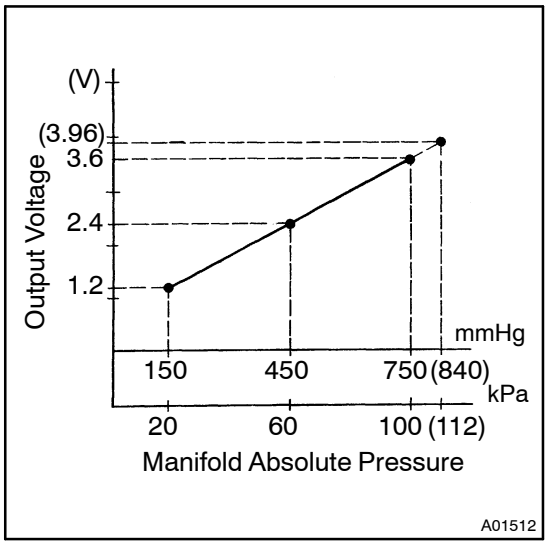
DI31C–03

CIRCUIT INSPECTION

DTC	P0 105/31	Vacuum Sensor Circuit

CIRCUIT DESCRIPTION



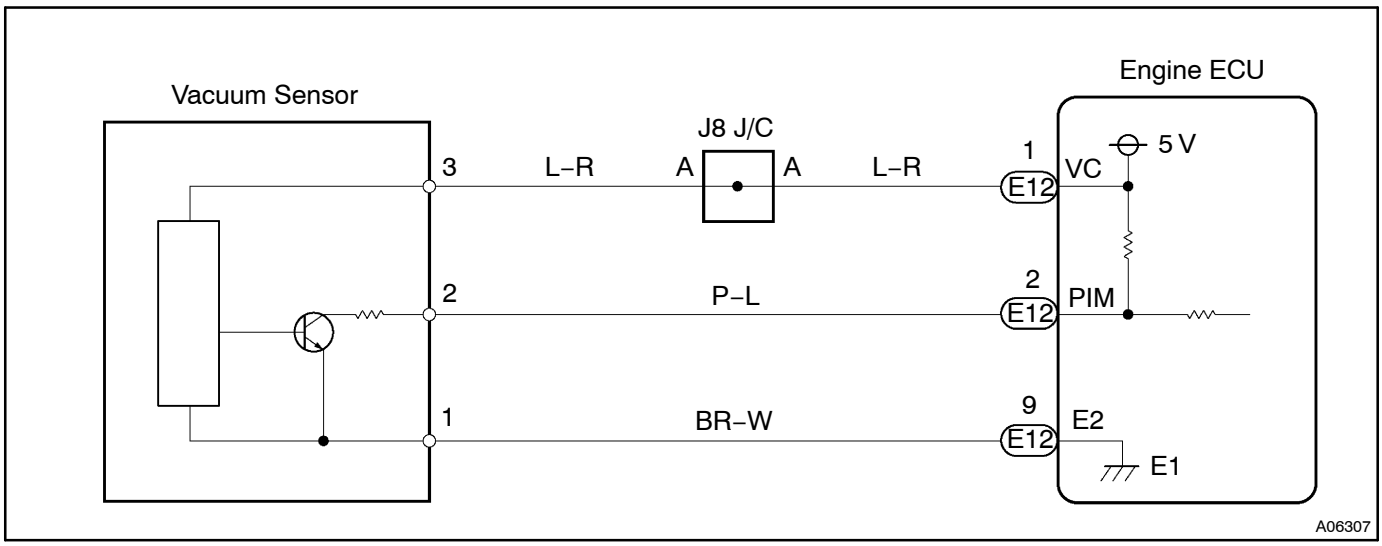
By a built –in sensor unit, the vacuum sensor detects the intake manifold pressure as a voltage. The engine ECU then determines the basic injection duration and basic ignition advance angle based on this voltage.
Since the vacuum sensor does not use the atmospheric pressure as a criterion, but senses the absolute pressure inside the intake manifold (the pressure in proportion to the preset absolute vacuum 0), it is not influenced by fluctuations in the atmospheric pressure due to high altitude and other factors. This permits it to control the air fuel ratio at the proper level under all conditions.

DTC No.	DTC Detection condition	Trouble Area
P0105/31	Open or short in vacuum sensor circuit for 0.5 sec. or more	• Open or short in vacuum sensor circuit • Vacuum sensor • Engine ECU

If the engine ECU detects diagnostic trouble code ”P0105/31”, it operates the fail safe function, keeping the ignition timing and fuel injection volume constant and making it possible to drive the vehicle.
HINT:
After confirming DTC ”P0105/31” use the hand –held tester to confirm the manifold absolute pressure from ”CURRENT DATA”.

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

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- 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.
- If DTC "P0105/31" (Vacuum Sensor Circuit Malfunction), "P0110/24" (Intake Air Temp. Circuit Malfunction), "P0115/22" (Water Temp. Circuit Malfunction), "P0120/41" (Throttle Position Sensor Circuit Malfunction) are output simultaneously, E2 (Sensor Ground) may be open.

When using hand–held tester

1	**Connect the hand–held tester, and read value of manifold absolute pressure.**

PREPARATION:

(a) Connect the hand–held tester to the DLC3.

(b) Turn the ignition switch ON and hand–held tester main switch ON.

CHECK:

Read value of manifold absolute pressure on the hand–held tester.

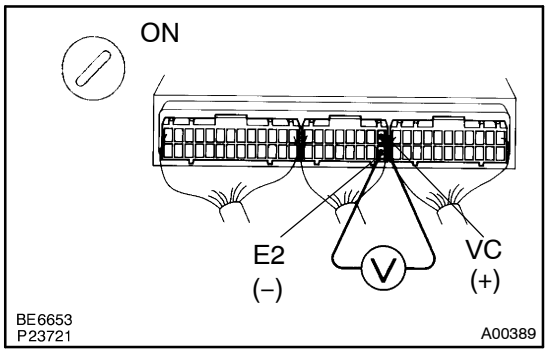
OK:

Same as atmospheric pressure.

OK → **Check for intermittent problems (See page DI–4).**

NG

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



PREPARATION:
(a) Remove the glove compartment door.
(b) Turn the ignition switch ON.

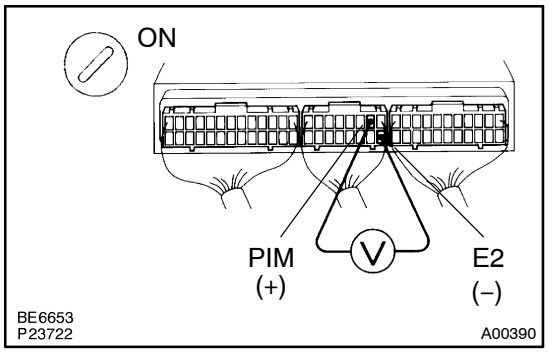
CHECK:
Measure voltage between terminals VC and E2 of engine ECU connector.

OK:
Voltage: 4.5 – 5.5 V

NG	Check and replace engine ECU (See page IN–19).

OK

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



PREPARATION:
(a) Remove the glove compartment door.
(b) Turn the ignition switch ON.

CHECK:
Measure voltage between terminals PIM and E2 of engine ECU connector.

OK:
Voltage: 3.3 – 3.9 V

OK	Check and replace engine ECU (See page IN–19).

NG

4	Check for open and short in harness and connector between vacuum sensor and engine ECU.

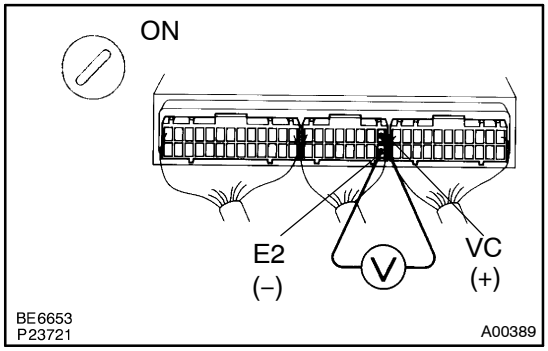
NG	Repair and replace harness or connector.

OK

Replace vacuum sensor.

When not using hand–held tester

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



PREPARATION:
(a) Remove the glove compartment door.
(b) Turn the ignition switch ON.

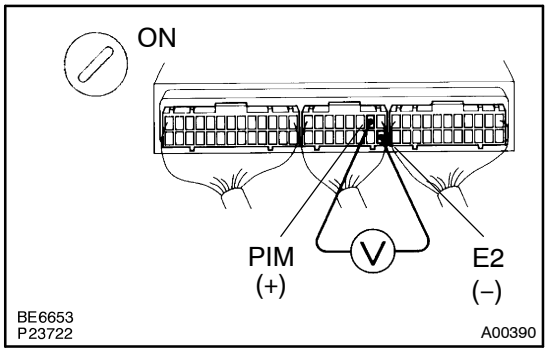
CHECK:
Measure voltage between terminals VC and E2 of engine ECU connector.

OK:
Voltage: 4.5 – 5.5 V

NG	**Check and replace engine ECU (See page IN–19).**

OK

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



PREPARATION:
(a) Remove the glove compartment door.
(b) Turn the ignition switch ON.

CHECK:
Measure voltage between terminals PIM and E2 of engine ECU connector.

OK:
Voltage: 3.3 – 3.9 V

OK	**Check and replace engine ECU (See page IN–19).**

NG

3	**Check for open and short in harness and connector between vacuum sensor and engine ECU.**

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

OK

Replace vacuum sensor.