

CLEANING & INSPECTION

CLEANING

1. Wash all parts, except seals, in a suitable cleaning solvent. Brush or scrape all foreign matter from the parts. Be careful not to damage any parts with the scraper. Do not clean, wash, or soak transmission seals in cleaning solvent. Dry all parts with compressed air.
2. Rotate the bearings in a cleaning solvent until all lubricant is removed. Hold the bearing assembly to prevent it from rotating while drying it with compressed air. **DO NOT** spin bearings with compressed air.
3. Lubricate the bearings with approved transmission lubricant. Wrap them in a clean, lint-free cloth or paper, until ready for use.

INSPECTION

Bearings

Bearing Raceways

NOTE: Bearings that have been removed using special service tools may have been damaged simply due to the tool design. Be sure the following checks are made to determine if the bearing can be put back into service.

1. Inner Ring Raceway - While holding outer ring stationary, rotate inner ring at least three revolutions. Examine raceway of inner ring for pits or spalling. If pits or spalling are unacceptable, replace the bearing assembly. Light particle indentation is acceptable.
2. Outer Ring Raceway - While holding inner ring stationary, rotate outer ring at least three revolutions. Examine raceway of the outer ring from the same side as the raceway of the inner ring. If raceway is spalled or pitted, similar to that shown, replace the bearing assembly. Light particle indentation is acceptable.

Bearing External Surfaces

The bearing must be replaced if damage is found in any of the following areas:

1. Radial cracks on front and rear faces of outer or inner rings.
2. Cracks on outside diameter or outer ring (particularly around snap ring groove).
3. Deformation or cracks in ball cage (particularly around rivets).

Bearing Spin Test

1. Lubricate bearing raceways with a slight amount of clean oil. Turn the bearing back and forth slowly until raceways and balls are coated with oil.
2. Hold bearing by inner ring in a vertical position. Vertical movement between the inner and outer rings is acceptable. Spin outer ring several times by hand (**DO NOT** spin bearings with compressed air.). If roughness or vibration is noticeable or the outer ring stops abruptly, the bearing should be cleaned again and lubricated. Roughness in a bearing is usually caused by foreign particles in the bearing, which comes from inside the transmission case. If bearing is still rough after cleaning and relubricating three times, it must be replaced.

3. Hold bearing by the inner ring in a horizontal position. Spin outer ring several times by hand (do not use compressed air). If bearing is still rough after cleaning and re-lubricating three times (if not done in Step 2), it must be replaced. If bearing passes the visual inspection and spin tests, it can be re-installed in transmission.

Countershaft

Inspect splines and gear teeth for damage or wear. Replace countershaft if bent, damaged or worn.

Input Shaft

Replace input shaft if splines are damaged, needle bearing surface in bore of bearing is worn or rough, or if cone surface is damaged. **DO NOT** spin bearings with compressed air.

Output Shaft

Mount output shaft in V-blocks. Check runout on shaft at several locations. If runout exceeds .002" (.05 mm), replace output shaft.

Synchronizers

If teeth on synchronizer ring are chipped, broken or worn, replace synchronizer ring. Note that 3rd gear synchronizer is different from others. To check for wear, mount synchronizer to mating gear and measure clearance between gear and synchronizer side faces using a feeler gauge. If clearance is less than .031" (.80 mm), replace synchronizer ring or mating gear.

Transmission

1. Inspect transmission case and housing for cracks, worn or damaged bores, damaged threads, or any other damage that could affect operation of the transmission. Inspect the machined mating surfaces for burrs, nicks or damage.
2. Inspect the front face of case for small nicks or burrs that could cause misalignment of transmission with flywheel housing. Remove all small nicks or burrs with a fine stone.
3. Inspect bell housing for cracks. Make sure the machined mating surfaces are free from burrs, nicks, or any other damage.
4. Check the condition of shift levers, forks, shift rails and shafts.