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

DTC	P0341	CAMSHAFT POSITION SENSOR ”A” CIRCUIT RANGE/PERFORMANCE (BANK 1 OR SINGLE SENSOR)

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

DTC	P0346	CAMSHAFT POSITION SENSOR ”A” CIRCUIT RANGE/PERFORMANCE (BANK 2)

CIRCUIT DESCRIPTION

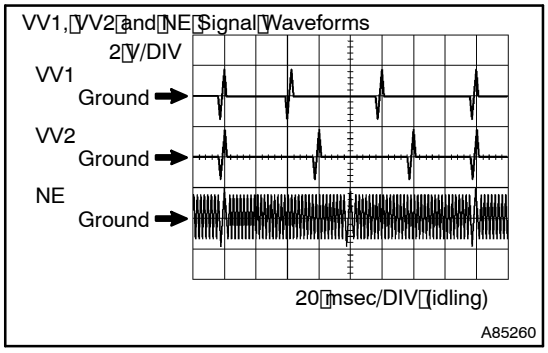
The Variable Valve Timing (VVT) sensor consists of a magnet, iron core and pickup coil. The VVT signal plate has 3 teeth on its outer circumference and is installed on the camshaft timing pulley. When the camshafts rotates, changes occur on the camshaft protrusions and the pickup coil air gaps. These changes cause fluctuations in the magnetic field and generate voltage in the pickup coil.

Each sensor monitors its timing rotor, which is located on the camshaft. The ECM uses the sensor to detect the camshaft angle. The camshaft rotation synchronizes with the crankshaft rotation, and this sensor communicates the rotation of the camshaft timing rotor as a pulse signal to the ECM. Based on the signal, the ECM controls camshaft position.

DTC No.	DTC Detection Condition	Trouble Area
P0340 P0345	• No VVT sensor signal to ECM during cranking (2 trip detection logic) • No VVT sensor signal to ECM with engine speed 600 rpm or more (1 trip detection logic)	• Open or short in VVT sensor circuit • VVT sensor • Camshaft timing pulley • Timing belt has a jumped tooth • ECM
P0341 P0346	While crankshaft rotates twice, VVT sensor signal is input to ECM 5 times or more (1 trip detection logic)	• Open or short in VVT sensor circuit • VVT sensor • Camshaft timing pulley • Timing belt has a jumped tooth • ECM

HINT:

- DTC P0340 and P0345 indicate a malfunction related to the VVT sensor (+) circuit (wire harness (from ECM to VVT sensor) and VVT sensor).
- DTC P0341 and P0346 indicate a malfunction related to the VVT sensor (–) circuit (wire harness (from ECM to VVT sensor) and VVT sensor).



Reference: Inspection using an oscilloscope.
During cranking or idling, check the waveform of the ECM connector.

Tester Connection	Specified Condition
E6–19 (VV1+) – E6–18 (VV1–)	Correct waveform is as shown
E5–19 (VV2+) – E5–18 (VV2–)	Correct waveform is as shown
E6–32 (NE+) – E6–31 (NE–)	Correct waveform is as shown

MONITOR DESCRIPTION

If there is no signal from the VVT sensor even though the engine is revolving, or if the rotation of the camshaft and the crankshaft is not synchronized, the ECM 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

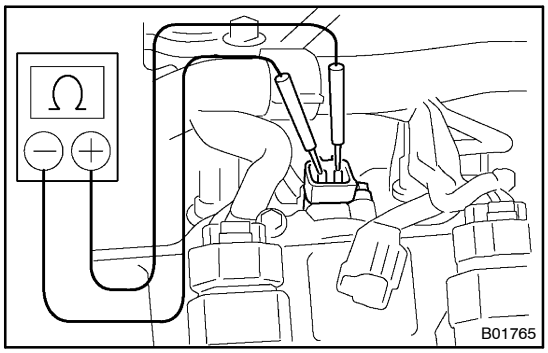
Refer to DTC P0016 on page 05–51.

INSPECTION PROCEDURE

HINT:

- If DTC P0340 and P0341 are displayed, check the left bank VVT sensor.
- If DTC P0345 and P0346 are displayed, check the right bank VVT sensor.
- 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 INSPECT VVT SENSOR



(a) Disconnect the V5 or V6 VVT sensor connector.
(b) Measure the resistance between the terminals of the VVT sensor.
Standard:

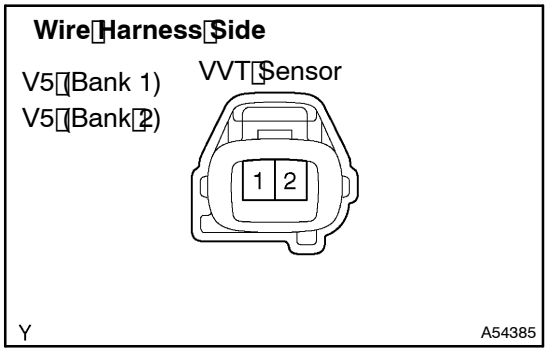
Tester Connection	Specified Condition
1 – 2	• 835 to 1,400 Ω at cold • 1,060 to 1,645 Ω at hot

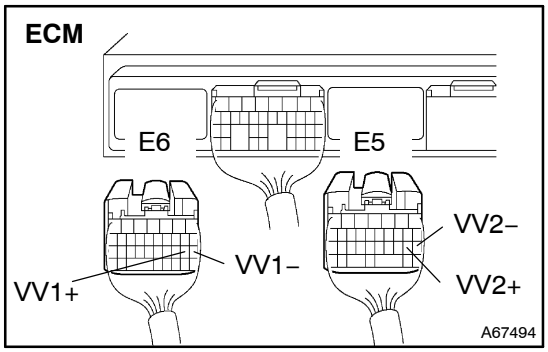
NOTICE:
In the above chart, the terms "cold" and "hot" refer to the temperature of the coils.
"Cold" means approximately –10 to 50°C (14 to 122°F).
"Hot" means approximately 50 to 100°C (122 to 212°F).

NG → REPLACE VVT SENSOR (See page 14–111)

OK

2 CHECK WIRE HARNESS (VVT SENSOR – ECM)





(a) Disconnect the V5 or V6 VVT sensor connector.
(b) Disconnect the E6 or E5 ECM connector.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
V5–1 – E6–19 (VV1+)	Below 1 Ω
V5–2 – E6–18 (VV1–)	Below 1 Ω
V5–2 – E5–19 (VV2+)	Below 1 Ω
V5–2 – E5–18 (VV2–)	Below 1 Ω
V5–1 or E6–19 (VV1+) – Body ground	10 kΩ or higher
V5–2 or E6–18 (VV1–) – Body ground	10 kΩ or higher
V5–2 or E5–19 (VV2+) – Body ground	10 kΩ or higher
V5–2 or E5–18 (VV2–) – Body ground	10 kΩ or higher

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

OK

3 CHECK SENSOR INSTALLATION (VVT SENSOR)

NG → **TIGHTEN SENSOR**

OK

4 CHECK CRANKSHAFT TIMING PULLEY

(a) Check the teeth of the camshaft timing pulley.

NG → **REPLACE CRANKSHAFT TIMING PULLEY**

OK

REPLACE ECM (See page 10–21)