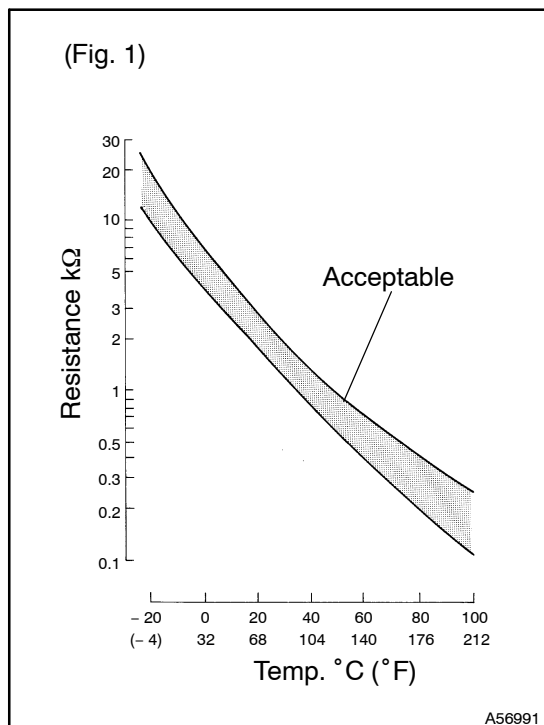


|            |           |   |
|------------|-----------|---|
| <b>DTC</b> | <b>39</b> | <b>FUEL TEMP.SENSOR CIRCUIT<br/>MALFUNCTION</b> |
|------------|-----------|---|

## CIRCUIT DESCRIPTION



The fuel temperature sensor senses the fuel temperature. A thermistor built into the sensor changes the resistance value according to the fuel temperature. The lower the fuel temperature, the greater the thermistor resistance value, and the higher the fuel temperature, the lower the thermistor resistance value (See Fig. 1).

The fuel temperature sensor is connected to the ECM (See below). The 5 V power source voltage in the ECM is applied to the fuel temperature sensor from terminal THF via a resistor R. That is, resistor R and the fuel temperature sensor are connected in series. When the resistance value of the fuel temperature sensor changes in accordance with changes in the fuel temperature, the potential at terminal THF also changes. Based on this signal, the ECM performs the pressure control compensation of the supply pump and error detection compensation of the highly pressurized fuel system.

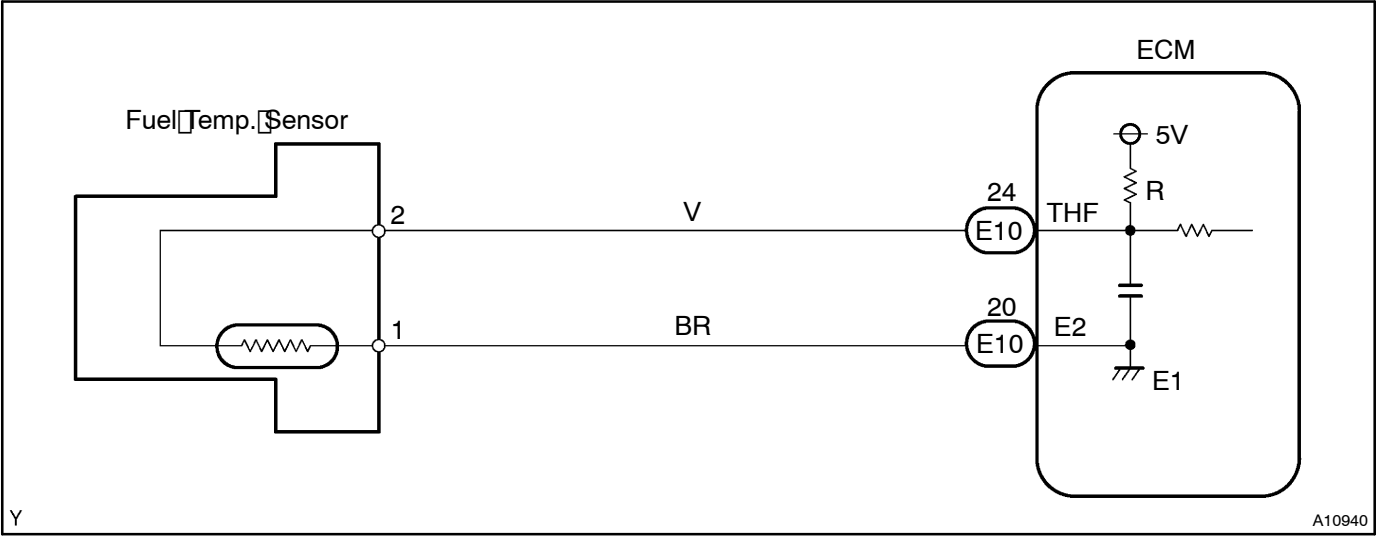
| DTC No. | DTC Detection Condition   | Trouble Area   |
|---------|---|--|
| 39      | Open or short in fuel temp. sensor circuit for 0.5 sec. or more | <ul style="list-style-type: none"> <li>• Open or short in fuel temp. sensor circuit</li> <li>• Fuel temp. sensor</li> <li>• ECM</li> </ul> |

### HINT:

After confirming DTC 39, use the hand-held tester to confirm the fuel temperature from the CURRENT DATA.

| Temperature displayed | Malfunction   |
|-----------------------|---------------|
| - 40°C (- 40°F)       | Open circuit  |
| 140°C (284°F) or more | Short circuit |

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC 22, 24, 35 and 39 are output simultaneously, E2 (sensor ground) may be open.
- Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

When using hand-held tester:

1

READ VALUE OF HAND-HELD TESTER (FUEL TEMP.)

- (a) Read the temperature value on the hand-held tester.  
Temperature: The same as actual fuel temperature.

Result:

| A             | B                     | C  |
|---------------|-----------------------|----|
| -40°C (-40°F) | 140°C (284°F) or more | OK |

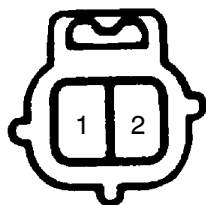
B

Go to step 4

C

CHECK FOR INTERMITTENT PROBLEMS  
(See page 05-156)

A

**2 CHECK HARNESS AND CONNECTOR(CHECK FOR OPEN)**

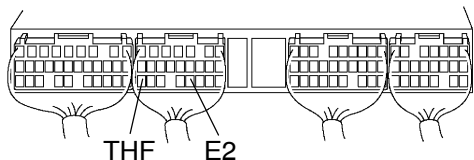
A50582

- (a) Disconnect the fuel temperature sensor connector.
- (b) Connect the sensor terminals 1 with 2 of water temperature sensor harness side connector.
- (c) Turn the ignition switch ON.
- (d) Read the temperature value on the hand-held tester.  
**Temperature: 140°C (284°F) or more**

OK

**REPLACE INJECTION PUMP ASSY**

NG

**3 INSPECT ECM(CHECK FOR OPEN)**

Y

A56850

- (a) Connect between terminals THF and E2 of the ECM connector.
- (b) Turn the ignition switch ON.
- (c) Read the temperature value on the hand-held tester.  
**Temperature: 140°C (284°F) or more**

OK

**REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

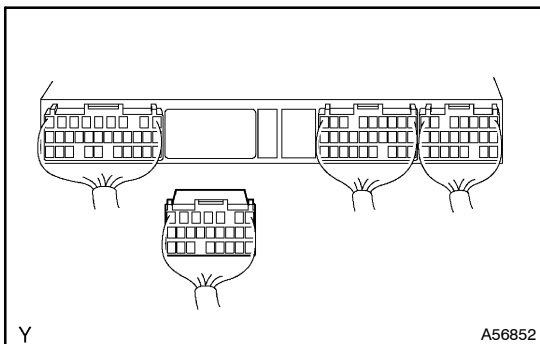
**CHECK AND REPLACE ECM****4 CHECK HARNESS AND CONNECTOR(CHECK FOR SHORT)**

- (a) Disconnect the fuel temperature sensor connector.
- (b) Turn the ignition switch ON.
- (c) Read the temperature value on the hand-held tester.  
**Temperature: - 40°C (- 40°F)**

OK

**REPLACE SENSOR, FUEL TEMPERATURE**

NG

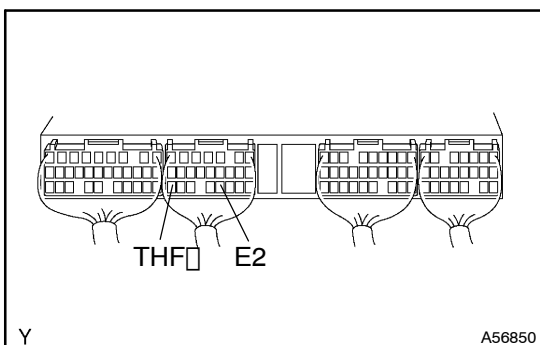
**5 INSPECT ECM (CHECK FOR SHORT)**

- (a) Disconnect the ECM E10 connector.  
 (b) Turn the ignition switch ON.  
 (c) Read the temperature value on the hand-held tester.  
**Temperature:  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ )**

OK

**REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

**CHECK AND REPLACE ECM****When not using hand-held tester:****1 INSPECT ECM**

- (a) Turn the ignition switch ON.  
 (b) Measure the voltage between terminals THF and E2 of the ECM connector.

**Voltage:**

| Fuel Temp. (°C) (°F)     | Voltage     |
|--------------------------|-------------|
| 20 (68) (Engine is cool) | 0.2 - 3.8 V |
| 80 (176) (Engine is hot) | 0.1 - 1.5 V |

OK

**CHECK FOR INTERMITTENT PROBLEMS  
(See page 05-156)**

NG

**2 INSPECT INJECTION PUMP ASSY**

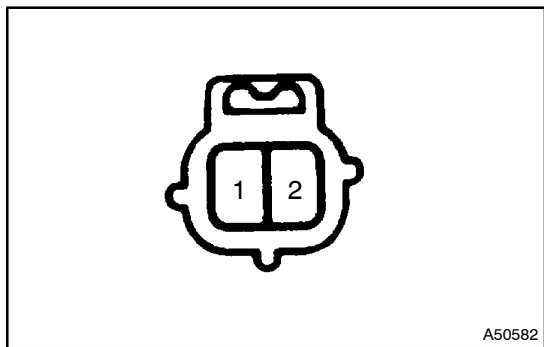
- (a) Inspect the fuel temperature sensor.  
 (1) Disconnect the fuel temperature sensor connector.  
 (2) Measure the resistance between the fuel temperature sensor terminals.  
**Resistance: 0.5 - 3.0  $\Omega$  at  $40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ )**

NG

**REPLACE INJECTION PUMP ASSY**

OK

### 3 CHECK HARNESS AND CONNECTOR(ECM-FUEL TEMP.SENSOR)



- (a) Disconnect the fuel temperature sensor connector.
- (b) Disconnect the ECM E10 connector.
- (c) Check for open between the terminals 2 of the fuel temperature sensor harness side connector and THF of the ECM E10 connector.

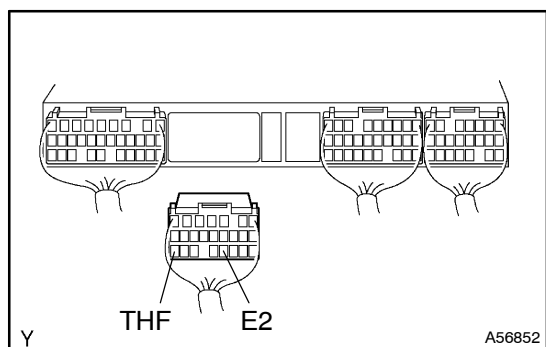
**Resistance: 1  $\Omega$  or less**

- (d) Check for open between the terminals 1 of the fuel temperature sensor harness side connector and E2 of the ECM E10 connector.

**Resistance: 1  $\Omega$  or less**

- (e) Check for short between the terminals THF and E2 of the ECM E10 connector.

**Resistance: 1 M $\Omega$  or more**



NG

**REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

**CHECK AND REPLACE ECM**