GROUP 55

HEATER, AIR CONDITIONER AND VENTILATION

CONTENTS

SERVICE SPECIFICATIONS

M1551000301731

Item		Standard value
Idle speed r/min (N or P range)		650 ± 100
Idle-up speed r/min (N or P range)		750 ± 100
Air gap (magnetic clutch) mm		0.25 – 0.45
A/C refrigerant temperature switch operating temperature °C	Being turned off	135
	Being turned on	120

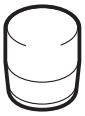
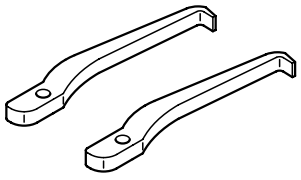
LUBRICANTS

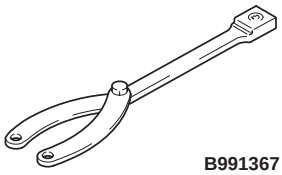
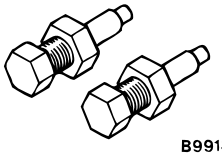
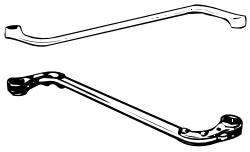
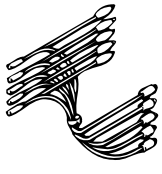
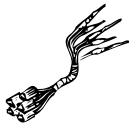
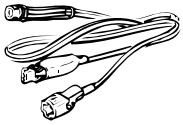
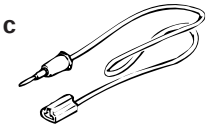
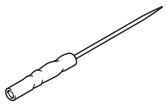
M1551000401415

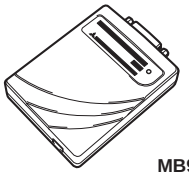
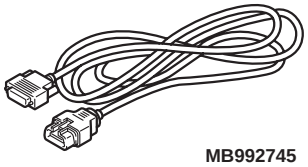
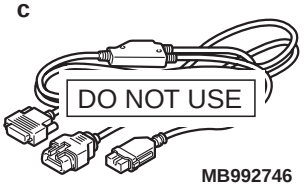
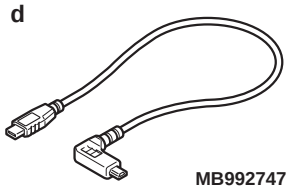
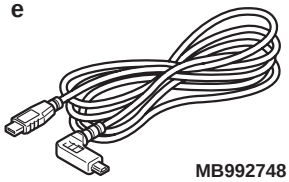
Item	Specified lubricant	Quantity
Compressor refrigerant unit lubricant mL	SUN PAG 56 or S10X	70 + 20 (target value: 70)
Each connection of refrigerant line		As required
Refrigerant g	HFC134a (R134a)	500 ± 20

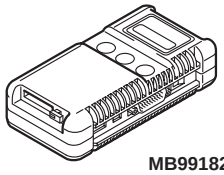
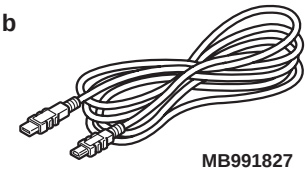
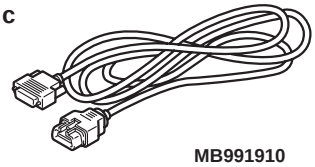
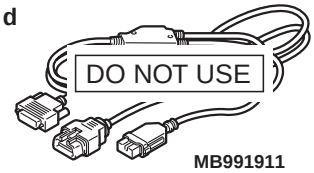
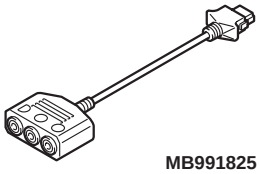
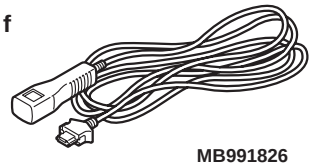
SPECIAL TOOLS

M1551000601248

Tool	Number	Name	Use
 MB990810	MB990810	Side bearing puller	A/C compressor rotor removal and installation
 MB992623	MB992623	Guide	
 MB992624	MB992624	Pusher	
	MD999566	Claw	

Tool	Number	Name	Use
 B991367	MB991367	Special spanner	Removal and installation of the A/C compressor armature mounting nut
 B991386	MB991386	Pin	
 MB990900	MB990900 or MB991164	Door hinge adjusting wrench	Removal and installation of front deck cross member heater unit assembly
 MB991658	MB991658	Test harness	Inspection of the A/C pressure sensor
a  b  c  d  DO NOT USE MB991223	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

Tool	Number	Name	Use
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	Check the A/C (The M.U.T.-III diagnosis codes display, service data display and actuator test)

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle Communication Interface (V. C. I). b. USB cable c. M.U.T.-III main harness A (applicable to vehicles with CAN communication) d. M.U.T.-III main harness B (applicable to vehicles without CAN communication) e. Measurement adapter f. Trigger harness	⚠ **CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.** Check the A/C (The M.U.T.-III diagnosis codes display, service data display and actuator test)

TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

M1554004701150

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – Contents of Troubleshooting

DIAGNOSIS FUNCTION

M1554004801180

READING DIAGNOSIS CODES

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

ERASING DIAGNOSIS CODES

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

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using M.U.T.-III (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – Diagnosis Function).

When detecting the trouble and storing the diagnosis code, the ECU connected to CAN bus line obtains the data when the diagnosis code is confirmed, and then stores the ECU status of that time. By analysing each data from M.U.T.-III, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

Item No.	Item name	Data item	Unit
01	Odometer	Total driving distance when the diagnosis code is generated	km
02	Ignition cycle	Number of times the ignition switch is turned "ON" or "LOCK (OFF)" after the past failure transition	Number of counts is displayed.
04	Accumulated minute	Cumulative time for current malfunction of diagnosis code	min

DIAGNOSIS CODE CHART

M1554004902287

Code No.	Diagnostic item	Reference page	Service data display contents when diagnosis code is set
B10C0	Interior temperature sensor system (short circuit)	P.55-8	24°C
B10C1	Interior temperature sensor system (open circuit)		
B1031	Fin thermo sensor system (short circuit)	P.55-8	Inside air recirculation: Room temperature Outside air induction: Ambient temperature + 10°C
B1032	Fin thermo sensor system (open circuit)		
B1079	A/C refrigerant leaks	P.55-9	–
U0141	ETACS-ECU CAN time-out	P.55-10	–
U0155	Meter CAN time-out	P.55-11	–
U0168	KOS CAN time-out	P.55-12	–
U0184	Audio CAN time-out	P.55-14	–
U0230	Power gate CAN time-out	P.55-15	–
U0245	AND CAN time-out	P.55-16	–
U1000	OSS CAN time-out	P.55-18	–
U1190	No receive fault detect signal	P.55-19	–
U1195	Coding not completed	P.55-19	–
U1199	Chassis No. not programmed	P.55-19	–

DIAGNOSIS CODE PROCEDURES

Code No.B10C0: Interior temperature sensor system (short circuit)
Code No.B10C1: Interior temperature sensor system (open circuit)

COMMENTS ON TROUBLE SYMPTOM

This code is set when the interior temperature sensor circuit is short (Code No.B10C0) or is open (Code No.B10C1)

PROBABLE CAUSES

- Malfunction of the interior temperature sensor
- Damaged the wiring harness or connectors
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III data list

Check that the following service data display contents are normal. (Refer to P.55-29).

Item No.63: Interior temperature sensor

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

STEP 2. Check of open and short circuit in SENG and INC line between interior temperature sensor and heater controller assembly (A/C-ECU) connector.

NOTE: Prior to the wiring harness inspection, check joint connector and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check the interior temperature sensor.

Refer to P.55-50.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the air mixing damper control motor and potentiometer.

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU).
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction).

Code No.B1031: Fin thermo Sensor system (short circuit)
Code No.B1032: Fin thermo Sensor system (open circuit)

COMMENTS ON TROUBLE SYMPTOM

This code is set when the fin thermo sensor circuit is short (Code No.B1031) or is open (Code No.B1032).

PROBABLE CAUSES

- Malfunction of the fin thermo sensor
- Damaged wiring harness or connectors
- Malfunction of the heater controller assembly (A/C-ECU)

STEP 2. Check of open and short circuit in + and - line between fin thermo sensor and auto heater controller assembly (A/C-ECU) connector.

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III data list

Check that the following service data display contents are normal. (Refer to P.55-29).

Item No.20: Air thermo sensor

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

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check the fin thermo sensor.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the air mixing damper control motor and potentiometer.

STEP 4. Check whether the diagnosis code is reset.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU).
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction).

Code No. B1079: A/C Refrigerant leaks

COMMENTS ON TROUBLE SYMPTOM

If this code is set, the refrigerant level may not be appropriate, or the A/C pressure sensor may be faulty (If this code is set, the A/C indicator will flash).

PROBABLE CAUSES

- Inadequate refrigerant level
- Malfunction of the A/C pressure sensor
- Malfunction of the ambient temperature sensor
- Damaged wiring harness or connectors
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. Check the condenser assembly

Check that the condenser assembly is not wet.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Wait until the condenser is dry, and check that no diagnosis code is set.

STEP 2. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C, Troubleshooting).

STEP 3. M.U.T.-III diagnosis code

Check that the diagnosis code related to the A/C is not set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO : Go to Step 4.

STEP 4. M.U.T.-III data list

Check that the following service data display contents are normal. (Refer to P.55-29)

Item No.19: Ambient temperature sensor

Q: Is the check result normal?
YES : Go to Step 5.
NO : Refer to Inspection Procedure 5: Ambient temperature sensor system P.55-27.

STEP 5. Check the A/C pressure sensor

Refer to P.55-40.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Replace the A/C pressure sensor.

STEP 6. Refrigerant level check

Refer to P.55-34.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Correct the refrigerant level.

STEP 7. Check whether the diagnosis code is reset

Q: Is the diagnosis code set?
YES : Refer to Inspection Procedure 11: A/C pressure sensor system P.55-27.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction).

Code No. U0141: ETACS-ECU CAN time-out

⚠ CAUTION
If diagnosis code No.U0141 is set in the heater controller assembly (A/C-ECU), diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The heater controller assembly (A/C-ECU) receives air conditioner operation-related signal from the ETACS-ECU via the CAN bus lines. If the heater controller assembly (A/C-ECU) can not receive the air conditioner operation-related signal at all on the ETACS-ECU, diagnosis code No.U0141 will be set.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the heater controller assembly (A/C-ECU), the power supply system to the ETACS-ECU, the ETACS-ECU itself, or the A/C-ECU may be faulty.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the ETACS-ECU and the heater controller assembly (A/C-ECU), and the power supply system to the ETACS-ECU. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION
If the ignition switch is turned on without starting the engine and then three minutes pass, the heater controller assembly (A/C-ECU) may store U0141 as past trouble.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the ETACS-ECU
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the ETACS-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the ETACS-ECU. Refer to .
NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

- Combination meter

U0141: ETACS-ECU timeout

Q: Is the diagnosis code set?
YES : Go to Step 4
NO : Go to Step 5

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the ETACS-ECU, and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the ETACS-ECU and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the ETACS-ECU and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Return to Step 1.
NO : The procedure is complete.

Code No. U0155: Meter CAN time-out

⚠ CAUTION
If diagnosis code No.U0155 is set in the heater controller assembly (A/C-ECU), diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The heater controller assembly (A/C-ECU) receives air conditioner control-related signals from the combination meter via the CAN bus lines. If the ECU cannot receive any of the air conditioner control-related signals from the combination meter, diagnosis code U0155 will be stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the combination meter and the A/C-ECU, the power supply system to the combination meter, the combination meter itself, or the heater controller assembly (A/C-ECU) may be faulty.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the heater controller assembly (A/C-ECU) and the combination meter, and the power supply system to the combination meter. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, the diagnosis code U0168 (past trouble) may be set to the heater controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the combination meter
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2
NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the combination meter-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the combination meter. Refer to .
NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.
- ETACS-ECU

U0155: Combination meter timeout

Q: Is the diagnosis code set?
YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the combination meter, and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the combination meter and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the combination meter and the A/C-ECU (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Return to Step 1.
NO : The procedure is complete.

Code No. U0168: KOS CAN time-out

⚠ CAUTION
If diagnosis code No.U0168 is set in the A/C-ECU, diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT
The heater controller assembly (A/C-ECU) receives air conditioner control-related signals from the KOS via the CAN bus lines. If the ECU cannot receive any of the air conditioner control-related signals from the KOS, diagnosis code U0168 will be stored.

COMMENTS ON TROUBLE SYMPTOM
Current trouble
- Connector(s) or wiring harness in KOS the CAN bus lines between the WCM and the heater controller assembly (A/C-ECU), the power supply system to the WCM, the WCM itself, or the A/C-ECU may be faulty.

Past trouble
- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the heater controller assembly (A/C-ECU) and the WCM, and the power supply system to the WCM. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).?

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION

If the ignition switch is turned to the ON position without starting the engine, the diagnosis code U0168 (past trouble) may be set to the heater controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the KOS
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code

Check whether the KOS-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Diagnose the KOS. (Refer to GROUP 42B "Symptom chart").

NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code

Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

- ETACS-ECU

U0168: KOS timeout

Q: Is the diagnosis code set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the KOS, and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the WCM and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the WCM and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No. U0184: Audio CAN time-out

⚠ CAUTION
If diagnosis code No.U0184 is set in the heater controller assembly (A/C-ECU), diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The heater controller assembly (A/C-ECU) receives air conditioner control-related signals from the audio system via the CAN bus lines. If the ECU cannot receive any of the air conditioner control-related signals from the audio system, diagnosis code U0184 will be stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the audio system and the heater controller assembly (A/C-ECU), the power supply system to the audio system, the audio system itself, or the heater controller assembly (A/C-ECU) may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the heater controller assembly (A/C-ECU) and the audio system, and the power supply system to the audio system. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, the diagnosis code U0184 (past trouble) may be set to the heater controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the audio
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the audio-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the audio. Refer to .
NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

- Audio

U0184: Audio-related time-out diagnosis code

Q: Is the diagnosis code set?
YES : Go to Step 4
NO : Go to Step 5

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the audio, and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the audio and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the audio and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Return to Step 1.
NO : The procedure is complete.

Code No. U0230: Power Gate CAN time-out

⚠ CAUTION
If diagnosis code No.U0230 is set in the heater controller assembly (A/C-ECU), diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The heater controller assembly (A/C-ECU) receives air conditioner control-related signals from the electric tailgate via the CAN bus lines. If the ECU cannot receive any of the air conditioner control-related signals from the electric tailgate, diagnosis code U0230 will be stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the electric tailgate and the heater controller assembly (A/C-ECU), the power supply system to the electric tailgate, the electric tailgate itself, or the heater controller assembly (A/C-ECU) may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the heater controller assembly (A/C-ECU) and the electric tailgate, and the power supply system to the electric tailgate. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, the diagnosis code U0230 (past trouble) may be set to the heater controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the audio
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the audio-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the power gate. Refer to .
NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.
- ETACS-ECU

U0230: Power Gate CAN timeout

Q: Is the diagnosis code set?
YES : Go to Step 4
NO : Go to Step 5

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the electric tailgate, and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the electric tailgate and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the electric tailgate and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Return to Step 1.
NO : The procedure is complete.

Code No. U0245: ANDCAN time-out

⚠ CAUTION
If diagnosis code No.U0245 is set in the heater controller assembly (A/C-ECU), diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT
The heater controller assembly (A/C-ECU) receives air conditioner control-related signals from the combination meter or CAN box unit (MMCS) via the CAN bus lines. If the ECU cannot receive any of the air conditioner control-related signals from the combination meter or CAN box unit (MMCS), diagnosis code U0245 will be stored.

COMMENTS ON TROUBLE SYMPTOM
Current trouble
- Connector(s) or wiring harness in the CAN bus lines between the combination meter or CAN box unit (MMCS) and the heater controller assembly (A/C-ECU), the power supply system to the combination meter or CAN box unit (MMCS), the combination meter or CAN box unit (MMCS) itself, or the heater controller assembly (A/C-ECU) may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the heater controller assembly (A/C-ECU) and the combination meter or CAN box unit (MMCS), and the power supply system to the combination meter or CAN box unit (MMCS). For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION

If the ignition switch is turned to the ON position without starting the engine, the diagnosis code U0184 (past trouble) may be set to the heater controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the audio
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code

Check whether the audio-related diagnosis code is set.

Q: Is the diagnosis code set?

YES : Diagnose the audio. Refer to .

NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code

Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

- Combination meter

U0245: AND CAN timeout

Q: Is the diagnosis code set?

YES : Go to Step 4

NO : Go to Step 5

STEP 4. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the combination meter or CAN box unit (MMCS), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the combination meter or CAN box unit (MMCS) and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the combination meter or CAN box unit (MMCS) and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.

(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No. U1000: OSS CAN time-out

⚠ CAUTION
If diagnosis code No.U1000 is set in the heater controller assembly (A/C-ECU), diagnose the CAN main bus line.

⚠ CAUTION
Whenever the ECU is replaced, ensure that the communication circuit is normal.

TROUBLE JUDGMENT

The heater controller assembly (A/C-ECU) receives air conditioner control-related signals from the OSS-ECU via the CAN bus lines. If the ECU cannot receive any of the air conditioner control-related signals from the OSS-ECU, diagnosis code U1000 will be stored.

COMMENTS ON TROUBLE SYMPTOM

Current trouble

- Connector(s) or wiring harness in the CAN bus lines between the OSS-ECU and the heater controller assembly (A/C-ECU), the power supply system to the OSS-ECU, the OSS-ECU itself, or the heater controller assembly (A/C-ECU) may be defective.

Past trouble

- Carry out diagnosis with particular emphasis on connector(s) or wiring harness in the CAN bus lines between the heater controller assembly (A/C-ECU) and the OSS-ECU, and the power supply system to the OSS-ECU. For diagnosis procedures, refer to "How to treat past trouble" (Refer to GROUP 00 – How to Treat Past Trouble).

NOTE: For a past trouble, you can not find it by the M.U.T.-III CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, refer to GROUP 00, How to Cope with Intermittent Malfunction and check the CAN bus lines. You can narrow down the possible cause of the trouble by referring to the diagnosis code, which is set regarding the CAN communication-linked ECUs (Refer to GROUP 54C – CAN Bus Line Diagnostic Flow).

⚠ CAUTION
If the ignition switch is turned to the ON position without starting the engine, the diagnosis code U0184 (past trouble) may be set to the heater controller assembly (A/C-ECU) after three minutes.

PROBABLE CAUSES

- Damaged wiring harness or connectors
- Malfunction of the audio
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting). On completion, go to Step 6.

STEP 2. M.U.T.-III other system diagnosis code
Check whether the audio-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Diagnose the audio. Refer to .
NO : Go to Step 3

STEP 3. M.U.T.-III other system diagnosis code
Check if a diagnosis code, which relates to CAN communication-linked systems below, is set.

- Combination meter

U1000: OSS CAN timeout

Q: Is the diagnosis code set?
YES : Go to Step 4
NO : Go to Step 5

STEP 4. Check whether the diagnosis code is reset.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the OSS-ECU, and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the OSS-ECU and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 5. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Replace the heater controller assembly (A/C-ECU), and then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus line between the OSS-ECU and the heater controller assembly (A/C-ECU) (Refer to GROUP 00 – How to Cope with Intermittent Malfunction).

STEP 6. Check whether the diagnosis code is reset.

Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Return to Step 1.
NO : The procedure is complete.

Code No.U1190 No receive fault detect signal

TROUBLE JUDGMENT

ETACS-ECU sends the diagnosis code (U code) detection permission or prohibition signal to each ECU connected to the CAN bus line. If the heater controller assembly (A/C-ECU) cannot receive the diagnosis code (U code) detection permission or prohibition signal for 5 seconds after turning the electric motor switch to ON position, diagnosis code U1190 will be set.

PROBABLE CAUSES

- Malfunction of the ETACS-ECU
- Malfunction of CAN bus line

Code No.U1195 Coding not completed

⚠ CAUTION
- **If the diagnosis code No. U1195 is set, diagnose the CAN bus lines.**
- **When replacing the ECU, always check that the communication circuit is normal.**

DIAGNOSTIC FUNCTION

If the vehicle information data is not registered to the ETACS-ECU, the heater controller assembly (A/C-ECU) sets the diagnosis code No. U1195.

PROBABLE CAUSES

- Malfunction of CAN bus line
- Malfunction of combination meter
- Malfunction of the ETACS-ECU

Code No.U1199 Chassis No. not programmed

DIAGNOSTIC FUNCTION

If the chassis number is not written to the ETACS-ECU, the ETACS-ECU sets diagnosis code No.U1199.

PROBABLE CAUSES

- Chassis No. not programmed
- Malfunction of the ETACS-ECU

TROUBLE SYMPTOM CHART

M1554005002685

Trouble symptom	Inspection procedure No.	Reference page
Communication with the M.U.T.-III is not possible	1	P.55-20
Cool air does not come	2	P.55-20
The blower does not work	3	P.55-21
The blower air volume cannot be changed	4	P.55-22
The inside/outside air changeover is impossible	5	P.55-23
The A/C compressor does not work	6	P.55-23
A/C outlet air temperature cannot be set	7	P.55-25
Air outlets changeover is impossible	8	P.55-26
Ambient temperature sensor system	9	P.55-26
A/C pressure sensor system	10	P.55-27
Blower motor power supply system	11	P.55-27
A/C-ECU power supply system	12	P.55-28

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication with the M.U.T.-III is not possible.

COMMENTS ON TROUBLE SYMPTOM

If communication with all other systems is not possible, there is a high possibility that there is a malfunction of the diagnosis line. If only the A/C system can not communicate with the M.U.T.-III, the heater controller assembly (A/C-ECU) may be defective.

PROBABLE CAUSE

Malfunction of the heater controller assembly (A/C-ECU)

INSPECTION PROCEDURE 2: Cool air does not come

CIRCUIT OPERATION

If the blower air temperature can not be cool when turning A/C switch ON and lowering the preset temperature, inadequate refrigerant quantity, sensors, harness or connectors may be suspected.

PROBABLE CAUSE

Damaged wiring harness or connectors

DIAGNOSIS PROCEDURE

STEP 1. Check the blower operation

Check that air blows through the air outlets.
(1) Turn the ignition switch to the ON position.
(2) Blower knob: Other than OFF
(3) Check that the air comes out of the blower.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to Inspection Procedure 3 "The blower does not work P.55-21".

STEP 2. Check the A/C compressor operation
Check that the compressor operates under the following conditions.
- Engine operation
- Air conditioner switch: ON
- Blower knob: Maximum air volume
- Temperature control dial: 18°C (MAX COOL)

NOTE: The compressor does not work when the blower intake temperature is 0°C or less.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to Inspection Procedure 6 "The A/C compressor does not work P.55-23",

STEP 3. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting).

STEP 4. M.U.T.-III diagnosis code
Check that the diagnosis code related to the air conditioner is not set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO : Go to Step 5.

STEP 5. Refrigerant level check
Check that the refrigerant level is adequate. Refer to P.55-34.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction).
NO : Charge or remove the refrigerant level. Refer to P.55-34.

INSPECTION PROCEDURE 3: The blower does not work

COMMENTS ON TROUBLE SYMPTOM
If the blower motor does not operate, the blower motor circuit system may be defective.

PROBABLE CAUSES
- Malfunction of the blower motor
- Malfunction of the power transistor
- Malfunction of the heater controller assembly (A/C-ECU)
- Damaged wiring harness or connectors

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III diagnosis code.
Recheck if the diagnosis code is set.
(1) Erase the diagnosis code.
(2) Ignition switch: LOCK (OFF) to ON
(3) Check if the diagnosis code is set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO : Go to Step 3.

STEP 3. Check the blower relay.
Refer to P.55-41.

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

STEP 4. Check the blower motor.
Refer to P.55-48.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the blower motor.

STEP 5. Voltage measurement at blower motor connector.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the ON position.
(3) Voltage between terminal 1 and body earth.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 6.
NO : INSPECTION PROCEDURE 14: Refer to "Blower motor power supply system" P.55-27.

STEP 6. Resistance measurement at the C-109 power transistor connector.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Continuity between terminal 1 and body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the wiring harness wires between power transistor connector terminal No. 1 and body earth.

STEP 7. Check of open circuit in power transistor power supply line between blower motor and power transistor connector.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Repair the connector(s) or wiring harness.

STEP 8. Check of open circuit in P/TB and P/TC line between blower motor, power transistor and heater controller assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness.

STEP 9. Replace the power transistor and recheck the trouble symptom
Check that the blower motor operates normally.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the heater controller assembly (A/C-ECU).

INSPECTION PROCEDURE 4: The blower air volume cannot be changed

COMMENTS ON TROUBLE SYMPTOM
If air volume cannot be adjusted by using the blower control, the A/C control panel, the heater controller assembly (A/C-ECU) or the power transistor may be faulty.

PROBABLE CAUSES
- Malfunction of the power transistor
- Damaged wiring harness or connectors
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting).

STEP 2. M.U.T.-III diagnosis code
Check that the diagnosis code related to the air conditioner is not set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO : Go to Step 3.

STEP 3. Resistance measurement at the power transistor connector.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Continuity between terminal 1 and body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the wiring harness wires between power transistor connector terminal No. 1 and body earth.

STEP 4. Check of open circuit in P/TB, P/TC and E line between blower motor, power transistor, earth J/C(DASH) and heater controller assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 5. Replace the power transistor and recheck the trouble symptom
Check that the blower motor operates normally.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the heater controller assembly (A/C-ECU).

INSPECTION PROCEDURE 5: The Inside/Outside Air Changeover is impossible.

COMMENTS ON TROUBLE SYMPTOM
If the air recirculation cannot be changed by using the inside air/outside air changeover switch, the inside air/outside air changeover motor system may be faulty.

PROBABLE CAUSES
- Malfunction of the outside/inside air selection damper control motor
- Damaged wiring harness or connectors
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSIS PROCEDURE

STEP 1. Check the operation of the heater control panel assembly (A/C-ECU)
Check that the A/C switch, rear window defogger switch and air volume control dial can operate.

Q: Is the check result normal?
YES : Go to Step 2.
NO : INSPECTION PROCEDURE 15: Refer to heater control panel assembly (A/C-ECU) power supply system P.55-28.

STEP 2. M.U.T.-III diagnosis code
Check that the diagnosis code related to the air conditioner is not set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO : Go to Step 3.

STEP 3. M.U.T.-III actuator test
Carry out the actuator test. (Refer to P.55-31).

Item No.5: In/out select damper (Select "position reset".)

Q: Does the blower motor work normally?
YES : This diagnosis is complete.
NO : Go to Step 4.

STEP 4. Check of open circuit in F/RA, F/RA' F/RB and F/RB' line between outside/inside air selection damper control motor and heater control panel assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness.

STEP 5. Replace the air outside/inside air circulation switching damper motor, and then recheck the trouble symptom.
Check to see that the outside air/inside air circulation switching damper motor operates normally.
NOTE: Whenever the motor is replaced, initialise the motor position by using the Actuator Test.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the heater control panel assembly (A/C-ECU).

INSPECTION PROCEDURE 6: The A/C compressor does not work

COMMENTS ON TROUBLE SYMPTOM
When the A/C compressor does not work, the A/C compressor circuit system may be defective.

PROBABLE CAUSES
- Malfunction of the A/C compressor
- Malfunction of the A/C compressor relay
- Damaged harness wires or connectors
- Malfunction of the engine-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use the M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting).

STEP 2. M.U.T.-III diagnosis code
Check whether the A/C sets a diagnosis code or not.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to diagnosis code chart P.55-7.

STEP 3. Voltage measurement at A/C compressor assembly connector.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Disconnect engine-ECU connector and earth terminal 102.
(4) Voltage between terminal 1 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 8.

STEP 4. Check the A/C compressor.
Refer to P.55-51.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the A/C compressor.

STEP 5. Check the refrigerant temperature switch.
Refer to P.55-54.

Q: Is the refrigerant temperature switch operating properly?
YES : Go to Step 6.
NO : Replace the refrigerant temperature switch.

STEP 6. Check the refrigerant level.
Refer to P.55-34.

Q: Is the refrigerant level correct?
YES : Go to Step 7.
NO : Correct the refrigerant level (Refer to On-vehicle Service P.55-34).

STEP 7. Replace the A/C-ECU, and then recheck the trouble symptom
Check that the compressor works normally.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the engine-ECU (Refer to GROUP 13A – Engine-ECU).

STEP 8. Check the A/C compressor relay
Refer to P.55-41.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Replace the A/C compressor relay.

STEP 9. Voltage measurement at A-14X A/C compressor relay connector.
(1) Remove the relay, and measure at the relay block side.
(2) Voltage between terminal 2, 4 and body earth.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 11.
NO : Go to Step 10.

STEP 10. Check of open circuit in A/C compressor relay power supply line between fusible link and A/C compressor relay connector.

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

STEP 11.Check of open circuit in A/C compressor relay power supply line between A/C compressor relay connector and A/C compressor assembly connector.

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

Q: Is the check result normal?
YES : Go to Step 12.
NO : Repair the connector(s) or wiring harness.

STEP 12. Check of open circuit in AC/R line (engine-ECU) between A/C compressor relay connector and engine-ECU connector.

Q: Is the check result normal?

YES : The trouble can be an intermittent malfunction (Refer to GROUP 00, How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness.

INSPECTION PROCEDURE 7: A/C outlet air temperature cannot be set

COMMENTS ON TROUBLE SYMPTOM

If the air conditioner outlet temperature cannot be adjusted, the air mixing damper control motor or the heater controller assembly (A/C-ECU) may be faulty.

NOTE: It cannot be adjusted while the engine coolant temperature is low.

PROBABLE CAUSES

- Malfunction of the air mix damper control motor
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSTIC PROCEDURE

STEP 1. Check the compressor operation

Check that the compressor operates under the following conditions.

- Engine operation
- Air volume control dial: Maximum
- Air conditioner switch: ON
- Temperature control dial: MAX COOL

Q: Is the check result normal?
YES : Go to Step 2.
NO : Refer to INSPECTION PROCEDURE 6: "The A/C compressor does not work P.55-23.

STEP 2. M.U.T.-III diagnosis code

Check that the diagnosis code related to the air conditioner is not set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO <Single-zone AUTO A/C> : Go to Step 3.
NO <Dual-zone AUTO A/C> : Go to Step 5.

STEP 3. M.U.T.-III actuator test

Carry out the actuator test. (Refer to P.55-31).

Item No.17: As air mix damper motor (Select "Damper position setting".)

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Go to Step 4.

STEP 4. Check of open circuit in IG1, A/DA, A/DA', A/DB, A/DB' line between air mixing damper control motor connector and heater controller assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness.

STEP 5. M.U.T.-III actuator test

Carry out the actuator test. (Refer to P.55-31).

Item No.16: Dr air mix damper motor (Select "Damper position setting".)

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

STEP 6. Check of open circuit in IG1, A/DA, A/DA', A/DB, A/DB' line between air mixing damper control motor connector (LH) and heater controller assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness.

STEP 7. M.U.T.-III actuator test

Carry out the actuator test. (Refer to P.55-31).

Item No.17: As air mix damper motor (Select "Damper position setting".)

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Go to Step 8.

STEP 8. Check of open circuit in IG1, A/PA, A/PA', A/PB, A/PB' line between air mixing damper control motor connector (RH) and heater controller assembly (A/C-ECU) connector.

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

STEP 9. Replace the air mixing damper control motor, and recheck the trouble symptom.
Check that A/C outlet air temperature can be adjusted.

NOTE: Whenever the motor is replaced, initialise the motor position by using the Actuator Test.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the heater controller assembly (A/C-ECU).

INSPECTION PROCEDURE 8: Air outlets changeover is impossible.

COMMENTS ON TROUBLE SYMPTOM

If the air conditioner outlets changeover is impossible, the mode selection damper control motor or the heater controller assembly (A/C-ECU) may be faulty.

PROBABLE CAUSES

- Malfunction of the mode selection damper control motor
- Malfunction of the heater controller assembly (A/C-ECU)

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnosis code
Check that the diagnosis code related to the air conditioner is not set.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to P.55-7.
NO : Go to Step 2.

STEP 2. M.U.T.-III actuator test
Carry out the actuator test. (Refer to P.55-31).

Item 08: Air outlet c/o damper: (Select "position reset".)

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Go to Step 3.

STEP 3. Check of open circuit in IG1, M/MA, M/MA' M/MB and M/MB' line between mode selection damper control motor and heater control panel assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness.

STEP 4. Replace the mode selection damper control motor, and recheck the trouble symptom.
Check that the air outlets can be changed.

NOTE: Whenever the motor is replaced, initialise the motor position by using the Actuator Test.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the heater controller assembly (A/C-ECU).

INSPECTION PROCEDURE 9: Ambient temperature sensor system

⚠ CAUTION
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in Immobilizer System – How to Register Key ID .)**

COMMENTS ON TROUBLE SYMPTOM

If the ambient temperature sensor system is defective, a malfunction may be present in the wiring harness between the ambient temperature sensor and the ETACS-ECU.

PROBABLE CAUSES

- Malfunction of the ambient temperature sensor
- Malfunction of the ETACS-ECU
- Damaged wiring harness or connectors

DIAGNOSTIC PROCEDURE

STEP 1. Inspection of the ambient temperature sensor

Refer to P.55-49.

Q: Is the A/C pressure sensor normal?
YES : Go to Step 2.
NO : Replace the ambient temperature sensor.

STEP 2. Check of open circuit in AMB+ and AMB- line (ETACS-ECU) between ambient temperature sensor connector and ETACS-ECU connector.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the connector(s) or wiring harness.

STEP 3. Check the data list below on the M.U.T.-III.

All the following items in the data list should be normal (Refer to P.55-29).

Item No.19: Ambient temperature sensor

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the ETACS-ECU.

STEP 4. Retest the system.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

INSPECTION PROCEDURE 10: A/C pressure sensor system

COMMENTS ON TROUBLE SYMPTOM

If the A/C pressure sensor system is defective, the wiring harness between the A/C pressure sensor and the heater controller assembly (A/C-ECU) is suspected.

PROBABLE CAUSES

- Malfunction of the A/C pressure sensor
- Malfunction of the heater controller assembly (A/C-ECU)
- Damaged wiring harness or connectors

INSPECTION PROCEDURE 11: Blower motor power supply system

⚠ CAUTION

- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in Immobilizer System – How to Register Key ID .)**

COMMENTS ON TROUBLE SYMPTOM

If the blower motor is not energised, the blower relay system is suspected.

PROBABLE CAUSES

- Malfunction of the blower relay
- Damaged wiring harness or connectors
- Malfunction of the ETACS-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Measure the voltage at blower relay connector.

(1) Remove the relay, and measure at the junction block side.
(2) Voltage between terminals 2, 4 and body earth

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Check of open circuit in blower relay power supply line between blower relay connector and fusible link (5).

NOTE: Prior to the wiring harness inspection, check ETACS-ECU connector and repair if necessary.

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness.

STEP 3. Check of open circuit in blower motor line between blower motor connector terminal and blower relay.

NOTE: Prior to the wiring harness inspection, check ETACS-ECU connector and repair if necessary.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the connector(s) or wiring harness.

STEP 4. Retest the system.

Check that the blower motor is energised.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU.

INSPECTION PROCEDURE 12: Heater controller assembly (A/C-ECU) power supply system

COMMENTS ON TROUBLE SYMPTOM

If the heater controller assembly (A/C-ECU) is not energised, the power supply or earth system to the ECU may be defective.

PROBABLE CAUSES

- Malfunction of the heater controller assembly (A/C-ECU)
- Damaged wiring harness or connectors

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III other system's diagnosis code

Check that the ETACS-ECU has not set a diagnosis code.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis code procedures. Refer to GROUP 54A, ETACS-ECU .
NO : Go to Step 2.

STEP 2. Measure the voltage at the heater controller assembly (A/C-ECU) connector.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Ignition switch: ON
(3) Voltage between terminal No. 20 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 of open circuit in heater controller assembly (A/C-ECU) IG1line between ETACS-ECU connector and heater controller assembly (A/C-ECU) connector.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness.

STEP 4. Measure the voltage at the heater controller assembly (A/C-ECU) connector.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Voltage between terminal No. 19 and body earth

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check of open circuit in heater controller assembly (A/C-ECU) B/UP line between ETACS-ECU connector and heater controller assembly (A/C-ECU) connector.

NOTE: Prior to the wiring harness inspection, check joint connector and repair if necessary.

Q: Is the check result normal?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness.

STEP 6. Measure the resistance at the heater controller assembly (A/C-ECU) connector.

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between terminal No. 18 and body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Replace the heater controller assembly (A/C-ECU).

NO : Go to Step 7.

STEP 7. Check of open circuit in heater controller assembly (A/C-ECU) E line between heater controller assembly (A/C-ECU) connector and earth J/C (DASH) connector.

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points - How to Cope with Intermittent Malfunction).

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

DATA LIST REFERENCE TABLE

M1554005101429

Item No.	Check item	Inspection status	The display contents under normal condition
17	Engine speed	–	Displays correct engine speed.
19	Ambient temperature sensor		Ambient temperature is the same as M.U.T.-III displayed temperature
20	Air thermo sensor		Evaporator outlet temperature is the same as M.U.T.-III displayed temperature.
21	Interior temperature sensor		Interior temperature is the same as M.U.T.-III displayed temperature
24	Engine coolant TEMP sensor		Engine coolant temperature is the same as M.U.T.-III displayed temperature.
26	Vehicle speed		Displays vehicle speed.
27	A/C Compressor drive request	Compressor ON	ON
		Compressor OFF	OFF
28	Air conditioning switch	Air conditioner switch ON	ON
		Air conditioner switch OFF	OFF

Item No.	Check item	Inspection status	The display contents under normal condition
29	Refrigerant leak (Level 20%)	–	Normal
34	Idle up request		Displays idle-up request signal.
45	In/out select damper poten (target)		Displays outside/inside air selection damper target position.
46	In/out select damp potentiometer		Displays outside/inside air selection damper position.
55	Air outlet c/o potentiometer		Displays air outlet changeover damper position.
56	Air outlet c/o potentio. (Target)		Displays air outlet changeover damper target position.
57	Refrigerant leak (Low pressure)		Normal
60	Rear defogger switch	Rear window defogger switch ON	ON
		Rear window defogger switch OFF	OFF
61	Pressure sensor	–	Displays refrigerant pressure.
68	Front blower fan		Displays blower motor condition.
69	Front blower fan (Target)		Displays blower motor target value.
74	Condenser fan		Displays condenser fan running condition.
91	A/C Compressor drive flag		ON when the compressor is activated.
92	Wiper operation flag		ON when the wiper is operated.
93	Ignition position information		Ignition switch position status
94	Power source voltage		Displays power supply voltage.
95	IOD fuse equipment flag		IOD fuse status
96	A/T lock up open request	Request not to lock up the CVT: ON	ON
		Request not to lock up the CVT: OFF	OFF
151	Dr air mix potentiometer	–	Displays the air mix damper position (driver's side).
152	As air mix potentiometer		Displays the air mix damper position (front passenger's side).

Item No.	Check item	Inspection status	The display contents under normal condition
153	High pressure fail flag	At normal high pressure	OFF
		At abnormal high pressure	ON
154	Dr temperature setting	–	Displays air conditioner set temperature (driver's side).
155	As temperature setting		Displays air conditioner set temperature (front passenger's side).
160	Low pressure fail flag	At normal low pressure	OFF
		At abnormal low pressure	ON

*NOTE: *: Other items than listed above are also displayed. However, ignore them.*

ACTUATOR TEST TABLE

M1554005201277

Item No.	Check item	Driven content
2	Idle up request*	Idle-up request signal
5	In/out selection damper	The moving position of outside/inside air selection damper motor
7	Front blower fan	The amount of blower motor rotation
8	Air outlet c/o damper	Air outlet changeover damper motor moving position
10	Condenser fan*	The amount of condenser fan rotation
11	Air conditioning switch*	A/C switch selection position
12	Rear defogger switch*	Rear window defogger switch selection position
13	A/T lock up open request	Selected request signal not to lock up the CVT is sent.
16	Dr air mix damper motor	The air mix damper motor (driver's side) moves to the selected position.
17	As air mix damper motor	The air mix damper motor (front passenger's side) moves to the selected position.

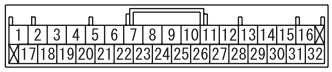
NOTE:

- **: When the engine is not running these functions do not work.*
- *Other items than listed above are also displayed. However, ignore them.*

CHECK AT A/C-ECU TERMINALS

M1552010302857

<C-205>



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ACB05937AB

Terminal No.	Terminal code	Check item	Check condition	Normal condition
1	SENB	A/C pressure sensor power supply	Ignition switch: IG2	5 V

Terminal No.	Terminal code	Check item	Check condition	Normal condition
2	ILO-	–	–	–
3	HTR3			
4	HTR2			
5	HTR1			
6 – 11	–			
12	AC/P	A/C pressure sensor input	Refer to P.55-40.	Refer to P.55-40.
13	INC	Interior temperature sensor	Sensor probe temperature: 25°C (4.0 kΩ)	2.1 to 2.7 V
14 – 16	–	–	–	–
17	SENG	Sensor earth	Always	1 V or less
18	E	Earth		
19	B/UP	Battery power supply		System voltage
20	IG1	IG power supply	Ignition switch: ON	
21	P/TC	Power transistor (DRAIN)	Air volume control dial: Maximum air volume	0 to 2 V
22	ILL+	–	–	–
23	ILO+			
24	ILL-			
25	P/TB	Power transistor (GATE)	Air volume control dial: Maximum air volume	System voltage
26 – 30	–	–	–	–
31	CANL			
32	CANH			
41	IG1	Motor power supply	Ignition switch: ON	System voltage
42	A/PB'	Air mixing damper control motor*1 or Air mixing damper control motor (RH)*2	–	–
43	A/PA'			
44	A/PB			
45	A/PA			
46	A/DB'	Air mixing damper control motor (LH)*2		
47	A/DA'			
48	A/DB			
49	A/DA			
50	+	Fin thermo sensor	Sensor probe temperature: 25°C (4.0 kΩ)	2.1 to 2.7 V

Terminal No.	Terminal code	Check item	Check condition	Normal condition
51	M/MA	Mode selection damper control motor	–	–
52	M/MB			
53	M/MA'			
54	M/MB'			
55	F/RA	Outside/inside damper control motor		
56	F/RB			
57	F/RA'			
58	F/RB'			
59	–	–		
60	-	Fin thermo sensor earth	Always	1 V or less

NOTE:

- **1: SINGLE-ZONE AUTO A/C.*
- **2: DUAL-ZONE AUTO A/C.*

CUSTOMIZATION FUNCTION

M1550001400014

By operating the M.U.T.-III ETACS system, the following functions can be customised. The programmed information is held even when the battery is disconnected.

Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting content (M.U.T.-III display)	Adjusting content
A/C Recirculation Control	With/without the inside/outside air automatic control function	Disable	No function
		Enable	With function (Initial condition)
A/C Switch Control	With/without A/C automatic control function	Disable	No function
		Enable	With function (Initial condition)
A/C Sensible temp. customize	Adjusting mean value for temperature setting	-2	Decreases the control temperature 2°C than the temperature displayed on the LCD.
		-1	Decreases the control temperature 1°C than the temperature displayed on the LCD.
		0	No change (Initial condition)
		1	Increases the control temperature 1°C than the temperature displayed on the LCD.
		2	Increases the control temperature 2°C than the temperature displayed on the LCD.

Adjustment item (M.U.T.-III display)	Adjustment item	Adjusting content (M.U.T.-III display)	Adjusting content
FOOT / DEF Air outlet ratio	Changes air distribution rate for DEF/FOOT vents during manual operation.	Normal	D/F2 (Initial condition)
		FOOT > DEF	D/F1(more to FOOT vent): More air flows through FOOT vents.
		FOOT < DEF	D/F3(more to DEF vent): More air flows through DEF vents.
FACE / FOOT Air outlet ratio	Changes air distribution rate for FACE/FOOT vents during manual operation.	Normal	B/L2 (Initial condition)
		FACE > FOOT	B/L1(more to FACE vent): More air flows through FACE vents.
		FACE < FOOT	B/L3(more to FOOT vent): More air flows through FOOT vents.
Auto Rear Defogger(Engine Start)	When ambient temperature is 3°C or less, the rear defogger will be turned on automatically. (The rear window defogger has never been activated since the ignition switch was turned on last time)	Disable	No function (Initial condition)
		Enable	With function

ON-VEHICLE SERVICE

DRIVE BELT INSPECTION

M1552001001673

Refer to GROUP 11A – Engine Adjustment, Drive Belt Tension Check .

REFRIGERANT LEVEL CHECK, DRAINING AND CHARGING

M1559200100334

Remove the refrigerant by the flon reclaim machine and replenish the specified quantity of refrigerant.

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

REFILLING OF OIL IN THE A/C SYSTEM

M1552020000356

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 70 mL of compressor oil. While the A/C system is in operation, the oil is carried through the entire system by the refrigerant. Some of this oil will be trapped and retained in various parts of the system. When the following system components are changed, it is necessary to add oil to the system to replace the oil being removed with the component.

Compressor oil: SUN PAG 56 or S10X
Quantity
Evaporator: 25 mL
Condenser: 15 mL
Each piping: 5 mL

PERFORMANCE TEST

M1552001401400

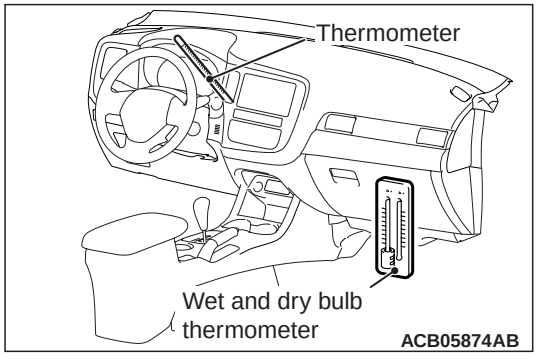
TEST CONDITION

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

TEST CONDITION SETTING

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

COOLING PERFORMANCE CHECK



1. Insert a thermometer into the air outlet located at the centre of instrument panel.

   NOTE: Set a thermometer so that cool air from the air outlet blows directly against the sensing part.
2. Set a wet and dry bulb thermometer in the air intake of the front passenger's foot area (below the glove box).

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

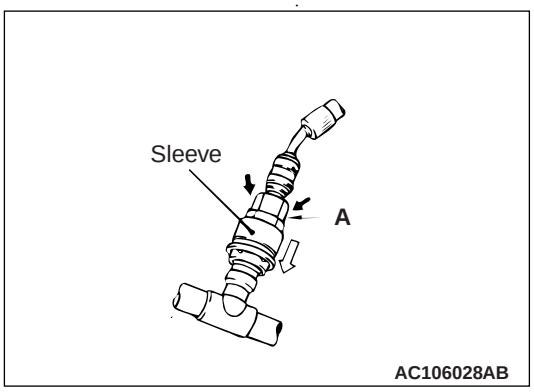
Garage ambient temperature °C	**20**	**25**	**30**	**35**	**40**	**45**	**50**
Discharge air temperature °C	-1.1 – 12.3	4.3 – 17.7	9.7 – 23.1	15.1 – 28.5	20.5 – 33.9	25.5 – 39.3	31.3 – 44.7

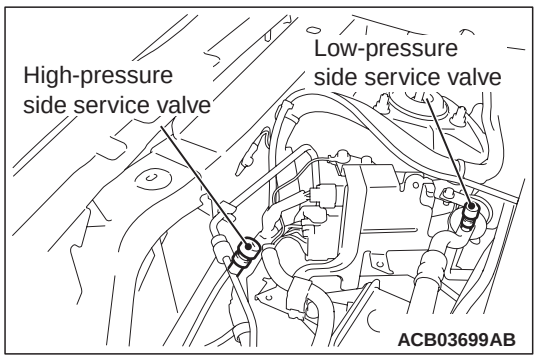
REFRIGERANT GAS PRESSURE CHECK

⚠ CAUTION

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

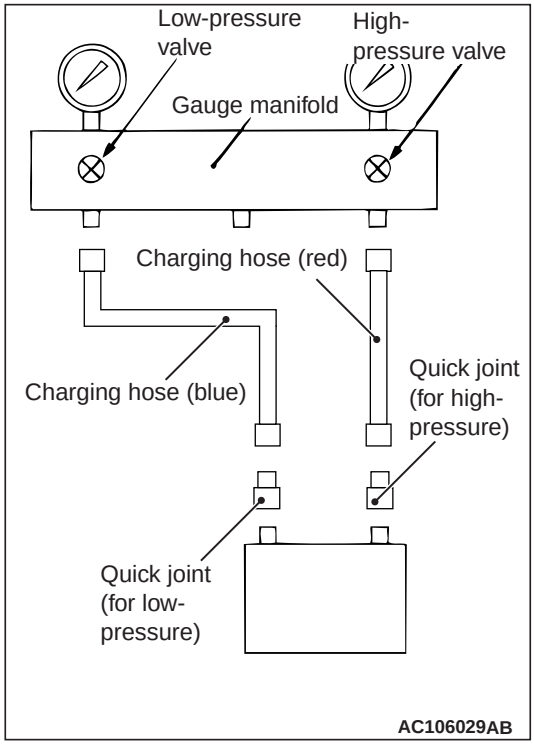
⚠ CAUTION





Place the quick joint onto the service valve, and press to fit the part A securely until the sleeve clicks into place.

- **When connecting, run your hand along the hose while pressing to ensure that there are no bends in the hose.**



1. Check that the engine and A/C are stopped.
2. Close the high-pressure valve of the gauge manifold.
3. Connect the charging hose (red) to the hi-pressure side of the gauge manifold.
4. Connect the quick joint (for high pressure) to the charging hose (red).
5. Install the quick joint (for high pressure) to the high-pressure side service valve of the vehicle.
6. Close the low-pressure valve of the gauge manifold.
7. Connect the charging hose (blue) to the low-pressure side of the gauge manifold.
8. Connect the quick joint (for low pressure) to the charging hose (blue).
9. Install the quick joint (for low pressure) to the low-pressure side service valve of the vehicle.
10. Start and fully warm up the engine, and then check that the engine speed of the test condition is satisfied.
11. Set the A/C control panel to the mode instructed in the test conditions.
12. Measure the high pressure/low pressure, and check that the measurement is within the permissible range of the table below. If the value is outside the permissible range, refer to the cooling performance check result, and perform a check according to the diagnosis chart of refrigerant system.

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

Garage ambient temperature °C	**20**	**25**	**30**	**35**	**40**	**45**	**50**
Compressor high pressure kPa	881 – 1, 377	1, 086 – 1, 582	1,291 – 1,787	1,496 – 1,992	1,701 – 2,197	1,906 – 2,402	2,111 – 2,607
Compressor low pressure kPa	204 – 369	255 – 420	306 – 471	357 – 522	408 – 573	459 – 624	510 – 675

DIAGNOSIS BY REFRIGERANT PRESSURE

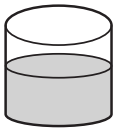
M1552023000225

A/C system symptom	**Measurement circumstance**				**Cause**	**Measures**
	High pressure	**Low pressure**	**Air outlet temperature**	**Note**		
Cooler is not effective.	Low	High	High	• Pressure for low pressure side is high, and high pressure side is low. • When the A/C operation is stopped, the pressures of low pressure side and high pressure side immediately become identical.	• Leakage inside compressor • Faulty compression of compressor	1. Check according to the compressor check. 1. When no foreign object is present to the oil, and when the colour is light grey, replace only the compressor. 2. When foreign objects are mixed to the oil, and the colour is black, replace the compressor and receiver. 2. Perform the evacuation sufficiently to remove the foreign objects and moisture in the cycle. 3. Fill the new gas to the specified amount.
	High	High	High	• Low pressure side/high pressure side pressure is too high. • Low pressure side piping is too hot to touch.	• Air is mixed to the refrigerant cycle. • Evacuation is insufficient.	1. Perform the evacuation sufficiently, and remove the foreign objects and moisture in the cycle. 2. Fill the new gas to the specified amount.

A/C system symptom	Measurement circumstance				Cause	Measures
	High pressure	Low pressure	Air outlet temperature	Note		
Sufficient cooling and insufficient cooling occur periodically.	Fluctuation	Fluctuation	Fluctuation	During the air conditioner operation, the low pressure side pressure alternates between the negative pressure and normal. (also in the high pressure side, the abnormal and normal statuses are alternated).	The moisture in the refrigerant cycle becomes frozen in the expansion valve, then the circulation of refrigerant is stopped temporarily. Subsequently, the status recovers to normal by the melting of ice.	1. Replace the receiver (drier). 2. Perform the evacuation sufficiently, and remove the moisture in the cycle. 3. Fill the new refrigerant to the specified amount.
Cooler is sometimes not effective. (works occasionally)	Low	Vacuum	Fluctuation	• The low pressure side pressure indicates the vacuum, and the high pressure side indicates the low pressure. • To the piping before and after the expansion valve, frost or dew is observed.	• The foreign objects or moisture inside the refrigerant cycle deposits or freezes inside the expansion valve, and the refrigerant flow is disturbed. • Because of the expansion valve operation failure, the refrigerant flow is disturbed.	1. Check the expansion valve. 1. If foreign objects are present inside the expansion valve, remove them by using an air gun or others. 2. When no foreign object is present, the expansion valve operation failure is suspected. Therefore, replace the expansion valve. 2. Perform the evacuation sufficiently, and remove the foreign objects and moisture in the cycle. 3. Fill the new refrigerant to the specified amount.

A/C system symptom	Measurement circumstance				Cause	Measures
	High pressure	Low pressure	Air outlet temperature	Note		
Cooling effectiveness is bad.	Low	Low	Slightly high	• Low pressure side/high pressure side pressure is low. • Outlet air temperature is high.	• Gas leakage is present to somewhere in the refrigerant cycle. • Refrigerant gas amount is insufficient.	1. When the pressure gauge indication is close to zero, check the leak position, and then repair the leakage. Also, when the value is lower than the standard pressure, check if the gas leakage is present, and repair if necessary. 2. After checking the leak position, sufficiently perform the evacuation, then fill the new gas to the specified amount.
	High	High	Slightly high	Low pressure side/high pressure side pressure is too high.	• Refrigerant amount is excessive. • Condenser cooling is insufficient.	1. Clean the condenser fin (fouling, fin clogging) 2. Check the condenser fan motor (radiator fan) operation. 3. When 1 and 2 are normal, recover all the refrigerant. Then, perform a sufficient evacuation again, and fill the new gas to the specified amount.
	High	High	High	• Low pressure side/high pressure side pressure is too high. • Frost or dew is formed to the low pressure side.	Expansion valve trouble (valve opened excessively)	Replace the expansion valve.
	Normal	Normal	Slightly high	-	Because of the slight difference of measurement environment, secular change of vehicle, or others, it is possible that the outlet temperature fluctuation has occurred.	Check the status for a while, and if the status does not improve, recover all the refrigerant, then fill to the appropriate amount.

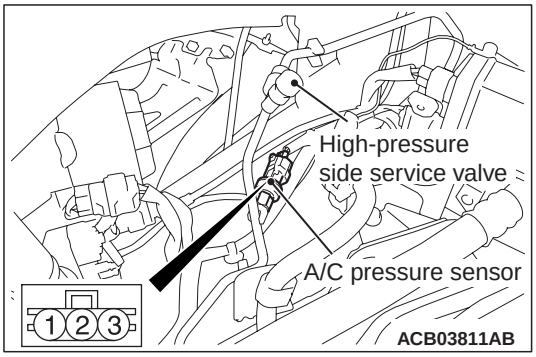
COMPRESSOR CHECK

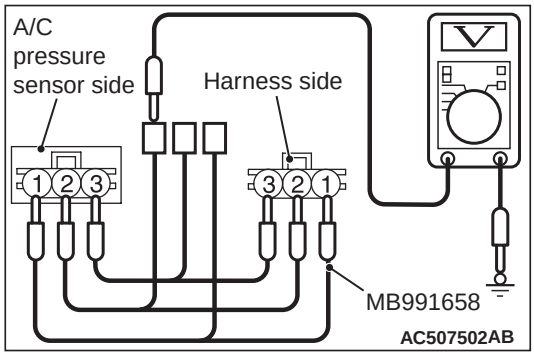
Trouble symptom	Check method/circumstance	Cause	Measures
Abnormal noise from compressor main body at A/C operation (rattling noise)	• Refrigerant cycle gauge pressure check 1. Low pressure side/high pressure side pressure is high. 2. Pressure hunting occurs.	Abnormal noise due to excessive refrigerant charging	Fill an appropriate amount of refrigerant.
	• Check the refrigerant cycle gauge pressure. When the pressure difference between the low pressure side and high pressure side is small, remove the compressor oil, and perform the oil judgment.	Damage to inside the compressor	Compressor oil judgment result: Between transparent and grey/ No contamination with foreign materials  Measures: Replace only the compressor. Compressor oil judgment result: Between grey and black/ Contaminated with foreign materials  easures: Replace the compressor and the rec AC610320AB
Compressor malfunction (belt slip)	Check the compressor rotation, and if a seizure or sticking is present, remove the compressor oil, then perform a judgment.		

SIMPLE INSPECTION OF THE A/C PRESSURE SENSOR

M1552014700668

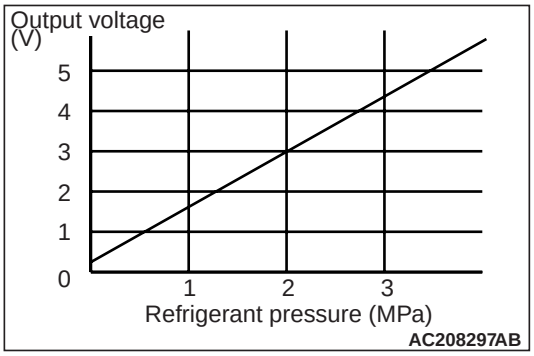
1. Assemble a gauge manifold on the high pressure service valve.





2. Disconnect the A/C pressure sensor connector and connect the special tool test harness (MB991658) as shown.

3. Start the engine and then turn ON the air conditioner switch.



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

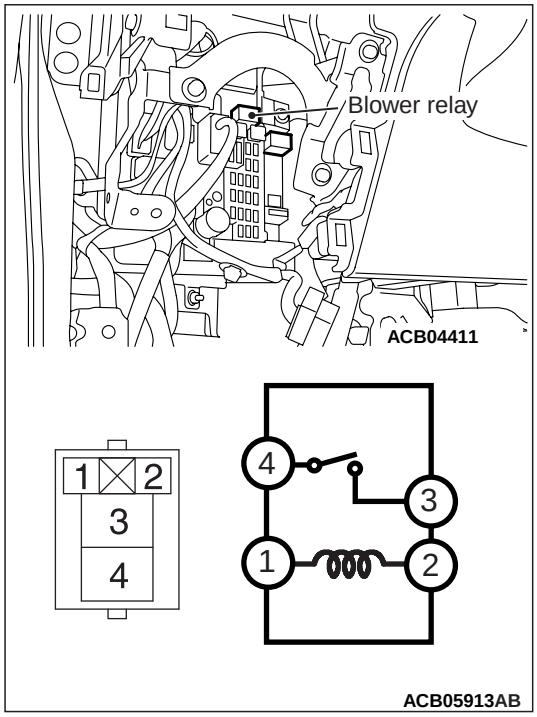
NOTE:

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

RELAY CHECK

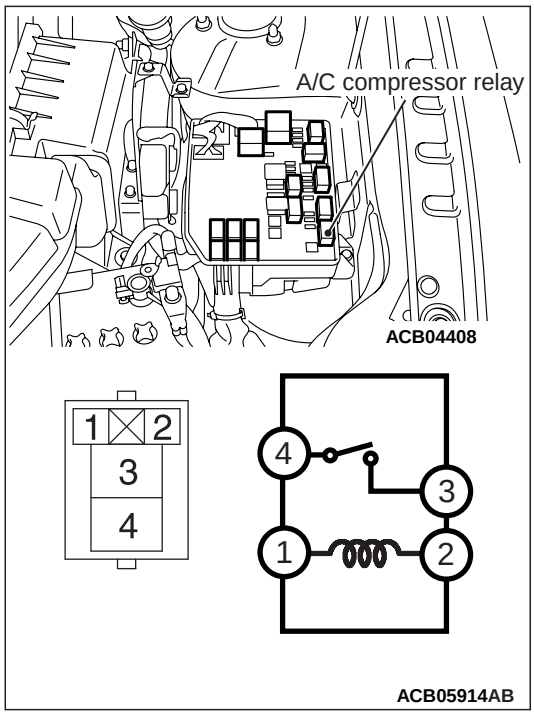
M1552008801562

BLOWER RELAY CONTINUITY CHECK



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

A/C COMPRESSOR RELAY CONTINUITY CHECK



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

IDLE-UP INSPECTION

M1552001602076

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

   Standard value:
   700 ± 50 r/min

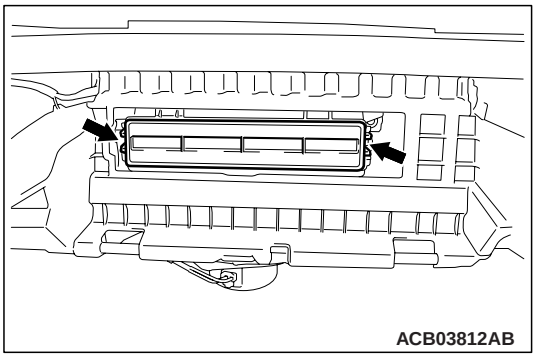
   NOTE: The idling speed is controlled by the ISC system automatically, so does not require adjustment.
3. Operate the air conditioner by turning on the A/C switch. Then check that the idling speed is within the standard value range.

   Standard value:
   750 ± 100 r/min

REPLACE THE CLEAN AIR FILTER

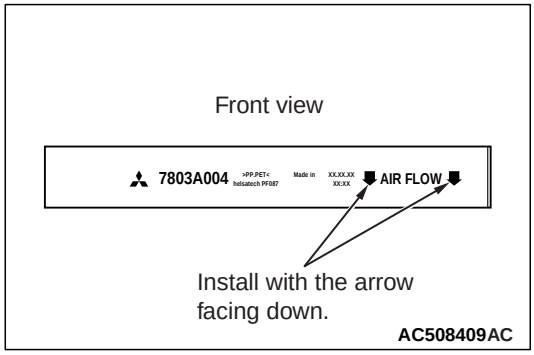
M1552020600529

1. Remove the glove box (Refer to GROUP 52A – Instrumental panel assembly,).
2. Loosen the two lugs as shown to replace the clean air filter.



ACB03812AB

NOTE: The arrow on the clean air filter should face downwards.



AC508409AC

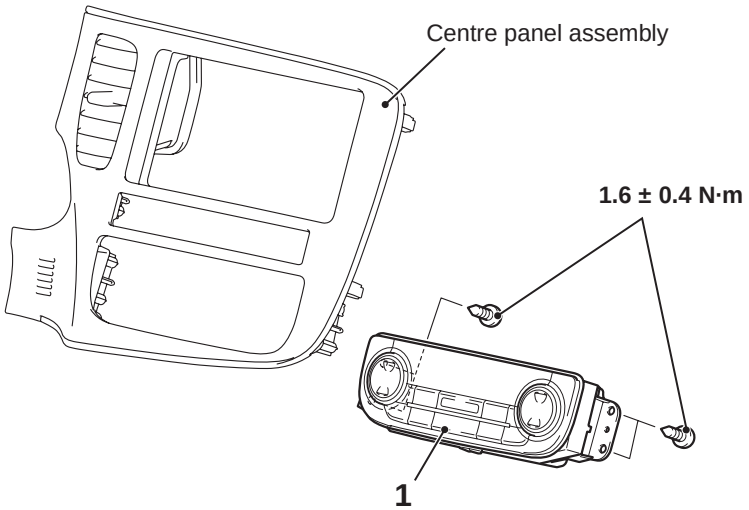
3. Install the glove box.

HEATER CONTROL UNIT

REMOVAL AND INSTALLATION

M1554014700910

Pre-removal and Post-installation Operation
- Centre panel assembly (Refer to GROUP 52A, Instrument panel assembly)



ACB05963AB

Removal

1. Heater controller assembly

HEATER UNIT AND BLOWER ASSEMBLY

REMOVAL AND INSTALLATION

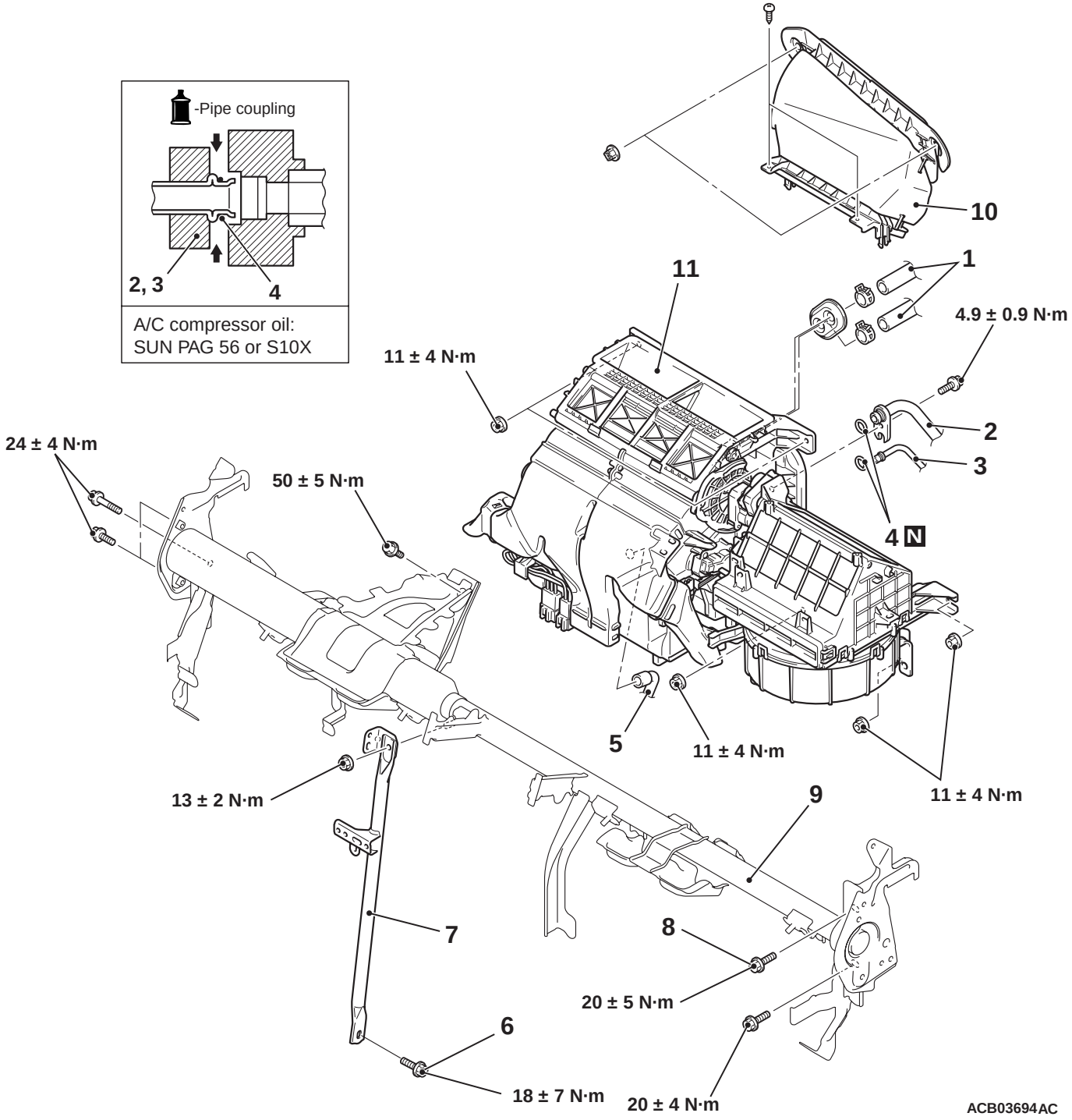
M1552020801098

⚠ WARNING

For removal and installation of the passenger's side air bag module, always observe the service procedures described in GROUP 52B, Driver's Air Bag Module to Passenger's (Front) Air Bag Module .

Pre-removal and Post-installation Operation

- Refrigerant draining and Refilling (Refer to Charging and Discharging P.55-34).
- Engine coolant replacement (Refer to GROUP 14, On-vehicle Service).
- Dash panel heat protector (Refer to GROUP 42A, Loose Panel).



Removal steps

1. Heater piping hose connection

<<**A**>> 2. A/C compressor suction hose connection

<<**A**>> 3. A/C condenser outlet pipe connection

4. O-ring
5. A/C evaporator drain hose
- Instrument panel removal and Installation (Refer to GROUP 52A, Instrument Panel).

Removal steps (Continued)

- Instrument panel wiring harness connector disconnection

6. Earth bolt
7. Centre flame assembly
8. Earth bolt
9. Front deck crossmember
10. Heater air intake duct
11. Heater assembly

REMOVAL SERVICE POINTS

<<A>> A/C COMPRESSOR SUCTION HOSE AND A/C CONDENSER OUTLET PIPE DISCONNECTION

⚠ CAUTION

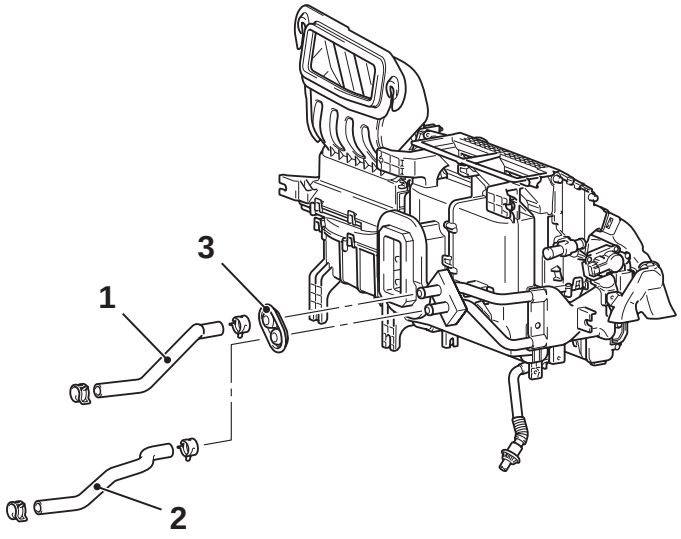
As the compressor oil and receiver are highly moisture absorbent, use a non-porous material to plug the hose and nipples.

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

HEATER HOSE

REMOVAL AND INSTALLATION

M1551007700221



ACB03700AB

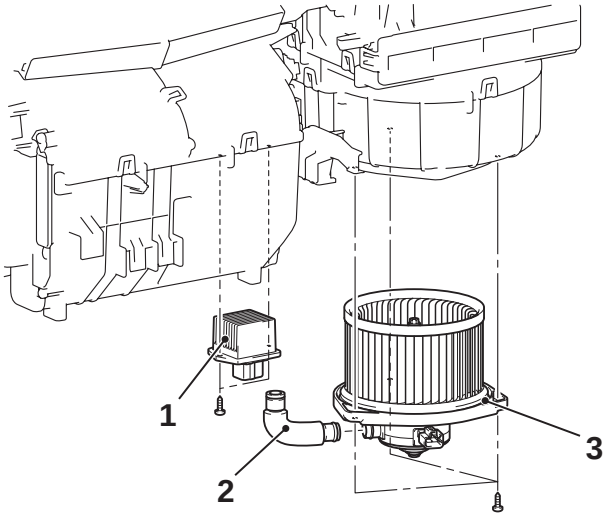
Heater piping hose removal steps

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

MODE SELECTION DAMPER CONTROL MOTOR, AIR MIXING DAMPER CONTROL MOTOR, OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR, POWER TRANSISTOR AND BLOWER MOTOR

REMOVAL AND INSTALLATION

M1554014900594



ACB05868AB

Power transistor removal steps

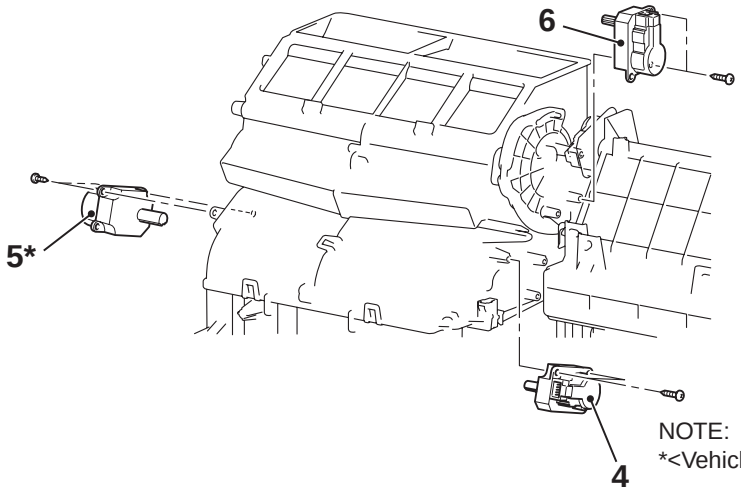
- Bottom cover assembly (passenger's side) (Refer to GROUP 52A – Instrument Panel).

1. Power transistor

Blower motor removal steps

- Bottom cover assembly (passenger's side) (Refer to GROUP 52A – Instrument Panel).

2. Hose
3. Blower motor



NOTE:
*<Vehicles with Dual-zone AUTO A/C>

ACB05867AB

Air mixing damper control motor, mode selection damper control motor removal steps

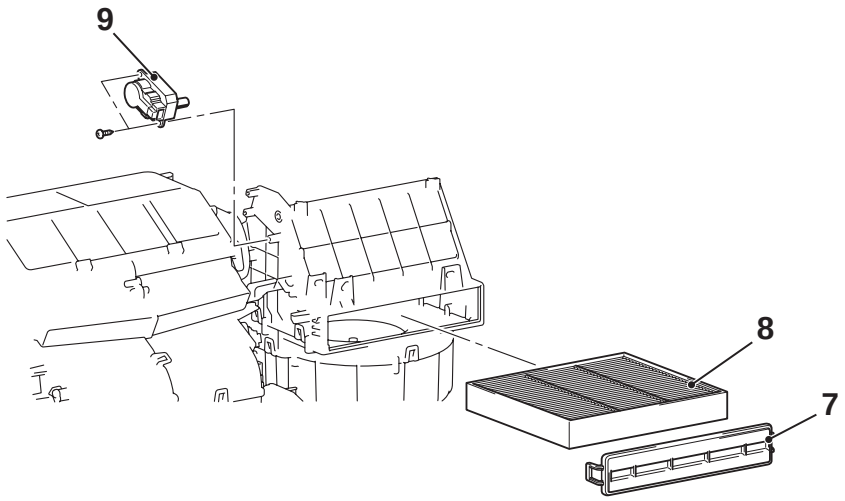
- Foot duct (Refer to P.55-59).

<<**A**>> 4. Air mixing damper control motor <Vehicles with Single-zone AUTO A/C> or Air mixing damper control motor (RH) <Vehicles with Dual-zone AUTO A/C>

Air mixing damper control motor, mode selection damper control motor removal steps (Continued)

<<**A**>> 5. Air mixing damper control motor (LH) <Vehicles with Dual-zone AUTO A/C>

<<**A**>> 6. Mode selection damper control motor



ACB05869 AB

Outside/inside air selection damper control motor removal steps

- Glove box, Globe box assembly (Refer to GROUP 52A – Instrument Panel).

7. Clean air filter cover

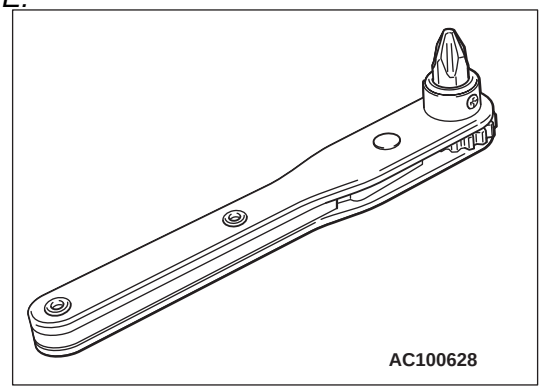
>>**B**<< 8. Clean air filter

<<**A**>> >>**A**<< 9. Outside/inside air selection damper control motor

REMOVAL SERVICE POINT

<<A>> AIR MIXING DAMPER CONTROL MOTOR, OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR, MODE SELECTION DAMPER CONTROL MOTOR REMOVAL

NOTE:



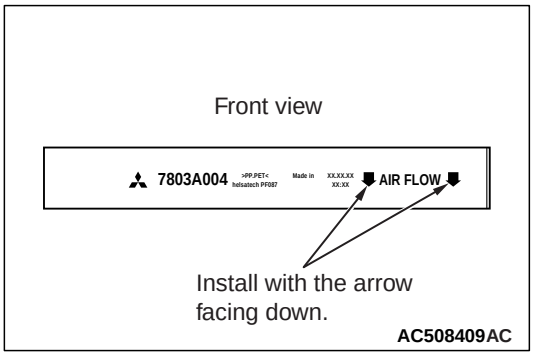
A normal plate-type ratchet driver is recommended.

INSTALLATION SERVICE POINT

>>A<< OUTSIDE/INSIDE AIR SELECTION DAMPER CONTROL MOTOR INSTALLATION

Install the outside/inside air selection damper control motor while pressing the outside/inside air selection damper from the hole of the blower motor.

>>B<< CLEAN AIR FILTER INSTALLATION

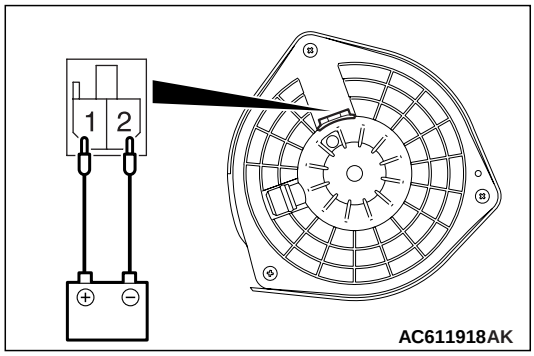


Install the clean air filter in the direction shown.

INSPECTION

M1552014305182

BLOWER MOTOR CHECK



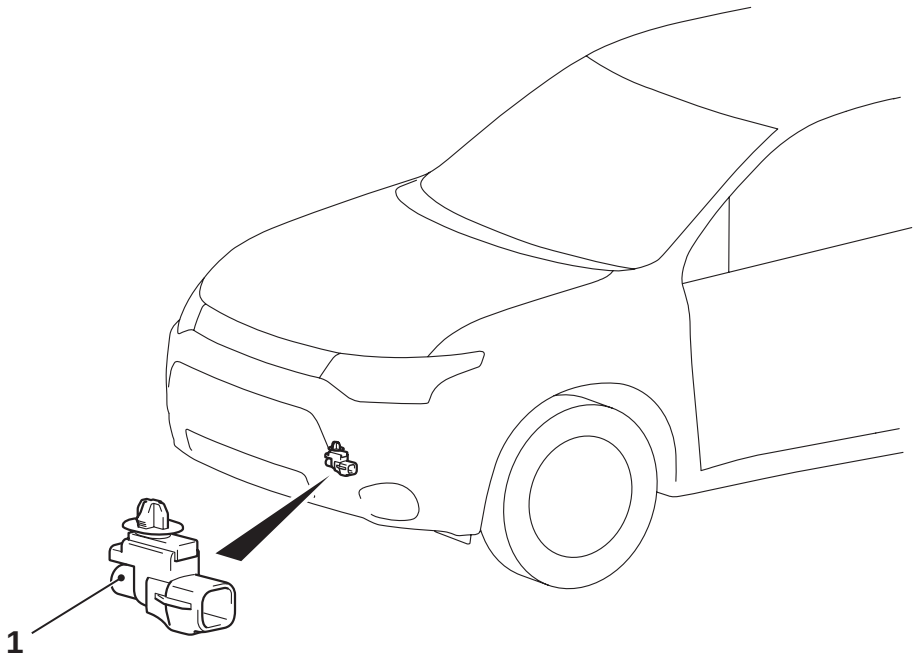
Check that the motor turns when applying battery power between the connector terminals. Also check to see that there is no abnormal sound emitted from the motor at this time.

AMBIENT TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

M1554003400915

Pre-removal and Post-installation Operation
- Air cleaner intake duct (Refer to GROUP 15, Air Cleaner)
- Headlamp support upper panel cover (Refer to GROUP 51, Radiator Grille)



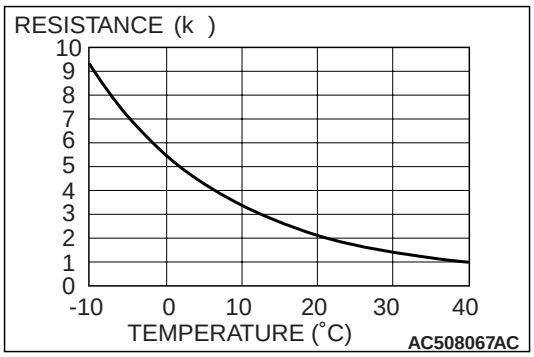
Removal

1. Ambient temperature sensor

INSPECTION

M1552014305193

AMBIENT TEMPERATURE SENSOR CHECK



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

INTERIOR TEMPERATURE SENSOR

REMOVAL AND INSTALLATION

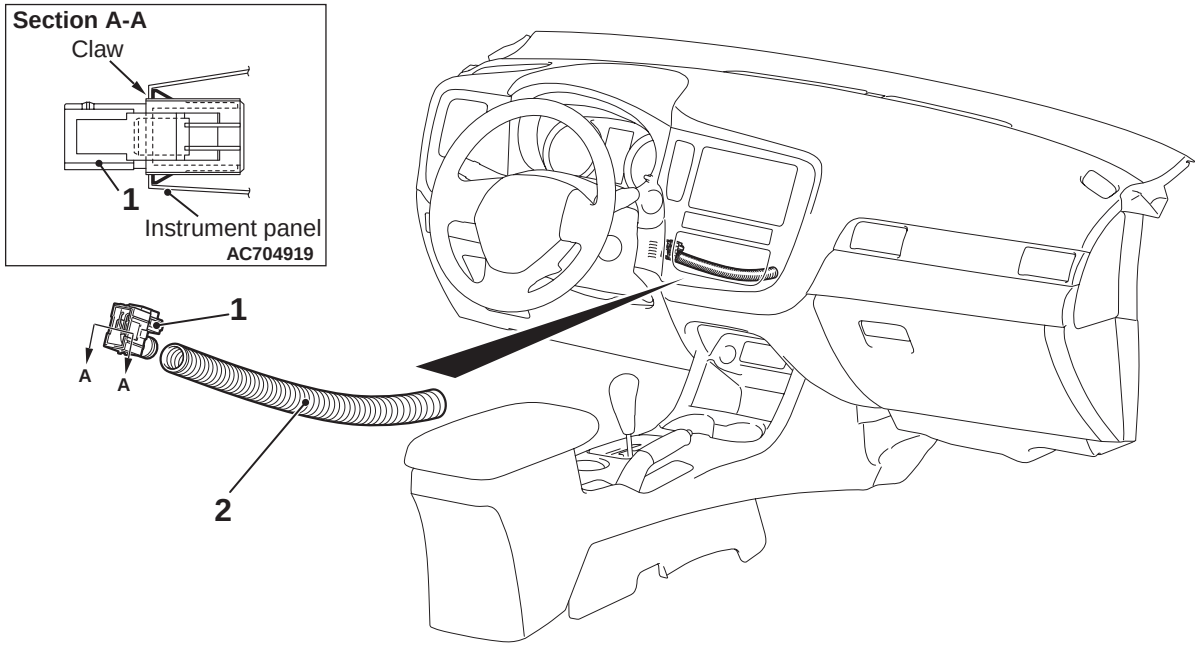
M1554026400488

⚠ WARNING

For removal and installation of the Knee air bag module, always observe the service procedures described in GROUP 52B, Knee Air Bag Module .

Pre-removal and Post-installation Operation

- Knee air bag module (Refer to GROUP 52B – Knee Air Bag Module).

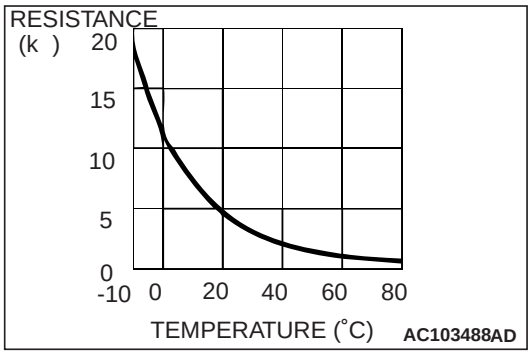


Removal steps
1. Aspirator hose
2. Interior temperature sensor

INSPECTION

M1552014305201

INTERIOR TEMPERATURE SENSOR CHECK



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

COMPRESSOR ASSEMBLY

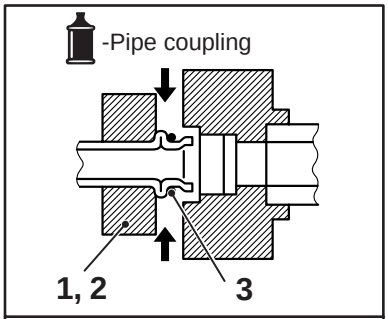
REMOVAL AND INSTALLATION

M1552004403609

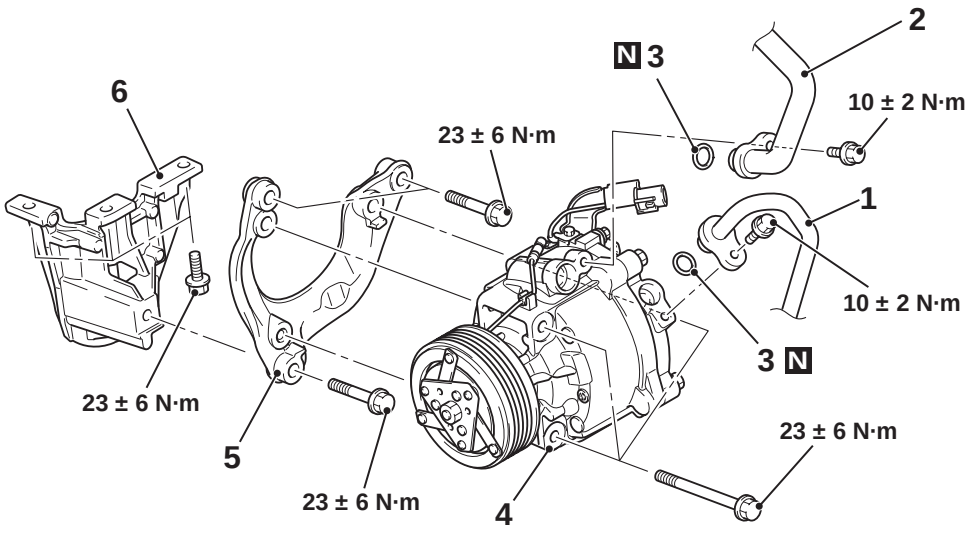
⚠ CAUTION

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

Pre-removal operation	Post-installation Operation
• Discharging refrigerant (Refer to P.55-34) • Engine room under cover front A and B, Engine room side cover removal (Refer to GROUP 51, Under Cover). • Drive belt removal (Refer to GROUP 11A – Crankshaft Pulley)	• Drive belt installation (Refer to GROUP 11A – Crankshaft Pulley) • Drive belt tension check and adjustment (Refer to GROUP 11A – Drive Belt Tension Check). • Charging refrigerant (Refer to P.55-34) • Engine room under cover front A and B, Engine room side cover installation (Refer to GROUP 51, Under Cover).



A/C compressor oil:
SUN PAG 56 or S10X



AC900337AG

Removal steps

<<**A**>> 1. A/C compressor discharge hose
<<**A**>> 2. A/C compressor suction hose
3. O-ring
<<**B**>> >>**A**<< 4. A/C compressor and clutch assembly
5. A/C compressor bracket A
5. A/C compressor bracket B

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

REMOVAL SERVICE POINTS

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

⚠ CAUTION

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

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

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

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

INSTALLATION SERVICE POINT

>>A<< A/C COMPRESSOR AND CLUTCH ASSEMBLY INSTALLATION

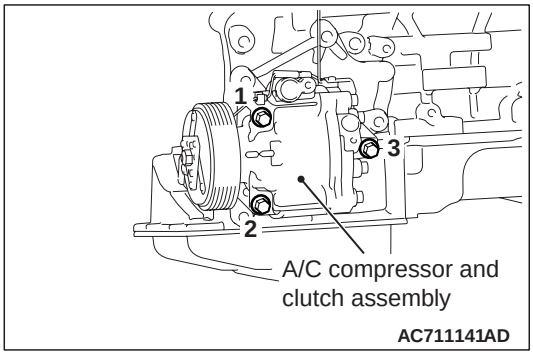
If a new compressor is installed, first adjust the amount of oil according to the procedures described below, and then install the compressor.

1. Measure the amount X mL 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 = 70mL

70 mL − X mL = Y mL

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



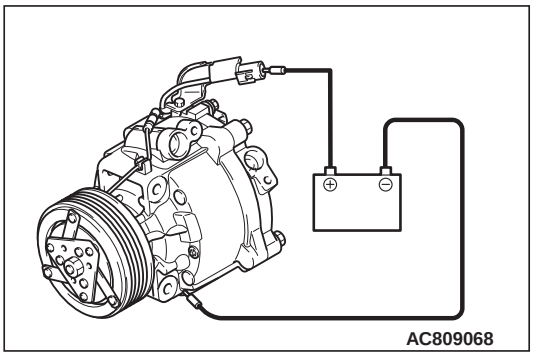
3. Tighten A/C compressor assembly mounting bolts to the specified torque in the order of number shown in the figure.

Tightening torque: 23 ± 6 N·m

INSPECTION

M1552004501473

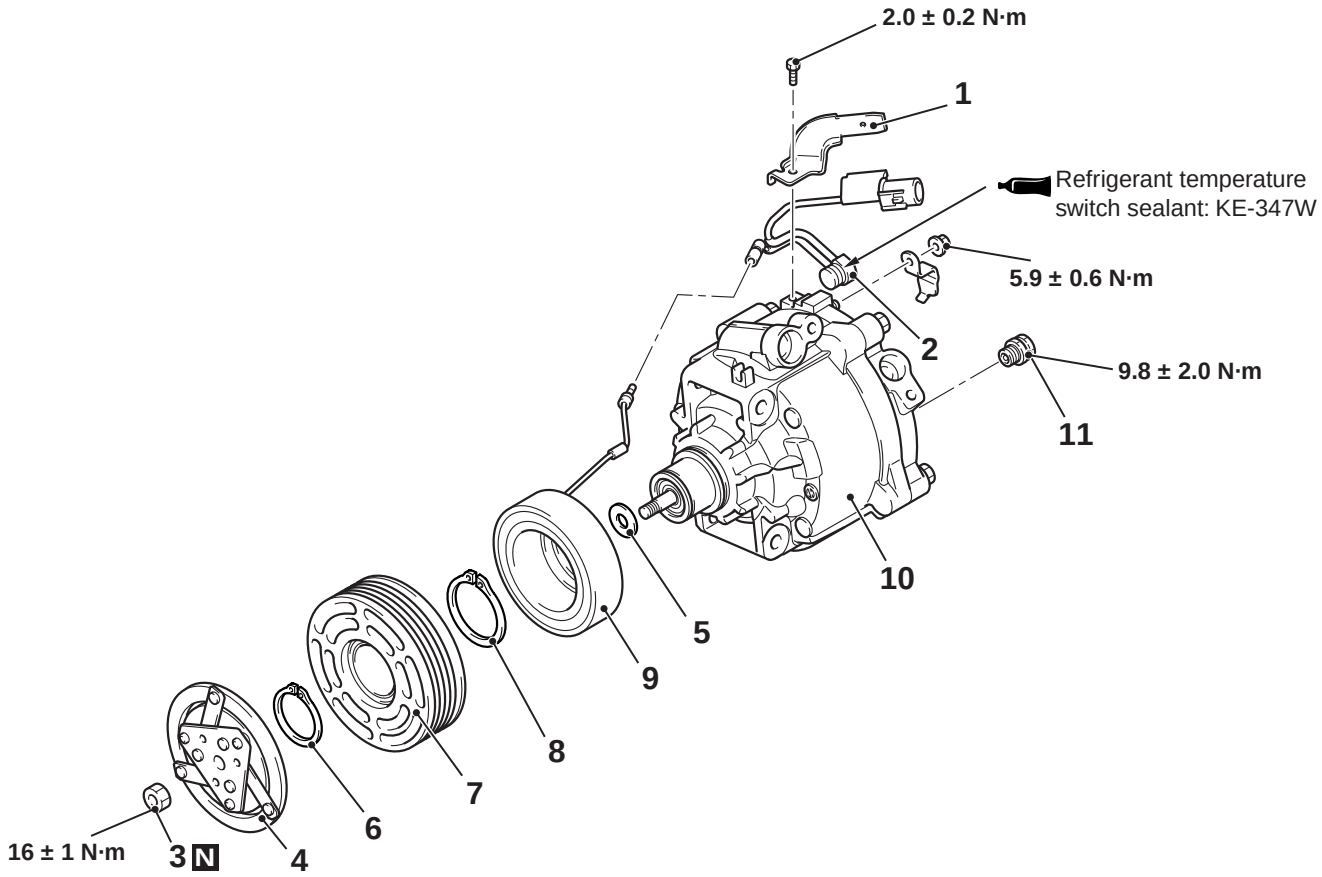
CHECK THE MAGNETIC CLUTCH FOR A/C COMPRESSOR



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

DISASSEMBLY AND REASSEMBLY

M1552004603539



AC808733AC

Refrigerant temperature switch disassembly steps

1. Bracket
2. Refrigerant temperature switch

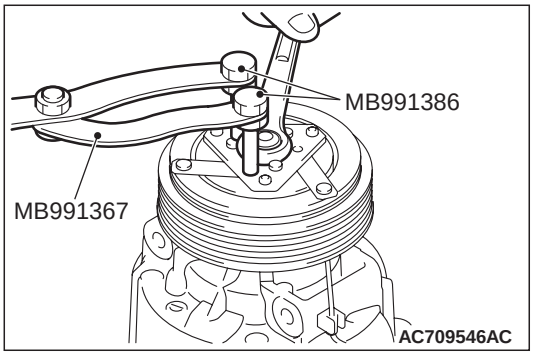
A/C compressor clutch disassembly steps

>>F<< • Air gap adjustment
<<A>> >>E<< 3. Self-locking nut
4. Armature
5. Shim
>>D<< 6. Snap ring
<<B>> >>C<< 7. Rotor
8. Snap ring
>>B<< 9. A/C compressor coil
10. A/C compressor
>>A<< 11. A/C compressor high pressure relief valve

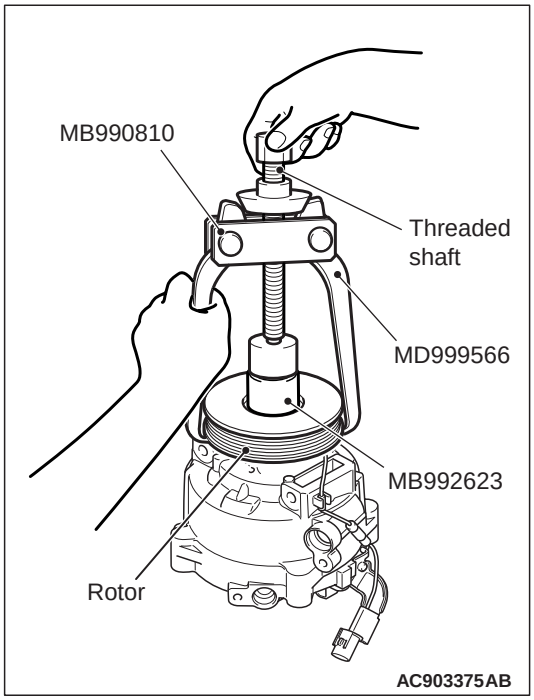
<<B>> ROTOR REMOVAL

DISASSEMBLY SERVICE POINTS

<<A>> SELF-LOCKING NUT REMOVAL



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



⚠ CAUTION

- **Be sure to use the guide (MB992623) when the side bearing puller (MB990810) is used to prevent the damage of A/C compressor.**
- **If the threaded shaft of side bearing puller (MB990810) is turned than necessary, the rotor may be distorted. Therefore, turn the threaded shaft lightly only by hand without using any tools.**

Rotor can be removed by hand, but if it is difficult to remove it, use the guide (MB992623) and the side bearing puller (MB990810) as shown.

REASSEMBLY SERVICE POINTS

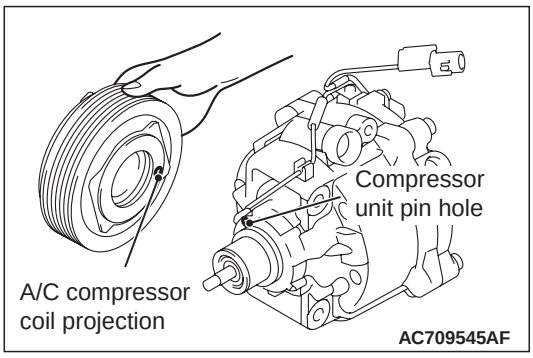
>>A<< A/C COMPRESSOR HIGH PRESSURE RELIEF VALVE INSTALLATION

⚠ CAUTION

Be careful not to damage the O-ring when installing the high-pressure relief valve. Apply the specified refrigerating machine oil the high-pressure relief valve mounting hole before installation

Check that O-ring is installed to the high-pressure relief and use the adjust torque wrench to install the high-pressure relief valve to the main body of the compressor.

>>B<< A/C COMPRESSOR COIL ATTACHMENT

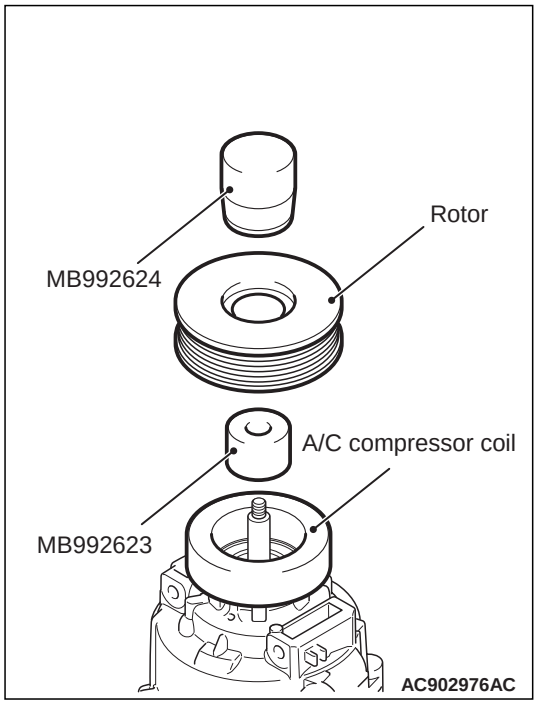


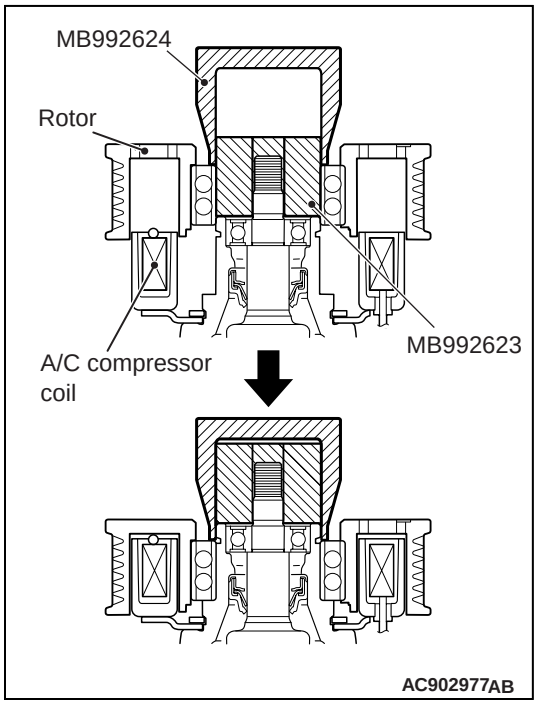
Line up the pin hole on the compressor unit with the A/C compressor coil projection and attach.

>>C<< ROTOR INSTALLATION

⚠ CAUTION

If the outer wheel side of rotor is pushed, an abnormal noise can be generated because the inside of rotor is damaged, therefore, always push the inner wheel side.

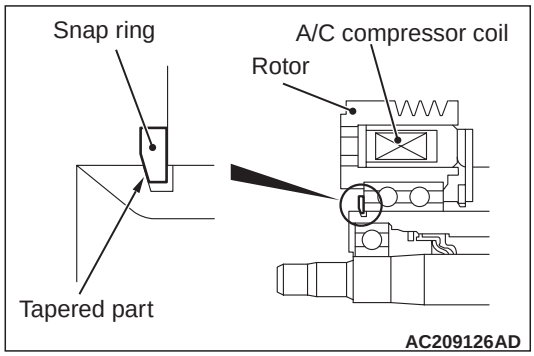




Install the rotor while pushing the inner wheel side slowly using the pusher (MB992624) and guide (MB992623).

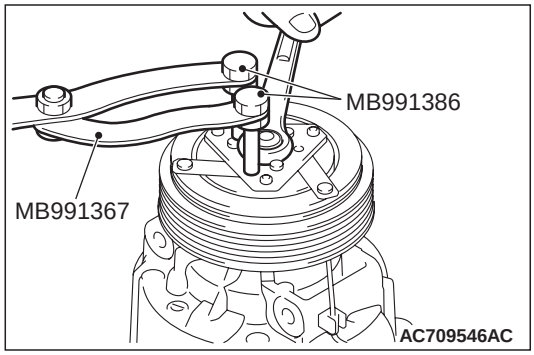
NOTE: Insert the rotor in a direction perpendicular to the A/C compressor.

>>D<< SNAP RING INSTALLATION



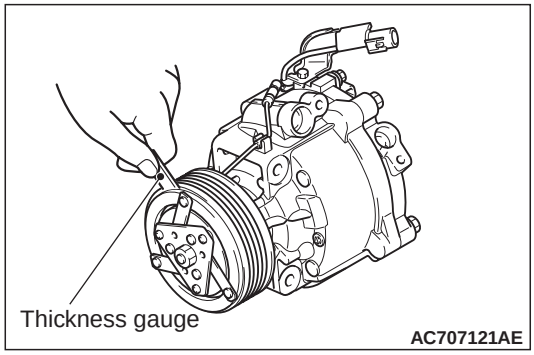
Using snap ring pliers, fit the snap ring so that the snap ring's tapered part is on the outside.

>>E<< SELF-LOCKING NUT INSTALLATION



Using a special tool, as when removing the nut, secure the armature and tighten the self-locking nut.

>>F<< AIR GAP ADJUSTMENT



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

Standard value:
0.25 – 0.45 mm

NOTE: If there is a deviation of the air gap from the standard value, make the necessary adjustment by adjusting the number of shims.

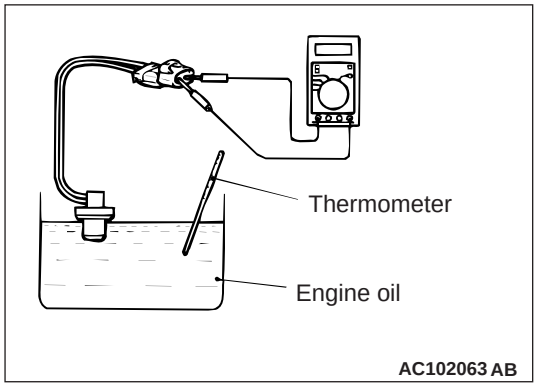
INSPECTION

M1552004701239

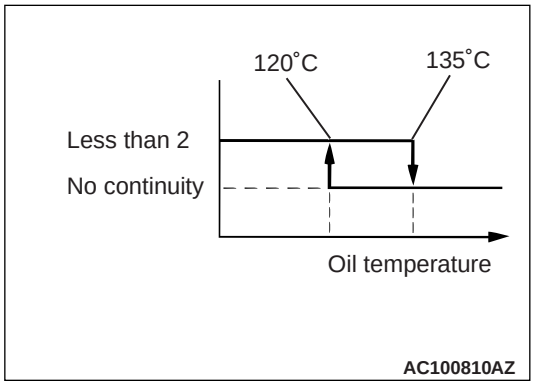
REFRIGERANT TEMPERATURE SWITCH

⚠ CAUTION

Do not heat than necessary.



1. Immerse the refrigerant temperature sensor probe into engine oil to heat the sensor probe.



2. If the oil temperature reaches the standard value, there should be continuity between the switch terminals.

Standard value:

Switch status	**Operating temperature °C**
Being turned off (No continuity)	135
Being turned on { Continuity exists (2 Ω or less)}	120

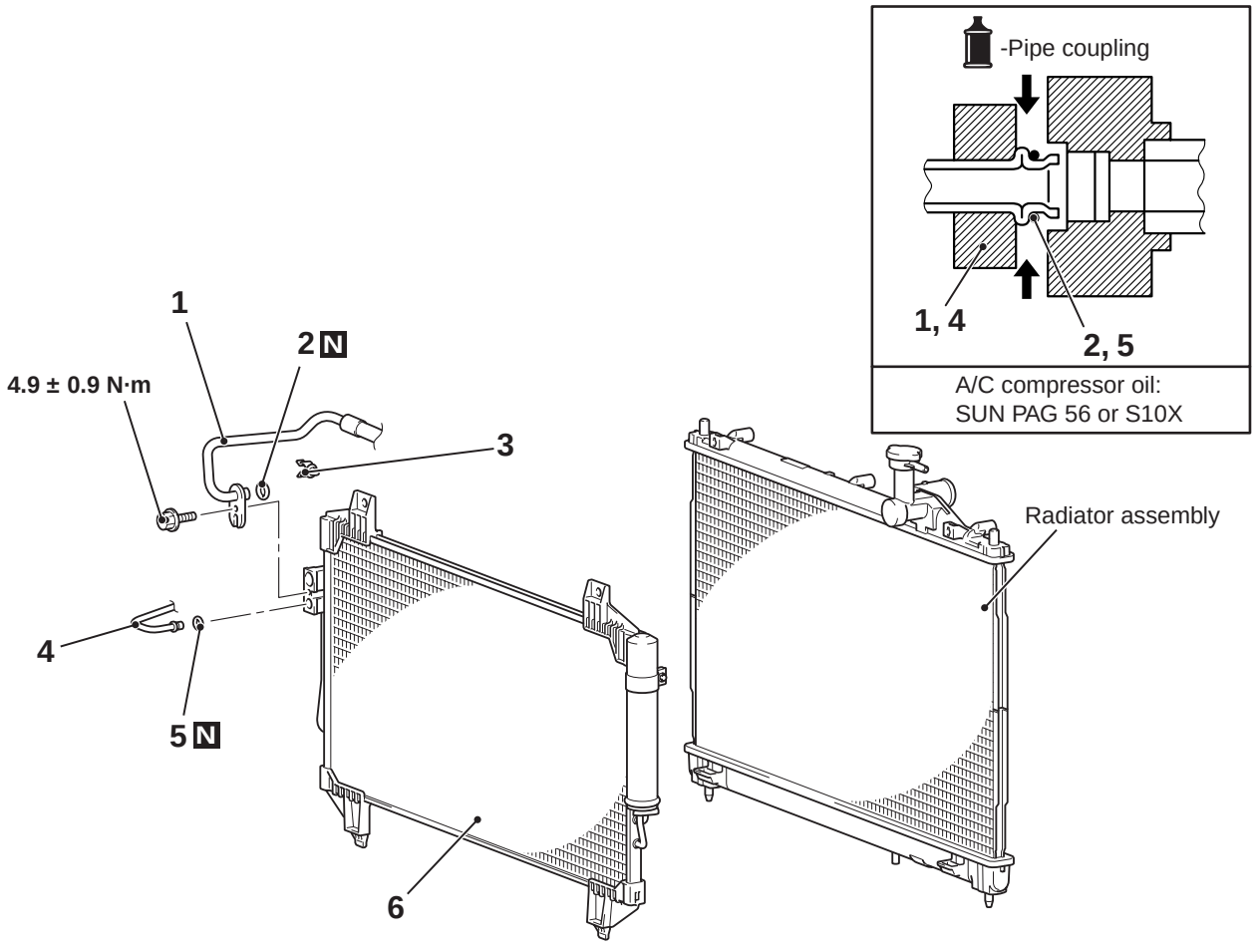
NOTE: When the oil temperature is 135°C or more and there is no continuity, the switch will not be turned on {Continuity exists (2 Ω or less)} until the temperature reduces to 120°C or less.

CONDENSER ASSEMBLY

REMOVAL AND INSTALLATION

M1552015401607

Pre-removal and Post-installation Operation
- Discharging and Recharging refrigerant (Refer to P.55-34).
- Air Cleaner Intake Duct (Refer to GROUP 15 – Air Cleaner).
- Headlamp support upper panel cover (Refer to GROUP 51, Radiator Grille)
- Hood latch (Refer to GROUP 42A – Hood).
- Headlamp support panel upper (Refer to GROUP 42A – Loose Panel).



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Removal steps

<<A>> >>A<< 1. A/C compressor discharge hose connection
2. O-ring
3. Clamp
<<A>> 4. A/C condenser outlet pipe connection
5. O-ring
6. Condenser assembly

NOTE: Condenser fan removal and installation refer to GROUP 14 – Radiator .

REMOVAL SERVICE POINT

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

⚠ CAUTION

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

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

INSTALLATION SERVICE POINT

>>A<< A/C COMPRESSOR DISCHARGE HOSE INSTALLATION

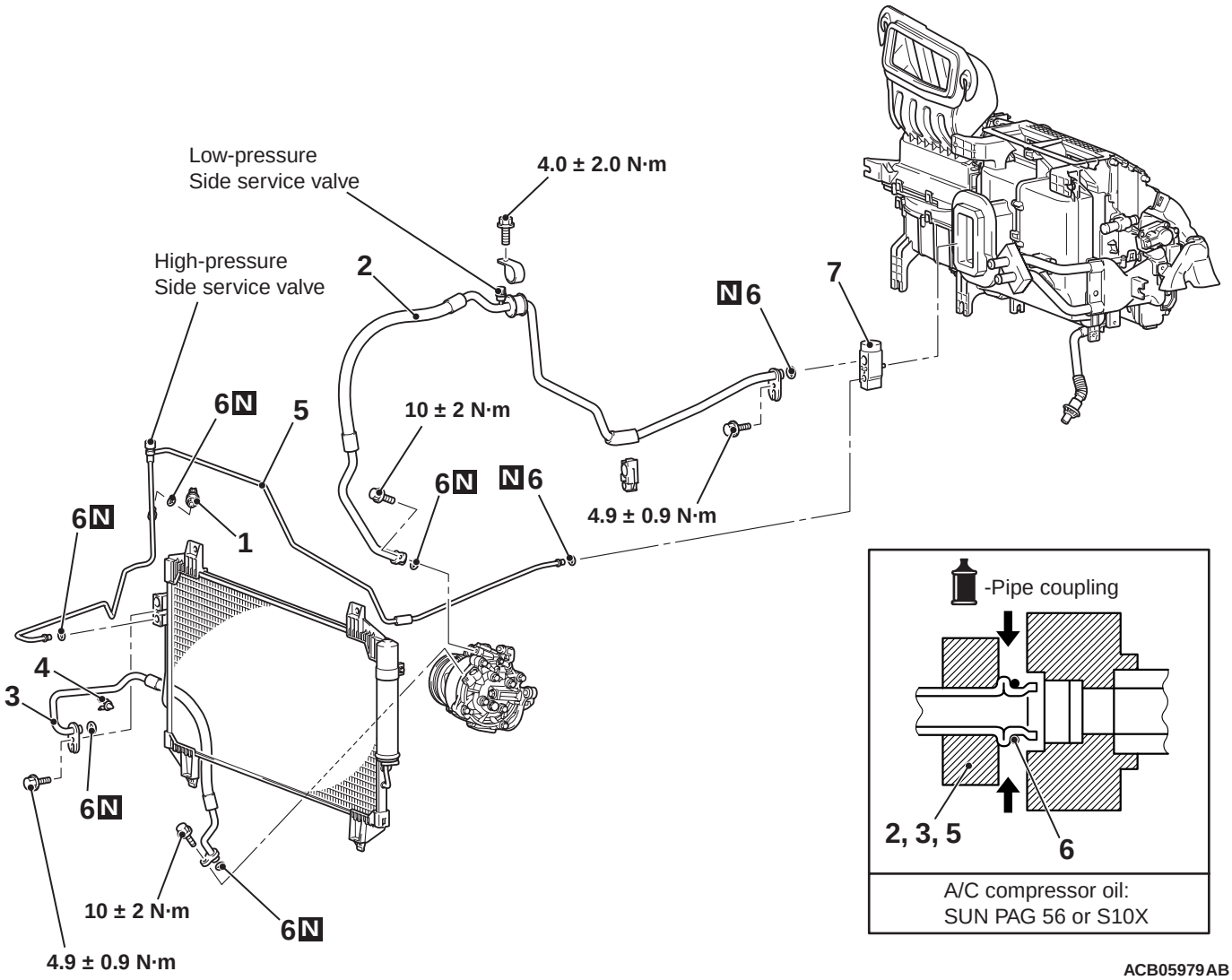
Assemble the clamp into the condenser assembly, and then assemble the A/C condenser discharge hose into the clamp.

REFRIGERANT LINE

REMOVAL AND INSTALLATION

M1552006402895

Pre-removal and Post-installation Operation
Discharging and Recharging refrigerant (Refer to P.55-34).



A/C pressure sensor removal steps

<<A>> 1. A/C pressure sensor
<<A>> 6. O-ring

A/C compressor suction hose removal steps

- Dash panel heat protector (Refer to GROUP 42A, Loose Panel).

<<A>> 2. A/C compressor suction hose
<<A>> 6. O-ring

A/C condenser outlet pipe and A/C compressor discharge hose removal steps

- Air Cleaner Intake Duct Removal and Installation (Refer to GROUP 15 – Air Cleaner)
- Headlamp support panel upper (Refer to GROUP 51, Radiator Grille)

<<A>> >>A<< 3. A/C compressor discharge hose
<<A>> 6. O-ring
4. Clamp
<<A>> 5. A/C condenser outlet pipe
<<A>> 6. O-ring

Expansion valve removal steps

- Dash panel heat protector (Refer to GROUP 42A, Loose Panel).

<<A>> 2. A/C compressor suction hose connection (at heater assembly side)
<<A>> 6. O-ring
<<A>> 5. A/C condenser outlet pipe connection (at heater assembly side)

Expansion valve removal steps

<<A>> 6. O-ring
<<A>> 7. Expansion valve

REMOVAL SERVICE POINT

<<A>> HOSE AND PIPE REMOVAL

⚠ CAUTION

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

Plug the nipple of condenser, compressor, and expansion valve to prevent the entry of dust and dirt.

INSTALLATION SERVICE POINT

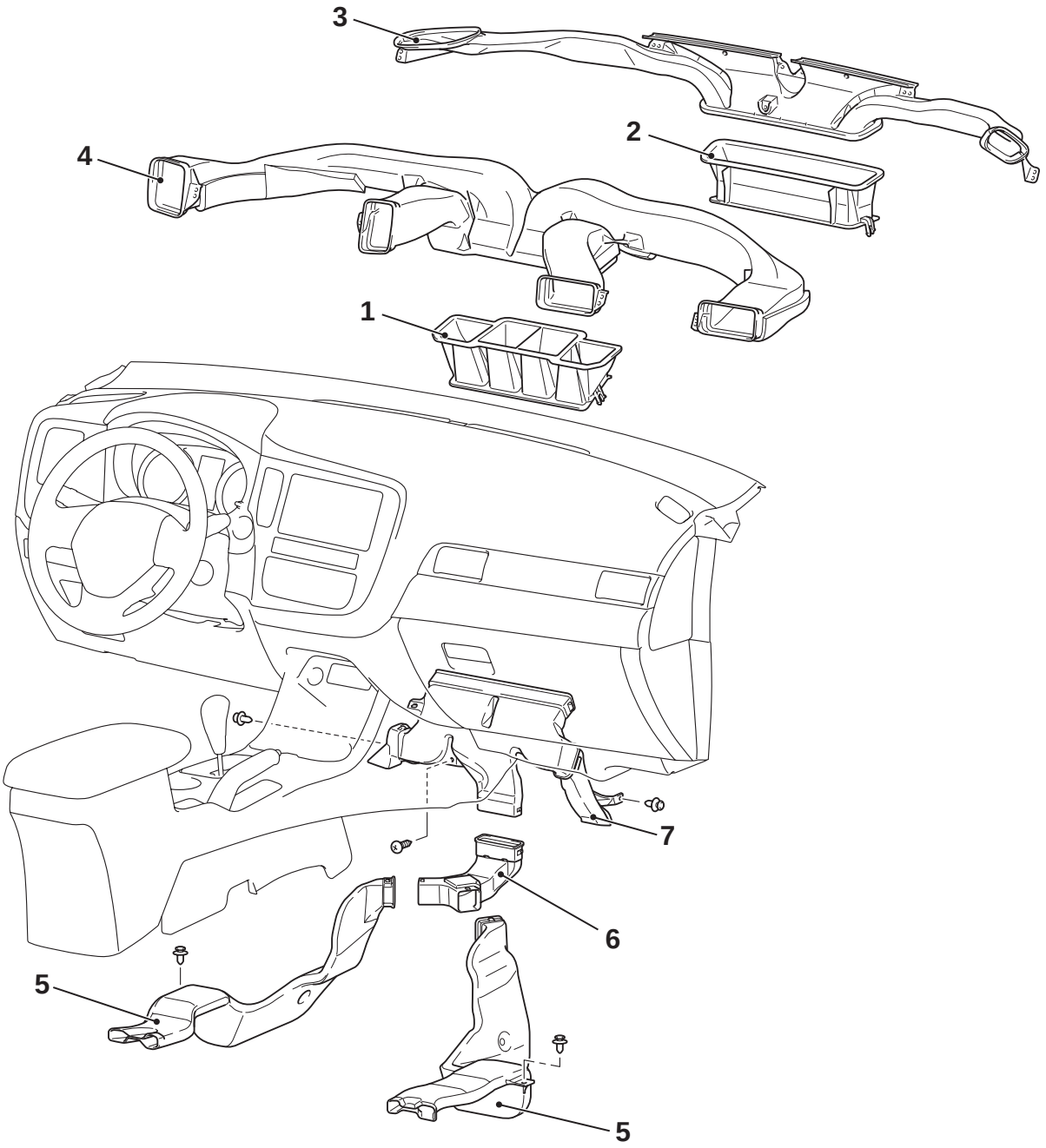
>>A<< A/C COMPRESSOR DISCHARGE HOSE INSTALLATION

Assemble the clamp into the condenser assembly, and then assemble the A/C condenser discharge hose into the clamp.

DUCTS

REMOVAL AND INSTALLATION

M1553001001449



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Removal steps for rear centre duct, front centre duct, side defroster duct, defroster nozzle, ventilation air distribution duct

- Instrument panel assembly (Refer to GROUP 52A – Instrumental Panel).

1. Rear centre duct
2. Front centre duct

Removal steps for rear centre duct, front centre duct, side defroster duct, defroster nozzle, ventilation air distribution duct

3. Defroster nozzle
4. Ventilation air distribution duct

Rear heater duct removal steps
- Floor console flont (Refer to GROUP 52A – Flont Floor Console).
- Bottom cover assembly (driver's side &passenger's side) (Refer to GROUP 52A – Instrumental Panel).

5. Rear heater duct B
- Front seat assembly (Refer to GROUP 52A – Front Seat).
- Front scuff plate, Cowl side trim (Refer to GROUP 52A – Interior Trim).
- Turn up the floor carpet.

6. Rear heater duct A

Foot duct removal steps
- Heater unit and blower assembly (Refer to P.55-43).

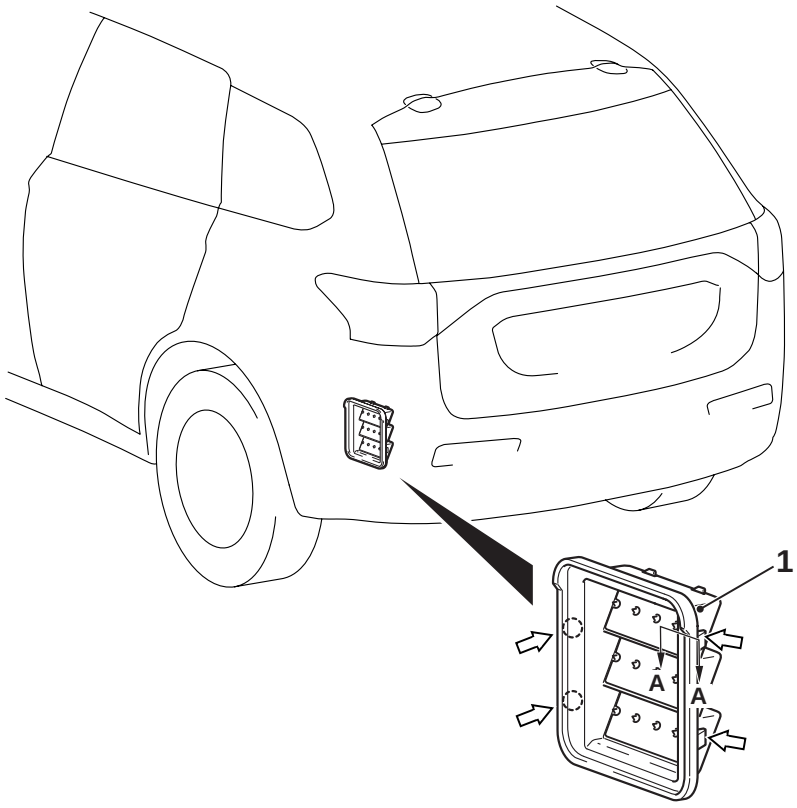
7. Foot duct

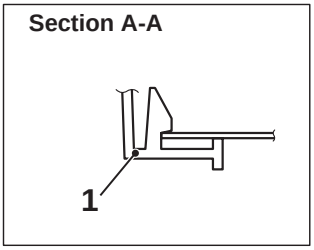
VENTILATORS

REMOVAL AND INSTALLATION

M1553002800791

Pre-removal and Post-installation Operation
- Rear Bumper Removal and Installation (Refer to GROUP 51 – Rear Bumper).





Note
⇦ : Claw positions

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Removal

1. Rear ventilator duct