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**Document ID# 691230
2002 Chevrolet Blazer - 4WD**

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DTC P0101

Circuit Description

The mass air flow (MAF) sensor is an air flow meter that measures the amount of air entering the engine. The powertrain control module (PCM) uses the MAF sensor signal in order to provide the correct fuel delivery for a wide range of engine speeds and loads. A small quantity of air entering the engine indicates a deceleration or idle. A large quantity of air entering the engine indicates an acceleration or high load condition. The MAF sensor has the following circuits:

- An ignition 1 voltage circuit
- A ground circuit
- A signal circuit

The PCM applies a voltage to the sensor on the signal circuit. The sensor uses the voltage in order to produce a frequency based on inlet air flow through the sensor bore. The frequency varies within a range of around 2,000 Hertz at idle to about 10,000 Hertz at maximum engine load. The PCM uses the following sensor inputs in order to calculate a predicted MAF value:

- The manifold absolute pressure (MAP)
- The intake air temperature (IAT)
- The engine speed (RPM)

The PCM compares the actual MAF sensor frequency signal to the predicted MAF value. This comparison will determine if the signal is stuck based on a lack of variation, or is too low or too high for a given operating condition. DTC P0101 sets if the actual MAF sensor frequency signal is not within a predetermined range of the calculated MAF value.

Conditions for Running the DTC

- DTCs P0102, P0103, P0106, P0107, P0108, P0112, P0113, P0121, P0122, P0123, P0335, P0336, P0401, P0440, P0442, P0443, P0446, P0449, P1106, P1107, P1111, P1112, P1121, P1122, and P1441 are not set.
- The engine is running.
- The ignition 1 signal is between 11-18 volts.
- The throttle position (TP) sensor angle is less than 95 percent.
- The change in the TP sensor angle is less than 5 percent.
- The MAP sensor is less than 80 kPa.
- The change in the MAP sensor is less than 3 kPa.
- The above conditions are met for 1.5 seconds.

Conditions for Setting the DTC

The PCM detects that the actual MAF sensor frequency signal is not within a predetermined range of the

calculated MAF value for more than 4.0 seconds.

Diagnostic Aids

Inspect for the following conditions:

- An incorrectly routed harness. Inspect the harness of the MAF sensor in order to verify that it is not routed too close to the following components:
 - The secondary ignition wires or coils
 - Any solenoids
 - Any relays
 - Any motors
- The throttle plate for sticking, or for deposits on the throttle plate or in the throttle bore.
- A low minimum air rate through the sensor bore may cause this DTC to set at idle or during deceleration. Inspect for any vacuum leaks downstream of the MAF sensor.
- A wide open throttle (WOT) acceleration from a stop should cause the MAF sensor g/s display on the scan tool to increase rapidly. This increase should be from 6-12 g/s at idle to 130 g/s or more at the time of the 1-2 shift. If the increase is not observed, inspect for a restriction in the induction system or the exhaust system.
- The barometric pressure that is used in order to calculate the predicted mass air flow value is initially based on the MAP sensor at key ON. When the engine is running the MAP sensor value is continually updated near wide open throttle. A skewed MAP sensor will cause the calculated mass air flow value to be inaccurate. The value shown for the MAP sensor display varies with the altitude. With the ignition ON and the engine OFF, 103 kPa is the approximate value near sea level. This value will decrease by approximately 3 kPa for every 305 meters (1,000 feet) of altitude.
- A high resistance on the ground circuit of the MAP sensor may cause this DTC to set.
- Any loss of vacuum to the MAP sensor may cause this DTC to set.
- A high resistance in the ignition voltage circuit of the MAF sensor may cause this DTC to set.

If you suspect the condition may be related to aftermarket accessories, refer to [Checking Aftermarket Accessories](#) in Wiring Systems.

If the condition is intermittent, refer to [Intermittent Conditions](#) .

Test Description

The numbers below refer to the step numbers on the diagnostic table.

4. This step will determine if the MAP sensor voltage is within the proper range at idle.
5. This step will determine if the MAP sensor responds properly to the change in manifold pressure.
6. This step will determine if the throttle position (TP) sensor is operating properly.
7. This step will determine if any mechanical faults have caused this DTC to set.

Step	Action	Values	Yes	No
<i>Schematic Reference:</i> Engine Controls Schematics				

1	Did you perform the Diagnostic System Check-Engine Controls ?	--	Go to Step 2	Go to Diagnostic System Check - Engine Controls
2	<ol style="list-style-type: none"> 1. Start the engine. 2. Monitor the Diagnostic Trouble Code (DTC) Information with the scan tool. <p>Does the scan tool display any other DTCs set?</p>	--	Go to Diagnostic Trouble Code (DTC) List	Go to Step 3
3	<ol style="list-style-type: none"> 1. Observe the Freeze Frame/Failure Records data for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text or as close to the Freeze Frame/Failure Records data that you observed. <p>Does the DTC fail this ignition?</p>	--	Go to Step 4	Go to Diagnostic Aids
4	<ol style="list-style-type: none"> 1. Allow the engine to reach operating temperature. 2. Observe the MAP sensor voltage with a scan tool . <p>Is the MAP sensor voltage within the specified range?</p>	0.8-4V	Go to Step 5	Go to DTC P0106
5	<ol style="list-style-type: none"> 1. Idle the engine. 2. Observe the MAP sensor kPa with a scan tool. 3. Increase the engine speed slowly to 3,000 RPM and then back to idle. <p>Does the MAP sensor kPa change smoothly and gradually through the specified range of the test?</p>	--	Go to Step 6	Go to DTC P0106
6	<p>Important:</p> <p>If the vehicle is equipped with throttle actuator control (TAC), proceed to the next step.</p> <ol style="list-style-type: none"> 1. Turn OFF the ignition. 2. Turn ON the ignition, with the engine OFF. 3. Observe the TP sensor angle from closed throttle to wide open throttle (WOT). 4. Depress completely and then release the accelerator pedal. <p>Does the scan tool indicate that the TP sensor angle changed smoothly and completely through</p>	0-100%		

	the specified range of the test?		Go to Step 7	Go to DTC P0121
7	<p>Inspect for the following conditions:</p> <ul style="list-style-type: none"> • A restricted air intake duct • A collapsed air intake duct • A misaligned air intake duct • A dirty air filter element • A deteriorating air filter element • Any objects blocking the air inlet screen of the MAF sensor • Any debris on the sensing elements of the MAF sensor • Any vacuum leak downstream of the MAF sensor • A poor vacuum connection at the MAP sensor • A restricted exhaust system <p>Did you find and correct the condition?</p>	--	Go to Step 10	Go to Step 8
8	<p>Test for an intermittent and for a poor connection at the MAF sensor. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 10	Go to Step 9
9	<p>Replace the MAF sensor. Refer to Mass Air Flow (MAF) Sensor Replacement .</p> <p>Did you complete the replacement?</p>	--	Go to Step 10	--
10	<ol style="list-style-type: none"> 1. Use the scan tool in order to clear the DTCs. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. <p>Does the DTC run and pass?</p>	--	Go to Step 11	Go to Step 2
11	<p>With a scan tool, observe the stored information, Capture Info.</p> <p>Does the scan tool display any DTCs that you have not diagnosed?</p>	--	Go to Diagnostic Trouble Code (DTC) List	System OK

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