

DTC	P0340	Camshaft Position Sensor "A" Circuit
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DTC	P0341	Camshaft Position Sensor "A" Circuit Range/Performance
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DTC	P0345	Camshaft Position Sensor "A" Circuit (Bank 2)
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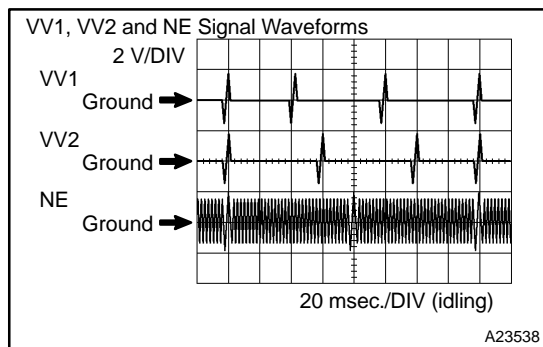
DTC	P0346	Camshaft Position Sensor "A" Circuit Range/Performance (Bank 2)
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CIRCUIT DESCRIPTION

The camshaft position sensor consists of a magnet, an iron core and a pick-up coil. This sensor monitors a timing rotor located on the camshaft and is used by the ECM 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 fuel injection time and ignition timing.

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

DTC No.	DTC Detection Condition	Trouble Area
P0340 P0345	No camshaft position sensor signal to ECM during cranking (2 trip detection logic) No camshaft position sensor signal to ECM with engine speed 600 rpm or more (1 trip detection logic)	<ul style="list-style-type: none"> • Open or short in camshaft position sensor circuit • VVT sensor • Camshaft • Jumping teeth of timing belt • ECM
P0341 P0346	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+ (E5-27) – G2– (E5-32)	Correct waveform is as shown
NE+ (E5-25) – NE– (E5-24)	

MONITOR DESCRIPTION

If there are no signals 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	VVT sensor (Bank 1) range check or rationality
	P0341	VVT sensor (Bank 1) range check or rationality
	P0345	VVT sensor (Bank 2) range check or rationality
	P0346	VVT sensor (Bank 2) range check or rationality
Required sensors/components	Main sensors/components	VVT sensor
	Related sensors/components	Crankshaft position sensor, Engine speed sensor
Frequency of operation	Continuous	
Duration	P0340, P0345 case 1: 4 sec. P0340, P0345 case 2: 5 sec. P0341, P0346: 720° CA	
MIL operation	P0340, P0345 case 1: 2 driving cycles P0340, P0345 case 2, P0341, P0346: Immediate	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever this DTC is not present	See page DI-437	
P0340, P0345 Case 1:		
Starter	ON	
Minimum battery voltage while starter ON	–	11 V
P0340, P0345 Case 2:		
Engine RPM	600 rpm	–
Starter	OFF	
Battery voltage	8 V	–
Ignition switch	ON	
P0341, P0346:		
Starter	After OFF to ON timing	
Engine revolution	720° CA	

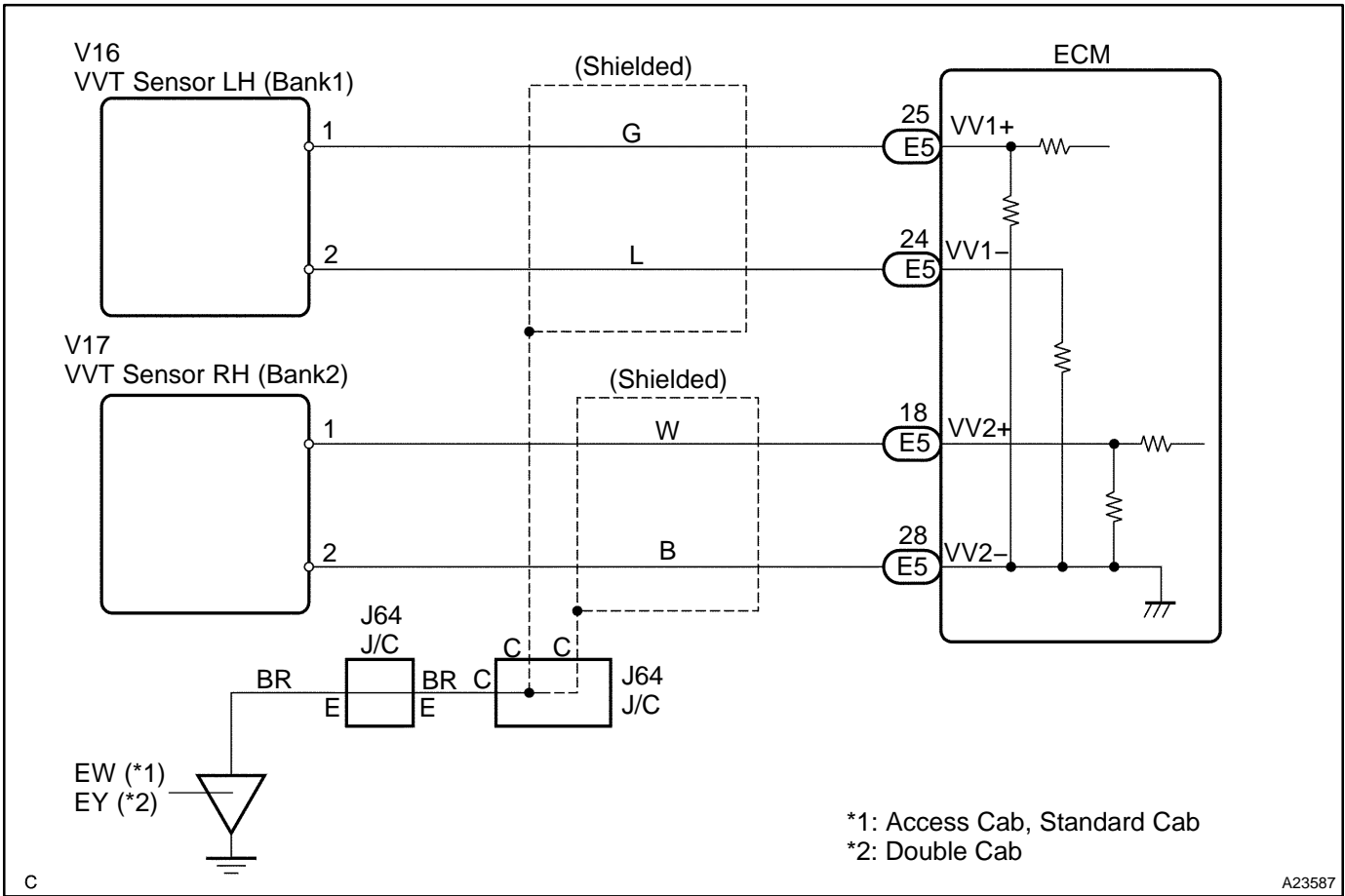
TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
P0340, P0345 Case 1:	
VVT sensor signal	No signal
P0340, P0345 Case 2:	
VVT sensor signal	No signal
P0341, P0346:	
VVT sensor count	12 or more / 720°CA (= Engine 2 revolutions)

COMPONENT OPERATING RANGE

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

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, 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

Inspect resistance of VVT sensor (See page SF-78).

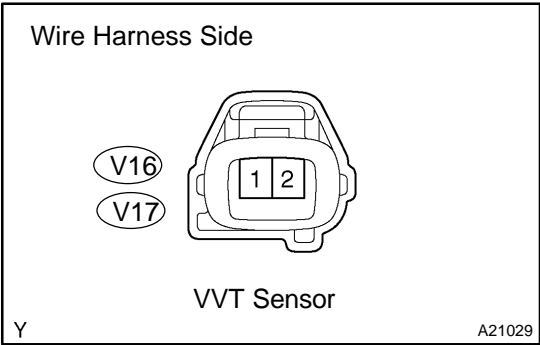
NG

Replace VVT sensor (See page SF-79).

OK

2

Check for open and short in harness and connector between ECM and VVT sensor.



PREPARATION:

- (a) Disconnect the VVT sensor connector.
- (b) Disconnect the E5 ECM connector.

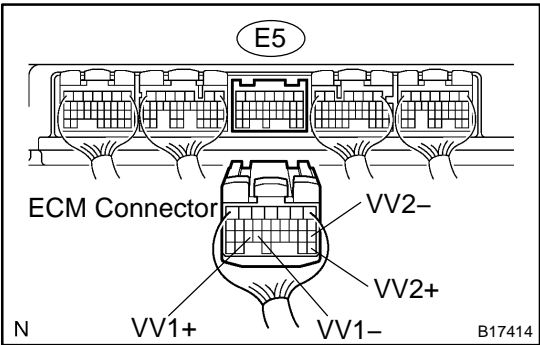
CHECK:

Measure the resistance between the wire harness side connectors.

OK:

Standard:

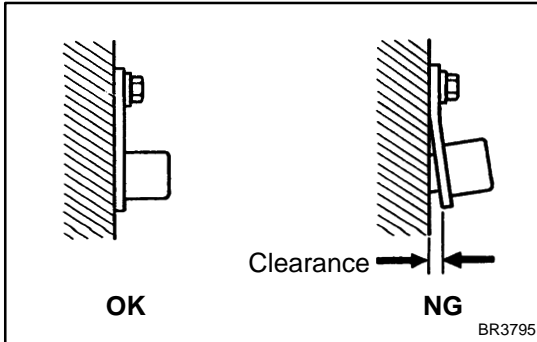
Tester Connection	Specified Condition
VVT sensor (V16-1) – VV1+ (E5-25)	Below 1 Ω
VVT sensor (V16-2) – VV1- (E5-24)	Below 1 Ω
VVT sensor (V17-1) – VV2+ (E5-18)	Below 1 Ω
VVT sensor (V17-2) – VV2- (E5-28)	Below 1 Ω
VVT sensor (V16 -1) or VV1+ (E5-25) – Body ground	10 kΩ or higher
VVT sensor (V16-2) or VV1- (E5-24) – Body ground	10 kΩ or higher
VVT sensor (V17 -1) or VV2+ (E5-18) – Body ground	10 kΩ or higher
VVT sensor (V17-2) or VV2- (E5-28) – Body ground	10 kΩ or higher



NG

Repair or replace harness or connector.

OK

3 Check sensor installation (VVT sensor).**CHECK:**

Check the VVT sensor installation.

OK:

The VVT sensor is installed properly.

NG**Tighten sensor installation bolt.****OK****4 Inspect teeth of camshaft.****PREPARATION:**Remove the cylinder head cover (See page [EM-36](#)).**CHECK:**

Check the tooth of the camshaft.

NG**Replace camshaft.****OK****Replace ECM.**