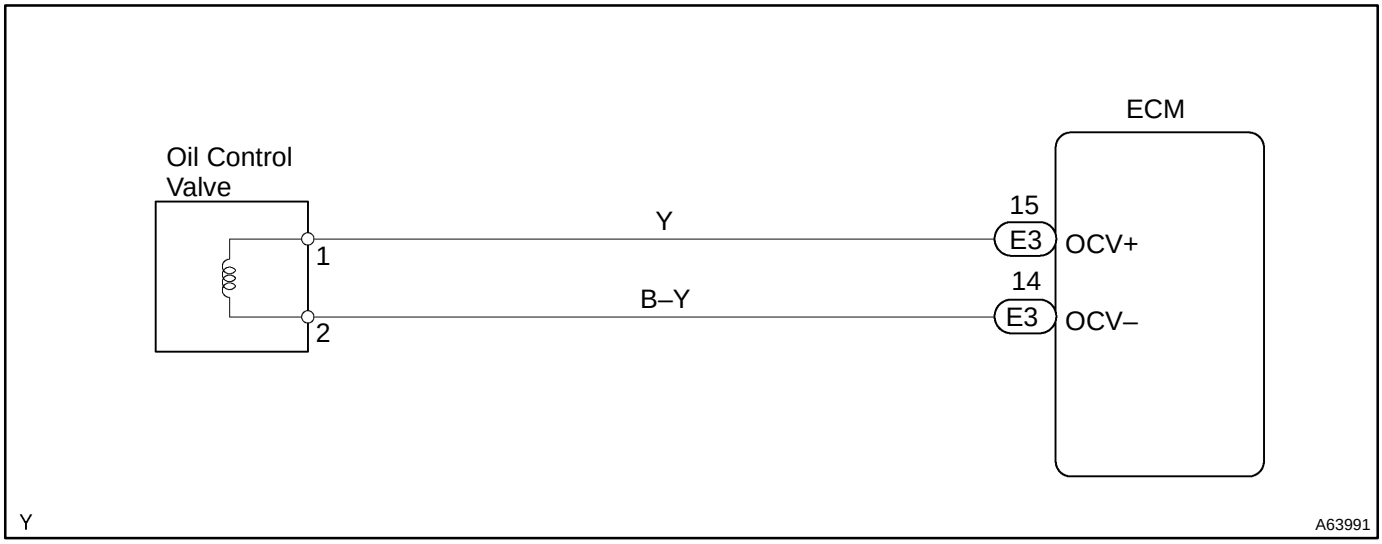
DTC P1349 VVT SYSTEM MALFUNCTION (BANK 1)

CIRCUIT DESCRIPTION

VVT system controls the intake valve timing to proper timing in response to driving condition.
ECM controls OCV (Oil Control Valve) to make the intake valve timing properly, and, oil pressure controlled with OCV is supplied to the VVT controller, and then, VVT controller changes relative position between the camshaft and the crankshaft.

DTC No.	DTC Detecting Condition	Trouble Area
1349	Condition (a) or (b) continues for after the engine is warmed up and engine speed at 400 – 4,000 rpm: (a) Valve timing does not change from of current valve timing (b) Current valve timing is fixed	• Valve timing • Oil control valve • VVT controller assembly • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P1349 is displayed, check VVT system circuit.
- Read freeze frame data using the hand–held tester or OBD II scan tool, as freeze frame data records the engine conditions when the malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.

Hand–held tester:

1	CHECK VALVE TIMING (See page 14–262)

NG → ADJUST VALVE TIMING

OK

2 PERFORM ACTIVE TEST BY HAND–HELD TESTER(OPERATION OF OCV)

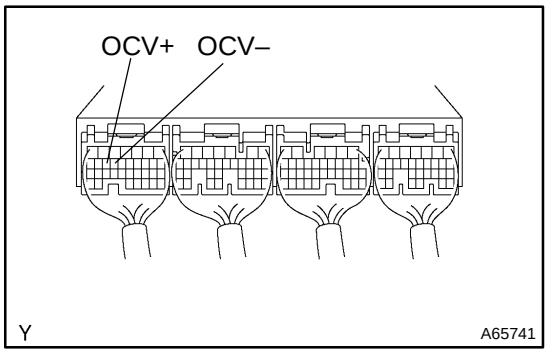
(a) Start the engine and warm it up.
(b) Connect the hand–held tester and select VVT on the ACTIVE TEST menu.
(c) Check the engine speed when operating the OCV by the hand–held tester.
OCV is OFF: Normal engine speed
OCV is ON: Rough idle or engine stall

HINT:
*: DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

OK → **VVT SYSTEM OK**

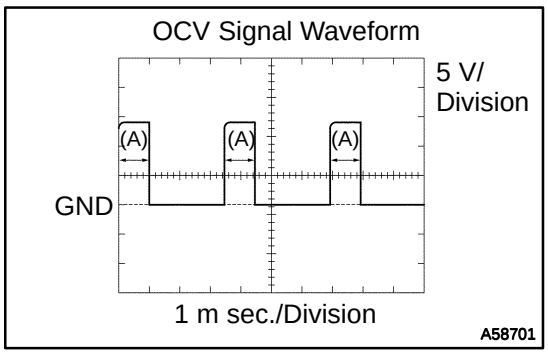
NG

3 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Check the waveform between terminals OCV+ and OCV– of the ECM connector.

HINT:
- The correct waveform is as shown in the left.
- The waveform frequency (A) becomes longer as the engine speed becomes higher.



NG → **CHECK AND REPLACE ECM**

OK

4 INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14–262)

NG → **REPLACE VVT CONTROLLER ASSEMBLY, AND THEN GO TO NEXT STEP**

OK

5	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10–12)

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY, AND THEN GO TO NEXT STEP

OK

6	CHECK BLOCKAGE(OCV AND OIL HOLE)

NG → REPAIR OR REPLACE

OK

7	PERFORM SIMULATION TEST(CHECK DTC)

(a) Clear the DTC (See page 05–157).
(b) Perform the simulation test.
(c) Check whether or not DTC P1349 is stored (See page 05–157).

Result:

	A	B
RESULT	P1349 is output.	P1349 is not output.

HINT:
DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

B → VVT SYSTEM OK

A

CHECK AND REPLACE ECM

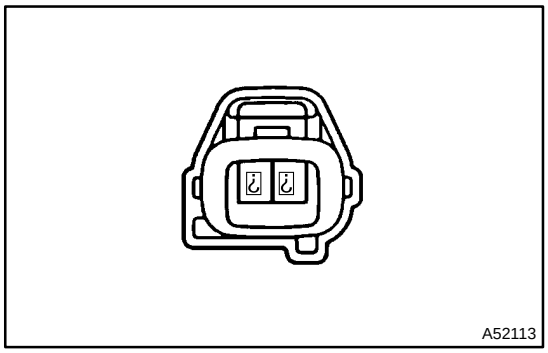
OBD II scan tool (excluding hand–held tester):

1	CHECK VALVE TIMING (See page 14–262)

NG → ADJUST VALVE TIMING

OK

2 CHECK OPERATION OF OCV



(a) Start the engine.
(b) Check the engine speed when disconnecting the OCV connector.
(c) Check the engine speed when applying battery positive voltage to the terminals of the OCV.

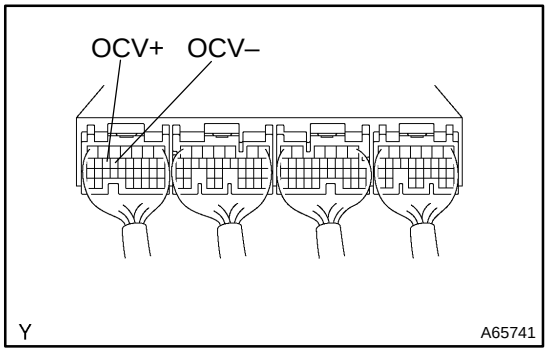
Result:

Result	Check (b)	Check (c)
A	Normal engine speed	Rough idle or engine stall
B	Except 1	

B → **Go to step 4**

A

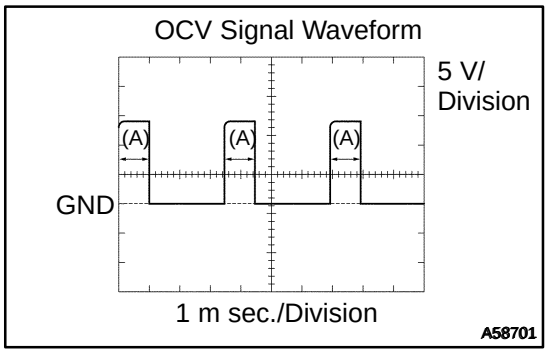
3 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Check the waveform between terminals OCV+ and OCV– of the ECM connector.

HINT:

- The correct waveform is as shown in the left.
- The waveform frequency (A) becomes longer as the engine speed becomes higher.
- DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.



OK → **VVT SYSTEM OK**

NG

CHECK AND REPLACE ECM

4 INSPECT CAMSHAFT TIMING GEAR ASSY (See page 14–262)

NG → **REPLACE VVT CONTROLLER ASSEMBLY, AND THEN GO TO NEXT STEP**

OK

5	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY (See page 10–12)

NG → REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSEMBLY, AND THEN GO TO NEXT STEP

OK

6	CHECK BLOCKAGE(OCV AND OIL HOLE)

NG → REPAIR OR REPLACE

OK

7	PERFORM SIMULATION TEST(DTC CHECK)

(a) Clear the DTC (See page 05–157).
(b) Perform the simulation test.
(c) Check whether or not DTC P1349 is stored (See page 05–157).

Result:

	A	B
RESULT	P1349 is output.	P1349 is not output.

HINT:
DTC P1349 is also output when a foreign object is detected in some parts of the system in the engine oil, and then the system returns to normal in a short time. As ECM is controlled to eject a foreign object, there is no problem on the VVT. There is also no problem on the VVT as the oil filter should catch the foreign object in the engine oil.

B → VVT SYSTEM OK

A

CHECK AND REPLACE ECM