John Deere
1214
Mower-Conditioner

JOHN DEERE

TECHNICAL MANUAL

John Deere 1214
Mower-Conditioner

TM1132 (01DEC74) English

John Deere Ottumwa Works
TM1132 (01DEC74)

LITHO IN U.S.A.
ENGLISH

1214 MOWER-CONDITIONER
TECHNICAL MANUAL
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CONTENTS

"All information, illustrations and specifications contained in this technical manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice."

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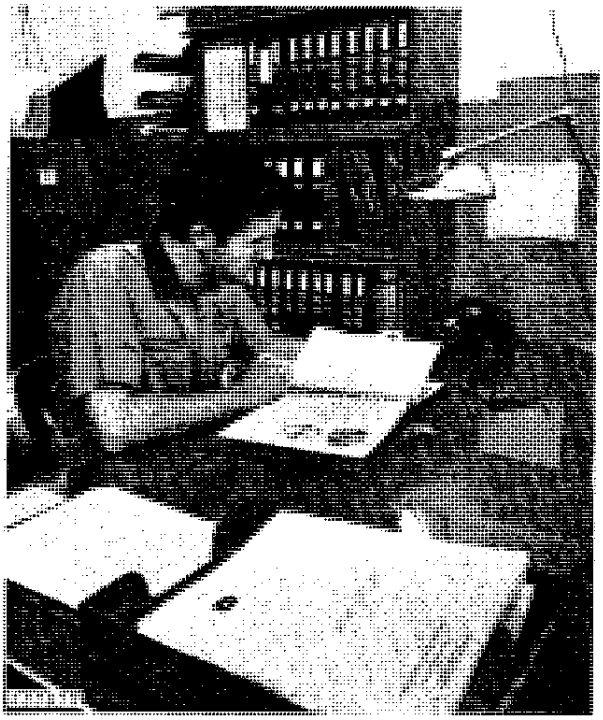
INTRODUCTION



Use FOS Manuals for Reference

Use Technical Manuals for Actual Service

This technical manual is part of a twin concept of service:

- **FOS Manuals — for reference**
- **Technical Manuals — for actual service**

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover *basic* theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new men and for reference by experienced men.

Technical Manuals are concise service guides for a *specific* machine. Technical Manuals are on-the-job guides containing only the vital information needed by a journeyman mechanic.

When a serviceman should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you — a journeyman mechanic. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

⚠ This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

SI UNITS OF MEASURE

Metric equivalents have been included, where applicable throughout this technical manual.

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GENERAL

DESCRIPTION

The 1214 Mower-Conditioner is driven by a pump attached to the tractor PTO shaft. The pump in turn drives the hydraulic motor which is attached to the cutting platform by a drive chain.

The platform can be hydraulically positioned behind the tractor for transport. This allows for maneuvering of the platform around trees, through gates and placing the machinery into transport and operating positions.

When servicing the mower-conditioner, pay particular attention to the tractor-mower-conditioner hookup geometry, Fig. 1.

Unequal angles occur if the tractor drawbar is not set for the proper length relative to the PTO operating speed. If the equal angles are not maintained, the following problems could occur.

1. Premature failure of the hydraulic components.
2. Damage to the hydraulic hoses.

The proper equal angle hitch hookup dimension is illustrated in Fig. 1.

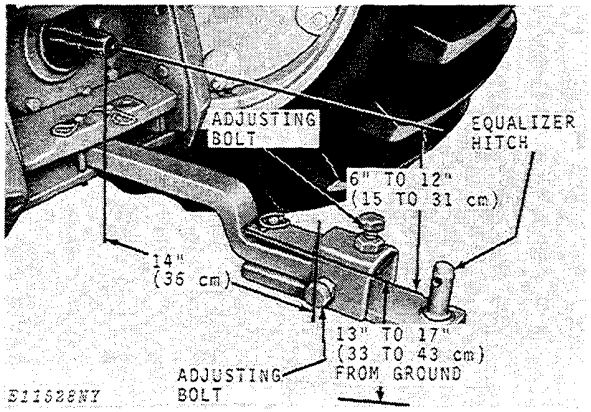


Fig. 1—Hookup Dimensions

See operator's manual for correct installation of pump.

TRACTOR REQUIREMENTS

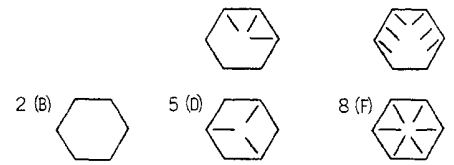
The tractor must have two hydraulic outlets; one for the two hoses which pivot the carrier frame and one for the single hose to lift the platform.

The tractor must have a 540 rpm PTO with a minimum of 60 horsepower to obtain the maximum capacity from the mower-conditioner.

TORQUE CHART

The table below gives correct torque values for various bolts and cap screws. Most hardware used is high-strength (note dashes on hex. heads).

RECOMMENDED TORQUE IN FT-LBS (Nm)
COARSE AND FINE THREADS



Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10 (14)	14 (19)
5/16	Not used	20 (27)	30 (41)
3/8	Not used	35 (47)	50 (68)
7/16	35 (47)	55 (75)	80 (108)
1/2	55 (75)	85 (115)	120 (163)
9/16	75 (102)	130 (176)	175 (237)
5/8	105 (142)	170 (230)	240 (325)
3/4	185 (251)	300 (407)	425 (576)
7/8	160 (217)	445 (603)	685 (929)
1	250 (339)	670 (908)	1030 (1396)
1-1/8	330 (447)	910 (1234)	1460 (1979)
1-1/4	480 (651)	1250 (1695)	2060 (2793)

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LUBRICATION

The mower-conditioner can operate efficiently only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

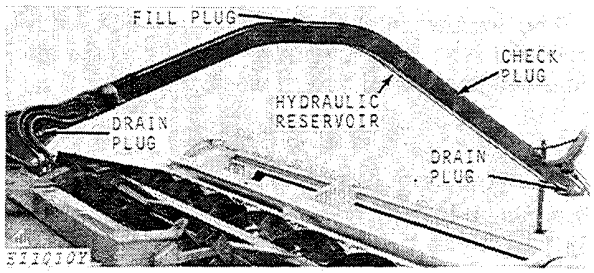

Fig. 2—Hydraulic Reservoir

CAUTION: Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, 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. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Checking Oil Level

Periodically check the oil level in the hydraulic reservoir.

IMPORTANT: Keep oil clean, free of dust, water, and sealing compound. Do NOT use hydraulic brake fluid.

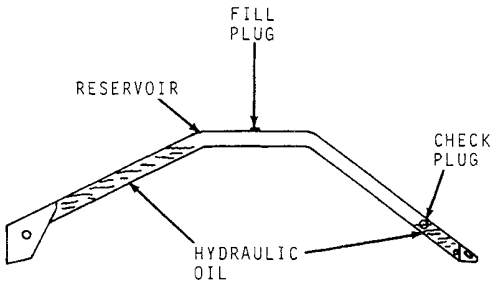

Fig. 3—Checking Oil Level

With the mower-conditioner attached to the tractor, remove fill plug and loosen check plug. If oil flows from check plug, retighten check plug and replace fill plug. If no oil flows from check plug, fill with John Deere Hy-GARD Transmission and Hydraulic Oil or its equivalent until flow occurs. Tighten check plug and replace fill plug.

NOTE: John Deere Hy-GARD Transmission and Hydraulic Oil may be added to or mixed with John Deere Type 303 Special-Purpose Oil.

Operate pump for two minutes and recheck oil level, filling as needed.

Draining Water

Periodically drain the water out of the tongue (reservoir). This is especially important after winter storage.

To drain, loosen front and rear drain plugs slightly and let water drip out. Drain until oil drips from plugs. Tighten drain plugs.

CAUTION: Do not over-loosen plugs or oil will spurt from holes.

Changing Filter

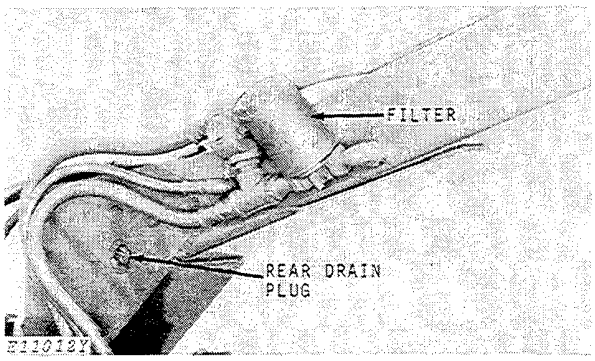

Fig. 4—Hydraulic Filter

Once each season change the hydraulic oil filter.

Loosen rear drain plug and drain rear of reservoir.

CAUTION: Take care when loosening drain plug.

Replace filter and refill rear of reservoir.

Draining Reservoir

To drain reservoir, loosen front and rear drain plug and remove oil.

Tighten plugs and refill, using 18 U.S. gals. (68 l) of John Deere Hy-GARD Transmission and Hydraulic Oil.

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HYDRAULIC DRIVES

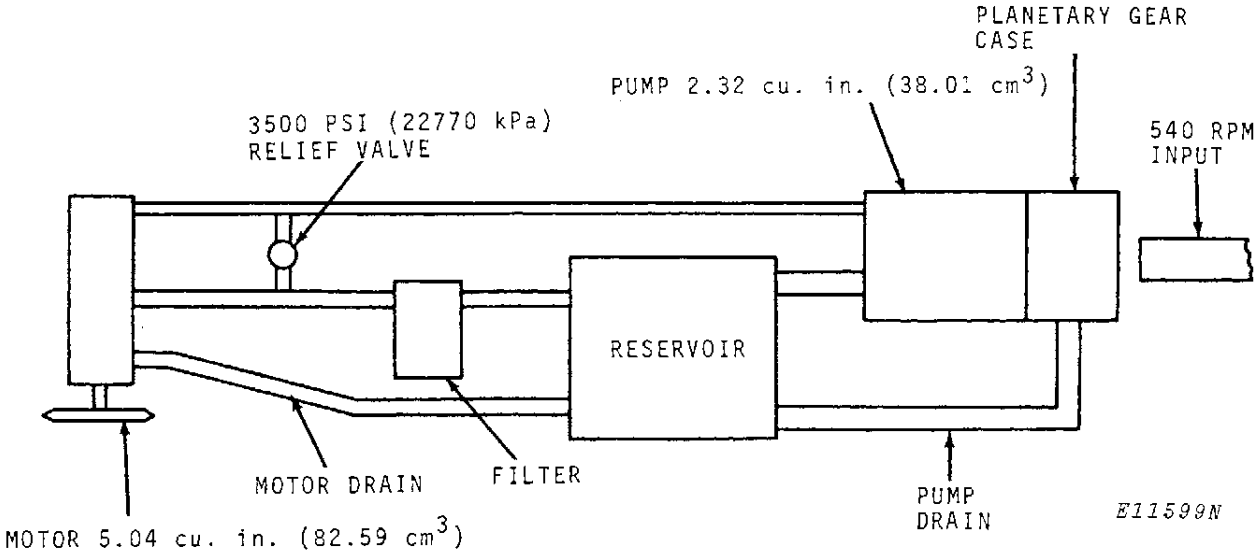

Fig. 1—Hydraulic System

GENERAL

Fig. 1 shows the principal components in the 1214 hydraulic drive circuit. The pump is a 2.32 cu. in. (38.01 cm^3) displacement pump driven at 2160 rpm. There is a four-to-one step-up from 540 rpm through the planetary gear case to obtain the 2160 rpm.

The motor is a 5.04 cu. in. (82.59 cm^3) displacement motor which drives the platform.

The relief valve is a 3500 psi (24132 kPa) valve which insures that damage will not occur to the motor due to excessive pressure.

The system is protected from contamination by a ten-micron filter which is attached to the hydraulic reservoir.

There are two drain lines, one from the planetary case and one from the motor. The line from the planetary case goes to the reservoir. The leakage of the pump drains into the planetary case and becomes the lubricant for the planetary. At the other drain line, the motor drain dumps directly into the reservoir.

The various components that make up the mower-conditioner hydraulic system are connected to each other by metal oil lines and rubber hoses.

IMPORTANT: When disconnecting a line or hose from a hydraulic component, always mark the end and the port from which it was removed so it can be connected to the proper port when reassembling. If lines or hoses are not connected to the proper ports, serious damage can result to the component or to the entire hydraulic system.

Use two wrenches when attaching a hose or line to a fitting to avoid excessive twisting of the line or hose. Check the entire length of lines and hoses to be certain they are not rubbing on moving parts or vibrating because of loose clamps.

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DIAGNOSING MALFUNCTIONS

Problem	Possible Cause
Motor Turns While Unloaded But Slows Down or Stops When Load is Applied	
	Scored back plate
	Scored connector plate
	Scored or worn piston shoes
	Low relief valve pressure
Motor Will Not Turn	
	Severly scored back plate and connector plate
	Contaminate particle holding connector off back plate
Rapid Tapping Noise in Motor	
	Free floating pistons seating on bearing race
	Noisy Pump Caused by Cavitation
	Oil too heavy
	Suction line plugged
Noisy Pump Caused by Cavitation	
	Oil too heavy
	Suction line plugged
Pump Shaft Seal Leakage	
	Worn shaft seal
	Excessive internal wear
Excessive Case Drain Flow	
	Excessive internal wear in pump or motor
Oil Heating	
	Oil supply low
	Contaminated oil
	Setting of relief valve too high or too low
	Wrong kind of oil
Foaming Oil	
	Low oil level
	Air leaking into suction line
	Wrong kind of oil

TESTING THE SYSTEM

Make a preliminary check of the reservoir, oil lines, connections and components.

Commercial testing equipment is available to assist in testing the pressure, rate of flow and temperature in the hydraulic system.

NOTE: When using a commercial tester, follow the instructions included with the tester for checking and testing the hydraulic system.

Testing Procedure

The basic procedure when testing the hydraulic system is to apply a controlled load to the system or a component of the system to check pressure and rate of flow.

Check the readings on the gauges of the test equipment against the specifications to determine if the system is functioning properly.

Preparing For the Test

Become familiar with the hydraulic system being tested. To properly interpret readings obtained on the pressure gauge or analyzer, the serviceman must know:

1. Pump and motor drain rate .....gpm (lpm)
2. Normal operating temperature .....degrees Fahrenheit (C)
3. System relief valve pressure .....psi (kPa)

If a hydraulic analyzer is used, read the operating instructions supplied with the analyzer and become familiar with the location of each gauge and operating control. Be sure the capacity of the analyzer is the same as or greater than the hydraulic system being tested.

⚠ CAUTION: When simulating work loads with the load valve, never exceed the rated pressure of the hydraulic circuit being tested.

Make any operating adjustments that may be required on the analyzer before the test is begun. (Refer to the analyzer operating instructions for this information.)

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Installing the Thermometer

The temperature of the oil should be checked at the check port of the reservoir. Be certain the stem of the thermometer extends down into the oil at least 3 or 4 inches (7.62 or 10.16 cm).

The test should be run with temperature at 110 to 120°F (43.3 to 48.9°C). All tests should be run within 10 degrees (5.6°C) of each other.

TESTS

Checking Relief Valve Pressure

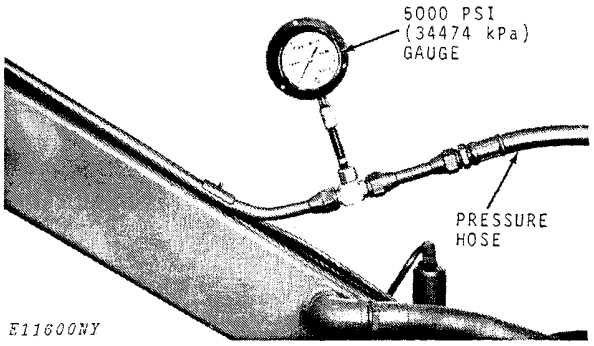

Fig. 2—Checking Relief Pressure

Install the 5000 psi (34474 kPa) pressure gauge in the pressure line (Fig. 2). Be certain to install the correct size fittings and tighten connecting fittings securely.

⚠ CAUTION: When operating at relief pressure, the oil will become extremely hot. Do not touch the reservoir or personal injury could occur.

With the tractor operating at full throttle and hydraulic oil at operating temperature, 110 to 120°F (43 to 49°C), check the pressure needed to operate the relief valve. The proper pressure needed must be between 3500 and 3600 psi (24150 and 24840 kPa). If this pressure is not met the relief valve may be defective. See RELIEF VALVE on page 26.

Checking the Pump Drain Rate

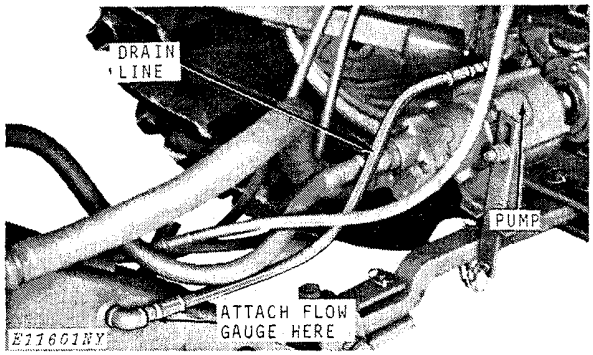

Fig. 3—Checking Pump Drain Rate

Connect flow gauge as shown in Fig. 3 to check pump drain rate.

Operate the tractor at full throttle until the oil reaches operating temperature, 110 to 120°F (43 to 49°C). The proper drainage should not exceed 3.5 gpm (13.2 lpm) at full pressure.

If the reading exceeds 3.5 gpm (13.2 lpm) there is excessive wear in pump. See PUMP, page 8.

Checking Motor Drain Rate

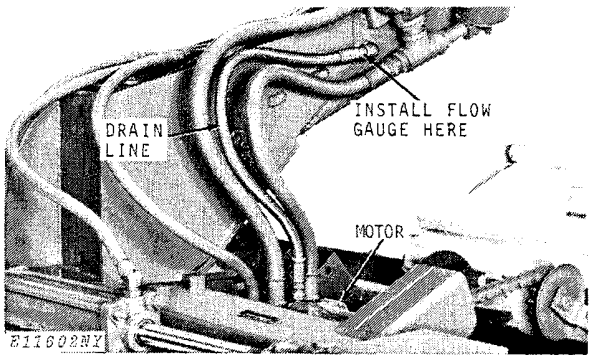

Fig. 4—Checking Motor Drain Rate

Connect flow gauge as shown in Fig. 4 to check the motor drain rate.

Operate the tractor at full throttle until it reaches operating temperature, 110 to 120°F (43 to 49°C). The proper drainage should not exceed 1.5 gpm (5.7 lpm) at full pressure.

If the reading exceeds 1.5 gpm (5.7 lpm), there is excessive wear in motor. See MOTOR, page 20.

HYDRAULIC PUMP

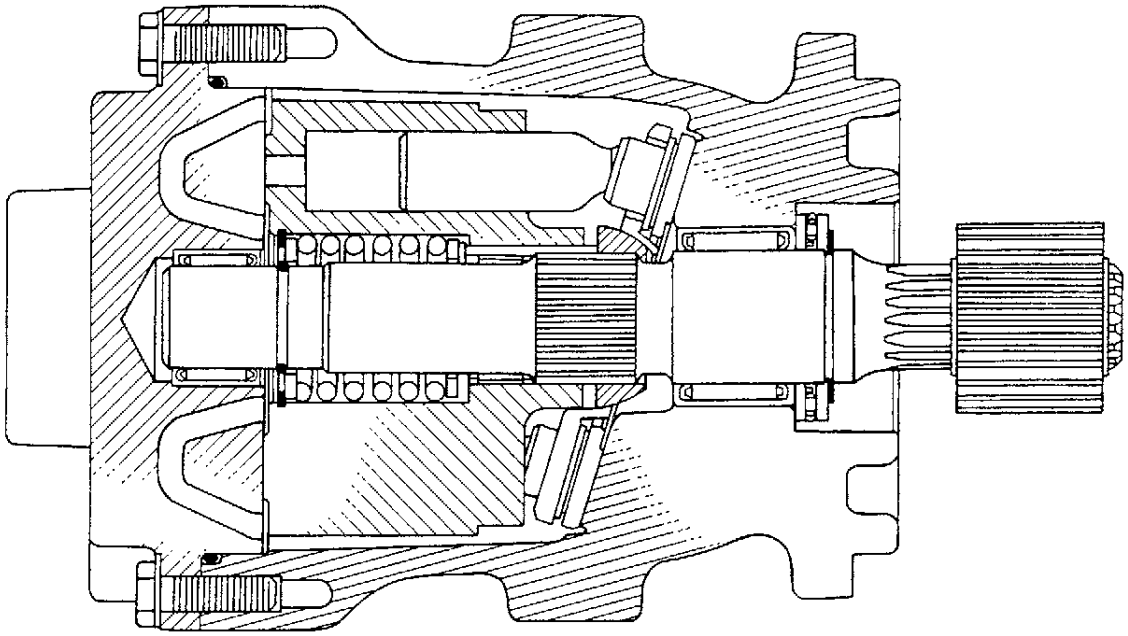

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Fig. 5—Hydraulic Pump Cross Section

General Information

Fig. 5 shows the internal parts of the hydraulic pump. The pump has a 2.32 cu. in. (38.01 cm^3) displacement and operates at 2160 rpm. This produces more than 21 gpm (79.5 lpm) of oil to the motor.

Diagnosing Malfunctions

See "Diagnosing Malfunctions" on page 6.

One important check on the pump is the amount of drain which is flowing to the reservoir. When the flow has exceeded 3.5 gpm (13.2 lpm), excessive wear is indicated. Excessive wear creates excessive heat which must be dissipated in the reservoir. See page 7 for testing drainage.

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Removal

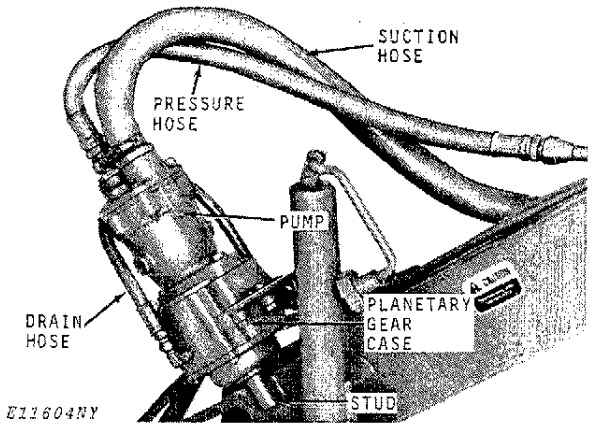


Fig. 6—Pump Hoses

Remove pump from tractor PTO shaft and place on transport stud.

Drain complete hydraulic system, see page 4.

Remove suction and high pressure hoses from pump.

Remove drain hose from planetary gear case.

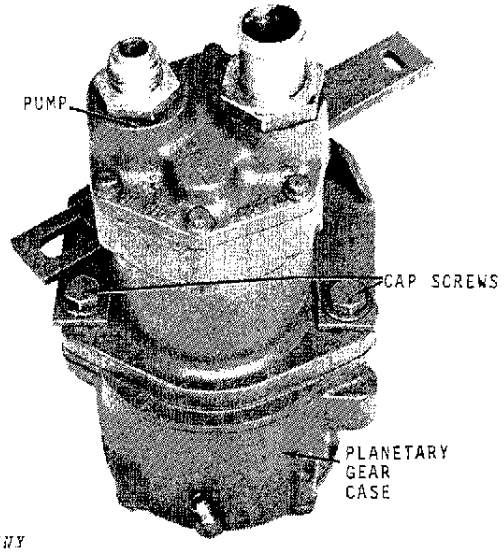
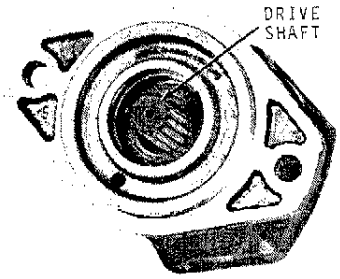


Fig. 7—Removing Planetary Gear Case

Remove two cap screws from pump and lift pump from planetary gear case.

Disassembly

Clean outside of pump thoroughly.



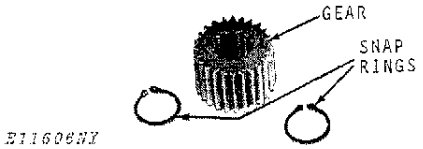


Fig. 8—Snap Rings and Gear

Remove snap ring from drive shaft and slide gear from shaft. Remove second snap ring from shaft.

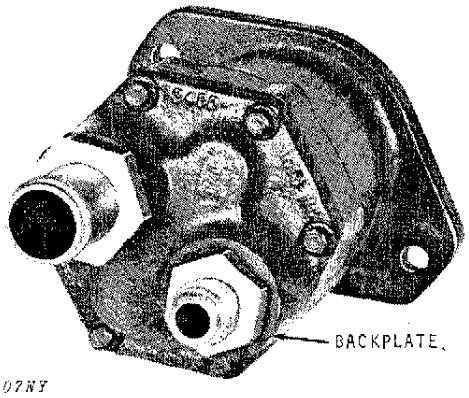


Fig. 9—Removing Backplate

Remove six 5/16 x 1-inch cap screws from backplate.

Using a plastic mallet, tap the backplate to loosen it; then pull the backplate straight up and out of pump.

Remove O-ring from backplate.

HYDRAULIC PUMP — Continued

Disassembly — Continued

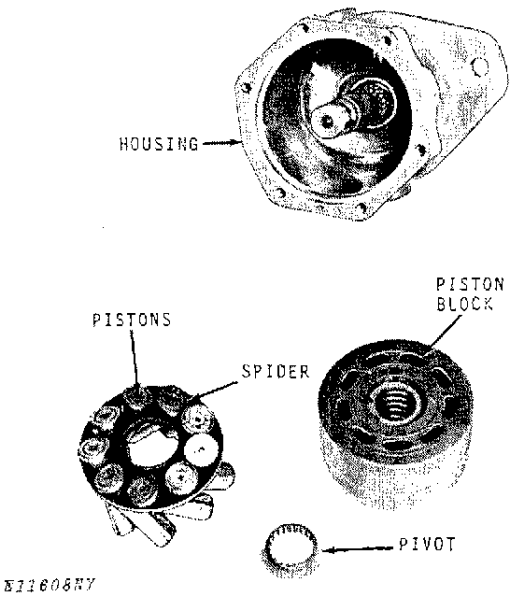


Fig. 10—Removing Piston Block Assembly

Remove the complete piston block assembly from the housing and shaft.

Remove pistons, spider and pivot from piston block assembly.

⚠ CAUTION: Do Not remove snap ring from piston block at this time. This will cause spring to fly from block and could cause personal injury. Follow procedure, on page 11, if the spring is to be removed from the piston block.

The piston block need not be disassembled unless the pins (18), Fig. 14 or spring (20) is damaged.

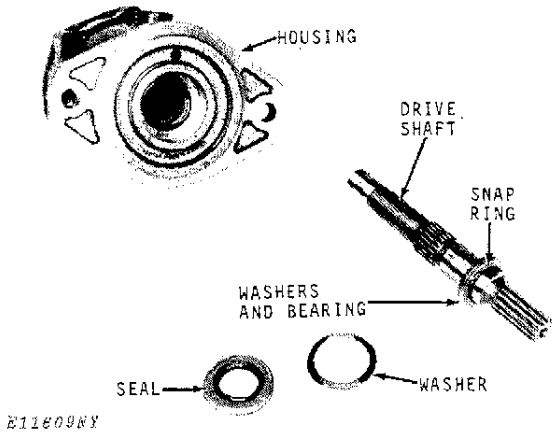


Fig. 11—Removing Drive Shaft

Remove snap ring (3, Fig. 14) from housing.

Remove shaft seal from housing. Replace with new seal during assembly.

Remove washer (5) from housing.

Remove drive shaft from housing.

Remove the two snap rings (6), thrust washers and thrust bearing from drive shaft.

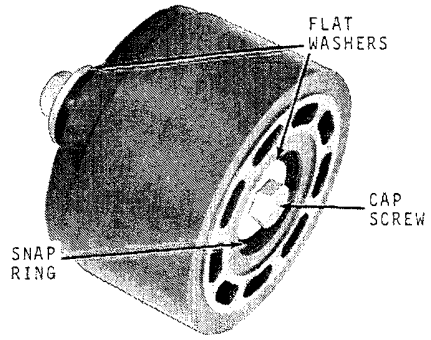


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Fig. 12—Removing Spring and Pins

Two 3/8 I.D. x 1-1/8 O.D.-inch flat washers, one 3/8 x 3-1/4-inch cap screw and one 3/8-inch nut will be needed to remove spring.

Place one flat washer over the cap screw and insert cap screw through the center of the piston block.

Place the other washer over the cap screw and let it rest on the three pins on back of the piston.

Thread nut or cap screw and compress the spring inside the piston block.

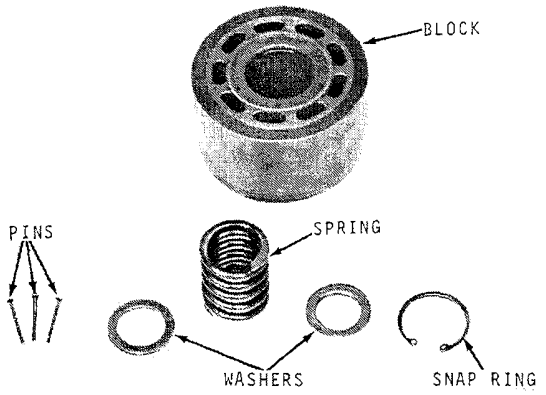

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Fig. 13—Spring Removed

Remove the internal snap ring.

Remove the cap screw and two flat washers.

Remove washers, spring, three pins and pin keeper from the block.

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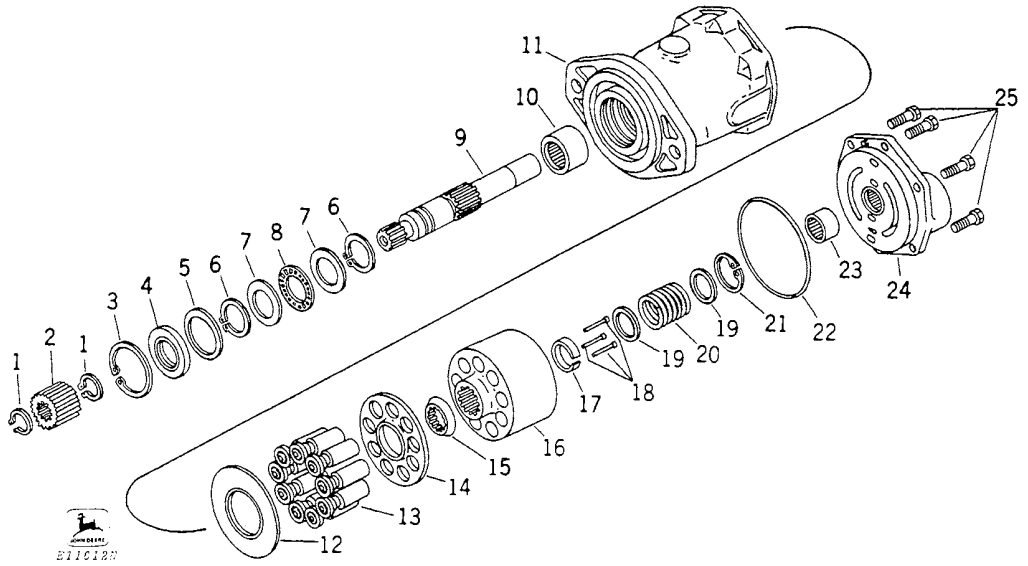
HYDRAULIC PUMP — Continued



1—Snap Ring (2 used)
2—Gear
3—Internal Snap Ring
4—Shaft Seal
5—Washer
6—Snap Ring (2 used)
7—Thrust Washer (2 used)
8—Thrust Bearing
9—Drive Shaft
10—Bearing
11—Housing
12—Thrust Race
13—Pistons
14—Spider
15—Spider Pivot
16—Piston Block
17—Pin Keeper
18—Loading Pin (3 used)
19—Washer (2 used)
20—Compression Spring
21—Snap Ring
22—O-ring
23—Bearing
24—Backplate
25—Socket Screw (6 used)

Fig. 14—Exploded View of Pump

Inspection

Wash all parts in clean solvent.

Examine needle bearings (10 and 23), Fig. 14 in housing and backplate. If needles are free of excessive play and are still in bearing cage there is no need to replace the bearing.

Inspect thrust washers (7) and bearing (8). All surfaces should be free of any signs of wear.

Inspect spider (14) and pivot (15). Conical surfaces should be free of wear and score marks.

Inspect the pistons (13). The O.D. surfaces should be smooth and free of scoring. The shoes should be snug fit to the piston. The face of the shoes should be flat and free of scoring and flaking.

Inspect the piston block (16). The bores should be free of scoring. The surface that contacts the backplate should be smooth and free of grooves or metal build-up.

Inspect the thrust race (12). The surface should show no signs of scoring or grooves.

Inspect the flat surface on the backplate (24). It should be free of excessive scoring or metal build-up.

Inspect the drive shaft (9) for wear on the bearing areas. Check spline area for twisted or broken teeth.

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Assembly

Lubricate all parts before assembly.

Install three pins in the special grooves of the spline with the head of pin toward the inside of block.

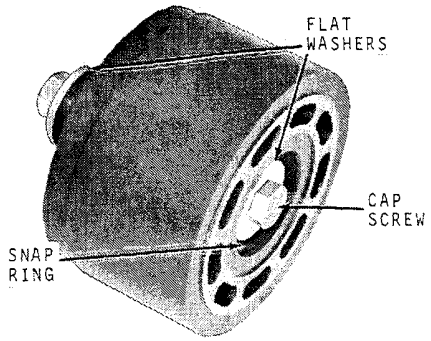

Fig. 15—Compressing Spring

Install one washer (19, Fig. 14), spring and second washer. Use the two 3/8-inch I.D. flat washers and the 3/8 x 3-1/4-inch cap screw to compress the spring. Install snap ring into piston block. Remove cap screw and flat washers.

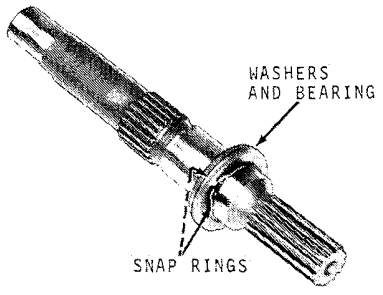

Fig. 16—Thrust Washers and Bearing

Install snap ring on rear groove on shaft. Slide one washer, thrust bearing and second washer on shaft. Install snap ring in front groove on shaft.

Replace needle bearing in housing, if necessary.

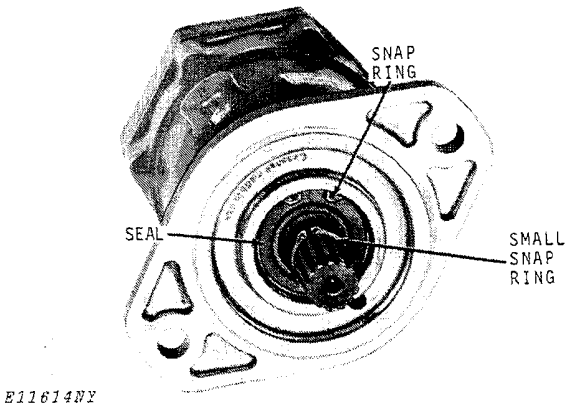

Fig. 17—Oil Seal and Snap Ring Installed

Install shaft in housing. Install washer (5, Fig. 14) on shaft. Oil I.D. of new shaft seal and press into housing. Retain with snap ring.

Install small snap ring into rear groove on drive shaft.

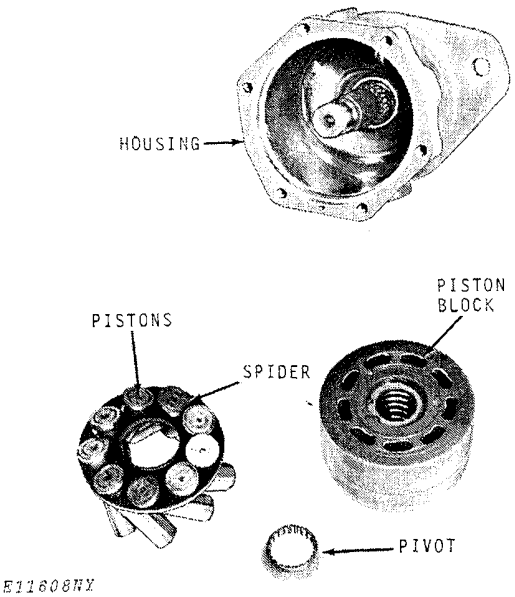

Fig. 18—Piston Assembly

Lubricate thrust race and install in housing. Place pivot on piston block. Install spider and piston assemblies in piston block.

Align splines of pivot and piston block. Slide onto drive shaft.

The piston shoes must contact the thrust race. Be certain all parts are in their proper position.