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Ford

Service Manual

**FW-20, FW-30,
FW-40 & FW-60**

Service Manual

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Tractors

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14.00" CLUTCH PARTS IDENTIFICATION

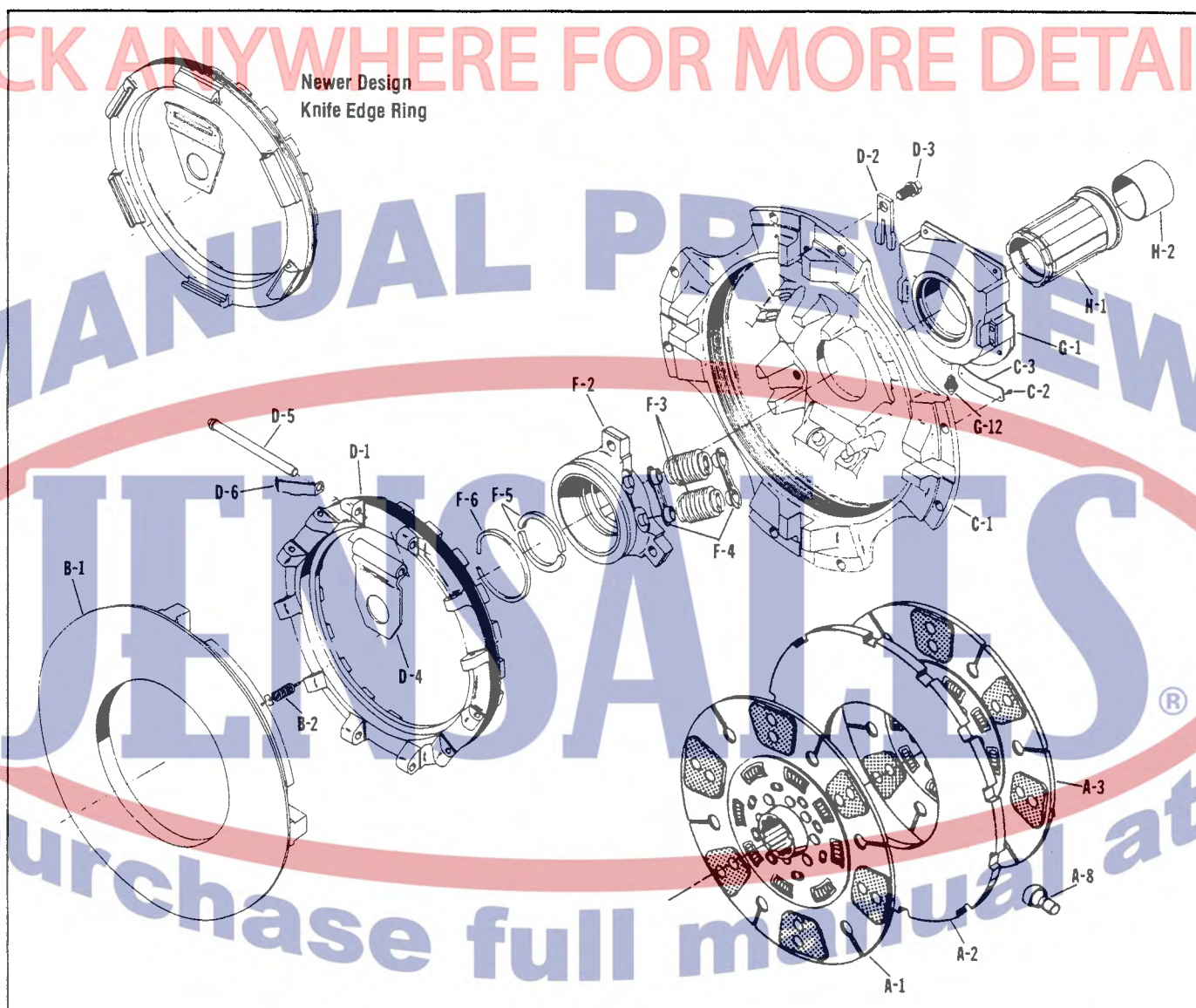


Figure 1:

A-1 DISC, driven front
 A-2 PLATE, intermediate
 A-3 DISC, driven rear
 A-8 DRIVE PIN
 B-1 PLATE, pressure
 B-2 SPRING, return
 C-1 RING, flywheel
 C-2 PIN, name plate
 C-3 PLATE, name
 D-1 RING, adjusting
 D-2 LOCK, adjusting ring
 D-3 BOLT & lock washer
 assembly

D-4 LEVER
 D-5 PIN, pivot
 D-6 CLIP, spring
 F-2 RETAINER, release sleeve
 F-3 SPRING, pressure
 F-4 PIVOT, spring
 F-5 RING, release sleeve
 F-6 RING, snap
 G-1 BEARING & COVER,
 Sub-Assembly
 G-12 NIPPLE, Zerk
 H-1 RELEASE SLEEVE, Sub-Assembly
 H-2 BUSHING, Release Sleeve

Clutch Adjustment

"Mechanical Clutch" External Linkage Adjustment:

10. Check pedal free travel as follows before installing rod clevis pin. Rotate clutch outer arm until the clutch release yoke fingers contact the release bearing thrust pads (a slight resistance should be felt). Hold and mark the end of the clutch "cross shaft" in this position, while observing the mark on the end of the cross shaft rotate the shaft back (away from the release bearing) 1/8 inch (3.175 mm) from the marked position. Screw clutch rod clevis "in" or "out" so that the pin will go through clevis and clutch release arm freely in this position. (see Fig. 10).



Figure 10:

NOTE: When 1/8 inch (.125") (3.175 mm) clearance is correct, there will be approximately 1-1/2 inch (3.81 cm) "total" pedal free travel through the linkage (Fig. 11).

11. Reinstall the clevis pin, split key and clutch external return spring.



Figure 11:

Hydraulic Clutch "External" Linkage Adjustment:

IMPORTANT:

Before making external clutch "linkage" adjustment, check and make clutch adjustment as described in "clutch" adjustment (steps 1 through 9), then proceed as follows:

1. Check clutch master cylinder actuator rod length to obtain .125 inch (.317 cm) movement of the rod before the master cylinder piston is actuated with the pedal in the full up position. This clearance is necessary to ensure full retraction of both the master cylinder and slave cylinder pistons. If adjustment should be necessary, loosen the jamb nut on the actuating rod and screw the rod "in" or "out" to obtain the recommended .125 inch (.317 cm) lash and retighten the jamb nut. (see Fig. 12).

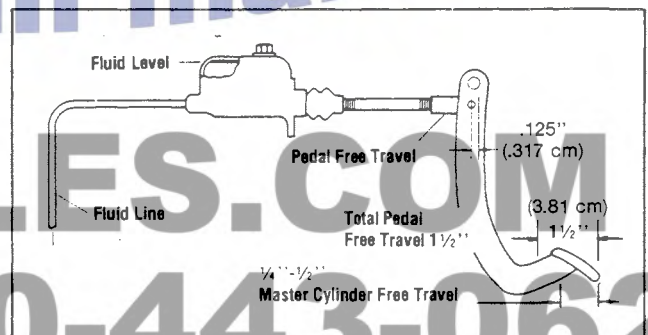


Figure 12:

PART THREE

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TWO SPEED TRANSFER CASE

MANUAL PREVIEW

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GENERAL INFORMATION

Identification

Two Speed Transfer Case

The identification plate location is on the left rear surface of the transfer case housing near the oil reservoir Figure 1. If the unit lacks an identification plate, it may be identified by the following characteristics:

1. A shift detent block mounted on the front.
2. Shaft centers are all in line.
3. Internal oil reservoir and dipstick.
4. Model E gear ratio direct in low range.

Refer to general specification.



Figure 1

Application

The Model E transfer case is available as optional equipment on the Ford FW-20, 30, 40 and 60 tractors. This unit is mounted stationary on rubber mounts in the tractor frame.

General Specifications

Model E:

Ratio — Low range, 1 to 1

Ratio — High range, .88 to 1

Type — Helical gearing, with sliding clutch arrangement for range selection. Tapered roller bearings on shafts.

Lubrication — Pressure lubricated with filtered, air cooled oil pumped from integral reservoir.

OPERATING PRINCIPLES

Power Flow

Driving forces from the tractor's transmission are admitted to the top shaft (input shaft) of the transfer case. The input shaft is fitted with a sliding clutch which contains internal splines that are constantly in mesh with the input shaft splines.

By means of a shift fork and rod, the clutch is moved either fore or aft. The internal splines mesh with the external splines of the selective gear hub that it is moved toward, thus mechanically locking the input shaft and selected gear together.

As the input shaft is forced to turn, the selected gear must turn with it. Since the selected gears are always in mesh with their mating gears, the center shaft and output shaft are also forced to turn. The non-selected gear will also turn, but the rate of speed will differ from that of the input shaft. The non-selected gear will idle on caged roller bearings between its bore and input shaft journal.

By studying the following power flow diagrams Figures 2-4, you can visualize how drive ratios (or ground speed) are dependent upon which gears are utilized for a given range selection.

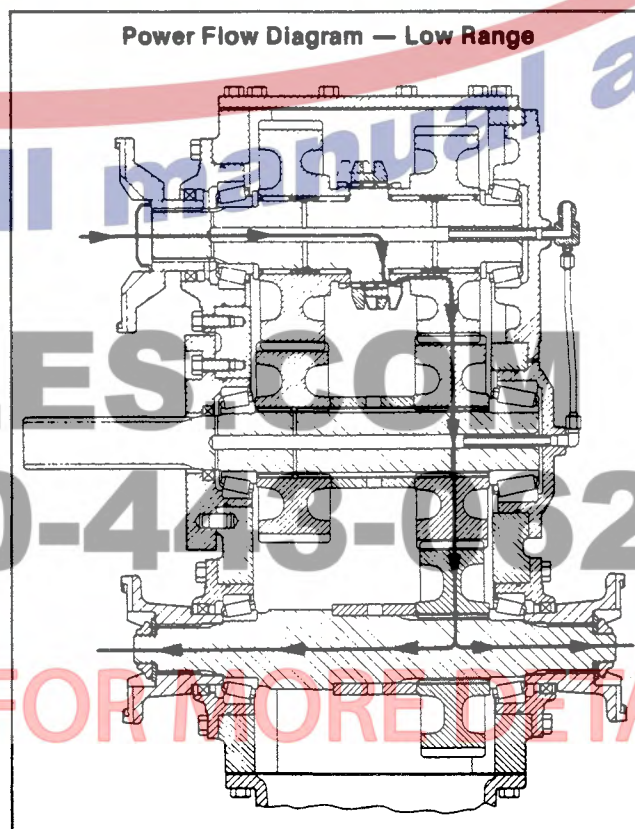


Figure 2

REMOVAL AND DISASSEMBLY

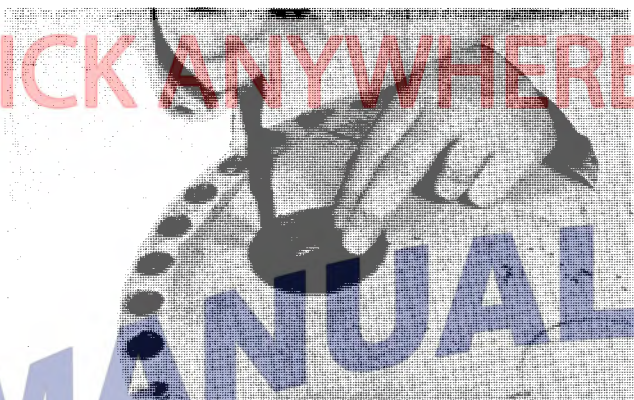


Figure 19

19. Using snap ring pliers, remove the Truarc snap ring, Figure 19. Tap the planet pinion shaft toward the outboard side of the planet carrier and retain the lock ball, Figure 20. Proceed to



Figure 20

remove the shaft completely, Figure 21, and save the rollers as they fall from the bores of the planet pinion and carrier, if they are to be reused.



Figure 21

Disassembly of Differential Carrier Assembly

1. Remove the capscrews fastening the differential carrier housing to the axle housing. Place them in a separate container from other fasteners.
2. Separate the differential carrier housing from the axle housing using a hoist and mount it in a stand or holding fixture, Figure 22. Axle shafts must be removed in order to remove the differential carrier assembly.

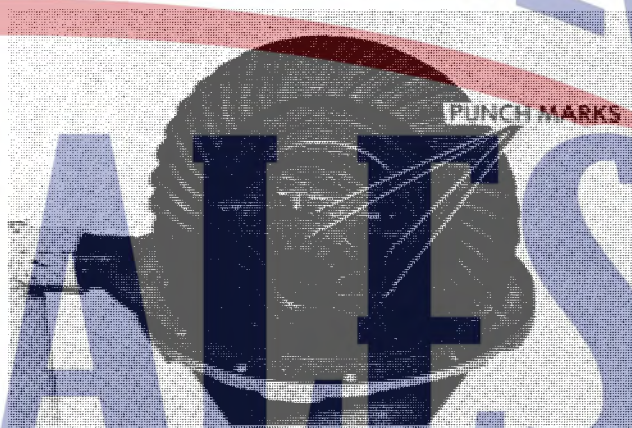


Figure 22

3. Punch mark the caps of the carrier housing, Figure 22, and the carrier housing for correct location at reassembly. If preliminary inspection reveals that the ring gear and drive pinion are satisfactory, check the backlash and tooth pattern for easier adjustment at reassembly. At this time loosen the drive pinion flange nut if drive pinion and cage assembly requires disassembly.
4. Cut the lock wires, then remove the capscrews, carrier bearing caps and bearing adjusters. Tilt the ring gear away from the drive pinion and lift the differential and ring gear assembly from the carrier housing, Figure 23.

5. Remove the drive pinion bearing cage to carrier housing capscrews. Force the drive pinion and cage assembly from the carrier housing. Do not allow the assembly to fall. Record the size and quantity of shims under the case flange for easier adjustment during reassembly.

REASSEMBLY



Figure 78



Figure 81



Figure 79

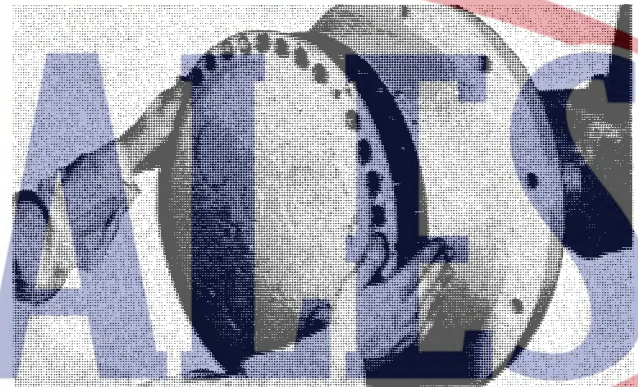


Figure 82

15. Install the axle shaft/sun gear assembly with thrust washer, Figure 80. Leave the shaft as shown, then install the planet carrier assembly over the shaft, Figure 81, and install the "O" ring seal. Push the planet carrier assembly inward and align the planet pinion gear teeth with the internal ring gear, Figure 82. Observe the bolt pattern of the wheel hub.

16. Apply a lock and sealant compound to the threads of each capscREW, Figure 83 and torque to 100 to 130 lb. ft. (13.83 to 17.97 kb/m), Figure 84.



Figure 80



Figure 83