DTC	P0340	CAMSHAFT POSITION SENSOR ”A” CIRCUIT (BANK 1 OR SINGLE SENSOR)

DTC	P0342	CAMSHAFT POSITION SENSOR ”A” CIRCUIT LOW INPUT (BANK 1 OR SINGLE SENSOR)

DTC	P0343	CAMSHAFT POSITION SENSOR ”A” CIRCUIT HIGH INPUT (BANK 1 OR SINGLE SENSOR)

DTC	P0345	CAMSHAFT POSITION SENSOR ”A” CIRCUIT (BANK 2)

DTC	P0347	CAMSHAFT POSITION SENSOR ”A” CIRCUIT LOW INPUT (BANK 2)

DTC	P0348	CAMSHAFT POSITION SENSOR ”A” CIRCUIT HIGH INPUT (BANK 2)

CIRCUIT DESCRIPTION

The camshaft position sensor (G signal) consists of a magnet and MRE element.
The camshaft drive gear has 5 teeth on its inner circumference. When the camshaft gear rotates, air gap changes between the protrusion on the gear and the pickup coil. The change affects the magnetic field and result in change in the resistance of the MRE element. The crankshaft angle sensor plate has 32 teeth and output 32 signals every engine revolution. The ECM detects the standard crankshaft angle based on the G signal and actual crankshaft angle and engine speed by NE signal.

DTC No.	DTC Detection Condition	Trouble Area
P0340 P0345	STA ON: No camshaft position sensor signal to ECM during cranking for 4 seconds or more STA OFF: No camshaft position sensor signal to ECM with engine speed 600 or more	• Open or short in camshaft position sensor circuit • Camshaft position sensor • Camshaft drive gear • ECM
P0342 P0343 P0347 P0348	No VVT sensor signal to ECM with engine speed 600 rpm or more for 5 seconds or more. (1 trip detection logic)	• Open or short in VVT sensor circuit • VVT sensor • Camshaft timing pulley • Jumping teeth of timing chain • ECM

WIRING DIAGRAM

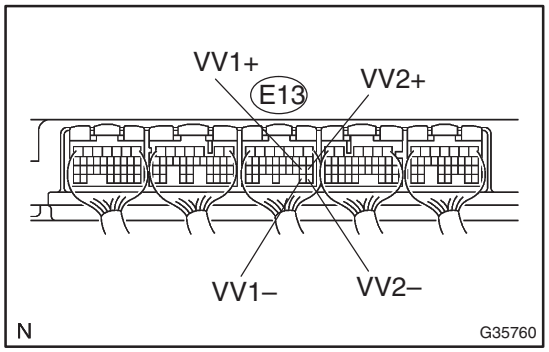
Refer to DTC P0335 on page 05–311.

INSPECTION PROCEDURE

HINT:

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, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1	CHECK ECM TERMINAL VOLTAGE

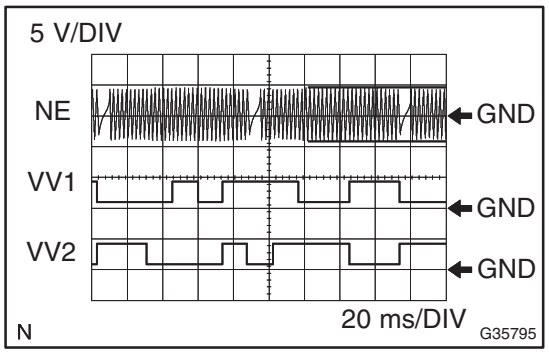


(a) Inspect using an oscilloscope.

(1) While the engine is idling, check the waveform of the ECM connector.

Standard:

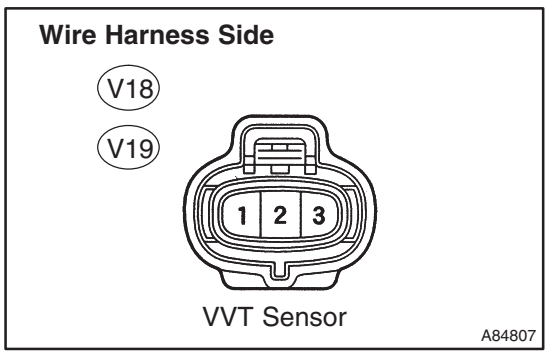
Symbols (Terminal No.)	Specified condition
VV1+ (E13–27) – VV1– (E13–29)	Correct waveform is as shown
VV2+ (E13–26) – VV2– (E13–28)	Correct waveform is as shown
NE+ (E13–25) – NE– (E13–24)	Correct waveform is as shown



NG → **REPLACE VVT SENSOR**

OK

2	CHECK VVT SENSOR(SENSOR POWER SOURCE)



(a) Disconnect the VVT sensor connector.

(b) Measure the voltage between terminals 3 and body ground.

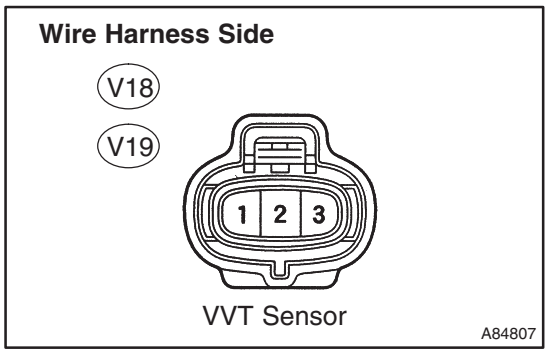
Standard:

4.5 to 5.5 V

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

OK

3	CHECK HARNESS AND CONNECTOR(VVT SENSOR – ECM)



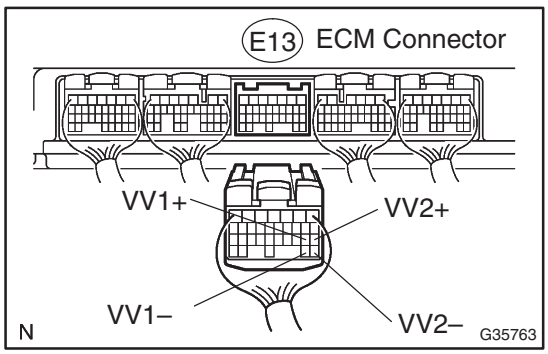
(a) Disconnect the VVT sensor connector.
(b) Disconnect the E13 ECM connector.
(c) Check for resistance between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
VVT sensor (V19–1) – VV1+ (E13–19)	Below 1 Ω
VVT sensor (V18–1) – VV2+ (E13–18)	Below 1 Ω
VVT sensor (V18–2) – VV1– (E13–20)	Below 1 Ω
VVT sensor (V19–2) – VV2– (E13–20)	Below 1 Ω

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
VVT sensor (V19–1) or VV1+ (E13–19) – Body ground	10 kΩ or higher
VVT sensor (V18–1) or VV2+ (E13–18) – Body ground	10 kΩ or higher
VVT sensor (V18–2) or VV1– (E13–28) – Body ground	10 kΩ or higher
VVT sensor (V19–2) or VV2– (E13–29) – Body ground	10 kΩ or higher



NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

4	CHECK SENSOR INSTALLATION(VVT SENSOR) (SEE PAGE 18–11)

NG → TIGHTEN SENSOR

OK

5	CHECK CAMSHAFT TIMING GEAR ASSY(TEETH OF PLATE)

(a) Check the teeth of the signal plate.

NG → REPLACE CAMSHAFT TIMING GEAR ASSY

OK

REPLACE VVT SENSOR