

<b>DTC</b>	<b>P0011/59</b>	<b>CAMSHAFT POSITION "A" – TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 1)</b>
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<b>DTC</b>	<b>P0012/59</b>	<b>CAMSHAFT POSITION "A" – TIMING OVER-RETARDED (BANK 1)</b>
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## CIRCUIT DESCRIPTION

Refer to DTC P0010/39 on [page 05-282](#).

DTC No.	DTC Detection Condition	Trouble Area
P0011/59	Advanced Cam Timing: After engine is warmed up, valve timing does not change from current valve timing while driving at engine speed of 500 to 4,000 rpm (1 trip detection logic)	<ul style="list-style-type: none"> <li>Valve Timing</li> <li>Oil Control Valve</li> <li>Camshaft Timing Gear Assy</li> <li>ECM</li> </ul>
P0012/59	Retarded Cam Timing: After engine is warmed up, valve timing does not change from current valve timing while driving at engine speed of 500 to 4,000 rpm (2 trip detection logic)	<ul style="list-style-type: none"> <li>Valve Timing</li> <li>Oil Control Valve</li> <li>Camshaft Timing Gear Assy</li> <li>ECM</li> </ul>

## WIRING DIAGRAM

Refer to DTC P0010/39 on [page 05-282](#).

## INSPECTION PROCEDURE

HINT:

Advanced Timing Over (Valve timing is out of specified range)	P0011/59
Retarded Timing Over (Valve timing is out of specified range)	P0012/59

- If DTC P0011/59 or P0012/59 is present, check the VVT system circuit.
- Read freeze frame data using the intelligent tester II. Freeze frame data record the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, 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.

### When using intelligent tester II:

<b>1</b>	<b>CHECK VALVE TIMING (See page 14-41)</b>
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- (a) Check for looseness or a jumped tooth of the timing chain.

**OK: The matchmarks of the crankshaft pulley and camshaft pulley are aligning.**

**NG**

**ADJUST VALVE TIMING (See page 14-41)**

**OK**

**2 PERFORM ACTIVE TEST USING INTELLIGENT TESTER II (OPERATE OCV)**

- (a) Start the engine and warm it up.
- (b) Turn the ignition switch to OFF.
- (c) Connect the intelligent tester II to the DLC3.
- (d) Turn the ignition switch to ON and turn the intelligent tester II ON.
- (e) Select the following menu items: Powertrain / Engine and ECT / Active Test / VVT Control (Bank 1).
- (f) Check the engine speed when operating the OCV using the intelligent tester II.

**Standard:**

Tester Operation	Specified Condition
OCV is OFF	Normal engine speed
OCV is ON	Rough idle or engine stall

**NG****Go to step 4****OK****3 CHECK IF DTC OUTPUT RECURS (DTC P0011/59 OR P0012/59)**

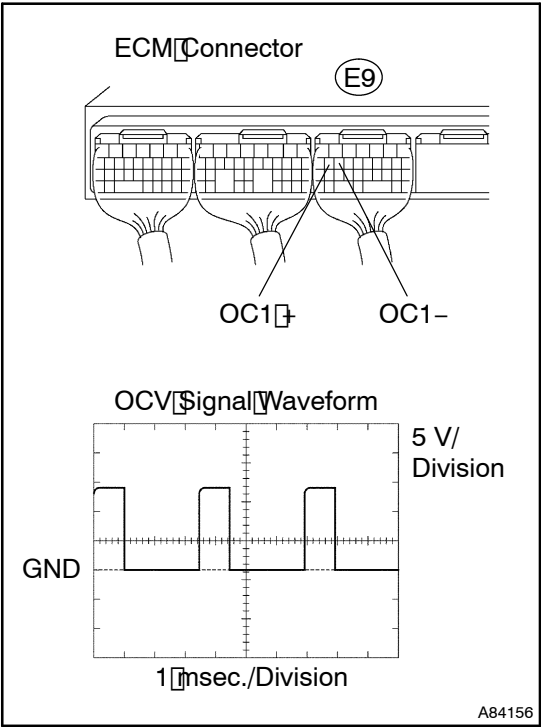
- (a) Clear the DTC(s) using the intelligent tester II (see page 05-268).
- (b) Start the engine and warm it up.
- (c) Drive the vehicle for 10 minutes or more.
- (d) Read output DTCs using the intelligent tester II.

**OK: No DTC output.****OK****VVT SYSTEM OK****HINT:**

DTC P0011/59 or P0012/59 is output when foreign objects in engine oil are caught in some parts of the system. These DTCs will stay registered even when the system returns to normal after a short time. These foreign objects are then captured by the oil filter, thus the source of the problem is eliminated.

**NG**

4 INSPECT ECM(OCV SIGNAL)



- (a) Inspect using the oscilloscope.  
(b) During idling, check the waveform between the specified terminals of the E9 ECM connector.

**Standard:**

Tester Connection	Specified Condition
OC1+ (E9-15) - OC1- (E9-15)	Correct waveform is as shown

NG

REPLACE ECM (See page 10-30)

OK

5 INSPECT OIL CONTROL VALVE FILTER

OK: The filter is not clogged.

NG

REPLACE OIL CONTROL VALVE FILTER

OK

6 INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(OCV)  
(See page 10-3)

OK: The OCV has no contamination and moves smoothly.

OK

Go to step 8

NG

7 REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY(OCV)

GO

**8 INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14-55)**

OK: The camshaft timing gear rotates smoothly when applying pressure.

OK

Go to step 10

NG

**9 REPLACE CAMSHAFT TIMING GEAR ASSY**

GO

**10 CHECK FOR BLOCKAGE (OCV, OIL CHECK VALVE AND OIL HOLE)**

OK: No blockage.

NG

REPAIR OR REPLACE

OK

**11 CHECK IF DTC OUTPUT RECURS (DTC P0011/59 OR P0012/59)**

(a) Clear the DTC(s) using the intelligent tester (see page 05-268).

(b) Start the engine and warm it up.

(c) Drive the vehicle for 10 minutes or more.

(d) Read output DTCs using the intelligent tester.

Standard: No DTC output.

OK

VVT SYSTEM OK

## HINT:

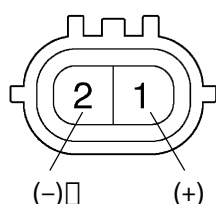
DTC P0011/59 or P0012/59 is output when foreign objects in engine oil are caught in some parts of the system. These DTCs will stay registered even when the system returns to normal after a short time. These foreign objects are then captured by the oil filter, thus the source of the problem is eliminated.

NG

**REPLACE ECM (See page 10-30)**

**When not using intelligent tester:****1 CHECK VALVE TIMING (See page 14-41)**

- (a) Check for looseness or a jumped tooth of the timing chain.

**OK:** The matchmarks of the crankshaft pulley and camshaft pulley are aligning.**NG****ADJUST VALVE TIMING (See page 14-41)****OK****2 INSPECT ECM (OPERATION OF OCV)****Component Side:**

Camshaft Timing Oil Control Valve

A76968

- (a) Start the engine.  
 (b) Check the engine speed at (1) and (2).  
 (1) Disconnect the C2 OCV connector.  
 (2) Apply the positive battery voltage between the terminals of the OCV.

**Result:**

Proceed To	Check (1)	Check (2)
A	Normal engine speed	Rough idle or engine stall
B	Condition other than A	

- (3) Reconnect the OCV connector.

**B****Go to step 4****A****3 CHECK IF DTC OUTPUT RECURS (DTC P0011/59 OR P0012/59)**

- (a) Clear the DTC(s).  
 (1) Disconnect the battery terminal or remove the EFI and ETCS fuses for more than 60 seconds.  
 (b) Start the engine and warm it up.  
 (c) Drive the vehicle for 10 minutes or more.  
 (d) Read output DTCs.

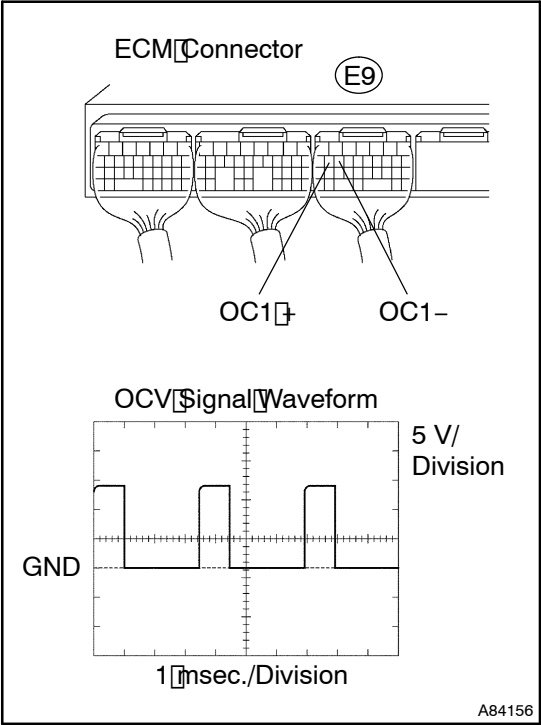
**Standard: No DTC output.****OK****VVT SYSTEM OK****HINT:**

DTC P0011/59 or P0012/59 is output when foreign objects in engine oil are caught in some parts of the system. These DTCs will stay registered even when the system returns to normal after a short time. These foreign objects are then captured by the oil filter, thus the source of the problem is eliminated.

**NG**

4

INSPECT ECM(OCV SIGNAL)



- (a) Inspect using the oscilloscope.
- (b) During idling, check the waveform between the specified terminals of the E9 ECM connector.
- Standard:**

Tester Connection	Specified Condition
OC1+(E9-15) - OC1-(E9-15)	Correct waveform is as shown

NG

REPLACE ECM (See page 10-30)

OK

5

INSPECT OIL CONTROL VALVE FILTER

OK: The filter is not clogged.

NG

REPLACE OIL CONTROL VALVE FILTER

OK

6

INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(OCV)  
(See page 10-3)

OK: The OCV has no contamination and moves smoothly.

OK

Go to step 8

NG

7

REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY(OCV)

GO

**8 INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14-55)**

OK: The camshaft timing gear rotates smoothly when applying pressure.

OK

Go to step 10

NG

**9 REPLACE CAMSHAFT TIMING GEAR ASSY**

GO

**10 CHECK FOR BLOCKAGE (OCV, OIL CHECK VALVE AND OIL HOLE)**

OK: No blockage.

NG

REPAIR OR REPLACE

OK

**11 CHECK IF DTC OUTPUT RECURS (DTC P0011/59 OR P0012/59)**

(a) Clear the DTC(s).

(1) Disconnect the battery cable or remove the EFI and ETCS fuses for more than 60 seconds.

(b) Start the engine and warm it up.

(c) Drive the vehicle for 10 minutes or more.

(d) Read output DTCs.

**Standard: No DTC output.**

OK

VVT SYSTEM OK

HINT:

DTC P0011/59 or P0012/59 is output when foreign objects in engine oil are caught in some parts of the system. These DTCs will stay registered even when the system returns to normal after a short time. These foreign objects are then captured by the oil filter, thus the source of the problem is eliminated.

NG

**REPLACE ECM (See page 10-30)**