DTC	P0168/39	FUEL TEMPERATURE TOO HIGH

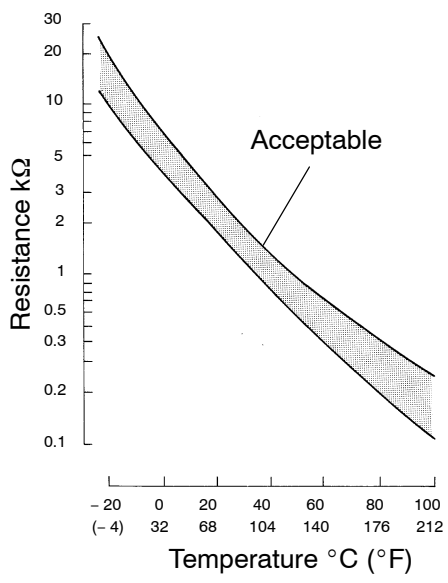
DTC	P0180/39	FUEL TEMPERATURE SENSOR ”A” CIRCUIT

DTC	P0182/39	FUEL TEMPERATURE SENSOR ”A” CIRCUIT LOW INPUT

DTC	P0183/39	FUEL TEMPERATURE SENSOR ”A” CIRCUIT HIGH INPUT

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 is, the greater the thermistor resistance becomes, and the higher the fuel temperature is, the lower the thermistor resistance becomes (see Fig. 1).

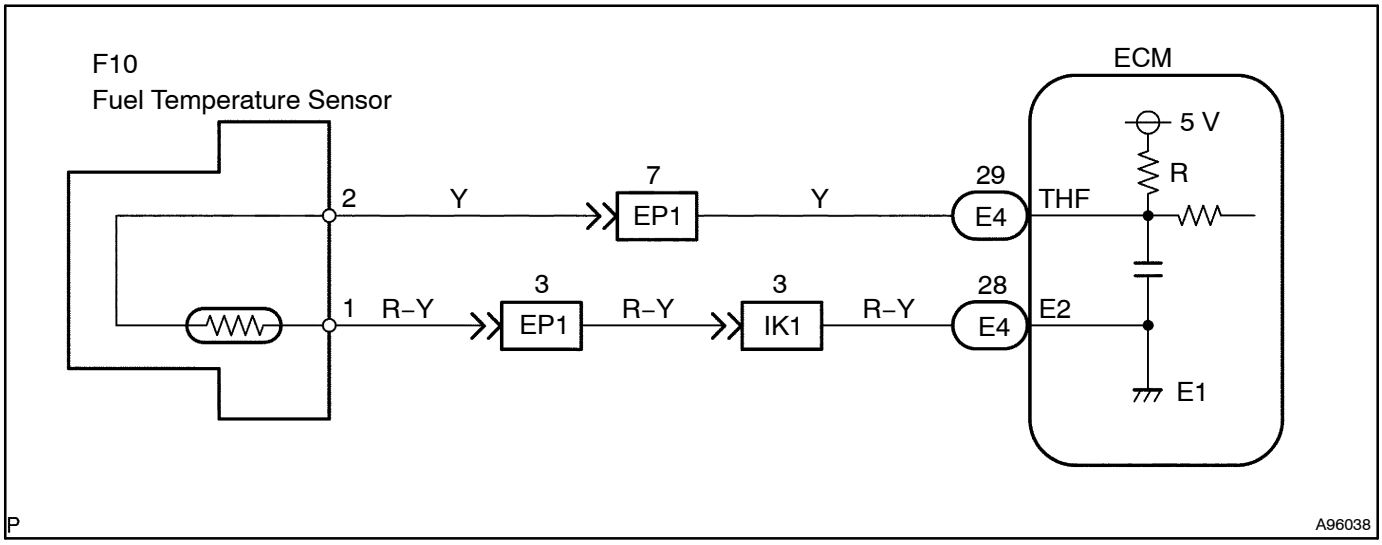
The fuel temperature sensor is connected to the ECM. The 5 V power source voltage in the ECM is applied to the fuel temperature sensor from terminal THF via resistor R. The resistor R and the fuel temperature sensor are connected in series. When the resistance value of the fuel temperature sensor changes in accordance with the fuel temperature, the voltage at terminal THF also changes. Based on this signal, the ECM corrects the pressure control compensation of the supply pump and an error.

DTC No.	DTC Detection Condition	Trouble Area
P0168/39	After engine is warmed up, conditions (a), (b) and (c) continue for more than 1 second: (a) Engine speed: 1,000 rpm or more (b) Vehicle speed: 10 km/h (6 mph) or more (c) Fuel temperature: 96°C (205°F) or more	• Open or short in fuel temperature sensor circuit • Fuel temperature sensor • ECM
P0180/39	Open or short in fuel temperature sensor circuit for 0.5 seconds	Same as DTC No. P0168/39
P0182/39	Short in fuel temperature sensor circuit for 0.5 seconds	Same as DTC No. P0168/39
P0183/39	Open in fuel temperature sensor circuit for 0.5 seconds	Same as DTC No. P0168/39

HINT:
After confirming DTC ”P0180/39, P0182/39 or P0183/39”, use the hand–held tester to confirm the fuel temperature from the FUEL TEMP menu (to reach the FUEL TEMP menu: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / FUEL TEMP).

Temperature Displayed	Malfunction
–40˚C (–40˚F)	Open circuit
140˚C (284˚F) or more	Short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs that are related to different systems are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may have an open circuit.
- Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

When using hand–held tester:

1	READ VALUE OF DATA LIST (FUEL TEMPERATURE)

(a) Connect the hand–held tester (with 24 V VIM) to the DLC3.
(b) Turn the ignition switch ON and turn the hand–held tester ON.
(c) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / FUEL TEMP. Read the values.
Standard: Same value as the actual fuel temperature.
Result:

Temperature Displayed	Proceed to
–40°C (–40°F)	A
140°C (284°F) or more	B
OK (same as actual fuel temperature)	C

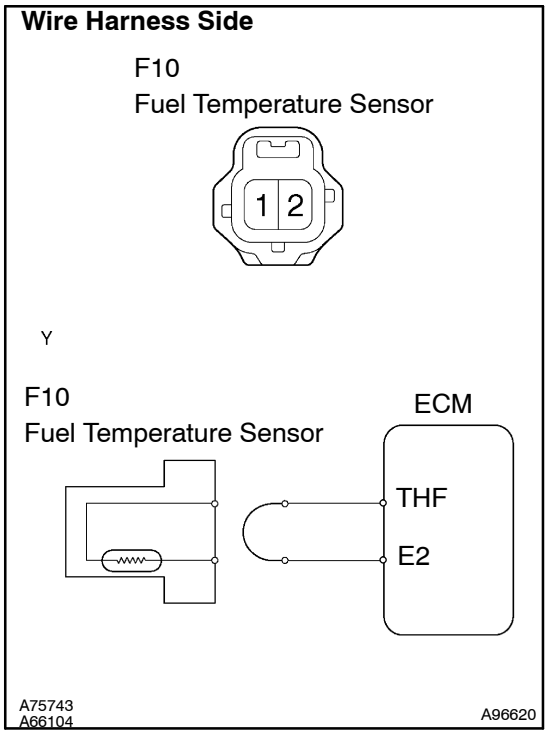
HINT:
- If there is an open circuit, the hand–held tester indicates –40°C (–40°F).
- If there is a short circuit, the hand–held tester indicates 140°C (284°F) or more.

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–10)**

A

2	READ VALUE OF DATA LIST (CHECK FOR OPEN IN WIRE HARNESS)

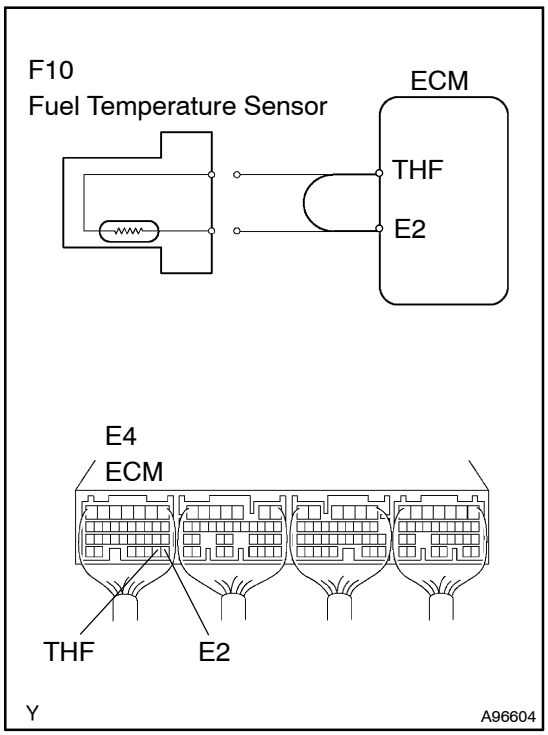


(a) Disconnect the F10 sensor connector.
(b) Connect terminals 1 and 2 of the wire harness side connector.
(c) Turn the ignition switch ON.
(d) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / FUEL TEMP. Read the values.
Standard: 140°C (284°F) or more

OK → **CONFIRM GOOD CONNECTION AT SENSOR. IF OK, REPLACE FUEL TEMPERATURE SENSOR**

NG

3 READ VALUE OF DATA LIST (CHECK FOR OPEN IN ECM)



(a) Disconnect the F10 sensor connector.
(b) Connect terminals THF and E2 of the E4 ECM connector.

HINT:

Before checking, do a visual and contact pressure check for the ECM connector.

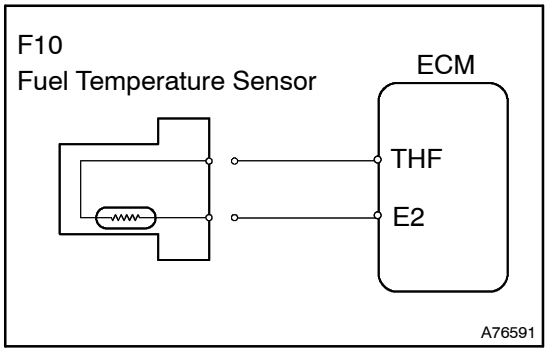
(c) Turn the ignition switch ON.
(d) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / FUEL TEMP. Read the values.
Standard: 140°C (284°F) or more

NG → **CONFIRM GOOD CONNECTION AT ECM. IF OK, REPLACE ECM (See page 10–10)**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

4 READ VALUE OF DATA LIST (CHECK FOR SHORT IN WIRE HARNESS)

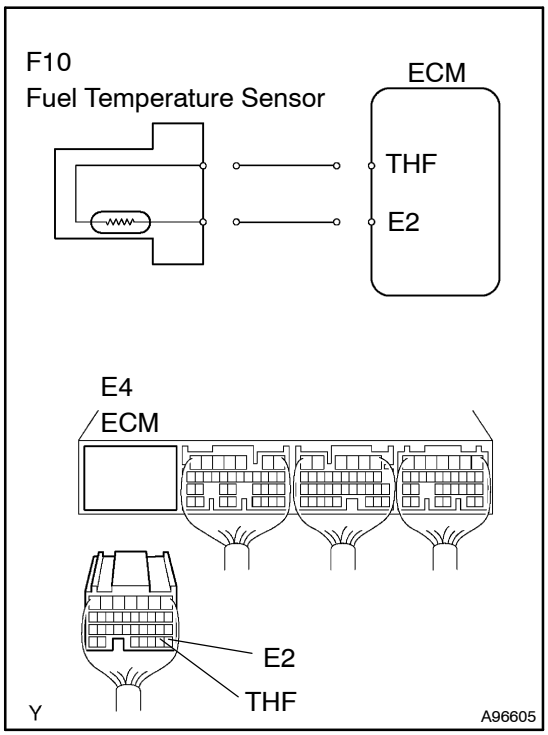


(a) Disconnect the F10 sensor connector.
(b) Turn the ignition switch ON.
(c) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / FUEL TEMP. Read the values.
Standard: –40°C (–40°F)

OK → **REPLACE FUEL TEMPERATURE SENSOR**

NG

5	READ VALUE OF DATA LIST (CHECK FOR SHORT IN ECM)



(a) Disconnect the E4 ECM connector.
(b) Turn the ignition switch ON.
(c) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / Fuel temp. Read the values.
Standard: –40°C (–40°F)

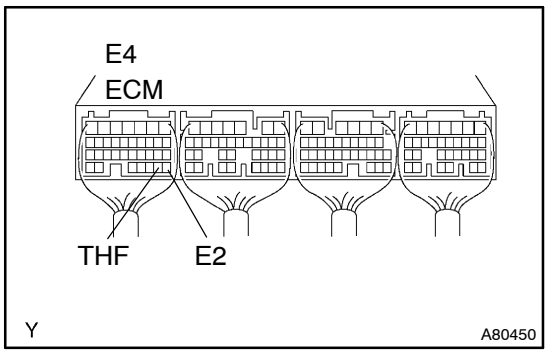
NG → **REPLACE ECM (See page 10–10)**

OK

REPAIR OR REPLACE HARNESS AND CONNECTOR

When not using hand–held tester:

1	CHECK ECM (THF VOLTAGE)



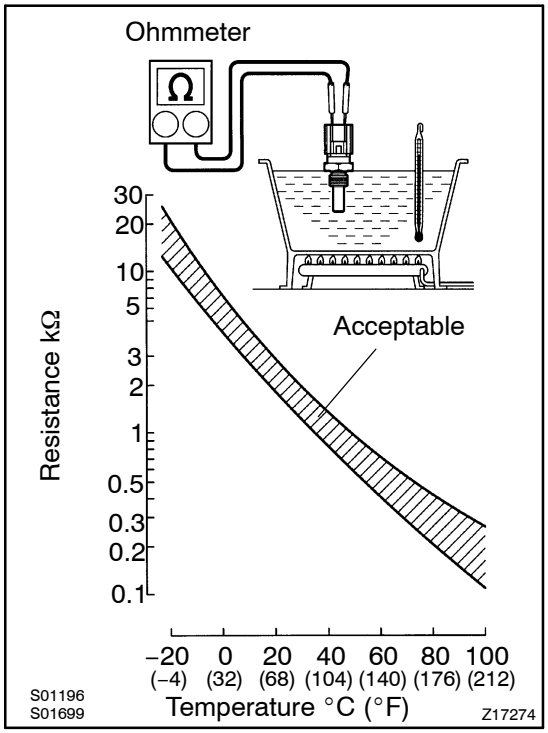
(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connector.
Standard:

Tester Connection	Condition	Specified Condition
E4–29 (THF) – E4–28 (E2)	Ignition switch ON (engine is cold)	1.2 to 1.6 V

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–10)**

NG

2 INSPECT FUEL TEMPERATURE SENSOR



(a) Remove the fuel temperature sensor.
(b) Using an ohmmeter, measure the resistance between terminals.

Standard:

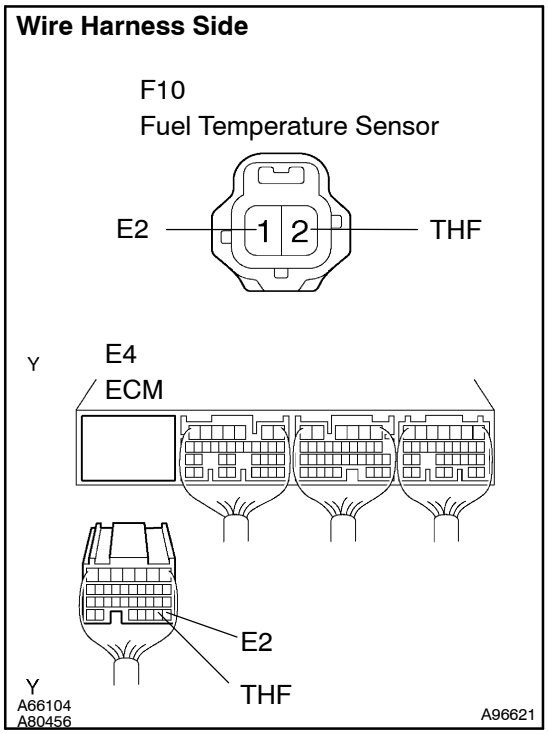
Connection	Specified Condition
20°C (68°F)	2.32 to 2.59 kΩ
80°C (176°F)	0.310 to 0.326 kΩ

NOTICE:
If checking the ECT 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 WIRE HARNESS (ECM – FUEL TEMPERATURE SENSOR)



(a) Disconnect the F10 sensor connector.
(b) Disconnect the E4 ECM connector.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
F10–2 (THF) – E4–29 (THF) F10–1 (E2) – E4–28 (E2)	Below 1 Ω
E4–29 (THF) – E4–28 (E2)	10 kΩ or higher

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

OK

REPLACE ECM (See page 10–10)