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

DESCRIPTION

Refer to DTC P0100 (See page ES-116).

DTC No.	DTC Detection Condition	Trouble Area
P0101	1. High voltage: Conditions (a), (b) and (c) continue for more than 10 seconds (2 trip detection logic): (a) Engine speed is less than 2000 rpm (b) Engine coolant temperature is 70°C (158°F) or higher (c) Voltage output of Mass Air Flow (MAF) meter is more than 1.24 V (varies with Throttle Position [TP] sensor voltage) 2. Low voltage: Conditions (a) and (b) continue for more than 10 seconds (2 trip detection logic): (a) Engine speed is more than 300 rpm (b) Voltage output of MAF meter is less than 0.80 V (varies with TP sensor voltage)	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, changing 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 air flow 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 0.73 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 times
MIL Operation	2 driving cycles
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever these DTCs are not present	P0115, P0116, P0117, P0118 (ECT Sensor), P0120, P0121, P0122, P0123, P0220, P0222, P0223, P2135 (TP Sensor), P0125 (Insufficient ECT for Closed Loop), P0335 (CKP Sensor), P0340 (CMP Sensor)
Throttle position (TP sensor voltage)	0.24 V or more

Engine	Running
Battery voltage	10.5 V or more
ECT	70°C (158°F) or more
IAT sensor current	OK
ECT sensor current	OK
CKP sensor current	OK
TP sensor current	OK
FTP sensor	OK
EVAP leak detection pump	OK
EVAP vent valve	OK

TYPICAL MALFUNCTION THRESHOLDS

Averaged engine load	Less than 0.80 %, or more than 1.24 %

WIRING DIAGRAM

Refer to DTC P0100 (See page ES-118).

INSPECTION PROCEDURE

HINT:
Read freeze frame data using the intelligent tester. The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air-fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.

1	CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0101)

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch to the ON position.
(c) Turn the tester on.
(d) Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
(e) Read the 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 (See page ES-504)**

A

GO TO DTC CHART (See page ES-56)