

DTC	P0101	Mass or Volume Air Flow Circuit Range / Performance Problem
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DESCRIPTION

Refer to DTC P0100 (See page [ES-89](#)).

DTC No.	DTC Detection Conditions	Trouble Areas
P0101	<ul style="list-style-type: none"> • High voltage: Conditions (a), (b) and (c) continue for more than 10 seconds (2 trip detection logic) <ul style="list-style-type: none"> (a) Engine speed less than 2,000 rpm (b) Engine coolant temperature 70°C (158°F) or higher (c) Voltage output of Mass Air Flow (MAF) meter more than 2.2 V (varies with Throttle Position [TP] sensor voltage) • Low voltage: Conditions (a) and (b) continue for more than 10 seconds (2 trip detection logic) <ul style="list-style-type: none"> (a) Engine speed more than 300 rpm (b) Voltage output of MAF meter less than 0.83 V (varies with TP sensor voltage) 	<ul style="list-style-type: none"> • MAF meter

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 0.83 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)	Crankshaft position 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 - P0223, P2135 (TP sensor) P0125 (insufficient ECT for closed loop) P0335 (CKP sensor) P0340 (CMP 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 voltage	4.9 V or less

Mass Air Flow Meter Rationality (Low Voltage):

Engine speed	More than 300 rpm
Mass air flow meter voltage	0.2 V or more
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 0.83 V (varies with throttle position sensor voltage)
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WIRING DIAGRAM

Refer to DTC P0100 (See page [ES-91](#)).

HINT:

Read freeze frame data using an intelligent tester. Freeze frame data record 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)
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- (a) Connect an intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the tester ON.
- (d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
- (e) 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
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A

GO TO DTC CHART
