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Document ID# 885596
2003 Chevrolet Chevy Suburban - 4WD

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DTC C0472 or C0473

Circuit Description

The steering wheel position sensor (SWPS) provides one analog signal and 3 digital signals. The digital signals, Phase A, Phase B and marker pulse, are direct inputs to the rear wheel steering control module. The analog signal is input to the BCM and is sent via a class 2 message to the rear wheel steering control module. Battery voltage is supplied to the sensor from the cruise fuse to operate the digital portion of the sensor.

A 12-volt reference is provided by the rear wheel steering control module to the Phase A, Phase B, and marker pulse circuits of the SWPS. The module monitors each circuit as it is either remains high or is pulled low by the SWPS

The scan tool displays the Phase A and Phase B Data parameters as either HIGH or LOW when the steering wheel is being rotated. Each change from HIGH to LOW, or LOW to HIGH, represents one degree of steering wheel rotation. When observing the Phase A and Phase B data with the scan tool, the parameters will not always display the same value at the same time.

The marker pulse is a digital pulse signal that is displayed as HIGH by the scan tool with the steering wheel angle between +10 degrees and -10 degrees. At greater than 10 degrees steering wheel angle in either direction, the marker pulse data will be displayed as LOW.

The BCM provides the 5-volt reference and low reference for the analog portion of the SWPS. The BCM reads the SWPS analog signal in voltage, which is typically 2.5-volt with the steering wheel on center. The voltage ranges from 0.25-volt at approximately one full turn left to 4.75-volt at approximately one full turn right. The voltage will then remain at that level for the remainder of steering wheel travel. This voltage can be monitored in BCM data display.

The rear wheel steering control module receives the analog signal via a class 2 message from the BCM. When monitoring the rear wheel steering data, this information is displayed in the Steering Wheel Angle (TBC) Data parameter, and is shown in degrees. The range of the display is +/- 225 degrees, with negative numbers representing steering input to the left, and positive numbers representing input to the right.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The BCM detects that the analog steering signal circuit is an open, shorted to ground or shorted to voltage.

Action Taken When the DTC Sets

The BCM sends a serial data message reporting the failed steering signal.

Conditions for Clearing the DTC

- A current DTC will clear when the malfunction is no longer present.
- A history DTC will clear after 100 consecutive malfunction free ignition cycles or when the scan tool Clear DTCs function is used.

Diagnostic Aids

Thoroughly inspect connections or circuitry that may cause an intermittent malfunction. Refer to [Testing for Electrical Intermittents](#) , [Testing for Intermittent and Poor Connections](#) , [Wiring Repairs](#) and [Connector Repairs](#) in Wiring Systems.

Test Description

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

4. This step checks the 5-volt reference and signal circuits. It also checks the ability of the BCM to read the signal circuit.
5. This step checks the integrity of the low reference circuit.
10. This step tests for excessive voltage on the 5-volt reference circuit.

Step	Action	Values	Yes	No
<i>Schematic Reference:</i> Body Control System Schematics in Body Control System				
<i>Connector End View Reference:</i> Rear Wheel Steering Connector End Views				
1	Did you perform the Rear Wheel Steering Diagnostic System Check?	--	Go to Step 2	Go to Diagnostic System Check - Rear Wheel Steering
2	<ol style="list-style-type: none"> 1. Use the scan tool to clear the DTC. 2. Start the engine. 3. With the engine running, turn the steering wheel back and forth from lock to lock. Does the DTC reset?	--	Go to Step 3	Go to Diagnostic Aids
3	<ol style="list-style-type: none"> 1. Turn the ignition OFF. 2. Disconnect the steering wheel position sensor harness connector. 3. Turn the ignition ON. 4. Select the Body Control Module Data List on the scan tool. 5. Observe the Analog SWPS Signal parameter on the scan tool. Does the scan tool indicate that the Steering Wheel Position Sensor Data parameter is less than specified	0.15 V	Go to	

	value?		Step 4	Go to Step 9
4	<p>1. Connect a 3-amp fused jumper wire between the steering wheel position 5-volt reference circuit and the analog steering signal circuit.</p> <p>2. Observe the Analog SWPS Signal parameter on the scan tool.</p> <p>Does the scan tool indicate that the Steering Wheel Position Sensor Data parameter is greater than specified value?</p>	4.75 V	Go to Step 5	Go to Step 6
5	<p>Use a DMM to measure the voltage between the steering wheel position 5-volt reference circuit and the steering wheel position low reference circuit.</p> <p>Does the voltage measure greater than the specified value?</p>	4.75 V	Go to Step 10	Go to Step 8
6	<p>Test the 5-volt reference circuit of the steering wheel position sensor for an open or short to ground. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 7
7	<p>Test the signal circuit of the steering wheel position sensor for an open or a short to ground. Refer to Testing for Short to Ground and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 12
8	<p>Test the low reference circuit of the steering wheel position sensor for an open. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 12
9	<p>Test the signal circuit of the steering wheel position sensor for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 14
10	<p>Test the 5-volt reference circuit of the steering wheel position sensor for a short to voltage. Refer to Circuit Testing and Wiring Repairs in Wiring Systems.</p> <p>Did you find and correct the condition?</p>	--	Go to Step 15	Go to Step 11
11	<p>Inspect for poor connections at the harness connector of the steering wheel position sensor. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems.</p>	--	Go to	

	Did you find and correct the condition?		Step 15	Go to Step 13
12	Inspect for poor connections at the harness connector of the BCM. Refer to Testing for Intermittent and Poor Connections and Connector Repairs in Wiring Systems. Did you find and correct the condition?	--	Go to Step 15	Go to Step 14
13	Important Perform the learn alignment procedure. Refer to Measuring Wheel Alignment Replace the steering wheel position sensor. Refer to Steering Wheel Position Sensor or Steering Shaft Lower Bearing Replacement in Steering Wheel and Column. Did you complete the replacement?	--	Go to Step 15	--
14	Important Perform the setup procedure for the BCM. Replace the BCM. Refer to Body Control Module Replacement in Body Control Systems. Did you complete the replacement?	--	Go to Step 15	--
15	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the conditions for running the DTC as specified in the supporting text. Does the DTC reset?	--	Go to Step 2	System OK

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