DIC2D–03

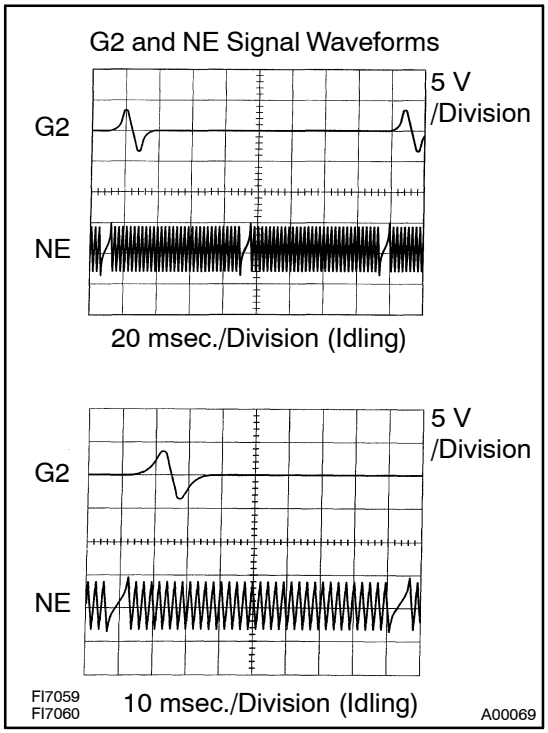
DTC	P0335/12/13	Crankshaft Position Sensor ”A” Circuit

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 pick–up coil. The sensor plate has 34 teeth and is installed on the crankshaft. The pick–up coil is made of an iron core and magnet. The sensor plate rotates and as each tooth passes through the pick–up coil, a pulse signal is created. The pick–up coil generates 34 signals for each engine revolution. Based on these signals, the engine control ECU calculates the crankshaft position and engine RPM. Using these calculations, the fuel injection time and ignition timing are controlled.

DTC No.	DTC Detecting Condition	Trouble Area
P0335/12/13	No crankshaft position sensor signal to engine control ECU during cranking (2 trip detection logic)	• Open or short in crankshaft position sensor circuit • Crankshaft position sensor • Signal plate • Engine control ECU
	No crankshaft position sensor signal to engine control ECU with engine speed 600 rpm or more (2 trip detection logic)	
P0339/13	In condition (a), (b) and (c), when no crankshaft position sensor (NE) signal is input for 0.05 sec. or more. : (1 trip detection logic) (f) Engine revolution 1000 rpm or more (g) STA signal is OFF (h) 3 sec. or more has lapsed after STA signal is switched from ON to OFF.	



Reference: Inspection using the oscilloscope.

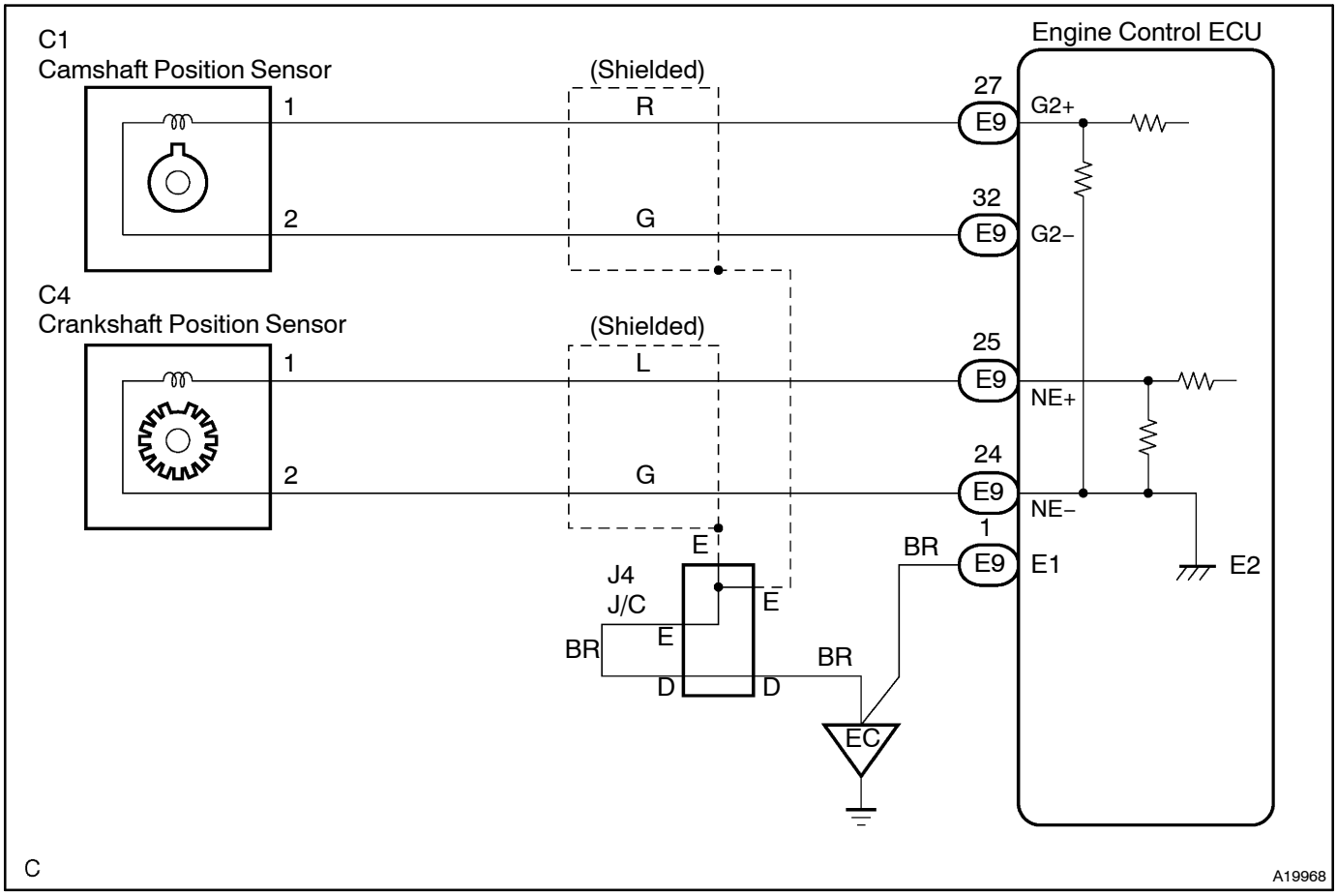
The correct waveform is as shown.

Tester Connection	Specified Condition
G2+ (E7–27) – G2– (E7–32)	Correct waveform is as shown
NE+ (E7–25) – NE– (E7–24)	

MONITOR DESCRIPTION

If there is no signal from the crankshaft sensor even though the engine is revolving, the engine control ECU interprets this as a malfunction of the sensor.
This monitor runs for 10 seconds (the first 10 seconds of engine idle) after the engine is started.

WIRING DIAGRAM



INSPECTION PROCEDURE

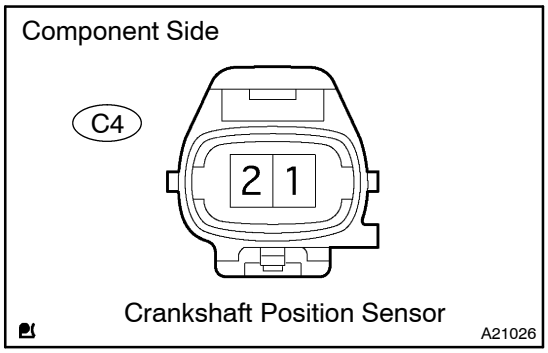
HINT:

- Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting it is useful for determining whether the vehicle was running or stopped. the engine was warmed up or not, the air–fuel ratio lean or rich, etc. at the time of the malfunction.
- READ VALUE OF HAND–HELD TESTER OR OBD II SCAN TOOL

(a) Connect the hand–held tester to the DLC3.
(b) Start the engine and push the hand–held tester or the OBD II scan tool main switch ON.
(c) Select the item ”DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / ENGINE SPD”.

- The engine speed can be confirmed in DATA LIST using the hand–held tester. If there is no NE signals from the crankshaft position sensor despite the engine revolving, the engine speed will be indicated as zero. If voltage output of the crankshaft position sensor is insufficient, the engine speed will be indicated as lower RPM (than the actual RPM).

1	**Check resistance of crankshaft position sensor.**



PREPARATION:

Disconnect the C4 crankshaft position sensor connector.

CHECK:

Measure the resistance between terminals 1 and 2.

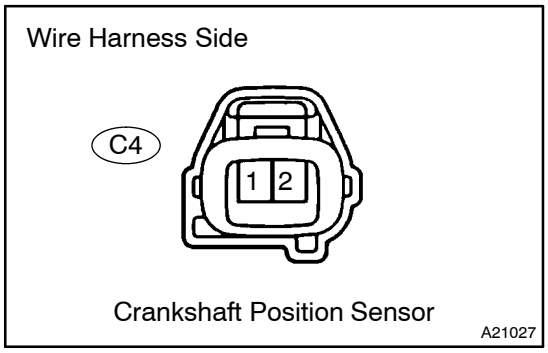
OK:

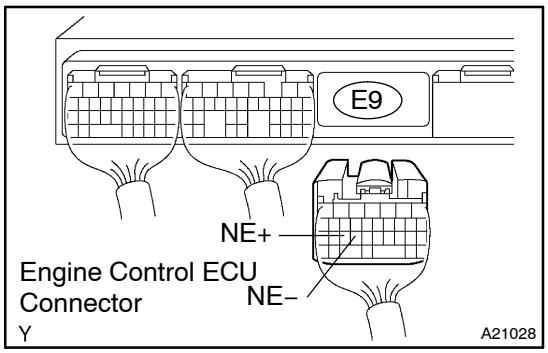
Tester Connection	Specified Condition
1 – 2	1,850 to 2,450 Ω (at 20°C (68°F))

NG → **Replace crankshaft position sensor.**

OK

2	Check for open and short in harness and connector between engine control ECU and crankshaft position sensor.





PREPARATION:

(a) Disconnect the C4 crankshaft position sensor connector.

(b) Disconnect the E9 engine control ECU connector.

CHECK:

Measure the resistance between the wire harness side connectors.

OK:

Tester Connection	Specified Condition
Crankshaft position sensor (C4–1) – NE+ (E9–25)	Below 1 Ω
Crankshaft position sensor (C4–2) – NE– (E9–24)	Below 1 Ω
Crankshaft position sensor (C4–1) or NE+ (E9–25) – Body ground	10 kΩ or higher
Crankshaft position sensor (C4–2) or NE– (E9–24) – Body ground	10 kΩ or higher

NG → **Repair or replace harness or connector.**

OK

3	Check sensor installation (crankshaft position sensor).

CHECK:

Check the crankshaft position sensor installation.

NG → **Tighten sensor.**

OK

4	**Inspect teeth of sensor plate.**

PREPARATION:

Remove the crankshaft angle sensor plate (See Pub. No. RM630E, page EM–14).

CHECK:

Check the teeth of sensor plate.

NG → **Replace sensor plate.**

OK

Replace engine control ECU (See Pub. No. RM630E, page FI–74).