

**Subject:**

Design and operation

**Unit:**

Tremec 6060 6-speed manual

**Vehicle Applications:**

Ford Mustang, C5 and C6  
Chevrolet Corvette, Pontiac  
GTO, Cadillac CTS-V, Dodge  
Viper and Sidewinder,  
Aston Martin Vanquish

**Essential Reading:**

- Rebuilder
- Shop Owner
- Center Manager
- Diagnostician
- R & R

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# Tremec's New 6060 Six-Speed

The T56 six-speed transmission has been around for many years now. Originally designed by BorgWarner for the GM F-bodies (Camaro/Firebird), the design has been refined since Tremec bought the BorgWarner manual-transmission business. The T56 is now the six-speed of choice for the Ford Mustang, Chevrolet C5 and C6 Corvettes, Pontiac GTO, Cadillac CTS-V, Dodge Viper and Sidewinder, and Aston Martin Vanquish.

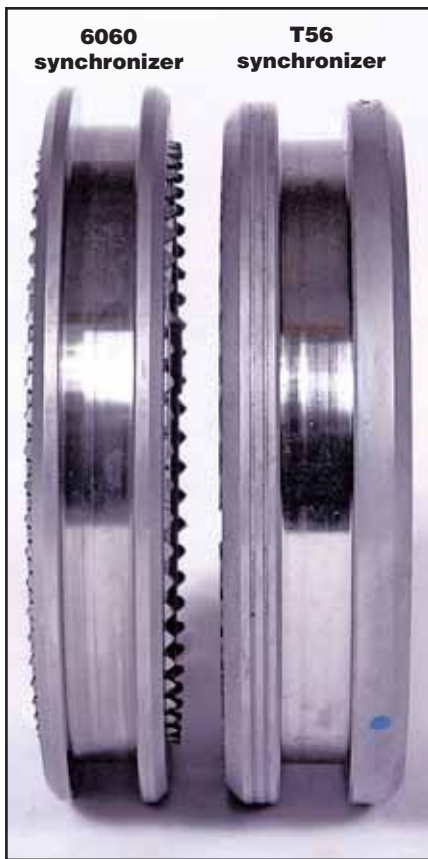
Tremec also manufactures aftermarket versions of the T56 for use in earlier cars to replace a T5, Muncie, T10, Saginaw or Toploader. The T56 is enjoying huge success because of its ability to handle high torque loads, its smooth shifting and its quiet gear train. With fifth and sixth being overdrives, there is the benefit of smooth highway cruising at low engine speed to conserve fuel.

Early units used paper-lined synchro rings that were dual-cone technology for low shift effort. Tremec then redesigned the synchronizers for the Corvettes, Cadillacs and GTOs to use triple-cone technology on first and second gears and double-cone on the third and fourth gears. The paper-



6060 shift fork

T56 shift fork



lined rings were replaced with carbon-fiber-lined rings. These changes increased the torque-handling capability of the T56.

As time marches on, new models mean new design changes, and Tremec has now brought out the new 6060 version of the T56. As horsepower and torque levels increased, Ford selected the 6060 design for the 2007-and-up Shelby GT 500 Cobra model. If my sources are correct, the 6060 also will be found in the 2009 Camaro, Dodge Challenger and Corvette.

The 6060 is an evolutionary design change to the very successful T56. They look the same externally, and to a great degree internally, but there are definite changes that make parts swapping impossible between the two designs. The 6060 was designed to improve shift effort as automakers compete with globalization of the higher-end and performance markets, and to carry

higher torque loads to match the new power plants.

The 6060 transmission uses triple-cone synchronizer technology for the first and second gears, and dual-cone synchronizers for third, fourth, fifth, sixth and reverse. The previous Cobra T56 unit used dual-cone synchros for first, second, third and fourth, with single-cone synchros for fifth, sixth and reverse. By increasing the surface area of the synchro rings by two or three times, you get much higher torque capability along with smoother shifting, particularly on downshifts. This is done without increasing the centerline distance between the mainshaft and the countershaft. Along with the increased surface area on the synchros, there has been an increase in the diameter of the synchronizer assemblies. Carbon-fiber-lined synchro rings have been upgraded to sintered bronze material for more durabili-

ty and consistent manufacture.

Although the synchronizer diameter has been increased, the synchro hubs have been narrowed to shorten the amount of travel fore and aft required to complete a shift. Gone are the T56 synchro keys and hoop-type springs; these have been replaced by struts with encapsulated balls and springs to further smooth the shift effort.

The speed gears are also redesigned with a two-piece assembly, where the plate bearing the clutch teeth is laser welded to the gear. The T56 design uses one-piece forged gears, which although durable do not allow the precise machining found on the 6060 gears. The gear-face width of the speed gears has been increased for higher torque capacity. The narrower synchro assemblies provide for more gear thickness. The clutch teeth on the 6060 speed gears have positive stops to prevent over-shifting, and this eliminates the

need for stops on the shifter assembly.

As computer programs, cams, induction and fuel injection have improved, the new engines generate more horsepower and torque, putting increased demand on other driveline components. The T56 10-spline input shaft has been upgraded to a 26-spline input shaft on the 6060. The main (output) shaft has increased diameter and a fixed flange for the driveshaft connection. The T56 countershaft was a two-piece design, which has been replaced by a one-piece countershaft on the 6060 for increased strength. A slight redesign of the main transmission case eliminates the previous T56 adapter plate with the bellhousing, increasing torsional rigidity for the case assembly.

The T56 is a great design that continues to provide smooth, quiet operation for a great variety of models. Tremec has put a lot of effort into this design evolution creating the 6060, and we will start to see these coming into our shops, as performance cars are good for business. No matter how good the manufacturers make the drivelines, there is no way to improve the drivers. **TD**

