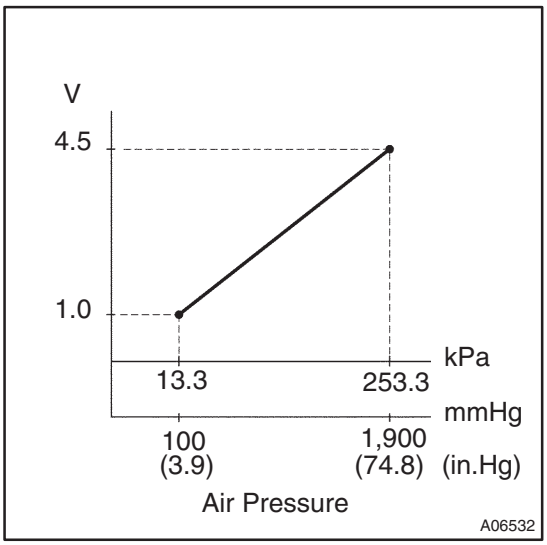
DTC	P0105/31	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT

DTC	P0107/31	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT LOW INPUT

DTC	P0108/31	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION



The manifold absolute pressure sensor detects the intake manifold pressure by using the built–in sensor unit. The ECM determines the basic injection duration and injection advance timing based on the voltage output by the manifold absolute pressure sensor.

The manifold absolute pressure sensor monitors the absolute pressure inside the intake manifold (default is 0 kPa (0 mmHg, 0 in.Hg)), so that the ECM controls the air–fuel ratio at the proper level under any driving conditions, without influence of fluctuations in the atmospheric pressure due to factors such as high altitude etc.

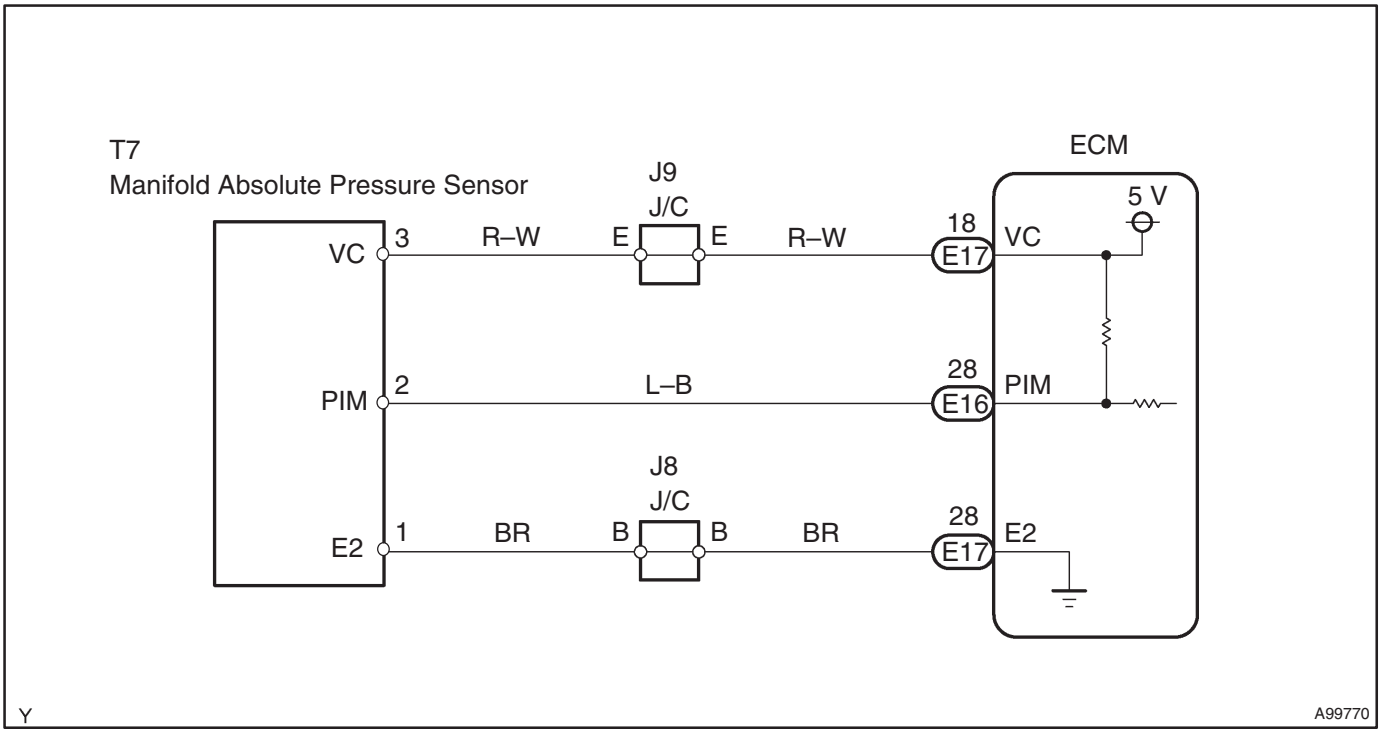
DTC No.	DTC Detection Condition	Trouble Area
P0105/31 P0107/31 P0108/31	Open or short in manifold absolute pressure sensor circuit for 0.5 seconds or more (1 trip detection logic)	• Open or short in manifold absolute pressure sensor circuit • Manifold absolute pressure sensor • Turbocharger sub–assy • EGR valve assy • ECM

HINT:

When DTC P0105/31, P0107/31 or P0108/31 is detected, check the intake manifold pressure by entering the following menus on the intelligent tester II: Powertrain / Engine / Data List / MAP.

Intake Manifold Pressure	Malfunction
Approximately 0 kPa	Short in PIM circuit
250 kPa or more	• Open or short in VC circuit • Open in PIM circuit • Open in E2 circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- If DTCs related to different systems that have terminal E2 as the ground terminal are output simultaneously, terminal E2 may have an open circuit.
- Read freeze frame data using the intelligent tester II. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, and other data from the time the malfunction occurred.

When using intelligent tester II:

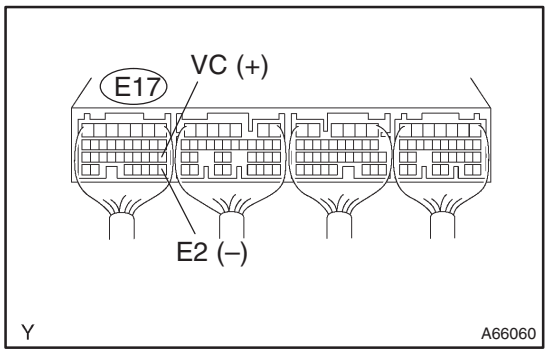
1	READ DATA LIST (MANIFOLD ABSOLUTE PRESSURE)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the ignition switch ON and turn the intelligent tester II ON.
(c) Enter the following menus: Powertrain / Engine / Data List / MAF.
(d) Read the values.
Standard: Same value as the actual atmospheric pressure.

OK	CHECK FOR INTERMITTENT PROBLEMS (See page 05–439)

NG

2 CHECK ECM (VC VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connector.
Standard:

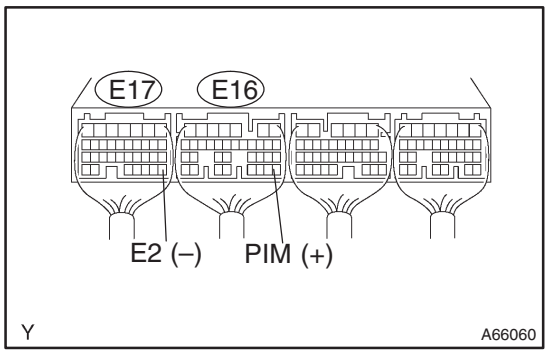
Tester Connection	Specified Condition
E17–18 (VC) – E17–28 (E2)	4.5 to 5.5 V

NG → **REPLACE ECM (See Pub. No. RM990E, page 10–34)**

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

OK

3 CHECK ECM (PIM VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connectors.
Standard:

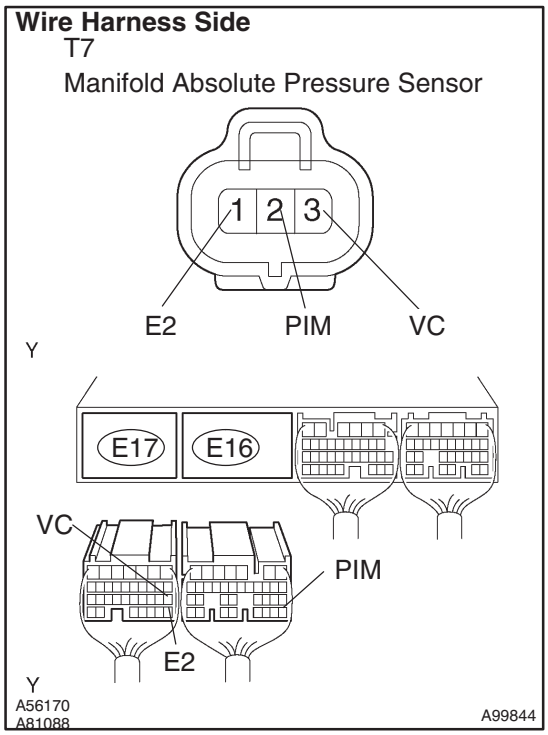
Tester Connection	Condition	Specified Condition
E16–28 (PIM) – E17–28 (E2)	Applied negative pressure of 40 kPa (300 mmHg, 11.8 in.Hg)	1.3 to 1.9 V
E16–28 (PIM) – E17–28 (E2)	Same as atmospheric pressure	2.4 to 3.1 V
E16–28 (PIM) – E17–28 (E2)	Applied positive pressure of 170 kPa (1,275 mmHg, 190.5 in.Hg)	3.7 to 4.3 V

OK → **REPLACE ECM (See Pub. No. RM990E, page 10–34)**

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

NG

4 CHECK WIRE HARNESS (MANIFOLD ABSOLUTE PRESSURE SENSOR – ECM)



(a) Disconnect the T7 manifold absolute pressure sensor connector.
(b) Disconnect the E16 and E17 ECM connectors.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
T7–2 (PIM) – E16–28 (PIM)	Below 1 Ω
T7–3 (VC) – E17–18 (VC)	Below 1 Ω
T7–1 (E2) – E17–28 (E2)	Below 1 Ω
T7–2 (PIM) or E16–28 (PIM) – Body ground	10 kΩ higher
T7–3 (VC) or E17–18 (VC) – Body ground	10 kΩ higher
T7–1 (E2) or E17–28 (E2) – Body ground	10 kΩ higher

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

OK

5 INSPECT TURBOCHARGER SUB–ASSY (See page 13–1)

OK: None of the inspection results show any abnormalities.

NG → **REPLACE TURBOCHARGER SUB–ASSY (See page 13–10)**

OK

6 INSPECT EGR VALVE ASSY (See page 12–20)

OK: None of the inspection results show any abnormalities.

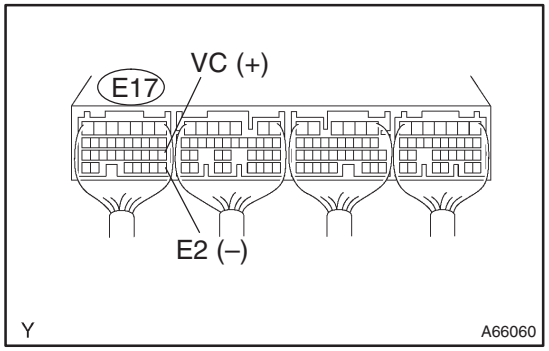
NG → **REPLACE EGR VALVE ASSY (See page 10–20)**

OK

REPLACE MANIFOLD ABSOLUTE PRESSURE SENSOR

When not using intelligent tester II:

1 CHECK ECM (VC VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connector.
Standard:

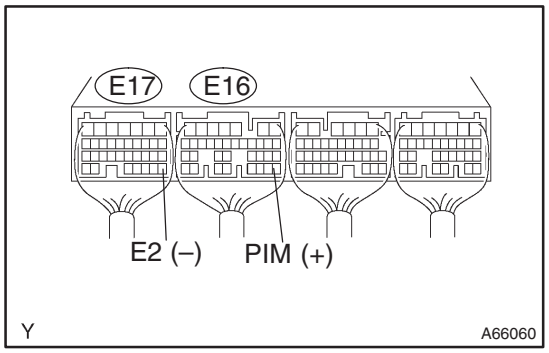
Tester Connection	Specified Condition
E17–18 (VC) – E17–28 (E2)	4.5 to 5.5 V

NG → **REPLACE ECM (See Pub. No. RM990E, page 10–34)**

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

OK

2 CHECK ECM (PIM VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage of the ECM connectors.
Standard:

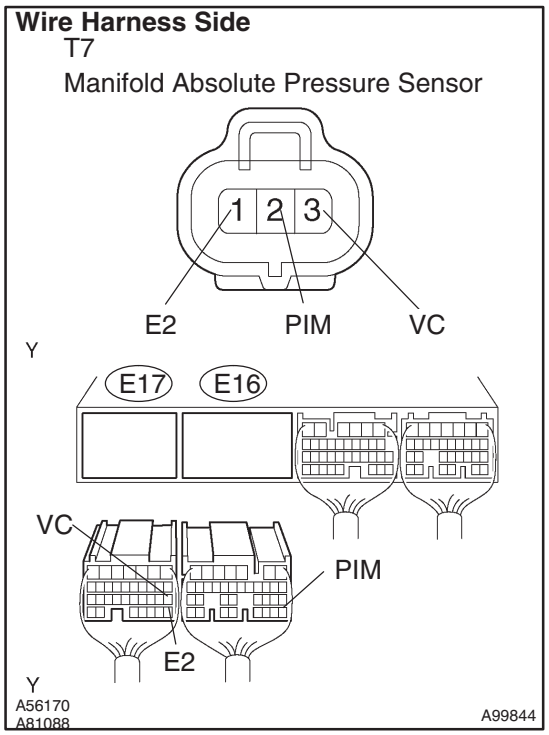
Tester Connection	Condition	Specified Condition
E16–28 (PIM) – E17–28 (E2)	Applied negative pressure of 40 kPa (300 mmHg, 11.8 in.Hg)	1.3 to 1.9 V
E16–28 (PIM) – E17–28 (E2)	Same as atmospheric pressure	2.4 to 3.1 V
E16–28 (PIM) – E17–28 (E2)	Applied positive pressure of 170 kPa (1,275 mmHg, 190.5 in.Hg)	3.7 to 4.3 V

OK → **REPLACE ECM (See Pub. No. RM990E, page 10–34)**

NOTICE:
After replacing the ECM, allow for ECM learning start the engine and idle it until it is fully warmed up.

NG

3 CHECK WIRE HARNESS (MANIFOLD ABSOLUTE PRESSURE SENSOR – ECM)



(a) Disconnect the T7 manifold absolute pressure sensor connector.
(b) Disconnect the E16 and E17 ECM connectors.
(c) Measure the resistance of the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
T7–2 (PIM) – E16–28 (PIM)	Below 1 Ω
T7–3 (VC) – E17–18 (VC)	Below 1 Ω
T7–1 (E2) – E17–28 (E2)	Below 1 Ω
T7–2 (PIM) or E16–28 (PIM) – Body ground	10 kΩ higher
T7–3 (VC) or E17–18 (VC) – Body ground	10 kΩ higher
T7–1 (E2) or E17–28 (E2) – Body ground	10 kΩ higher

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

OK

4 INSPECT TURBOCHARGER SUB–ASSY (See page 13–1)

OK: None of the inspection results show any abnormalities.

NG → **REPLACE TURBOCHARGER SUB–ASSY (See page 13–10)**

OK

5 INSPECT EGR VALVE ASSY (See page 12–20)

OK: None of the inspection results show any abnormalities.

NG → **REPLACE EGR VALVE ASSY (See page 10–20)**

OK

REPLACE MANIFOLD ABSOLUTE PRESSURE SENSOR