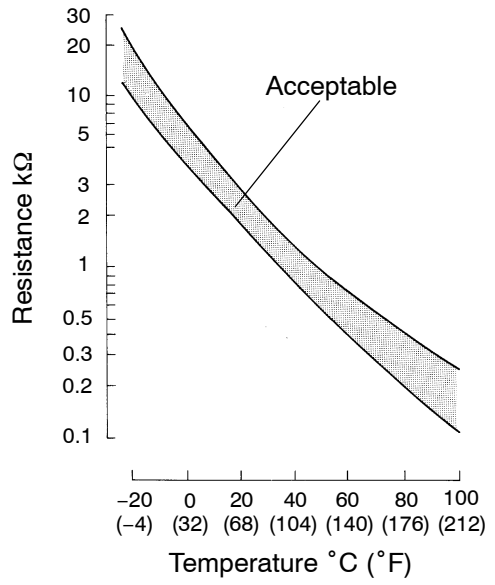
DI9SQ–01

DTC	22	Water Temperature Sensor Circuit

CIRCUIT DESCRIPTION

(Fig.1)

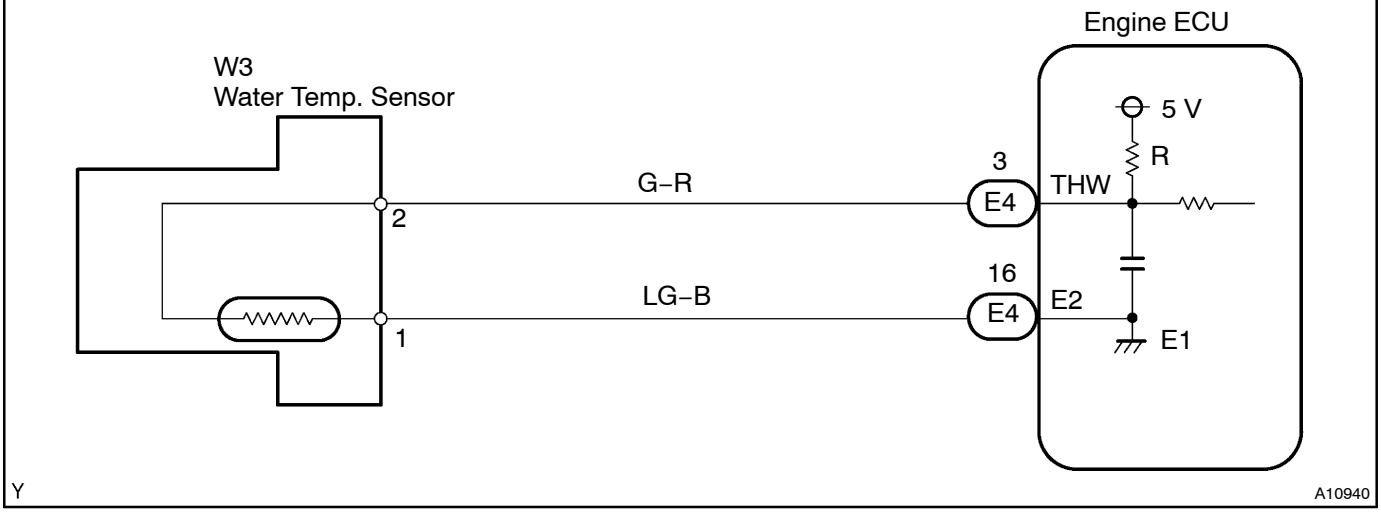


The water temperature sensor senses the coolant temperature. A thermistor built into the sensor changes the resistance value according to the coolant temperature. The lower the coolant temperature, the greater the thermistor resistance value, and the higher the coolant temperature, the lower the thermistor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

The water temperature sensor is connected to the engine ECU (See below). The 5 V power source voltage in the engine ECU is applied to the water temperature sensor from the terminal THW via a resistor R. That is, the resistor R and the water temperature sensor are connected in series. When the resistance value of the water temperature sensor changes in accordance with changes in the coolant temperature, the potential at the terminal THW also changes. Based on this signal, the engine ECU increases the fuel injection volume to improve driveability during cold engine operation. If the engine ECU detects the DTC code 22, it operates the fail safe function in which the engine coolant temperature is assumed to be 80°C (170°F).

DTC No.	DTC Detection Condition	Trouble Area
22	Open or short in water temp. sensor circuit 0.5 sec. or more	• Open or short in water temp. sensor circuit • Water temp. sensor • Engine ECU

WIRING DIAGRAM

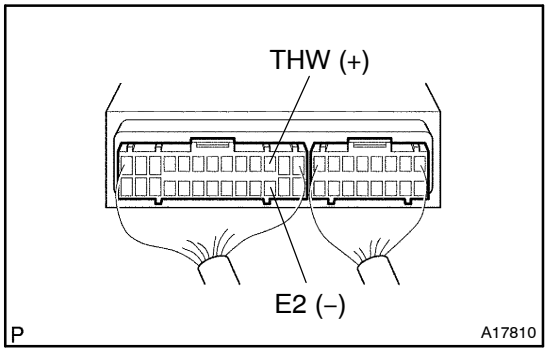


INSPECTION PROCEDURE

HINT:

If DTCs 22, 24, 31 and 41 are output simultaneously, E2 (sensor ground) may be open.

1	**Check voltage between terminals THW and of engine ECU connector.**



PREPARATION:

(a) Remove the glove compartment.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals THW and E2 of the engine ECU connecter.

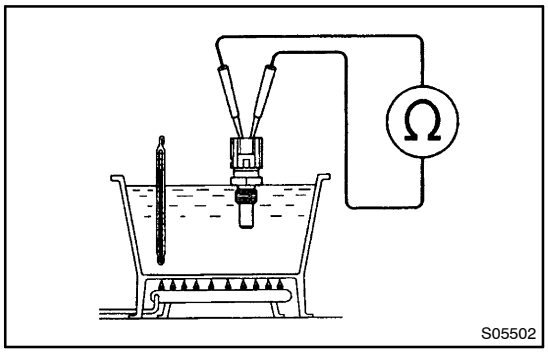
OK:

Water Temp.	Voltage
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 DI–164).**

NG

2	**Check water temperature sensor.**



PREPARATION:

Disconnect the water temperature sensor connecter.

CHECK:

Measure the resistance between the terminals.

OK:

Resistance is within Acceptable Zone on chart.

Water Temp.	Resistance
20°C (68°F) (Engine is cool)	2 – 3 kΩ
80°C (176°F) Engine is hot)	0.2 – 0.4 kΩ

NG	**Replace water temperature sensor.**

OK

3	**Check for open and short in harness and connector between engine ECU and water temperature sensor (See page IN–19).**

NG → **Repair or replace harness or connector.**

OK

Check and replace engine ECU.