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

CIRCUIT DESCRIPTION

The camshaft position sensor (G signal) consists of a magnet and MRE element.
The camshaft drive gear has 5 teeth on its inner circumference. When the camshaft gear rotates, air gap changes between the protrusion on the gear and the pickup coil. The change affects the magnetic field and result in change in the resistance of the MRE element. The crankshaft angle sensor plate has 32 teeth and output 32 signals every engine revolution. The ECM detects the standard crankshaft angle based on the G signal and actual crankshaft angle and engine speed by NE signal.

DTC No.	DTC Detection Condition	Trouble Area
P0340/12	STA ON: No camshaft position sensor signal to ECM during cranking 4 times or more STA OFF: No camshaft position sensor signal to ECM with engine speed 650 to 3,000 rpm 20 times or more	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Camshaft drive gear • ECM

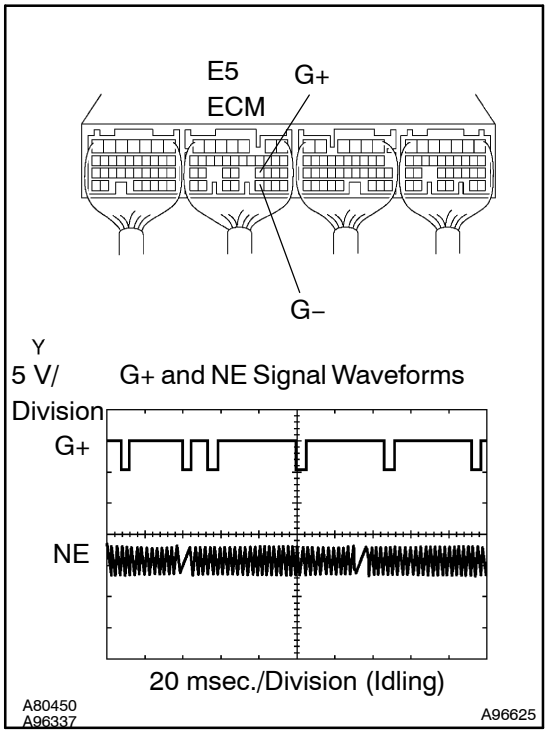
WIRING DIAGRAM

Refer to DTC P0335/12 on page 05–107.

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1 CHECK CAMSHAFT POSITION SENSOR



(a) Inspect using an oscilloscope.
(1) While the engine is idling, check the waveform of the ECM connector.

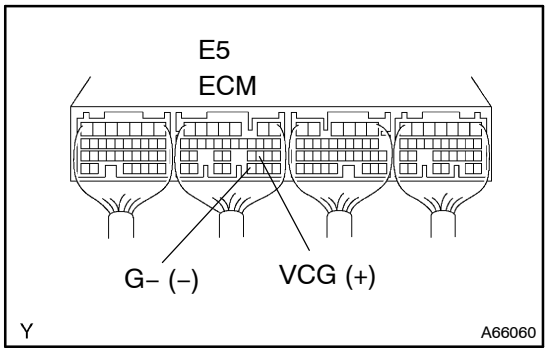
Standard:

Tester Connection	Specified Condition
E5–23 (G+) – E5–31 (G–)	Correct waveform is as shown

NG → **REPLACE CAMSHAFT POSITION SENSOR**

OK

2 CHECK ECM (VCG VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connector.

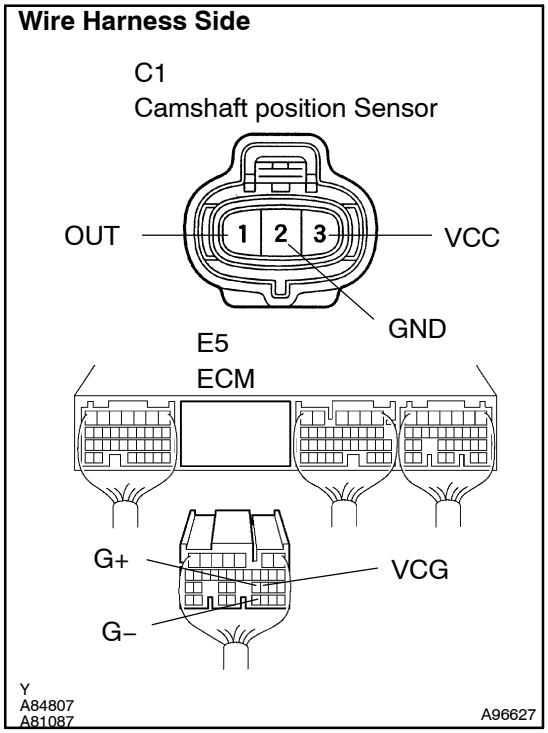
Standard:

Tester Connection	Specified Condition
E5–22 (VCG) – E5–31 (G–)	4.5 to 5.5 V

NG → **REPLACE ECM (See page 10–10)**

OK

3 CHECK WIRE HARNESS (CAMSHAFT POSITION SENSOR – ECM)



(a) Disconnect the C1 camshaft position sensor connector.
(b) Disconnect the E5 ECM connector.
(c) Measure the resistance of the wire harness side connectors.

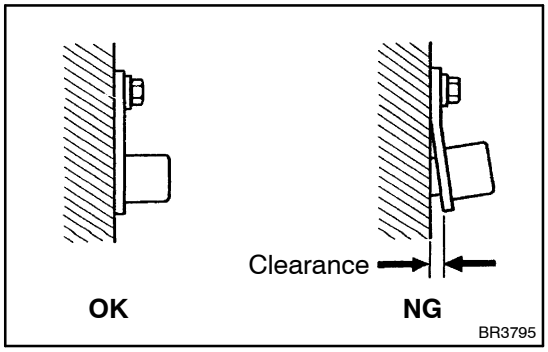
Standard:

Tester Connection	Specified Condition
C1–1 (OUT) – E5–23 (G+) C1–2 (GND) – E5–31 (G–) C1–3 (VCC) – E5–22 (VCG)	Below 1 Ω
C1–1 (OUT) or E5–23 (G+) – Body ground C1–2 (GND) or E5–31 (G–) – Body ground C1–3 (VCC) or E5–22 (VCG) – Body ground	10 kΩ or higher

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

OK

4 CHECK SENSOR INSTALLATION (CAMSHAFT POSITION SENSOR)



OK:
The camshaft position sensor is installed properly.

NG → **TIGHTEN SENSOR**

OK

5 INSPECT CAMSHAFT DRIVE GEAR

(a) Check the teeth of the camshaft drive gear.

NG → **REPLACE CAMSHAFT DRIVE GEAR**

OK

6 REPLACE CAMSHAFT POSITION SENSOR

GO

7	CHECK DTC OUTPUT

(a) Connect the hand–held tester (with 24 V VIM) to the DLC3.
(b) Turn the ignition switch ON and turn the hand–held tester ON.
(c) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DTC INFO / CURRENT CODES.
(d) Read DTCs.

Result:

Display (DTC output)	Proceed to
P0340/12 is output	A
No DTC is output	B

B → **SYSTEM IS OK**

A

REPLACE ECM (See page 10–10)