

<b>DTC</b>	<b>P0335</b>	<b>Crankshaft Position Sensor "A" Circuit</b>
<b>DTC</b>	<b>P0339</b>	<b>Crankshaft Position Sensor "A" Circuit Intermittent</b>

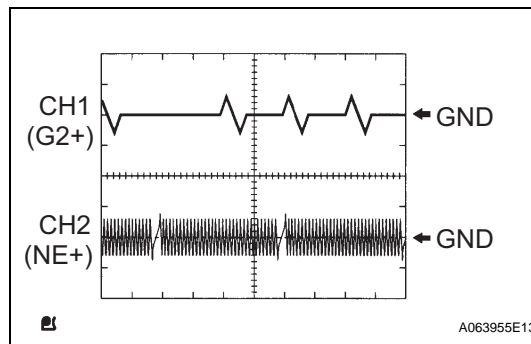
## DESCRIPTION

The Crankshaft Position (CKP) sensor system consists of a CKP sensor plate and a pickup coil. The sensor plate has 34 teeth and is installed on the crankshaft. The pickup coil is made of wound copper wire, an iron core and magnet. The sensor plate rotates and, as each tooth passes through the pickup coil, a pulse signal is created. The pickup coil generates 34 signals per engine revolution. Based on these signals, the ECM calculates the crankshaft position and engine RPM. Using these calculations, the fuel injection time and ignition timing are controlled.

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DTC No.	DTC Detection Conditions	Trouble Areas
P0335	When either condition below is met: <ul style="list-style-type: none"> <li>No CKP sensor signal to ECM while cranking (1 trip detection logic)</li> <li>No CKP sensor signal to ECM at engine speed of 600 rpm or more (1 trip detection logic)</li> </ul>	<ul style="list-style-type: none"> <li>Open or short in CKP sensor circuit</li> <li>CKP sensor</li> <li>CKP sensor plate</li> <li>ECM</li> </ul>
P0339	Under conditions (a), (b) and (c), no CKP sensor signal to ECM for 0.05 seconds or more (1 trip detection logic): (a) Engine speed 1,000 rpm or more (b) Starter signal OFF (c) 3 seconds or more have elapsed since starter signal switched from ON to OFF	<ul style="list-style-type: none"> <li>Open or short in CKP sensor circuit</li> <li>CKP sensor</li> <li>CKP sensor plate</li> <li>ECM</li> </ul>

Reference: Inspection using an oscilloscope.



### HINT:

- The correct waveform is as shown.
- G2+ stands for the Camshaft Position (CMP) sensor signal, and NE+ stands for the 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 msec./Division
Conditions	Cranking or idling

## MONITOR DESCRIPTION

If there is no signal from the CKP sensor despite the engine revolving, 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	P0335: CKP sensor range check or rationality
Required Sensors/Components (Main)	CKP sensor
Required Sensors/Components (Related)	CMP sensor
Frequency of Operation	Continuous
Duration	3 times
MIL Operation	Immediate
Sequence of Operation	None

## TYPICAL ENABLING CONDITIONS

### All:

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Monitor runs whenever following DTCs not present	None
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### Case 1:

Time after starter OFF to ON	0.3 seconds or more
Number of CMP sensor signal pulse	6 times
Battery voltage	7 V or more
CMP sensor circuit failure	Not detected
Ignition switch	ON

### Case 2:

Starter	OFF
Engine speed	600 rpm or more
Time after starter from ON to OFF	3 seconds or more

## TYPICAL MALFUNCTION THRESHOLDS

### Case 1:

Number of CKP sensor signal pulse	132 or less, and 174 or more
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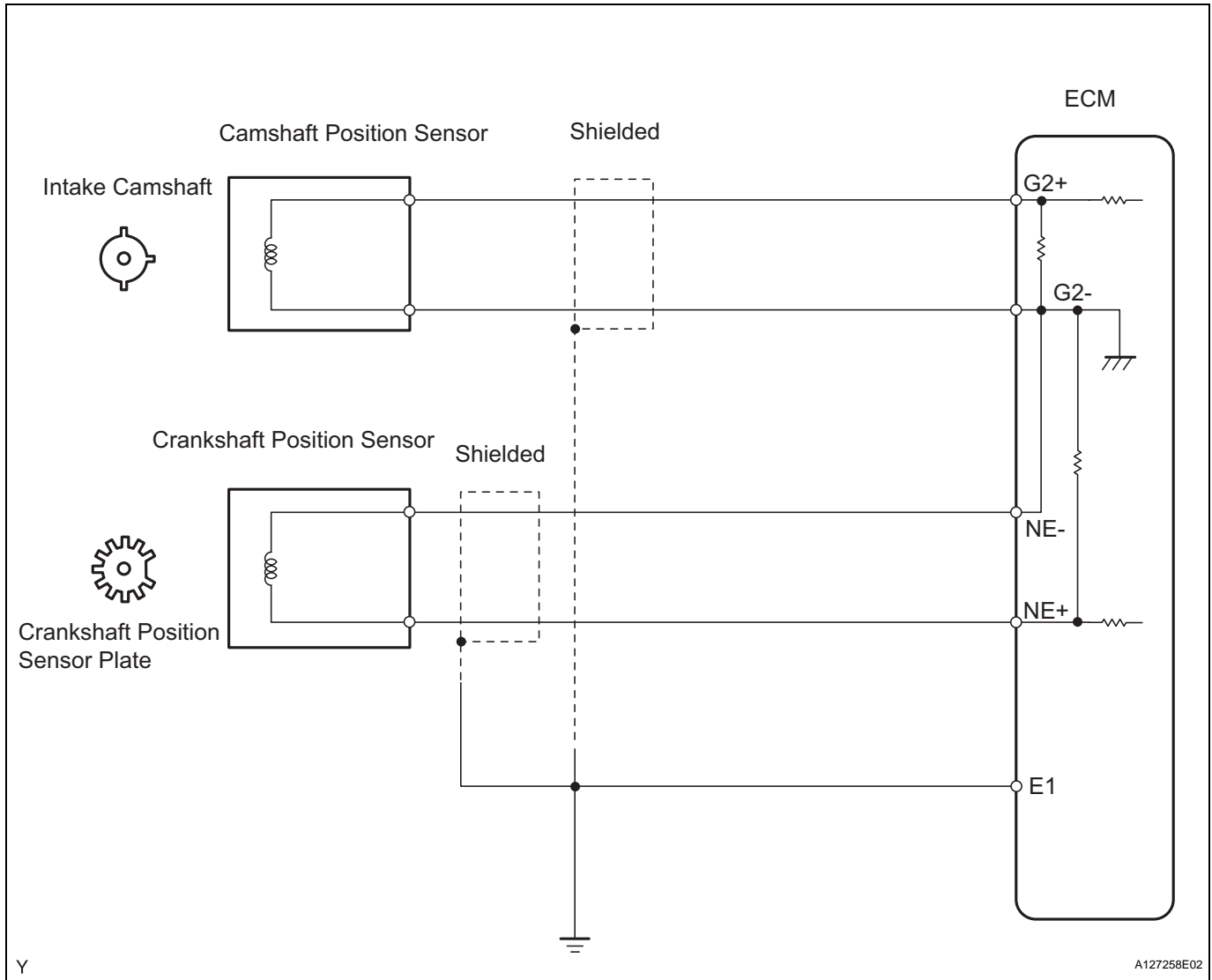
### Case 2:

Engine speed signal	No signal
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## COMPONENT OPERATING RANGE

CKP sensor	<ul style="list-style-type: none"> <li>CKP sensor output voltage fluctuates while crankshaft revolving</li> <li>34 CKP sensor signals per crankshaft revolution</li> </ul>
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## WIRING DIAGRAM



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## INSPECTION PROCEDURE

### HINT:

- If no problem is found through this diagnostic troubleshoot procedure, troubleshoot the engine mechanical systems.
- Check the engine speed. The engine speed can be checked by using the intelligent tester. To check, follow the operation below:
  - Connect the intelligent tester to the DLC3.
  - Start the engine.
  - Turn the tester ON
  - Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / ENGINE SPD.

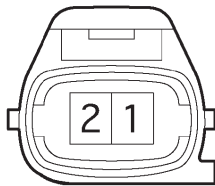
The engine speed may be indicated as zero despite the engine revolving normally. This is caused by a lack of NE signals from the Crankshaft Position (CKP) sensor. Alternatively, the engine speed may be indicated as lower than the actual engine speed if the CKP sensor output voltage is insufficient.
- 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 READ VALUE USING INTELLIGENT TESTER (ENGINE SPD)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the tester ON.
- (d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DATA LIST / PRIMARY / ENGINE SPD.
- (e) Start the engine.
- (f) Read the values displayed on the tester while the engine is running.

**Standard:****Correct values are displayed.****HINT:**

- To check the engine speed change, display the graph on the tester.
- If the engine does not start, check the engine speed while cranking.
- If the engine speed indicated on the tester remains zero (0), there may be an open or short in the Crankshaft Position (CKP) sensor circuit.

**OK****CHECK FOR INTERMITTENT PROBLEMS****NG****2 INSPECT CRANKSHAFT POSITION SENSOR (RESISTANCE)****Component Side:**

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- (a) Disconnect the B22 CKP sensor connector.
- (b) Measure the resistance between terminals 1 and 2.

**Standard resistance**

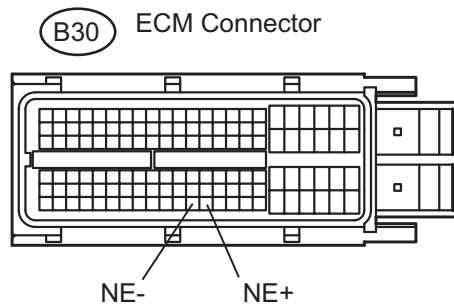
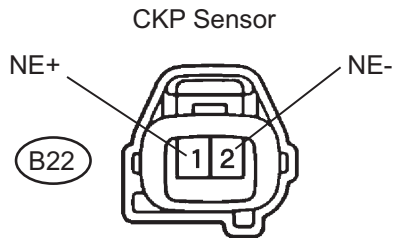
Tester Connections	Conditions	Specified Conditions
1 - 2	Cold	985 to 1,600 $\Omega$
1 - 2	Hot	1,265 to 1,890 $\Omega$

**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 CKP sensor connector.

**NG****REPLACE CRANKSHAFT POSITION SENSOR****OK****ES**

**3 CHECK HARNESS AND CONNECTOR (CRANKSHAFT POSITION SENSOR - ECM)****Wire Harness Side:**

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- Disconnect the B22 CKP sensor connector.
- Disconnect the B30 ECM connector.
- Measure the resistance.

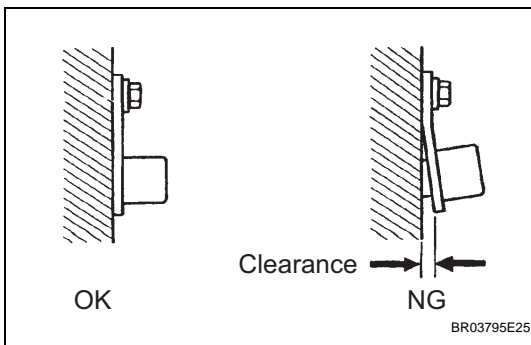
**Standard resistance (Check for open)**

Tester Connections	Specified Conditions
B22-1 (NE+) - B30-122 (NE+)	Below 1 $\Omega$
B22-2 (NE-) - B30-121 (NE-)	Below 1 $\Omega$

**Standard resistance (Check for short)**

Tester Connections	Specified Conditions
B22-1 (NE+) or B30-122 (NE+) - Body ground	10 k $\Omega$ or higher
B22-2 (NE-) or B30-121 (NE-) - Body ground	10 k $\Omega$ or higher

- Reconnect the ECM connector.
- Reconnect the CKP sensor connector.

**NG****REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****4 CHECK SENSOR INSTALLATION (CRANKSHAFT POSITION SENSOR)**

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- Check the CKP sensor installation.

**OK:****Sensor is installed correctly.****NG****SECURELY REINSTALL SENSOR****OK****5 CHECK CRANKSHAFT POSITION SENSOR PLATE (TEETH OF SENSOR PLATE)**

- Check the teeth of the sensor plate.

**OK:****Sensor plate does not have any cracks or deformation.****NG****REPLACE CRANKSHAFT POSITION SENSOR PLATE****ES**

OK

6 REPLACE CRANKSHAFT POSITION SENSOR

NEXT

7 CHECK WHETHER DTC OUTPUT RECURS

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- (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 / CURRENT CODES.
- (g) Read DTCs.

Result

Display (DTC Output)	Proceed To
No output	A
P0335 or P0339	B

HINT:  
If the engine does not start, replace the ECM.

B REPLACE ECM

A

END