TECH LINK

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6.6L Duramax Diesel Engine Operating Characteristics

The 6.6L Duramax diesel engine (RPO L5P) and Allison 6-speed transmission (RPO MW7) available in 2017-2018 Silverado, Sierra; and 2019 Silverado 2500/3500 and Sierra 2500/3500 models have several different operating characteristics when compared to the previous generation powertrain. Some customers may notice these differences if they owned an earlier 2011-2016 Silverado or Sierra diesel-equipped model.

The new 6.6L Duramax diesel shares only bore and stroke dimensions with the previous diesel engine. It features a new GM-developed control system with an electrically-actuated/electronically-controlled turbocharging system and an advanced solenoid fuel system. The engine is matched to an updated Allison 6-speed transmission that's designed to accommodate the engine's higher torque capacity.

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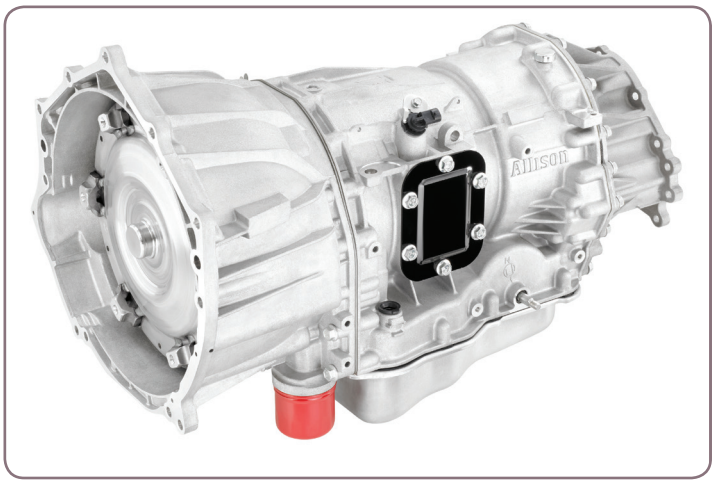


Allison 6-speed transmission

Following are several operating characteristics of the 6.6L Duramax diesel engine and Allison 6-speed transmission that should be considered normal operation.

Extended Crank

The new engine may take more time to start after turning the key to start than the previous engine due to the change in the fuel system and calibrations.

Transmission Torque Request Override

With 445 horsepower and 910 lb.-ft. of torque, the new engine has increased horsepower and torque compared to the previous diesel engine. After slowing down and then pressing on the accelerator or when changing gears (such as when plowing snow), a short delay in response may be noticed. This delay is designed to help protect the drivetrain from a sudden torque increase. The Transmission Control Module (TCM) overrides the torque request from the driver via the accelerator pedal in order to control engine torque to a level that protects the transmission hardware when making a gear change.

The request override may be noticed most often when a 6th-to-4th gear downshift occurs when applying the accelerator at 70% or greater between 45 and 55 mph (72 and 88 km/h) or when applying the accelerator after a moderate to aggressive braking maneuver from 20-30 mph (32-48 km/h) down to 0-10 mph (0-16 km/h) where a 3rd-to-1st gear downshift occurs.

Transmission Adapt Learns

On a vehicle with relatively low miles, or with low miles since the TCM was reprogrammed, the transmission may seem to shift hard or the engine may seem to flair between shifts. There also may be bumps or jerks when the vehicle downshifts. If this condition is found, it may be necessary to perform a transmission shift adapt quick learn using GDS2.

Change in Torque Converter Lock-up Strategy

In the new 6-speed transmission, the torque converter now locks in 3rd gear instead of 5th gear. As a result, the vehicle will feel more responsive when accelerating from 3rd gear and higher and transmission downshifts may be more noticeable.

On very light accelerator pedal applications when the torque converter is locked, a hesitation, shutter, or stumble may be felt. This feeling is a result of the very high torque the Duramax is capable of producing at low engine speeds as well as the engine being directly coupled to the rear drive wheels. When the torque converter clutch is not locked, it can serve as a viscous damper between the engine and rear drive tires. When the torque converter clutch is locked, 100% of the rapidly increasing torque is delivered to the rear tires.

Differences in DPF Regeneration

There is a difference in the Diesel Particulate Filter regeneration in the new 6.6L diesel engine. The regeneration in these trucks should be shorter, but drivers may find that they are more frequent.

Thanks to Larry Yaw

Knock Sound from Engine When Hot

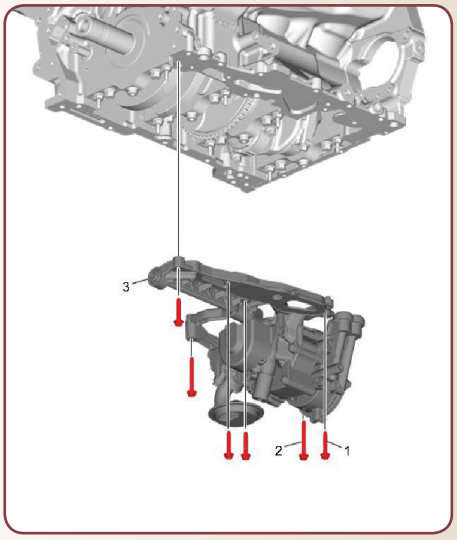
Some 2016-2017 ATS, CTS, CT6, Camaro; 2017 LaCrosse, XT5 and Acadia models equipped with the 3.0L V6 engine (RPO LGW) or 3.6L V6 engine (RPO LGX) may have a hollow knocking or tapping sound coming from the engine compartment when the engine is hot. The sound may be due to the operation of the mechanical vacuum pump for the brake system. The sound does not affect the ability of the vacuum pump to supply vacuum to the brake booster or the longevity of the vacuum pump.

If the sound is heard coming from the engine compartment, start the engine and let it idle until the oil temperature reaches 208°F (98°C).

If the sound is present, pump the brakes 3–5 times to check if the sound goes away. If the sound stops, it will return a short time later. The sound occurs when the brake booster system is at equilibrium (fully drawn down). Pumping the brakes requires the vacuum pump to create more vacuum to compensate.

If the sound goes away when applying the brakes, replace the engine oil pump. The mechanical vacuum pump is part of the oil pump assembly inside the oil pan and is the source of vacuum for the brake system.

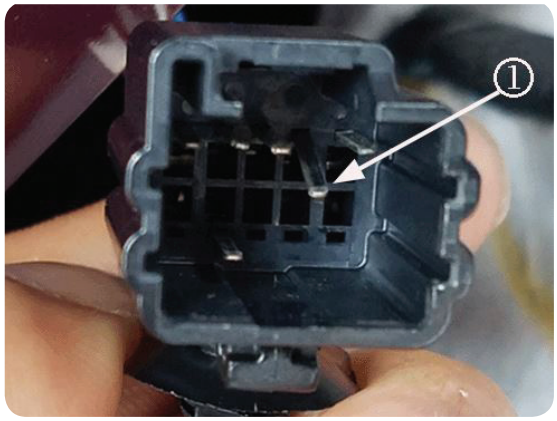
Thanks to Bryan Salisbury



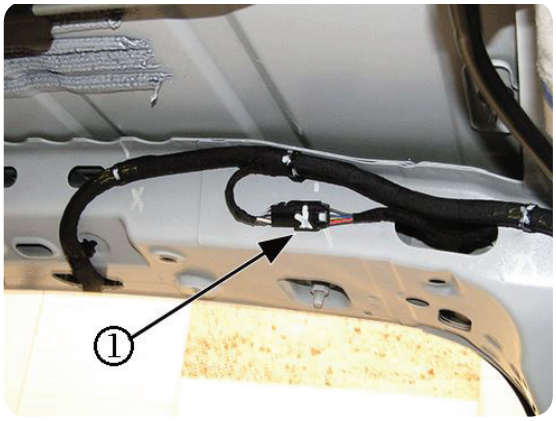
Oil pump (#3) for the 3.6L V6 engine

Power Liftgate Stops or Will Not Close from Open Position

The power liftgate may stop when opening from the fully closed position (usually opening not more than 15 inches, or 38 cm) or will not close from the open position on some 2018-2019 Equinox and Terrain models. DTCs B153E (Liftgate Position Sensor Signal Circuit), B153F (Liftgate Object Sensor Signal Circuit) or B396A (Left Liftgate Motor Control Circuit) may be set in the power liftgate module.



Bent pin condition



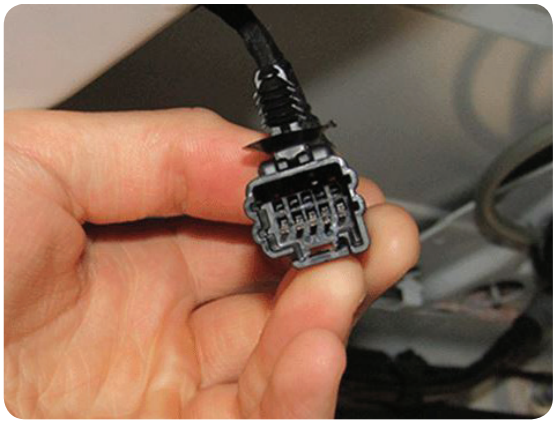
Body harness-to-liftgate power assist actuator connector

DTCs B153E or B396A

If DTCs B153E or B396A are set, the cause may be that the male terminals in the body harness 10-way in-line connector to the liftgate power assist actuator may not be dimensionally stable or may be misaligned, causing intermittent electrical contact.

Lower the left rear portion of the headliner to access the body harness-to-liftgate assist actuator connector.

Inspect the body harness male in-line connector for any bent or misaligned terminals. Straighten any misaligned terminals and reconnect the connectors. Verify proper opening and closing of the power liftgate.



Inspect the body harness male in-line connector terminals.

DTC B153F

If DTC B153F is set, check that the male terminals in the liftgate object sensor connector to the liftgate harness are stable. Any misaligned terminals may cause intermittent electrical contact.

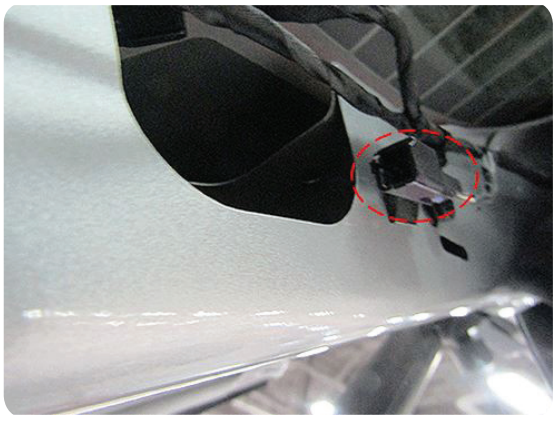
Remove the liftgate upper center and upper side trim panels to access the B71L Liftgate Object Sensor – Left or B71R Liftgate Object Sensor – Right connectors.

Check for any bent or misaligned terminals in the liftgate object sensor male in-line connector. Straighten any misaligned terminals and reconnect the connectors. Verify proper opening and closing of the power liftgate.

Do not replace the liftgate power assist actuator or the power liftgate module before inspecting the connectors.

Thanks to Rob Smith and Kris Villegas

Remove the liftgate upper center and upper side trim panels to access the connectors.



Check the terminals in the liftgate object sensor male in-line connector.

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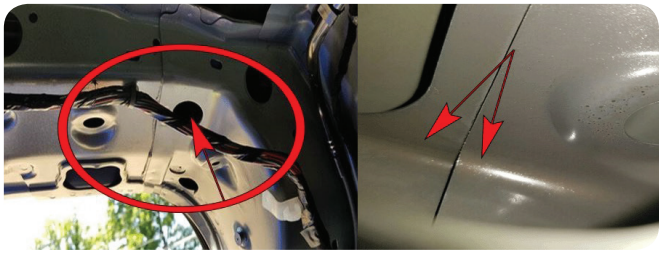
Body Creak Sound near Upper Liftgate Hinge

A body creak sound or rattle may be heard near the upper header by the liftgate hinge on some 2018-2019 XT5 models. The sound or rattle may be caused by the two metal structure panels, located in the rear header, rubbing together. The condition is most often found on the left side of the vehicle.

Lower only the rear portion of the headliner.

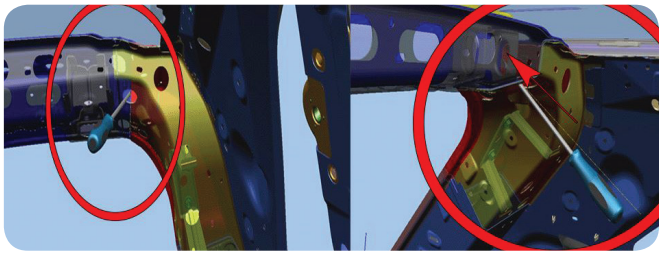
Pry the two metal structure panels away from each other to eliminate the sound or rattle. Remove both quarter upper trim panels and both center pillar upper trim panels. Lower the rear portion of the headliner only.

To separate the two panels at the seam, go through the access hole using a cotter pin tool or similar tool. The panel seam is located toward the liftgate opening on a 90° angle. It is not directly above the access hole.



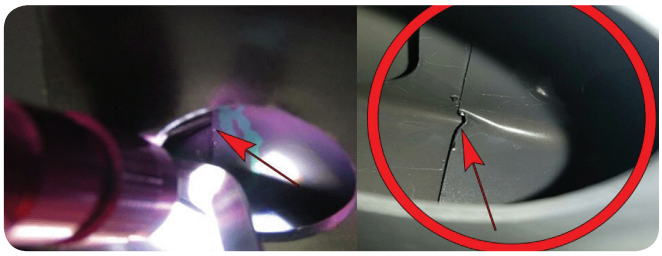
Use the access hole to reach the panels.

Place the tool between the two panels and twist or apply pressure to separate the panels.



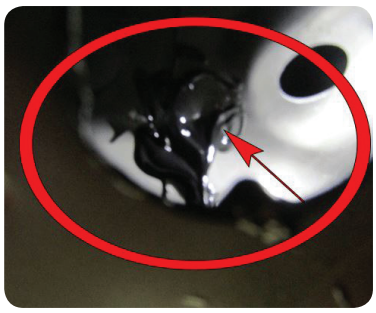
The panel seam is on a 90° angle from the access hole.

After the panels are separated, apply any approved metal panel bonding adhesive between the two metal panels. Refer to metal panel bonding in the appropriate Service Information.



Separate the two panels.

Thanks to Tom Burlingame



Apply an approved metal panel bonding adhesive.

TAC Assistance with Vehicle Vibration Diagnosis

Vibration issues are some of the most challenging conditions to accurately diagnose and repair. To help with diagnosis, the CH-51450 Pico Oscilloscope Diagnostic Kit with NVH was released for all U.S. and Canadian dealerships as an essential tool. In addition, there are a number of PI documents and service bulletins in the Service Information that address vibration concerns.

In order to better assist dealerships and help get vehicles repaired right the first time, the GM Technical Assistance Center (TAC) requires any calls regarding vehicle vibration conditions to have a Pico oscilloscope data file sent in prior to calling TAC. The Pico data file will provide insight into the frequency of the vibration and the possible causes. Component vibrations, such as a blower motor, brake pulsation or shudder, do not require a Pico data file.

Vibration Diagnostic Process

Anyone calling TAC without the first performing the following process will be given a case number and instructed to call back with the required information.

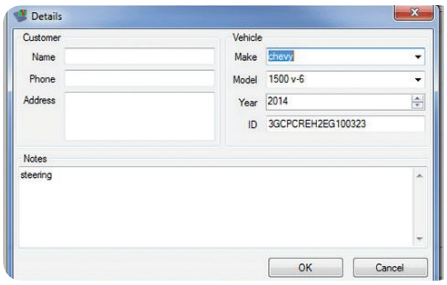
1. Drive the vehicle and record a Pico data file of the vibration condition. Save the file to your computer for possible use later.
2. Review the Pico data file and use that information to assist in determining the root cause or component resulting in the vibration.
3. Repair the vehicle using the Pico data file information along with any published information relevant to the vibration frequency observed.
4. If the repair attempt made the condition better but did not eliminate it, or had no effect at all, and assistance is requested from TAC, record another Pico data file and save it to your computer.
5. Compose an e-mail to TAC and, in the subject line, include the text "Vibration," your BAC, the last eight digits of the VIN, and the TAC Case Number if the TAC case is already established.
6. Attach any Pico data files associated with the current vehicle and condition.
7. Wait at least an 1/2 hour — allowing time for the e-mail and all information to be received by TAC — before contacting TAC to set up a TAC case.

TAC will not be able to provide any assistance to any calls for a vehicle vibration that do not have an accompanying Pico data file, or if there is any missing information as requested.

Sending a File

To send a Pico data file:

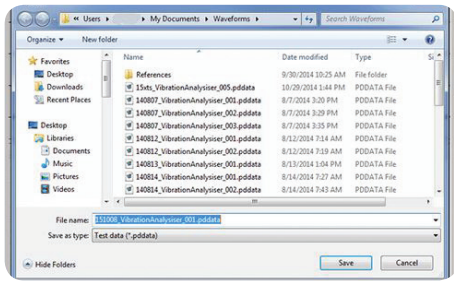
1. While viewing the file in the Pico application, select File Save.
2. In the Details box, save the vehicle information as well as customer information. Add any related information in the Notes section, such as a sensor location, road surface, etc.



When saving a data file, include vehicle information, customer information, and any related notes.

3. Save the file to a location on your computer where it will be easy to find. The default location will be waveforms.

It's not necessary to rename the file, but it is critical to be able to find the location where it was saved.



Save the file to your computer.

4. Create an email message and include Vibration, your BAC, and the last eight digits of the VIN in the subject line.
5. Click the Attach button/icon in the email account and attach the Pico data file. More than one file can be attached to the email if needed.

Be sure to include the required information in the email subject line.

6. Add any notes to the email if desired and then select Send to send the information to TAC.

For additional information about the TAC process for vehicle vibration diagnostic assistance, refer to #PIP5601.

Thanks to Steve Schipansky

Service Know-How

10218.12V – Emerging Issues (U.S.) – December 13, 2018

The monthly GM Service Know-How Emerging Issues seminars provide service/technical information on current issues and GM certified repairs. The latest service topics from GM Brand Quality and Engineering include a review of the CT6 electro-hydraulic brake booster.

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