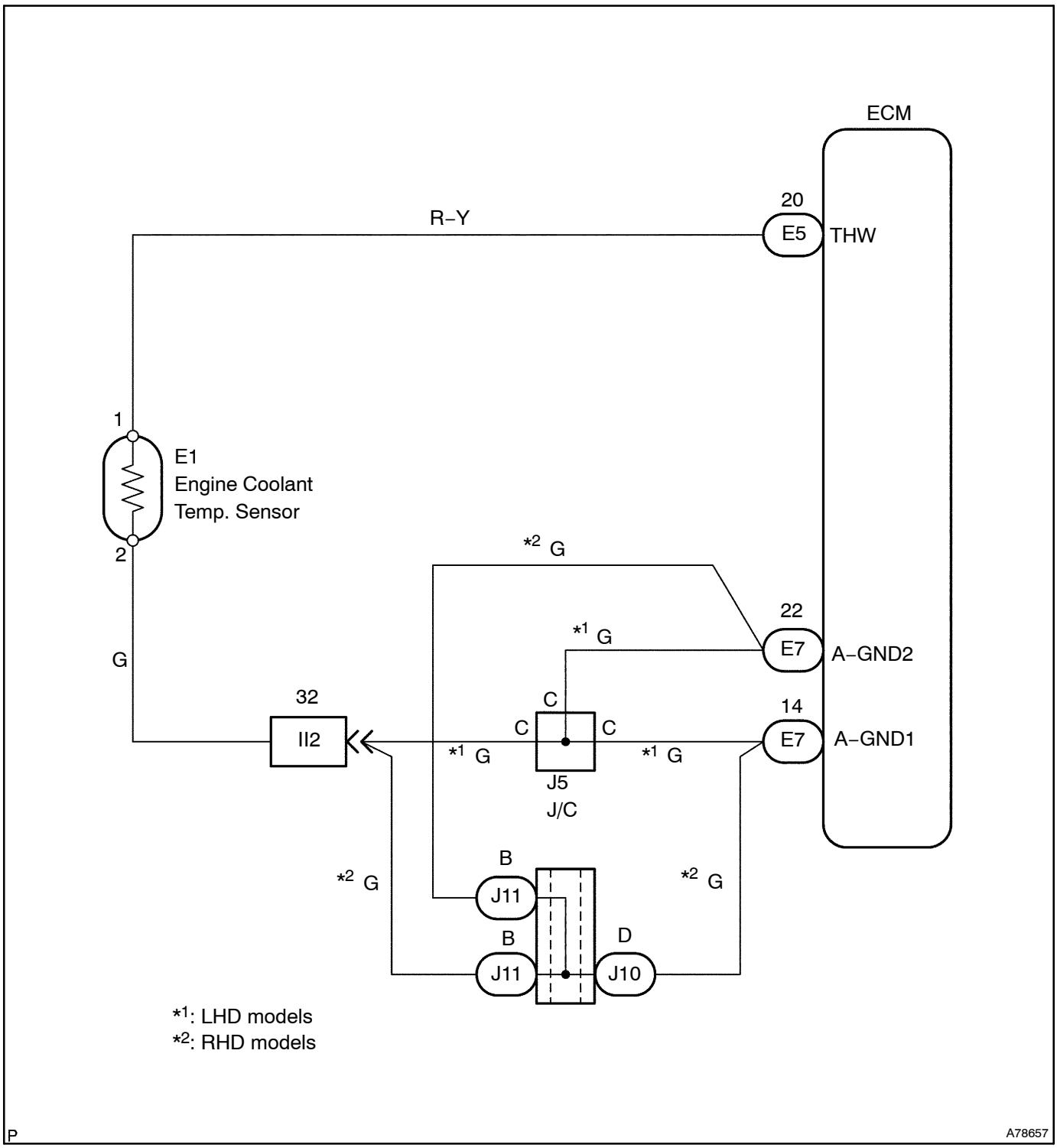
DTC	22	WATER TEMPERATURE SENSOR CIRCUIT MALFUNCTION

CIRCUIT DESCRIPTION

The engine coolant 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 is, the greater the thermistor resistance value becomes, and the higher the coolant temperature is, the lower the thermistor resistance value becomes (See Fig. 1). The water temperature sensor is connected to the ECM (See the WIRING DIAGRAM). 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 water temperature sensor are connected in series. When the resistance value of the engine coolant temperature sensor changes in accordance with the changes in the coolant temperature, the potential at 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 Detection Condition	Trouble Area
22	Open or short in engine coolant temp. sensor circuit for 3.0 sec. or more	• Open or short in water temp. sensor circuit • Engine coolant temp. sensor • ECM

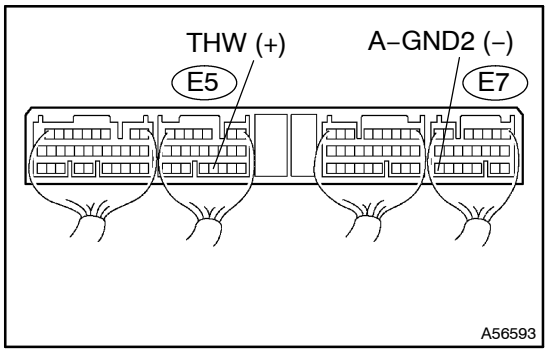
WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
If DTCs 22 and 39 are output simultaneously, terminal A–GND2 (sensor ground) may be open.

1 CHECK ECM (RESISTANCE)



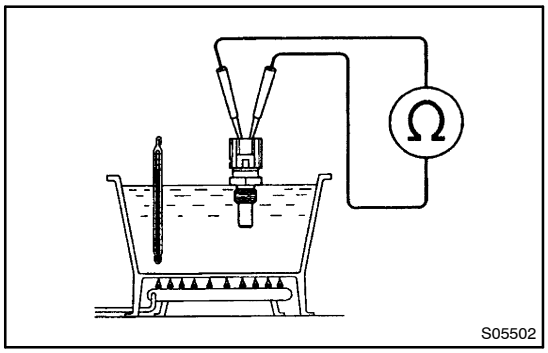
(a) Turn the ignition switch to LOCK.
(b) Check the resistance between the terminals of the ECM connector.
Resistance:

Engine Coolant Temp. °C (°F)	Symbols (Terminal No.)	Resistance
20 (68) (Engine is cool)	THW (E5–20) ⇔ A–GND2 (E7–22)	Approx. 2.4 kΩ
80 (176) (Engine is hot)	THW (E5–20) ⇔ A–GND2 (E7–22)	Approx. 530 Ω

OK → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–104)**

NG

2 INSPECT ENGINE COOLANT TEMPERATURE SENSOR (CHECK RESISTANCE)



(a) Disconnect the E1 engine coolant temperature sensor connector.
(b) Remove the engine coolant temperature sensor.
(c) Measure the resistance between the terminals.
Resistance:

Engine Coolant Temp. °C (°F)	Resistance
20 (68)	Approx. 2.4 kΩ
80 (176)	Approx. 530 Ω

NG → **REPLACE ENGINE COOLANT TEMPERATURE SENSOR**

OK

3 CHECK WIRE HARNESS (ECM ⇔ ENGINE COOLANT TEMPERATURE SENSOR) (See page 01–27)

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

OK

CHECK AND REPLACE ECM (See page 01–27)