



Service Bulletin

Bulletin No.: 17-NA-221

Date: August, 2022

TECHNICAL

Subject: Poor Engine Performance in Extremely Cold Weather Conditions for LE2 Engines, Charge Air Cooler Icing - Malfunction Indicator Lamp (MIL) Illuminated, DTC P0299, P0234, P0236, P2227, P00C7 Set

Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Buick	Encore	2016	2019	—	—	1.4L (LE2)	—
		2021	2022				
Chevrolet	Trax	2021	2022				

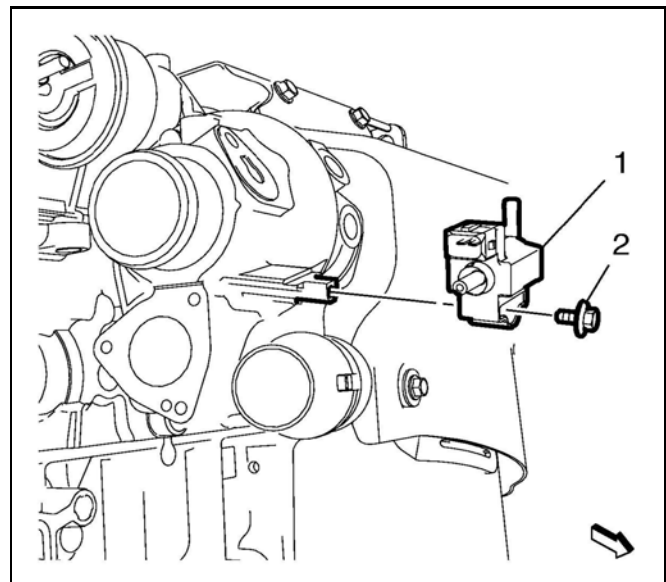
Involved Region or Country	North America
Condition	<p>Some customers may comment that when driving short distances and/or slow speed driving cycles, their vehicle experiences one or several of the following conditions within the first 10 to 15 minutes of vehicle operation in extremely cold weather conditions (-18°C or less / 0°F or less):</p> <ul style="list-style-type: none"> • Loss of power • Smoke out the tail pipe • Hesitation on acceleration • Stalling condition • Burning oil odor possibly caused by oil leak • May also notice a Malfunction Indicator Lamp illuminated • After driving for a period of time, the driveability issues seem to diminish. <p>This condition may also cause an increase in crankcase pressure, creating oil leaks at seals and gaskets.</p> <p>Technicians may find one or more of the following DTCs set:</p> <ul style="list-style-type: none"> • P0234 • P0236 • P0299 • P2227 • P00C7
Cause	This condition may be caused by ice accumulation in the charge air cooler (CAC), restricting air flow to the throttle body.

<p>Correction</p>	<p>If any of the above conditions are present, allow time for possible ice build up in the CAC to melt by allowing the vehicle to thaw in a warm climate.</p> <p>If any of the following conditions are validated to be caused by freezing/icing, replace the CAC.</p> <p>If not previously performed, an oil change may be necessary to remove any moisture from the engine. Prior to the oil change, run the engine at idle for an extended period of time to melt any ice in the engine.</p> <p>If there is a check engine light with a P0234 or P0299 DTC during cold weather driving, refer to Turbocharger Air Pressure Sensor Inspection below.</p> <p>Note: Frozen oil/water contaminant in the turbocharger wastegate regulator solenoid valve (TCV) is often concurrent with vehicle operating conditions that cause CAC freezing. If DTC P0234 is set - Turbocharger Wastegate Regulator Solenoid Valve Inspection.</p> <p>Important: For additional information on Oil/Moisture Condensate Freezing Up in the turbocharger wastegate regulator solenoid valve, refer to Turbocharger Wastegate Regulator Solenoid Valve (TCV) Thermo-Wrap below.</p> <p>Important: The new ECM calibration is only applicable for MY 2018, 2019 and 2021 vehicles with LE2 engines. In MY 2020 there was no LE2 engine.</p> <p>Note: The Engine Control Module calibration should be updated. The new calibration will enable a revised transmission shift pattern during cold weather operation, which does not use overdrive as frequently. As a result, <i>some customers</i> may notice elevated engine RPMs during highway operation. This operating mode will reduce the potential for ice to build up inside the charge air cooler, and the potential for setting P0299 or P0234 diagnostic codes.</p> <p>The customer must be <i>informed</i> by dealership personnel by explaining the new engine control module calibration and its <i>effects</i> on transmission shift patterns at highway speeds during cold weather to avoid a customer return to the dealership after the programming is completed.</p>
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Important: Service agents must comply with all International, Federal, State, Provincial, and/or Local laws applicable to the activities it performs under this bulletin, including but not limited to handling, deploying, preparing, classifying, packaging, marking, labeling, and shipping dangerous goods. In the event of a conflict between the procedures set forth in this bulletin and the laws that apply to your dealership, you must follow those applicable laws.

Important: Allow time for the vehicle to thaw in a warm environment to avoid damaging or breaking parts that may be required to be re-installed.

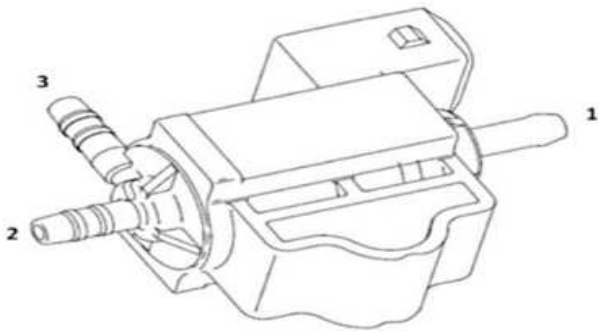
Turbocharger Wastegate Regulator Solenoid Valve (TCV) Thermo-Wrap



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1. Remove the turbocharger wastegate regulator solenoid valve (1). Refer to *Turbocharger Wastegate Regulator Solenoid Valve Replacement* in the Service Manual.
2. Drain the turbocharger wastegate regulator solenoid valve (TCV) by turning the valve upside down.

Note: Check port #2 to assure the spring gets lifted off the seat. This will be determined by the compressed air not dead heading when applied to port #2. When applying air to this port a small amount of air should be observed at port #3 and even less air will be noticed at port #1. If this does not happen, the TCV plunger may have hardened deposits from hot operating conditions which will impede TCV plunger movement, and the turbocharger wastegate regulator solenoid valve should be replaced.



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3. Using clean shop air regulated to 80-100 PSI, blow through all three ports (1, 2 & 3) for 5 seconds each.

⇒ Repeat step 3 twice.



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4. Prior to reinstalling the TCV, pre-position the thermal wrap. This will aid in installation of the wrap once the TCV is reinstalled.



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Note: The end result of the wrap, will surround the TCV as shown in the graphic above.

5. Install the TCV. Refer to *Turbocharger Wastegate Regulator Solenoid Valve Replacement* in the Service Manual.



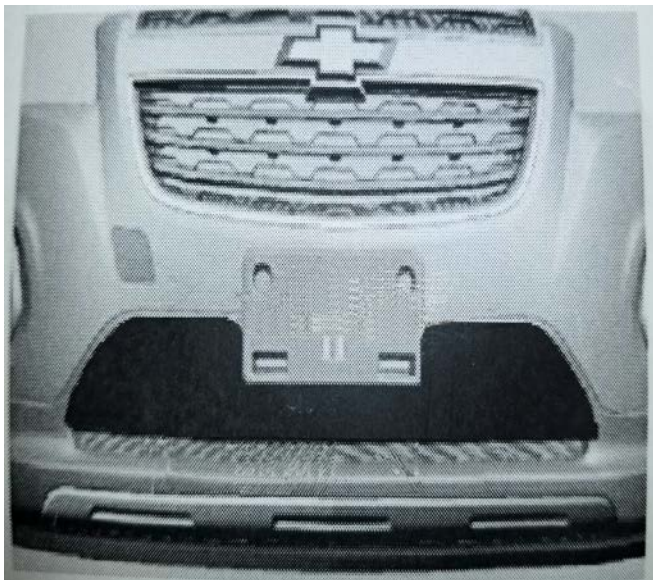
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6. Once the mounting bolt and hoses are properly installed, pull the lower portion of the wrap upward, and snap it into position.
7. Clear all DTCs using GDS and evaluate.

Grille Winter Cover Installation

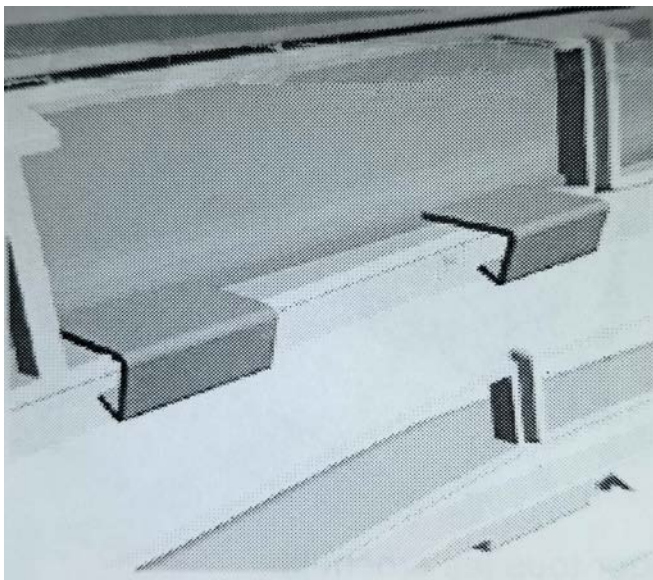
Warning: Remove grille cover during temperatures above 32°F/ 0°C to prevent engine and transmission overheating. Remove grille cover before towing a trailer of any size. Failure to do so will decrease transmission cooling efficiency and possibly cause damage to the drivetrain.

Note: The cover may appear to be undersized. The vinyl used may stretch during installation to ensure a tight fit. It is highly recommended that the cover be installed in a warm shop environment.



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1. Using care, orientate the fascia winter cover to the bumper fascia.

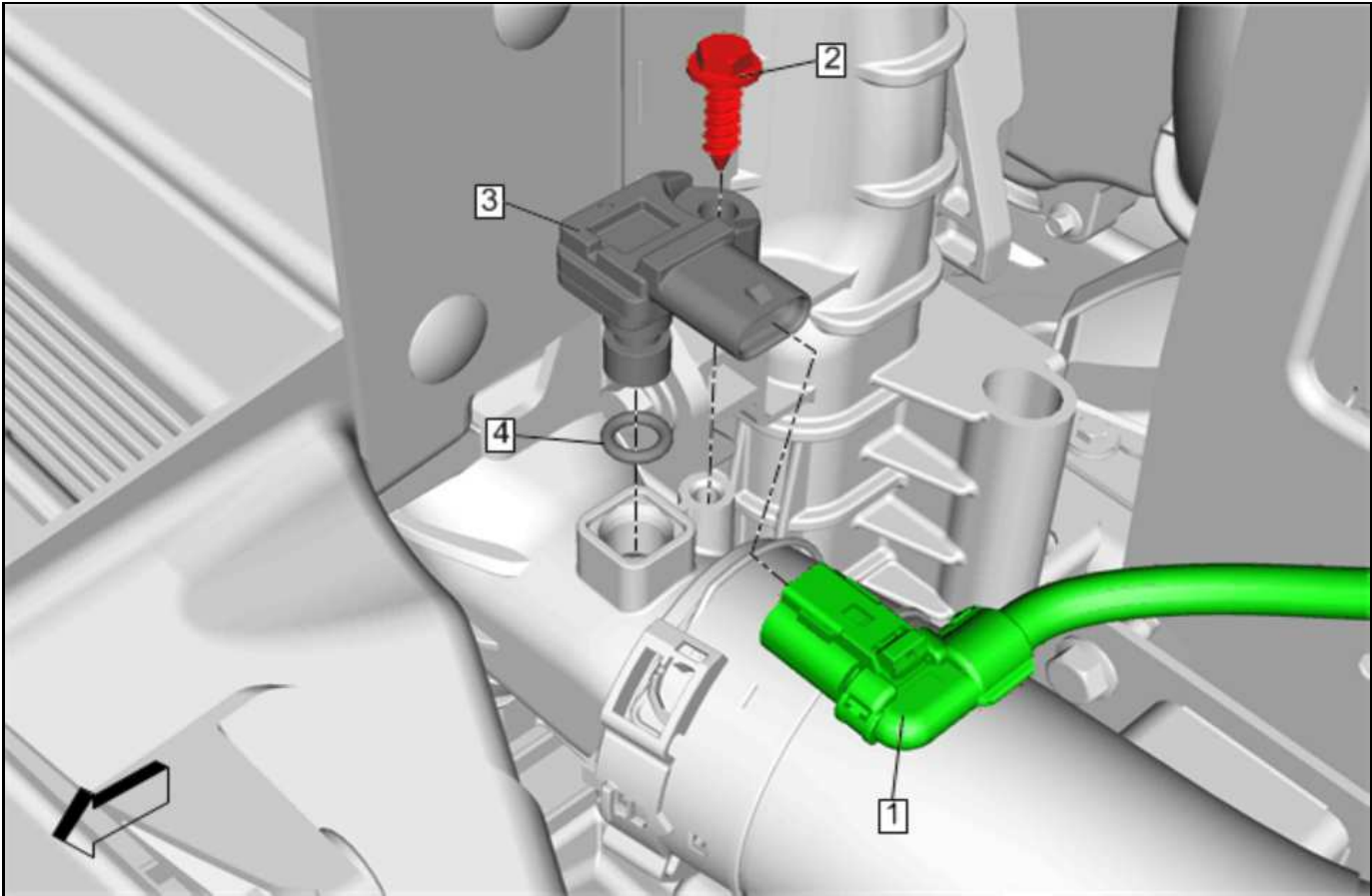


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2. Attach the cover to the fascia by pushing the hooks through the grille openings.
3. Validate that all the hooks are engaged and the cover is a tight fit.

Turbocharger Air Pressure Sensor Inspection

Important: Only perform steps 1-5 if DTC P0299 is set.



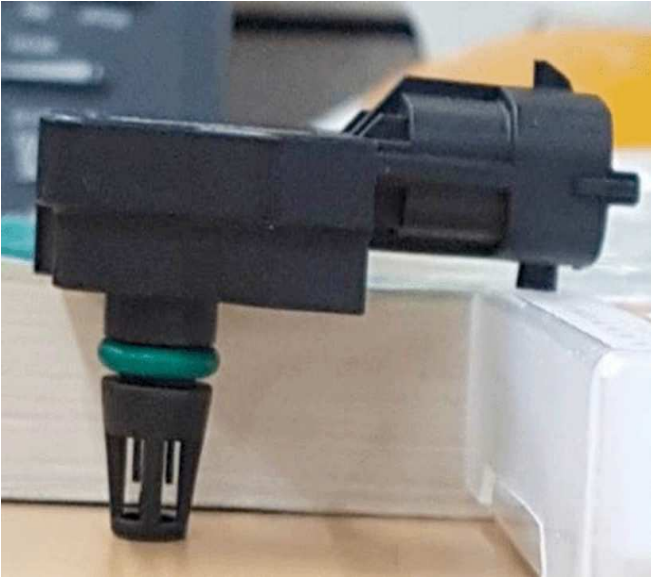
1. Remove the turbocharger air pressure sensor (3). Refer to *Turbocharger Air Pressure Sensor Replacement* in SI.



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Important: Due to the sensitivity of the sensor, **Do Not** use any chemical cleaners including water and **Do Not** use compressed air to remove contaminants.

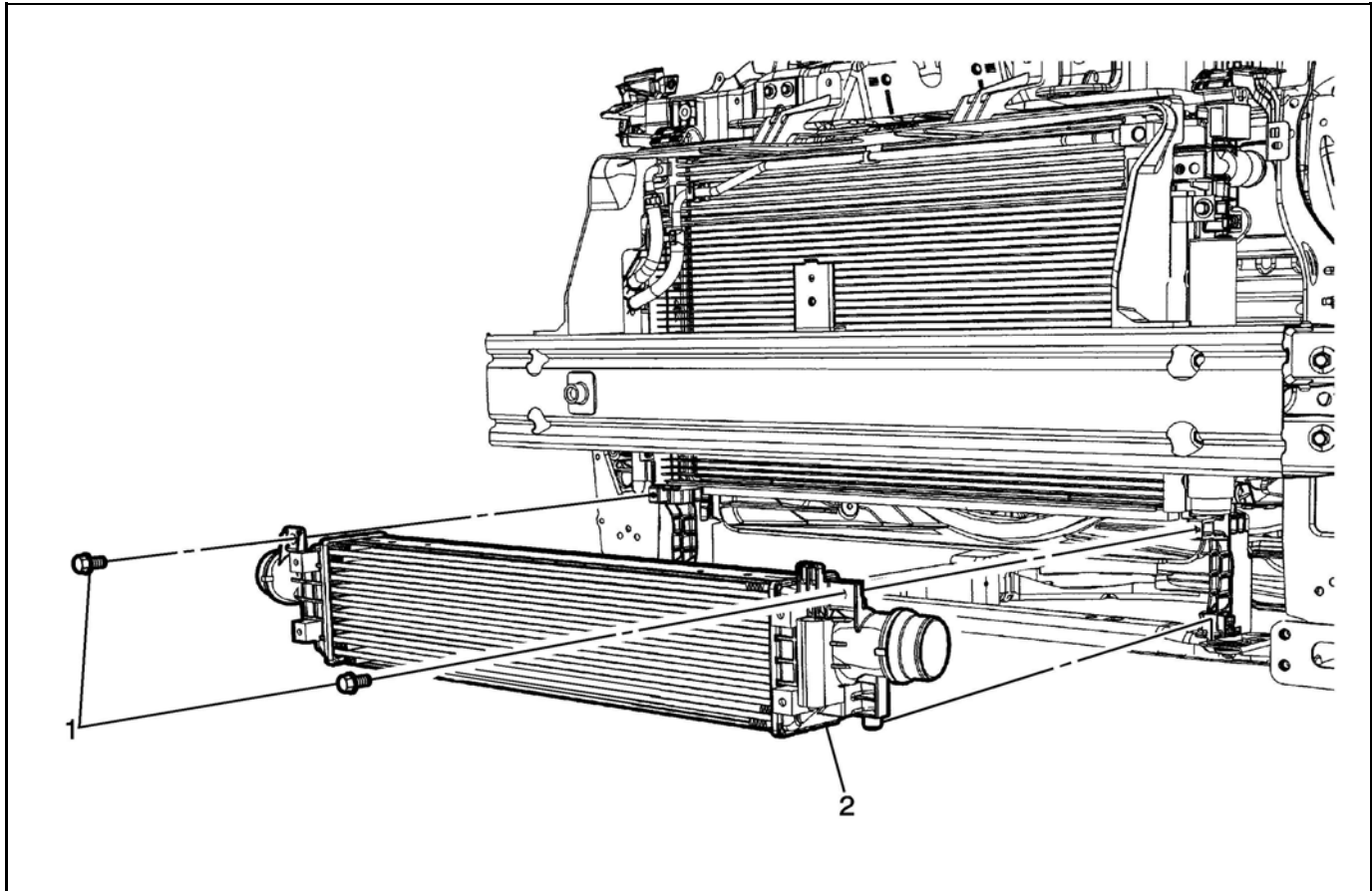
2. Inspect the sensor for any contaminants.



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3. Allow time for any ice build-up to melt by placing the sensor port down.
4. Clean the sensor with a clean towel.
5. Install the sensor.

Service Procedure



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1. Install the CAC (2). Refer to *Charge Air Cooler Replacement* in SI.

Important: Do Not perform an oil change if the oil change was recently done.

- If the oil change was recently done and no signs of moisture have been confirmed, Do Not proceed with procedure.
 - If the oil change was not previously done or moisture has been found in the oil, proceed with procedure.
2. If required, perform an oil change. Refer to *Engine Oil and Oil Filter Replacement* in the Service Manual.

Engine Control Module Programming

Important: Updated Engine Control Module calibration: The updated calibration will enable a revised transmission shift pattern during cold weather operation, which does not use overdrive as frequently. As a result, the customer may notice elevated engine RPMs during highway operation. This operating mode will reduce the potential for ice to build up inside the charge air cooler, and the potential for setting P0299 or P0234 diagnostic codes.

Caution: Before downloading the update files, be sure the computer is connected to the internet through a network cable (hardwired). DO NOT DOWNLOAD or

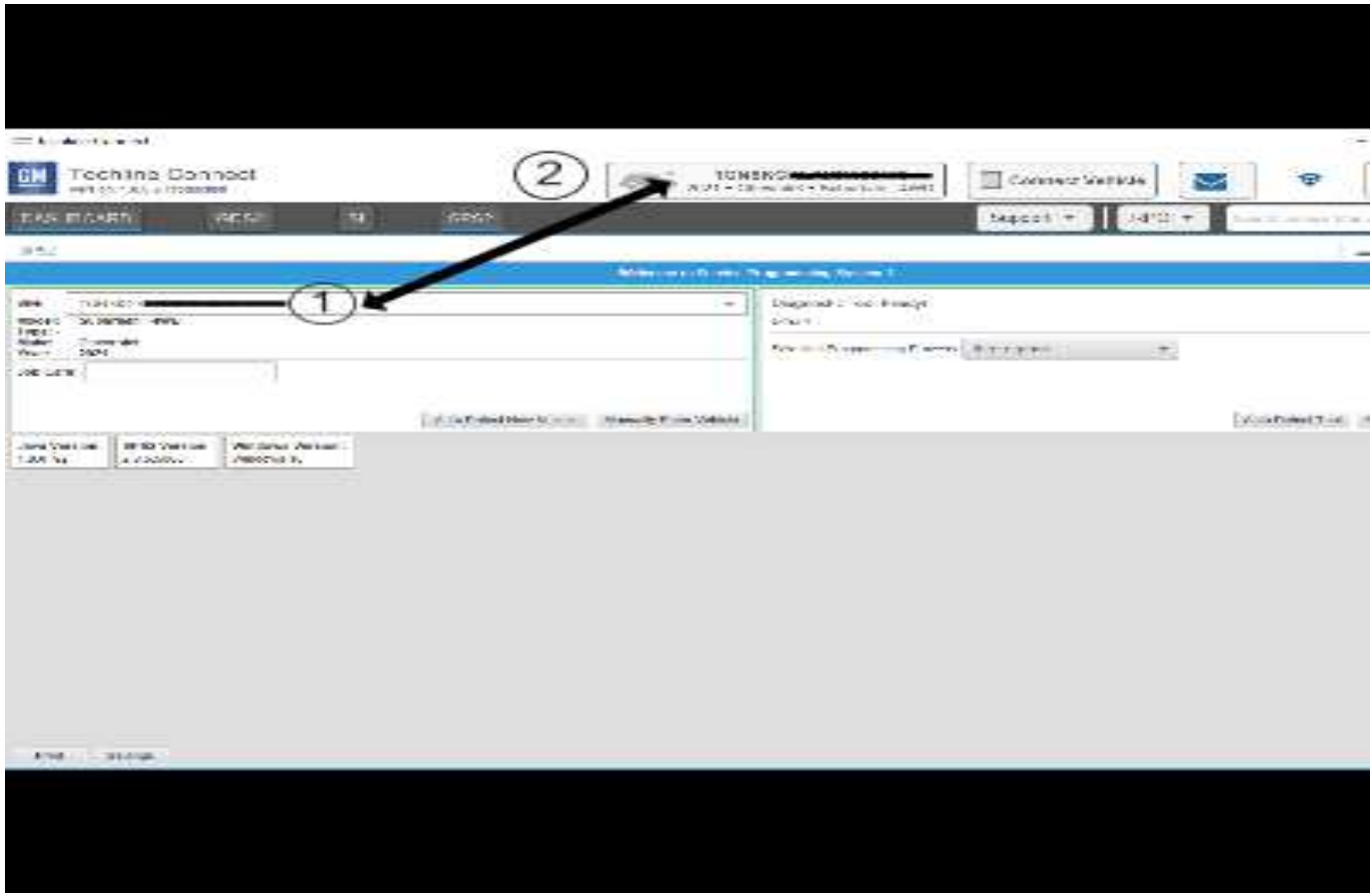
install the files wirelessly. If there is an interruption during programming, programming failure or control module damage may occur.

- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install a GM Authorized Programming Support Tool to maintain system voltage. Refer to www.gmdesolutions.com for further information. If not available, connect a fully charged 12V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Follow the on-screen prompts regarding ignition power mode, but ensure that anything that drains excessive power (exterior lights, HVAC blower motor, etc) is off.
- Please verify that the radio time and date are set correctly before inserting USB drive into vehicle for programming, **otherwise an error will result.**
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Important: The service technician always needs to verify that the VIN displayed in the TLC left side drop down menu and the top center window match the VIN plate of the vehicle to be programmed prior to using Service Programming System 2 (SPS2) for programming or reprogramming a module.

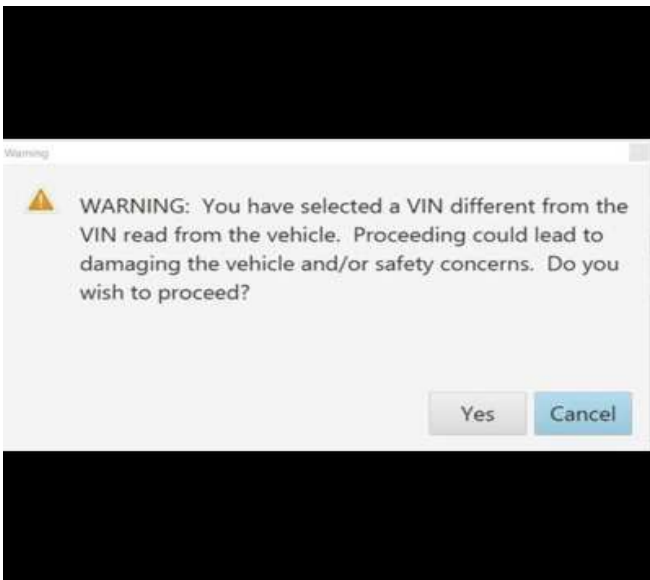
- For the TLC application, service technicians need to always ensure that the power mode (ignition) is “ON” before reading the VIN from the vehicle’s VIN master module and that they do not select a VIN that is already in the TLC application memory from a previous vehicle.
- If the VIN that shows up in the TLC top center window after correctly reading the VIN from the vehicle does not match the VIN plate of the vehicle, manually type in the VIN characters from the vehicle VIN plate into the TLC top center window and use these for programming or reprogramming the subject module with the correct vehicle VIN and software and/or calibrations.
- The Engine Control Module (ECM) is the master module (for VIP vehicles) that TLC reads to determine the VIN of the vehicle. If the VIN read from the vehicle by TLC does not match the VIN plate of the vehicle, the ECM also needs to be reprogrammed with the correct VIN, software and calibrations that match the vehicle’s VIN plate.
- The Body Control Module (BCM) is the master module (for GEM vehicles) that TLC reads to determine the VIN of the vehicle. If the VIN read from the vehicle by TLC does not match the VIN plate of the vehicle, the BCM also needs to be reprogrammed with the correct VIN, software and calibrations that match the vehicle’s VIN plate.

Caution: Be sure the VIN selected in the drop down menu (1) is the same as the vehicle connected (2) before beginning programming.

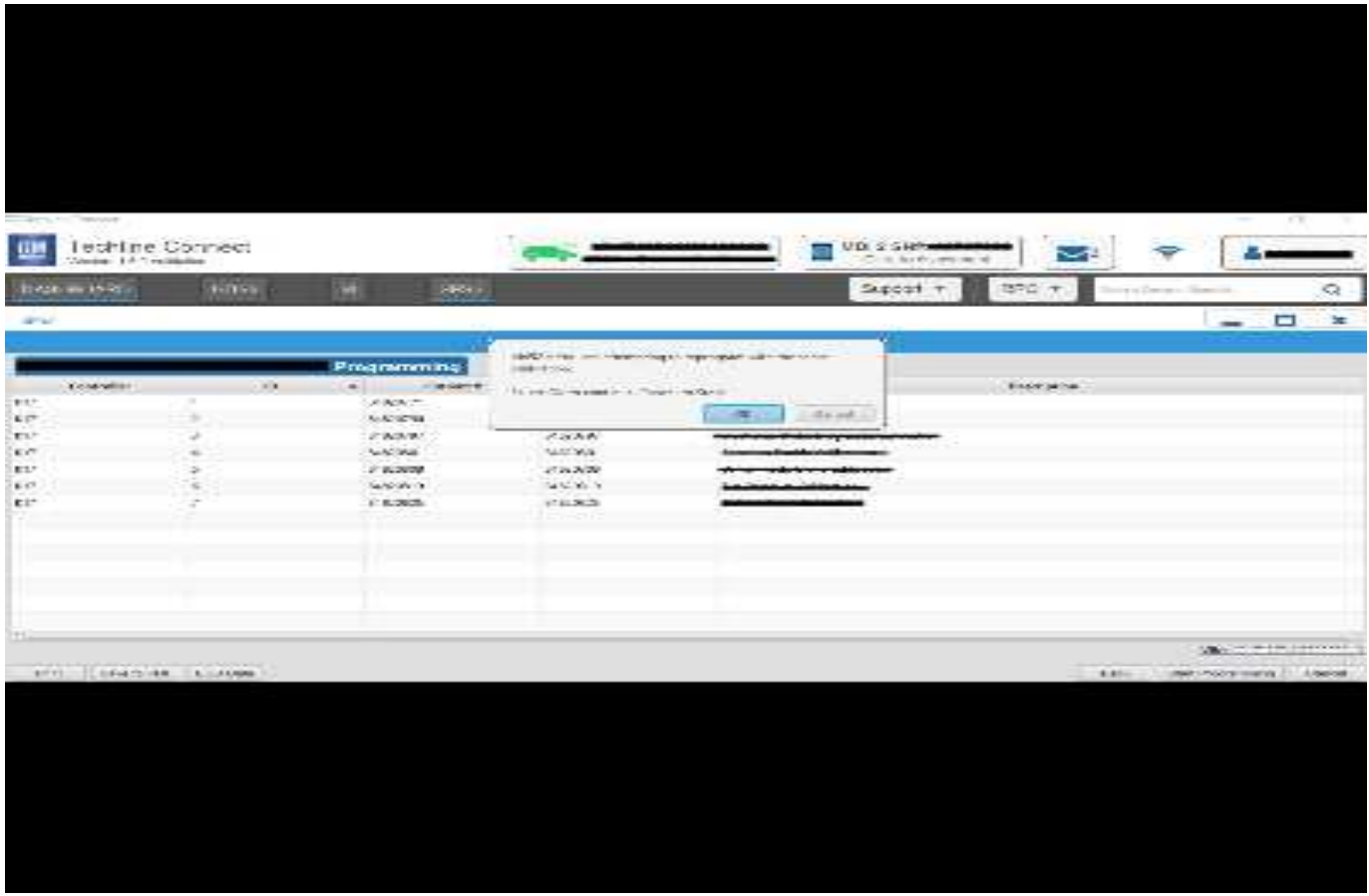


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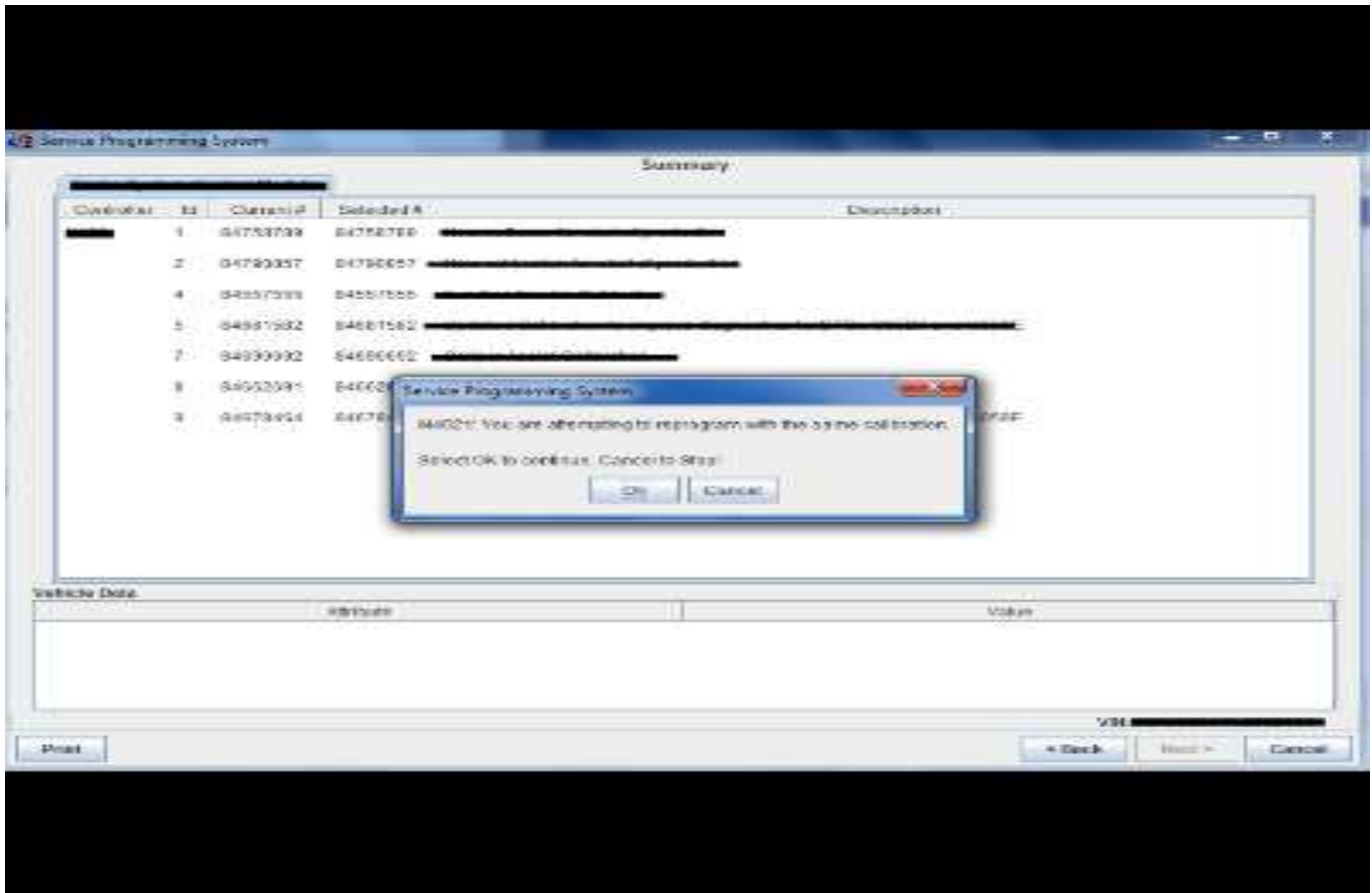
Important: If the vehicle VIN DOES NOT match, the message below will be shown.



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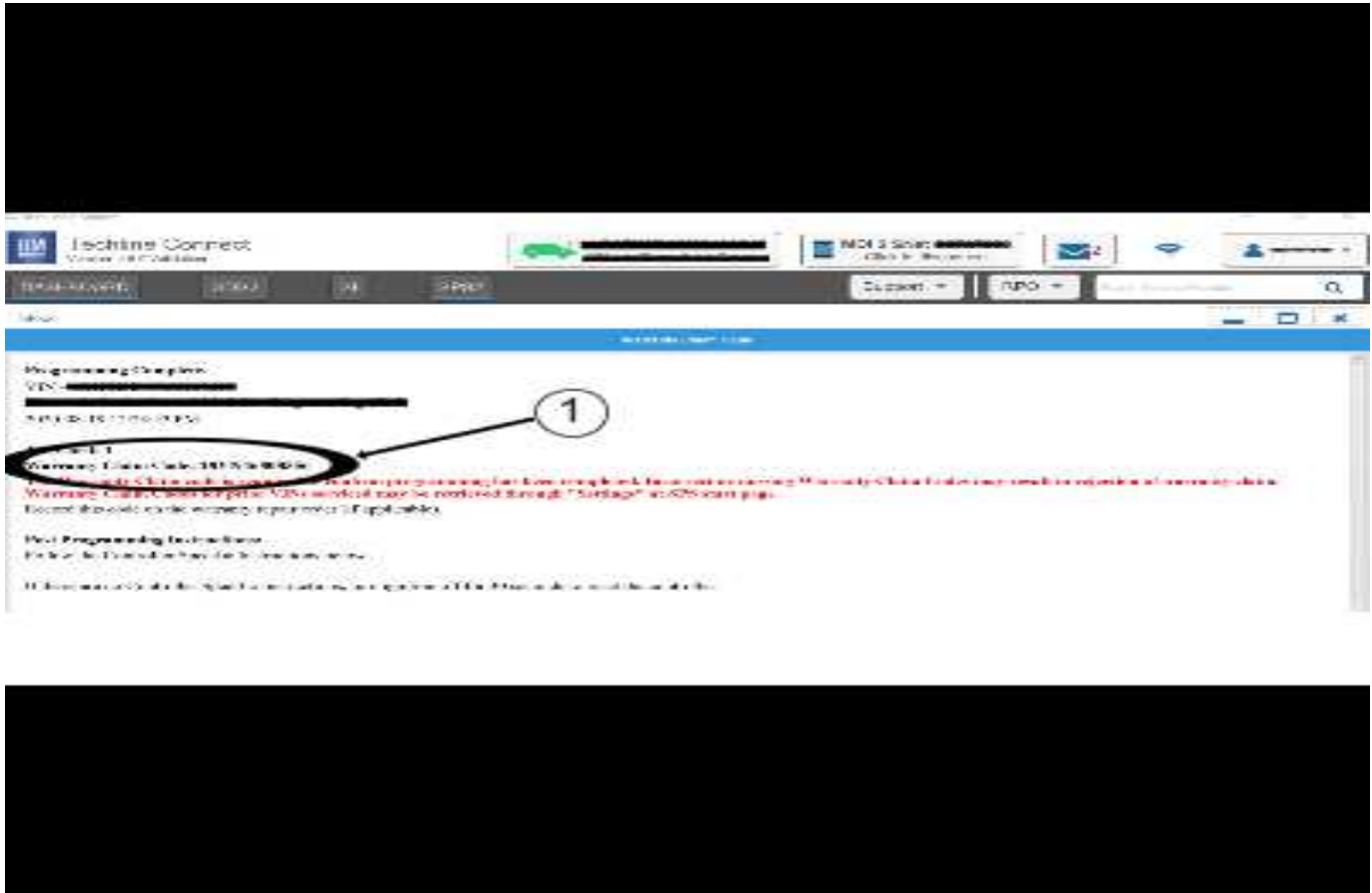


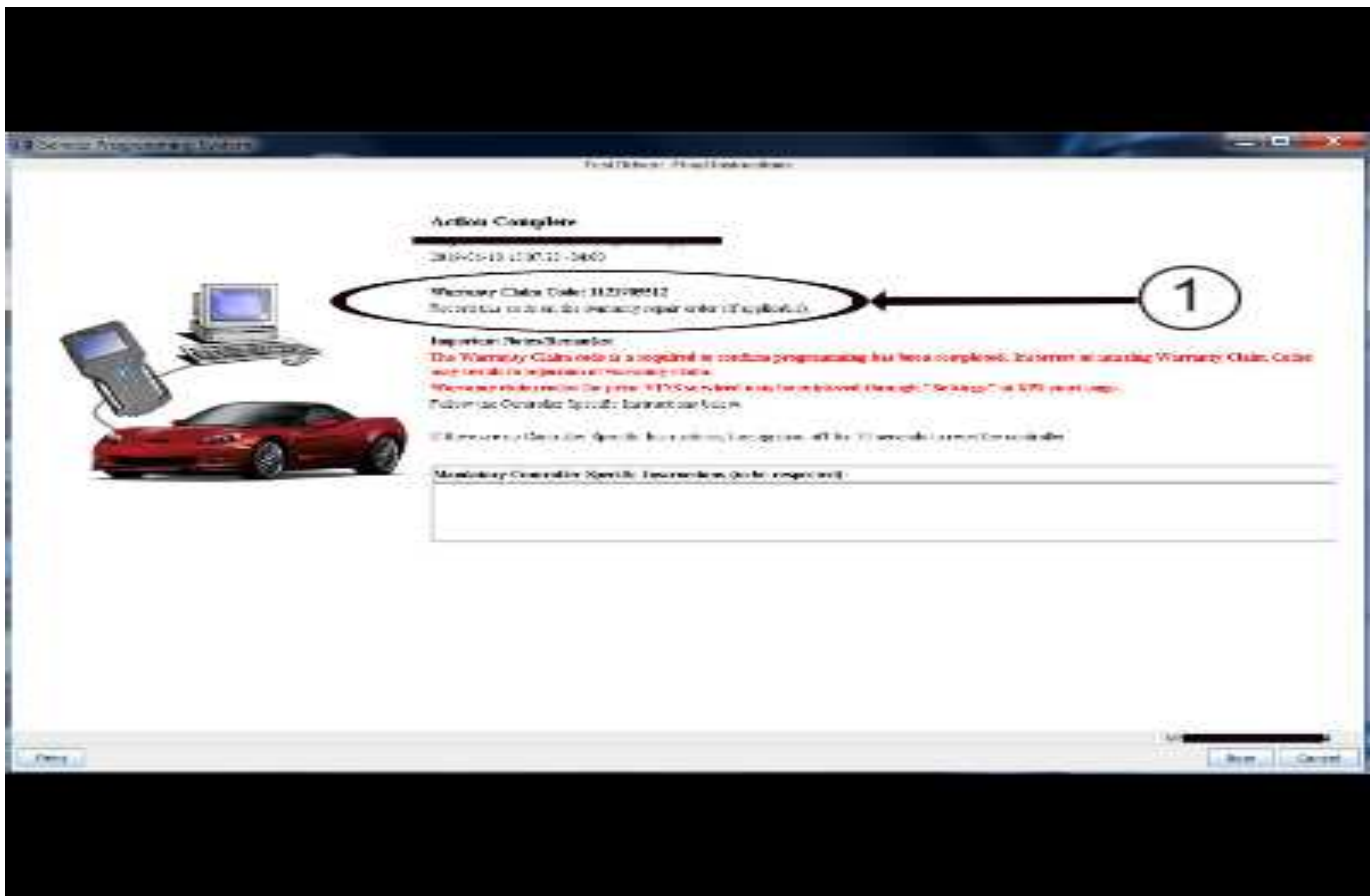
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Important: Techline Connect and TIS2WEB screens shown above.

Important: If the same calibration/software warning is noted on the TLC or SPS Summary screen, select OK and follow screen instructions. After a successful programming event, the WCC is located in the Service Programming System dialogue box of the SPS Summary screen. Document the WCC on the job card. No further action is required. Refer to the Warranty Information section of this bulletin.

1. Reprogram the ECM. Refer to *K20 Engine Control Module: Programming and Setup* in the Service Manual.





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Note: The screenshots above are an example of module programming and may not be indicative of the specific module that is being programmed. Module selection and VIN information have been blacked out.

Important: To avoid warranty transaction rejections, you **MUST** record the warranty claim code provided on the SPS Warranty Claim Code (WCC) screen shown above on the job card. Refer to callout 1 above for the location of the WCC on the SPS screen.

2. Record the SPS Warranty Claim Code on the job card for warranty transaction submission.

Parts Information

Description	Model Year	Part Number	Qty
Cooler, Charge Air	2016-2020	42574036	1
	2021	Installed in Production	—
Cover, Grille Winter	2016	42697326	1
	2021–2022 (Trax)	42697331	1
	2017-2022 (Encore)	42697332	1
Filter, Oil	2016-2021	Refer to the Electronic Parts Catalog (EPC).	
Oil			
Wrap, Thermal	All	25205589	1

Warranty Information

Important: Warranty coverage code E2 applies for this module programming event. ECM reprogramming is covered for 8 years/80,000 miles (U.S.) or 8 years/130,000 km (Canada).

Note: Warranty Coverage Codes E, E1 apply to Labor Operation 4081728.

For vehicles repaired under the Powertrain coverage, use the following labor operation. Reference the Applicable Warranties section of Investigate Vehicle History (IVH) for coverage information.

Labor Operation	Description	Labor Time
4081728*	Charge Air Cooler Replacement	1.1 hrs
Add	IAPT Inspection	0.2 hr
0580398*	Winter Grille Cover Installation	0.2 hr
Add	Oil Change	0.3 hr
4088298*	Removal of Condensation from Turbocharger Wastegate Regulator Solenoid Valve and Install Thermal Wrap	0.3 hr
2888358*	Engine Control Module Re-programming with SPS for Encore/Trax	0.3 hr

*This is a unique Labor Operation for bulletin use only.

Important: To avoid warranty transaction rejections, carefully read and follow the instructions below:

- The Warranty Claim Code must be accurately entered in the "SPS Warranty Claim Code" field of the transaction.
- When more than one Warranty Claim Code is generated for a programming event, it is required to document all Warranty Claim Codes in the "Correction" field on the job card. Dealers must also enter one of the codes in the "SPS Warranty Claim Code" field of the transaction, otherwise the transaction will reject. It is best practice to enter the FINAL code provided by SPS/SPS2.

Warranty Claim Code Information Retrieval

If the SPS Warranty Claim Code was not recorded on the Job Card, the code can be retrieved in the SPS system as follows:

- Open TLC/TIS on the computer used to program the vehicle.
- Select and start SPS/SPS2.
- Select Settings.
- Select the Warranty Claim Code tab.

The VIN, Warranty Claim Code and Date/Time will be listed on a roster of recent programming events. If the code is retrievable, dealers should resubmit the transaction making sure to include the code in the SPS Warranty Claim Code field.

Version	11
Modified	<p>Revised August 14, 2017 – Added engine RPO to Subject.</p> <p>Revised April 12, 2018 – Updated to 2018 model year and added breakpoint and IAPT information.</p> <p>Revised February 01, 2019 – Added the 2019 Model Year, an Important statement at beginning of bulletin, Grille Winter Cover Installation procedure and parts information, changed Intake Air Pressure and Temperature Sensor Inspection title to Turbocharger Air Pressure Sensor Inspection and updated Warranty Information.</p> <p>Revised April 09, 2019 – Added 2019 to the Model Years for the charge air cooler in the Parts Information.</p> <p>Revised February 12, 2021 – Added the 2020-2021 Model Years to Encore, added the Trax Model, removed the breakpoint date and updated the Model Years in Parts Information table.</p> <p>Revised August 05, 2021 – Added the 2022 Model Year, TVC information to the Correction section, Important statement to refer to PIP5812A under Turbocharger Wastegate Regulator Solenoid Valve Inspection section and Emission Warranty coverage statement to Warranty Information.</p> <p>Revised December 20, 2021 – Added a Note and Important in the Correction section, an Engine Control Module Programming section and ECM Programming Warranty Information.</p> <p>Revised January 14, 2022 – Updated information referencing PIP5812C in Correction section, updated the Warranty coverage Important statement and changed ECM Re-programming to Bulletin Only Labor Operation.</p> <p>Revised May 27, 2022 – Removed PIP5812C information, added Information to Correction section, added first Important statement under Correction, added Turbocharger Wastegate Regulator Solenoid Valve (TCV) Thermo-Wrap section, added Thermal Wrap Part Number to Parts Information and Added TCV and Wrap Installation Labor Operation.</p> <p>Revised August 11, 2022 – Added a graphic to Step 3 under Turbocharger Wastegate Regulator Solenoid Valve (TCV) Thermo-Wrap section and a Note under Warranty Information.</p>

