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#16-NA-175: Shake and/or Shudder During Light Throttle Acceleration Between 25 and 80 MPH (40 and 128 KM/H) at a Steady State - (Sep 19, 2017)

Subject: Shake and/or Shudder During Light Throttle Acceleration Between 40 and 128 KM/H (25 and 80 MPH) at a Steady State



Brand:	Model:	Model Year:		VIN Breakpoint	Engine:	Transmission:
		from	to			
Cadillac	GM Passenger Cars and Trucks	2015	2017		All	8L90 and 8L45 Automatic Transmission (RPOs M5U, M5T, M5N, M5X)
Chevrolet						
GMC						

Involved Region or Country	North America, N.A. Export Regions and Korea
Condition	<p>Some customers may comment on any of the following conditions:</p> <ul style="list-style-type: none"> • A shake and/or shudder during light throttle acceleration between 40 and 128 km/h (25 and 80 mph) steady state driving when transmission is not actively shifting gears. • A shudder feeling that may be described as driving over rumble strips or rough pavement. • Shudder feeling is evident in both Drive and M7 MY15-16 & L7 MY17 mode.

Diagnosis Instructions

To ensure TCC Shudder is diagnosed correctly, please drive the following schedule on a smooth road with transmission sump temperature between 50°C (122°F) - 70°C (158°F).

Important: For some road conditions, it may be required to apply the brake pedal and throttle simultaneously to stay within desired gear, engine firing mode, engine torque range, and engine/vehicle speed ranges.

For Full Size Trucks/SUVs - Press and hold the tow-haul mode button for 5 seconds to disable grade braking to prevent downshifts during test.

Run the following tests for 3 operational modes:

- Normal Operation (GDS2 for viewing only).
- GDS2 Commanding TCC in Disabled Operation. (TCC Open).
- GDS2 Commanding TCC in Enabled Operation. (TCC Locked).

Test:

See table below for conditions pertaining to specific applications. In each vehicle, constant throttle input on a smooth grade is desirable. PicoScope Measured Frequency is the approximate vibration frequency where TCC Shudder can be found, discussed in detail below.

Vehicle Information					Shudder Test Conditions					PicoScope
Make	Application:	Engine type	Engine RPO	Trans RPO	Gear	Engine Mode (V4, V6, V8)	Transmission Input Speed (rpm)	Vehicle Speed (mph)	Engine Torque (Nm)	Measured Frequency (+/- 2 Hz)
Chevrolet/GMC	Colorado/Canyon	6 CYL. NA	LGZ	M5T	8	V6	1100-1500	42-55	150-250	25
Cadillac	CTS	6 CYL. NA	LGX	M5N	8	V6	1100-1500	42-55	100-250	23
Cadillac	CTS	4 CYL. Turbo	LTG	M5N	8	V4	1100-1500	42-55	100-250	23
Cadillac	CTS-V	8 CYL. Supercharged	LT4	M5U	8	V8	1000-1500	42-62	200-375	28
Cadillac	ATS	4 CYL. NA	LCV	M5T	8	V4	1100-1500	42-55	100-250	23
Cadillac	ATS	6 CYL. NA	LGX	M5N	8	V6	1100-1500	42-55	100-250	23
Cadillac	ATS	4 CYL. Turbo	LTG	M5N	8	V4	1100-1500	42-55	100-250	23
Cadillac	ATS-V	6 CYL. Twin Turbo	LF4	M5U	8	V6	1100-1500	42-55	150-300	26
Cadillac	CT6	6 CYL. Twin Turbo	LGW	M5X	8	V6	1100-1500	42-55	150-300	26
Cadillac	CT6	6 CYL. NA	LGX	M5N	8	V6	1100-1500	42-55		23

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									100-250	
Cadillac	CT6	4 CYL. Turbo	LTG	M5N	8	V4	1100-1500	42-55	100-250	23
Chevrolet	Camaro	6 CYL. NA	LGX	M5T	8	V6	1100-1500	42-55	100-250	23
Chevrolet	Camaro	4 CYL. Turbo	LTG	M5T	8	V4	1100-1500	42-55	100-250	23
Chevrolet	Camaro SS	8 CYL. NA	LT1	M5U	8	V4/V8	1000-1,500	40-55	(V4) 100-200 / (V8) 175-375	28
Chevrolet	Corvette	8 CYL. NA	LT1	M5U	8	V4 (Eco Driving Mode)	1000-1800	40-80	125-250	28
Chevrolet	Corvette Z06	8 CYL. Supercharged	LT4	M5U	8	V4 (Eco Driving Mode)	1000-1800	40-80	125-250	28
Chevrolet/GMC	Silverado/Sierra	8 CYL. NA	L83	M5U	8	V8	1050-1500	45-55	200-375	26
Chevrolet/GMC	Silverado/Sierra	8 CYL. NA BAS	L8B	M5X	8	V8	1050-1500	45-55	200-375	26
Chevrolet/GMC/Cadillac	Silverado/Sierra/Yukon Denali/Denali XL/Escalade/ESV	8 CYL. NA	L86	M5U	8	V8	1050-1500	45-55	200-375	26

*

To confirm TCC Shudder, the vibration concern must be created in normal operation (Mode A) of the test. If the concern is gone with the torque converter clutch disabled (Mode B, TCC Open) and is gone with torque converter clutch enabled (Mode C, TCC Locked), then *the vibration root cause is TCC Shudder, and the fluid flush procedure corrective action described below should be performed.*

If the concern is not present in Mode A, then the vibration concern is NOT TCC shudder.

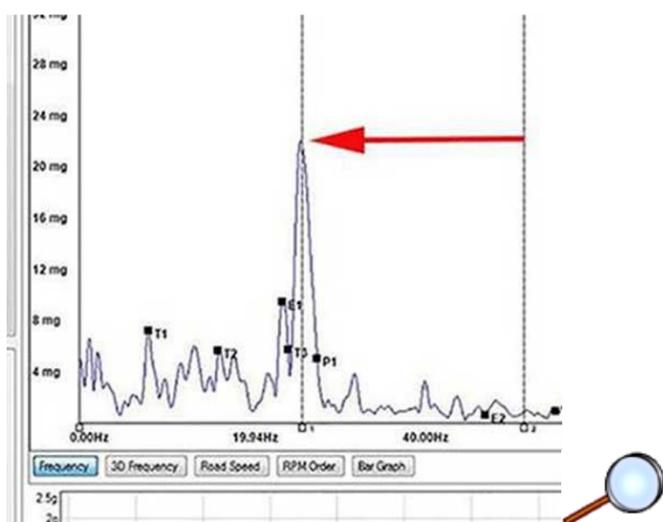
If the concern is still present with the torque converter clutch disabled (Mode B) or with the torque converter clutch enabled (Mode C, TCC slip speed at zero), then the vibration root cause is NOT TCC Shudder.

Vibrations not identified as TCC Shudder should be further investigated using the "Vehicle Vibration Diagnosis" in SI as a starting point.

Picoscope Test

The PicoScope (CH-51450) essential tool and NVH software can be used to confirm TCC Shudder, Engine, Tire, or Driveline component related conditions.

To confirm TCC Shudder, record the PicoScope data while driving in 8th gear in the application specific condition above. Minimize extraneous vibration input by testing on a smooth road and correct any other known vehicle vibration issues (tires, brakes, etc.) before conducting test. If TCC Shudder is present, a vibration peak will appear (highlighted by arrow below) within +/-2 Hz of the frequency listed in the table above. TCC Shudder vibration frequency is stationary in 8th gear. If the vibration frequency follows vehicle speed or engine speed, then it is NOT TCC Shudder.



In the above illustration, frequency and default view have been selected.

All Applications except the 2017 Chevrolet Colorado and GMC Canyon Service Procedure

Important: Requires DEXRON HP Fluid (GM Part No. 19355656). In Canada, use Mobil 1 Synthetic LV ATF DEXRON HP (GM Part No. 19353430).

Note: U.S. dealers must order the Mobil 1 Synthetic LV ATF DEXRON HP fluid through your local General Motors oil distributor. Canadian dealers must order through CCA using the current part number in the Electronic Part Catalog

1. Cooler Flush, Drain, Clean pan/magnet, Replace Filter (If needed), Oil Fill, & Circulate New Fluid.

Note: The Transmission Fluid Cooler Flow Test and Flushing procedure can be located by building the vehicle in SI, select Transmission, Transmission Cooling, Diagnostic Information and Procedures. Select the appropriate transmission.

- A.) Flush the cooler lines and cooler. Refer to SI for proper procedure.

Note: DEXRON VI transmission fluid may be used to flow and flush the transmission cooling system. Compressed air should be used to remove any residual fluid from transmission cooler lines.

- B.) Remove the transmission fluid pan and drain transmission fluid following SI procedures for the application you're working on. Discard all oil.

Note: If you find that the fluid is cloudy, milky, or appears to be contaminated with water or engine coolant, DO NOT proceed with below steps. Follow Both SI Procedures for "Cooling System Leak Testing (L83, L86)" and "Engine Coolant/Water in Transmission."

- C.) Clean the pan/magnet if any metallic particles present and replace transmission filter if debris is found.

Install the transmission fluid pan and refill with new Mobil 1 Synthetic LV ATF DEXRON HP transmission fluid following the "Fluid Fill Procedure" in SI to obtain correct fluid level.

The shudder should be improved after the completion of this flush procedure.

Note: Shudder should improve right away, but for full affect the vehicle may need to be driven up to 200 miles (322 km). and a minimum of two cold to hot drive cycles before determining if the fluid flush corrected the condition or not. Do not re-evaluate vehicle for additional customer shudder concerns until the vehicle has been driven 200 miles (322 km).

2017 Chevrolet Colorado and GMC Canyon Service Procedure

1. Flush the cooler lines and cooler. Refer to SI for proper procedure.

Note: DEXRON VI transmission fluid may be used to flow and flush the transmission cooling system. Compressed air should be used to remove any residual fluid from transmission cooler lines.

- A.) Remove the transmission fluid pan and drain transmission fluid following SI procedures for the application you're working on. Discard all oil.

Note: If you find that the fluid is cloudy, milky, or appears to be contaminated with water or engine coolant, DO NOT proceed with below steps. Follow Both SI Procedures for "Cooling System Leak Testing (L83, L86)" and "Engine Coolant/Water in Transmission."

- B.) Clean the pan/magnet if any metallic particles present and replace transmission filter if debris is found.
- C.) Install the transmission fluid pan and refill with new Mobil 1 Synthetic LV ATF DEXRON HP transmission fluid using enough volume to have oil come out of oil level check plug.

Important: Operate the vehicle on the hoist for 10 minutes. Cycle through all forward gear ranges, Reverse and Neutral.

2. Drain, Oil Fill, & Circulate New Fluid.

- A.) Remove the transmission fluid pan and drain transmission fluid again. Discard all oil.
- B.) Install the transmission fluid pan and refill with new Mobil 1 Synthetic LV ATF DEXRON HP transmission fluid using enough volume to have oil come out of oil level check plug.

Important: Operate the vehicle on the hoist for 10 minutes. Cycle through all forward gear ranges, Reverse and Neutral.

3. Drain, Oil level Set, and Drive to Evaluate.

- A.) Remove the transmission fluid pan and drain transmission fluid again. Discard all oil.
- B.) Install the transmission fluid pan and refill with new Mobil 1 Synthetic LV ATF DEXRON HP transmission fluid following the "Fluid Fill Procedure" in SI to obtain correct fluid level.

The shudder should be improved after the completion of this triple flush procedure.

Note: Shudder should improve right away, but for full affect the vehicle may need to be driven up to 200 miles (322 km). and a minimum of two cold to hot drive cycles before determining if the fluid flush corrected the condition or not. Do not re-evaluate vehicle for additional customer shudder concerns until the vehicle has been driven 200 miles (322 km).

Warranty Information

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
8480478*	Flush and Drain Fluids for Transmission Shake and/or Shutter Repair	Use Actual Clock Time
*This is a unique Labor Operation for Bulletin use only.		

Version	7
Modified	June 01, 2016 – Added a breakpoint date. November 29, 2016 – Added the 2017 Model Year and updated information including graphics under Diagnosis Instructions. February 27, 2017 – Updated the Model section and added additional information to Test section. April 18, 2017 – Updated the Shudder Chart information. August 24, 2017 – Updated information. September 19, 2017 – Updated the Service Procedure.

GM bulletins are intended for use by professional technicians, NOT a "do-it-yourselfer". They are written to inform these technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do a job properly and safely. If a condition is described, DO NOT assume that the bulletin applies to your vehicle, or that your vehicle will have that condition. See your GM dealer for information on whether your vehicle may benefit from the information.



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