| DTC | P0335/12 | CRANKSHAFT POSITION SENSOR ”A” CIRCUIT |
|---|---|---|

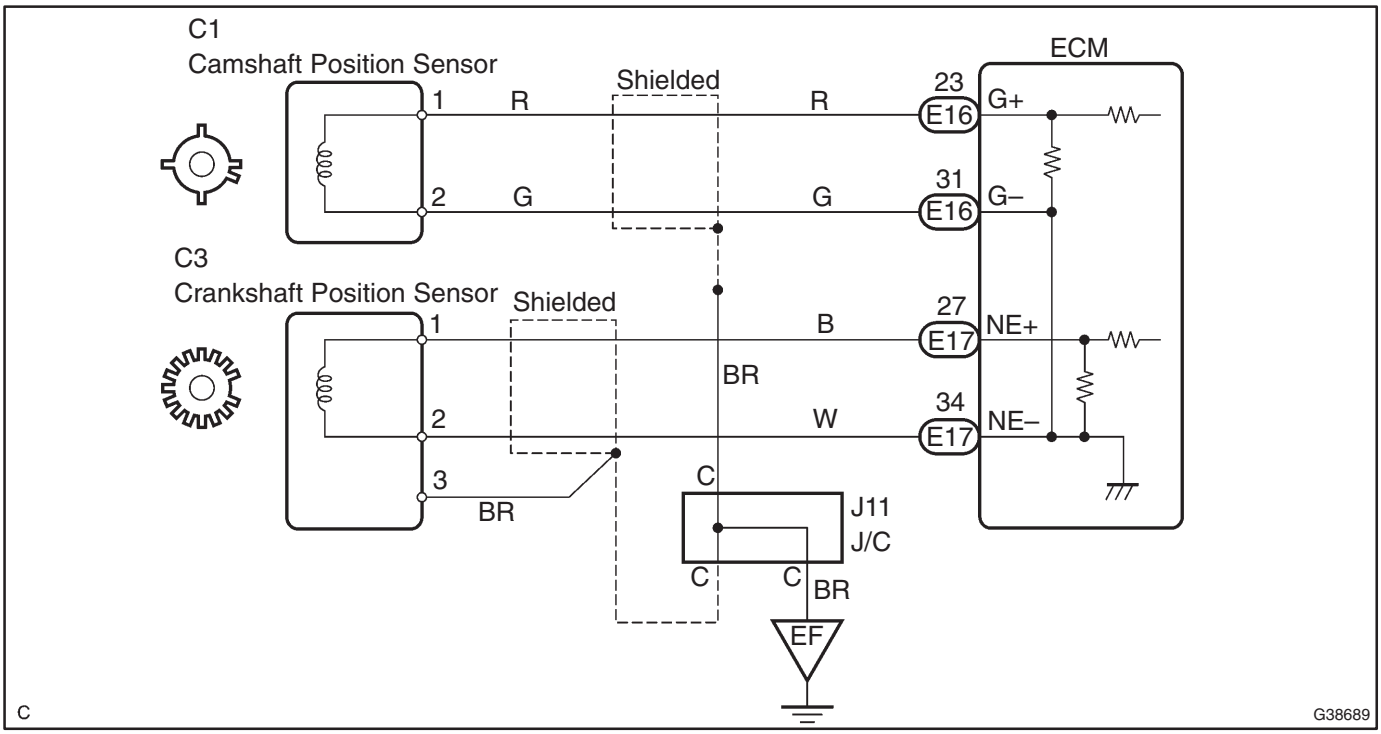
| DTC | P0339/13 | CRANKSHAFT POSITION SENSOR ”A” CIRCUIT INTERMITTENT |
|---|---|---|

## CIRCUIT DESCRIPTION

The crankshaft position sensor system consists of a crankshaft position sensor plate and a pickup coil. The sensor plate has 34 teeth and is installed on the crankshaft. The pickup coil is made of 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 for each engine revolution. Based on these signals, the ECM calculates the crankshaft position and engine RPM. Using these calculations, the common rail system is controlled.

| DTC No. | DTC Detection Condition | Trouble Area |
|---|---|---|
| P0335/12 | • No crankshaft position sensor signal to ECM while cranking (1 trip detection logic) | • Open or short in crankshaft position sensor circuit<br>• Crankshaft position sensor<br>• Crankshaft position sensor plate No. 1<br>• ECM |
| P0335/13 | • No crankshaft position sensor signal to ECM with engine speed 600 rpm or more (1 trip detection logic) | • Open or short in crankshaft position sensor circuit<br>• Crankshaft position sensor<br>• Crankshaft position sensor plate No. 1<br>• ECM |
| P0339/13 | No crankshaft position sensor signal to ECM is input for 0.05 seconds or more, and conditions (a), (b) and (c) are met (1 trip detection logic):<br>(a) Engine is at 1,000 rpm or more<br>(b) STA signal is OFF<br>(c) 3 seconds or more have elapsed after STA signal is switched from ON to OFF | • Open or short in crankshaft position sensor circuit<br>• Crankshaft position sensor<br>• Crankshaft position sensor plate No. 1<br>• ECM |

## WIRING DIAGRAM

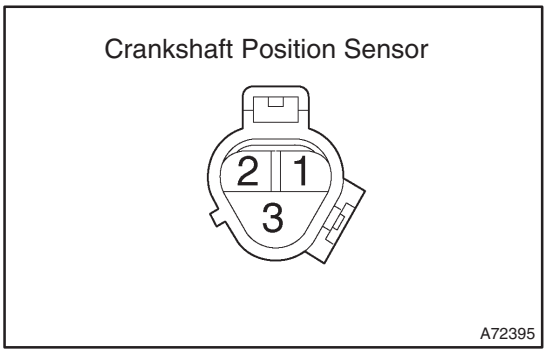


## INSPECTION PROCEDURE

HINT:

- If no trouble is found in the diagnostic troubleshooting procedure of DTC P0335/12, troubleshoot the engine mechanical system.
- Read freeze frame data using the intelligent tester II. 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, and other data from the time the malfunction occurred.

| 1 | INSPECT CRANKSHAFT POSITION SENSOR (RESISTANCE) |
|---|---|




(a) Disconnect the C3 sensor connector.

(b) Measure the resistance of the sensor.

**Standard:**

| Tester Connection | Condition | Specified Condition |
|---|---|---|
| 1 – 2 | Cold | 1,630 to 2,740 Ω |
| 1 – 2 | Hot | 2,065 to 3,225 Ω |

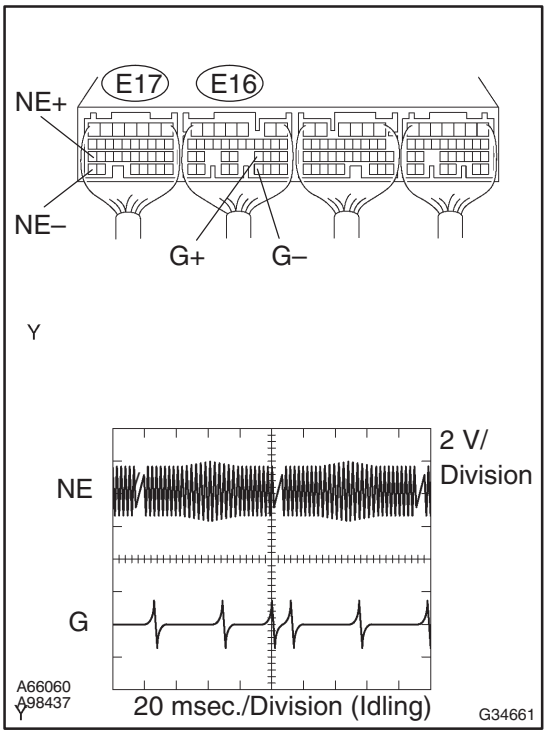
**NOTICE:**

**In the chart above, the terms "cold" and "hot" refer to the temperature of the coils. "Cold" means approximately –10 to 50°C (14 to 122°F). "Hot" means approximately 50 to 100°C (122 to 212°F).**

HINT:

While cranking or idling the engine, check the waveform of the ECM connectors using an oscilloscope.

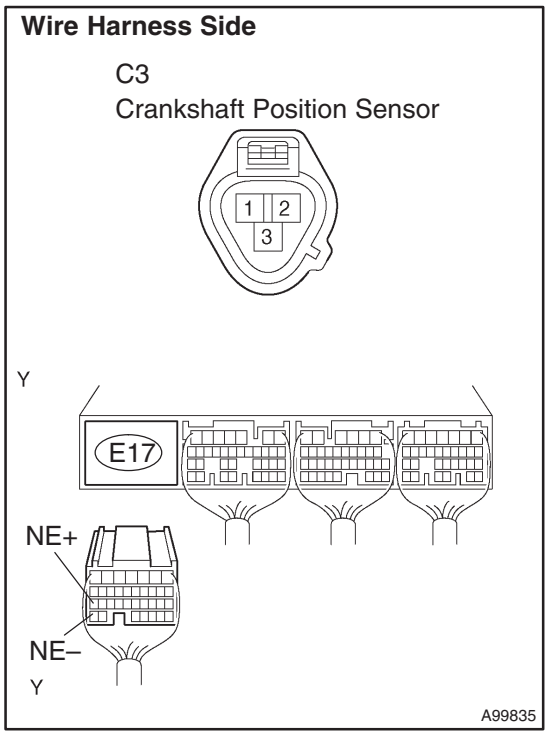
| Tester Connection | Specified Condition |
|---|---|
| E16–23 (G+) – E16–31 (G–)<br>E17–27 (NE+) – E17–34 (NE–) | Correct waveform is as shown |




**NG** → **REPLACE CRANKSHAFT POSITION SENSOR**

**OK**

## 2 CHECK WIRE HARNESS (CRANKSHAFT POSITION SENSOR – ECM)




(a) Disconnect the C3 sensor connector.
(b) Disconnect the E17 ECM connector.
(c) Measure the resistance of the wire harness side connectors.

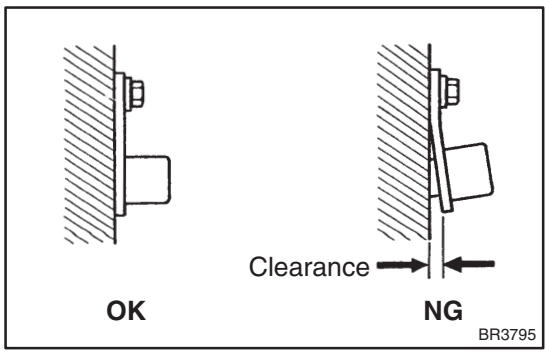
**Standard:**

| Tester Connection | Specified Condition |
|---|---|
| C3–1 – E17–27 (NE+) | Below 1 Ω |
| C3–2 – E17–34 (NE–) | Below 1 Ω |
| C3–1 or E17–27 (NE+) – Body ground | 10 kΩ or higher |
| C3–2 or E17–34 (NE–) – Body ground | 10 kΩ or higher |

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

**OK**

## 3 CHECK SENSOR INSTALLATION (CRANKSHAFT POSITION SENSOR)




(a) Check the sensor installation.
**OK: Sensor is installed correctly.**

**NG** → **SECURELY REINSTALL SENSOR**

**OK**

| 4 | CHECK CRANKSHAFT POSITION SENSOR PLATE NO.1 |
|---|---|

(a) Check the teeth of the crankshaft position sensor plate No. 1.
**OK: Plate's teeth do not have any cracks or deformation.**

**NG** → **REPLACE CRANKSHAFT POSITION SENSOR PLATE NO.1**

**OK**

**REPLACE ECM (See Pub. No. RM990E, page 10–34)**

**NOTICE:**
**After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.**