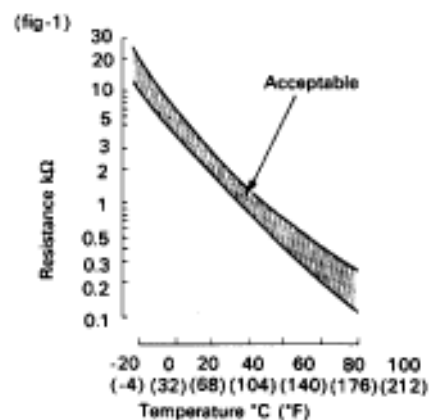


**Diag. Code 22****Water Temp. Sensor Circuit****— CIRCUIT DESCRIPTION —**

The water temperature sensor senses the coolant temperature. A thermistor built in 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 ECU (See next page). The 5 V power source voltage in the 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 ECU increases the fuel injection volume to improve driveability during cold engine operation. If the ECU records the diagnostic code 22, it operates the fail safe function, keeping the coolant temperature at a constant 80°C (176°F).



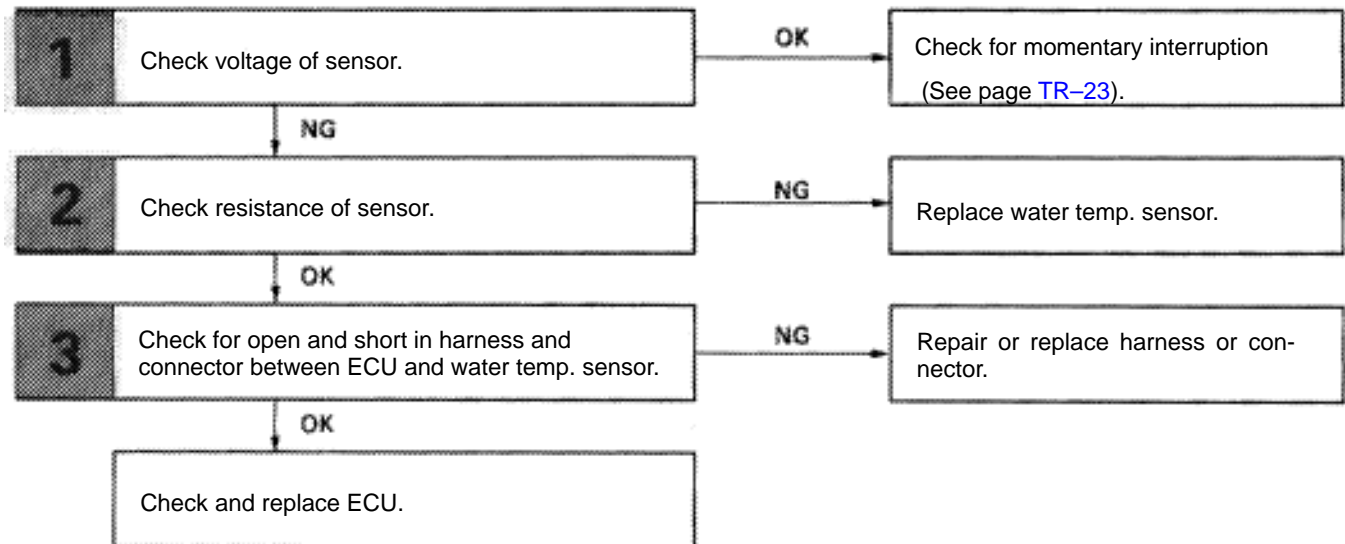
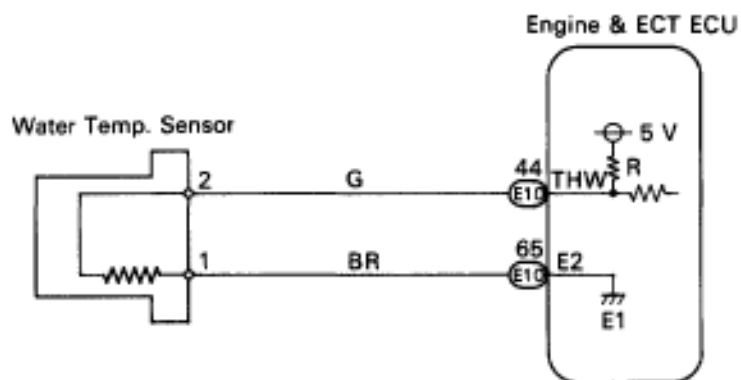
## &lt; Reference &gt;

Water Temp. °C (°F)	Resistance (kΩ)	Voltage (V)
-20 (-4)	16.0	4.3
0 (32)	5.9	3.4
20 (68)	2.5	2.4
40 (104)	1.2	1.5
60 (140)	0.6	0.9
80 (176)	0.3	0.5
100 (212)	0.2	0.3

Code No.	Diagnostic Code Detecting Condition	Trouble Area
22	Open or short in water temp. sensor circuit for 0.5 sec. or more.	<ul style="list-style-type: none"> <li>• Open or short in water temp. sensor circuit</li> <li>• Water temp. sensor</li> <li>• ECU</li> </ul>

**DIAGNOSTIC CHART**

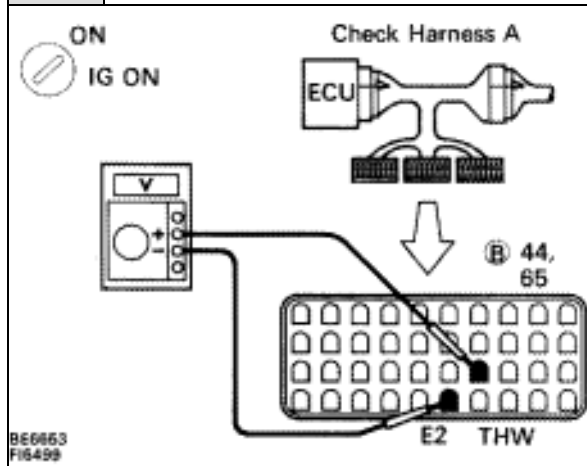
HINT: If diagnostic codes "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit) and "41" (throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.

**WIRING DIAGRAM**

## INSPECTION PROCEDURE

HINT: If diagnostic codes "22" (water temperature sensor circuit), "24" (intake air temperature sensor circuit) and "41" (throttle position sensor circuit) are output simultaneously, E2 (sensor ground) may be open.

### 1 Check voltage between terminals THW and E2 of engine & ECT ECU connector.



**P** (2) Connect the Check Harness A.  
(See page TR-30)

(2) Turn ignition switch on.

**C** Measure voltage between terminals THW and E2 and engine & ECT ECU connector.

**OK**

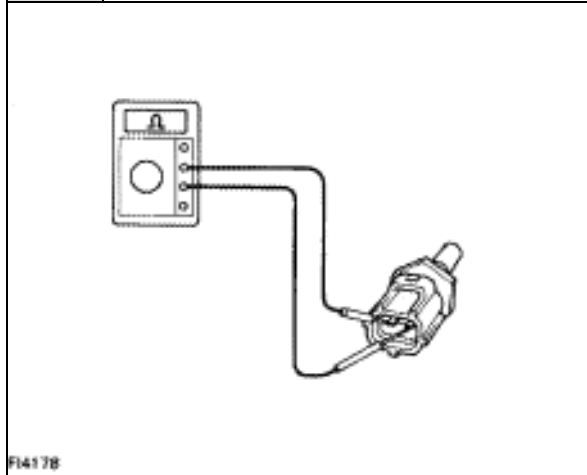
Water Temp. °C (°F)	Voltage
20 (68) (Engine is cool)	1 – 3 V
80 (176) (Engine is hot)	0.1 – 1.0 V

NG

OK

Check for momentary interruption  
(See Page TR-23).

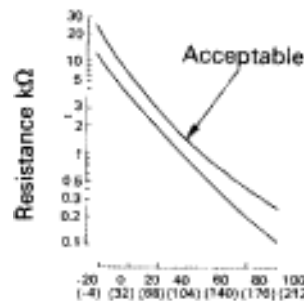
### 2 Check water temp. sensor.



**P** Disconnect the water temp. sensor connector.  
(See page FI-99).

**C** Measure resistance between terminals.

**OK** Resistance is within Acceptable Zone on chart.



Water temp. °C (°F)	Resistance
20 (68)	2 – 3 kΩ
80 (176)	0.2 – 0.4 kΩ

OK

NG

Replace water temp. sensor.

### 3 Check for open and short in harness and connector between engine & ECT ECU and water temp. sensor (See page IN-27).

OK

NG

Repair or replace harness or connector.

Check and replace engine & ECT ECU.

—MEMO—