

<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 DTCs P0100 on page [05-65](#).

DTC No.	DTC Detection Condition	Trouble Area
P0101	After engine is warmed up, conditions (a) to (d) continue for more than 10 seconds (2 trip detection logic): (a) Engine speed less than 900 rpm (b) Throttle valve fully closed (c) Mass air flow sensor output greater than 2.2 V (d) Engine coolant temperature higher than 70°C (158°F)	• Mass air flow sensor
	Conditions (a) and (b) continue for more than 6 seconds: (2 trip detection logic) (a) VTA greater than 0.1 V (b) Mass air flow sensor output less than 0.4 V	

## MONITOR DESCRIPTION

The MAF (Mass Air Flow) sensor 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 provides a proper air-fuel ratio. Inside the MAF sensor, 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 thermister, changing their resistance. To maintain a constant current value, the ECM varies the voltage applied to these components in the MAF sensor. 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 outside the normal operating range. The ECM interprets this deviation as a defect in the MAF sensor 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 sensor and sets a DTC.

## MONITOR STRATEGY

Related DTCs	P0101	Mass air flow sensor rationality
Required sensors/components	Main sensors	Mass air flow sensor
	Related sensors	Engine speed sensor, engine coolant temperature sensor, throttle position sensor
Frequency of operation	Continuous	
Duration	10 seconds (high voltage) 6 seconds (Low voltage)	
MIL operation	2 driving cycles	
Sequence of operation	None	

## TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The monitor will run whenever the following DTCs are not present	See "List of Disable a Monitor" (On page 05-25)	
<b>High voltage:</b>		
Engine speed	–	900 rpm
Idle	ON	
Engine coolant temperature	70°C (158°F)	–
<b>Low voltage:</b>		
Engine speed	0 rpm	–
Throttle position	0.1 V	–

## TYPICAL MALFUNCTION THRESHOLDS

Detection Criteria	Threshold
Mass air flow sensor voltage (high voltage)	More than 2.2 V
Mass air flow sensor voltage (low voltage)	Less than 0.4 V

## WIRING DIAGRAM

Refer to DTC P0100 on page 05-65.

## INSPECTION PROCEDURE

### HINT:

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

- Connect the hand-held tester or the OBD II scan tool to the DLC3.
- Turn the ignition switch ON and push the hand-held tester or the OBD II scan tool main switch ON.
- Select the item "DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES".
- Read the DTCs.

### Result:

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

### HINT:

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

**B** → REPLACE MASS AIR FLOW SENSOR

**A**

**GO TO RELEVANT DTC CHART (See page 05-35)**