DI9TJ–01

DTC	33 (1)	Exhaust Gas Control System Malfunction

DTC	33 (2)	Exhaust Gas Control System Malfunction

CIRCUIT DESCRIPTION

DTC 33 (1):

The engine ECU fully closes the exhaust control valve via the VSV when the warm up switch is ON. This makes it possible to increase the engine load and then maintain the high temperature of the exhaust gas. As a result, the engine water temperature increases.

Outer temperature, water temperature, the number of engine revolution and injection volume while the engine is running, are the conditions to fully close the valve. The valve, however, will once fully close then fully open, regardless of any conditions whenever the ignition switch is turned OFF and the vehicle's speed is 0 km/h.

If the valve becomes unable to operate, owing to a foreign object being stuck or other factors, while the valve is fully closed, the engine ECU will output DTC 33 (1) by detecting a signal from the turbo pressure. At this time, the engine check lamp starts blinking.

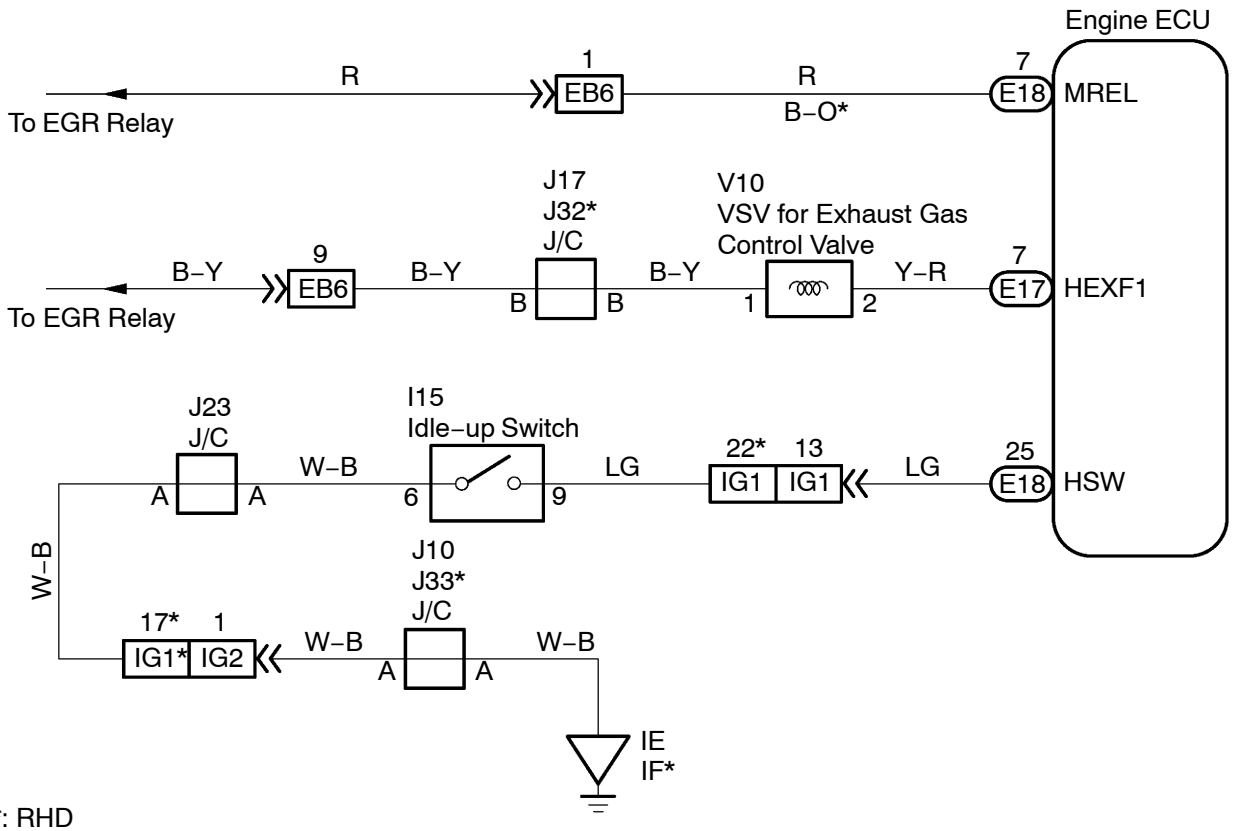
DTC 33 (2):

When the warm up switch is ON, the exhaust gas pressure is too high because a foreign object is stuck or for other reasons, the engine ECU detects forces the exhaust control valve to fully open. At this time, DTC 33 (2) is output but the engine check lamp does not blink.

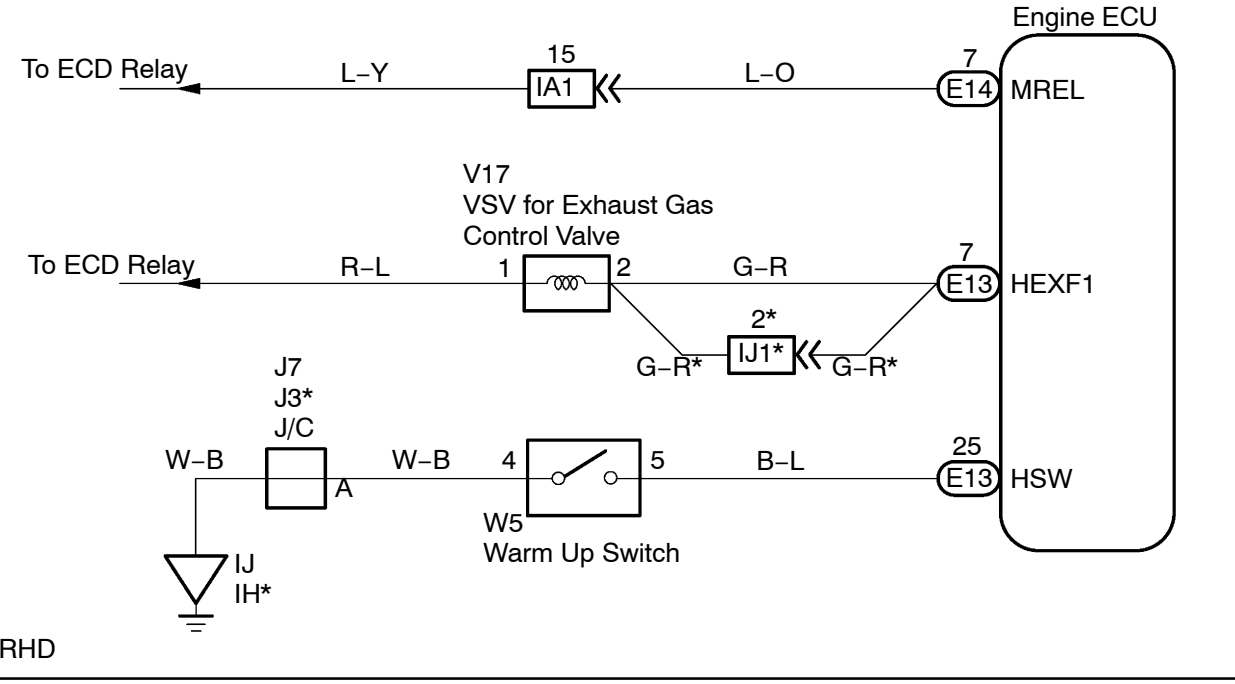
DTC No	DTC Detection Condition	Trouble Area
33(1)	Exhaust control valve fully closed does not operate	• Exhaust gas control valve • Open or short in VSV for exhaust control valve • Turbo pressure • Turbocharger • EGR valve • Engine ECU
33(2)	Exhaust control valve does not fully close (Clearance is clogged)	• Exhaust gas control valve • Air flow meter • EGR valve • Engine ECU

WIRING DIAGRAM

KLH



KDN

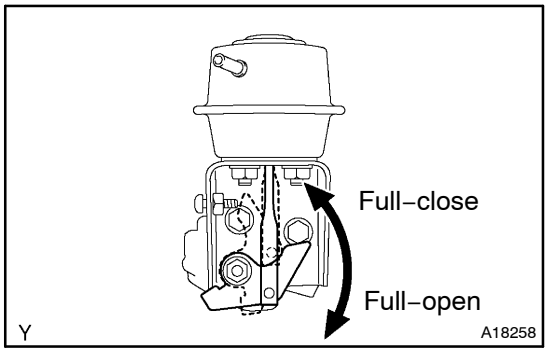


INSPECTION PROCEDURE

HINT:
Read freeze frame data on the hand–held tester. Because 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, etc. at the time of the malfunction.

When using hand–held tester:

1	**Check exhaust gas contorl valve operation.**



PREPARATION:
Warm up the engine.
CHECK:
When turning the ignition switch OFF, check that the control arm moves to the full–close position and remains there for 2 seconds or more.
HINT:
Movement of the control arm can be seen from the bottom of the vehicle.

OK → **Go to step 10.**

NG

2	**Perform ACTIVE TEST for exhaust gas contorol valve on hand–held tester.**

OK:

When the VSV is ON, the valve rod moves smoothly.

NG → **Go to step 9.**

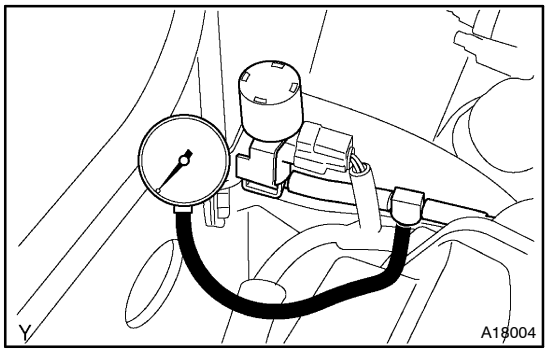
OK

3	**Check vacuum hose connection to VSV for exhaust gas control valve.**

NG → **Repair or replace vacuum hose.**

OK

4	Check vacuum between VSV for exhaust gas contorl valve and exhaust gas control valve.



PREPARATION:

(a) Using a 3–way connector, connect a vacuum gauge to the hose between the VSV and exhaust control valve.
(b) Connect the hand–held tester to the DLC3.
(c) Warm up the engine to above 80˚C (176˚F).
(d) The engine is idle.
(e) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check the vacuum when VSV is operated by the hand–held tester.

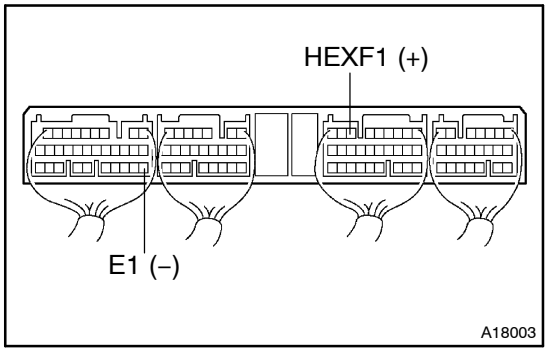
RESULT:

VSV	Vacuum
ON	0 kPa (0 mmHg, 0 in. Hg)
OFF	Above 28 kPa (210 mmHg, 8.3 in. Hg)

OK	Go to step 9.

NG

5	Check voltage between terminal HEXF1 and E1 of engine ECU connector.



PREPARATION:

(a) Remove the glove compartment box.
(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminal HEXF1 and E1.

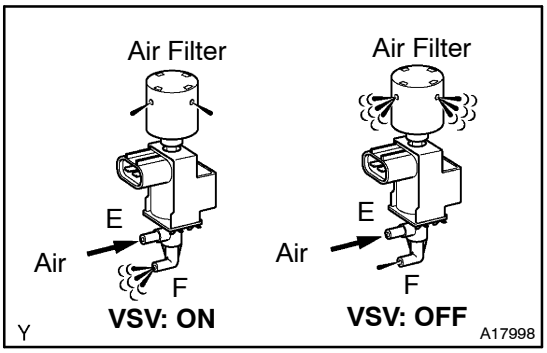
OK:

Voltage: above 8.0 V

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

OK

6	Check operation of VSV for exhaust gas control valve.



PREPARATION:

(a) Disconnect the vacuum hoses from the VSV.
(b) Connect the hand–held tester to the DLC3.
(c) Turn the ignition switch ON.
(d) Select the ACTIVE TEST mode on the hand–held tester.

CHECK:

Check the operation of the VSV when it is operated by the hand–held tester.

OK:

VSV operation	Air flowing of VSV
ON	Port E to F
OFF	Port E to air filter

NG → **Replace VSV.**

OK

7	Check for open and short in harness and connector between VSV and engine ECU, and EFI main relay (Marking : EFI) (See page IN–20).

NG → **Repair or replace harness or connector.**

OK

8	Check exhaust gas contorol valve.

PREPARATION:

Remove the exhaust gas control valve.

CHECK:

Check that no foreign object exists in the exhaust control valve.

NG → **Repair or replace exhaust gas control valve.**

OK

9	Check air inlet hose from turbocharger.

NG → Repair or replace air inlet hose.

OK

10	Check vacuum hose to turbo pressure sensor.

NG → Repair or replace vacuum hose.

OK

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

When not using hand–held tester:

1	Check exhaust gas contorl valve operation (See step 1 when using hand–held tester).

NG → Repair or replace exhaust gas contorl valve.

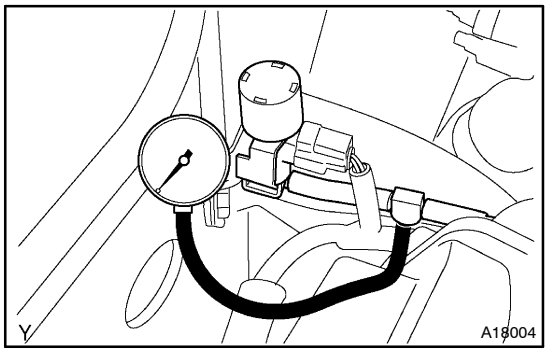
OK

2	Check vacuum hose connection to VSV for exhaust gas control valve.

NG → Repair or replace vacuum hose.

OK

3	Check vacuum between VSV for exhaust gas contorl valve and exhaust gas control valve.



PREPARATION:

(a) Using a 3–way connector, connect a vacuum gauge to the hose between the VSV and exhaust control valve.
(b) Warm up the engine to above 80˚C (176˚F).
(c) Operate the EGR system.

RESULT:

Warm–up switch	Vacuum
ON	0 kPa (0 mmHg, 0 in. Hg)
OFF	Above 28 kPa (210 mmHg, 8.3 in. Hg)

OK → **Go to step 8.**

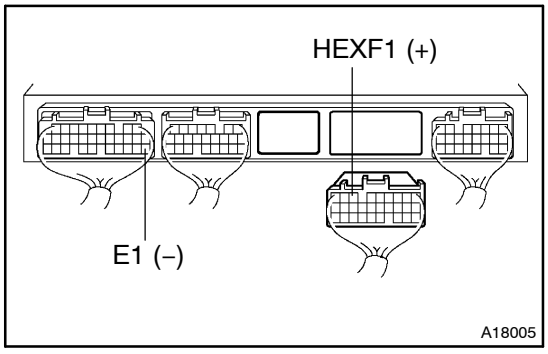
NG

4	Check voltage between terminal HEXF1 of engine ECU connector and body ground (See step 5 when using hand–held tester).

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

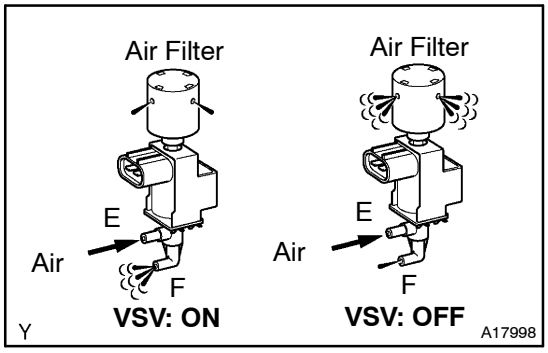
OK

5	Check operation of VSV for exhaust gas control valve.



PREPARATION:

(a) Remove the glove compartment box.
(b) KLH:
Disconnect the E17 connector from the engine ECU.
(c) KDN:
Disconnect the E13 connector from the engine ECU.
(d) Turn the ignition switch ON.



CHECK:

Check the VSV operation.

(1) Connect terminal HEXF1 and E1 (VSV is ON).

(2) Disconnect terminal HEXF1 and E1 (VSV is OFF).

OK:

VSV operation	Air flowing of VSV
ON	Port E to F
OFF	Port E to air filter

NG → **Replace VSV.**

OK

6	**Check for open and short in harness and connector between VSV and engine ECU, and VSV and ECD main relay (See page IN–20).**

NG → **Repair or replace harness or connector.**

OK

7	**Check exhaust gas contorol valve.**

PREPARATION:

Remove the exhaust gas control valve.

CHECK:

Check that no foreign object exists in the exhaust gas control valve.

NG → **Repair or replace exhaust gas control valve.**

OK

8	**Check air inlet hose from turbocharger.**

NG → **Repair or replace air inlet hose.**

OK

9	Check vacuum hose to turbo pressure sensor.

NG → Repair or replace vacuum hose.

OK →

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