DI9ZY–01

DTC	P1349/59	VVT System Malfunction

CIRCUIT DESCRIPTION

Refer to VVT Sensor/Camshaft Position Sensor Circuit Range/Performance Problem on page DI–110.

DTC No.	DTC Detecting Condition	Trouble Area
P1349/59	Conditions (a) or (b) continues for after engine is warmed up and engine speed at 500 – 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 • Engine ECU

WIRING DIAGRAM
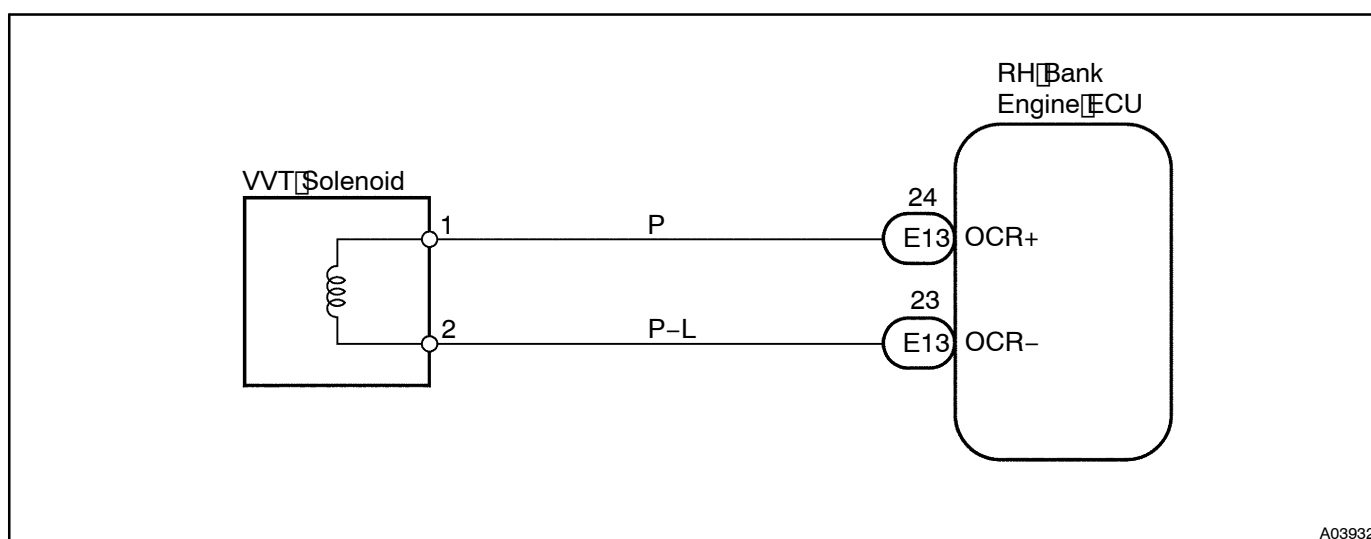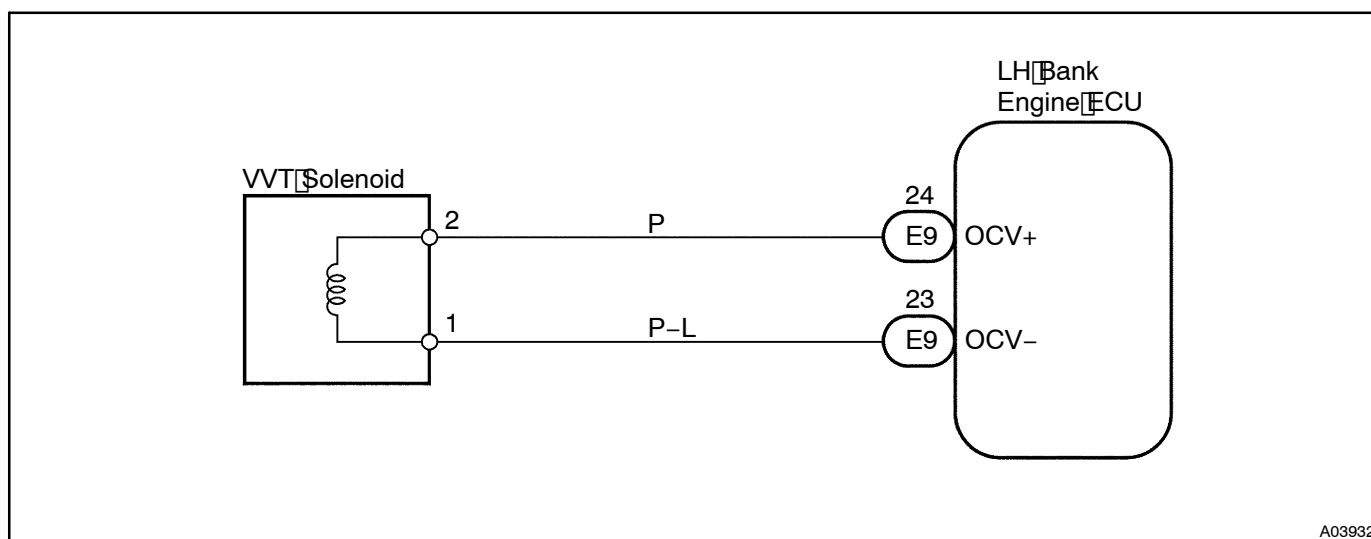
INSPECTION PROCEDURE

HINT:
- LH and RH bank engine ECU detect this DTC code respectively. The inspection procedures are same for both LH and RH bank engine ECU and described in this manual. Even though terminal name and part name on the side of RH bank are described in parenthesis, perform the inspection for only ECU that has detected DTC.
- 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 warmed up or not, the air−fuel ratio lean or rich, etc. at the time of the malfunction.

When using hand−held tester

| 1 | Check valve timing (See Pub No. RM677E, page EM−14). |

NG ⟩ **Repair valve timing.**

OK

| 2 | Check operation of OCV. |

PREPARATION:
(a) Start the engine and warmed it up.
(b) Connect the hand−held tester and select VVT from ACTIVE TEST menu.
CHECK:
Check the engine speed when operate the OCV by the hand−held tester.
OK:

OCV is OFF:
Normal engine speed
**OCV is ON:**
Rough idle or engine stall

OK ⟩ **VVT system is OK.***

*: DTC P1349/59 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 engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

3	Check voltage between terminals OCV+ and OCV– of engine ECU connector.
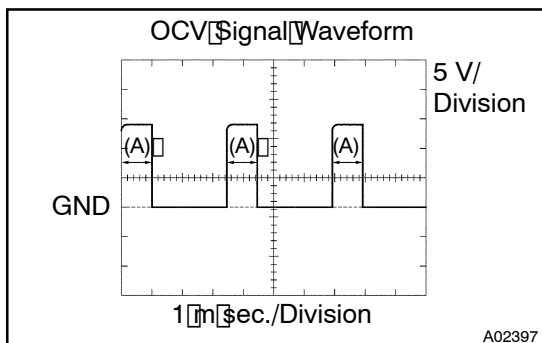
OCV Signal Waveform

5 V/Division

(A) (A) (A)

GND

1 m sec./Division

A02397

Reference: INSPECTION USING OSCILLOSCOPE
Turn the ignition switch to ON, check waveform between terminals OCV+ and OCV– of the engine ECU connector.
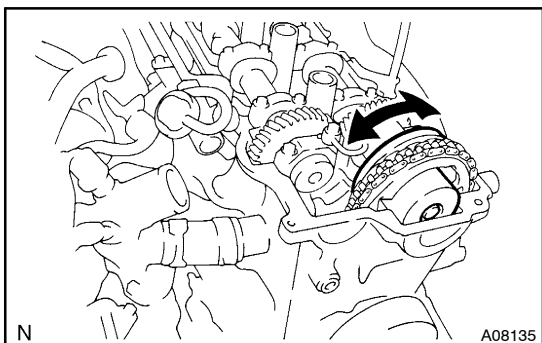HINT:
- The correct waveform is as shown.
- The waveform frequency (A) is lengthened as the engine speed becomes higher.

NG	Check and replace engine ECU (**See page IN–20**).

OK

4	Check VVT controller assembly.

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PREPARATION:
(a) Remove the cylinder head cover.
(b) Remove the timing chain (See Pub No. RM677E, page EM–14).
(c) Remove the oil control valve.
(d) Drain oil into the VVT controller assembly (See Pub No. RM677E, page EM–14).
CHECK:
Check whether the oil into VVT controller assembly is drained or not.
OK:
    The oil into VVT controller assembly is drained.

NG	Replace VVT controller assembly, and then go to step 5.

OK

5	Check oil control valve (See Pub No. RM677E, page EM–41).

NG	Replace oil control valve, and then go to step 6.

OK

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| 6 | Check blockage of oil control valve, oil check valve and oil pipe No.1. |

NG > Repair or replace.

OK

| 7 | Check whether or not DTC P1349/59 is stored. |

PREPARATION:
(a)   Clear the DTC (See page DI−4).
(b)   Perform simulation test.
CHECK:
Check whether or not DTC P1349/59 is stored (See page DI−4).
OK:
   DTC P1349/59 is not stored

OK > VVT system is OK.*

*: DTC P1349/59 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 engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.
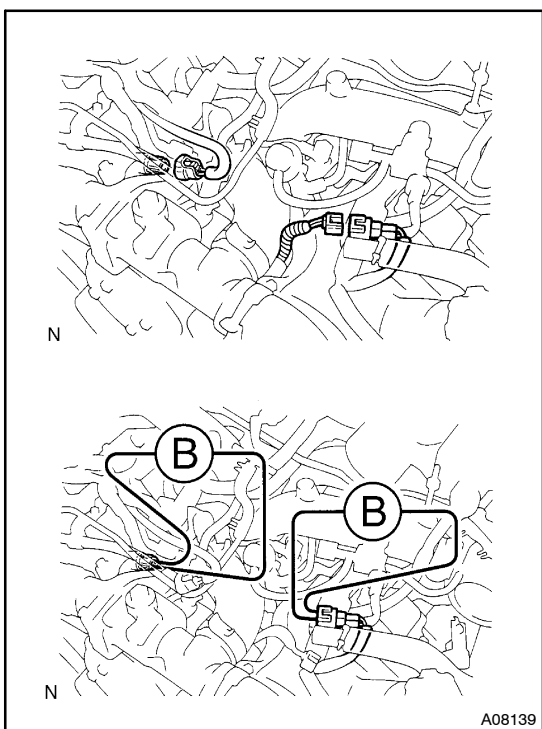
NG

Check and replace engine ECU (See page IN−20).

When not using hand–held tester

1	Check valve timing (See Pub No. RM677E, page EM–14).

> **NG** ⟩ Repair valve timing.

OK

2	Check operation of OCV.

PREPARATION:
Start the engine.
CHECK:
(a)   Check the engine speed when disconnect the OCV connector.
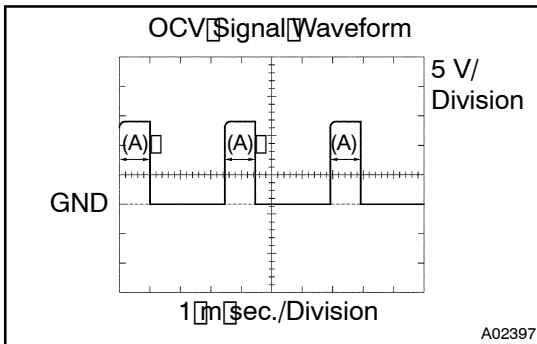(b)   Check the engine speed when apply battery voltage to the OCV connector.
RESULT:

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

> **2** ⟩ Go to step 4.

1

3	**Check voltage between terminals OCV+ and OCV– of engine ECU connector.**

OCV Signal Waveform

5 V/Division

(A)   (A)   (A)

GND

1 m sec./Division

A02397

Reference: INSPECTION USING OSCILLOSCOPE

Turn the ignition switch to ON, check 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.

OK	VVT system is OK.*

*: DTC P1349/59 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 engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG

Check and replace engine ECU (See page IN–20).

4	**Check VVT controller assembly.**
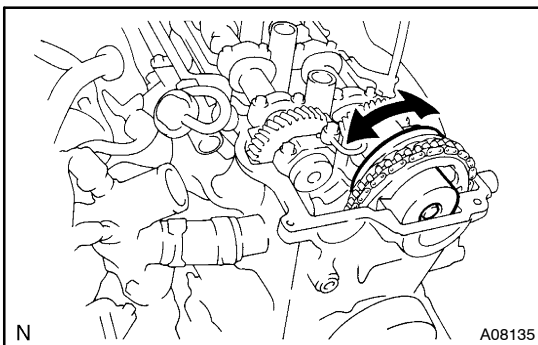
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PREPARATION:
(a) Remove the cylinder head cover.
(b) Remove the timing chain (See Pub No. RM677E, page EM–14).
(c) Remove the oil control valve.
(d) Drain oil into the VVT controller assembly (See Pub No. RM677E, page EM–14).

CHECK:
Check whether the oil into VVT controller assembly is drained or not.

OK:
The oil into VVT controller assembly is drained.

NG	Replace VVT controller assembly, and then go to step 5.

OK

5	Check oil control valve (See Pub No. RM677E, page FI–35).

NG > **Replace oil control valve, and then go to step 6.**

OK ▽

6	Check blockage of oil control valve, oil check valve and oil pipe No.1.

NG > **Repair or replace.**

OK ▽

7	Check whether or not DTC P1349/59 is stored.

PREPARATION:
(a) Clear the DTC (See page DI–4).
(b) Perform simulation test.
CHECK:
Check whether or not DTC P1349/59 is stored (See page DI–4).
OK:
   DTC P1349/59 is not stored

OK > **VVT system is OK.***

*: DTC P1349/59 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 engine ECU controls so that foreign objects are ejected, there is no problem about VVT. There is also no problem since the oil filter should get the foreign object in the engine oil.

NG ▽

Check and replace engine ECU (See page IN–20).