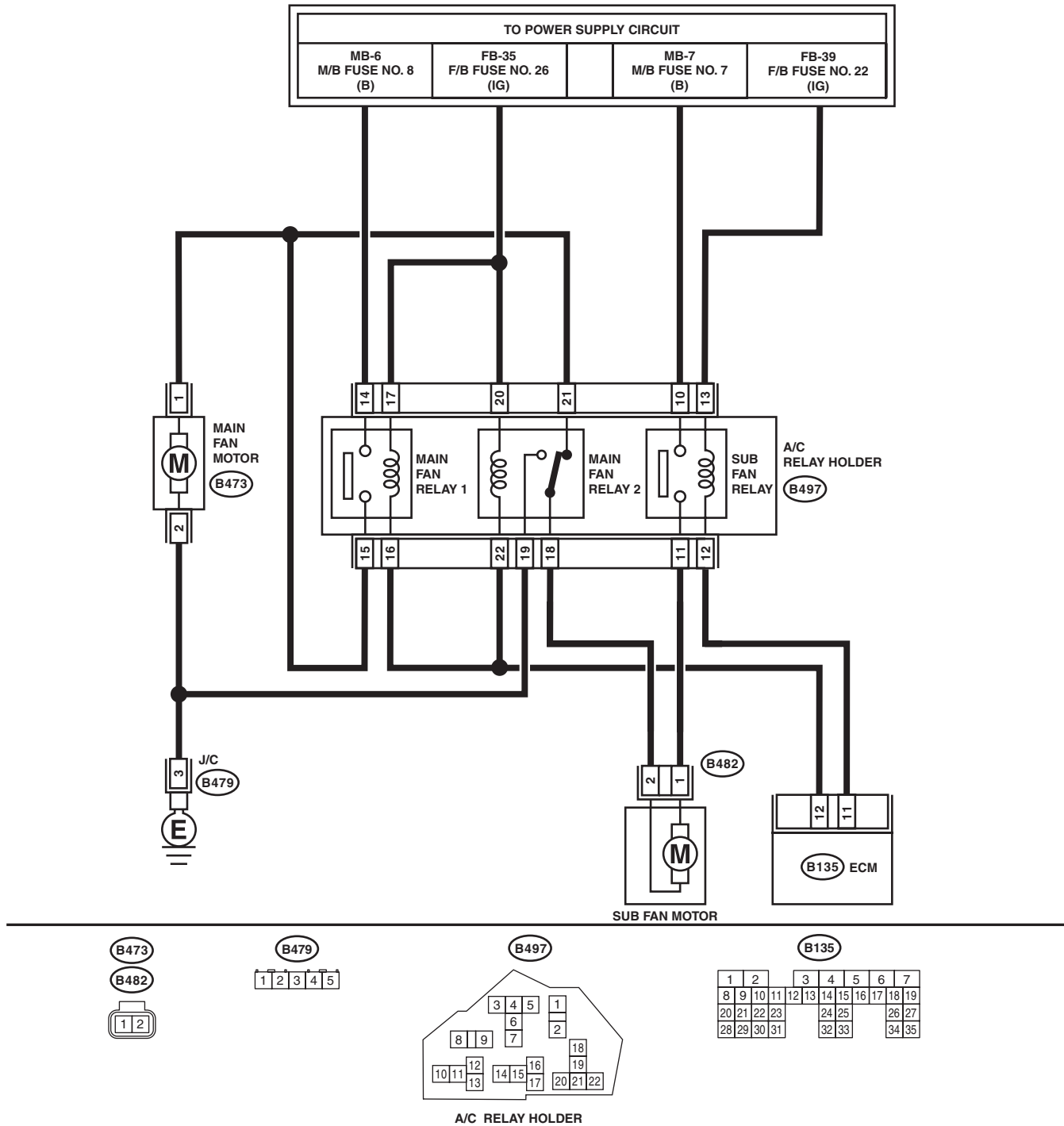


## 2. Radiator Fan System

### A: WIRING DIAGRAM



CO-02631

# Radiator Fan System

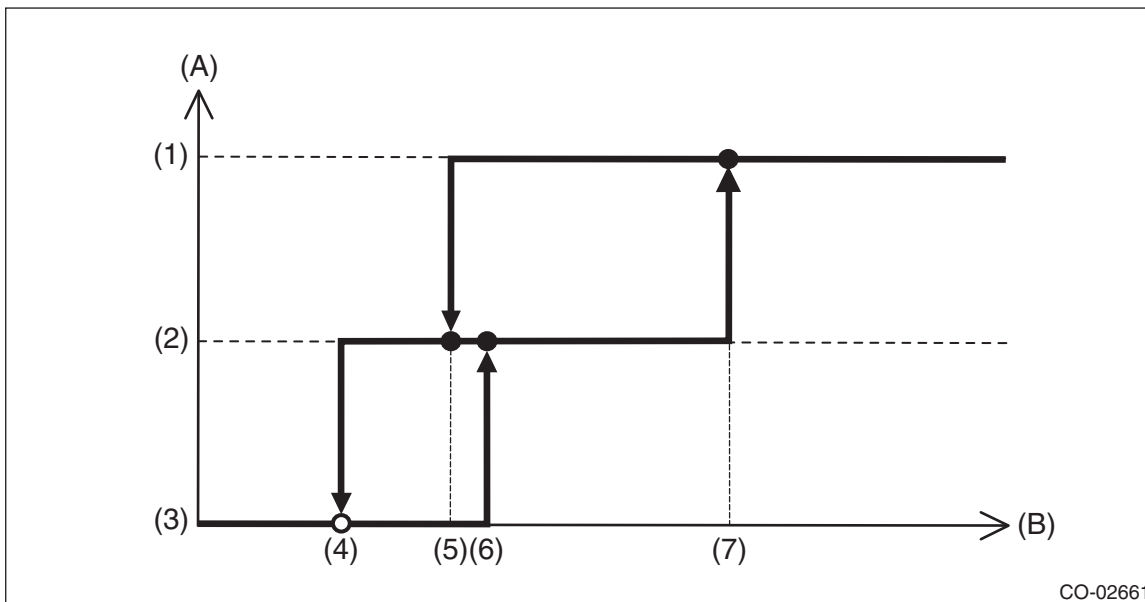
## COOLING

### B: INSPECTION

#### Operating condition:

Radiator fan operates depending on the radiator fan operation mode related to engine coolant temperature or the radiator fan operation mode related to A/C compressor load, whichever is higher as an operation mode.

- Radiator fan operation mode related to engine coolant temperature



(A) Radiator fan operation mode

(B) Engine coolant temperature

(1) High-Speed

(4) 96°C (205°F)

(7) 100°C (212°F)

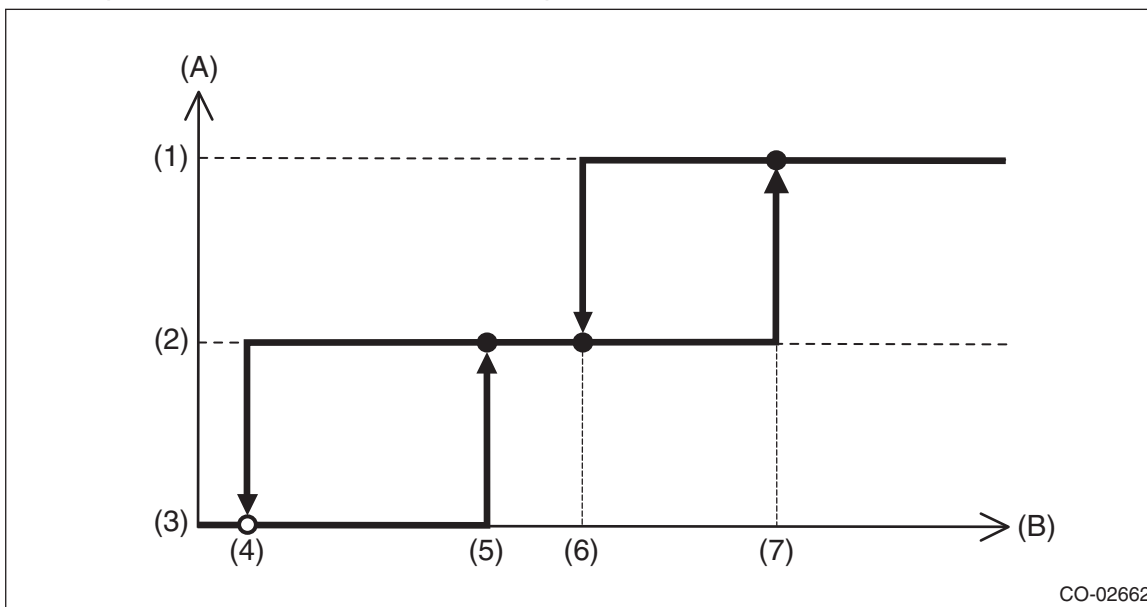
(2) Low-Speed

(5) 97.5°C (207°F)

(3) OFF

(6) 98°C (208°F)

- Radiator fan operation mode related to A/C compressor load



(A) Radiator fan operation mode

(B) A/C compressor refrigerant pressure

(1) High-Speed

(2) Low-Speed

(3) OFF

(4) 0.8 MPa (8.16 kgf/cm<sup>2</sup>, 116 psi)

(5) 1.125 MPa (11.47 kgf/cm<sup>2</sup>, 163 psi)

(6) 1.25 MPa (12.75 kgf/cm<sup>2</sup>, 181 psi)

(7) 1.5 MPa (15.30 kgf/cm<sup>2</sup>, 218 psi)

## DIAGNOSIS:

Radiator main fan and radiator sub fans do not rotate under the above operating conditions.

Step	Check	Yes	No
<b>1 CHECK OPERATION OF RADIATOR FAN.</b> 1) Connect the delivery mode fuse. 2) Turn the ignition switch to ON. 3) Using the Subaru Select Monitor, check the forced operation of the radiator fan relay. <b>NOTE:</b> • When performing a forced operation radiator fan relay check using the Subaru Select Monitor, the radiator main fan and radiator sub fan will repeat low speed revolution → high speed revolution → OFF in this order. • Subaru Select Monitor For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".	Do the radiator main fans and radiator sub fans rotate at low speed?	Go to step 2.	Go to step 3.

# Radiator Fan System

## COOLING

Step	Check	Yes	No
<b>2 CHECK OPERATION OF RADIATOR FAN.</b> 1) Connect the delivery mode fuse. 2) Turn the ignition switch to ON. 3) Perform the compulsory operation check for the radiator fan relay using Subaru Select Monitor. <b>NOTE:</b> • When performing a forced operation radiator fan relay check using the Subaru Select Monitor, the radiator main fan and radiator sub fan will repeat low speed revolution → high speed revolution → OFF in this order. • Subaru Select Monitor For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.	Do the radiator main fans and radiator sub fans rotate at high speed?	Radiator main fan system is normal.	Go to step 27.
<b>3 CHECK POWER SUPPLY TO SUB FAN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Remove the sub fan relay from A/C relay holder. 3) Measure the voltage between sub fan relay connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B497) No. 10 (+) — Chassis ground (–):</b>	Is the voltage 10 V or more?	Go to step 4.	Go to step 5.
<b>4 CHECK POWER SUPPLY TO SUB FAN RELAY.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between sub fan relay connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B497) No. 13 (+) — Chassis ground (–):</b>	Is the voltage 10 V or more?	Go to step 7.	Go to step 6.
<b>5 CHECK FUSE.</b> 1) Turn the ignition switch to OFF. 2) Remove the fuse No. 7. 3) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Repair the power supply line.
<b>6 CHECK FUSE.</b> 1) Turn the ignition switch to OFF. 2) Remove the fuse No. 22. 3) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Repair the power supply line.
<b>7 CHECK SUB FAN RELAY.</b> 1) Turn the ignition switch to OFF. 2) Measure the resistance between sub fan relay terminals. <b>Terminals</b> <b>No. 10 — No. 11:</b>	Is the resistance 1 MΩ or more?	Go to step 8.	Replace the sub fan relay.
<b>8 CHECK SUB FAN RELAY.</b> 1) Connect the battery to terminals No. 12 and No. 13 of the sub fan relay. 2) Measure the resistance between sub fan relay terminals. <b>Terminals</b> <b>No. 10 — No. 11:</b>	Is the resistance less than 1 Ω?	Go to step 9.	Replace the sub fan relay.

# Radiator Fan System

COOLING

Step	Check	Yes	No
<b>9 CHECK HARNESS BETWEEN SUB FAN RELAY CONNECTOR AND SUB FAN MOTOR CONNECTOR.</b> 1) Disconnect the connector from the sub fan motor. 2) Measure the resistance of harness between sub fan relay connector and sub fan motor connector. <b>Connector &amp; terminal</b> <b>(B482) No. 1 — (B497) No. 11:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 10.	Repair the open circuit of harness between sub fan relay connector and sub fan motor connector.
<b>10 CHECK HARNESS BETWEEN SUB FAN MOTOR CONNECTOR AND MAIN FAN RELAY 2 CONNECTOR.</b> 1) Remove the main fan relay 2 from A/C relay holder. 2) Measure the resistance of harness between sub fan motor connector and main fan relay 2 connector. <b>Connector &amp; terminal</b> <b>(B482) No. 2 — (B497) No. 18:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 11.	Repair the open circuit of the harness between sub fan motor connector and main fan relay 2 connector.
<b>11 CHECK FOR POOR CONTACT.</b> Check poor contact of sub fan motor connector.	Is there poor contact of the sub fan motor connector?	Repair the poor contact of sub fan motor connector.	Go to step 12.
<b>12 CHECK SUB FAN MOTOR.</b> Connect the battery positive (+) terminal to terminal No. 1 of the sub fan motor, and the ground (–) terminal to terminal No. 2.	Does the radiator sub fan rotate?	Go to step 13.	Replace the sub fan motor.
<b>13 CHECK MAIN FAN RELAY 2.</b> Measure the resistance between main fan relay 2 terminals. <b>Terminals</b> <b>No. 21 — No. 18:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 14.	Replace the main fan relay 2.
<b>14 CHECK HARNESS BETWEEN MAIN FAN RELAY 2 CONNECTOR AND MAIN FAN MOTOR CONNECTOR.</b> 1) Disconnect the connector from the main fan motor. 2) Measure the resistance of the harness between main fan relay 2 connector and main fan motor connector. <b>Connector &amp; terminal</b> <b>(B473) No. 1 — (B497) No. 21:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 15.	Repair the open circuit of the harness between main fan relay 2 connector and main fan motor connector.
<b>15 CHECK GROUND CIRCUIT OF MAIN FAN MOTOR.</b> Measure the resistance between main fan motor connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B473) No. 2 — Chassis ground:</b>	Is the resistance less than 5 $\Omega$ ?	Go to step 16.	Repair the open circuit of the harness between the main fan motor connector and chassis ground or poor contact of the joint connector.
<b>16 CHECK FOR POOR CONTACT.</b> Check poor contact of main fan motor connector.	Is there poor contact of the main fan motor connector?	Repair the poor contact of main fan motor connector.	Go to step 17.
<b>17 CHECK MAIN FAN MOTOR.</b> Connect the battery positive (+) terminal to terminal No. 1 of the main fan motor, and the ground (–) terminal to terminal No. 2.	Does the radiator main fan rotate?	Go to step 18.	Replace the main fan motor.

# Radiator Fan System

## COOLING

Step	Check	Yes	No
<b>18 CHECK HARNESS BETWEEN SUB FAN RELAY CONNECTOR AND ECM.</b> 1) Disconnect the connectors from ECM. 2) Measure the resistance between the sub fan relay connector and ECM connector. <b>Connector &amp; terminal</b> <b>(B135) No. 11 — (B497) No. 12:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 19.	Repair the open circuit of harness between sub fan relay connector and ECM.
<b>19 CHECK FOR POOR CONTACT.</b> Check for poor contact of ECM connector.	Is there poor contact of ECM connector?	Repair the poor contact of ECM connector.	Check the DTC. Repair the trouble cause. <Ref. to EN(H4DOTC)(diag)-42, Read Diagnostic Trouble Code (DTC).>
<b>20 CHECK MAIN FAN RELAY 1.</b> 1) Turn the ignition switch to OFF. 2) Remove the main fan relay 1 from A/C relay holder. 3) Measure the resistance between main fan relay 1 terminals. <b>Terminals</b> <b>No. 14 — No. 15:</b>	Is the resistance 1 M $\Omega$ or more?	Go to step 21.	Replace the main fan relay 1.
<b>21 CHECK MAIN FAN RELAY 1.</b> 1) Connect terminals No. 17 and No. 16 of the main fan relay 1 to the battery. 2) Measure the resistance between main fan relay 1 terminals. <b>Terminals</b> <b>No. 14 — No. 15:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 22.	Replace the main fan relay 1.
<b>22 CHECK HARNESS BETWEEN MAIN FAN RELAY 1 CONNECTOR AND MAIN FAN MOTOR CONNECTOR.</b> 1) Disconnect the connector from the main fan motor. 2) Measure the resistance of the harness between main fan relay 1 connector and main fan motor connector. <b>Connector &amp; terminal</b> <b>(B473) No. 1 — (B497) No. 15:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 23.	Repair the open circuit of the harness between main fan relay 1 connector and main fan motor connector.
<b>23 CHECK HARNESS BETWEEN MAIN FAN RELAY 1 CONNECTOR AND ECM.</b> 1) Disconnect the connectors from ECM. 2) Measure the resistance between the main fan relay 1 connector and ECM connector. <b>Connector &amp; terminal</b> <b>(B135) No. 12 — (B497) No. 16:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 24.	Repair the open circuit of the harness between main fan relay 1 connector and ECM.
<b>24 CHECK HARNESS BETWEEN MAIN FAN RELAY 2 CONNECTOR AND ECM.</b> Measure the resistance between the main fan relay 2 connector and ECM connector. <b>Connector &amp; terminal</b> <b>(B135) No. 12 — (B497) No. 22:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 25.	Repair the open circuit of the harness between main fan relay 2 connector and ECM.
<b>25 CHECK FUSE.</b> 1) Turn the ignition switch to OFF. 2) Remove the fuse No. 8 and 26. 3) Check the condition of fuse.	Is the fuse blown out?	Replace the fuse.	Go to step 26.
<b>26 CHECK FOR POOR CONTACT.</b> Check for poor contact of ECM connector.	Is there poor contact of ECM connector?	Repair the poor contact of ECM connector.	Repair the power supply circuit to the main fuse box.

# Radiator Fan System

COOLING

Step	Check	Yes	No
<b>27 CHECK OPERATION OF RADIATOR FAN.</b> If the both fans do not rotate at high speed in the condition of step 2, check whether the radiator sub fan is rotating.	Does the radiator sub fan rotate?	Go to step 20.	Go to step 28.
<b>28 CHECK GROUND CIRCUIT OF MAIN FAN RELAY 2.</b> 1) Remove the main fan relay 2 from A/C relay holder. 2) Measure the resistance between main fan relay 2 connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B497) No. 19 — Chassis ground:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 29.	Repair the open circuit of the harness between main fan relay 2 connector and chassis ground or poor contact of the joint connector.
<b>29 CHECK POWER SUPPLY TO MAIN FAN RELAY 2.</b> 1) Turn the ignition switch to ON. 2) Measure the voltage between main fan relay 2 connector and chassis ground. <b>Connector &amp; terminal</b> <b>(B497) No. 20 (+) — Chassis ground (-):</b>	Is the voltage 10 V or more?	Go to step 30.	Repair the power supply line.
<b>30 CHECK MAIN FAN RELAY 2.</b> 1) Turn the ignition switch to OFF. 2) Remove the main fan relay 2. 3) Measure the resistance between main fan relay 2 terminals. <b>Terminals</b> <b>No. 18 — No. 19:</b>	Is the resistance 1 M $\Omega$ or more?	Go to step 31.	Replace the main fan relay 2.
<b>31 CHECK MAIN FAN RELAY 2.</b> 1) Connect the battery to terminals No. 20 and No. 22 of the main fan relay 2. 2) Measure the resistance between main fan relay 2 terminals. <b>Terminals</b> <b>No. 18 — No. 19:</b>	Is the resistance less than 1 $\Omega$ ?	Go to step 23.	Replace the main fan relay 2.