

2015 - 2017 Corvette: Service Bulletin: Shake and/or Shudder During Light Throttle Acceleration Between 25 and 80 MPH (40 and 128 KM/H) at a Steady State

#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 - (Feb 27, 2017)

Subject:				Shake and/or Shudder During Light Throttle Acceleration Between 25 and 80 MPH (40 and 128 KM/H) at a Steady State		
Brand:	Model:	Model Year:		VIN Breakpoint	Engine:	Transmission:
		from	to			
Cadillac	GM	2015	2017		Refer to table below	8L90 (M5U, M5X)
Chevrolet	Passenger					
GMC	Cars and Trucks					8L45 (M5T, M5N)
<i>Involved Region or Country</i>				North America and N.A. Export Regions		
<i>Condition</i>				Some customers may comment on any of the following conditions: <ul style="list-style-type: none">• A shake and/or shudder during light throttle acceleration between 25 and 80 mph (40 and 128 km/h) 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.<ul style="list-style-type: none">◦ For 2015-2016 vehicles, shudder feeling is evident in both Drive and M7 mode.◦ For 2017 vehicles, shudder feeling is evident in both Drive and L7 mode.		

Diagnosis Instructions

To ensure TCC shudder is diagnosed correctly, please drive the following schedule on a

smooth road with transmission sump temperature between 122°F (50°C) - 158°F (70°C).

Important: For some road conditions, it may be required to apply the brake pedal and throttle simultaneously to stay within desired 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:

A. Normal Operation (GDS2 for viewing only).

B. GDS2 Commanding TCC in Disabled Operation. (TCC Open).

C. GDS2 Commanding TCC in Enabled Operation. (TCC Locked).

Test:

Refer to the 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	
<i>Make</i>	<i>Applicat ion:</i>	<i>Engine type</i>	<i>Engine RPO</i>	<i>Trans RPO</i>	<i>Gear</i>	<i>Engine Mode (V4, V6, Input V8)</i>	<i>Transmi ssion Speed (rpm)</i>	<i>Vehicle Speed (mph)</i>	<i>Engine Torque (Nm)</i>	<i>Measure d Frequ ency (+/- 2 Hz.)</i>
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	NA	1100-1500	42-55	100-250	23
Cadillac	CTS-V	8 CYL.	LT4	M5U	8	V8	1000-1500	42-62	200-375	28

	Supercharged					00	
Cadillac ATS	4 CYL. LCV	M5T	8	NA	1100-15 42-55	100-250 23	
	NA				00		
Cadillac ATS	6 CYL. LGX	M5N	8	V6	1100-15 42-55	100-250 23	
	NA				00		
Cadillac ATS	4 CYL. LTG	M5N	8	NA	1100-15 42-55	100-250 23	
	Turbo				00		
Cadillac ATS-V	6 CYL. LF4	M5U	8	V6	1100-15 42-55	150-300 26	
	Twin Turbo				00		
Cadillac CT6	6 CYL. LGW	M5X	8	V6	1100-15 42-55	150-300 26	
	Twin Turbo				00		
Cadillac CT6	6 CYL. LGX	M5N	8	V6	1100-15 42-55	100-250 23	
	NA				00		
Cadillac CT6	4 CYL. LTG	M5N	8	NA	1100-15 42-55	100-250 23	
	Turbo				00		
Chevrolet Camaro	6 CYL. LGX	M5T	8	V4/V6	1100-15 42-55	100-250 23	
et	NA				00		
Chevrolet Camaro	4 CYL. LTG	M5T	8	V4	1100-15 42-55	100-250 23	
et	Turbo				00		
Chevrolet Camaro	8 CYL. LT1	M5U	8	V4/V8	1000-1, 40-55	100-200 28	
et	NA				500	/175-375	
Chevrolet Corvette	8 CYL. LT1	M5U	8	V4 (Eco Driving Mode)	1000-18 40-80	125-250 28	
et	NA				00		
Chevrolet Corvette Z06	8 CYL. LT4 Supercharged	M5U	8	V4 (Eco Driving Mode)	1000-18 40-80	125-250 28	
					00		
Chevrolet/GMC Silverado/Sierra	8 CYL. L83	M5U	8	V8	1050-15 45-55	200-375 26	
	NA				00		
Chevrolet/GMC Silverado/Sierra	8 CYL. L8B	M5X	8	V8	1050-15 45-55	200-375 26	
	NA				00		
	BAS						
Chevrolet/GMC Silverado/Sierra	8 CYL. L86	M5U	8	V8	1050-15 45-55	200-375 26	
	NA				00		
/Cadillac /Yukon							
c	Denali/						
	Denali						
	XL/Es						
	calade/E						

SV

*

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 when the torque converter clutch enabled (Mode C, TCC Locked), *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), the root cause of vibration is NOT shudder. Vibrations not identified as shudder should be further investigated using the “Vehicle Vibration Diagnosis in SI as a starting point.

The use of the PICO scope and NVH software can be used to confirm TCC shudder, Engine, Tire or Driveline component related conditions.

To confirm TCC shudder record the PICO scope 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 should remain constant in 8th gear as indicated in the above table. 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.

Service Procedure

Important: Requires Mobil 1 Synthetic LV ATF DEXRON HP (GM Part No. 19353429, in Canada 19353430).

Note: U.S. dealers must order the Mobil 1 Synthetic LV ATF DEXRON HP fluid through your local General Motors oil distributor. Canadian dealer must order through CCA.

Step 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.

1 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.

1 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."

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

1 d.) Install the transmission fluid pan and refill with new 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.

Step 2: Drain, Oil Fill, & Circulate New Fluid

2 a.) Remove the transmission fluid pan and drain transmission fluid again. Discard all oil.

2 b.) Install the transmission fluid pan and refill with new 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.

Step 3: Drain, Oil level Set, and Drive to Evaluate

3 a.) Remove the transmission fluid pan and drain transmission fluid again. Discard all oil.

3 b.) Install the transmission fluid pan and refill with new 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 directionally right away, but for full affect the vehicle may need to be driven up to 200 miles (322 km). and at least 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 Bumper-to-Bumper coverage (Canada Base Warranty 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.		
<i>Version</i>	4	
<i>Modified</i>	June 01, 2016 – Added a breakpoint date.	
	Nov. 29, 2016 – Added the 2017 Model Year and updated information including graphics under Diagnosis Instructions.	
	Feb. 27, 2017 - Updated the Model section and added additional information to Test section.	

Online URL: <https://www.corvetteactioncenter.com/tech/knowledgebase/article.php?id=1324>