A Look Inside The T45 Transmission

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Contributing Editor

The T5 Borg-Warner transmission enjoyed one of the largest production runs in automotive history. When GM released the new F-body (Camaro/Firebird) in 1993, one of the features of the car was a six-speed transmission – the T56. With a very stout 450-ft./lb. torque rating, the T56 also is used in the Dodge Viper.

When Ford Motor Co. came out with a redesigned Mustang using a 4.6-liter V-8 instead of the venerable 5.0 HO engine, it needed a trans with a better torque capacity than the T5. The T56 was not in Ford's plans, so it had Borg-Warner design a new 5-speed – the T45.

The T45 is used in the 4.6-liter, 2-valve Mustang and the Mustang Cobra model with the 4-valve 4.6 engine. This unit has five forward speeds with all forward speeds in constant mesh and all gears synchronized. Ratios are 3.37-1 1st, 1.99-1 2nd, 1.33-1 3rd, 1-1 4th, 0.67-1 5th and 3.22-1 reverse.

This unit is a design evolution of the T5 world-class design with some unique new features. Gone is the shift cover. The clutch housing is detachable and forms the front of the unit. The main case is a one-piece design, open at both ends similar to the T56 design. The shift selector and worm track in the extension housing are carried over from the T5.

Reverse is redesigned totally and is unique. The reverse gears on the mainshaft and countershaft are in constant mesh. The reverse idler gear now is mounted in the extension housing and is in constant mesh with the other reverse gears.

The 5th-speed gear and

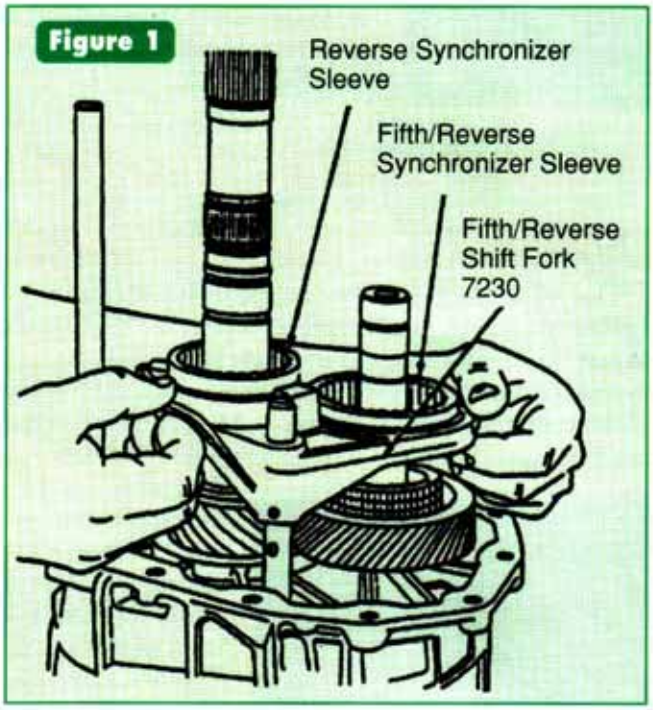
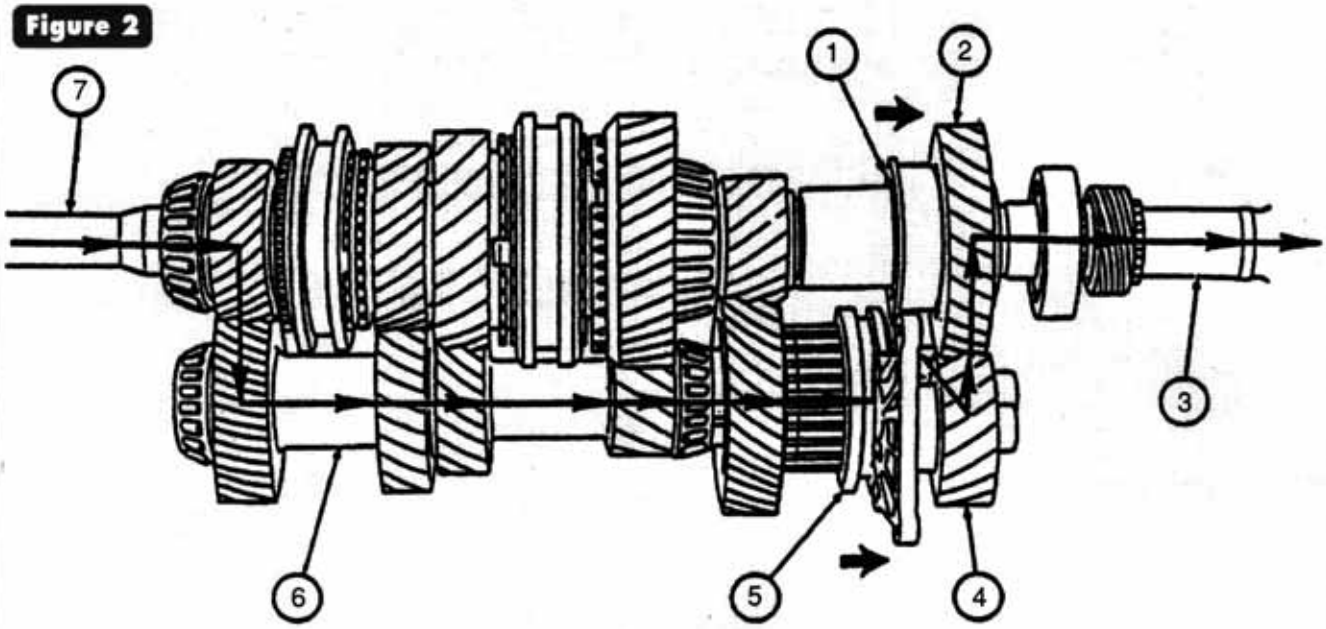


Figure 2



Item	Part Number	Description
1	7106	Reverse-Gear Synchronizer Sleeve
2	7K013	Reverse Gear Driven
3	7061	Output and Fifth-Gear Drive Shaft

Part Item	Number	Description
4	7141	Reverse Idler Gear
5	7124	Fifth/Reverse Synchronizer
6	7113	Countershaft
7	7017	Input Shaft

synchronizer are on the countershaft with reverse mounted behind them (See Figure 1). Ford calls this a "double disconnect" system for reverse. The 5th and reverse fork is a double fork that shifts the 5th/reverse synchro and a separate reverse engagement sleeve on the mainshaft that locks the mainshaft reverse gear to the mainshaft. Thus we have reverse gears in constant mesh but freewheeling until the driver engages reverse (See Figure 2).

The T45 uses tapered bearings on both mainshaft and countershaft, with selective shims under both front-bearing races to set endplay. Countershaft endplay should be 0-0.002 in., and output-shaft endplay should be set 0-0.003 in.

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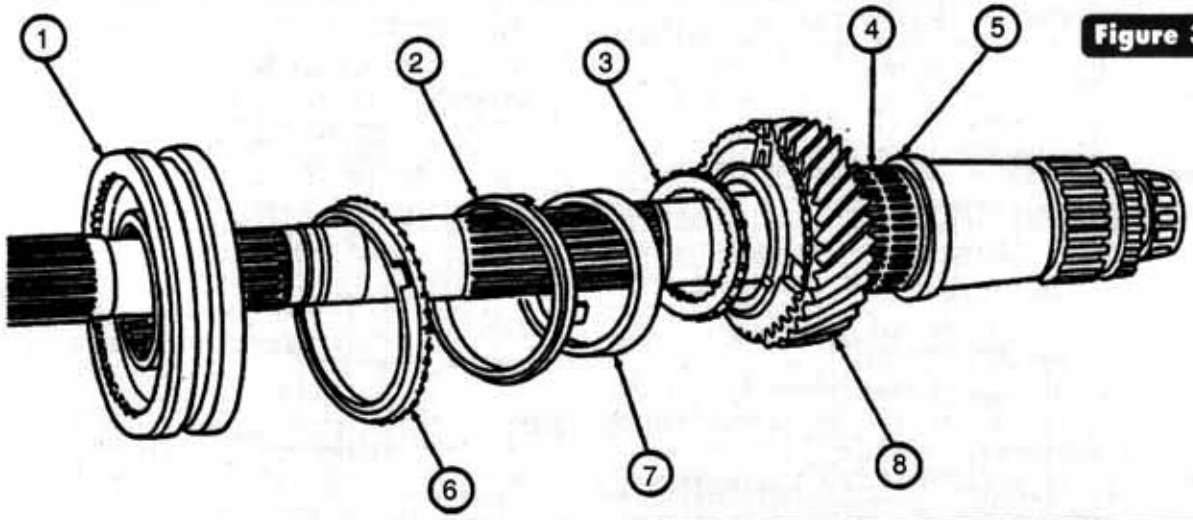

Figure 3

Item	Part Number	Description
1	7124	Synchronizer
2	7174	First- and Second-Gear Synchronizer Outer Cone
3	7Z491	Thrust Washer
4	7B369	Needle Bearing
5	—	Output-Shaft Thrust Flange (Part of 7061)

Item	Part Number	Description
6	7102	Second Gear
7	7175	First- and Second-Gear Synchronizer Inner Cone
8	7107	Synchronizer Blocking Ring

This trans uses compound lined synchro rings for smooth shifting. The 3-4-5 rings are single-cone design, and clearance between the ring and the speed gear should be 0.025 in. or greater. The 1-2 synchro rings are a double-cone design, and the clearance between the blocking ring and the coupling teeth of the speed gear should be a minimum of 0.035 in. (See Figure 3).

The reverse synchro ring is a threaded brass traditional design. As with all compound lined rings, they should be soaked in the proper lube (ATF in this case) before installation. Putting these rings in dry will shorten their life span dramatically and create shift problems. The T45 should be filled with 6.4-6.7 pints of Mercon ATF or the equivalent.

Several problems have been found in the field with this unit. Occasionally it will be difficult to shift into reverse. The shift will feel blocked out. Disengaging the clutch, shifting to neutral and releasing the clutch to get the shafts turning and then trying to shift into reverse should be all that is necessary. This sequence is mentioned in the owner's manual – if anybody ever bothers to read it.

Some units in the field would jump out of reverse when the clutch was engaged. Some engineering changes were made to reverse. Test the unit as follows: Shift into reverse and back up at least 15 times. If you cannot duplicate the customer complaint, the driver probably did not fully engage reverse. If the unit will jump out of reverse, see whether Ford will buy it under warranty, and refer to Oasis message #11393.

Some 1997-98 models jumped out of 4th gear while being driven. If you can duplicate this condition, the main drive gear will need replacing. It is necessary to install a new bearing race in the input gear for the tapered bearing supporting the nose of the mainshaft.

Getting a copy of the Ford service manual will make disassembly and repair easier. Although this transmission is a new design, it is not difficult to work on. TD

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