



Service Bulletin

Bulletin No.: 21-NA-278

Date: November, 2021

INFORMATION

Subject: Diagnostic Strategy for Ticking, Tap or Rattle Noise from Engine with Possible Misfire, Malfunction Indicator Lamp (MIL) Illuminated - DTCs P0300, P0301-P0306 and/or P0016-P0019 Set

This bulletin replaces PIP5486H and PIP5493J. Please discard PIP5486H and PIP5493J.

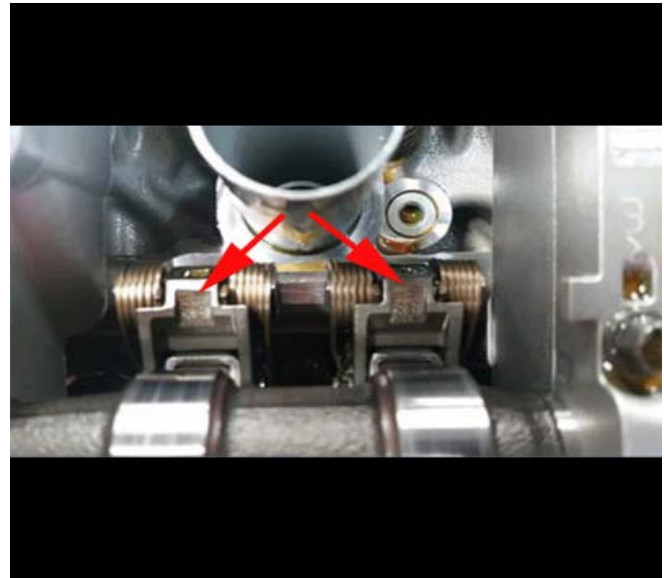
Brand:	Model:	Model Year:		VIN:		Engine: (3.0L, 3.6L)	Transmission:
		from	to	from	to		
Buick	LaCrosse	2017	2019	—	—	LGX	—
	Regal	2018	2020			LGX	
Cadillac	ATS	2016	2019			LGX	
	CT5	2020	2022			LGX	
	CT6	2016	2020			LGW, LGX	
	CTS	2016	2019			LGX	
	XT5	2017	2022			LGX	
Chevrolet	Blazer	2018	2021			LGX	
	Camaro	2016	2022			LGX	
	Colorado	2017	2022			LGZ	
GMC	Acadia	2017	2022	LGX			
	Canyon			LGZ			
Holden	Acadia	2019	2020	—	—	LGX	
	Commodore	2018	2020				

Involved Region or Country	North America, Europe, Uzbekistan, Russia, Middle East, Iraq, Israel, Palestine, Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, Japan, Cadillac Korea (South Korea), GM Korea Company, China, Taiwan, Thailand, Singapore, Philippines, Australia/New Zealand, Egypt, Other Africa, South Africa
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Condition	<p>Some customers may comment that the vehicle has a rattle, tick, or knock type noise. Some customers may also state that the MIL may have been illuminated.</p> <p>– This noise and/or MIL light may also be accompanied by DTC P0300 (Engine Misfire Detected) and/or a specific cylinder misfire DTC such as P0300, P0301-P0306 or possible camshaft correlation codes P0016-P0019.</p> <p>Note: Please take a sound file or video with sound of any noise prior to any disassembly. If this step is skipped, you may be asked to reassemble the engine prior to being helped with determining if the engine needs to be replaced. See the latest version of PIP5358 – Vehicle Noise Diagnosis and TAC Requests for Assistance with Noise Related Complaints for instruction on using the PICO for this.</p> <p>This sound file may be needed when contacting GM Technical Assistance Center (TAC) or if needed further review with engineering. This noise could be all the time, only under load, or intermittent depending on the severity of the noise. You may find this noise hard to isolate to one area in the engine. After you have recorded a sound file of the noise, try to isolate the noise to a general area of the engine. At that point following the steps in this bulletin in order may help pinpoint the concern.</p> <p>The concern may be more noticeable on the Active Fuel management System (AFM) cylinders.</p>
Cause	<p>This condition may be caused by spongy Stationary Hydraulic Lash Adjusters (SHLAs) or damaged Switching Roller Finger Followers (SRFF), damaged camshaft actuator or camshaft locating slots or a left bank timing chain tensioner gasket not sealing. The condition could be all the time, only under load, intermittent, or when first started after a hot soak depending on the cause.</p>
Correction	<p>If any of the conditions listed above have been verified, refer to the Service Procedure below.</p>

Service Procedure

1. Perform injector diagnosis to ensure there are no leaking injectors causing a noise due to excessive fuel in one cylinder:
 - Perform GDS2 or AFIT test on injectors to isolate a leaking injector.
 - Replace any out of specification injectors.
 - Re-evaluate the noise.
2. Perform cylinder cancellation for each cylinder. This may help pinpoint the source of a rattle noise.
3. Perform normal SI diagnostics testing all spark and fuel components for issues. Coil grounds and wiring, injector concerns, spark plugs, etc.
4. Remove the intake manifold and visually inspect for excessive carbon on the intake valve stems and top of the valve causing noise.
 - If carbon is present, then follow Service Bulletin # 16-NA-383 to clean the valves or replace heads as needed.
 - Re-evaluate the noise concern.
5. Remove the cam cover of the affected bank or both if unable to isolate to inspect for soft, spongy, or damaged SHLAs or rockers on all cylinders.



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⇒ Push down on the rocker end at the SHLA to test for soft or spongy feel.



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⇒ Check for any visible damage to non-AFM rocker clips.



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Note: If all SHLAs (lifters) are hard and no damage to rockers is visible, proceed to step 6.

6. If the replacement SHLAs are still spongy, it will be necessary to remove the affected head and inspect the head gasket for debris in the oil passages as indicated in the graphic above.
 - ⇒ If debris is found, inspect the camshaft caps for wear or discoloration due to lack of oil.
 - ⇒ If wear or discoloration is found, then replace the cylinder head assembly with camshafts.
 - ⇒ If there is no wear or discoloration, clean the oil passages and replace the head gasket.
 - ⇒ Change the oil and filter.
 - ⇒ Reevaluate the noise concern.

7. Without starting the engine, crank engine over and ensure that the valves are opening and closing.
 - If they are not operating correctly, it will be necessary to inspect the SRFFs for any damage.
8. Inspect the SRFFs and rocker assemblies for any damage or dislodge.
 - ⇒ While inspecting the rockers, it will be necessary to rotate the engine over by hand to ensure that the rockers are opening the valves.

Note: Camshaft carrier assembly removal will be necessary to fully inspect the rockers and SRFFs.

⇒ Below are pictures of possible SRFF failures. If any one of the SRFFs are damaged, it will be necessary to replace all four on the affected cylinder.



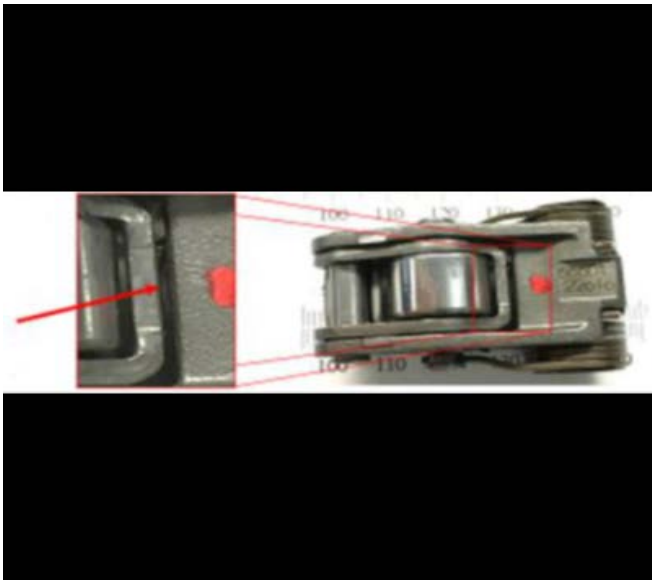
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⇒ Broken Torsion Spring



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⇒ Broken or Worn Pin Shelf



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⇒ Stuck Locking Pin

For any of the above conditions, engine replacement is not necessary. Please perform the repair for the particular issue found.



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9. Remove the camshaft actuators on the bank that is misfiring and inspect the end of the camshafts and the pin in the actuators for being bent.
 - ⇒ If any broken parts are found during inspection, replace all damaged parts.



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10. Inspect the left bank timing chain tensioner gasket for not sealing correctly.
 - ⇒ Replace the tensioner and gasket if this condition is found.
11. If noise condition is still present, proceed to step 12.
12. Raise the vehicle while running or with an assistant inside.
 - With chassis ears or a stethoscope, listen to the right and left side of the engine.
 - Once the noise is isolated or if unable to isolate, remove the piston and rod assemblies from the affected bank(s) to inspect for either a loose rod bushing in the rod or a loose wrist pin in the bushing.
 - There should be no metal in the oil for this condition.
 - If this is found, a piston and rod assembly will repair this noise.

Once all the above inspections and/or diagnostics are completed, if nothing is found to be the cause for the noise, engine replacement MAY be necessary.

Version	1
Modified	Released November 23, 2021

