

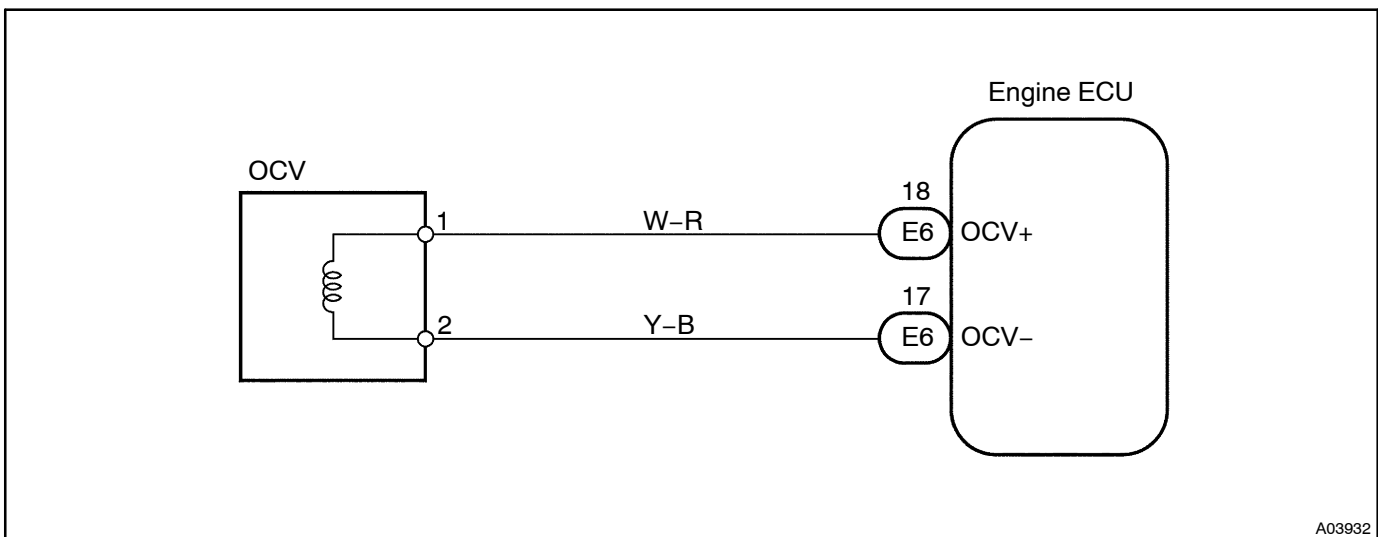
DTC	P1349/59	VVT System Malfunction (Bank 1)
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CIRCUIT DESCRIPTION

VVT system controls the intake valve timing to proper timing in response to driving condition. ECU 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
P1349/59	Condition (a) or (b) continues for after the engine is warmed up and engine speeded 400 - 4,000 rpm: (a) Valve timing does not change from of current valve timing (b) Current valve timing is fixed	<ul style="list-style-type: none"> • Valve timing • OCV • VVT controller assembly • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTC P1349/59 is displayed, check left bank VVT system circuit.
- Read freeze frame data using hand-held tester. Because freeze frame 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.

When using hand-held tester:

1	Perform confirmation test.
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PREPARATION:

Start the engine.

CHECK:

Check whether or not rough idle or engine stall is occurred.

OK:

Normal engine speed (rough idle or engine stall is not occurred.)

NG

Go to step 5.

OK

2 Check operation of OCV.**PREPARATION:**

- (a) Start the engine and warm it up.
- (b) Connect the hand-held tester and select the VVT from the ACTIVE TEST menu.

CHECK:

Check the engine speed when the VVT active test is enabled.

OK:

VVT active test is in the OFF state: Normal engine speed

VVT active test is in the ON state: Rough idle or engine stall

OK

VVT system is OK.*

*: DTC P1349 is also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As the engine ECU controls so that foreign objects are ejected, there is no problem about the VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

3 Check whether or not DTC P1349 is stored.**PREPARATION:**

- (a) Clear the DTC (See page DI-17).
- (b) Perform simulation test.

CHECK:

Check whether or not DTC P1349 is stored (See page DI-123).

OK:

DTC P1349 is not stored.

OK

VVT system is OK.*

*: DTC P1349 is also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As the engine ECU controls so that foreign objects are ejected, there is no problem about the VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

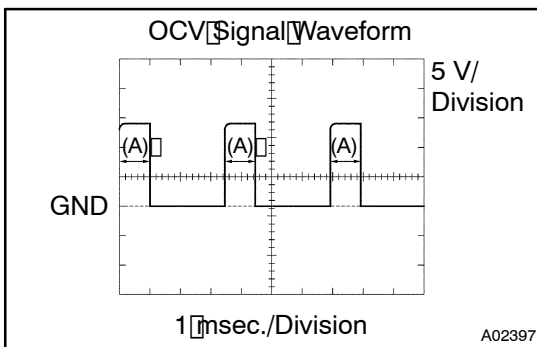
4 Check valve timing (See page EM-20).

NG

Repair valve timing.

OK

5 Check voltage between terminals OCV+ and OCV- of engine ECU connector.

**Reference: INSPECTION USING OSCILLOSCOPE**

Turn the ignition switch ON, and check the waveform between terminals OCV+ and OCV- of the engine ECU connector.

HINT:

- The correct waveform is as shown.
- The waveform frequency (A) is lengthened as the engine speed becomes higher.

NG

Check and replace engine ECU (See page IN-32).

OK

6 Check OCV (See page FI-42).

NG

Replace OCV, and then go to step 7.

OK

7 Check camshaft timing gear (VVT-i) (See page EM-44).

NG

Replace

OK

8	Check blockage of OCV, oil check valve and oil pipe No.1.
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NG

Repair or replace.

OK

9	Check whether or not DTC P1349 is stored.
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NG

Replace engine ECU.

OK

VVT system is OK.*

*: DTC P1349 is also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As the engine ECU controls so that foreign objects are ejected, there is no problem about the VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

When not using hand-held tester:

1	Perform confirmation test.
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PREPARATION:

Start the engine.

CHECK:

Check whether or not rough idle or engine stall is occurred.

OK:

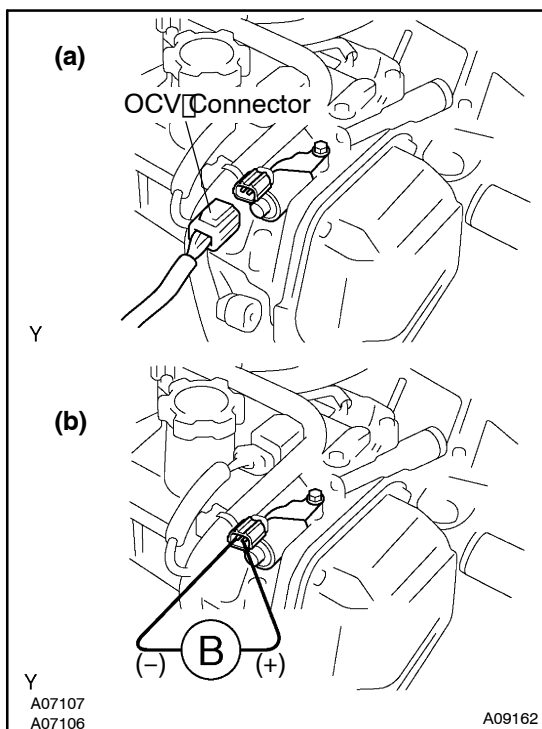
Normal engine speed (rough idle or engine stall is not occurred.)

NG

Go to step 5.

OK

2	Check operation of OCV.
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**PREPARATION:**

Start the engine.

CHECK:

- (a) Check the engine speed when disconnecting the OCVC connector.
- (b) Check the engine speed when apply battery voltage between the terminals of the OCVC.

RESULT:

Result	Check (a)	Check (b)
1	Normal engine speed	Rough idle or engine stall
2	Except	

2

Go to step 6.

1

3 Check whether or not DTC 59 is stored.

PREPARATION:

- (a) Clear the DTC (See page DI-17).
- (b) Perform simulation test.

CHECK:

Check whether or not DTC 59 is stored (See page DI-123).

OK:

DTC 59 is not stored.

OK

VVT system is OK.*

*: DTC 59 is also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As the ECV controls so that foreign objects are ejected, there is no problem about the VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

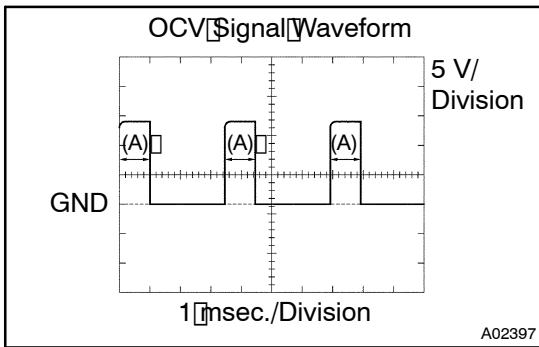
4 Check valve timing (See page EM-20).

NG

Repair valve timing.

NG

5 Check voltage between terminals OCV+ and OCV- of engine ECU connector.

**Reference: INSPECTION USING OSCILLOSCOPE**

Turn the ignition switch ON, and check the waveform between terminals OCV+ and OCV- of the engine ECU connector.

HINT:

- The correct waveform is as shown.
- The waveform frequency (A) is lengthened as the engine speed becomes higher.

NG

Check and replace engine ECU (See page IN-32).

OK

6 Check OCV (See page FI-42).

NG

Replace OCV, and then go to step 7.

OK

7 Check for open and short in harness and connector in OCV circuit.

NG

Repair or replace.

OK

8 Check camshaft timing gear (VVT-i) (See page EM-44).

NG

Replace.

OK**9 Check blockage of OCV, oil check valve and oil pipe No.1.****NG****Repair or replace.****OK****10 Check whether or not DTC 59 is stored.****NG****Replace engine ECU.****OK****VVT system is OK.***

*: DTC 59 is also output after the foreign object is caught in some part of the system in the engine oil and the system returns to normal in a short time. As the engine ECU controls so that foreign objects are ejected, there is no problem about the VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.