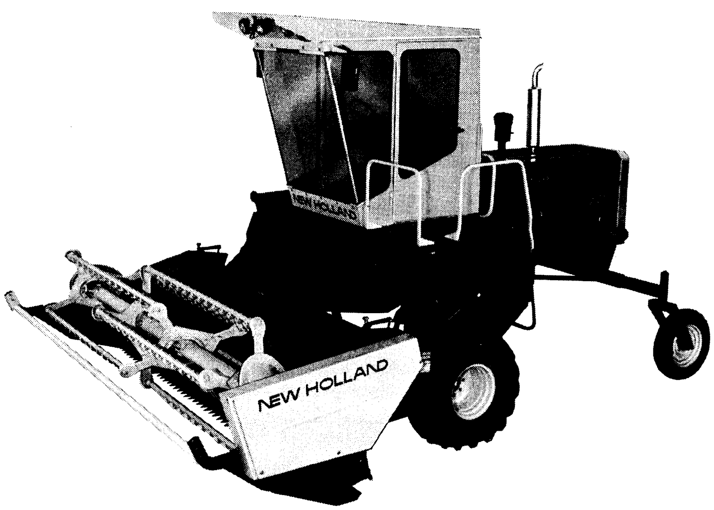
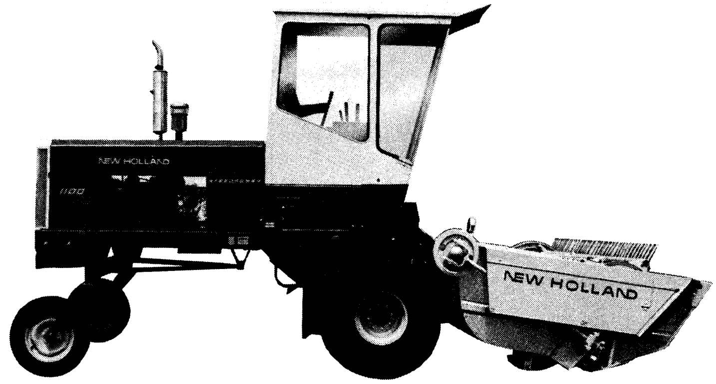
SERVICE MANUAL

SPEEDROWER®
910—1100
HAYBINE®
1495

90° GEARBOXES

SPERRY NEW HOLLAND





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90° GEARBOXES

IMPORTANT: TWO TYPES OF 90° GEARBOXES HAVE BEEN USED IN 1100 SPEEDROWERS AND 1495 HAYBINES. IF THE GEARBOX **DOES NOT HAVE** A SEPARATE INPUT NECK CASTING REFER TO SERVICE PROCEDURES FOR TYPE 1 GEARBOX. IF THE GEARBOX **HAS** A SEPARATE INPUT NECK CASTING, COOLING FINS CAST INTO THE BOTTOM OF THE GEARBOX HOUSING, AND A DIP STICK ON THE OIL FILL PLUG REFER TO SERVICE PROCEDURES FOR TYPE 2 GEARBOX.

CONTENTS

INTRODUCTION

90° gearbox (Type 1) was used in early production machines:

A. ALL 910 Speedrowers

B. 1100 Speedrowers BELOW S/N 379085

C. 1495 Planetary Haybines BELOW S/N 373120

90° gearbox (Type 2) was used in later production machines:

A. 1100 Speedrower S/N 379085 and ABOVE. (See Figure 1.)

B. 1495 Planetary drive Haybines S/N 373121 and ABOVE. (See Figure 1.)

C. ALL 1495 hydrostatic drive Haybines. (See Figure 2.)

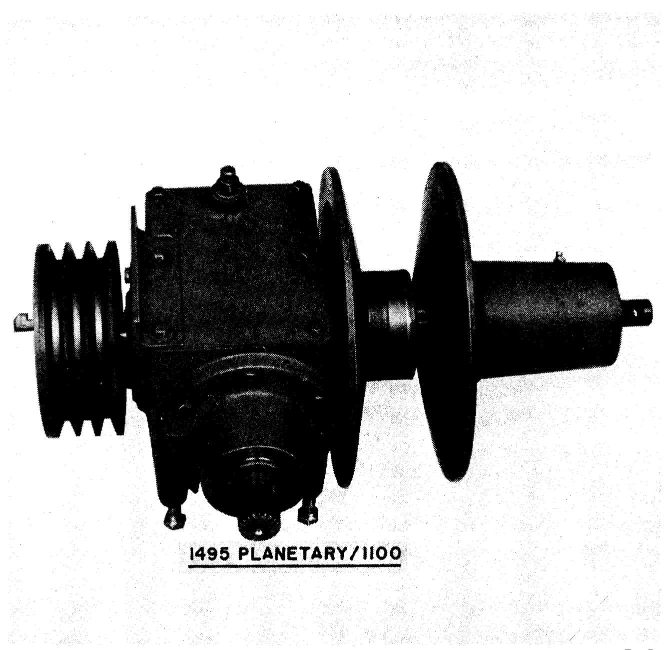

FIGURE 1

PLEASE NOTE!

A. The 90° gearbox (Type 2) DOES NOT require a fan on the input shaft. Also, this gearbox CANNOT be installed on earlier production 1100's and 1495's without changing the mounting area.

B. The 90° gearbox (Type 2) is the same for 1100 Speedrowers and 1495 Haybines with planetary drive. See Figure 1.

C. The 1495 Haybines with hydrostatic drive will have a different output shaft in the gearbox (Type 2) to accommodate a double sheave to drive the hydrostatic transmissions. See Figure 2.

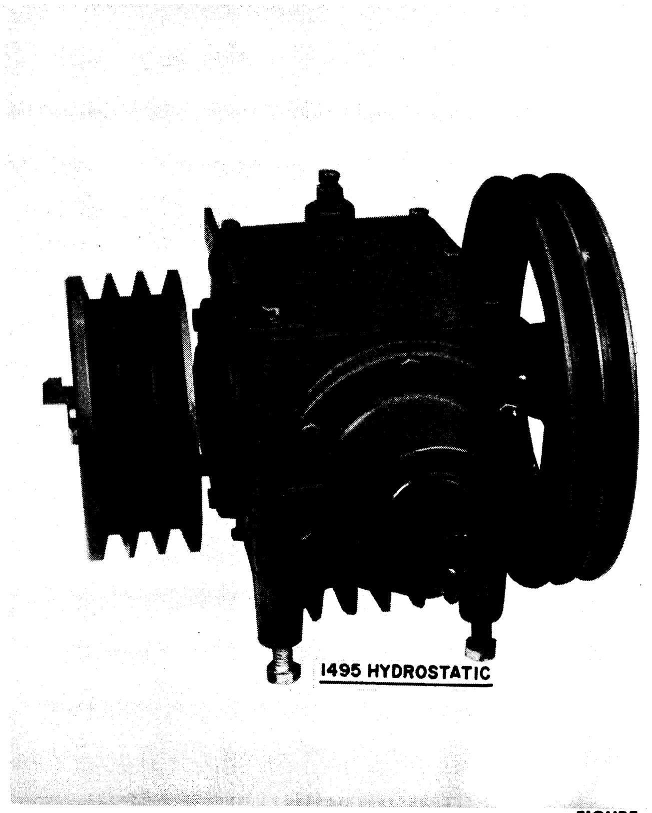

FIGURE 2

REMOVING THE GEARBOX

(TYPE 1 **OR** 2)

WARNING: DISCONNECT BATTERY CABLES BEFORE STARTING TO REMOVE GEARBOX.

LEFT SIDE

1. Remove the left quarter panel behind the steps of the operator's platform.
2. (1100 Speedrowers and 1495 Haybines only). Loosen set screw in pump coupler. Remove the two bolts holding the pump body to the mounting bracket (torque arm). Remove the pump coupler from the gearbox sheave.
3. (910 Speedrowers only). Remove the pump coupler chain.
4. (910 Speedrowers only). Remove the compressor drive belt on machines with air conditioning driven directly from the 90° gearbox.
5. Raise the clutching belt guide on the top of the gearbox.

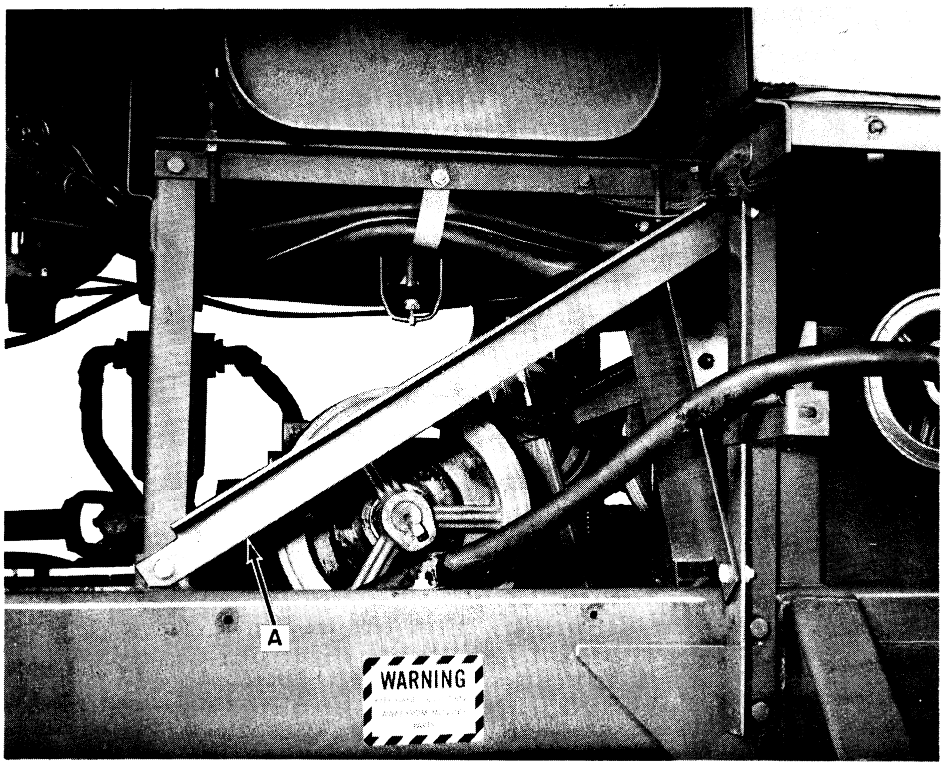

FIGURE 3

RIGHT SIDE

6. Remove the right quarter panel which shields the right end of the fuel tank.
7. Remove the diagonal brace A, Figure 3, on the right side (not used on older machines or 910 Speedrower).
8. Remove the PTO shaft yoke from the tapered spline on the input shaft of the gearbox. Figure 4 shows one method of removing the yoke from the input shaft. A ⅜" x 1" cap screw acts as a spacer and

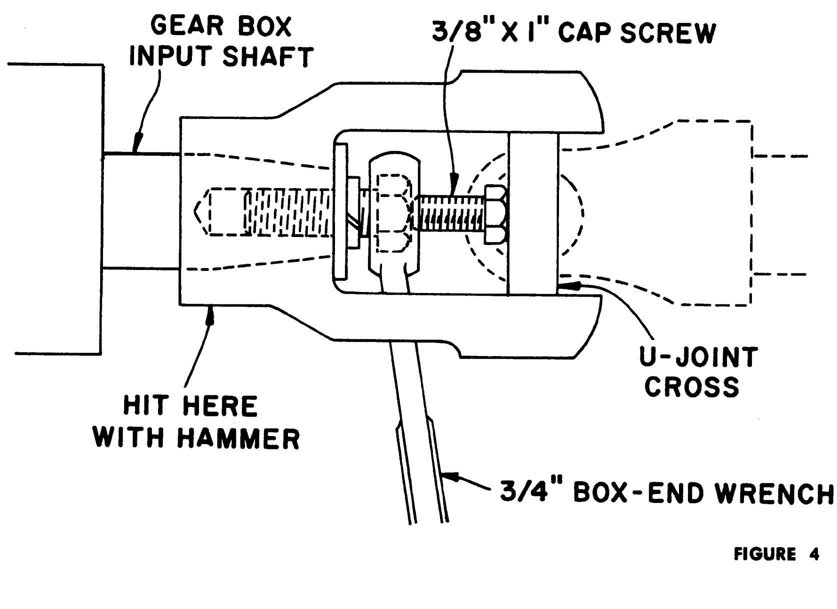

FIGURE 4

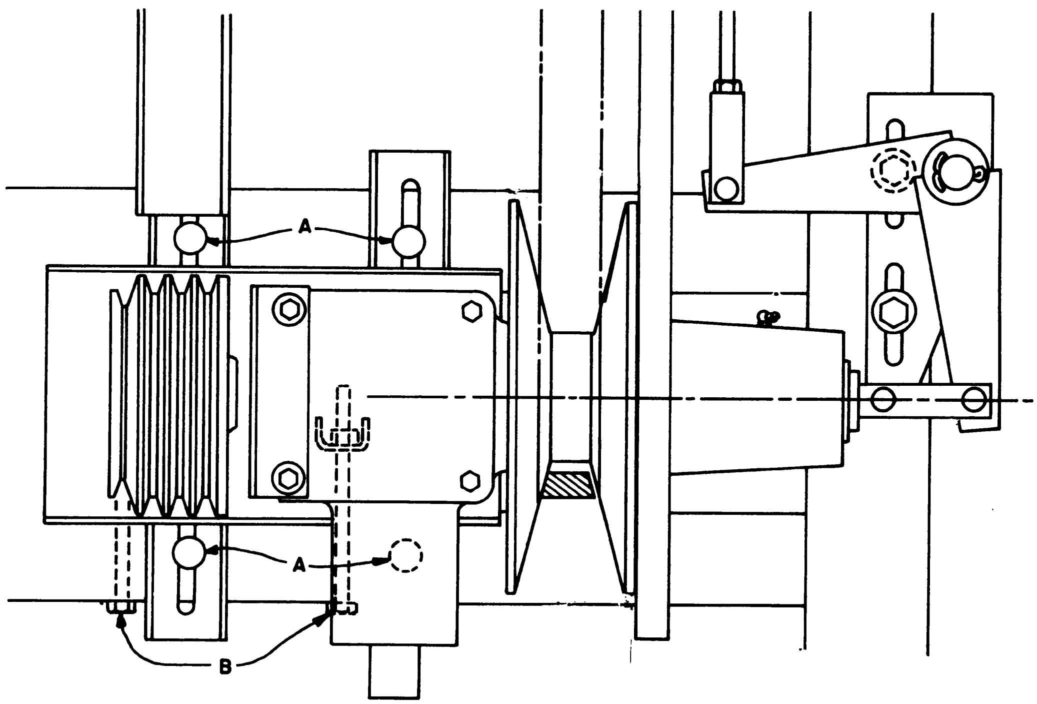

FIGURE 5

applies pressure to the "U" joint cross when the center bolt is turned out against the cap screw. Apply pressure to the "U" joint cross and hit the hub of the input shaft yoke with a hammer.

9. LOOSEN the four gearbox mounting plate bolts, A, Figure 5. (1495P and 1100 shown) On the 910 Speedrower ONLY, loosen four additional bolts in rocker pin weld assembly.

10. Loosen the belts by moving the gearbox forward with the adjusting bolts, B, Figure 5. (1495P and 1100 shown)

11. (1495 and 1100 only). Remove pin, A, and bell crank, B, Figure 6.

12. (910 Speedrower only). Disconnect the rocker arm linkage from the floating sheave half.

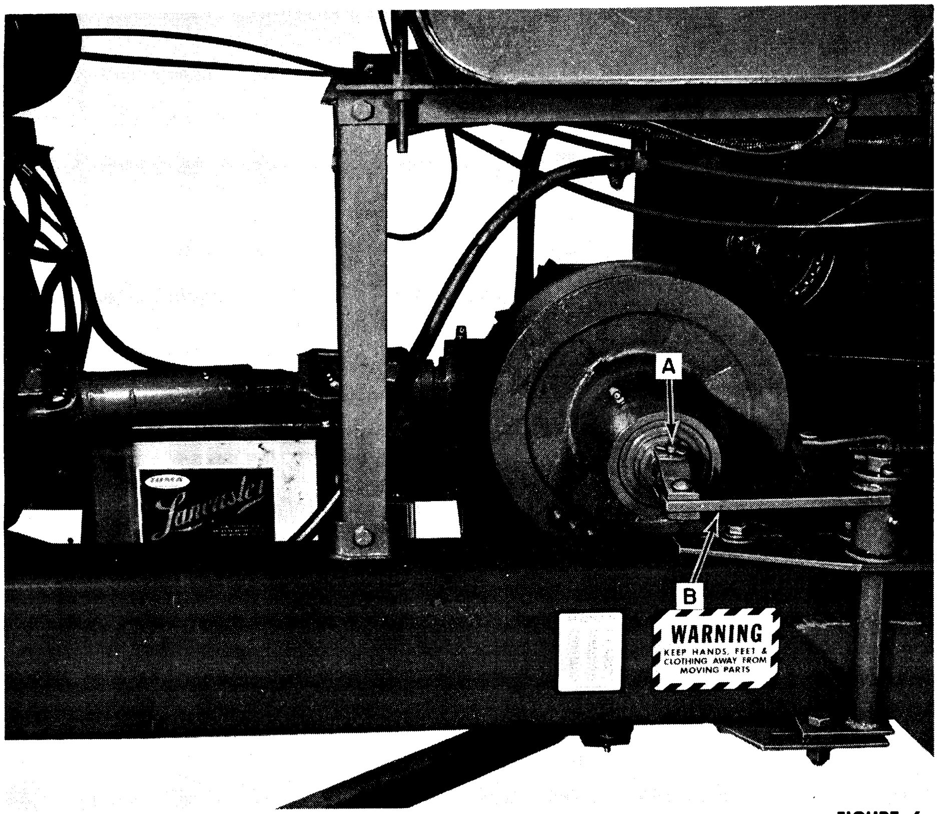

FIGURE 6

13. Remove the rear sliding sheave half on planetary machines. Remove belt(s) from the sheave on right side of gearbox.

14. Remove the four cap screws which hold the gearbox to its mounting plate.

CAUTION: THE GEARBOX WEIGHS ABOUT 65 LBS. (30 kg).

15. (1100 and 1495). Lift and slide the complete gearbox out the right side of the machine.

16. (910 only). Lower the gearbox between the gearbox mount and the right main frame channel.

CAUTION: THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR OWN PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL!

SERVICING 90° GEARBOX

(TYPE 2)

1495P AND 1100 GEAR BOX (TYPE 2)

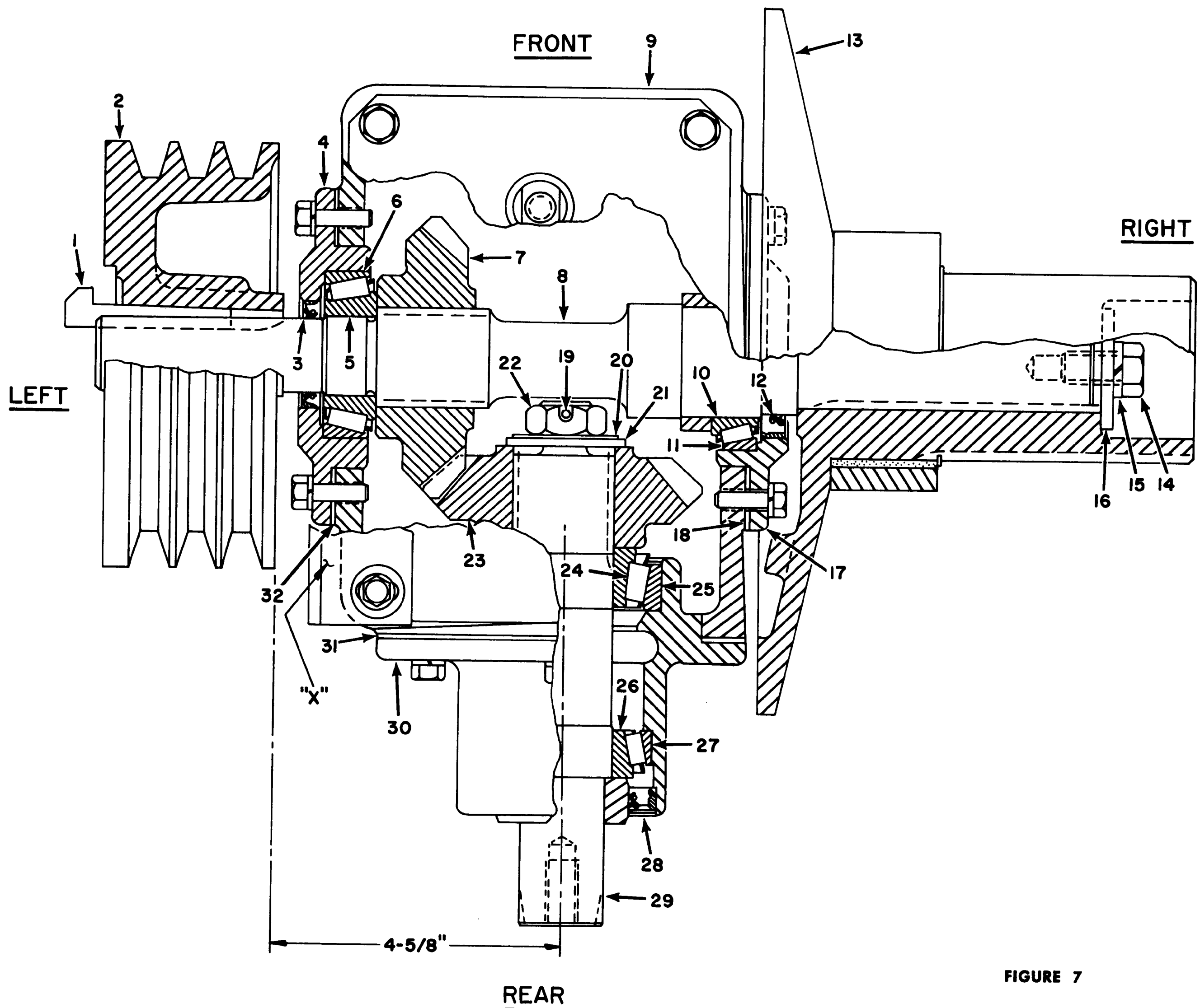

FIGURE 7

PARTS LIST

(See Figures 7, 8, and 9).

1. Gib key
2. Clutching belt sheave
3. Left-hand seal
4. Left-hand bearing cap
5. Left-hand bearing cone } Sold only as matched set
6. Left-hand bearing cup } Sold only as matched set
7. Bevel gear (27 tooth — output)
8. Output shaft
9. Gearbox housing
10. Right-hand bearing cone
11. Right-hand bearing cup
12. Right-hand seal
13. Sheave (1100 Speedrower and 1495P Haybine)

13A. (1495P only)

14. Cap screw, ½" x 1" Grade 5 } (1100, 1495P only)
15. Lock washer, ½" } (1100, 1495P only)
16. Special washer } (1100, 1495P only)

1495H GEAR BOX (TYPE 2)

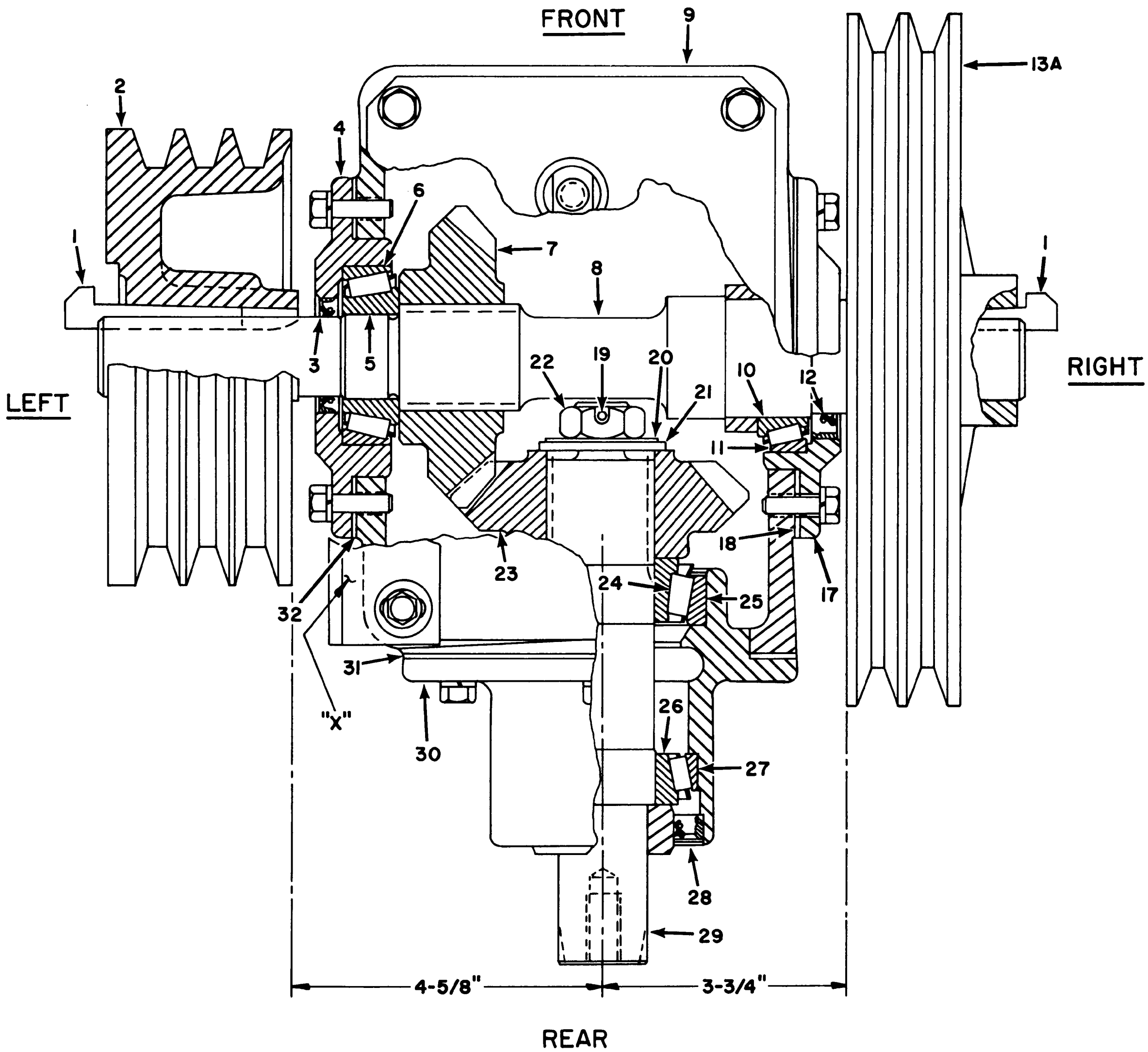

FIGURE 8

17. Right-hand bearing cap
18. Shims (same as 32)
19. Cotter pin, 3/16" x 1½"
20. Special washer (.030" thick) add as required to obtain 2 to 4 in. lb. pre-load on input shaft).
21. Special washer (⅛" thick)
22. Slotted nut
23. Bevel gear (26 tooth — input)
24. Front bearing cone
25. Front bearing cup
26. Rear bearing cone
27. Rear bearing cup
28. Input seal
29. Input shaft
30. Mount assembly
31. Shims
32. Shims (same as 18)

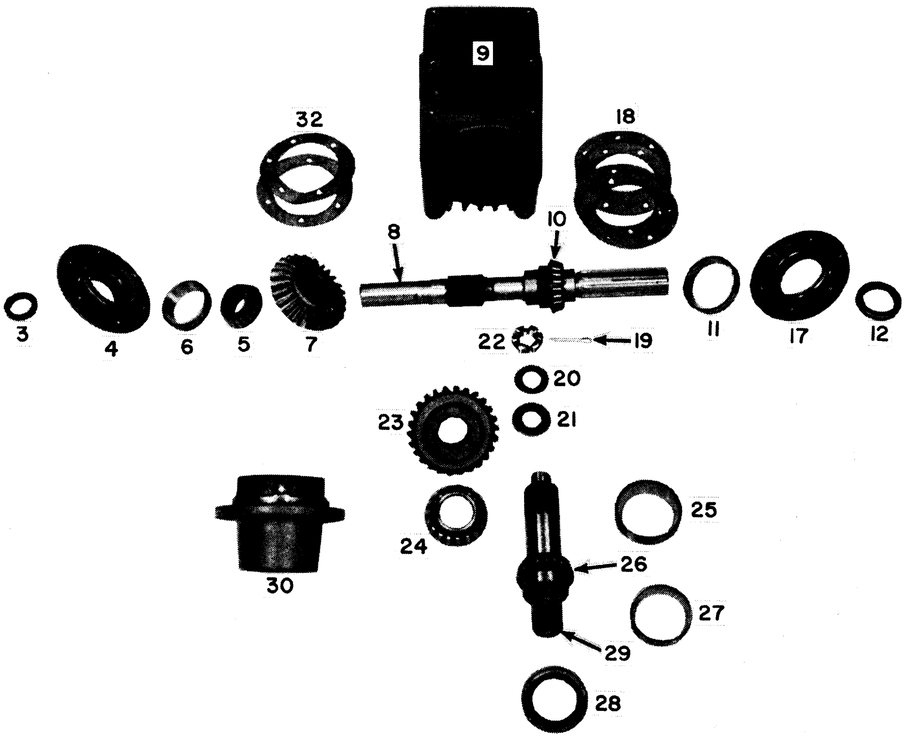

FIGURE 9

DISASSEMBLY (Type 2 Gearbox)

Refer to parts list and Figures 7, 8, and 9.

NOTE: Bearing cones will be a drive or press fit on both shafts. Install four ½" cap screws in gearbox housing, A, Figure 10, to provide a stable stand and to give clearance for sheaves while repairing the box.

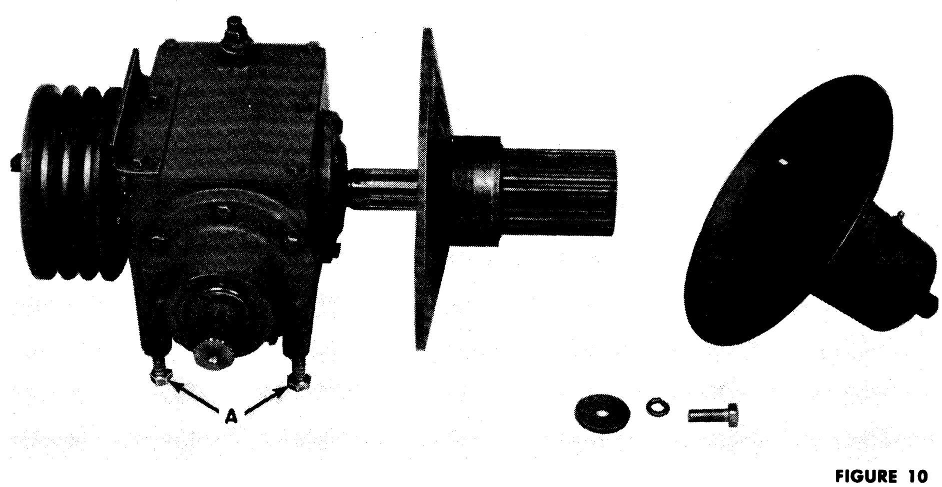

FIGURE 10

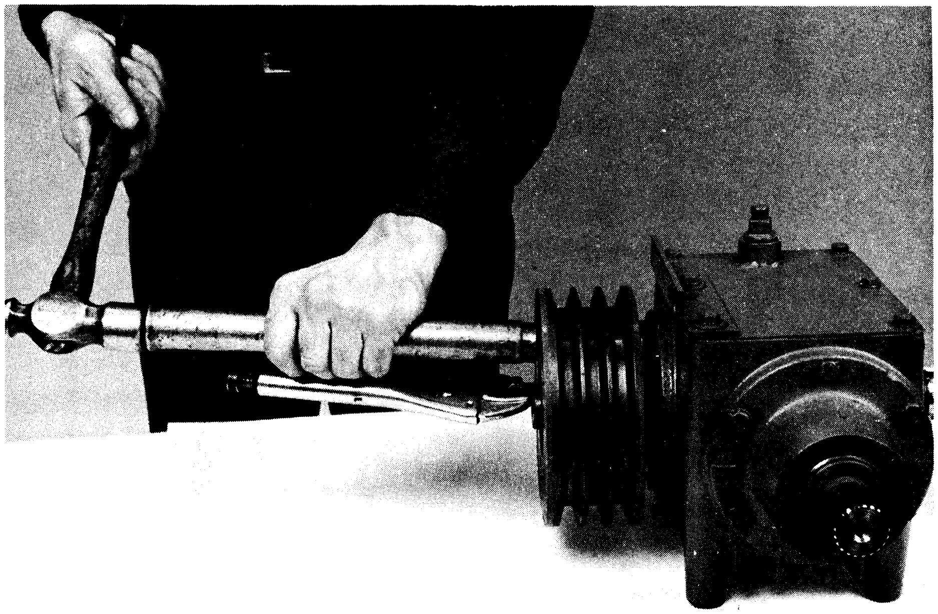

FIGURE 11

1. Lock vise grips on the left-hand gib key (1) and against the end of the shaft (8) as shown in Figure 11. Support the shaft (8) on the opposite end and then drive sheave (2) in with a suitable drift and hammer.
2. Remove all paint and rust from the end of the shaft (8) as shown in Figure 12.
3. Install scrap nut(s) that will fill ALL of the gap between the sheave (2) and gib key head, see Figure 13. Pull sheave and key together with a suitable two-jaw puller as shown in Figure 13.
4. (1495P and 1100 only). Remove the right-hand variable sheave (13) from the output shaft of gearbox. The sheave (13) is held on the straight splined shaft with a cap screw (14), lock washer (15), and flat washer (16). See Figure 10.
5. (1495P only). Remove the right double sheave (13A) and gib key from the output shaft (8). Refer to steps 1 through 3 in "Disassembly" for method of removing sheave.

FIGURE 12

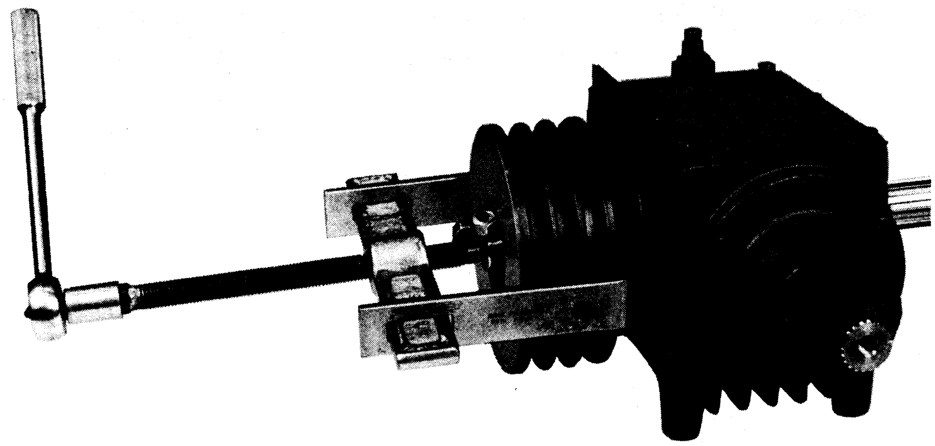

FIGURE 13

6. Remove top cover and drain the lubricant and flush with solvent.
7. Remove input neck assembly (30). See Figure 14.
8. Remove left-hand bearing cap (4), and right-hand bearing cap (17), as shown in Figure 15.

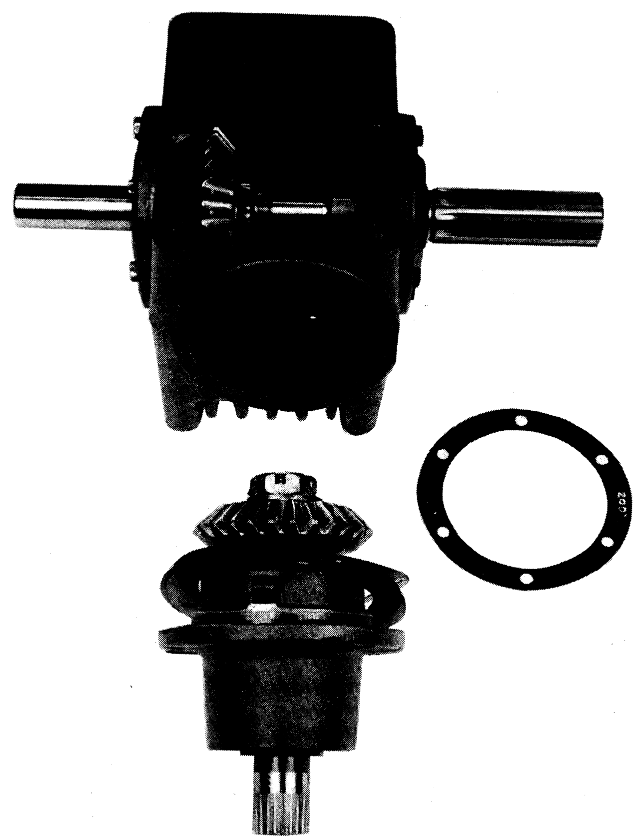

FIGURE 14

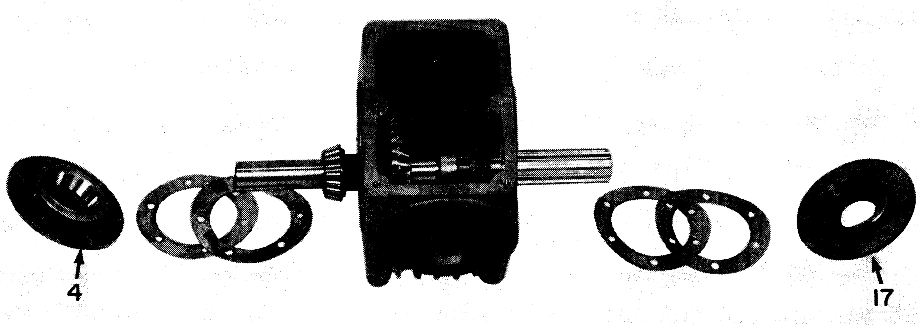

FIGURE 15

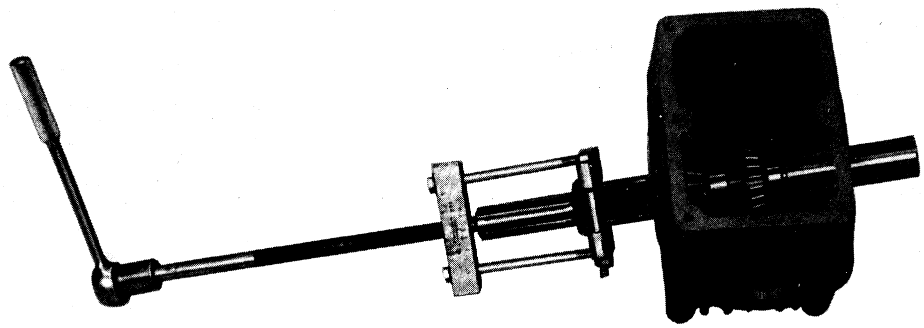

FIGURE 16

9. Pull left-hand bearing (5) off output shaft (8) as shown in Figure 16. Remove shaft from the housing (9).

PARTS INSPECTION

(TYPE 2 GEARBOX)

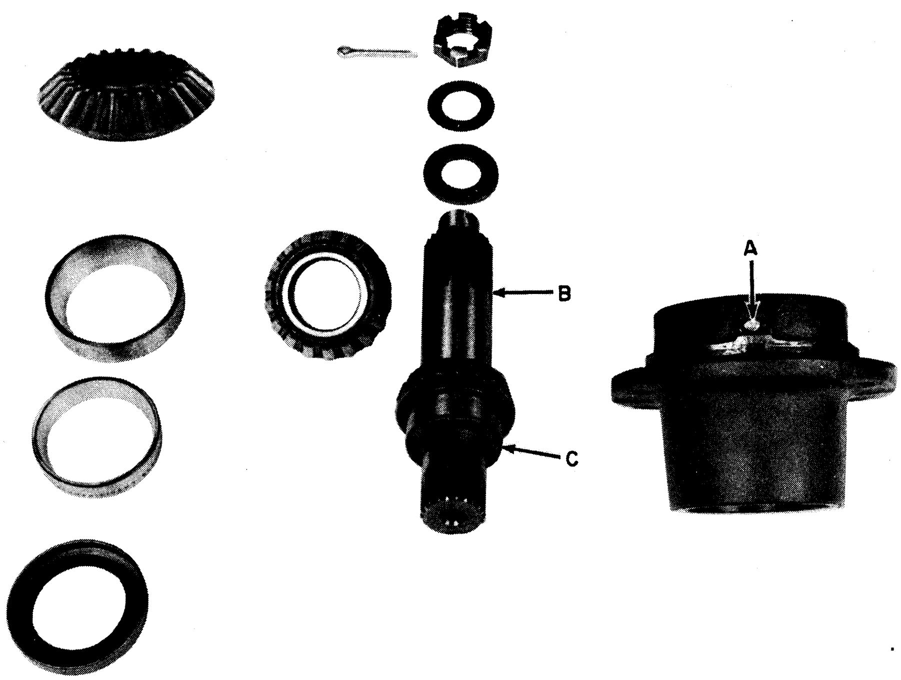

FIGURE 17

1. Input shaft components (refer to Figure 17).
   A. Check for spline wear under front bearing cone at B, Figure 17. Cones must be a tight fit on shaft.
   B. Check oil seal collar for wear at C, Figure 17.
   C. Check input neck oil passage, A, Figure 17, to insure that it is open.
   D. Check bearings and gear for wear.

2. Output shaft components (refer to Figure 18).
   A. Check shaft for excessive wear under oil seal lips at A, Figure 18.
   B. Cones must be a tight fit on shaft.
   C. Oil ports in left-hand and right-hand bearing caps (4 and 17) must be open for free passage of oil.
   D. Bearing cups (6 and 11) must be tight and properly seated in caps (4 and 17.)

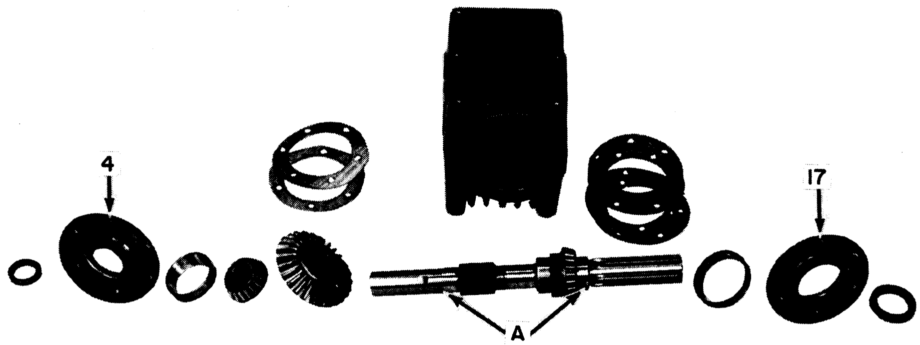

FIGURE 18

NOTE: Any parts that show signs of wear should be replaced.

ASSEMBLY

(TYPE 2 GEARBOX)

NOTE: During final assembly all cap screws must be coated with #2 Permatex®.

INPUT SHAFT ASSEMBLY (See Figure 19)

Set-up input neck, shaft, and bearings as separate sub-assembly.

1. Pack rear bearing cone (26) with light grease. DO NOT pack the front bearing cone (24) with grease, but it may be coated with SAE 90 multi-purpose oil.
2. Assemble input shaft assembly. Bearing cups (25 and 27) must be tight in the neck and seated properly.
3. Adjust bearings to 2-4 inch pounds (.23-.45 N·m) pre-load (rotating torque) with the slotted nut (22). It may be necessary to use a thin shim washer (20) between slotted nut (22) and thick washer (21) to get this pre-load.

   IMPORTANT: PRE-LOAD (ROTATING TORQUE) MUST BE OBTAINED WITH THE SEAL (28) REMOVED. BEARINGS MUST BE LUBRICATED WHEN PRE-LOAD IS ADJUSTED.
4. After the 2-4 inch-pounds (.23-.45 N·m) pre-load has been obtained, install the cotter pin (19) and cut off the ends of the cotter pin so they do not extend over the end of the shaft (29).

   IMPORTANT: WHEN INSTALLING COTTER PIN (19) THROUGH SLOTTED NUT MAKE SURE THE BENT ENDS DO NOT EXTEND OVER THE END OF THE SHAFT (29).

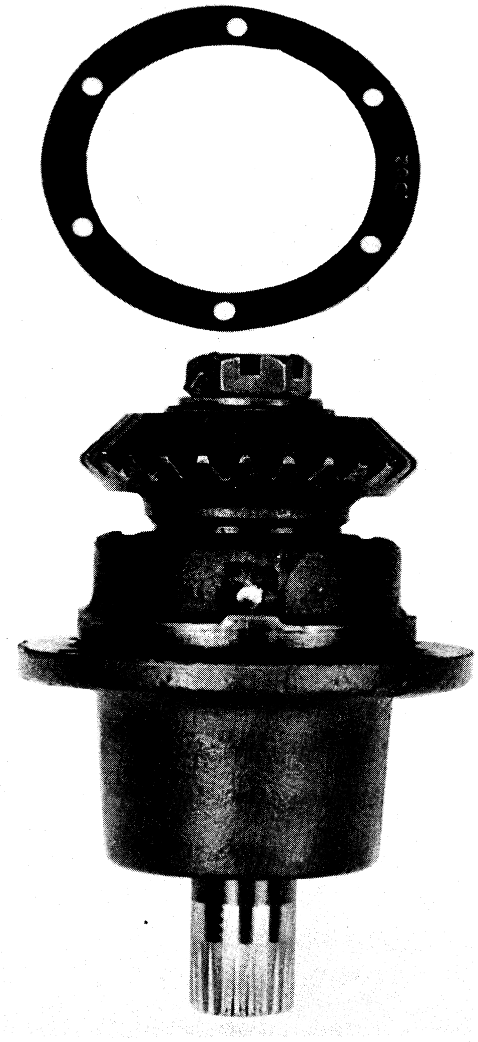

FIGURE 19

OUTPUT SHAFT (See Figure 18)

1. Pack left-hand bearing cone (5) and right-hand bearing cone (10) with LIGHT grease.

   ATTENTION: WHEN INSTALLING BEARING CONES ON THE OUTPUT SHAFT A BEARING DRIVER SHOULD BE USED TO PREVENT DAMAGE TO BEARING CONES DURING ASSEMBLY.

2. Install right-hand bearing cone (10) on output shaft.

3. Place the 27-tooth gear (7) in the box (9) and START shaft (8) through gear and left-hand bearing cone (5). Drive left-hand bearing cone (5) onto the shaft (8) until it is fully seated.

   IMPORTANT: LEFT BEARING CONE (5) AND OUTPUT BEVEL GEAR (27 TOOTH) ARE LOCATED PROPERLY IN THE BOX BY SELECTING THE TOTAL THICKNESS OF THE SHIM PACK BETWEEN THE LEFT BEARING CAP (4) AND HOUSING (9).

4. The shim pack for the left-hand bearing cap (4) must be determined by the following method:

   A. Shim factor stamped into gearbox casting at 4 o'clock position from left bearing cap (4). See Figure 20. The shim factor ranges from 0 through 5. The box shown has a shim factor of 4.

   B. Shim factor stamped into left-hand bearing cap (4). The number is stamped in the unfinished side of the cap, see Figure 21. The bearing cap shown has a shim factor of 1.

   C. Left-hand output shaft bearing (5 and 6). The left-hand bearing assembly is sold as a MATCHED CUP AND CONE.

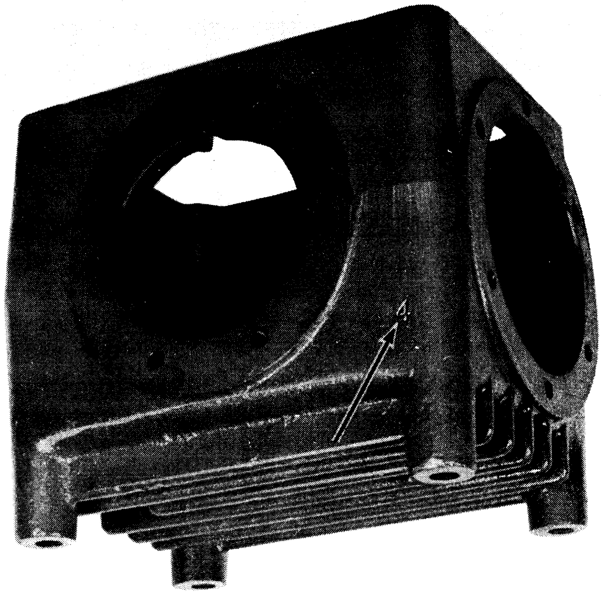

FIGURE 20

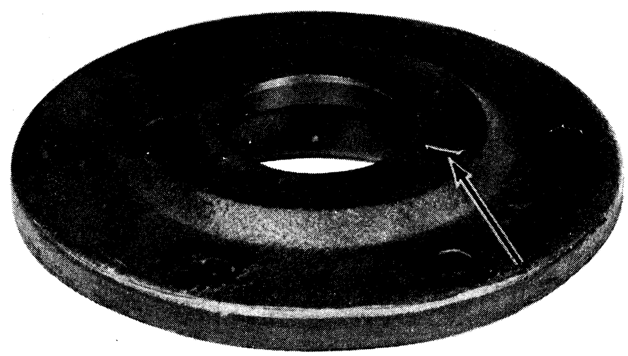

FIGURE 21

A Service Parts bearing has a paper enclosed which lists the bearing shim factor. See Figure 22. The bearing shim factor may range from 0 through 8. The bearing assembly shown has a shim factor of 6.

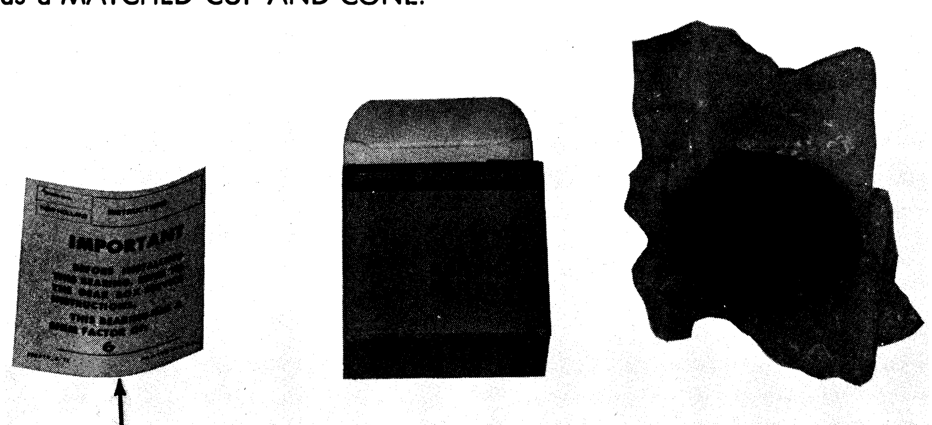

FIGURE 22