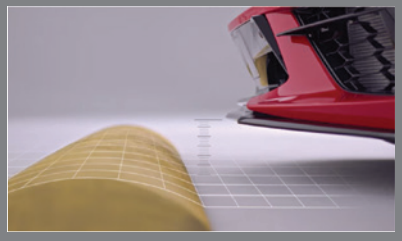
TECH LINK

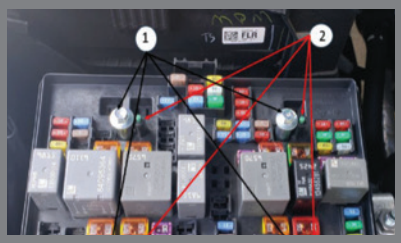
July 2020, Volume 22, No. 13

Corvette Cooling System Draining and Filling Tips



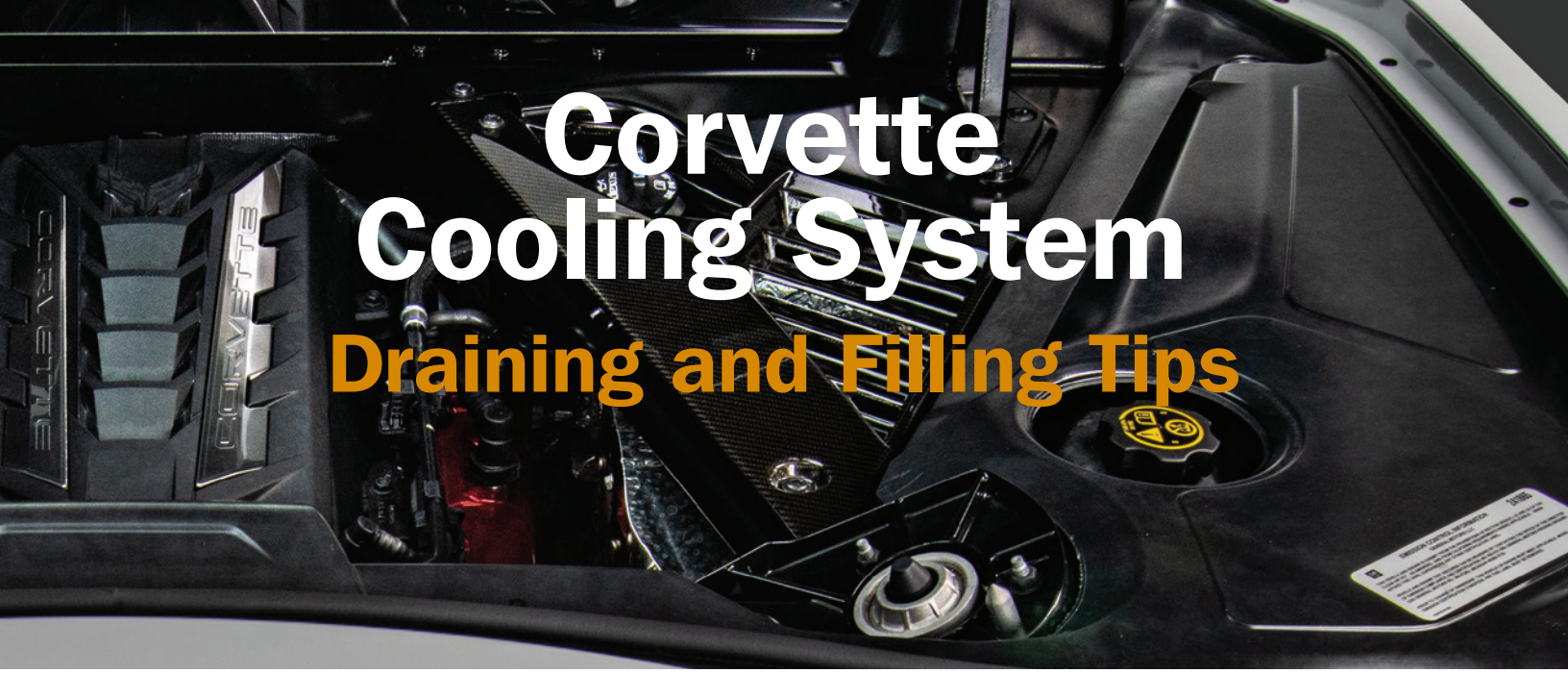
Servicing the Front Leveling System

see page 4



Inspect UBEC Bolts for Electrical Concerns

see page 7



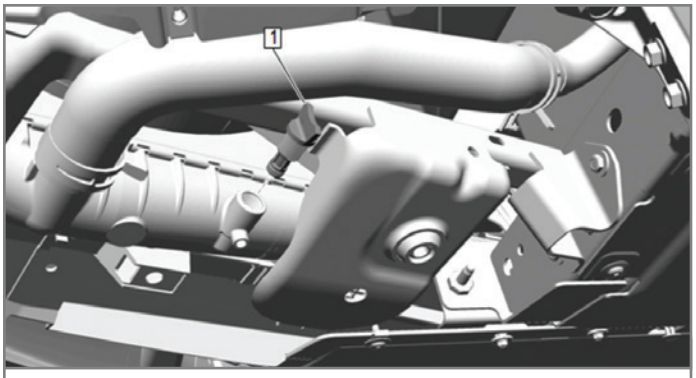
Corvette Cooling System

Draining and Filling Tips

The cooling system of the 6.2L V8 engine (RPO LT2) on the 2020 Corvette is designed to help maintain engine performance under extreme track environments. When filling the system, it's required to run the engine several times during the procedure to ensure all air is bled from the system. Use a mixture of 40% DEX-COOL engine coolant and 60% clean, drinkable water. The complete draining and filling procedure can be found in document ID: 5404647 in the appropropriate Service Information.

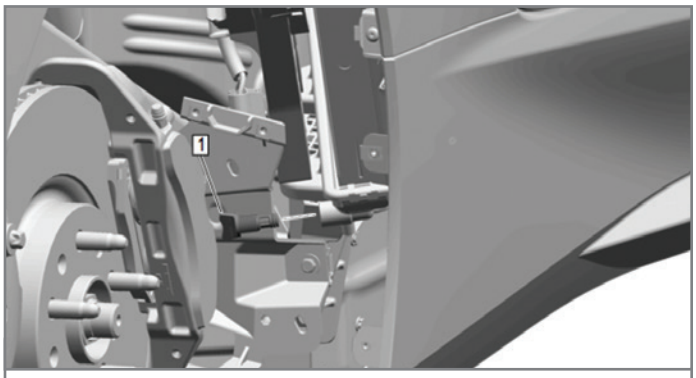
RADIATOR DRAIN COCKS AND HOSE CONNECTORS

There is a radiator drain cock at each of the two engine radiators.



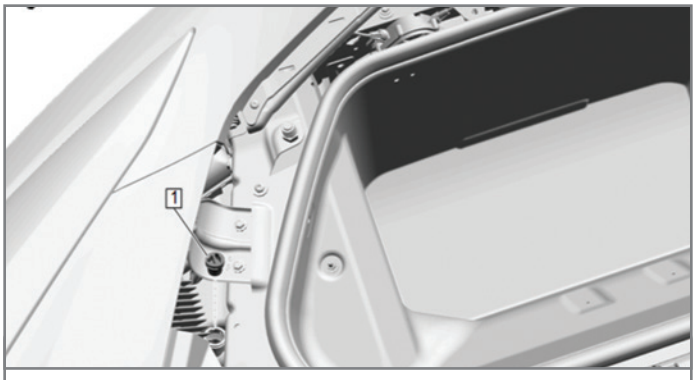
Radiator drain cock at engine radiator.

There also is a radiator drain cock at each of the two engine auxiliary radiators in front of the rear wheels.



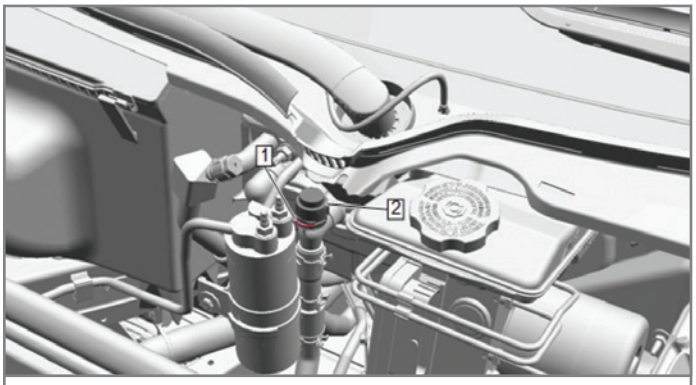
Radiator drain cock at auxiliary radiator.

The auxiliary radiator inlet hose connectors and hose caps for each auxiliary radiator are located at the front of the vehicle on each side of the front compartment. The front compartment rear access cover and front sight shield must be removed.



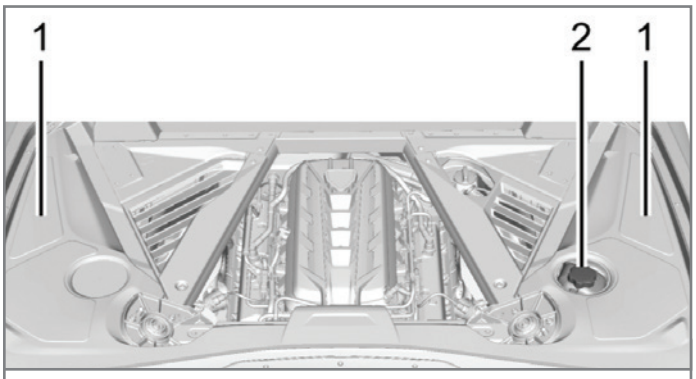
Auxiliary radiator inlet hose connector

CONTINUED ON PAGE 3



Radiator inlet hose retainer (1) and connector cover (2)

The radiator inlet hose connector cover, located at the rear of the vehicle, uses a hose retainer. Disengage the hose retainer to remove the connector cover.



Radiator surge tank (2)

DRAINING AND FILLING

After draining the system, inspect the coolant. If the coolant is normal in appearance, follow the filling procedure. If the coolant appears discolored, follow the flush procedure. Refer to the appropriate Service Information procedure.

TIP: Be sure to complete all steps of the appropriate filling or flushing procedure. An improper coolant level may cause engine damage.

When filling the radiator surge tank, monitor the auxiliary radiator inlet hose connectors and install the hose caps when coolant flows from the connectors. Fill the radiator surge tank to the base of the fill neck. It may be necessary to add coolant to the top of each auxiliary radiator inlet hose connector if coolant doesn't flow from the auxiliary radiator inlet hose connectors.

RUNNING THE ENGINE

The filling procedure requires starting and running the engine several times. The air conditioning should be off.

A critical part of the filling procedure instructs running the engine at idle until one of the auxiliary radiator outlet hoses near the auxiliary radiator inlet hose connector becomes warm or the coolant temperature approaches 185°F (85°C). Once the hose is confirmed hot, engine speed should be held at 3,000 RPM for 10 minutes.

TIP: The engine speed must be 3,000 RPM for 10 minutes in order to generate enough volume of coolant flow to push any air pockets out of the cooling system.

After running the engine and letting it cool for at least one hour, the coolant level at the auxiliary radiator inlet hose connectors and the radiator inlet hose connector must be checked again. Additional cool down time will lower the coolant level in the radiator surge tank, allowing more coolant to be added to the system. Fill the radiator surge tank to the base of the fill neck while monitoring the connectors.

Cold fill line in the surge tank

Once the filling procedure is completed, the coolant level should be adjusted to the cold fill line on the radiator surge tank. After the vehicle has been driven for a while, check the coolant level in the surge tank and fill to the cold fill line on the radiator surge tank, if necessary.

Refer to Service Information document ID: 5404647 for the complete draining and filling procedure.

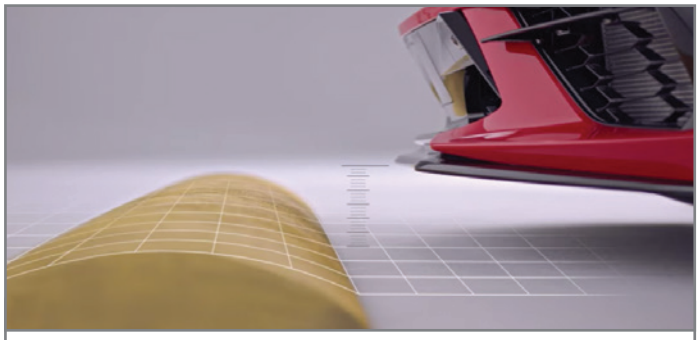
▶ Thanks to Jeff Strausser

SERVICING | The Front Leveling System

There may be a Service Front Leveling System message displayed on the Driver Information Center on some 2020 Corvette models. DTC U3000 SYM49 (Control Module Internal Malfunction) also may be set.

If these conditions are found, reprogram the Front Suspension Lifting/Lowering Hydraulic Power Pack Module with the latest calibration. Refer to K218 Front Suspension Lifting/Lowering Hydraulic Power Pack Module: Programming and Setup in the appropriate Service Information.

TIP: If the Same Calibration/Software Warning is noted on the Service Programming System (SPS) screen, select OK and follow the screen instructions. After a successful programming event, the Warranty Claim Code (WCC) will be displayed on the SPS Summary screen.



Front leveling system

FRONT LEVELING SYSTEM

The Front Ride Height Control (FRHC) system is designed to raise the front of the vehicle out of trim (nominal unraised position of the suspension) position during low-speed driving scenarios in order to help avoid objects on the ground and reduce the potential for damage to the front spoiler. The increased ground clearance can help to navigate speed bumps and steep driveways.

The FRHC system consists of front shock absorbers with built in two-position lift actuators, hoses, lines, hydraulic fluid reservoir and an electro-hydraulic control unit. In addition to providing increased ground clearance to navigate speed bumps and steep driveways, a benefit of the system is that it can increase vehicle height to clear drive-on hoists, frame contact hoists or floor jacks during a service event.

The vehicle is raised or lowered primarily by using the Lift/Lower Select Switch on the center console.

Lift/Lower Select Switch

The electrical components of the front leveling system include:

- S86 Vehicle Stability Control System Switch
- Front Ride Height Leveling Subsystems – K218 Front Suspension Lifting/Leveling Hydraulic Power Pack Module, Fluid Reservoir, Front Ride Height Hydraulic Control Unit (HCU), and Front Ride Height Left/Right Front Actuator (includes displacement sensor)
- P16 Instrument Cluster
- K20 Engine Control Module
- K160 Brake System Control Module

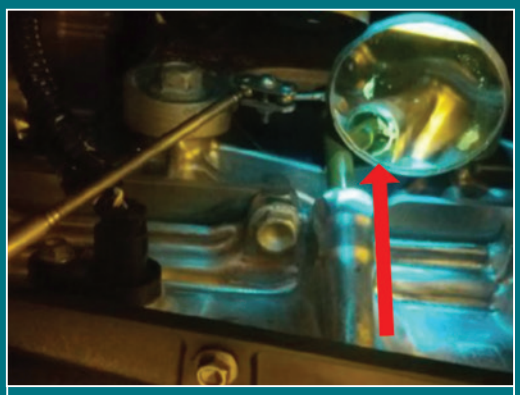
Refer to Bulletin #20-NA-140 for additional information.

▶ Thanks to Jeff Strausser

Inspecting the Dipstick Tube O-Ring and Lower Oil Pan

When diagnosing engine oil leaks on 2019-2020 Silverado, Sierra; and 2020 CT4-V models equipped with the 2.7L turbocharged 4-cylinder engine (RPO L3B), inspect the dipstick tube O-ring and areas above the composite oil pan sealing surface. These potential oil leak areas should be checked before identifying the lower composite oil pan as the source of the engine oil leak.

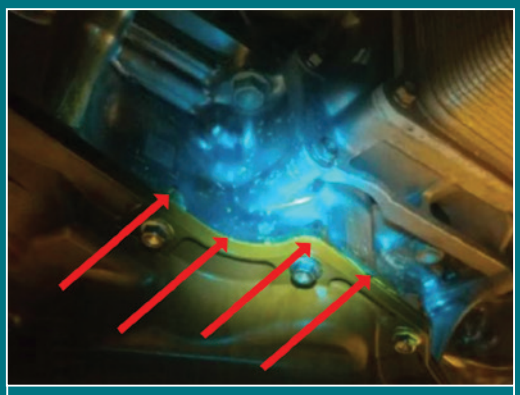
Check for an oil leak from the dipstick tube O-ring with an inspection mirror.



Check for an oil leak from the dipstick tube O-ring.

Use a black light and tracer dye to identify an oil leak from the composite oil pan sealing surface.

TIP: The use of engine oil dye and trace powders are recommended to assist with isolating engine oil leak points. Be sure to clean suspected leak areas thoroughly before using trace powders.

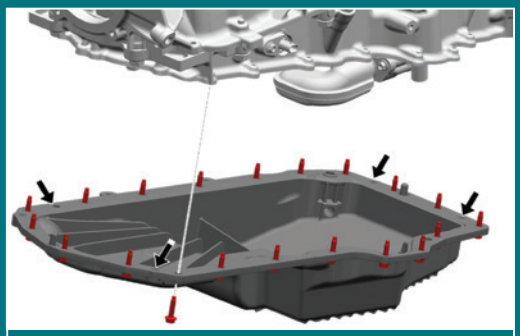


Black light and tracer dye identify an oil leak from the composite oil pan sealing surface.

LOWER OIL PAN

The composite oil pan is attached at the engine block lower structural extension (LCE). The oil pan incorporates four jack screws (threaded inserts) that need to be used during the removal procedure. Tighten the jack screw by hand 1 to 2 turns. Turn each uniformly and move to the next screw until the oil pan has full separation from the LCE. Do not pry on the oil pan to LCE or the sealing surface may be damaged.

TIP: Do not gouge or scratch any engine sealing surface during the cleaning process. GM recommends using a plastic razor blade, plastic gasket scraper, a wood scraper or a non-metallic scraper to remove all sealer/gasket material on the surface of engine components that are to be reused. Do not use any other method or technique to remove the sealant or the gasket material from a part.



The oil pan incorporates four jack screws to help with removal.

▶ Thanks to Robert Halas

Harmonic Balancer Sliding Back on Crankshaft

A belt chirp sound or metal-to-metal sound may be heard on some 2019-2020 Silverado HD, Sierra, HD and Silverado 4500HD/5500HD/6500HD models equipped with the 6.6L Duramax diesel engine (RPO L5P, L5D).

The outer ring of the harmonic balancer may slide back on the crankshaft and cause a misalignment of the accessory belt. If the outer ring slides back far enough, it may contact the timing cover and oil pans.

Damage to timing cover and upper oil pan

Inspect the harmonic balancer, timing cover and oil pans for any damage and replace as needed.

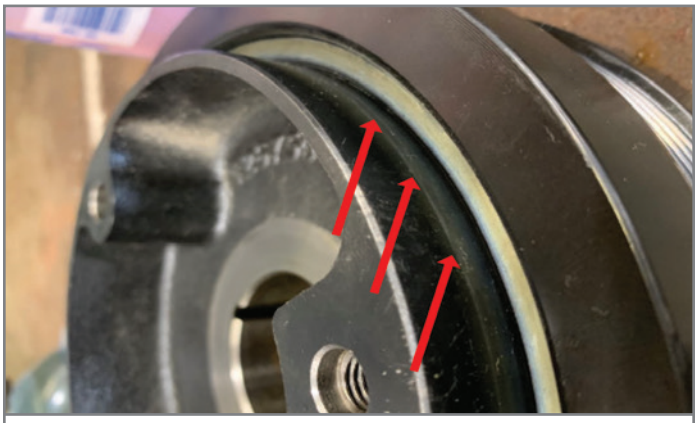
Harmonic balancer damage

Check for damage to the harmonic balancer due to contact.

Also check for separation of the harmonic balancer's inner and outer rings.

Separation of the inner and outer rings

The damper has a hub that is longer than the inertia ring. Look for a witness mark where the elastomer was originally positioned to identify any movement.



Check the hub directly at the elastomer.

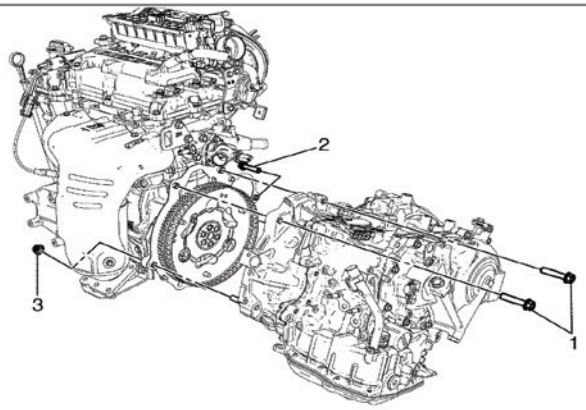
Refer to the appropriate Service Information for the proper procedures to remove the harmonic balancer, timing cover and oil pans.

For additional information, refer to #PIP5742.

▶ Thanks to John Stempnik

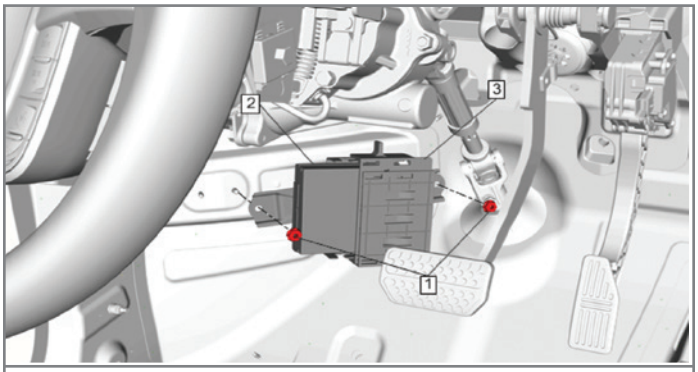
Spark CVT7 Transmission Replacement

Several DTCs may set after replacing the CVT7 transmission (RPO M4M) in some 2014-2015 Spark models. The most common codes that may set are P0797 (Pressure Control Solenoid Valve 3 – Stuck On), P0841 (Transmission Fluid Pressure Sensor Performance), P0863 (TCM Communication Circuit), P0961 (Line Pressure Control Solenoid Valve Performance), P0965 (Pressure Control Solenoid Valve 2 System Performance) or P2714 (Pressure Control Solenoid Valve 4 – Stuck Off). Other DTCs also may set.



CVT7 transmission

TIP: DTC P1790 (Transmission Control Module Checksum Error) will always set after the transmission is replaced. Refer to the appropriate Service Information for information on how to address this code by programming the TCM.



X2 connector (#2) at the TCM

The DTCs may be the result of poor connection conditions. When removing the transmission connector from the transmission and temporarily relocating the wiring harness to allow removal of the transmission, the TCM X2 connector may crack and cause wiring and connection issues.

Follow the diagnostics in the Service Information for the DTCs that set after transmission replacement. If a resolution is not found, replace the TCM X2 connector and install new terminated leads. Do not replace the transmission for any DTCs setting right after the transmission has been replaced.

Refer to #PIP5732 for additional information and part numbers.

▶ Thanks to Terry Neuendorf

Inspect UBEC Bolts for Electrical Concerns

Some 2019-2020 Silverado and Sierra models may have any of several electrical-related concerns, including no crank, starter engages after engine start, flickering headlamps, erratic instrument cluster gauges, or high or low system voltage. In addition, DTCs B1325, B2750, B305D, B297B, C0049, P0562, P0700, U0100, U0101, U0102, or U3006 may be set. Some conditions may be noticed more with powertrain movement, such as when accelerating or braking.

1. Fuse block bolts
2. Green pop-up indicators

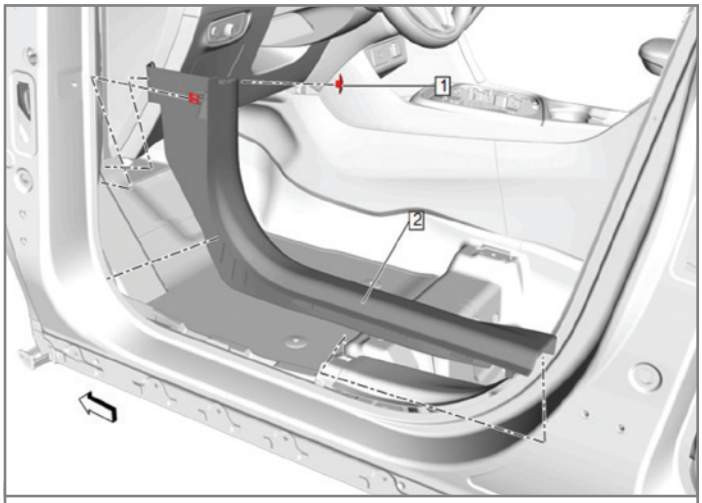
These electrical concerns may be caused by the X50A Underhood Fuse Block bolts being loose. The fuse block has built-in indicators next to the bolts that pop-up as the bolts are tightened to indicate that the fuse block is fully installed. In some cases, the green indicators will be popped up but the bolts may still be loose.

Check the fuse block bolts for properly installation. Verify they are torqued to 53 lb.-in. (6 Nm).

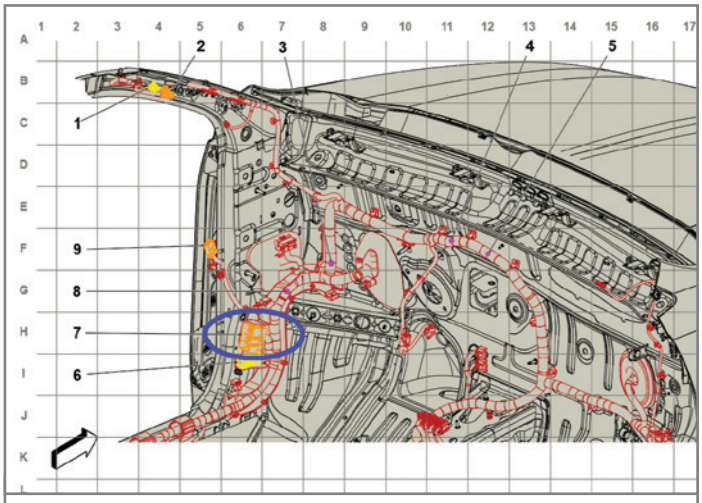
▶ Thanks to Jim Will

Loose Instrument Panel-to-Body Harness Connector

Some 2020 Encore GX and 2021 Trailblazer models may have several electrical conditions, including no audio from the radio, an inoperative power liftgate (RPO TC2), if equipped, and/or an inoperative instrument cluster. DTCs P159F (Fuel Economy Mode Switch Circuit Low Voltage), U0184 (Lost Communication With Radio), U0198 (Lost Communication with Telematics Communication Interface Control Module), and U1501 (LIN Bus) may be set.



Remove the left front side door sill garnish molding.



X200 connector (7)

These conditions may be caused by the X200 Instrument Panel-to-Body Harness connector not being fully connected and locked, resulting in an open circuit. Inspect the X200 connector, located at the lower left A-pillar. Remove the left front side door sill garnish molding to access the connector.

Inspect the X200 connector for not being seated before disconnecting it. It should be seated correctly on all four sides. Also ensure that the wires are not twisted or too taut, and that the routing is correct.

After correcting the connection, verify that the conditions have been eliminated before reinstalling the door sill garnish molding.

Refer to Bulletin #20-NA-135 for additional information.

▶ Thanks to Frank Jakubiec

Exhaust Brake Feel During Operation

The enhanced exhaust brake is one of several improvements in 2020 Silverado and Sierra models equipped with the 6.6L Duramax diesel engine (RPO L5P). The exhaust brake feature can be used to provide additional braking when the vehicle is decelerating with a heavy load and/or down a steep grade.

The exhaust brake system is activated using a driver-selected switch that provides an input to the BCM, which sends a request to the ECM. The ECM processes the request and controls exhaust brake operation based on various sensor inputs. The ECM commands the turbocharger vane position to maximum boost for exhaust brake operation.

Exhaust brake switch

Prior to the 2020 model year, the movement of the turbocharger vanes was very rapid and the engagement of the exhaust brake could be felt by the driver. For 2020, the movement of the vanes is slower, which can give the feeling that the exhaust brake is not operating correctly. As long as the Driver Information Center (DIC) message "Exhaust Brake On" is displayed and no DTCs are set, the vehicle is functioning properly.

For additional customer information, refer to the following exhaust brake description from the Owner's Manual:

- Automatic downshifts will not occur if the vehicle is in Range Selection Mode.
- The exhaust brake only activates when the transmission torque converter is locked. This can vary based on vehicle speed, gear, and load.
- To activate the system, press the Exhaust Brake button on the center stack. A light in the switch will come on when the exhaust brake is activated. The switch must be pressed at each vehicle start for the system to be active. The DIC displays the message Exhaust Brake On for approximately three seconds, and then clears.
- To turn the brake off, press the exhaust brake switch a second time. The DIC displays the message Exhaust Brake Off for approximately three seconds, and then clears.
- The exhaust brake will be more active when in Tow/Haul Mode.

▶ Thanks to John Stempnik

TECH LINK

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:
Michael O'Hare
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