DTC	P0100	MASS OR VOLUME AIR FLOW CIRCUIT

DTC	P0102	MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT

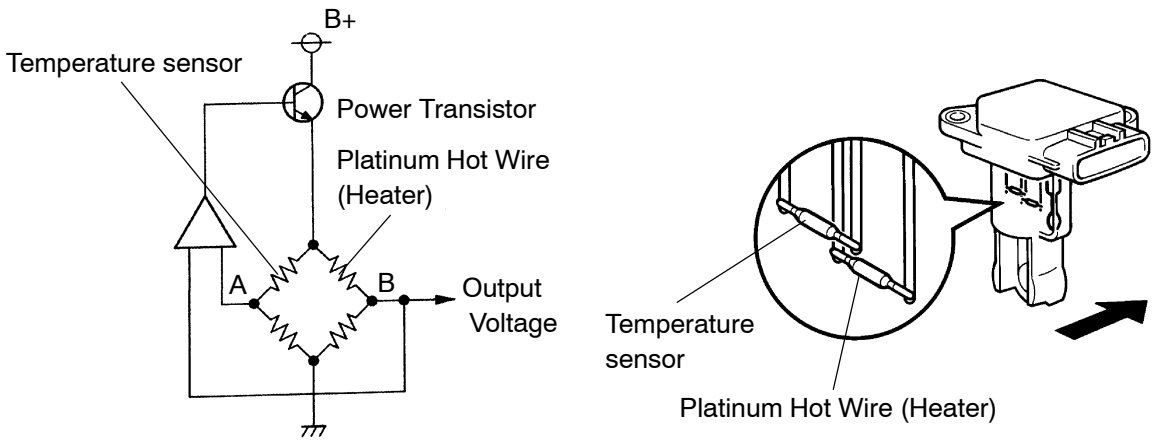
DTC	P0103	MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

The Mass Air Flow (MAF) meter measures the amount of air flowing through the throttle valve. The ECM uses this information to determine the fuel injection time and provide a proper air fuel ratio. Inside the MAF meter, there is a heated platinum wire exposed to the flow of intake air.

By applying a specific current to the wire, the ECM heats this wire to a given temperature. The flow of incoming air cools the wire and an internal thermistor, affecting their resistance. To maintain a constant current value, the ECM varies the voltage applied to these components in the MAF meter. The voltage level is proportional to the airflow through the sensor. The ECM interprets this voltage as the intake air amount.

The circuit is constructed so that the platinum hot wire and temperature sensor provide a bridge circuit, with the power transistor controlled so that the potential of A and B remains equal to maintain the set temperature.



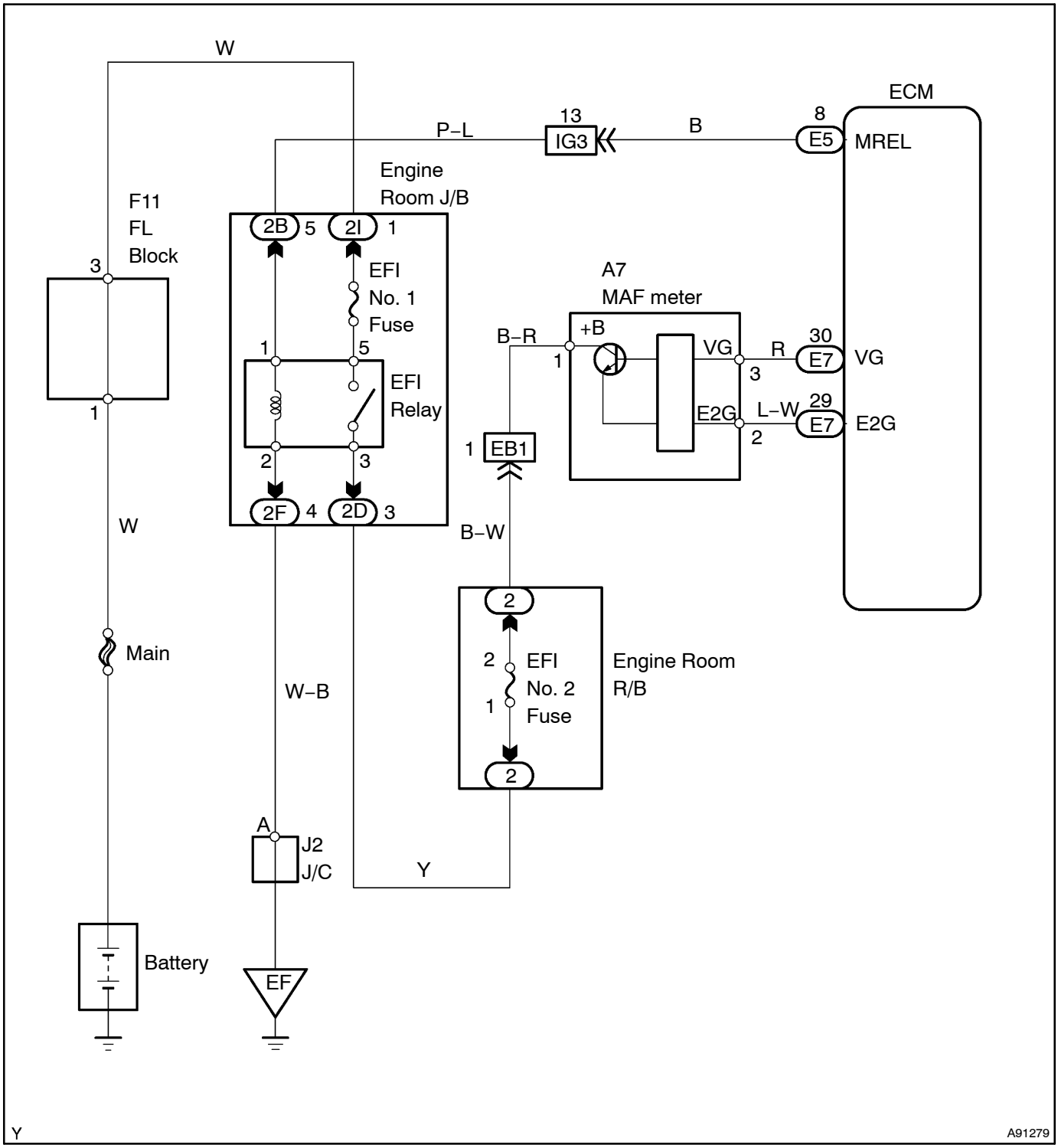
DTC No.	DTC Detection Condition	Trouble Area
P0100	When MAF meter circuit has an open or a short for more than 3 seconds under 4,000 rpm engine speed	• Open or short in MAF meter circuit • MAF meter • ECM
P0102	When MAF meter circuit has an open for more than 3 seconds under 4,000 rpm engine speed	• Open or short in MAF meter circuit • MAF meter • ECM
P0103	When MAF meter circuit has a short for more than 3 seconds under 4,000 rpm engine speed	• Open or short in MAF meter circuit • MAF meter • ECM

HINT:

After confirming DTC P0100, P0102 or P0103, use the hand–held tester to confirm the MAF ratio from the ALL menu (to reach the ALL menu: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL).

Air Flow Value (gm/s)	Malfunction
Approx. 0.0	• MAF meter power source circuit open • VG circuit open or short
271.0 or more	• E2G circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand–held tester. 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, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1 READ VALUE OF HAND–HELD TESTER (MAF RATE)

(a) Connect the hand–held tester to the DLC3.
(b) Start the engine.
(c) Push the hand–held tester main switch ON.
(d) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DATA LIST / ALL / MAF. Read the values.

Result:

Air Flow Rate (gm/s)	Proceed to
0.0	A
271.0 or more	B
MAF rate greater than 1 but less than 270.0 *1	C

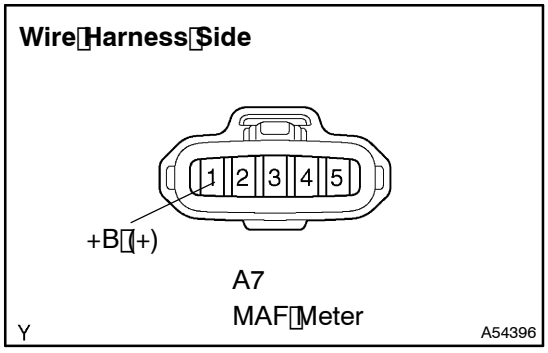
*1: The value must change when the throttle valve is opened or closed.

B → **Go to step 6**

C → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–8)**

A

2 CHECK MASS AIR FLOW METER (POWER SOURCE)



(a) Turn the ignition switch ON.
(b) Disconnect the A7 MAF meter connector.
(c) Check the voltage of the wire harness side connector.

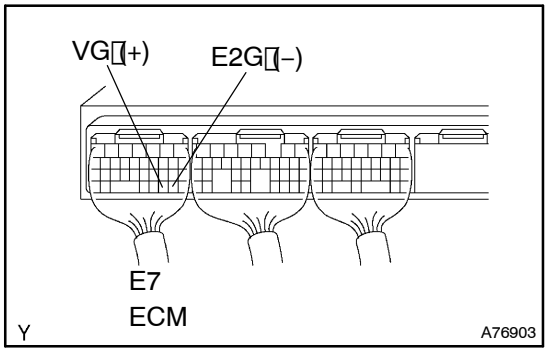
Standard:

Tester Connection	Specified Condition
A7–1 (+B) – Body ground	9 to 14 V

NG → **Go to step 5**

OK

3 CHECK ECM (VG VOLTAGE)



(a) Start the engine.
(b) Check the voltage of the ECM connector.

HINT:
The shift position should be P or N and the A/C switch should be turned OFF.

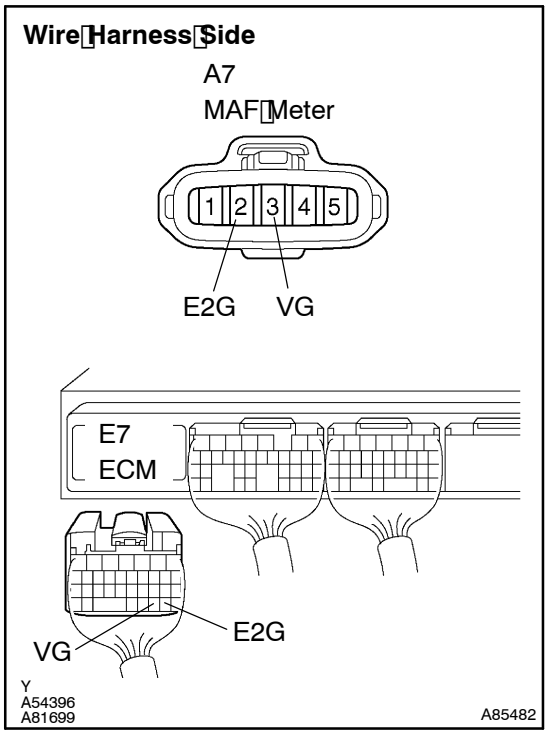
Standard:

Tester Connection	Condition	Specified Condition
E7–30 (VG) – E7–29 (E2G)	Engine is idling	0.5 to 3.0 V

OK ⇒ REPLACE ECM (See page 10–13)

NG

4 CHECK WIRE HARNESS (MAF METER – ECM)



(a) Disconnect the A7 MAF meter connector.
(b) Disconnect the E7 ECM connector.
(c) Check the resistance of the wire harness side connectors.

Standard:

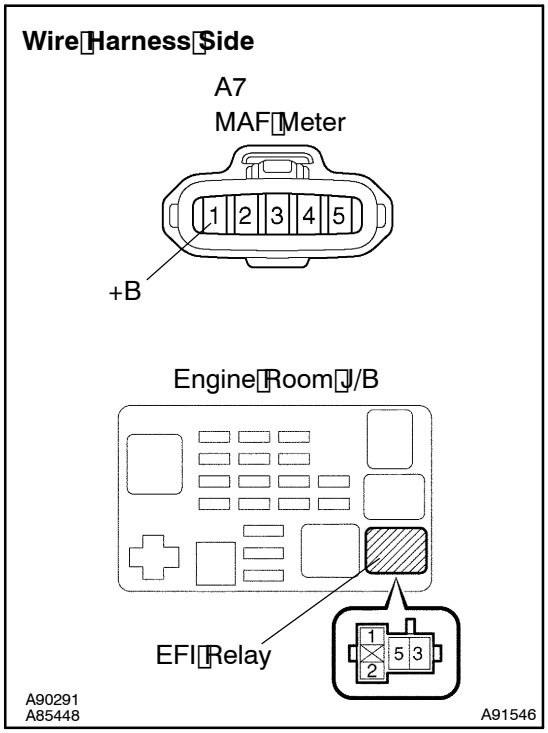
Tester Connection	Specified Condition
A7–3 (VG) – E7–30 (VG) A7–2 (E2G) – E7–29 (E2G)	Below 1 Ω
A7–3 (VG) or E7–30 (VG) – Body ground	10 kΩ or higher

NG ⇒ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE MASS AIR FLOW METER

5 CHECK WIRE HARNESS (MAF METER – EFI RELAY)



(a) Disconnect the A7 MAF meter connector.
(b) Remove the EFI relay from the engine room J/B.
(c) Check the resistance of the wire harness side connectors.

Standard:

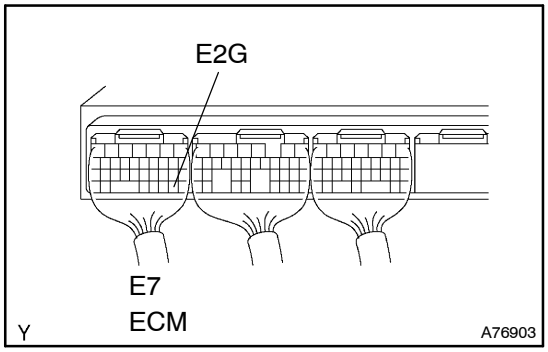
Tester Connection	Specified Condition
A7–1 (+B) – J/B EFI relay terminal 3	Below 1 Ω
A7–1 (+B) or J/B EFI relay terminal 3 – Body ground	10 kΩ or higher

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

OK

→ **INSPECT ECM POWER SOURCE CIRCUIT (See page 05–151)**

6 INSPECT ECM (SENSOR GROUND)



(a) Check the resistance of the ECM connector.

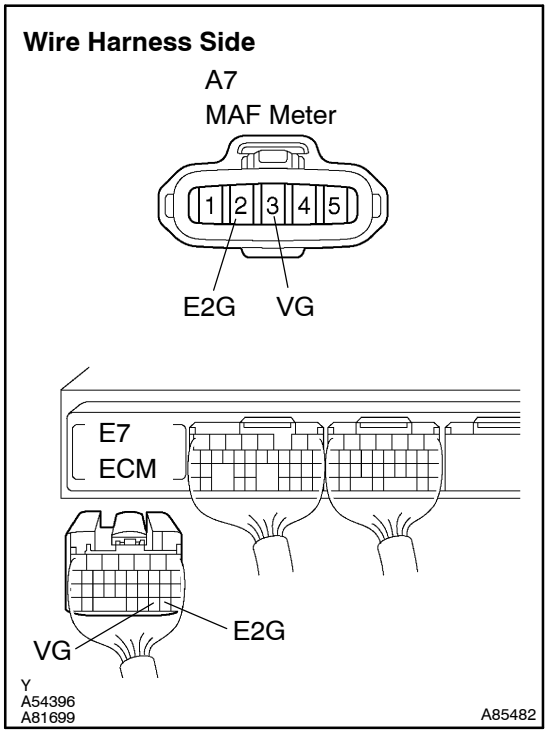
Standard:

Tester Connection	Specified Condition
E7–29 (E2G) – Body ground	Below 1 Ω

NG → **REPLACE ECM (See page 10–13)**

OK

7 CHECK WIRE HARNESS (MAF METER – ECM)



(a) Disconnect the A7 MAF meter connector.
(b) Disconnect the E7 ECM connector.
(c) Check the resistance of between the wire harness side connectors.

Standard:

Tester Connection	Specified Condition
A7–3 (VG) – E7–30 (VG) A7–2 (E2G) – E7–29 (E2G)	Below 1 Ω
A7–3 (VG) or E7–30 (VG) – Body ground	10 kΩ or higher

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

OK

REPLACE MASS AIR FLOW METER