

# Diagnostic Procedure for Actuators

HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

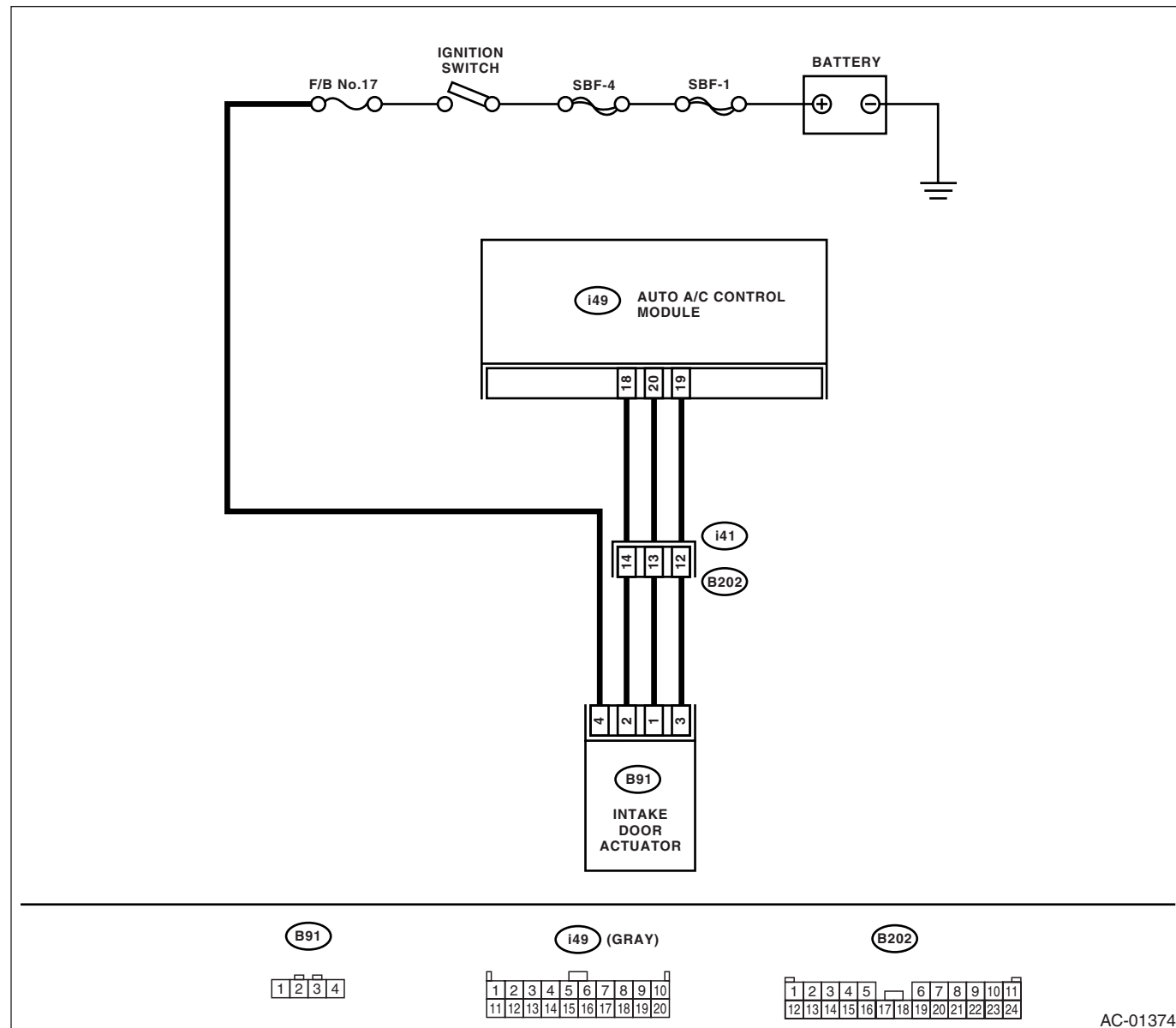
## 7. Diagnostic Procedure for Actuators

### A: INTAKE DOOR ACTUATOR

#### TROUBLE SYMPTOM:

FRESH/RECIRC mode is not changed.

#### WIRING DIAGRAM:



Step	Check	Yes	No
1 <b>CHECK POWER SUPPLY FOR INTAKE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the intake door actuator connector. 3) Turn the ignition switch to ON. 4) Measure the voltage between intake door actuator connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B91) No. 4 (+) — Chassis ground (-):</b>	Is the voltage 7 V or more (at normal temperature)?	Go to step 2.	Check for open or short circuit in the harness between intake door actuator and fuse.

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Step	Check	Yes	No
<b>2</b> <b>CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND INTAKE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the auto A/C control module connector. 3) Measure the resistance between intake door actuator connector and auto A/C control module connector. <b>Connector &amp; terminal</b> <i>(i49) No. 18 — (B91) No. 2:</i> <i>(i49) No. 20 — (B91) No. 1:</i> <i>(i49) No. 19 — (B91) No. 3:</i>	Is the resistance less than 1 $\Omega$ ?	Go to step 3.	Repair the open circuit in harness between auto A/C control module and intake door actuator.
<b>3</b> <b>CHECK OPERATION OF INTAKE DOOR ACTUATOR.</b> 1) Connect the intake door actuator connector. 2) Ground the auto A/C control module connector with a suitable wire. 3) Turn the ignition switch to ON, and check the operation of intake door actuator. <b>Connector &amp; terminal</b> <i>(i49) No. 20 — Chassis ground:</i>	Is the intake door actuator moved to FRESH?	Go to step 4.	Replace the intake door actuator.
<b>4</b> <b>CHECK OPERATION OF INTAKE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Ground the auto A/C control module connector with a suitable wire. 3) Turn the ignition switch to ON, and check the operation of intake door actuator. <b>Connector &amp; terminal:</b> <i>(i49) No. 18 — Chassis ground:</i>	Is the intake door actuator moved to RECIRC?	Replace the auto A/C control module.	Replace the intake door actuator.

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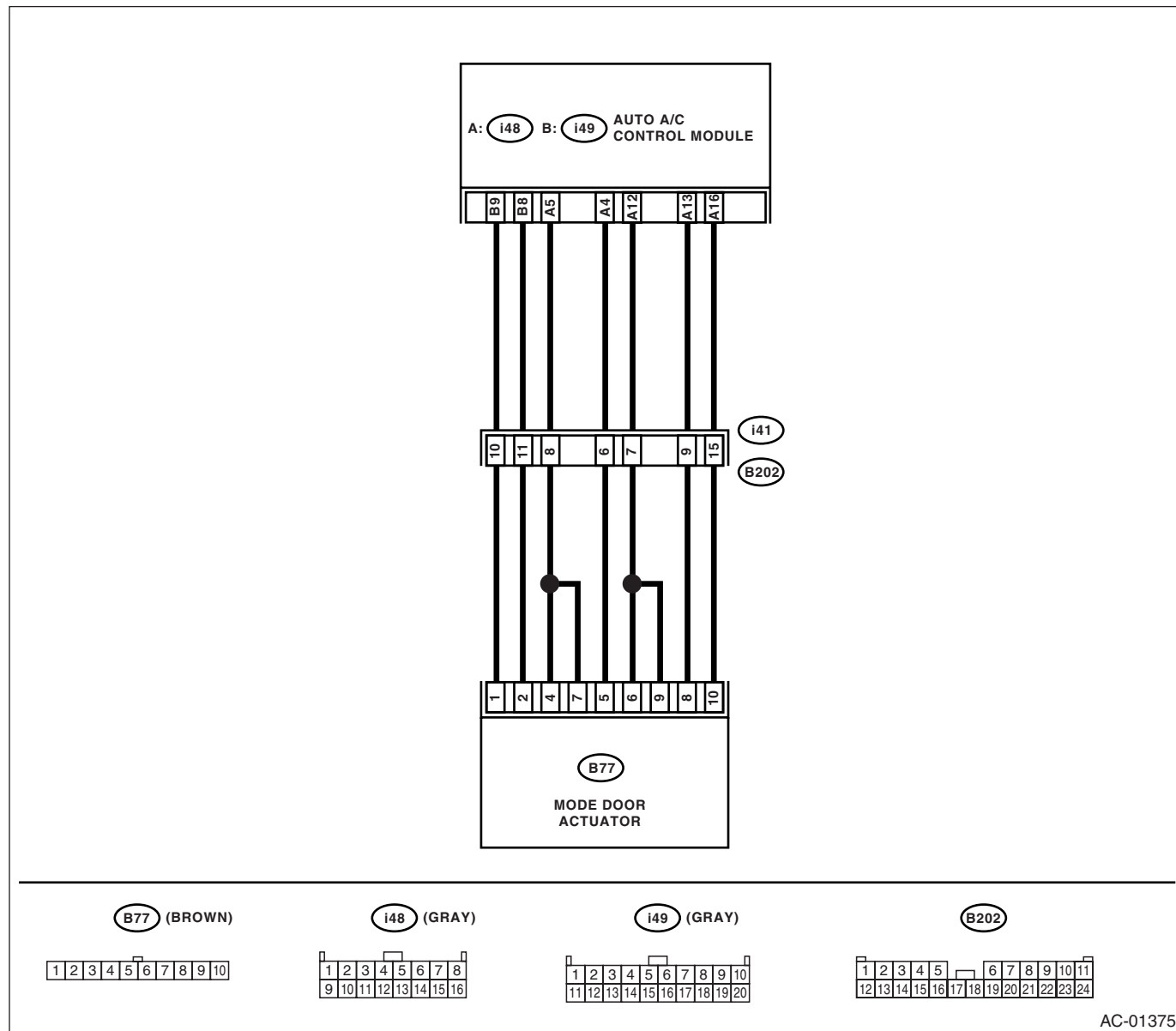
HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## B: MODE DOOR ACTUATOR

### TROUBLE SYMPTOM:

Air flow outlet is not changed.

### WIRING DIAGRAM:



Step	Check	Yes	No
<b>1</b> <b>CHECK THE POWER SUPPLY OF THE AUTO A/C CONTROL MODULE.</b> 1) Turn the ignition switch to ON. 2) Set the air flow control dial to the VENT position. 3) Press the defroster switch and measure the voltage between the auto A/C control module and the chassis ground when switching from VENT to DEF. <b>Connector &amp; terminal</b> <b>(i49) No. 9 (+) — Chassis ground (-):</b>	Is the voltage more than 12 V?	Go to step 2.	Replace the auto A/C control module.

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Step	Check	Yes	No
<b>2 CHECK THE POWER SUPPLY OF THE ACTUATOR.</b> 1) Set the air flow control dial to the VENT position. 2) Press the defroster switch and measure the voltage between the mode door actuator harness connector terminal and the chassis ground when switching from VENT to DEF. <b>Connector &amp; terminal</b> <b>(B77) No. 1 (+) — Chassis ground (-):</b>	Is the voltage 7 V or more (at normal temperature)?	Go to step 3.	Repair the open circuit of harness between the auto A/C control module and mode door actuator.
<b>3 CHECK AUTO A/C CONTROL MODULE SIGNALS.</b> 1) Press the defroster switch. 2) Turn the air flow control dial to VENT and measure the voltage between the auto A/C control module and the chassis ground when switching from DEF to VENT. <b>Connector &amp; terminal</b> <b>(i49) No. 8 (+) — Chassis ground (-):</b>	Is the voltage more than 12 V?	Go to step 4.	Replace the auto A/C control module.
<b>4 CHECK THE SIGNALS OF THE ACTUATOR.</b> 1) Press the defroster switch. 2) Turn the air flow control dial to the VENT position and measure the voltage between the mode door actuator harness connector terminal and the chassis ground when switching from DEF to VENT. <b>Connector &amp; terminal</b> <b>(B77) No. 2 (+) — Chassis ground (-):</b>	Is the voltage 7 V or more (at normal temperature)?	Go to step 5.	Repair the open circuit of harness between the auto A/C control module and mode door actuator.
<b>5 CHECK THE ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the mode door actuator. 3) Connect the positive terminal (+) of the battery to No. 1 terminal of the mode door actuator, and the negative (-) terminal to No. 2 terminal. Check whether the actuator is running. 4) Connect the negative (-) terminal of the battery to No. 1 and the positive terminal (+) to No. 2 terminal and check whether the actuator is running.	Does the motor operate normally?	Go to step 6.	Replace the mode door actuator.
<b>6 CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn the ignition switch to ON. 2) Turn the air flow control dial and measure the voltage between auto A/C control module harness connector terminal and chassis ground for each mode. <b>Connector &amp; terminal</b> <b>(i48) No. 4 (+) — Chassis ground (-):</b>	Is the voltage approx. 5 V at the HEAT, D/H and DEF positions; and approx. 0 V at the VENT and BI-LEVEL positions?	Go to step 9.	Go to step 7.
<b>7 CHECK AUTO A/C CONTROL MODULE SIGNAL POWER.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the mode door actuator. 3) Turn the ignition switch to ON. 4) Measure the voltage between the mode door actuator harness connector terminal and chassis ground. <b>Connector &amp; terminal</b> <b>(B77) No. 5 (+) — Chassis ground (-):</b>	Is the voltage approx. 5 V?	Go to step 9.	Go to step 8.

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Step	Check	Yes	No
<b>8 CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND MODE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the auto A/C control module and mode door actuator. 3) Measure the resistance of the harness between the auto A/C control module and mode door actuator. <b>Connector &amp; terminal</b> <b>(i48) No. 4 — (B77) No. 5:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the auto A/C control module.	Repair the open circuit of harness between the auto A/C control module and mode door actuator.
<b>9 CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn the ignition switch to ON. 2) Turn the air flow control dial and measure the voltage between auto A/C control module harness connector terminal and chassis ground for each mode. <b>Connector &amp; terminal</b> <b>(i48) No. 12 (+) — Chassis ground (-):</b>	Is the voltage approx. 5 V at the VENT position; and approx. 0 V at the BI-LEVEL, HEAT and DEFpositions?	Go to step 12.	Go to step 10.
<b>10 CHECK AUTO A/C CONTROL MODULE SIGNAL POWER.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the mode door actuator. 3) Turn the ignition switch to ON. 4) Measure the voltage between the mode door actuator harness connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B77) No. 6 (+) — Chassis ground (-):</b> <b>(B77) No. 9 (+) — Chassis ground (-):</b>	Is the voltage approx. 5 V?	Go to step 12.	Go to step 11.
<b>11 CHECK HARNESS BETWEEN AUTO A/C CONTROL MODULE AND MODE DOOR ACTUATOR.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the auto A/C control module and mode door actuator. 3) Measure the resistance of the harness between the auto A/C control module and mode door actuator. <b>Connector &amp; terminal</b> <b>(i48) No. 12 — (B77) No. 6:</b> <b>(i48) No. 12 — (B77) No. 9:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the auto A/C control module.	Repair the open circuit of harness between the auto A/C control module and mode door actuator.
<b>12 CHECK AUTO A/C CONTROL MODULE SIGNAL VOLTAGE.</b> 1) Turn the ignition switch to ON. 2) Turn the air flow control dial and measure the voltage between auto A/C control module harness connector and chassis ground for each mode. <b>Connector &amp; terminal</b> <b>(i48) No. 5 (+) — Chassis ground (-):</b>	Is the voltage approx. 5 V at the BI-LEVEL and DEF positions; and approx. 0 V at the VENT, HEAT and D/H positions?	Go to step 15.	Go to step 13.

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

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Step	Check	Yes	No
<b>18</b> <b>CHECK ACTUATOR GROUND CIRCUIT.</b> 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the auto A/C control module. 3) Measure the resistance of the harness between the auto A/C control module and mode door actuator. <b>Connector &amp; terminal</b> <b>(i48) No. 16 — (B77) No. 10:</b>	Is the resistance less than 1 $\Omega$ ?	Replace the mode door actuator.	Repair the open circuit of harness between the auto A/C control module and mode door actuator.
<b>19</b> <b>CHECK POOR CONTACT.</b> Check poor contact of auto A/C control module connector.	Is there poor contact in the connector?	Repair the connector.	Replace the auto A/C control module.

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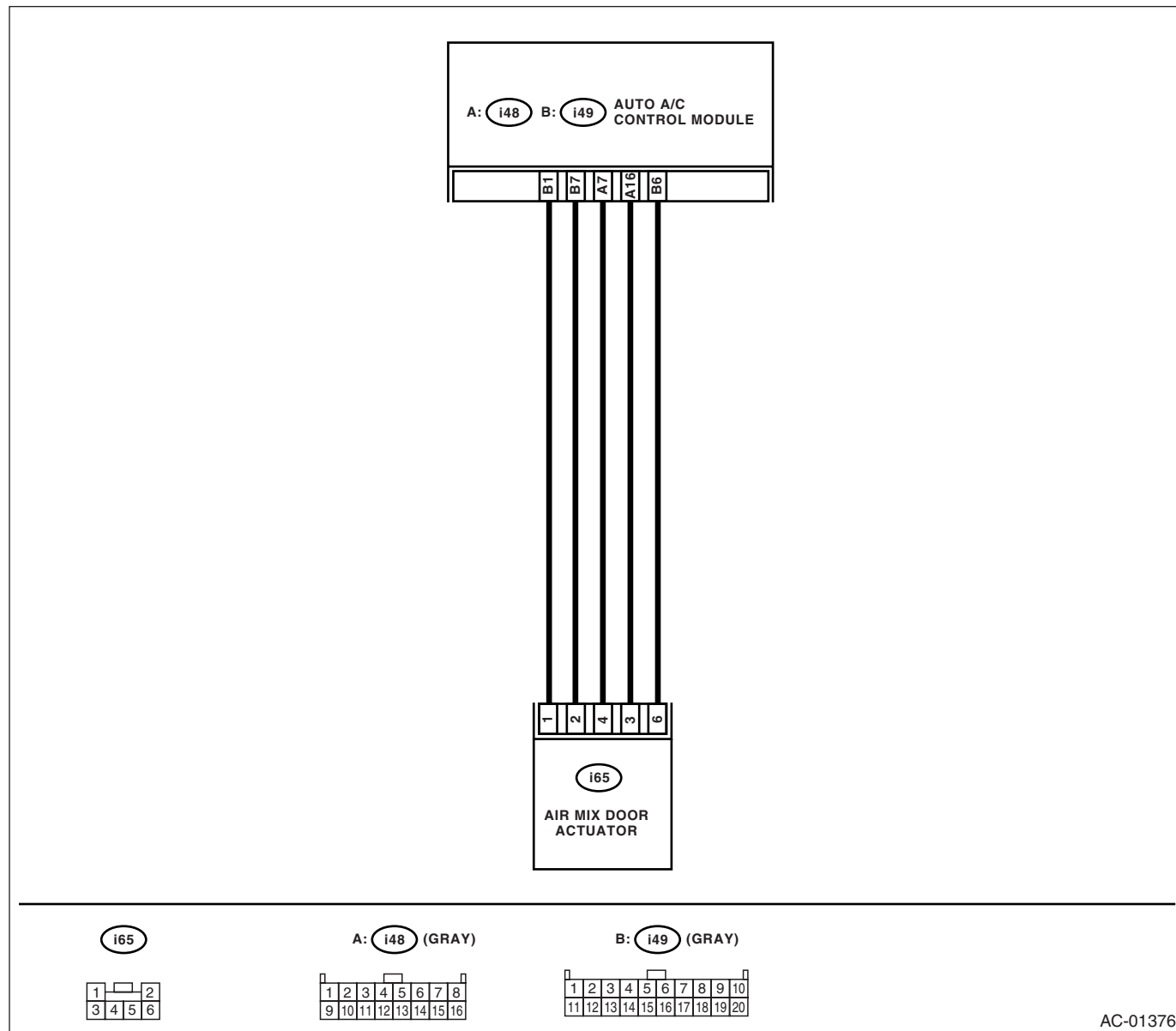
HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS)

## C: AIR MIX DOOR ACTUATOR

### TROUBLE SYMPTOM:

Outlet air temperature does not change.

### WIRING DIAGRAM:



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Step	Check	Yes	No
<b>1</b> <b>CHECK POWER SUPPLY FOR 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 ON. 4) Measure the voltage between auto A/C control module connector terminals. <b>Connector &amp; terminal</b> <b>(i48) No. 7 (+) — (i48) No. 16 (-):</b>	Is the voltage approx. 5 V?	Go to step 2.	Replace the auto A/C control module.



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Step	Check	Yes	No
<b>2</b> <b>CHECK POWER SUPPLY FOR AIR MIX DOOR ACTUATOR.</b> Measure the voltage between auto A/C control module connector terminal and chassis ground after turning the temperature control dial to maximum COOL position. <b>Connector &amp; terminal</b> <b>(i49) No. 6 (+) — Chassis ground (-):</b>	Is the voltage 7 V or more (at normal temperature)?	Go to step 3.	Replace the auto A/C control module.
<b>3</b> <b>CHECK POWER SUPPLY FOR AIR MIX DOOR ACTUATOR.</b> Measure the voltage between auto A/C control module connector terminal and chassis ground after turning the temperature control dial to maximum HOT position. <b>Connector &amp; terminal</b> <b>(i49) No. 7 (+) — Chassis ground (-):</b>	Is the voltage 7 V or more (at normal temperature)?	Go to step 4.	Replace the auto A/C control module.
<b>4</b> <b>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>(i65) No. 1 — (i49) No. 1:</b> <b>(i65) No. 2 — (i49) No. 7:</b> <b>(i65) No. 3 — (i48) No. 16:</b> <b>(i65) No. 4 — (i48) No. 7:</b> <b>(i65) No. 6 — (i49) No. 6:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 5.	Repair the open circuit of harness between auto A/C control module and air mix door actuator.
<b>5</b> <b>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 ON. 3) Check the voltage between auto A/C control module connector terminals while changing the setting temperature between maximum COOL and maximum HOT. <b>Connector &amp; terminal</b> <b>(i49) No. 1 (+) — (i48) No. 16 (-):</b>	Is the voltage 0.5 (Max. HOT) — 4.5 (Max. COOL) V?	Go to step 6.	Replace the air mix door actuator.
<b>6</b> <b>CHECK POOR CONTACT.</b> Check poor contact of auto A/C control module and connector.	Is there poor contact in the connector?	Repair the connector.	Replace the auto A/C control module.