DTC	P0011	CAMSHAFT POSITION "A" – TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE (BANK 1)

DTC	P0012	CAMSHAFT POSITION "A" – TIMING OVER-RETARDED (BANK 1)

CIRCUIT DESCRIPTION

Refer to DTC P0010 on page 05–45.

DTC No.	DTC Detection Condition	Trouble Area
P0011 P0012	After engine is warmed up, condition (a) or (b) continues at engine speed of 900 to 5,000 rpm: (a) Valve timing does not change from current valve timing (b) Current valve timing is fixed	• Valve timing • Oil control valve • Camshaft timing gear assembly • ECM

WIRING DIAGRAM

Refer to DTC P0010 on page 05–45.

INSPECTION PROCEDURE

HINT:

Advanced timing over standard level (Valve timing is out of specified range)	P0011
Retarded timing over standard level (Valve timing is out of specified range)	P0012

- If DTC P0011 or P0012 is present, check the VVT system circuit.
- Read freeze frame data using the intelligent tester II. Freeze frame data records the engine condition 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 VALVE TIMING (CHECK FOR LOOSE AND A JUMPED TOOTH OF TIMING CHAIN) (See page 14–6)

OK: The match marks of crankshaft pulley and camshaft pulley are aligning.

NG → ADJUST VALVE TIMING (See page 14–6)

OK

2	PERFORM ACTIVE TEST BY INTELLIGENT TESTER II (OPERATE OCV)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) Put the engine in inspection mode (see page 05–1).
(e) Start the engine and warm it up.
(f) Select the item: Powertrain / Engine and ECT / Active Test / Activate the VVT System (Bank 1).
(g) Using the intelligent tester II, operate the OCV and check the engine speed.

Standard:

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

NOTICE:
Do not drive the vehicle without deactivating inspection mode, otherwise damaging the transaxle may result.

NG → **Go to step 4**

OK

3	CHECK IF DTC OUTPUT RECURS

(a) Clear the DTCs (see page 05–25).
(b) Start the HV system and warm the engine up.
(c) Drive the vehicle with the shift position B at vehicle speed of more than 44 mph (70 km/h) approximately for 10 minutes or more.
(d) Read output DTC using the intelligent tester II.

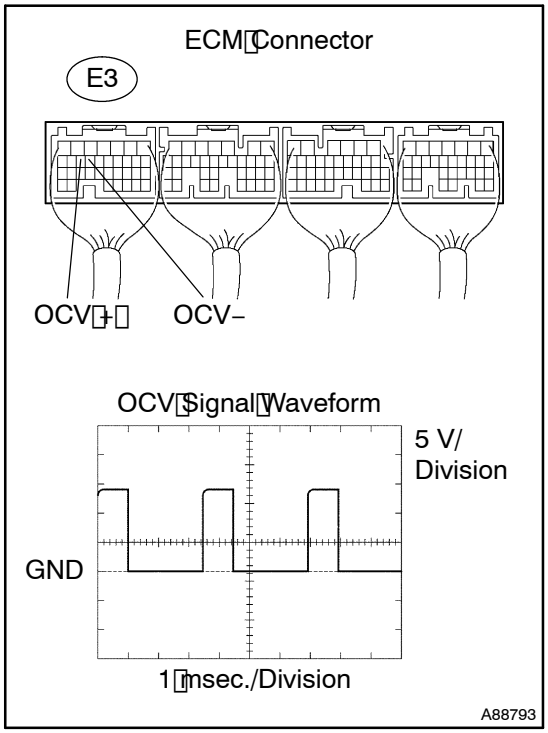
OK: No DTC output.

HINT:
*: DTC P0011 or P0012 is output when a foreign object in engine oil is caught in some part of the system. These codes will stay registered even if the system returns to normal after a short time. Foreign objects are filtered out by the oil filter.

OK → **VVT SYSTEM OK***

NG

4	INSPECT ECM(OCV SIGNAL)



(a) During idling, check the waveform between the specified terminals of the E3 ECM connector using an oscilloscope.

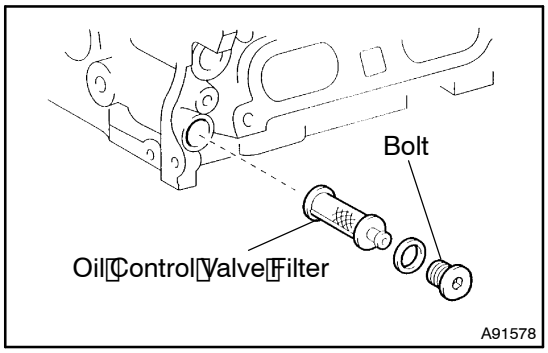
Standard:

Tester Connection	Specified Condition
OCV+ (E3–15) – OCV– (E3–14)	Correct waveform is as shown

NG → REPLACE ECM (See page 10–24)

OK

5	INSPECT OIL CONTROL VALVE FILTER (See page 14–128)



(a) Remove the air cleaner inlet bolt and oil control valve filter.
(b) Check for blockages in the oil control valve filter.
(c) Reinstall the filter, bolt and air cleaner inlet.

NOTICE:
If necessary, clean the filter.

OK: The filter has not clogged.

NG → REPLACE OIL CONTROL VALVE FILTER (See page 14–128)

OK

6	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(OCV) (See page 10–5)

OK: 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 14–98)

OK: Go to step 10

NG

9	REPLACE CAMSHAFT TIMING GEAR ASSY

GO

10	CHECK CHECK IF DTC OUTPUT RECURS

(a) Erase the DTCs by using the intelligent tester II (see page 05–25).
(b) Start the HV system, and warm the engine up.
(c) Drive the vehicle with the shift position in B at the vehicle speed of more than 70 km/h (44 mph) approximately for 10 minutes or more.
(d) Read output DTC using the intelligent tester II.
OK: No DTC output.

HINT:
*: DTC P0011 or P0012 is output when a foreign object in engine oil is caught in some part of the system. These codes will stay registered even if the system returns to normal after a short time. Foreign objects are filtered out by the oil filter.

OK: VVT SYSTEM OK*

NG

REPLACE ECM (See page 10–24)