GROUP 55A

HEATER, AIR CONDITIONER AND VENTILATION

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SERVICE SPECIFICATIONS

M1552000300441

Item			Standard value
Idle speed r/min			700 ±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
A/C refrigerant temperature switch operating temperature °C		Being turned off	150
		Being turned on	120

LUBRICANTS

M1552000400482

Item	Specified lubricant	Quantity
Compressor refrigerant unit lubricant	SUN PAG 56	120 mL
Each connection of refrigerant line	SUN PAG 56	As required
Refrigerant	R-134a (HFC-134a)	480 – 520 g

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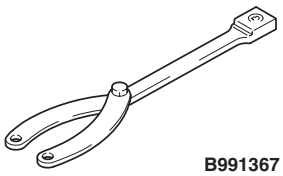
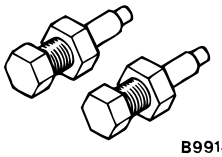
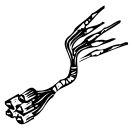
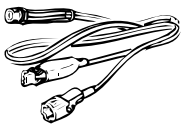
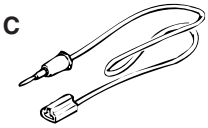
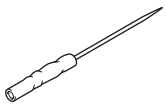
SPECIAL TOOLS

M1552000600312

Tool	Number	Name	Use
 B991367	MB991367	Special spanner	Armature mounting nut of compressor removal and installation
 B991386	MB991386	Pin	
A  B  C  D DO NOT USE MB991223AZ	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Making voltage and resistance measurements during troubleshooting A: Connect pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at harness wire or connector

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TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

M1552009600427

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –Contents of Troubleshooting P.00-5.

SYMPTOM CHART

M1552009900677

NOTE: Refer to GROUP 14, Troubleshooting P.14-4 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
Outside/inside 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-17
Blower air amount cannot be changed.	5	P.55A-24
Rear window defogger function does not operate.	6	P.55A-27
Rear window defogger Timer function does not operate.	7	P.55A-33
Malfunction of the A/C-ECU power supply system.	8	P.55A-34
A/C compressor power supply system.	9	P.55A-37
Condenser Fan does not operate.	10	Refer to GROUP 14 P.14-4

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.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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 "4 (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 is not emitted) P.55A-10."

NO : Refer to Inspection procedure 4 "Blower fan and motor do not turn P.55A-17."

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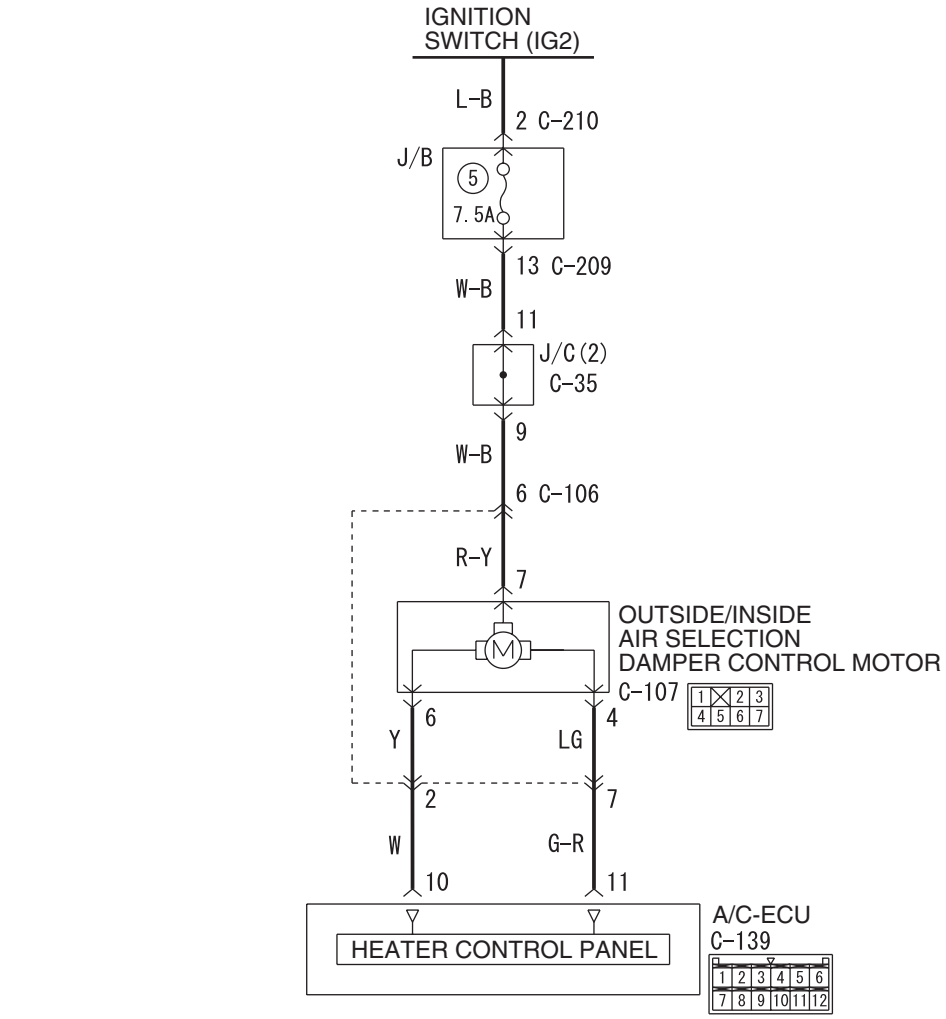
Inspection Procedure 2: Outside/Inside Air Selection is not possible.

Outside/Inside Air Selection Damper Control Motor 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 : Grey R : Red P : Pink V : Violet PU : Purple

W5J55L000A

COMMENTS ON TROUBLE SYMPTOM

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

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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

Q: Do the rear window defogger and A/C work normally?
YES : Go to Step 2.
NO : Refer to Inspection procedure 8 "Malfunction of the A/C-ECU power supply system P.55A-34."

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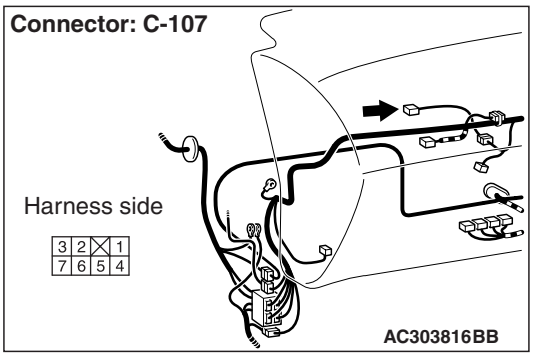
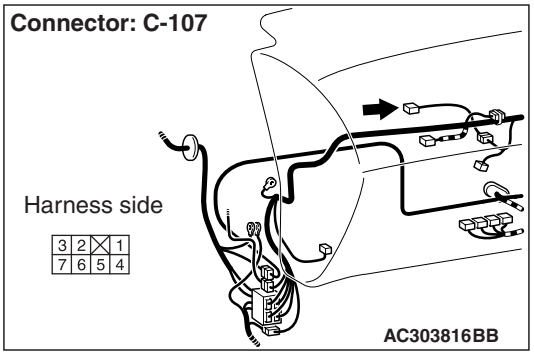
STEP 2. Connector check: C-107 outside/inside air selection damper control motor connector



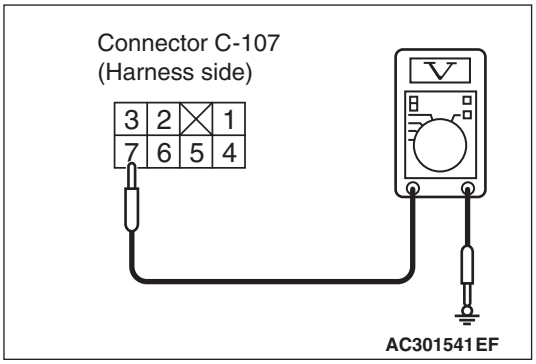
Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector.

STEP 3. Voltage measurement at the C-107 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 4.

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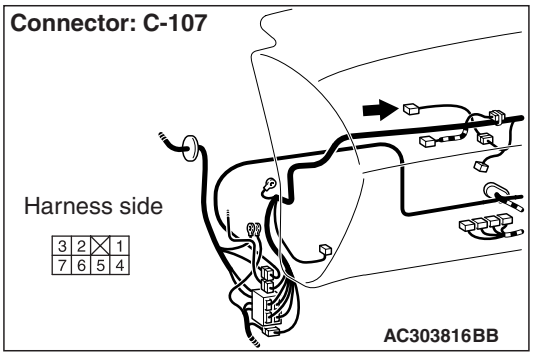
STEP 4. Check the wiring harness between C-107 outside/inside air selection damper control motor connector terminal No.7 and the ignition switch (IG2).



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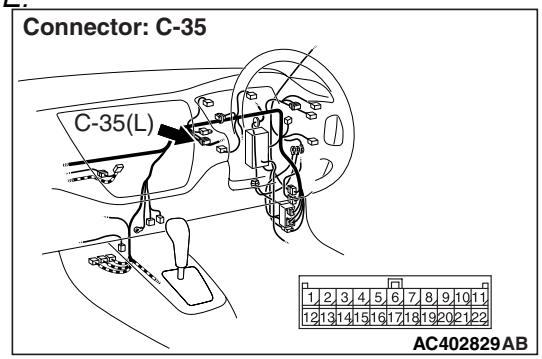
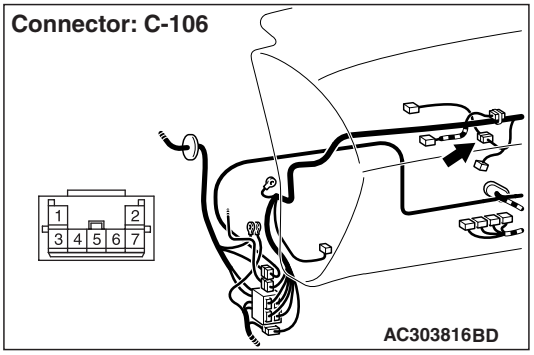
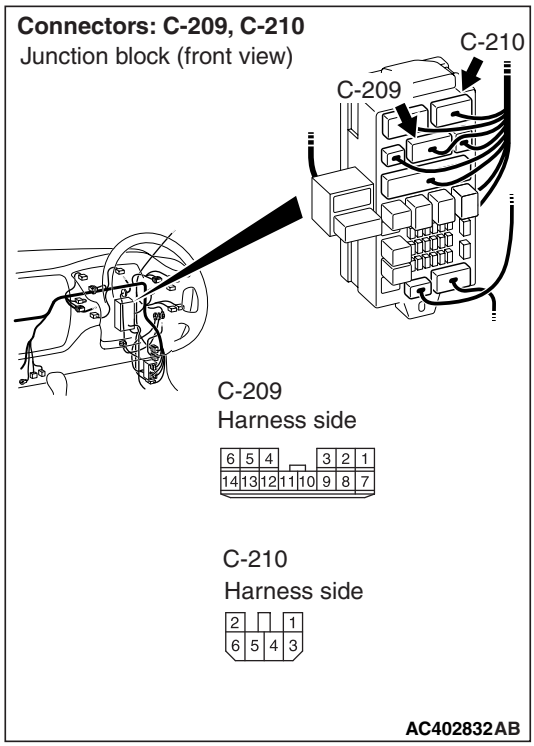






Prior to the wiring harness inspection, check intermediate connector C-106, joint connector C-35, junction block connectors C-209 and C-210, and repair if necessary.

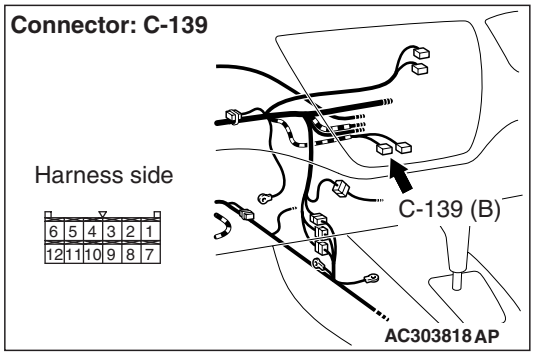
Check the outside/inside air selection damper control motor power supply line for open circuit.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Repair the wiring harness.

STEP 5. Connector check: C-139 A/C-ECU connector



Q: Is the check result normal?

YES : Go to Step 6.

NO : Repair the connector.

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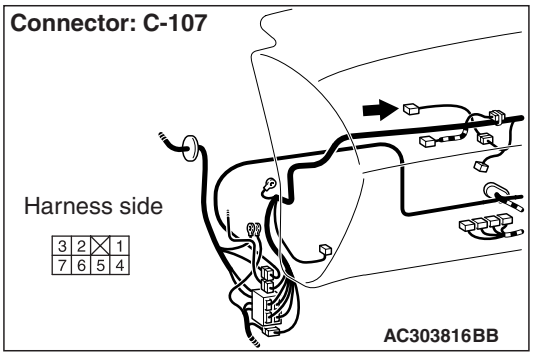
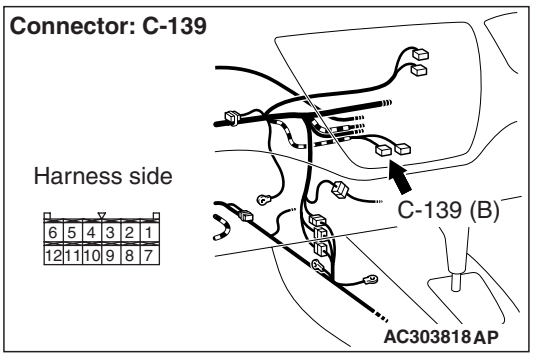
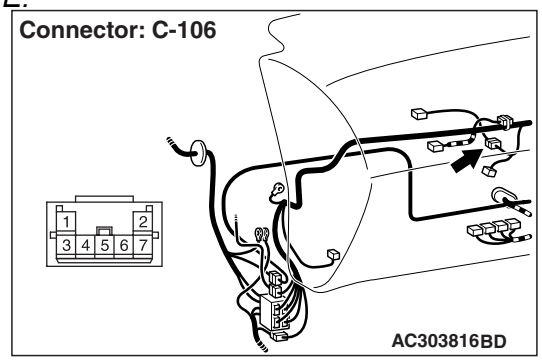
STEP 6. Check the wiring harness between C-107 outside/inside air selection damper control motor connector (terminals 6 and 4) and C-139 A/C-ECU connector (terminals 10 and 11).





NOTE:



Prior to the wiring harness inspection, check intermediate connector C-106, and repair if necessary.
Check the outside/inside air selection damper control motor earth line for open or short circuit.

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

STEP 7. Check the outside/inside air selection damper control motor
Refer to P.55A-55.

Q: Does outside/inside air selection damper control motor work normally?
YES : Replace the manual A/C control panel (A/C-ECU).
NO : Replace the outside/inside air selection damper control motor.

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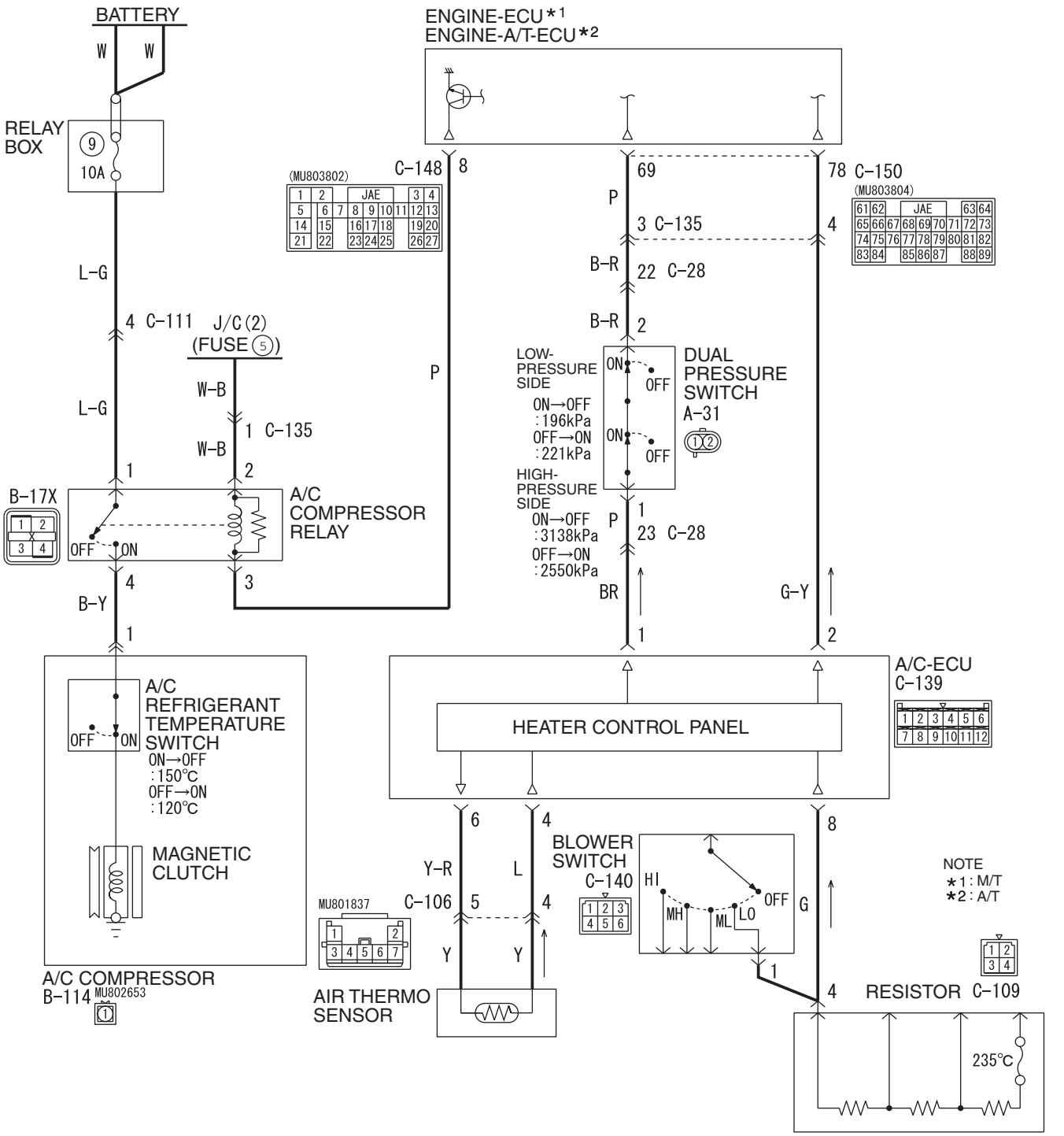
Inspection Procedure 3: When the A/C is Operating, Temperature Inside the Passenger Compartment does not Decrease (Cool Air is not Emitted).

A/C-ECU System 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 : Grey R : Red P : Pink V : Violet PU : Purple

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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.

PROBABLE CAUSES

- Improper amount of refrigerant
- Malfunction of the air thermo sensor
- Malfunction of the dual pressure switch
- 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-ECU <M/T> or the engine-A/T-ECU <A/T>

DIAGNOSIS PROCEDURE

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

Q: Do the rear window defogger and outside/inside air selection damper control motor work normally?
YES : Go to Step 2.
NO : Refer to Inspection procedure 8 "Malfunction of the A/C-ECU power supply system P.55A-34."

STEP 2. Check the blower motor operation.

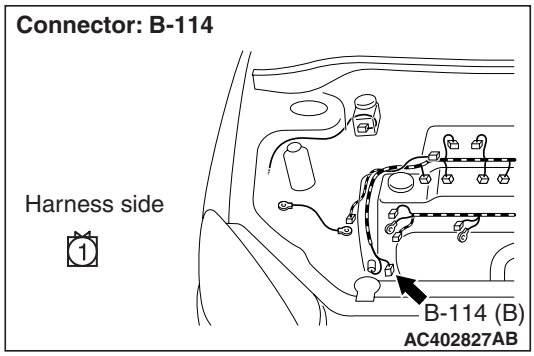
Q: Does the blower motor work normally?
YES : Go to Step 3.
NO : Refer to Inspection procedure 4 "Blower fan and motor do not turn P.55A-17."

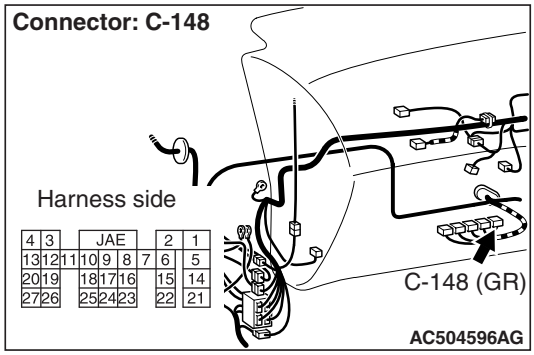
STEP 3. Check the A/C compressor.

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.

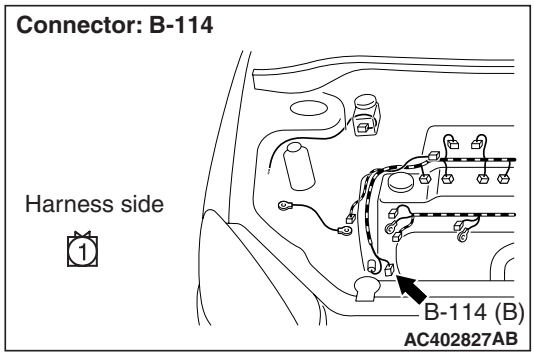
STEP 4. Connector check: B-114 A/C compressor connector and C-148 engine-ECU connector <M/T> or engine-A/T-ECU connector <A/T>





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

STEP 5. Voltage measurement at the B-114 A/C compressor connector.



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

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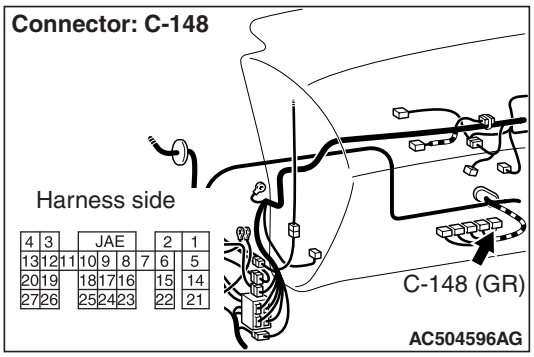
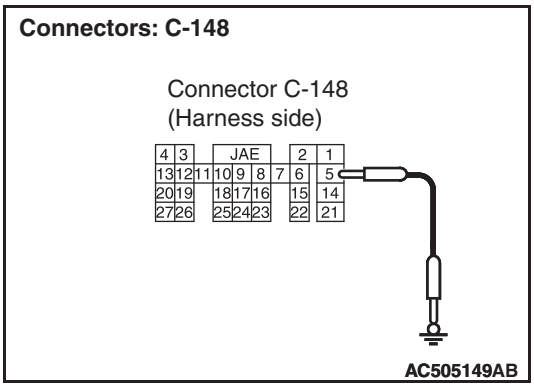
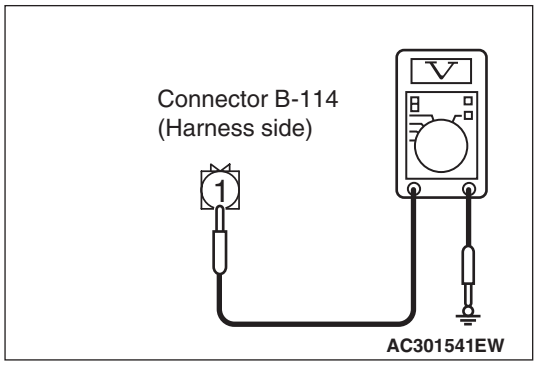
(2) Turn the ignition switch to the "ON" position.





(3) Disconnect engine-ECU <M/T> or engine-A/T-ECU <A/T> connector C-148, and earth terminal 8.

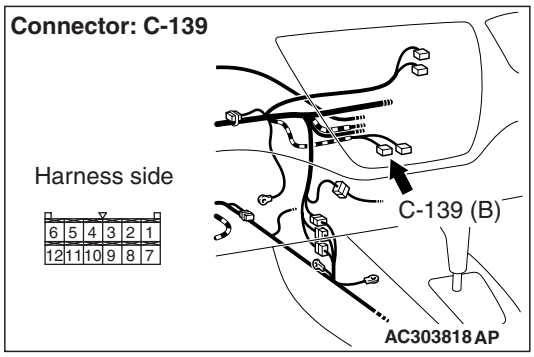


(4) Measure the voltage between terminal 1 and body earth.

OK: System voltage

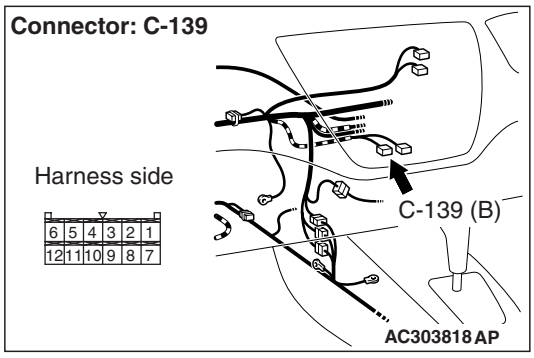
Q: Is the check result normal?
YES : Go to Step 6.
NO : Refer to Inspection procedure 9 "A/C compressor power supply system P.55A-37."

STEP 6. Connector check: C-139 A/C-ECU connector

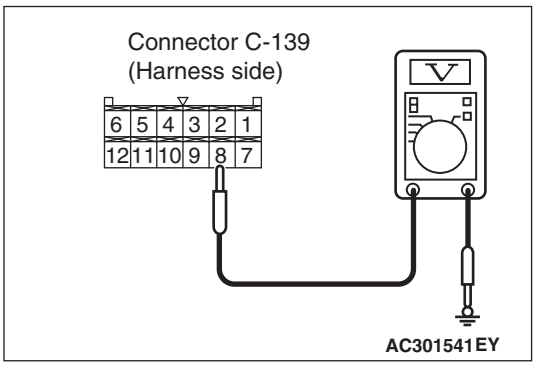


Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the connector.

STEP 7. Voltage measurement at C-139 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 10.
NO : Go to Step 8.

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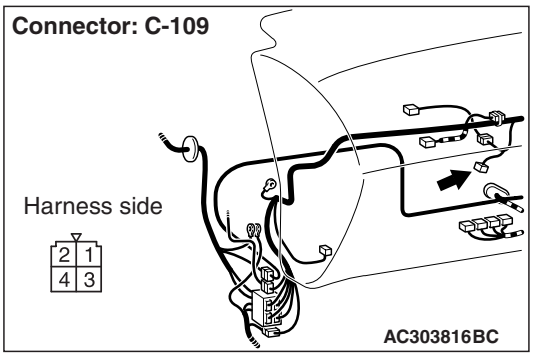
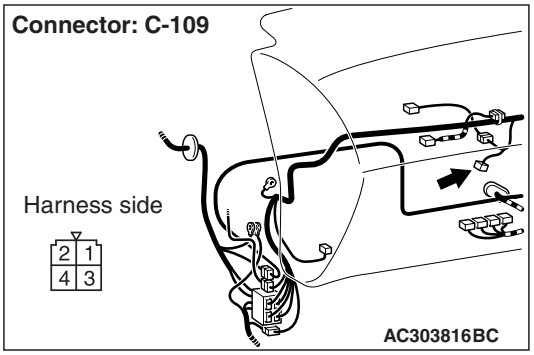
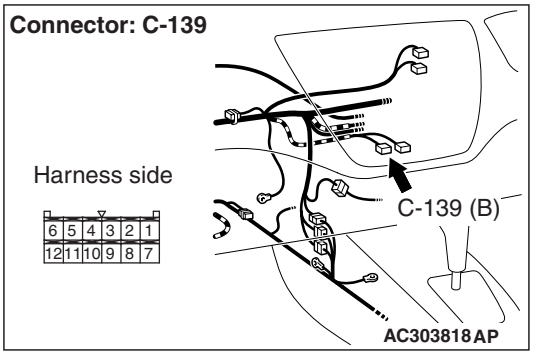
STEP 8. Connector check: C-109 resistor connector



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

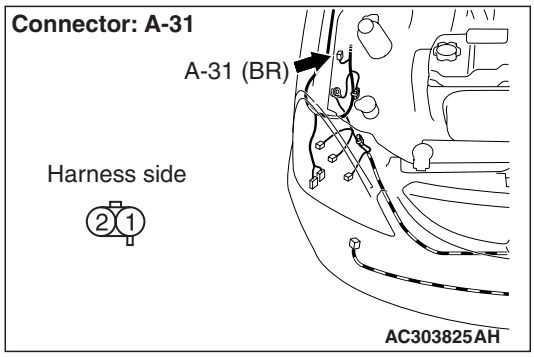
STEP 9. Check the wiring harness between C-109 resistor connector terminal No.4 and C-139 A/C-ECU connector terminal No.8.





Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

STEP 10. Connector check: A-31 dual pressure switch connector



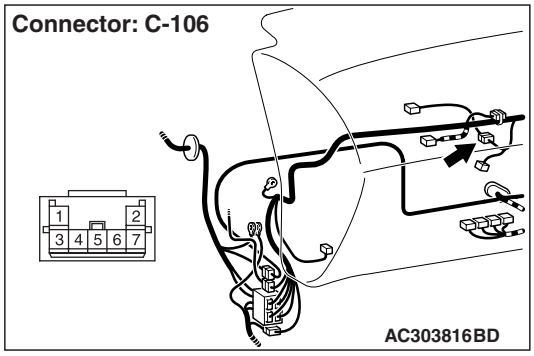
Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the connector.

STEP 11. Check the dual pressure switch operation.

Refer to P.55A-43.

Q: Is the dual pressure switch operating properly?
YES : Go to Step 12.
NO : Replace the dual pressure switch.

STEP 12. Connector check: C-106 air thermo sensor connector



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

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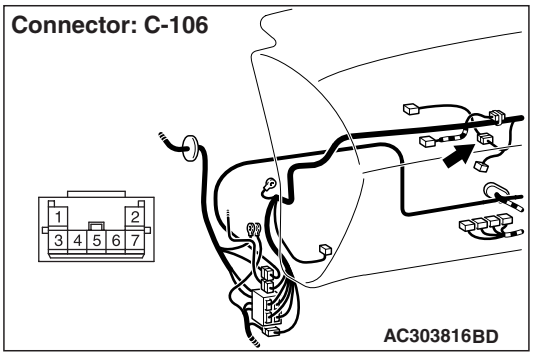
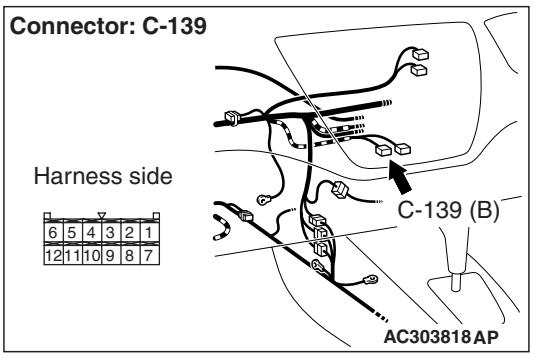
STEP 13. Check the wiring harness between C-106 air thermo sensor connector (terminals 4 and 5) and C-139 A/C-ECU connector (terminals 4 and 6).

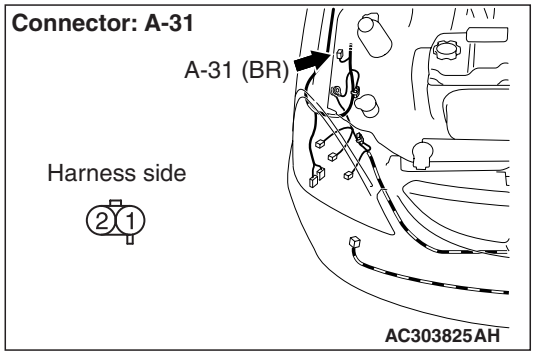


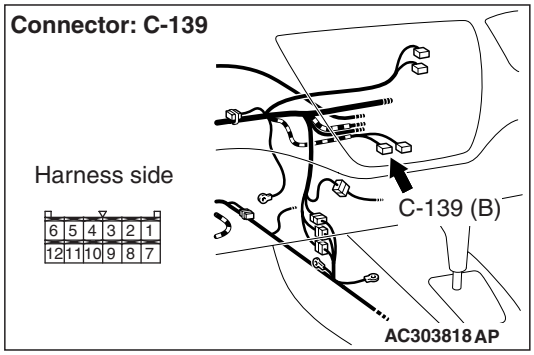


Check the air thermo sensor output and earth line for open or short circuit.

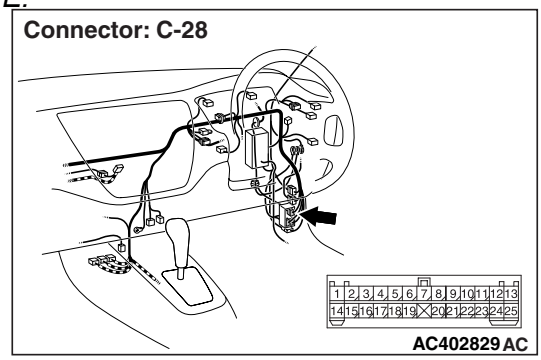
Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the wiring harness.

STEP 14. Check the wiring harness between A-31 dual pressure switch connector terminal No.1 and C-139 A/C-ECU connector terminal No.1.





NOTE:



Prior to the wiring harness inspection, check intermediate connector C-28, and repair if necessary.
Check the dual pressure switch output line for open or short circuit.

Q: Is the check result normal?
YES : Go to Step 15.
NO : Repair the wiring harness.

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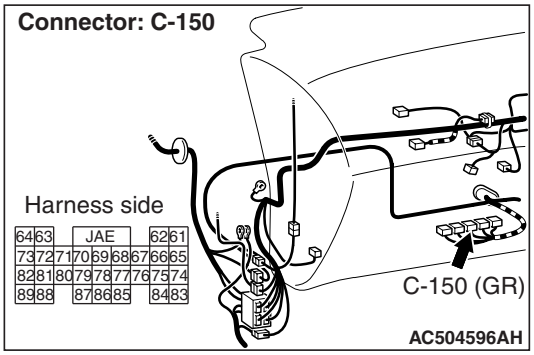
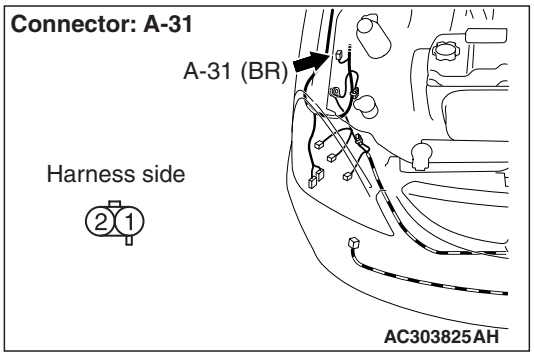
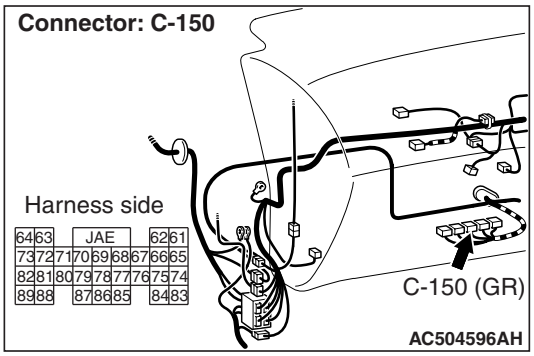
STEP 15. Connector check: C-150 engine-ECU connector <M/T> or engine-A/T-ECU connector <A/T>



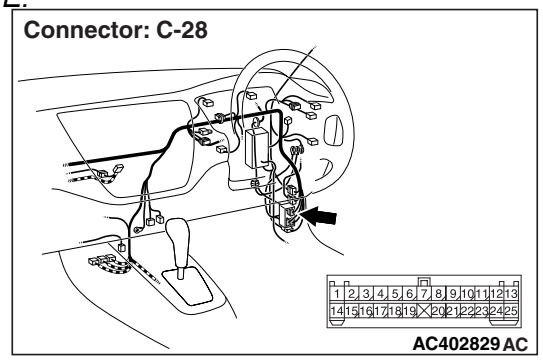
Q: Is the check result normal?
YES : Go to Step 16.
NO : Repair the connector.

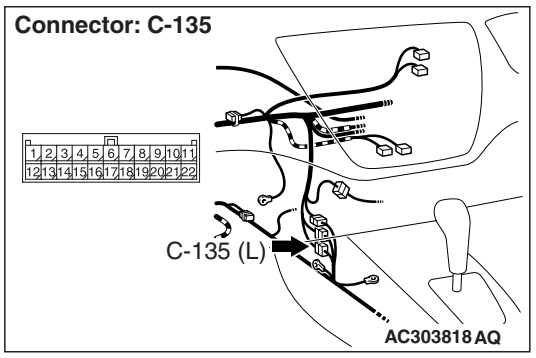
STEP 16. Check the wiring harness between C-150 engine-ECU connector <M/T> or engine-A/T-ECU connector <A/T> terminal No.69 and A-31 dual pressure switch connector terminal No.2.





NOTE:

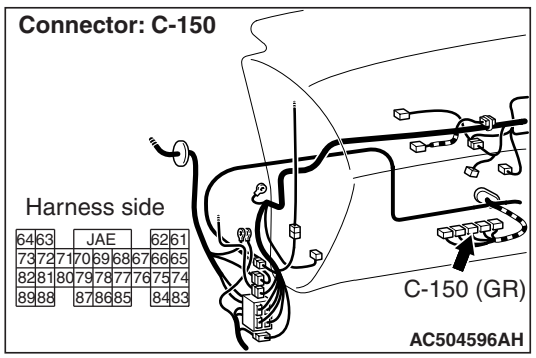




Prior to the wiring harness inspection, check intermediate connector C-28 and C-135, and repair if necessary.
Check the communication line for open or short circuit.

Q: Is the check result normal?
YES : Go to Step 17.
NO : Repair the wiring harness.

STEP 17. Connector check: C-150 engine-ECU connector <M/T> or engine-A/T-ECU connector <A/T>



Q: Is the check result normal?
YES : Go to Step 18.
NO : Repair the connector.

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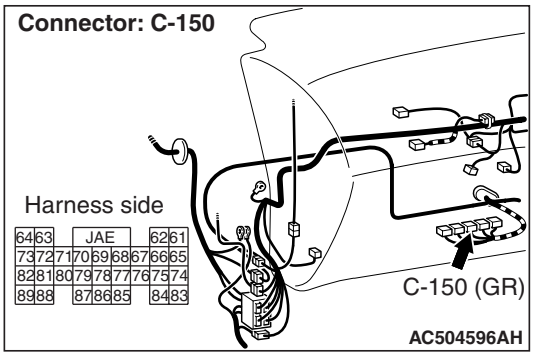
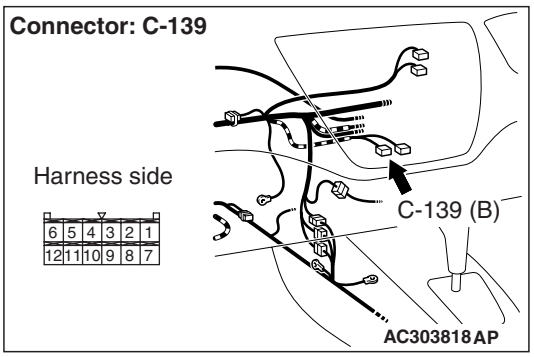
STEP 18. Check the wiring harness between C-150 engine-ECU connector <M/T> or engine-A/T-ECU <A/T> connectors terminal No.78 and C-139 A/C-ECU connector terminal No.2.





Check the communication line for open or short circuit.

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

STEP 19. Check the magnetic clutch operation.
Refer to P.55A-59.

Q: Can the sound of the magnetic clutch (click) be heard?
YES : Go to Step 20.
NO : Replace the compressor magnet clutch.

STEP 20. Check the refrigerant temperature switch.
Refer to P.55A-61.

Q: Is the refrigerant temperature switch operating properly?
YES : Go to Step 21.
NO : Replace the refrigerant temperature switch.

STEP 21. Check the air thermo sensor.
Refer to P.55A-57.

Q: Is the air thermo sensor in good condition?
YES : Go to Step 22.
NO : Replace the air thermo sensor.

STEP 22. Check the refrigerant level.
Refer to P.55A-43.

Q: Is the refrigerant level correct?
YES : Go to Step 23.
NO : Charge or remove the refrigerant level. Refer to P.55A-43.

STEP 23. Replace the A/C-ECU.
Check that the air conditioner works normally.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the engine-ECU <M/T> or the engine-A/T-ECU <A/T>.

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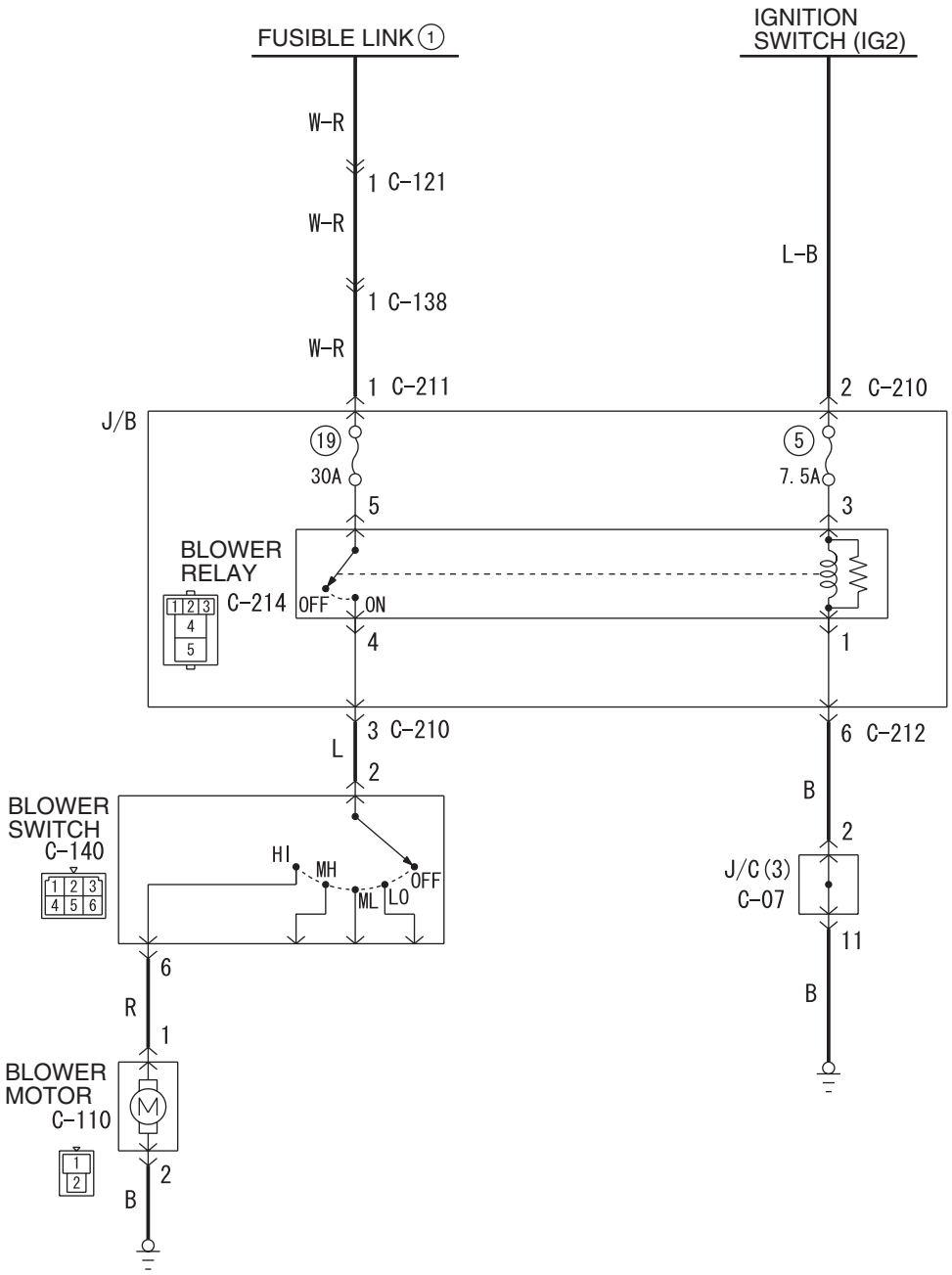
Inspection Procedure 4: Blower Fan and Motor do not Turn.

Blower Motor 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 : Grey R : Red P : Pink V : Violet PU : Purple

W5J55L002A

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.

PROBABLE CAUSES

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

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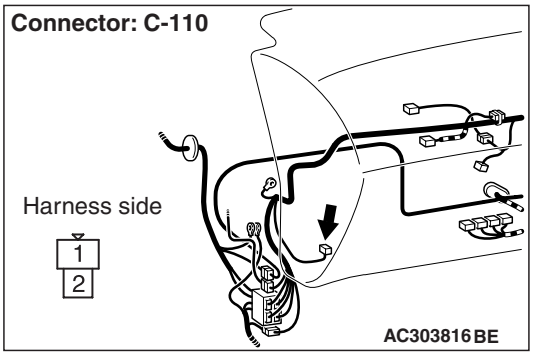
DIAGNOSIS PROCEDURE

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.

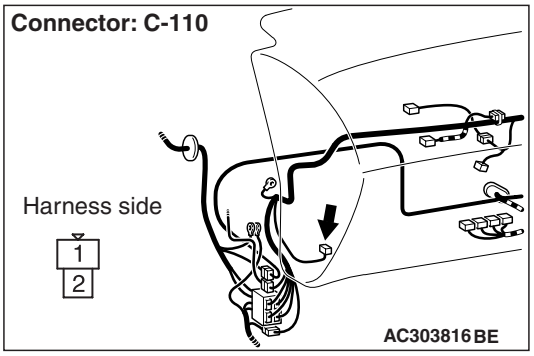
Q: Does the blower motor operate when the blower switch is moved to the "4 (HI) " position?
YES : Refer to Inspection procedure 5 "Blower air amount cannot be changed P.55A-24."
NO : Go to Step 2.

STEP 2. Connector check: C-110 blower motor connector

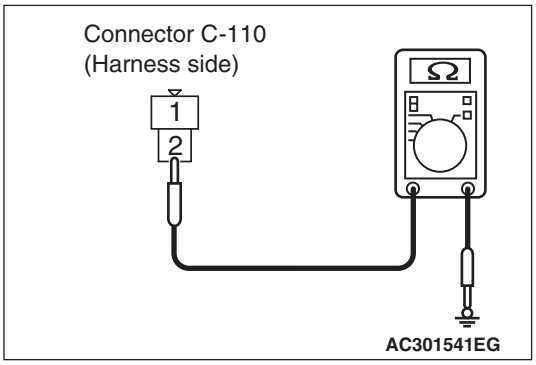


Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector.

STEP 3. Resistance measurement at the C-110 blower motor connector.



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

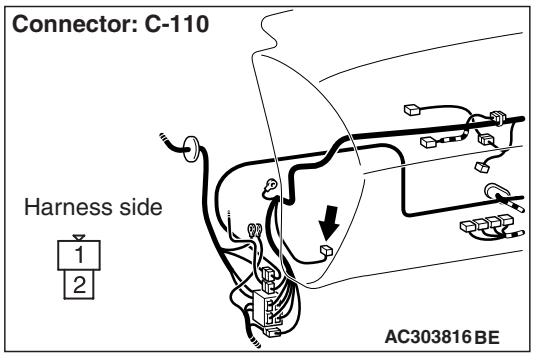


(2) Measure the resistance between terminal 2 and body earth.

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Check the wiring harness between C-110 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 Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

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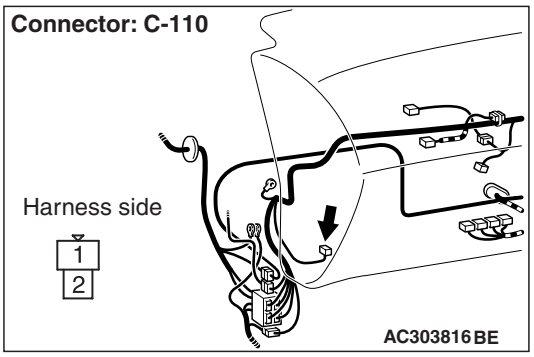
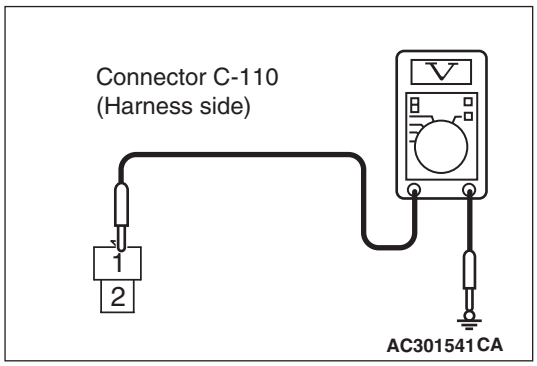
STEP 5. Voltage measurement at C-110 blower motor connector.



(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.

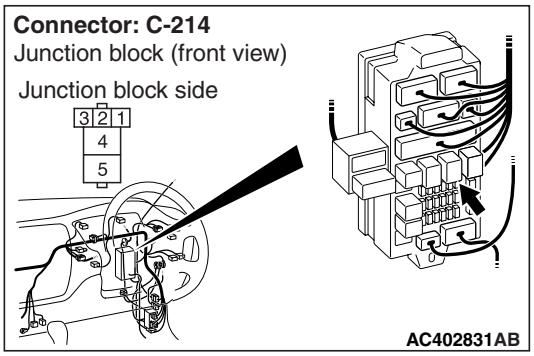


(4) Measure the voltage between terminal 1 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 18.
NO : Go to Step 6.

STEP 6. Connector check: C-214 blower relay connector

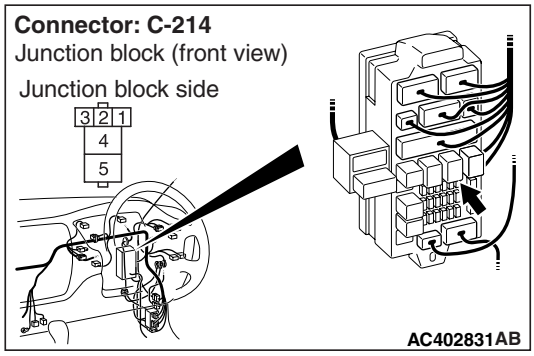


Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the connector.

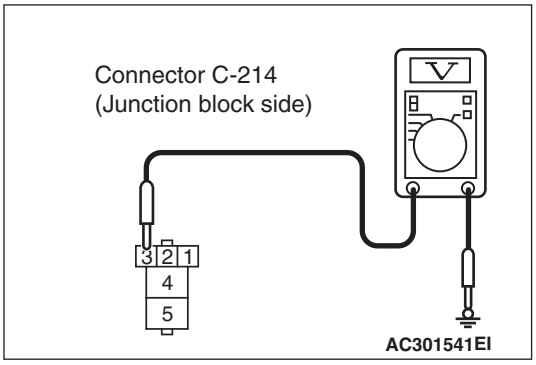
STEP 7. Check the blower relay continuity.
Refer to P.55A-46.

Q: Is the blower relay continuity in good condition?
YES : Go to Step 8.
NO : Replace the blower relay.

STEP 8. Voltage measurement at C-214 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 3 and earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

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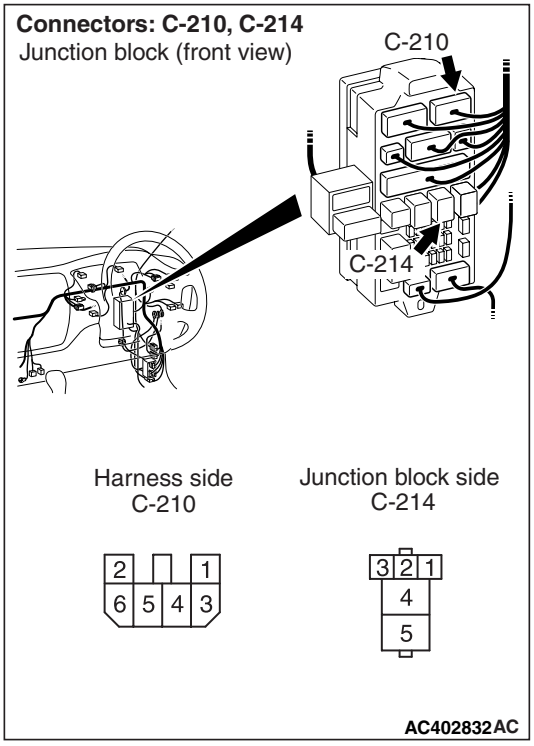
STEP 9. Check the wiring harness between C-214 blower relay connector terminal No.3 and the ignition switch (IG2).



NOTE: Prior to the wiring harness inspection, check junction block connector C-210, and repair if necessary.

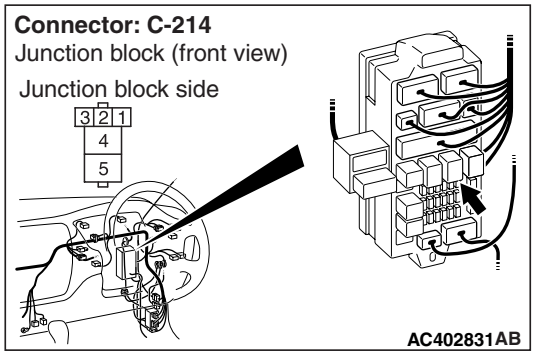
Check the blower relay power supply line for open circuit.

Q: Is the check result normal?

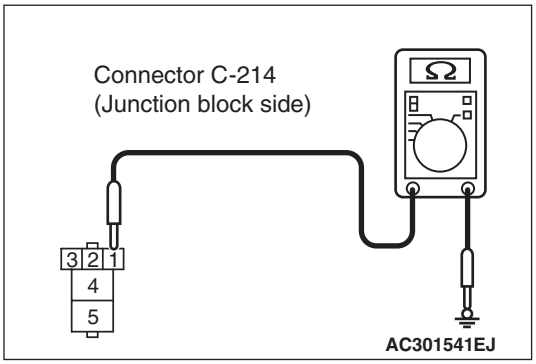
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Repair the wiring harness.

STEP 10. Resistance measurement at C-214 blower relay connector.



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



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

OK: 2 ohms or less

Q: Is the check result normal?

YES : Go to Step 12.

NO : Go to Step 11.

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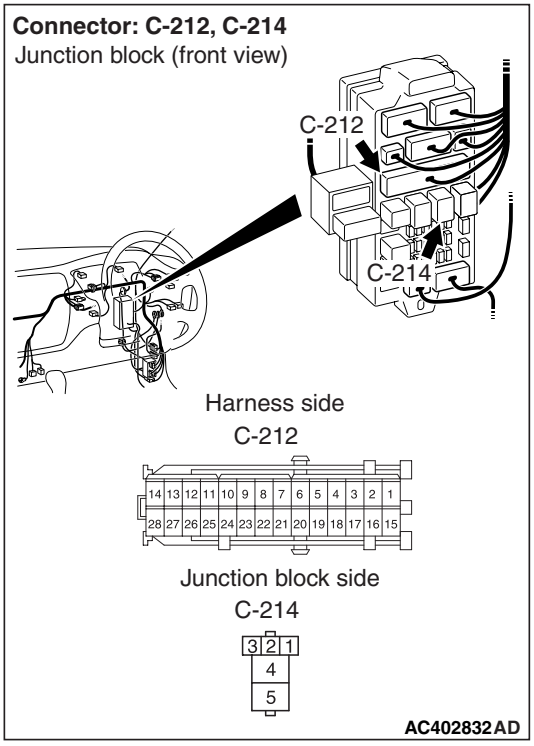
STEP 11. Check the wiring harness between C-214 blower relay connector terminal No.1 and earth.



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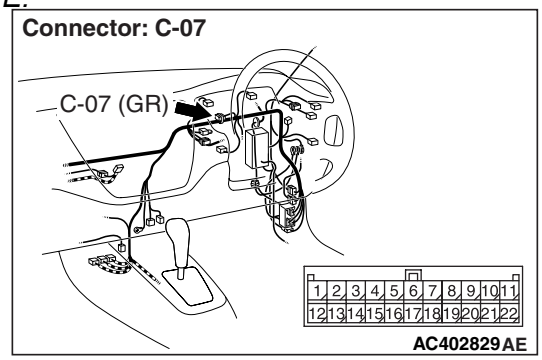


Prior to the wiring harness inspection, check junction block connectors C-212 and joint connectors C-07, and repair if necessary.

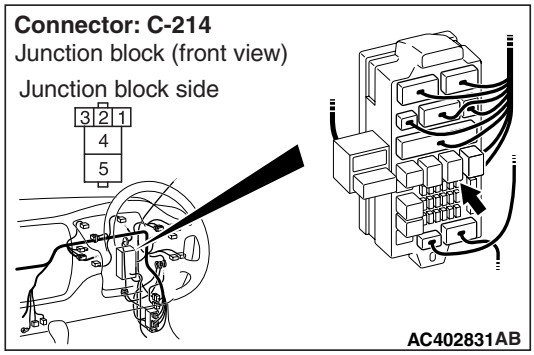
Check the blower relay earth wires for open circuit.

Q: Is the check result normal?

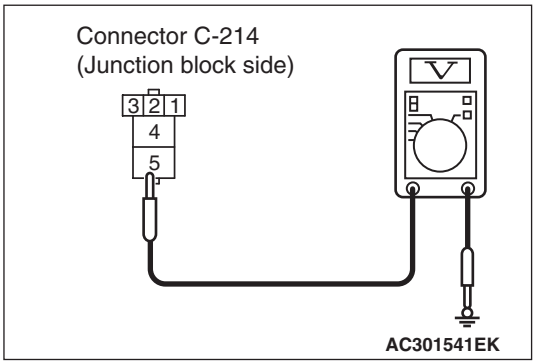
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Repair the wiring harness.

STEP 12. Voltage measurement at C-214 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 14.

NO : Go to Step 13.

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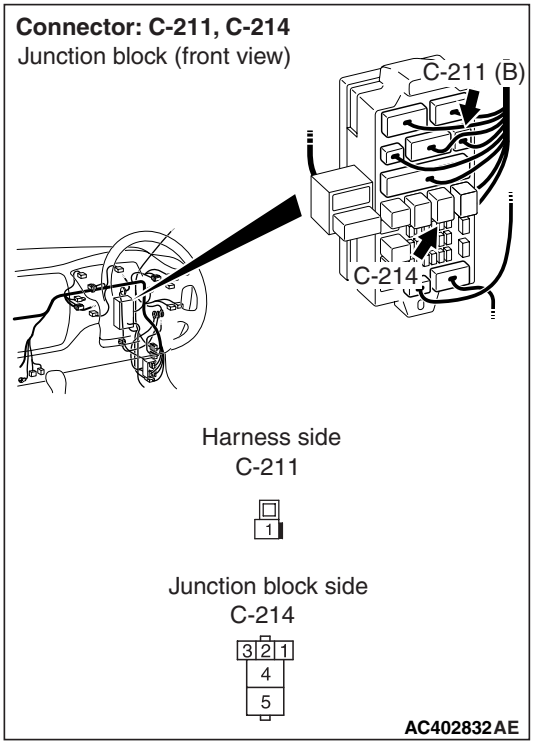
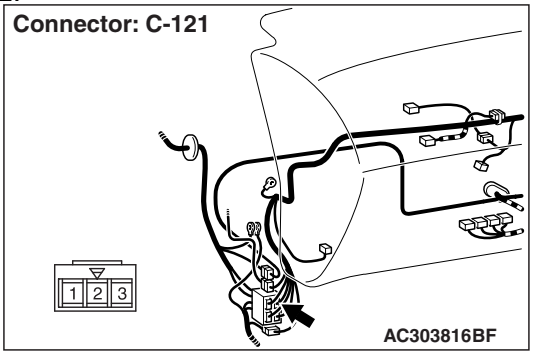
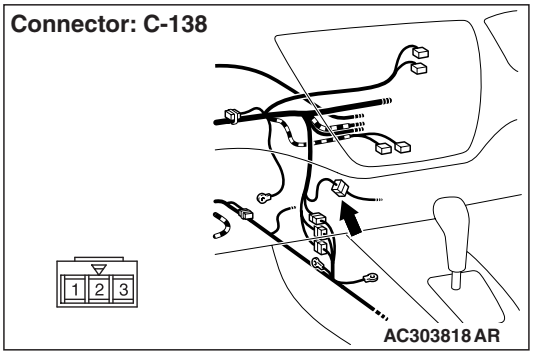
STEP 13. Check the wiring harness between C-214 blower relay connector terminal No.5 and fusible link (1).



NOTE:

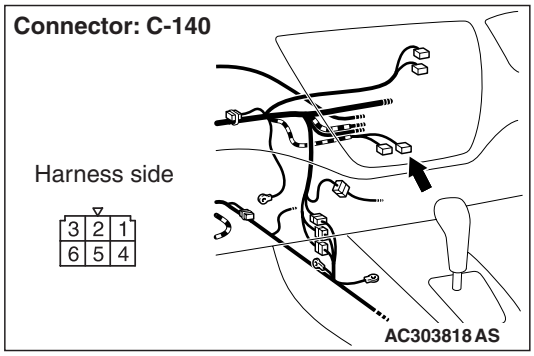




Prior to the wiring harness inspection, check intermediate connectors C-121, C-138 and junction block connector C-211, and repair if necessary.
Check the blower relay power supply line for open circuit.

Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

STEP 14. Connector check: C-140 blower switch connector



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

STEP 15. Check the blower switch continuity.
Refer to P.55A-49.

Q: Is the blower switch continuity in good condition?
YES : Go to Step 16.
NO : Replace the blower switch.

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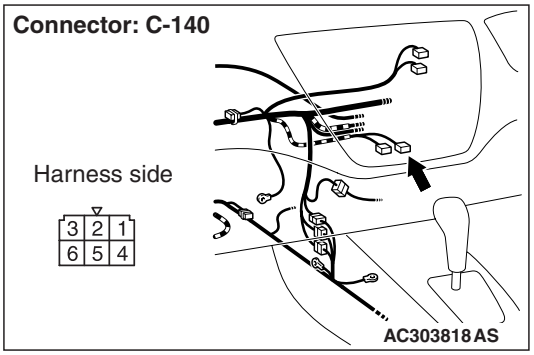
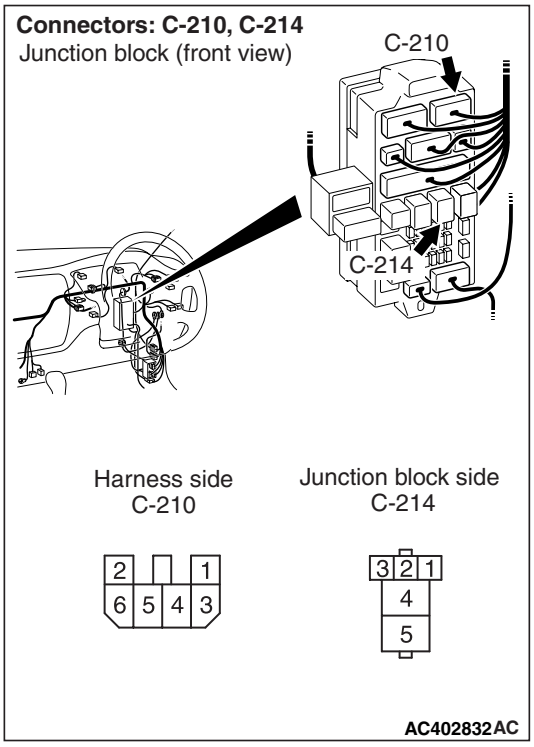
STEP 16. Check the wiring harness between C-140 blower switch connector terminal No.2 and C-214 blower relay connector terminal No.4.





NOTE: Prior to the wiring harness inspection, check junction block connectors C-210, and repair if necessary.

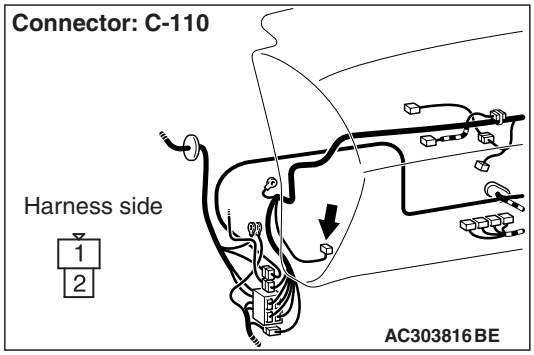
Check the blower relay output line for open circuit.

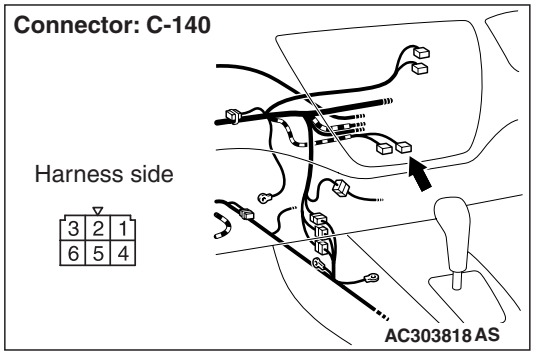
Q: Is the check result normal?

YES : Go to Step 17.

NO : Repair the wiring harness.

STEP 17. Check the wiring harness between C-110 blower motor connector terminal No.1 and C-140 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 Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Repair the wiring harness.

STEP 18. Check the blower fan and motor operation.

Refer to P.55A-55.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Replace the blower motor.

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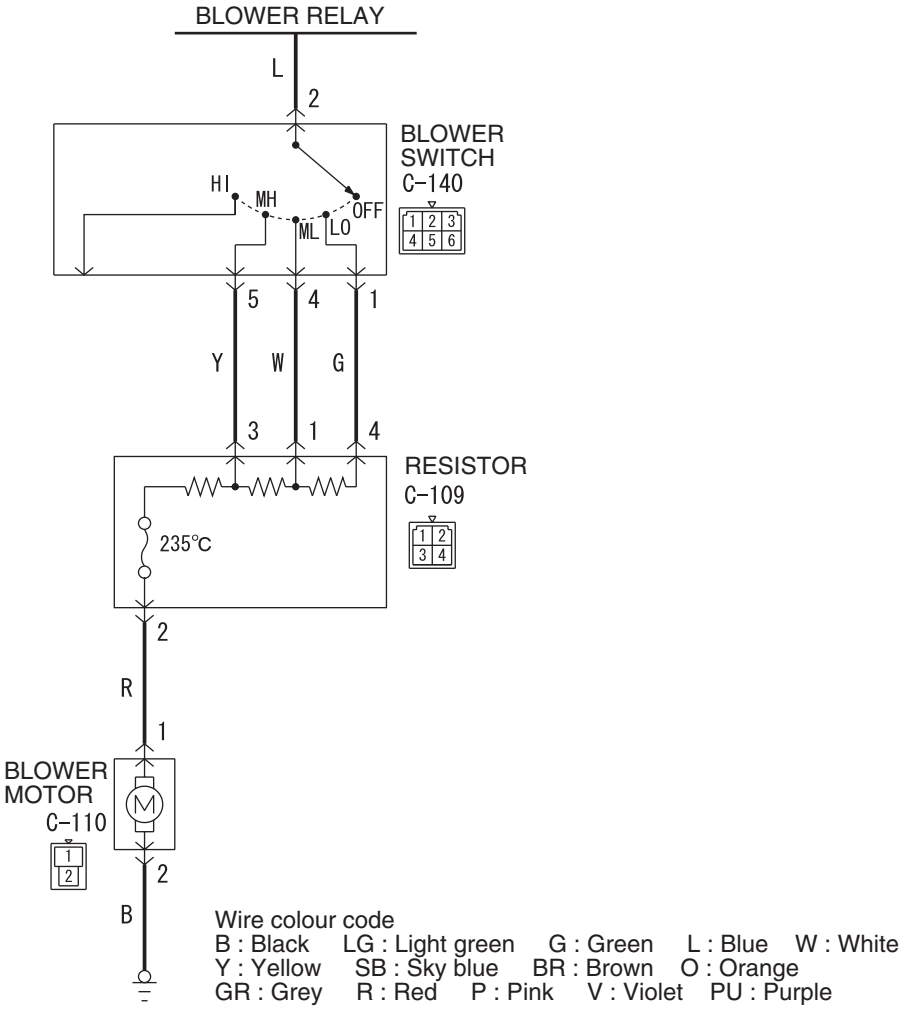
Inspection Procedure 5: Blower Air Amount cannot be Changed.

Blower Switch and Resistor Circuit



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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.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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-17."

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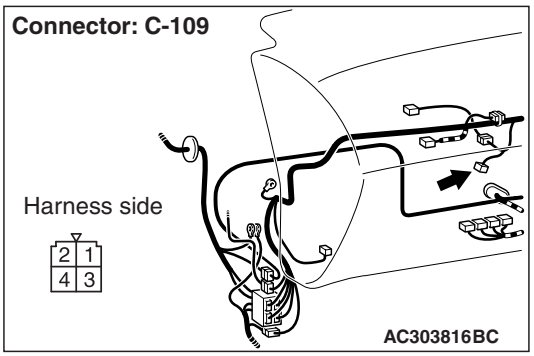
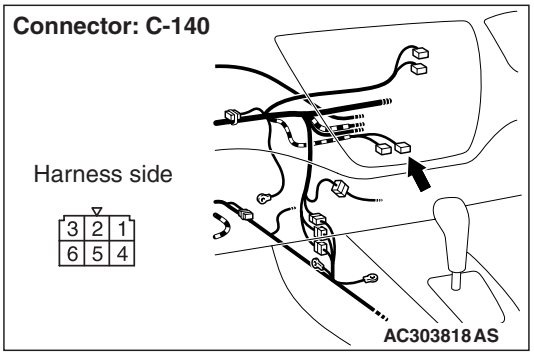
STEP 2. Connector check: C-140 blower switch connector and C-109 resistor connector





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

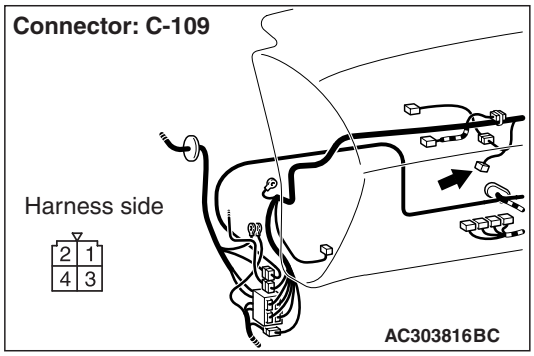
STEP 3. Check the blower switch continuity.
Refer to P.55A-49.

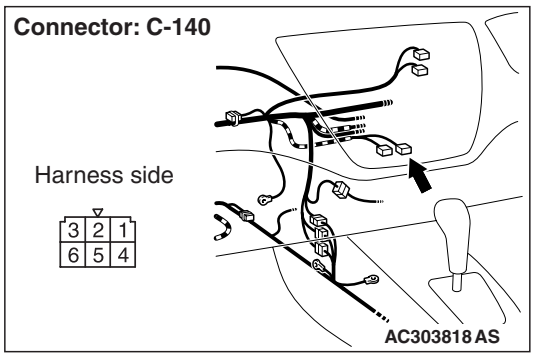
Q: Is the blower switch continuity in good condition?
YES : Go to Step 4.
NO : Replace the blower switch.

STEP 4. Check the resistor resistance value.
Refer to P.55A-55.

Q: Is the measured value at the standard value?
YES : Go to Step 5.
NO : Replace the resistor.

STEP 5. Check the wiring harness between C-140 blower switch connector (terminals 1, 4 and 5) and C-109 resistor connector (terminals 4, 1 and 3).

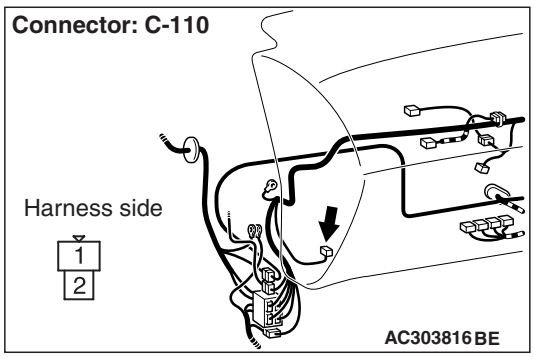




Check the blower switch output line for open circuit.

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

STEP 6. Connector check: C-110 blower motor connector



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

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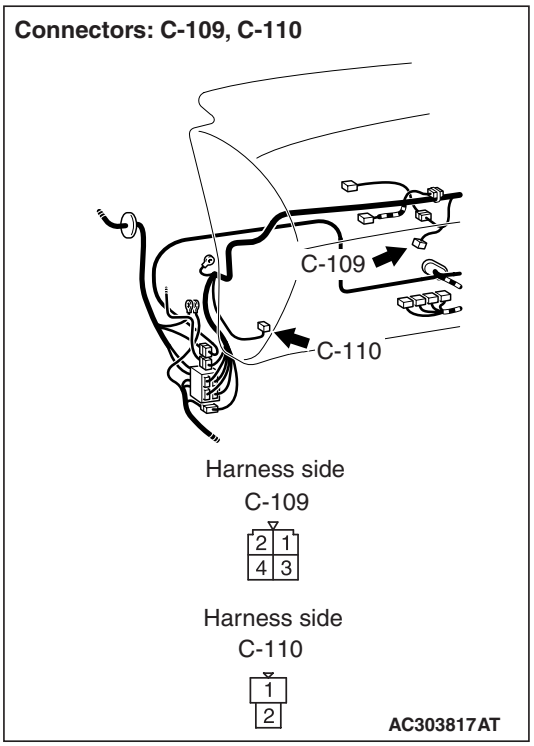
STEP 7. Check the wiring harness between C-110 blower motor connector (terminal 1) and C-109 resistor connector (terminal 2).



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.

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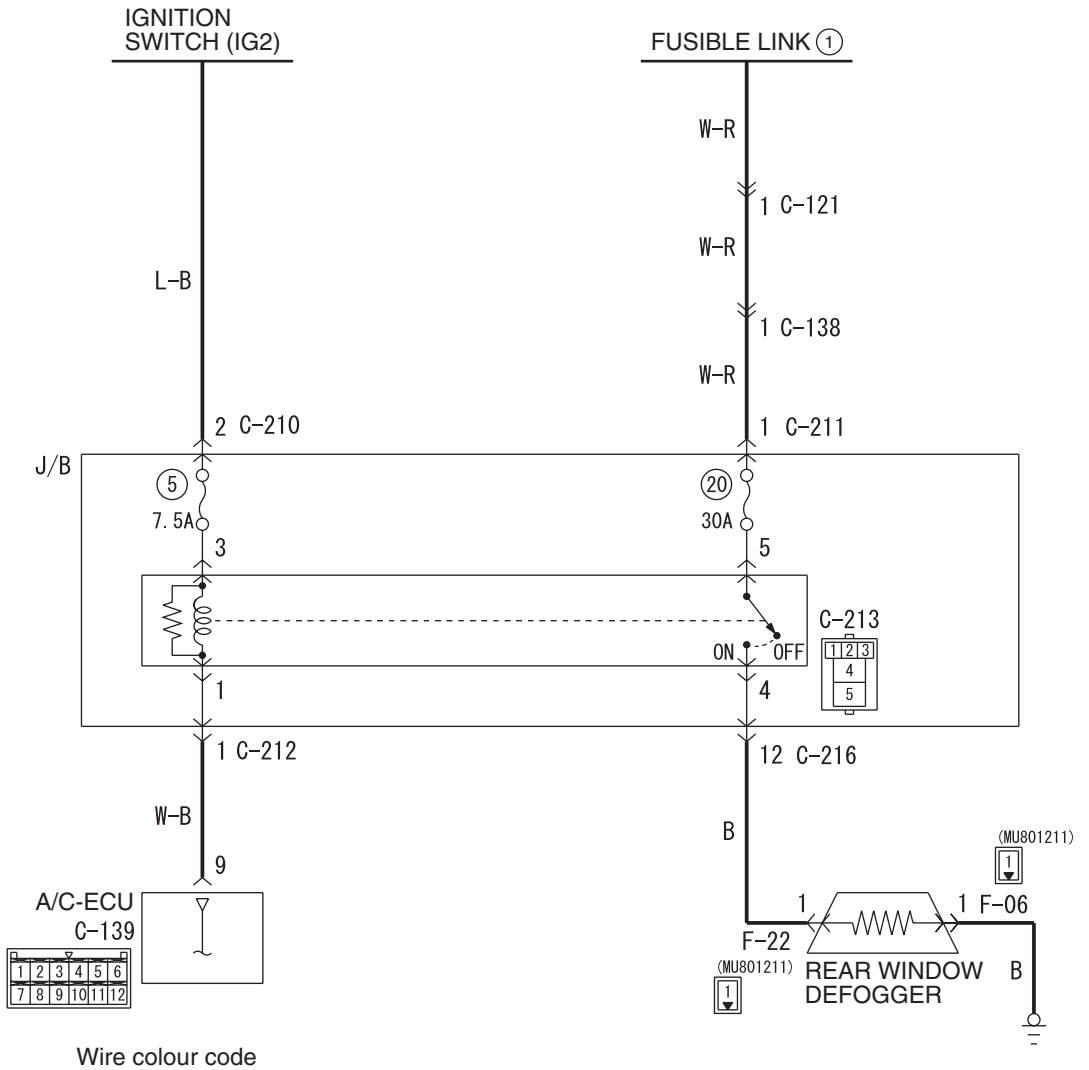
Inspection Procedure 6: Rear Window Defogger Function does not Operate.

Rear Window 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 : Grey R : Red P : Pink V : Violet PU : Purple

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COMMENTS ON TROUBLE SYMPTOM

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

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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 8 "Malfunction of the A/C-ECU Power Supply system P.55A-34."

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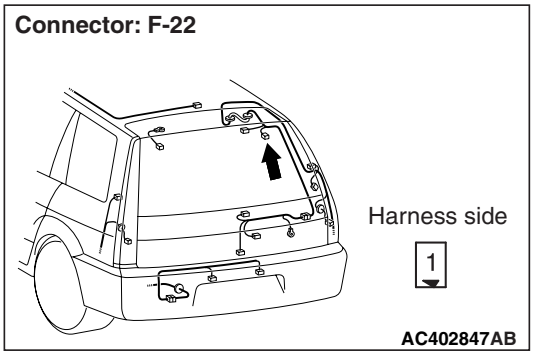
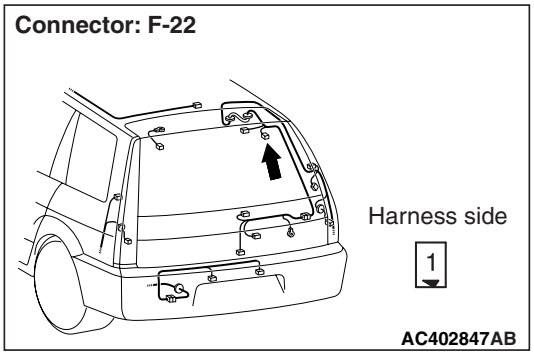
STEP 2. Connector check: F-22 rear window defogger connector

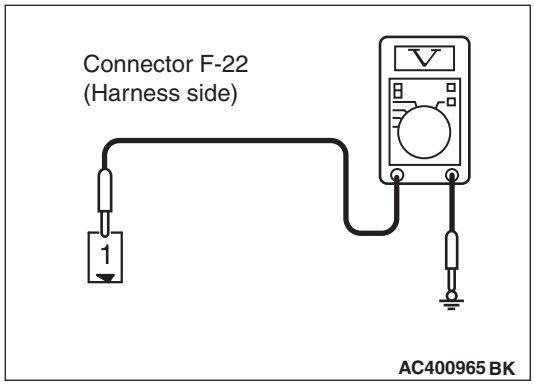


Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector.

STEP 3. Voltage measurement at F-22 rear window defogger connector.



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

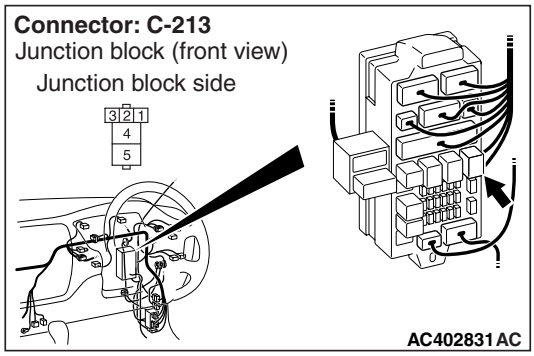


(4) Measure the voltage between terminal 1 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 13.
NO : Go to Step 4.

STEP 4. Connector check: C-213 rear window defogger relay connector



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

STEP 5. Check the rear window defogger relay continuity.

Refer to GROUP 54A, Rear Window Defogger P.54A-109.

Q: Is the rear window defogger relay continuity in good condition?
YES : Go to Step 6.
NO : Replace the rear window defogger relay.

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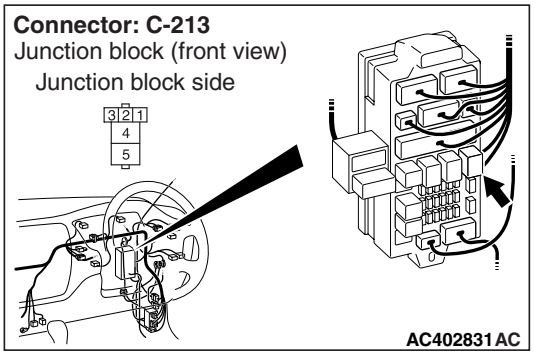
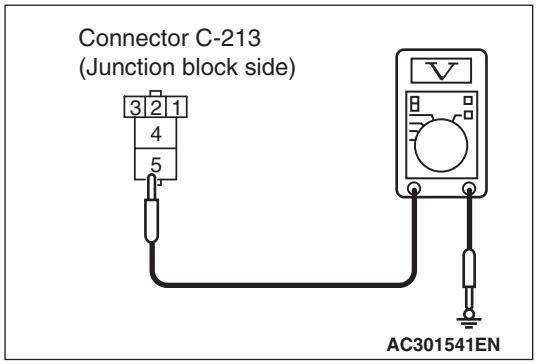
STEP 6. Voltage measurement at C-213 rear window defogger relay connector.



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



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

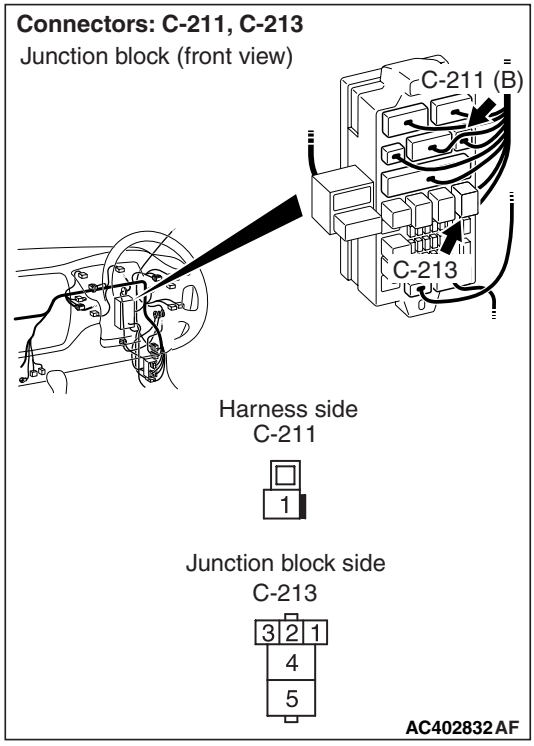
OK: System voltage

Q: Is the check result normal?

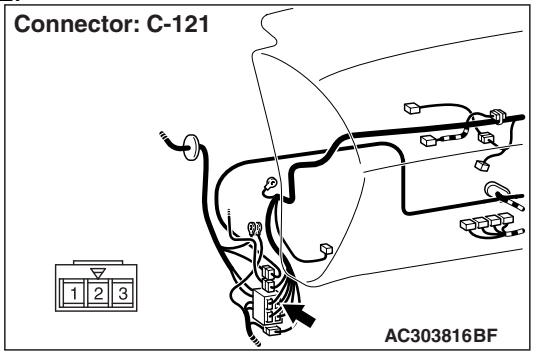
YES : Go to Step 8.

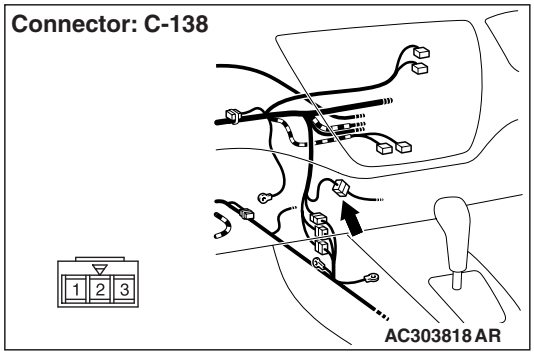
NO : Go to Step 7.

STEP 7. Check the wiring harness between C-213 rear window defogger relay connector terminal No.5 and the fusible link (1).



NOTE:





Prior to the wiring harness inspection, check intermediate connector C-121, C-138 and junction block connector C-211, and repair if necessary.

Check the rear window defogger relay power supply line for open circuit.

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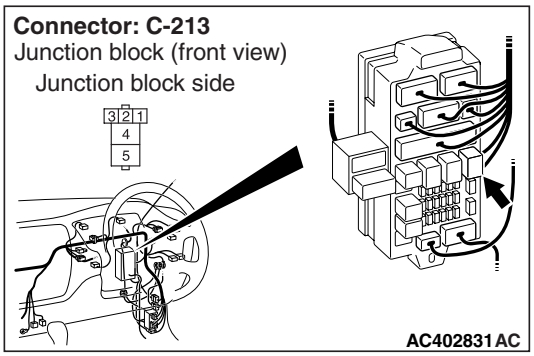
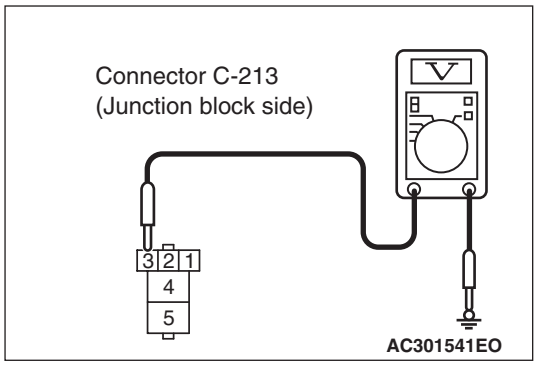
Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

STEP 8. Voltage measurement at C-213 rear window defogger relay connector.



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

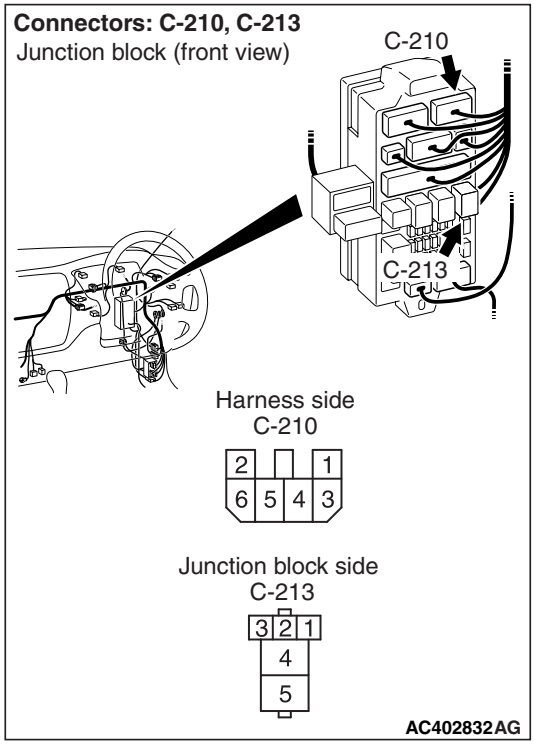


(3) Measure the voltage between terminal 3 and earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

STEP 9. Check the wiring harness between C-213 rear window defogger relay connector terminal No.3 and ignition switch (IG2).



NOTE: Prior to the wiring harness inspection, check junction block connector C-210, and repair if necessary.
Check the rear window 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 Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

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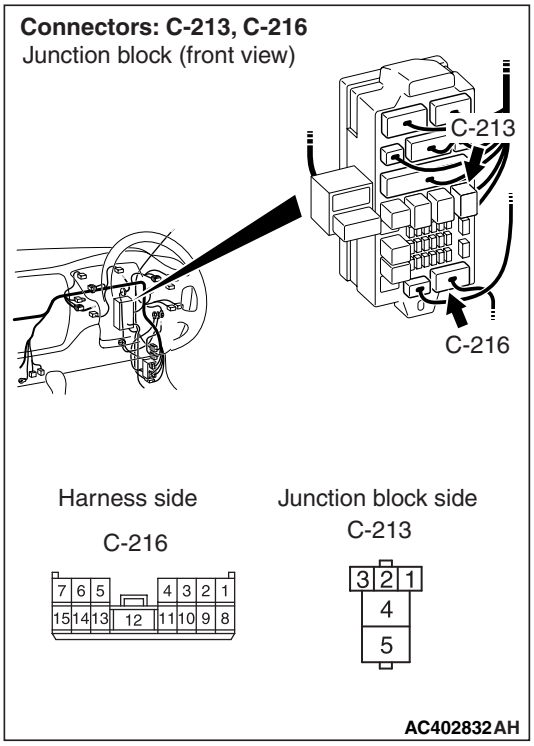
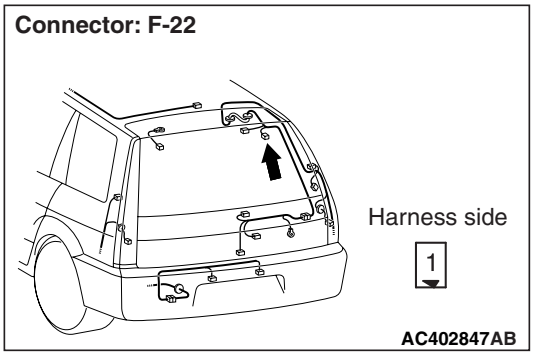
STEP 10. Check the wiring harness between C-213 rear window defogger relay connector terminal No.4 and F-22 rear window defogger connector terminal No.1.

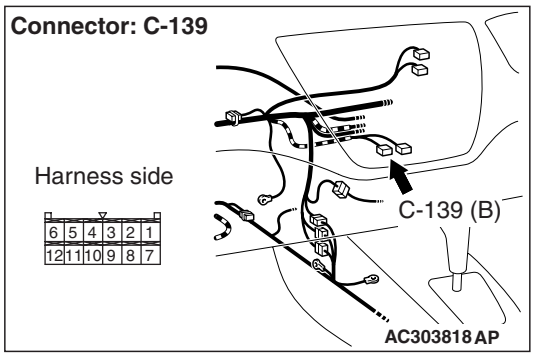




NOTE: Prior to the wiring harness inspection, check junction block connector C-216, and repair if necessary.
Check the rear window defogger relay output line for open circuit.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the wiring harness.

STEP 11. Connector check: C-139 A/C-ECU connector



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

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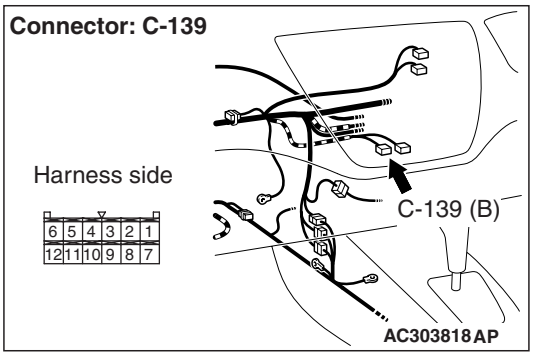
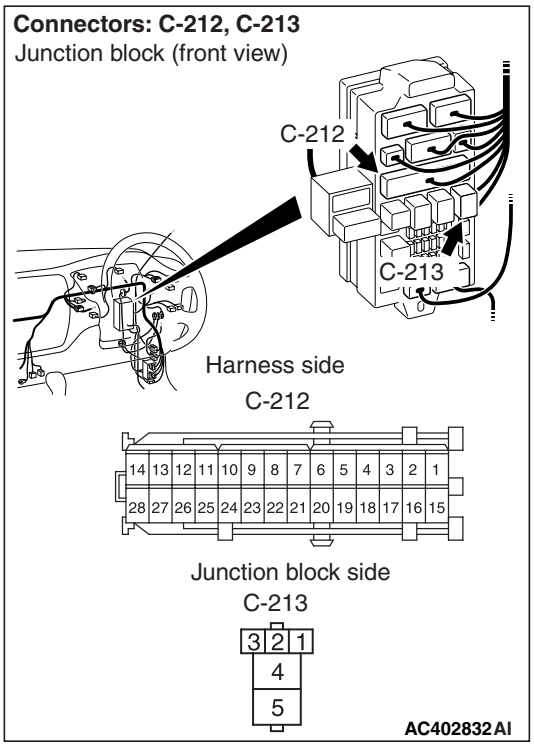
STEP 12. Check the wiring harness between C-213 rear window defogger relay connector terminal No.1 and C-139 A/C-ECU connector terminal No.9.

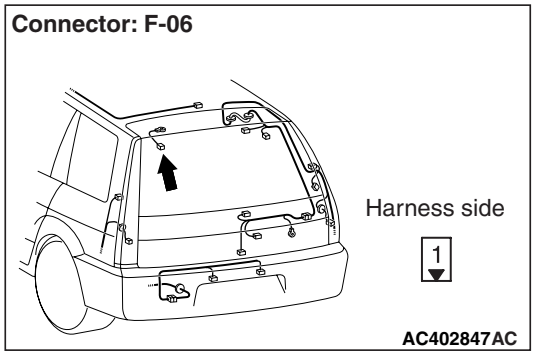




NOTE: Prior to the wiring harness inspection, check junction block connector C-212, and repair if necessary.
Check the rear window defogger relay earth line for open or short circuit.

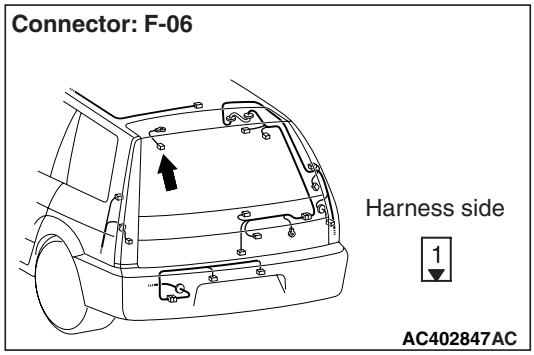
Q: Is the check result normal?
YES : Replace the manual air conditioner control panel (A/C-ECU).
NO : Repair the wiring harness.

STEP 13. Connector check: F-06 rear window defogger connector

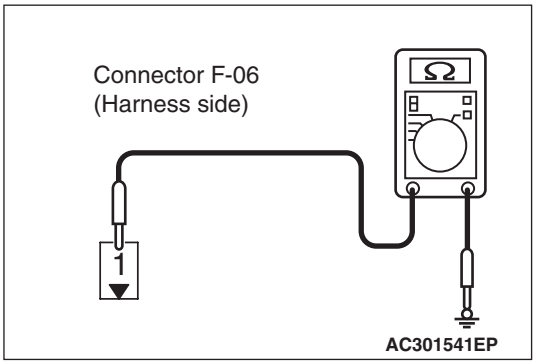


Q: Is the check result normal?
YES : Go to Step 14.
NO : Repair the connector.

STEP 14. Resistance measurement at F-06 rear window defogger connector.



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



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

OK: 2 ohms or less

Q: Is the check result normal?
YES : Go to Step 16.
NO : Go to Step 15.

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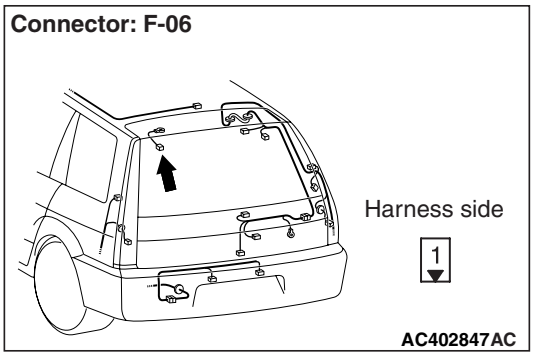
STEP 15. Check the wiring harness between F-06 rear window defogger connector terminal No.1 and earth.



Check the rear window defogger 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 Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

STEP 16. Check the rear window defogger.
Refer to GROUP 54A, Rear window defogger P.54A-109.

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

Inspection Procedure 7: Rear Window Defogger Timer Function does not Operate.

COMMENTS ON TROUBLE SYMPTOM

Turn ON the rear window defogger switch. If the rear window defogger does not shut off after roughly 11 minutes then the rear window defogger timer is malfunctioning.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

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

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

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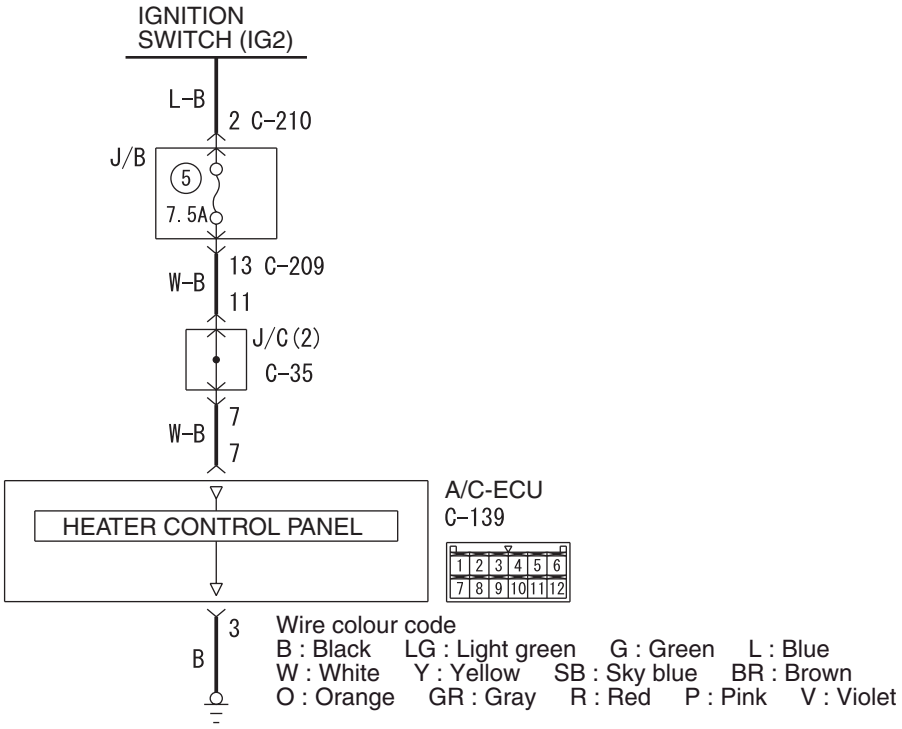
Inspection Procedure 8: Malfunction of the A/C-ECU Power Supply System.

A/C-ECU Power Supply Circuit



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COMMENTS ON TROUBLE SYMPTOM

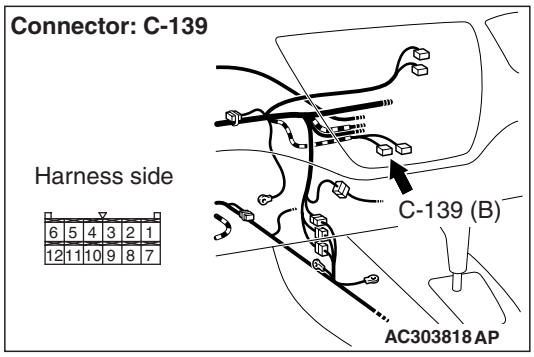
The A/C-ECU power system may be defective if the air conditioner, defogger, and outside/inside air selection damper motor all do not operate normally.

PROBABLE CAUSES

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

DIAGNOSIS PROCEDURE

STEP 1. Connector check: C-139 A/C-ECU connector



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

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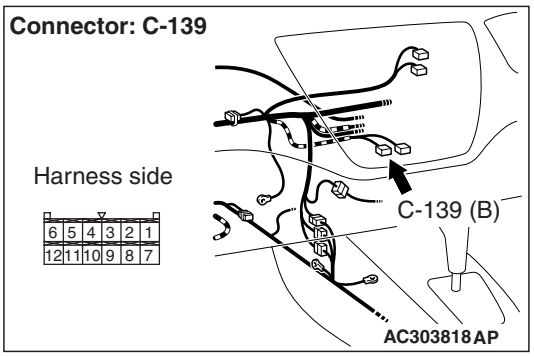
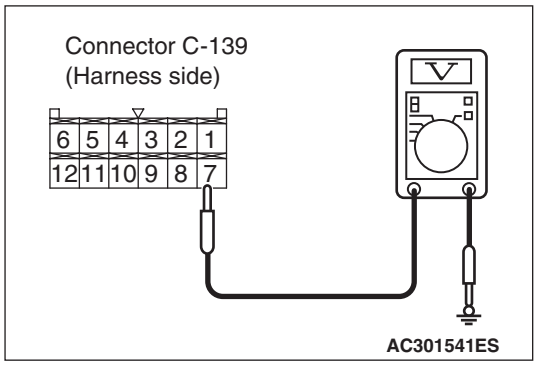
STEP 2. Voltage measurement at C-139 A/C-ECU connector.



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

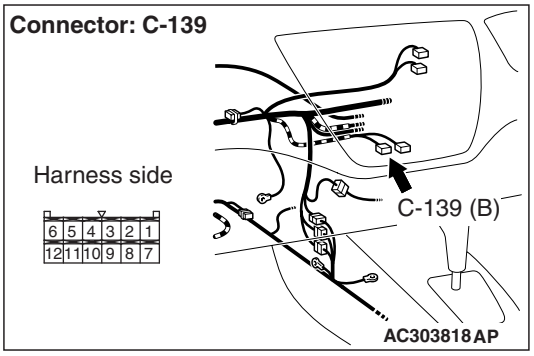


(3) Measure the voltage between terminal 7 and body earth.

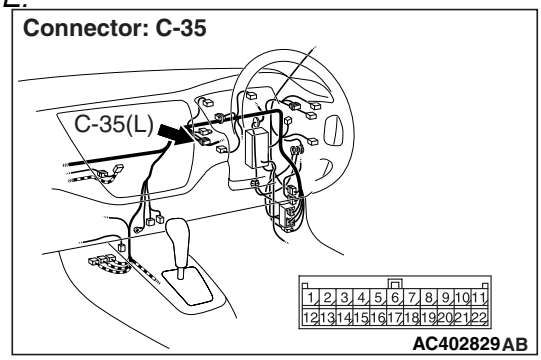
OK: System voltage

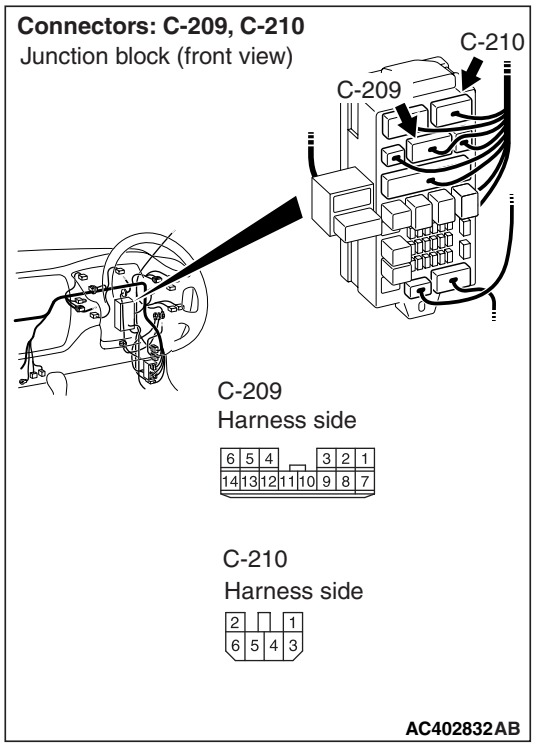
Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check the wiring harness between C-139 A/C-ECU connector terminal No.7 and the ignition switch (IG2).



NOTE:





Prior to the wiring harness inspection, check junction block connectors C-210, C-209 and joint connector C-35, 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 Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

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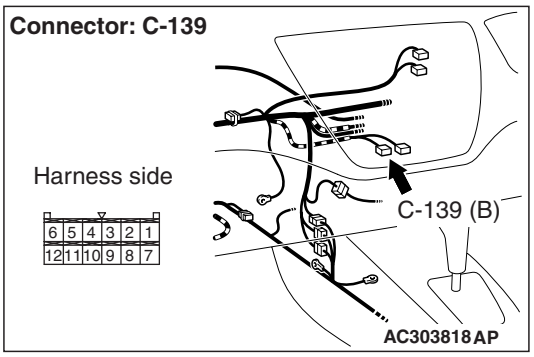
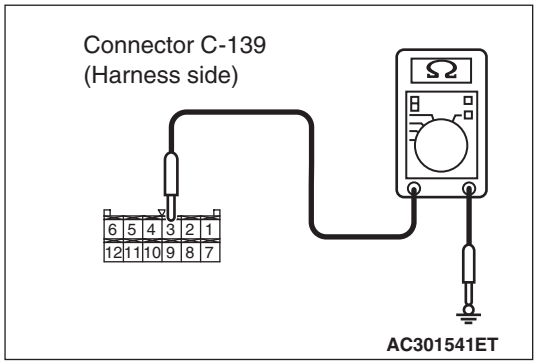
STEP 4. Resistance measurement at the C-139 A/C-ECU connector.



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



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

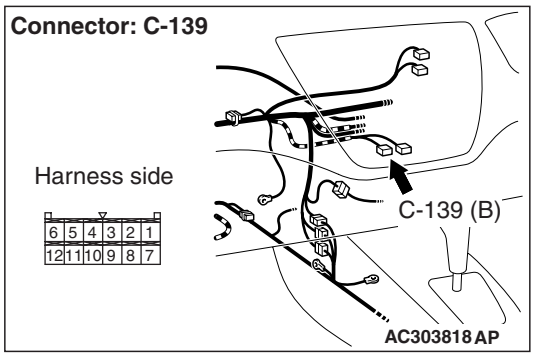
OK: 2 ohms or less

Q: Is the check result normal?

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

NO : Go to Step 5.

STEP 5. Check the wiring harness between C-139 A/C-ECU connector terminal No.3 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.

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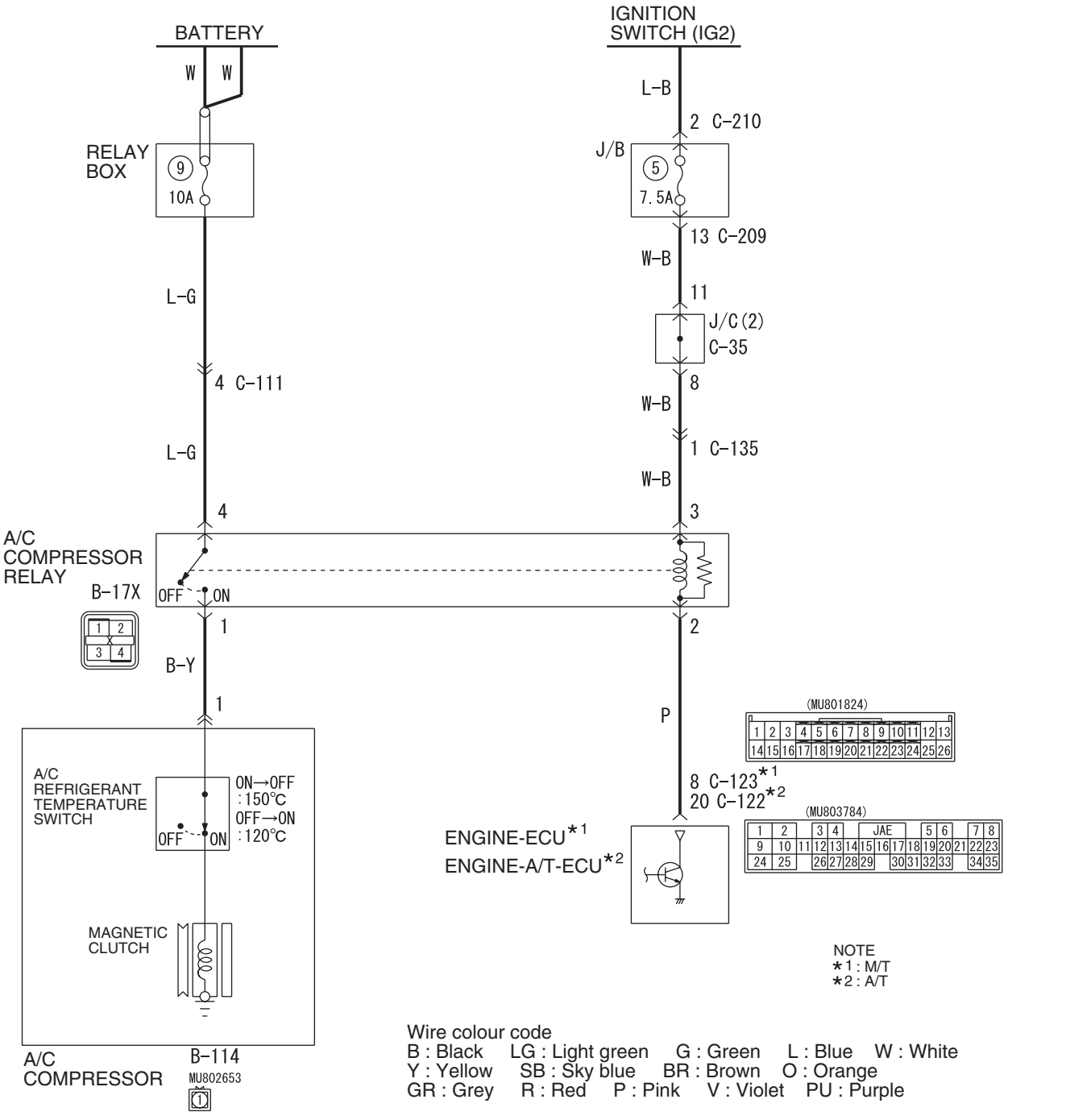
Inspection Procedure 9: A/C Compressor power supply system.

A/C Compressor 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 : Grey R : Red P : Pink V : Violet PU : Purple

W5J55L005A

COMMENTS ON TROUBLE SYMPTOM

If the power is not supplied to the A/C compressor, the A/C compressor circuit system may be defective.

PROBABLE CAUSES

- Malfunction of the A/C compressor relay
- Damaged the wiring harness or connectors

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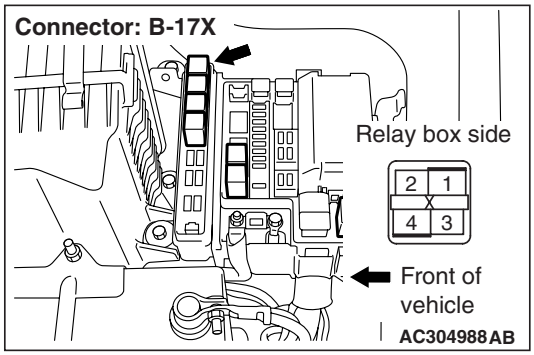
DIAGNOSIS

STEP 1. Connector check: B-17X A/C compressor relay connector



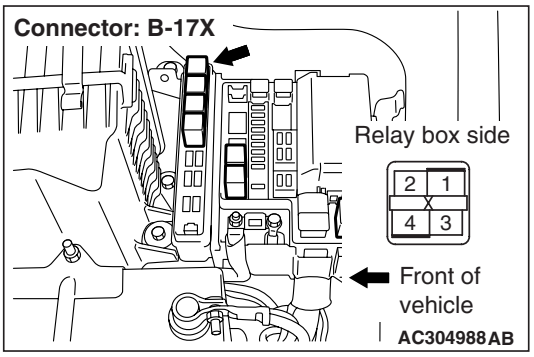
Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the connector.

STEP 2. Check the A/C compressor relay continuity.

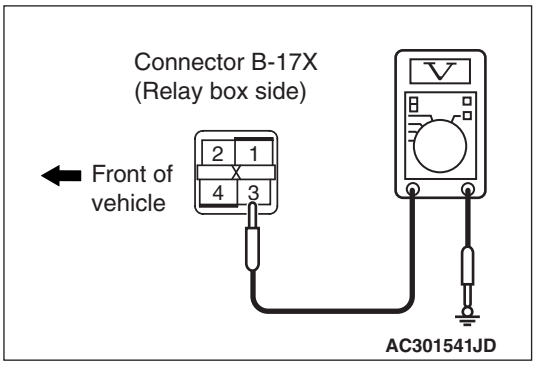
Refer to P.55A-46.

Q: Is the A/C compressor relay in good condition?
YES : Go to Step 3.
NO : Replace the A/C compressor relay.

STEP 3. Voltage measurement at B-17X 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 2 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

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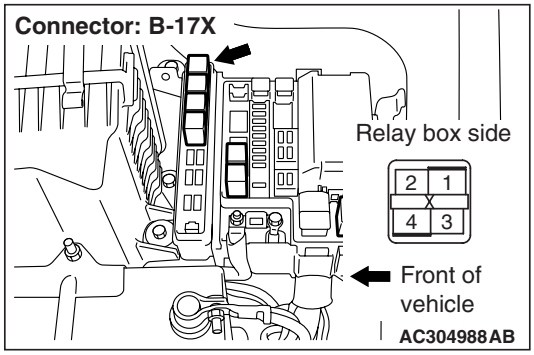
STEP 4. Check the wiring harness between B-17X A/C compressor relay connector terminal No.3 and the ignition switch (IG2).



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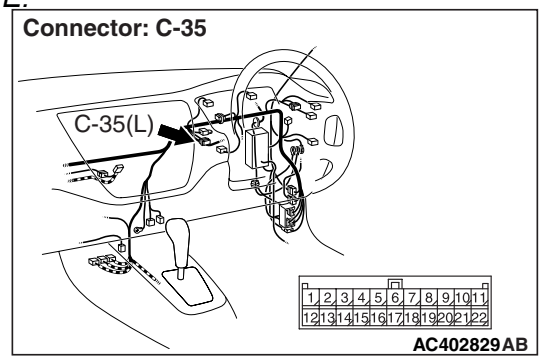
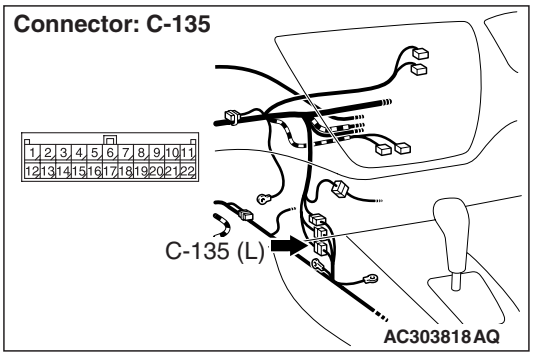
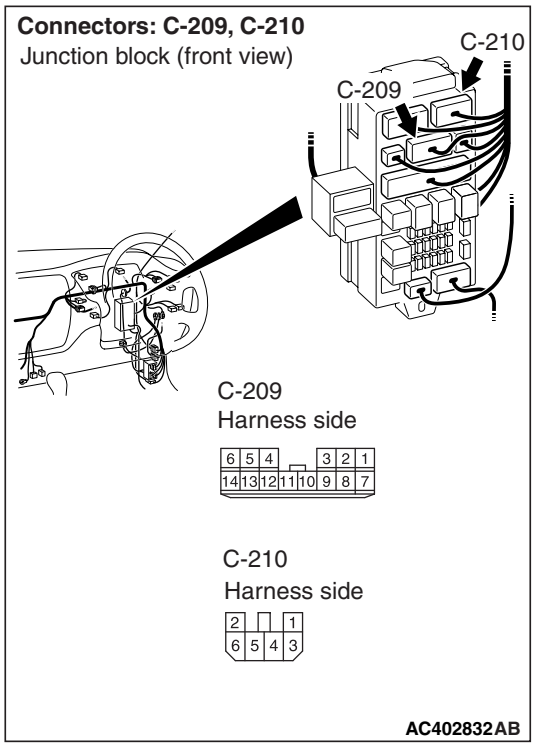






Prior to the wiring harness inspection, check intermediate connector C-135, joint connector C-35, junction block connectors C-209 and C-210, and repair if necessary.

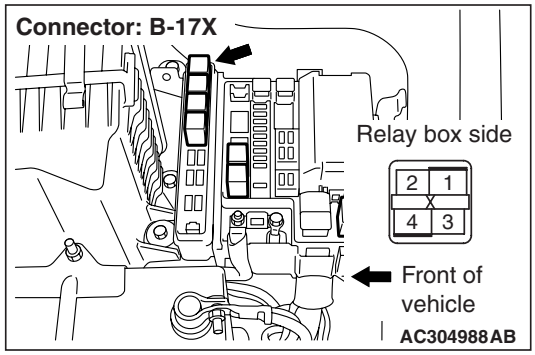
Check the A/C compressor relay power supply line for open circuit.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).

NO : Repair the wiring harness.

STEP 5. Voltage measurement at B-17X A/C compressor relay connector.



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

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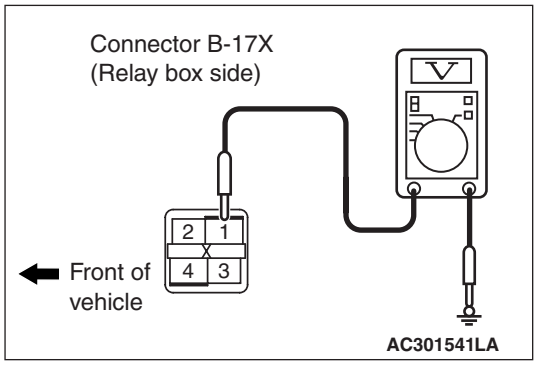
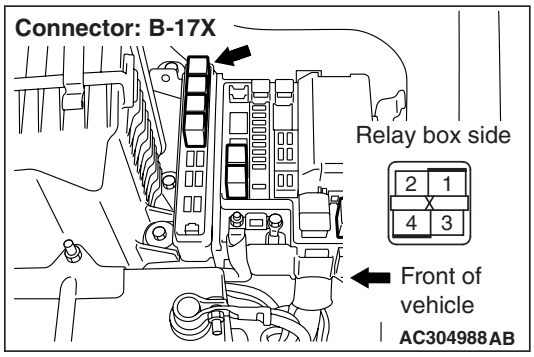


(2) Measure the voltage between terminal 1 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check the wiring harness between B-17X A/C compressor relay connector terminal No.1 and the battery.



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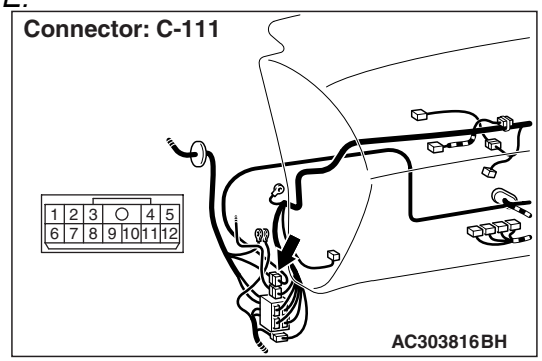
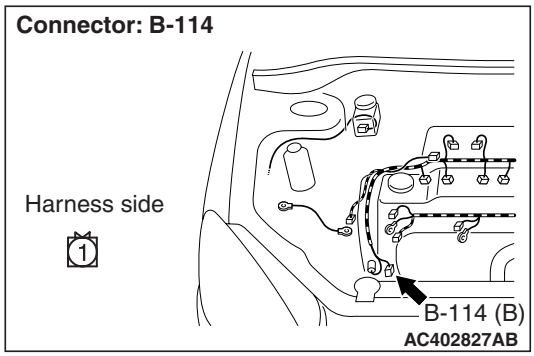


Prior to the wiring harness inspection, check intermediate connector C-111, and repair if necessary.
Check the A/C compressor relay power supply line for open circuit.

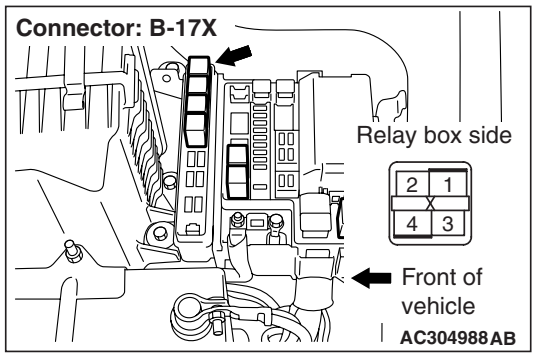
Q: Is the check result normal?
YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

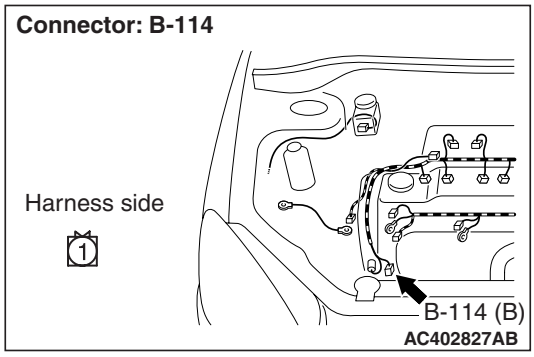
STEP 7. Connector check: B-114 A/C compressor connector



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

STEP 8. Check the wiring harness between B-17X A/C compressor relay connector terminal No.4 and B-114 A/C compressor connector terminal No.1.





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

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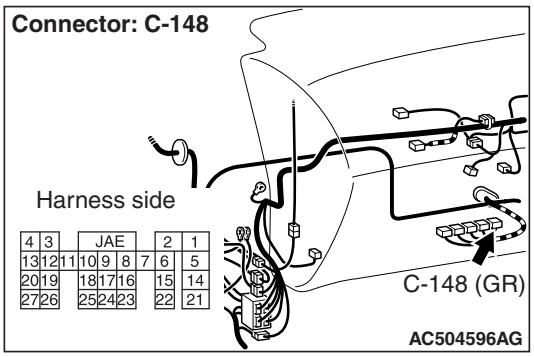
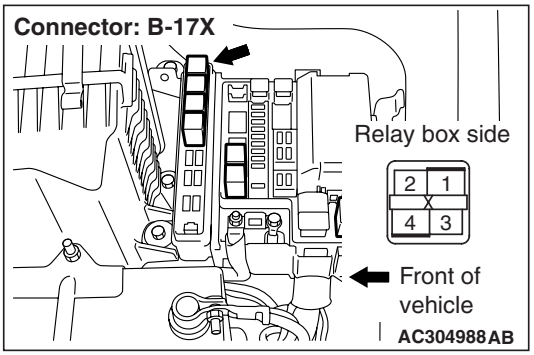
Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the wiring harness.

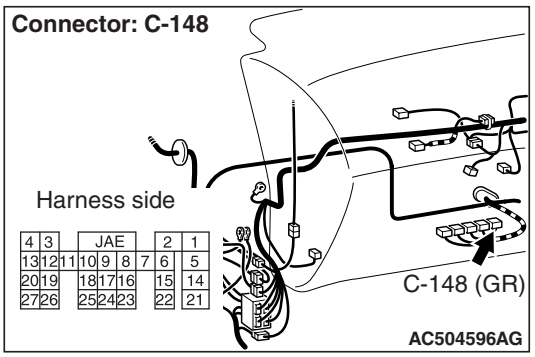
STEP 9. Connector check: C-148 engine-ECU connector <M/T> or engine-A/T-ECU connector <A/T>



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

STEP 10. Check the wiring harness between C-148 engine-ECU connector or engine-A/T-ECU connector terminal No.8 and B-17X A/C compressor relay connector terminal No.2.





Check the A/C compressor 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 Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-13).
NO : Repair the wiring harness.

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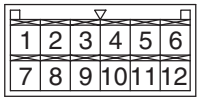
CHECK AT ECU TERMINAL

M1552010300828

<C-139>



AC304990AB

Terminal No.	Check item	Checking requirement	Normal condition
1	Output to the engine-A/T-ECU (A/C1)	A/C stopped	0 V
		• A/C switch: ON • Blower switch: ON	System voltage
2	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
3	Earth	Always	0 V
4	Earth to the air thermo sensor	Always	0 V
5	Power supply to the A/C illumination	Lighting switch: ON	System voltage
6	Air thermo sensor (outlet side)	Sensor probe temperature 25° C (1.5k ohm)	2.2 V
7	Power supply to the ignition switch (IG2)	Ignition switch: ON	System voltage
8	Blower switch (lo)	blower switch: lo	System voltage
9	Rear defogger switch	Defogger switch: ON	0 V
		Defogger switch: OFF	System voltage
10	Inside/outside air selection 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
11	Inside/outside air selection 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
12	Earth to the A/C illumination	Always	0 V

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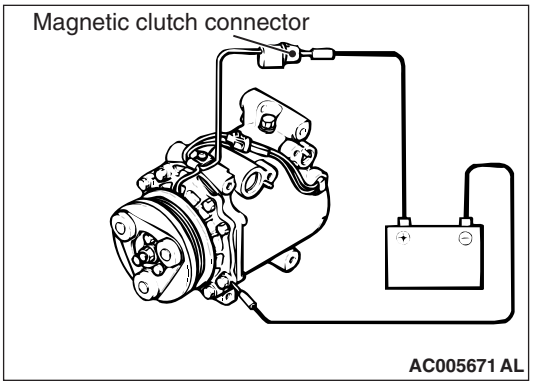
ON-VEHICLE SERVICE

MAGNETIC CLUTCH TEST

M1552008500502

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.

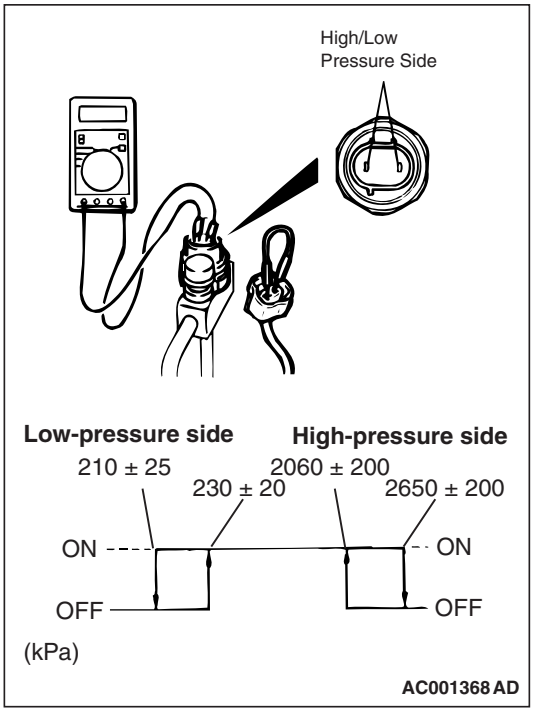
COMPRESSOR DRIVE BELT ADJUSTMENT

M1552001000517

Refer to GROUP 11A, On-vehicle Service –Drive Belt Tension Check P.11A-7.

DUAL PRESSURE SWITCH CHECK

M1552010400450



1. Remove the dual pressure switch connector and connect the high/low pressure side terminals located on the harness side as shown in the illustration.
2. Install a gauge manifold to the high-pressure side service valve of the refrigerant line. (Refer to P.55A-63.)
3. When the high/low pressure sides of the dual pressure switch are at operation pressure (ON) the resistance should less than two ohms between the terminals. If open circuit, replace the switch.

CHARGING AND DISCHARGING

M1552022200066

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

M1552020000099

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 140mL 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

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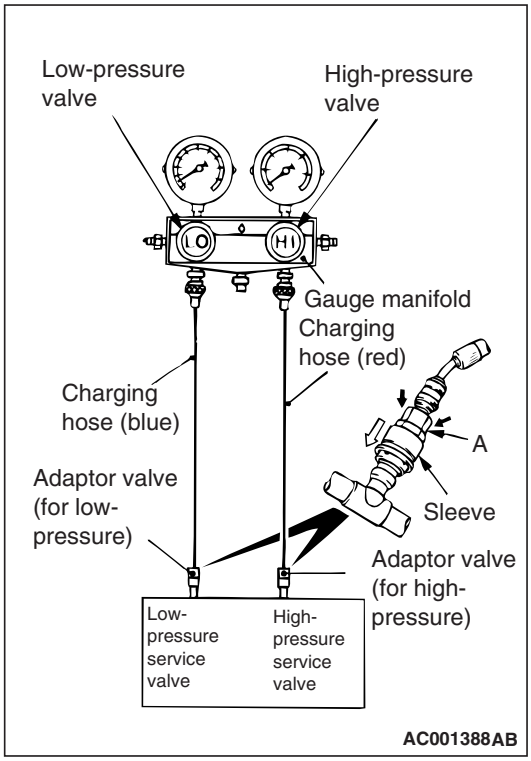
PERFORMANCE TEST

M1552001400355

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.

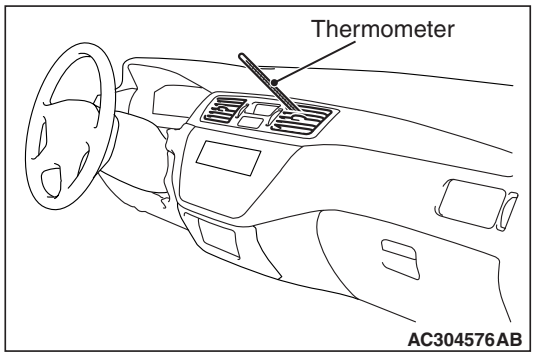
⚠ CAUTION

- **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. Keep engine speed to idling speed with A/C clutch engaged.
9. Engine should be warmed up with doors and all 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.

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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

M1552001500396

LOST CHARGE

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

1. Evacuate the system (Refer to P.55A-43).
2. Charge the system with approximately 480 –520 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.

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COMPRESSOR NOISE CHECK

M1552008700380

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.

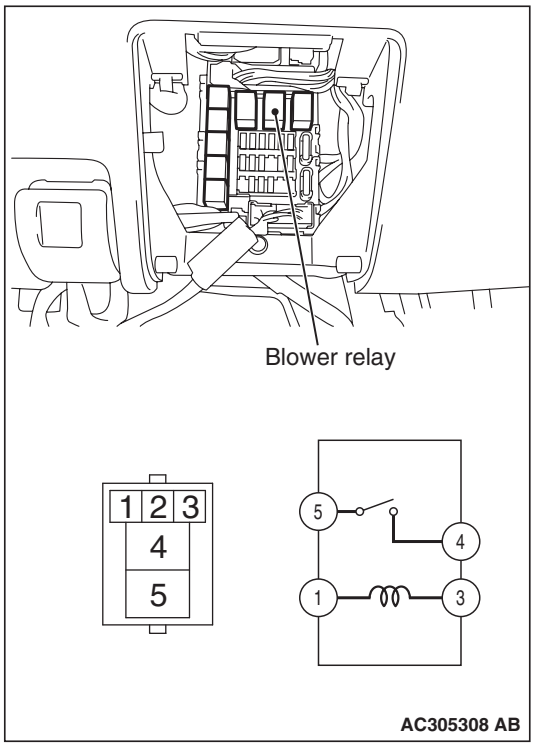
ADJUSTMENT

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-43).
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

M1552008800309

BLOWER RELAY CONTINUITY CHECK



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

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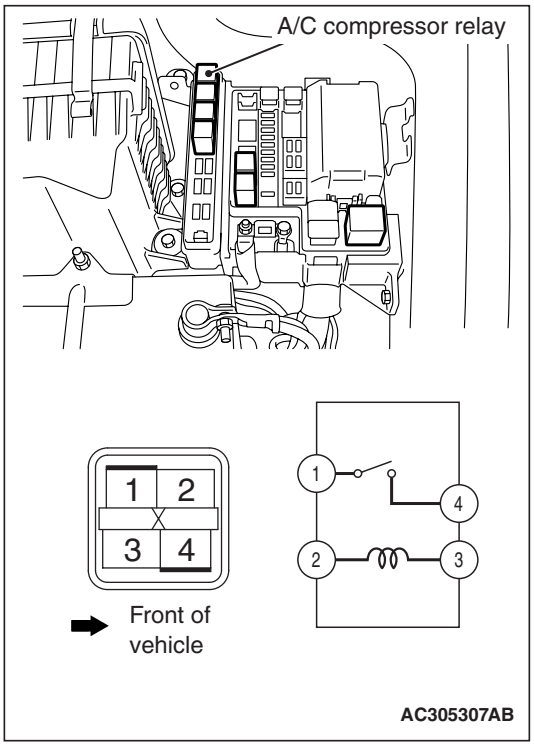
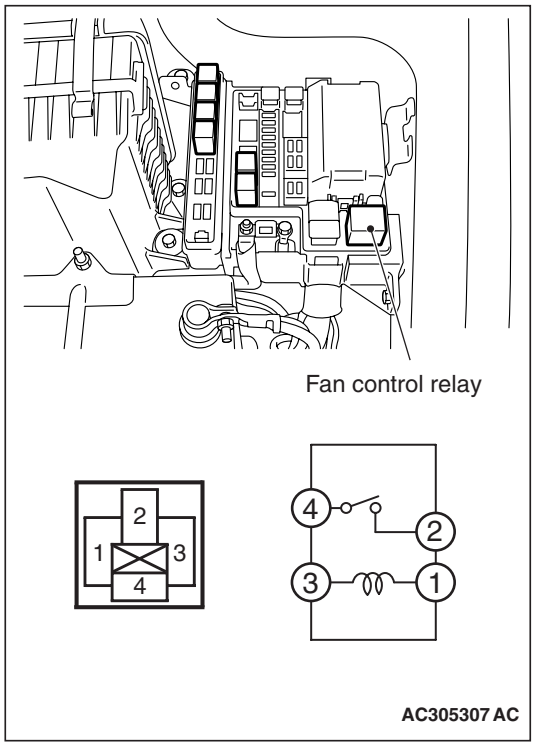
A/C COMPRESSOR RELAY CONTINUITY CHECK



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

M1552001600702

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. Refer to GROUP 11A, On-vehicle Service –Idle Speed Check P.11A-13.

   Standard value: 700 ±50 r/min

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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.

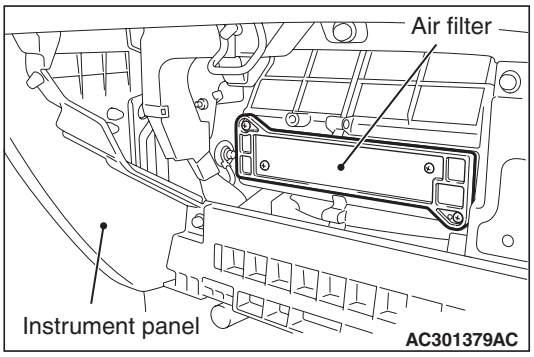
   Standard value: 850 ± 50 r/min

   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

M1552020100212

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

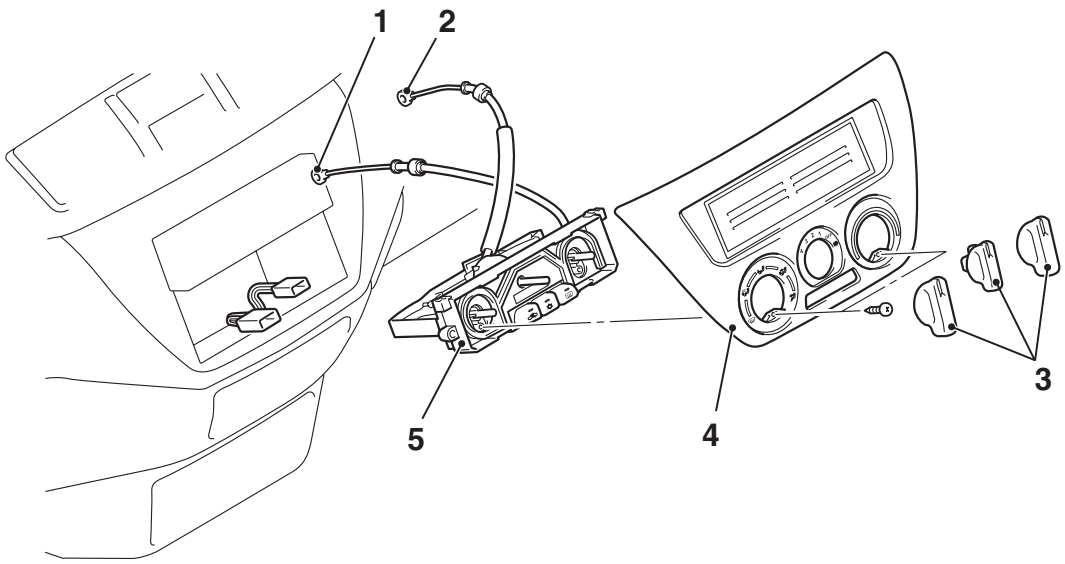


2. Remove the two screws as shown, and replace the clean air filter.
3. Install the glove box.

HEATER CONTROL ASSEMBLY AND A/C SWITCH

REMOVAL AND INSTALLATION

M1552002400518



AC403356AB

Removal steps

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

Removal steps (Continued)

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

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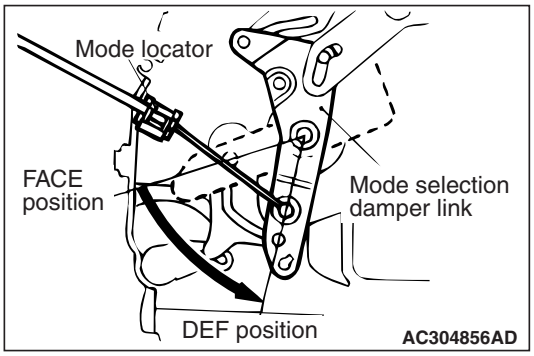
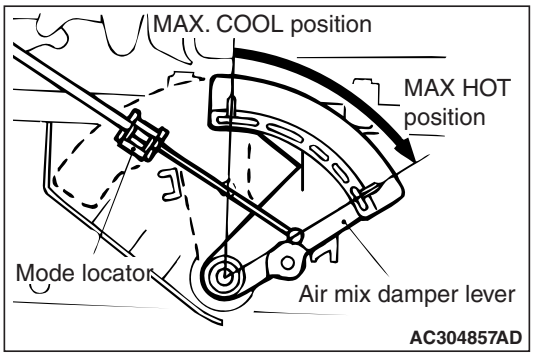
INSTALLATION SERVICE POINT

>>A<< MODE SELECTION DAMPER CABLE CONNECTION



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 CONTROL CABLE CONNECTION

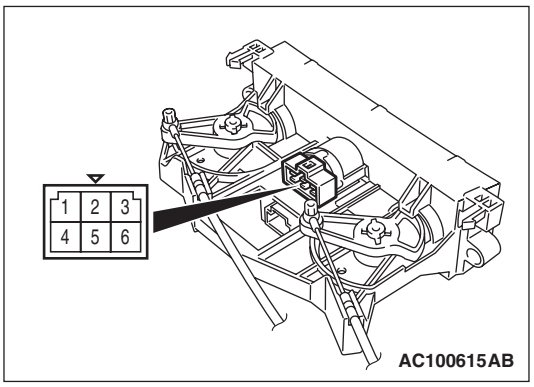


1. Turn the heater control assembly's temperature adjustment knob all the way to the HOT side.
2. Set the heater unit's air mix door lever to the MAX HOT position (turn the damper lever as the left illustration) and attach the cable.
3. Set the mode locator to the heater unit case and secure with a clip.

INSPECTION

M1552014300927

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

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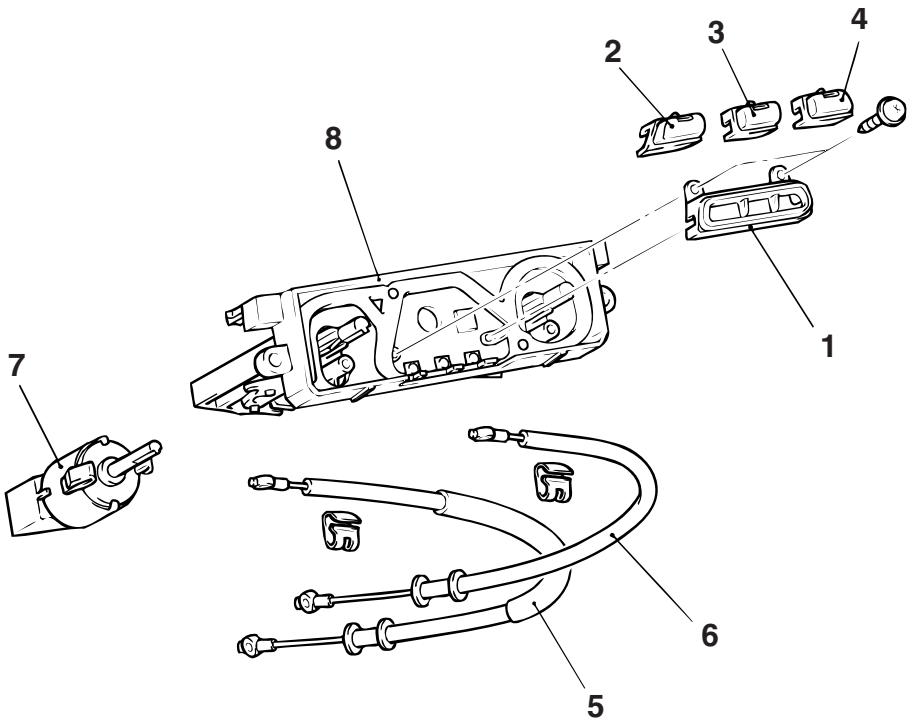
DISASSEMBLY AND REASSEMBLY

M1552014200395



AC203375AC

Disassembly steps

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

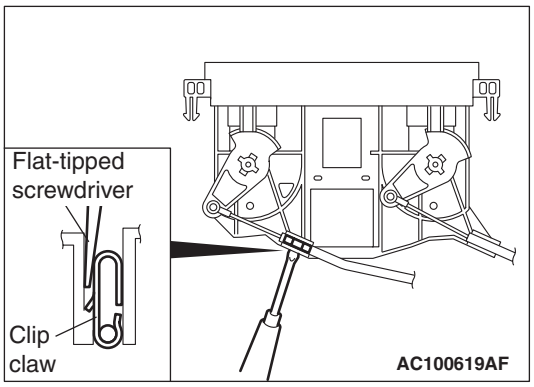
<<A>> 5. Mode selection damper control cable

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

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

DISASSEMBLY SERVICE POINT

<<A>> MODE SELECTION DAMPER CONTROL CABLE AND AIR MIXING DAMPER CONTROL 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.

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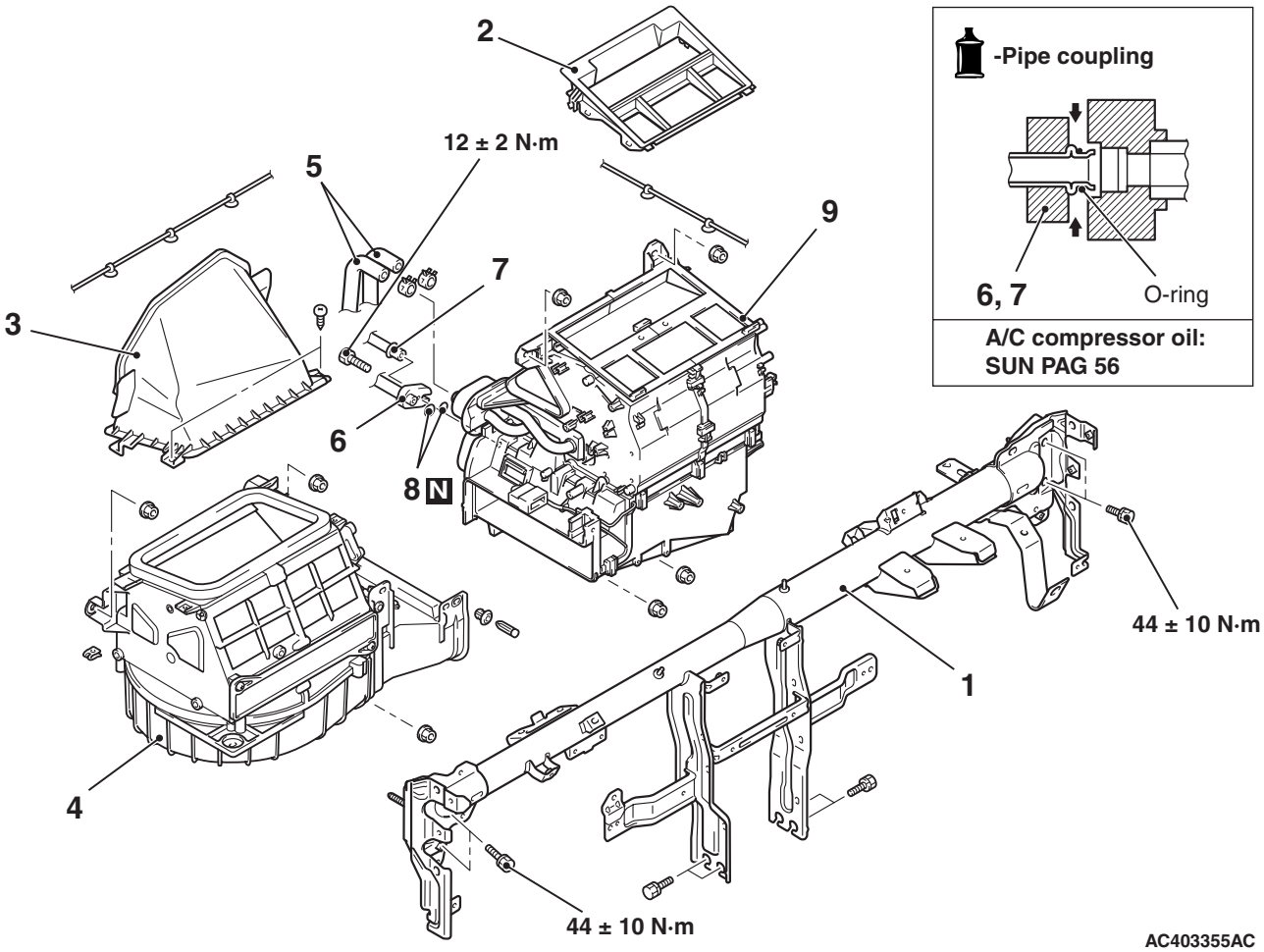
HEATER UNIT, HEATER CORE, BLOWER ASSEMBLY AND EVAPORATOR UNIT

REMOVAL AND INSTALLATION

M1552011600554

Pre-removal and Post-installation Operation
- Refrigerant draining and Refilling (Refer to Charging and Discharging P.55A-43).
- Engine coolant Draining and Refilling (Refer to GROUP 14, On vehicles service P.14-21).
- Instrument Panel Removal and Installation (Refer to GROUP 52A P.52A-2).
- Air cleaner cover and air flow sensor assembly Removal and Installation (Refer to GROUP 15 P.15-3).
- Rear console assembly Removal and Installation (Refer to GROUP 52A P.52A-8).
- Front floor console assembly Removal and Installation (Refer to GROUP 52A P.52A-7).
- Front seat assembly Removal and Installation (Refer to GROUP 52A P.52A-22).



Removal steps
1. Front deck crossmember
2. Centre duct <<A>>
3. Intake duct <<A>>
- Foot duct (RH), Rear heater duct A (RH) upper side (Refer to P.55A-65.)
4. Blower assembly

Removal steps (Continued)
5. Heater hose connection
6. Flexible suction hose connection
7. Liquid pipe B connection
8. O-ring
9. Heater unit

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REMOVAL SERVICE POINT

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

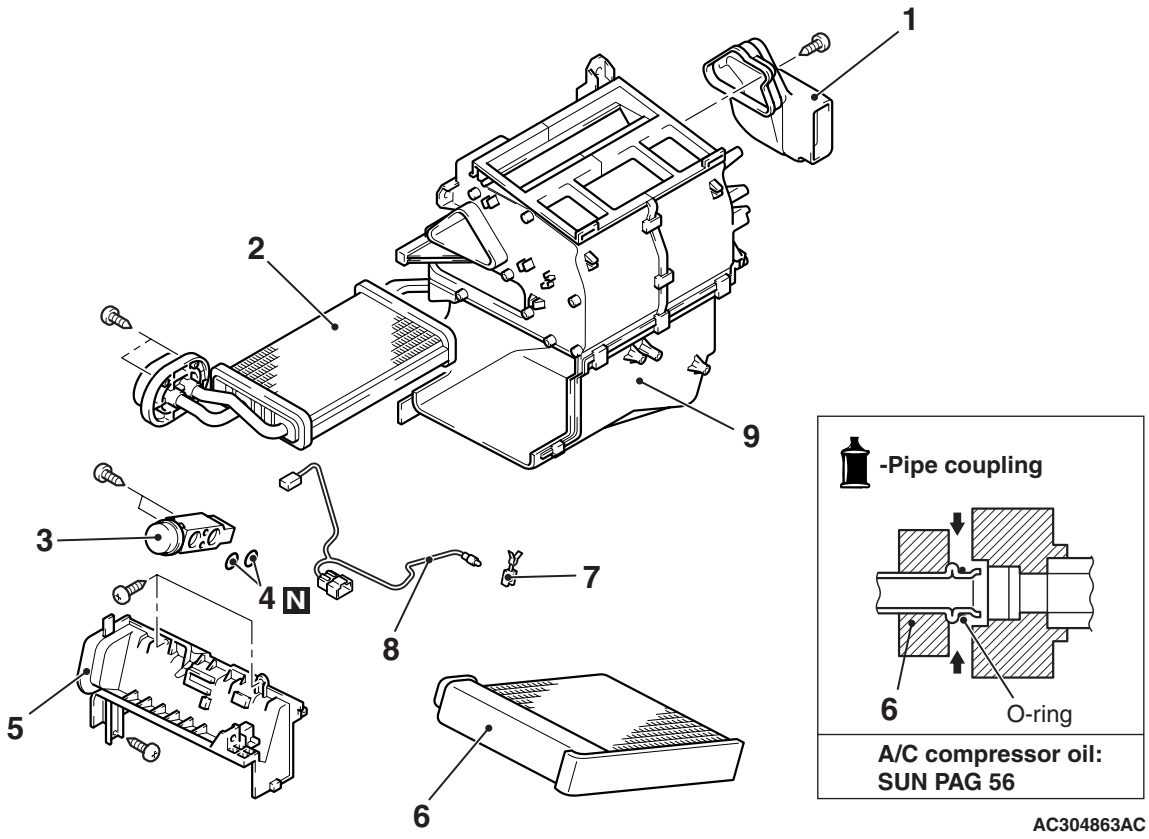
⚠ CAUTION

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.

DISASSEMBLY AND ASSEMBLY

M1551005400569



AC304863AC

Disassembly steps

1. Foot duct (RH)
2. Heater core
3. Expansion valve
4. O-ring
5. Evaporator cover

Disassembly steps (Continued)

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

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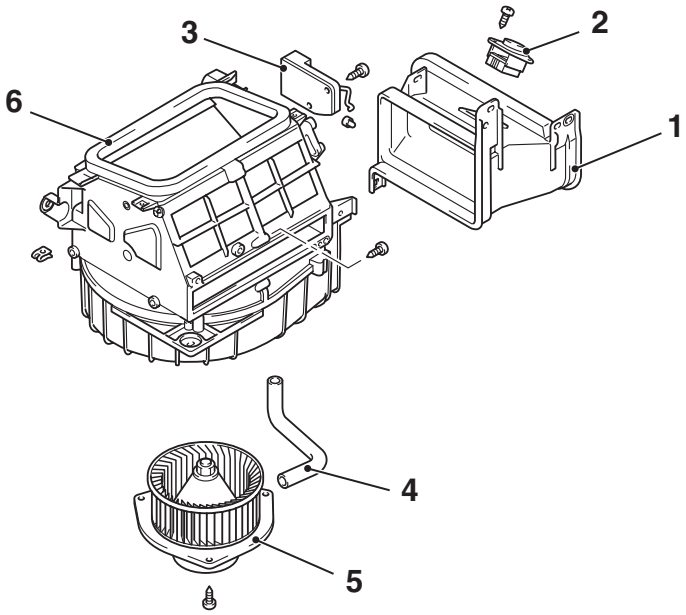
DISASSEMBLY AND REASSEMBLY

M1551005500243



AC403586AB

Disassembly steps

1. Joint duct
2. Resister
3. Outside/inside air selection damper control motor

Disassembly steps (Continued)

4. Hose
5. Blower motor
6. Blower case

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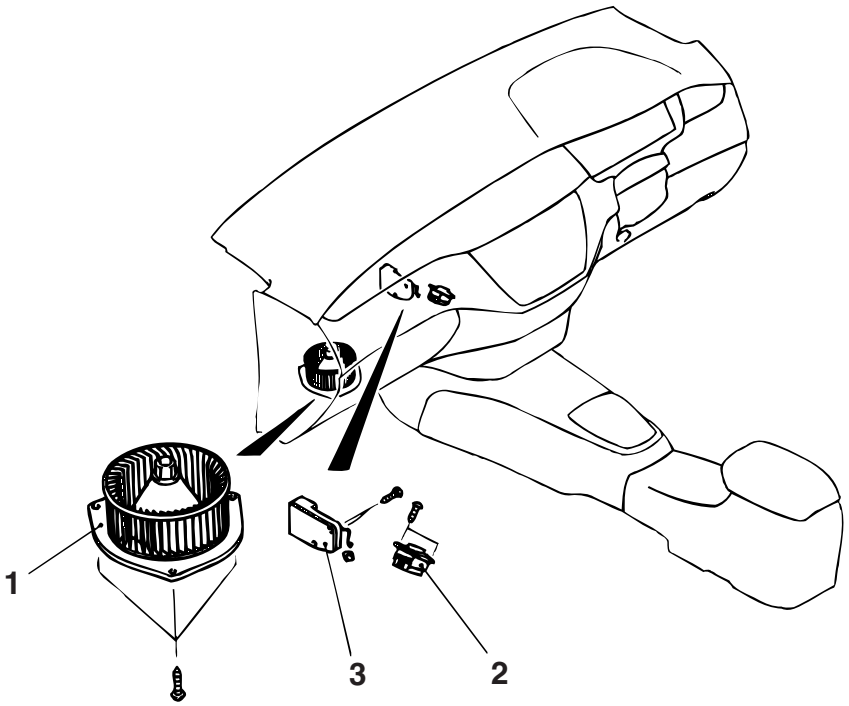
Group TOC

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

REMOVAL AND INSTALLATION

M1551002800502



AC203381AB

Blower motor removal step
- Front passenger's side under cover

<<A>> 1. Blower motor

Resistor removal step
- Glove box (Refer to GROUP 52A, Instrument Panel P.52A-2).
- Engine-ECU <M/T> or Engine-A/T-ECU <A/T> (Refer to GROUP 13A, Engine-ECU and Engine-A/T-ECU P.13A-335).

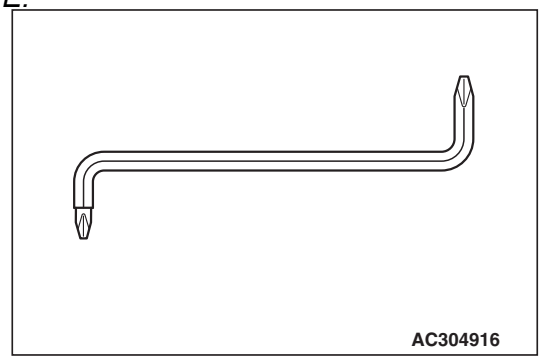
2. Resistor

Outside/inside air selection damper control motor removal step
- Glove box (Refer to GROUP 52A, Instrument Panel P.52A-2).
- Engine-ECU <M/T> or Engine-A/T-ECU <A/T> (Refer to GROUP 13A, Engine-ECU and Engine-A/T-ECU P.13A-335).

3. Outside/inside air selection damper control motor

REMOVAL SERVICE POINT
<<A>> BLOWER MOTOR REMOVAL

NOTE:



AC304916

Use of commercially available offset screw driver is recommended.

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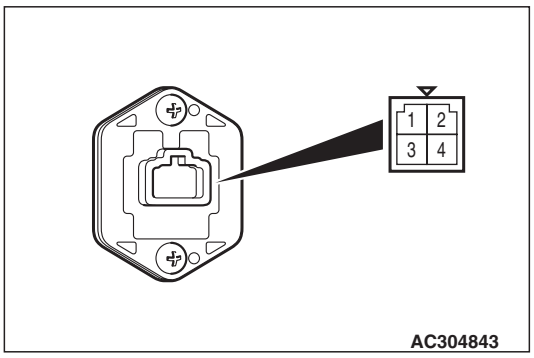
INSPECTION

M1551006300457

RESISTER CHECK

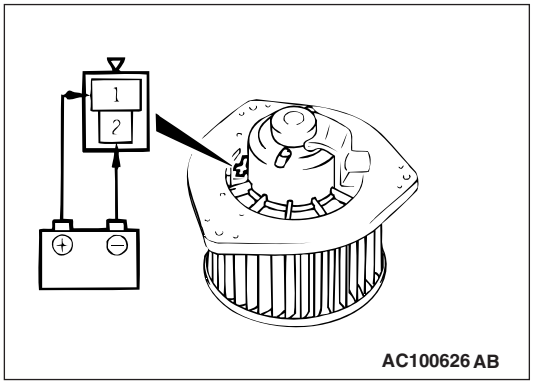


Use an ohmmeter to measure the resistance between the terminals. Check that the measured value is at the standard value.

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

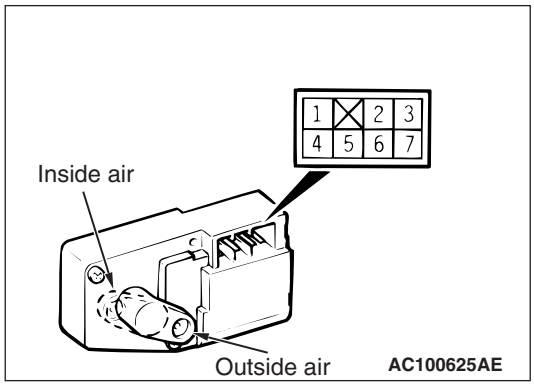
BLOWER FAN AND MOTOR CHECK



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

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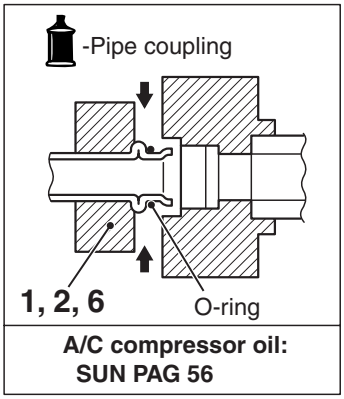
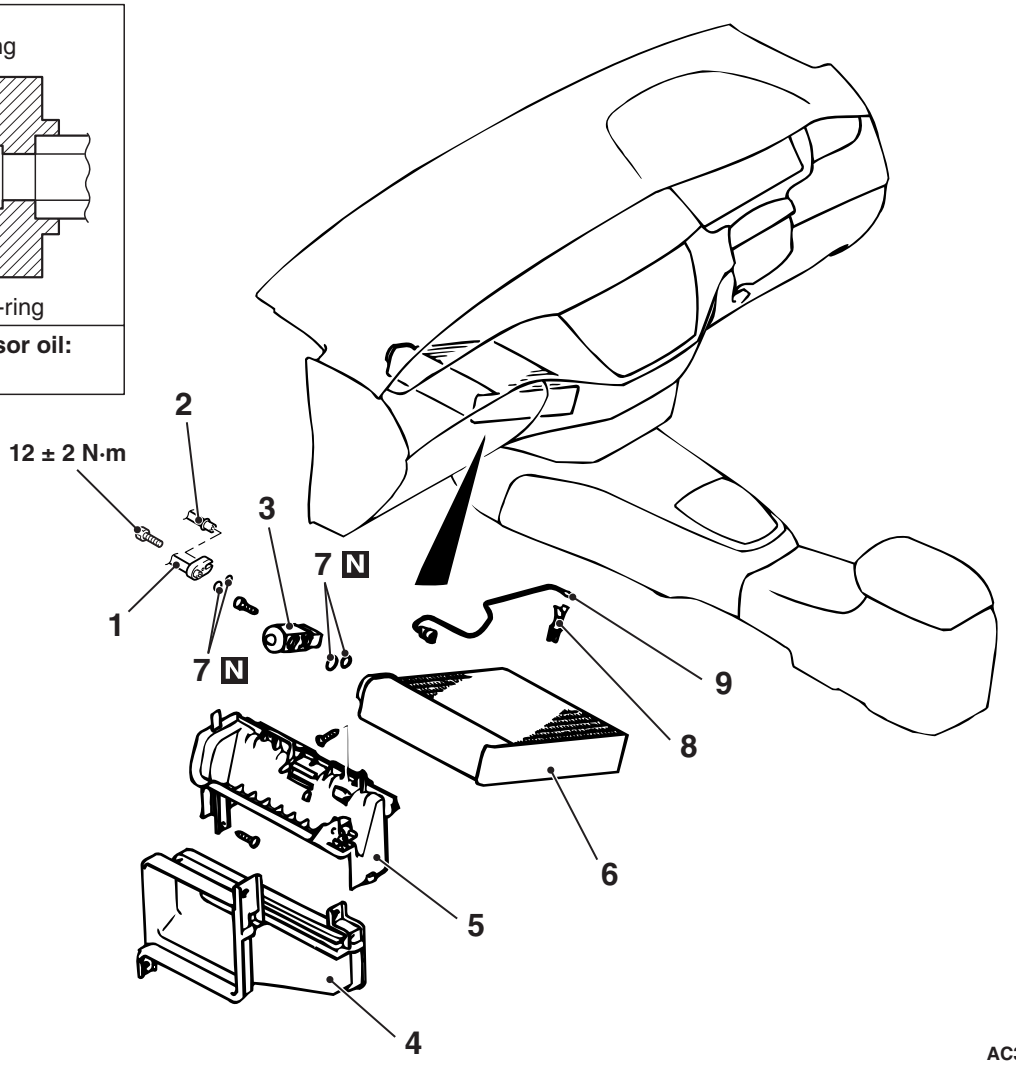
EVAPORATOR ASSEMBLY

REMOVAL AND INSTALLATION

M1552003600582

Pre-removal and Post-installation Operation
- Refrigerant draining and Refilling (Refer to charging and discharging P.55A-43).
- Air cleaner and air cleaner air flow sensor assembly Removal and Installation (Refer to GROUP 15 P.15-3).





Removal steps

<<A>> 1. Flexible suction hose connection
<<A>> 2. Liquid pipe B connection
3. Expansion valve
- Glove box (Refer to GROUP 52A, Instrument Panel P.52A-2).
- Engine-ECU <M/T> or Engine-A/T-ECU <A/T> (Refer to GROUP 13A, Engine-ECU and Engine-A/T-ECU P.13A-335).

4. Joint duct

<<B>>

Removal steps (Continued)
- Foot duct (LH), Rear heater duct (LH) (Refer to P.55A-65).

5. Evaporator cover
6. Evaporator
7. O-ring
8. Air thermo sensor clip
9. Air thermo sensor

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REMOVAL SERVICE POINT

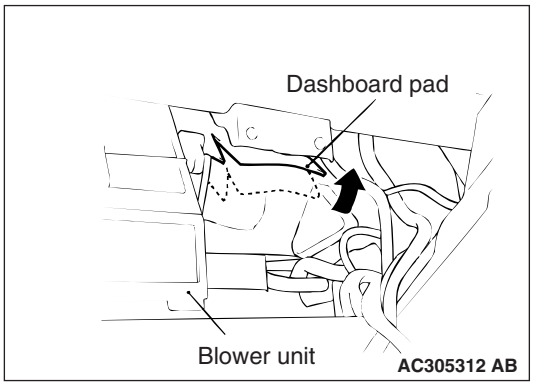
<<A>> FLEXIBLE SUCTION HOSE AND LIQUID PIPE B DISCONNECTION

⚠ 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.

<<B>> EVAPORATOR REMOVAL



⚠ CAUTION

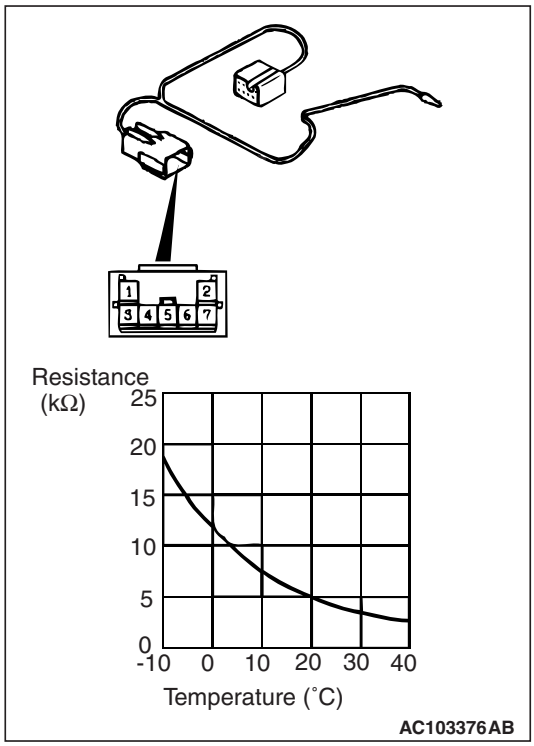
Do not cut the upper side of the pad.

1. When removing the evaporator, cut and fold back the dashboard pad as in the diagram. (The thickness of the pad interferes with the removal of the evaporator.)
2. Remove the evaporator.

INSPECTION

M1552014300938

AIR THERMO SENSOR INSPECTION



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.

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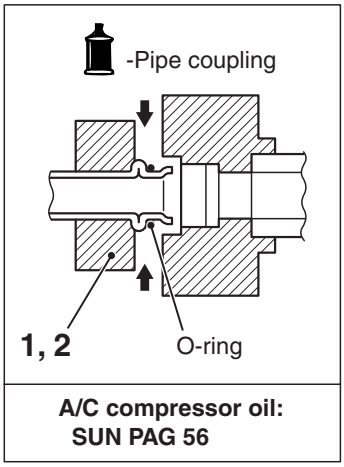
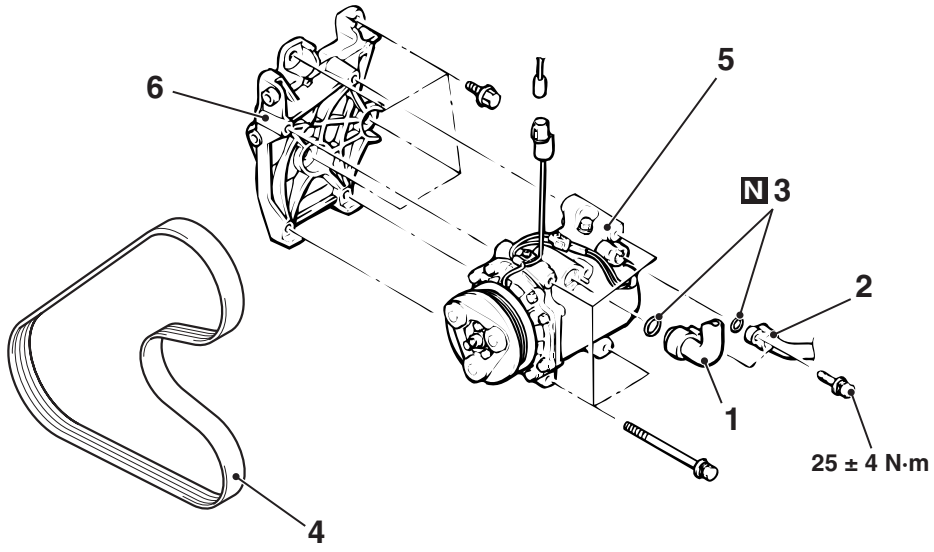
COMPRESSOR ASSEMBLY AND TENSION PULLEY

REMOVAL AND INSTALLATION

M1552004100546

Pre-removal Operation	Post-installation Operation
• Refrigerant Discharging (Refer to P.55A-43).	• Drive Belt Tension Adjustment (Refer to GROUP 11A, On-vehicles Service –Drive Belt Tension Check P.11A-7). • Refrigerant Charging (Refer to P.55A-43).





AC309173AC

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

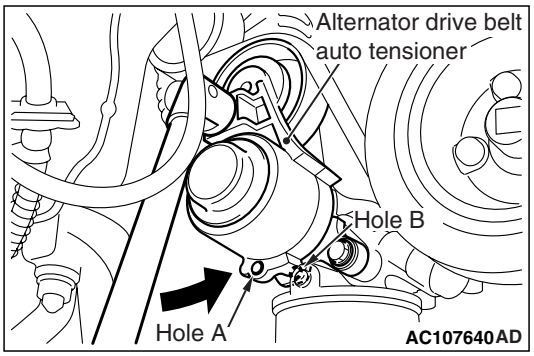
⚠ CAUTION

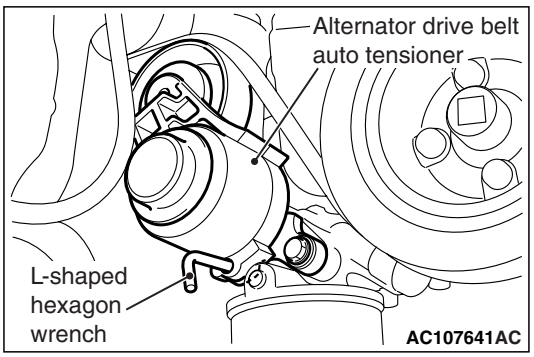
As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

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 alternator 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 alternator drive belt auto tensioner, and turn the alternator drive belt auto tensioner anti-clockwise until it hits the stopper.

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⚠ CAUTION

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

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

<<C>> A/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 = 120mL

   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.

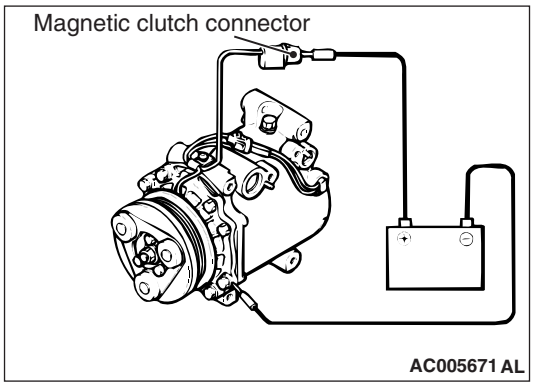
Quantity:

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

INSPECTION

M1552014301845

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.

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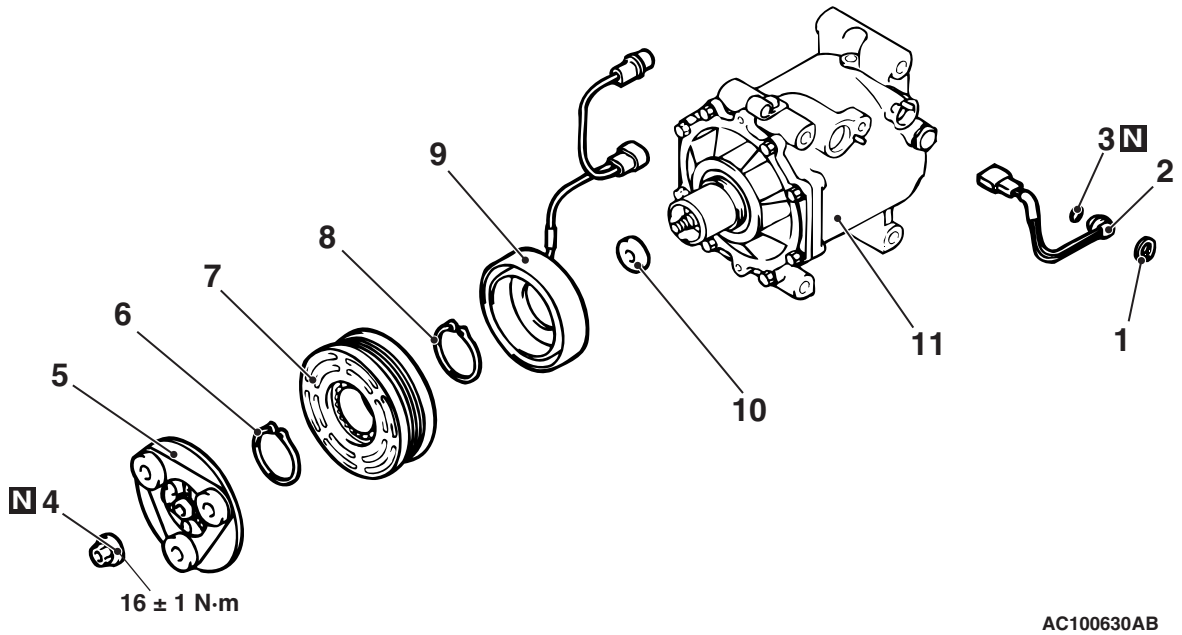
DISASSEMBLY AND REASSEMBLY

M1552004600660



AC100630AB

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

5. Armature

>>B<< 6. Snap ring

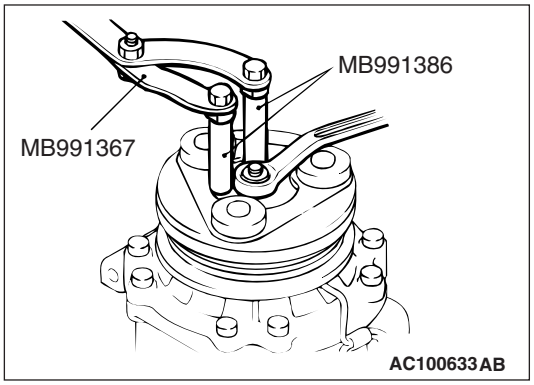
7. Rotor
8. Snap ring

>>A<< 9. Field core

10. Shim
11. A/C compressor

DISASSEMBLY SERVICE POINT

<<A>> SELF-LOCKING NUT REMOVAL



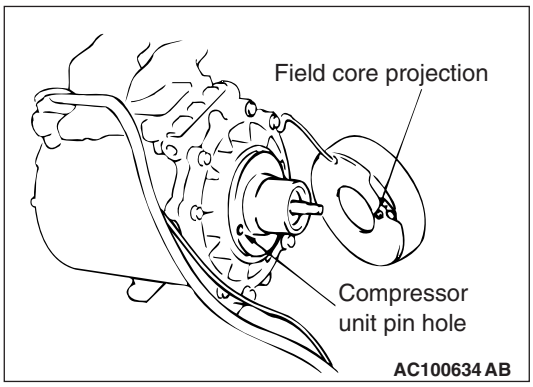
AC100633AB

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

- Special spanner (MB991367)
- Pin (MB991386)

REASSEMBLY SERVICE POINTS

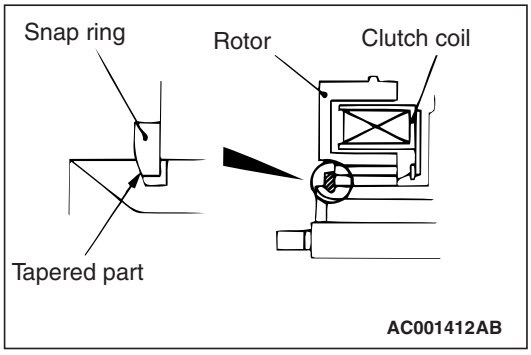
>>A<< FIELD CORE ATTACHMENT



AC100634AB

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

>>B<< SNAP RING INSTALLATION



AC001412AB

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

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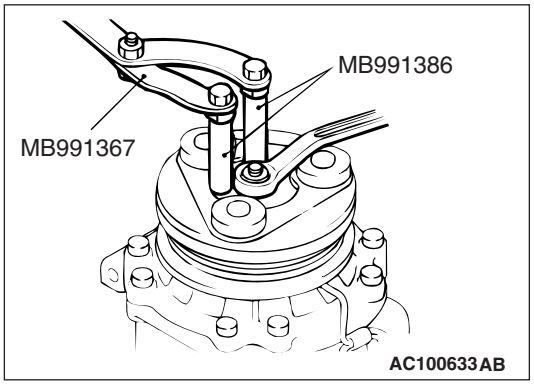
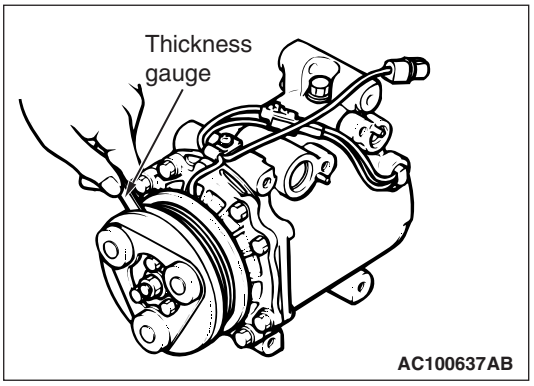
>>C<< SELF-LOCKING NUT INSTALLATION



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

- Special spanner (MB991367)
- Pin (MB991386)

>>D<< AIR GAP ADJUSTMENT



Check that the clutch air gap is inside the standard value. If outside the standard value, use a shim to adjust the gap.

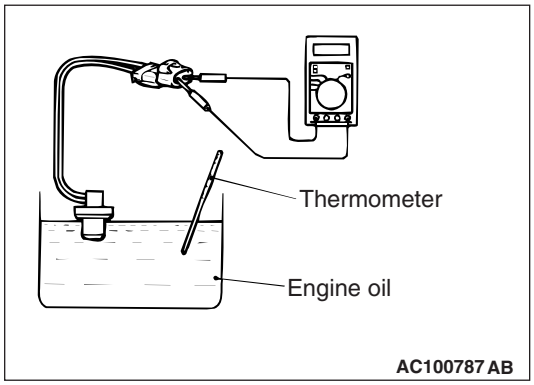
Standard value: 0.3 – 0.5 mm

INSPECTION

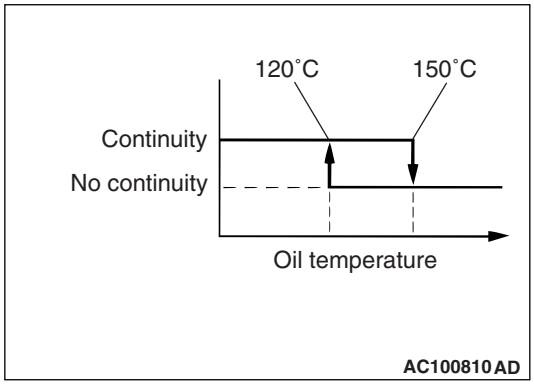
M1552014300950

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.

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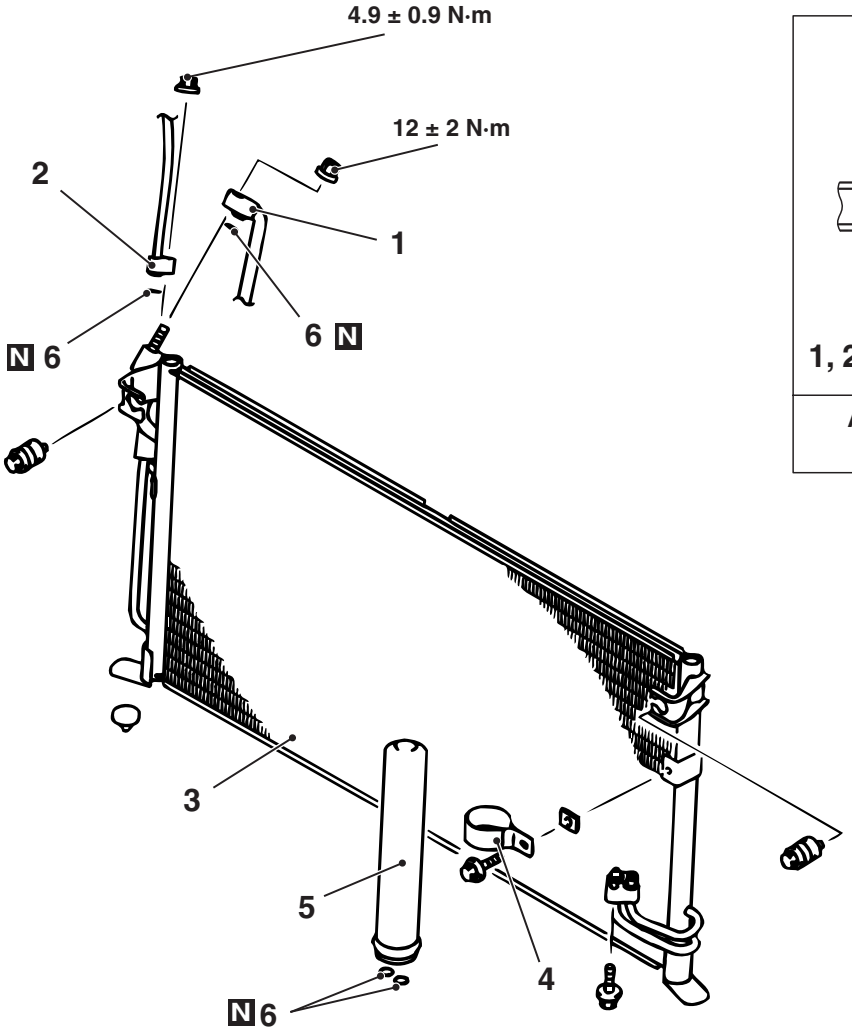
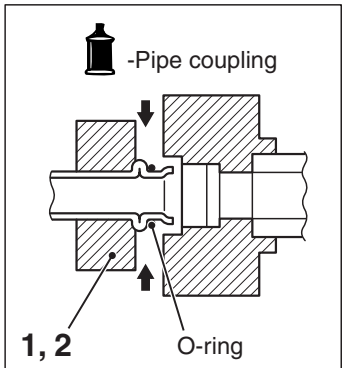
CONDENSER AND CONDENSER FAN MOTOR

REMOVAL AND INSTALLATION

M1552006700696

Pre-removal and Post-installation Operation
- Refrigerant draining and Refilling (Refer to charging and discharging P.55A-43).
- Air cleaner cover and air flow sensor assembly Removal and Installation (Refer to GROUP 15 P.15-3).





A/C compressor oil: SUN PAG 56

Removal steps

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

REMOVAL SERVICE POINT

<<A>> FLEXIBLE DISCHARGE 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.

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Group TOC

INSTALLATION SERVICE POINT

>>A<< CONDENSER ASSEMBLY INSTALLATION

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

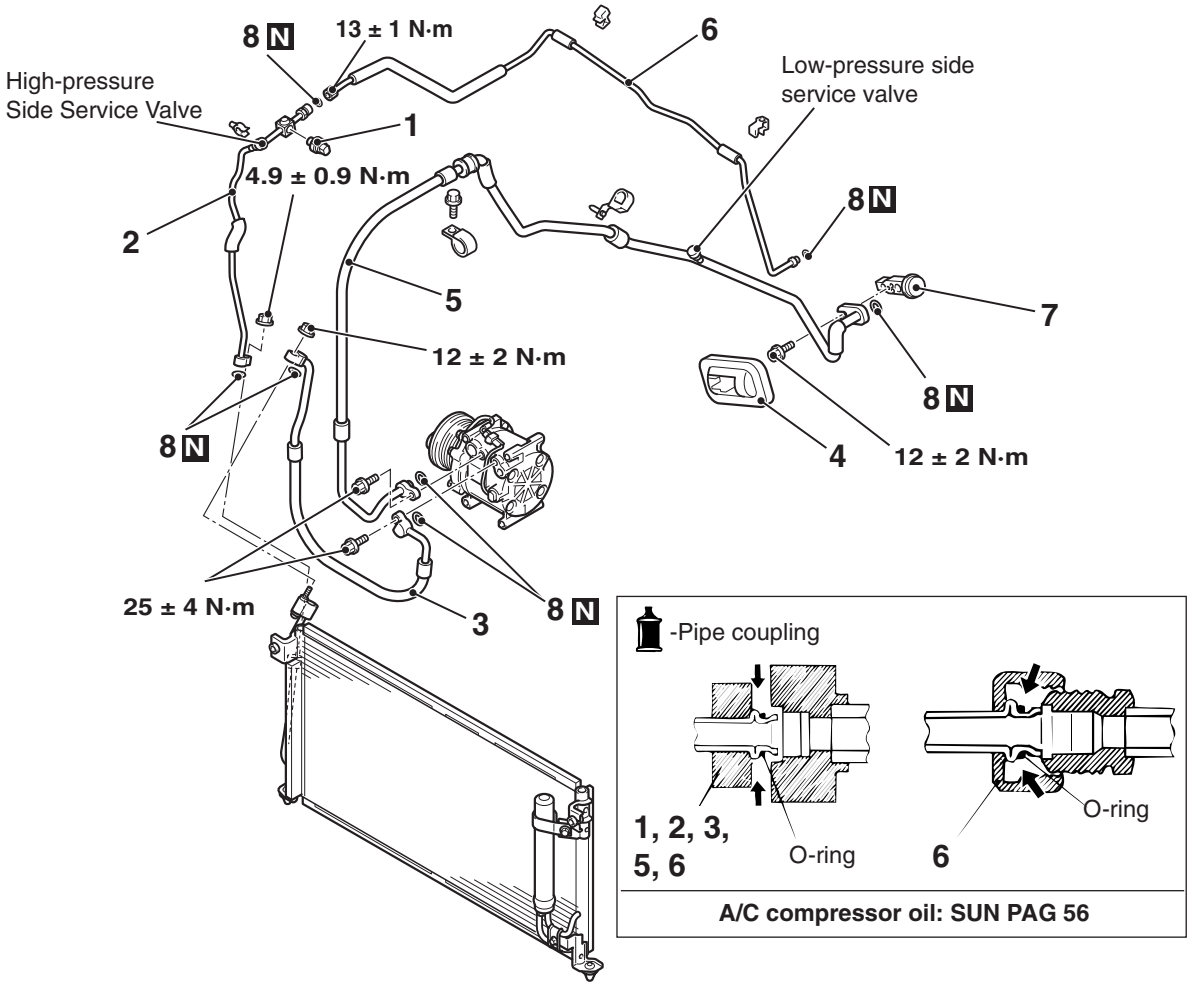
Compressor oil: SUN PAG 56
Quantity: 15 mL

REFRIGERANT LINE

REMOVAL AND INSTALLATION

M1552006401104

Pre-removal and Post-installation Operation
- Refrigerant Draining and Refilling (Refer to P.55A-43.)
- Air Cleaner Removal and Installation (Refer to GROUP 15 P.15-3.)
- Radiator Grille Removal and Installation (Refer to GROUP 51, Front bumper P.51-2.)



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Removal steps

<<A>> 1. Dual pressure switch
<<A>> 2. Liquid pipe A

Removal steps (Continued)

<<A>> 3. Flexible discharge hose
4. Expansion valve cover

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Removal steps (Continued)

<<A>> >>A<< 5. Flexible suction hose
<<A>> >>A<< 6. Liquid pipe B
7. Expansion valve cover
8. O-ring

REMOVAL SERVICE POINT

<<A>> DUAL PRESSURE SWITCH/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/PIPE 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

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DUCTS

REMOVAL AND INSTALLATION

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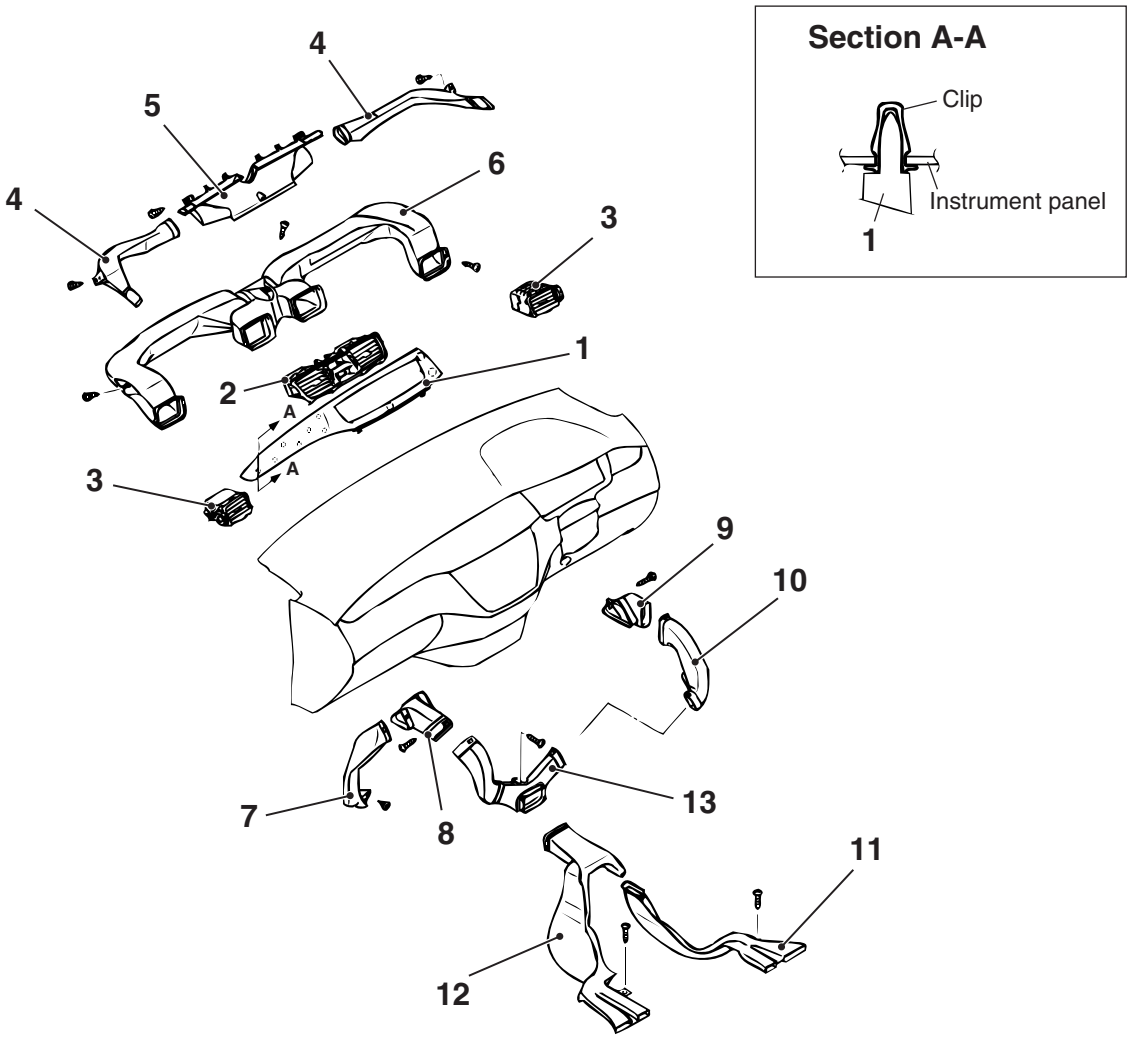

AC403432AC

Air outlet removal steps
1. Centre air outlet panel
2. Centre air outlet
3. Side air outlet

Defroster nozzle and distribution duct removal steps
- Instrument panel (Refer to GROUP 52A P.52A-2.)

4. Side defroster duct
5. Defroster nozzle
6. Distribution duct

Foot duct removal steps
- Console cover and Glove box (Refer to GROUP 52A, Instrument panel P.52A-2.)

7. Foot duct (LH)

Foot duct removal steps
8. Rear heater duct A (LH) upper side
- Under cover (Refer to GROUP 52A, Instrument panel P.52A-2.)

9. Foot duct (RH)

Rear heater duct removal steps
- Front floor console (Refer to GROUP 52A P.52A-7.)
- Front seat (Refer to GROUP 52A P.52A-22.)
- Floor carpet and floor pads

10. Rear heater duct A (RH)
11. Rear heater duct B (RH)
12. Rear heater duct B (LH)
13. Rear heater duct A (LH) lower side

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VENTILATORS

REMOVAL AND INSTALLATION

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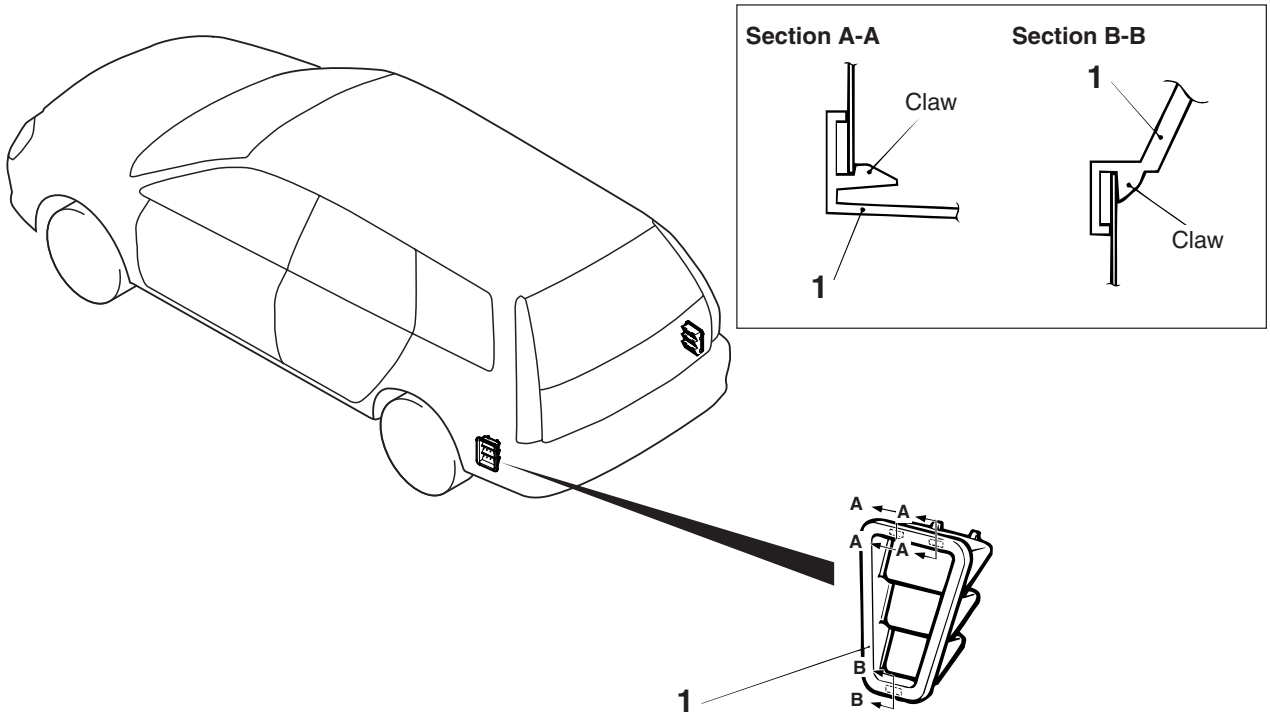

AC304951AE

Rear ventilation duct removal steps

- Rear bumper assembly (Refer to GROUP 51 P.51-7.)

1. Rear ventilation duct