Service Bulletin

Bulletin No.: 23-NA-058
Date: March, 2024

TECHNICAL

Subject: **Cold Start Rattle Noise from the Engine Compartment, Malfunction Indicator Lamp (MIL) Illuminated - DTC P0299 Set**

This bulletin replaces PIP5829A. Please discard PIP5829A

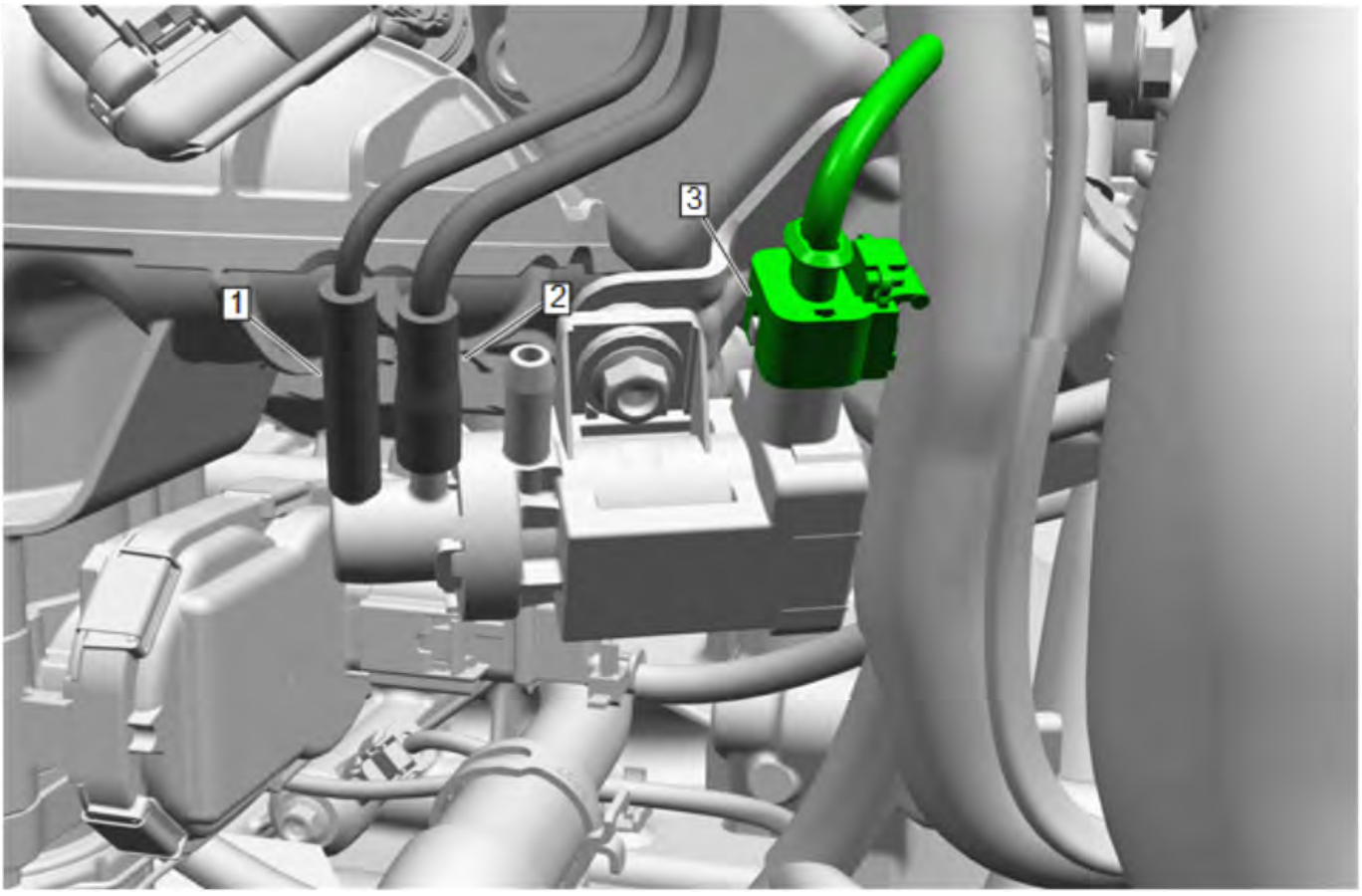
Brand:	Model:	Model Year:		VIN:		Engine:	Transmission:
		from	to	from	to		
Buick	Encore GX	2020	2023			1.2L (LIH)	
Chevrolet	Trailblazer	2021					

Involved Region or Country	North America
Condition	Some customers may comment on one or more of the following conditions: • MIL illuminated • Cold Start Rattle Noise from the Engine Compartment Some technicians may find DTC P0299 (Engine Underboost) Current or in history of the Engine Control Module (ECM).
Cause	Potential turbocharger wastegate linkage wear.
Correction	If the complaint is a cold start rattle noise, put the car on a hoist and use the remote start feature to start the vehicle while prepared to touch the wastegate actuator rod with a long screwdriver. – This rod is visible from under the vehicles near the catalytic converter. • If during the cold start converter light off procedure, the rattle noise can be heard and is then damped by touching the wastegate actuator rod with the screwdriver, then the premature wastegate linkage wear is present and will likely be solved by replacing the turbocharger. Refer to *Compressor Air Intake Turbocharger Replacement* in the Service Manual. • If DTC P0299 is set, refer to Service Information.

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.

Service Information

Check Vacuum Supply from the Vacuum Pump



5392518

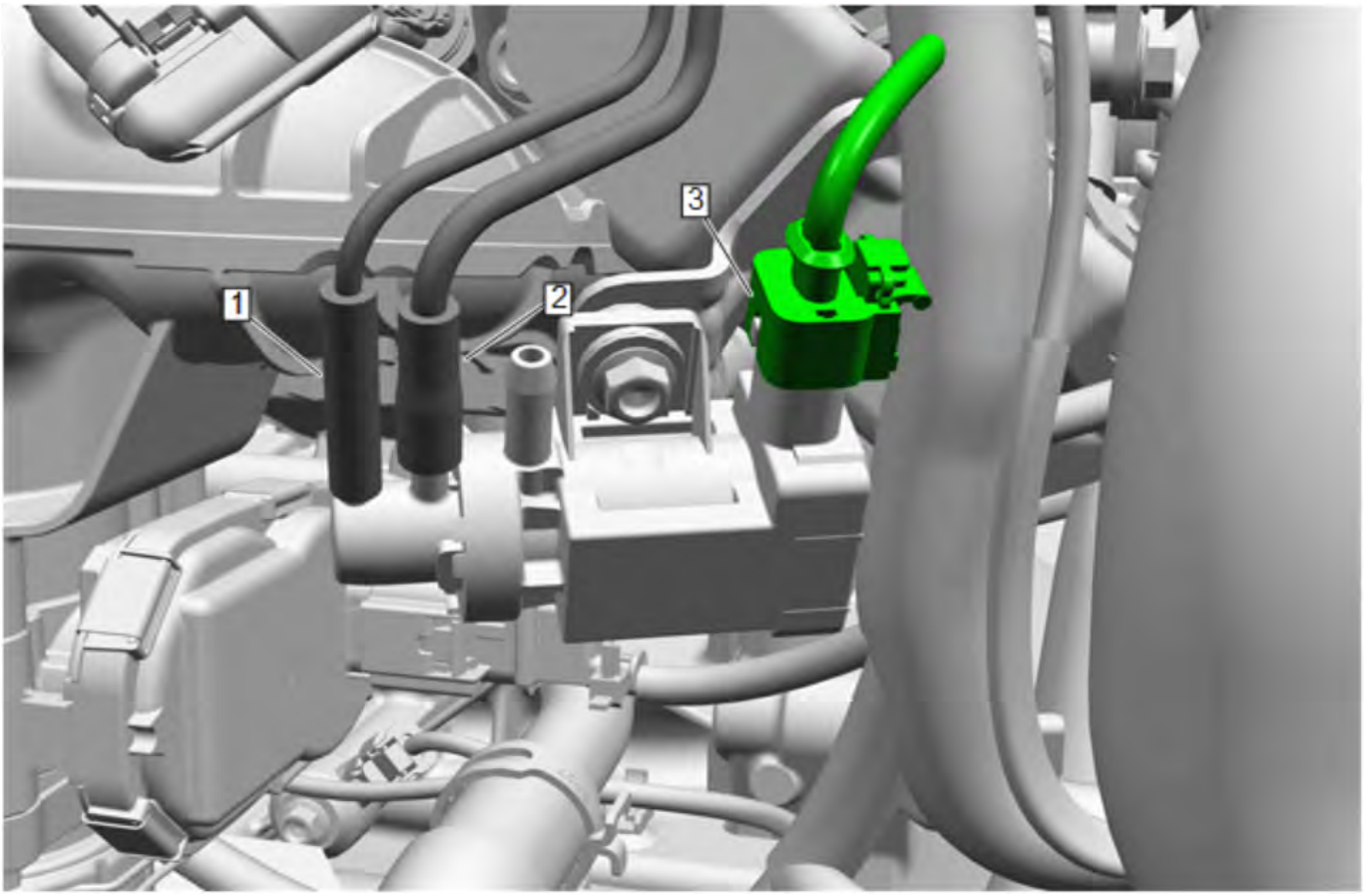
1. Disconnect the Turbocharger Wastegate Actuator Vacuum Control Solenoid Valve Hose (1) from the Turbocharger Wastegate Regulator Solenoid Valve.
2. Utilizing EN-23738-A Vacuum Pump with an integral vacuum gauge, connect said pump to the Turbocharger Wastegate Actuator Vacuum Control Solenoid Valve Hose.
3. Engine at operating temperature at idle.
4. Verify the tool reading: EN-23738-A Vacuum Pump = −50 kPa (−0.5 bar, 15 in Hg).
   - If the desired pressure/vacuum cannot be achieved or does not hold steady:

⇒ Ignition/Vehicle » Off.

⇒ Test or replace the component: Vacuum Pump Assembly and related hoses.

- If the desired pressure/vacuum can be achieved and holds steady:
  - Engine » Off.
  - Reconnect the Turbocharger Wastegate Actuator Vacuum Control Solenoid Valve Hose to the Turbocharger Wastegate Regulator Solenoid Valve and refer to Check Wastegate Vacuum Regulator Valve Function.

Check Wastegate Vacuum Regulator Valve Function



5392518

1. Disconnect the Turbocharger Wastegate Actuator Vacuum Tank Solenoid Valve Tub (2) from the Turbocharger Wastegate Regulator Solenoid Valve.
2. Connect the EN-23738-A Vacuum Pump to the Turbocharger Wastegate Solenoid Valve Actuator supply port.
3. Engine at operating temperature at idle.
4. Verify the tool reading: EN-23738-A Vacuum Pump = Less than −17 kPa(−0.17 bar, 5 in Hg).
   - If −17 kPa(−0.17 bar, 5 in Hg) or greater.

⇒ Test or replace the component: Turbocharger Wastegate Regulator Solenoid Valve. Refer to *Turbocharger Wastegate Regulator Solenoid Valve Removal* in the Service Manual and *Turbocharger Wastegate Regulator Solenoid Valve Installation* in the Service Manual.

- If less than −17 kPa(−0.17 bar, 5 in Hg).

⇒ Engine Speed Greater than 4000 RPM — For 2 s.

⇒ Verify the tool reading: EN-23738-A Vacuum Pump = Greater than −50 kPa(−0.5 bar, 15 in Hg).

- If less than−50 kPa(−0.5 bar, 15 in Hg).

⇒ Test or replace the component: Turbocharger Wastegate Regulator Solenoid Valve. Refer to *Turbocharger Wastegate Regulator Solenoid Valve Removal* in the Service Manual and *Turbocharger Wastegate Regulator Solenoid Valve Installation* in the Service Manual.

- If Greater than −50 kPa(−0.5 bar, 15 in Hg). The Turbocharger Wastegate Regulator Solenoid Valve has been validated to be functioning correctly and proceed to Turbocharger Inspection.

Turbocharger Inspection

1. Remove the Turbocharger from the vehicle and inspect the Turbocharger Wastegate linkage for excessive wear/play. (Compare to replacement Turbocharger if necessary).
   ⇒ Evaluate the external vacuum actuator rod-link-end-to-arm for Inner arm (ID) to outer pin (OD) clearance of more than approximately 1.5 mm clearance.
   ⇒ Look for significant ovalization of the arm hole (more than 1.5 mm delta smallest to largest clearance axis).
2. Inspect the wastegate-spindle to turbine-housing-bushing for excessive clearance.
   ⇒ Evaluate based on ability to rock the wastegate-spindle within the turbine-housing-bushing significantly. Expect up to ~ 2 degrees in normal wear range. Excessive

movement may be a concern if greater than ~ 2 in one radial direction indicating excessive wear (ovalization of bushing).

⇒ Take note if there is contact of the underside of the rod-link-end-to-arm to the external top side of the turbine casting (beyond the top of bushing OD regular contact radius). This is a clear indicator of excessive spindle to bushing interface wear.

⇒ If any of the above conditions have been verified, replace the Turbocharger. Refer to *Compressor Air Intake Turbocharger Replacement* in the Service Manual.

⇒ If the vehicle is **not** already equipped with a Vacuum Tank Kit, refer to *Turbocharger Wastegate Actuator Vacuum Tank Replacement* in the Service Manual.

3. Perform: Intake System Learned Values Reset.

Parts Information

Note: Only select the parts that coincide with the repair performed.

Causal Part	Description	Part Number	Qty
X	VALVE, TURBO WASTEGATE REG SOL	55599331	1
X	TURBO-CHARGER, CMPR AIR INT	25204082	1
N/A	CLAMP, EXH PIPE	55513359	1
N/A	HOSE, PCV VAC	55513554	1
N/A	GASKET, TURBO	55494843	1
N/A	GASKET, CTLTC CONV	12641115	1
N/A	GASKET, TURBO OIL RTN PIPE	55514397	2
N/A	GASKET, EXH SYS FRT	13499082	1
N/A	NUT, TURBO	11612078	4
N/A	PIPE, TURBO OIL FEED	55495320	1
N/A	KIT	25205791	1

Warranty Information

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

Labor Operation	Description	Labor Time
4023250	Turbocharger Wastegate Regulator Solenoid Valve Replacement	Use Published Labor Time
4023220	Turbocharger Wastegate Actuator Vacuum Tank Replacement	
4088328*	Turbocharger Replacement	3.3 Hrs.
*This is a unique Labor Operation for Bulletin use only.		

Version	7
Modified	Released March 30, 2023 Revised August 03, 2023 - Changed the Warranty Information from Emissions to Powertrain coverage. Revised August 17, 2023 - Removed 55487539 and 55497445 from the Parts Information section. Revised September 07, 2023 - Added new Hyperlink to Compressor Air Intake Turbocharger Replacement in Correction and Service Information sections. Revised November 17, 2023 - Changed the Warranty Information from Powertrain to Emissions coverage. Revised March 11, 2024 - Changed Engine RPM to 4000 in Check Wastegate Vacuum Regulator Valve Function section. Revised March 15, 2024 - Added Turbocharger Wastegate Actuator Vacuum Tank Replacement and step 4 under Turbocharger Inspection section.