DICCP–01

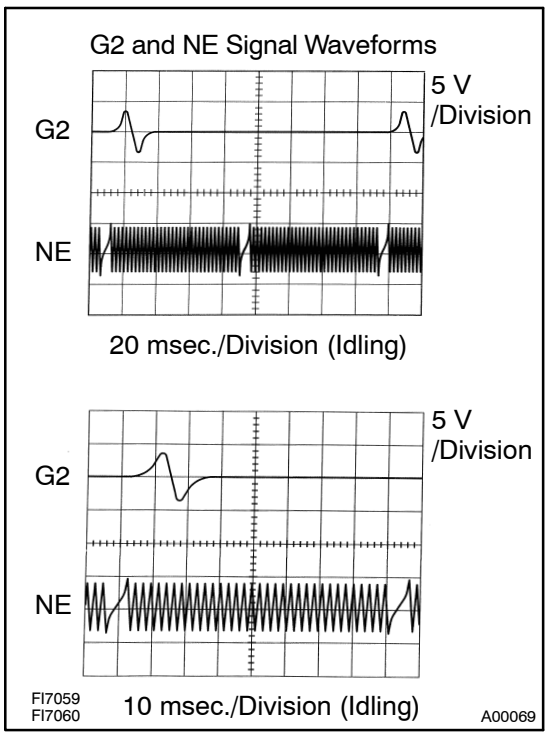
DTC	P0340	Camshaft Position Sensor ”A” Circuit (Bank 1 or Single Sensor)

DTC	P0341	Camshaft Position Sensor ”A” Circuit Range/Performance (Single Sensor)

CIRCUIT DESCRIPTION

The camshaft position sensor (G signal) consists of a magnet iron core and pickup coil.
The G signal plate has 1 tooth on its outer circumference and is installed on the LH camshaft timing pulley. When the camshafts rotate, protrusion on the signal plate and air gap on the pickup coil change, causing fluctuations in the magnetic field and generating a voltage in the pickup coil.
The NE signal plate has 34 teeth and is mounted on the crankshaft. The NE signal sensor generates 34 signals at every engine revolution. The ECM detects the crankshaft angle and the engine revolution based on the NE signals, and the cylinder and the angle of the G2 based on the combination of the G and NE signals.

DTC No.	DTC Detection Condition	Trouble Area
P0340	No camshaft position sensor signal to ECM during cranking (2 trip detection logic)	• Open or short in camshaft position sensor circuit • Camshaft position sensor • LH camshaft timing pulley • Jumping teeth of timing belt • ECM
	No camshaft position sensor signal to ECM with engine speed 600 rpm or more (1 trip detection logic)	
P0341	While crankshaft rotates twice, camshaft position sensor signal will be input to ECM 12 times or more (1 trip detection logic) • Hint: Under normal condition, the camshaft position signal is input into the ECM 3 times per 2 engine revolutions	



Reference: Inspection using the oscilloscope.
The correct waveform is as shown.

Tester Connection	Specified Condition
G2+ (E6–27) – G2– (E6–32)	Correct waveform is as shown
NE+ (E6–25) – NE– (E6–24)	

MONITOR DESCRIPTION

If there is no signal from the camshaft position sensor even though the engine is turning, or if the rotation of the camshaft and the crankshaft is not synchronized, the ECM interprets this as a malfunction of the sensor.

MONITOR STRATEGY

Related DTCs	P0340	Camshaft position sensor (Bank 1) range check or rationality
	P0341	Camshaft position sensor (Bank 1) range check or rationality
Required sensors/components	Main sensors/components	Camshaft position sensor
	Related sensors/components	Crankshaft position sensor, Engine speed sensor
Frequency of operation	Continuous	
Duration	5 sec.	
MIL operation	P0340 case 1 (no signal): 2 driving cycles P0340 case 2 (mis–aligned), P0341: Immediate	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See "List of disable a monitor" (on page DI–3)	
P0340 Case 1 (No signal):		
Starter	ON	
Minimum battery voltage while starter ON	–	11 V
P0340 Case 2 (Mis–aligned):		
Engine speed	600 rpm	–
Starter	OFF	
P0341:		
Starter	After OFF to ON timing	
Engine revolution	720°CA	

TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
P0340 Case 1 (No signal):	
Camshaft position sensor signal	No signal
P0340 Case 2 (Mis–aligned):	
Crankshaft/camshaft alignment is mis–aligned (judged by comparing the crankshaft position to the camshaft position)	
Camshaft position sensor signal: No input in appropriate timing.	
P0341:	
Crankshaft/Camshaft alignment	Mis–aligned
Camshaft position sensor count	12 or more / 720°CA (= Engine 2 revolutions)

COMPONENT OPERATING RANGE

Parameter	Standard Value
Camshaft position sensor signal input during every 720°CA	3

WIRING DIAGRAM

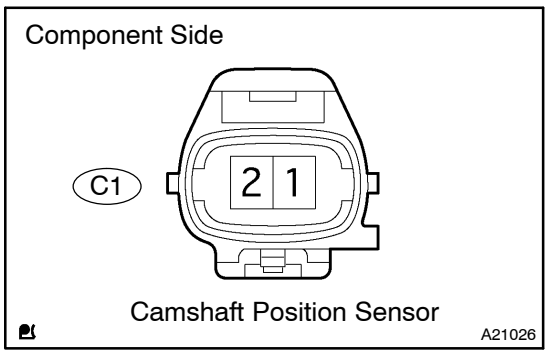
Refer to DTC P0335 on page DI–191.

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand–held tester or the OBD II scan tool. 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, if the air–fuel ratio was lean or rich, as well as other data from the time when a malfunction occurred.

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



PREPARATION:

Disconnect the C1 camshaft position sensor connector.

CHECK:

Measure the resistance between terminals 1 and 2.

OK:

Tester Connection	Specified Condition
1 – 2	1,630 to 2,740 Ω at cold
	2,065 to 3,225 Ω at hot

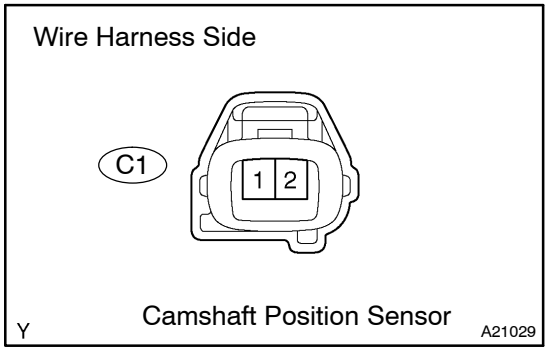
NOTICE:

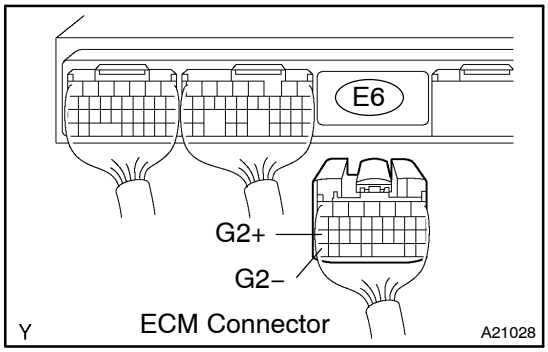
" Cold" and "Hot" shown above mean the temperature of the coils themselves. "Cold" is from –10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

NG → **Replace camshaft position sensor.**

OK

2	Check for open and short in harness and connector between ECM and camshaft position sensor.





PREPARATION:

(a) Disconnect the C1 camshaft position sensor connector.

(b) Disconnect the E6 ECM connector.

CHECK:

Measure the resistance between the wire harness side connectors.

OK:

Tester Connection	Specified Condition
Camshaft position sensor (C1–1) – G2+ (E6–27)	Below 1 Ω
Camshaft position sensor (C1–2) – G2– (E6–32)	Below 1 Ω
Camshaft position sensor (C1–1) or G2+ (E6–27) – Body ground	10 kΩ or higher
Camshaft position sensor (C1–2) or G2– (E6–32) – Body ground	10 kΩ or higher

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

OK

3	Check sensor installation (Camshaft position sensor).

CHECK:

Check the camshaft position sensor installation.

NG → **Tighten sensor.**

OK

4	**Inspect teeth of LH camshaft timing belt pulley.**

PREPARATION:
Remove the LH camshaft timing belt pulley (See page EM–35).
CHECK:
Check the LH camshaft timing belt pulley.

NG → **Replace LH camshaft timing pulley.**

OK

Replace ECM (See page SF–60).