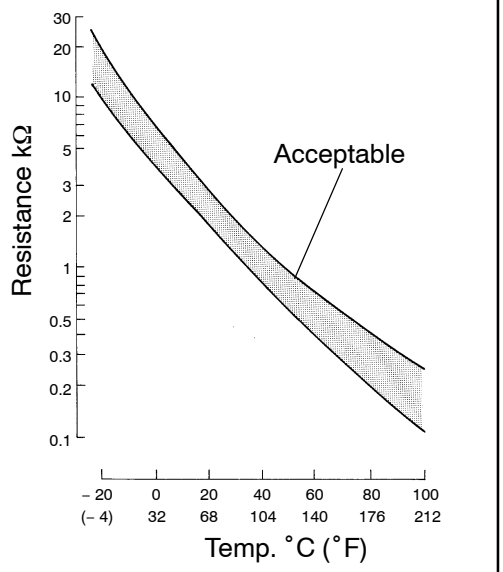
DTC	39	FUEL TEMPERATURE SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

(Fig. 1)



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. 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.

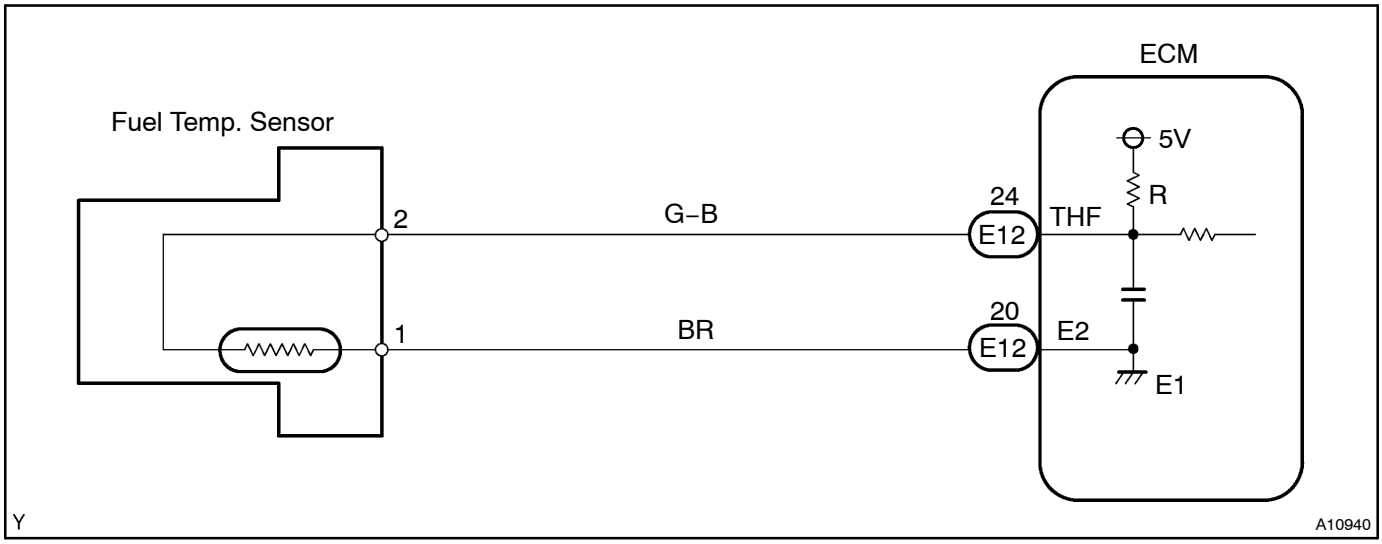
DTC No.	DTC Detection Condition	Trouble Area
39	Open or short in fuel temperature sensor circuit for 0.5 sec. or more	• Open or short in fuel temp. sensor circuit • Fuel temperature sensor • ECM

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 different DTCs that are related to different systems are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may be open.
- Read freeze frame data using the 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:

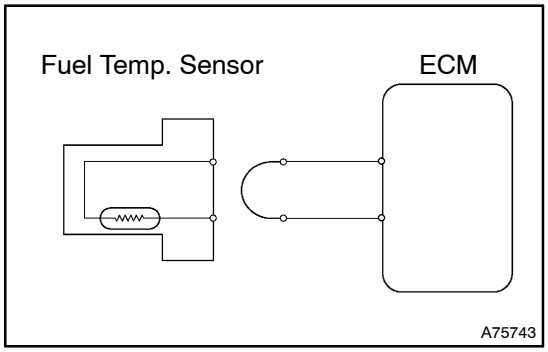
Display	Proceed
– 40 °C(– 40 °F)	A
140 °C(284 °F) or more	B
OK	C

B → **Go to step 4**

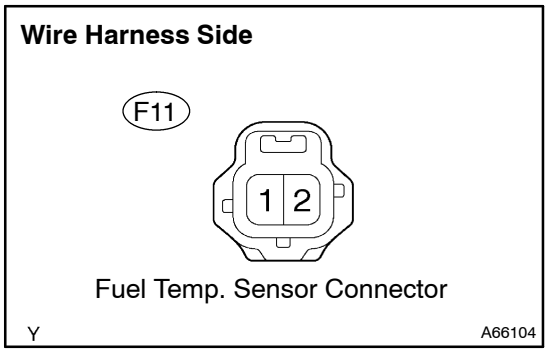
C → **CHECK FOR INTERMITTENT PROBLEMS** (See page 05–429)

A

2 CHECK HARNESS AND CONNECTOR(CHECK FOR OPEN)



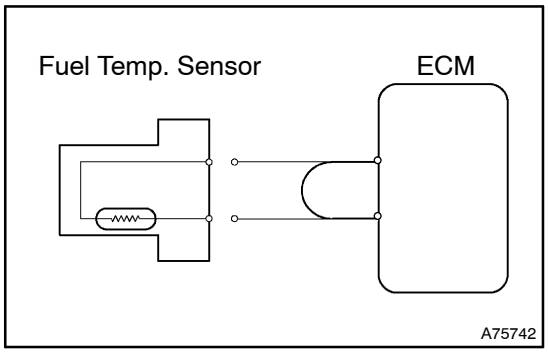
(a) Disconnect the fuel temperature sensor connector.
(b) Connect the sensor terminals 1 with 2 of fuel temperature sensor harness side connector.
(c) Turn the ignition switch ON.
(d) Read the temperature value on the hand–held tester.
Temperature: 140˚C (284˚F) or more



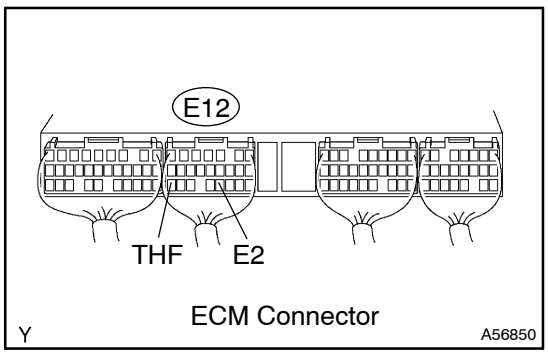
OK → **REPLACE FUEL TEMPERATURE SENSOR**

NG

3 INSPECT ECM(CHECK FOR OPEN)



(a) Connect between terminals THF and E2 of the ECM E12 connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand–held tester.
Temperature: 140˚C (284˚F) or more

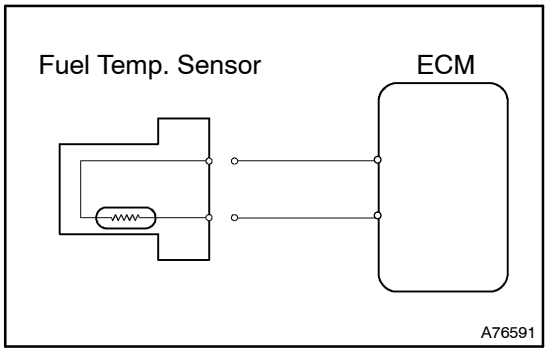


OK	REPAIR OR REPLACE HARNESS OR CONNECTOR

NG

CHECK AND REPLACE ECM

4 CHECK HARNESS AND CONNECTOR(CHECK FOR SHORT)

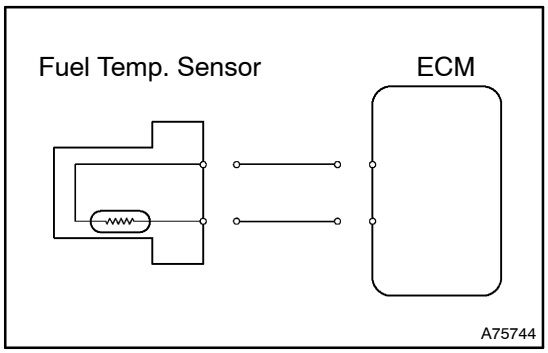


(a) Disconnect the fuel temperature sensor connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand–held tester.
Temperature: – 40°C (– 40°F)

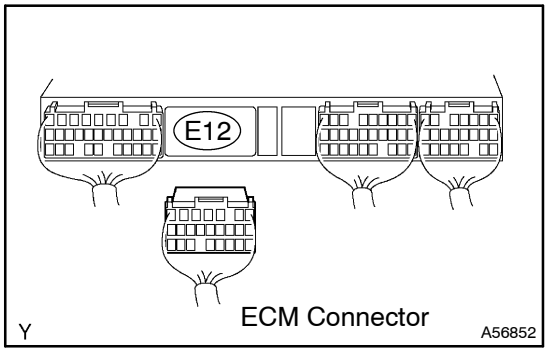
OK	REPLACE FUEL TEMPERATURE SENSOR

NG

5 INSPECT ECM(CHECK FOR SHORT)



(a) Disconnect the ECM E12 connector.
(b) Turn the ignition switch ON.
(c) Read the temperature value on the hand–held tester.
Temperature: – 40°C (– 40°F)



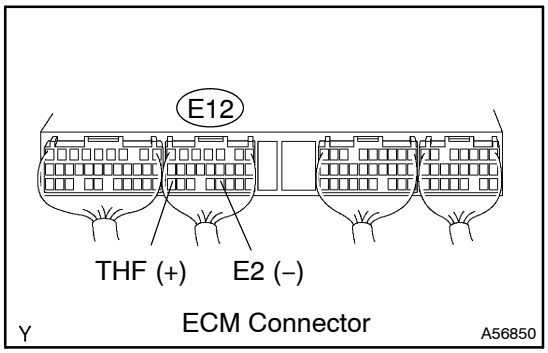
OK	REPAIR OR REPLACE HARNESS OR CONNECTOR

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 the terminals of the ECM E12 connector.

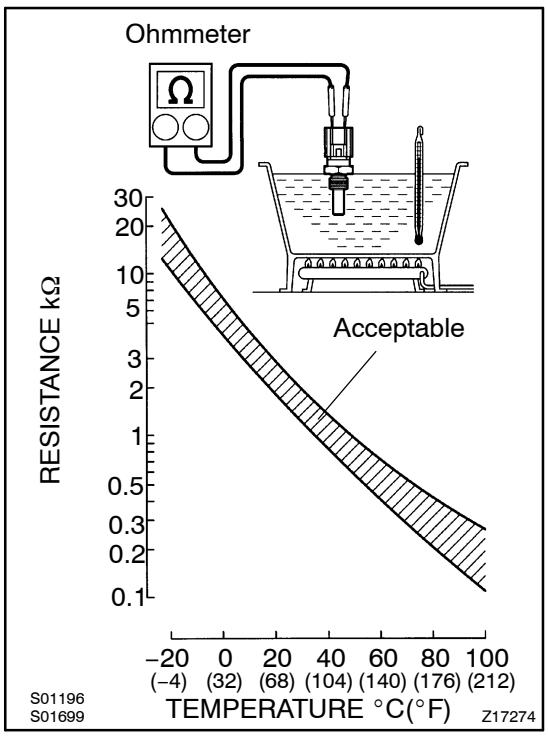
Voltage:

Symbols (Terminal No.)	Condition	Specified condition
THF (E12 – 24) ⇔ E2 (E12 – 20)	20 °C (68 °F)	0.2 – 3.8 V
	80 °C (176 °F)	0.1 – 1.5 V

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–429)**

NG

2	INSPECT FUEL TEMPERATURE SENSOR



(a) Check fuel temperature sensor for resistance.
(1) Using an ohmmeter, measure the resistance between terminals.

Resistance:
Approx. 20°C (68°F) 2.21 – 2.69 kΩ
Approx. 80°C (176°F) 0.287 – 0.349 kΩ

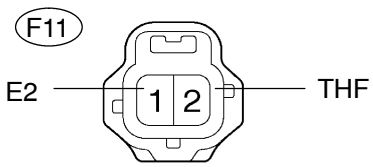
NOTICE:
In case of checking the water temperature sensor in the water, be careful not to allow water to go into the terminals, and after checking, wipe out the sensor.

NG → **REPLACE FUEL TEMPERATURE SENSOR**

OK

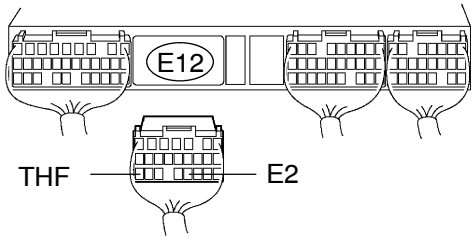
3 CHECK HARNESS AND CONNECTOR(ECM – FUEL TEMPERATURE SENSOR)

Wire Harness Side



Fuel Temperature Sensor Connector

Y A66104



Y ECM Connector A56852

(a) Disconnect the fuel temperature sensor connector.
(b) Disconnect the ECM E12 connector.
(c) Check the continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
THF (F11 – 2) ⇔ THF (E12 – 24)	Continuity
E2 (F11 – 1) ⇔ E2 (E12 – 20)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
THF (E12 – 24) ⇔ E2 (E12 – 20)	No continuity

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

CHECK AND REPLACE ECM