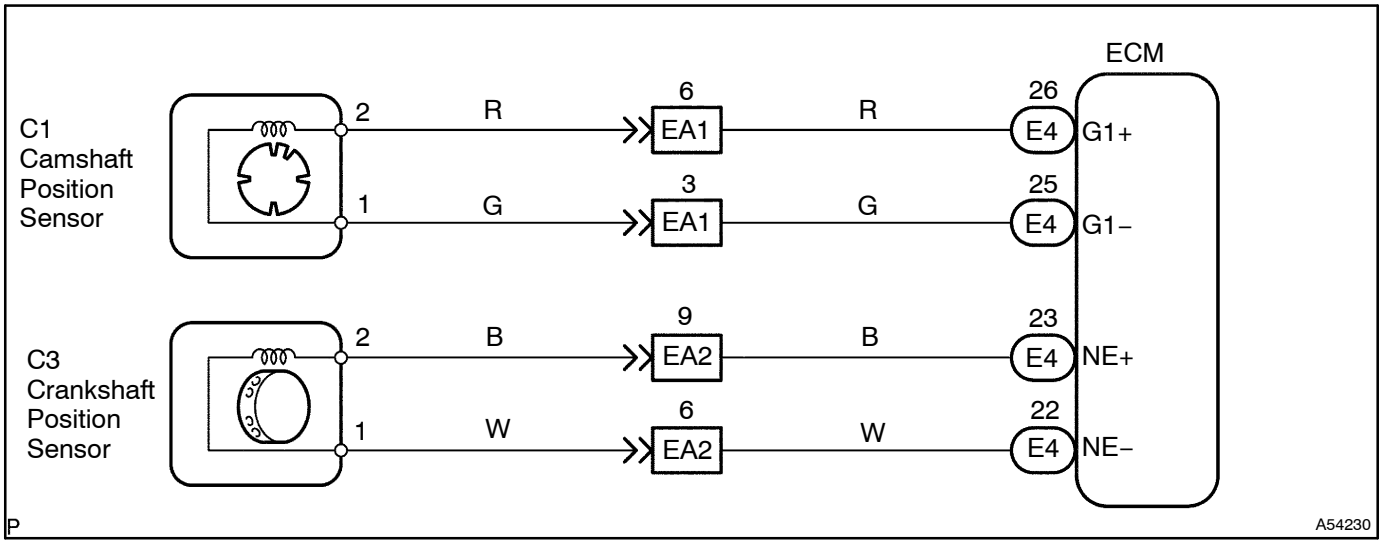
DTC	12	ENGINE SPEED SENSOR CIRCUIT MALFUNCTION1 (TDC OR G1 CIRCUIT)

CIRCUIT DESCRIPTION

The composition of this sensor, mounted on the supply pump, is the same as that of the main engine revolution sensor, however, the coil volume is different. As the engine rotates, the protrusions and air gaps on the center of the supply pump camshaft create magnetic field by the magnet in the sensor. Then, the magnetic field generates alternative voltage in the coil.
The protrusions and air gaps exist for every 90 degrees of the camshaft (180 degrees of crankshaft angle), and therefore 5 pulses are output for 1 revolution of the camshaft (2 revolutions of the engine).
And also, there is another protrusion and air gap to output a pulse. Based on this pulse, NE standard pulse of the engine No. 1 cylinder can be recognized.

DTC No.	DTC Detection Condition	Trouble Area
12	G1 signal has not been input when NE signal detects 3,600 revolutions	• Open or short in crankshaft position sensor circuit • Camshaft position sensor • Camshaft timing pulley • ECM

WIRING DIAGRAM

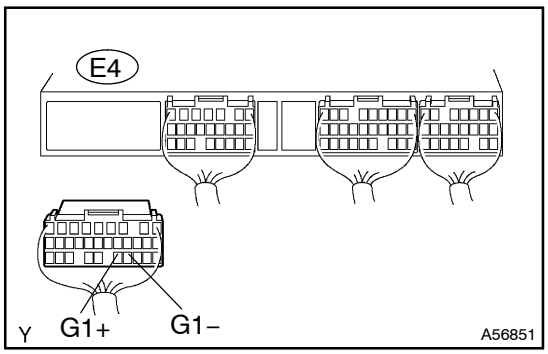


INSPECTION PROCEDURE

HINT:

- Perform troubleshooting of DTC 12 first. If no trouble is found, troubleshoot the following mechanical system.
- Read freeze frame data using the hand–held tester, 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	CHECK ECM

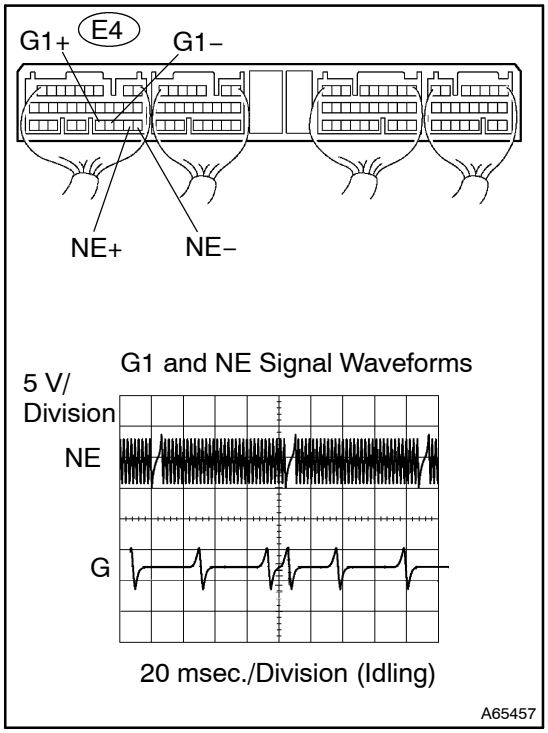


(a) Turn the ignition switch to LOCK.
(b) Disconnect the E4 ECM connector.
(c) Measure the resistance between terminals G1+ and G1– of the E4 ECM connector.
Resistance: 1.85 – 2.45 kΩ at 20°C (68°F)

NG → **Go to step 3**

OK

2	CHECK ECM



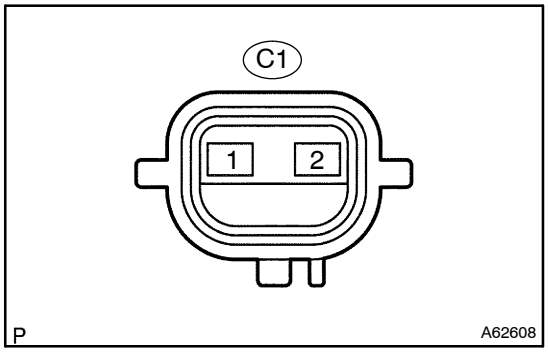
(a) Reference:
Inspect using on oscilloscope.
(1) While cranking or idling, check the waveform between terminals G1+ and G1–, and NE+ and NE– of the E4 ECM connector.

HINT:
The correct waveforms are as shown in the illustration.

OK → **Go to step 5**

NG

3	CHECK CAMSHAFT POSITION SENSOR



(a) Disconnect the C1 camshaft position sensor connector.
(b) Check the resistance between terminals 1 and 2 of the C1 crankshaft position sensor.
Resistance: 1.85 – 2.45 kΩ at 20°C (68°F)

HINT:
"Cold" and "Hot" above express the temperature of the part itself. "Cold" is from –10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

NG → **REPLACE CAMSHAFT POSITION SENSOR**

OK

4	CHECK WIRE HARNESS

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

OK

5	CHECK SENSOR ATTACHMENT PART

NG → **REPLACE INJECTION OR SUPPLY PUMP ASSY**

OK

CHECK AND REPLACE ECM