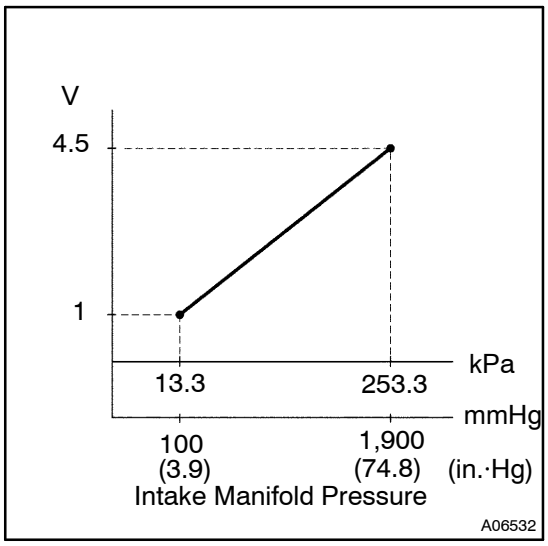
DI9S5–01

DTC	31 (2)	Turbo Pressure Sensor Circuit Malfunction

CIRCUIT DESCRIPTION



The turbo pressure sensor is connected to the intake manifold. The engine ECU detects the intake manifold pressure as a voltage by the sensor. The engine ECU uses the intake manifold pressure signal to correct the injection volume control and injection timing control.

The VSV for turbo pressure sensor switches the atmosphere applied to the turbo pressure sensor to the intake manifold pressure. The turbo pressure sensor monitors both the atmospheric pressure and intake manifold pressure and transmits the output voltage to the engine ECU, and the engine ECU uses this atmospheric pressure value to correct the injection volume.

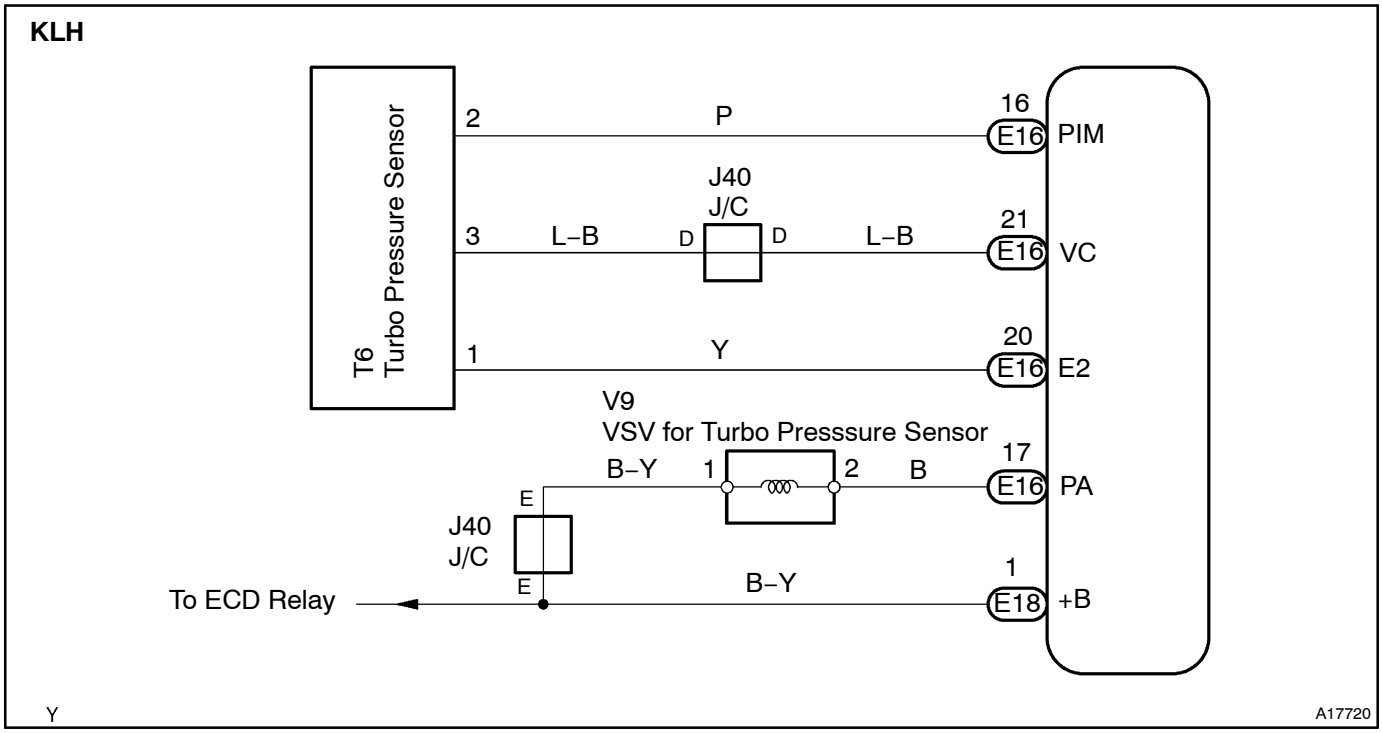
DTC No.	DTC Detecting Condition	Trouble Area
31 (2)	Open or short in turbo pressure sensor circuit for 2 sec. or more	• Open or short in turbo pressure sensor circuit • Turbo pressure sensor • Open or short in VSV for turbo pressure sensor circuit • VSV for turbo pressure sensor • Vacuum hose disconnected or blocked • Turbocharger • EGR valve • Air flow meter • Engine ECU

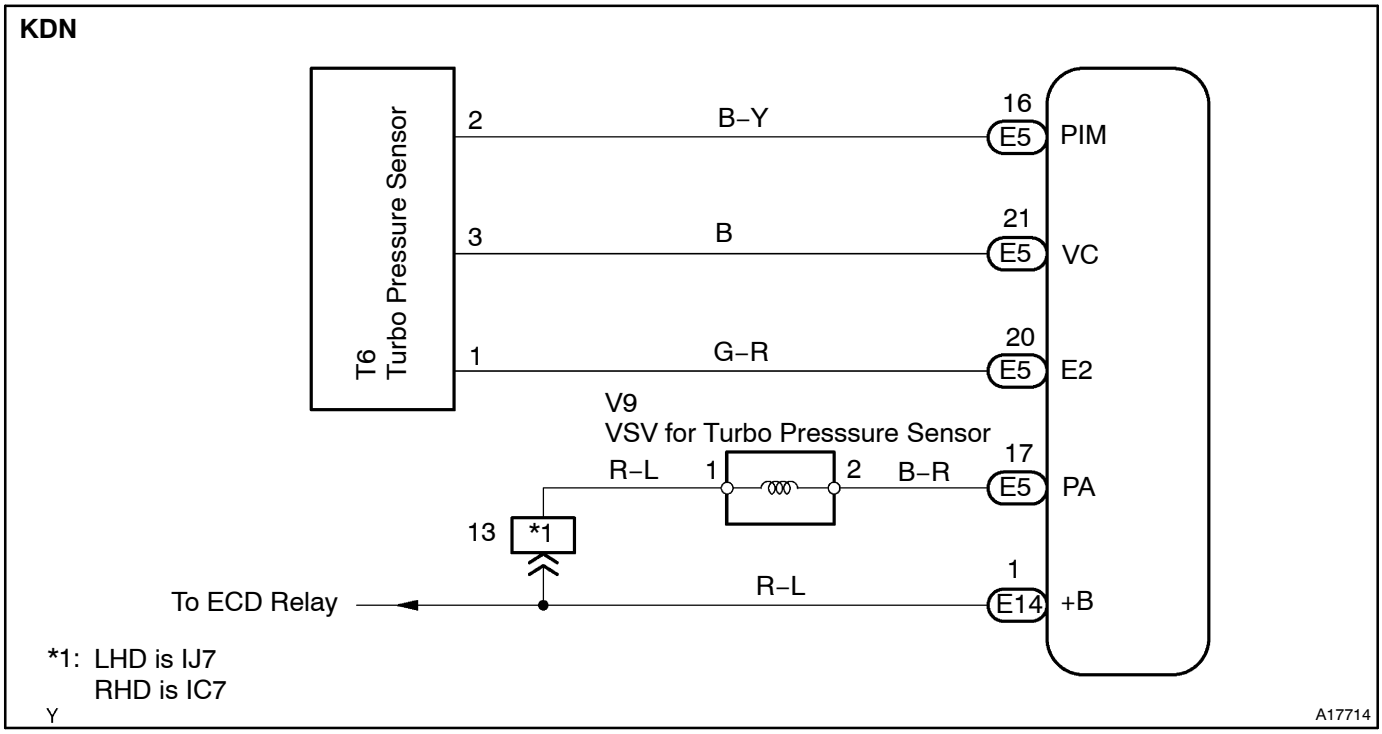
HINT:

After confirming DTC 31, use the hand–held tester to confirm the intake manifold pressure from the CURRENT DATA.

Intake Manifold Pressure (kPa)	Malfunction
Approx. 0	• PIM circuit short
250 or more	• VC circuit open or short • PIM circuit open • E2 circuit open

WIRING DIAGRAM





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	Read value of intake manifold pressure on hand–held tester.

OK:

The same as the atmospheric pressure.

OK → Go to step 5.

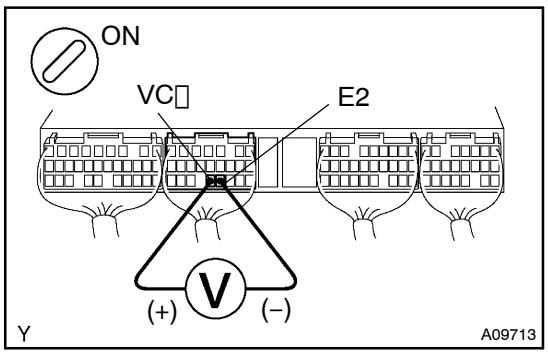
NG

2	Check turbo pressure sensor (See page ED–16).

NG → Replace turbo pressure sensor.

OK

3	Check voltage between terminals VC and E2 of engine ECU connector.



PREPARATION:

(a) Remove the glove compartment box.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VC and E2.

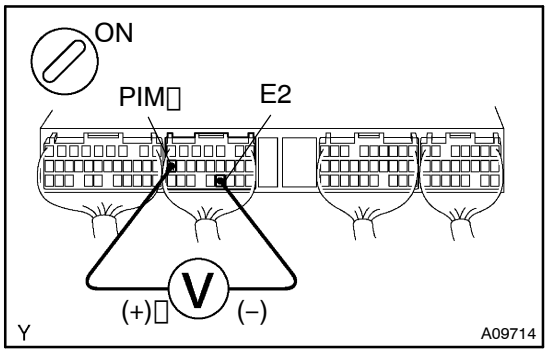
OK:

Voltage: 4.5 – 5.5 V

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

OK

4	Check voltage between terminals PIM and E2 of engine ECU connector.



PREPARATION:

(a) Remove the glove compartment box.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals PIM and E2.

OK:

Voltage: 1.7 – 2.9 V

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

NG

Check for open and short in harness and connector between engine ECU and turbo pressure sensor (See page IN–20).

5	Check connection of vacuum hose between turbo pressure sensor and VSV for turbo pressure sensor, and VSV for turbo pressure sensor and intake manifold.

NG	Repair or replace.

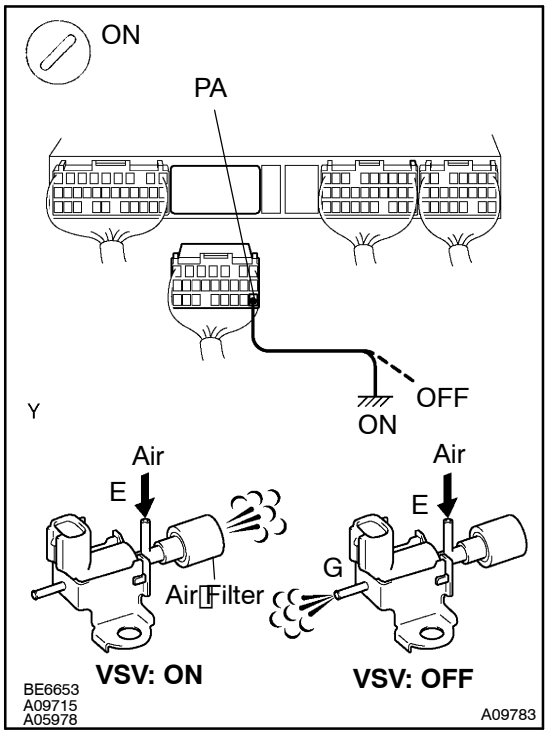
OK

6	Check resistance of VSV for turbo pressure sensor (See page ED–16).

NG	Replace VSV for turbo pressure sensor.

OK

7	Check VSV for turbo pressure sensor.



PREPARATION:

(a) Remove the glove compartment box.
(b) KLH:
Disconnect the E16 connector from the engine ECU.
(c) KDN:
Disconnect the E5 connector from the engine ECU.
(d) Turn the ignition switch ON.

CHECK:

Check the VSV function.
(a) Connect terminal PA of the engine ECU connector and the body ground (VSV is ON).
(b) Disconnect terminal PA of the engine ECU connector from the body ground (VSV is OFF).

OK:

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

OK	Go to step 9.

NG

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

NG	Repair harness or connector.

OK

Replace VSV for turbo pressure sensor.

9	Check turbocharger assembly (See page TC–1).

NG → Replace turbocharger.

OK

10	Check EGR valve (See page EC–6)

NG → Replace EGR valve.

OK

11	Check air flow meter (See page ED–3)

NG → Replace air flow meter.

OK

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

When not using hand–held tester:

1	Check turbo pressure sensor (See page ED–16).

NG → Replace turbo pressure sensor.

OK

2	Check voltage between terminals VC and E2 of engine ECU connector (See step 3 when using hand–held tester).

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

OK ↓

3	Check voltage between terminals PIM and E2 of engine ECU connector (See step 4 when using hand–held tester).

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

NG ↓

4	Check for open and short in harness and connector between engine ECU and turbo pressure sensor (See page IN–20).

NG → Repair or replace harness or connector.

OK ↓

5	Check connection of vacuum hose between turbo pressure sensor and VSV for turbo pressure sensor, and VSV for turbo pressure sensor and intake manifold.

NG → Repair or replace.

OK ↓

6	Check resistance of VSV for turbo pressure sensor (See page ED–16).

NG → Replace VSV for turbo pressure sensor.

OK

7	Check VSV for turbo pressure sensor (See step 7 when using hand–held tester).

OK → Go to step 11.

NG

8	Check turbocharger assembly (See page TC–1).

NG → Replace turbocharger.

OK

9	Check EGR valve (See page EC–6)

NG → Replace EGR valve.

OK

10	Check air flow meter (See page ED–3)

NG → Replace air flow meter.

OK

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

11	**Check for open and short in harness and connector between engine ECU and VSV for turbo pressure sensor and ECD main relay (Marking: INJ) (See page IN–20).**

NG → **Repair harness or connector.**

OK

Replace VSV for turbo pressure sensor.