



Repairing The Borg-Warner T56 Transmission

By Mike Weinberg
Contributing Editor

With performance an engineering factor in new-vehicle marketing and the need to meet federal emissions standards, Borg-Warner Powertrain Systems developed the T56 transmission. Found in late-model Camaros and Firebirds behind the 5.7-liter motor and in Chrysler Corp.'s fire-breathing Viper sports car, these units can handle more than 400 ft/lb of torque. Six synchronized forward speeds (5th and 6th being overdriven) and a synchronized reverse make this one of the strongest, most advanced transmission designs on the market. In order to help comply with ever-more-stringent emissions rules, an

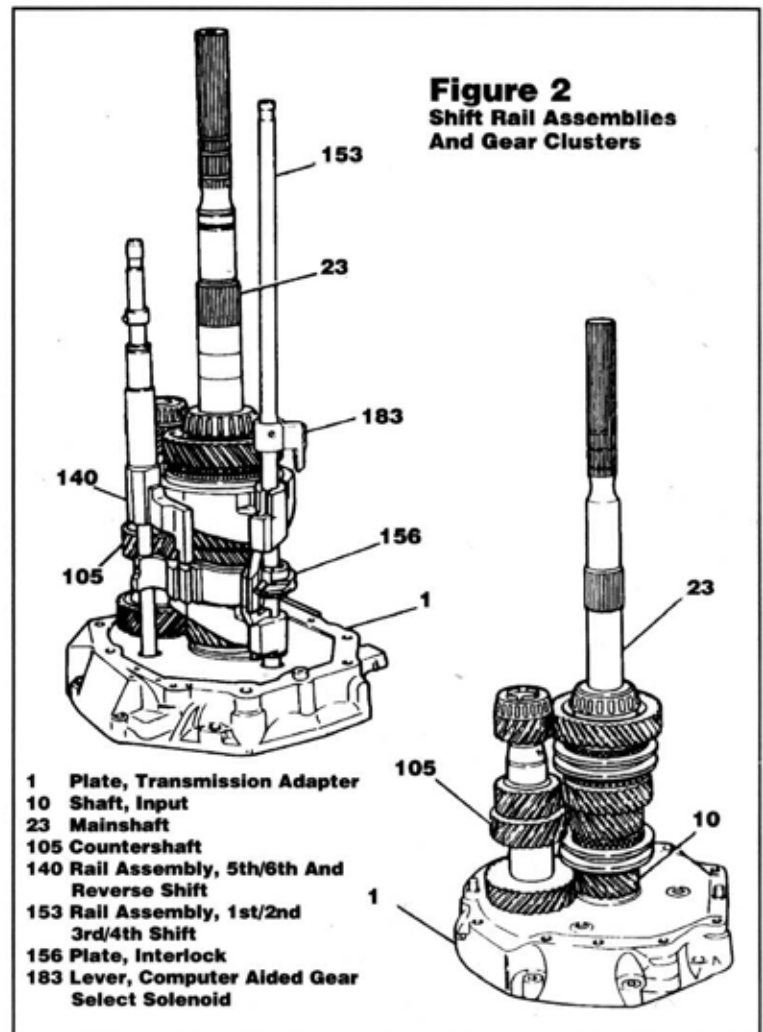
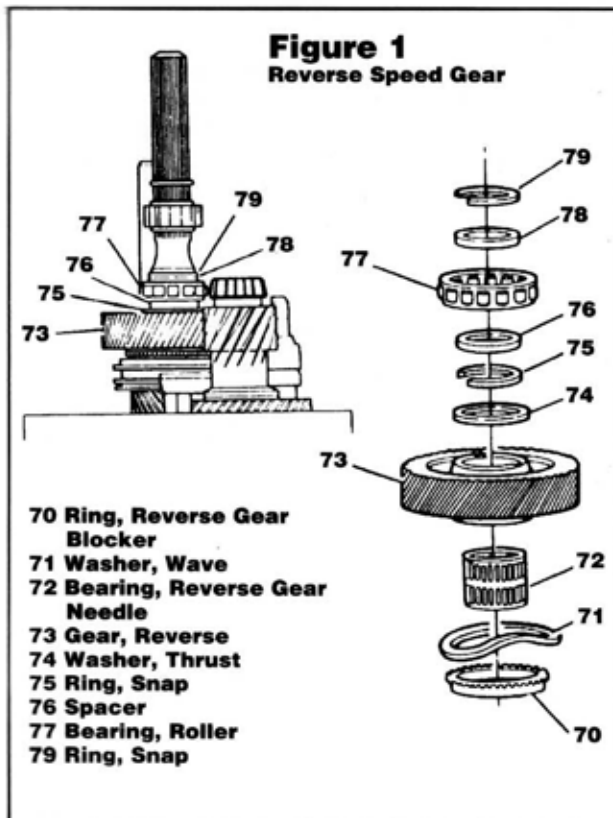
electronically controlled "skip-shift" function has been incorporated into the design. 2nd and 3rd gears will be electronically inhibited, and the driver will shift from 1st to 4th under the following conditions: coolant temperature above 161° F, throttle opening of 35% or less, vehicle speed between 15 and 21 mph, reset at less than 1 mph.

Borg-Warner has made available two models of the T56 for aftermarket replacement of the T5 and T10 transmissions in older Camaros, Firebirds and Mustangs.

You may find another profit center in your business offering these units to your racing, hot-rod and muscle-car customers.

In many respects, the T56 is a beefier version of the T5 design. Space does not permit a complete guide to overhaul on these pages, but we will cover the critical points. For your education and protection, obtaining a service manual is a must. Several essential tools recommended by the vehicle manufacturers make teardown and assembly easy and safe.

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Up To Standards

Removing the shifter will expose the rear offset lever, which is similar to that of the T5. Before removing the offset-lever roll pin be sure to check the plastic isolator cup that the stick sits in. Chevrolet cautions that if the cup is worn or not fully retained by adhesive, replace the offset lever. After removing the extension-housing bolts, slide the extension housing off the shift rails. Place the trans in a vertical position (input down) to remove the speedo drive gear, roller bearing and reverse-gear assembly. Please note that under the reverse gear is a waved washer (See Figure 1). Now the reverse synchro assembly and reverse shift fork can be disassembled. As usual, match-marking all synchro assemblies on teardown will be a foolproof method for making sure all parts are reassembled correctly. At this point, the 5th/6th driven gear can be removed from the mainshaft. Returning the unit to a horizontal position will make removal of the extension countershaft and its component parts possible.

Return the unit to vertical again and remove the skip-shift electronic solenoid, cover-plate bolts, shift-detent assembly, roll pin, front offset-lever roll pin, case-to-adaptor plate bolts, and two shift-lever guide bolts that are on top of the case. The trans case now can be removed, exposing the gear train and shift rails. A word to the wise: It is important to hold the front offset lever against the guide plate to prevent the escape of the detent ball and spring in the lever. These parts will vanish if you are not careful (don't ask how I know). Rotate the 5th/6th/reverse shift rail of the interlock plate and remove. Lift the mainshaft enough to remove the countershaft and then remove the mainshaft and shift rails as a unit (See Figure 2).

Thorough cleaning and inspection of all subassemblies will yield the appropriate repair estimate. One important item is the removable tapered bearing cup inside the input shaft for the small tapered bearing on the nose of the mainshaft.

All the specifications for re-assembly are available in the service manual, but nothing is more critical on this trans than proper shim selection for correct endplay and preload. This requires the use of a good-quality dial indicator and several essential tools. J39444-1 and J39444-2 are available from Kent-Moore Tools. To make the procedure as simple as possible you must measure and correct mainshaft endplay through a shim under the tapered bearing cup in the adaptor plate to achieve a 0-to-0.002 preload (See Figure 3). Then measure and set the endplay to the same dimensions on the countershaft. After the countershaft is correctly shimmed, you adjust the extension countershaft endplay to 0.002-0.005 axial play (NO preload). This is not the place to take a shortcut or hope for the best. Beg, buy, borrow or steal the manual. As with all late-model transmissions, the tolerances are close and critical for proper operation and for a unit that will live well beyond the warranty.

In the transmission industry today you cannot function without the tools and the know-how. We are seeing a shakeout in the industry. The rebuilders who are investing in themselves by acquiring knowledge are busy. The shops that are letting the technology pass them by are depending on junkyards to keep them alive and spending time with judges and lawyers. If it were easy, everybody would be doing it. **TD**



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