TECH LINK

September 2022, Volume 24, No. 17

Checking for Exhaust System Leaks

Tail Lamp Water Leak

see page 4

Fine Tune Service Information Searches with RPO Data

see page 6

Checking for Exhaust System Leaks

Several DTCs set in the Engine Control Module (ECM) may be caused by an exhaust leak on some 2020-2022 Silverado 1500, Sierra 1500; 2021-2023 Tahoe, Suburban, Yukon and Escalade models equipped with the 3.0L Duramax diesel engine (RPO LM2). The exhaust leak will allow oxygen into the exhaust and result in an incorrect Nitrogen Oxide sensor reading.

The following DTCs may be set:

- P11D5: Nitrogen Oxides Sensor 2 Exceeded Minimum Learning Limit
- P14D9: NOx Sensor Exceeded Minimum Learning Limit Bank 1 Sensor 3
- P20EE: Nitrogen Oxides Catalytic Converter Efficiency Below Threshold
- P2C7A: Nitrogen Oxides Catalytic Converter 2 Efficiency Below Threshold
- P0421: Catalytic Converter Low Efficiency

Check for exhaust system leaks.

There are two different types of leak tests that can be performed on the induction or exhaust system — a smoke leak test where the area being tested is filled with pressurized smoke and the leak is detected by visually inspecting for smoke exiting the system or a pressure leak test where soapy water is applied to the outside of the area being tested and leaks are visually identified by the presence of bubbles forming over the leaking area. When determining which test to perform, consider that with a smoke

Seal the exhaust cooling ports.

Install the inflatable adapter from the GE-52250 machine.

CONTINUED ON PAGE 3

test, the smoke is often easy to see exiting relatively large leak locations but is harder to see exiting a smaller leak. Smoke also can be removed when it passes through the Diesel Particulate Filter (DPF). Using a pressure leak test, bubbles will form over a small leak, making it easy to spot, but it's difficult for a soap film to form over a large leak.

To help identify the location of the exhaust leak on the 3.0L diesel exhaust system, perform a leak test using the GE-52250 High Pressure Leak Detector.

Refer to Bulletin #22-NA-168 for details on using the GE-52250 High Pressure Leak Detector to locate the exhaust leak. The cooling ports in the exhaust system must be sealed off before installing the inflatable adapter from the GE-52250 machine.

In addition, check the joint between the rear Selective Catalyst Reduction (SCR) and the tail pipe. If there is a large leak at this joint, any smoke or pressure introduced during testing will escape. Seal the joint before testing.

Using the vapor test and the shop air supply along with a soapy water mixture, all connections, welds and sensors should be checked for air leaks. These areas include the turbocharger, NOx sensors, DEF injector and clamp connections.

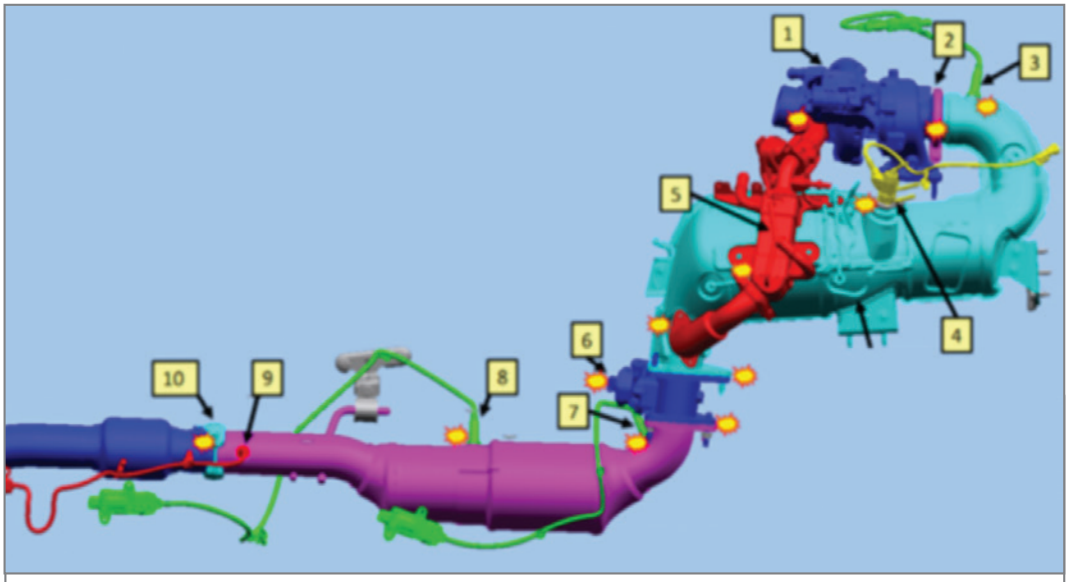
Exhaust clamp connection

TIP: A leak at the turbocharger vane actuator shaft or the EGR back-pressure valve actuator is considered a normal condition. Any smoke or bubbles from these areas should be ignored.

Once all leaks have been identified and corrections to the exhaust system have been made, verify that the exhaust is sealed by retesting with the GE-52250 High Pressure Leak Detector.

For additional information, refer to Bulletin #22-NA-168.

▶ Thanks to Larry Yaw



Areas that require inspection for leaks

Tail Lamp Water Leak

A rear tail lamp water leak on some 2018-2023 Equinox and Terrain models may result in a no start or extended crank condition, a drained battery, a fuel pump that runs with the key/ignition off or a Service Safety Restraints message on the Driver Information Center (DIC). DTC P12A6 (Fuel Pump Driver Control Module Enable Circuit Performance) and DTC B0073 (Passenger Seat Belt Switch Circuit) also may be set. These conditions may occur if there is water intrusion at the right-side tail lamp from a cracked or broken lens or housing.

Tail lamp damage may lead to connector issues.

Check for damage to the right-side tail lamp lens or housing. Water in the housing may migrate through the bulb connector wire strands to the X350 connector, the X320 connector or the Body Control Module (BCM).

If these conditions are found, inspect the tail lamp bulb connectors for signs of corrosion or water. Replace the tail lamp and bulb connector, if corroded.

TIP: Damaged tail lamps and wiring and/or connector issues caused by the damage are not warrantable repairs unless the tail lamp is found to be defective. Impact and collision damage is not a tail lamp defect.

X350 CONNECTOR

If DTC P12A6 is set, check connector X350, which is the Fuel Tank Harness to Body Harness connector under the vehicle. Corrosion in the connector may result in a no start or extended crank condition. The water intrusion also can short terminals together, which may cause the fuel pump to continue to run after the key/ignition is turned off and drain the battery.

If water intrusion or corrosion is found, replace the damaged connector with terminated leads on the body harness side and/or replace the fuel pump control module harness as needed.

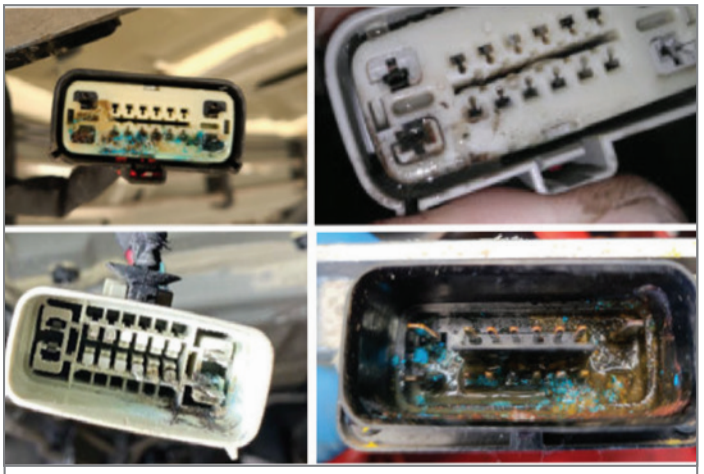
X320 CONNECTOR

If DTC B0073 is set or a Service Safety Restraints message is displayed on the DIC, check connector X320, Right Front Seat Harness to Body Harness, for any corrosion or water damage. Be sure to disable the SIR system prior to inspection. Make any wiring repairs as needed.

If there is water damage at either connector, also check the BCM connector for any signs of water intrusion. Refer to the appropriate Service Information for repairs to wiring, connectors and terminated leads.

If water intrusion or corrosion is not found, add dielectric grease to the connector and continue with diagnosis following the appropriate Service Information for the set DTC.

For additional information, refer to Bulletin #22-NA-170.

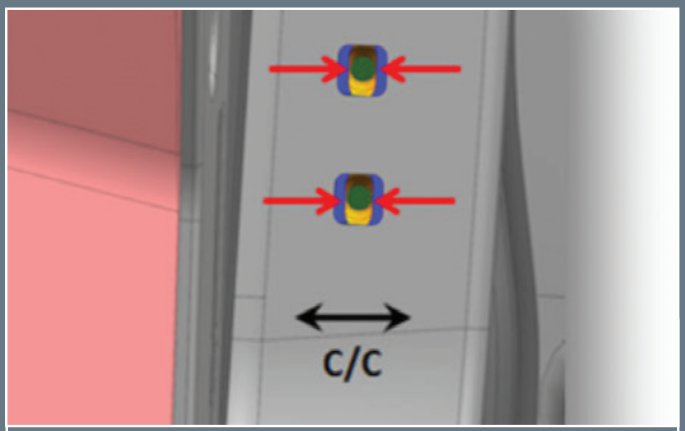


Check for connector damage from water intrusion.

▶ Thanks to Rob Smith

Full-Size SUV Rear Door Alignment

Some 2021-2023 Tahoe, Suburban, Yukon and Escalade models may have a right rear door that requires alignment. If the rear door is not flush or sticks out excessively at the bottom when closed, align the door following the alignment procedure in Bulletin #22-NA-179.



The upper and lower slots will need to be modified.

To align the rear door to specification, it will be necessary to remove the striker to gain access to the door striker net slots in the body. Both the upper and lower slots will need to be modified for proper door alignment.

Ensure the striker is properly positioned.

The bulletin details the modification procedure along with how to reinstall the striker. The striker must be parallel to the bodyside and not rotated. Closing the door flush to the mating panel will allow the door latch to position the final location of the striker.

Once the striker is properly positioned, the bolts can be torqued to specification. Alternate torquing is recommended to prevent the striker from rotating.

Refer to Bulletin #22-NA-179 for the complete alignment procedure and additional information.

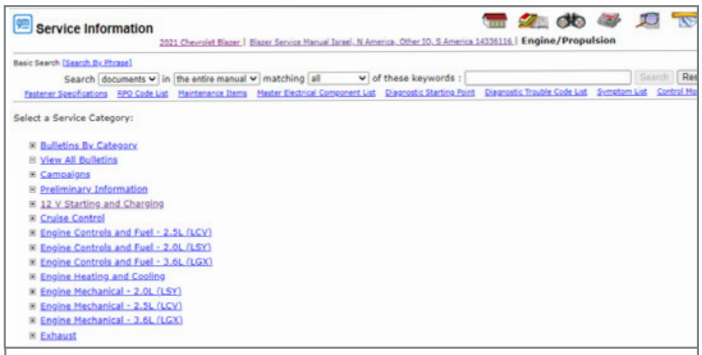
▶ **Thanks to Hassan Abdallah**

FINE TUNE

Service Information Searches with RPO Data

Technicians navigating in Service Information (SI) using the year, make and model (YMM) of a vehicle are used to seeing all service manual content for that vehicle displayed — that means every engine, every transmission, and every other system. However, there is a way to pare down some information when using SI that will deliver specific information for a particular vehicle.

A new feature of Service Information on some models beginning with model year 2021 is RPO filtering, which enables SI authors to associate RPO codes to publication subsections, information elements, bulletins and other SI data. After entering a Vehicle Identification Number (VIN), these RPO associations only display the content that applies to that VIN

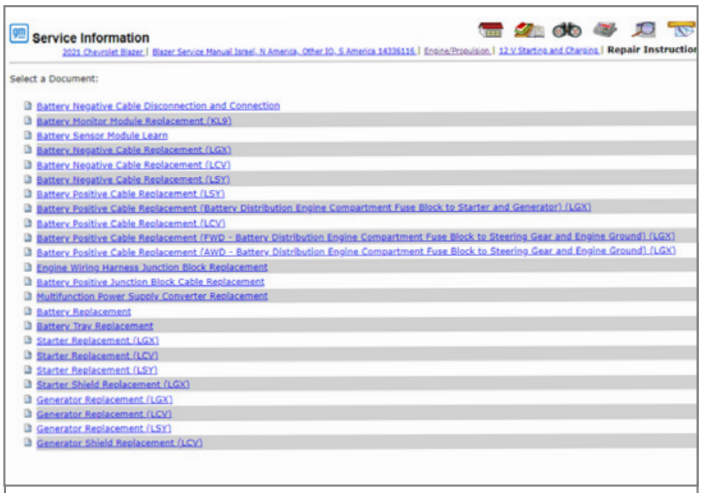


Navigating using year, make and model information returns all results.

Navigating using a VIN returns specific RPO results.

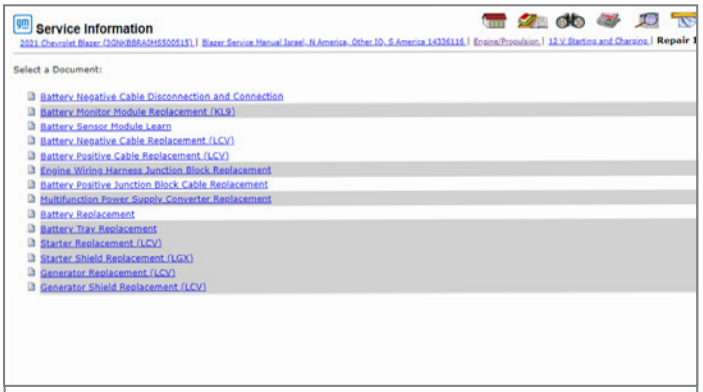
If RPO filtering is not available, all available content for the VIN or YMM will be displayed as it does today.

When reviewing the Repair Instructions document list when navigating using only year, make and model, it displays numerous procedures for a variety of RPOs.



Navigating using year, make and model information only in the Repair Instructions.

However, when navigating using a VIN, the Repair Instructions document list only displays the specific results related to the vehicle RPO data.



Navigating using a VIN returns specific RPO results in the Repair Instructions.

Implementation of the RPO authoring in Service Information will take a phased approach. Look for additional search results using RPO filtering coming soon.

Thanks to Heather Ball

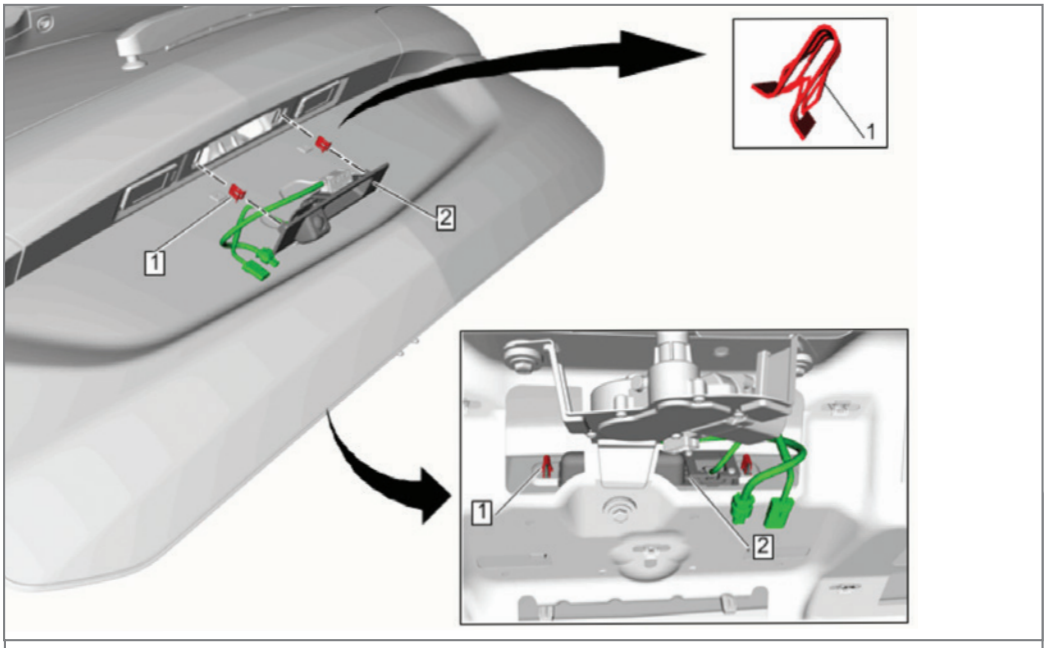
Intermittent Blue or Black Rearview Camera Screen

The rearview camera may be intermittently inoperable on some 2019-2022 Equinox and Terrain models. The digital HD rearview camera screen (RPO UVB, UV2) may display only a blue or black screen with an error message.

If these conditions are present, check the condition of the rearview camera harness connector. To access the connector, remove the rear closure fixed-handle applique on the liftgate.

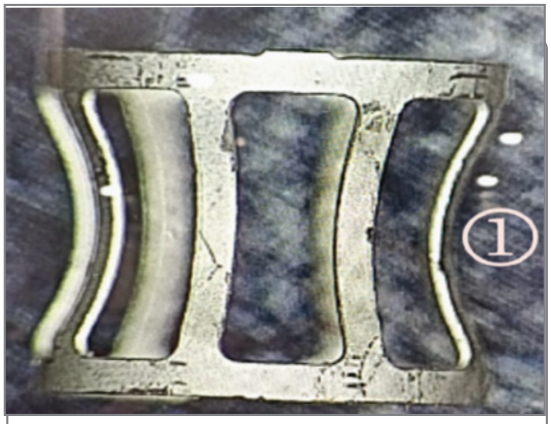
Disconnect the harness connector and inspect the connector contact area for the barrel spring. The barrel spring should be present in the cable inside the connector.

If the barrel spring is not present in the cable, replace the harness. If the barrel spring is present, follow the appropriate Service Information diagnostics.

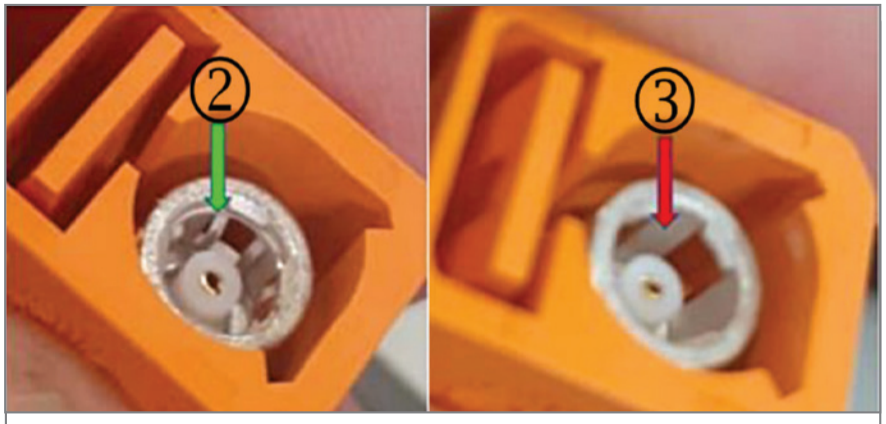


Remove the rear closure fixed-handle applique to access the connector (Equinox shown).

Refer to Bulletin #22-NA-177 for additional information.



Harness connector barrel spring



Cable connector with a barrel spring (#2) and without a barrel spring (#3).

▶ Thanks to Rob Smith

Lost Communication with Engine Coolant Pump

There may be a poor connection issue with the electric engine coolant pump on some 2019-2022 Silverado 1500, Sierra 1500; 2021-2022 CT4 and CT4-V models equipped with the 2.7L turbocharged engine (RPO L3B). The Check Engine MIL may be illuminated and DTC U0672 (Lost Communication with Engine Coolant Pump) may be set.

The electric coolant pump is attached to the side of the engine and controls the coolant flow, replacing the conventional belt- or chain-driven pump whose speed is directly coupled to engine speed. The coolant flow from the electric coolant pump is not related to engine speed but is independently controlled by the Engine Control Module to maintain an ideal engine operating temperature during all engine speeds and operating conditions.

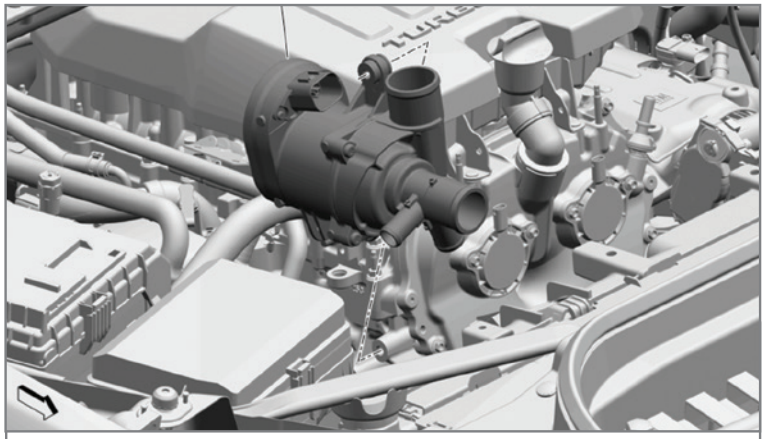
If DTC U0672 is set, check for any coolant pump-related wiring contamination, terminal tension or lock issues that may cause a poor connection and intermittent communication.

If the inspection of the wiring harness and connector does not identify any issues, cycle the electric engine coolant pump connection and clear DTC U0672. If the code resets, refer to the appropriate Service Information to further diagnostics. If the code does not reset, release the vehicle.

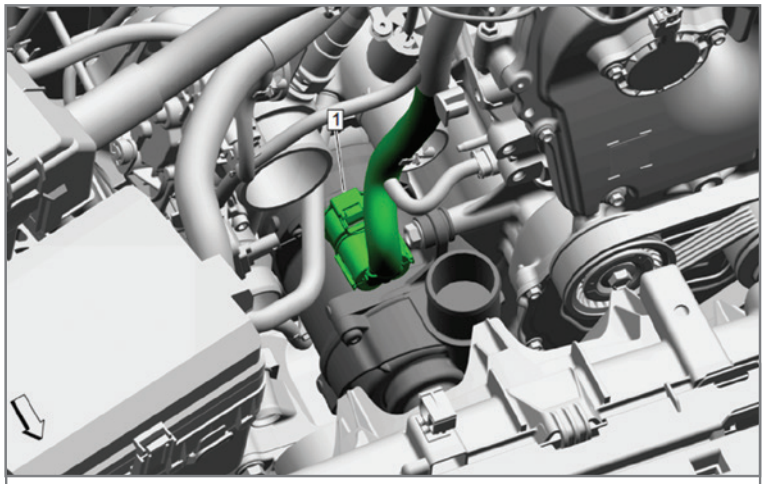
Do not replace any parts at this time. During warranty analysis, many coolant pumps that have been replaced have had no trouble found. Further information will be released when available.

Refer to #PIP5863 for additional information.

▶ Thanks to Raymond Haglund



Electric coolant pump



Connector at the electric coolant pump

Wheel Speed Sensor Inspection

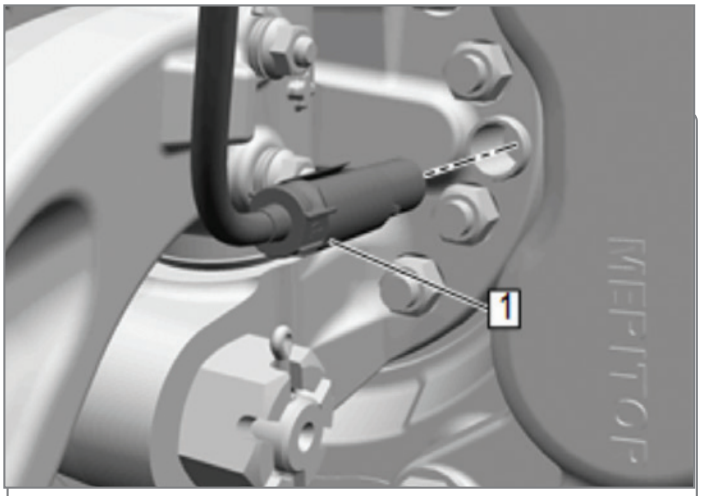
Some 2019-2022 Silverado 4500HD/5500HD/6500HD models may an illuminated ABS, traction control and/or brake warning MIL along with several DTCs set. These conditions may be due to an out-of-adjustment wheel speed sensor air gap, loose hub bearings, debris on the wheel speed sensor or a damaged reluctor ring.

Possible DTCs include:

- DTC C0500 or C0501 – Left Front Wheel Speed Sensor
- DTC C0506 or C0507 – Right Front Wheel Speed Sensor
- DTC C050C or C050D – Left Rear Wheel Speed Sensor
- DTC C0512 or C0513 – Right Rear Wheel Speed Sensor

Before replacing the wheel speed sensor, perform the following inspections to help determine the root cause of the condition:

- Check that all tires are the same size and tread wear is even.
- Inspect the harness to the wheel speed sensor for any signs of damage or a loose terminal interface.
- Inspect the wheel speed sensor air gap. Make sure it is adjusted per the wheel speed sensor replacement document in the appropriate Service Information. A large gap may lead to an erratic signal while no gap may produce noise. If the wheel speed sensor air gap is out of adjustment, remove, clean, reinstall and then test the wheel speed sensor. During installation, ensure the wheel speed sensor bottoms out on the reluctor ring inside the hub. The air gap will be established by the contact between the reluctor ring and the wheel speed sensor.



Front wheel speed sensor

- Clean any buildup of debris between the backing plate and the rotor, such as mud, ice, etc.
- Inspect for a loose wheel bearing and check the torque as specified in Service Information.
- Use an oscilloscope to look for any spikes in the wheel speed sensor pattern that may be caused by a damaged reluctor.

If no issues are found with any of these components, a new wheel speed sensor should be installed. Test drive the vehicle after any repairs to verify proper operation.

For more information, refer to #PIT5937.

Thanks to Jim Will

TECHLINK

GM TechLink is published for all GM retail technicians and service consultants to provide timely information to help increase knowledge about GM products and improve the performance of the service department.

Publisher:
Ravishankar Bommanahally
GM Customer Care and Aftersales

Editor:
Lisa G. Scott
GM Customer Care and Aftersales

Technical Editor:
Mark Spencer
mspencer@gpstrategies.com

Production Manager:
Marie Meredith

Creative Design:
5by5 Design LLC
dkelly@5by5dzign.com

Write to:
TechLink
PO Box 500, Troy, MI 48007-0500

GM TechLink on the Web:
GM GlobalConnect