

DTC	P0340	Camshaft Position Sensor "A" Circuit (Bank 1 or Single Sensor)
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DESCRIPTION

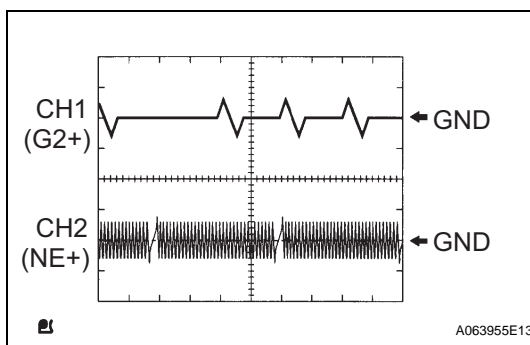
The Camshaft Position (CMP) sensor consists of a magnet and an iron core which is wrapped with copper wire, and is installed onto the cylinder head. When the camshaft rotates, each of 3 teeth on the camshaft passes through the CMP sensor. This activates the internal magnet in the sensor, generating a voltage in the copper wire. The camshaft rotation is synchronized with the crankshaft rotation. When the crankshaft turns twice, the voltage is generated 3 times in the CMP sensor. The generated voltage in the sensor acts as a signal, allowing the ECM to locate the camshaft position. This signal is then used to control ignition timing, fuel injection timing, and the VVT system.

DTC No.	DTC Detection Conditions	Trouble Areas
P0340	Case 1 • No Camshaft Position (CMP) sensor signal to ECM while cranking (2 trip detection logic) Case 2 • Camshaft/Crankshaft misalignment detected at engine speed of 600 rpm or more (1 trip detection logic)	• Open or short in CMP sensor circuit • CMP sensor • Camshaft • Jumped tooth of timing chain • ECM

HINT:

DTC P0340 indicates a malfunction relating to the CMP sensor (+) circuit (the wire harness between the ECM and CMP sensor, and the CMP sensor itself).

Reference: Inspection using an oscilloscope



HINT:

- The correct waveform is as shown in the illustration.
- G2+ stands for the CMP sensor signal, and NE+ stands for the Crankshaft Position (CKP) sensor signal.
- Grounding failure of the shielded wire may cause noise in waveforms.

Items	Contents
Terminals	CH1: G2+ - G2- CH2: NE+ - NE-
Equipment Settings	5 V/Division, 20 ms/Division
Conditions	Cranking or idling

MONITOR DESCRIPTION

If no signal is transmitted by the CMP sensor despite the engine revolving, or the rotation of the camshaft and the crankshaft is not synchronized, the ECM interprets this as a malfunction of the sensor.

If the malfunction is not repaired successfully, a DTC is set 10 seconds after the engine is next started.

MONITOR STRATEGY

Related DTCs	P0340: Camshaft position sensor range check P0340: Camshaft position/crankshaft position misalignment
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Required Sensors/Components (Main)	Camshaft Position (CMP) sensor
Required Sensors/Components (Related)	Crankshaft Position (CKP) sensor
Frequency of Operation	Continuous
Duration	4 seconds: CMP sensor range check 5 seconds: Camshaft position/crankshaft position misalignment
MIL Operation	2 driving cycles: CMP sensor range check Immediate: Camshaft position/crankshaft position misalignment
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

All:

Monitor runs whenever following DTCs not present	None
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Camshaft Position Sensor Range Check:

Starter	ON
Minimal battery voltage while starter ON	Less than 11 V

Camshaft Position/Crankshaft Position Misalignment:

Engine speed	600 rpm or more
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

Camshaft Position Sensor Range Check:

CMP sensor signal	No signal
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Camshaft Position/Crankshaft Position Misalignment:

Camshaft position and crankshaft position phase	Misaligned
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COMPONENT OPERATING RANGE

CMP sensor	<ul style="list-style-type: none"> CMP sensor output voltage fluctuates while camshaft revolving 3 CMP sensor signals per 2 crankshaft revolutions
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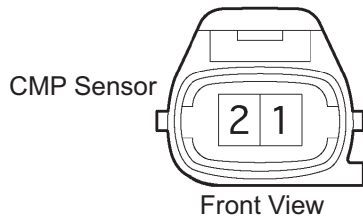
WIRING DIAGRAM

Refer to DTC P0335 (see page [ES-174](#)).

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the intelligent tester. Freeze frame data records the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, 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 INSPECT CAMSHAFT POSITION SENSOR (RESISTANCE)**Component Side:**

G037727E04

- (a) Disconnect the B6 Camshaft Position (CMP) sensor connector.

- (b) Measure the resistance between terminals 1 and 2.

Standard resistance

Tester Connections	Conditions	Specified Conditions
1 - 2	Cold	1,630 to 2,740 Ω
1 - 2	Hot	2,065 to 3,225 Ω

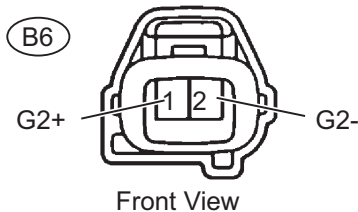
HINT:

Terms cold and hot refer to the temperature of the sensor. Cold means approximately -10° to 50°C (14° to 122°F). Hot means approximately 50° to 100°C (122° to 212°F).

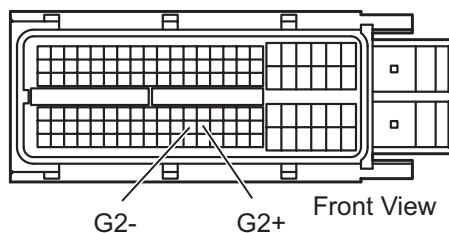
- (c) Reconnect the CMP sensor connector.

NG**REPLACE CAMSHAFT POSITION SENSOR****OK****2 CHECK HARNESS AND CONNECTOR (CAMSHAFT POSITION SENSOR - ECM)****Wire Harness Side:**

CMP Sensor Connector



B30 ECM Connector



A106885E03

- (a) Disconnect the B6 CMP sensor connector.

- (b) Disconnect the B30 ECM connector.

- (c) Measure the resistance.

Standard resistance (Check for open)

Tester Connections	Specified Conditions
B6-1 (G2+) - B30-99 (G2+)	Below 1 Ω
B6-2 (G2-) - B30-98 (G2-)	Below 1 Ω

Standard resistance (Check for short)

Tester Connections	Specified Conditions
B6-1 (G2+) or B30-99 (G2+) - Body ground	10 k Ω or higher
B6-2 (G2-) or B30-98 (G2-) - Body ground	10 k Ω or higher

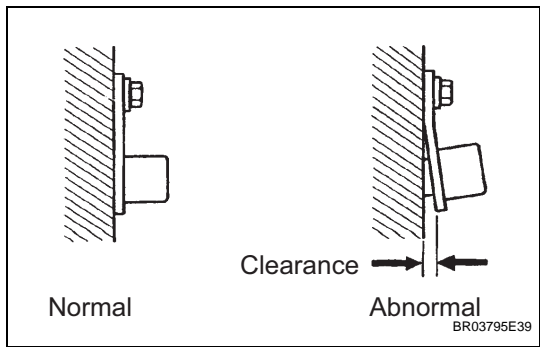
- (d) Reconnect the ECM connector.

- (e) Reconnect the CMP sensor connector.

NG**REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****ES**

3

CHECK SENSOR INSTALLATION (CAMSHAFT POSITION SENSOR)



(a) Check the CMP sensor installation.

OK:
Sensor is installed correctly.

NG

SECURELY REINSTALL SENSOR

OK

4

CHECK VALVE TIMING (See page ES-77)

NG

ADJUST VALVE TIMING

OK

5

CHECK CAMSHAFT

(a) Check the teeth of the camshaft.

OK:
Camshaft teeth do not have any cracks or deformation.

NG

REPLACE CAMSHAFT

OK

6

REPLACE CAMSHAFT POSITION SENSOR

NEXT

7

CHECK WHETHER DTC OUTPUT RECURS

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the tester ON.
- (d) Clear DTCs (see page ES-35).
- (e) Start the engine.
- (f) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / PENDING CODES.
- (g) Read DTCs.

Result

Display (DTC Output)	Proceed To
No output	A

Display (DTC Output)	Proceed To
P0340	B

HINT:

If the engine does not start, replace the ECM.

B**REPLACE ECM****A****END**