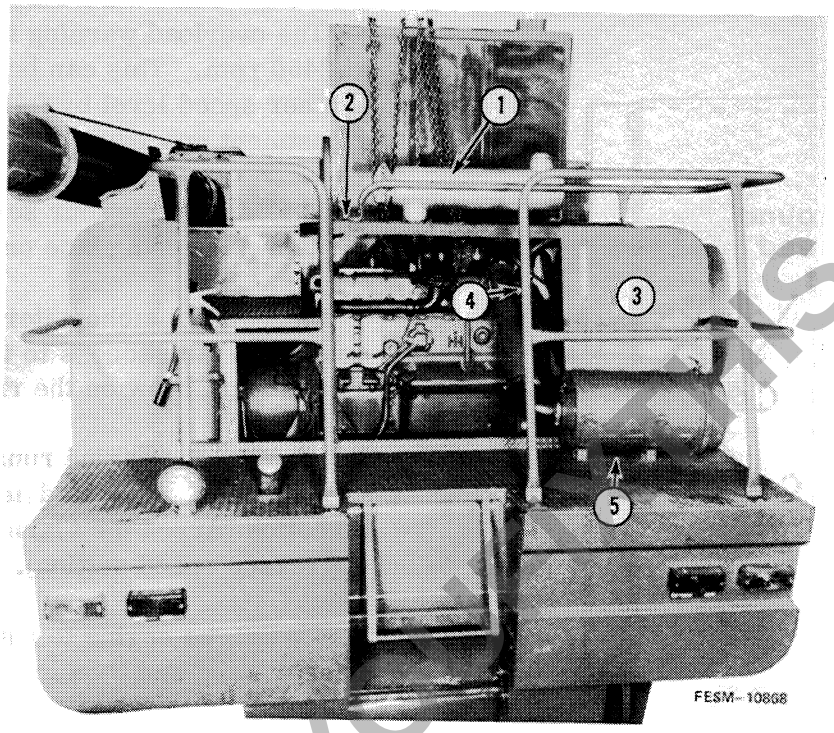
ENGINE

Removal



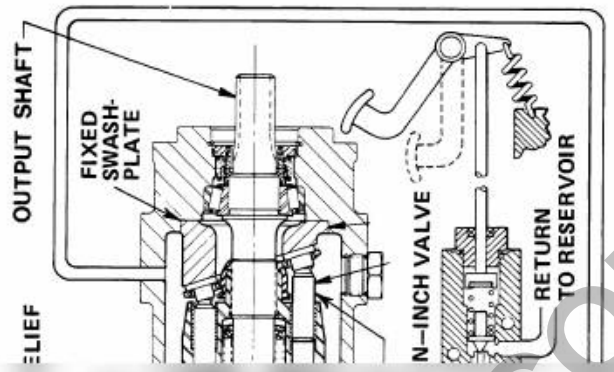
1. Muffler
2. Top hood
3. Side hood
4. Right hand rail
5. Air cleaner

1. Disconnect the battery.

2. Remove the right-hand railing, the muffler, the side and top hoods and the air cleaner.

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General Contents

Page

Safe Work Rules, Standard Torque Data for Nuts and Bolts, Metric Conversion Tables, Standard Torque Data for Hydraulic Tubes and Fittings, Flangette Bearing Installation, Special Service Tools Required, Service Information System (S.I.S.). . . . . IV – XVI

SECTION

1 ENGINE AND FUEL TANK

2 SEPARATOR DRIVE UNITS

3 HYDROSTATIC DRIVE

4 BRAKES, TRANSMISSION, DIFFERENTIAL, FINAL DRIVES, GUIDE WHEELS AND TRACKS

5 HYDRAULIC SYSTEM

5A ELECTO-HYDRAULIC SYSTEM

6 CUTTING AND FEEDING

7 THRESHING AND SEPARATING

8 CLEANING SYSTEM

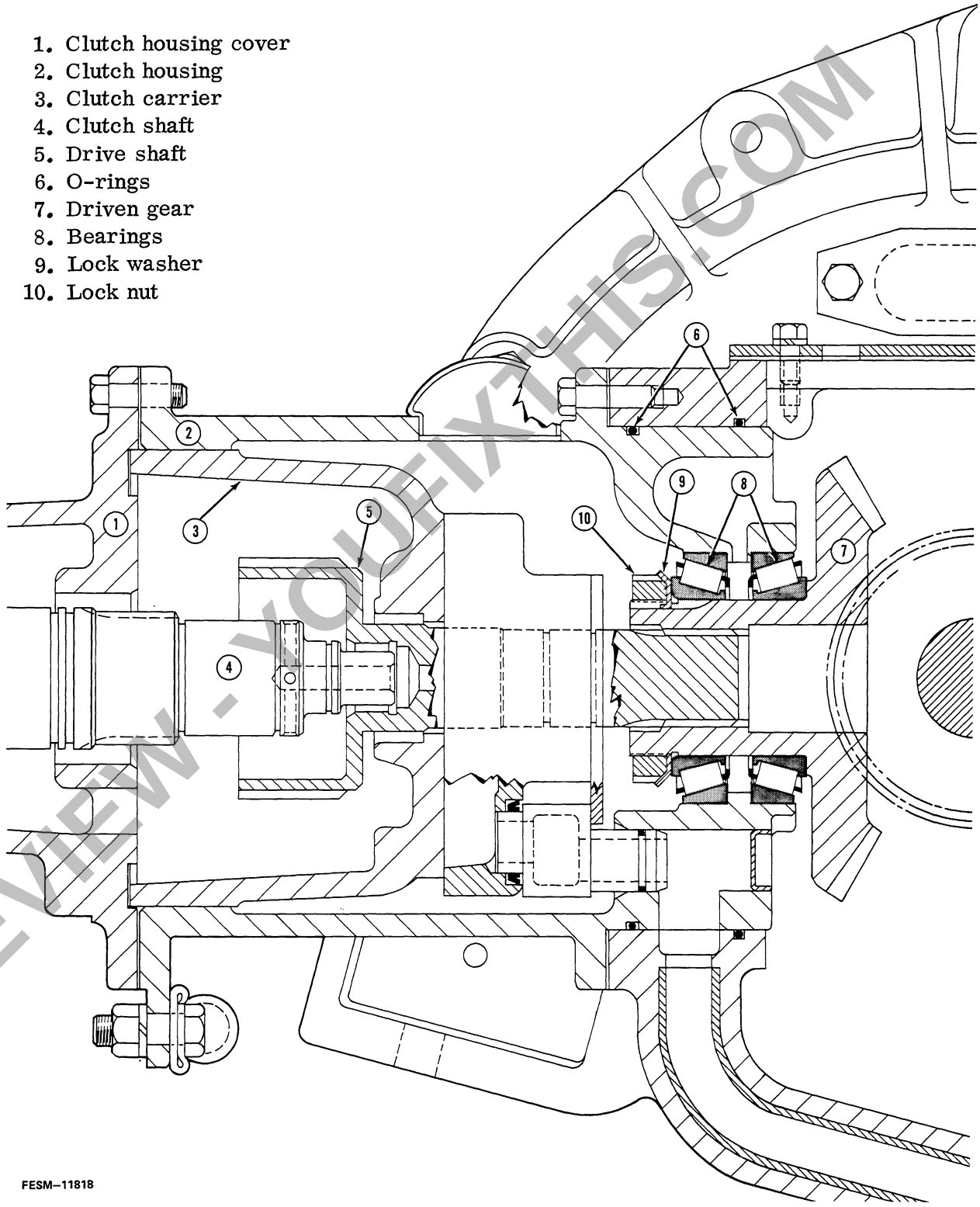
9 ELEVATORS AND GRAIN TANK

10 OPERATOR'S CAB AND ELECTRICAL SYSTEM

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1. Clutch housing cover
2. Clutch housing
3. Clutch carrier
4. Clutch shaft
5. Drive shaft
6. O-rings
7. Driven gear
8. Bearings
9. Lock washer
10. Lock nut



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Work is, therefore, done hydrostatically; the fluid is in a contained vessel under a "static" pressure. Although the fluid actually moves through the connecting lines, this is still considered as being under a "static" head and energy is transferred by the fluid, and not by the kinetic energy of the moving fluid. The fluid is considered as being non-compressible and, therefore, can be pictured as a "flexible solid" which conforms to the shape of the vessel containing it.

This illustrates the basic principles in their simplest form. Modern hydrostatic transmissions consist of multiple piston pumps and multiple piston motors arranged in a manner so as to continuously perform the transfer of energy shown in Illustration 1.

A modern piston pump is designed with a rotating shaft which imparts a reciprocating motion to its pistons pumping fluid in a continuous stream to a motor which accepts the fluid under pressure in its pistons, which in turn imparts a rotating motion to the motor shaft. This arrangement is still based on the basic principles shown in Illust. 1.

In a hydrostatic drive, there are only three basic items to control, these three items are:

1. Rate of fluid flow.
2. Direction of fluid flow.
3. Fluid pressure.

Since infinite control of these three basic items is possible, it therefore follows that a hydrostatic drive is infinitely controllable. Infinite control over the rate of fluid flow results in control of the output speed. Infinite control over the direction of fluid flow results in control of the direction of the output shaft. Infinite control over the fluid pressure results in control of the magnitude of force applied to the output shaft. Therefore, infinite control over the speed, direction and magnitude of force of the output shaft is obtainable.

Hydrostatic drives can be arranged in what are termed "open circuits" and "closed circuits". Open circuits are those which draw fluid from a reservoir to the pump, then to the motor and back to the reservoir from the motor. Closed circuits are those where the pump and motor are looped together and the fluid recirculates from the pump to the motor and back to the pump. The only fluid introduced into the "loop" from the reservoir comes from the charge or make-up pump. The following text will deal with "closed circuits".

A hydrostatic drive consists of a pump and a motor. The pump can be either a fixed displacement type or a variable displacement type. The motor can be either a fixed displacement or a variable displacement type. These four basic elements can be combined in four different basic circuits. Our system uses a variable displacement pump together with a fixed displacement motor.

Illustration 2 shows a phantom view of a variable displacement, reversing swashplate pump. This pump is of the axial piston, rotating cylinder block design.

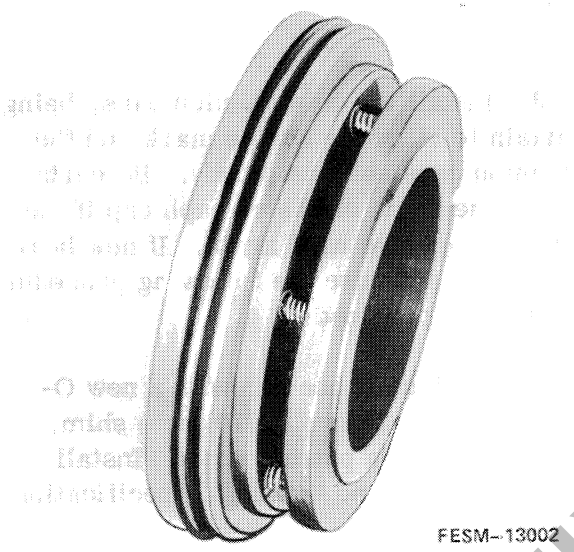
Referring to Illustration 2, the drive shaft, through a spline, drives the cylinder block. Nine pistons are located in the cylinder block and they reciprocate in the cylinder block. The distance they reciprocate depends on the angle the swashplate is tilted. The drive shaft and cylinder block are the only parts that rotate.

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Front Seal Assembly

1. Thoroughly clean all seal components and blow dry with compressed air.



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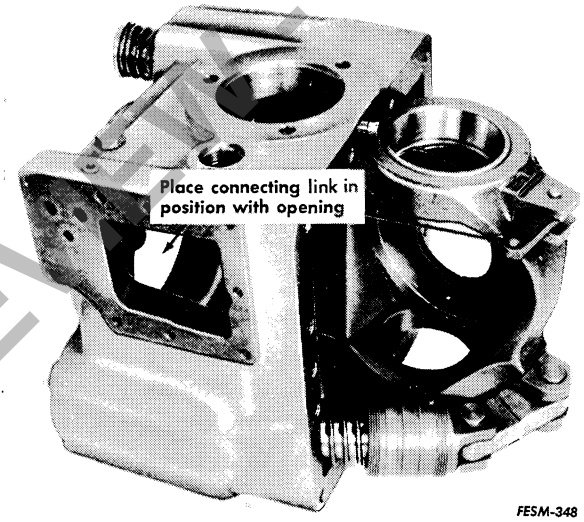
NOTE: If seal is to be used again, take care not to scratch the lapped faces of the two seal halves.

2. Check the seal springs for breakage.

3. Inspect the lapped surfaces of the steel half and bronze half of the seal. If the lapped surface is damaged in any way, replace the complete seal.

NOTE: In an emergency, the lapped surface of the seal may be re-lapped using 4/0 polishing paper. Use a figure eight motion when lapping.

4. If the seal halves are to be used again, wrap in a clean paper or lint free cloth and set aside.



FESM-348

Reassembly

NOTE: During reassembly, coat all parts with clean Hy-Tran. Replace all O-rings and gaskets.

1. If the trunnion bearings were replaced, press the new bearing races into the swashplate.

2. Coat the pistons and bearing races with Hy-Tran. Install the swashplate assembly into the housing. Be sure the control valve linkage arm on the swashplate is located at the control valve opening.

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SERVICE PROCEDURES
–SUNDSTRAND HYDROSTATIC PUMPS AND MOTORS–
GENERAL

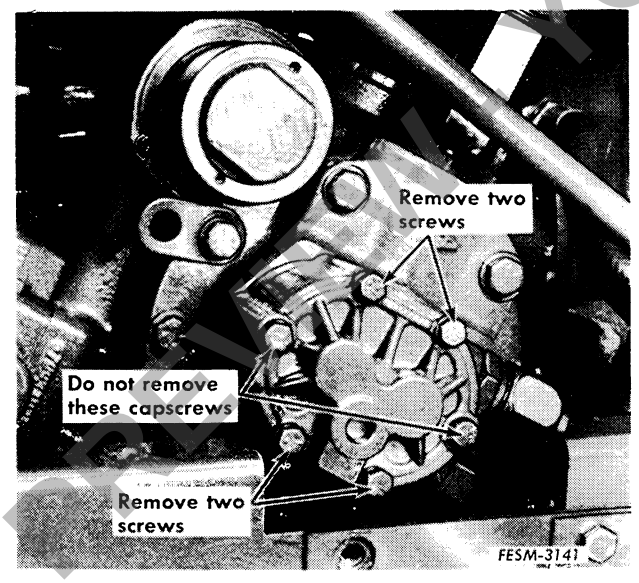
The life of any hydrostatic system is dependent upon keeping the system clean. It is not necessary to change the fluid everytime the system is serviced, unless the system has been contaminated due to failure of internal parts. However, each time the fluid is changed the filter element change period is the same as for a new machine. Replace the fluid filter element after the first 25 hours of operation, after the next 100 hours and every 300 hours thereafter. Be sure to use clean IH Hy-Tran when refilling the system.

Charge Pump Replacement, Check and Relief Valve Service

Removal

NOTE: In order to service the charge pump and/or check valves, the complete pump assembly must be removed from the combine and placed on a work bench.

1. Remove the hydrostatic drive pump from the combine. Refer to "Removal and Installation of the Pump".



Illust. 9. Charge pump removal.

2. Remove two capscrews from the top side and two capscrews from the bottom side of the charge pump.

NOTE: Do not remove the two capscrews located one on each side of the charge pump as these capscrews hold the pump together and are not used for mounting.

3. Remove the charging pump assembly. The assembly is located with a roll pin. It will, therefore, be necessary to overcome the friction of this roll pin when removing the charge pump.

CAUTION: Do not use sharp tools to pry the pump loose. It may scratch the sealing surface and cause leakage when the charge pump is installed. If the charge pump will not break loose, tap lightly on the side of the charge pump housing, using a soft hammer.

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3. The valve must be replaced under the following circumstances:

(a) If washer does not move as described in step 2.

(b) If washer movement appears to be erratic or sluggish.

(c) If any dimension shown in the illustration cannot be obtained.

Removal

1. Clean the area around the equalizer valve and master cylinders.

2. Loosen the nuts on the two master cylinder to equalizer valve tubes. Loosen the nuts on the right and left upper brake tubes.

3. Remove the equalizer valve retaining bolts and remove the valve.

Installation

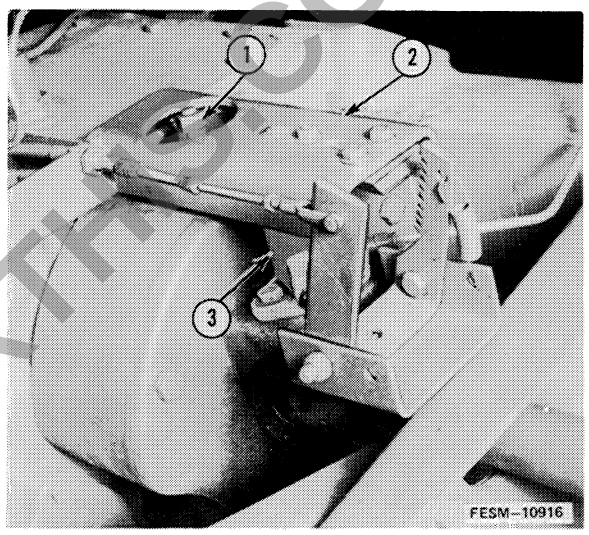
1. Install new valve in reverse order of removal.

2. Bleed the brake system. Refer to instructions given under "Bleeding the System".

Brake Cylinders

Removal, Disassembly, Inspection & Repair

-1460 S/N 32000 and below-
-1480 S/N 34000 and below-



1. Brake adjusting nut
2. Brake lever
3. Brake cylinder

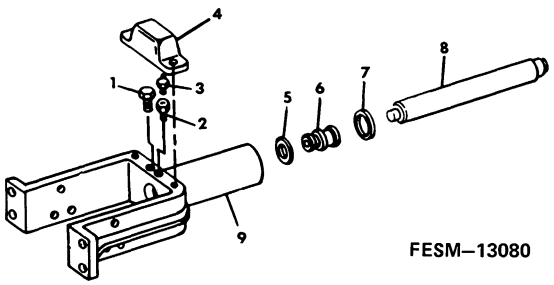
1. Measure thread exposed above the brake lock nut adjusting nut so that this can be used when reassembling to save time in final adjustment.

2. Remove the lock nut from the brake adjusting nut and turn the adjusting nut against the brake cylinder lever to release part of the spring pressure on the cylinder lever.

3. Unlatch the brake return spring and back off the adjusting nut to the top of thread area.

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Hydraulic Track Adjuster



FESM–13080

1. Relief valve
2. Check valve
3. Lubrication fitting
4. Valve shield
5. Seal
6. Piston body
7. Scraper
8. Adjuster rod
9. Rear idler fork

Description

(Reference numbers refer to the exploded view)

The hydraulic track adjuster is located between the pivot shaft bulkhead and the rear idler. The idler fork supports the rear idler and serves as a cylinder for the piston assembly. The adjusting rod (8) is supported by the bulkhead at the front and the cylinder of the rear idler fork.

Lubricant is introduced into the cylinder through a lubrication fitting (3) located on the idler fork. This lubricant, acting upon the piston assembly and adjusting rod within the cylinder, forces the idler fork and rear idler forward for track adjustment. A relief valve (1) on the idler fork prevents overloading of the track due to mud and dirt build-up in the track assembly and is also used to relieve track chain tension for removing the track chain.

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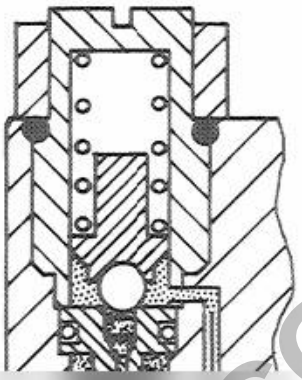


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The secondary system relief valve is located in the passageway between the two flow dividers and is exposed to flow at the inlet end of the secondary flow divider. This relief valve controls the maximum fluid pressure to the reel lift and unloader auger swing sections of the stack valve and to the steering hand pump.



Both relief valves function in the same

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UNLOADER AUGER SWING VALVE

Dissassembly

1. Remove the palnut securing the coil cap. Remove the coil.

2. Remove the sleeve assembly, wash-

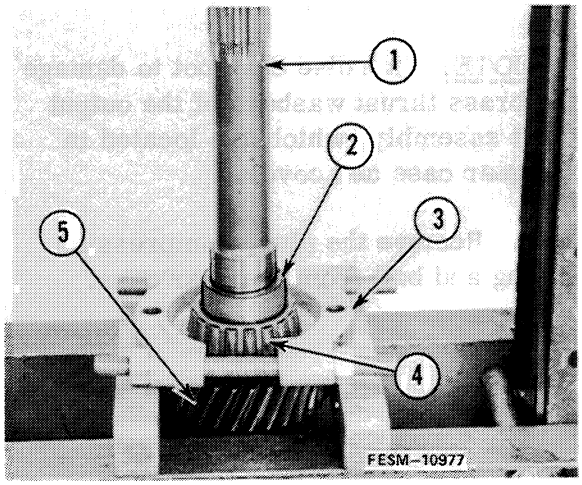
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Input Shaft

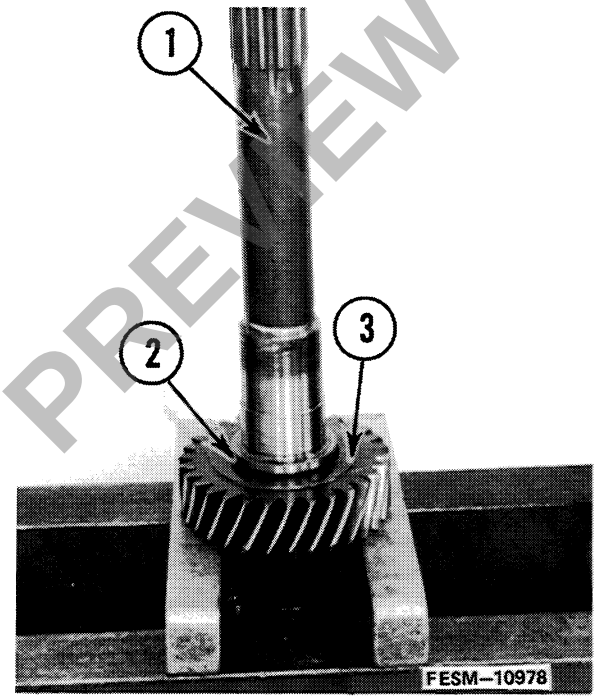
Disassembly



1. Using a 17–473–23 bearing puller attachment between the bearing and pinion gear press or pull the bearing and spacer from the shaft.

2. Press the shaft from the bottom bearing in the same manner.

1. Input shaft
2. Spacer
3. 17–473–23 Bearing puller attachment
4. Bearing
5. Pinion gear



3. Remove the retaining ring and press the shaft from the pinion gear.

1. Input shaft
2. Snap ring
3. Pinion gear

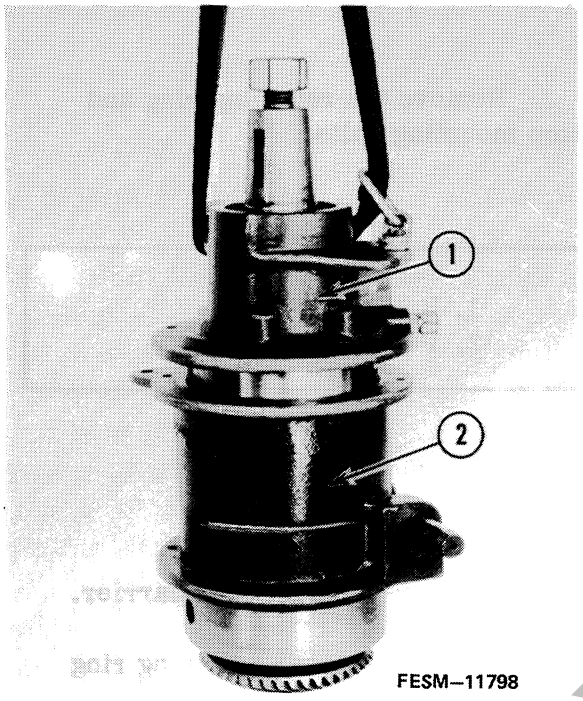
Inspection

1. Wash all parts in cleaning solvent and dry with compressed air.

2. Check the bearings for roughness, damage or wear and replace if necessary.

3. Check the gears for damaged teeth, worn spots or distortion.

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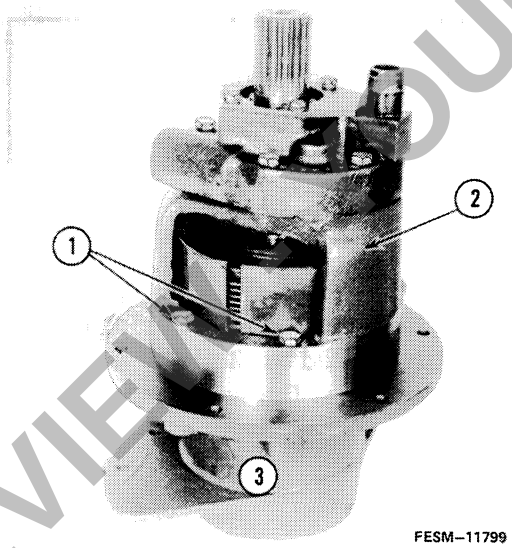


FESM–11798

1. Separate the clutch assembly from the clutch housing.

NOTE: Place alignment marks on the two housings to help index the two pieces upon reassembly.

1. Clutch assembly
2. Clutch housing



FESM–11799

2. Remove the clutch carrier retaining bolts and separate the carrier and drive shaft assembly from the clutch cover.

1. Carrier retaining bolts
2. Clutch carrier and drive shaft assembly
3. Clutch cover

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HOW IT WORKS

The hydrostatic drive consists of a hydrostatic pump, filter, oil cooler, reservoir and high and low pressure fluid lines. Hydraulic fluid is pumped through high pressure lines forming a closed loop circuit between the pump and the motor.

The direction and volume of fluid in this circuit is controlled by a mechanically operated valve mounted on the variable displacement pump. A charge pump provides fluid pressure and flow to the valve and a positive fluid supply to the system.

Fluid from the charge pump is directed through the two check valves in the pump end cover. The charge pump/check valve combination provides fluid to both sides of the hydrostatic circuit and fills or primes all lines, valves, etc.

When the circuit is primed, the charge pump flow dumps across the charge pump relief valve to the pump housing to aid in cooling and flushing the pump. The fluid then returns to the reservoir passing through the oil cooler.

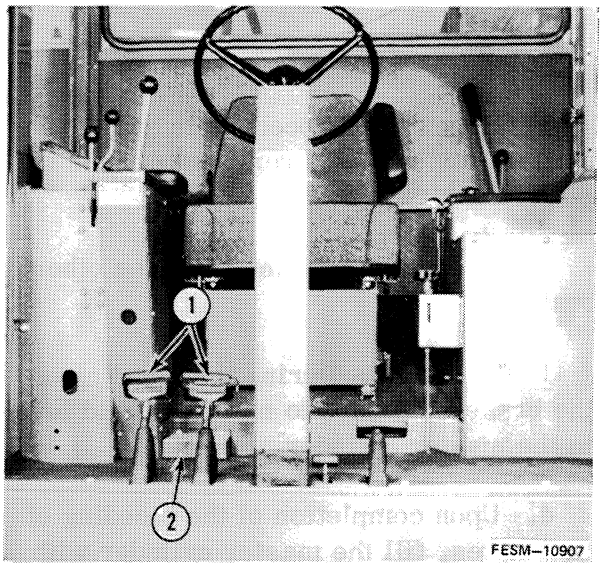
Neutral

The reversible variable flow displacement pump is driven directly from the engine. The fixed (or variable if so equipped) motor is mounted on the transmission. The two units are connected by hydraulic lines.

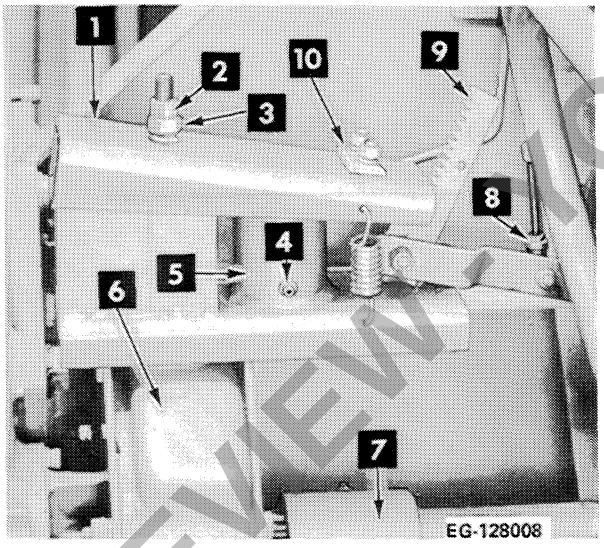
The variable displacement pump is held in a positive neutral position by centering springs located between the servo control sleeves and servo pistons which are connected to the variable swashplate.

The variable swashplate must be maintained in a true neutral location to prevent reciprocation of the pistons in the pump cylinder barrel.

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1. Brake pedals
2. Master cylinder cover



1. Brake lever
2. Brake adjuster jam nut
3. Brake adjuster nut
4. Bleeder valve
5. Wheel cylinder
6. Brake
7. Drive shaft sleeve
8. Parking brake cable and adjuster
9. Ratchet sector
10. Ratchet bar

Brake Housing

1. Set the transmission in neutral and jack up the wheel to be adjusted.

2. Adjust the brake adjusting nut until wheel turns freely.

3. Tighten the brake adjusting nut while rotating the wheel until wheel drag locks the wheel.

4. Back off the adjusting nut 1 to 1-1/2 turns and lock the nut.

5. Operate both brake pedals to insure that they are even and have equal pressure.

6. Operate the combine and check for overheating. If the brake cover is hot loosen the adjusting nut and repeat the procedure.

Parking Brake

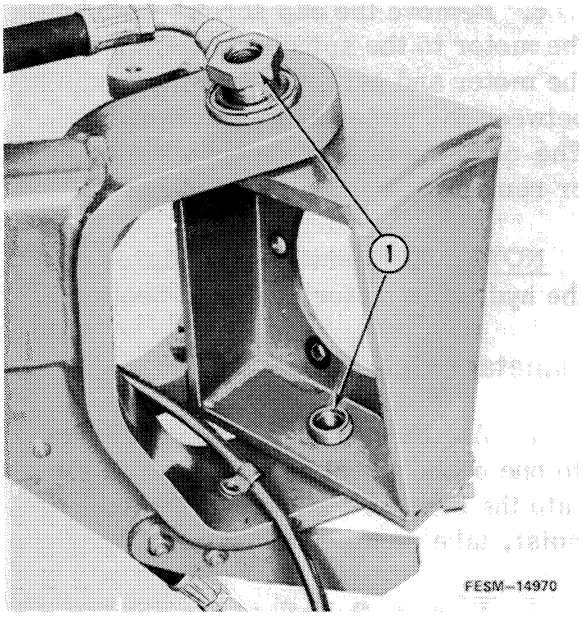
1. To engage parking brake, depress the left brake pedal. With the pedal depressed pull up on the parking brake lever and turn to lock. Flashing warning light on control panel will indicate to operator the brake is in "on" position.

2. To release, depress the left brake pedal and turn the parking lever to unlock and push down to turn off warning light.

3. The parking brake cable has an adjustable clevis on the brake ratchet sector. With the left-hand brake pedal depressed, adjust the cable so that the ratchet sector will engage the ratchet bar when the parking brake lever is pulled up and locked.

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13. Unscrew and remove the pivot bolts from the box support assembly.

1. Ported pivot bolts



14. Using a suitable punch, drive downward on the outer race of the lower spherical radial bearing until there is enough clearance to remove the box support from the axle extension.

CAUTION! Be sure to use protective safety glasses when using the punch and hammer.

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Installation

The installation procedure is the reverse of the removal procedure.

Purge the system of air after the installation has been completed.

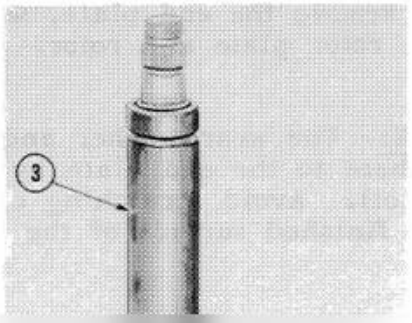
To bleed air from the hydraulic reel lift system, loosen the pipe plug in

To even the reel lift: The cylinders will synchronize with each other by momentarily holding the lift control valve "on demand" at either end of the cylinder stroke. Repeat cycle as necessary.

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Disassembly

IMPORTANT: Before disassembling the pump, scribe punch marks on the end plate, rotor plate, distributor plate and pump housing. This will keep the wear patterns of the plates in their original wear positions.

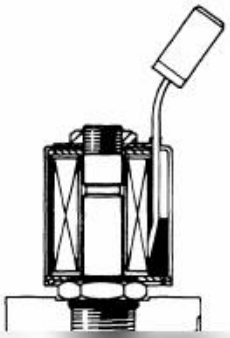
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Feeder Clutch Valve

Two different style clutch valves are available. The direct acting style valve has a solenoid operating a cartridge type directional spool. The pilot operated style valve has a solenoid operating a poppet and a hydraulic actuated, spring return directional spool.



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