

## CIRCUIT INSPECTION

<b>Diag. Code 12</b>	<b>RPM Signal Circuit (No.1)</b>
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### — CIRCUIT DESCRIPTION —

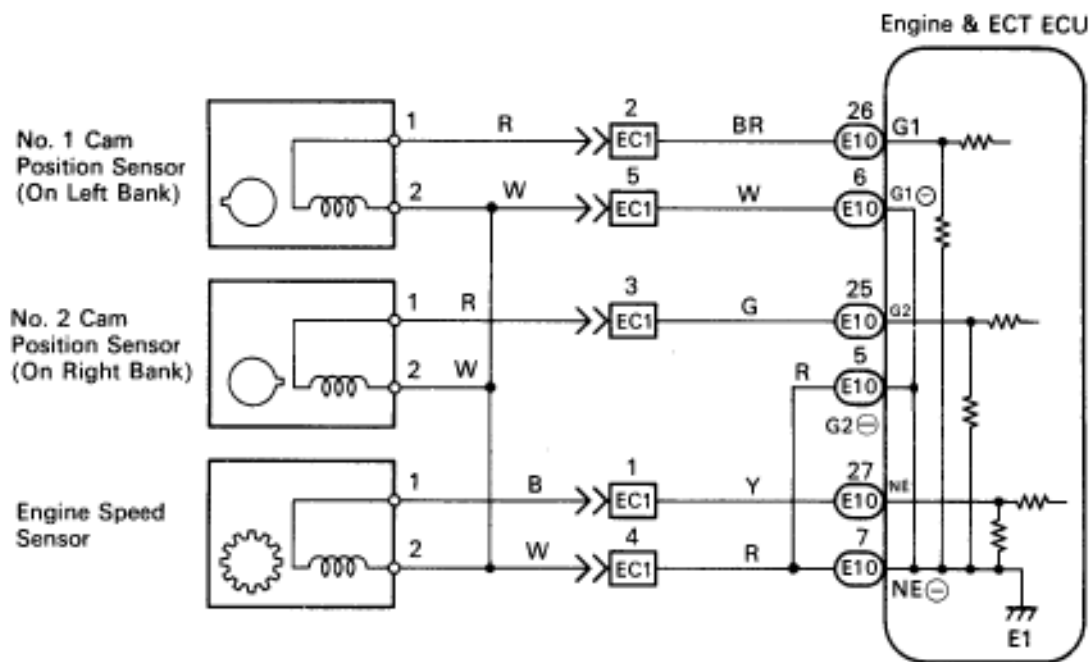
Cam position sensors (G1 and G2 signals) and engine speed sensor (NE signal) consist of a signal plate and a pick up coil.

The G1, G2 signal plates have one tooth each on its outer circumference and are mounted on the left and right bank camshafts.

When the camshafts rotate, the protrusion on the signal plate and the air gap on the pick up coil change, causing fluctuations in the magnetic field and generating an electromotive force in the pick up coil.

The NE signal plate has 12 teeth and is mounted on the crankshaft. The NE signal sensor generates 12 NE signals per engine revolution. The ECU detects the standard crankshaft angle based on the G1, G2 signals, and the actual crankshaft angle and the engine speed by the NE signals.

Code No.	Diagnostic Code Detecting Condition	Trouble Area
<b>12</b>	No "NE" or "G1" and "G2" signal to ECU within 2 sec. after cranking.	<ul style="list-style-type: none"> <li>• Open or short in engine speed sensor, No. 1, No. 2 cam position sensor circuit</li> <li>• Engine speed sensor</li> <li>• No. 1, No. 2 cam position sensor</li> <li>• Starter</li> <li>• ECU</li> </ul>



# INSPECTION PROCEDURE

**1**
**Check engine speed sensor, No. 1, No. 2 cam position sensor**

No. 1 cam position sensor



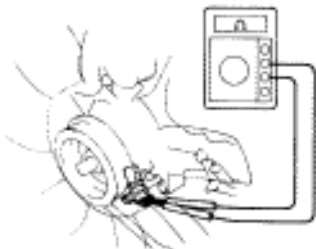
le-2-2-D

No. 2 cam position sensor



le-2-2-E

Engine speed sensor


 IG1062  
IG1061  
IG1063

**P**

For engine speed sensor.

(2) Remove engine under cover.

(2) Disconnect engine speed sensor connector.

For No.1, No. 2 cam position sensor,

(2) Disconnect No. 1, No. 2 cam position sensor connectors.

**C**

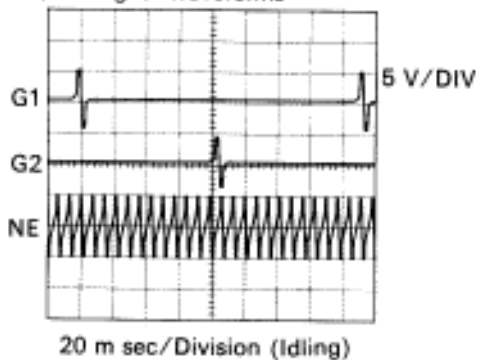
Measure resistance of engine speed sensor, No. 1 and No. 2 cam position sensor.

**OK**

	Resistance
No. 1 cam position sensor	950 ~ 1,250 $\Omega$
No. 2 cam position sensor	950 ~ 1,250 $\Omega$
Engine speed sensor	950 ~ 1,250 $\Omega$

**Reference**
**INSPECTION USING OSCILLOSCOPE**

G, NE signal waveforms



FI6519

- During cranking or idling, check between terminals G1, G2 and G1 $\ominus$ , NE and NE $\ominus$  of engine & ECT ECU.

HINT: The correct waveforms appear as shown in the illustration on the left.

**OK**
**NG**

Replace engine speed sensor, No. 1, No. 2 cam position sensor.

**2**

Check for open and short in harness and connector between engine & ECT ECU and each sensor (See page [IN-27](#)).

**OK****NG**

Repair or replace harness or connector.

**3**

Inspect sensor installation and teeth of signal plate.

**OK****NG**

Tighten the sensor.  
Replace signal plate.

Check and replace engine and ECT ECU.