert a thermometer in the centre air outlet and operate the engine for 20 minutes.

NOTE: If the clutch cycles, take the reading before the clutch disengages.

11. Note the discharge air temperature.

Performance Temperature Chart

Garage ambient temperature °C	20	25	30	35
Discharge air temperature °C	8.0 – 11.0	12.0 – 16.0	17.0 – 21.0	22.5 – 27.5
Compressor high pressure kPa	740 – 840	950 – 1,050	1,160 – 1,300	1,360 – 1,550
Compressor low pressure kPa	150 – 190	190 – 240	240 – 300	300 – 375

REFRIGERANT LEAK REPAIR PROCEDURE

M1552001500266

LOST CHARGE

If the system has lost all charge due to a leak:

1. Evacuate the system (Refer to P.55A-52).
2. Charge the system with approximately 550 g of refrigerant.
3. Check for leaks.
4. Discharge the system.
5. Repair leaks.

⚠ CAUTION

Replacement filter-drier units must be sealed while in storage. The drier used in these units will saturate water quickly upon exposure to the atmosphere. When installing a drier, have all tools and supplies ready for quick assembly to avoid keeping the system open any longer than necessary.

6. Replace receiver drier.
7. Evacuate and charge system.

LOW CHARGE

If the system has not lost all of its refrigerant charge; locate and repair all leaks. If it is necessary to increase the system pressure to find the leak (because of an especially low charge) add refrigerant. If it is possible to repair the leak without discharging the refrigerant system, use the procedure for correcting low refrigerant level.

HANDLING TUBING AND FITTINGS

Kinks in the refrigerant tubing or sharp bends in the refrigerant hose lines will greatly reduce the capacity of the entire system. High pressures are produced in the system when it is operating. Extreme care must be exercised to make sure that all connections are pressure tight. Dirt and moisture can enter the system when it is opened for repair or replacement of lines or components. The following precautions must be observed. The system must be completely discharged before opening any fitting of connection in the refrigeration system. Open fittings with caution even after the system has been discharged. If any pressure is noticed as a fitting is loosened, allow trapped pressure to bleed off very slowly.

Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing. A good rule for the flexible hose lines is keep the radius of all bends at least 10 times the diameter of the hose.

Sharper bends will reduce the flow of refrigerant. The flexible hose lines should be routed so that they are at least 80 mm from the exhaust manifold. It is good practice to inspect all flexible hose lines at least once a year to make sure they are in good condition and properly routed.
On standard plumbing fittings with O-rings, these O-rings are not reusable.

COMPRESSOR NOISE CHECK

M1552008700261

You must first know the conditions when the noise occurs. These conditions are: weather, vehicle speed, in gear or neutral, engine temperature or any other special conditions.
Noises that develop during A/C operation can often be misleading. For example: what sounds like a failed front bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets, or a loose clutch assembly. Verify accessory drive belt tension (power steering or alternator).
Improper accessory drive belt tension can cause a misleading noise when the compressor is engaged and little or no noise when the compressor is disengaged.
Drive belts are speed-sensitive. That is, at different engine speeds, and depending upon belt tension, belts can develop unusual noises that are often mistaken for mechanical problems within the compressor.

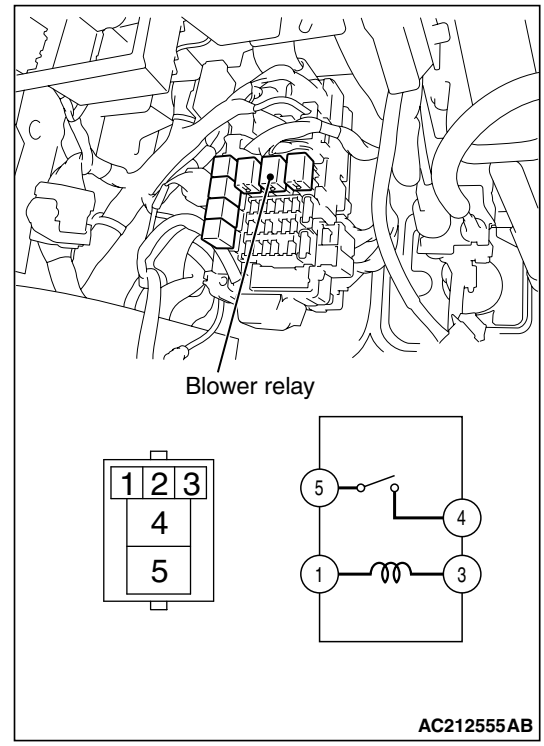
ADJUSTMENT

1. Select a quiet area for testing. Duplicate conditions as much as possible. Switch the compressor on and off several times to clearly identify compressor noise. To duplicate high ambient conditions (high head pressure), restrict air flow through the condenser. Install a manifold gauge set to make sure discharge pressure doesn't exceed 2,070 kPa.
2. Tighten all compressor mounting bolts, clutch mounting bolt, and compressor drive belt. Check to assure clutch coil is tight (no rotation or wobble).
3. Check refrigerant hoses for rubbing or interference that can cause unusual noises.
4. Check refrigerant charge (Refer to P.55A-48).
5. Recheck compressor noise as in Step 1.
6. If noise still exists, loosen compressor mounting bolts and retighten. Repeat Step 1.
7. If noise continues, replace compressor and repeat Step 1.

POWER RELAY CHECK

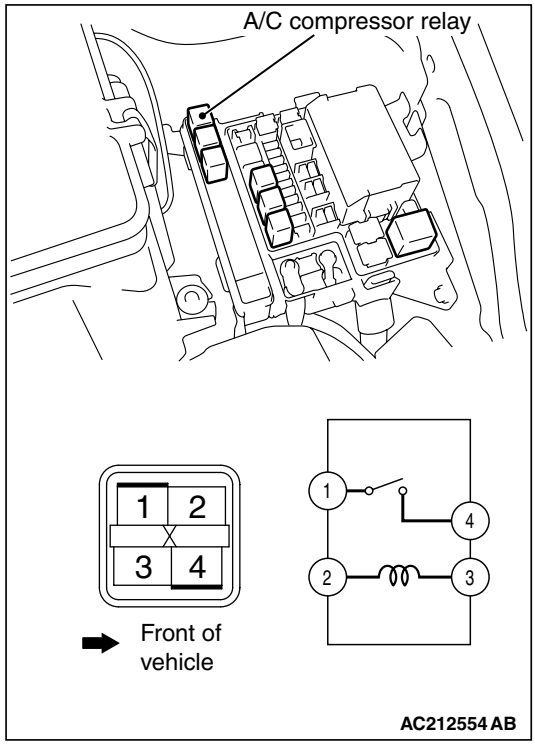
M1552008800280

BLOWER RELAY CONTINUITY CHECK



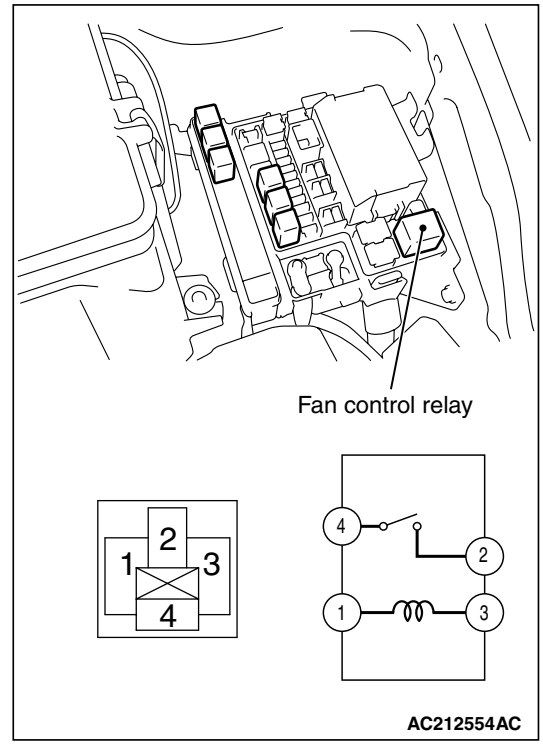
Battery voltage	Tester connection	Specified condition
Not applied	4 – 5	Open circuit
• Connect terminal 1 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	4 – 5	Less than 2 ohms

A/C COMPRESSOR RELAY CONTINUITY CHECK



Battery voltage	Tester connection	Specified condition
Not applied	1 – 4	Open circuit
• Connect terminal 3 to the positive battery terminal • Connect terminal 2 to the negative battery terminal	1 – 4	Less than 2 ohms

FAN CONTROL RELAY CONTINUITY CHECK



Battery voltage	Tester connection	Specified condition
Not applied	2 – 4	Open circuit
• Connect terminal 1 to the positive battery terminal • Connect terminal 3 to the negative battery terminal	2 – 4	Less than 2 ohms

IDLE-UP OPERATION CHECK

M1552001600348

1. Before inspection and adjustment, set vehicle in the following condition:
   - Engine coolant temperature: 80 – 90 °C
   - Lamps, electric cooling fan and accessories: Set to OFF
   - Transmission: Neutral ("N" or "P" for vehicles with A/T)
   - Steering wheel: Straightforward
2. Check whether or not the idle speed is the standard value. Refer to GROUP 13A, On-vehicle Service – Basic Idle Speed Adjustment P.13A-307.

   Standard value: 750 ± 50 r/min

3. When the A/C is running after turning the A/C switch to ON, and the blower switch to the 3(MH) or 4(HI) position, check to be sure that the idle speed is at the standard value.

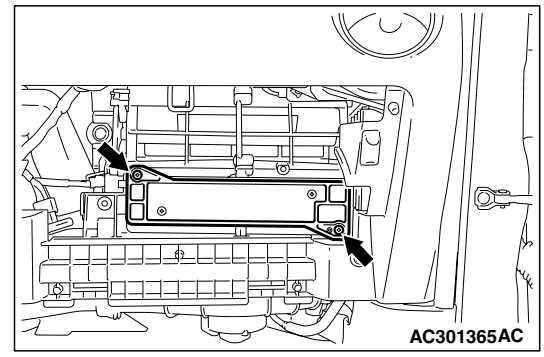
   Standard value: 850 ± 50 r/min

   NOTE: It is not necessary to make an adjustment, because the idling speed is automatically adjusted by the ISC system. If, however, a deviation from the standard value occurs for some reason, check the ISC system.

CLEAN AIR FILTER REPLACEMENT PROCEDURE

M1552020100029

1. Remove the glove box. (Refer to GROUP 52A, Instrument Panel P.52A-2)

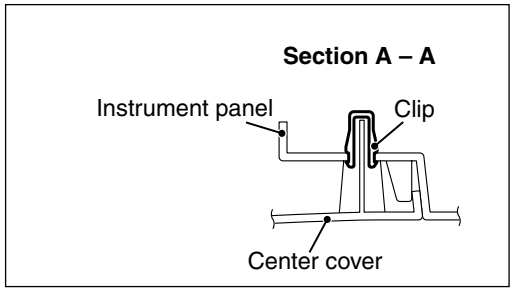


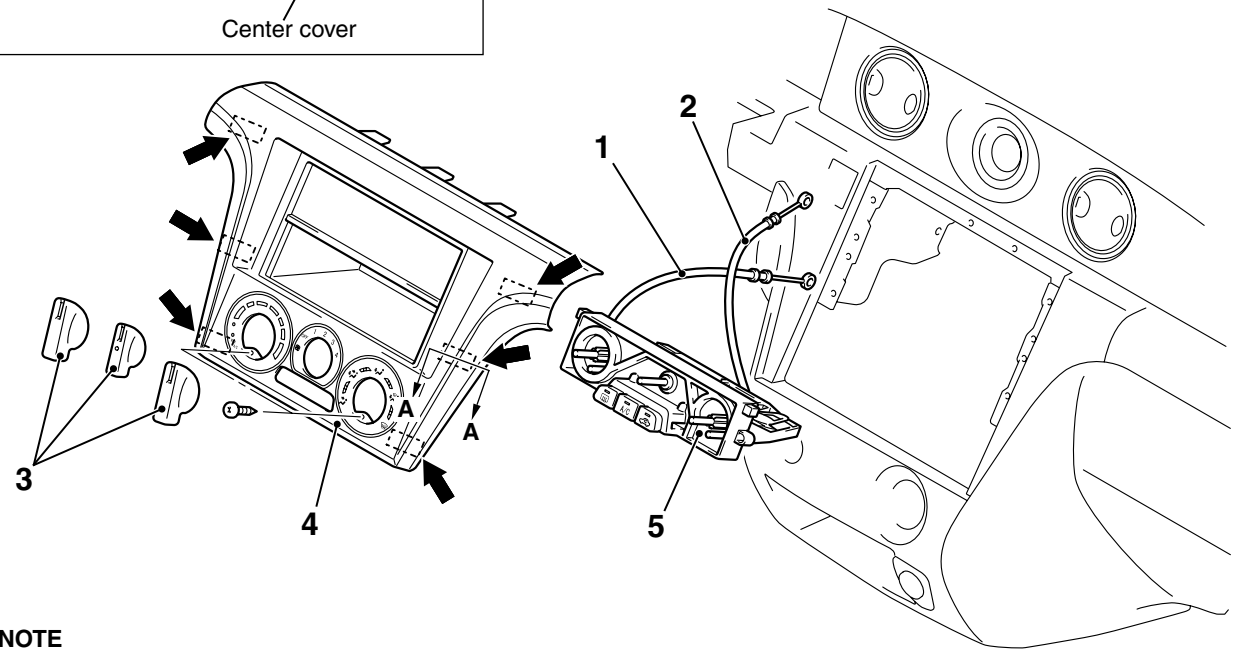
2. Remove the two screws as shown, and replace the clean air filter.
3. Install the glove box.

HEATER CONTROL ASSEMBLY AND A/C SWITCH

REMOVAL AND INSTALLATION

M1552002400314





NOTE
: Clip position

AC106926AB

Removal steps

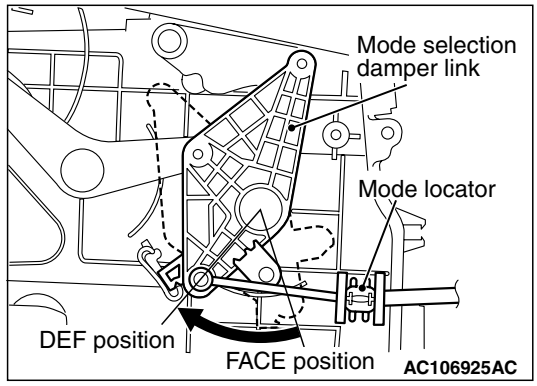
>>B<< 1. Air mixing door control cable connection
>>A<< 2. Mode selection damper control cable connection
3. Knob

Removal steps (Continued)

4. Centre panel
5. Manual air conditioner control panel assembly

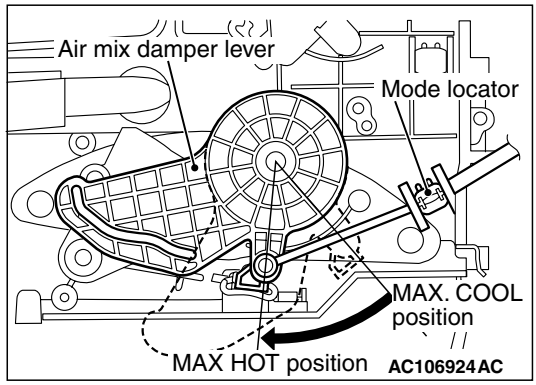
INSTALLATION SERVICE POINT

>>A<< BLOWER VENT CHANGEOVER DAMPER CABLE



1. Set the heater control assembly's blower vent changeover knob to the DEF position.
2. Set the heater unit's blower vent changeover damper relay to the DEF position (turn the damper relay to the left until it stops) and install the cable.
3. Set the mode locator to the heater unit case and secure with a clip.

>>B<< AIR MIX DOOR CABLE CONNECTION

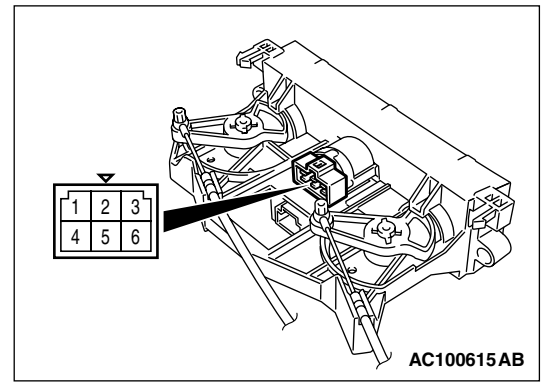


1. Turn the heater control assembly's temperature adjustment knob all the way to the HOT side.
2. Set the heater unit's air mix door lever to the MAX HOT position (turn the damper lever as the left illustration) and attach the cable.
3. Set the mode locator to the heater unit case and secure with a clip.

INSPECTION

M1552014300682

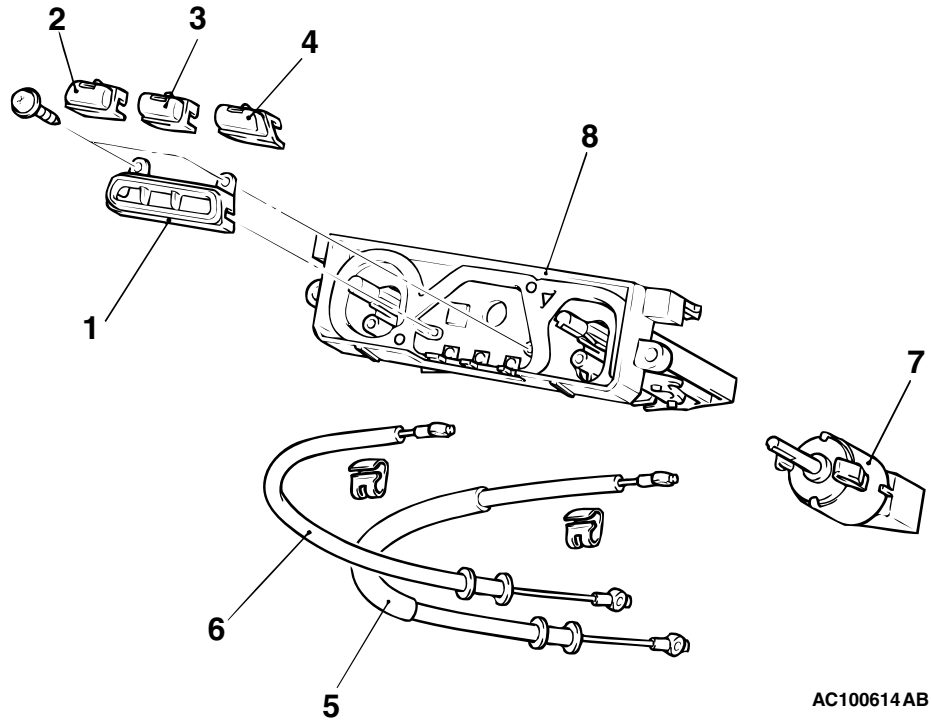
BLOWER SWITCH CONTINUITY CHECK



Switch position	Tester connection	Specified condition
0 (OFF)	1 – 2, 2 – 4, 2 – 5, 2 – 6	Open circuit
1 (LO)	1 – 2	Less than 2 ohms
2 (ML)	2 – 4	Less than 2 ohms
3 (MH)	2 – 5	Less than 2 ohms
4 (HI)	2 – 6	Less than 2 ohms

DISASSEMBLY AND REASSEMBLY

M1552014200157



Disassembly steps

1. Switch panel
2. Rear window defogger switch
3. Air conditioner switch
4. Inside/outside air selection switch

<<A>> 5. Mode selection damper control cable

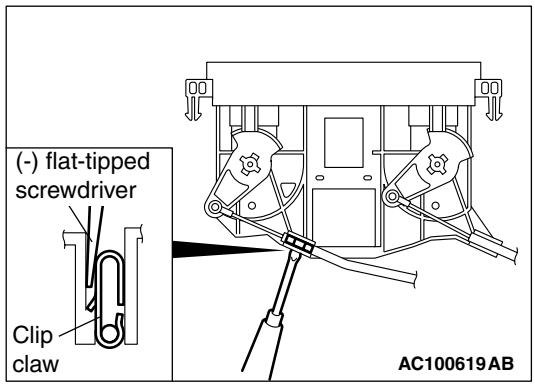
<<A>> 6. Air mixing damper control cable

Disassembly steps (Continued)

7. Blower switch assembly
8. Manual air conditioner control panel (A/C-ECU)

DISASSEMBLY SERVICE POINT

<<A>> BLOW VENT CHANGEOVER DAMPER CABLE AND AIR MIX DAMPER CABLE REMOVAL



Insert a flat-tipped screwdriver into the clip through the inside of the control base and prize out the clip claw to disconnect the cables.

HEATER UNIT, HEATER CORE, BLOWER ASSEMBLY AND EVAPORATOR UNIT

REMOVAL AND INSTALLATION

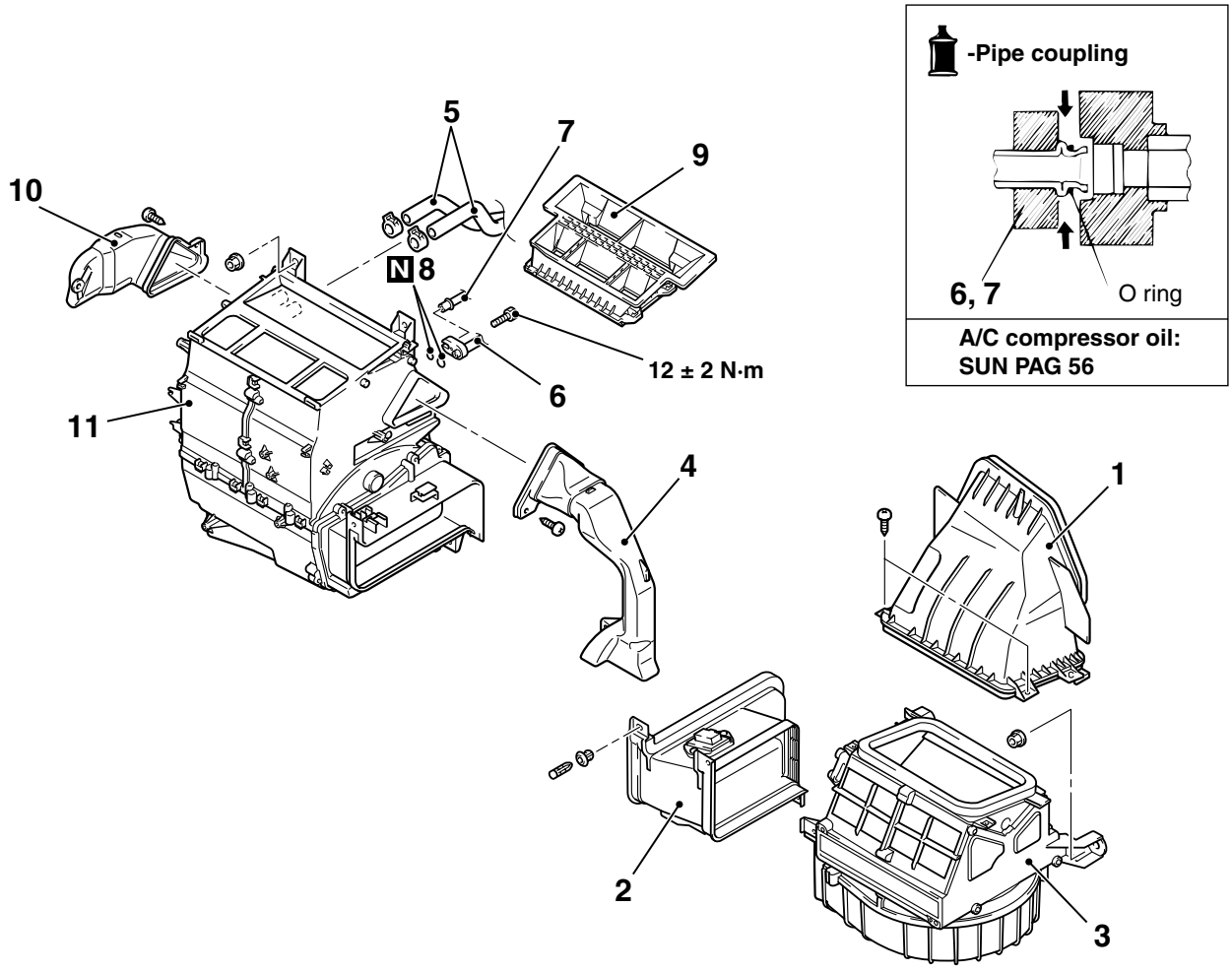
M1552011600253

⚠ WARNING

When removing and installing the heater unit, do not let it bump against the SRS-ECU or the components.

Pre-removal and Post-installation Operation

- Refrigerant draining and Refilling (Refer to Charging P.55A-49 and Discharging P.55A-52).
- Engine coolant Draining and Refilling (Refer to GROUP 14, On vehicles service P.14-15).
- Instrument Panel Removal and Installation (Refer to GROUP 52A, Instrument Panel P.52A-2).
- Air cleaner cover and air flow sensor assembly Removal and Installation (Refer to GROUP 14, Air cleaner P.15-3).



AC200906AB

Removal steps

1. Intake duct
2. Joint duct
3. Blower assembly
4. Foot duct <front passenger's side>
5. Heater hose connection

<<A>> 6. Liquid pipe B connection

Removal steps (Continued)

<<A>> 7. Flexible suction hose connection
8. O ring
9. Centre duct
10. Foot duct <driver's side>
11. Heater unit

REMOVAL SERVICE POINT

<<A>> FLEXIBLE SUCTION HOSE AND LIQUID PIPE B DISCONNECTION

⚠ CAUTION

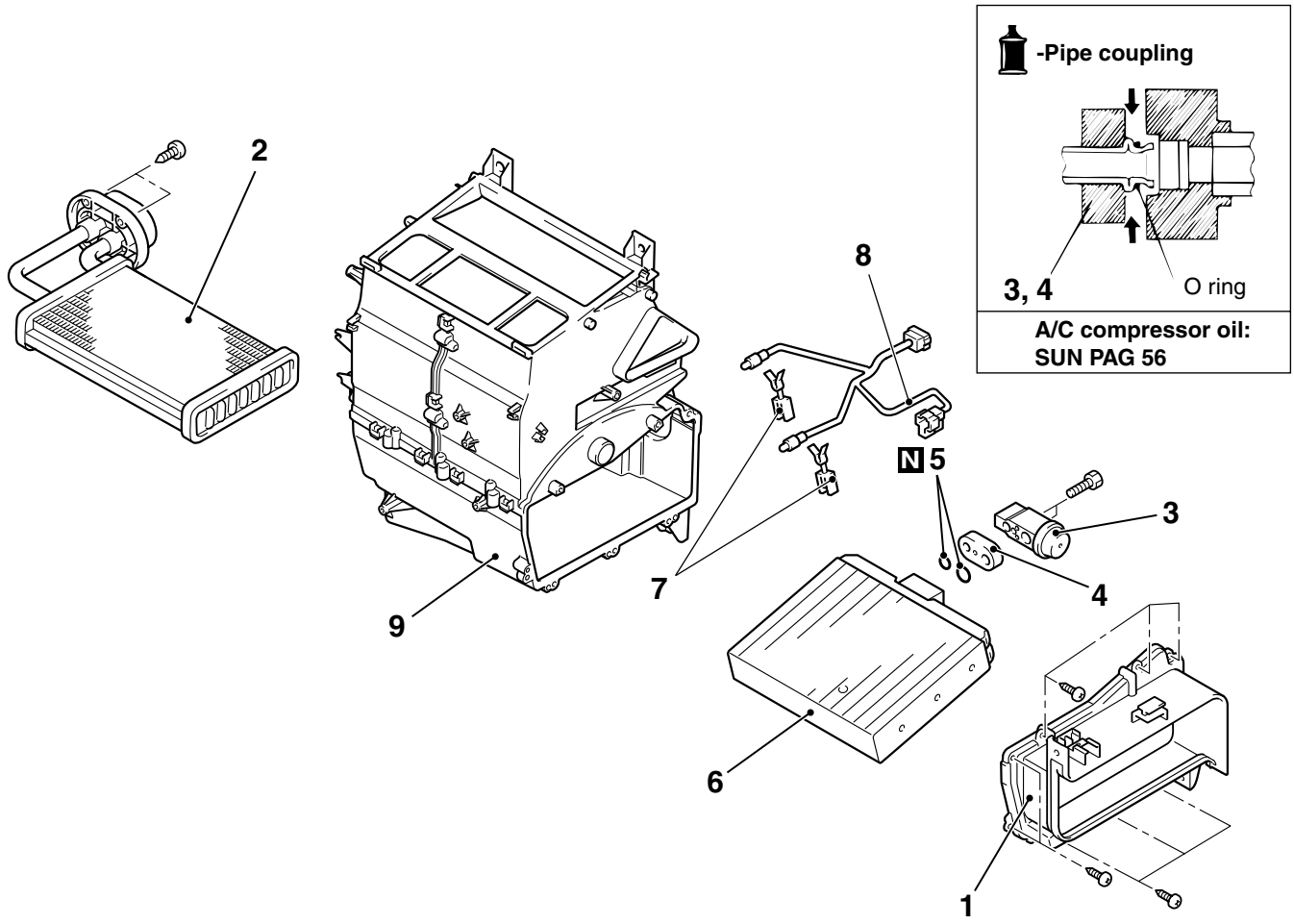
As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

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

HEATER UNIT

DISASSEMBLY AND REASSEMBLY

M1551005400194



Disassembly steps

1. Evaporator cover
2. Heater core
3. Expansion valve
4. Joint
5. O ring

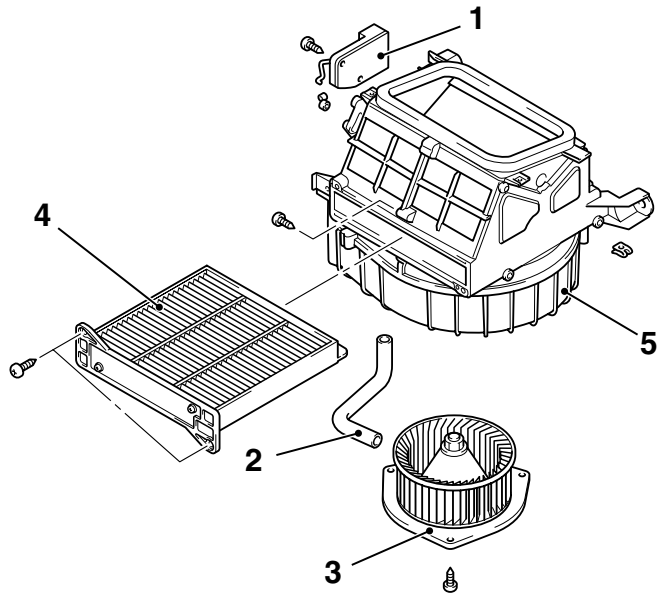
Disassembly steps (Continued)

6. Evaporator
7. Air thermo sensor clip
8. Air thermo sensor
9. Heater case

BLOWER ASSEMBLY

DISASSEMBLY AND REASSEMBLY

M1551005500168



AC301387AB

Disassembly steps

1. Outside/inside air selection damper control motor
2. Hose

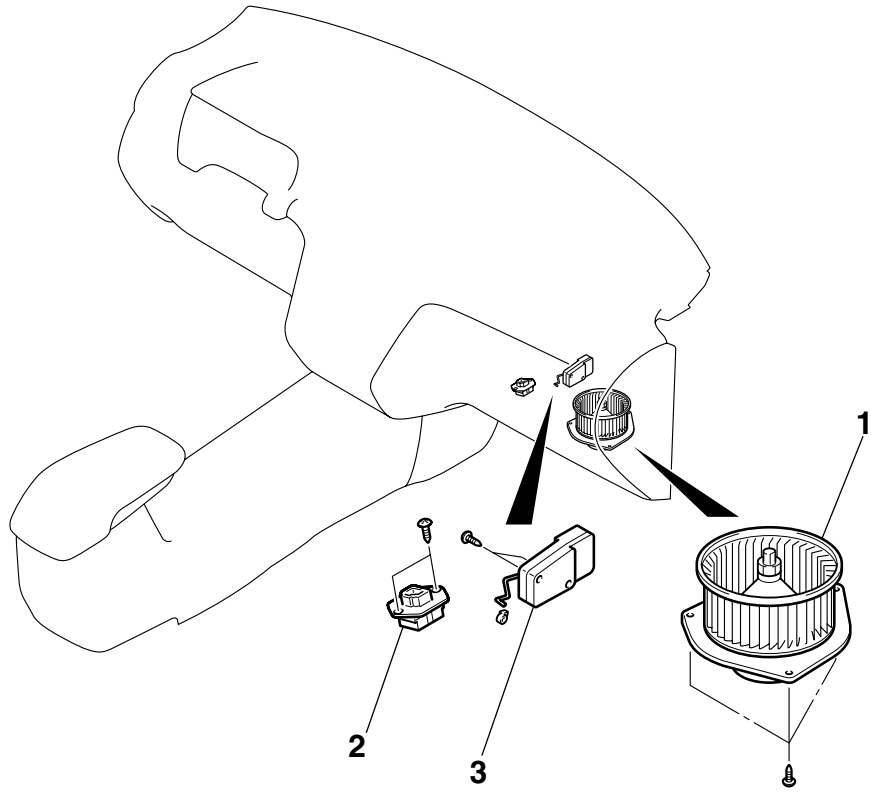
Disassembly steps (Continued)

3. Blower motor
4. Clean air filter
5. Blower case

BLOWERMOTOR, RESISTOR AND OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR

REMOVAL AND INSTALLATION

M1551002800308



AC200968AB

Blower motor removal step
1. Blower motor

Resistor removal step
- Glove box (Refer to GROUP 52A, Instrument Panel P.52A-2).

2. Resistor

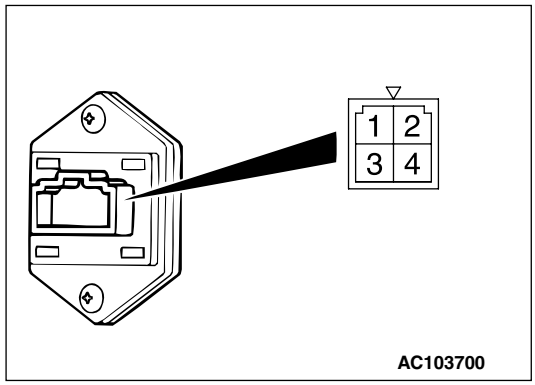
Outside/inside air selection damper control motor removal step
- Glove box (Refer to GROUP 52A, Instrument Panel P.52A-2).

3. Outside/inside air selection damper control motor

INSPECTION

M1551006300264

RESISTER CHECK



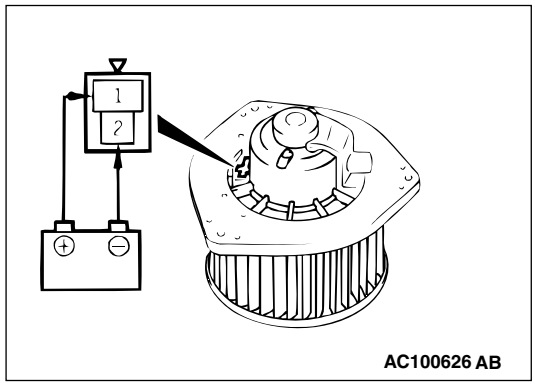
AC103700

Use an ohmmeter to measure the resistance between the terminals. Check that the measured value is at the standard value.

Standard value:

Measurement terminal	Standard value (Ω)
Between terminals 2 and 4 (LO)	2.54
Between terminals 1 and 2 (ML)	1.24
Between terminals 2 and 3 (MH)	0.6

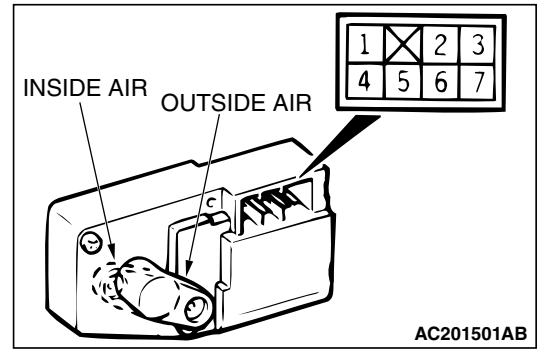
BLOWER FAN AND MOTOR CHECK



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

OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR CHECK

⚠ CAUTION



Cut off the battery voltage when the damper is in the inside/outside air position.

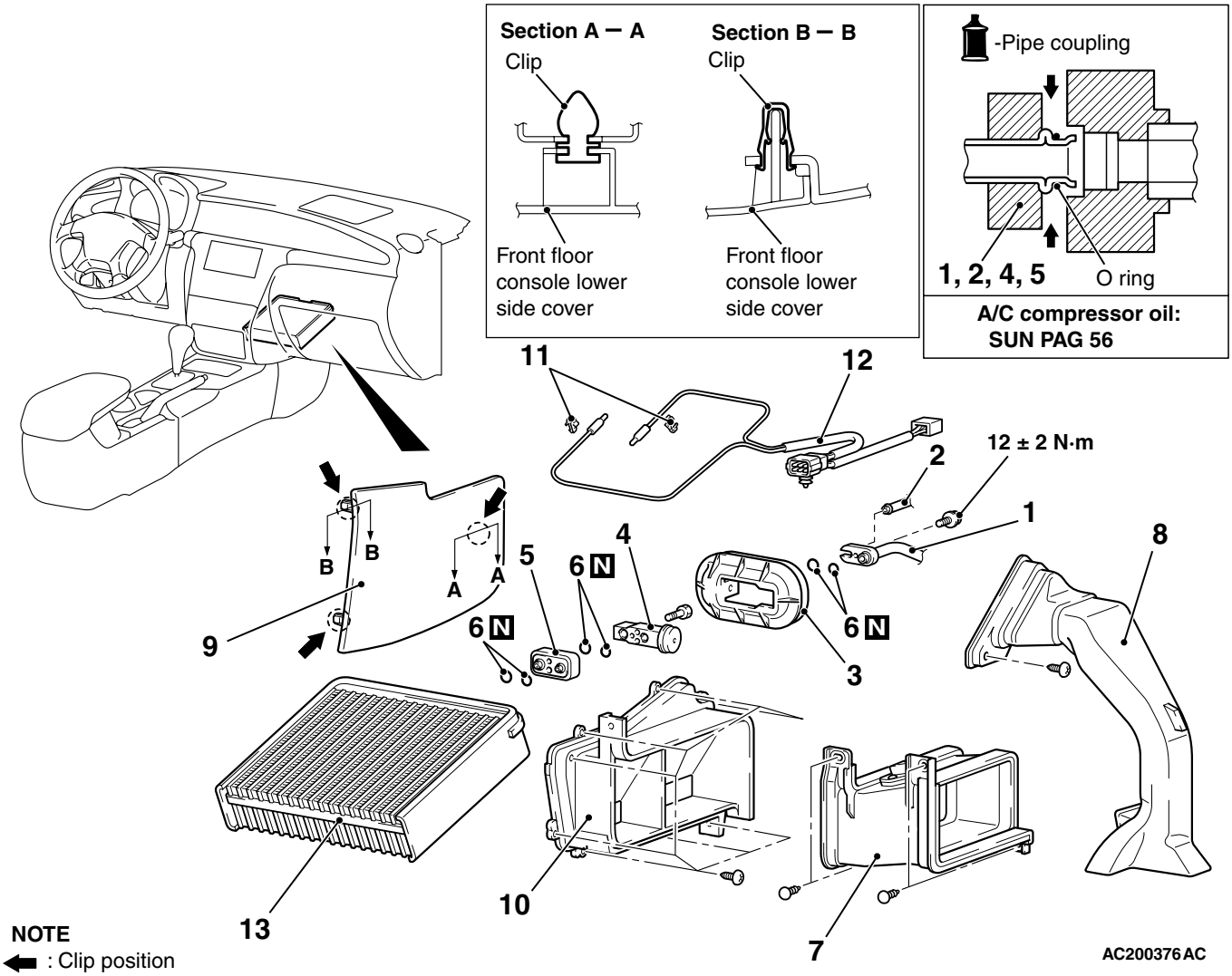
Lever position	Battery connection	Lever operation
At the inside position	• Connect terminal 7 to the positive battery terminal • Connect terminal 4 to the negative battery terminal	The lever moves from the inside position to the outside position
At the outside position	• Connect terminal 7 to the positive battery terminal • Connect terminal 6 to the negative battery terminal	The lever moves from the outside position to the inside position

EVAPORATOR ASSEMBLY

REMOVAL AND INSTALLATION

M1552003600184

Pre-removal and Post-installation Operation
- Refrigerant draining and Refilling (Refer to Charging P.55A-49 and Discharging P.55A-52).
- Air cleaner cover and air flow sensor assembly Removal and Installation (Refer to GROUP 14, Air cleaner P.15-3).



Removal steps

<<A>> 1. Flexible suction hose connection
<<A>> 2. Liquid pipe B connection
<<A>> 3. Expansion valve cover
<<A>> 4. Expansion valve
<<A>> 5. Joint
6. O ring
- Glove box (Refer to GROUP 52A, Instrument Panel P.52A-2, P.52A-2).

Removal steps (Continued)

7. Joint duct
8. Foot duct <driver's side>
9. Front floor console lower side cover
10. Evaporator cover
11. Air thermo sensor clip
12. Air thermo sensor
13. Evaporator

REMOVAL SERVICE POINT

<<A>> FLEXIBLE SUCTION HOSE AND LIQUID PIPE B DISCONNECTION

⚠ CAUTION

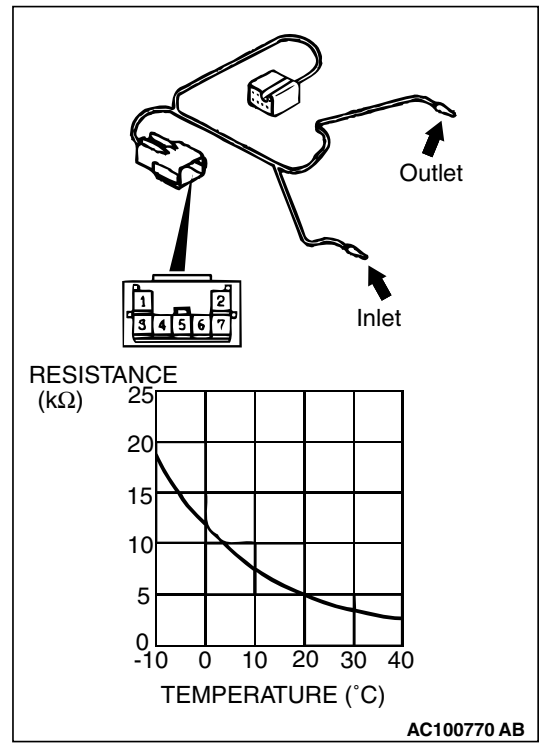
As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

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

INSPECTION

M1552014300693

AIR THERMO SENSOR INSPECTION



INLET SIDE

Measure the resistance between connector terminals 1 and 3 under at least two different temperatures. The resistance values should generally match those in the graph.

NOTE: . The temperature at the check should not exceed the range in the graph.

OUTLET SIDE

Measure the resistance between connector terminals 4 and 5 under at least two different temperatures. The resistance values should generally match those in the graph.

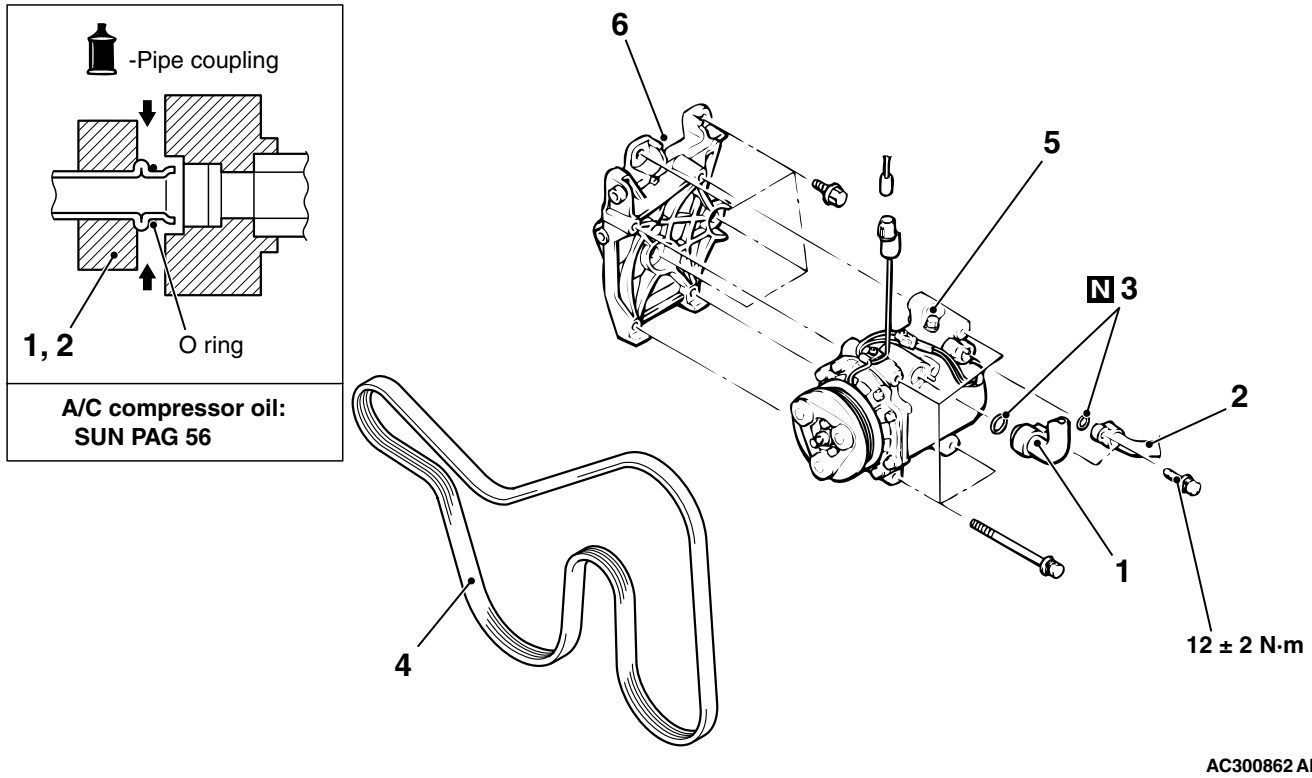
NOTE: The temperature at the check should not exceed the range in the graph.

COMPRESSOR ASSEMBLY AND TENSION PULLEY

REMOVAL AND INSTALLATION

M1552004100223

Pre-removal Operation	Post-installation Operation
• Refrigerant Discharging (Refer to P.55A-49).	• Drive Belt Tension Adjustment (Refer to GROUP 11A, On-vehicles Service – Drive Belt Tension Check P.11A-6). • Refrigerant Charging (Refer to P.55A-49).



Removal steps

<<A>> 1. Flexible suction hose connection
<<A>> 2. Flexible discharge hose connection
3. O ring

Removal steps (Continued)

<<B>> 4. Drive belt
<<C>> >>A<< 5. A/C compressor
6. A/C compressor bracket

REMOVAL SERVICE POINTS

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

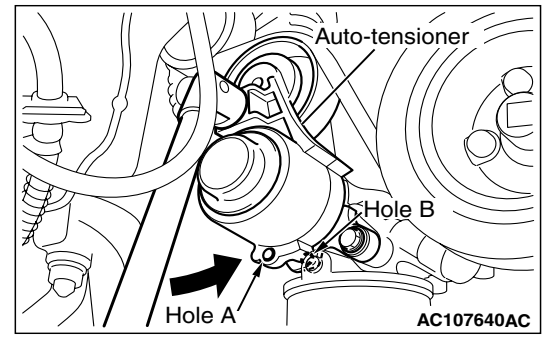
⚠ CAUTION

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 hoses and compressor nipples.

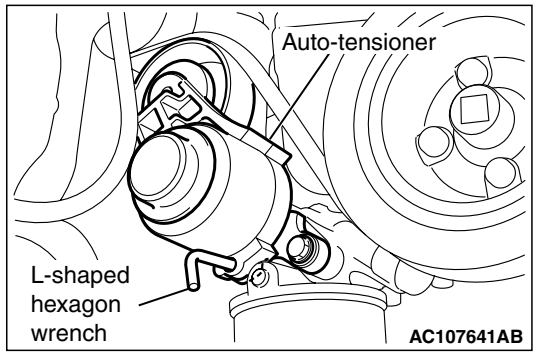
<<B>> DRIVE BELT REMOVAL

The following operations will be needed due to the serpentine drive system with the drive belt auto-tensioner.



1. Securely insert the spindle handle or ratchet handle with a 12.7 mm insertion angle into the jig hole of the auto-tensioner, and turn the auto-tensioner anti-clockwise until it hits the stopper.

⚠ CAUTION
To reuse the drive belt, draw an arrow indicating the rotating direction (clockwise) on the back of the belt using chalk.



2. Align hole A with hole B, insert an L-shaped hexagon wrench, etc. to fix and then remove the drive belt.

<<C>> COMPRESSOR REMOVAL
Take care not to spill any compressor oil when removing the compressor.

INSTALLATION SERVICE POINT

>>A<< A/C 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 mL

   120 mL−X mL = Y mL

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

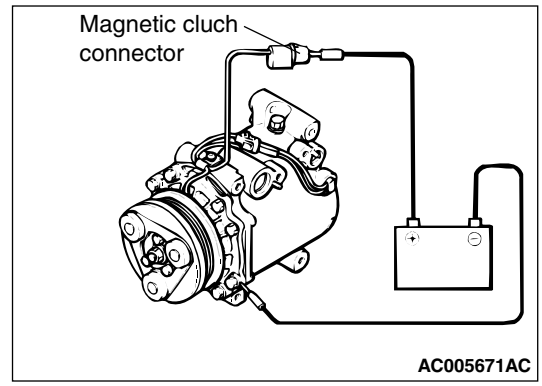
NOTE: When replacing the following parts at the same times as the compressor, subtract the rated oil amount of the each part from Y mL and discharge from the new compressor.

Quantity:
- **Evaporator: 60 mL**
- **Condenser: 15 mL**
- **Suction hose: 10 mL**
- **Receiver: 10 mL**

INSPECTION

M1552014300701

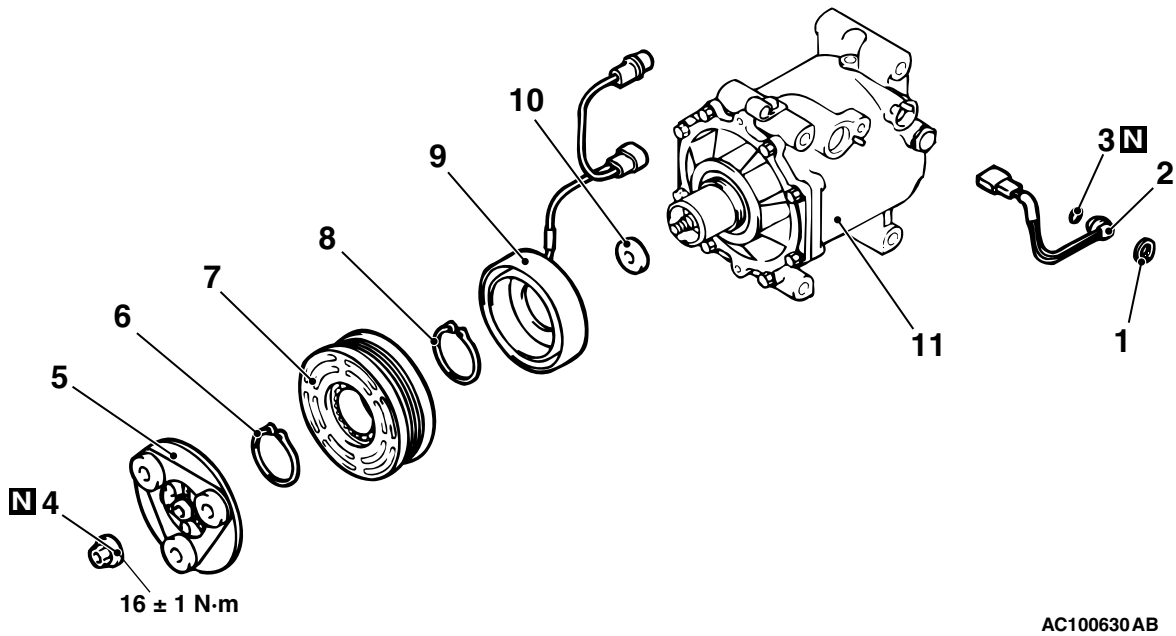
COMPRESSOR MAGNETIC CLUTCH OPERATION CHECK



Connect the compressor connector terminal to the battery positive (+) terminal and earth the battery's negative (−) terminal to the compressor unit. At that time, the magnetic clutch should make a definite operating sound.

DISASSEMBLY AND REASSEMBLY

M1552004600381



AC100630 AB

Cooling temperature switch disassembly steps

1. Snap ring
2. Refrigerant temperature switch
3. O ring

Magnetic clutch disassembly

>>D<< • Air gap adjustment

<<A>> >>C<< 4. Self-locking nut

Magnetic clutch disassembly

5. Armature

>>B<< 6. Snap ring

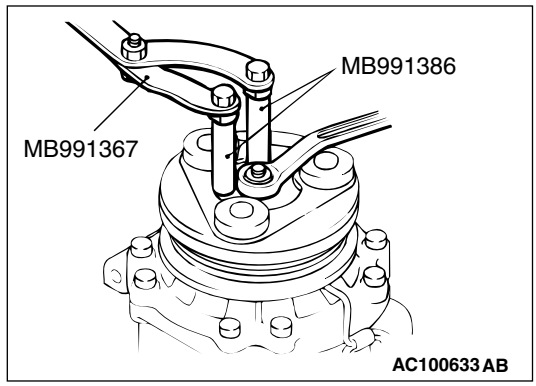
7. Rotor
8. Snap ring

>>A<< 9. Field core

10. Shim
11. A/C compressor

DISASSEMBLY SERVICE POINT

<<A>> SELF-LOCKING NUT REMOVAL



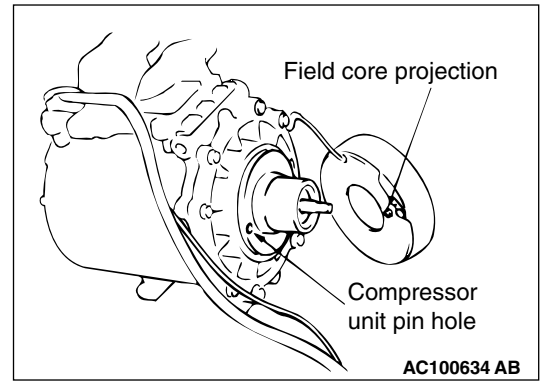
AC100633 AB

Use the special tools to remove the self-locking nut.

- Special spanner (MB991367)
- Pin (MB991386)

REASSEMBLY SERVICE POINTS

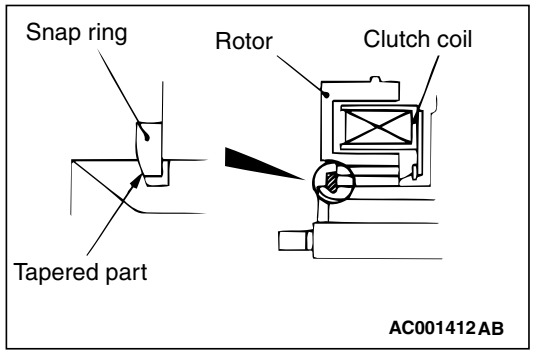
>>A<< FIELD CORE ATTACHMENT



AC100634 AB

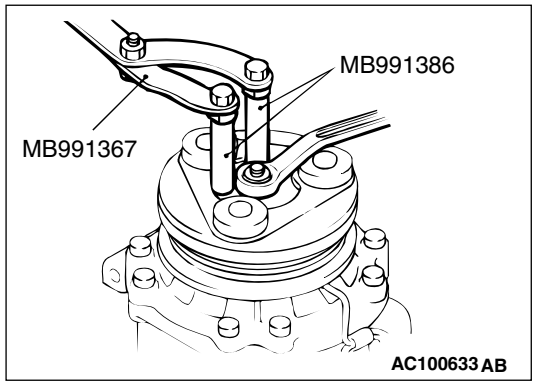
Line up the pin hole on the compressor unit with the field core projection and attach.

>>B<< SNAP RING INSTALLATION



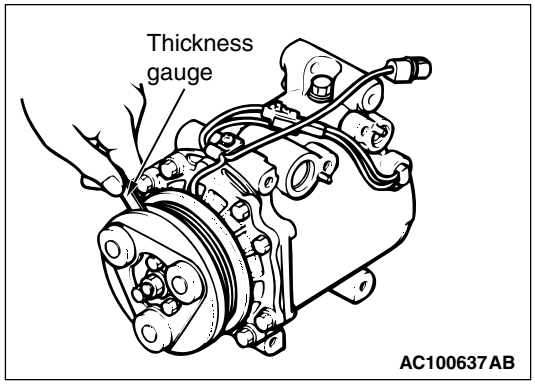
Using snap ring pliers, fit the snap ring so that the snap ring's tapered part is on the outside.

>>C<< SELF-LOCKING NUT INSTALLATION



Use the special tools to install the self-locking nut.
- Special spanner (MB991367)
- Pin (MB991386)

>>D<< AIR GAP ADJUSTMENT



Apply voltage from the battery to the magnetic clutch and check that the clutch air gap is inside the standard value. If outside the standard value, use a shim to adjust the gap.

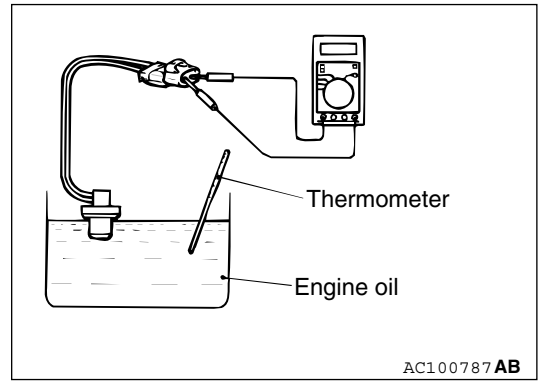
Standard value: 0.3 – 0.5 mm

INSPECTION

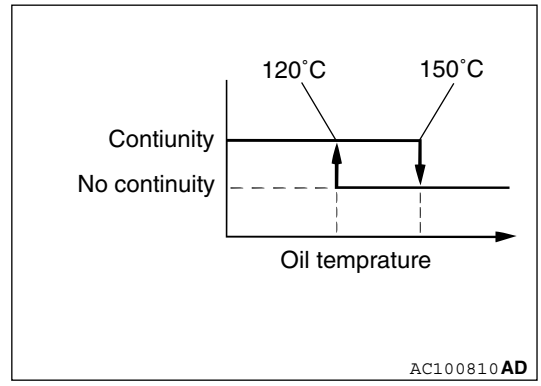
M1552014300712

REFRIGERANT TEMPERATURE SWITCH

⚠ CAUTION
Do not heat more than necessary.



1. Dip the metal part of the cooling temperature switch into engine oil and increase the oil temperature using a gas burner or similar.



2. When the oil temperature reaches the standard value, check that voltage is supplied between the terminals.

Standard value:

Item	Temperature
Less than 2 ohms	Slightly below 150°C
No continuity	150°C or more

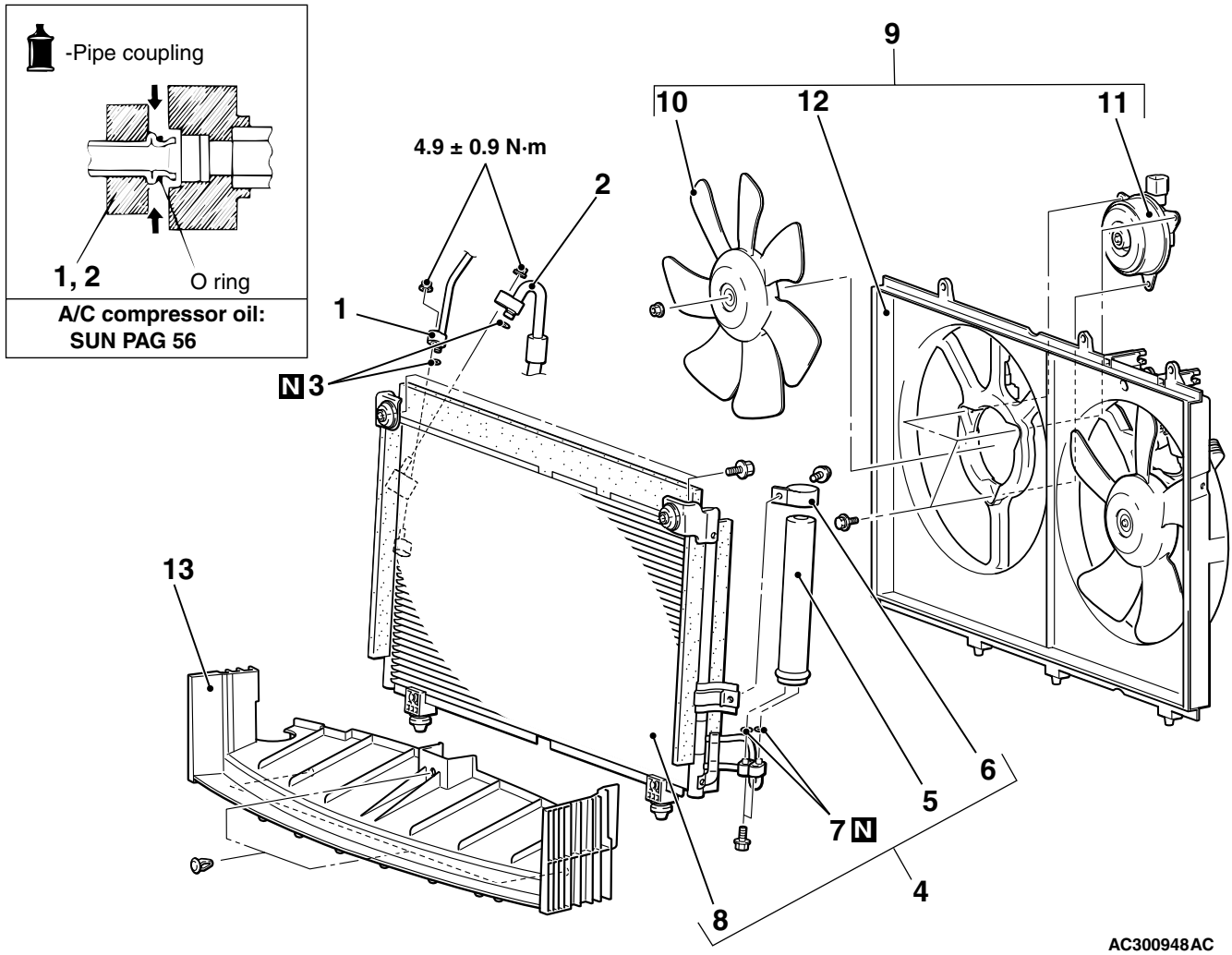
NOTE: When the oil temperature is 150°C or more and there is no continuity, the resistance will not be 2Ω or lower until the oil temperature reduces to 120°C or less.

CONDENSER AND CONDENSER FAN MOTOR

REMOVAL AND INSTALLATION

M1552006700351

Pre-removal and Post-installation Operation
- Refrigerant draining and Refilling (Refer to Charging P.55A-49 and Discharging P.55A-52).
- Air cleaner cover and air flow sensor assembly Removal and Installation (Refer to GROUP 14, Air cleaner P.15-3).



Condenser removal steps

<<A>> 1. Liquid pipe A connection
<<A>> 2. Flexible discharge hose connection
3. O ring
>>A<< 4. Condenser assembly
5. Receiver
6. Clamp
7. O ring
8. Condenser

Fan shroud assembly removal steps

9. Fan shroud assembly
10. Fan
11. Fan motor
12. Fan shroud

Air guide panel removal steps

- Front bumper (Refer to 51, Front bumper P.51-3).

13. Air guide panel

REMOVAL SERVICE POINT

<<A>> FLEXIBLE SUCTION HOSE AND LIQUID PIPE A 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 condenser assembly nipples.

INSTALLATION SERVICE POINT

>>A<< CONDENSER INSTALLATION

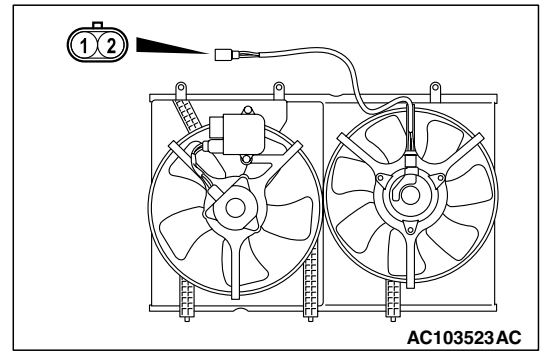
When replacing the condenser, refill it with a specified amount of compressor oil and install it. (to the vehicle).

Compressor oil: SUN PAG 56
Quantity: 15 mL

INSPECTION

M1552014300723

CONDENSER FAN MOTOR CHECK



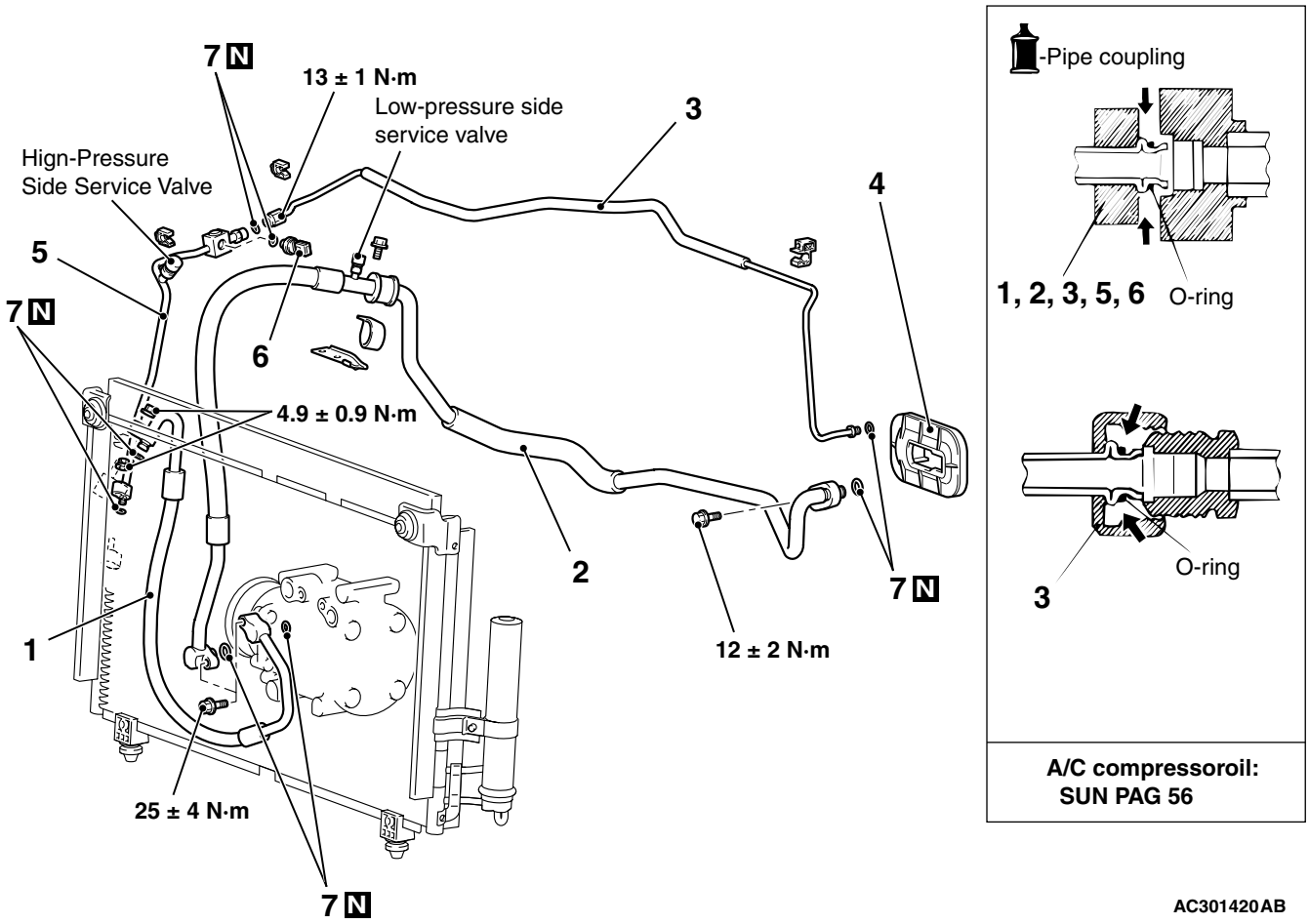
Check to be sure that the condenser fan motor operates when battery voltage is applied to terminal 2 and terminal 1 earthed.

REFRIGERANT LINE

REMOVAL AND INSTALLATION

M1552006400372

Pre-removal and Post-installation Operation
- Refrigerant Draining and Refilling (Refer to Charging and Discharging P.55A-49).
- Air cleaner cover and air flow sensor assembly Removal and Installation (Refer to GROUP 14, Air cleaner P.15-3).
- Radiator Grille Removal and Installation (Refer to GROUP 51, Radiator Grille P.51-10).



Removal steps

<<A>> 1. Flexible discharge hose
<<A>> >>A<< 2. Flexible suction hose
<<A>> 3. Liquid pipe B
4. Evaporator cover

Removal steps (Continued)

<<A>> 5. Liquid pipe A
<<A>> 6. A/C pressure sensor
7. O ring

REMOVAL SERVICE POINT

<<A>> HOSE/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 other foreign bodies, plug the condenser, compressor, and expansion valve nipples.

INSTALLATION SERVICE POINT

>>A<< SUCTION HOSE INSTALLATION

When replacing the suction hose, refill them with a specified amount of compressor oil, and then install them.

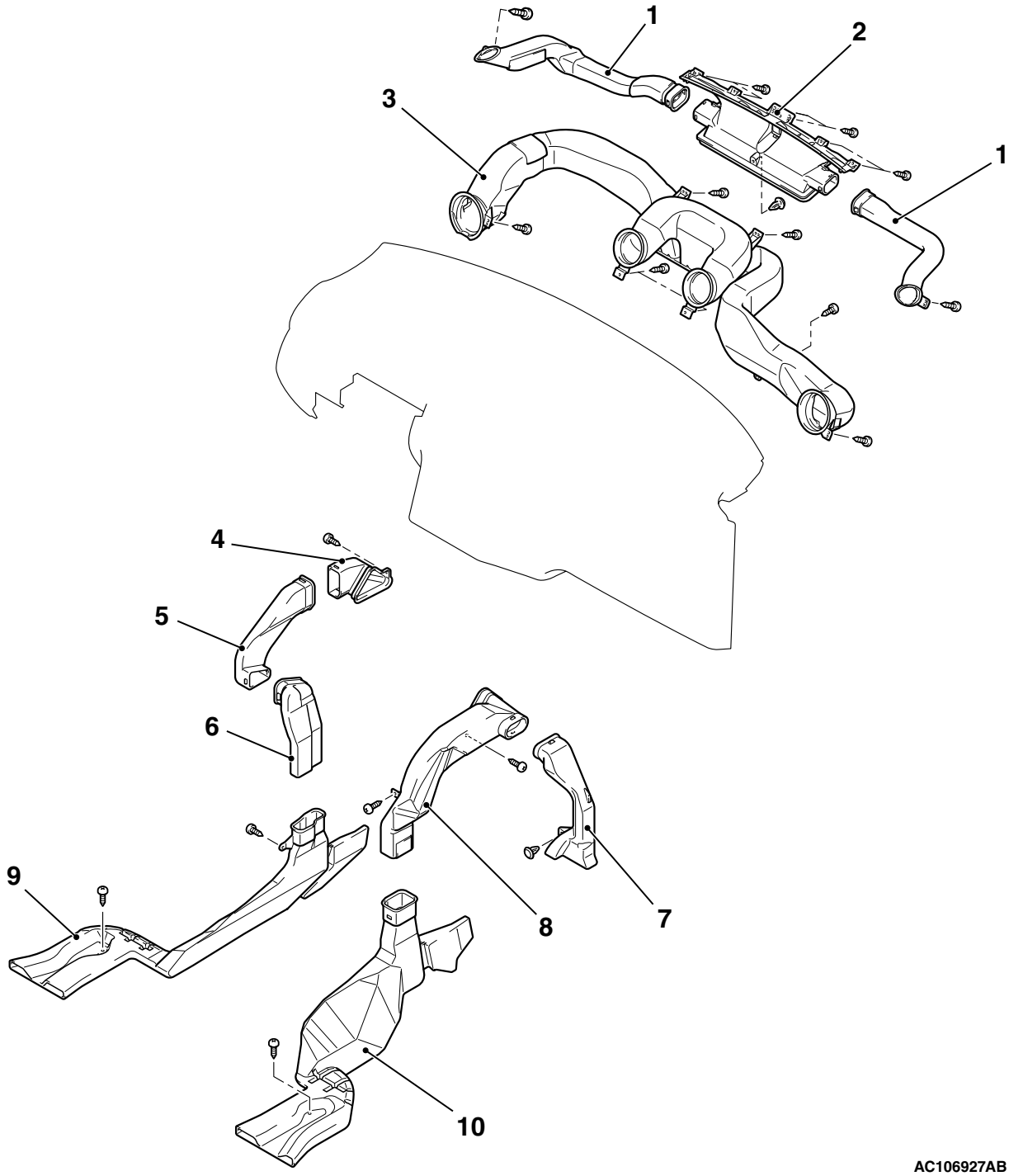
Compressor oil: SUN PAG 56

Quantity: Suction hose: 10 cm^3

VENTILATORS

REMOVAL AND INSTALLATION

M1553001600307



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Defroster nozzle and distribution duct removal steps

- Instrument panel (Refer to 52A P.52A-2.)

1. Side defroster duct
2. Defroster nozzle
3. Distribution duct

Foot duct and rear heater duct removal steps

- Under cover (Refer to GROUP 52A, Instrument panel P.52A-2.)

4. Foot duct <driver's side>
5. Rear heater duct A <driver's side>
6. Rear heater duct B upper side <driver's side>

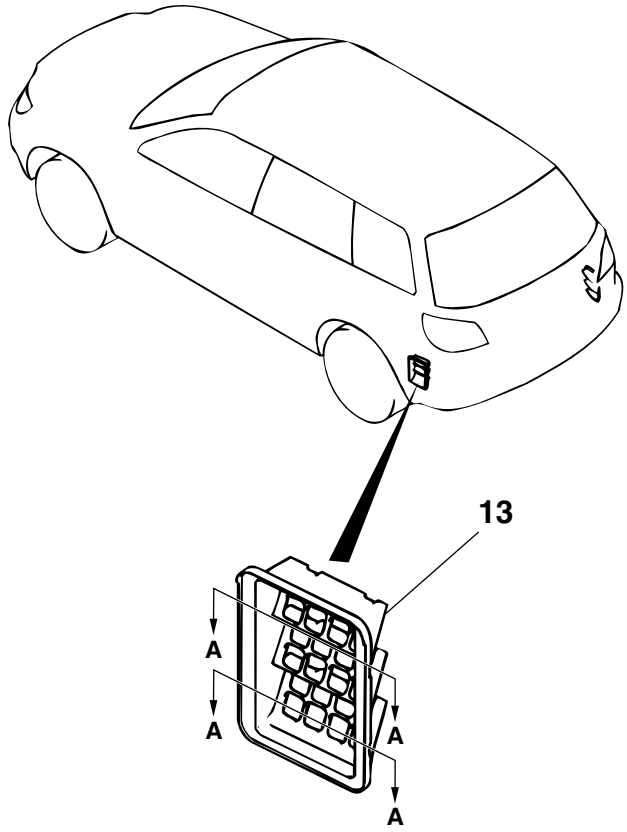
Foot duct and rear heater duct removal steps (Continued)

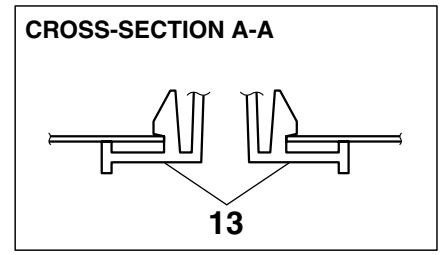
- Glove box (Refer to GROUP 52A, Instrument panel P.52A-2.)

7. Foot duct <front passenger's side>
10. Rear heater duct A <front passenger's side>

- Floor carpet
- Front seat assembly (Refer to GROUP 52A, Front seat assembly P.52A-21.)
- Front floor console (Refer to GROUP 52A, Floor console P.52A-8.)

11. Rear heater duct B lower side <driver's side>
12. Rear heater duct B <front passenger's side>





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Rear ventilation duct removal steps

- Rear bumper assembly (Refer to GROUP 51, Rear bumper P.51-6.)

13. Rear ventilation duct