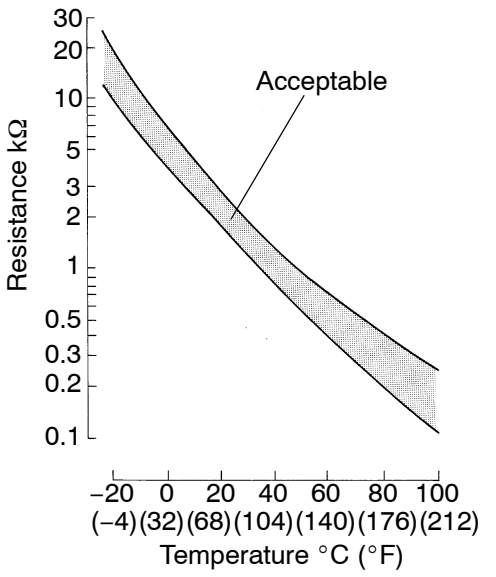
DTC 22 WATER TEMP. SENSOR CIRCUIT

CIRCUIT DESCRIPTION

(Fig. 1)



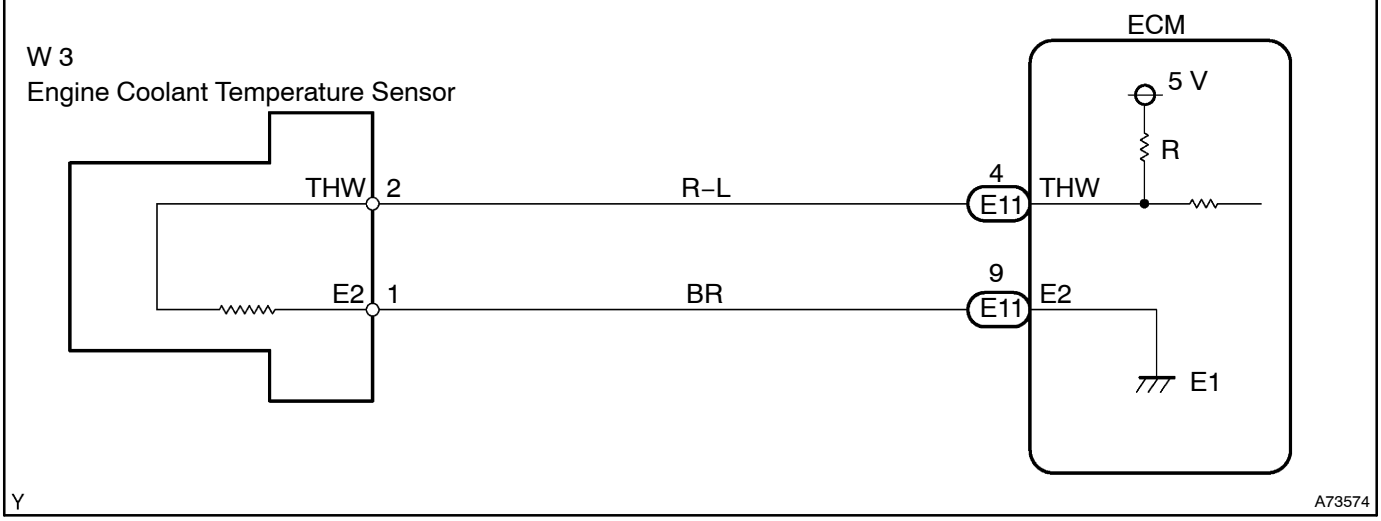
The engine coolant temperature sensor senses the water temperature.

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

The engine coolant temperature sensor is connected to the ECM (see below). The 5 V power source voltage in the ECM is applied to the engine coolant temperature sensor from terminal THW via a resistor R. That is, resistor R and the engine coolant temperature sensor are connected in series. When the resistance valve of the engine coolant temperature sensor changes in accordance with changes in the water temperature the potential at the terminal THW also changes. Based on this signal, the ECM increases the fuel injection volume to improve driveability during cold engine operation.

DTC No.	DTC Detecting Condition	Trouble Area
22	Open or short in engine coolant temperature sensor circuit 0.5 sec. or more	• Open or short in engine coolant temperature sensor circuit • Engine coolant temperature sensor • ECM

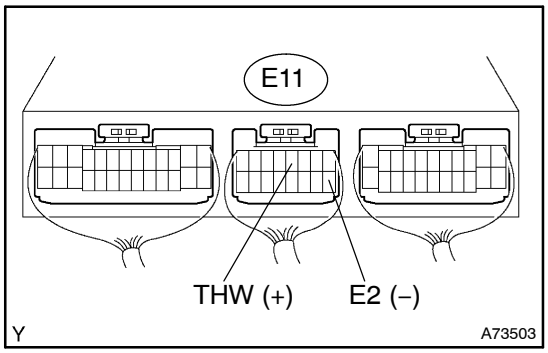
WIRING DIAGRAM



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.

1 CHECK ECM (THW VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals of E11 ECM connector.

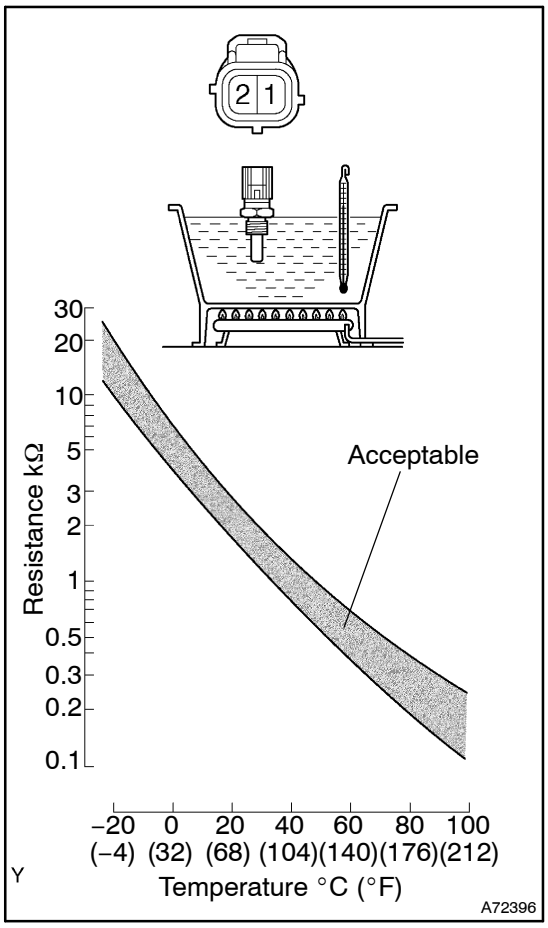
Voltage:

Symbols (Terminal No.)	Water temp.	Specified condition
THW (E11–4) ⇔ E2 (E11–9)	20°C (68°F) (Engine is cool)	0.5 – 3.4 V
	80°C (176°F) (Engine is hot)	0.2 – 1.0 V

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–4)**

NG

2 INSPECT ENGINE COOLANT TEMPERATURE SENSOR



(a) Measure the resistance between the terminals.

Resistance:

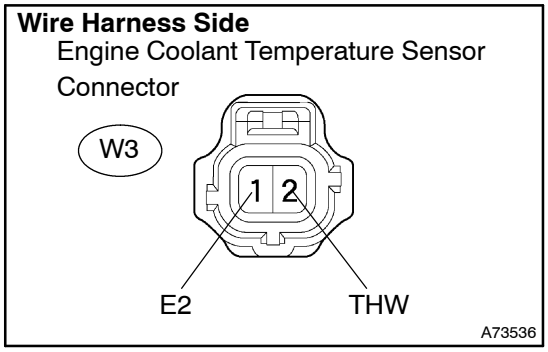
Terminal No.	Specified condition
1 ⇔ 2	2.32 – 2.59 kΩ at 20°C (68°F)
	0.310 – 0.326 kΩ at 80°C (176°F)

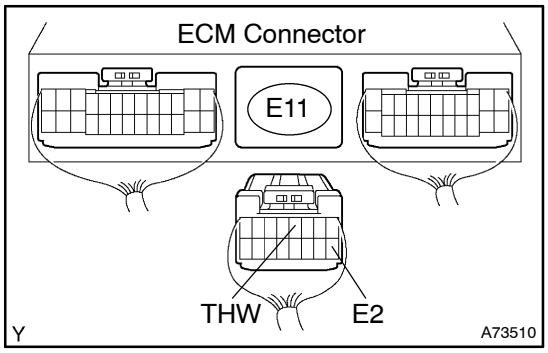
NOTICE:
In case of checking the engine coolant temperature sensor in the water, be careful not to allow water to go into the terminals, and after checking, wipe out the sensor.

NG → **REPLACE ENGINE COOLANT TEMPERATURE SENSOR**

OK

3	CHECK HARNESS AND CONNECTOR (ENGINE COOLANT TEMPERATURE SENSOR ⇔ ECM)





(a) Disconnect W3 engine coolant temperature sensor connector.
(b) Disconnect the E11 ECM connector
(c) Check the continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
THW (W3–2) ⇔ THW (E11–4)	Continuity
E2 (W3–1) ⇔ E2 (E11–9)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
THW (W3–2) or THW (E11–4) ⇔ Other terminals and body ground	No continuity

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

OK

CHECK AND REPLACE ECM (See page 01–36)