

<b>DTC</b>	<b>P0101</b>	<b>MASS OR VOLUME AIR FLOW CIRCUIT RANGE/PERFORMANCE PROBLEM</b>
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## CIRCUIT DESCRIPTION

Refer to DTC P0100 on page [05-89](#).

DTC No.	DTC Detection Condition	Trouble Area
P0101	After the engine is warmed up, conditions (a), (b), (c) and (d) continue for more than 10 seconds (2 trip detection logic): (a) Throttle valve is fully closed (b) Voltage output of the mass air flow meter is more than 2.2 V (c) Engine coolant temperature is more than 70°C (158°F) (d) Engine speed is less than 900 rpm	• Mass air flow meter
P0101	Conditions (a) and (b), or (a) and (c) continue for more than 6 seconds (2 trip detection logic): (a) Throttle position sensor output voltage is more than 0.1V (b) Voltage output of the mass air flow meter is less than 0.4 V when engine speed is less than 1,500 rpm (c) Voltage output of the mass air flow meter is less than 1.0 V when engine speed is 1,500 rpm or more	• Mass air flow meter

## MONITOR DESCRIPTION

The MAF (Mass Air Flow) meter is a sensor that helps the ECM calculate 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, changing 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 air flow through the sensor and the ECM interprets this voltage as the intake air amount. If there is a defect in the sensor or an open or short circuit, the voltage level will deviate from the normal operating range. The ECM interprets this deviation as a defect in the MAF meter and sets a DTC.

Example: If the voltage is more than 2.2 V at idle or less than 0.4 V at idle off, the ECM interprets this as a defect in the MAF meter and sets a DTC.

## MONITOR STRATEGY

Related DTCs	P0101: Mass air flow meter rationality
Required sensors/components	Main sensors: Mass air flow meter Related sensors: Engine speed sensor, engine coolant temperature sensor, throttle position sensor
Frequency of operation	Continuous
Duration	10 seconds
MIL operation	2 driving cycles
Sequence of operation	None

## TYPICAL ENABLING CONDITIONS

### CASE1: Mass air flow meter rationality

The monitor will run whenever the following DTCs are not present	See page <a href="#">05-20</a>
Engine speed	Less than 900 rpm
Idle	ON
Engine coolant temperature	70°C (158°F) or more

### CASE2: Mass air flow meter rationality

Engine speed	0 rpm or more
Throttle position sensor output	0.1 V or more

## TYPICAL MALFUNCTION THRESHOLDS

### CASE1: Mass air flow meter rationality

Mass air flow meter voltage (high voltage)	More than 2.2 V
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### CASE2: Mass air flow meter rationality

Mass air flow meter voltage (low voltage)	Less than 0.4 V at engine speed of less than 1,500 rpm Less than 1.0 V at engine speed of 1,500 rpm or more
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## WIRING DIAGRAM

Refer to DTC P0100 on page [05-89](#).

## INSPECTION PROCEDURE

### HINT:

Read freeze frame data using the hand-held tester or the OBD II scan tool. Freeze frame data records the engine condition when 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 CHECK OTHER DTC OUTPUT(IN ADDITION TO DTC P0101)

- (a) Connect the hand-held tester or the OBD II scan tool to the DLC3.
- (b) Turn the power switch ON (IG).
- (c) Turn the hand-held tester or the OBD II scan tool ON.
- (d) On the hand-held tester, select the item: DIAGNOSIS / ENHANCED OBD / ENGINE AND ECT / DTC INFO / CURRENT CODES.
- (e) Read DTCs.

### Result:

Display (DTC output)	Proceed to
P0101 and other DTCs	A
P0101	B

### HINT:

If any other codes besides P0101 are output, perform troubleshooting for those DTCs first.

**B**

**REPLACE MASS AIR FLOW METER**

**A**

**GO TO RELEVANT DTC CHART (See page [05-55](#))**