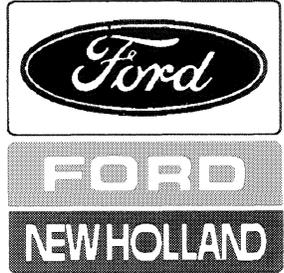


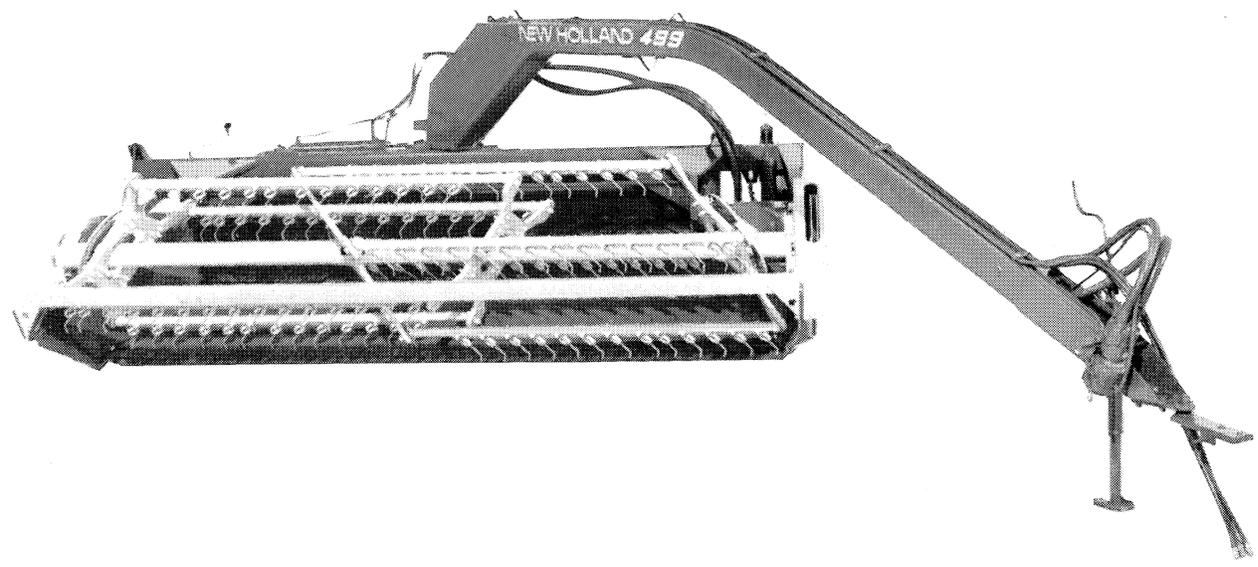
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# NEW HOLLAND

## Service Manual



### Pivot Tongue Haybine® Mower-Conditioner 499



# INTRODUCTION

This manual provides, in condensed form, service and maintenance information for repairing or rebuilding a New Holland Model 499 pivot tongue Haybine® mower-conditioner.

The operator's manual issued with each machine should be used in conjunction with this manual, as much of the information contained here is condensed or supplementary in nature.

The first section details a step-by-step procedure to troubleshoot the hydrostatic system. Each component must be tested separately to isolate a problem. Detailed information to rebuild each component is provided separately.

This manual details the procedures for removal, disassembly, reassembly, etc., that have been 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.



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

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## GENERAL INFORMATION

“Left” and “right” are determined from a position facing in the direction of travel of the unit during operation.

Install a lock washer on all bolts unless a jam nut or self-locking nut is specified. Install a flat washer on all slotted holes except under the heads of carriage and truss head bolts.

# HYDROSTATIC SYSTEM

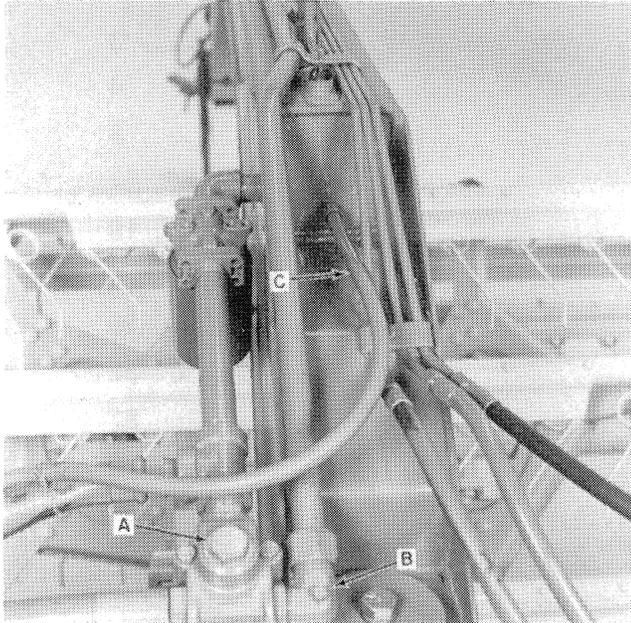


FIGURE 1

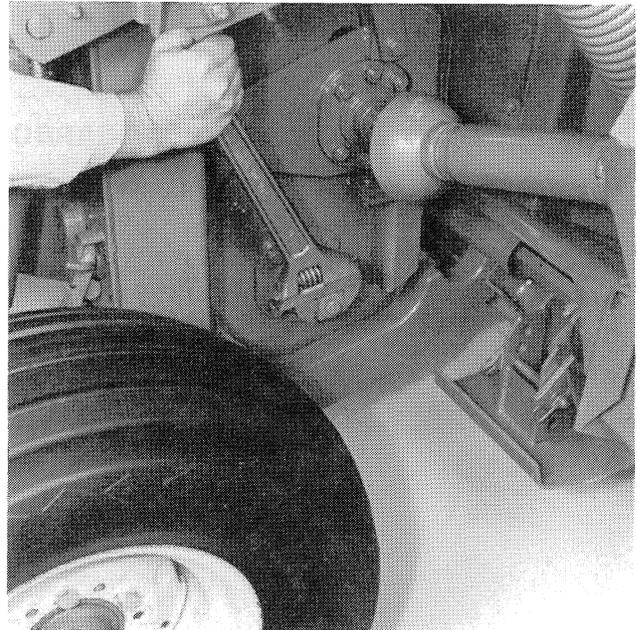


FIGURE 2

The hydrostatic system consists of a pump and gearbox assembly, relief valve, motor, and filter. The high pressure oil from the pump goes through the pressure relief valve and then to the motor. Return oil is filtered between the motor and the tongue reservoir.

If a unit loses hydraulic power, use the following procedure to troubleshoot the system.

1. Check the hydrostatic oil level in the tongue as detailed in the operator's manual.
2. Change the oil filter.
3. Remove the relief valve, A, Figure 1, from the housing. Clean the valve and inspect for wear or contamination. Inspect O-rings for possible wear and replace if worn or damaged. Reinstall valve or replace and then test machine.



**WARNING: GAUGES, GAUGE FITTINGS, AND HOSES MUST HAVE OPERATING PRESSURE RATINGS AT LEAST 25 PERCENT HIGHER THAN HIGHEST PRESSURES OF THE SYSTEM.**

**NEVER ADJUST RELIEF VALVES TO HIGHER PRESSURES THAN THOSE SPECIFIED BY THE EQUIPMENT MANUFACTURER.**



**WARNING: ALWAYS PROTECT THE SKIN AND EYES FROM ESCAPING FLUID UNDER PRESSURE. FLUID UNDER PRESSURE CAN HAVE SUFFICIENT FORCE TO PENETRATE THE SKIN, CAUSING SERIOUS PERSONAL INJURY.**

**IF INJURED BY ESCAPING FLUID, OBTAIN MEDICAL ASSISTANCE AT ONCE. SERIOUS INFECTION OR REACTION CAN DEVELOP IF MEDICAL TREATMENT IS NOT ADMINISTERED IMMEDIATELY.**

**BEFORE DISCONNECTING LINES OR FITTINGS, BE SURE TO RELIEVE ALL PRESSURE. BEFORE APPLYING PRESSURE TO THE SYSTEM, BE SURE ALL CONNECTIONS ARE TIGHT AND THAT LINES, PIPES, AND HOSES ARE NOT DAMAGED.**

4. Remove 1/4" NPT plug, B, Figure 1, and install a high pressure gauge. **NOTE: The relief valve is set for 3500 psi (24,133 kPa) and is non-adjustable.**
5. Block the machine by placing a wrench on the lower roll hub as shown in Figure 2. **NOTE: Turn the machine by hand until the wrench contacts the main frame.**



**WARNING: MAKE SURE WRENCH IS PROPERLY SECURED BEFORE STARTING TRACTOR TO CHECK PRESSURE.**

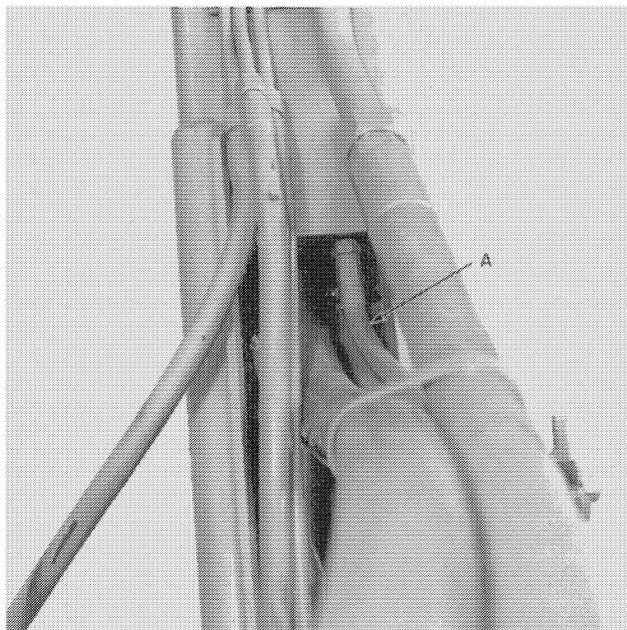


FIGURE 3

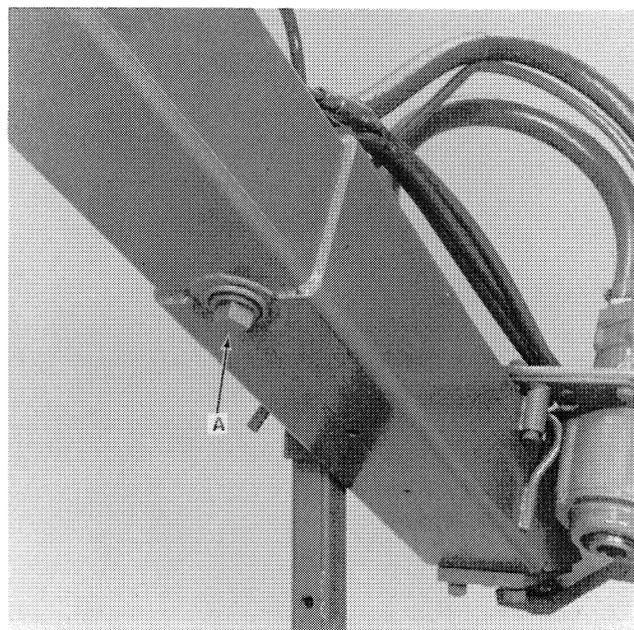


FIGURE 4

Start the tractor and engage the PTO. The pressure should be 3500 psi (24,133 kPa). **IMPORTANT:** Do not bypass oil through the relief valve for any length of time as tremendous heat will build up in the valve. If pressure is normal, the relief valve is functioning properly and leakage must be checked at pump and motor.

6. If a flow meter is not available to check case drain oil volume at pump, oil can be collected in a measurable container. Disconnect case drain return line, A, Figure 3, and install a  $\frac{3}{8}$ " pipe plug in tongue.
7. Start the tractor and time a certain volume of oil collected. Normally the flow should be approximately  $1\frac{1}{2}$  gallons (5.5 L) per minute. Any amount over 2 gallons (7 L) indicates worn internal pump components and pump must be rebuilt.
8. If pump oil volume is normal, check volume at motor case return line. Remove line at C, Figure 1.

Normal flow should be approximately  $1\frac{1}{2}$  gallons (5.5 L) per minute. Any amount over 2 gallons (7 L) indicates worn internal motor components and motor must be rebuilt.

## HYDROSTATIC OIL

The hydrostatic oil must be kept free of dirt, dust, water, rust, etc., or hydrostatic components could be severely damaged. If a catastrophic failure occurs with a pump or motor, the system must be drained.

To drain the oil, lower the front of the tongue as low as possible. Remove drain plug, A, Figure 4. Remove lines from pump and motor. Clean hoses and tubing with air and solvent.

Flush tongue by spraying solvent under pressure into rear of tongue so metal chips, etc. will be moved to front of tongue. Clean chips and foreign material from front of tongue through drain port.

Install pump, motor, hose, tubing and drain plug. Install new filter and add five gallons (19 L) of hydraulic oil. Refer to operator's manual for approved oils.

Start tractor and run at about  $\frac{1}{2}$  throttle to allow full flow through filter. This procedure will help clean system if any contamination was left in it.

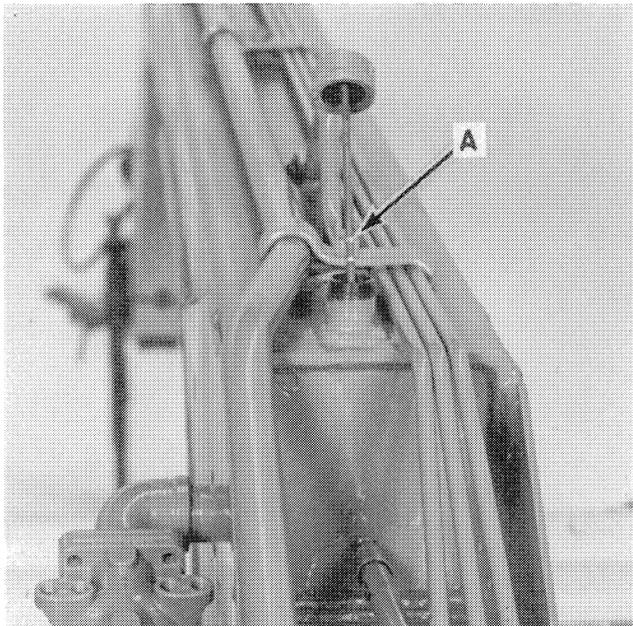


FIGURE 5

Drain oil again and add hydraulic oil to dipstick marking shown at A, Figure 5. Make sure tongue is level when checking oil. Approximately 20 gallons (75.7 L) of oil are required to fill reservoir to recommended level.

Install a new oil filter after the system has been cleaned and again after the first 50 hours of operation.

## HYDROSTATIC PUMP AND GEARBOX

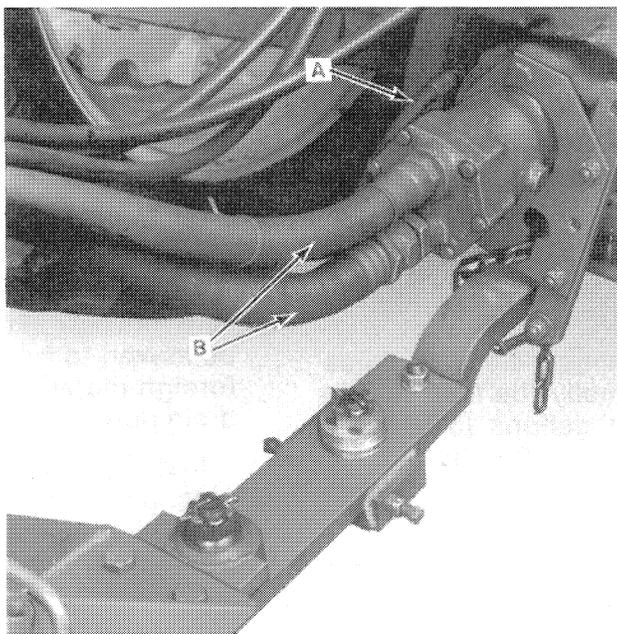


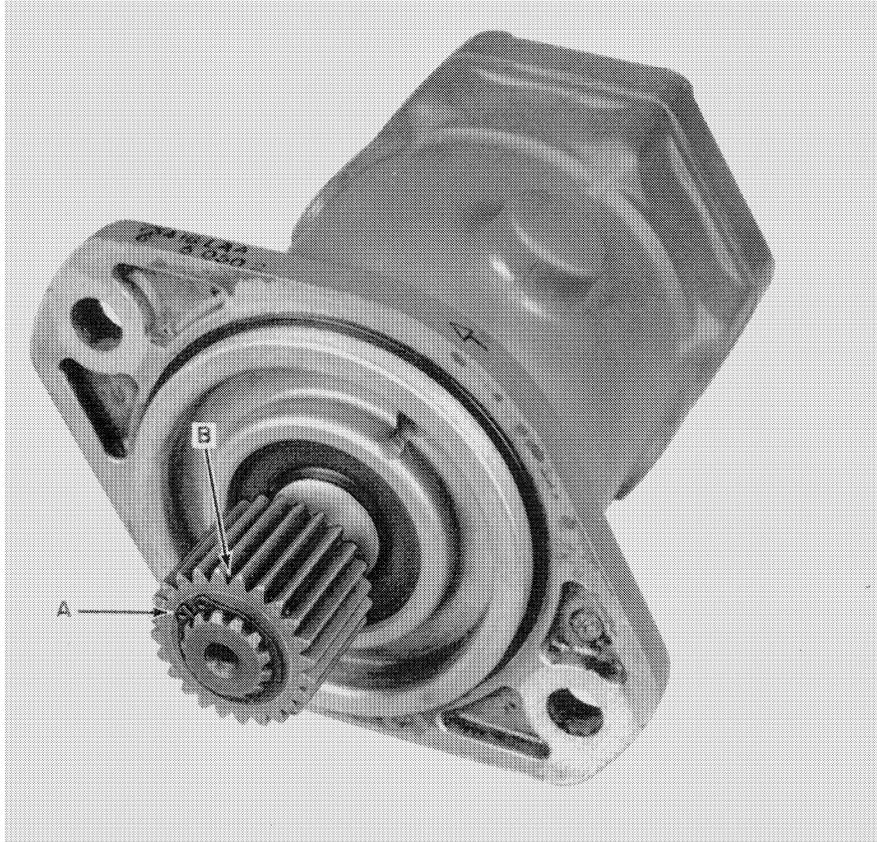
FIGURE 6

1. Remove the three hydraulic oil lines, A and B, Figure 6.



**FIGURE 7**

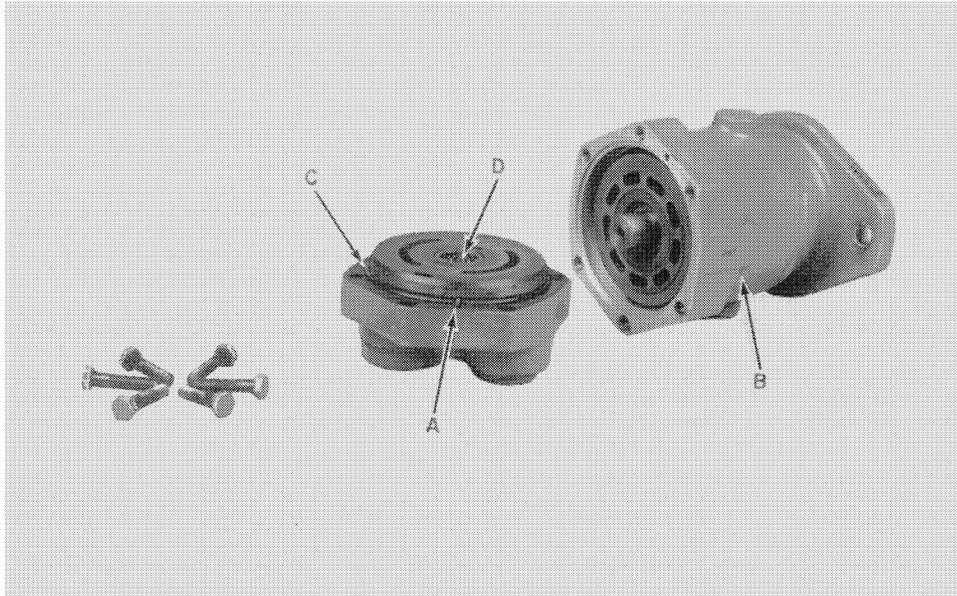
2. Remove the torque arm and bracket from the pump. The bracket is secured with two bolts, A, Figure 7, that secure the gearbox to the pump.



**FIGURE 8**

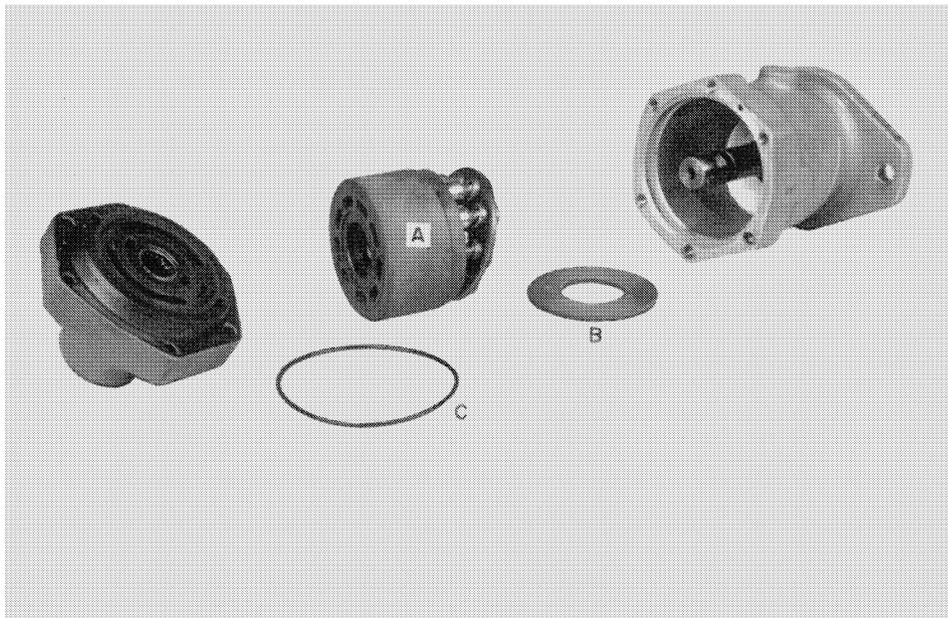
### **PUMP Disassembly**

1. Clean outside of pump thoroughly before disassembling pump.
2. Remove snap ring, A, Figure 8, and remove gear, B.
3. Remove rear snap ring after gear is removed.



**FIGURE 9**

4. Remove six cap screws to remove back plate, A, Figure 9, from housing assembly, B. Use a soft hammer to loosen back plate and then pull back plate straight out.
5. Remove O-ring, C, Figure 9.



**FIGURE 10**

6. Remove the complete piston block assembly, A, Figure 10, from the housing.

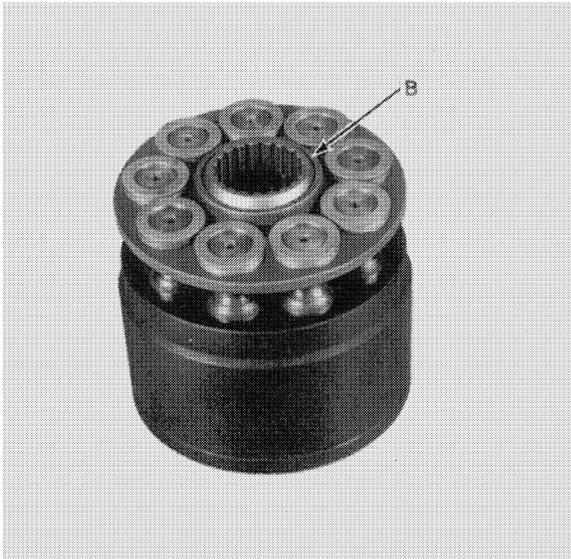


FIGURE 11

7. Lift the piston plate, pivot, and shoe assemblies, B, Figure 11, out of the rotating block. Lay these parts on cardboard to avoid damage to them.
8. Remove cam plate, B, Figure 10, and place it on cardboard.

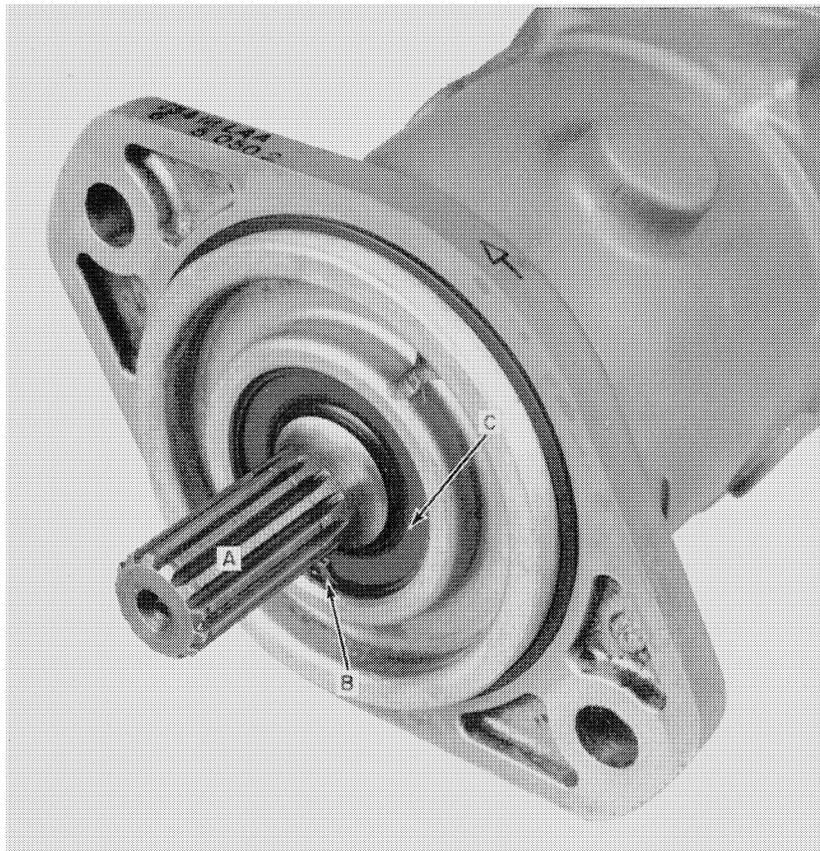


FIGURE 12

9. To remove the drive shaft, A, Figure 12, first remove the retaining ring, B.



FIGURE 13

10. Remove the shaft seal, C, Figure 13, from the housing. Remove washer, D, and then remove drive shaft from housing.
11. Remove snap rings, thrust washers, and thrust bearing at E, Figure 13.

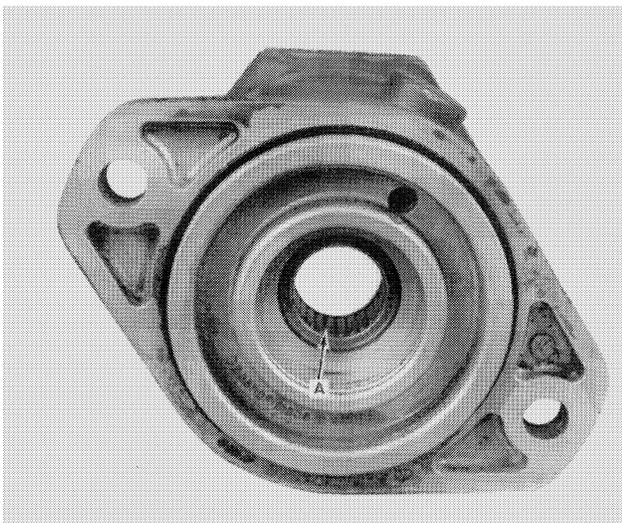


FIGURE 14

12. Remove the needle bearings, D, Figure 9, and A, Figure 14, if they show wear or excessive play.

### Inspection

1. Wash all parts thoroughly in a cleaning solvent.
2. Examine all parts for wear or fretting. The shoe assemblies should be smooth and free of scoring, and fit snugly in the rotating block. The face of the shoes should be flat and free of scoring and flaking. Do not lap shoes.

**NOTE: Rotating group is only serviceable as a complete kit. Refer to Service Parts Catalog.**

### Assembly

1. Lubricate all moving parts with STP before assembly.
2. Install snap rings, thrust bearing, and thrust washers, E, Figure 13, on drive shaft.
3. Install drive shaft in housing and install washer, D, Figure 13.
4. Lubricate inside (ID) of oil seal and install as shown at C, Figure 12. Install retaining ring, B.
5. Make sure the pivot and shoe assemblies are installed in the rotating block as shown in Figure 11.
6. Lubricate cam plate, B, Figure 10, and install in housing.
7. Install the piston block assembly, A, Figure 10, in housing assembly. The shoe assemblies must contact the cam plate.

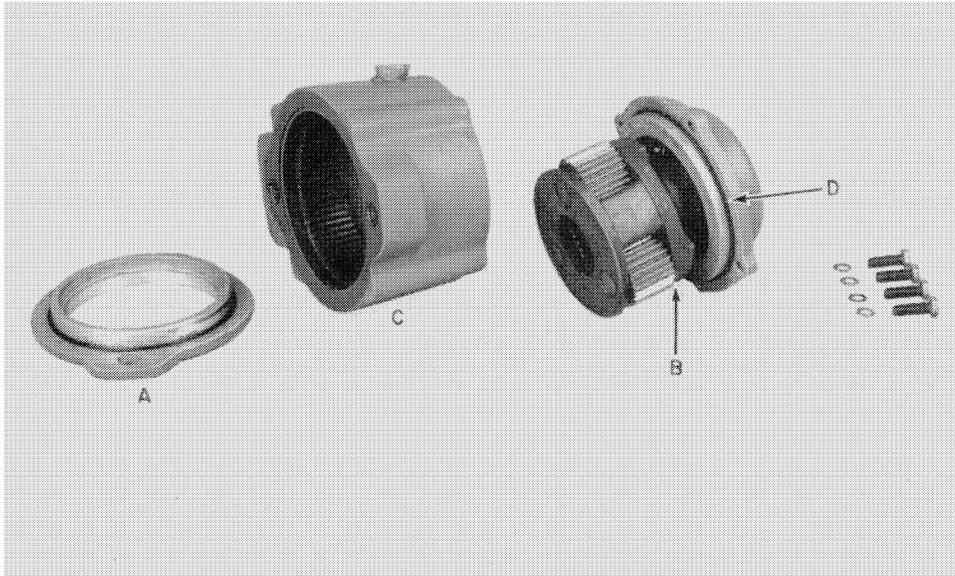


FIGURE 15

8. Install new O-ring, C, Figure 10, on back plate.
9. Install back plate, A, Figure 9. Align roll pin in hole in housing. Install cap screws and tighten to 15 to 18 ft. lbs. (20 to 24 N·m) torque.
10. Install rear snap ring, gear B, Figure 8, and front snap ring, A, on drive shaft.

## GEARBOX

### Disassembly

1. Remove adapter plate, A, Figure 15, from housing. Remove O-ring from adapter plate.
2. Remove four cap screws and remove front plate and planetary gear assembly, B, Figure 15, from housing. Remove O-ring from front plate.

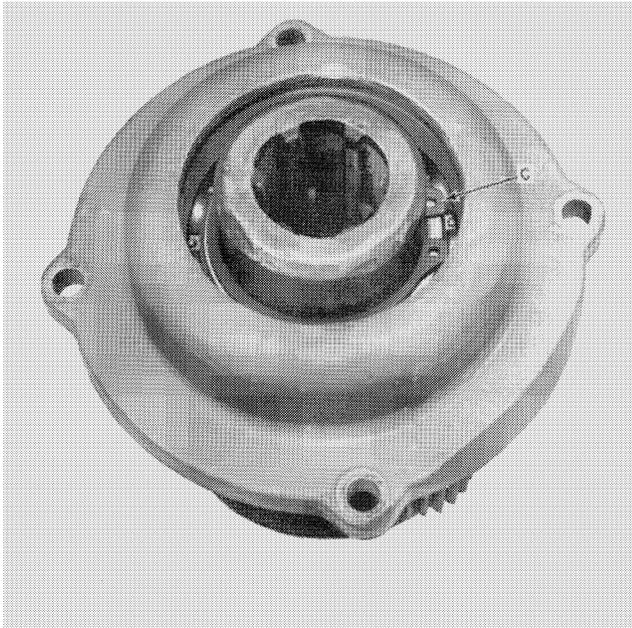


FIGURE 16

3. Remove retaining ring, C, Figure 16.

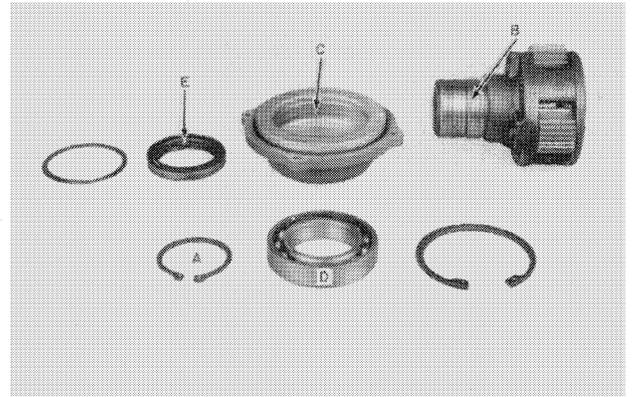


FIGURE 18

5. Remove retaining ring, A, Figure 18.

6. Remove carrier and gear assembly, B, Figure 18, from front plate, C. The carrier shaft is a light press fit in bearing, D.

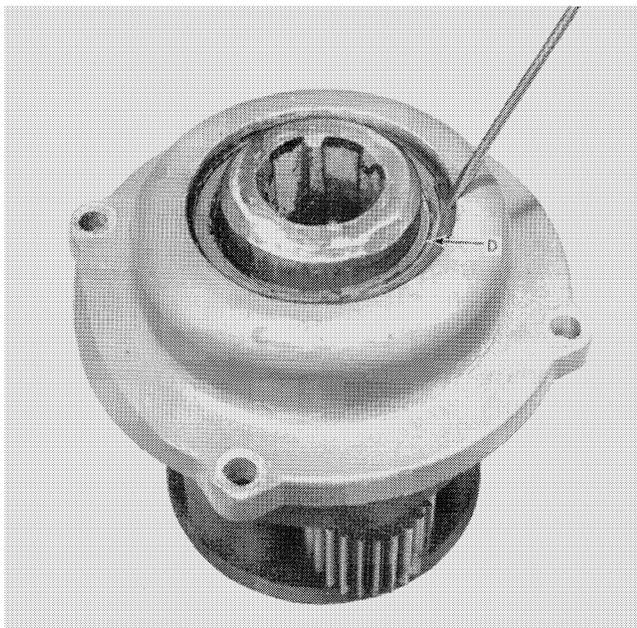


FIGURE 17

4. Remove shaft seal, D, Figure 17. **NOTE: Seal will be damaged and must be replaced.**

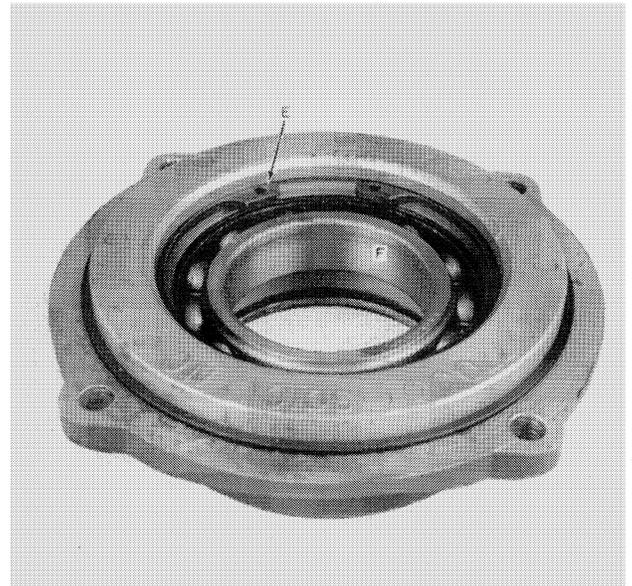


FIGURE 19

7. Remove bearing retaining ring, E, Figure 19. Remove bearing, F.



FIGURE 20

8. To remove gears, B, Figure 20, press pin shafts, A, from carrier, C.

### Inspection

1. Wash all parts thoroughly in a cleaning solvent.
2. Examine gear teeth and internal teeth in housing, C, Figure 15. The teeth should show no signs of excessive wear. Worn parts must be replaced.

3. If the ID of the gear teeth exceeds .755" (20 mm) replace the gears.
4. Inspect the splines inside the carrier for wear. Replace carrier if splines are worn.

### Assembly

1. Install bearing, F, and retaining ring, E, Figure 19, in front plate.
2. Install gears in carrier and press pin shafts, A, Figure 20, in until they are flush.
3. Press carrier assembly, B, through bearing in front plate and install retaining ring, A, Figure 18.
4. Press shaft seal, E, Figure 18, in front plate and install retaining ring as shown in Figure 16.
5. Install new O-ring on face of front plate at D, Figure 15, and install assembly into housing. Secure with four cap screws and washers and tighten to 15-18 ft. lbs. (20-24 N·m) torque.
6. Install new O-ring on face of adapter plate, A, Figure 15, and install on housing assembly. Secure plate with two cap screws and tighten to 55-60 ft. lbs. (74-81 N·m) torque.

## HYDROSTATIC MOTOR

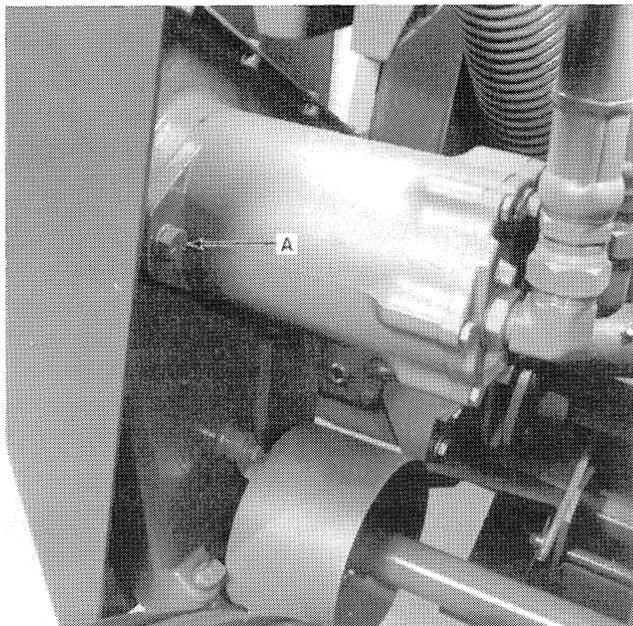


FIGURE 21

### Removal

1. Disconnect hoses from motor, Figure 21. Cap hoses to prevent foreign material from entering system.
2. Remove mounting bolts, A, and slide motor out of gearbox.

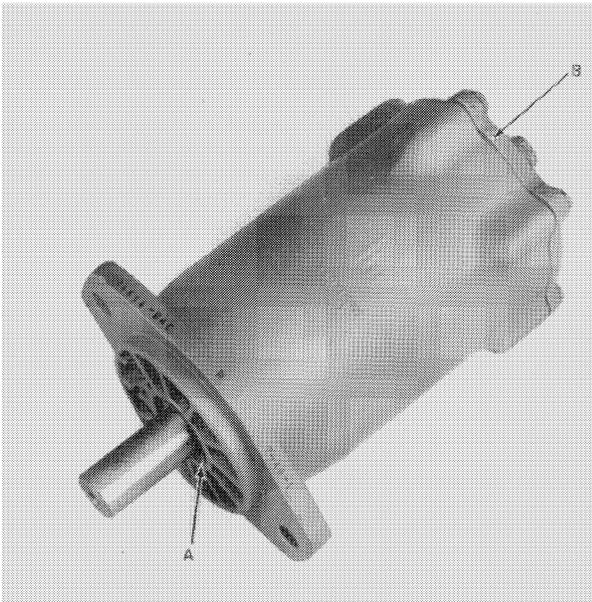


FIGURE 22

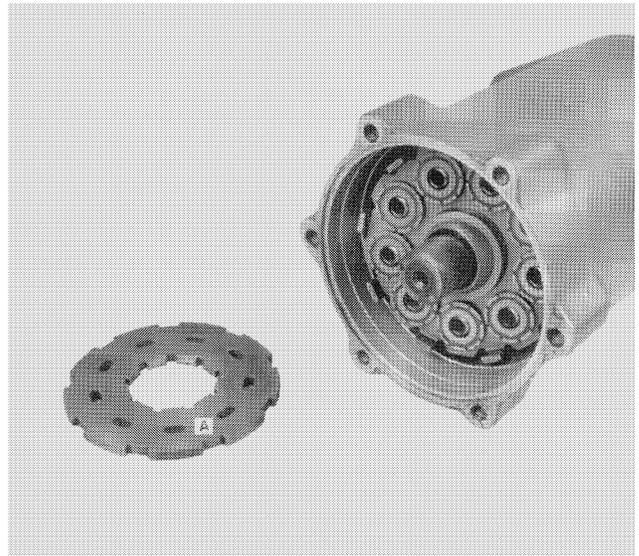


FIGURE 24

### Disassembly

1. Clean outside of motor thoroughly before disassembling motor.
2. Remove retaining ring from housing assembly, A, Figure 22.
3. Remove the cap screws from back plate assembly, B.
4. Use a soft hammer and tap on bolt hole lugs while rotating housing either direction to loosen back plate. Then tap on underside of lugs to remove back plate.

5. Remove O-ring, C, Figure 23, from back plate.
6. Remove thrust washers and thrust bearing, D, Figure 23, from back plate.
7. Remove connector plate, A, Figure 24.
8. Remove pistons and spider, B, Figure 25.

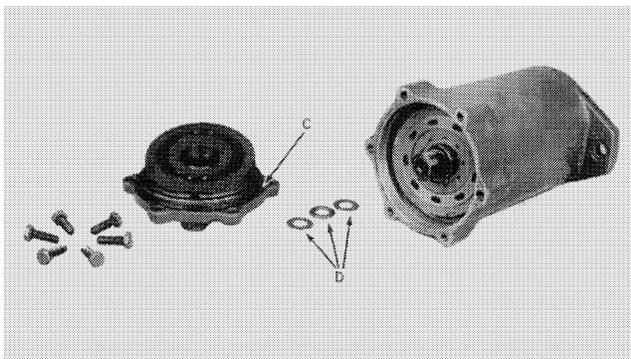


FIGURE 23

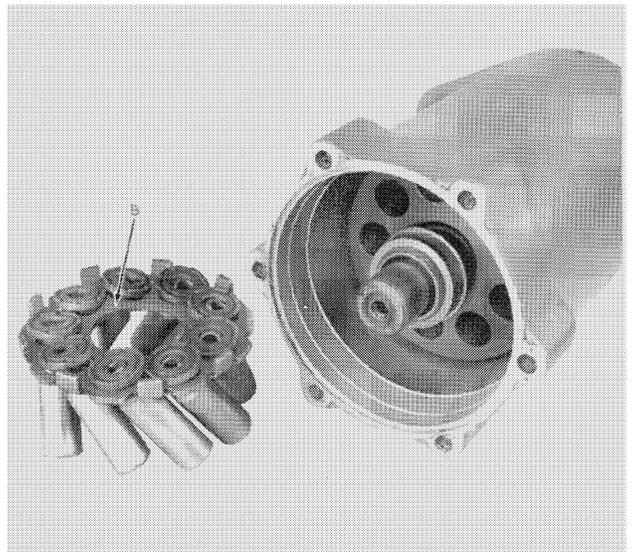
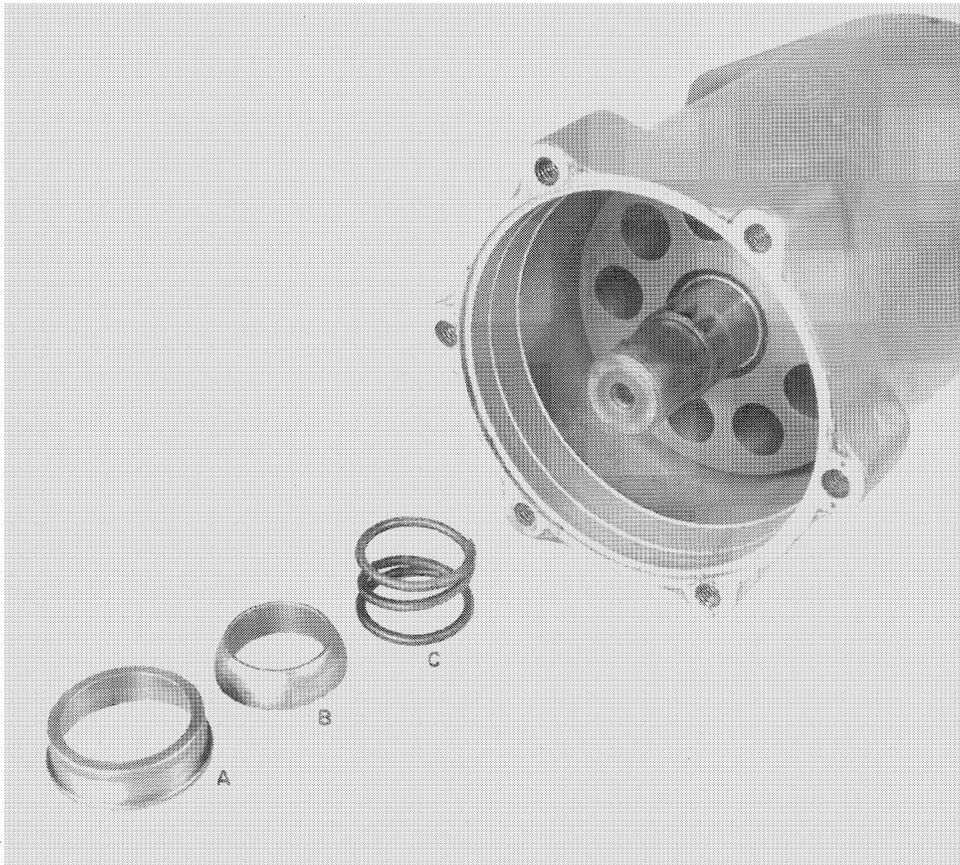


FIGURE 25



**FIGURE 26**

9. Remove pilot, A, pivot, B, and spring, C, Figure 26.



**FIGURE 27**

10. Remove complete piston block and shaft assembly, C, Figure 27.

11. Remove pistons from block as shown in Figure 28. Remove pivot, B, and spacer, A, from shaft. Remove piston block and key from shaft.

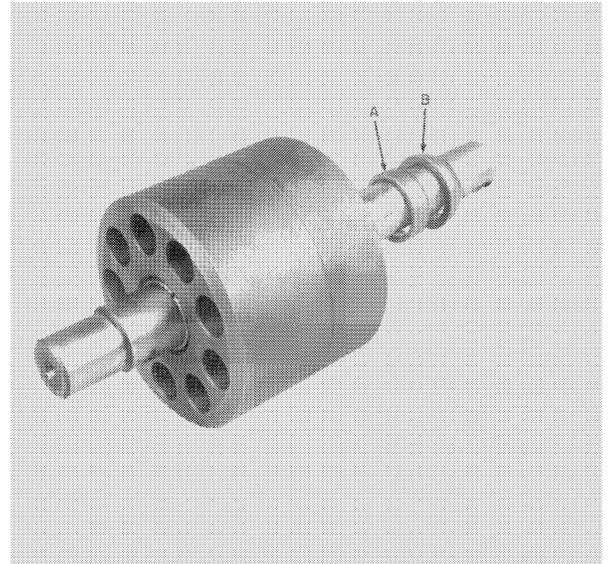


FIGURE 28

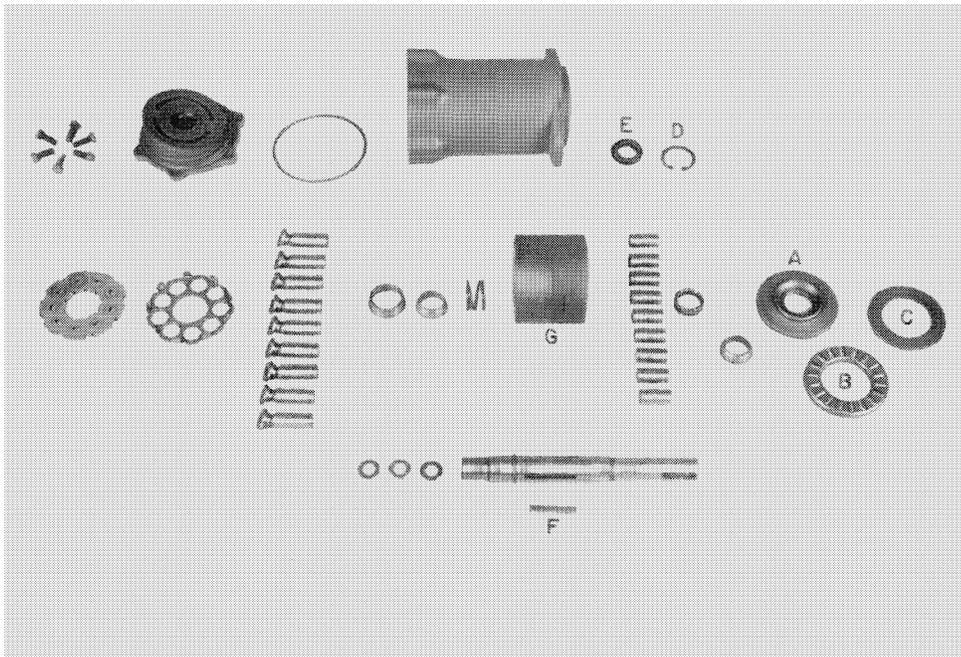


FIGURE 29

12. Remove piston race assembly, A, thrust bearing, B, and thrust washer, C, Figure 29. Remove retaining ring, D, and seal, E, from housing.

## Inspection

1. Wash all parts thoroughly in a cleaning solvent.
2. Examine the needle bearings in the housing. If the needles do not have excessive play and remain in the bearing cage, there is no need to replace the bearings.
3. Inspect all components for wear or scoring marks. Replace all questionable parts as required.

## Assembly

1. Install snap ring on shaft if it was removed and install key, F, Figure 29.
2. Slide piston block, G, Figure 29, on shaft with bore chamfer toward snap ring.
3. Lubricate the pistons and install in the piston block as shown in Figure 27. **NOTE: Pointed ends of pistons are pointed outward toward long end of shaft.**
4. Slide spacer, A, and pivot, B, Figure 28, on shaft.
5. Position housing with open end up. Lubricate thrust washer, C, Figure 29, and install in housing.
6. Slide piston race assembly, A, and thrust bearing, B, Figure 29, on shaft.
7. Lay housing on side and insert lubricated shaft and piston block assembly in housing. Make sure parts are properly aligned and seated.

8. Place the splined end of shaft in a protected jawed vise with open end of housing up. Let shaft hang through housing to keep parts in position.
9. Place spring, C, Figure 26, over shaft. Lubricate and assemble pistons in spider as shown in Figure 25. Assemble pivot, B, and spacer, A, Figure 26, and piston assembly into piston block as shown in Figure 24.
10. Lubricate shoes of pistons and lay flat part of connector plate, A, Figure 24, over pistons.
11. Install new O-ring, C, Figure 23, on back plate. Lay thrust washers and thrust bearing, D, on end of shaft. Install back plate and rotate back plate until all bolt holes are properly aligned. Install bolts and tighten to 15-18 ft. lbs. (20-24 N·m) torque.
12. Remove assembly from vise and install new shaft seal, E, Figure 29. Install retaining ring, D.

## HYDROSTATIC PUMP AND GEARBOX START-UP

Before running the gearbox and pump on tractor, fill gearbox and pump at least half full of hydraulic oil (refer to operator's manual for approved oils).

Connect all lines securely and fill oil reservoir to proper level. Start tractor and run machine slowly under no load for 10 minutes. Re-check hoses and oil reservoir level before operating machine in field.

# HYDRAULIC CYLINDERS

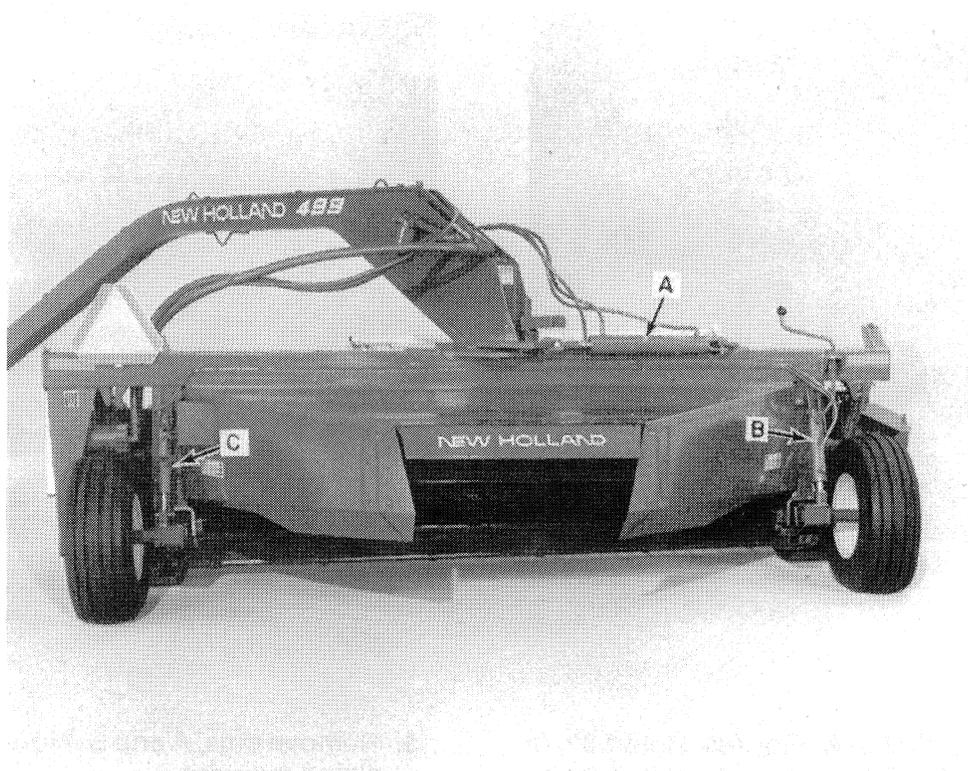


FIGURE 30

Three different cylinders are used on the machine. The swing cylinder, A, Figure 30, is a double-acting cylinder. The right lift cylinder, B, is a master cylinder that supplies oil to the left lift cylinder, C. The left cylinder operates as a slave cylinder.



**WARNING: BEFORE ATTEMPTING TO REMOVE LIFT CYLINDERS, B AND C, FIGURE 30. DO THE FOLLOWING:**

1. Raise header with tractor hydraulics.

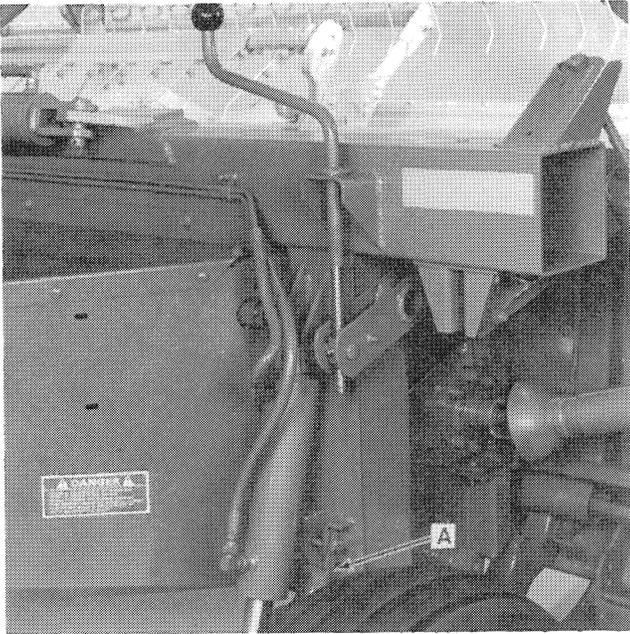


FIGURE 31

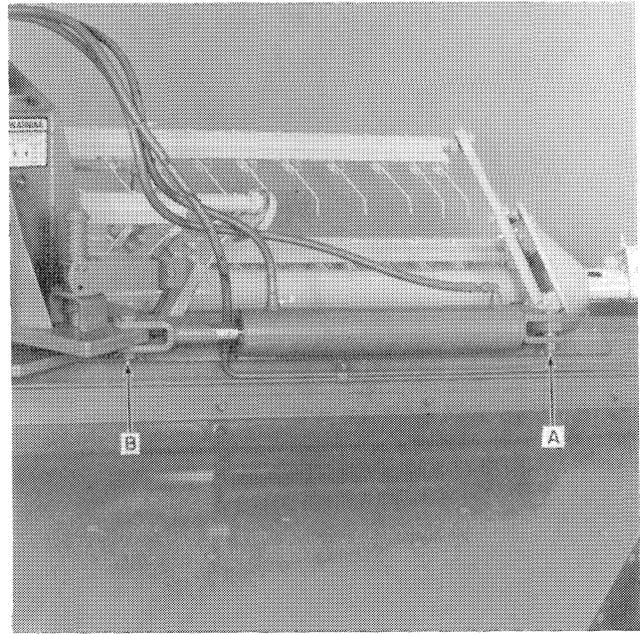


FIGURE 33

2. Engage stop links, A, Figures 31 and 32, in locked position as shown. Lower header so weight is carried on stop links.
3. Remove hoses at cylinder ports to remove either of three cylinders.
4. Remove pins, B and C, Figure 32, to remove lift cylinder. **NOTE: The left side is shown. The right side is similar.**

5. Remove pins, A and B, Figure 33, to remove swing cylinder.

#### SWING CYLINDER DISASSEMBLY

1. Remove three cap screws, A, Figure 34, and remove end cap. Drain oil from cylinder.

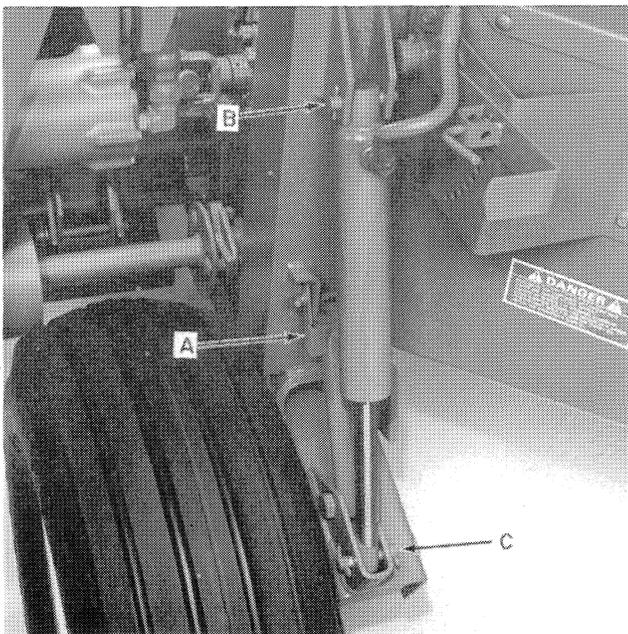


FIGURE 32

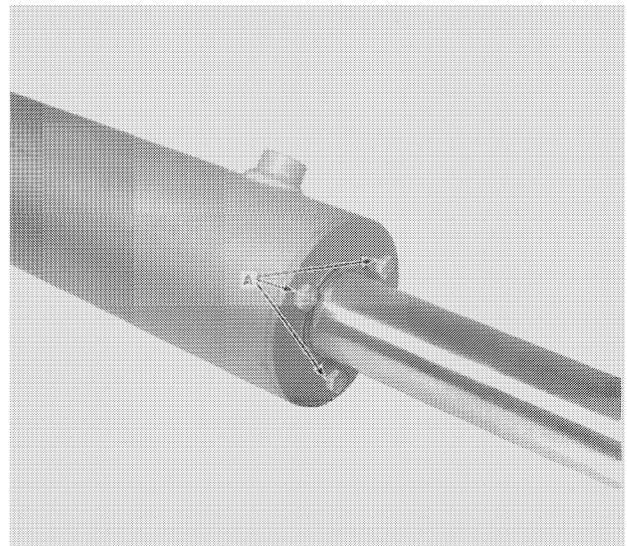


FIGURE 34

2. Tap cylinder head, B, Figure 35, into cylinder far enough to remove retaining ring, C, with a screwdriver.
3. Pull complete piston rod assembly out of barrel. **NOTE: Oil rings and seals must be replaced.**

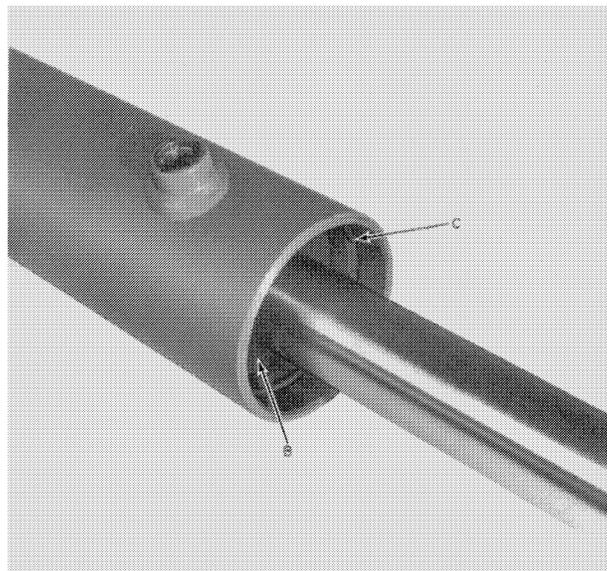


FIGURE 35

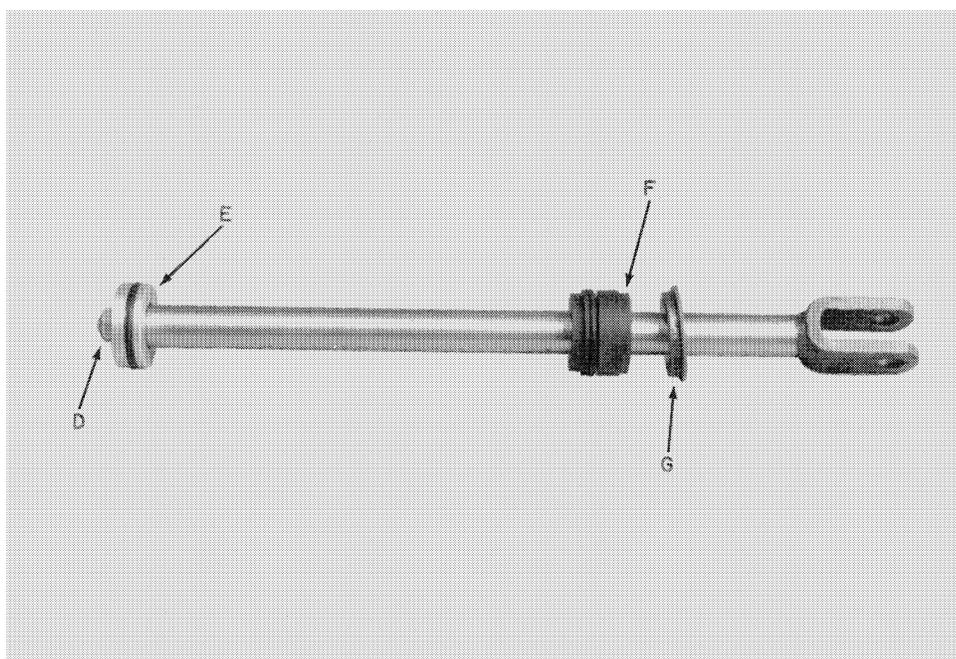


FIGURE 36

4. Remove rod nut, D, Figure 36, and remove piston, E, and cylinder head, F. Remove end cap, G.

### Inspection

1. Examine parts for wear and nicks. Remove any burrs inside cylinders.
2. Remove all seals and O-rings, carefully noting lip position on seals.

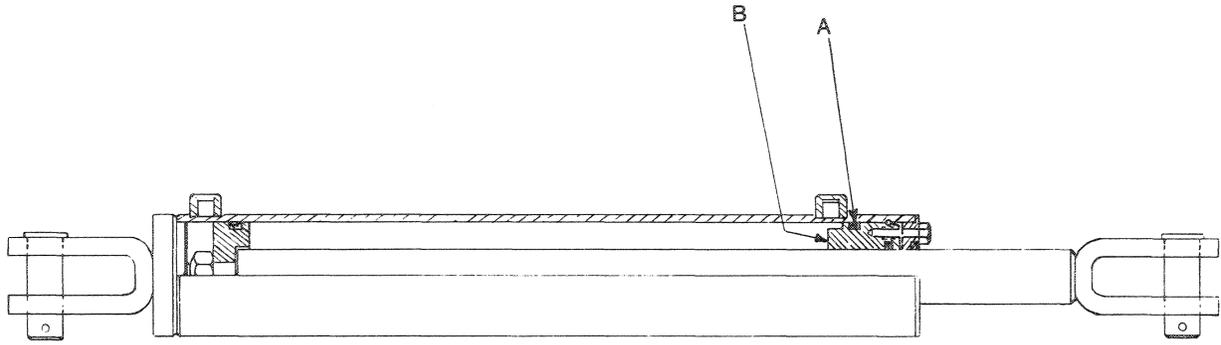


FIGURE 37

### Assembly

1. Lubricate all seals, O-rings, and sliding surfaces before assembly. **NOTE: Two different size seals, A, Figure 37, are included in seal kit for either style cylinder head, B.**
2. Install cap, cylinder head, and piston as shown in Figure 36. Tighten rod nut, D, to 250 ft. lbs. (339 N·m) torque.
3. Insert complete piston rod assembly into barrel and install retaining ring, C, Figure 35.

4. Install end cap and tighten cap screws to 8 ft. lbs. (11 N·m) torque.
5. Install cylinder on machine and tighten hoses securely.

### MASTER CYLINDER DISASSEMBLY

1. Remove set screw, A, Figure 38.
2. Tap the cylinder head, Figure 39, into cylinder far enough to remove retaining ring, B, with a screwdriver.
3. Pull complete piston rod assembly out of barrel. **NOTE: O-rings and seals must be replaced.**

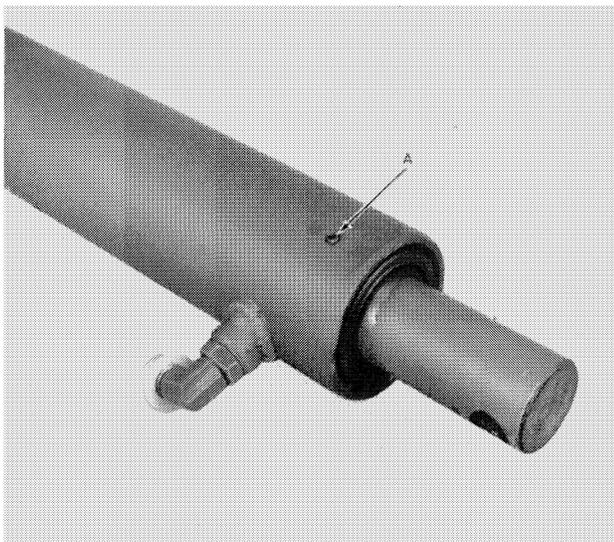


FIGURE 38

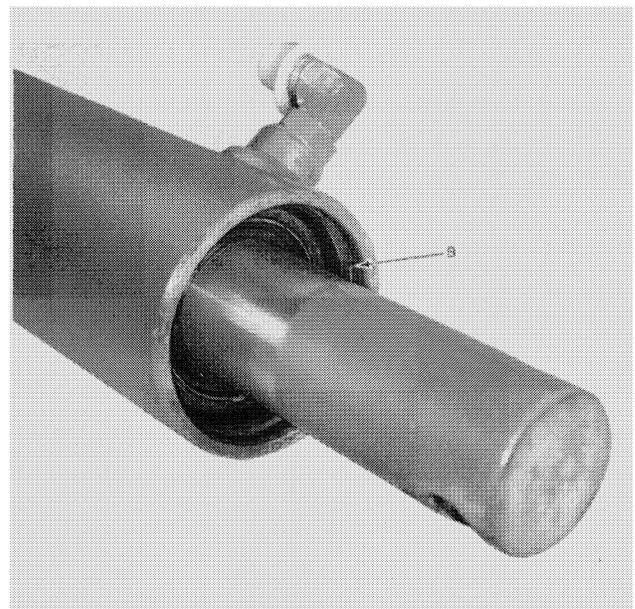


FIGURE 39

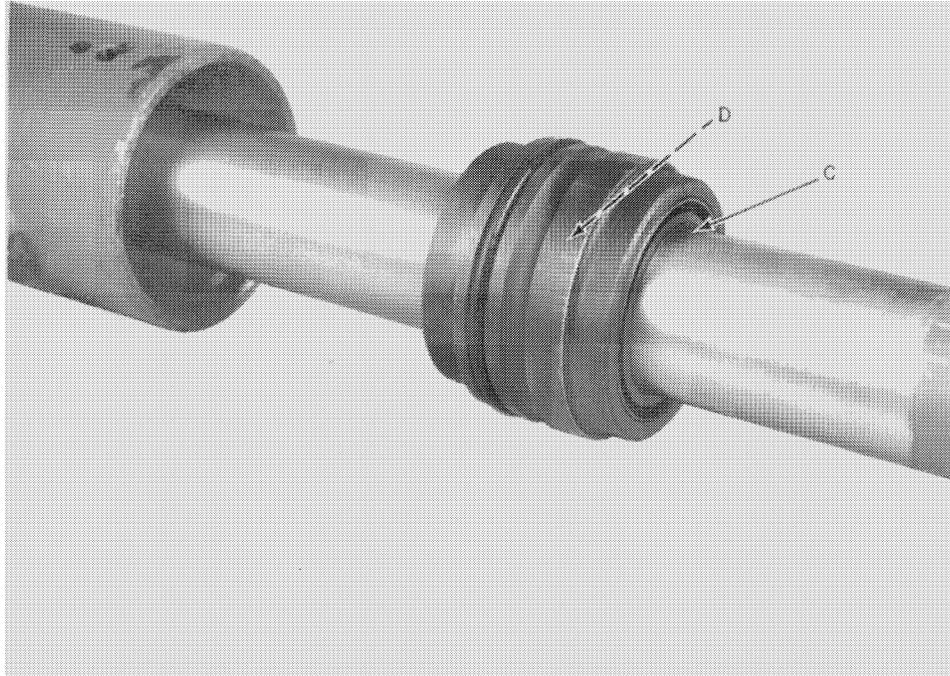


FIGURE 40

4. Remove rod nut, E, Figure 41, and remove piston, I, and cylinder head, H.

#### Inspection

1. Examine parts for wear or nicks. Remove any burrs inside cylinder.
2. Remove all seals and O-rings, carefully noting lip position on seals.

#### Assembly

1. Lubricate all seals, O-rings, and sliding surfaces before assembly.
2. Install new seal inside cylinder head, D, Figure 40. Install seal, C. Slide cylinder head assembly over piston rod.

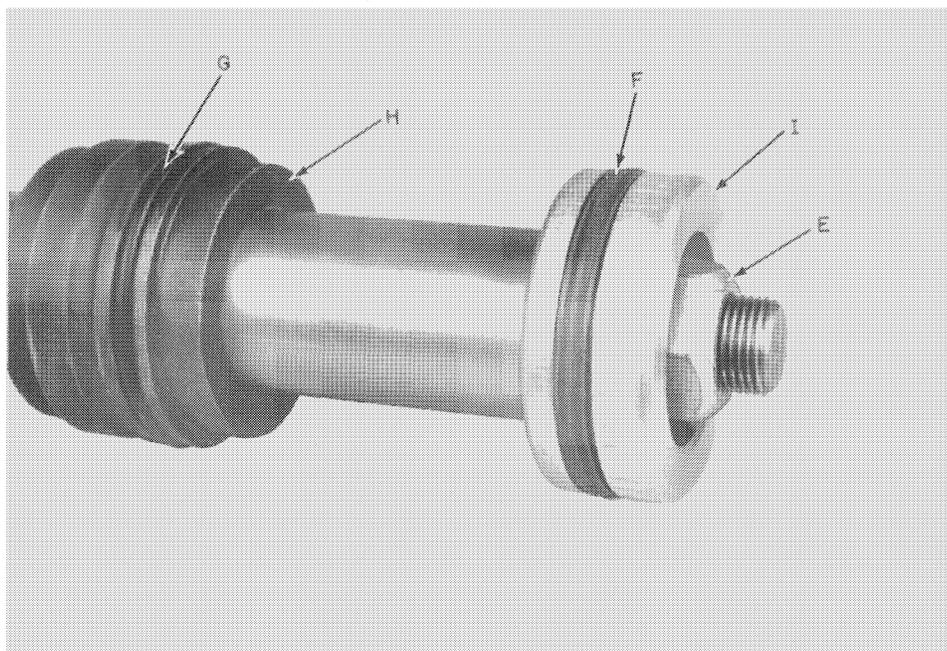


FIGURE 41

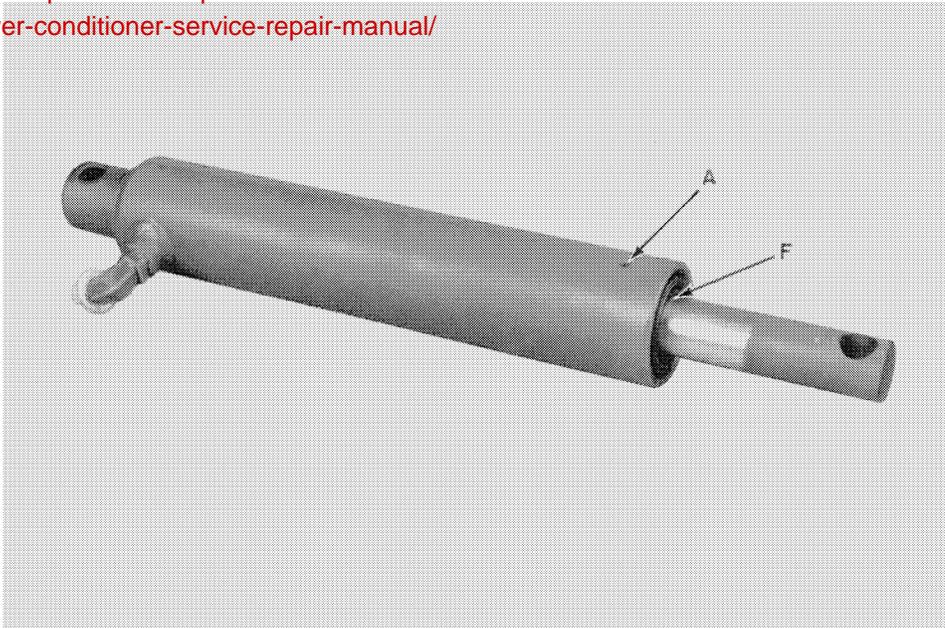


FIGURE 42

3. Install piston, I, Figure 41, and lock nut, E. Tighten lock nut to 155 ft. lbs. (210 N·m) torque.
4. Install O-ring, G, and seal, F, Figure 41.
5. Insert complete piston rod assembly into barrel and install retaining ring, B, Figure 39.
6. Install set screw, A, Figure 38, aligning it with groove in cylinder head, H, Figure 41.

### SLAVE CYLINDER DISASSEMBLY

1. Remove set screw, A, Figure 42.
2. Tap the cylinder head, F, Figure 42, into cylinder far enough to remove retaining ring, B, Figure 43.
3. Pull complete cylinder rod assembly out of barrel.

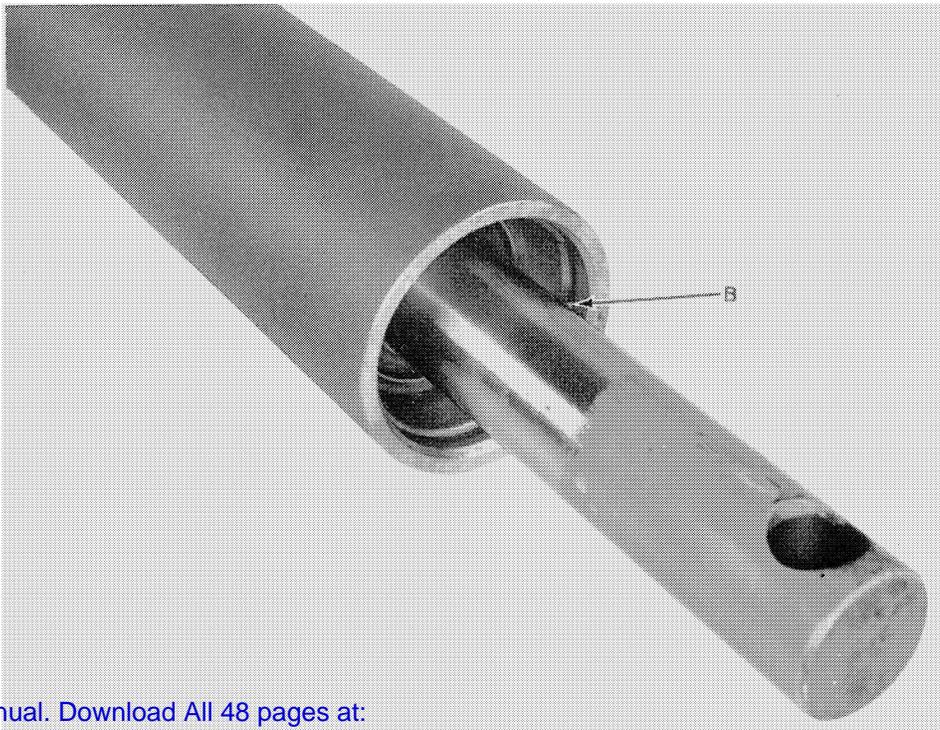


FIGURE 43