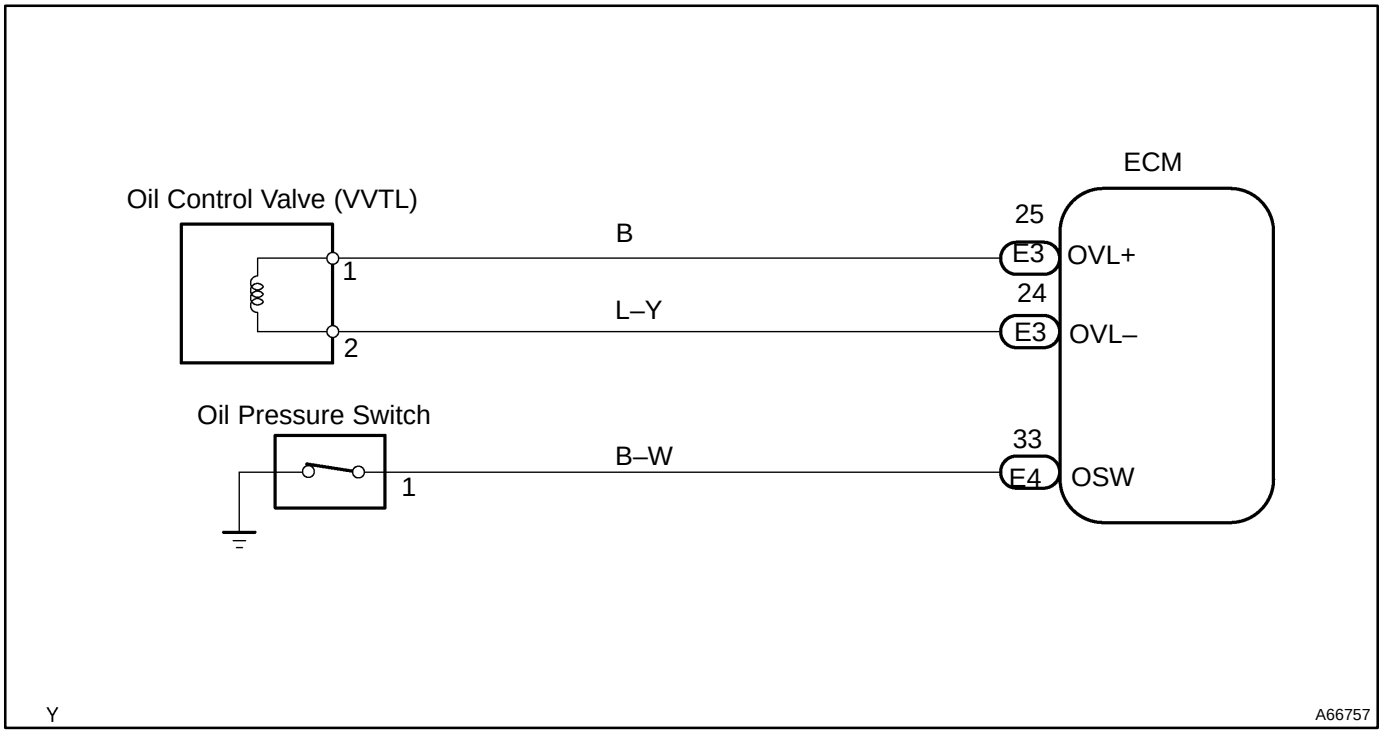
DTC	P1690	OCV FOR VVTL CIRCUIT MULFUNCTION

CIRCUIT DESCRIPTION

When the engine speed reaches 6,200 rpm, the VVTL system switches the locker arm from low speed to high speed. The ECM control the OCV to apply hydraulic pressure to the piston in the locker arm and switch the locker arm by locking the slipper for high speed.

DTC No.	DTC Detecting Condition	Trouble Area
P1690	Open or short in oil control valve (for VVTL) circuit	• Open or short in oil control valve (for VVTL) circuit • Oil control valve (for VVTL) • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

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:

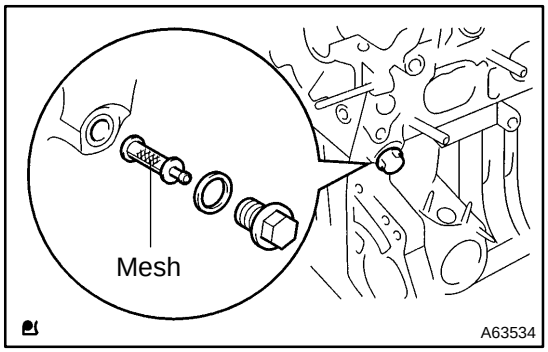
1	PERFORM ACTIVE TEST BY CAMSHAFT TIMING OIL CONTROL VALVE ASSY(for VVTL)

(a) Start the engine and warmed it up.
(b) Connect the hand–held tester and select VVTL from ACTIVE TEST menu.
(c) Maintain engine speed at 1,500 – 2,500 rpm.
(d) Check the engine speed when operate the OCV for VVTL by the hand–held tester.
Result:
VVTL system is OFF (OCV is OFF): Normal engine speed
VVTL system is ON (OCV is ON): Rough engine speed or engine stalled

OK → **CHECK FOR INTERMITTENT PROBLEMS**

NG

2	CHECK OIL CONTROL VALVE FILTER



(a) Remove the generator. (See page 19–15)
(b) Remove the oil control valve filter.
(c) Check the oil control valve filter.
(1) Confirm that the filter is clear.
(d) Place a new gasket on the bolt and install the filter.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

NG → **REPLACE OIL CONTROL VALVE FILTER**

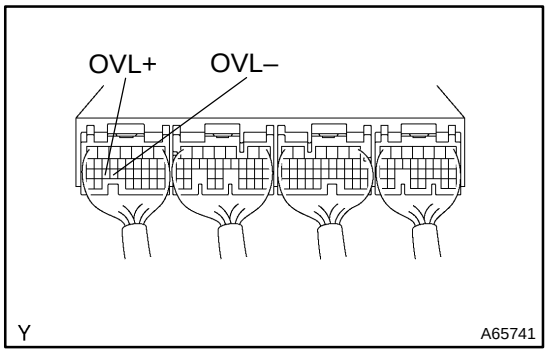
OK

3	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(for VVTL) (See page 10–12)

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY**

OK

4	CHECK ECM(OVL+ – OVL–)

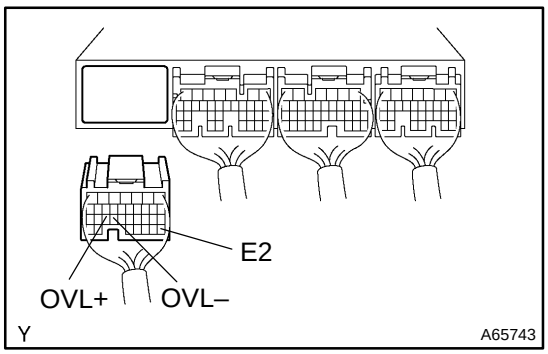


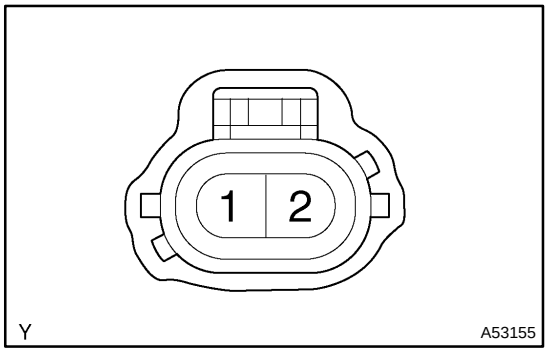
(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals OVL+ and OVL– of the ECM connector.
Voltage: 9 – 14 V

NG → **CHECK AND REPLACE ECM**

OK

5	CHECK HARNESS AND CONNECTOR(ECM – OCV for VVTL)





(a) Disconnect the ECM E3 connector.
(b) Disconnect the camshaft timing control valve connector.
(c) Check continuity between the terminals OVL+ of the ECM connector and 1 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals OVL+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OVL– of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OVL– of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS

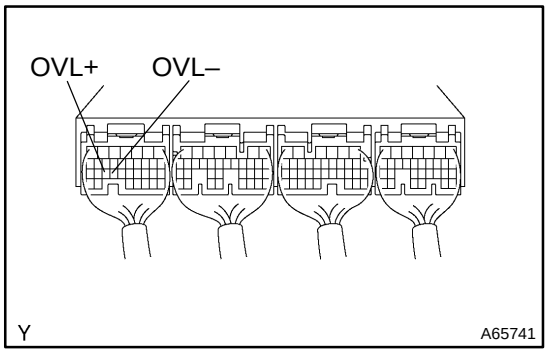
OBD II scan tool (excluding hand–held tester) :

1	INSPECT CAMSHAFT TIMING OIL CONTROL VALVE ASSY(for VVTL) (See 10–12page)

NG → **REPLACE CAMSHAFT TIMING OIL CONTROL VALVE ASSY**

OK

2 CHECK ECM(OVL+ – OVL–)

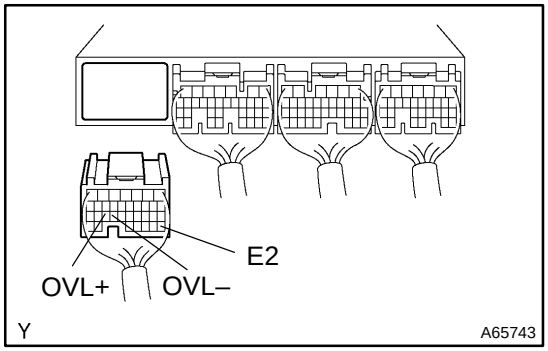


(a) Turn the ignition switch ON.
(b) Measure voltage between the terminals OVL+ and OVL– of the ECM connector.
Voltage: 9 – 14 V

NG → **CHECK AND REPLACE ECM**

OK

3 CHECK HARNESS AND CONNECTOR(ECM – OCV for VVTL)



(a) Disconnect the ECM E3 connector.
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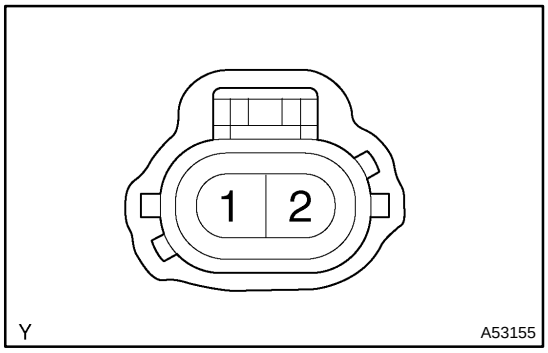
Resistance: 1 Ω or less
(d) Check for short between the terminals OVL+ of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more
(e) Check continuity between the terminals OVL– of the ECM connector and 2 of the camshaft timing control valve connector.
Resistance: 1 Ω or less
(f) Check for short between the terminals OVL– of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

CHECK FOR INTERMITTENT PROBLEMS