DTC P0016 Crankshaft Position - Camshaft Position Correlation (Bank 1 Sensor A)

DESCRIPTION

MONITOR DESCRIPTION

WIRING DIAGRAM

INSPECTION PROCEDURE

CHECK VALVE TIMING (CHECK FOR LOOSE AND A JUMPED TOOTH OF TIMING CHAIN)

REPLACE ECM

ADJUST VALVE TIMING (REPAIR OR REPLACE TIMING CHAIN)

CHECK WHETHER DTC OUTPUT RECURS

DTC P0016 Crankshaft Position - Camshaft Position Correlation (Bank 1 Sensor A)
DTC P0017 Crankshaft Position - Camshaft Position Correlation (Bank 1 Sensor B)
DTC P0018 Crankshaft Position - Camshaft Position Correlation (Bank 2 Sensor A)
DTC P0019 Crankshaft Position - Camshaft Position Correlation (Bank 2 Sensor B)

for Preparation Click here

DESCRIPTION

In the VVT system, the appropriate intake and exhaust valve open and close timing is controlled by the ECM. The ECM performs intake and exhaust valve control by performing the following: 1) controlling the camshaft and camshaft oil control valve, and operating the camshaft timing gear; and 2) changing the relative positions of the gaps between the camshaft and crankshaft.

DTC No.	DTC Detection Condition	Trouble Area
P0016	Deviation in crankshaft position sensor signal and VVT sensor 1 (for intake camshaft [bank 1]) signal (2 trip detection logic)	• Mechanical system (timing chain has jumped tooth or chain stretched) • ECM
P0017	Deviation in crankshaft position sensor signal and VVT sensor 1 (for exhaust camshaft [bank 1]) signal (2 trip detection logic)	• Mechanical system (timing chain has jumped tooth or chain stretched) • ECM
P0018	Deviation in crankshaft position sensor signal and VVT sensor 2 (for intake camshaft [bank 2]) signal (2 trip detection logic)	• Mechanical system (timing chain has jumped tooth or chain stretched) • ECM
P0019	Deviation in crankshaft position sensor signal and VVT sensor 2 (for exhaust camshaft [bank 2]) signal (2 trip detection logic)	• Mechanical system (timing chain has jumped tooth or chain stretched) • ECM

MONITOR DESCRIPTION

To monitor the correlation of the intake camshaft position and crankshaft position, the ECM checks the VVT learning value while the engine is idling. The VVT learning value is calibrated based on the camshaft position and crankshaft position. The intake valve timing is set to the most retarded angle while the engine is idling. If the VVT learning value is out of the specified range in consecutive driving cycles, the ECM illuminates the MIL and sets the DTC P0016 (Bank 1) or P0018 (Bank 2).
To monitor the correlation of the exhaust camshaft position and crankshaft position, the ECM checks the VVT learning value while the engine is idling. The VVT learning value is calibrated based on the camshaft position and crankshaft position. The exhaust valve timing is set to the most advanced angle while the engine is idling. If the VVT learning value is out of the specified range in consecutive driving cycles, the ECM illuminates the MIL and sets the DTC P0017 (Bank 1) or P0019 (Bank 2).

WIRING DIAGRAM

Refer to DTC P0335 (Click here).

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the intelligent tester. The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air-fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction (Click here).

1.CHECK VALVE TIMING (CHECK FOR LOOSE AND A JUMPED TOOTH OF TIMING CHAIN)

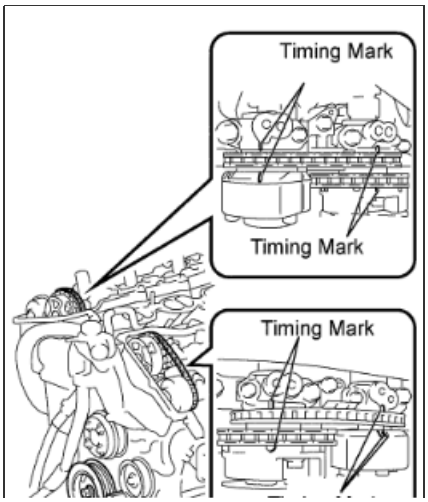
a. Remove the cylinder head cover RH and LH.

b. Turn the crankshaft pulley, and align its groove with the timing mark "0" of the timing chain cover.

c. Check that the timing marks of the camshaft timing gears are aligned with the timing marks of the bearing cap as shown in the illustration.
If not, turn the crankshaft 1 revolution (360°), then align the marks as above.

OK:
Timing marks on camshaft timing gears are aligned as shown in the illustration.

d. Reinstall the cylinder head cover.



NG → Go to step 3

OK

2.REPLACE ECM

NEXT → Go to step 4

3.ADJUST VALVE TIMING (REPAIR OR REPLACE TIMING CHAIN)

NEXT

4.CHECK WHETHER DTC OUTPUT RECURS

NOTICE:

After replacing the ECM or adjusting valve timing, confirm that the DTC output does not recur.

a. Put the engine in inspection mode (Click here).

b. Connect the intelligent tester to the DLC3.

c. Turn the tester ON.

d. Clear DTCs (Click here).

e. Switch the ECM from normal mode to check mode using the tester (Click here).

f. Warm up the engine.

g. Allow the engine to idle for 1 minute or more, and then drive the vehicle for 1 minute or more.

h. Confirm that no DTC is set, using the tester.

OK:
No DTC output

NEXT

END