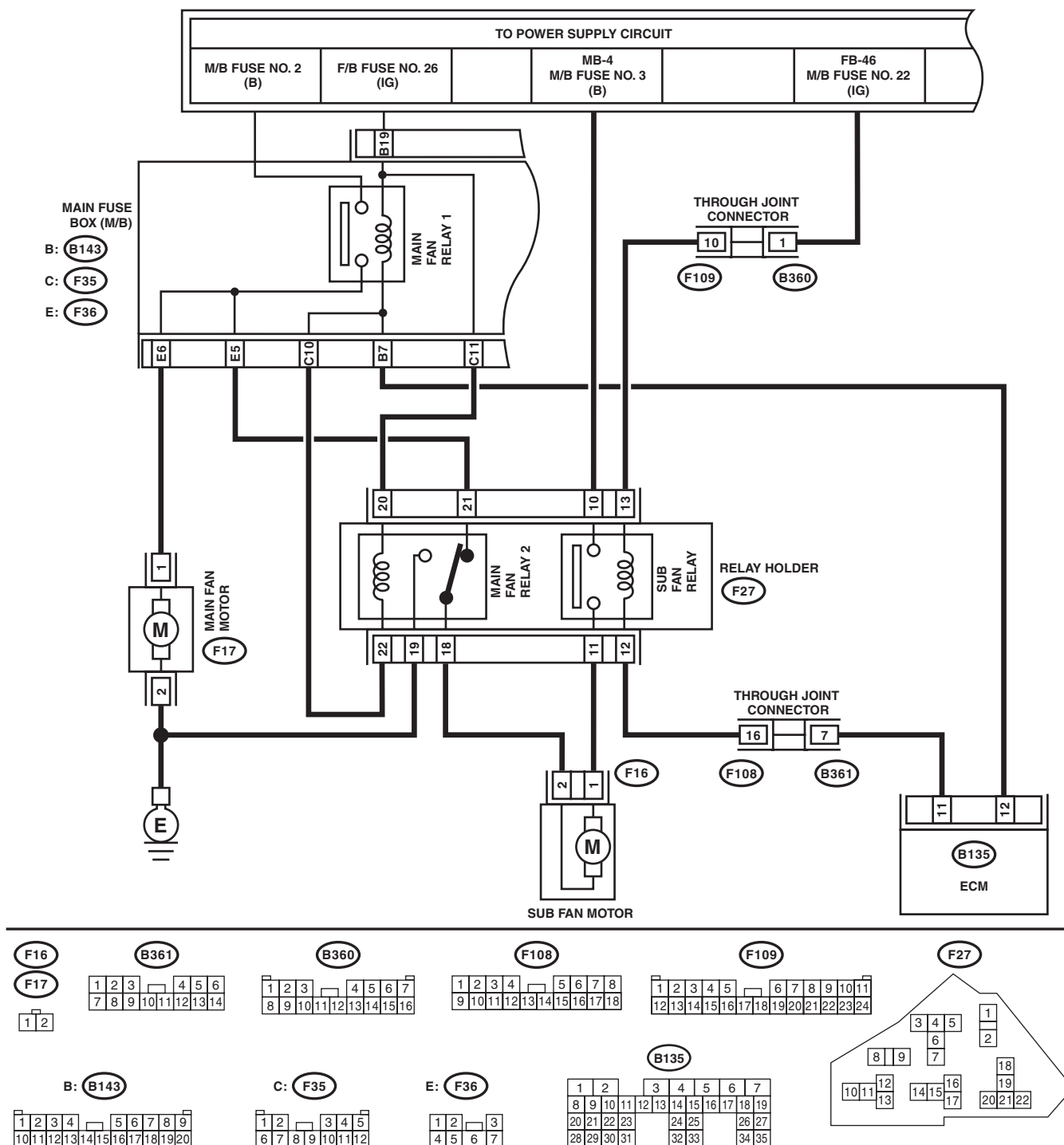


## 2. Radiator Fan System

### A: WIRING DIAGRAM

Radiator Fan System <Ref. to WI-64, WIRING DIAGRAM, Radiator Fan System.>



CO-02773

# Radiator Fan System

## COOLING

### B: INSPECTION

#### OPERATING CONDITION:

| Vehicle speed                                                                                        | A/C compressor load | Engine coolant temperature                                       |                                                                        |                                                                  |
|------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                                                      |                     | Increase: 89°C (192°F) or less<br>Decrease: 87°C (189°F) or less | Increase: 90 — 95°C (194 — 203°F)<br>Decrease: 88 — 90°C (190 — 194°F) | Increase: 96°C (205°F) or more<br>Decrease: 91°C (196°F) or more |
|                                                                                                      |                     | Radiator fan operation                                           | Radiator fan operation                                                 | Radiator fan operation                                           |
| During acceleration: 19 km/h (12 MPH) or less<br>During deceleration: 10 km/h (6 MPH) or less        | OFF                 | OFF                                                              | Low-Speed                                                              | High-Speed                                                       |
|                                                                                                      | Low                 | Low-Speed                                                        | Low-Speed                                                              | High-Speed                                                       |
|                                                                                                      | High                | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |
| During acceleration: 20 — 69 km/h (12 — 43 MPH)<br>During deceleration: 11 — 64 km/h (7 — 40 MPH)    | OFF                 | OFF                                                              | Low-Speed                                                              | High-Speed                                                       |
|                                                                                                      | Low                 | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |
|                                                                                                      | High                | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |
| During acceleration: 70 — 105 km/h (43 — 65 MPH)<br>During deceleration: 65 — 100 km/h (40 — 62 MPH) | OFF                 | OFF                                                              | Low-Speed                                                              | High-Speed                                                       |
|                                                                                                      | Low                 | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |
|                                                                                                      | High                | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |
| During acceleration: 106 km/h (66 MPH) or more<br>During deceleration: 101 km/h (63 MPH) or more     | OFF                 | OFF                                                              | High-Speed                                                             | High-Speed                                                       |
|                                                                                                      | Low                 | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |
|                                                                                                      | High                | High-Speed                                                       | High-Speed                                                             | High-Speed                                                       |

## 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><br>1) Connect the delivery (test) mode connector.<br>2) Turn the ignition switch to ON.<br>3) Perform the compulsory operation check for the radiator fan relay using Subaru Select Monitor.<br><b>NOTE:</b><br>• 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.<br>• Subaru Select Monitor<br>Refer to “Compulsory Valve Operation Check Mode” for detailed procedures. <Ref. to EN(H4DOTC)(diag)-64, Compulsory Valve Operation Check Mode.> | Do the radiator main fans and radiator sub fans rotate at low speed?  | Go to step 2.                       | Go to step 3.                 |
| <b>2 CHECK OPERATION OF RADIATOR FAN.</b><br>1) Connect the delivery (test) mode connector.<br>2) Turn the ignition switch to ON.<br>3) Perform the compulsory operation check for the radiator fan relay using Subaru Select Monitor.<br><b>NOTE:</b><br>• 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.<br>• Subaru Select Monitor<br>Refer to “Compulsory Valve Operation Check Mode” for detailed procedures. <Ref. to EN(H4DOTC)(diag)-64, Compulsory Valve Operation Check Mode.> | 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><br>1) Turn the ignition switch to OFF.<br>2) Remove the sub fan relay from the relay holder.<br>3) Measure the voltage between sub fan relay connector and chassis ground.<br><b>Connector &amp; terminal</b><br><b>(F27) 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><br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between sub fan relay connector and chassis ground.<br><b>Connector &amp; terminal</b><br><b>(F27) 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><br>1) Turn the ignition switch to OFF.<br>2) Remove the fuse No. 3.<br>3) Check the condition of fuse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Is the fuse blown out?                                                | Replace the fuse.                   | Repair the power supply line. |

# Radiator Fan System

## COOLING

| Step                                                                                                                                                                                                                                                                                                                                   | Check                                                 | Yes                                                 | No                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>6 CHECK FUSE.</b><br>1) Turn the ignition switch to OFF.<br>2) Remove the fuse No. 22.<br>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><br>1) Turn the ignition switch to OFF.<br>2) Measure the resistance between sub fan relay terminals.<br><i>Terminals</i><br><i>No. 10 — No. 11:</i>                                                                                                                                                      | Is the resistance 1 M $\Omega$ or more?               | Go to step 8.                                       | Replace the sub fan relay.                                                                              |
| <b>8 CHECK SUB FAN RELAY.</b><br>1) Connect the battery to terminals No. 13 and No. 12 of the sub fan relay.<br>2) Measure the resistance between sub fan relay terminals.<br><i>Terminals</i><br><i>No. 10 — No. 11:</i>                                                                                                              | Is the resistance less than 1 $\Omega$ ?              | Go to step 9.                                       | Replace the sub fan relay.                                                                              |
| <b>9 CHECK HARNESS BETWEEN SUB FAN RELAY CONNECTOR AND SUB FAN MOTOR CONNECTOR.</b><br>1) Disconnect the connector from the sub fan motor.<br>2) Measure the resistance of harness between sub fan relay connector and sub fan motor connector.<br><i>Connector &amp; terminal</i><br><i>(F16) No. 1 — (F27) No. 11:</i>               | 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><br>1) Remove main fan relay 2 from the relay holder.<br>2) Measure the resistance of harness between sub fan motor connector and main fan relay 2 connector.<br><i>Connector &amp; terminal</i><br><i>(F16) No. 2 — (F27) No. 18:</i>          | 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><br>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><br>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><br>Measure the resistance between main fan relay 2 terminals.<br><i>Terminals</i><br><i>No. 21 — No. 18:</i>                                                                                                                                                                                         | 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><br>1) Disconnect the connector from the main fan motor.<br>2) Measure the resistance of the harness between main fan relay 2 connector and main fan motor connector.<br><i>Connector &amp; terminal</i><br><i>(F17) No. 1 — (F27) No. 21:</i> | 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. |

# Radiator Fan System

COOLING

| Step                                                                                                                                                                                                                                                                                                                                  | Check                                                  | Yes                                                  | No                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>15 CHECK MAIN FAN MOTOR AND GROUND CIRCUIT.</b><br>Measure the resistance between main fan motor connector and chassis ground.<br><b>Connector &amp; terminal</b><br><b>(F17) No. 2 — Chassis ground:</b>                                                                                                                          | Is the resistance less than 5 $\Omega$ ?               | Go to step 16.                                       | Repair the open circuit of the harness between main fan motor connector and chassis ground.                 |
| <b>16 CHECK FOR POOR CONTACT.</b><br>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><br>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.                                                                                 |
| <b>18 CHECK HARNESS BETWEEN SUB FAN RELAY CONNECTOR AND ECM.</b><br>1) Disconnect the connector from ECM.<br>2) Measure the resistance between the sub fan relay connector and ECM connector.<br><b>Connector &amp; terminal</b><br><b>(B135) No. 11 — (F27) 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><br>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)-48, Read Diagnostic Trouble Code (DTC).> |
| <b>20 CHECK MAIN FAN RELAY 1.</b><br>1) Turn the ignition switch to OFF.<br>2) Remove main fan relay 1 from the main fuse box.<br>3) Measure the resistance between terminals of main fan relay 1 switch.                                                                                                                             | 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><br>1) Connect the main fan relay 1 coil side terminal to the battery.<br>2) Measure the resistance between terminals of main fan relay 1 switch.                                                                                                                                                    | 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><br>1) Disconnect the connector from the main fan motor.<br>2) Measure the resistance of the harness between main fan relay 1 connector and main fan motor connector.<br><b>Connector &amp; terminal</b><br><b>(F17) No. 1 — (F36) No. 6:</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><br>1) Disconnect the connector from ECM.<br>2) Measure the resistance between the main fan relay 1 connector and ECM connector.<br><b>Connector &amp; terminal</b><br><b>(B135) No. 12 — (B143) No. 7:</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.                          |

# Radiator Fan System

## COOLING

| Step                                                                                                                                                                                                                                                                     | Check                                    | Yes                                       | No                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>24 CHECK HARNESS BETWEEN MAIN FAN RELAY 2 CONNECTOR AND ECM.</b><br>Measure the resistance between the main fan relay 2 connector and ECM connector.<br><b>Connector &amp; terminal</b><br><b>(B135) No. 12 — (F27) 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><br>1) Turn the ignition switch to OFF.<br>2) Remove the fuse No. 2 and No. 26.<br>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><br>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.                                     |
| <b>27 CHECK OPERATION OF RADIATOR FAN.</b><br>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><br>1) Remove main fan relay 2 from the relay holder.<br>2) Measure the resistance between main fan relay 2 connector and chassis ground.<br><b>Connector &amp; terminal</b><br><b>(F27) No. 19 — Chassis ground:</b> | Is the resistance less than 1 $\Omega$ ? | Go to step 29.                            | Repair the open circuit of harness between main fan relay 2 connector and chassis ground. |
| <b>29 CHECK POWER SUPPLY TO MAIN FAN RELAY 2.</b><br>1) Turn the ignition switch to ON.<br>2) Measure the voltage between main fan relay 2 connector and chassis ground.<br><b>Connector &amp; terminal</b><br><b>(F27) 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><br>1) Turn the ignition switch to OFF.<br>2) Remove the main fan relay 2.<br>3) Measure the resistance between main fan relay 2 terminals.<br><b>Terminals</b><br><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><br>1) Connect the battery to terminals No. 20 and No. 22 of the main fan relay 2.<br>2) Measure the resistance between main fan relay 2 terminals.<br><b>Terminals</b><br><b>No. 18 — No. 19:</b>                                      | Is the resistance less than 1 $\Omega$ ? | Go to step 23.                            | Replace the main fan relay 2.                                                             |