

# Exploring the New Venture 3550 Transmission

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Contributing Editor

Starting with the 2000 model year, Chrysler introduced a new five-speed manual transmission in the Jeep Wrangler (TJ) models. Manufactured by New Venture Gear, this unit is designed to replace the AX15 transmissions used in previous models. This unit is classified as a medium-duty, fully synchronized transmission and is used with the 4.0-liter straight-six engines.

The design of this unit is a variation of the New Venture 3500 transmissions found in Chevrolet and Dodge full-sized pickups. Reverse is synchronized, and the bellhousing is removable. The cases are in two parts and made of aluminum with a single-rail shift system. This transmission is equipped with an external clutch slave cylinder mounted on the bellhousing. The transmission uses ball and roller bearings to support the input, mainshaft and counter gear. All speed gears ride on caged needle roller bearings. The shift mechanism and general design reflect its heritage from the 3500-series transmissions.

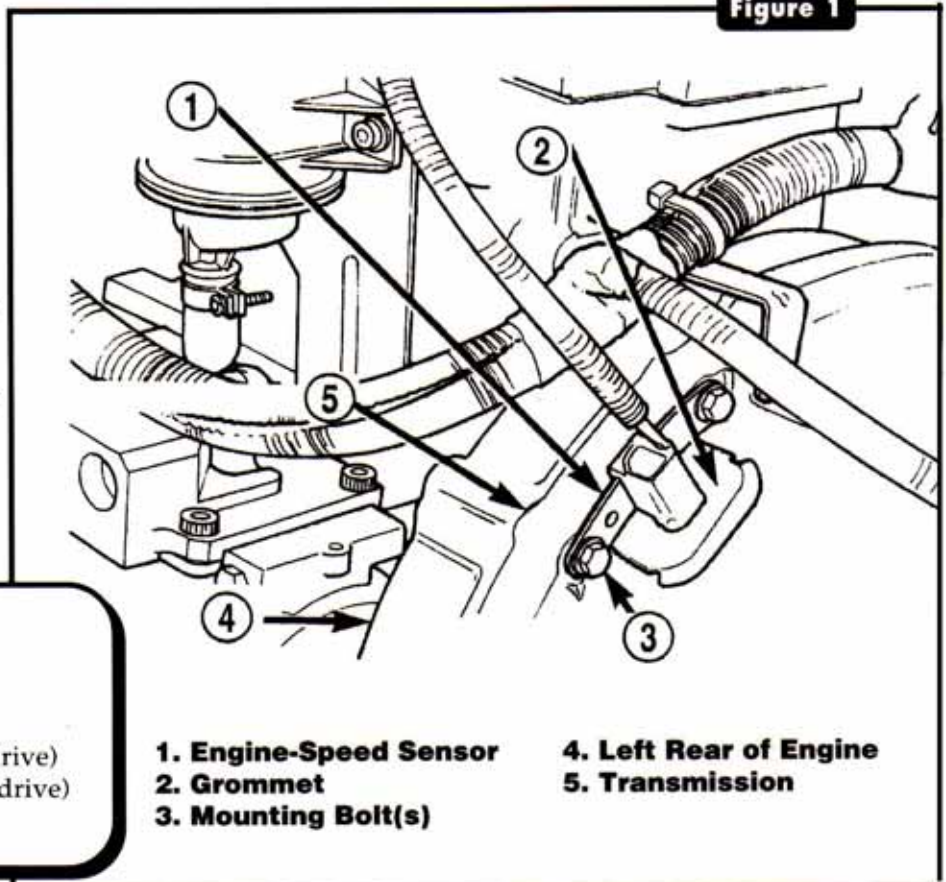
This unit may be identified by a series of part numbers on a decal attached to the top of the extension housing, just in front of the shift tower. The shift tower is retained to the extension housing by four bolts. Do not attempt to take the shift tower apart. If it needs to be replaced for wear or damage, you must replace it as an assembly; no service parts are available.

This unit is designed in two- and four-wheel-drive models.

Rebuilding it requires the same essential tools as rebuilding the NV 3500-series transmissions. When removing the transmission, it is important that you first remove the crankshaft-position sensor from the bellhousing to prevent damage to the sensor or wiring. This sensor is attached to the bellhousing at the 11 o'clock position (See Figure 1).

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Figure 1

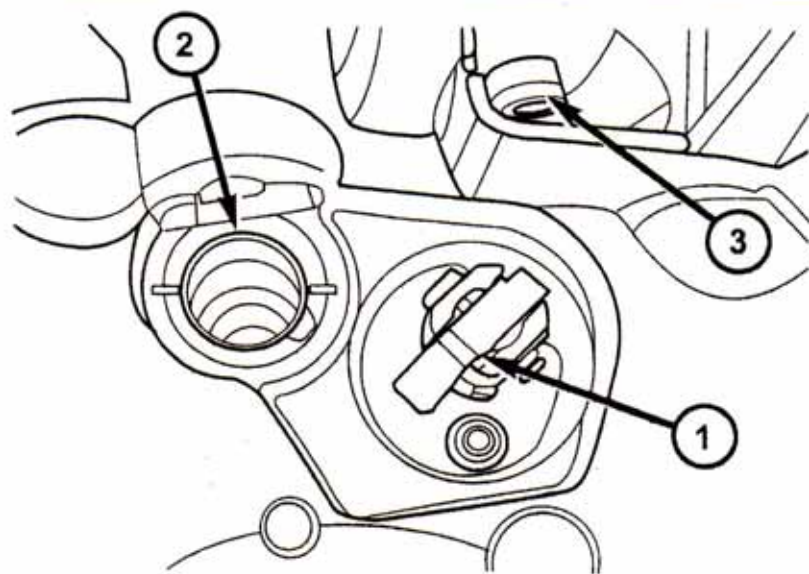


## Gear ratios:

1st gear	_____	4.01-1
2nd gear	_____	2.32-1
3rd gear	_____	1.40-1
4th gear	_____	1-1 (direct drive)
5th gear	_____	0.78-1 (overdrive)
Reverse	_____	3.55-1

1. Engine-Speed Sensor  
2. Grommet  
3. Mounting Bolt(s)

4. Left Rear of Engine  
5. Transmission



**Reverse Blocker**

- 1. Reverse Blocker**
- 2. Shifter-Shaft Bushing**
- 3. Vent**

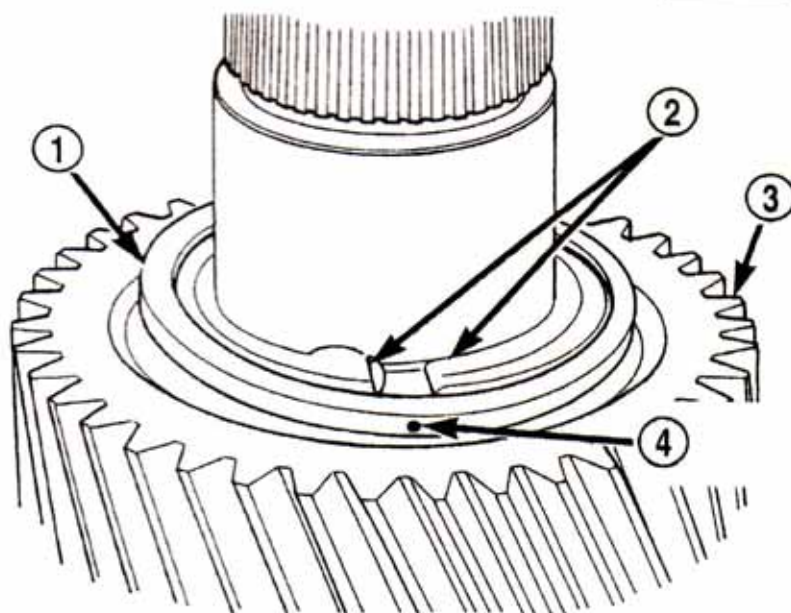
**Figure 2**

ring (See Figure 3). This ring has a dimple punched into it at the factory, and to reassemble the trans you will need to locate the dimple in the proper place on the split thrust washer. The 3rd- and 4th-gear synchro rings are compound lined single-piece rings, but the 1st- and 2nd-gear synchro rings are of the three-piece design common in late units. This unit will shift very well using GM Synchronesh fluid.

The reverse idler system consists of a shaft with bearings and various thrust washers, a needle bearing, two snap rings and two small balls that prevent the thicker thrust washers from spinning on the idler shaft. If you disassemble this shaft, be careful to note the position of all the components for

Disassembly of the transmission is routine except for the following cautions: When driving the roll pin out of the main shift socket, be careful to drive it down only enough to free the main shift rail. Driving it too deep can cause it to damage the geartrain. When removing the front case, you will notice a reverse-restraint mechanism (reverse blocker, Figure 2) bolted to the inside of the front case next to the main shift-rail bushing. The service repair manual says to remove this piece. A very small self-tapping screw retains the reverse blocker in the case. I would suggest not removing this piece unless it needs to be replaced. If the retaining screw strips out, this will be the toughest Heli-coil job of your life.

When removing the speed gear from the mainshaft, you will see that a two-piece thrust washer positions the 3rd gear on the mainshaft and is retained by a retaining

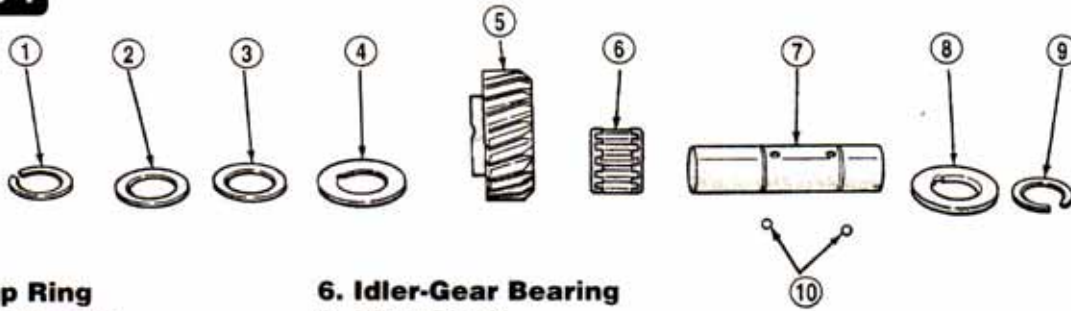


**Figure 3**

**Retaining Ring**

- 1. Thrust-Washer Retaining Ring**
- 2. Thrust-Washer Halves**
- 3. Second Gear**
- 4. Locating Dimple**

**Figure 4**



- 1. Snap Ring
- 2. Flat Washer
- 3. Wave Washer
- 4. Thrust Washer
- 5. Reverse Idler Gear

- 6. Idler-Gear Bearing
- 7. Idler Shaft
- 8. Thrust Washer
- 9. Snap Ring
- 10. Thrust-Washer Lockballs

## Reverse-Idler Components

correct reassembly (See Figure 4). It is important to note that one of the washers on the shaft is a waved spring washer that is used to load the reverse idler gear to prevent gear rattle.

The countershaft bearings are

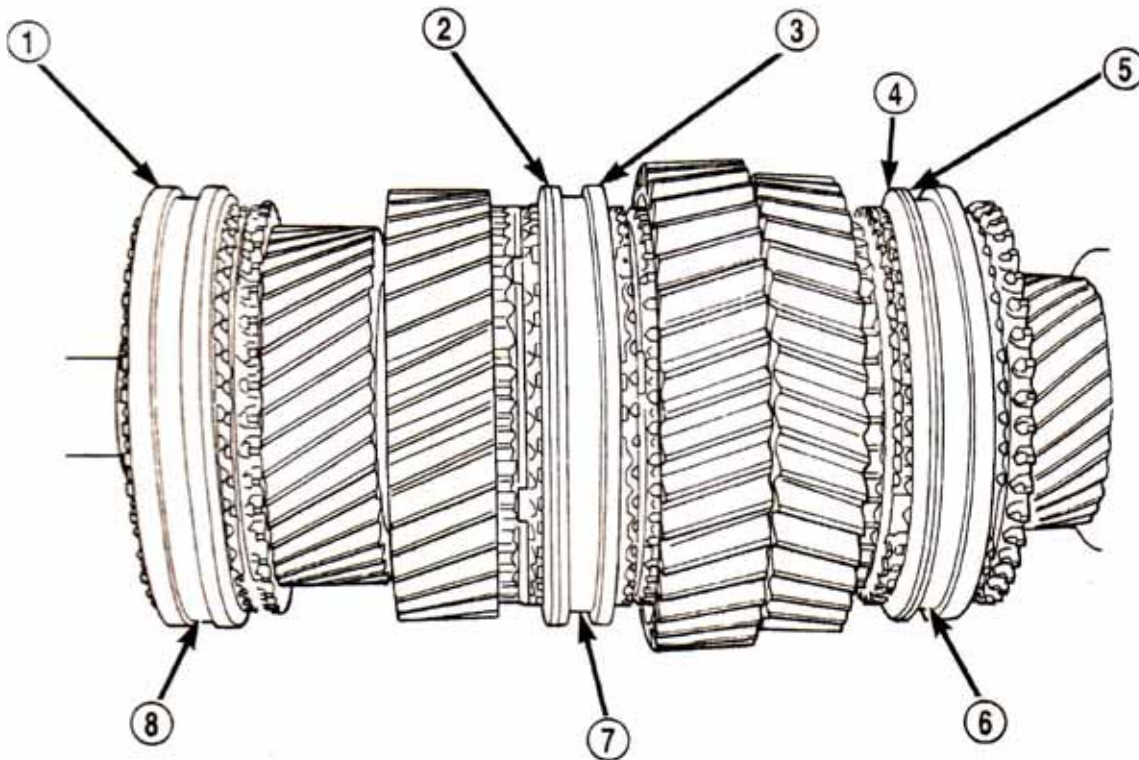
straight roller bearings. Plastic cages retain the bearings, which are directional. Each cage has a small side and a large side. The small side goes toward the bearing race in the case, and the large side fits around a step machined on the

counter gear to position the bearing. When installing the bearings on the countershaft, make sure they are oriented correctly (Refer to Figure 6), and use assembly lube to hold the bearings tightly to

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**Figure 5**

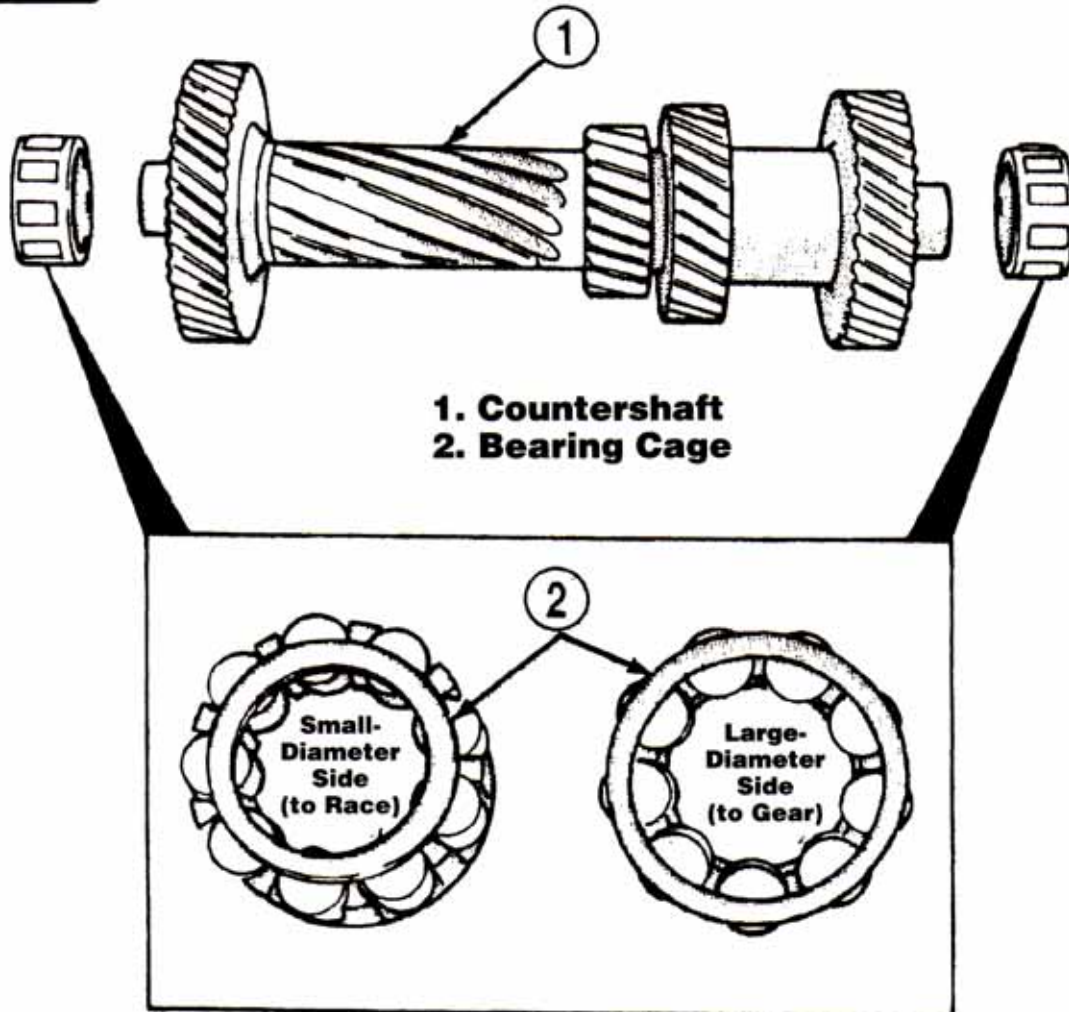
## Synchro Sleeve Locations



- 1. Double Groove Forward
- 2. Groove Forward
- 3. First-Gear Side Marking Toward First Gear
- 4. Taper Forward

- 5. Groove Forward
- 6. 5th-Reverse Synchro Sleeve
- 7. 1-2 Synchro Sleeve
- 8. 3-4 Synchro Sleeve

Figure 6



the counter gear. Failure to do so will result in broken cages and a comeback. As a point of interest the service manual says the countershaft-bearing races are not sold separately and if they need to be replaced you must buy a case. This is incorrect, as the bearings and the races are available from aftermarket gear suppliers.

We have covered the key points concerning this unit. As always, getting a service manual will make work on this transmission a lot easier. As a further point of interest, if parts are too expensive or

difficult to obtain, a late-model AX15 is a direct bolt-in replacement for this unit. No other changes need to be made, as they use the same bellhousing and the shifter position and cross member are the same.

In these troubled times I wish you all a happy, healthy and safe holiday season. **TD**

*All illustrations courtesy of Chrysler Corp.*

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