SERVICE MANUAL

HARVESTER MODEL 880

SPERRY NEW HOLLAND

Reprinted

FOREWORD

This information covers servicing procedures for component parts and assemblies of the 880 Forage Harvester.

The purpose of this manual is to provide in condensed form service and maintenance information which will serve as a guide to a serviceman when repairing or rebuilding New Holland equipment in the shop and be of help to him in diagnosing and correcting service difficulties in the field.

It is intended that the operator's manuals and assembly instructions issued with each machine be used in conjunction with this manual, since much of the information contained herein is condensed or supplementary in nature.

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PTO ASSEMBLY

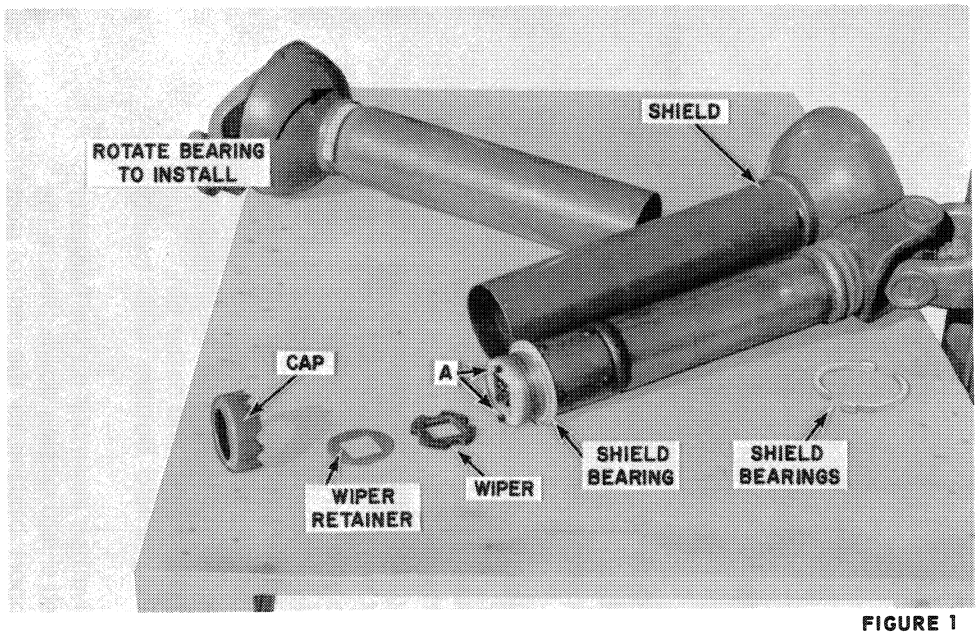


FIGURE 1

DUST CAP

The dust cap of the rear tractor PTO section is replaceable with Service Kit #95605. The kit consists of wiper felt, wiper retainer and retainer or end cap.

Pull the front tractor half of the PTO section off the remainder of the PTO assembly. Remove the rotating shield from the rear half of the PTO section and pry the end cap off.

To assemble, place the flat (plastic) retainer and the felt draper in the end cap. Position the end cap over the PTO shaft and secure by tapping the four cap tabs down. Replace the rotating shield.

TELESCOPING BALL BEARINGS

The ball bearings in the rear half of the tractor PTO section may be replaced. Remove the dust cap and two bolts indicated at A, Figure 1.

Clean the bearing race and install 41 balls into each race area. Install the end cap (Part #136975) with all bearings in place and secure with two bolts A, Figure 1.

ROTATING SHIELD BEARINGS

The rotating shield bearing may be removed by prying the exposed part of the bearing up and rotating the bearing around the outer diameter of the shield. After removing the two shield bearings, the shield may be removed from the shaft for servicing of the shield.

To assemble the shield and bearing on the shaft, first position the shield in place on the shaft. Then insert the bearing by rotating the small end of the bearing through the shield opening until the bearing snaps into position. Repeat for the second shield bearing.

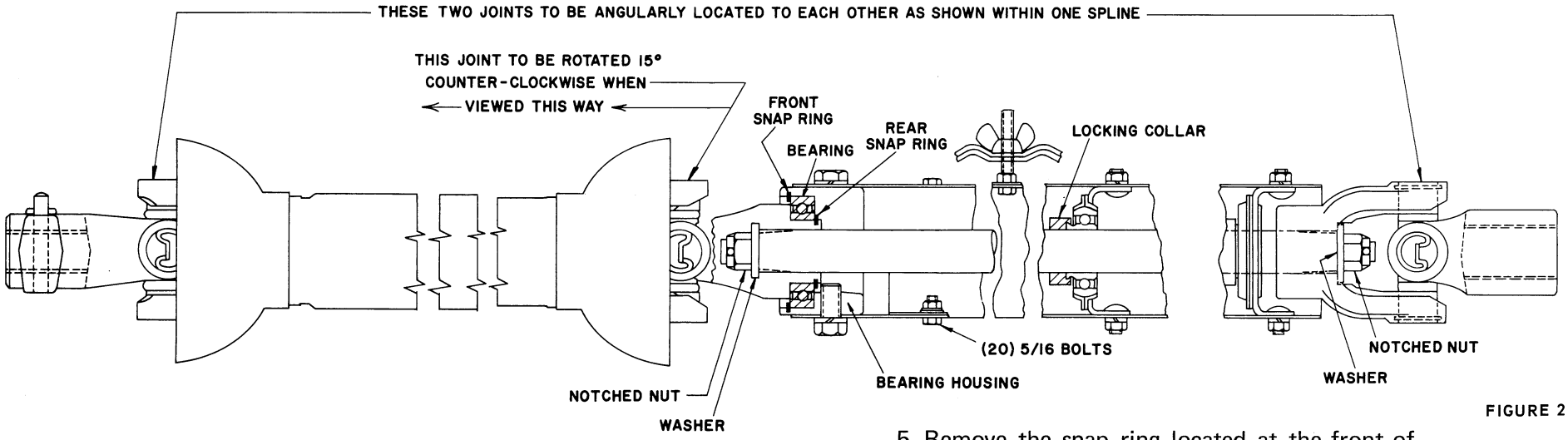


FIGURE 2

TIPPING OR SUPPORT BEARING (Removal)

Normally the PTO support bearing and housing may be serviced easier after removing the PTO drive line assembly from the harvester.

1. Remove the front half of the tractor PTO section and the two cap screws which secure the support bearing housing to the control post. The drive line assembly may now be removed from the harvester.
2. Remove the bottom section of the long PTO shield by removing the twenty 5/16" bolts.
3. Remove the cotter pin and notch nut which secures the rear half of the tractor PTO section to the tapered splines of the long PTO shaft. The rear half of the PTO, support bearing and bearing housing may now be removed from the long shaft.
4. Remove the retainer (or snap ring) located at the rear of the support bearing which secures the inner race of the support bearing to the universal joint. The U-joint may now be removed from the bearing.
5. Remove the snap ring located at the front of the support bearing which secures the outer race of the support bearing to the housing.

SUPPORT BEARING (Assembly)

1. Install the bearing into the bearing housing and secure with retainer ring.
2. Install bearing and housing assembly onto the universal joint yoke (Part #136989). Secure the bearing to the yoke with snap ring.
3. Locate the U-joint yoke on the splines of the long shaft in respect to the U-joint on the rear of the long shaft. Refer to Figure 2 for U-joint alignment. Secure the U-joint to the long shaft with washer, notched nut and cotter pin.
4. Attach the long shield bottom with twenty 5/16" bolts.
5. Install the drive line assembly on the harvester with the bolted shield section down. Secure the drive line support bearing to the control post with two 5/8" x 1-1/4" cap screws.

NOTE: UNIVERSAL JOINTS MUST BE ANGLED AS SHOWN IN FIGURE 2, otherwise excessive PTO vibration may occur when operating the harvester.

PTO – ANGLE GEARBOX

To service the angle (or obtuse angle) gearbox of the 880 Harvester, the gearbox should be removed from the harvester. The gearbox instructions are the same for 1000 R.P.M. drive or 540 R.P.M. drive. The different drives are determined by the gear set being used. 540 R.P.M. drive – 40 tooth bevel gear and 21 tooth pinion. 1000 R.P.M. drive – 31 tooth bevel gear and 30 tooth pinion. (Gears are serviced only in matched sets.)

TO REMOVE GEARBOX

1. Remove the two cap screws that secure the P.T.O. support bearing to the control post. Slide the P.T.O. drive line forward to remove the P.T.O. universal from the gearbox input shaft. The P.T.O. drive may be blocked up between the tongue and the rear area of the P.T.O. drive line; however, this method is not recommended due to safety.
2. Remove the shield (Part #137282) which covers the angle gearbox and drive to the cutterhead.
3. Remove the four gearbox mounting bolts accessible from the underside of the gearbox support.
4. Remove the cap screw and washer from the end of the gearbox output shaft. Slide the slip clutch assembly from the gearbox output shaft as the gearbox is moved to the left.

DISASSEMBLY

1. Drain the oil by removing the gearbox cover.
2. By means of a punch and hammer loosen the stake nut "A", Figure 3. Continue turning the stake nut so that the nut is free of the threaded area on input shaft.
3. Remove retainer "B" and cap "C", Figure 3.
4. By moving the input shaft forward (or towards retainer "B") remove the shaft from the gearbox. The "bevel gear" must be blocked to prevent damage to the gear case during the shaft removal. Hydraulic press may be required to remove the shaft from the bevel gear. (Assembled with 3500–500 pound force.)

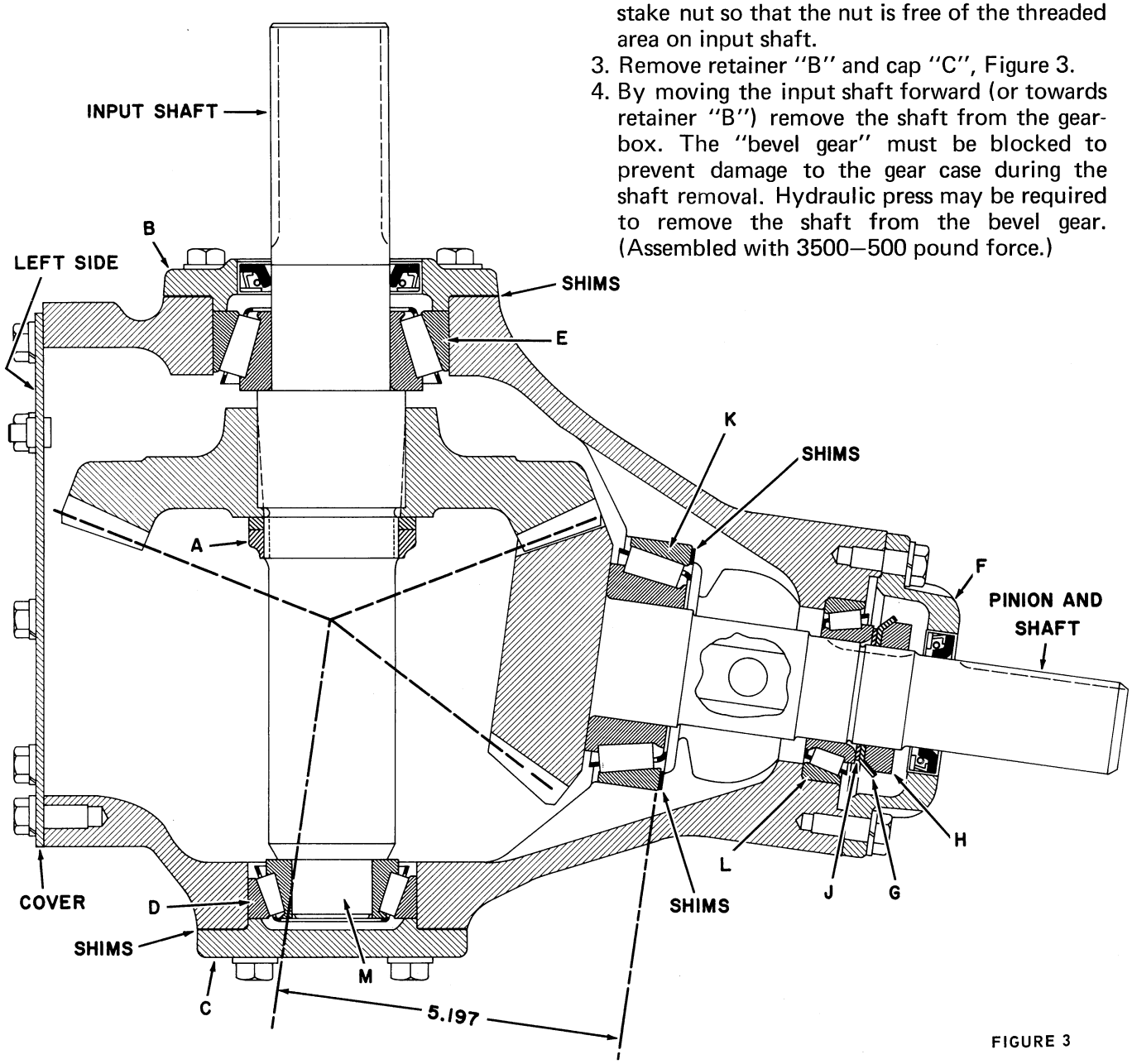


FIGURE 3

5. The bevel gear then may be removed to the left. Bearing D and E may be removed at this time.
6. Remove the seal retainer F.
7. Raise the tab of lock washer G, then remove lock nut H, lock washer G and washer J.
8. The pinion and shaft may be moved to the left for removal from the gearbox.
9. Bearings K and L may be removed for servicing.

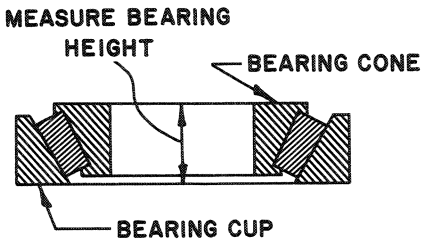
ASSEMBLY OF GEARBOX

Flush the gearbox and parts thoroughly before assembling of the gearbox.

1. Before installing the pinion and bearings K and L determine the shims required behind bearing K. To determine the number of shims a number will be stamped on the gearbox near the filler plug. See Figure 4.

Locate the same number reading across the top line of the chart.

Next, bearing K, Part #166817 is packed with an important note indicating the shim factor of that particular bearing. The shim factor is the variation of the bearing height.



The shim factor will range from 0 to 8. Locate in the left vertical column of the chart the shim factor of the bearing to be installed. Read the chart for the total shim thickness required behind bearing K.

EXAMPLE: The gear case has the digit Number "6" stamped near the filler plug. Read across the top line of the chart to Number "6".

The shim factor of bearing K has been found to be 4. Locate the shim factor 4 in the left vertical column. Follow the chart across from 4 to the column under the Number "6". The chart reads 12 in this case. Therefore, .012" thickness of shims will be required behind bearing cup K when assembling the gearbox.

Shims are available in .003, .005 and .007 thickness.

2. Install bearing cone K on the pinion shaft as shown in Figures 3 and 4. NOTE: Bearing cones may be heated in oil to 250 degrees to ease assembly.
3. Install with the shims and bearing cup K the pinion and bearing into the gearbox. Shims available in .003, .005 and .007 thickness. The required shim thickness determined in Step 1.
4. Install bearing cup and cone "L" as shown in Figure 3.
5. Install washer "J", lock washer "G" and nut "H" with beveled side toward the lock washer. Tighten nut "H" to require 5 to 10 inch pound torque to turn the pinion bearing preload. Secure nut H in position with a tab on lock washer G.

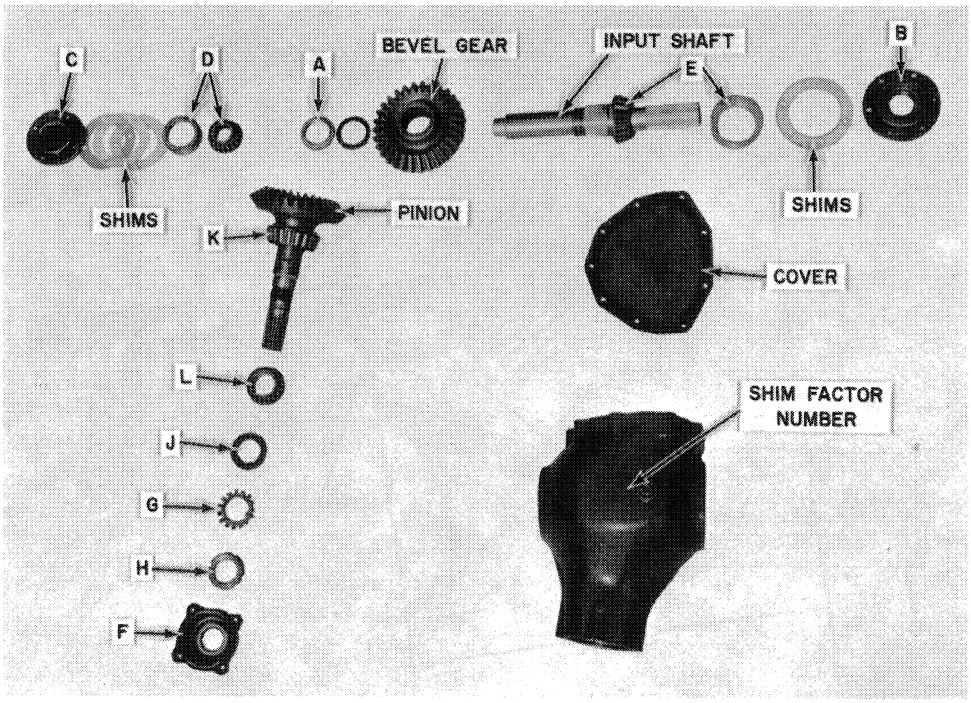


FIGURE 4

SHIM FACTOR	SHIM FACTOR – STAMPED ON GEAR BOX										
	1	2	3	4	5	6	7	8	9	11	22
9	11	12	13	14	15	16	17	18	19	20	21
7	10	11	12	13	14	15	16	17	18	19	20
6	9	10	11	12	13	14	15	16	17	18	19
5	8	9	10	11	12	13	14	15	16	17	18
4	7	8	9	10	11	12	13	14	15	16	17
3	6	7	8	9	10	11	12	13	14	15	16
2	5	6	7	8	9	10	11	12	13	14	15
1	4	5	6	7	8	9	10	11	12	13	14
0	3	4	5	6	7	8	9	10	11	12	13

6. Place the bevel gear into position inside the case and insert the input shaft through the bevel gear. Press the bevel gear onto the shaft with a force of 3500 to 5000 pounds. Use a spacer over the end of the shaft from point M to support the bevel gear and press against the opposite end of the input shaft. BEVEL GEAR MUST BE SUPPORTED WHEN PRESSING SHAFT INTO PLACE, otherwise gear case may be damaged.
7. Place the washer and stake nut "A" on the input shaft from point M.
8. Install bearings D and E as shown in Figure 3.
9. Shim under retainer B and cap C to obtain 5 to 10 inch pounds bearing preload. Combined preload of the pinion and input shaft bearings would be 10 to 15 inch pounds. Backlash between the pinion and bevel gear must be present when checking the bearing preload.
10. Add and remove shims (maintaining the bearing preload determined in Step 9) to obtain .008 to .012 backlash between the bevel gear and pinion. Figure 5 shows one method of checking the backlash.
11. Use permatex #2 under cap C and retainer B.

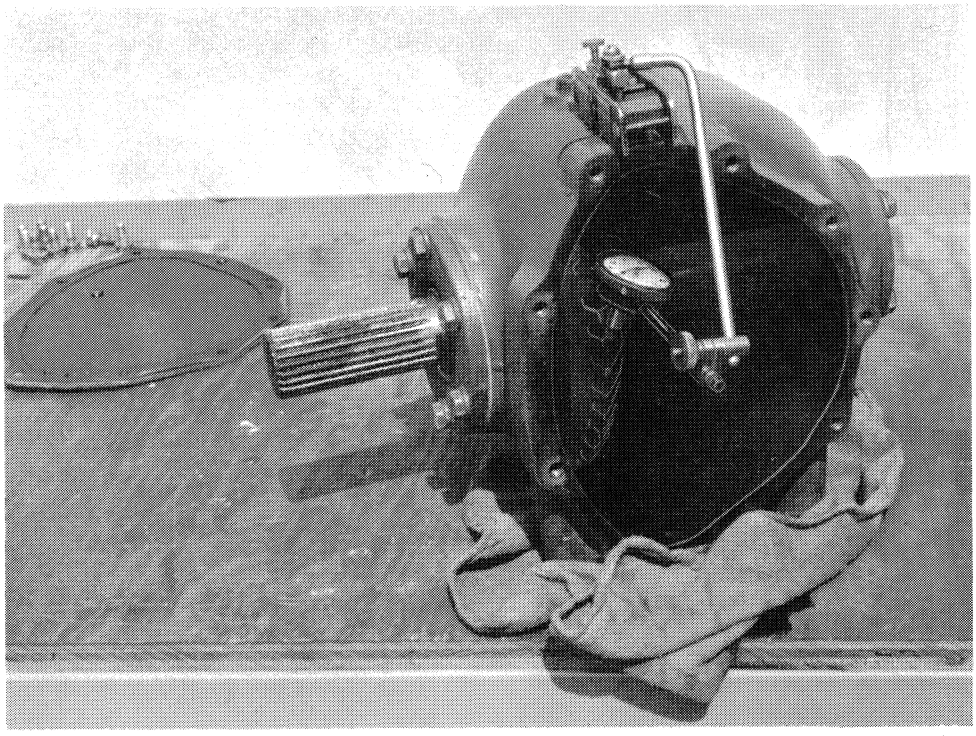


FIGURE 5

12. Install the seals into retainer B and F with the seal lip in as shown in Figure 3.
13. Install retainer F with #2 permatex.
14. Install the back cover and gasket with permatex #2.
15. Fill the gearbox (approximately 4 pints) to level plug with multi-purpose gear lube #90.

PLANETARY REVERSING GEARBOX

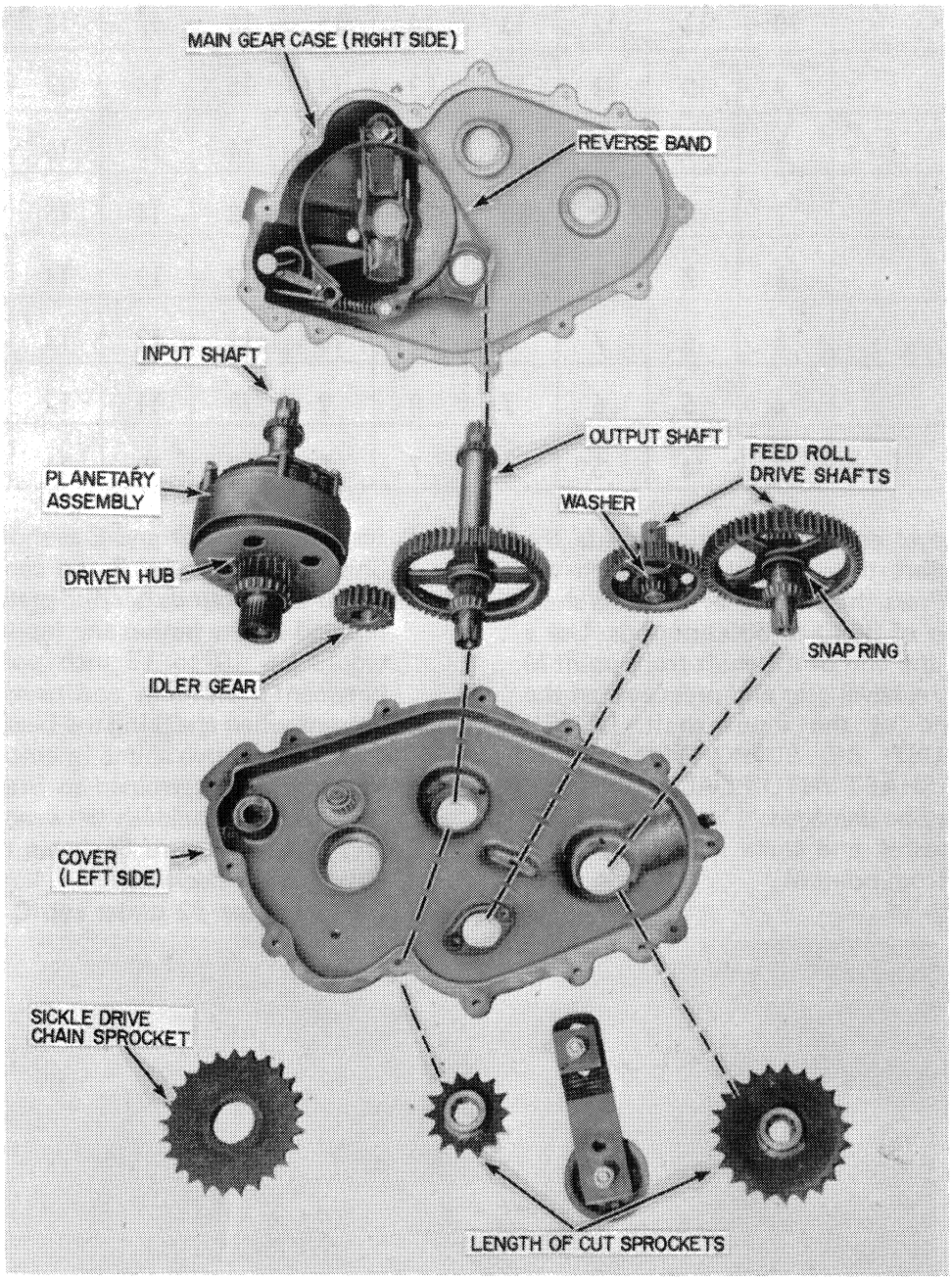


FIGURE 6

POWER TRANSMITTED

The power is transmitted from the input shaft to planetary. With the planetary clutch engaged (for normal feeding position) the driven planetary hub will turn with the input shaft. The driven planetary hub will in turn drive the sickle drive chain sprocket and the idler gear.

The idler gear through the larger gear drives the output shaft. From the right side of the output shaft power is transmitted to the attachment. From the left side of the output shaft outside the gearbox through the length of cut sprocket, the uppermost shaft is driven. The opposite end of the upper shaft drives the upper feed rolls and through the gear set the lower feed roll drive shaft is driven.

When the planetary clutch is disengaged the driven hub will not turn which provides neutral position. In this position the sickle drive, attachment drive and feed roll drive will be at a standstill.

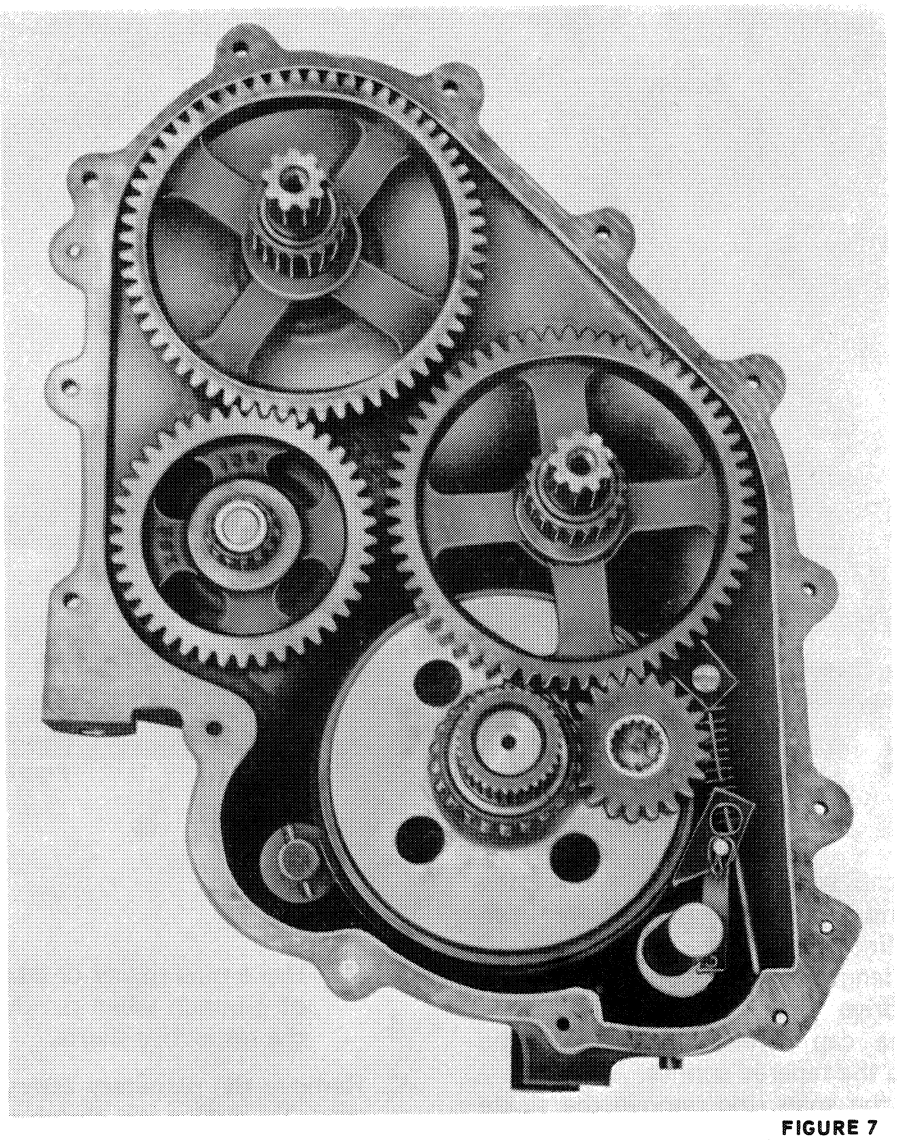


FIGURE 7

By tightening the reverse band the planetary will be locked and cause the planetary driven hub to turn in reverse. With the planetary hub reversing, all drives will be operated in a reverse direction. As the reverse band is tightened more torque will be available for reverse. Due to the sun gear arrangement, reverse speed is approximately 1/2 the forward speed.

REMOVING THE GEARBOX

The gearbox must be removed from the harvester for servicing.

1. Remove the drive belt idler spring adjusting bolt.
2. Remove the drive belts from the drive sheave.
3. Remove the sickle drive chain S, and attachment drive chain R, Figure 8.
4. Remove the bolts indicated at A, Figure 8, which secures the feed universals to the feed roll drive shafts.
5. Remove the three gearbox mounting bolts.
6. Clean the exterior of the box.

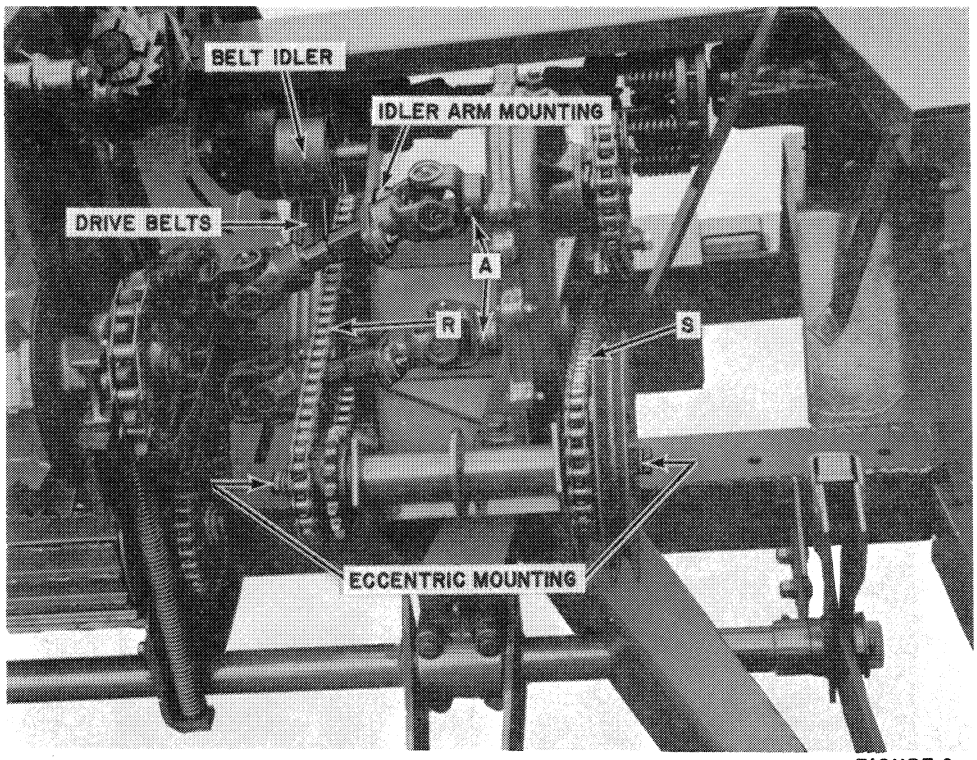


FIGURE 8

DISASSEMBLY

1. Remove the cap screw from the end of the input shaft and remove the belt sheave from the tapered splines.
2. Remove the length of cut sprockets by removing the drive chain idler bracket, drive chain and the cap screws which hold the sprockets onto the tapered splines.
3. By removing the snap ring remove the sickle drive chain sprocket from the planetary driven hub. Then remove the second snap ring also located on the planetary driven hub.
4. Remove the attachment drive sprocket from the right end of the output shaft by removing the cap screw.
5. Remove the belt idler mounting bracket and the control lever.
6. Separate the gearbox cover from the main gear case by removing the thirteen 5/16" bolts.
7. Turn the planetary driven hub as shown in Figure 15 and remove the snap ring which secures the idler gear to the idler shaft.

   The shaft and gear assemblies may now be removed from the gear case.

SUB ASSEMBLIES

A. To remove the gear from the respective feed roll drive shaft, press the gear toward the right end of the shaft.

B. The output shaft drive gear may be removed by first removing left snap ring and pressing the gear toward the left end of the shaft.

NOTE: Use a pipe spacer or bearing puller instead of a punch when removing bearings from the respective shafts.

C. Remove the planetary assembly from the gear case. To service the clutch discs, remove bearing A, Figure 12, and six bolts C. Pressure plate, clutch discs and drive plates may now be removed from the right end of the end input shaft.

D. The planetary idler gears may be serviced by removing the snap ring from the respective idler gears and removing the gears from the respective shafts. The center gear may be removed before or after removal of the idler gears. To separate the clutch carrier and input shaft, move the clutch carrier toward the left end of the shaft. See Figure 13.

E. To remove the reverse band, remove bolt and locking clip from underside of gearbox. See Figure 11. Remove band adjusting bolt and the band assembly may be removed.

F. The cam bar weld assembly is serviced by removing nut D and lock washer shown in Figure 9.

G. The control shaft must be removed in order to service the cam follower bearing. Use care when removing the control shaft due to special hardened washers and thrust bearing shown in Figure 9.

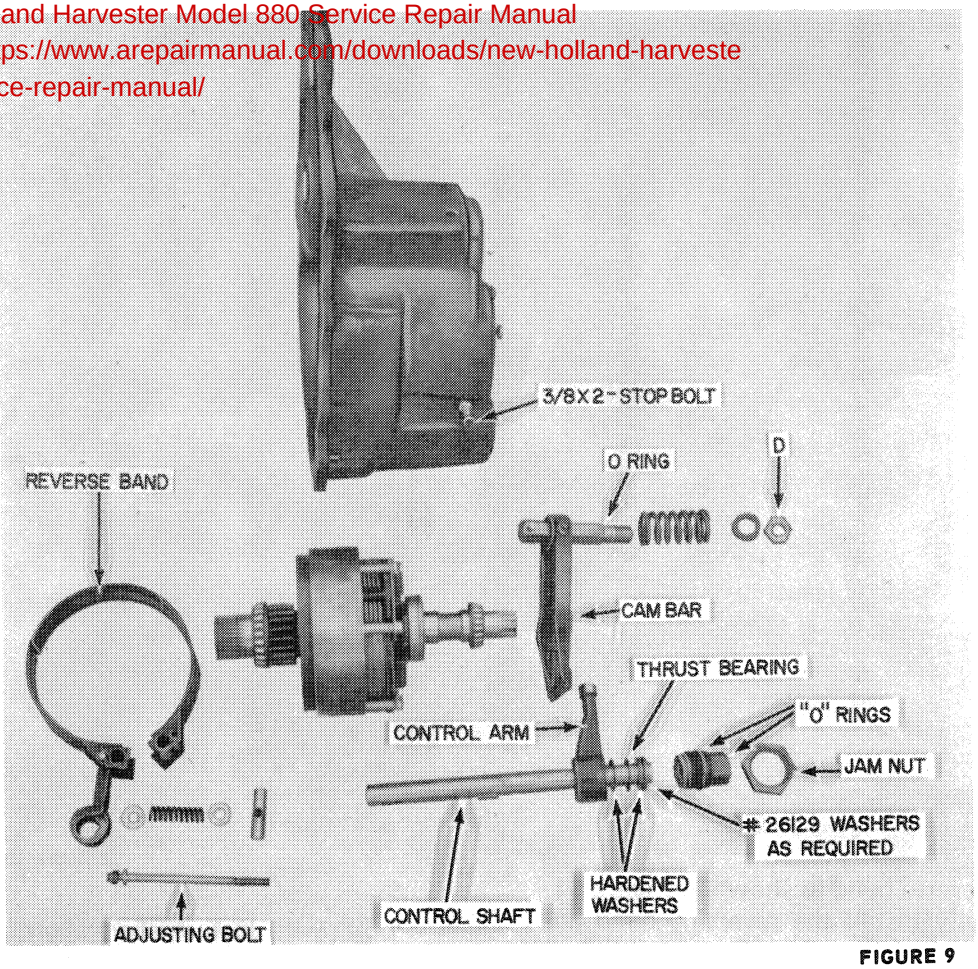


FIGURE 9

ASSEMBLY

Clean the gearbox and all parts thoroughly before attempting to assemble. It is recommended that all seals and gaskets be replaced. Bearings should be replaced as required.

Use permatex #2 on all bolt threads and joints where oil leakage may occur except where "O" rings are used. Install "O" rings with a coating of Type A transmission oil on the O-ring and the shaft. Also use oil on all bushings before installation. Shim material should be used over splines when installing shafts through O-rings or seals.

1. Install guide, Figure 10 with two 5/16" x 1" bolts and lock washers. Next install Grade 5—1/2" x 2-1/4" bolt with jam nut.
2. Install cam follower bearing into the control arm with 10 to 15 foot pound torque; then secure with allen socket head set screw (cup point) and jam nut.

   Install two woodruff keys #15—1/4 x 1 in the control shaft; slide the control arm into position as shown in Figure 9. Secure the control arm by using 5/16 x 1 cone point set screw and jam nut. (Note: The set screw seats into a detent in the shaft.) Also, install 3/8 x 2 bolt and jam nut with permatex as shown in Figure 9.
3. Place the control shaft in the main housing as shown in Figure 10. Place one hardened washer (dark in color) next to the control arm, thrust bearing, hardened washer and #26129 washers as required (suggest six washers as a starting point). With an "O" ring in the interior of clutch adjusting nut and coated with oil, install the adjusting nut over the control shaft. Thread the adjusting nut into the gearbox until the outer "O" ring seat is near the outer edge of the case. Use shim stock and oil to protect the "O" ring then install the outer "O" ring on the adjusting nut and loosely install the jam nut on the adjusting nut. (Place the "O" ring seat of the jam nut towards the gearbox.)
4. Secure the cam bar to stud shaft with 5/16 x 1-3/4 Type A grooved pin. Install "O" ring on the stud shaft as indicated in Figure 9. Place spring on the stud shaft and install as shown in Figure 10. Secure the stud shaft with lock washer and nut. The cam bar must be centered between the guide tabs as indicated in Figure 10. Securing nut must be positioned for belt installation.