

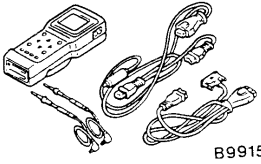
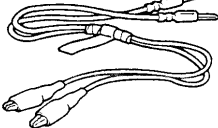
## SERVICE SPECIFICATIONS

Item			Typical value
Idling speed (rpm): N or P range	4G94		650 ± 50 *
Idle-up (rpm): N or P range	4G94	A/C LOW:	700 ± 50 *
		A/C HIGH:	800 ± 50 *
Air mix door potentiometer resistance kΩ	MAX HOT		Around 5.35
	MAX COOL		Around 0.65
Blow vent changeover damper potentiometer resistance kΩ	DEF position		Around 0.65
	FACE position		Around 5.35

### NOTE

\*: Indicates the value more than 4 minutes after the start of idling.

## SPECIAL TOOLS

Tool	Number	Name	Use
 B991502	MB991502	MUT-II sub-assembly	Automatic air conditioner inspection
 B991529	MB991529	Diagnosis code check harness	Automatic air conditioner inspection when using voltmeter

## TROUBLESHOOTING

### BASIC FLOW OF TROUBLESHOOTING

Refer to [Troubleshooting](#)

### DIAGNOSTIC FUNCTIONS

#### 1 Reading Diagnosis Codes

Connect the MUT-II to the 16-pin diagnosis connector and read the diagnosis code.  
(Refer to [How to Use Troubleshooting/Inspection Service Points.](#))

#### 2 Erasing Diagnosis Codes

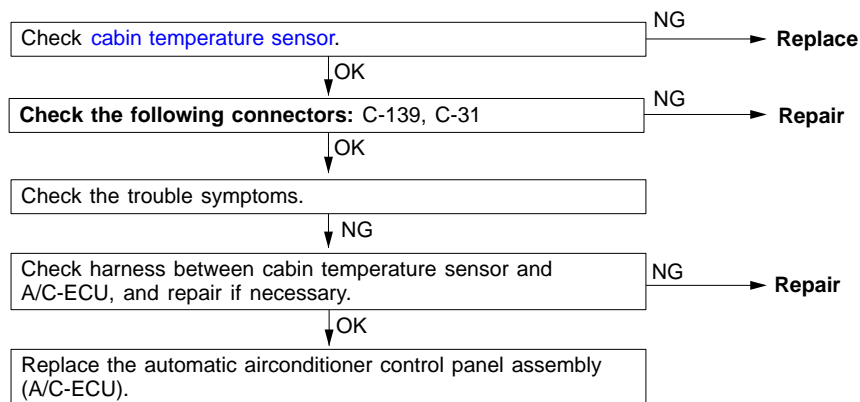
Refer to [How to Use Troubleshooting/Inspection Service Points.](#)

## CLASSIFICATION TABLE OF DIAGNOSIS CODES

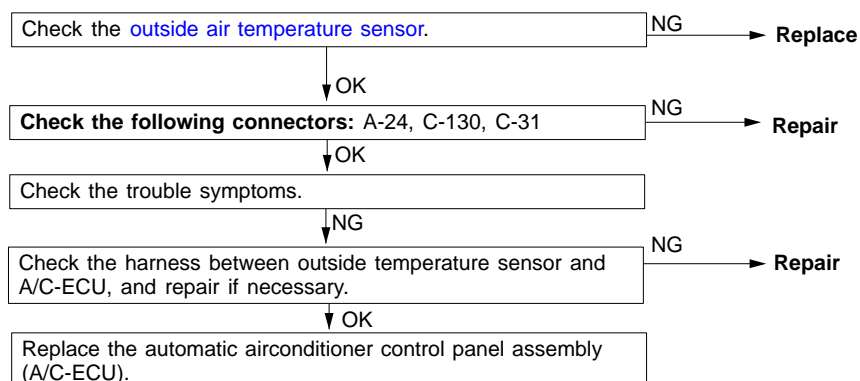
Code	Diagnosis item
11	Cabin temperature sensor system (wire breakage)
12	Cabin temperature sensor system (short circuit)
13	Outside air temperature sensor system (wire breakage)
14	Outside air temperature sensor system (short circuit)
15	Heater water temperature sensor system (wire breakage)
16	Heater water temperature sensor system (short circuit)
21	Air thermo sensor system (wire breakage)
22	Air thermo sensor system (short circuit)
31	Air mix door potentiometer system
32	Blow vent changeover damper potentiometer system
41	Air mix door motor drive system
42	Blow vent changeover damper motor drive system

## INSPECTION BY DIAGNOSIS CODE

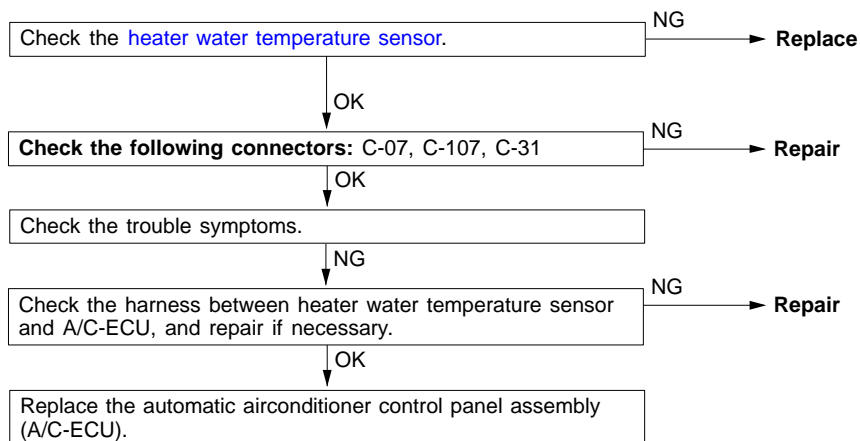
Codes 11, 12 Cabin temperature sensor system	Probable cause
These codes are output when a wire breakage (code 11) or short circuit (code 12) is detected in the cabin temperature sensor circuit.	<ul style="list-style-type: none"> <li>• Cabin temperature sensor fault</li> <li>• Connector or harness fault</li> <li>• A/C-ECU fault</li> </ul>



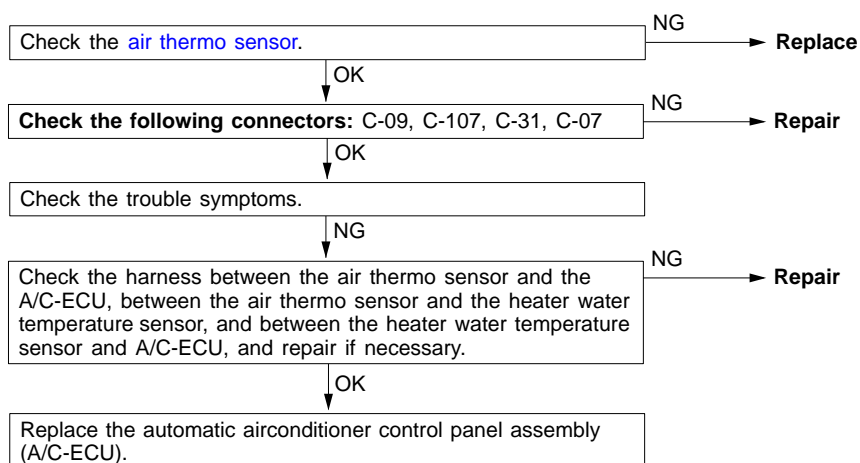
Code 13, 14 Outside air temperature sensor system	Probable cause
These codes are output when a wire breakage (code 13) or short circuit (code 14) is detected in the outside air temperature sensor circuit.	<ul style="list-style-type: none"> <li>• Outside air temperature sensor fault</li> <li>• Connector or harness fault</li> <li>• A/C-ECU fault</li> </ul>



Code 15, 16 Heater water temperature sensor system	Probable cause
These codes are output when a wire breakage (code 15) or short circuit (code 16) is detected in the heater water temperature sensor circuit.	<ul style="list-style-type: none"> <li>Heater water temperature sensor fault</li> <li>Connector or harness fault</li> <li>A/C-ECU fault</li> </ul>



Code 21, 22 Air thermo sensor system	Probable cause
These codes are output when a wire breakage (code 21) or short circuit (code 22) is detected in the air thermo sensor circuit.	<ul style="list-style-type: none"> <li>Air thermo sensor fault</li> <li>Connector or harness fault</li> <li>A/C-ECU fault</li> </ul>



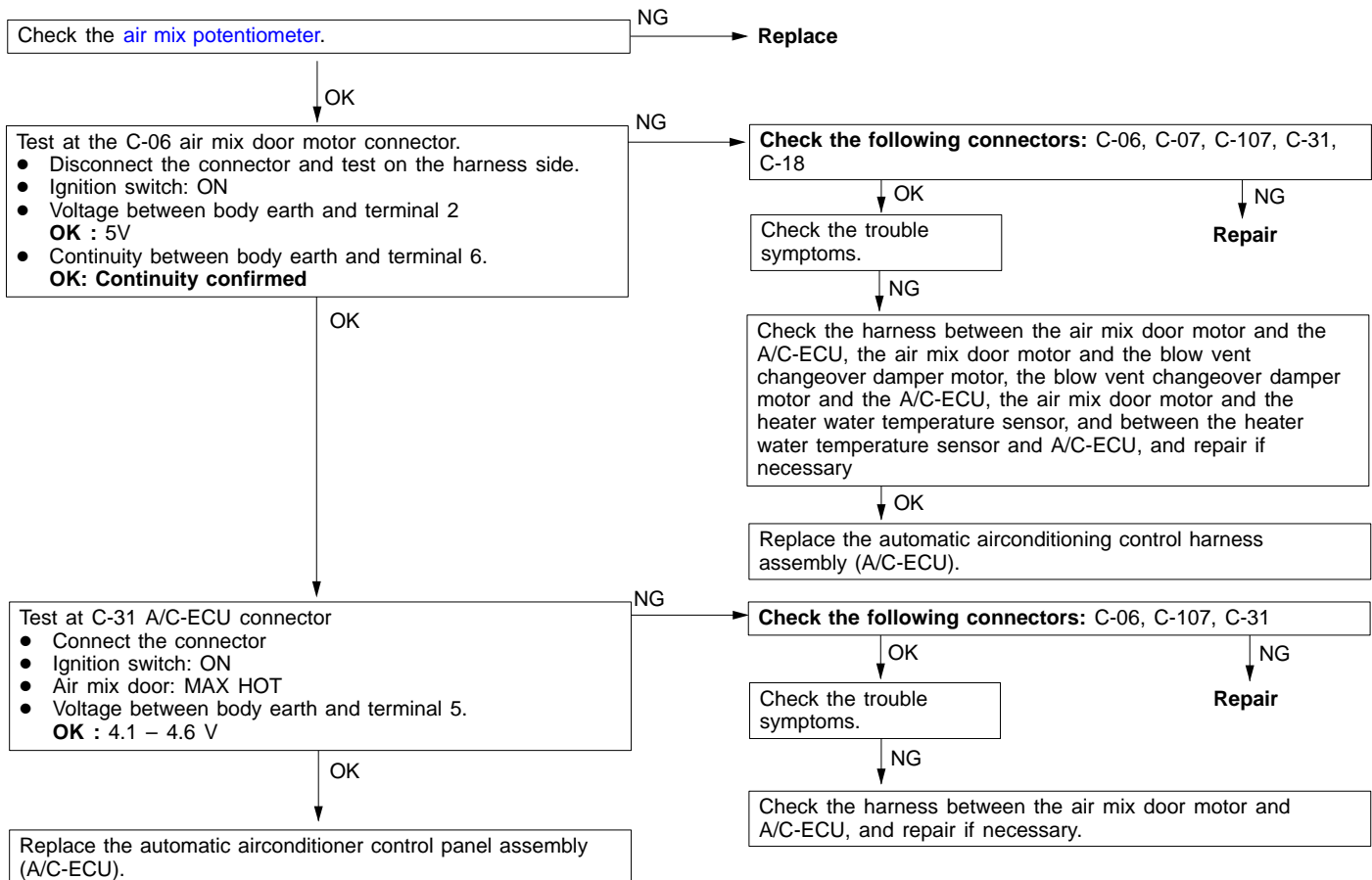
# 55B AUTOMATIC AIR CONDITIONER BASE – Troubleshooting

MAIN

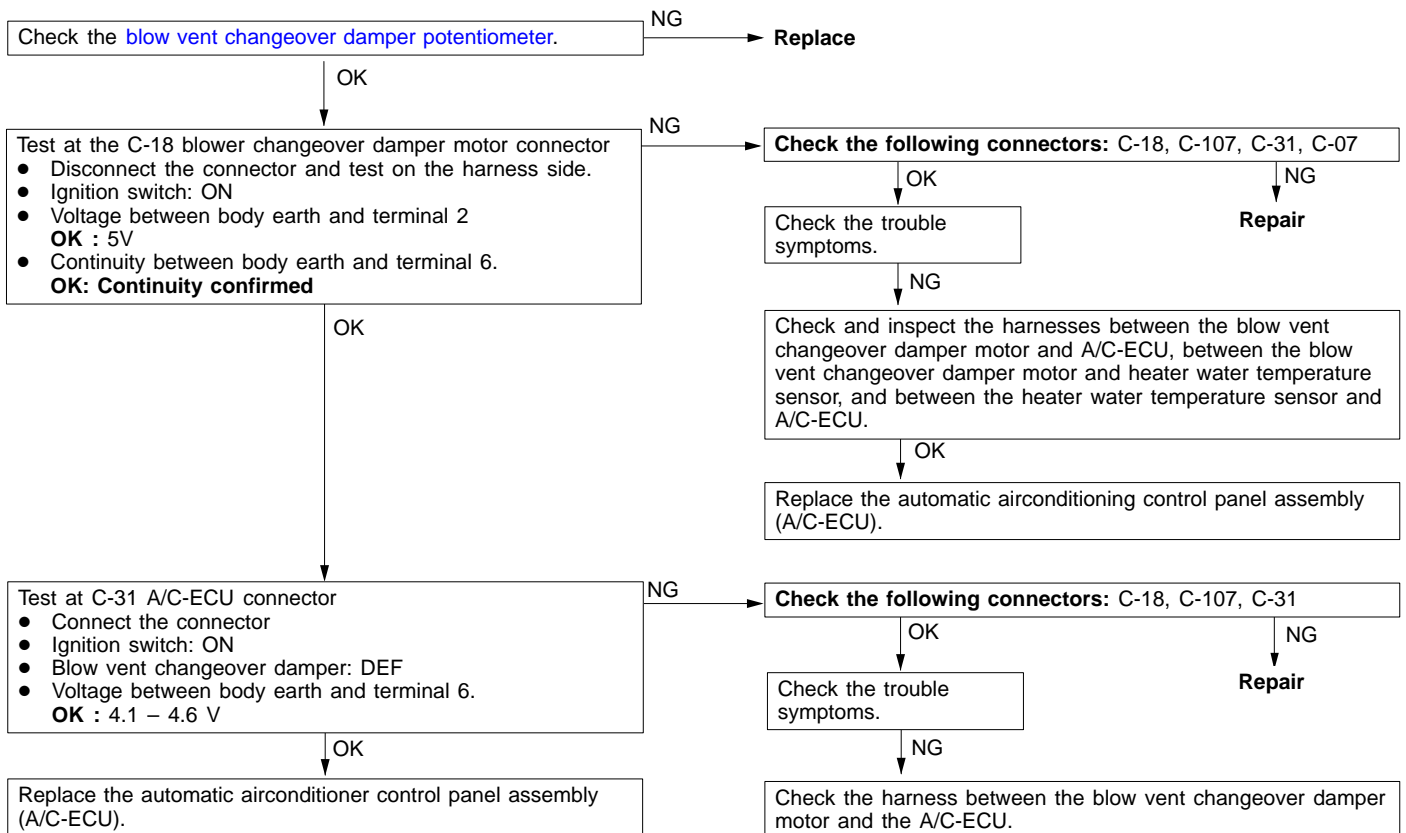
Group  
55

55B

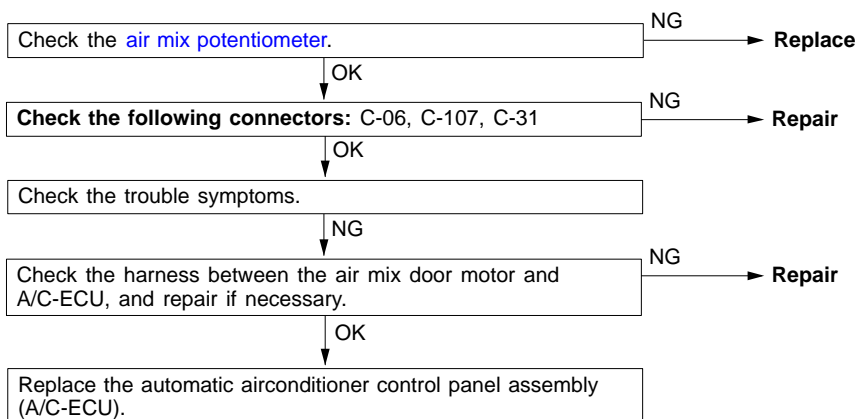
Code 31 Air mix door potentiometer system	Probable cause
This code is output when there is no input from the air mix door potentiometer to the A/C-ECU because of a harness wire breakage or a short circuit.	<ul style="list-style-type: none"> <li>Air mix door potentiometer fault</li> <li>Connector or harness fault</li> <li>A/C-ECU fault</li> </ul>



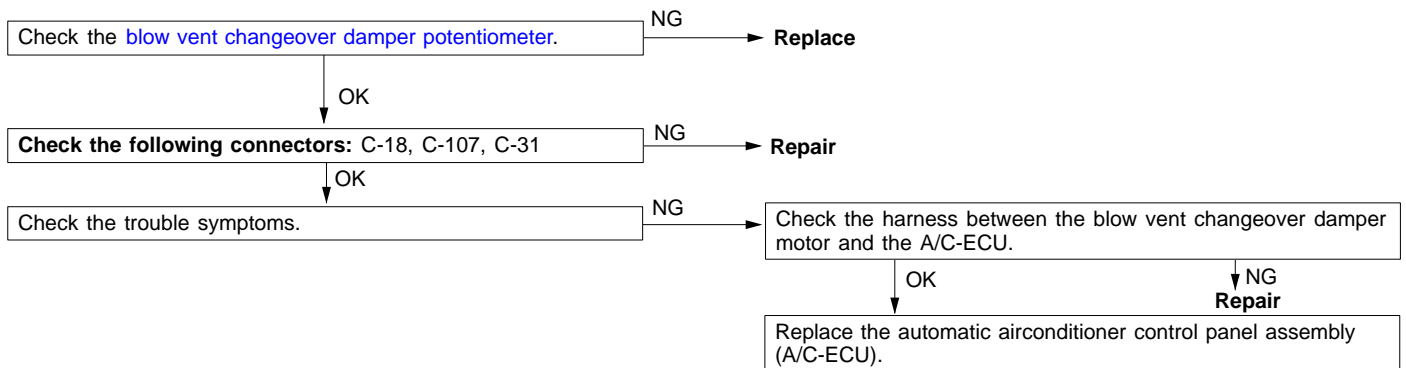
Code 32 Blow vent changeover damper potentiometer system	Probable cause
This code is output when there is no input from the blow vent changeover damper potentiometer to the A/C-ECU because of a harness wire breakage or a short circuit.	<ul style="list-style-type: none"> <li>Blow vent changeover damper door potentiometer fault</li> <li>Connector or harness fault</li> <li>A/C-ECU fault</li> </ul>



Code 41 Air mix door motor drive system	Probable cause
This code is output when the air mix door could not turn as far as the set aperture.	<ul style="list-style-type: none"> <li>Air mix door motor fault</li> <li>Connector or harness fault</li> <li>A/C-ECU fault</li> </ul>



Code 42 Blow vent changeover damper motor drive system	Probable cause
This code is output when the blow vent changeover damper could not turn as far as the set aperture.	<ul style="list-style-type: none"> <li>Blow vent changeover damper motor fault</li> <li>Connector or harness fault</li> <li>A/C-ECU fault</li> </ul>



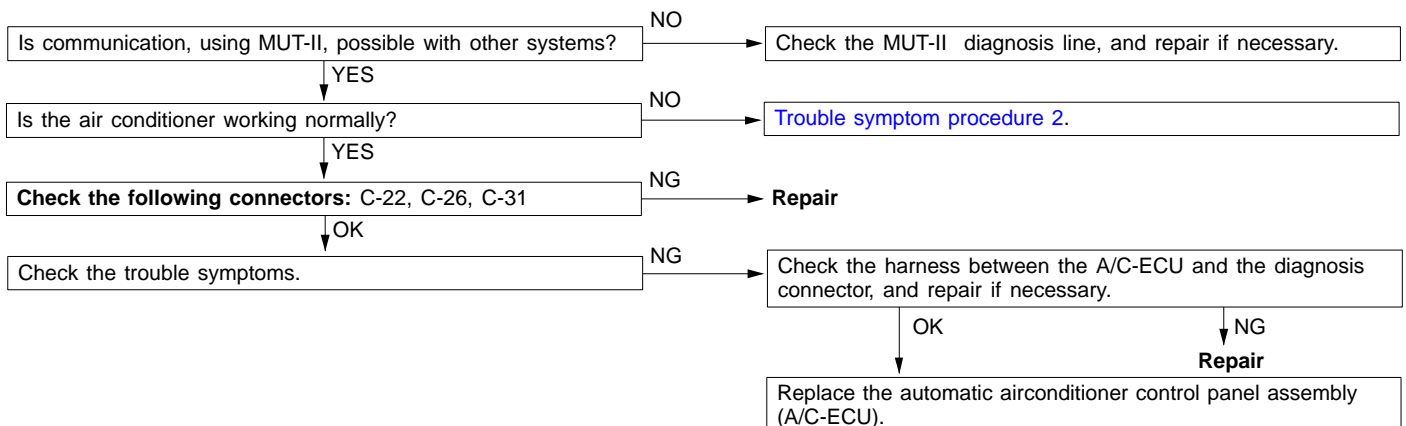
## CLASSIFICATION TABLE OF TROUBLE SYMPTOMS

Trouble symptom	Inspection procedure No.
Cannot communicate with MUT-II.	1
Airconditioning not working at all.	2
The temperature of the air output from the air conditioner cannot be regulated.	3
The blower is not working.	4
The volume of air output from the blower cannot be adjusted.	5
The blow vent cannot be switched.	6
Air cannot be switched between cabin and outside.	7
The rear defogger is not working.	8
The radiator cooling fan is not working.	—

## INSPECTION PROCEDURE BY SYMPTOM

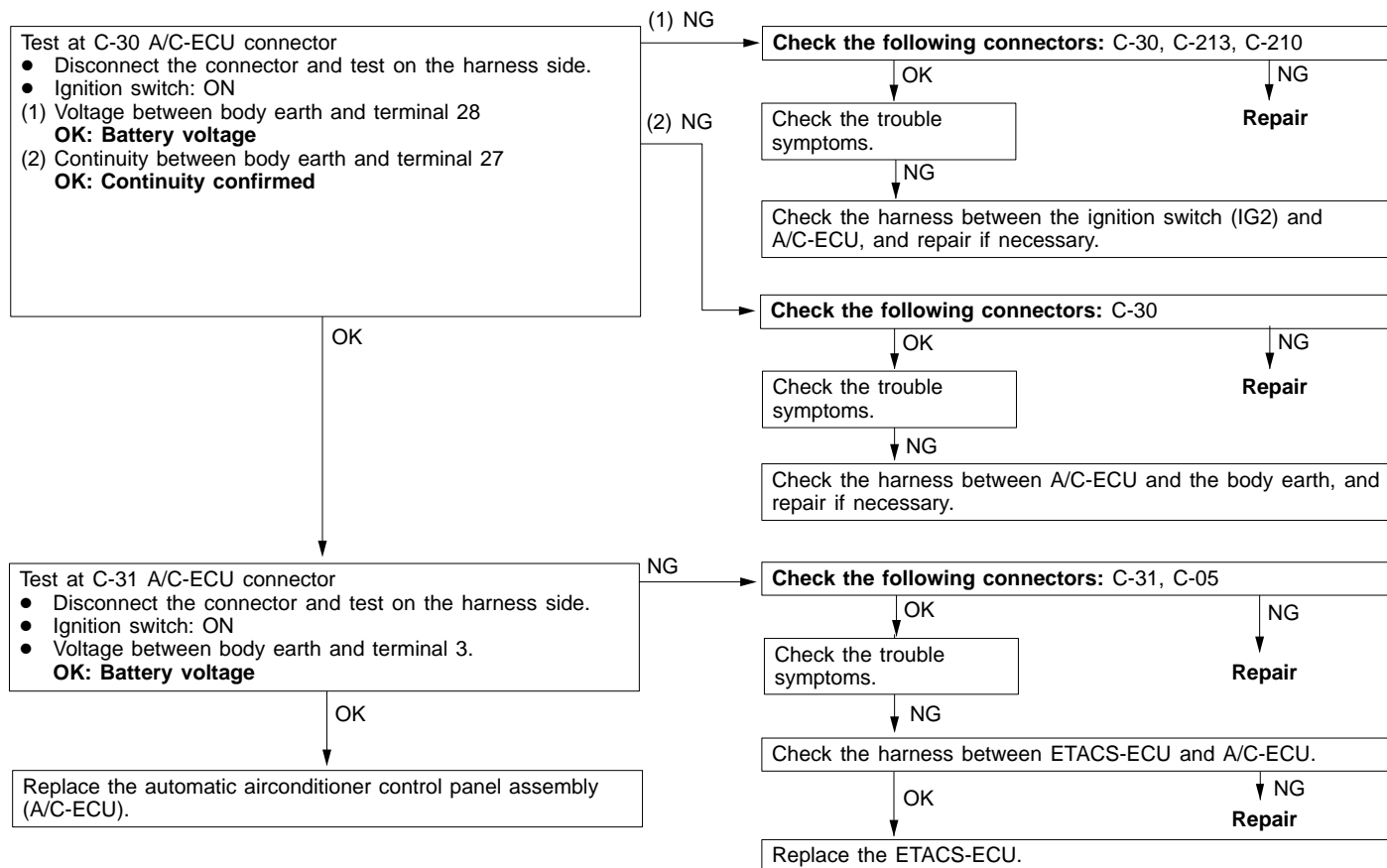
### Inspection procedure 1

Cannot communicate with MUT-II.	Probable cause
If cannot communicate with any other system, it is highly likely that the problem is a diagnosis line fault.If the communication problem is only with the air conditioner, the fault is probably in the A/C-ECU diagnosis line.	<ul style="list-style-type: none"> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



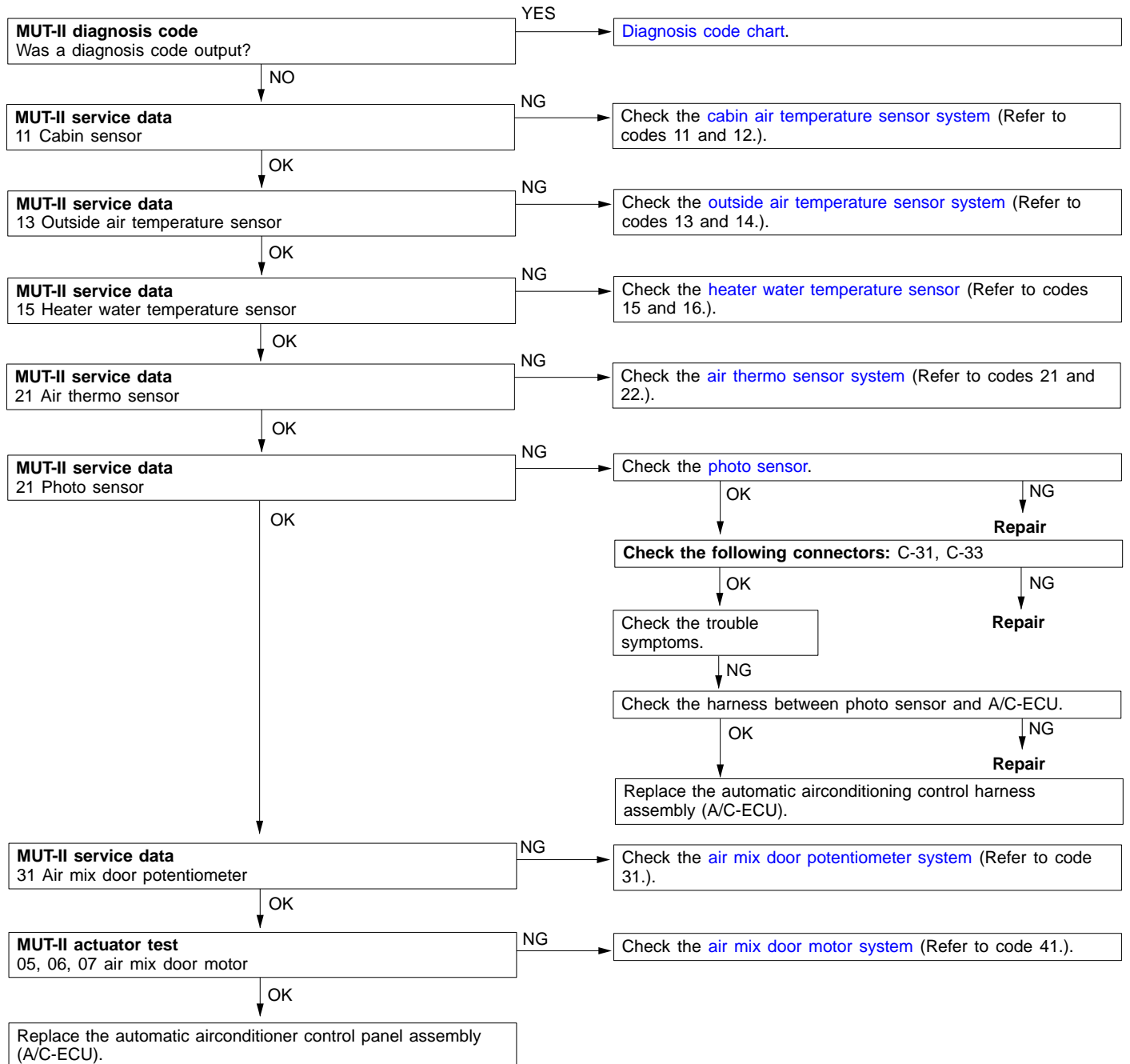
## Inspection procedure 2

Air conditioner does not work at all.	Probable cause
Probably a fault in the A/C-ECU power supply system (including earth).	<ul style="list-style-type: none"> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



## Inspection procedure 3

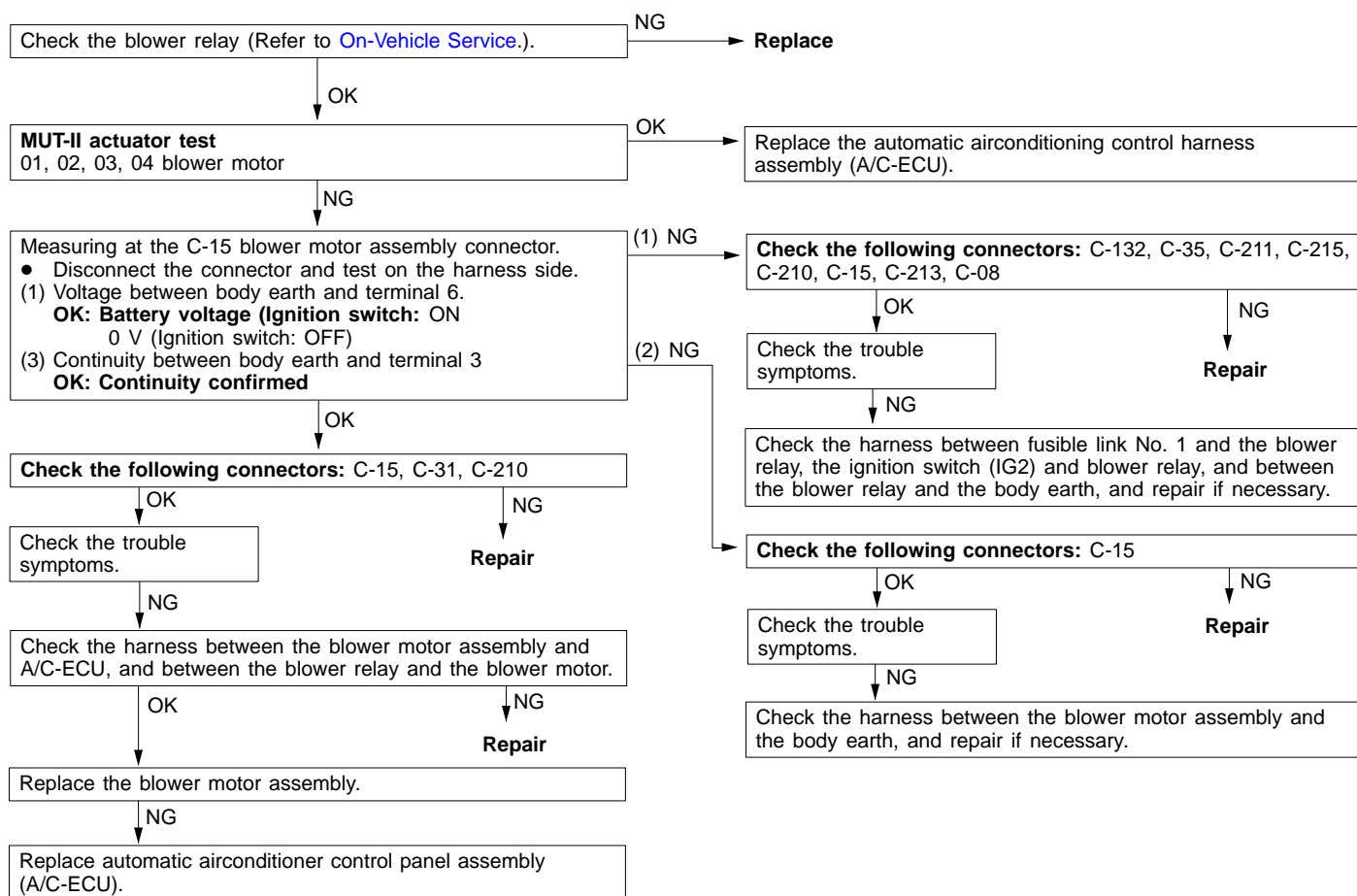
The temperature of the air output from the air conditioner cannot be adjusted.	Probable cause
If the temperature of the air blown out cannot be raised or lowered, a sensor might be at fault or the operation of the air mix door could be faulty.	<ul style="list-style-type: none"> <li>• Cabin temperature sensor fault</li> <li>• Outside air temperature sensor fault</li> <li>• Heater water temperature sensor fault</li> <li>• Air thermo sensor fault</li> <li>• Photo sensor fault</li> <li>• Air mix door motor fault</li> <li>• Harness or connector fault</li> <li>• A/C-ECU fault</li> </ul>





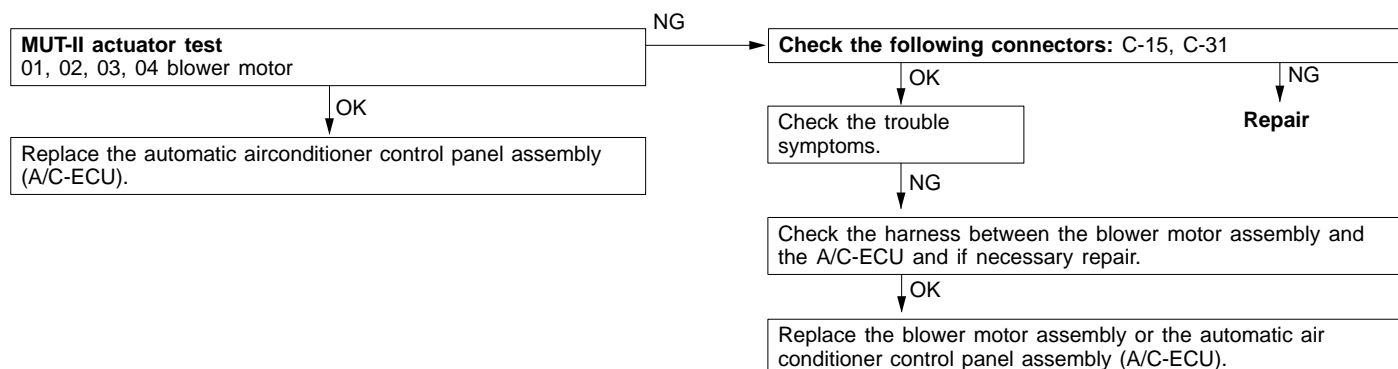
## Inspection procedure 4

The blower is not working.	Probable cause
If no air blasts out even though the blower switch is ON, there is probably a fault in the blower relay circuit system.	<ul style="list-style-type: none"> <li>Blower relay fault</li> <li>Blower motor assembly fault</li> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



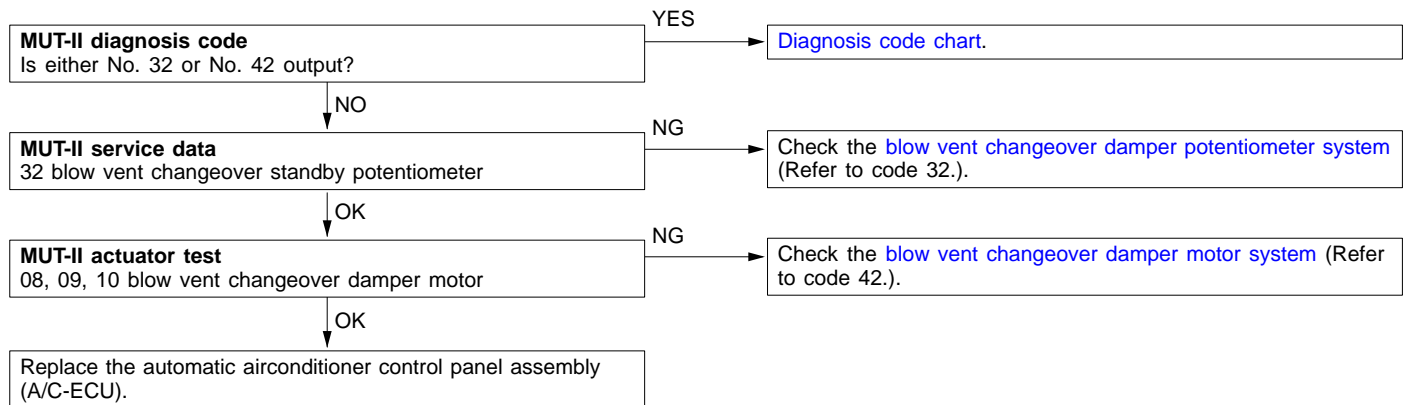
## Inspection procedure 5

The volume of air blown out by the blower cannot be regulated.	Probable cause
If the amount of air blasted out does not change even though the volume is adjusted, there is probably a fault in the blower pulse controller circuit system.	<ul style="list-style-type: none"> <li>Blower motor assembly fault</li> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



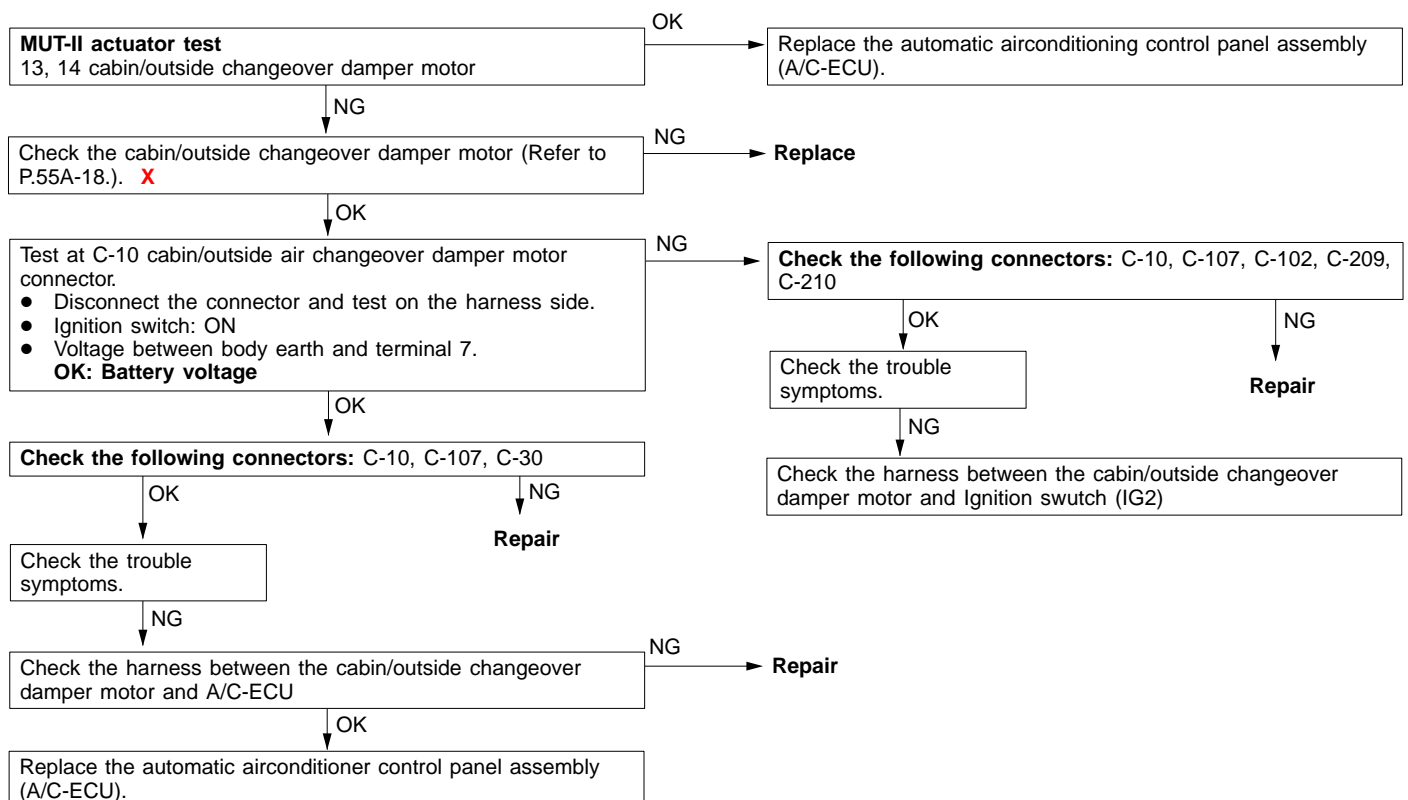
## Inspection procedure 6

The blower blow vents cannot be switched.	Probable cause
If the blow vent cannot be switched to another outlet using the blow vent changeover knob, there is probably a fault in the blow vent changeover damper motor's circuit system.	<ul style="list-style-type: none"> <li>Blow vent changeover damper motor fault</li> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



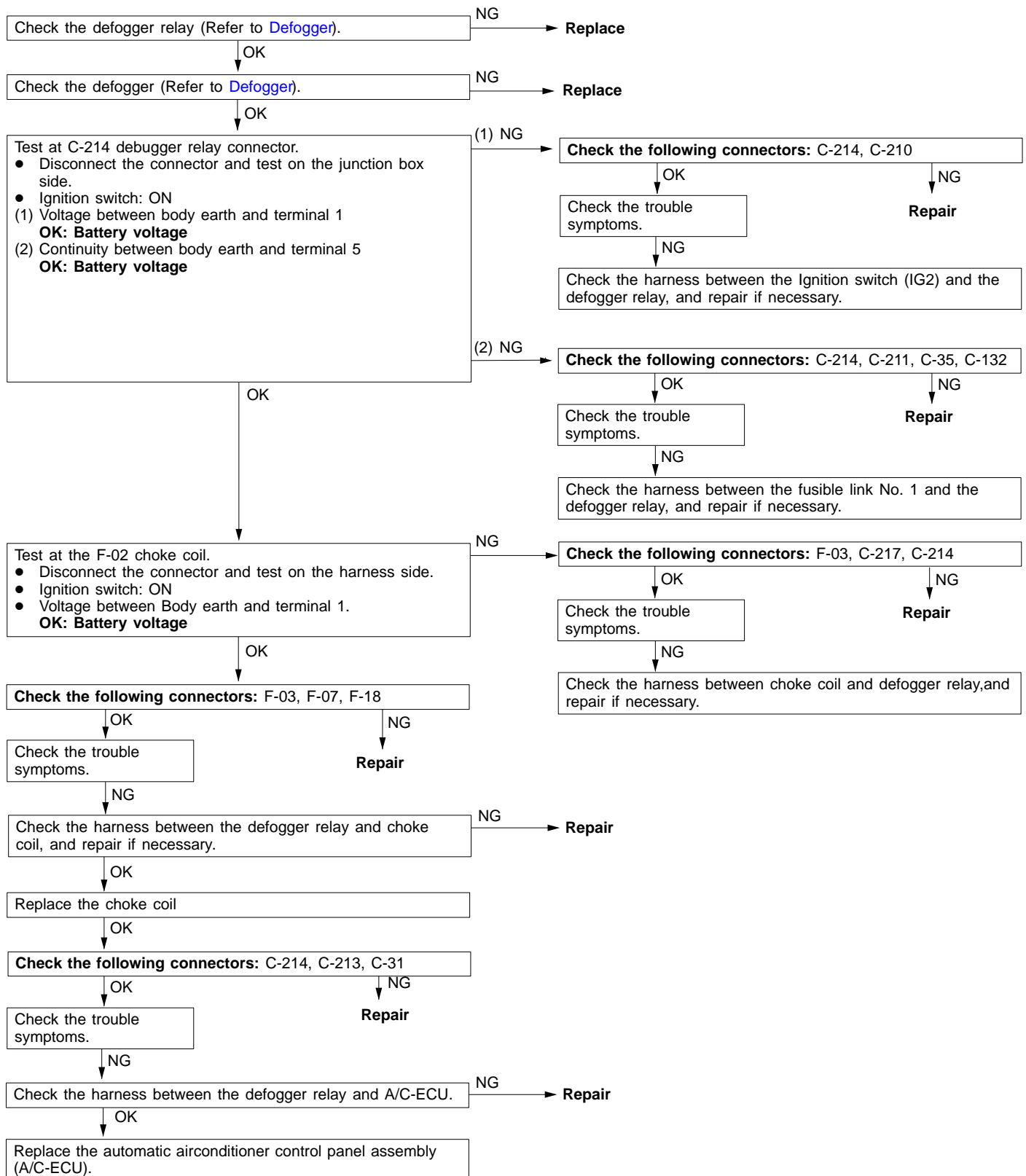
## Inspection procedure 7

Outside/cabin air changeover not working.	Probable cause
If the air conditioner cannot be switched between cabin/outside air even though the cabin/outside switch is ON, there is probably a fault in the cabin/outside changeover damper motor system.	<ul style="list-style-type: none"> <li>Cabin/outside changeover damper motor fault</li> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



## Inspection procedure 8

Rear defogger not working.	Probable cause
If the rear window defogger does not work even though it is switched ON (the 20minute timer is activated), there is probably a fault in the defogger relay system.	<ul style="list-style-type: none"> <li>Defogger relay fault</li> <li>Harness or connector fault</li> <li>A/C-ECU fault</li> </ul>



## LIST OF SERVICE DATA

Item No.	Inspection item	Check content	
11	Cabin temperature sensor	Ignition switch: ON	Cabin temperature and the MUT-II display temperature match.
13	Outside Air Temperature Sensor	Ignition switch: ON	Outside air temperature and the MUT-II display temperature match.
15	Heater water temperature sensor	Ignition switch: ON	The heater core wall surface temperature and the MUT-II display temperature match.
21	Air thermo sensor	Ignition switch: ON	The evaporator outlet temperature and the MUT-II display temperature match.
25	Photo Sensor	Ignition switch: ON Regulates the amount of incident light	The amount of incident light is inversely proportional to the voltage displayed on MUT-II.
31	Air mix door potentiometer	Ignition switch: ON Door position: MAX HOT	Aperture: Approx. 100% open
		Ignition switch: ON Door position: MAX COOL	Aperture: Approx. 0% open
32	Blow vent changeover damper potentiometer	Ignition switch: ON Damper position: FACE	Aperture: Approx. 0% open
		Ignition switch: ON Damper position: FOOT	Aperture: Approx. 60% open
		Ignition switch: ON Damper position: FOOT/DEF	Aperture: Approx. 80% open
		Ignition switch: ON Damper position: DEF	Aperture: Approx. 100% open

## LIST OF ACTUATOR TESTS

Item No.	Inspection item	Drive content
01	Blower motor	Stopped
02		Low speed
03		Medium speed
04		High speed
05	Air mix door motor	Aperture: Approx. 0% open
06		Aperture: Approx. 50% open
07		Aperture: Approx. 100% open
08	Blow vent changeover damper motor	FACE
09		FOOT
10		DEF
11	Compressor output	OFF
12		ON
13	Cabin/outside changeover damper motor	Outside air
14		Cabin air
15	A/C2	OFF (engine speed under high load)
16		ON (engine speed under low load)

## INSPECTION WITH A/C-ECU TERMINAL

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36

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Terminal No.	Inspection item	Inspection conditions	Normal state
1	Cabin temperature sensor input	Temperature at sensor: 25°C (4 kΩ)	2.1 – 2.7 V
2	Blower pulse controller output	Blower ON	0.7 – 2.5 V (AC effective value)
3	Backup power supply	Normally	Battery voltage
4	Heater water temperature sensor input	Temperature at sensor: 25°C (4 kΩ)	2.1 – 2.7 V
5	Air mix door potentiometer input	When door shifted to MAX HOT position	4.1 – 4.6 V
6	Blow vent changeover damper potentiometer input	When damper shifted to DEF position	4.1 – 4.6 V
7	Outside air temperature sensor input	Temperature at sensor: 25°C (4 kΩ)	2.1 – 2.7 V
8	Air thermo sensor input	Temperature at sensor: 25°C (4 kΩ)	2.1 – 2.7 V
9	Photo sensor (–)	Illuminance 0 lux	5 V
		Illuminance 100,000 lux or higher	Around 0 V
10	Potentiometer power supply	Normally	5 V
11	–	–	–
12	–	–	–
13	–	–	–
14	–	–	–
15	–	–	–
16	Rear defogger	Rear defogger ON	2.0 V or below
		Rear defogger OFF	Battery voltage
17	Diagnosis output	Ignition switch: ON	Needle fluctuates between 0 and 12 V.
18	Diagnosis input	Ignition switch: ON	Around 5 V
19	Photo sensor (+)	Normally	0 V
20	Sensor, potentiometer earth	Normally	0 V
21	Blow vent changeover damper motor (FACE)	When damper shifted to FACE position	10 V
		When damper shifted to DEF position	Trickle voltage (0.5 V)
22	Air mix door motor (MAX COOL)	When door shifted to MAX COOL position.	10 V
		When door shifted to MAX HOT position	Trickle voltage (0.5 V)

## 55B AUTOMATIC AIR CONDITIONER BASE – Troubleshooting

Terminal No.	Inspection item	Inspection conditions	Normal state
23	Cabin/outside air changeover damper motor (outside air)	When damper shifted to cabin air circulation position.	10 V (motor stopped)
		When damper shifted to outside air inductance position.	2.0 V or below
24	Blow vent changeover damper motor (DEF)	When damper shifted to FACE position	Trickle voltage (0.5 V)
		When damper shifted to DEF position	10 V
25	Air mix door motor (MAX HOT)	When door shifted to MAX COOL position.	Trickle voltage (0.5 V)
		When door shifted to MAX HOT position	10 V
26	Cabin/outside air changeover damper motor (cabin air)	When damper shifted to cabin air circulation position.	2.0 V or below
		When damper shifted to outside air inductance position.	10 V (motor stopped)
27	Ground	Normally	Power supplied
28	IG2 power supply	Ignition switch: ON	Battery voltage
29	Illumination earth	Normally	Power supplied
30	Illumination power supply	Ignition switch: ON	Battery voltage
31	–	–	–
32	Engine/CVT-ECU output (A/C2)	Airconditioning low	Battery voltage
33	–	–	–
34	Engine/CVT-ECU output (A/C2)	Airconditioning OFF	0 V
		Airconditioning ON (compressor ON)	Battery voltage
35	–	–	–
36	ACC power supply	Ignition switch: ACC	Battery voltage

**MAIN**
**Group  
55**
**55B**

## ON-VEHICLE SERVICE

### IDLE-UP INSPECTION <4G94>

- (1) Before the check, set the following conditions.
- (2) Confirm that the idling speed is set to the typical value.

**Standard value:  $650 \pm 50$  r/min \***

#### NOTE

The idling speed does not need adjusting as it is automatically controlled by the ISC system.

- (3) Check that the idling speed conforms with the standard value when the A/C switch is turned ON and the airconditioning operates.

#### Standard value:

**<A/C low load>  $700 \pm 50$  r/min \***

**<A/C high load>  $800 \pm 50$  r/min \***

\*: Indicates the value more than 4 minutes after the start of idling.

#### NOTE

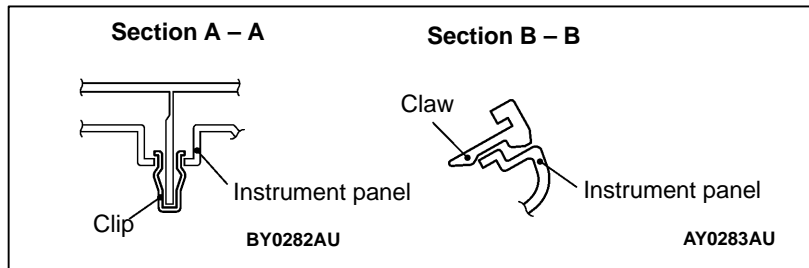
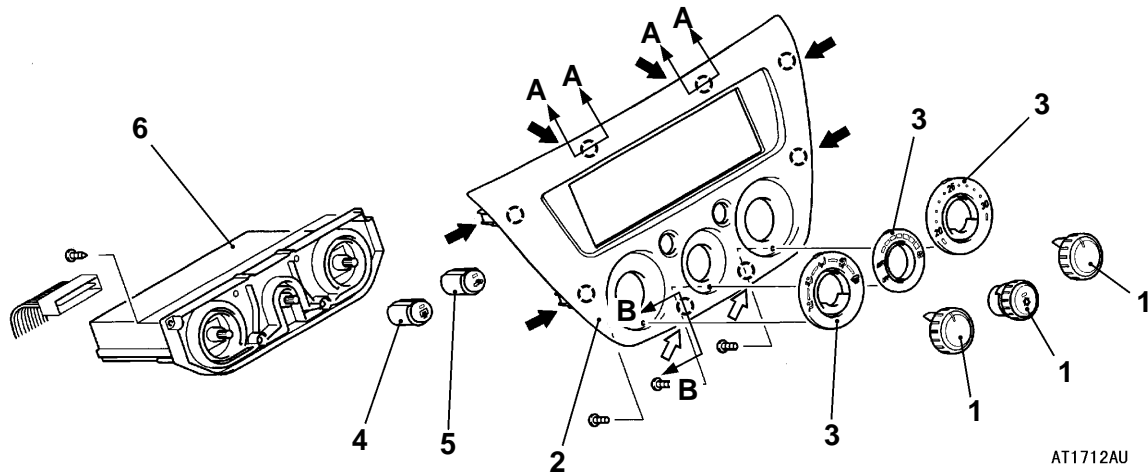
A/C LOW: The A/C is the A/C state when not HIGH.

A/C HIGH: The A/C is HIGH in one of the following states.

- When, in outside air inductance mode, the temperature of the outside air is 25°C or over.
- When, in outside air inductance mode, the air thermo sensor (outlet side) detects a temperature of no 15°C or over.
- When, in cabin air circulation mode (ECONOMY operation), the air thermo sensor (outlet side) detects a temperature of 8°C or over.

# AUTOMATIC AIR CONDITIONER CONTROL PANEL ASSEMBLY (A/C-ECU)

## REMOVAL AND INSTALLATION



### Removal steps

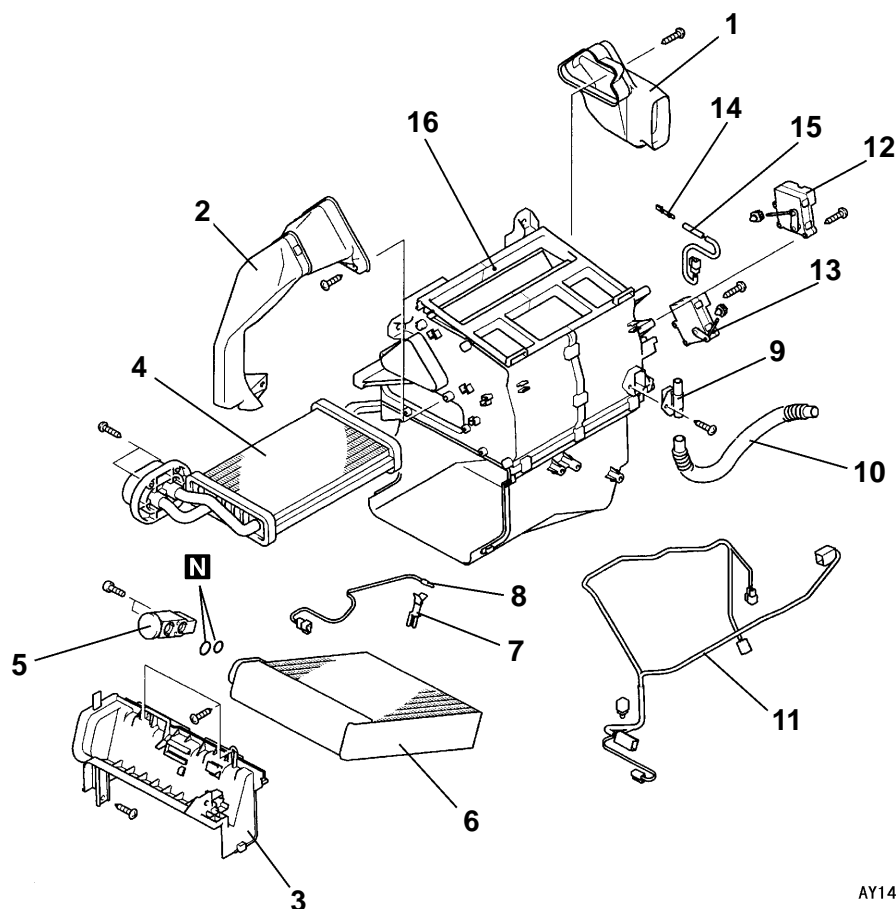
1. Knob assembly
2. Center panel assembly
3. Panel assembly
4. Rear defogger knob
5. Outside/cabin air changeover knob
6. Automatic air conditioner control panel assembly (A/C-ECU)



## HEATER UNIT

### REMOVAL AND INSTALLATION

Removal and installation is the same as for the air conditioner heater unit in the Heater Manual.



AY1402AU

#### Removal steps

- |                           |  |
|---------------------------|--|
| 1. Right-hand foot duct   | 9. Aspirator                             |
| 2. Left-hand foot duct    | 10. Aspirator hose                       |
| 3. Evaporator cover       | 11. Harness                              |
| 4. Heater core            | 12. Blow vent changeover damper motor    |
| 5. Expansion bulb         | 13. Air mix door motor                   |
| 6. Evaporator             | 14. Heater water temperature sensor clip |
| 7. Air thermo sensor clip | 15. Heater water temperature sensor      |
| 8. Air thermo sensor      | 16. Heater case                          |

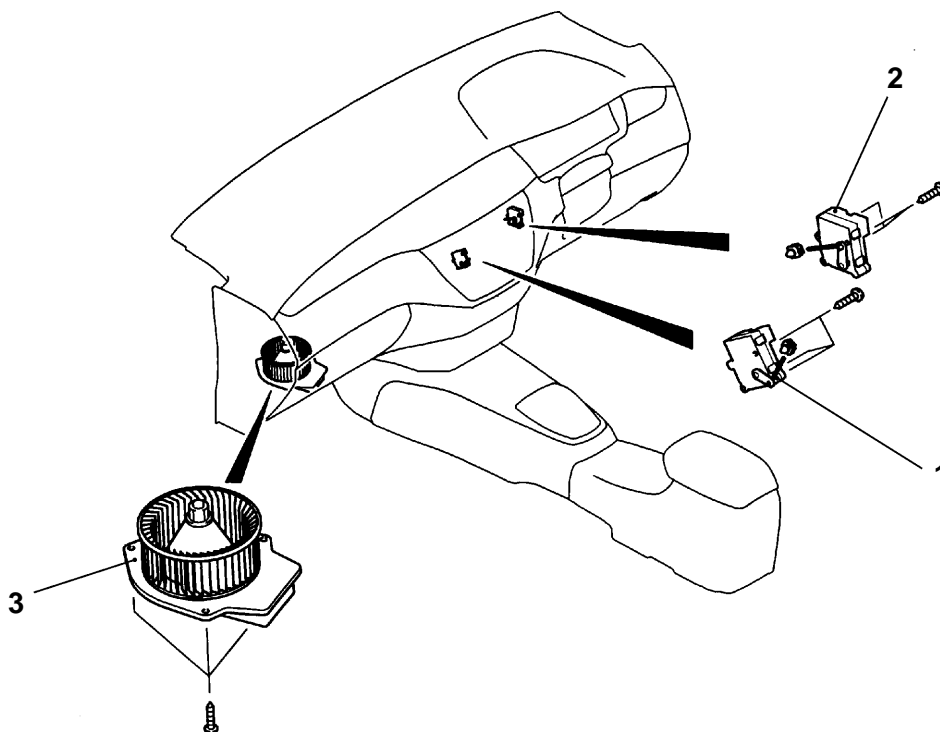
# AIR MIX DOOR MOTOR, BLOW VENT CHANGEOVER DAMPER MOTOR, BLOWER MOTOR

## REMOVAL AND INSTALLATION

MAIN

Group  
55

55B



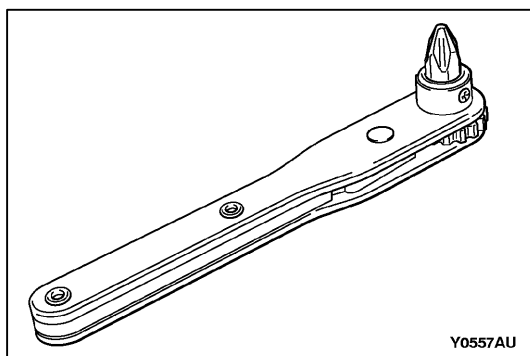
AY0456AU



- 1. Air mix door motor
- 2. Blow vent damper motor



- 3. Blower motor

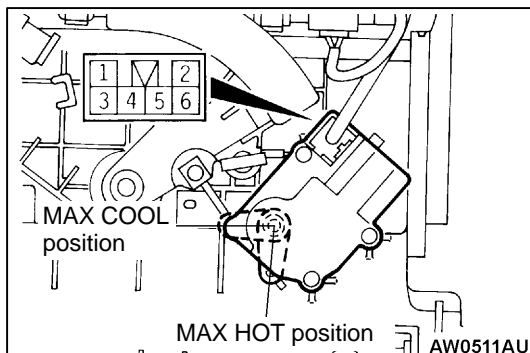


## REMOVAL SERVICE POINTS

### ◀A▶ REMOVAL OF BLOWER MOTOR AND BLOW VENT CHANGEOVER DAMPER MOTOR

#### NOTE

A normal plate-type ratchet driver is recommended.



## INSPECTION

### AIR MIX DOOR MOTOR CHECK

#### Motor Check

Battery connection terminal		Lever operation
1	3	
+	-	Turn to HOT side.
-	+	Turn to COOL side.

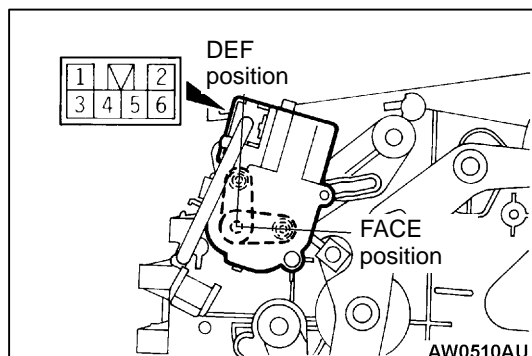
#### NOTE

When the lever is in the OFF position, no power is supplied.

**Potentiometer Check**

When measuring the resistance between connector terminals nos. 2 and 5, and between terminals 5 and 6 under the same conditions as the 1-1 check, confirm that the resistance gradually fluctuates within the standard value range.

**Standard value: 0.65 – 5.35 k $\Omega$**

**BLOW VENT CHANGEOVER DAMPER MOTOR CHECK****Motor Check**

Battery connection terminal		Lever operation
1	3	
+	-	Turn to DEF. side.
-	+	Turn to FACE side.

**NOTE**

When the lever is in the OFF position, no power is supplied.

**POTENTIOMETER CHECK**

When measuring the resistance between connector terminals nos. 2 and 5, and between terminals 5 and 6 under the same conditions as the 2-1 check, confirm that the resistance gradually fluctuates within the standard value range.

**Standard value: 0.65 – 5.35 k $\Omega$**

**BLOWER MOTOR CHECK**

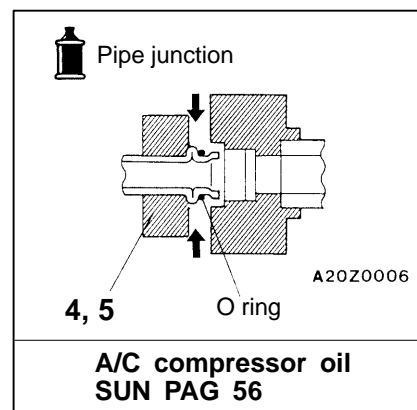
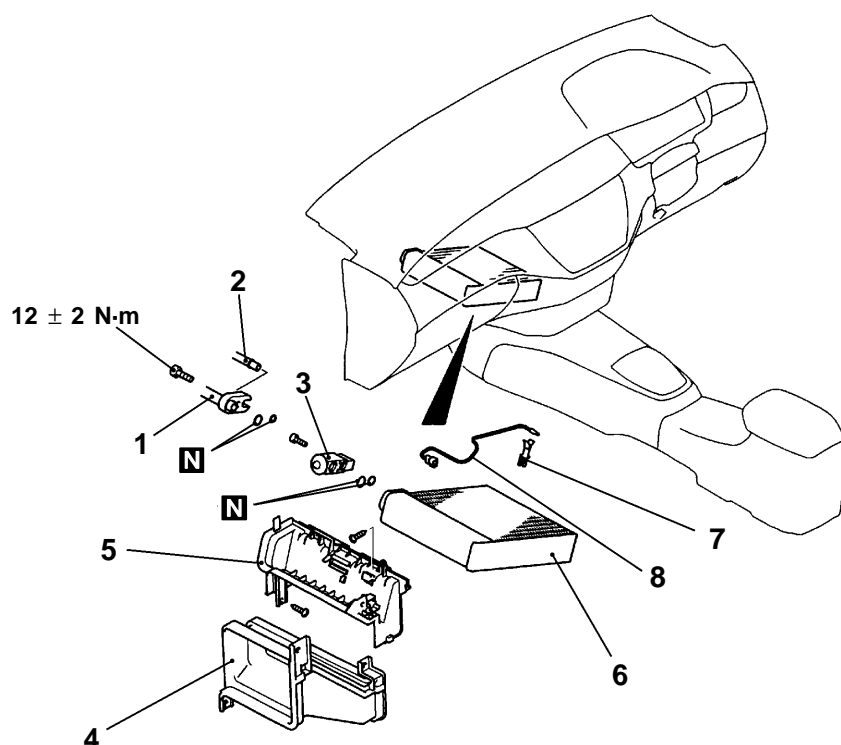
With the blower motor installed in the vehicle, use MUT-II to execute nos. 01 – 04 of the actuator test. Confirm that the motor is operating normally.

# EVAPORATOR, AIR THERMO SENSOR REMOVAL AND INSTALLATION

MAIN

Group  
55

55B



AY0392AU

## Removal steps

- Glovebox (Refer to [Instrument Panel.](#))

1. Flexible suction hose connection
2. Liquid pipe B connection
3. Expansion valve

4. Joint duct
5. Evaporator cover
6. Evaporator
7. Air thermo sensor clip
8. Air thermo sensor



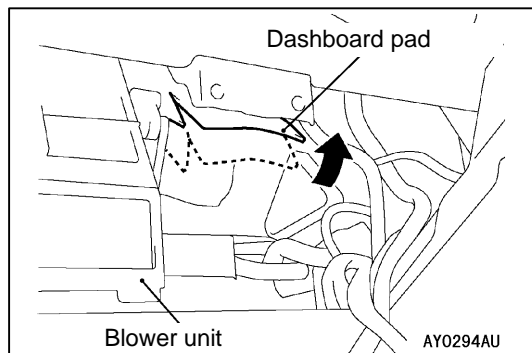
## REMOVAL SERVICE POINTS

### ◀A▶ FLEXIBLE SUCTION HOSE/LIQUID PIPE B/EXPANSION VALVE DISCONNECTION

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

#### NOTE

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



## ◀B▶ EVAPORATOR REMOVAL

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

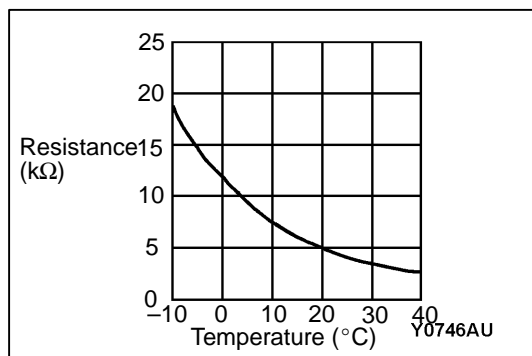
### NOTE

Do not cut the top of the pad.

## INSTALLATION SERVICE POINTS

### ▶A◀ EVAPORATOR INSTALLATION

After installing the evaporator, glue the cut dashboard panel pad with an adhesive agent.



## AIR THERMO SENSOR CHECK

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

### NOTE

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

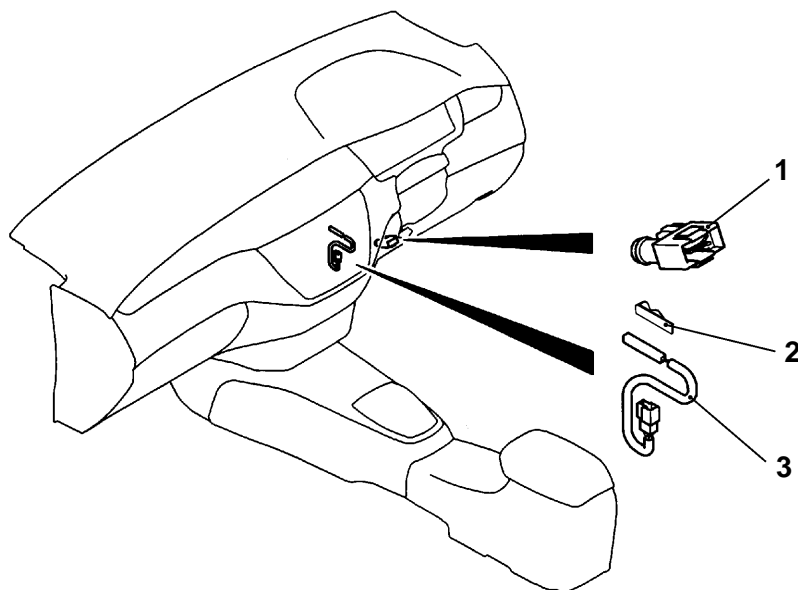
# CABIN TEMPERATURE SENSOR, HEATER WATER TEMPERATURE SENSOR

## REMOVAL AND INSTALLATION

MAIN

Group  
55

55B



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1. Cabin Temperature Sensor

### Heater water temperature sensor removal steps

- Foot duct removal



2. Clip



3. Heater water temperature sensor

## REMOVAL SERVICE POINTS

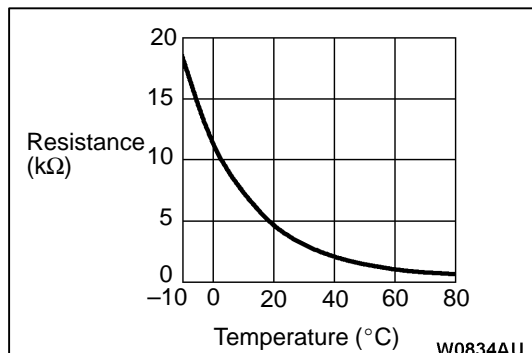
### ◀A▶ CLIP/HEATER WATER TEMPERATURE SENSOR REMOVAL

Remove the clip from the side of the heater unit and lift the heater water temperature sensor out of the heater unit.

## INSTALLATION SERVICE POINTS

### ▶A◀ HEATER WATER TEMPERATURE SENSOR/CLIP INSTALLATION

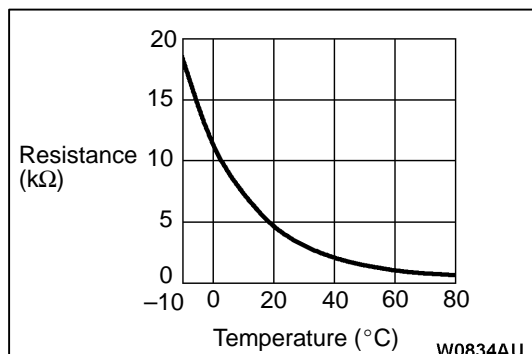
Insert the heater water temperature sensor into the mounting hole on the side of the heater unit and secure the sensor with the clip.



## INSPECTION

### CABIN TEMPERATURE SENSOR CHECK

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



### HEATER WATER TEMPERATURE SENSOR CHECK

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

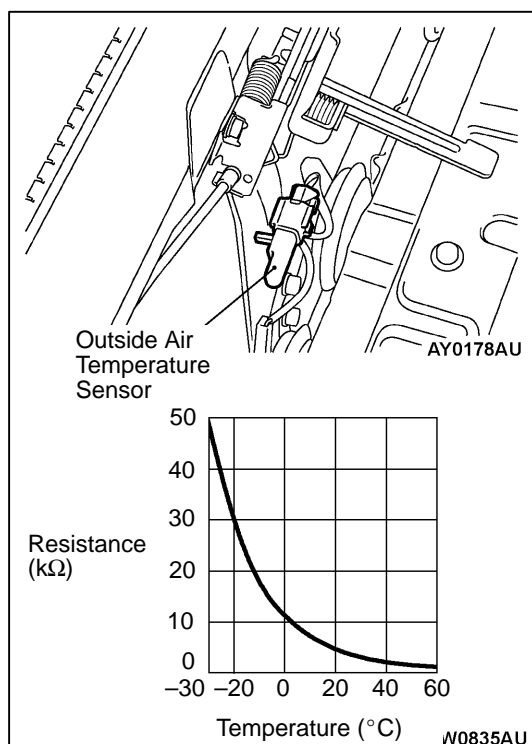
## PHOTO SENSOR REMOVAL AND INSTALLATION

Refer to [Instrument panel](#)

## INSPECTION

### PHOTO SENSOR CHECK

When the full automatic air conditioner is operating, cover the insolation sensor photo-sensor with your hand. If the blower speed drops, it is normal. If the blower speed does not drop, replace the photo sensor.



## OUTSIDE AIR TEMPERATURE SENSOR

## INSPECTION

### OUTSIDE AIR TEMPERATURE SENSOR CHECK

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

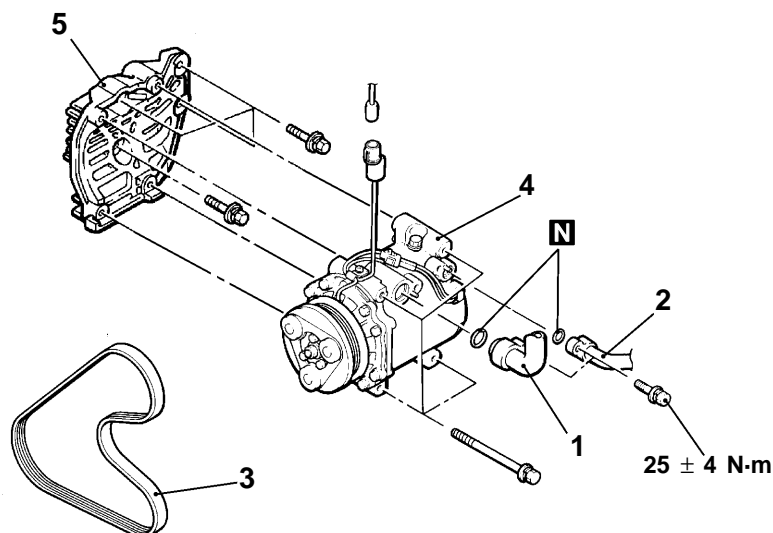
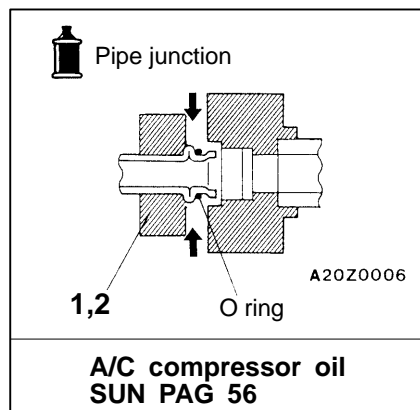
# COMPRESSOR

## REMOVAL AND INSTALLATION

**Pre-removal Operation**  
Refrigerant Draining.

**Post-removal Operation**

- Refrigerant Refilling.
- Drive Belt Tension Check (Refer to [Engine Adjustment.](#))



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### Removal steps



1. Flexible suction hose connection
2. Flexible discharge hose connection
3. Drive belt



4. Compressor
5. Compressor bracket

## REMOVAL SERVICE POINTS

### ◀A▶ FLEXIBLE SUCTION HOSE/FLEXIBLE DISCHARGE HOSE DISCONNECTION

To prevent the entry of dust or other foreign bodies, plug the dismantled hoses and compressor nipples.

#### NOTE

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

### ◀B▶ DRIVE BELT REMOVAL

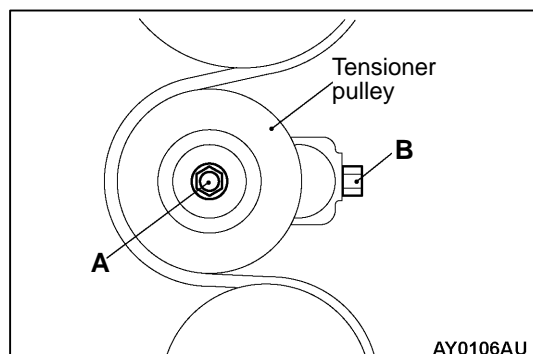
1. Tighten tensioner pulley locknut A.
2. Turn the adjusting bolt B anticlockwise, and then remove the drive belt.

#### NOTE

If the drive belt is to be reused, be sure to first mark an arrow showing the rotation direction (clockwise) on the back of the belt.

### ◀C▶ COMPRESSOR REMOVAL

Take care not to spill any compressor oil when removing the compressor.





## INSTALLATION SERVICE POINTS

### ►A◄ COMPRESSOR INSTALLATION

When installing a new compressor, install after first adjusting the oil level as follows.

1. Measure the oil in the compressor you removed ( $X \text{ cm}^3$ ).
2. Drain the amount of oil calculated by the following formula from the new compressor. Now install the compressor.

$$150 \text{ cm}^3 - X \text{ cm}^3 = Y \text{ cm}^3$$

NOTE:

- (1)  $150 \text{ cm}^3$  indicates the amount of oil sealed in the new compressor at the factory.
- (2)  $Y \text{ cm}^3$  indicates the amount of oil in the refrigerant line, compressor, and cooling unit.

### INSPECTION

Refer to [Compressor](#).

## OTHER PARTS

The other parts and servicing methods are the same as for the air conditioner in the Manual Heater

- On-vehicle service
- A/C pressure sensor
- Blower relay, A/C compressor relay, fan controller
- Cabin/outside air changeover damper motor
- Blower assembly
- Condenser assembly, condenser fan
- Refrigerant line
- Duct type
- Ventilation