NEW HOLLAND

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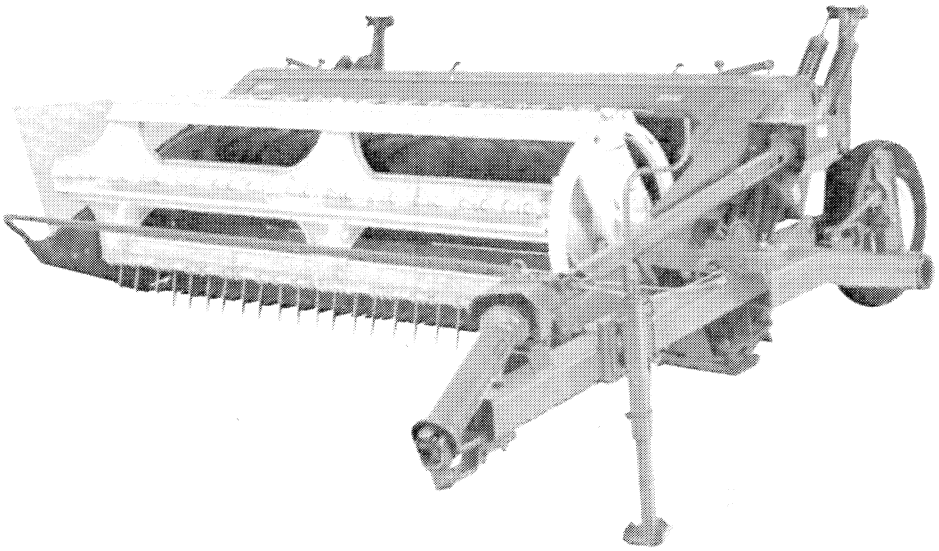
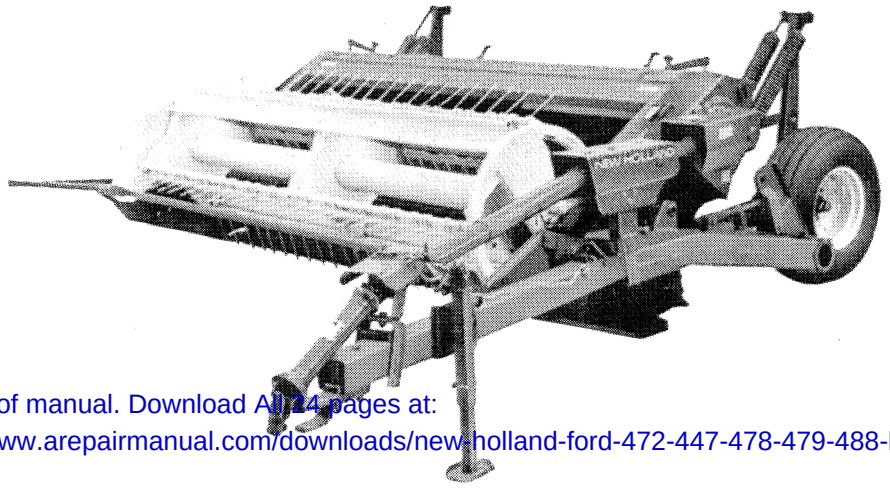
Service Manual

Haybine®
Mower-Conditioner
472, 477, 478, 479 and 488

Issue 10-89

(Replaces All Previous Issues)





Reprinted

INTRODUCTION

This service manual provides the technical information needed to properly service the Haybine® mower-conditioner. This service manual, in addition to the operator's manual supplied with the unit, will help to correctly service and maintain the mower-conditioner.

On Ford New Holland equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

This manual details the procedures of removal, disassembly, and reassembly found to be the easiest and least time-consuming. There may be several other ways of completing the same job, but it has been established that the methods in this manual are best. Modifications to these procedures are your own decision.

CONTENTS

PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("CAUTION", "WARNING", and "DANGER") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.

CAUTION: THE WORD "CAUTION" IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.

WARNING: THE WORD "WARNING" DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS A POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.

DANGER: THE WORD "DANGER" DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

FAILURE TO FOLLOW THE "CAUTION", "WARNING", AND "DANGER" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

MACHINE SAFETY

Additional precautionary statements ("ATTENTION" and "IMPORTANT") are followed by specific instructions. These statements are intended for machine safety.

ATTENTION: The word "ATTENTION" is used to warn the operator of potential machine damage if a certain procedure is not followed.

IMPORTANT: The word "IMPORTANT" is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.

WOBBLE DRIVE

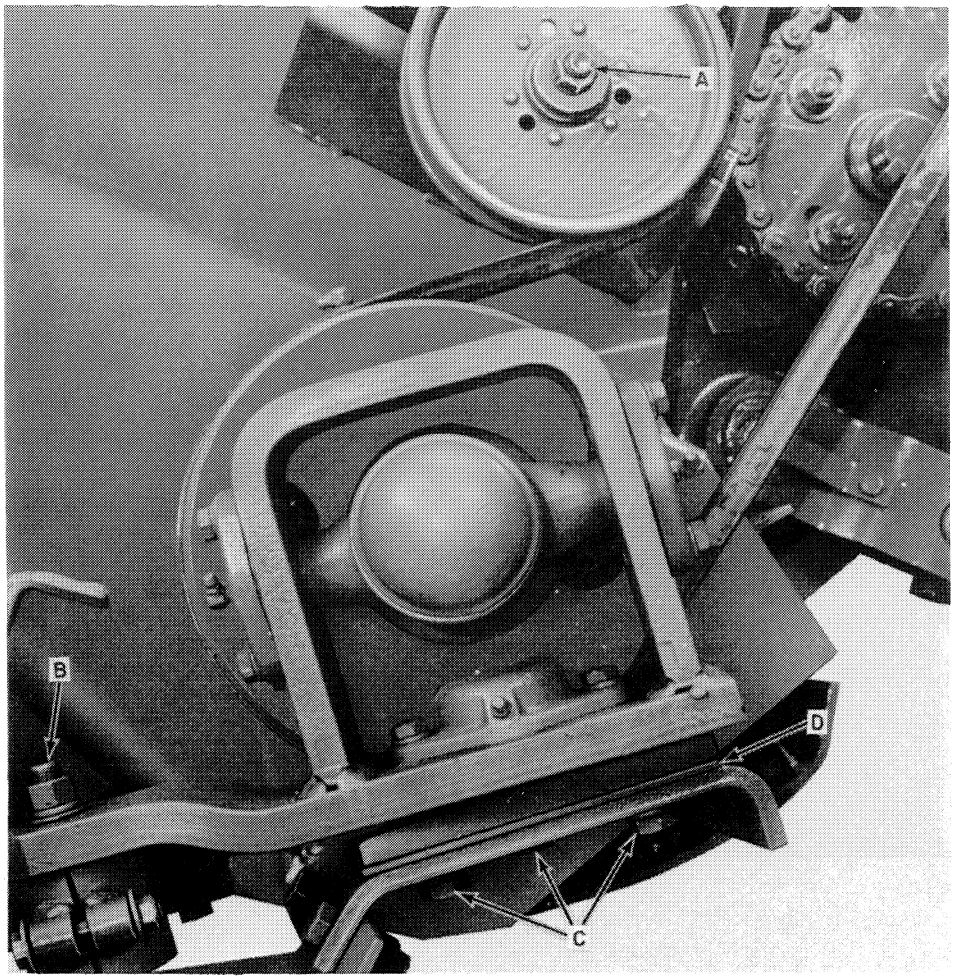


FIGURE 1

REMOVAL

1. Loosen the sickle drive belt idler at A, Figure 1.
2. Remove the belt from the drive sheave, under the hinged cover, and the wobble sheave.
3. Remove the knife head bolt, B, Figure 1.
4. Remove bolts, C, and spacer, D, Figure 1.

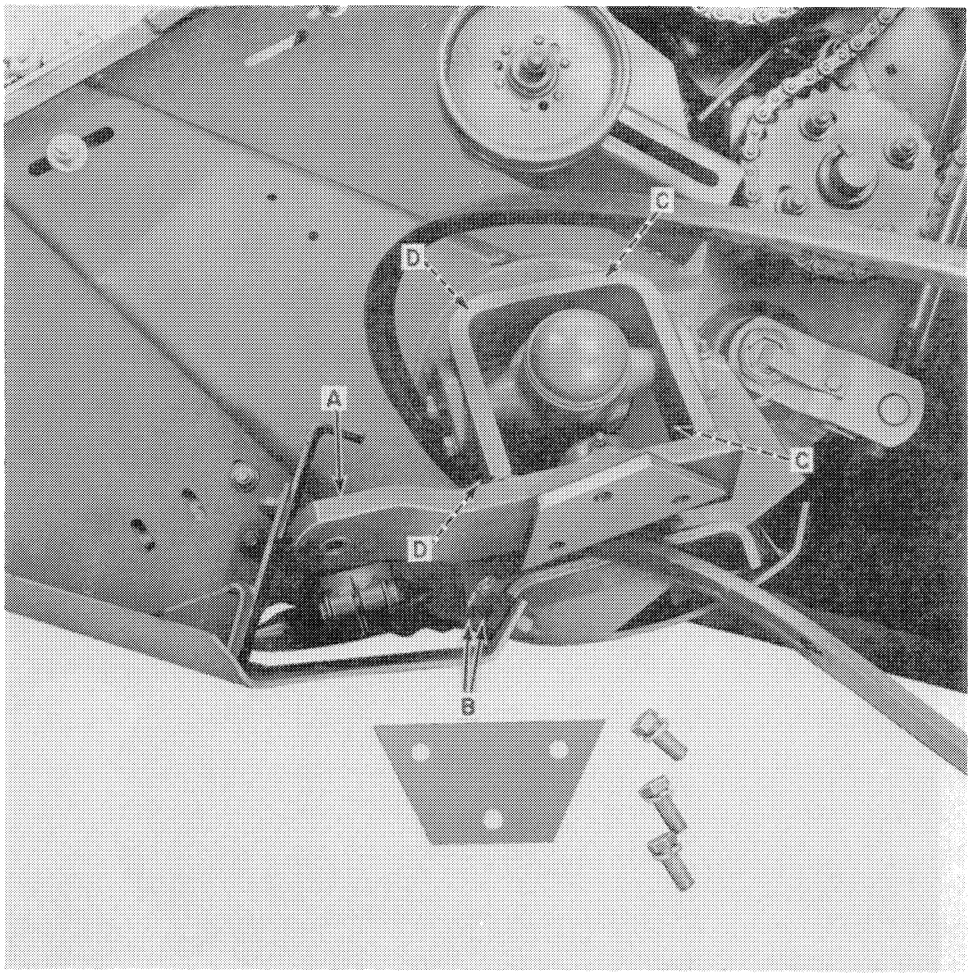


FIGURE 2

5. Rotate the wobble sheave until wobble yoke, A, Figure 2, is in the highest position. Rotate the steady rest support as shown and remove the belt.
6. Remove bolts, B, and bolts or nuts, D and C, Figure 2. Then remove the complete wobble assembly from the mower-conditioner.

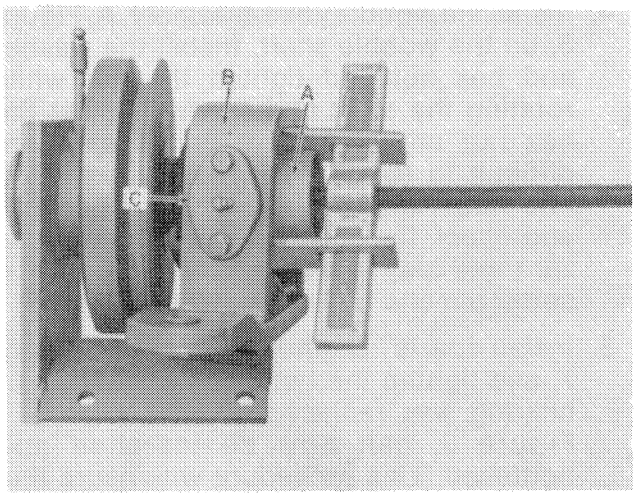


FIGURE 3

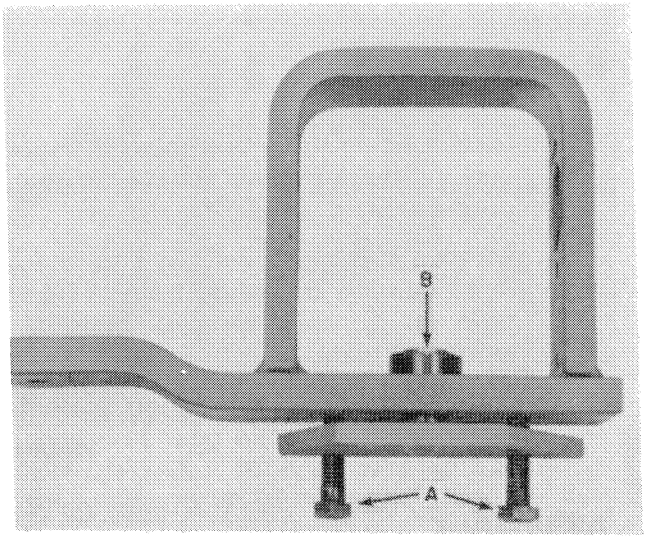


FIGURE 5

DISASSEMBLY

1. Remove the cap, cotter pin, and hex nut from the wobble hub, A, Figure 3. Install a bearing puller and remove the complete wobble hub assembly from the wobble shaft as a unit.

   NOTE: If the bearing puller being used will not fit inside yoke, B, Figure 3, the puller can be placed on trunnion bearing caps at C, after grease fittings are removed.

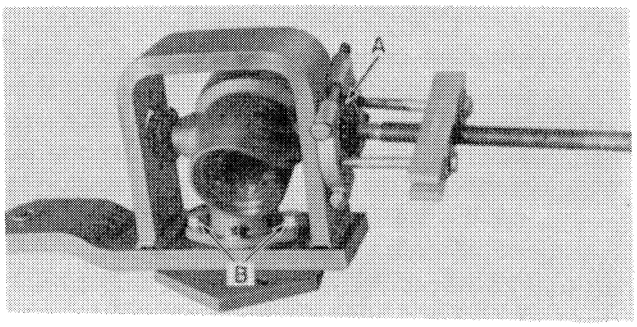


FIGURE 4

2. To disassemble the yoke assembly, remove the trunnion bearing caps and shims. Use a bearing puller, A, Figure 4, to remove the trunnion bearing and seal assemblies. Do not try to save these assemblies because the seal is usually damaged when removed.
3. Remove bolts, B, Figure 4, from the steady rest bearing cap and gasket. Install two ½" cap screws at A, Figure 5, and turn the bolts in against the yoke to remove the steady rest bearing and locking collar, B, Figure 5, as one assembly.
4. Remove the cap, cotter pin and hex nut from the wobble shaft at A, Figure 6. Use a bearing puller and push the wobble shaft and sheave assembly out of the support. Remove bearings, B, C, and D, Figure 6, from the wobble shaft with a bearing puller.

   NOTE: Do not remove the sheave from the wobble shaft. The sheave is pressed on the wobble shaft and has a woodruff key installed.

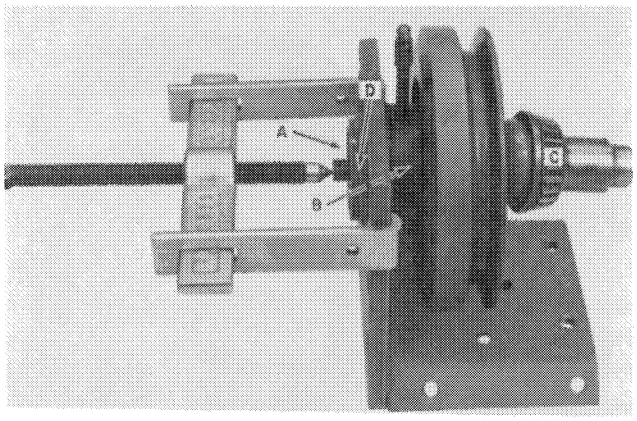


FIGURE 6

ASSEMBLY

Inspect all parts and bearings carefully and replace them if any wear is evident. Use adequate sleeves or spacers to install bearing cones, cups, and seals. If bearings are reused, be sure they are properly cleaned with a suitable solvent. Repack used or new bearings with wheel bearing grease.

1. Install the wobble shaft assembly shown in Figure 6. Install a washer and hex nut and tighten until the bearings have a running fit of 6-10 in. lbs. (0.68-1.13 N·m). These bearings have an interference fit and must be properly seated before the nut is tightened. Install the cotter pin and cap.
2. Install the steady rest support, Figure 5. If the steady rest bearing was replaced, do not install locking collar, B, at this time.
3. Install the wobble hub, Figure 4, in the wobble yoke.

   NOTE: Make sure the large part of the hub is to the rear.

   Install the trunnion bearing and seal assemblies. Install an equal amount of shims under both bearing caps. Make sure the bearing caps have the grease fittings pointed out as shown at A, Figure 7.

   Tighten bolts, B and C, Figure 7, evenly on both sides. Make sure the caps do not set up a binding load on the radius of the yoke. Add or subtract shims under the bearing cups until it takes 6-10 in. lbs. (0.68-1.13 N·m) force to rotate the hub. The hub should not have any binding or end play. Shim sizes are 0.003", 0.005", 0.007", and 0.020".
4. Install the wobble yoke assembly, A, Figure 3, on the wobble shaft. Install the washer and hex nut and tighten the nut while rotating the shaft and sheave. Adjust the hex nut until the shaft and sheave are difficult to rotate. Then back the nut off one flat. Tap the sheave with a hammer and check for end play. There should be zero end play in the assembly before the cotter pin and cap are installed.
5. Install spacer, D, and two bolts, E, Figure 7, and tighten the bolts. If the steady rest bearing was replaced, locking collar, B, Figure 5, can now be installed and tightened. This procedure will insure that the bearing is not moved out of its original position. Install the gasket and bearing cap, F, Figure 7.

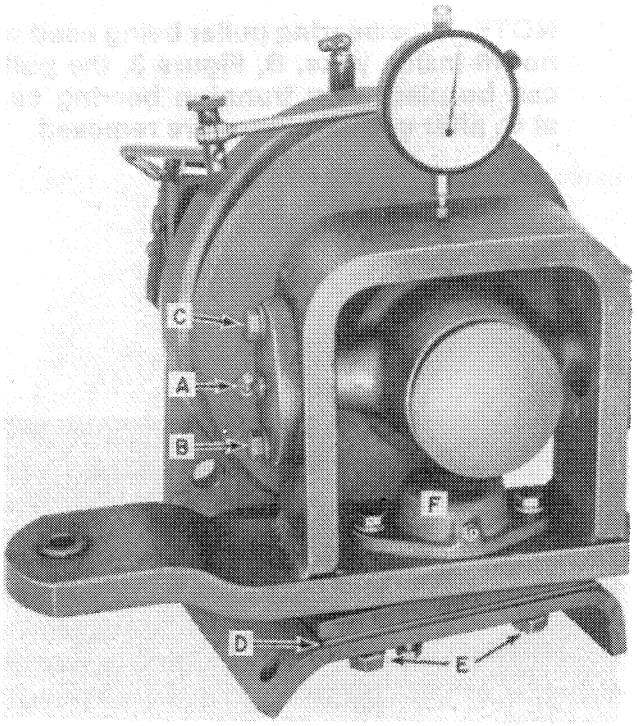


FIGURE 7

6. Loosen bolts, E, Figure 7, two full turns. The wobble yoke assembly should not have any more than 0.006" (0.15 mm) vertical movement while turning the wobble sheave through one full revolution. Use a dial indicator, shown in Figure 7, to check movement. If there is more than 0.006" (0.15 mm) movement, recheck bearings for proper seating and preload.

   IMPORTANT: Excessive movement will cause repeated steady rest bearing and knife head bushing failures. Bolts, E, Figure 7, can now be removed.

INSTALLATION

Install the wobble assembly using bolts or nuts at C and D, Figure 2. Install bolts, B. Tighten the hardware installed up to this point.

Work the sickle belt under the steady rest support. Install bolts, C, Figure 1, and tighten these bolts.

Turn the drive sheave and position the knife so the knife head bolt, A, Figure 8, can be installed (with the bolt head at the bottom) through the hole in guard, B. In this position, the knife sections should be midway between the guard points. Keep the knife in this position and tighten the locknut on the knife head bolt to 85 ft. lbs. (115 N·m). Loosen clamp bolt, C. Adjust the knife head up or down on the bushing so the knife sections rest lightly on the ledger surface of the guards at D. Tighten the clamp bolt, C, up with the knife sections mid-way between the guard points.

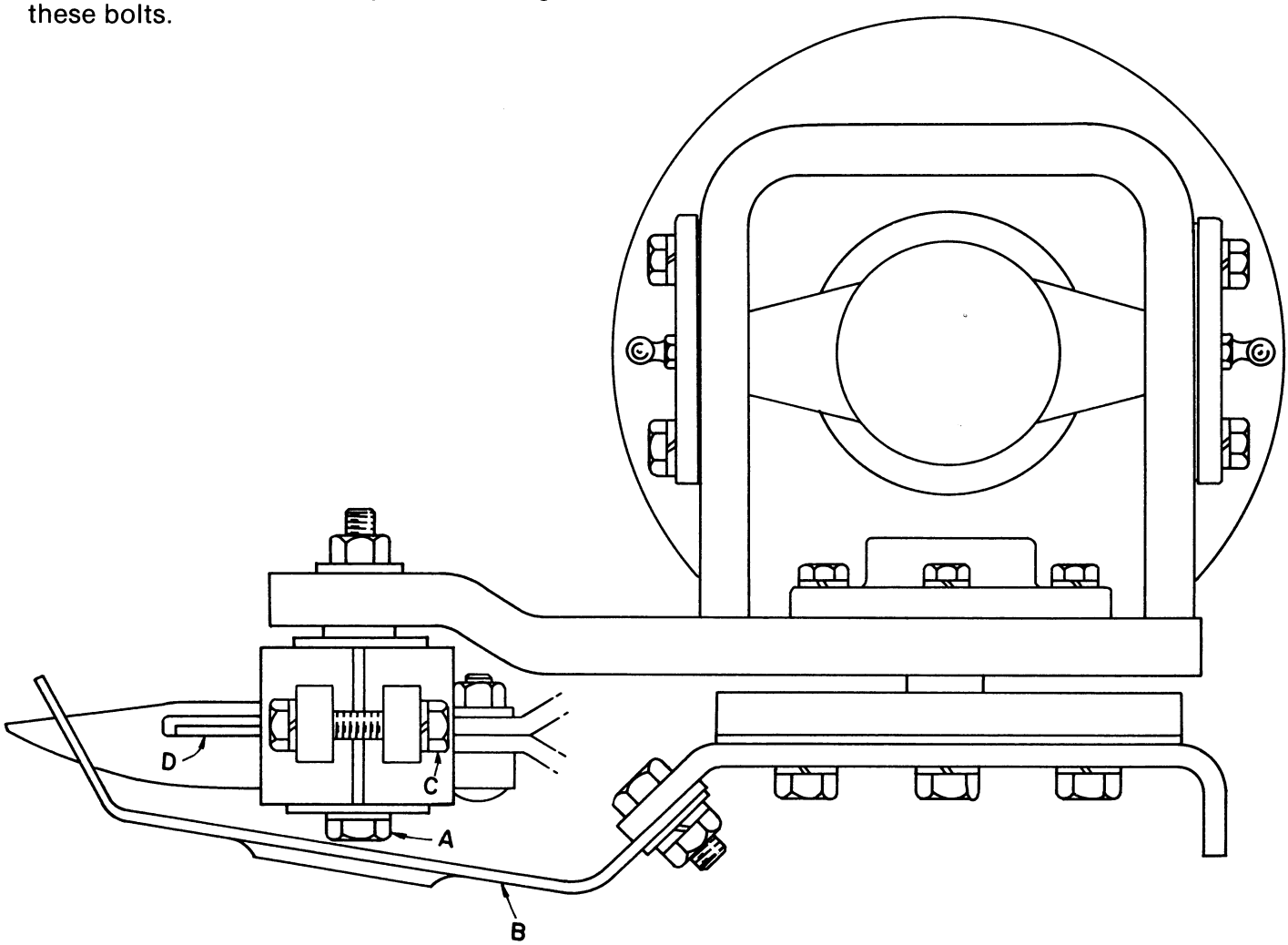


FIGURE 8

GEARBOX

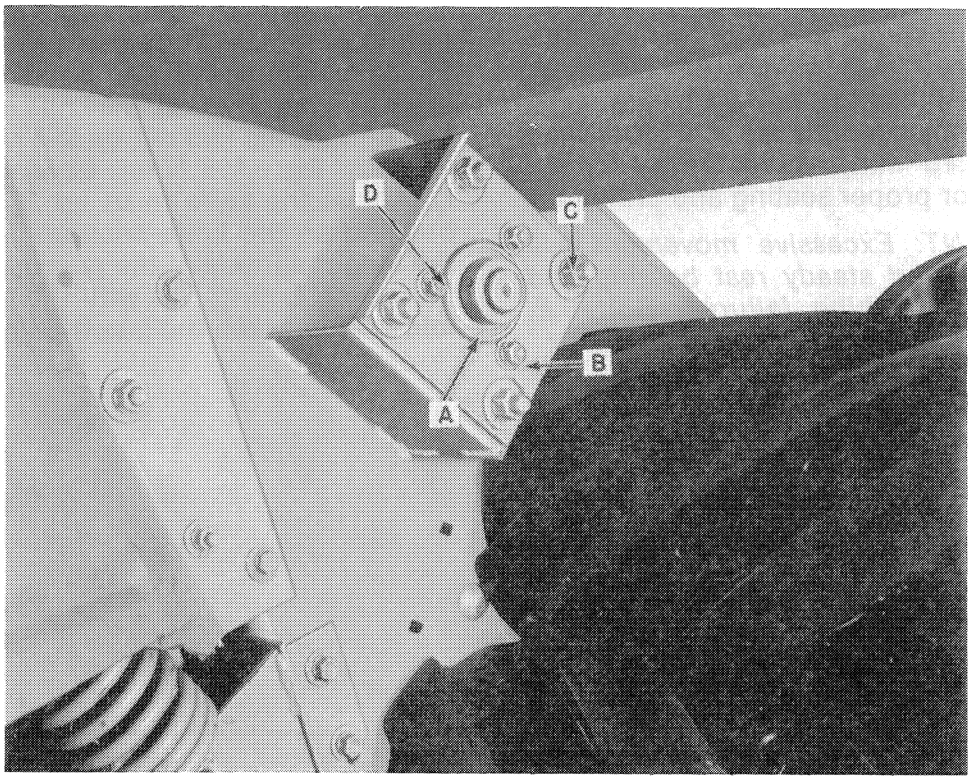


FIGURE 9

REMOVAL

1. Remove the PTO cover as shown in Figure 10.
2. Loosen the jam nut and setscrew at A, Figure 10, and remove the slip clutch assembly from the input shaft.
3. Remove both roll drive chains.
4. Loosen the sickle drive belt idler, B, Figure 10, and slip the belt off the drive sheave on the gearbox output shaft.
5. Remove locking collar, A, Figure 9, and the three bearing mounting bolts, B. Remove bolts, C, Figure 9, and remove the bearing and mounting plate.
6. Remove the gearbox mounting plate bolts, C, Figure 10. Remove the gearbox and plate as one assembly. BE CAREFUL NOT TO LOSE THE OVERRUNNING CLUTCH PINS AND SPRINGS. (Two are used on older Model 477's and four on older Model 479's.) Remove the clutch sprocket, shims, spacer, and sheave hub. Be sure to remember how the shims and spacer were installed.

   NOTE: On the Models 472, 477, and 478, the hub is held with a setscrew. On the Models 479 and 488, the hub is positioned with collar, F, Figure 11. On units that do not have the overrunning clutch, the hub is a part of the roll drive sprocket weld assembly.
7. Remove the four bolts holding the gearbox to the support plate.

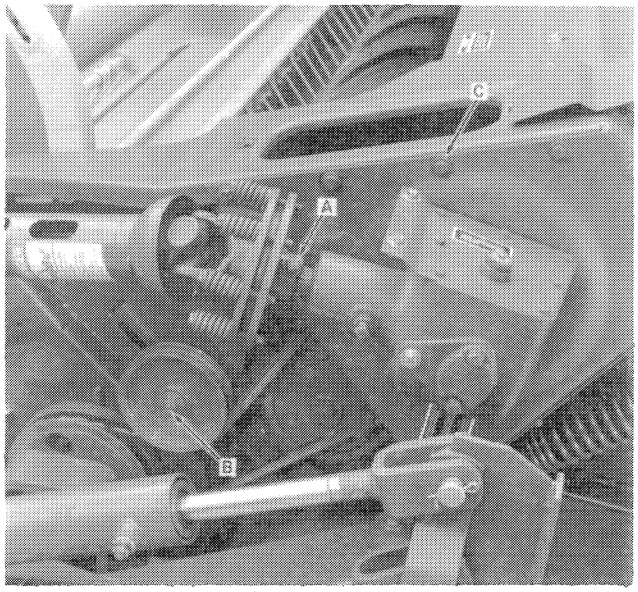


FIGURE 10

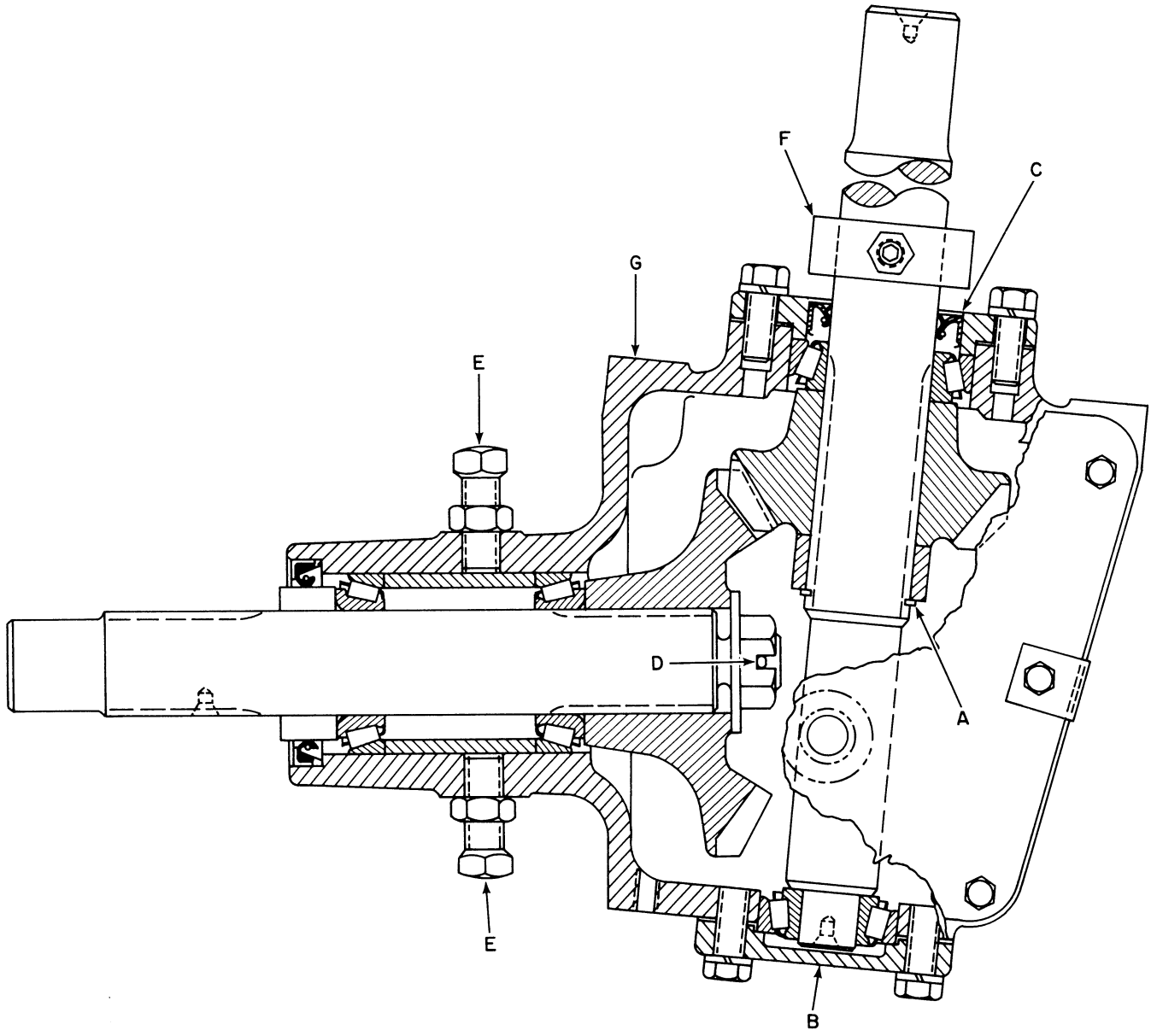


FIGURE 11

DISASSEMBLY

1. Remove the gearbox cover and drain all the oil.

   NOTE: 1000 RPM gearboxes have a metal tag attached to the cover.

2. Remove snap ring, A, Figure 11, from the output shaft. Remove bearing caps, B and C, Figure 11.
3. Slide the shaft out of the gearbox and remove the spacer and pinion gear. The bearing cups and cones can now be removed.
4. Remove cotter pin, D, Figure 11, nut and flat washer from the input shaft.
5. Loosen setscrews, E, Figure 11, and remove the shaft assembly. Remove the bearings and spacer.

NOTE: Clean all parts and carefully inspect all parts for wear or pitting. Replace parts as required.

ASSEMBLY

NOTE: Pack all bearings with general-purpose grease.

1. Install the bearings and spacer on the input shaft. Install the shaft in the gearbox and install the bevel gear, flat washer, and nut. Tighten the nut to obtain 5-10 in. lbs. (0.56-1.13 N·m) torque on the bearings and shaft assembly. Install cotter pin, D, Figure 11, and the oil seal. DO NOT TIGHTEN THE SETSCREWS.

2. Install the output shaft, bearing cup and cone and bearing cap, C, Figure 11. Use the same number of shims used previously if the original bearing is used. If a new bearing is being used, the number of shims required must be determined. Example: if the slip of paper with the new bearing has a 12 on it, the gearbox may have "18" stamped on the lower machined surface at G, Figure 11, and the bearing cap, C, Figure 11, may have a "5" stamped on it. This means all three numbers must be added, for a total of 35. This total indicates shims must be used giving a total of 0.035". Shims are available in sizes 0.003", 0.005", 0.007", and 0.020". This method will insure that the mounting distances between the shafts and gears are correct. Use Permatex® on the bearing cap bolts.
3. Install the pinion gear, spacer, and snap ring, A. Install the bearing cup, cone and cap, B. Use the required amount of shims to obtain 5-10 in. lbs. (0.56-1.13 N·m) torque on the output shaft. These shims are also available in 0.003", 0.005", 0.007", and 0.020" thickness.
4. The backlash between gears must be 0.004" to 0.012" at the closest point. To adjust, move the input shaft assembly as required and tighten setscrews, E, Figure 11, to 50 ft. lbs. (68 N·m) torque. Tighten the jam nuts.
5. Fill the gearbox with API GL5 80W-90 multipurpose gear lubricant to the bottom hole of bearing cap, B, Figure 11. Install the cover and clip (if 1000 RPM).

INSTALLATION

1. Attach the gearbox to the mounting plate. Attach the mounting plate and gearbox to the mower-conditioner. Make sure that the belt, overrunning clutch sprocket, hub, springs, pins, spacers and shims are installed properly.

   NOTE: Make sure that collar, F, Figure 11, is installed in its original position on the Models 479 and 488. Tighten all mounting plate bolts, C, Figure 10.
2. Install the bearing on the output shaft and install bearing flange bolts, B, Figure 9, in the mounting plate. Install mounting plate bolts, C, Figure 9. Tighten bearing bolts, B, and then tighten bolts, C, last. This will eliminate a radial loading on the bearing if this sequence is followed.

   NOTE: On units that have the overrunning clutch, shims must be installed between the long spacer and bearing at D, Figure 9, for a maximum end play of 1/16" (1.6 mm) on the complete clutch assembly. At the same time, the overrunning clutch must be free to rotate. Install locking collar, A, Figure 9, and tighten in the direction of rotation.
3. Install the roll drive chains. Tighten the chains and check roll timing. Adjust as detailed in the operator's manual.
4. Install the slip clutch assembly. Make sure setscrew, A, Figure 10, and the jam nut are securely tightened. Install the PTO cover.