Fuel Pump Control Circuit

**DESCRIPTION**
Refer to DTC P0230 (See page ES-164).

**WIRING DIAGRAM**
Refer to DTC P0230 (See page ES-166).

**INSPECTION PROCEDURE**

1. **CHECK FUEL PUMP OPERATION**
   (a) Check if there is pressure in the fuel inlet hose.
   **HINT:**
   If there is fuel pressure, you will hear the sound of fuel flowing.
   
   ![Diagram](image)

   **OK**
   Go to step 10

2. **PERFORM ACTIVE TEST USING INTELLIGENT TESTER (OPERATE CIRCUIT OPENING RELAY)**
   (a) Connect an intelligent tester to the DLC3.
   (b) Turn the ignition switch ON and turn the tester ON.
   (c) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / FUEL PUMP / SPD.
   (d) Check whether operating sounds can be heard while operating the relay using the tester.
   **OK:**
   Operating sounds can be heard from relay.
   
   ![Diagram](image)

   **OK**
   Go to step 5

3. **INSPECT CIRCUIT OPENING RELAY**
   (a) Remove the circuit opening relay from the engine room R/B.
   (b) Check the circuit opening relay resistance.
   **Standard Resistance**
   
<table>
<thead>
<tr>
<th>Tester Connections</th>
<th>Specified Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 5</td>
<td>10 kΩ or higher</td>
</tr>
<tr>
<td>3 - 5</td>
<td>Below 1 Ω</td>
</tr>
<tr>
<td></td>
<td>(when battery voltage applied to terminals 1 and 2)</td>
</tr>
</tbody>
</table>
   (c) Reinstall the circuit opening relay.

   ![Diagram](image)

   **NG**
   REPLACE CIRCUIT OPENING RELAY
4 INSPECT ECM (FC VOLTAGE)

(a) Turn the ignition switch ON.
(b) Measure the voltage between the terminals of the B3 and E47 ECM connectors.

**Standard Voltage**

<table>
<thead>
<tr>
<th>Tester Connections</th>
<th>Specified Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC (E47-10) - E1 (B3-1)</td>
<td>11 to 14 V</td>
</tr>
</tbody>
</table>

**OK**  REPLACE ECM (See page ES-446)

NG

CHECK AND REPLACE HARNESS AND CONNECTOR (ECM - CIRCUIT OPENING RELAY - IGNITION SWITCH)

5 INSPECT ECM POWER SOURCE CIRCUIT

Inspect the ECM power source circuit (See page ES-384).

NG  REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

6 INSPECT FUEL PUMP RELAY ASSEMBLY

(a) Remove the fuel pump relay from the engine room R/B.
(b) Check the fuel pump relay resistance.

**Standard Resistance**

<table>
<thead>
<tr>
<th>Tester Connections</th>
<th>Specified Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 4</td>
<td>Below 1 Ω</td>
</tr>
<tr>
<td>3 - 5</td>
<td>10 kΩ or higher</td>
</tr>
<tr>
<td>3 - 4</td>
<td>10 kΩ or higher</td>
</tr>
<tr>
<td>(when battery voltage applied to terminals 1 and 2)</td>
<td></td>
</tr>
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<td>3 - 5</td>
<td>Below 1 Ω</td>
</tr>
<tr>
<td>(when battery voltage applied to terminals 1 and 2)</td>
<td></td>
</tr>
</tbody>
</table>

(c) Reinstall the fuel pump relay.

NG  REPLACE FUEL PUMP RELAY ASSEMBLY

OK
7 INSPECT FUEL PUMP ASSEMBLY

(a) Inspect the fuel pump resistance.
   (1) Measure the resistance between terminals 4 and 5. **Standard Resistance:**
       0.2 to 3.0 Ω at 20°C (68°F)
(b) Inspect the fuel pump operation.
   (1) Apply battery voltage to both terminals. Check that the pump operates.
   **NOTICE:**
   • These tests must be done quickly (within 10 seconds) to prevent the coil from burning out.
   • Keep the fuel pump as far away from the battery as possible.
   • Always do the switching at the battery side.

NG REPLACE FUEL PUMP ASSEMBLY (See page FU-27)

OK

8 CHECK HARNESS AND CONNECTOR (FUEL PUMP - FUEL PUMP RELAY, FUEL PUMP - BODY GROUND)

(a) Check the harness and connector between the fuel pump and fuel pump relay.
   (1) Disconnect the L5 fuel pump connector.
   (2) Remove the fuel pump relay from the engine room R/B.
   (3) Check the resistance.
   **Standard Resistance (Check for open)**
   **Tester Connections** | **Specified Conditions**
   Fuel pump (L5-4) - Fuel pump relay (4) | Below 1 Ω

(b) Check the harness and connector between the fuel pump and body ground.
   (1) Disconnect the fuel pump connector.
   (2) Check the resistance.
   **Standard Resistance (Check for open)**
   **Tester Connections** | **Specified Conditions**
   Fuel pump (L5-5) - Body ground | Below 1 Ω

(3) Reconnect the fuel pump connector.
**CHECK HARNESS AND CONNECTOR (CIRCUIT OPENING RELAY - FUEL PUMP RELAY)***

- **(a)** Remove the circuit opening relay from the engine room R/B.
- **(b)** Remove the fuel pump relay from the engine room R/B.
- **(c)** Check the resistance.

  **Standard Resistance (Check for open)**

<table>
<thead>
<tr>
<th>Tester Connections</th>
<th>Specified Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit opening relay (3) - Fuel pump relay (3)</td>
<td>Below 1 Ω</td>
</tr>
</tbody>
</table>

  **Standard Resistance (Check for short)**

<table>
<thead>
<tr>
<th>Tester Connections</th>
<th>Specified Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit opening relay (3) or Fuel pump relay (3) - Body ground</td>
<td>10 kΩ or higher</td>
</tr>
</tbody>
</table>

- **(d)** Reinstall the circuit opening relay.
- **(e)** Reinstall the fuel pump relay.

**CHECK AND REPAIR HARNESS AND CONNECTOR (EFI RELAY - CIRCUIT OPENING RELAY)**

**INSPECT FUEL PUMP RELAY ASSEMBLY***

- **(a)** Remove the fuel pump relay from the engine room R/B.
- **(b)** Check the fuel pump relay resistance.

  **Standard Resistance**

<table>
<thead>
<tr>
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</tbody>
</table>

- **(c)** Reinstall the fuel pump relay.
11 INSPECT FUEL PUMP RESISTOR (RESISTANCE)

(a) Inspect the fuel pump resistor resistance.
   (1) Measure the resistance.
   **Standard Resistance:**
   0.941 to 0.999 Ω at 20°C (68°F)

   ![Ohmmeter diagram]

   **NG**
   **REPLACE FUEL PUMP RESISTOR (See page FU-36)**

OK

12 CHECK HARNESS AND CONNECTOR (FUEL PUMP RELAY - FUEL PUMP RESISTOR - FUEL PUMP)

(a) Check the harness and connector between the fuel pump relay and fuel pump resistor.
   (1) Remove the fuel pump relay from the engine room R/B.
   (2) Disconnect the A13 fuel pump resistor connector.
   (3) Check the resistance.
   **Standard Resistance (Check for open)**
   **Standard Resistance (Check for short)**

   ![Fuel Pump Relay diagram]

   ![Fuel Pump Resistor Connector diagram]

   ![Fuel Pump Connector diagram]

(b) Check the harness and connector between the fuel pump resistor and fuel pump.
   (1) Disconnect the A13 fuel pump resistor connector.
   (2) Disconnect the L5 fuel pump connector.
   (3) Check the resistance.
   **Standard Resistance (Check for open)**
   **Standard Resistance (Check for short)**

   ![Tester Connections table]

   (4) Reinstall the fuel pump relay.
   (5) Reconnect the fuel pump resistor connector.
NG

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

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REPAIR OR REPLACE HARNESS OR CONNECTOR