

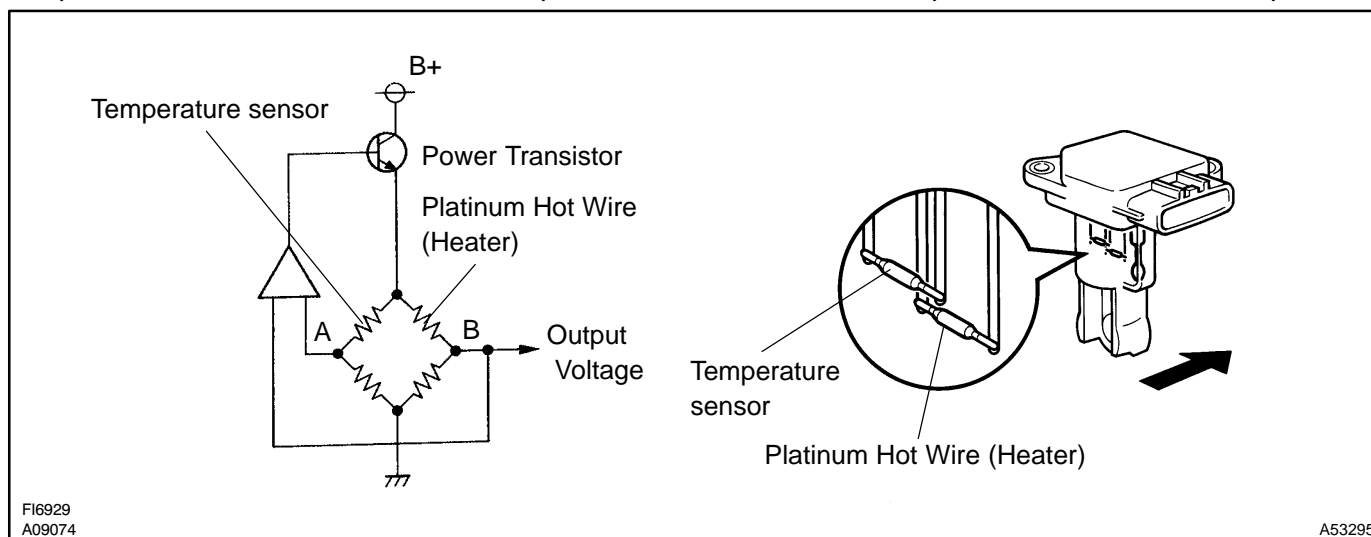
DTC	P0100	MASS OR VOLUME AIR FLOW CIRCUIT
DTC	P0102	MASS OR VOLUME AIR FLOW CIRCUIT LOW INPUT
DTC	P0103	MASS OR VOLUME AIR FLOW CIRCUIT HIGH INPUT

CIRCUIT DESCRIPTION

The mass air flow meter uses a platinum hot wire. The hot wire mass air flow meter consists of a platinum hot wire, a temperature sensor and a control circuit installed in a plastic housing. The hot wire mass air flow meter works on the principle that the hot wire and temperature sensor located in the intake air bypass of the housing detect any changes in the intake air temperature.

The hot wire is maintained at the set temperature by controlling the current flow through the hot wire. This current flow is then measured as the output voltage of the mass air flow meter.

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.



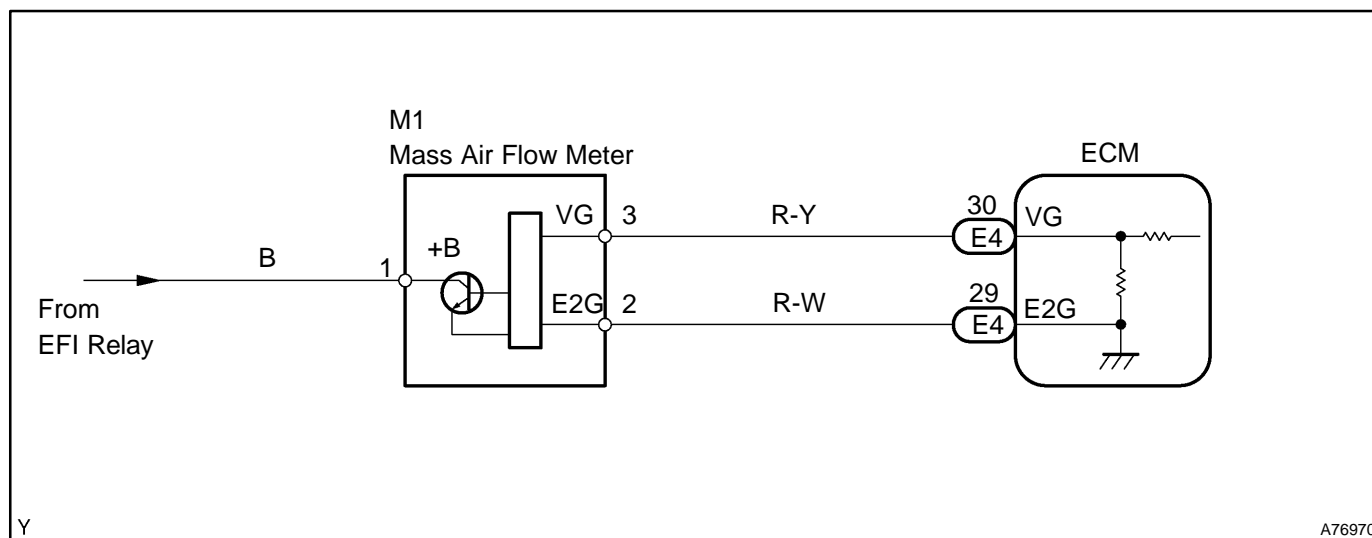
DTC No.	DTC Detection Condition	Trouble Area
P0100	Open or short in mass air flow meter circuit with more than 3 sec. engine speed 4,000 rpm or less	<ul style="list-style-type: none"> • Open or short in mass air flow meter circuit • Mass air flow meter • ECM
P0102	Open in mass air flow meter circuit with more than 3 sec. engine speed 4,000 rpm or less	
P0103	Short in mass air flow meter circuit with more than 3 sec. (+B circuit) engine speed 4,000 rpm or less	

HINT:

After confirming DTC "P0100, P0102 or P0103", use the hand-held tester or the OBD II scan tool to confirm the mass air flow ratio from the "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL".

Air Flow Value (gm/s)	Malfunction
Approx. 0.0	<ul style="list-style-type: none"> • Mass air flow meter power source circuit open • VG circuit open or short
271.0 or more	<ul style="list-style-type: none"> • E2G circuit open

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Read freeze frame data using the hand-held tester or the OBD II scan tool, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air-fuel ratio was lean or rich, etc. at the time of the malfunction.

1 READ VALUE OF HAND-HELD TESTER OR OBD II SCAN TOOL(MASS AIR FLOW RATE)

- Connect the hand-held tester or the OBD II scan tool to the DLC3.
- Start the engine.
- Push the hand-held tester or the OBD II scan tool main switch ON.
- Select the item "DIAGNOSIS/ENHANCED OBD II/DATA LIST/ALL/MAF" and read its value displayed on the hand-held tester or the OBD II scan tool.

Result:

Air flow rate (gm/s)	Proceed to
0.0	A
271.0 or more	B
$1 \leq \text{Mass Air Flow Rate} \leq 270.0$ or more (*1)	C

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

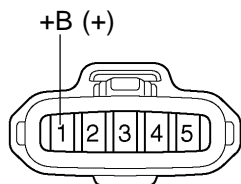
B

Go to step 6

C

CHECK FOR INTERMITTENT PROBLEMS
(See page 05-5)

A

2 INSPECT MASS AIR FLOW METER(POWER SOURCE)**Wire Harness Side**

Mass Air Flow Meter Connector

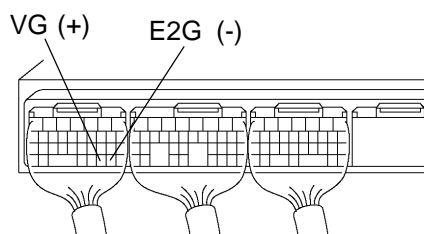
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- (a) Turn the ignition switch ON.
- (b) Disconnect the mass air flow meter connector.
- (c) Measure the voltage between the terminal of the wire harness side connector and body ground.

Standard:

Symbols (Terminal No.)	Specified condition
+B (1) - Body ground	9 to 14 V

NG**Go to step 5****OK****3 INSPECT ECM(VG VOLTAGE)**

ECM Connector

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- (a) Start the engine.
- (b) Measure the voltage between the terminals of the E4 ECM connector.

HINT:

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

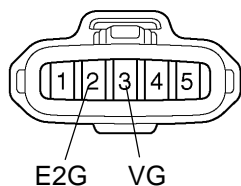
Standard:

Symbols (Terminal No.)	Condition	Specified condition
VG (E4-30) - E2G (E4-29)	Engine is idling	0.5 to 3.0 V

OK**CHECK AND REPLACE ECM**
(See page 01-35)**NG**

4 CHECK HARNESS AND CONNECTOR(MASS AIR FLOW METER - ECM)**Wire Harness Side**

Mass Air Flow Meter Connector



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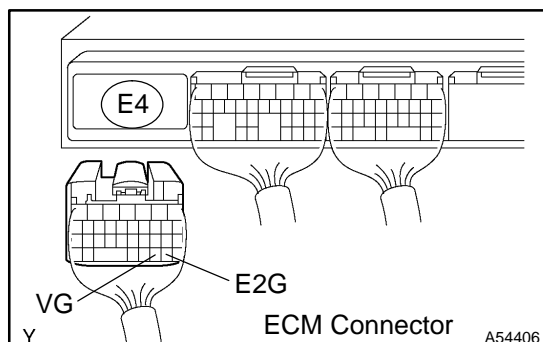
- Disconnect the mass air flow meter connector.
- Disconnect the E4 ECM connector.
- Check for continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
VG (3) - VG (E4-30)	Continuity
E2G (2) - E2G (E4-29)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
VG (3) or VG (E4-30) - Body ground	No continuity

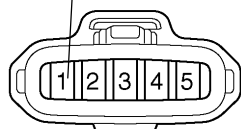


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NG**REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****REPLACE MASS AIR FLOW METER****5 CHECK HARNESS AND CONNECTOR(MASS AIR FLOW METER - EFI RELAY)****Wire Harness Side**

+B (+)



Mass Air Flow Meter Connector

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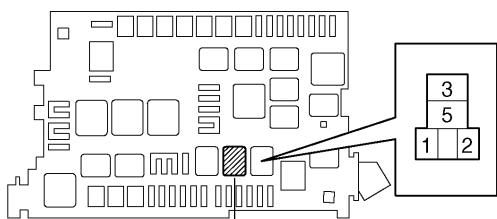
- Disconnect the mass air flow meter connector.
- Remove the EFI relay from the engine room R/B.
- Check for continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
+B (1) - EFI relay (3)	Continuity

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
+B (1) or EFI relay (3) - Body ground	No continuity

Engine Room R/B

EFI Relay

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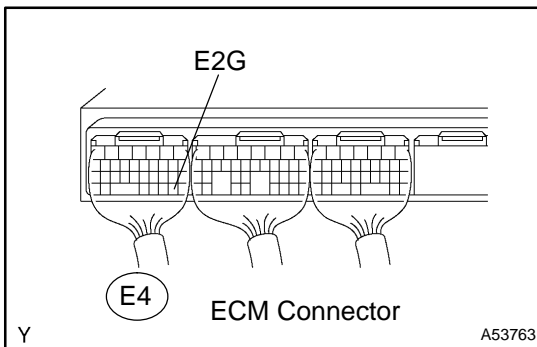
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REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK FOR ECM POWER SOURCE CIRCUIT (See page 05-228)

6 INSPECT ECM(SENSOR GROUND)



- (a) Check for continuity between the terminal of the E4 ECM connector and body ground.

Standard:

Symbols (Terminal No.)	Specified condition
E2G (E4-29) - Body ground	Continuity

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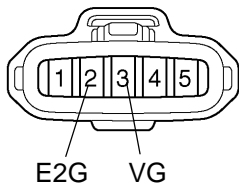
CHECK AND REPLACE ECM
(See page 01-35)

OK

7 CHECK HARNESS AND CONNECTOR(MASS AIR FLOW METER - ECM)

Wire Harness Side

Mass Air Flow Meter Connector



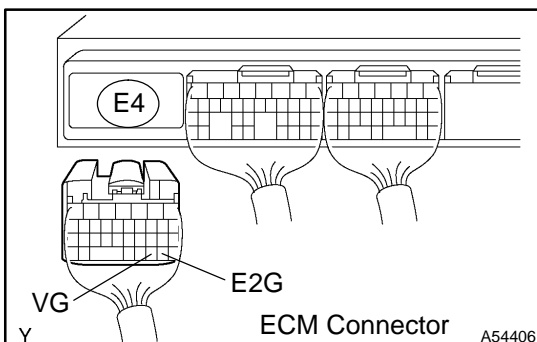
- (a) Disconnect the mass air flow meter connector.
 (b) Disconnect the E4 ECM connector.
 (c) Check for continuity between the wire harness side connectors.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
VG (3) - VG (E4-30)	Continuity
E2G (2) - E2G (E4-29)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
VG (3) or VG (E4-30) - Body ground	No continuity



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REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE MASS AIR FLOW METER