

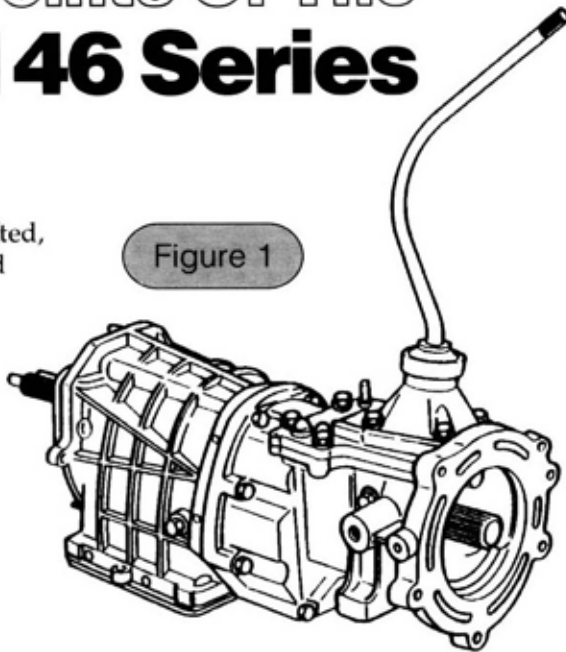
The Fine Points Of The FM145/146 Series



By Mike Weinberg
Contributing Editor

The FM145/146 is a top shifted, five-speed transmission found in the Ford downsized 4WD vehicles and, with slight variations, in Mitsubishi Monteros and Dodge Raiders. There are a large number of these Mitsubishi-designed units in service and learning their weak points and how to rebuild them properly will generate good shop profits.

Figure 1



Unit Description

The FM145 is a five-speed fully synchronized transmission with all gears in constant mesh, including the reverse idler gear. The reverse gears are helical cut to keep noise to a minimum. The input and mainshaft are

continues page 47

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*Includes New Morse Chain

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- CHEROKEE - XJ-NV231J, NV242J, NV249J
- LIBERTY - KJ-NV231J, NV242J
- GRAND CHEROKEE - ZJ, WJ, WK-NV140J, NV147J, NV231J, NV242J, NV245J, NV247J, NV249J
- CHEROKEE/WAGONEER/J10 - NP208J, NP215J, NP228J, NP229J

Rockland Standard Gear can custom fit all of these transfer cases to any TJ, YJ, ZJ, WJ, XJ & KJ model

231J Command Trac w/ Slip-Yoke Eliminator



247J & 249J AWD

Non-viscous - more MPG, less wear
Perfect for warmer climates
Retains safety of AWD



FORD Transfer Cases

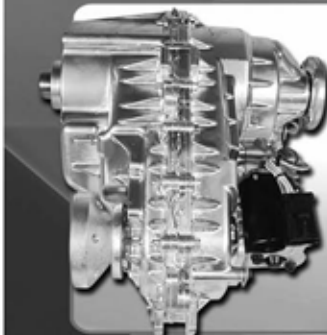
All Ford Transfer Cases are Remanufactured with the Latest O.E. Components
*Includes New Morse Chain

- EXPLORER, MOUNTAINEER - BW440F, BW440SF, BW4410F, BW4411F
- EXPEDITION, NAVIGATOR - BW440F, BW4410F
- AVIATOR - BW4410F, BW4411F
- BRONCO - NP208F, BW1356F, RANGER-BW1356F, BW1354F, BW440SF
- BRONCO II - BW1356F, BW1354F
- AEROSTAR - RA28F
- PICKUP - NP208F, BW1345F, BW1356F, BW4406F, BW4403F, BW4410F, NV271F, NV273F
- EXCURSION - NV271F, NV273F

Dodge Transfer Cases

All Dodge Transfer Cases are Remanufactured with O.E. Components
*Includes New Morse Chain
• Durango RT - Converts Full Time AWD to Select Trac or Command Trac

- DURANGO - NV133D, NV144D, NV231D, NV233D, NV242D, NV244D
- DAKOTA - NV231D, NV233D, NV242D, NV244D
- RAM PICKUP - NV241DL, NV241DH, NV271D, NV273D
- RAM QUAD CAB - NV231DH, NV241DL, NV243D, NV244D
- RAMCHARGER - NP208D, NV241D



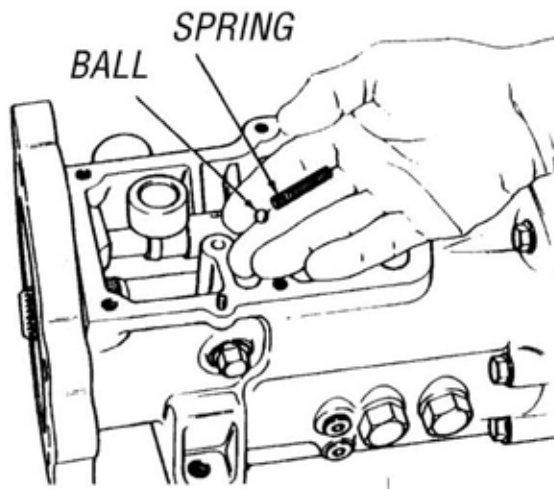


Figure 2

supported by ball bearings, and the counter shaft runs on tapered roller bearings.

Ford unit ratios are-

- 1st gear 3.967-1
- 2nd gear 2.136-1
- 3rd gear 1.360-1
- 4th gear 1-1 (Direct Drive)
- 5th gear .0856-1 (Overdrive)
- Rev gear 3.578-1

This unit uses several selective shims and snap rings and it is critical for proper operation that all clearances are within spec. The input bearing to front bearing retainer clearance should be 0 to .004 and is set by a large selective shim. This shim is lost easily on teardown and cleaning. Countershaft endplay is 0 to .002 and is set by a selective shim under the rear bearing retainer. The thick spacer on the countershaft front bearing is not selective and we have seen many units with the spacers in the wrong place with prematurely explosive results. The main drive-gear-bearing retaining snap ring and the mainshaft snap ring retaining the 3-4 synchro assembly are selective.

Common Failures And Mistakes

Upon disassembly of the extension housing, when removing the main shift rail restraint plungers

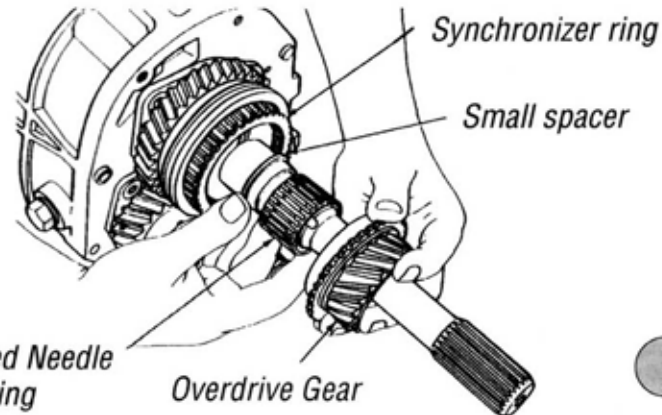


Figure 3

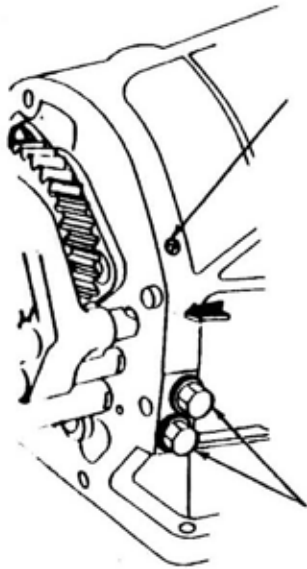
and springs, it is common to lose the reverse restraint resistance ball. While this will not cause unit damage, the shifter will be sloppy going to the 5th reverse rail.

It is common to find broken 5th speed gears on the main shaft. There may be several causes for this problem. There are some drivers who will shift to 5th at very low speeds (under 45 mph). It is important for you the professional technician to enlighten your customer to the fact that 5th gear or overdrive is a cruising gear for highway driving only. This goes for all J-types of overdrive transmissions. Shifting into overdrive under 50 mph just lugs the engine, beats up the gear train and demands greater throttle opening for acceleration. Another cause of 5th gear damage is more difficult to see but must be checked on all repairs. 5th gear on the main shaft is supported by a needle-roller bearing and a removable sleeve on the main shaft. Examine carefully the area on the 5th-rev synchro hub that the sleeve butts up to. It is common for the sleeve to spin and wear a groove in the hub.

This decreases the distance between 5th gear and the 5th gear thrust washer and main shaft lock nut and 5th gear binds up and breaks. Early models are equipped with a spacer in front of the 5th gear needle bearing. Later models eliminated the spacer and use a longer bearing. If you put the spacer in with the longer bearing, the unit will lock up when the mainshaft lock nut is tightened.

Look for wear on the rear bearing retainer. The mainshaft rear-case bearing can fail or spin against the retainer, wearing a groove in it, mainshaft endplay goes hyper and the trans dies young. I have seen many units fail due to loosening of the rear retainer Allen head bolts. When you put this together, use a quality brand of thread locking compound and torque the fasteners to the right spec.

Up To Standards



Poppet spring
and ball set
screw

Figure 4A

Poppet spring
and ball
retaining bolt

6.1 mm
(0.24 in)

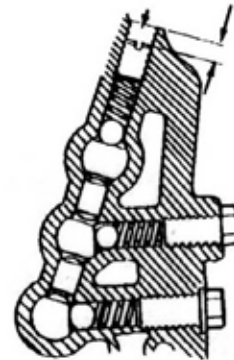


Figure 4B

Detent balls, springs and interlock pins are lost easily or installed incorrectly. The detent springs are tapered. The small end of the spring goes into the bore against the detent ball. Ford models use one threaded plug to set spring tension on the uppermost detent, while Mitsubishi and Dodge units use threaded plugs on all detents. The proper depth to which these

plugs should be set is .240 or just about $\frac{1}{4}$ of an inch.

After setting the plugs to the right depth the bores should be sealed with RTV silicone to keep corrosion out and prevent the plugs from backing out.

These are not hard units to build and bring in good money to the shop cash flow. Attention to detail will keep them on the road giving good service to your customer. ■

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Jeep Transfer Cases



- 231J Command Trac
- 242J Select Trac
- 247J Pump Coupler AWD
- 249 J AWD

Rockland Standard Gear can custom fit all of these transfer cases to any TJ, YJ, ZJ, WJ, XJ & KJ model

Ford Transfer Cases



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Dodge Transfer Cases



All Dodge Transfer Cases are Remanufactured with O.E. Components

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Models Available: 231D, 231DHD, 241DL, 241DHD, 242 Select Trac

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