DTC	P0115	ENGINE COOLANT TEMPERATURE CIRCUIT

DTC	P0117	ENGINE COOLANT TEMPERATURE CIRCUIT LOW INPUT

DTC	P0118	ENGINE COOLANT TEMPERATURE CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

A thermistor is built in the engine coolant temperature sensor and changes the resistance value according to the engine coolant temperature.

The structure of the sensor and connection to the ECM is the same as those of the intake air temperature sensor.

HINT:

If the ECM detects the DTC "P0115, P0117 or P0118" it operates the fail-safe function in which the engine coolant temperature is assumed to be 80 °C (176 °F).

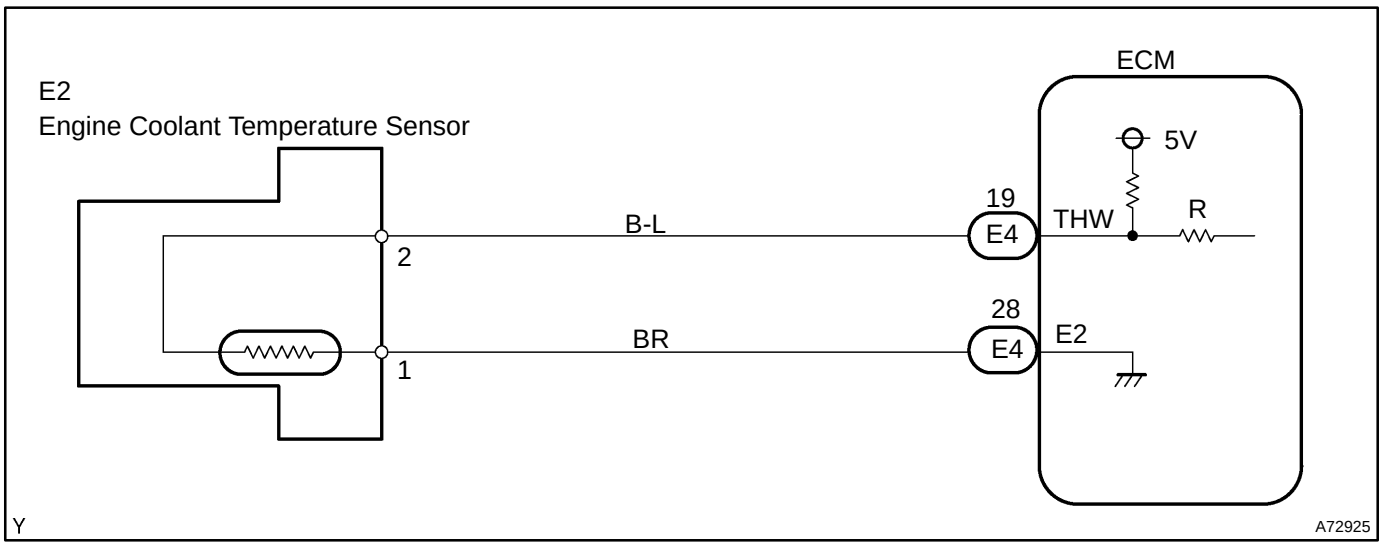
DTC No.	Proceed to	DTC Detection Condition	Trouble Area
P0115	Step 1	Open or short in engine coolant temp. sensor circuit for 0.5 sec.	• Open or short in engine coolant temp. sensor circuit • Engine coolant temp. sensor • ECM
P0117	Step 4	Short in engine coolant temp. sensor circuit for 0.5 sec.	
P0118	Step 2	Open in engine coolant temp. sensor circuit for 0.5 sec.	

HINT:

After confirming DTC "P0115, P0117 or P0118", use the hand-held tester or the OBD II scan tool to confirm the engine coolant temperature from the "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL".

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 a different system 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 or the OBD II scan tool, 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, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1	READ VALUE OF HAND-HELD TESTER OR OBD II SCAN TOOL(ENGINE COOLANT TEMPERATURE)

(a) Connect the hand-held tester or the OBD II scan tool to the DLC3.
(b) Turn the ignition switch ON and push the hand-held tester or the OBD II scan tool main switch ON.
(c) Select the item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/COOLANT TEMP" and read its value displayed on the hand-held tester or the OBD II scan tool.
Temperature: Same value as the actual intake air temperature.
Result:

Temperature Displayed	Proceed to
-40 ˚C (-40˚F)	A
140˚C (284˚F) or more	B
OK (Same as present temperature)	C

HINT:

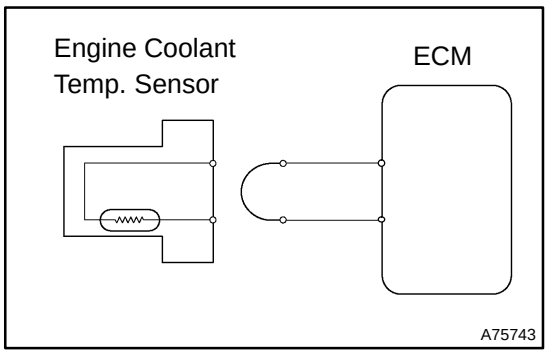
- If there is an open circuit, the hand-held tester or the OBD II scan tool indicates -40˚C (-40˚F).
- If there is a short circuit, the hand-held tester or the OBD II scan tool indicates 140˚C (284˚F) or more.

B → **Go to step 4**

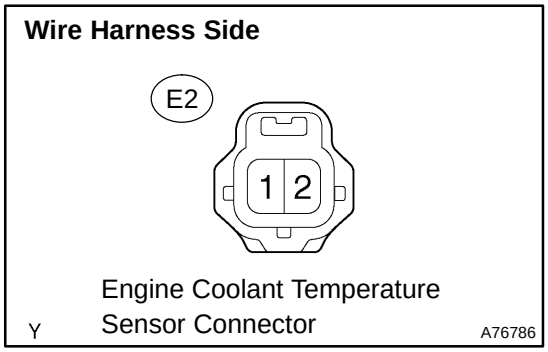
C → **CHECK FOR INTERMITTENT PROBLEMS (See page 05-5)**

A

2	READ VALUE OF HAND-HELD TESTER OR OBD II SCAN TOOL(CHECK FOR OPEN IN WIRE HARNESS)



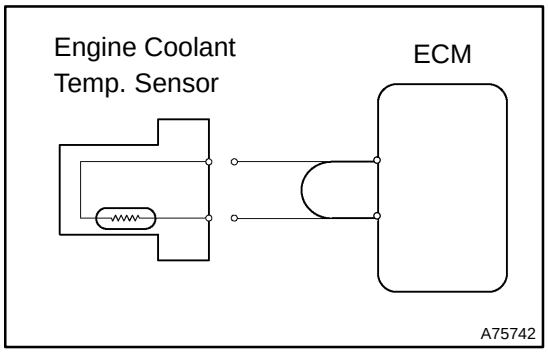
(a) Disconnect the engine coolant temperature sensor connector.
(b) Connect the terminals 1 and 2 of the engine coolant temperature sensor wire harness side connector.
(c) Turn the ignition switch ON.
(d) Select the item ”DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/COOLANT TEMP” and read its value displayed on the hand-held tester or the OBD II scan tool.
Temperature value: 140°C (284°F) or more



OK → **CONFIRM GOOD CONNECTION AT SENSOR. IF OK, REPLACE ENGINE COOLANT TEMP. SENSOR**

NG

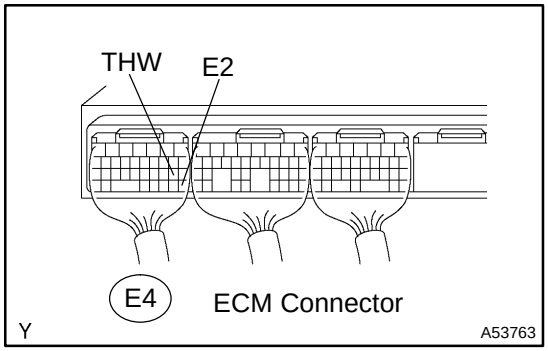
3	READ VALUE OF HAND-HELD TESTER OR OBD II SCAN TOOL(CHECK FOR OPEN IN ECM)



(a) Disconnect the engine coolant temperature sensor connector.
(b) Connect the terminals THW 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) Select the item ”DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/COOLANT TEMP” and read its value displayed on the hand-held tester or the OBD II scan tool.
Temperature value: 140°C (284°F) or more

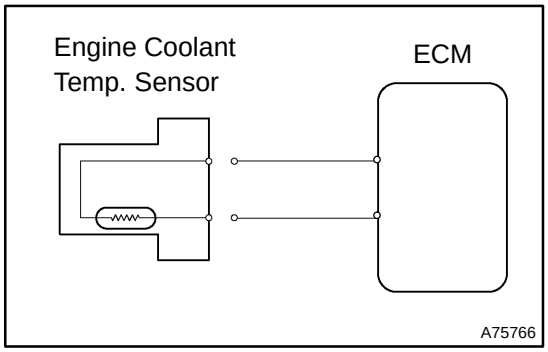


OK → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

NG

CONFIRM GOOD CONNECTION AT ECM. IF OK, CHECK AND REPLACE ECM (See page 01-35)

4	READ VALUE OF HAND-HELD TESTER OR OBD II SCAN TOOL(CHECK FOR SHORT IN WIRE HARNESS)

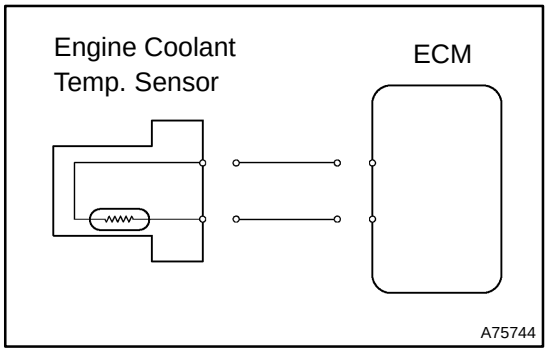


(a) Disconnect the engine coolant temperature sensor connector.
(b) Turn the ignition switch ON.
(c) Select the item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/COOLANT TEMP" and read its value displayed on the hand-held tester or the OBD II scan tool.
Temperature value: -40°C (-40°F)

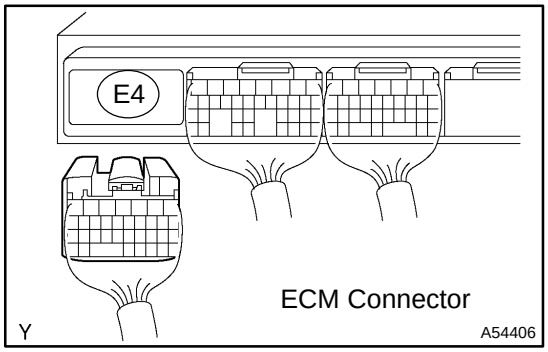
OK	REPLACE ENGINE COOLANT TEMPERATURE SENSOR

NG

5	READ VALUE OF HAND-HELD TESTER OR OBD II SCAN TOOL(CHECK FOR SHORT IN ECM)



(a) Disconnect the E4 ECM connector.
(b) Turn the ignition switch ON.
(c) Select the item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/COOLANT TEMP" and read its value displayed on the hand-held tester or the OBD II scan tool.
Temperature: -40°C (-40°F)



OK	REPAIR OR REPLACE HARNESS OR CONNECTOR

NG

CHECK AND REPLACE ECM (See page 01-35)