

<b>DTC</b>	<b>P0101</b>	<b>Mass Air Flow Circuit Range / Performance Problem</b>
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**DESCRIPTION**

Refer to DTC P0100 (see page [ES-75](#)).

DTC No.	DTC Detection Condition	Trouble Area
P0101	<ul style="list-style-type: none"> <li>• High voltage: Conditions (a), (b) and (c) continue for more than 10 seconds (2 trip detection logic): (a) Engine speed less than 2,000 rpm (b) Engine coolant temperature 70°C (158°F) or higher (c) Output voltage of Mass Air Flow (MAF) meter more than specified value example 2.2 V at throttle position equal to 0 (varies with throttle position sensor voltage)</li> <li>• Low voltage: Conditions (a) and (b) continue for more than 10 seconds (2 trip detection logic): (a) Engine speed more than 300 rpm (b) Output voltage of MAF meter less than specified value example 0.65 V at throttle position equal to 0 (varies with throttle position sensor voltage)</li> </ul>	Mass Air Flow (MAF) meter

**ES****MONITOR DESCRIPTION**

The MAF meter is a sensor that measures the amount of air flowing through the throttle valve. The ECM uses this information to determine the fuel injection time and to provide an appropriate air-fuel ratio. Inside the MAF meter, there is a heated platinum wire which is exposed to the flow of intake air. By applying a specific electrical current to the wire, the ECM heats it to a specific temperature. The flow of incoming air cools both the wire and an internal thermistor, affecting their resistance. To maintain a constant current value, the ECM varies the voltage applied to these components of the MAF meter. The voltage level is proportional to the airflow through the sensor, and the ECM uses it to calculate the intake air volume. If there is a defect in the sensor, or an open or short in the circuit, the voltage level deviates from the normal operating range. The ECM interprets this deviation as a malfunction in the MAF meter and sets the DTC. Example:

If the voltage is more than 2.2 V, or less than 0.65 V while idling, the ECM determines that there is a malfunction in the MAF meter and sets the DTC.

**MONITOR STRATEGY**

Related DTCs	P0101: Mass air flow meter rationality
Required Sensors/Components (Main)	Mass air flow meter
Required Sensors/Components (Related)	Engine speed sensor, engine coolant temperature sensor and throttle position sensor
Frequency of Operation	Continuous
Duration	10 seconds
MIL Operation	2 driving cycles
Sequence of Operation	None

**TYPICAL ENABLING CONDITIONS**

Monitor runs whenever following DTCs not present	P0115 - P0118 (ECT sensor) P0120 - P0123 (TP sensor) P0125 (insufficient ECT for closed loop) P0335 (crankshaft position sensor) P0340 (camshaft position sensor)
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**Mass Air Flow Meter Rationality (High Voltage):**

Engine speed	Less than 2,000 rpm
Engine coolant temperature	70°C (158°F) or more

**Mass Air Flow Meter Rationality (Low Voltage):**

Engine speed	More than 300 rpm
Fuel cut	OFF

**TYPICAL MALFUNCTION THRESHOLDS**

**Mass Air Flow Meter Rationality (High Voltage):**

Mass air flow meter voltage	More than 2.2 V (varies with throttle position sensor voltage)
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**Mass Air Flow Meter Rationality (Low Voltage):**

Mass air flow meter voltage	Less than 0.65 V (varies with throttle position sensor voltage)
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**ES**

**WIRING DIAGRAM**

Refer to DTC P0100 (see page [ES-77](#)).

**HINT:**

Read freeze frame data using the intelligent tester. Freeze frame data records the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, 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 ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0101)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON and turn the tester ON.
- (c) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- (d) Read DTCs.

**Result**

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

**HINT:**

If any DTCs other than P0101 are output, troubleshoot those DTCs first.

**B** → **REPLACE MASS AIR FLOW METER**

**A**

**GO TO DTC CHART**