DTC	P0340/12	CAMSHAFT POSITION SENSOR ”A” CIRCUIT (BANK 1 OR SINGLE SENSOR)

DTC	P0341/12	CAMSHAFT POSITION SENSOR ”A” CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR)

CIRCUIT DESCRIPTION

The camshaft position sensor (G signal) consists of a magnet, iron core and pickup coil.
The G signal plate has 1 teeth on its outer circumference and is mounted on the camshaft.
When the camshafts rotate, the protrusion on the signal plate and the air gap on the pickup coil changes, causing fluctuations in the magnetic field and generating an electromotive force in the pickup coil.
The NE signal plate has 34 teeth and is installed in the crankshaft timing sprocket. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the crankshaft angle the engine speed based on the NE signals, and the cylinder detection based on the combination of the G and NE signals.

DTC No.	DTC Detecting Condition	Trouble Area
P0340/12	No camshaft position sensor signal to ECM during cranking	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Camshaft • ECM
P0341/12	While crankshaft rotates twice, camshaft position sensor signal will be input to ECM 12 times or more	

HINT:

- DTC P0340/12 indicate a malfunction related to the camshaft position sensor (+) circuit. (Wire harness (ECM – camshaft position sensor) and camshaft position sensor)
- DTC P0341/12 indicate a malfunction related to the camshaft position sensor (–) circuit. (Wire harness (ECM – camshaft position sensor) and camshaft position sensor)

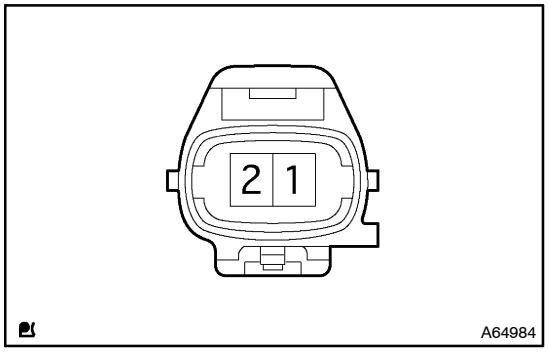
WIRING DIAGRAM

Refer to DTC P0335/12 on page 05–140.

INSPECTION PROCEDURE

HINT:
Read freed frame data using 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	INSPECT CAMSHAFT POSITION SENSOR (RESISTANCE) (REFERENCE: ECM G SIGNAL)



(a) Resistance inspection.

(1) Measure the resistance between the terminals.

Standard:

Terminal No.	Condition	Specified condition
1 ⇔ 2	Cold	835 – 1,400 Ω
	Hot	1,060 – 1,645 Ω

HINT:

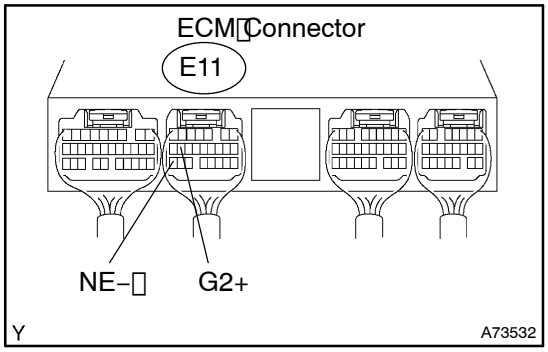
"Cold" and "Hot" on the table express the temperature of the coils themselves. "Cold" is from –10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F)

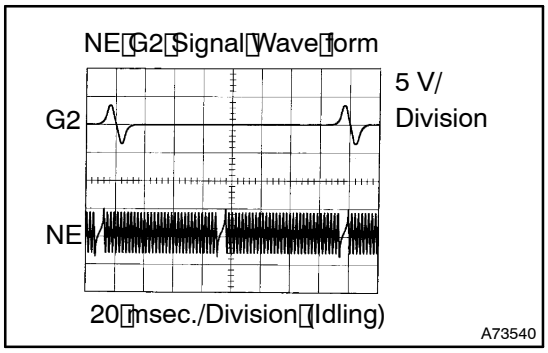
(b) Reference (using an oscilloscope).

(1) During cranking or idling, check the waveform between the terminals of the E11 ECM connector.

Standard:

Symbols (Terminal No.)	Specified condition
G2+ (E11–15) ⇔ NE– (E11–24)	Correct waveform is as shown

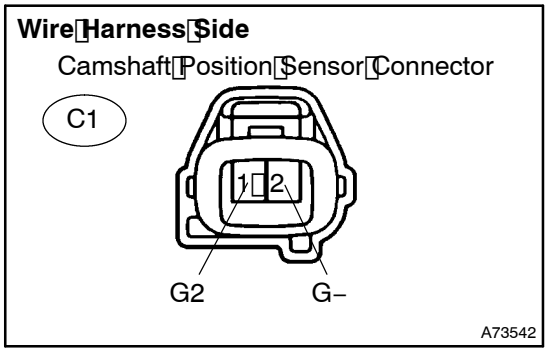


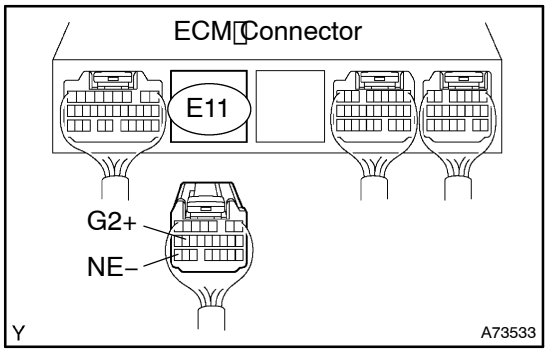


OK

NG → **REPLACE CAMSHAFT POSITION SENSOR (See page 18–5)**

2 CHECK HARNESS AND CONNECTOR (CAMSHAFT POSITION SENSOR ⇔ ECM)





(a) Disconnect the C1 camshaft position 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
G2 (C1–1) ⇔ G2+ (E11–15)	Continuity
G– (C1–2) ⇔ NE– (E11–24)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
G2 (C1–1) or G2+ (E11–15) ⇔ Other terminals and body ground	No continuity
G– (C1–2) or NE– (E11–24) ⇔ Other terminals and body ground	

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

OK

3 INSPECT SENSOR INSTALLATION (CAMSHAFT POSITION SENSOR)

(a) Inspect the camshaft position sensor installation.
Torque: 5.5 N·m (55 kgf·cm, 48 in.·lbf)

NG → **TIGHTEN SENSOR**

OK

4 INSPECT CAMSHAFT (TEETH OF PLATE)

(a) Check the teeth of the camshaft lobes.

NG → **REPAIR OR REPLACE CAMSHAFT**

OK

CHECK AND REPLACE ECM (See page 01–36)