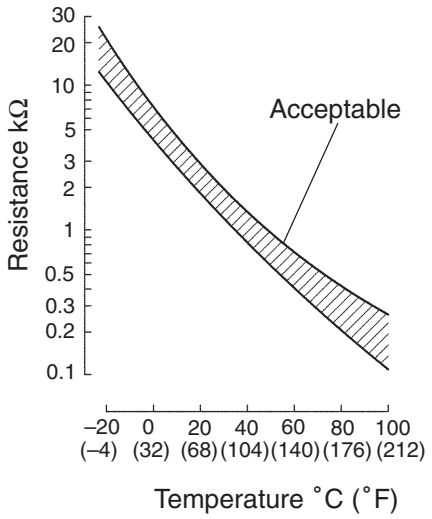
DTC	P0180/39	FUEL TEMPERATURE SENSOR "A" CIRCUIT

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 monitors the fuel temperature. The fuel temperature sensor has a thermistor that varies its resistance depending on the fuel temperature. When the fuel temperature is low, the resistance in the thermistor increases. When the temperature is high, the resistance drops. The variations in resistance are communicated to the ECM as changes in voltage (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 resistor R.

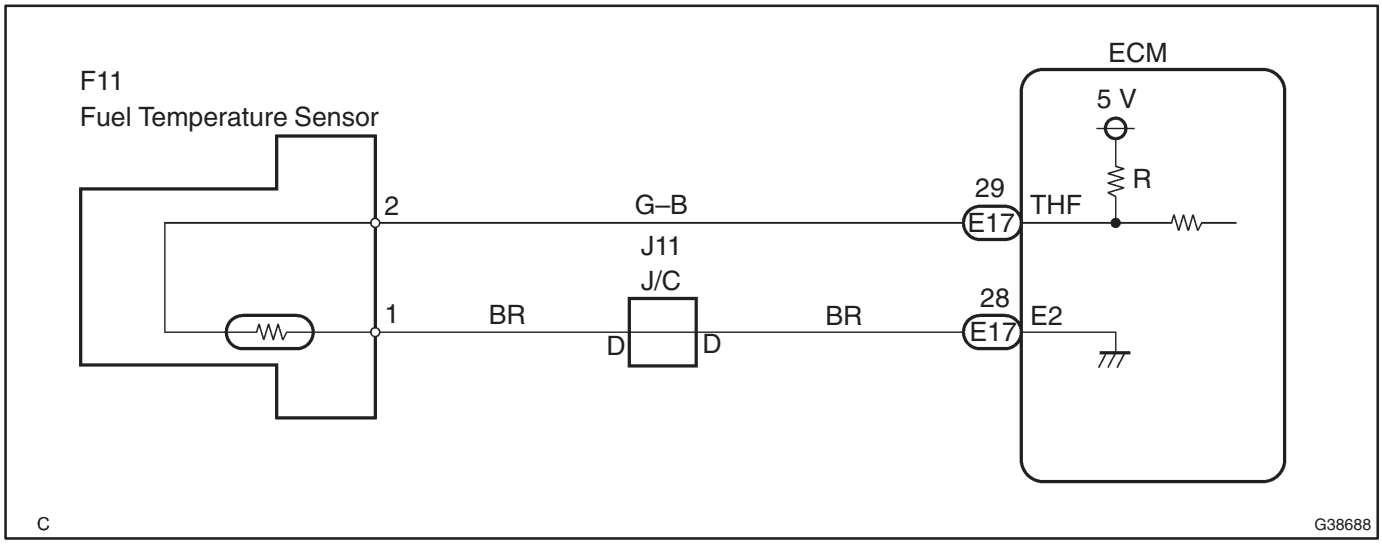
The resistor R and fuel temperature sensor are connected in series. When the resistance value of the fuel temperature sensor changes in accordance with changes in the fuel temperature, the voltage at terminal THF also changes. Based on this signal, the ECM corrects the pressure control compensation of the supply pump and errors.

DTC No.	DTC Detection Condition	Trouble Area	Proceed to
P0180/39	Open or short in fuel temperature sensor circuit for 0.5 seconds (1 trip detection logic)	• Open or short in fuel temperature sensor circuit • Fuel temperature sensor • ECM	Step 1
P0182/39	Short in fuel temperature sensor circuit for 0.5 seconds (1 trip detection logic)	• Open or short in fuel temperature sensor circuit • Fuel temperature sensor • ECM	Step 4
P0183/39	Open in fuel temperature sensor circuit for 0.5 seconds (1 trip detection logic)	• Open or short in fuel temperature sensor circuit • Fuel temperature sensor • ECM	Step 2

HINT:
When DTC P0180/39, P0182/39 and/or P0183/39 is detected, check the fuel temperature by entering the following menus on the intelligent tester II: Powertrain / Engine / Data List / Fuel Temperature.

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

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs related to different systems that have terminal E2 as the ground terminal are output simultaneously, terminal E2 may have an open circuit.
- Read freeze frame data using the intelligent tester II. 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, and other data from the time the malfunction occurred.

NOTICE:

Before starting the diagnostic procedures, check if the intellignt tester II Data List's "Fuel Temp (Turbo)" is displayed. Enter the following the menus: Powertrain / Engine / Data List.

Result:

Tester Displayed	Proceed to
"Fuel Temp (Turbo)" is displayed	"When using intelligent tester II" diagnostic procedures
"Fuel Temp (Turbo)" is not displayed	"When not using intelligent tester II" diagnostic procedures

When using intelligent tester II:

1	READ DATA LIST (FUEL TEMPARATURE)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the ignition switch ON and turn the intelligent tester II ON.
(c) Enter the following menus: Powertrain / Engine / Data List / Fuel Temp.
(d) Read the values.
OK: 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

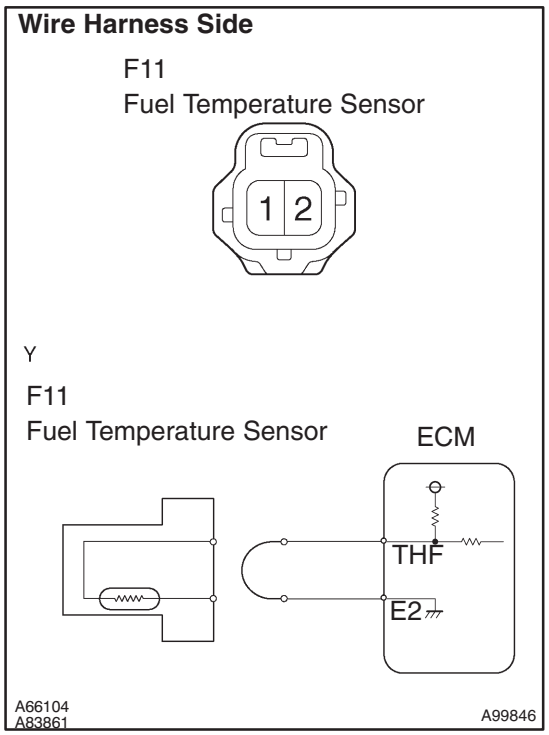
HINT:
- If there is an open circuit, the intelligent tester II indicates –40˚C (–40˚F).
- If there is a short circuit, the intelligent tester II indicates 140˚C (284˚F) or more.

B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–439)**

A

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

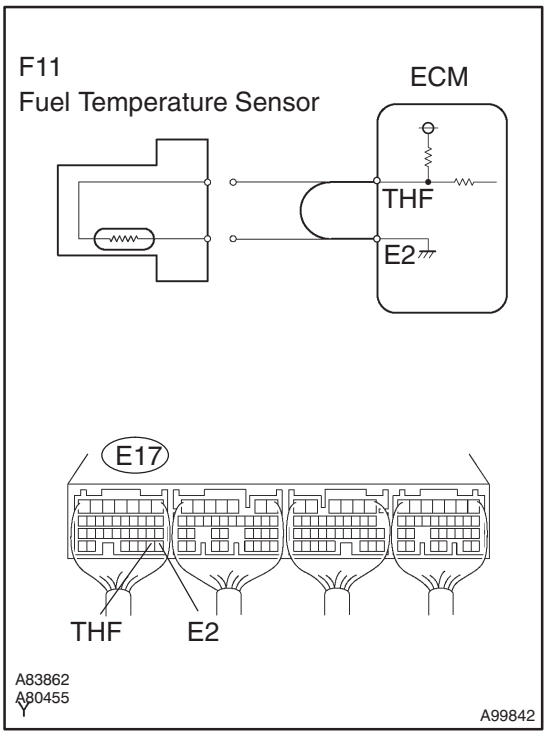


(a) Disconnect the F11 fuel temperature sensor connector.
(b) Connect terminals 1 and 2 of the fuel temperature sensor wire harness side connector.
(c) Connect the intelligent tester II to the DLC3.
(d) Turn the ignition switch ON and turn the intelligent tester II ON.
(e) Enter the following menus: Powertrain / Engine / Data List / Fuel Temp.
(f) 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 DATA LIST (CHECK FOR OPEN IN ECM)



(a) Disconnect the F11 fuel temperature sensor connector.
(b) Connect terminals THF and E2 of the E17 ECM connector.

HINT:
Before checking, perform a visual and contact pressure check on the ECM connector.

(c) Connect the intelligent tester II to the DLC3.
(d) Turn the ignition switch ON and turn the intelligent tester II ON.
(e) Enter the following menus: Powertrain / Engine / Data List / Fuel Temp.
(f) Read the values.
Standard: 140°C (284°F) or more

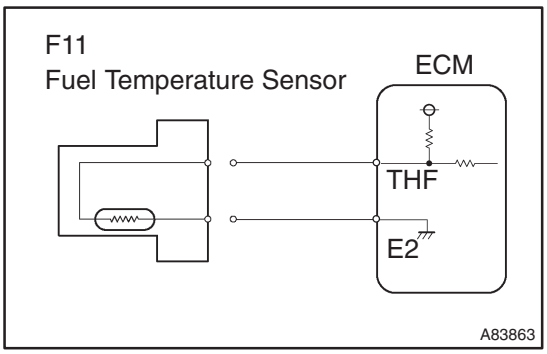
OK	**REPAIR OR REPLACE HARNESS AND CONNECTOR**

NG

CONFIRM GOOD CONNECTION AT ECM. IF OK, REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

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

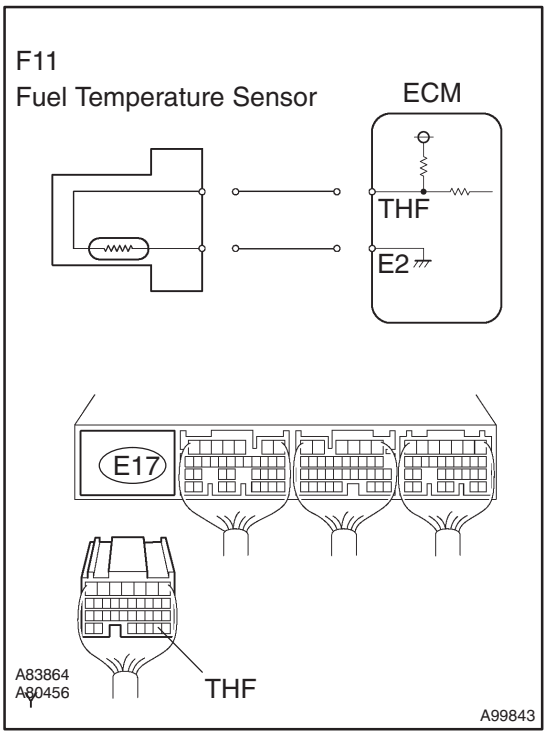


(a) Disconnect the F11 fuel temperature sensor connector.
(b) Connect the intelligent tester II to the DLC3.
(c) Turn the ignition switch ON and turn the intelligent tester II ON.
(d) Enter the following menus: Powertrain / Engine / Data List / Fuel Temp.
(e) Read the values.
Standard: –40°C (–40°F)

OK	**REPLACE FUEL TEMPERATURE SENSOR**

NG

5 READ DATA LIST (CHECK FOR SHORT IN ECM)



(a) Disconnect the F11 fuel temperature sensor connector.
(b) Disconnect the E17 ECM connector.
(c) Connect the intelligent tester II to the DLC3.
(d) Turn the ignition switch ON and turn the intelligent tester II ON.
(e) Enter the following menus: Powertrain / Engine / Data List / Fuel Temp.
(f) Read the values.
Standard: –40°C (–40°F)

OK	**REPAIR OR REPLACE HARNESS AND CONNECTOR**

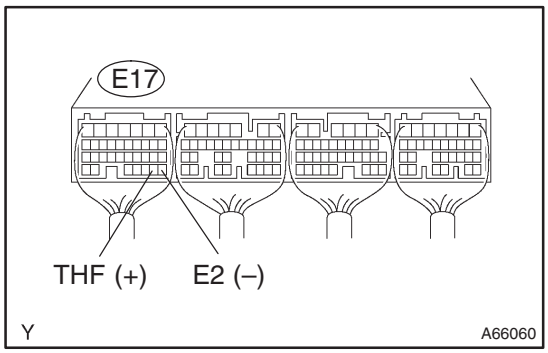
NG

REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

When not using intelligent tester II:

1 CHECK ECM (THF VOLTAGE)



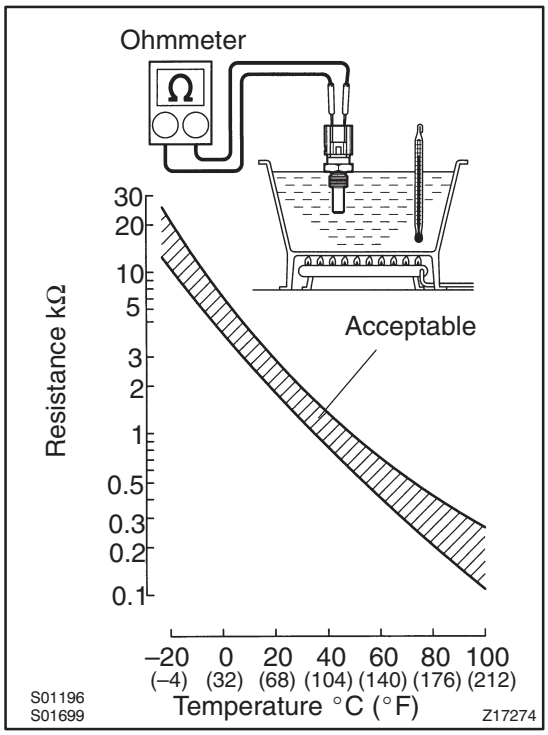
(a) Start the engine.
(b) Measure the voltage of the ECM connector.
Standard:

Tester Connection	Condition	Specified Condition
E17–29 (THF) – E17–28 (E2)	Idling, intake air temperature at 20°C (68°F)	0.5 to 3.4 V

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–439)**

NG

2 INSPECT FUEL TEMPERATURE SENSOR



(a) Remove the sensor.
(b) Measure the resistance of the sensor.
Standard:

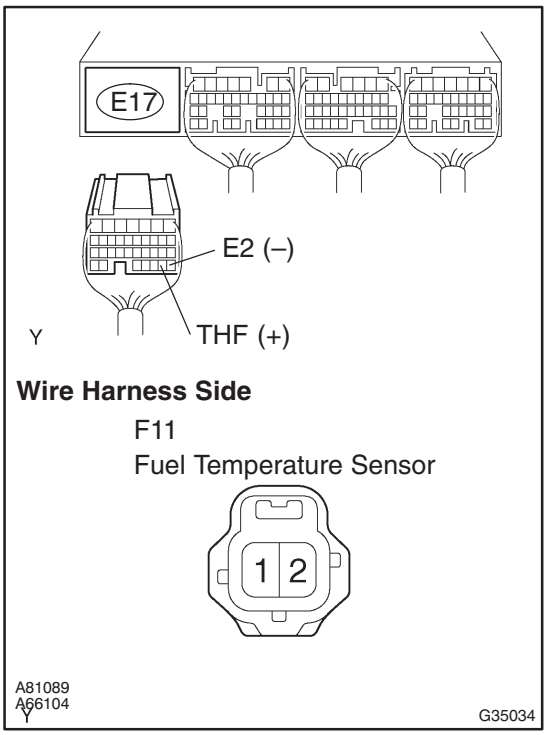
Condition	Specified Condition
Approx. 20°C (68°F)	2.32 to 2.59 kΩ
Approx. 80°C (176°F)	0.310 to 0.326 kΩ

NOTICE:
If checking the fuel temperature sensor in water, keep the terminals dry. After the check, wipe the sensor dry.

NG → **REPLACE FUEL TEMPERATURE SENSOR**

OK

3 CHECK WIRE HARNESS (ECM – FUEL TEMPERATURE SENSOR)



(a) Disconnect the E17 ECM connector.
(b) Disconnect the F11 sensor connector.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
E17–29 (THF) – F11–2	Below 1 Ω
E17–28 (E2) – F11–1	Below 1 Ω
E17–29 (THF) or F11–2 – Body ground	10 kΩ or higher
E17–28 (E2) or F11–1 – Body ground	10 kΩ or higher

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

OK

REPLACE ECM (See Pub. No. RM990E, page 10–34)

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.