

New Process 435 Four-Speed Transmission

PART 16-25

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DESCRIPTION

TRANSMISSION

The Model 435 four-speed transmission (Fig. 1), is provided with a floor-mounted shift lever or with a floor-mounted remote-control gearshift lever.

The first and reverse gears are spur cut (Fig. 2). The second, third and fourth gears are helical cut and are synchronized to permit easier shifting.

The input shaft is supported by a tapered roller bearing. The input shaft end play is controlled by the thickness of gaskets between the case and the front bearing retainer.

The front end of the output shaft is supported by a pilot bearing that is located in the input shaft. The rear end of the output shaft is supported by a ball bearing that is pressed onto the shaft. The bearing and shaft are held in the case by

a snap ring and a bearing retainer. Retention of the output shaft in the case may vary, depending on application, with the various extension housings that are used (Figs. 2 and 4) to fit several vehicle models.

The third- and fourth-speed synchronizer is mounted on the forward end of the output shaft and is held in place by the gear end of the input shaft and the third-speed gear. The third- and second-speed gears are located between the shoulder and the third- and fourth-speed synchronizer on the output shaft.

The second-speed synchronizer and the first-speed sliding gear are located toward the rear of the output shaft (Fig. 2). A spacer is provided to prevent the first-speed sliding gear from contacting the case.

The countershaft gear is supported by roller bearings installed at both ends of the gear. A roller-type thrust bearing and a bearing race are provided at the rear end of the gear. A thrust washer is also provided at the front of the gear. Uncaged rollers are used in production, but caged roller assemblies are available for service.

The reverse idler gear is supported by roller bearings except in F-100, -350 and P-500 installations, where a bronze bushing is used. Only the roller bearing-type gear is supplied for service replacement, however. The bearings are installed between the gear and a sleeve on the reverse idler shaft. The sets of bearings are separated by a snap ring and bearing race retainer spacer. Snap rings, installed in the center of the reverse idler gear, hold the entire assembly in position.

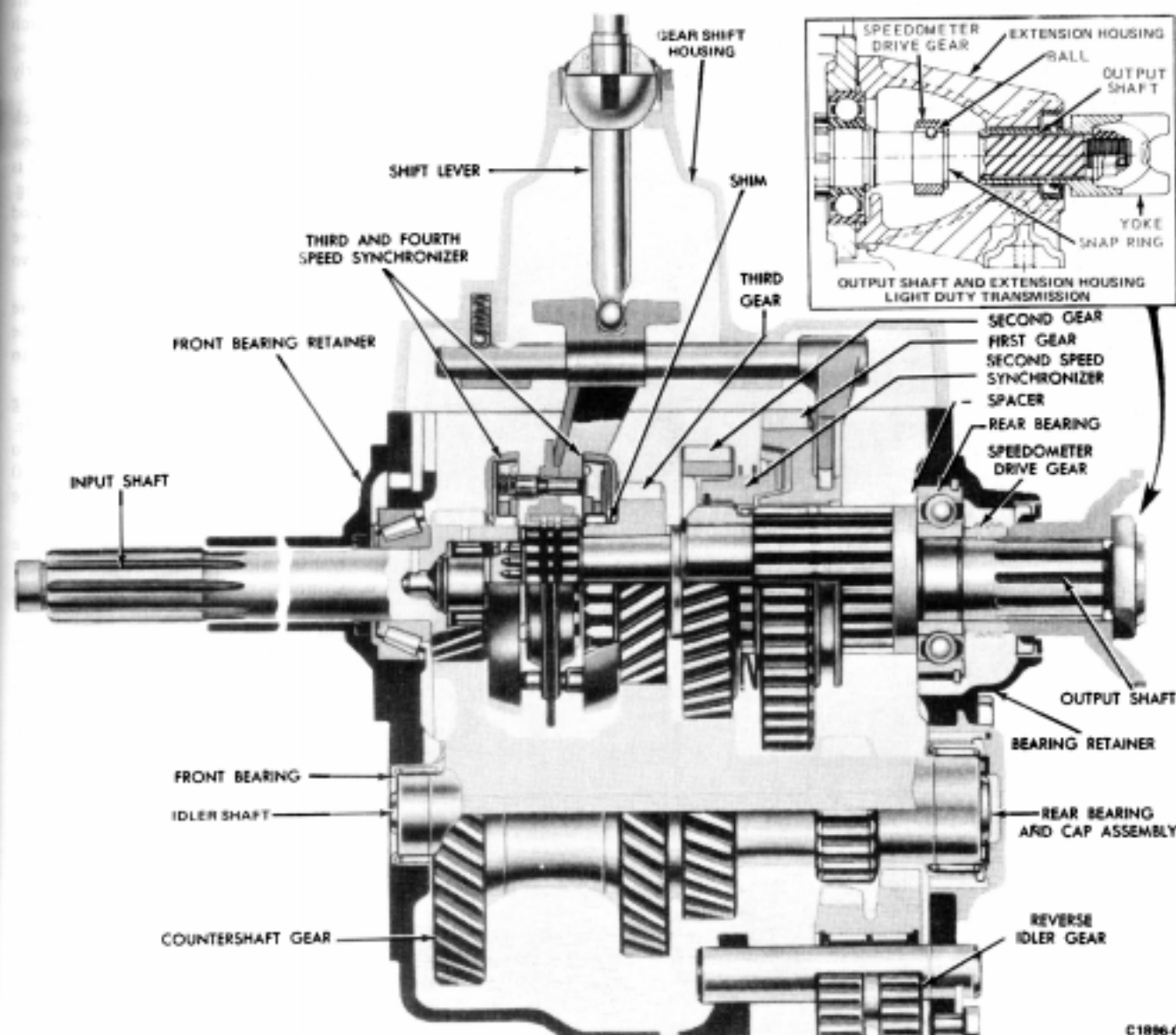


FIG. 2 Transmission Sectional View

REMOVAL AND INSTALLATION

TRANSMISSION

Refer to Figs. 2, 3 and 4 for various installation views.

Removal

1. On F-, LN- or B-Series vehicles, remove the rubber boot and floor mat.
2. On F-, LN- or B-Series vehicles, remove the floor pan transmission cover plate. Remove the weather pad on F-100—F-350. It may be necessary first to remove the seat assembly.
3. Disconnect the back-up light switch located in the rear of the gearshift housing cover.
4. Raise the vehicle and position safety stands. Position a transmission jack

under the transmission, and disconnect the speedometer cable.

5. Disconnect the parking brake lever from its linkage, and remove the gearshift housing. On a C-Series vehicle, disconnect the parking brake cable and bracket at the transmission.
6. Disconnect the drive shaft or coupling shaft. Remove the bolts that attach the coupling shaft center support to the crossmember and wire the coupling shaft and drive shaft to one side. On F-100 -350 Series vehicles, remove the transmission rear support.

7. On C-Series vehicles, remove the two transmission upper mounting nuts at the clutch housing (Fig. 3).
8. Remove the transmission attaching bolts at the clutch housing, and remove the transmission.

Installation

Before installing the transmission, apply a light film of lubricant (C1AZ-19590-B) to the release lever fulcrum and fork. Do not apply a thick coat of grease to these parts, as it will work out and contaminate the clutch disc.

1. Place the transmission on a transmission jack, and raise the

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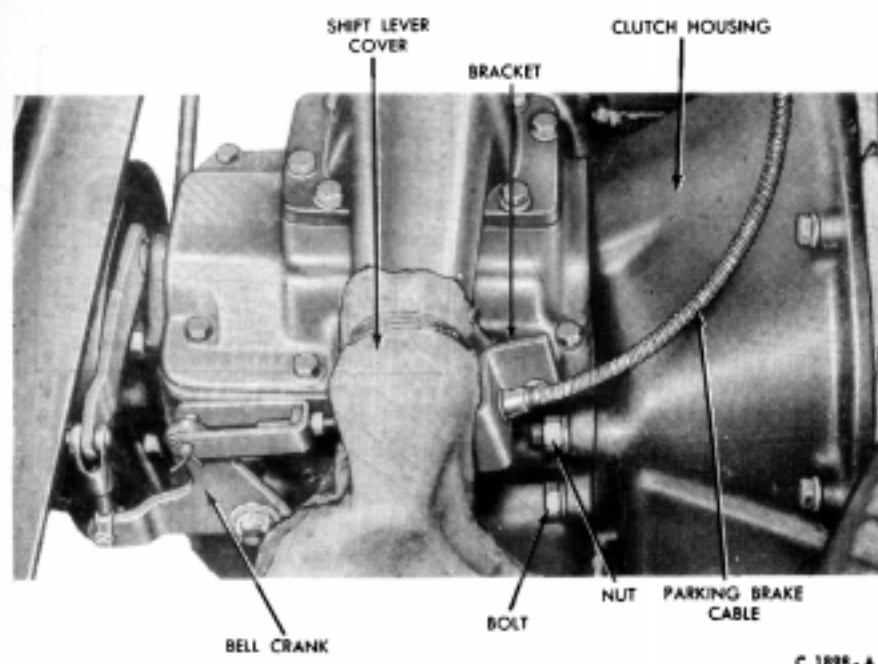


FIG. 3 Transmission Installed—C-Series

- transmission until the input shaft splines are aligned with the clutch disc splines. The clutch release bearing and hub must be properly positioned in the release lever fork.
2. Install guide studs in the clutch housing and slide the transmission forward on the guide studs until it is in position on the clutch housing. Install the attaching bolts or nuts, and tighten them to specification. Remove the guide studs and install the two lower attaching bolts.
3. Install the bolts attaching the coupling shaft center support to the crossmember. Tighten the bolts to specification.
4. Connect the drive shaft or coupling shaft and the speedometer cable. Tighten the U-joint nuts to specification. On F-100 and -350 Series vehicles, install the transmission rear support.
5. Connect the brake to the transmission.
6. Connect the back-up light switch wire.
7. On F-, LN- or B-Series vehicles, install the transmission cover plate. Install the seat assembly if it was removed.
8. On F-, LN- or B-Series vehicles, install weather pad, pad retainer, floor mat, and rubber boot.

DISASSEMBLY AND ASSEMBLY

TRANSMISSION

Disassembly

1. Place the gearshift lever in the neutral position, remove the gearshift housing attaching bolts, and remove the housing.
2. Lock the transmission in two gears, and remove the output flange nut. Remove the parking brake drum, brake and flange.
3. Remove the extension housing attaching bolts or nuts. Remove the extension housing from the output shaft.
4. Slip the speedometer drive gear off the output shaft.
5. Remove the front bearing retainer attaching bolts. Remove the retainer and gasket.
6. Rotate the input gear as required to align the notch in the input gear clutch teeth with the countershaft drive gear teeth. Remove the input gear and tapered roller bearing from the transmission (Fig. 5 and 6).
7. Remove the output shaft bearing (Fig. 8).
8. Remove the roller-type thrust bearing from the front of the output shaft.
9. Slide the third- and fourth-speed synchronizer off the output shaft and remove it from the case.

10. Lift the output shaft from the case as shown in Fig. 7.
11. Remove the reverse idler gear shaft retainer from the rear of the case (Fig. 7). Secure the puller T50T0100-A and adapter T50T-7140-B to the shaft. Hold the gear to prevent it from dropping, and then remove the idler shaft.
12. With the front of the transmission in the downward position, remove the attaching bolts from the countershaft gear rear bearing cap. Tap the cap with a soft-faced hammer to free it from the case. Remove the cap, race thrust bearing, and gasket (Fig. 9). Lift the gear from the case.

Assembly

Coat all parts with the specified transmission lubricant to prevent scoring when the transmission is first operated.

1. Place the input shaft, third/fourth speed synchronizer assembly clutch gear and thrust bearing on the output shaft and secure the complete assembly in a vise as shown in Fig. 10. On F-100-F-350, P-500 check the distance between the synchronizer and input shaft gear. If the distance is more than .070 to .095 inch, install the necessary thickness of shims

between the third-speed gear and the synchronizer brake drum. After the proper thickness of shims has been established, remove the input shaft from the output shaft.

The third- and fourth-speed synchronizer is a one-piece assembly consisting of a sliding clutch hub, three energizing pins, two energizing springs, three blocking ring pins, and two aluminum inner stop rings assembled as an integral unit. In addition, there are two outer stop rings.

When replacing the third- and fourth-speed synchronizer, use the new assembly (D3TZ-7124-B/NPG No.11338). Also, be sure to use the new outer stop rings, which are necessary to protect the inner stop rings against premature failure. Never mix old and new parts nor use old-style or worn outer stop rings.

2. Position the transmission case with the front in the downward position.
3. Apply a thin film of grease on the front thrust washer and position it in the front of the case. The thrust washer is bored off-center, therefore, make sure that the tangs match the slots in the case boss.

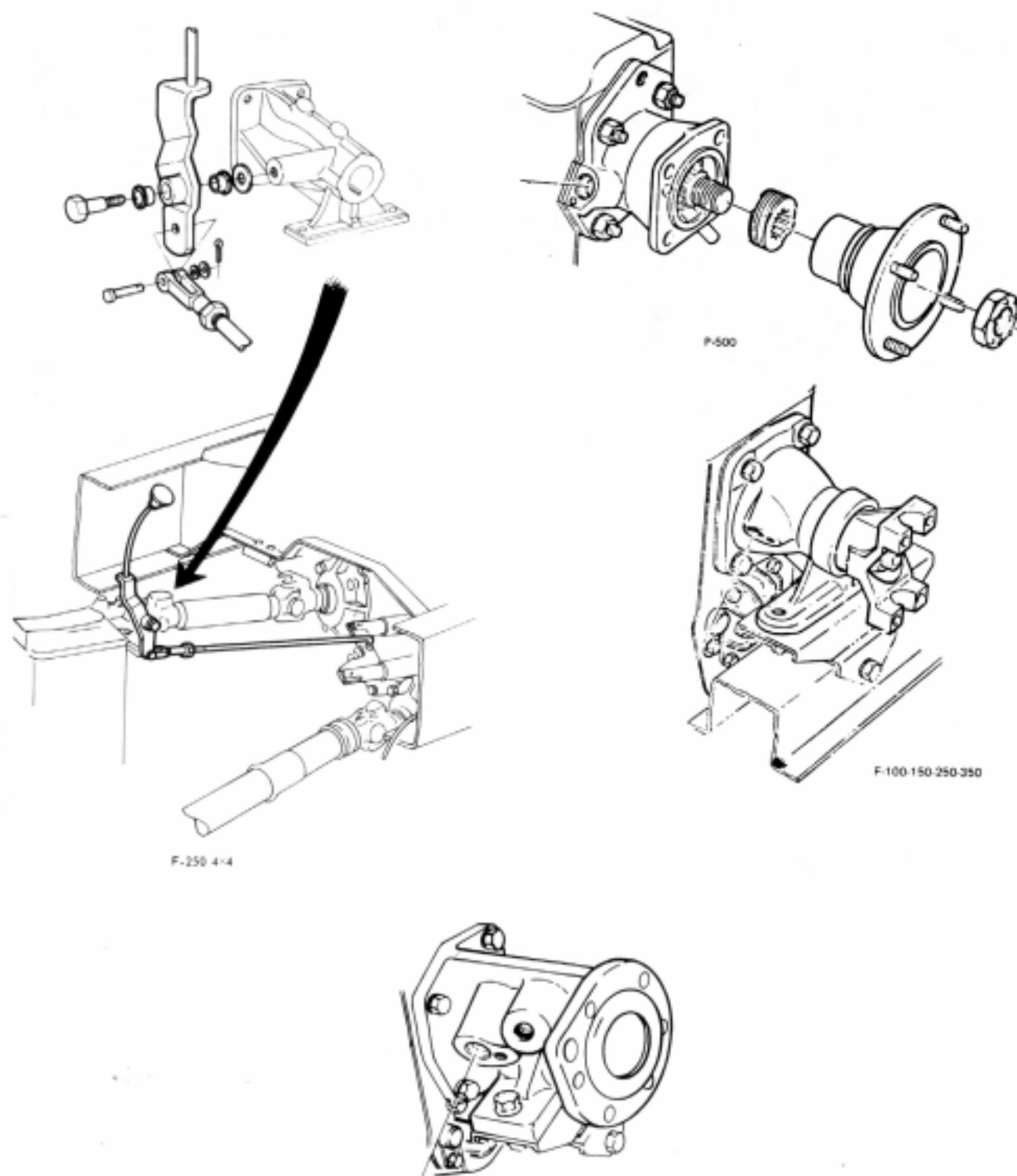


FIG. 4 Light Truck Installations—Model 435 Transmission

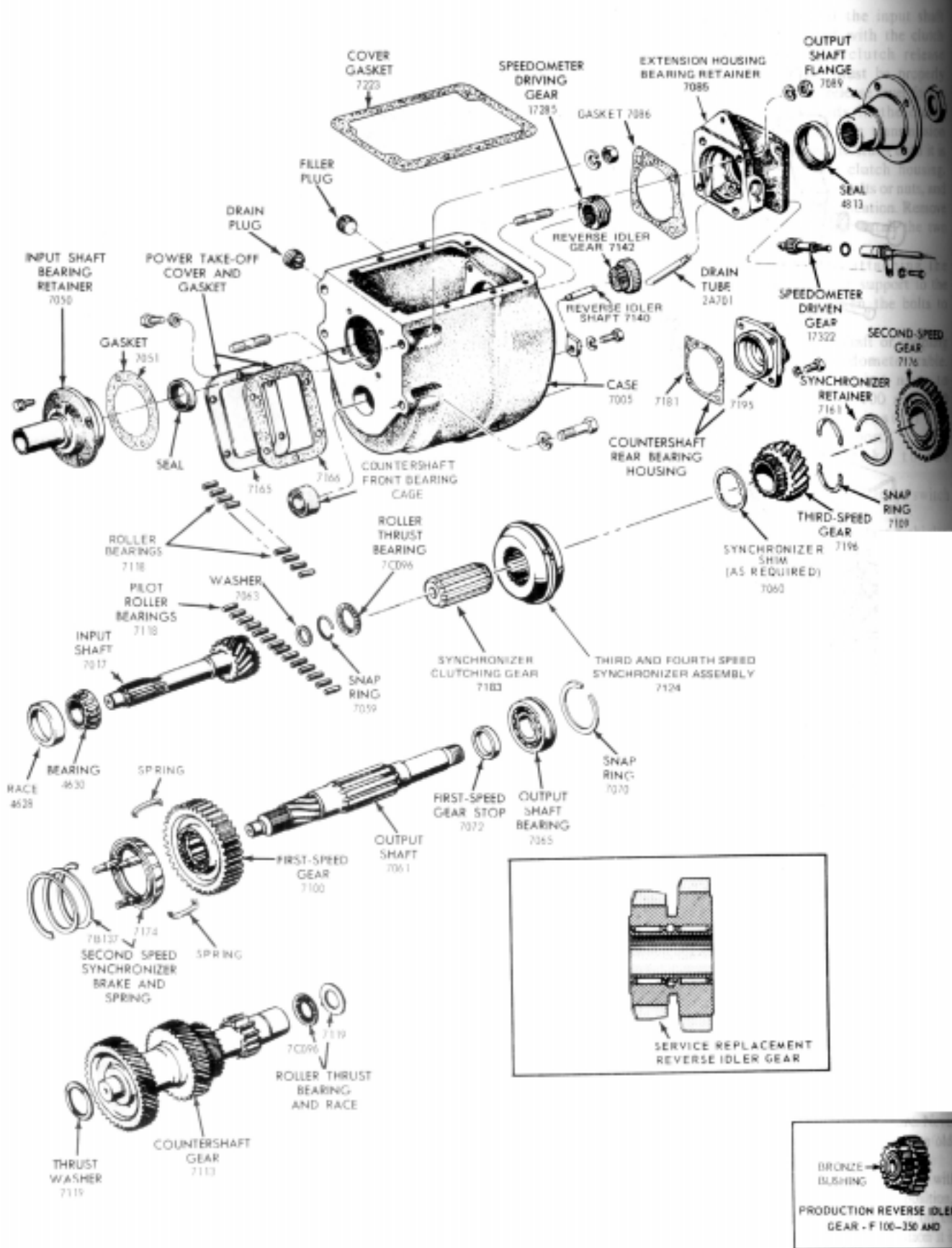


FIG. 5 Transmission Disassembled—F-100-350, P-500