TECH LINK

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Engine Performance in Extremely Cold Weather Conditions

CUSTOMER CARE AND AFTERSALES

Engine Performance in Extremely Cold Weather Conditions

While driving in extremely cold weather conditions, poor engine performance may be noticed on some 2013-2021 Encore and Trax models equipped with the 1.4L engine (RPO LUV). The poor performance may be related to a crankcase vent tube plugged with ice, ice forming in the intake manifold and blocking the PCV passage in the cylinder head and ice accumulation in the charge air cooler.

As a result, there may be a loss of power, hesitation on acceleration, an oil leak or other performance issues along with DTCs P0299 (Engine Underboost), P0234 (Engine Overboost), P2227 (Barometric Pressure (BARO) Sensor Performance) and P00C7 (Intake Air Pressure Measurement System - Multiple Sensors Not Plausible).

If any of the conditions are determined to be caused by freezing or icing, inspect the following components: grille winter cover, heated PCV bypass system, modified Charge Air Cooler (CAC), and CAC outlet air elbow duct. If not previously installed, install the grille cover, heated PCV bypass, modified CAC and elbow duct.

If these components have been installed and icing has been verified in extreme cold, perform the Intake Air Pressure and Temperature Sensor Inspection and Cleaning procedure and the CAC drain procedure. Check Bulletin #16-NA-405 for details.

If contamination (ice, water, oil or sludge) is found at the charge air bypass valve, refer to Bulletin #22-NA-067 for intake manifold replacement. It is not recommended to clean or flush the intake manifold or bypass solenoid.

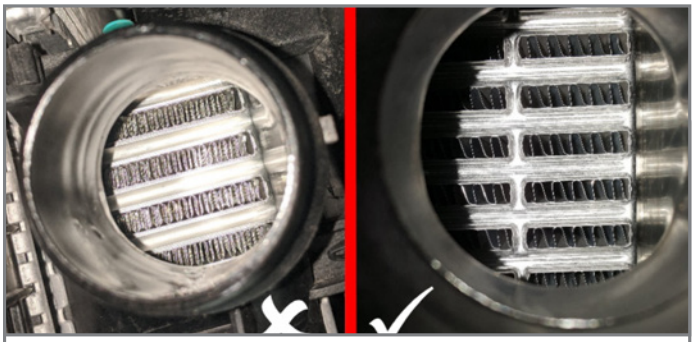
Grille cover

GRILLE WINTER COVER

A grille cover should be installed when operating the vehicle in extremely cold weather conditions. The cover may appear to be undersized and may stretch during installation to ensure a tight fit. Warm the vinyl cover to ensure that it will be pliable and easier to install onto the front bumper fascia.

The cover attaches to the fascia using hooks pushed through the grille opening. Make sure all hooks are engaged for a secure fit.

CHARGE AIR COOLER OUTLET AIR ELBOW DUCT



Older CAC design (left) and new design CAC (right).

Inspect the charge air cooler through the inlet to determine if the vehicle has the new or old design. If the charge air cooler is the old design (shown with an X below), replace the charge air cooler. If the charge air cooler is the new design (shown with a check mark below), which has wider fin spacing and a

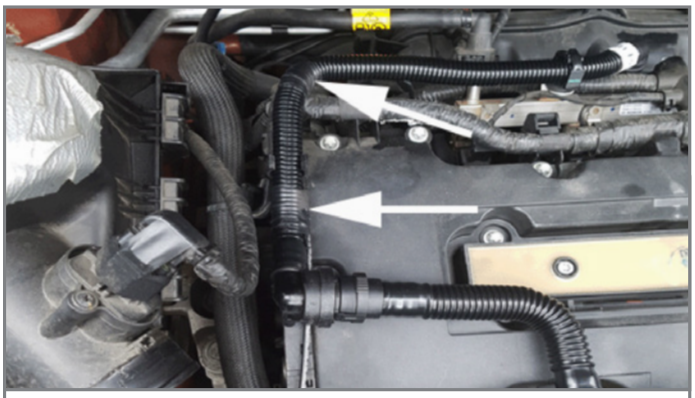
New elbow duct

CONTINUED ON PAGE 3

division in the middle of the charge air cooler, replacement is not necessary.

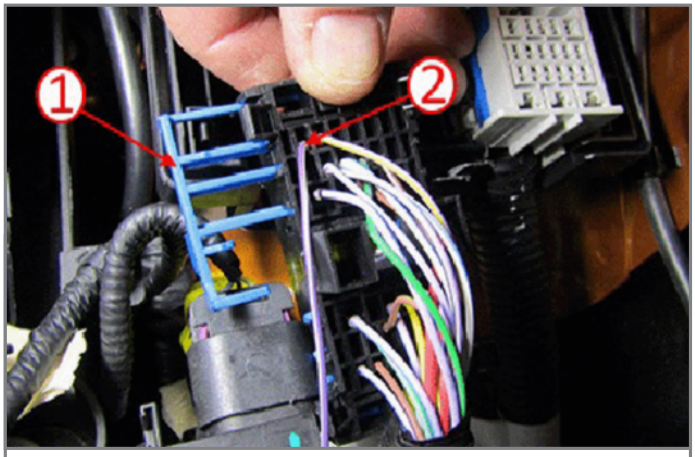
When installing the new elbow duct, first remove and clean the Intake Air Pressure and Temperature (IAPT) sensor. Remove the bands that secure the air hoses to the elbow duct and install the new elbow duct onto the air hoses, aligning the duct to the marks. The new elbow will have an estimated 45-degree mounting surface for the IAPT.

PCV HEATER



PCV heater

The PCV heater also should be installed into the air cleaner outlet duct and air resonator assembly. It may have been previously installed on the vehicle. N:



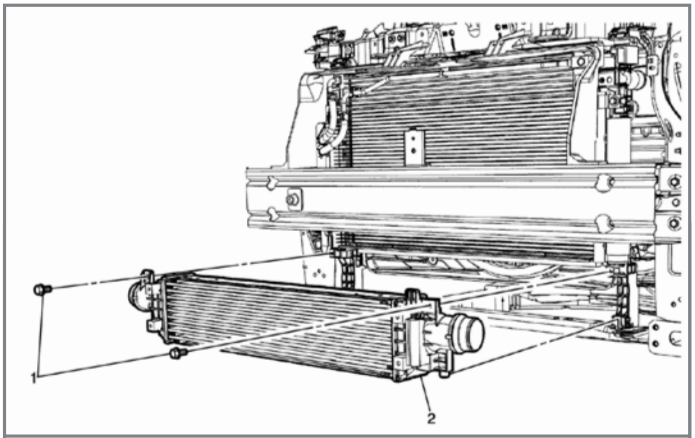
PCV heater wiring harness terminal connection

The PCV heater wiring harness terminal is connected to different cavities in the fuse block depending on the model year. Refer to Bulletin #16-NA-405 for information on connections for 2013-2016 models and 2017-2020 models. Route the PCV heater wiring harness across the engine wiring harness.

CHARGE AIR COOLER

If the revised charge air cooler has been installed, drain and reinstall the CAC.

If the CAC has not been replaced, install the new modified CAC.



Charge Air Cooler

INTAKE AIR PRESSURE AND TEMPERATURE SENSOR INSPECTION AND CLEANING

If all the components have been installed, remove the Intake Air Pressure and Temperature (IAPT) sensor and inspect for any contaminates.

IAPT sensor

Do not use any chemical cleaners or water, or use compressed air, to clean the sensitive IAPT sensor. Allow time for any ice build-up to melt by placing the sensor port down.

Refer to Bulletin #16-NA-405 for additional information and part numbers.

▶ Thanks to Scott Willems

DIAGNOSING

OVER-THE-AIR UPDATE CONCERNS

When an Over-the-Air (OTA) update has been downloaded to a 2021-2024 Chevrolet, Buick, GMC or Cadillac vehicle and is available to be installed, a message is displayed on the infotainment screen notifying the driver of the impending update. The message to accept and install an OTA update will not appear until the minimum values for the battery State of Charge (SOC) and Outside Ambient Temperature (OAT) are met.

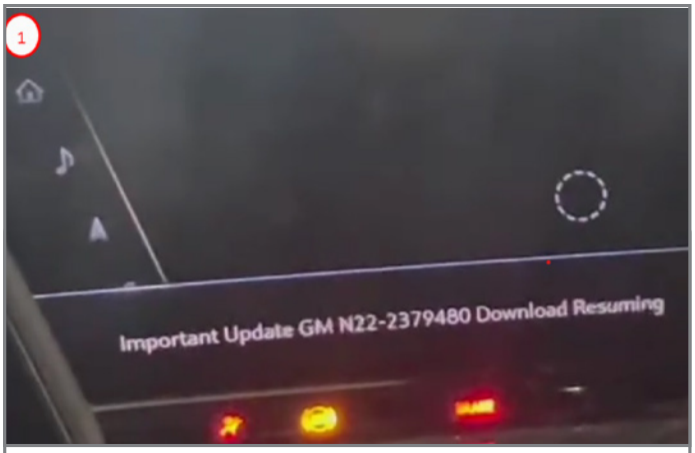
In order for an OTA update to be pushed to a vehicle, the vehicle must be parked for the entire download process. There is not a notification to the driver that the software update is being downloaded to the vehicle. Battery SOC and OAT values are not checked before a download. These checks are only performed once the software update is downloaded and ready to be installed. The OTA software download can occur in increments, so if the vehicle is driven during the download process, the download will be paused until the vehicle is parked and download conditions are met again.

Once the OTA software is downloaded, a message on the infotainment screen will display a prompt to accept the installation. The customer does not need to remain in the vehicle during the installation of the software. However, the vehicle cannot be driven during the installation and certain vehicle features may not be available. It's not required for the ignition to be on for the installation to begin. Installation time will vary based on the size of the update.

Additional information about OTA updates and the download and installation process has been released in Bulletin #23-NA-125.

The bulletin includes a variety of information in a Frequently Asked Questions format, including:

- OTA Overview and Requirements – covers requirements before an OTA update can begin, checking OTA updates on the infotainment screen and OnStar plans.
- OTA Download & Install Process – highlights the differences between a software download and the installation process, how long the installation takes, and what to do if the customer declines or does not accept the OTA update.



Download Resuming message

- OTA Communications – reviews customer communications about an OTA update as well as the differences between an OTA update and an In Market Enhancement (IME).

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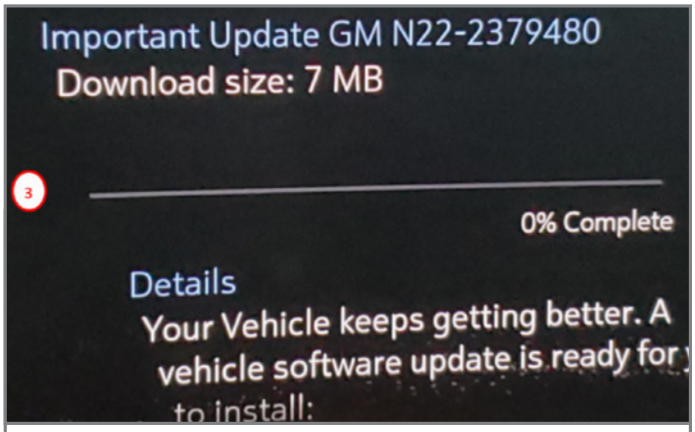
RESETTING AN OTA UPDATE

Following an OTA update, some of the following concerns may be present:

- Radio remains on for up to 11 minutes after Retained Accessory Power (RAP) is cancelled.
- No crank condition due to a dead battery. The vehicle will start and run after the battery is charged.
- Intermittent condition at start-up where the infotainment screen momentarily displays "Important Update … Download Resuming":
- Vehicle Update screen shows OTA Update failure or that the available OTA Update will not complete.



Available OTA Update will not complete.

These concerns may be the result of the OTA update being stuck in a pending or download state.

Perform the following items to reset the OTA Update and clear the messages:

1. Charge the vehicle battery and test for a good battery. Confirm the vehicle will start and run. Be sure to connect the negative battery charger lead to a solid engine ground or the ground stud in the engine compartment that is connected directly to the battery negative cable/terminal/post. Do not connect the battery charger lead directly to the negative battery post.

TIP: If the vehicle does not power up or start once the battery is charged, this procedure does not apply. Perform normal diagnostics in the appropriate Service Information.

2. Go to Vehicle Settings on the infotainment screen and verify under Vehicle Updates that an OTA Update is available. Record the campaign number that is shown.
3. Move the vehicle to a location that has a known good cellular connection. Turn off the ignition, exit the vehicle with the key fob, close all doors and lock the vehicle.
4. Contact TAC (U.S.) by creating a DCM case and reference PI #PIT5966 in the TAC case along with any other pertinent information, including the previously recorded campaign number. In Canada, call TAC to create a TAC case.
5. TAC will send your VIN to Engineering to have a reset performed. A confirmation message will be sent back from TAC indicating the reset has been requested.
6. Once the confirmation message has been received back from TAC, allow the vehicle to remain undisturbed for 2 hours.
7. During this time, the battery SOC must be above 70% for the OTA Update to prompt the install button.
8. After 2 hours, start the vehicle and verify that there are not any update messages shown on the infotainment screen. In addition, go back into Vehicle Settings on the infotainment screen and check the Vehicle Update to ensure there are no OTA Updates available. In some cases, there may be an OTA Update to accept.
9. Also confirm there are not any excessive parasitic battery draws.

Vehicle Update screen

For more information on resetting an OTA update, refer to #PIT5966B.

▶ **Thanks to Jim Will and Marco Salcedo**

Oil Pump and Engine Wiring Harness Conditions

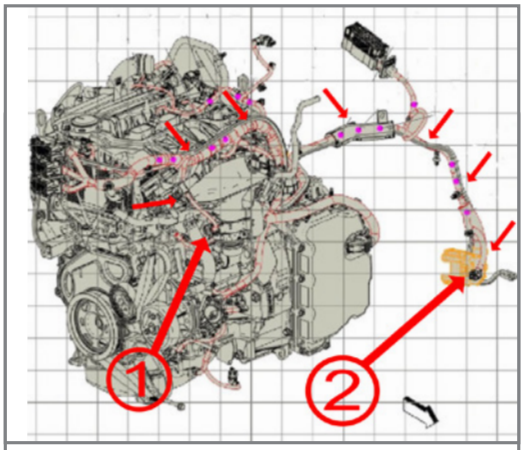
Several DTCs may be set on some 2024 Trax models equipped with the 1.2L engine (RPO LIH) that may be caused by debris in the oil pump or an engine wiring harness condition.

If DTCs P0521 (Engine Oil Pressure Sensor Performance) and/or P06DD (Engine Oil Pressure Control Solenoid Valve Stuck Off) or P06DE (Engine Oil Pressure Control Solenoid Valve Stuck On) are set, first check the engine oil level and address any drivability concerns.

WIRING HARNESS

If there are not any drivability concerns and the oil level is correct, remove the engine oil pressure control solenoid valve and inspect for proper terminal tensions, crimps and locks.

Next, test for 10 to 30 Ohms between control terminal 2/B and ignition terminal 1/A of the engine oil pressure control solenoid valve.



Check the engine wiring harness between the oil pressure sensor (#1) and connector X125 (#2).

If the test results are within range, inspect the solenoid valve for any signs of debris. If no debris is found and the concern is not isolated to the engine oil pressure control solenoid valve, remove the intake manifold to access the engine oil pressure sensor. Disconnect the engine oil pressure sensor and test for less than 10 Ohms between low reference circuit 580 terminal 2 and ECM connector X1 terminal 23.

If the resistance is within range, manipulate the engine wiring harness between the oil pressure sensor and connector X125 and look for a change in the resistance reading. If the concern is not isolated to the engine wiring harness, reinstall all components.

OIL PUMP

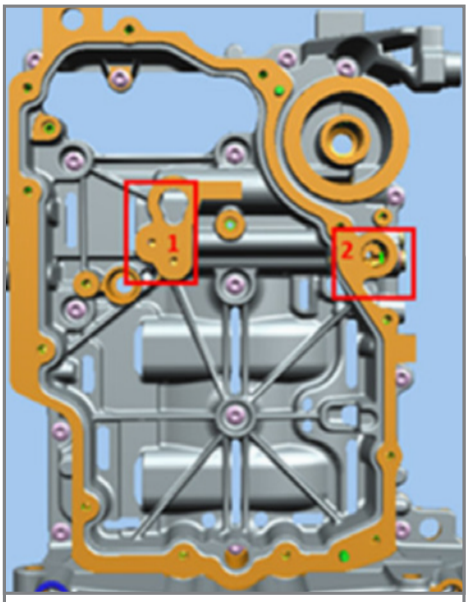
If the concern is not addressed by repairs to the engine wiring harness, it will be necessary to perform the engine oil pump screening test. The purpose of the procedure is to complete two tests of ten cycles each, or to trigger DTCs P0521, P06DD or P06DE, whichever comes first. The test should be stopped immediately upon triggering a listed DTC.

Refer to #PIP5932 for the complete testing procedure. During the test, engine speed will be raised for several short periods of time, followed by idling the engine. The test cycle should be performed ten times.

If any of the DTCs set during the first set of 10 cycles, refer to Engine Oil Pump Replacement in the appropriate Service Information.

If any of the DTCs are not present, turn off the engine, disconnect the scan tool and allow the modules to power down. Next, reconnect GDS2 and repeat the test cycle ten more times, again checking for DTCs P0521, P06DD and P06DE.

If the DTCs set during the second set of test cycles, refer to Engine Oil Pump Replacement in SI. If the DTCs do not set, no further action is required.



Ensure the three oil pump oil holes (Area 1) and OCV mounting hole (Area 2) are free of debris.

TIP: If oil pump replacement is needed, ensure the three oil pump oil holes (Area 1) and OCV mounting hole (Area 2) are free of debris before installing the oil pump and OCV. When installing the engine oil pan on the 1.2L engine, be sure to follow the RTV sealant instructions in #PIP5739 to ensure proper oil pan installation.

For additional information, refer to #PIP5932.

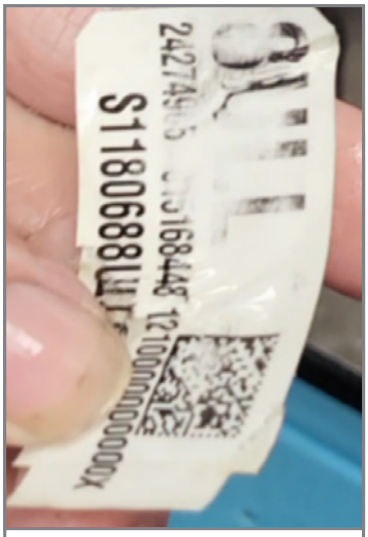
▶ Thanks to Raymond Haglund

Avoid the TUN# Label When Cleaning Transmission Cases

Recently, a number of 8-speed and 10-speed transmissions have been returned to the Warranty Parts Center with missing or unreadable Transmission Unique Label (TUN) labels. In some cases, the label is smeared or distorted due to how the case was cleaned before shipping.

The TUN# label identifies the transmission build and includes data for the valve body and Transmission Control Module.

If the TUN# label numbers and data matrix code cannot be read, the bottom pan of the transmission must be pulled to view the PUN# on the valve body in order to determine the model of the unit and correctly identify all components.



Unreadable TUN# label

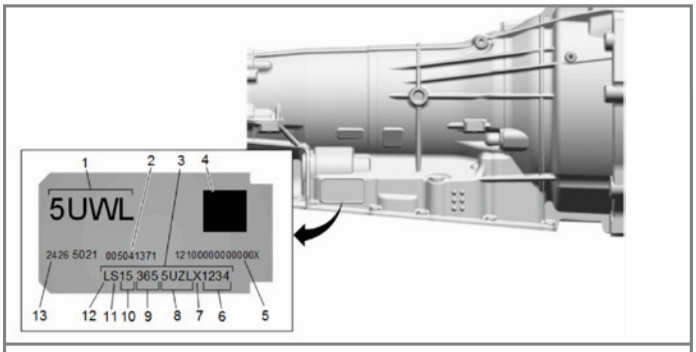
Clear, readable TUN# label

CLEANING THE TRANSMISSION

Before shipping the transmission, the case should be cleaned. However, use care not to get any cleaning solvent on the TUN# label and the surrounding area. The TUN# is located on the side of the transmission near the lower edge of the case.

TIP: When cleaning the unit, do not use any chemicals to wipe away dirt or debris on the TUN# label that may smear or remove the ink on the label. Brake cleaner or other solvents should not be sprayed or wiped directly on the TUN# label.

▶ Thanks to Mark Kevnick



TUN# label location

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