

# Driveline Vibrations and How To Eliminate Them

At Classic Motorsports Group, we often receive calls from customers trying to solve driveline vibration problems they are experiencing with their vehicles. Vibrations can be very difficult to detect and eliminate, but if you follow a few basic detection procedures by process of elimination, you should be able to successfully isolate and solve the problem.

Installing a Tremec overdrive transmission in your classic car is one of the best improvements you can make, but it sometimes changes the characteristics of how the engine's power band reacts with the vehicle. This change is usually inconsequential in the first four gears but can be very noticeable in the overdrive gears. Your car has never traveled as fast at such a low rpm before, and this can sometimes bring out noises and/or vibrations caused by engine harmonics or an imbalance that you never experienced before the installation of your new Tremec transmission.

The first step is to isolate where the vibration is coming from, how severe it is and whether it is a speed-related vibration or an RPM-related vibration.

## RPM related vibrations:

- 1) With car stopped, the transmission in neutral, and your foot OFF of the clutch rev the engine gradually from idle to about 4000 rpm. This will tell you if the flywheel, pressure plate and disc are in balance.
- 2) With car stopped, the clutch fully depressed, and the transmission in gear rev the engine as in step 1. Doing this eliminates the clutch disc from rotating with the assembly. If you had a vibration in step 1 and not in step 2, the clutch disc is suspected to be the problem because it's not turning in step 2.
- 3) If you have a vibration in step 1 *and* step 2, the problem could be the flywheel, pressure plate or disc. If the vibration is so severe it could shake the radio out of the dash, STOP THE

ENGINE. You could have the wrong flywheel or one with incorrect counter balance weights. Contact us immediately and we will help you determine what the problem is.

We try our absolute best to make sure that the correct parts are shipped with your kit, but sometimes shipping mistakes can happen. Also, early 350 Chevy and a 400 Chevy blocks with a two-piece rear main look exactly the same to most people. However, one is internally balanced and the other externally balanced. The flywheel flanges are the same and the wrong flywheel could easily be installed and cause a severe problem. If you don't know what engine you have, ask someone you can trust before you order your kit. Most 1986+ engines with one-piece rear main seals are considered internally balanced; however, the flywheels have weights to take the place of the flange that was removed for the change to a one-piece seal. A neutrally balanced flywheel WILL cause a vibration in this case, so getting the right parts is important.

On occasion, some customers believe that their vibration could be coming from inside the transmission. This is extremely unlikely as all of the gears are precision made. For a gear to vibrate, it would have to be severely deformed and would not pass any of the quality control checks at the factory. If it were to slip through QA checks, it would be very noisy and easy to diagnose.

### Speed Related Vibrations

Before diagnosing a speed related vibration, it is assumed that your installation went according to plan and your driveline working angles are within original specs or are within acceptable limits. Click here for more information on driveline and ujoint angles ([http://www.classicchevy5speed.com/files/Universal\\_Joint\\_Alignment\\_Proc\\_111606.pdf](http://www.classicchevy5speed.com/files/Universal_Joint_Alignment_Proc_111606.pdf)). If you are confident that your installation was performed correctly and you still have a speed related vibration, follow the steps below.

- 1) Drive the car and record the speeds at which the vibration occurs, when it is at its worst, and when it disappears. High speed vibrations at 60 MPH and higher are usually caused by a

- bad tire or a bad brake drum or rotor. Lower speed vibrations (depending on rear end ratios) at 35 to 45 mph are usually driveline related and could be an out-of-balance drive shaft or improper u-joint alignment.
- 2) If the vibration can be felt in the shifter, it is likely a front of the driveshaft balance problem or a bad u-joint. If you feel it in the back seat or in the floor at the rear, it could be a rear of the driveshaft balance problem or u-joint. However, a bad rear tire or drum can cause the same vibration in the rear. Before pulling the suspected driveshaft, swap the front wheels for the back and back to front or borrow a known balanced set of wheels to test drive the car. If you haven't balanced your wheels for a while, it wouldn't hurt to do so to ensure they are indeed balanced, just for peace of mind.
  - 3) Before pulling a suspected out-of-balance driveshaft, check to make sure the u-joint is properly positioned in the yoke. Some yokes have small tabs that the u-joint caps must be indexed behind to hold the driveshaft in the center of the yoke. If you removed the u-joint caps for any reason, did one of the needle bearings fall over when you put the cap back on? This little oversight WILL cause a bad vibration.
  - 4) Before pulling a suspected out-of-balance driveshaft, check the runout of the shaft with a dial indicator. If runout is ok (about .012") at the front and not the back, it could mean that you have a bent yoke or pinion. To check this, record the runout amount and mark where it is high and low. Now remove the driveshaft from the rear yoke, rotate it 180 degrees, re-install it and re-check runout. If it is the same amount and it is high and low in the same locations, the driveshaft is the problem. If it is the same amount, but the low and high spots have changed places, you have a bad yoke or a bent pinion.

Following the process of elimination will help track down most problems. However, if the potential vibration was already present and installing the overdrive has brought it to within noticeable range, you will have to play detective. Remember - make notes before you start. Your memory is not as reliable as you think.

The Classic Chevy 5-Speed Team