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**Document ID# 1274004  
2004 Chevrolet Blazer - 4WD**

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# DTC P0102

## 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 to provide the correct fuel delivery for all engine speeds and loads. A small quantity of air entering the engine indicates a deceleration or idle condition. 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 to produce a frequency based on the inlet air flow through the sensor bore. The frequency varies within a range of near 2,000 Hertz at idle to near 10,000 Hertz at maximum engine load. If the PCM detects the frequency signal is less than the possible range of a correctly operating MAF sensor DTC P0102 sets.

## Conditions for Running the DTC

- The engine is running.
- The engine speed is more than 400 RPM.
- The ignition 1 signal is more than 8 volts.
- The MAF sensor frequency is stable for more than 0.7 second.

## Conditions for Setting the DTC

The PCM detects that the MAF sensor frequency signal is less than 1,200 Hz.

## Action Taken When the DTC Sets

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

## Conditions for Clearing the MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.

- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

### Diagnostic Aids

- Inspect the harness of the MAF sensor 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
- Inspect for any contamination or debris on the sensing elements of the MAF sensor.
- A wide-open throttle acceleration from a stop should cause the MAF sensor parameter on the scan tool to increase rapidly. This increase should be from 3-10 g/s at idle to 150 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.
- A high resistance of 15 Ohms or more on the ground circuit or the ignition 1 circuit of the MAF sensor may cause this DTC to set. A high resistance may cause a driveability concern before this DTC sets.

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

### Test Description

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

- This step will determine if any mechanical faults have caused this DTC to set.
- This voltage drop test will determine if high resistance has caused this DTC to set.
- This step verifies the voltage signal from the PCM to the MAF sensor connector.
- This step tests the signal circuit of the MAF sensor for a short to another 5-volt reference circuit.
- This step will determine if the PCM is able to process the frequency signal that it receives from the MAF sensor.
- This step will determine which portion of the circuit or which component is shorted to ground.
- This step verifies that the signal circuit is not shorted to any other PCM circuit.

Step	Action	Values	Yes	No
<i>Schematic Reference:</i> <a href="#">Engine Controls Schematics</a>				
<i>Connector End View Reference:</i> <a href="#">Engine Controls Connector End Views</a> or <a href="#">Powertrain Control Module (PCM) Connector End Views</a>				
1	Did you perform the Diagnostic System Check-Engine Controls?	--		Go to <a href="#">Diagnostic System Check -</a>

			Go to <a href="#">Step 2</a>	<a href="#">Engine Controls</a>
2	<ol style="list-style-type: none"> <li>1. Start the engine.</li> <li>2. Observe the MAF Sensor parameter with a scan tool.</li> </ol> <p>Is the MAF Sensor parameter less than the specified value?</p>	1,200 Hz	Go to <a href="#">Step 4</a>	Go to <a href="#">Step 3</a>
3	<ol style="list-style-type: none"> <li>1. Observe the Freeze Frame/Failure Records for this DTC.</li> <li>2. Turn OFF the ignition for 30 seconds.</li> <li>3. Start the engine.</li> <li>4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records.</li> </ol> <p>Did the DTC fail this ignition?</p>	--	Go to <a href="#">Step 4</a>	Go to Diagnostic Aids
4	<ol style="list-style-type: none"> <li>1. Observe the MAF Sensor parameter with a scan tool.</li> <li>2. Move the harness and the connector of the mass air flow (MAF) sensor.</li> </ol> <p>Does the movement of the harness or the connector affect the MAF Sensor parameter?</p>	--	Go to <a href="#">Step 20</a>	Go to <a href="#">Step 5</a>
<a href="#">5</a>	<ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Inspect for the following conditions: <ul style="list-style-type: none"> <li>○ A restricted or collapsed air intake duct</li> <li>○ A misaligned air intake duct</li> <li>○ A dirty or deteriorating air filter element</li> <li>○ Any objects blocking the air inlet screen of the MAF sensor</li> <li>○ Any contamination or debris on the sensing elements of the MAF sensor</li> </ul> </li> </ol> <p>Did you find and correct the condition?</p>	--	Go to <a href="#">Step 28</a>	Go to <a href="#">Step 6</a>
6	<p>Inspect the fuse in the ignition 1 voltage circuit of the MAF sensor.</p> <p>Is the fuse open?</p>	--	Go to <a href="#">Step 14</a>	Go to <a href="#">Step 7</a>
	<ol style="list-style-type: none"> <li>1. Turn ON the ignition, with the engine OFF.</li> <li>2. Measure the battery voltage with a DMM.</li> <li>3. Disconnect the MAF sensor.</li> <li>4. Connect a test lamp between the ignition 1 voltage circuit of the MAF sensor and a good ground. Refer to <a href="#">Probing Electrical</a></li> </ol>			

7	<p><a href="#">Connectors</a> in Wiring Systems.</p> <p>5. Connect the DMM to the probe of the test lamp and a good ground. Refer to <a href="#">Measuring Voltage Drop</a> and <a href="#">Circuit Testing</a> in Wiring Systems.</p> <p>Is the voltage within 0.50 volts of the specified value?</p>	B+	Go to <a href="#">Step 8</a>	Go to <a href="#">Step 21</a>
8	<p><b>Important</b></p> <p>All electrical components and accessories must be turned OFF.</p> <p>1. Turn OFF the ignition for 60 seconds to allow the control modules to power down.</p> <p>2. Measure the resistance from the ground circuit of the MAF sensor to a good ground with a DMM. Refer to <a href="#">Circuit Testing</a> in Wiring Systems.</p> <p>Is the resistance less than the specified value?</p>	5 ohms	Go to <a href="#">Step 9</a>	Go to <a href="#">Step 22</a>
9	<p>1. Turn ON the ignition, with the engine OFF.</p> <p>2. Measure the voltage from the signal circuit of the MAF sensor to a good ground with a DMM. Refer to <a href="#">Circuit Testing</a> in Wiring Systems.</p> <p>Is the voltage within the specified range?</p>	4.8-5.2 V	Go to <a href="#">Step 10</a>	Go to <a href="#">Step 13</a>
10	<p>1. Connect a 3-amp fused jumper wire between the signal circuit of the MAF sensor and a good ground. Refer to <a href="#">Circuit Testing</a> in Wiring Systems.</p> <p>2. Start the engine.</p> <p>3. Observe the DTC Information with a scan tool.</p> <p>Do any additional DTCs set?</p>	--	Go to <a href="#">Step 24</a>	Go to <a href="#">Step 11</a>
11	<p>1. Turn OFF the ignition.</p> <p>2. Connect the voltage supply and the ground lead of the <a href="#">J 38522</a> Variable Signal Generator to the vehicle.</p> <p>3. Connect the red lead of the <a href="#">J 38522</a> to the signal circuit of the MAF sensor. Refer to <a href="#">Probing Electrical Connectors</a> in Wiring Systems.</p> <p>4. Set the Duty Cycle switch of the <a href="#">J 38522</a> to Normal.</p> <p>5. Set the Frequency switch of the <a href="#">J 38522</a> to 5 K.</p>	4950-5025 Hz		

	<p>6. Set the Signal switch of the <a href="#">J 38522</a> to 5 V.</p> <p>7. Start the engine.</p> <p>8. Observe the MAF Sensor parameter with a scan tool.</p> <p>Is the MAF Sensor parameter within the specified range?</p>		Go to <a href="#">Step 12</a>	Go to <a href="#">Step 15</a>
12	<p><b>Important</b></p> <p>An abnormal resistance on the signal circuit will disable the MAF sensor frequency before the voltage starts to drop out of the correct parameter of 4.8-5.2 V.</p> <p>1. Turn OFF the ignition.</p> <p>2. Disconnect the powertrain control module (PCM).</p> <p>3. Test the MAF sensor signal circuit for a high resistance. Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to <a href="#">Step 28</a>	Go to <a href="#">Step 18</a>
13	Is the voltage less than the specified value?	4.8 V	Go to <a href="#">Step 15</a>	Go to <a href="#">Step 16</a>
14	<p><b>Important:</b></p> <p>The ignition 1 voltage circuit of the MAF sensor is spliced to other components of the vehicle.</p> <p>Test the ignition 1 voltage circuit for a short to ground. Refer to <a href="#">Testing for Short to Ground</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to <a href="#">Step 28</a>	--
15	<p>1. Turn OFF the ignition.</p> <p>2. Disconnect the PCM.</p> <p>3. Test the signal circuit between the PCM and the MAF sensor for the following conditions:</p> <ul style="list-style-type: none"> <li>○ A high resistance</li> <li>○ An open circuit</li> <li>○ A short to ground</li> </ul> <p>Refer to <a href="#">Circuit Testing</a> and <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to <a href="#">Step 28</a>	Go to <a href="#">Step 17</a>
	<p><b>Important:</b></p> <p>Disconnecting the PCM connectors may eliminate</p>			

16	<p>the short to voltage if the signal circuit is shorted to another PCM circuit.</p> <ol style="list-style-type: none"> <li>1. Turn OFF the ignition.</li> <li>2. Disconnect the PCM.</li> <li>3. Turn ON the ignition, with the engine OFF.</li> <li>4. Measure the voltage from the signal circuit of the MAF sensor to a good ground with a DMM. Refer to <a href="#">Circuit Testing</a> in Wiring Systems.</li> </ol> <p>Is the voltage more than the specified value?</p>	0 V	Go to <a href="#">Step 23</a>	Go to <a href="#">Step 17</a>
17	<p>Measure the resistance from the signal circuit of the MAF sensor to all other circuits at both PCM connectors with a DMM. Refer to <a href="#">Circuit Testing</a> in Wiring Systems.</p> <p>Is the resistance less than the specified value?</p>	$\infty$ ohms	Go to <a href="#">Step 25</a>	Go to <a href="#">Step 19</a>
18	<p>Test for an intermittent and for a poor connection at the MAF sensor. Refer to <a href="#">Testing for Intermittent and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to <a href="#">Step 28</a>	Go to <a href="#">Step 26</a>
19	<p>Test for an intermittent and for a poor connection at the PCM. Refer to <a href="#">Testing for Intermittent and Poor Connections</a> and <a href="#">Connector Repairs</a> in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to <a href="#">Step 28</a>	Go to <a href="#">Step 27</a>
20	<p>Repair the wiring or the connector as needed. Refer to <a href="#">Wiring Repairs</a> and <a href="#">Connector Repairs</a> in Wiring Systems.</p> <p>Did you complete the repair?</p>	--	Go to <a href="#">Step 28</a>	--
21	<p>Repair the high resistance or the open in the MAF sensor ignition 1 voltage circuit. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you complete the repair?</p>	--	Go to <a href="#">Step 28</a>	--
22	<p>Repair the high resistance or the open in the MAF sensor ground circuit. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems.</p> <p>Did you complete the repair?</p>	--	Go to <a href="#">Step 28</a>	--
	<p>Repair the short to voltage in the MAF sensor signal circuit. Refer to <a href="#">Wiring Repairs</a> in Wiring</p>			

23	Systems. Did you complete the repair?	--	Go to <a href="#">Step 28</a>	--
24	Repair the short between the MAF sensor signal circuit and the 5-volt reference circuit for which the DTC set. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	--	Go to <a href="#">Step 28</a>	--
25	Repair the circuits that are shorted together. Refer to <a href="#">Wiring Repairs</a> in Wiring Systems. Did you complete the repair?	--	Go to <a href="#">Step 28</a>	--
26	Replace the MAF sensor. Refer to <a href="#">Mass Air Flow (MAF) Sensor Replacement</a> . Did you complete the replacement?	--	Go to <a href="#">Step 28</a>	--
27	Replace the PCM. Refer to <a href="#">Powertrain Control Module (PCM) Replacement</a> . Did you complete the replacement?	--	Go to <a href="#">Step 28</a>	--
28	<ol style="list-style-type: none"> <li>1. Clear the DTCs with a scan tool.</li> <li>2. Turn OFF the ignition for 30 seconds.</li> <li>3. Start the engine.</li> <li>4. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records.</li> </ol> Did the DTC fail this ignition?	--	Go to <a href="#">Step 2</a>	Go to <a href="#">Step 29</a>
29	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	--	Go to <a href="#">Diagnostic Trouble Code (DTC) List</a>	System OK

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