

# HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

# AC

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# BASIC DIAGNOSTIC PROCEDURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 1. Basic Diagnostic Procedure

### A: PROCEDURE

Step	Check	Yes	No
<b>1 START INSPECTIONS.</b> 1) Perform pre-inspection. 2) Perform self-diagnosis. <Ref. to AC-9, OPERATION, Self-Diagnosis Procedure.>	Dose self-diagnosis operate?	Go to step 2.	<Ref. to AC-12, A/C AND/OR SELF-DIAGNOSIS SYSTEMS DO NOT OPERATE, Diagnostics for A/C System Failure.>
<b>2 CHECK DTC.</b> Check DTC.	Is DTC indicated?	<Ref. to AC-24, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Go to step 3.
<b>3 CHECK BLOWER MOTOR OPERATION.</b> 1) Turn blower switch ON. 2) Check blower motor operation.	Is blower motor rotated?	Go to step 4.	<Ref. to AC-14, BLOWER MOTOR DOES NOT ROTATE, Diagnostics for A/C System Failure.>
<b>4 CHECK FRESH/RECIRC MODE.</b> Change FRESH/RECIRC mode by pushing mode switch.	Is FRESH/RECIRC mode changed?	Go to step 5.	<Ref. to AC-20, FRESH/RECIRC DOES NOT CHANGE, Diagnostics for A/C System Failure.>
<b>5 CHECK COMPARTMENT TEMPERATURE.</b> 1) Turn A/C switch ON. 2) Set temperature at 18°C (65°F) (MAX COOL). 3) Check compartment temperature changes.	Is the compartment temperature changed?	Go to step 6.	<Ref. to AC-16, COMPARTMENT TEMPERATURE DOES NOT CHANGE FROM "SET" TEMPERATURE OR AIR CONDITIONING SYSTEM DOES NOT RESPOND QUICKLY, Diagnostics for A/C System Failure.>
<b>6 CHECK A/C SYSTEM RESPONSE.</b> Change the temperature setting, and check response of A/C system.	Dose A/C system respond quickly?	A/C system is OK.	<Ref. to AC-16, COMPARTMENT TEMPERATURE DOES NOT CHANGE FROM "SET" TEMPERATURE OR AIR CONDITIONING SYSTEM DOES NOT RESPOND QUICKLY, Diagnostics for A/C System Failure.>

# GENERAL DESCRIPTION

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 2. General Description

### A: CAUTION

- 1) Never connect the battery in reverse polarity.
  - The auto A/C control module may be destroyed instantly.
- 2) Do not disconnect the battery terminals while the engine is running.
  - A large counter electromotive force will be generated in the alternator, and this voltage may damage electronic parts such as A/C control module.
- 3) Before disconnecting the connectors of each sensor and the A/C control module, be sure to turn off the ignition switch.
  - Otherwise, the Auto A/C control module may be damaged.
- 4) Every auto A/C-related part is a precision part. Do not drop them.
- 5) Airbag system wiring harness is routed near the A/C control panel (A/C control module) and junction box.

### CAUTION:

- All airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the A/C control panel (A/C control module) and junction box.

### B: INSPECTION

Before performing diagnosis, check the following items which might affect engine problems.

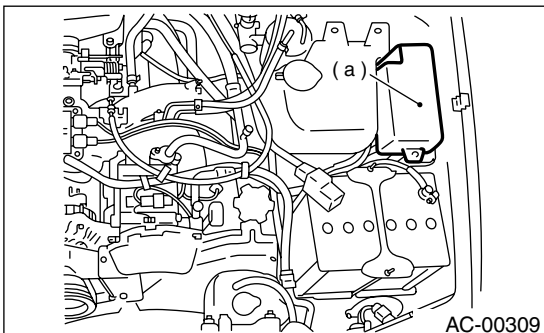
#### 1. BATTERY

- 1) Measure battery voltage and specific gravity of electrolyte.

**Standard voltage: 12 V**

**Specific gravity: Above 1.260**

- 2) Check the condition of the fuses for A/C, heater and other fuses.

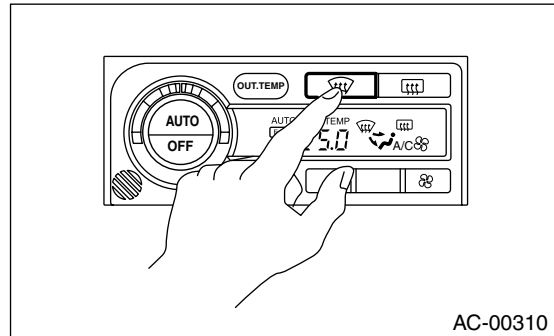


(a) Main fuse box

- 3) Check the condition of the harnesses and harness connectors connection.

## 2. ASPIRATOR HOSE

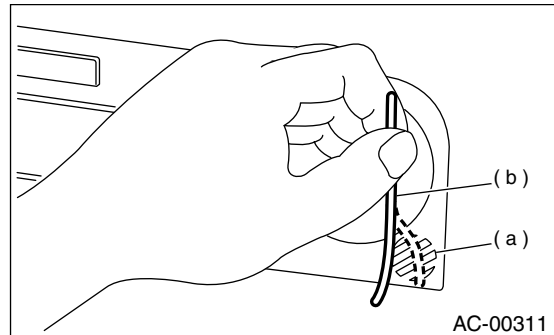
- 1) Turn ignition switch to ON.
- 2) Push "DEF" switch and then blower fan switch to turn the blower fan to maximum speed.



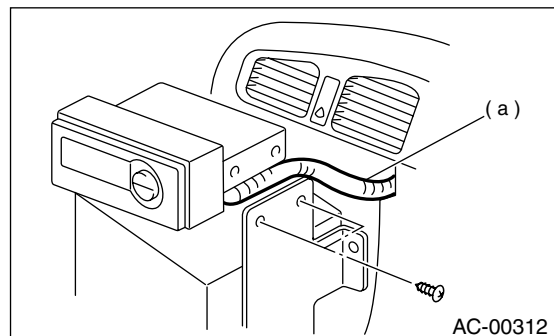
- 3) Firmly hold a thin thread (b) in front of the in-vehicle sensor suction port (a) for the auto A/C control unit and check that the thread moves towards the port indicating that air is being sucked into the port.

### NOTE:

- Ensure the thread does not get sucked into the port.



- 4) If the thread does not move at all, remove the auto A/C control unit <Ref. to AC-31, REMOVAL, Control Unit.> and check for improper connection of the aspirator hose (a) and auto A/C control unit and secure as necessary.



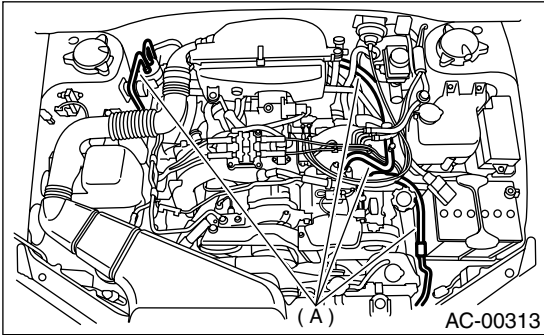
# GENERAL DESCRIPTION

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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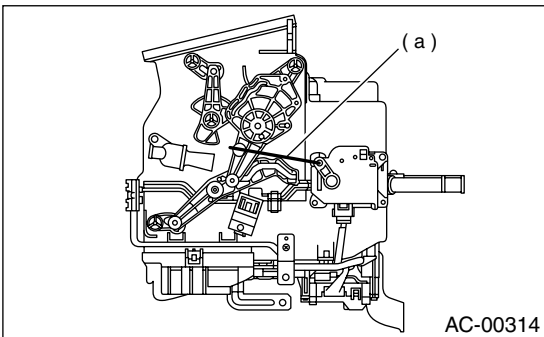
### 3. REFRIGERANT LINE

Check contact for refrigerant line (A).



### 4. CONTROL LINKAGE

- 1) Check state of mode door control rod and linkage.
- 2) Check state of air mix door control rod and linkage.
- 3) Check state of intake door control rod and linkage.



(a) Control rod

# GENERAL DESCRIPTION

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 5. CONTROL SWITCHES

Start and warm up engine completely.

1) Inspection using switches.

No.	Point to check	Switch operation	Judgement standard
1	OFF switch	OFF switch "ON"	"SET" temperature display go out. <ul style="list-style-type: none"> <li>• Air flow → OFF</li> <li>• Outlet → HEAT</li> <li>• Inlet → FRESH</li> <li>• Compressor → OFF</li> </ul>
2	AUTO switch	A. AUTO switch "ON" B. Temp. control dial 18°C (65°F) (Max. Cold)	a. AUTO switch display illuminates. b. <ul style="list-style-type: none"> <li>• Outlet air → Cool</li> <li>• Air flow → HI (AUTO)</li> <li>• Outlet → VENT</li> <li>• Inlet → AUTO</li> <li>• Compressor → AUTO</li> </ul>
		C. TEMP control dial is gradually set from 18°C (65°F) to 32°C (85°F).	c. Air and air outlet mode change as follows: <ul style="list-style-type: none"> <li>• Outlet air: cool → hot</li> <li>• Air flow: AUTO</li> <li>• Outlet: VENT → BI-LEVEL → HEAT</li> <li>• Inlet: AUTO</li> </ul>
		D. Temp. control dial 32°C (85°F) (Max. Hot)	d. Outlet air → Hot <ul style="list-style-type: none"> <li>• Air flow → HI (AUTO)</li> <li>• Outlet → HEAT</li> <li>• Inlet → FRESH (AUTO)</li> <li>• Compressor → AUTO</li> </ul>
3	DEF switch	A. DEF switch "ON" B. Temp. control dial 18 — 32°C (65 — 85°F)	a. DEF switch display illuminates. b. <ul style="list-style-type: none"> <li>• Outlet air temperature (AUTO control)</li> <li>• Air flow (AUTO control)</li> <li>• Outlet → DEF</li> <li>• Inlet → FRESH</li> <li>• Compressor → ON</li> </ul>
4	FRESH/RECIRC switch	FRESH/RECIRC switch "ON"	Changes from RECIRC → FRESH, or FRESH → RECIRC.
5	MODE switch	MODE switch "ON"	Outlet changes from VENT → BI-LEVEL → HEAT → DEF/HEAT each time MODE switch is pushed.
6	FAN switch	FAN switch "ON"	Fan speed changes from LO → M1 → M2 → HI each time FAN switch is pushed.
7	OUT-TEMP switch	OUT-TEMP switch "ON"	Ambient temperature flashes on "set" temperature display, and "set" temperature appears.

2) Compressor operation inspection

No.	Point to check	Switch operation	Judgement standard	Remarks
1	Compressor	A. AUTO switch "ON" B. A/C switch "ON" C. DEF switch "ON"	a. Compressor ON b. Compressor ON c. Compressor ON	Compressor turns OFF several seconds after AUTO switch is turned ON.

3) Illumination control inspection

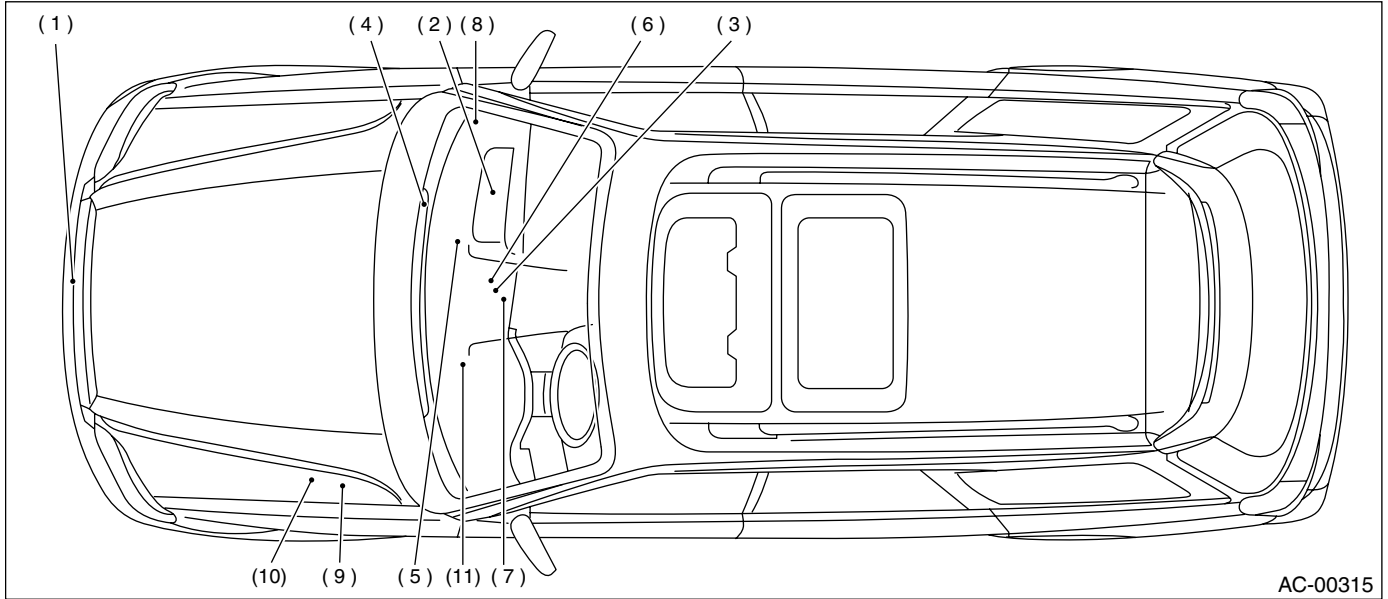
No.	Point to check	Switch operation	Judgement standard	Remarks
1	Illumination	Lighting switch "ON"	Illumination light illuminates and both switch light and "set" temperature display dim.	Green lights remain on although OFF and OUT-TEMP switches remain ON.
		Press OFF switch longer than 1 second.	Dimming of illumination is canceled.	

# ELECTRICAL COMPONENTS LOCATION

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 3. Electrical Components Location

### A: LOCATION



AC-00315

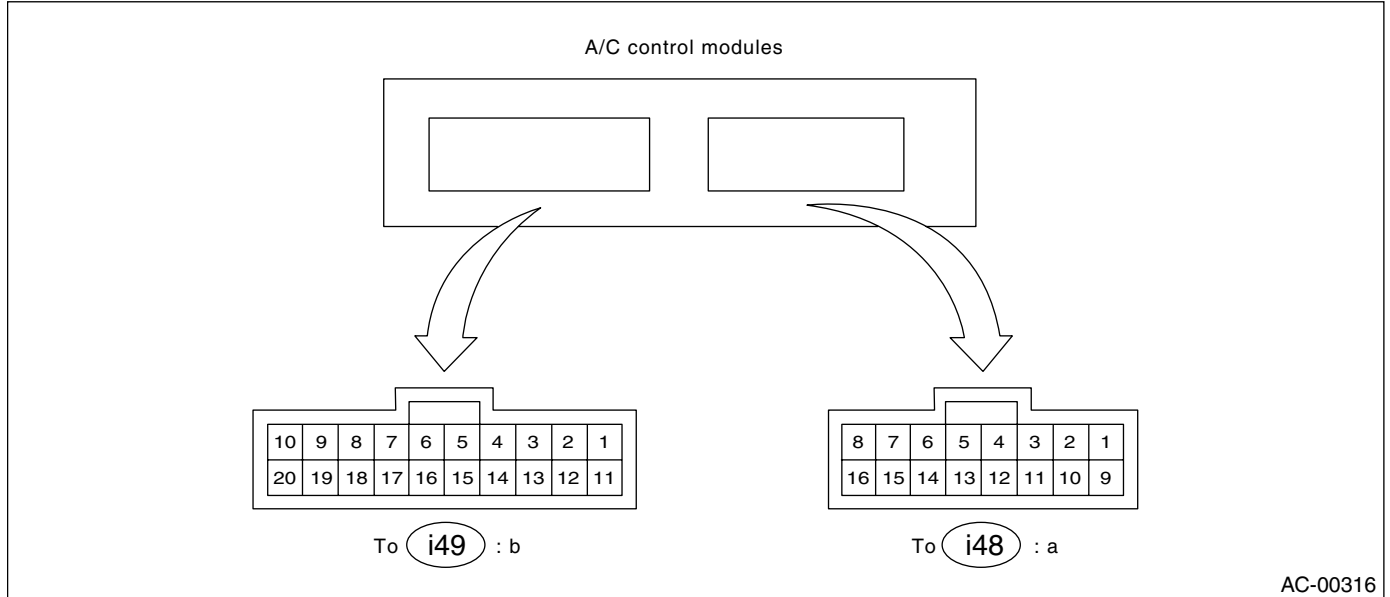
- |                       |                             |                         |
|-----------------------|-----------------------------|-------------------------|
| (1) Ambient sensor    | (5) Evaporator sensor       | (9) A/C relay           |
| (2) Blower motor      | (6) Auto A/C control module | (10) A/C fuse           |
| (3) In-vehicle sensor | (7) Air mix door actuator   | (11) Mode door actuator |
| (4) Sunload sensor    | (8) Intake door actuator    |                         |

# A/C CONTROL MODULE I/O SIGNAL

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 4. A/C Control Module I/O Signal

### A: ELECTRICAL SPECIFICATION



Content	Connector & Terminal No.	Signal (V)
BATT voltage (Memory back-up)	b1—b12	BATT voltage, 13 — 14 (engine running)
IGN power supply	a8—b12	Battery voltage (ignition switch ON), 13 — 14 (engine running)
ACC power supply (OFF: ignition in START or diagnosis system reset)	b2—b12	BATT voltage, 0 (engine cranking), BATT voltage (during engine starts)
A/C control module ground circuit	b12—body ground	0 (ignition switch ON) — circuit constantly grounded
Sensor ground circuit	b17—body ground	0 (ignition switch ON) — circuit constantly grounded
Ambient sensor	b6—b17	Approx. 3.3 (disconnect connector, and ignition switch ON)
Evaporator sensor	b7—b17	
Thermometer	b15—b12	
Sunload sensor	b16—b17	Approx. 4.2 (disconnect connector, and ignition switch ON)
Air mix door actuator	a4—a3	BATT voltage (AUTO mode) positive “+” at terminal “a4” and negative “-” at “a3” [temperature set at 18°C (65°F)]; negative “-” at terminal “a4” and positive “+” at “a3” [temperature set at 32°C (90°F)]
Air mix door actuator P.B.R.	a12—b17	Approx. 0.5 [temperature set at 18°C (65°F) in AUTO mode] Approx. 4.5 [temperature set at 32°C (90°F) in AUTO mode]
Mode actuator VENT	a5—b17	BATT voltage (ignition switch ON in MANUAL mode); positive “+” at terminal “a5” and negative “-” at “b17” (VENT); negative “-” at “a5” and positive “+” at “b17” (DEF)
Mode actuator DEF	a6—b17	BATT voltage (ignition switch ON in MANUAL mode) Approx. 4.5 (VENT); approx. 0.5 (DEF)
Intake door actuator FRS voltage	a7—a15	BATT voltage (CIRC switch OFF)
Intake door actuator CIRC voltage	a15—a7	BATT voltage (CIRC switch ON)
Blower fan relay	b14—body ground	BATT voltage (ignition switch ON)
A/C relay	b3—b12	0 (ignition and A/C switches ON) BATT voltage (A/C switch OFF)
Illumination control signal	b10—b20	BATT voltage (ignition and lighting switches ON)
Rear defogger	a13—b12	0 (IGN ON, R Def SW ON)

## **A/C CONTROL MODULE I/O SIGNAL**

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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### **B: SCHEMATIC**

<Ref. to WI-54, SCHEMATIC, Air Conditioning System.>

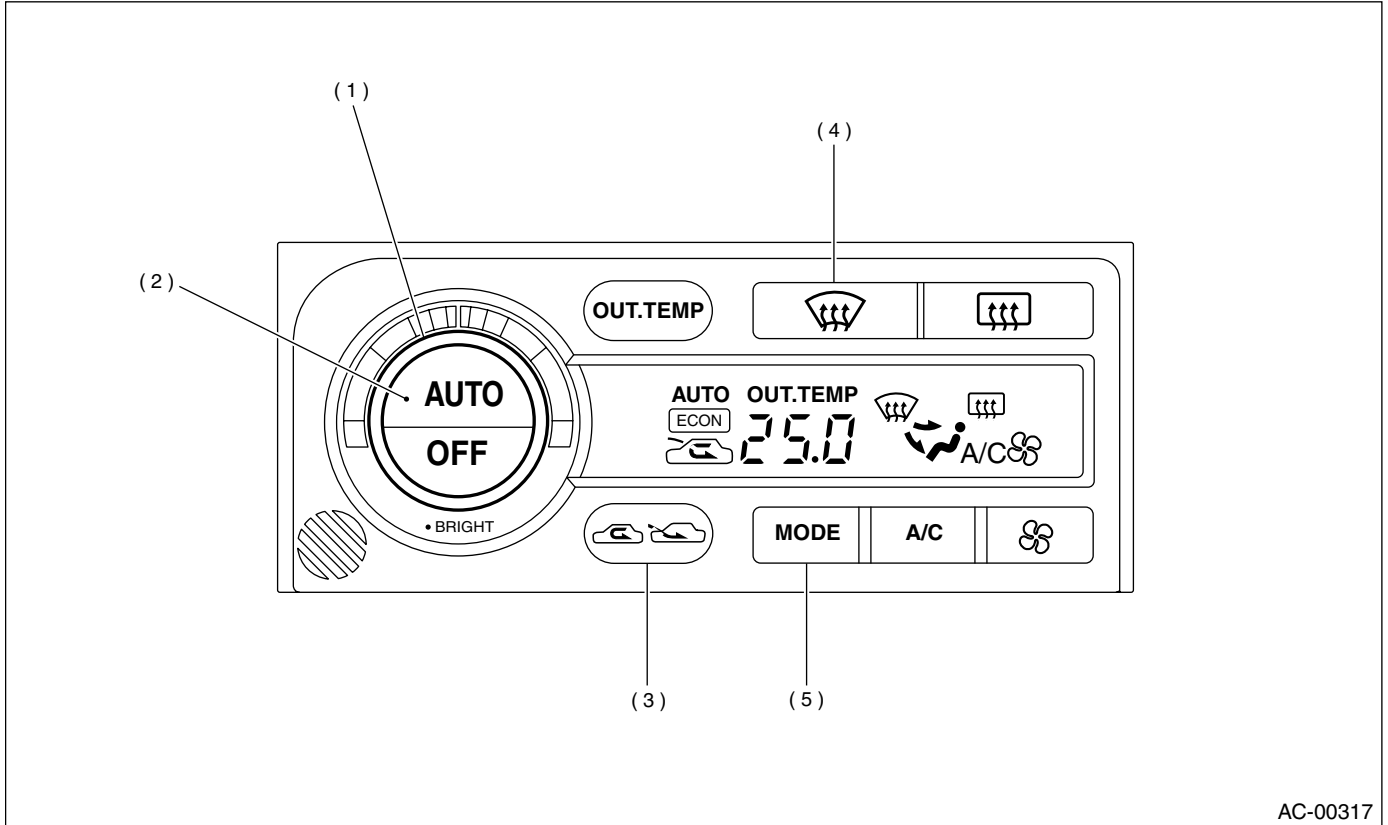


# SELF-DIAGNOSIS PROCEDURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 5. Self-Diagnosis Procedure

### A: OPERATION



AC-00317

- (1) Temperature control dial
- (2) AUTO switch

- (3) FRESH/RECIRC switch

- (5) MODE switch

# SELF-DIAGNOSIS PROCEDURE

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 SELECT CONTROL PANEL TO SELF-DIAGNOSIS MODE.</b> 1) Turn ignition switch to OFF. 2) While pushing "AUTO" and "FRESH/RECIRC" switches, start the engine.	Can it be moved to the self-diagnosis mode?	Go to step 2.	<Ref. to AC-12, A/C AND/OR SELF-DIAGNOSIS SYSTEMS DO NOT OPERATE, Diagnostics for A/C System Failure.>
<b>2 CHECK INDICATOR.</b> 1) Turn temperature control dial clockwise by one click. 2) Make sure that all characters illuminate on the display.	Does each character illuminate?	Go to step 3.	Go to step 7.
<b>3 CHECK EACH SENSOR AND EACH POTENTIOMETER.</b> 1) Turn temperature control dial clockwise by one click. 2) If system has the trouble for each sensor and/or each potentiometer, DTC is indicated on indicator. 3) If system has no trouble, DTC "20" is indicated on indicator.  NOTE: When the sunload sensor is checked inside the passenger compartment or in the shade, DTC "25" may appear on the indicator. Always check the sunload sensor in a place where it senses direct sunlight.	Is the DTC "20" indicated on indicator?	Go to step 4.	Perform diagnosis procedure according to the displayed DTC. <Ref. to AC-22, DTC FOR SENSOR AND POTENTIOMETER, LIST, List of Diagnostic Trouble Code (DTC).>
<b>4 CHECK DOOR MOTOR POSITION SWITCH.</b> 1) Turn temperature control dial clockwise by one click. 2) If system has the trouble for each door position switch, DTC is indicated on indicator. 3) If system has no trouble, DTC "30" is indicated on indicator.	Is the DTC "30" indicated on indicator?	Go to step 5.	Perform diagnosis procedure for mode door actuator. <Ref. to AC-34, DTC 31, 32, 33, 34 OR 35 (MODE DOOR ACTUATOR), Diagnostic Procedure with Diagnostic Trouble Code (DTC).>
<b>5 CHECK OPERATION OF EACH ACTUATOR, BLOWER FAN AND COMPRESSOR CLUTCH.</b> 1) Turn temperature control dial clockwise by one click. 2) Select operating mode by pushing every "DEF" switch. 3) Check the operation for each mode. •Air inlet: •Air outlet: •Air mix door: •Blower fan: •A/C compressor:	Does each mode displayed match the operating mode table? <Ref. to AC-11, OPERATING MODE TABLE, OPERATION, Self-Diagnosis Procedure.>	Go to step 6.	Go to step 7.

# SELF-DIAGNOSIS PROCEDURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>6 CHECK INDICATED VALUE OF EACH SENSOR.</b> 1) Turn temperature control dial clockwise by one click. 2) Each time the "DEF" switch is pressed, the value indicated on the display changes to correspond with the ambient sensor, in-vehicle sensor and intake sensor, in that order. 3) Make sure there is no big difference between the temperature indicated on the display and the measured temperature.	Is a proper input signal value displayed in each sensor?	End	Go to step 7.
<b>7 CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

## 1. OPERATING MODE TABLE

Mode display	41	42	43	44	45	46	47	48
Air inlet	REC	REC	REC	FRE	FRE	FRE	FRE	FRE
Air outlet	VENT	VENT	B/L	B/L	B/L	HEAT	D/H	DEF
Air mix door	FULL COOL	FULL COOL	FULL COOL	FULL HOT	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower fan	5V	5V	Power supply voltage	8.5V	8.5V	8.5V	8.5V	Power supply voltage
A/C compressor	ON	ON	ON	OFF	OFF	OFF	ON	ON

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

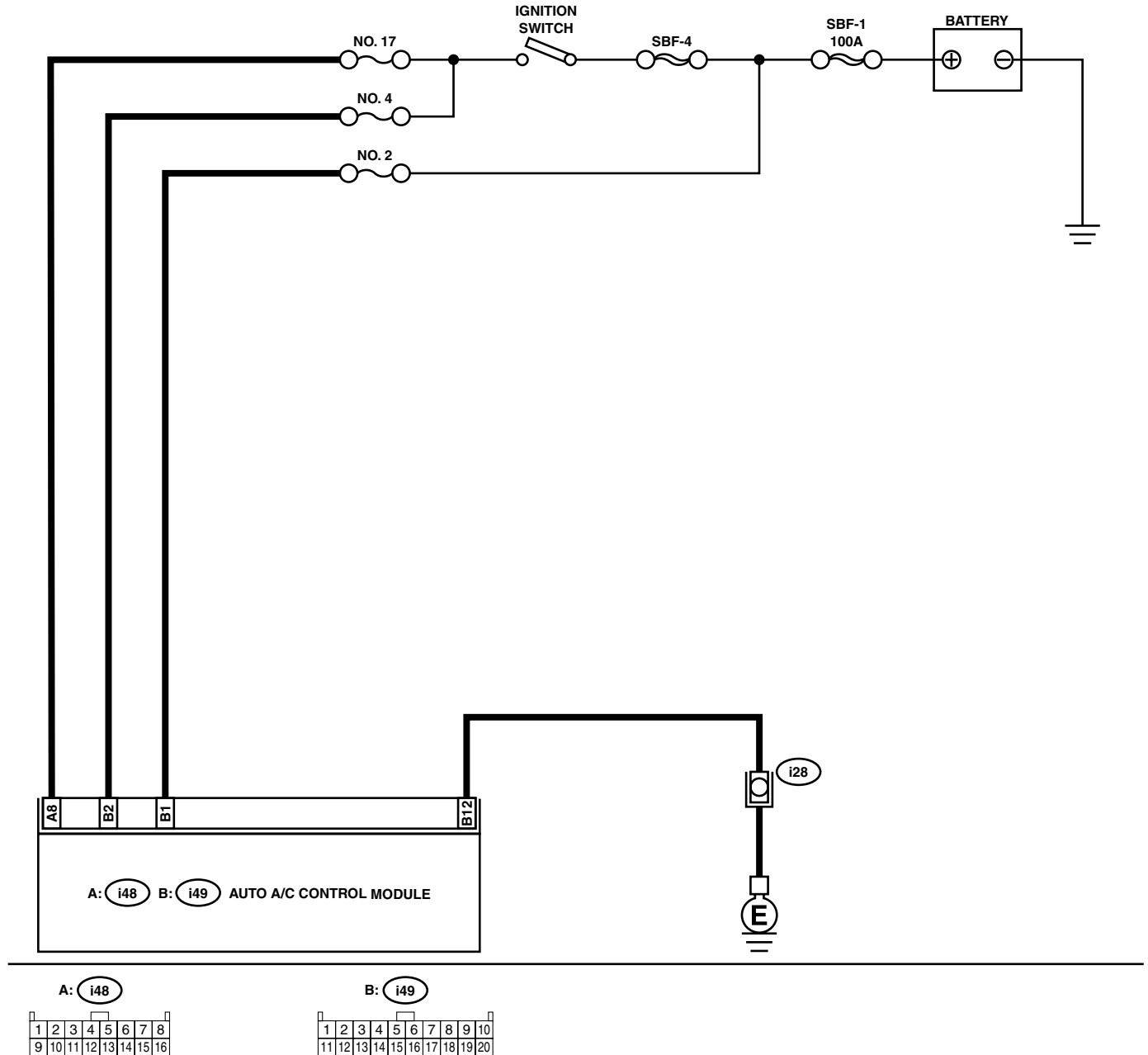
## 6. Diagnostics for A/C System Failure

### A: A/C AND/OR SELF-DIAGNOSIS SYSTEMS DO NOT OPERATE

#### TROUBLE SYMPTOM:

- "Set" temperature is not indicated on display, switch LEDs are faulty and switches do not operate.
- Self-diagnosis system does not operate.

#### WIRING DIAGRAM:



AC-00318

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK FUSE.</b> 1) Turn ignition switch to OFF. 2) Remove fuse No. 2 from main fuse box. 3) Check condition of fuse.	Is the fuse blown out?	Replace fuse.	Go to step 2.
<b>2</b> <b>CHECK FUSE.</b> 1) Turn ignition switch to OFF. 2) Remove fuses No. 4 and No. 17 from fuse & relay box. 3) Check condition of fuse.	Is the fuse blown-out?	Replace fuse.	Go to step 3.
<b>3</b> <b>CHECK A/C CONTROL MODULE POWER CIRCUIT.</b> 1) Disconnect A/C control module connector. 2) Measure voltage between A/C control module connector terminal and chassis ground when turning ignition switch to OFF. <b>Connector &amp; terminal</b> <i>(i49) No. 1 (+) — Chassis ground (-):</i>	Is the measured value more than 10 V?	Go to step 4.	Repair harness for power supply line.
<b>4</b> <b>CHECK A/C CONTROL MODULE POWER CIRCUIT.</b> Measure voltage between A/C control module connector terminal and chassis ground when turning ignition switch to ACC. <b>Connector &amp; terminal</b> <i>(i49) No. 2 (+) — Chassis ground (-):</i>	Is the measured value more than 10 V?	Go to step 5.	Repair harness for power supply line.
<b>5</b> <b>CHECK A/C CONTROL MODULE POWER CIRCUIT.</b> Measure voltage between A/C control module connector terminal and chassis ground when turning ignition switch to ON. <b>Connector &amp; terminal</b> <i>(i48) No. 8 (+) — Chassis ground (-):</i>	Is the measured value more than 10 V?	Go to step 6.	Repair harness for power supply line.
<b>6</b> <b>CHECK A/C CONTROL MODULE GROUND CIRCUIT.</b> Measure resistance of harness between A/C control module and chassis ground. <b>Connector &amp; terminal</b> <i>(i49) No. 12 — Chassis ground:</i>	Is the measured value less than 1 Ω?	Go to step 7.	Repair harness for ground line.
<b>7</b> <b>CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

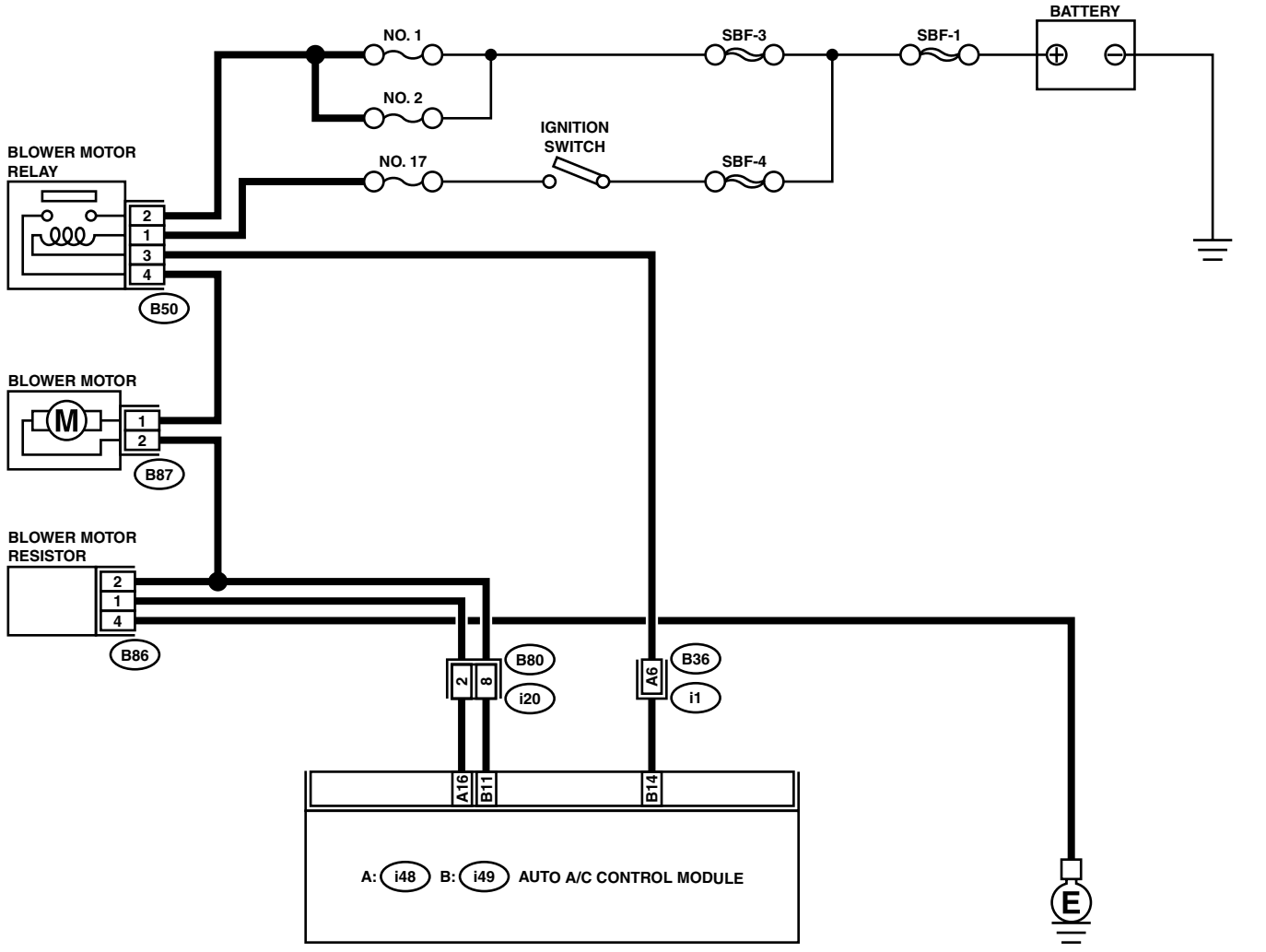
HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## B: BLOWER MOTOR DOES NOT ROTATE

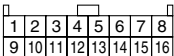
### TROUBLE SYMPTOM:

- Blower motor does not rotate.
- Blower motor does not rotate in "HI".

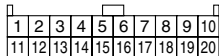
### WIRING DIAGRAM:



A: i48



B: i49



AC-00319

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

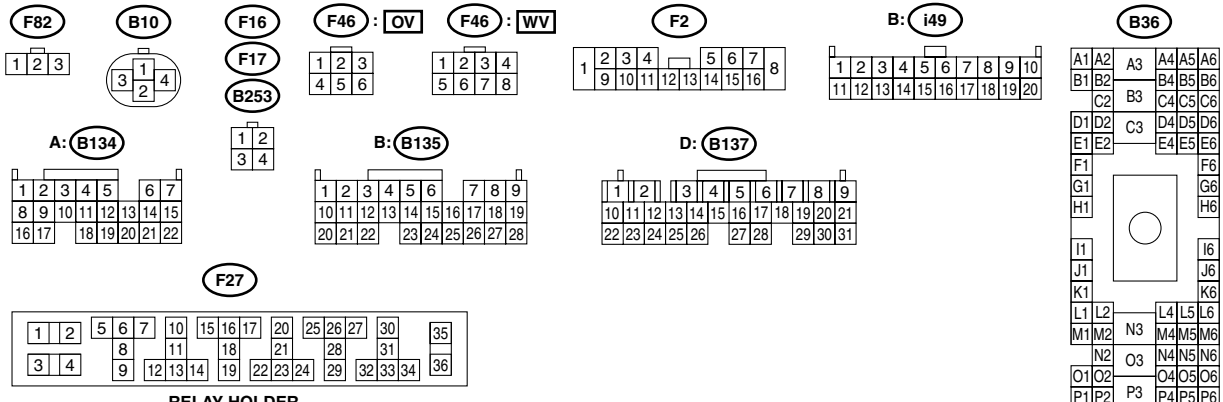
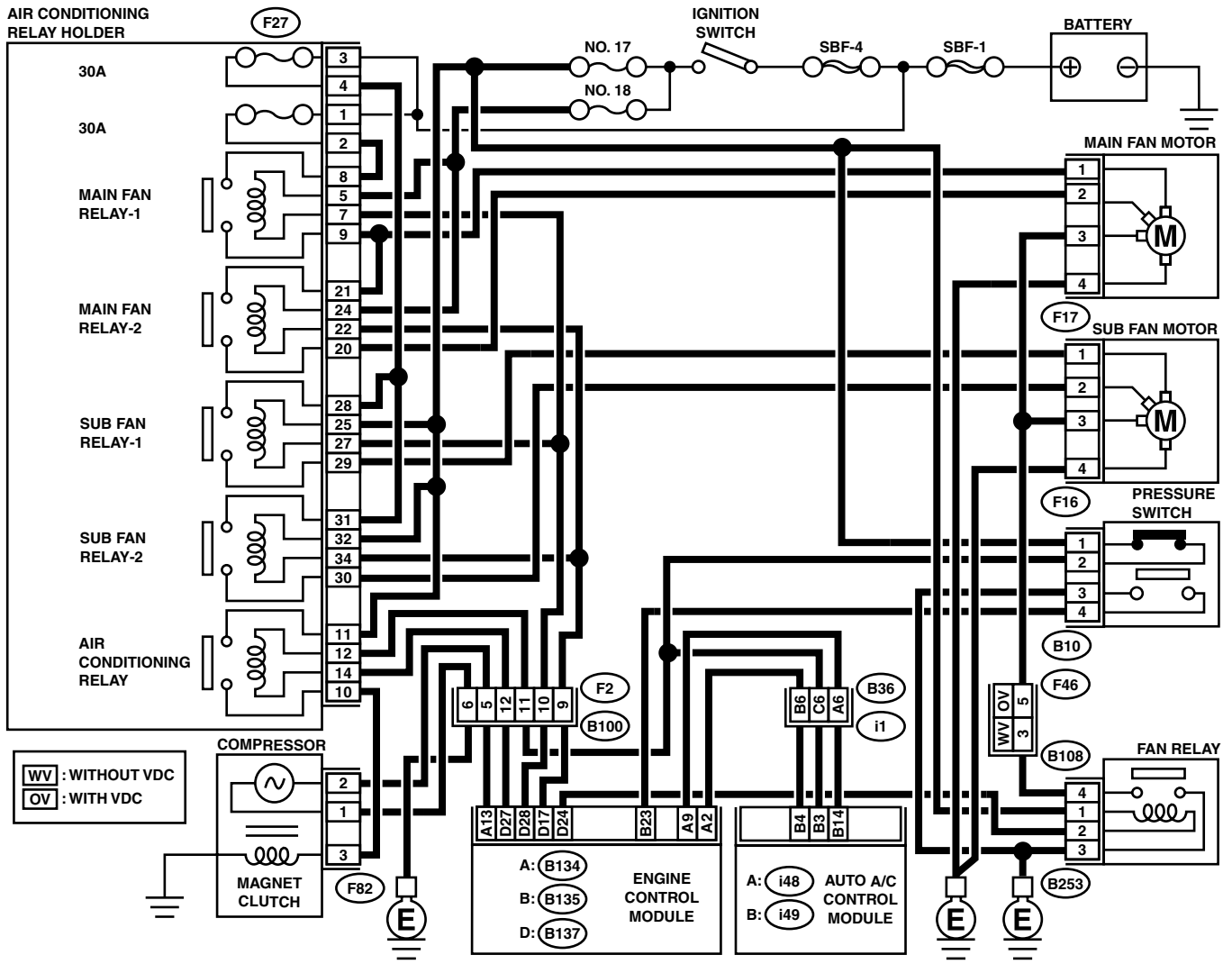
Step	Check	Yes	No
<b>1 CHECK FUSE.</b> 1) Remove No. 1, No. 2 and No. 17 fuses in fuse & relay box. 2) Check condition of fuses.	Is the fuse blown out?	Replace fuse.	Go to step 2.
<b>2 CHECK POWER SUPPLY TO BLOWER FAN MOTOR.</b> 1) Turn ignition switch to ON. 2) Turn blower switch to ON. 3) Measure voltage between blower fan motor and chassis ground. <b>Connector &amp; terminal</b> <b>(B87) No. 1 (+) — Chassis ground (-):</b>	Is the measured value more than 10 V?	Go to step 3.	Repair harness for blower fan motor power supply line.
<b>3 CHECK BLOWER FAN MOTOR RELAY.</b> 1) Turn ignition switch to OFF. 2) Remove blower fan motor relay. 3) Connect terminals as follows: Positive terminal (+) of battery to terminal No. 1 of blower fan motor relay Negative terminal (-) of battery to terminal No. 3 of blower fan motor relay 4) Measure resistance between No. 2 and No. 4 terminals. <b>Terminals:</b> <b>No. 2 — No. 4</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 4.	Replace blower fan motor relay.
<b>4 CHECK BLOWER FAN MOTOR.</b> 1) Disconnect connector from blower fan motor. 2) Connect terminals as follows: Positive terminal (+) of battery to terminal No. 1 of blower fan motor relay Negative terminal (-) of battery to terminal No. 2 of blower fan motor relay 3) Make sure that blower fan motor is operated.	Does the blower fan motor operate?	Go to step 5.	Replace blower fan motor.
<b>5 CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## C: COMPARTMENT TEMPERATURE DOES NOT CHANGE FROM "SET" TEMPERATURE OR AIR CONDITIONING SYSTEM DOES NOT RESPOND QUICKLY

### WIRING DIAGRAM:



AC-00864



# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK FUSE.</b> 1) Turn the ignition switch to OFF. 2) Remove the main fan fuse and sub fan fuse in main fuse box. 3) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Go to step 2.
<b>2 CHECK THE POWER SUPPLY TO PRESSURE SWITCH.</b> 1) Disconnect the connector from pressure switch. 2) Turn the ignition switch to OFF. 3) Measure the resistance between harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B10) No. 1 (+) — Chassis ground (-):</b>	Is the measured value more than 10 V?	Go to step 3.	Repair the harness for pressure switch power supply circuit.
<b>3 CHECK THE HARNESS BETWEEN PRESSURE SWITCH AND A/C RELAY HARNESS.</b> 1) Turn the ignition switch to OFF. 2) Remove the A/C relay in main fuse box. 3) Measure the resistance between A/C relay and pressure switch connector. <b>Connector &amp; terminal</b> <b>(F27) No. 12 — (B10) No. 2:</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 4.	Repair the harness between A/C relay and pressure switch.
<b>4 CHECK THE PRESSURE SWITCH.</b> Measure the resistance between pressure switch terminals. <b>Terminals</b> <b>No. 1 — No. 2:</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 5.	Replace the pressure switch.
<b>5 CHECK THE A/C CUT SIGNAL CIRCUIT.</b> 1) Disconnect the connector from A/C control module. 2) Measure the resistance between A/C control module and pressure switch connector. <b>Connector &amp; terminal</b> <b>(i49) No. 3 — (B10) No. 2:</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 6.	Repair the harness between A/C control module and pressure switch.
<b>6 CHECK THE A/C ON SIGNAL CIRCUIT.</b> 1) Disconnect the connector from engine control module. 2) Measure the resistance between engine control module and A/C control module connector. <b>Connector &amp; terminal</b> <b>(B134) No. 2 — (i49) No. 4:</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 7.	Repair the harness between A/C control module and engine control module.
<b>7 CHECK A/C RELAY.</b> 1) Remove the A/C relay in main fuse box. 2) Check the A/C relay. <Ref. to AC-40, INSPECTION, Relay and Fuse.>	Is the operation of the relay OK?	Go to step 8.	Replace the A/C relay.
<b>8 CHECK POWER SUPPLY TO MAGNET CLUTCH OF A/C COMPRESSOR.</b> 1) Turn the ignition switch to OFF, and then connect the A/C relay connector and all removed connectors. 2) Start the engine, and turn A/C switch to ON. 3) Set the temperature control dial to maximum cold position. 4) Measure the voltage between magnet clutch harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>(F82) No. 3 (+) — Chassis ground (-):</b>	Is the measured value more than 10.5 V (at normal temperature)?	Go to step 9.	Repair the harness for power supply line of A/C compressor.

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>9</b> <b>CHECK OPERATION OF MAIN FAN MOTOR.</b> 1) Start the engine and turn the A/C switch to ON. 2) Check the operation of main fan motor.	Does the main fan motor operate?	Go to step <b>14</b> .	Go to step <b>10</b> .
<b>10</b> <b>CHECK POWER SUPPLY TO MAIN FAN MOTOR.</b> <b>CAUTION:</b> <b>Be careful not to overheat the engine during repair.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from main fan motor. 3) Start the engine, and warm it up until engine coolant temperature increases over 95°C (203°F). 4) Stop the engine and turn ignition switch to ON. 5) Measure the voltage between main fan motor harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>Turbo engine model:</b> <b>(F17) No. 1, 2, 3 (+) — Chassis ground (-):</b>	Is the measured value more than 10 V?	Go to step <b>11</b> .	Repair the harness for main fan motor power supply circuit.
<b>11</b> <b>CHECK GROUND CIRCUIT OF MAIN FAN MOTOR.</b> 1) Measure the resistance between main fan motor harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>(F17) No. 4 — Chassis ground:</b>	Is the measured value less than 1 Ω?	Go to step <b>12</b> .	Repair the harness for main fan motor ground circuit.
<b>12</b> <b>CHECK MAIN FAN MOTOR.</b> Connect the battery positive (+) terminal to terminals No. 1, 2 and 3, and ground (-) terminal to terminal No. 4 of main fan motor connector to make sure that main fan motor rotate.	Does the main fan rotate?	Go to step <b>13</b> .	Replace the main fan motor.
<b>13</b> <b>CHECK POOR CONTACT IN MAIN FAN MOTOR CONNECTOR.</b> Check poor contact in main fan motor harness connector.	Is there poor contact in connector?	Go to step <b>14</b> .	Repair the poor contact in main fan motor connector.
<b>14</b> <b>CHECK OPERATION OF SUB FAN MOTOR.</b> 1) Start the engine and turn the A/C switch to ON. 2) Check the operation of sub fan motor.	Does the sub fan motor operate normally?	Go to step <b>19</b> .	Go to step <b>15</b> .

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<p><b>15 CHECK POWER SUPPLY TO SUB FAN MOTOR.</b></p> <p><b>CAUTION:</b> Be careful not to overheat the engine during repair.</p> <ol style="list-style-type: none"> <li>1) Turn the ignition switch to OFF.</li> <li>2) Disconnect the connector from sub fan motor.</li> <li>3) Start the engine, and warm it up until engine coolant temperature increases over 100°C (212°F).</li> <li>4) Stop the engine and turn ignition switch to ON.</li> <li>5) Measure the voltage between sub fan motor harness connector and chassis ground.</li> </ol> <p><b>Connector &amp; terminal</b> <b>(F16) No. 1, 2, 3 (+) — Chassis ground (-):</b></p>	Is the measured value more than 10 V?	Go to step 16.	Repair the harness for sub fan motor power supply circuit.
<p><b>16 CHECK GROUND CIRCUIT OF SUB FAN MOTOR.</b></p> <p>Measure the resistance between sub fan motor harness connector and chassis ground.</p> <p><b>Connector &amp; terminal</b> <b>(F16) No. 4 — Chassis ground:</b></p>	Is the measured value less than 1 Ω?	Go to step 17.	Repair the harness for sub fan motor ground circuit.
<p><b>17 CHECK SUB FAN MOTOR.</b></p> <p>Connect the battery positive (+) terminal to terminals No. 1, 2 and 3, and ground (-) terminal to terminal No. 4 of sub fan motor connector to make sure that sub fan motor rotate.</p>	Does the sub fan motor rotate?	Go to step 18.	Replace the sub fan motor.
<p><b>18 CHECK POOR CONTACT IN SUB FAN MOTOR CONNECTOR.</b></p> <p>Check poor contact in sub fan motor connector.</p>	Is there poor contact in connector?	Go to step 19.	Repair the poor contact in sub fan motor connector.
<p><b>19 CHECK POOR CONTACT IN AUTO A/C CONTROL MODULE CONNECTOR.</b></p> <p>Check poor contact in auto A/C control module connector.</p>	Is there poor contact in connector?	Replace the auto A/C control module.	Repair the connector.

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

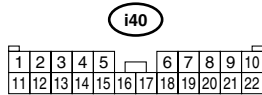
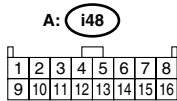
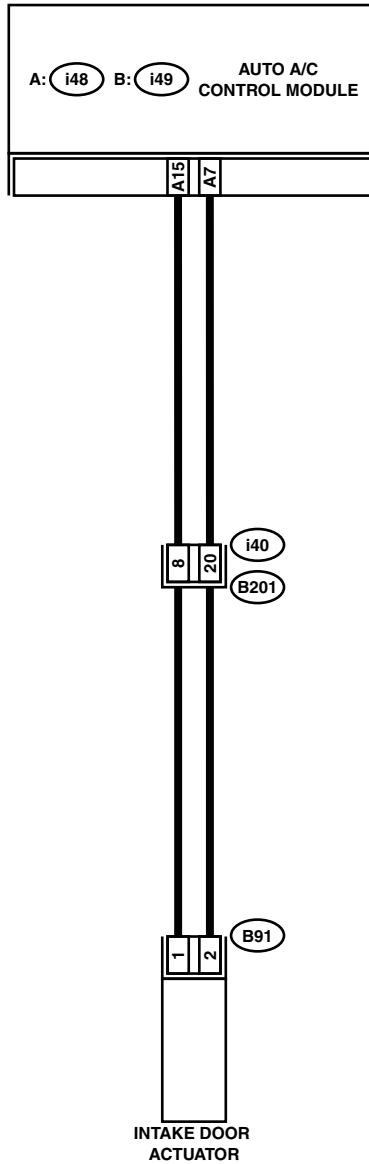
HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## D: FRESH/RECIRC DOES NOT CHANGE

### TROUBLE SYMPTOM:

FRESH/RECIRC mode door does not change.

### WIRING DIAGRAM:



AC-00320

# DIAGNOSTICS FOR A/C SYSTEM FAILURE

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK SWITCH OPERATION.</b> Make sure that the mode selection on display is changed when pushing the "FRESH/RECIRC" switch.	Does the mode selection change?	Go to step 7.	Go to step 2.
<b>2 CHECK FUSE.</b> 1) Remove No. 17 fuse in fuse & relay box. 2) Check condition of fuse.	Is the fuse blown-out?	Replace fuse.	Go to step 3.
<b>3 CHECK SIGNAL VOLTAGE.</b> 1) Change display to RECIRC by pushing FRESH/RECIRC switch. 2) Measure voltage between A/C control module and chassis ground.  <b>Connector &amp; terminal:</b> <i>(i48) No. 15 (+) — Chassis ground (-):</i>	Is the measured value less than 1 V?	Go to step 4.	Repair short circuit in harness between A/C control module and intake door actuator.
<b>4 CHECK SIGNAL VOLTAGE.</b> 1) Change display to FRESH with pushing FRESH/RECIRC switch. 2) Measure voltage between A/C control module and chassis ground.  <b>Connector &amp; terminal:</b> <i>(i48) No. 7 (+) — Chassis ground (-):</i>	Is the measured value less than 1 V?	Go to step 5.	Repair short circuit in harness between A/C control module and intake door actuator.
<b>5 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND INTAKE DOOR ACTUATOR.</b> 1) Turn ignition switch to OFF. 2) Disconnect connector from A/C control module and intake door motor. 3) Measure resistance of harness between A/C control module and intake door actuator.  <b>Connector &amp; terminal:</b> <i>(i48) No. 15 — (B91) No. 1</i>	Is the measured value less than 1 $\Omega$ ?	Go to step 6.	Repair open circuit in harness between A/C control module and intake door actuator.
<b>6 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND INTAKE DOOR ACTUATOR.</b> Measure resistance of harness between A/C control module and intake door actuator.  <b>Connector &amp; terminal:</b> <i>(i48) No. 7 — (B91) No. 2</i>	Is the measured value less than 1 $\Omega$ ?	Go to step 7.	Repair open circuit in harness between A/C control module and intake door actuator.
<b>7 CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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## 7. List of Diagnostic Trouble Code (DTC)

### A: LIST

#### 1. DTC FOR SENSOR AND POTENTIOMETER

DTC	Trouble Unit	Contents
20	No Trouble	—
21	Ambient sensor	Open
-21		Short
22	In-vehicle sensor	Open
-22		Short
24	Evaporator sensor	Open
-24		Short
25	Sunload sensor	Open
-25		Short
26	Air mix door motor	Open
-26		Short

#### 2. DTC FOR MODE DOOR POSITION SWITCH

DTC	30	31	32	33	34	35
Faulty Door	No Trouble	VENT	B/L	HEAT	D/H	DEF

# LIST OF DIAGNOSTIC TROUBLE CODE (DTC)

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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MEMO:

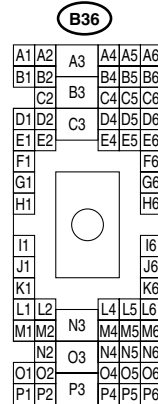
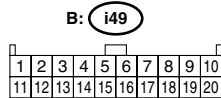
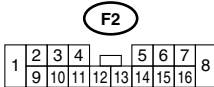
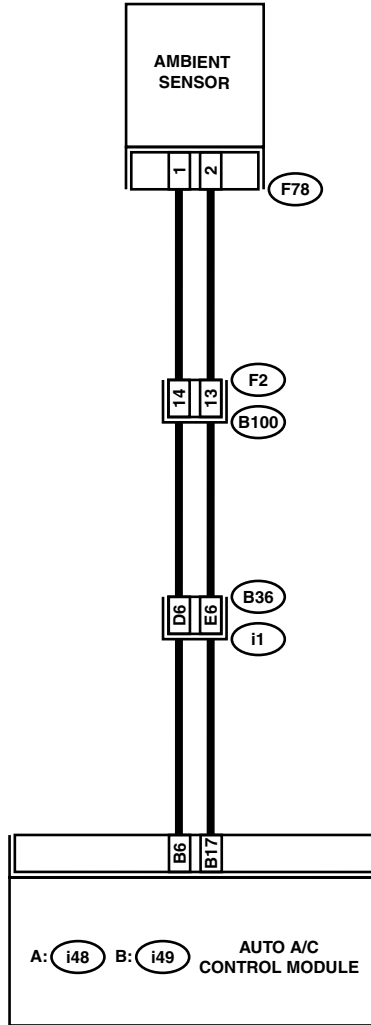
## 8. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

### A: DTC 21 OR -21 (AMBIENT SENSOR)

**TROUBLE SYMPTOM:**

Fan speed, outlets and inlets are not switched when AUTO or ECON switch is ON.

**WIRING DIAGRAM:**





# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK AMBIENT SENSOR.</b> 1) Turn ignition switch to OFF. 2) Disconnect connector from ambient sensor. 3) Measure resistance between connector terminals of ambient sensor.  <b>Terminals:</b> <b>No. 1 — No. 2</b>	Is the measured value approx. 2.2 k $\Omega$ at 25°C (77°F)?	Go to step 2.	Replace ambient sensor.
<b>2 CHECK INPUT SIGNALS FOR AMBIENT SENSOR.</b> 1) Turn ignition ON. 2) Measure voltage between ambient sensor harness connector terminals.  <b>Connector &amp; terminal:</b> <b>(F78) No. 1 (+) — No. 2 (-):</b>	Is the measured value approx. 4.5 V?	Go to step 6.	Go to step 3.
<b>3 CHECK OUTPUT SIGNALS FROM A/C CONTROL MODULE.</b> 1) Turn ignition switch to OFF. 2) Pull out A/C control panel. 3) Disconnect connector from ambient sensor. 4) Turn ignition switch to ON. 5) Measure voltage between connector terminals of A/C control module.  <b>Connector &amp; terminal:</b> <b>(i49) No. 6 (+) — No. 17 (-):</b>	Is the measured value approx. 4.5 V?	Go to step 6.	Go to step 4.
<b>4 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND AMBIENT SENSOR.</b> 1) Turn ignition switch to OFF. 2) Disconnect connectors from A/C control module. 3) Measure resistance of harness between A/C control module and ambient sensor.  <b>Connector &amp; terminal:</b> <b>(F78) No. 1 — (i49) No. 6</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 5.	Repair harness between A/C control module and ambient sensor.
<b>5 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND AMBIENT SENSOR.</b> Measure resistance of harness between A/C control module and ambient sensor.  <b>Connector &amp; terminal:</b> <b>(F78) No. 2 — (i49) No. 17</b>	Is the measured value less than 1 $\Omega$ ?	Go to step 6.	Repair harness between A/C control module and ambient sensor.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

## **DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)**

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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### **B: DTC 22 OR -22 (IN-VEHICLE SENSOR)**

#### **TROUBLE SYMPTOM:**

When turning AUTO switch to ON, blower fan speed, outlet port and inlet port is not changed.

If DTC 22 or -22 appears on the display, replace the A/C control module. The in-vehicle sensor is built into the A/C control module and cannot be replaced as a single unit.

**DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)**  
HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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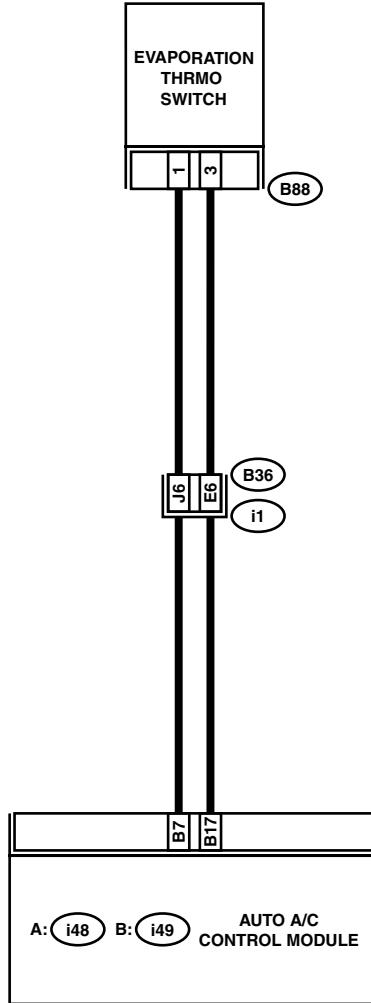
**MEMO:**

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## C: DTC 24 OR -24 (EVAPORATOR SENSOR)

WIRING DIAGRAM:



B88

1
2
3

B: i49

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

B36

A1	A2	A3	A4	A5	A6
B1	B2	B3	B4	B5	B6
C1	C2	C3	C4	C5	C6
D1	D2	D3	D4	D5	D6
E1	E2	E3	E4	E5	E6
F1					F6
G1					G6
H1					H6
I1					I6
J1					J6
K1					K6
L1	L2	L3	L4	L5	L6
M1	M2	M3	M4	M5	M6
N1	N2	N3	N4	N5	N6
O1	O2	O3	O4	O5	O6
P1	P2	P3	P4	P5	P6

AC-00323

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK EVAPORATOR SENSOR.</b> 1) Turn ignition switch to OFF. 2) Remove glove box. 3) Disconnect connector from evaporator sensor. 4) Measure resistance between connector terminals of evaporator sensor. <i>Terminals:</i> <i>No. 1 — No. 3</i>	Is the measured value approx. 1.8 to 2.0 k $\Omega$ at 20°C (68°F)?	Go to step 2.	Replace evaporator sensor.
<b>2 CHECK INPUT SIGNALS FOR EVAPORATOR SENSOR.</b> 1) Turn ignition switch to "ON". 2) Measure voltage between evaporator sensor harness connector terminal and chassis ground. <i>Connector &amp; terminal</i> <i>(B88) No. 1 (+) — Chassis ground (-):</i>	Is the measured value approx. 4.5 V?	Go to step 3.	Replace evaporator sensor.
<b>3 CHECK OUTPUT SIGNALS FROM A/C CONTROL MODULE.</b> 1) Turn ignition switch to OFF. 2) Pull out A/C control module. 3) Turn ignition switch to ON. 4) Measure voltage between A/C control module connector terminals. <i>Connector &amp; terminal:</i> <i>(i49) No. 7 (+) — No. 17 (-):</i>	Is the measured value approx. 4.5 V?	Go to step 4.	Go to step 6.
<b>4 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND EVAPORATOR SENSOR.</b> 1) Turn ignition switch to OFF. 2) Disconnect connectors from A/C control module. 3) Measure resistance of harness between A/C control module and evaporator sensor. <i>Connector &amp; terminal:</i> <i>(B88) No. 1 — (i49) No. 7</i>	Is the measured value less than 1 $\Omega$ ?	Go to step 5.	Repair harness between A/C control module and evaporator sensor.
<b>5 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND EVAPORATOR SENSOR.</b> Measure resistance of harness between A/C control module and evaporator sensor. <i>Connector &amp; terminal:</i> <i>(B88) No. 3 — (i49) No. 17</i>	Is the measured value less than 1 $\Omega$ ?	Go to step 6.	Repair harness between A/C control module and evaporator sensor.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## D: DTC 25 OR -25 (SUNLOAD SENSOR)

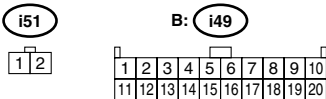
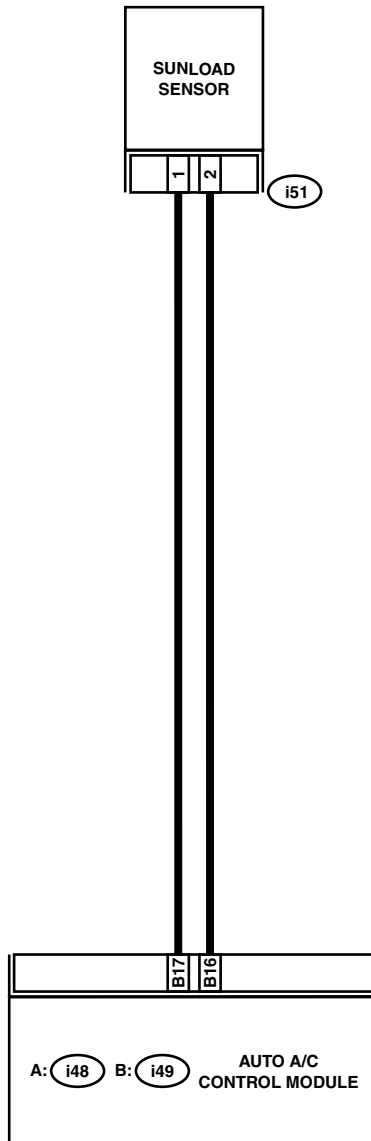
### TROUBLE SYMPTOM:

- Sensor identified that sunlight is at maximum. Then, A/C system is controlled to COOL side.
- Sensor identified that sunlight is at minimum. Then, A/C system is controlled to HOT side.

### NOTE:

When the sunload sensor is checked inside the passenger compartment or in the shade, DTC “25” may appear on the indicator. Always check the sunload sensor in a place where it senses direct sunlight.

### WIRING DIAGRAM:



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK INPUT VOLTAGE TO SUNLOAD SENSOR.</b> 1) Turn ignition switch to OFF. 2) Remove sunload sensor. <Ref. to AC-44, REMOVAL, Sunload Sensor (Auto A/C).> 3) Turn ignition switch to ON. 4) Measure input voltage to sunload sensor. <b>Connector &amp; terminal:</b> <i>(i51) No. 2 (+) — No. 1 (-):</i>	Is the measured value approx. 4.5 V?	Go to step 3.	Go to step 2.
<b>2 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND SUNLOAD SENSOR.</b> 1) Turn ignition switch to OFF. 2) Disconnect connectors from A/C control module. 3) Measure resistance of harness between A/C control module and sunload sensor. <b>Connector &amp; terminal:</b> <i>(i51) No. 2 — (i49) No. 16</i>	Is the measured value less than 1 $\Omega$ ?	Go to step 3.	Repair harness between A/C control module and sunload sensor.
<b>3 CHECK HARNESS CONNECTOR BETWEEN A/C CONTROL MODULE AND SUNLOAD SENSOR.</b> Measure resistance of harness between A/C control module and sunload sensor. <b>Connector &amp; terminal:</b> <i>(i51) No. 1 — (i49) No. 17</i>	Is the measured value less than 1 $\Omega$ ?	Go to step 4.	Repair harness between A/C control module and sunload sensor.
<b>4 CHECK VOLTAGE OF INPUT SIGNAL TO A/C CONTROL MODULE.</b> 1) Connect connectors to A/C control module and sunload sensor. 2) Turn ignition switch to ON. 3) Measure voltage between A/C control module connectors. <b>Connector &amp; terminal:</b> <i>(i49) No. 16 (+) — No. 17 (-):</i>	Is the measured value approx. 2.5 V?	Go to step 5.	Replace sunload sensor.
<b>5 CHECK POOR CONTACT.</b> Check poor contact in A/C control module connector.	Is there poor contact in connector?	Replace A/C control module.	Repair connector.

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

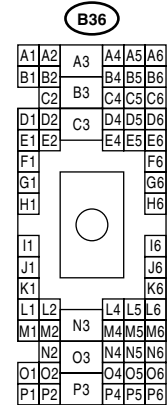
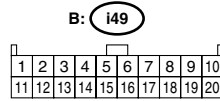
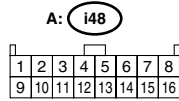
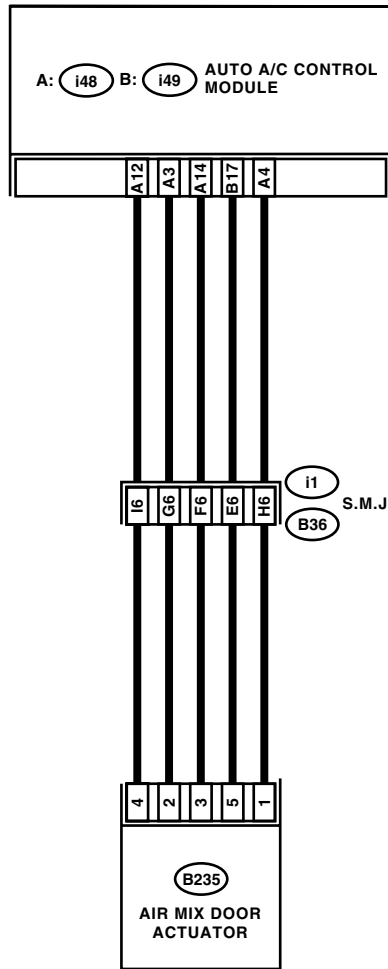
## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

### E: DTC 26 OR -26 (AIR MIX DOOR ACTUATOR)

**TROUBLE SYMPTOM:**

Outlet air temperature is not changed.

**WIRING DIAGRAM:**



AC-00937



# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1 CHECK POWER SUPPLY TO AIR MIX DOOR ACTUATOR PBR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the air mix door actuator connector. 3) Turn the ignition switch and AUTO switch to ON. 4) Measure the voltage between A/C control module connector terminals. <b>Connector &amp; terminal</b> <b>(i48) No. 14 (+) — (i49) No. 17 (-):</b>	Is the voltage approx. 5 V?	Go to step 2.	Replace the auto A/C control module.
<b>2 CHECK POWER SUPPLY TO AIR MIX DOOR ACTUATOR.</b> Measure the voltage between auto A/C control module connector terminal and chassis ground when setting temperature control dial to FULL COOL. <b>Connector &amp; terminal</b> <b>(i48) No. 4 (+) — Chassis ground (-):</b>	Is the voltage more than 7 V (At normal temperature)?	Go to step 3.	Replace the auto A/C control module.
<b>3 CHECK POWER SUPPLY TO AIR MIX DOOR ACTUATOR.</b> Measure the voltage between auto A/C control module connector terminal and chassis ground when setting temperature control dial to FULL HOT. <b>Connector &amp; terminal</b> <b>(i48) No. 3 (+) — Chassis ground (-):</b>	Is the voltage more than 7 V (At normal temperature)?	Go to step 4.	Replace the auto A/C control module.
<b>4 CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND AIR MIX DOOR ACTUATOR.</b> 1) Turn the A/C and ignition switch to OFF. 2) Disconnect the auto A/C control module connector. 3) Measure the resistance between auto A/C control module and air mix door actuator connector. <b>Connector &amp; terminal</b> <b>(B235) No. 1 — (i48) No. 4:</b> <b>(B235) No. 2 — (i48) No. 3:</b> <b>(B235) No. 3 — (i48) No. 14:</b> <b>(B235) No. 4 — (i48) No. 12:</b> <b>(B235) No. 5 — (i49) No. 17:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit in harness between auto A/C control module and air mix door actuator.
<b>5 CHECK AIR MIX DOOR ACTUATOR PBR SIGNAL.</b> 1) Connect the auto A/C control module and air mix door actuator connector. 2) Turn the ignition switch and AUTO switch to ON. 3) Change the set temperature between FULL COOL and FULL HOT, check voltage between auto A/C control module connector terminals. <b>Connector &amp; terminal</b> <b>(i48) No. 12 — (i49) No. 17 (-):</b>	Is the voltage 0.5 V (FULL COOL) — 4.5 V (FULL HOT)?	Go to step 6.	Replace the air mix door actuator.
<b>6 CHECK POOR CONTACT.</b> Check poor contact in the auto A/C control module connector.	Is there poor contact in the connector?	Repair the connector.	Replace the auto A/C control module.

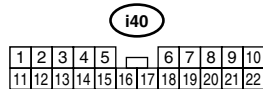
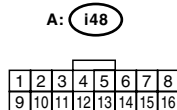
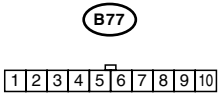
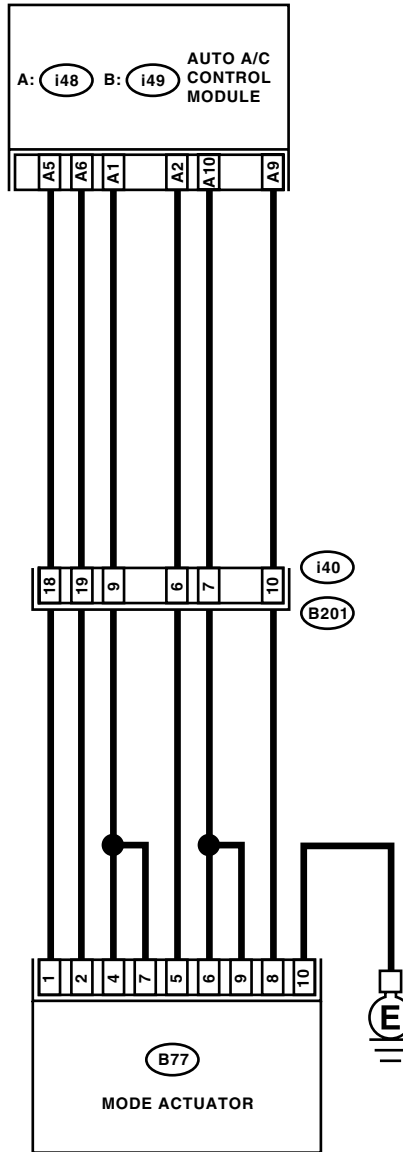
**DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)**  
 HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

**F: DTC 31, 32, 33, 34 OR 35 (MODE DOOR ACTUATOR)**

**TROUBLE SYMPTOM:**

Air flow outlet is not changed.

**WIRING DIAGRAM:**



AC-00331

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>1</b> <b>CHECK POWER SUPPLY FOR AUTO A/C CONTROL MODULE SIDE.</b> 1) Turn the ignition switch to ON. 2) Press the mode switch to VENT position. 3) Press the DEF switch and measure the voltage between auto A/C control module and chassis ground when VENT is changed to DEF position. <b>Connector &amp; terminal</b> <b>(i48) No. 6 (+) — Chassis ground (-):</b>	Is the measured value more than 12 V?	Go to step 2.	Replace the auto A/C control module.
<b>2</b> <b>CHECK POWER SUPPLY FOR ACTUATOR SIDE.</b> 1) Press the mode switch to VENT position. 2) Press the DEF switch and measure the voltage between mode door actuator harness connector and chassis ground when VENT is changed to DEF position. <b>Connector &amp; terminal</b> <b>(B77) No. 2 (+) — Chassis ground (-):</b>	Is the measured value more than 7 V (at normal temperature)?	Go to step 3.	Repair the harness between auto A/C control module and mode door actuator.
<b>3</b> <b>CHECK POWER SUPPLY FOR AUTO A/C CONTROL MODULE SIDE.</b> 1) Press the DEF switch. 2) Press the mode switch to VENT position and measure the voltage between auto A/C control module and chassis ground when DEF is changed to VENT position. <b>Connector &amp; terminal</b> <b>(i48) No. 5 (+) — Chassis ground (-):</b>	Is the measured value more than 12 V?	Go to step 4.	Replace the auto A/C control module.
<b>4</b> <b>CHECK POWER SUPPLY FOR ACTUATOR SIDE.</b> 1) Press the DEF switch. 2) Press the mode switch to VENT position and measure the voltage between mode door actuator harness connector and chassis ground when DEF is changed to VENT position. <b>Connector &amp; terminal</b> <b>(B77) No. 1 (+) — Chassis ground (-):</b>	Is the measured value more than 7 V?	Go to step 5.	Repair the harness between auto A/C control module and mode door actuator.
<b>5</b> <b>CHECK ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mode door actuator. 3) Connect the battery positive (+) terminal to terminal No. 1 and ground (-) terminal to terminal No. 2 of mode door actuator to make sure that actuator operates. 4) Connect the battery positive (+) terminal to terminal No. 2 and ground (-) terminal to terminal No. 1 of mode door actuator to make sure that actuator operates.	Does the motor operate normally?	Go to step 6.	Replace the mode door actuator.
<b>6</b> <b>CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn the ignition switch to ON. 2) Turn the mode control dial and measure voltage between auto A/C control module harness connector and chassis ground for each mode. <b>Connector &amp; terminal</b> <b>(i48) No. 2 (+) — Chassis ground (-):</b>	Is the measured value 5 V at HEAT, D/H, DEF and 0 V at VENT, BI-LEVEL?	Go to step 9.	Go to step 7.

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>7</b> <b>CHECK AUTO A/C CONTROL MODULE SIGNAL POWER SUPPLY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mode door actuator. 3) Turn the ignition switch to ON. 4) Measure the voltage between mode door actuator harness connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B77) No. 5 (+) — Chassis ground (-):</b>	Is the measured value 5 V?	Go to step 9.	Go to step 8.
<b>8</b> <b>CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND MODE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from auto A/C control module and mode door actuator. 3) Measure the resistance of harness between auto A/C control module and mode door actuator.  <b>Connector &amp; terminal</b> <b>(i48) No. 2 — (B77) No. 5:</b>	Is the measured value less than 1 Ω?	Replace the auto A/C control module.	Repair the harness between auto A/C control module and mode door actuator.
<b>9</b> <b>CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn ignition switch to ON. 2) Press the mode control dial and measure voltage between auto A/C control module harness connector and chassis ground for each mode.  <b>Connector &amp; terminal</b> <b>(i48) No. 10 (+) — Chassis ground (-):</b>	Is the measured value 5 V at VENT, D/H and 0 V at HEAT, BI-LEVEL, DEF?	Go to step 12.	Go to step 10.
<b>10</b> <b>CHECK AUTO A/C CONTROL MODULE SIGNAL POWER SUPPLY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mode door actuator. 3) Turn the ignition switch to ON. 4) Measure the voltage between mode door actuator harness connector and chassis ground.  <b>Connector &amp; terminal</b> <b>(B77) No. 6, 9 (+) — Chassis ground (-):</b>	Is the measured value 5 V?	Go to step 12.	Go to step 11.
<b>11</b> <b>CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND MODE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from auto A/C control module and mode door actuator. 3) Measure the resistance of harness between auto A/C control module and mode door actuator.  <b>Connector &amp; terminal</b> <b>(i48) No. 10 — (B77) No. 6, 9:</b>	Is the measured value less than 1 Ω?	Replace the auto A/C control module.	Repair the harness between auto A/C control module and mode door actuator.

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>12 CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn ignition switch to ON. 2) Turn the mode control dial and measure voltage between auto A/C control module harness connector and chassis ground for each mode. <b>Connector &amp; terminal</b> <i>(i48) No. 1 (+) — Chassis ground (-):</i>	Is the measured value 5 V at BI-LEVEL, DEF and 0 V at VENT, HEAT, D/H?	Go to step 15.	Go to step 13.
<b>13 CHECK AUTO A/C CONTROL MODULE SIGNAL POWER SUPPLY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mode door actuator. 3) Turn the ignition switch to ON. 4) Measure the voltage between mode door actuator harness connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B77) No. 4, 7 (+) — Chassis ground (-):</i>	Is the measured value 5 V?	Go to step 15.	Go to step 14.
<b>14 CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND MODE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from auto A/C control module and mode door actuator. 3) Measure the resistance of harness between auto A/C control module and mode door actuator. <b>Connector &amp; terminal</b> <i>(i48) No. 1 — (B77) No. 4, 7:</i>	Is the measured value less than 1 $\Omega$ ?	Replace the auto A/C control module.	Repair the harness between auto A/C control module and mode door actuator.
<b>15 CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn ignition switch to ON. 2) Press the mode switch and measure voltage between auto A/C control module harness connector and chassis ground for each mode. <b>Connector &amp; terminal</b> <i>(i48) No. 9 (+) — Chassis ground (-):</i>	Is the measured value 5 V at VENT, BI-LEVEL, HEAT and 0 V at D/H, DEF?	Go to step 19.	Go to step 16.
<b>16 CHECK AUTO A/C CONTROL MODULE SIGNAL POWER SUPPLY.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mode door actuator. 3) Turn the ignition switch to ON. 4) Measure the voltage between mode door actuator harness connector and chassis ground. <b>Connector &amp; terminal</b> <i>(B77) No. 8 (+) — Chassis ground (-):</i>	Is the measured value 5 V?	Go to step 18.	Go to step 17.

# DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

## HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

Step	Check	Yes	No
<b>17</b> <b>CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND MODE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from auto A/C control module and mode door actuator. 3) Measure the resistance of harness between auto A/C control module and mode door actuator. <b>Connector &amp; terminal</b> <b>(i48) No. 9 — (B77) No. 8:</b>	Is the measured value less than 1 $\Omega$ ?	Replace the auto A/C control module.	Repair the harness between auto A/C control module and mode door actuator.
<b>18</b> <b>CHECK ACTUATOR GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from mode door actuator. 3) Measure the resistance of harness between mode door actuator and chassis ground. <b>Connector &amp; terminal</b> <b>(B77) No. 10 — Chassis ground:</b>	Is the measured value less than 1 $\Omega$ ?	Replace the mode door actuator.	Repair the harness between auto A/C control module and mode door actuator.
<b>19</b> <b>CHECK POOR CONTACT.</b> Check poor contact in auto A/C control module connector.	Is there poor contact in connector?	Repair the poor contact in auto A/C control module.	Repair the connector.

# SYMPTOM RELATED DIAGNOSTIC

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## 9. Symptom Related Diagnostic

### A: GENERAL DIAGNOSTICS TABLE

Symptom	Component parts												
	A/C system fails to operate when IG SW is turned "ON".	Burned-out fuse.	Previous mode immediately before resetting operation is not retained in memory.	No indication appears on display.	Illumination does not dim at night.	Blower motor does not rotate or rotates erroneously.	A/C does not change from "Fresh" to "Recirc" or vice versa.	Air vents cannot be switched.	Compartment temperature does not increase (No hot air is discharged).	Compartment temperature does not decrease (No cool air is discharged).	Compartment temperature is higher than or lower than the set value.	Compartment temperature does not quickly respond to the set value.	Condenser fan does not operate during A/C operation.
Fuses (M/B No. 5, F/B No. 17)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poor connector contacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ground	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A/C control module	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air mix servo motor and potentiometer (including links)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air vent select servo motor and potentiometer (including links)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fresh-Recirc select servo motor and potentiometer (including links)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blower fan motor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power transistor & fuse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blower fan relay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A/C relay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnet clutch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiator fan motors (Main and sub)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiator fan relays (Main and sub)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sensors (In-vehicle, ambient, water temperature, evaporator, sunload, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In-vehicle sensor aspirator duct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

AC-00325

# **SYMPTOM RELATED DIAGNOSTIC**

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

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**MEMO:**