

Clutch Inspection and Maintenance (Part 1)

1. Flywheel: The three piece flywheels used on all years will loosen up and rattle, finally breaking the starter nose when they are out of round. They need to be reconditioned no matter how good they look. They also need to be balanced; GM had a very large tolerance on the face and edge run out and the balance of new flywheels (face 0.020 and edge 0.010). Check the center where it mates against the crankshaft hub, if they have been out of balance they will fret and the mating area may be damaged. The flywheel, pressure plate, release bearing and clutch fork pivot are a matched set for '60-'63 and for '64-'69; you can change the complete sets between early and late but not parts between the sets.

2. Pressure Plate: Check the ring gear for true and the condition of the teeth, check the wrap up straps (return springs) for any damage, check the main center spring for breaks at the stud holes and the tips for damage from a bad release bearing. Check for clutch material lodged under the spring. Measure the clearance (crush) between the plate and the six mounting areas with a straightedge. Early should be .210 maximum and late should be .110 maximum. That applies if you are using a disc with a thickness of 0.325, anything thinner would require less clearance. Balance the pressure plate with the flywheel.

When you bolt the pressure plate to the flywheel, install every other special bolt and alternately tighten in ¼ turn increments while watching the spring fingers retract. If the fingers show little retraction then the disc is too thin or the plate has had too much material removed during surfacing. When the three bolts are tight, install the other three and torque to 22 ft lbs.

3. Clutch Disc: The thickness can range from .280 to .325 depending on the rebuilder. If you have an original disc, it was 0.135 for each face; a total of approximately .330 including the wave spring. All rebuilds have to be the original 9 1/8" Borg & Beck welded center design. The riveted center design will hit the flywheel bolts or crankshaft hub when it wears down on late models and possibly on some early models. Make sure the splines on the disc are free of dings and check its slide on the clutch shaft. On a used disc check the wave springs (looking at the edge) to make sure they are not collapsed or sunk into the disc material. Check the disc for run out by putting the clutch shaft in the transaxle and turning the side gears with the disc installed on the splines. This checks the disc and the shaft.

4. Clutch Shaft: Early shafts are smaller in diameter than late shafts from the clutch disc splines to the transmission splines. Check the splines on both ends, check the shaft for run out as noted in 3 above, and polish the areas where the seal and the pilot bushing will work.

5. Release Bearing: Check it for smooth running and the face for wear. If it appears good, it can be packed by hand with a little patience or a new one is always available. The bearing used with the flat finger pressure plate and flat flywheel is slightly longer with a rounded contact face. The late style bearing is shorter and has a flat face.

6. Pilot Bushing: It must be replaced when doing a clutch job. For removal, pack the cavity with heavy grease and use the clutch shaft to jack it out hydraulically. Pre oil a new one by putting it on your finger, filling it with oil and squeezing until the oil sweats out through the sides. Install with the chamfer side out.

7. Clutch Shaft Seal: Change this seal in the release bearing shaft and be sure the split ring that is installed in front of the seal is sprung enough to fit snug. Be careful removing the seal – the shaft is cast iron and will break easily. There is a pre '64 seal and a '64-'69 seal. The determining factor is the transmission which has to match the clutch shaft, so be sure you select the proper seal. You could easily have a '63 transmission installed on a '64 or '65 or a '64-'65 transmission on a '61-'63. Also, if there is a drain plug on the transmission you need the small seal, as the plug indicates an early transmission. Always test the seal fit on the clutch shaft before installing it. Make sure there are no cracks in the release bearing shaft and dress up the area that the bearing rides on.

Next Month: Additional items in the clutch area.