DTC C0522

Circuit Description

This circuit monitors the rear position sensor signals for an out-of-specified operating range in IGNITION and RUN. The rear wheel position sensor has 2 signal circuits: position 1 and position 2. Position 1 is a linear measurement of voltage per degree. The voltage range for position 1 is from 0.25 to 4.75 volts, and the angular measurement range is from - 600° to +600°. At 0.25 volts the steering wheel has been rotated -600° past center. At 4.75 volts the steerin wheel has been rotated +600° past center.

Position 2 circuit is a linear measurement of voltage per degree. The voltage for position 2 increases or decreases from 0.25 to 4.75 volts every 180° which is a half steering wheel rotation. When the steering wheel is 0° or at center, position 1 and position 2 output signals measure 2.5 volts respectively.

Conditions for Running the DTC

The ignition must be ON with the engine ON.

Conditions for Setting the DTC

- Position A signal or position B signal circuit on the rear position sensor must be less than 0.075 volts.
- Position A signal or position B signal circuit on the rear position sensor must be greater than 4.925 volts.
- The 5 volt reference circuit is open or shorted to ground.
- The position sensor ground circuit is open.

Action Taken When the DTC Sets

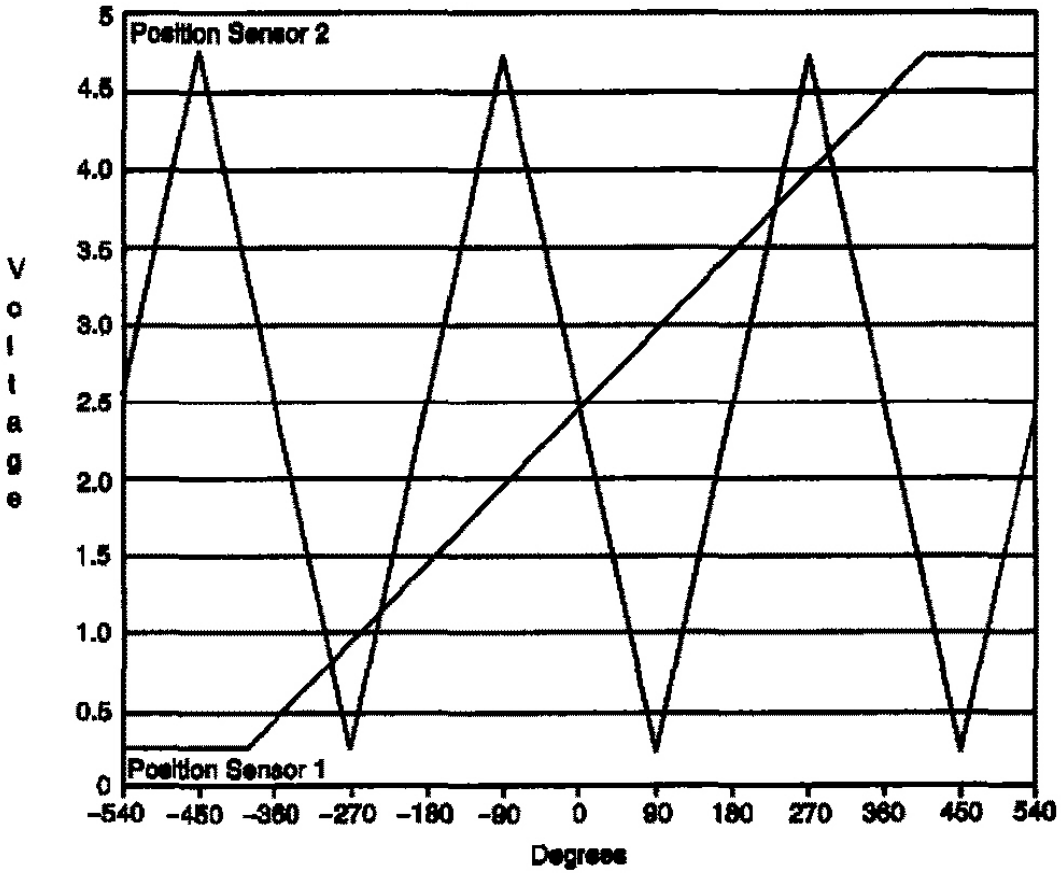
- The Service 4 Wheel Steer indicator in IPC will be displayed
- The code is displayed on the scan tool as DTC C0522.
- The output comm and to the motor is zeroed. The motor drive circuits are disabled using commands to open the power relay, and to close the motor shorting relay.
- The rear wheels will be returned to the centered position.

Conditions for Clearing the MIL/DTC

- Conditions for DTC are not currently present.
- The module receives a clear code comm and from the scan tool.
- A history DTC clears after 100 malfunction free ignition cycles.

Diagnostic Aids

- Use a DMM to check supply voltage.
- Use a DMM to measure the resistance. If the resistance at any of the items listed below are not in the specified range, replace the rear position sensor.
    - The resistance between the position 1 and the sensor ground circuit is 1720°.
    - The resistance between the position 1 and the 5 volt reference circuit is 1700°.
    - The resistance between the position 2 and the sensor ground circuit is 1780°.
    - The resistance between the position 2 and the 5 volt reference circuit is 1000°.
    - The resistance between the 5 volt reference circuit and the sensor ground circuit is 1780°.
- When the supply voltage is open or shorted to ground, position 1 and position 2 data parameter show 0 volts on the scan tool.
- When the ground circuit is open, position 1 and position 2 data parameter show 5 volts on the scan tool.
- Using the data display menu verify that the rear wheel position 1 has an output voltage range between 0.25--4.75 volts.
- Using the data display menu verify that the rear wheel position 2 has an output voltage range between 0.25-4.75 volts.
- Use a DMM to check resistance at the rear wheel position sensor. When the steering wheel is centered, the resistance between the rear wheel position sensor position 1 or position 2 signal and rear wheel position sensor ground is approximately 1,500°.
- Refer to **TESTING FOR INTERMITTENT and POOR CONNECTIONS** and Connector Repairs .
- Inspect the rear wheel position sensor for damage. If none is found then remove and inspect the sensor and coupler for damage or water intrusion. Refer to **Rear Position Sensor Replacement**. If water damage is found, refer to **Rack & Pinion Boot Replacement**.
- Rear Wheel Position Sensor Voltage--Rear Wheel Position Sensor Voltage 2 is at 2.5 volt when centered.
- Rear Wheel Position Sensor
- Rear Position Sensor Voltages



Rear Wheel Position Sensor Voltage Chart

Test Description

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

1) - This step requires the technician to perform the diagnostic procedure for the control module.

2) - The minimum high limit is the value of voltage above which the code will set. The maximum low limit is the value of voltage below which the code will set.

3) - Test for the proper operation of the position 1 or position 2 circuit in the high voltage range. Use a connector test adaptor kit in order to jumper the connections between the rear position sensor and the harness connector.

4) - Test for the proper operation of the position 1 or position 2 circuit in the high voltage range.

5) - Test for short to ground in the 5 volt reference circuit.

DTC C0522 Diagnosis

Step	Action	Values	Yes	No
1	Did you perform the Diagnostic System Check–Rear Wheel Steering?	—	Go to *Step 2*	Go to *Diagnostic System Check - Rear Wheel Steering*
2	1. Install a scan tool. 2. Turn the ignition switch to the ON position, with the engine OFF. 3. With a scan tool, observe the rear position sensor position 1 and the rear position sensor position 2 data parameters. Does the scan tool indicate that the position 1 and position 2 data parameter are within the specified range?	0.25-4.75 V	Go to Diagnostic Aids	Go to *Step 3*
3	1. Turn the ignition switch to the OFF position. 2. Disconnect the rear position sensor. 3. Jumper all of the circuits of the rear wheel position sensor to the harness connector of the rear position sensor using a connector test adaptor kit. 4. Disconnect the position 1 and position 2 circuit. 5. Turn the ignition switch to the ON position, with the engine OFF. 6. With a scan tool, observe the position 1 and the position 2 data parameters. Does the scan tool indicate that the position 1 or position 2 data parameter is greater than the specified value?	4.75 V	Go to *Step 4*	Go to *Step 8*
4	1. Turn the ignition switch to the ON position. with the engine OFF. 2. Connect the position 1 and the position 2 circuits. 3. Connect a 3 amp fused jumper wire between the sensor ground circuit of the rear position sensor and position 1 and position 2 of the rear position sensor. 4. Turn the ignition switch to the ON position. 5. With a scan tool, observe the position 1 and the position 2 data parameter. Does the scan tool indicate that the position 1 and/or the position 2 data parameter is less than the specified value?	0.25 V	Go to *Step 5*	Go to *Step 9*
5	1. Turn the ignition switch to the OFF position. 2. Disconnect the fused jumper wire. 3. Connect a 3 amp fused jumper wire between the 5 volt reference circuit of the rear position sensor and position 1 and position 2 of the rear position sensor. 4. Turn the ignition switch to the ON position. with the engine OFF. 5. With a scan tool, observe the position 1 and the position 2 data parameter. Does the scan tool indicate that the position 1 and/or position 2 data parameter is greater than the specified value?	4.75 V	Go to *Step 7*	Go to *Step 6*

Step	Action	Values	Yes	No
6	Test the 5 Volt reference circuit of the rear position sensor for a short to ground or an open. Refer to *Circuit Testing* and *Wiring Repairs* in Wiring Systems. Did you find and correct the condition?	—	Go to *Step 15*	Go to *Step 12*
7	Test the 5 volt reference circuit of the rear wheel position sensor for a short to voltage, a high resistance, or an open. Refer to *Circuit Testing* and *Wiring Repairs* in Wiring Systems. Did you find and correct the condition?	—	Go to *Step 15*	Go to *Step 11*
8	Test the position 1 and position 2 signal circuit of the rear wheel position sensor for a short to ground. Refer to *Circuit Testing* and to *Wiring Repairs* in Wiring Systems. Did you find and correct the condition?	—	Go to *Step 15*	Go to *Step 12*
9	Test the position 1 and position 2 signal circuit of the rear wheel position sensor for a short to voltage, a high resistance or a open. Refer to *Circuit Testing* and to *Wiring Repairs* in Wiring Systems. Did you find and correct the condition?	—	Go to *Step 15*	Go to *Step 10*
10	Test the ground circuit of the rear wheel position sensor for a high resistance or an open. Refer to *Circuit Testing* and to *Wiring Repairs* in Wiring Systems. Did you find and correct the condition?	—	Go to *Step 15*	Go to *Step 12*
11	Inspect for poor connections at the harness connector of the rear wheel position sensor. 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 13*
12	Inspect for poor connections at the harness connector of the rear wheel control module. Refer to *Testing for Intermittent and Poor Connections* and to *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 (With Rear Wheel Steering)* or *Measuring Wheel Alignment (Without Rear Wheel Steering)* in Wheel Alignment. Replace the rear wheel position sensor. Refer to *Rear Position Sensor Replacement*. Did you complete the replacement?	—	Go to *Step 15*	—
14	**Important:** Perform the Learn Alignment procedure. Refer to *Measuring Wheel Alignment (With Rear Wheel Steering)* or *Measuring Wheel Alignment (Without Rear Wheel Steering)* in Wheel Alignment. Replace the rear wheel steering module. Refer to *Rear Wheel Steering Control Module Replacement*. 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