

**OWNERS
MANUAL**

**Operation &
Maintenance**

for

MODEL 320 & 420A LOADERS

320 - 300 Tractor

420A - 400 Tractor

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INTRODUCTION

Your Owner's Manual will provide you with complete operating instructions, maintenance and parts information, detailed mounting instructions, specifications, important safety precautions to be observed when operating your John Deere tractor equipped with your Brantly front end loader. This manual will also point out necessary details for using the roto-tiller or belly mounted mowers with your Brantly front loader.

Read this manual carefully taking special note of information identified with this symbol . Pay strict attention to the maintenance and safety sections of this manual.

Right-hand (R.H.) and left-hand (L.H.) references are determined by standing at the rear of the tractor and facing the direction of forward travel (Front of Tractor).

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SAFETY PRECAUTIONS

IMPROPER USE OF TRACTOR EQUIPMENT CAN RESULT IN SERIOUS INJURY

Pay close and strict attention to the job at hand.

Keep all other persons clear of work area.

Know your equipment and its controls.

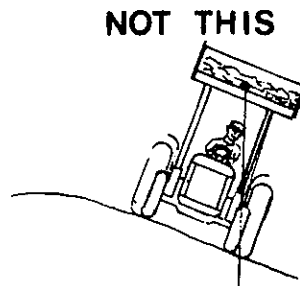
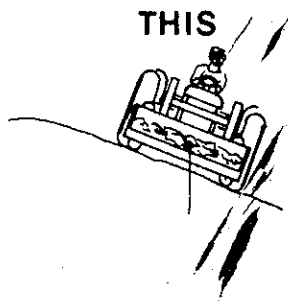
Always check the area around you to assure safe operation before moving equipment.

This equipment is not a toy. Do not allow children on, or near, equipment during operations.

Never drive tractor and loader down a hill steeper than 15 degrees.

Never exceed 3 MPH (1.8642 km/hr) when loaded.

Carry bucket low except when loading or unloading.



Always remain on tractor, at the controls, when tractor engine is running. Lower bucket, stop engine and remove ignition key when not on tractor.

Never use loader as a battering ram.

Never operate loader without necessary rear ballast.

Practice smooth, even transfer of loads. Sudden, jerky movements are dangerous to equipment and personnel.

Check hydraulic system before each use for signs of wear or leakage. Escaping liquids under pressure can be dangerous.

Keep hands, gloves, clothing away from moving parts.

DO NOT HURRY!

These instructions are intended to be general in nature. Since specific work situations will vary greatly, specific precautions and procedures must be developed by user to assure safe, efficient operation in his specific work environment.

SPECIFICATIONS

320 Front Loader for use with JD 140, 300, 312, 316 Tractors
 420A Front Loader for use with JD 400 Tractor

Controls: Two (2) Stacked Hydraulic

Bucket Cylinder: 16" (40.64 cm) x 2" (5.08 cm) with 1 1/8" (2.86 cm) Piston Rod.

Boom Cylinder: 22 1/2" (55.88 cm) x 2" (5.08 cm) with 1 1/8" (2.86 cm) Piston Rod.

Lift Capacity:

Breakaway Lift: 750 lbs. (340.5 kg)
 Bucket Capacity: 500 lbs. (227.0 kg)

Bucket Dumping Angle: 55 Degrees

Bucket Clearances: (Reference Dimensional Drawing)

Fully Dumped: (A) 51.0" (129.5 cm)
 Fully Raised (Level): (B) 62.0" (157.5 cm)
 Arm Clearance: (C) 66.0" (167.6 cm)
 (Bucket Fully Raised)
 Pivot, Raised: (D) 71.0" (180.3 cm)
 Reach, Dumped: (E) 12.0" (30.48 cm)
 Axle-To-Bucket: (F) 18.0" (45.72 cm)
 Grill-To-Bucket: (G) 9.0" (22.86 cm)
 Digging Depth: (H) 6.0" (15.24 cm)

Hydraulic System:

Type: 320 - Belt Driven Pump
 420A-P.T.O. Driven, Front Mounted

Reservoir Capacity: 5.0 qts. (4.731 L)
 Hydraulic Oil: Type "F" Automotive Transmission Fluid.

Operating Pressure: 900 PSI

Cycle Times:

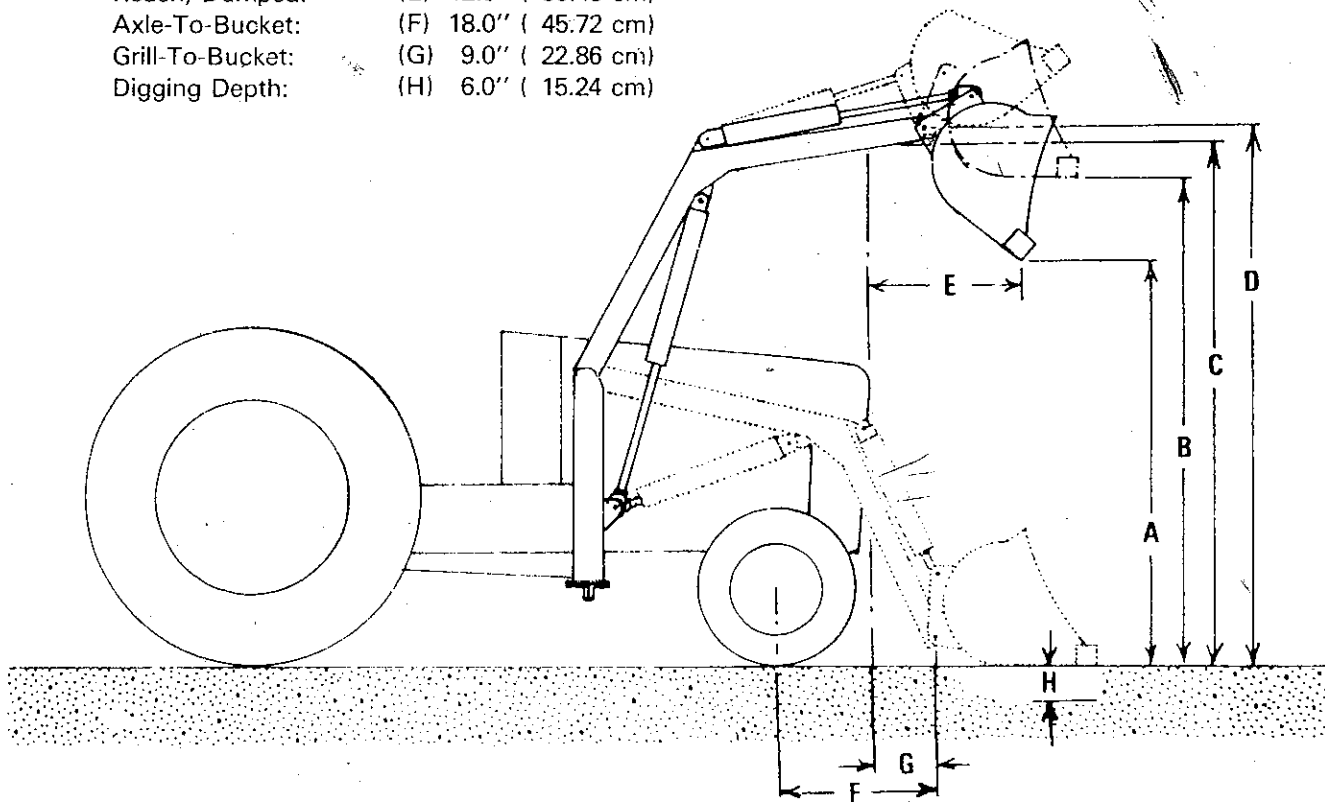
Boom Up: 7.0 sec.
 Boom Down: 4.5 sec.
 Bucket Open: 4.5 sec.
 Bucket Closed: 4.0 sec.

Weights:

Loader: 316.0 lbs. (143.5 kg)
 Pump Assembly: 12.0 lbs. (5.4 kg)
 Sand (Ballast) Box: 164.0 lbs. (74.5 kg)

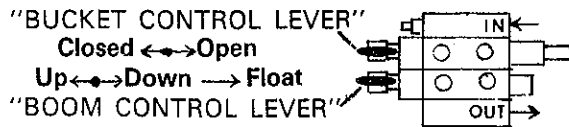
Optional Equipment:

40 Inch (101.60 cm) Bucket
 48 Inch (121.92 cm) Bucket
 60 Inch (152.40 cm) Bucket
 Sand (Ballast) Box



(Design and Specifications subject to change without notice.)

LOADER OPERATION



- A. For Maximum power, move the Tractor axle speed shift lever into the "LOW" speed position.
- B. Set Throttle Lever at approximately mid-range; adjustments up or down from this initial setting may be possible, even necessary, depending on type of material handled and operating conditions.
- C. Moving boom control lever to the rear will cause boom to rise. Pushing this lever into first forward position will cause boom to lower, while second forward position causes boom to float.
- D. Moving the bucket Control Lever forward will cause the bucket to dump. Moving the Bucket Control Lever toward the rear will cause the bucket to "level" or "close".
- E. Always operate the Tractor and Loader at slow speeds when (1) initially learning or in strange situations; (2) in tight places; and (3) over rough terrain. When the Tractor is moving, the bucket should only be raised enough to clear ground obstacles. Never operate Tractor, even under ideal conditions, at above 3.0 MPH (1.8642 km/hr).
- F. Brakes should be used with caution and, ideally, only in emergency situations, especially with full load. Avoid jerky, sudden stops and movements where at all possible.
- G. To fill Bucket, lower to ground (level) and then drive tractor forward slowly. (Bucket should be kept level.) When digging, drive straight forward into pile of material to be moved. Always start at the top of the pile of material and work downward to the desired level.
- H. The size of the load of material that should be attempted at one time will depend on the type of material to be moved, terrain, operating conditions. Wet material weighs more than dry; steep slopes will limit load size; sand weighs much more than straw, etc. Load size must always be regulated based on Loader lift capacity.
- J. Raise the Boom when approaching the Dump area by operating the Boom Control lever rearward. When Boom is of sufficient height to clear Dump area obstacles and the material in the Bucket is positioned directly over the desired placement area, move Bucket Control lever forward and dump Bucket.
- K. For leveling, or scraping, raise Boom to approximately mid-height. Push Bucket Control lever full forward until Bucket is in fully dumped position. Lower Boom until bucket Lip touches surface to be leveled. Drive Tractor forward, slowly, across area to be leveled, adjusting Boom height to achieve the most efficient leveling/scraping position, then back slowly across area letting Bucket Lip "drag" for best leveling. (Boom in "Float" position)
- L. The Controls and principles of Operation of the Loader are simple and straight forward. The most safe and efficient application of the principles to any given work situation can only come thru through Operator training and experience.
- M. Whenever the Loader is used without natural rear-end ballast of the Backhoe, it will be necessary to install and fill the sand (ballast) box. Fill with either (1) seven 60-pound (27.22 kg.) rear wheel weights, (2) sand or (3) other ballast, totalling approximately 420 pounds (190.54 kg). (Increase, if necessary to assure stable, efficient operation.)
- N. Prior to using the front end Loader or filling Ballast Box, etc., check tire pressure to assure that it complies with recommended Manufacturer's Specifications.
- O. Always store (stop) Loader with hydraulic cylinders retracted to prevent polished surface of rods from becoming pitted or rusted.



NOTE: Only very low speeds should be employed to minimize strain on Loader, achieve maximum leveling efficiency [avoid bounce], and minimize damage should lip of Bucket come into contact with underground obstructions [buried pipe, concrete footings, etc.] Always use "Float" position for leveling.

USE OF OTHER ALLIED EQUIPMENT

GENERAL

THE 420A FRONT LOADER HAS BEEN DESIGNED SO THAT THE 35A ROTO-TILLER AND MODEL 60 MOWER MAY BE USED WITHOUT REMOVAL OR ADJUSTMENT OF THE 420A LOADER.

The 320 Loader, due to pump drive arrangement, must be removed from the 300 tractor before other allied attachments can be used.

USE WITH 35A ROTO-TILLER (420A ONLY)

The Drive shaft for the rear P.T.O. passes thru the hole in the loader main crossframe and connects to the belly P.T.O. without any modification or change in equipment or mounting procedures.

USE WITH MODEL 60 MOWER (420A ONLY)

In order to use the model 60 mower without removing the older style 420 loaders, several changes (or modifications) are necessary, as follows:

- A. Do not install rear draft plates (These attach to tractor in same holes used for mounting 420A loader). A special hole is provided in 420A main crossframe mounting brackets for attaching rear draft arms.
- B. If older style 420 loader is used (without special mounting holes) it will be necessary to drill a $41/64$ hole (to clear $5/8$ " diameter rod) in loader main crossframe mounting brackets as shown in Fig. A. Also, it will be necessary to cut and drill a $5/8$ inch diameter rod as shown in Fig. B. (This rod may be ordered from Brantly Mfg. Co., Part No. 2338-1) Note: Bolts should not be used since rear draft arms must be free to swivel.

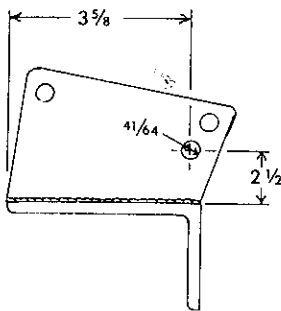


FIG. - A

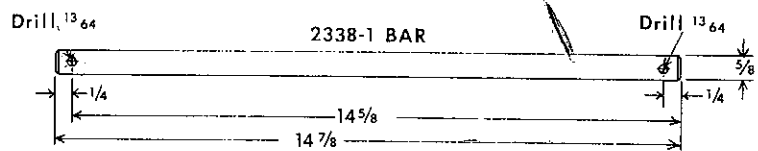
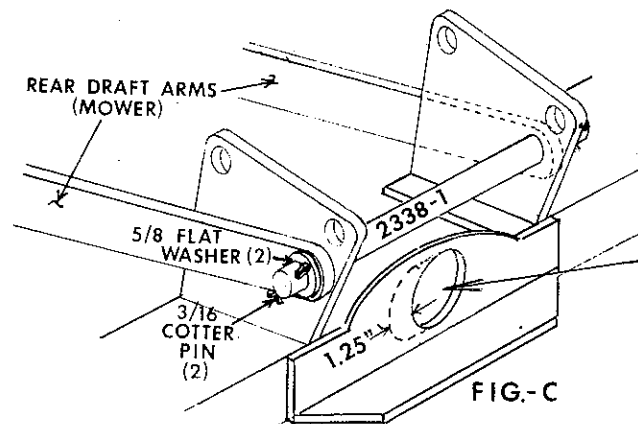


FIG. - B

- C. Attach mower rear draft arms to 420A loader main crossframe mounting brackets as shown in Fig. C. Balance of installation care, and use of mower will be as described in the mower operator's manual.

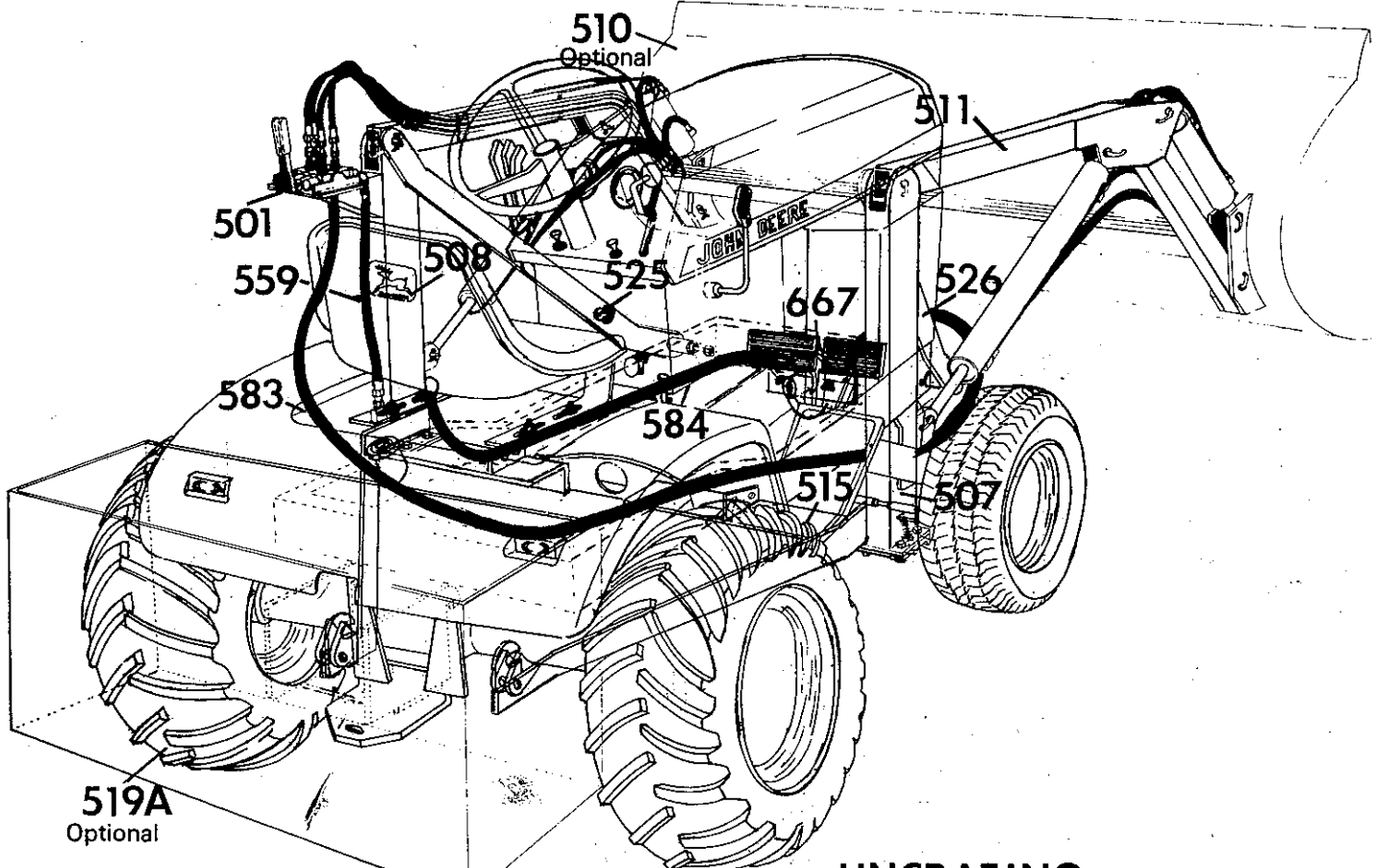
Note: Drive shaft for mower passes thru hole in loader main crossframe.



NOTE: Hole in Main Cross-frame must be elongated, on the right side, 1.25 inches on Loaders with serial number below 875.

INSTALLATION

420A LOADER



UNCRATING

ITEM	DESCRIPTION	PART NO.	QTY
1.	Main Cross Frame	515-1	1
2.	Right Side Frame	507-1	1
3.	Left Side Frame	508-1	1
4.	Main Frame Assembly	511-1	1
5.	Brace, Left Side	525-1	1
6.	Brace, Right Side	526-1	1
7.	420 LOADER ACCESSORY PACKAGE		
8.	Pump Mounting Bracket	788-1	1
9.	Pump	667-1	1
10.	P.T.O. Coupling	794-1	1
11.	Machine Bolts (For 788-1)	3/8" x 1 1/4"	2
12.	Machine Bolts (For 516-1)	5/16" x 1"	2
13.	Machine Bolts (For Mainframe)	3/8" x 1 1/4"	8
14.	Nuts	5/16"	2
15.	Lockwashers	5/16"	2
16.	Machine Bolts (Loader Mounting)	3/8" x 1 1/2"	4
17.	Nuts	3/8"	14
18.	Lockwashers	3/8"	14
19.	Adapter, Pump to 1/2" Hose	741-3	1
20.	Hose Clamps	1/2"	2
21.	Adapter, 90° O-Ring, Pump Pressure	738-1	1
22.	Suction Hose, 1/2" x 55"	584-1	1
23.	Pressure Hose, 3/8" x 85"	583-1	1
24.	Machine Bolts, Nuts, Lockwashers	5/8" x 3 1/2"	2
25.	Bushings	5/8" x 1 1/2"	2

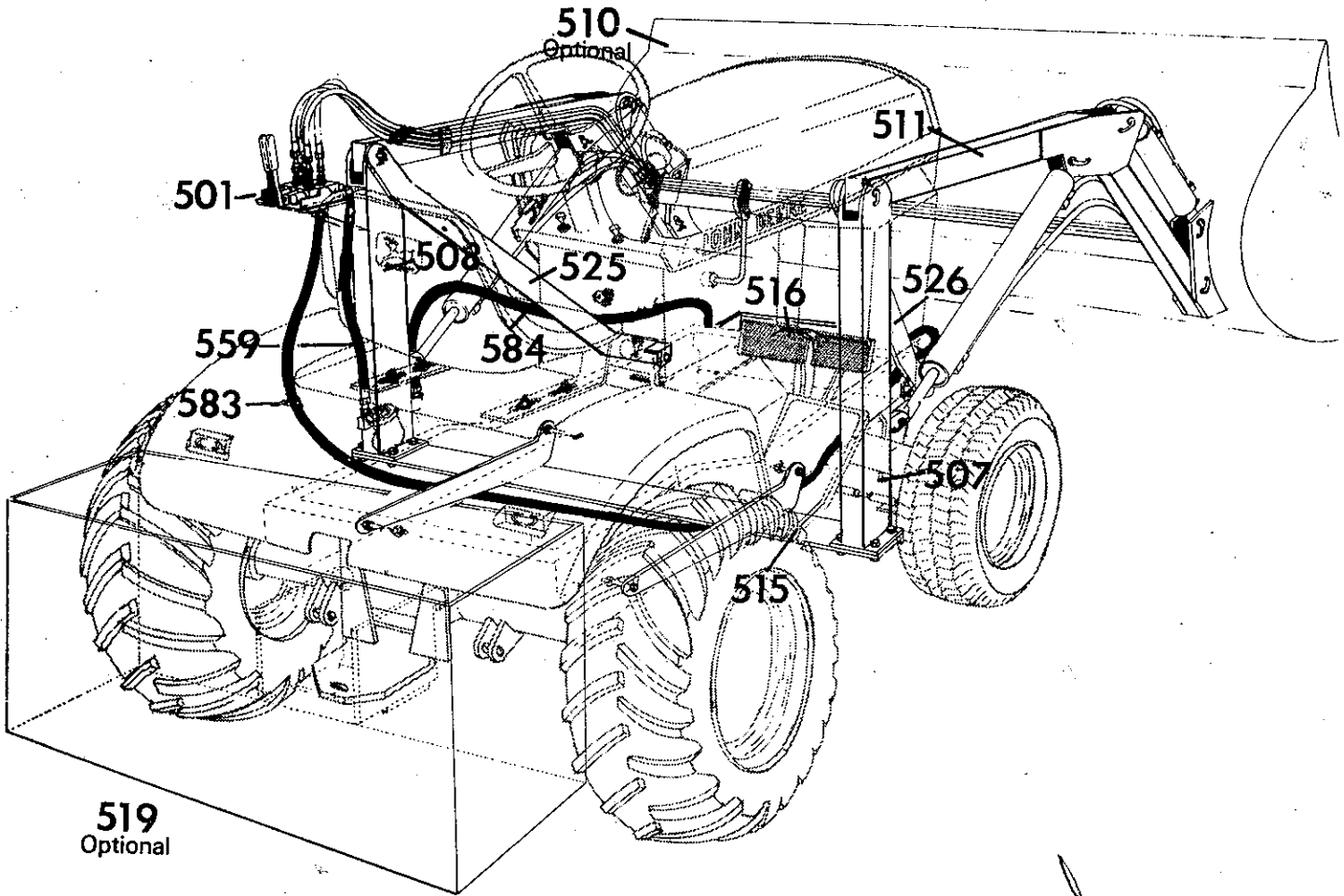
It should be noted that several of the items noted on these parts lists are assemblies. (Main Frame Assembly; Pump Assembly). Reference should be made to exploded view drawings for description of detailed parts making up these assemblies. (Reference pages 12 thru 16.)

Prior to any attempts to assemble, or mount, loader on tractor, check the appropriate parts list to assure that all items have been received. (420A, Page 6 ; 320, Page 7 .



YOUR MANUAL CONTAINS DETAILED ASSEMBLY, OPERATION, PARTS MAINTENANCE, AND TROUBLE LOCATION INFORMATION AS WELL AS IMPORTANT SAFETY PRECAUTIONS. FAMILIARIZE YOURSELF WITH ITS CONTENTS BEFORE MOUNTING OR OPERATING YOUR NEW BRANTLY LOADER.

320 LOADER



ITEM	DESCRIPTION	PART NO.	QTY
1.	Main Cross Frame	515-2	1
2.	Right Side Frame	507-2	1
3.	Left Side Frame	508-2	1
4.	Main Frame Assembly	511-2	1
5.	Brace, Left Side	525-2	1
6.	Brace, Right Side	526-2	1
7.	320 LOADER ACCESSORY PACKAGE		
8.	Pump Mounting Bracket	514	1
9.	Pump	516-1	*1
10.	Belt	546-1	*1
11.	Pulley	2258-A	*1
12.	Hose, Suction, 55 1/2 Inch	517	1
13.	Hose, Pressure, 85 Inch	518	1
14.	Adapter, Pump to 1/2" Hose	741-3	*1
15.	Adapter, 90° O-Ring	738-1	*1
16.	Hose Clamp	1/2"	2
17.	Machine Bolts, Nuts, Lockwashers	3/8" x 1 1/4"	8
18.	Machine Bolts, Nuts, Lockwashers	5/16" x 1 1/2"	2
19.	Machine Bolts, Nuts, Lockwashers	5/8" x 1 1/2"	2
20.	Machine Bolts, Nuts, Lockwashers	3/8" x 1 1/2"	2
*SHIPPED PRE-ASSEMBLED ON 514 BRACKET.			

MOUNTING LOADER ON TRACTOR

▶ ALTHOUGH 420A AND 320 LOADERS ARE QUITE SIMILAR, MOUNTING OF MAIN CROSS FRAME, UPRIGHTS, AND PUMP ASSEMBLIES ARE QUITE DIFFERENT AND WILL BE EXPLAINED INDEPENDENTLY.

▶ IN ALL MOUNTING PROCEDURES AND INSTRUCTIONS:

- 1) RIGHT OR LEFT DESIGNATIONS REFER TO RIGHT OR LEFT SIDE TRACTOR WHEN SEATED ON TRACTOR SEAT FACING FORWARD.
- 2) TIGHTEN ALL NUTS ON MOUNTING BOLTS ONLY FINGER TIGHT [UNLESS INSTRUCTIONS SPECIFICALLY INDICATE OTHERWISE] UNTIL ASSEMBLY IS COMPLETE, THEN TIGHTEN ALL NUTS SECURELY.
- 3) IF A PROBLEM OCCURS THAT HAS YOU BAFFLED, CONTACT YOUR DEALER OR BRANTLY MFG. CO. [405-335-5593] FOR ASSISTANCE. DON'T MAKE UNAUTHORIZED MODIFICATIONS.

A. INSTALLATION OF MAIN CROSS FRAME

420A LOADER

1. Remove 515-1 main cross frame from shipping crate or carton and attach to belly of 400 tractor (as shown in Fig. A-A.) using four (4) 3/8 x 1 1/2 machine bolts, nuts, lockwashers provided.

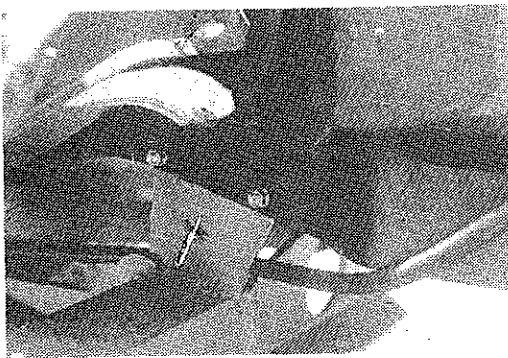


FIG. A-A

320 LOADER

1. Remove 515-2 main cross frame from shipping crate or carton and attach to belly of 300 tractor (as shown in Fig. B-B) using four (4) 3/8 x 1 1/2 machine bolts, nuts, lockwashers provided.

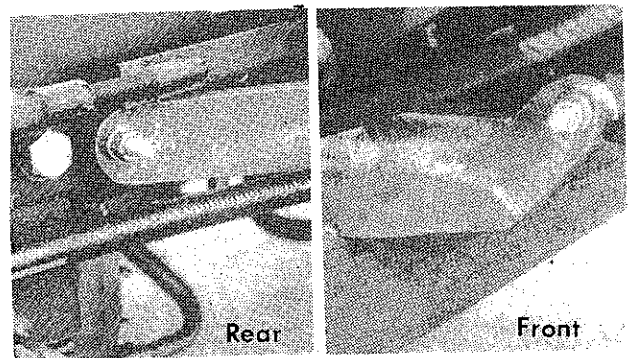


FIG. B-B

B. INSTALLATION OF UPRIGHTS (SIDE FRAMES)

1. Remove uprights (507-1 right side frame, 508-1 left side frame) from shipping carton. Install 507-1 right side frame by replacing pin anchoring category "o" 3-point hitch to tractor axle with 3/4 x 1/2 machine bolt; (b) "Hook" rear anchor lug on rear strut on 507-1 side frame over bolt used to replace 3-point hitch pins, install lockwasher & nut to hold strut loosely in place, (c) set 507-1 side frame on top of right end of 515-1 main cross frame, securing loosely with four (4) 3/8 x 1 1/4 machine bolts, lockwashers, hex nuts provided (Fig. C-C). Install 508-1 left side frame in same manner as described in (a, b, c) above. (Note: Rear anchor lugs may be hooked inside rear mounting lugs if 3-point hitch has been removed.)



FIG. C-C(2)

1. Remove uprights (507-2 right side frame, 508-2 left side frame) from shipping carton. Install 507-2 right side frame on right end of 515-2 main cross frame with cylinder mounting lugs toward front. Secure loosely with four (4) 3/8 x 1 1/4 machine bolts, lockwashers, hex nuts provided. Install 508-2 left side frame in same manner on left end of 515-2 cross frame.

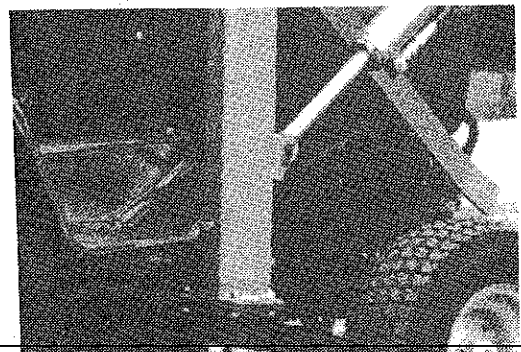


FIG. C-C(1)

C. INSTALLATION OF MAIN BOOM

Remove 511-1 main boom from shipping carton. Approach tractor from front, walking main boom toward tractor with arms (A) pointing toward rear of tractor, until arms (A) can be pinned at point (B) with 521-1 pins as shown in Fig. C-C & Fig. D-D. (Do not install nuts at this time). Lower front of boom to ground.

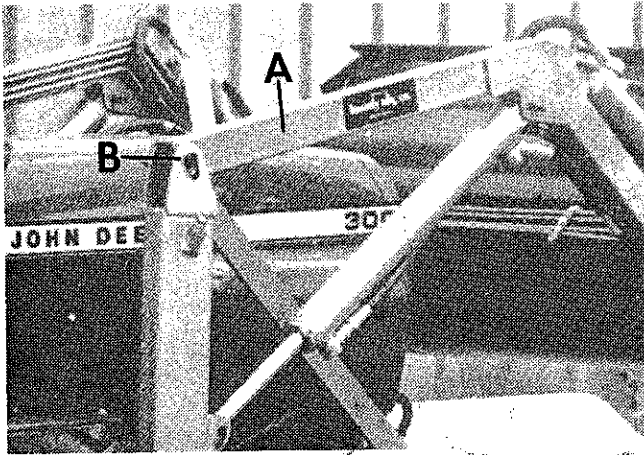


FIG. C-C (2)

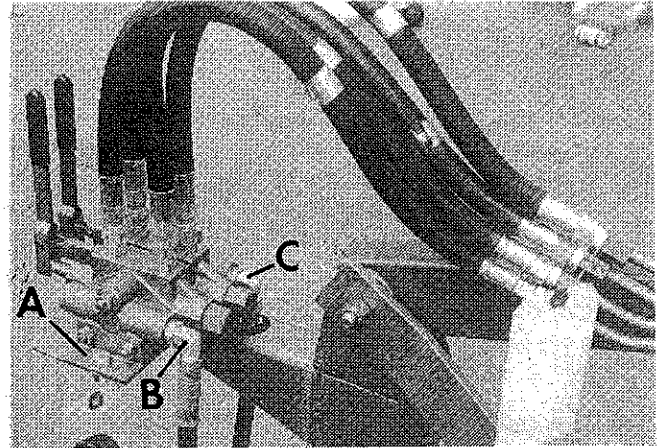


FIG. D-D

D. INSTALLATION OF SIDE BRACES

Remove 525-1 left side brace and 526-1 right side brace (525-2 and 526-2 for 320 loader) from shipping carton. Install 521-1 left side brace by sliding top end of side brace (End with hole) over 520-1 pin and secure (Loosely) with self-locking nut. (Fig. D-D using 5/8 x 3 1/2 machine bolt secure front end (End with bushing) to front of tractor frame as shown in Fig. E-E (On 320 loader, side brace front end has angle support, instead of bushing, and is secured with 5/8 x 1 1/2 machine bolt.) Install lockwasher & hex nut. Install 526-1 right side brace in same manner as 525-1. (420 loader) or 526-2 same as 525-2 (320 loader).

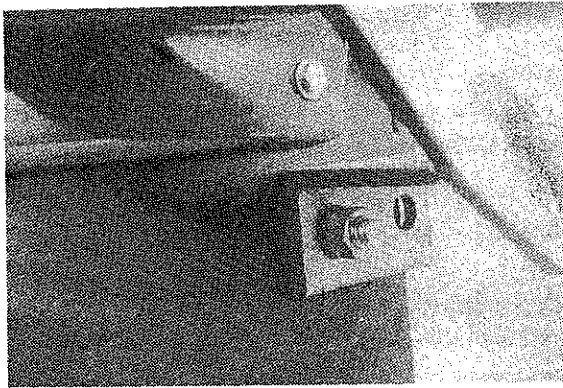


FIG. E-E

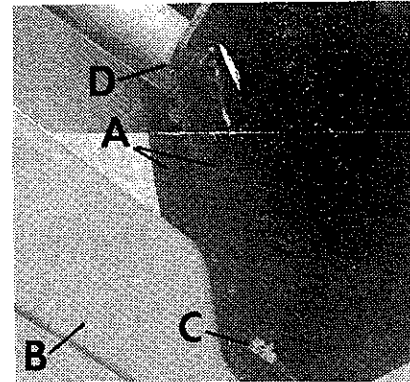


FIG. F-F

E. INSTALL CONTROL VALVE

The 501-1 control valve is shipped already attached to main boom hoses. Swing 501-1 valve toward front so that hoses are not twisted and secure to valve mounting plate (A) (Shown in Figure D-D located on 508 left side frame. Since the 508 left side frame also serves as a system hydraulic fluid reservoir, connect 559-1 hose to valve output at point (B) (The other end of 559-1 hose is already connected to 508 reservoir).

F. INSTALL BUCKET ON LOADER

Situate the bucket, with mounting brackets (A) facing to rear of tractor, directly in front of 511 main boom of loader. (Fig. F-F) Slide bucket toward 511 main boom until front arms (B) of main boom are seated inside mounting ears (C) of bucket. Align holes in boom arm (Both sides) with lower holes in bucket mounting ears and secure with 521-1 self-locking pin. (This is the longer (3 inch) self-locking pin in hardware kit.) Secure 521-1 pin with cotter key. Lift 523-1 bucket cylinder (shipped with top end already attached to loader boom.) and secure rod end of cylinder (D) between bucket mounting ears (Top hole) with 521-2 (short) pin. Secure 521-2 pin with cotter key.

All three (3) buckets (510-1 48 inch, 510-2 60 inch, and 510-3 40 inch) will fit either the 420A or 320 loaders, and all three mount in the same way.

G. MOUNTING PUMP ASSEMBLY

420A LOADER

1. Remove 667-1 pump and associated mounting hardware (shipped pre-assembled) from shipping carton. Slide pump assembly (with 794-1 P.T.O. coupling facing front P.T.O. shaft) toward tractor until coupling is fully seated on P.T.O. shaft. It will be necessary to "Hook" the 788-1 pump mounting bracket front plate (A) under tractor grill guard (B) so that plate (A) is inside grill guard (B) and secured in place by brackets (C), as shown in Fig. G-G.

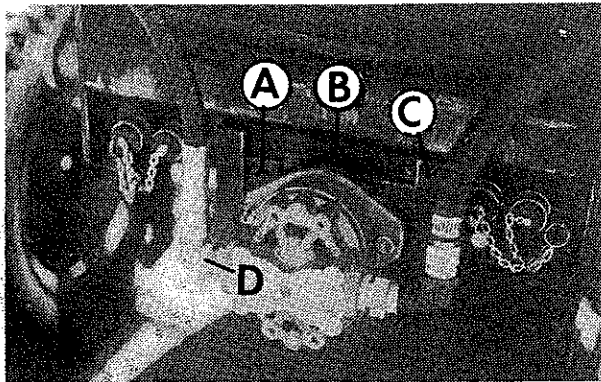


FIG. G-G

320 LOADER

1. Remove 516-1 pump and associated mounting hardware (shipped pre-assembled) from shipping carton. Pump assembly "Hooks" into tractor front attachment plate (A) as shown in Fig. H-H. Pump assembly is then secured with two (2) 5/8" x 1 1/2" machine bolts, lockwashers, and hex nuts. It will next be necessary to remove tractor front grill to install 5L410 belt. After belt is installed, belt tension can be adjusted by movement of pump mounting plate (B).

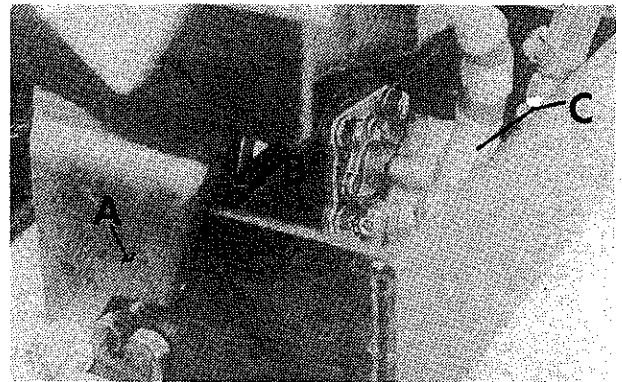


FIG. H-H

AT THIS POINT ALL MECHANICAL ATTACHMENT OF LOADER TO TRACTOR IS COMPLETE. TIGHTEN ALL NUTS SECURELY ON REAR STRUTS, MAIN CROSS FRAME, UPRIGHTS, AND SIDE BRACES.

H. HOSE INSTALLATION

▶ **ALL HOSES EXCEPT PRESSURE AND SUCTION HOSE TO PUMP ASSEMBLY ARE SHIPPED PRE-INSTALLED. REFERENCE SHOULD BE MADE TO PAGE 15. HOSE AND VALVE ASSEMBLY AND TO FIG. J-J BELOW FOR OVERALL SYSTEM HOSE DETAILS.**

1. The 518-1 pressure hose should be attached to pump pressure output (D) Fig. G-G, above (point C, Fig. H-H for 320 loader) and to loader control valve input (C) Fig. D-D, above.
2. The 517-1 suction hose should be attached to pump suction input (E) Fig. G-G (Point D, Fig. H-H for 320 loader) and secured with 1/2 inch hose clamp included in hardware kit. The 517-1 hose should then be routed over tractor front axle, keeping hose as low as possible, and connected to 508 upright (Reservoir) securing with 1/2 inch hose clamp.

▶ **517 SUCTION HOSE MUST BE KEPT LOW SINCE HYDRAULIC OIL IS GRAVITY FED TO PUMP. [RESERVOIR IS NOT PRESSURIZED.]**

▶ **DO NOT ADD FILTERS, OIL COOLERS, ETC. TO SYSTEM WITHOUT FIRST CHECKING FACTORY. MANY SUCH DEVICES, IF IMPROPERLY DESIGNED OR LOCATED IN SYSTEM CAN "STARVE" PUMP OF HYDRAULIC OIL. IF PUMP IS RUN WITHOUT ADEQUATE OIL SUPPLY PUMP CAN BE PERMANENTLY DAMAGED. DO NOT ATTEMPT TO USE BOTH LOADER UPRIGHTS AS RESERVOIRS OR ATTEMPT TO PARALLEL LOADER AND BACKHOE RESERVOIRS.**

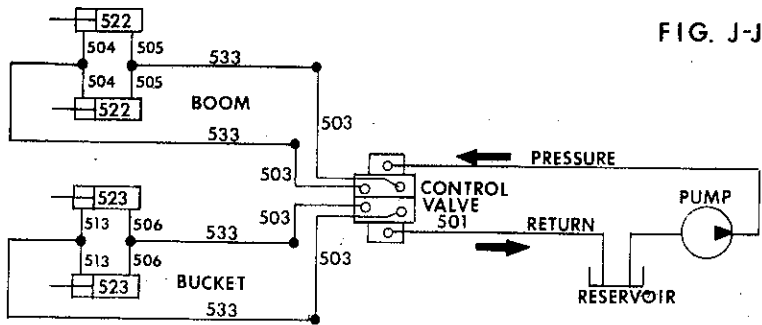
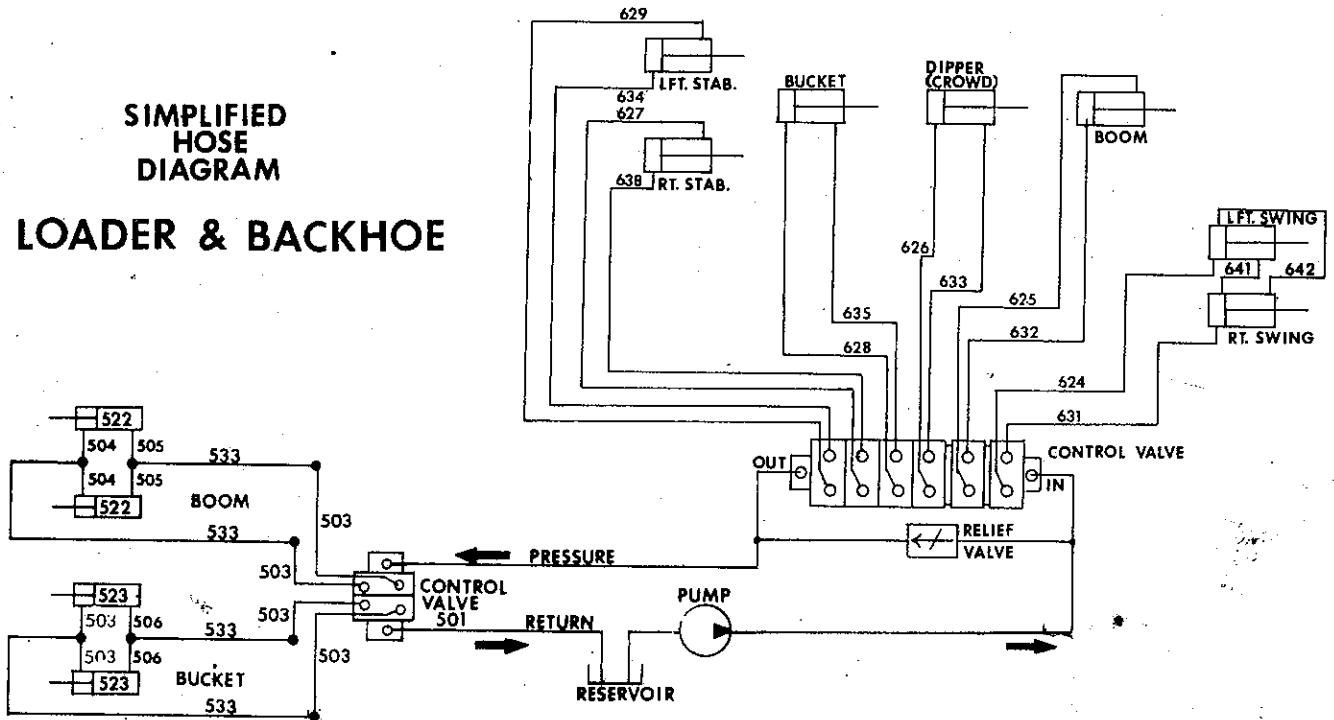


FIG. J-J

**SIMPLIFIED
HOSE
DIAGRAM
320/420 LOADER**

**SIMPLIFIED
HOSE
DIAGRAM
LOADER & BACKHOE**



NOTE: DO NOT ATTEMPT TO CONNECT (IN SERIES OR PARALLEL) TWO SEPARATE HYDRAULICS SYSTEMS. IF TWO DIFFERENT HYDRAULIC POWER SOURCES ARE USED, EACH MUST OPERATE INDEPENDENTLY OF THE OTHER.

J. FILLING SYSTEM WITH HYDRAULIC FLUID

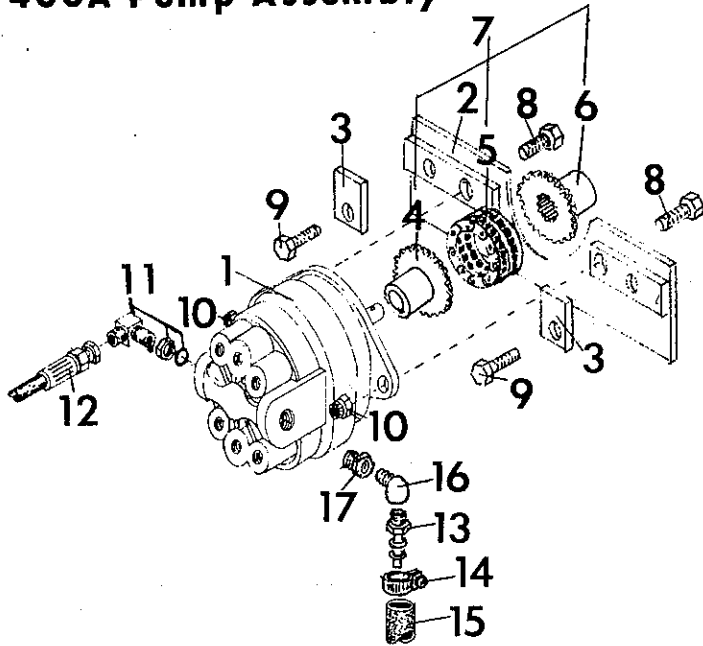
JOHN DEERE ALL-WEATHER HYDROSTATIC FLUID OR AN EQUIVALENT TYPE "F" AUTOMOTIVE AUTOMATIC TRANSMISSION F FLUID MUST BE USED IN 420A AND 320 HYDRAULIC SYSTEM.

To fill loader hydraulic system with oil (see note above) remove hydraulic/breather cap (located at top, outside face of 508 upright). Then with cylinders fully retracted fill hydraulic reservoir to within approximately two (2) inches of fill port. Start tractor, check for leaks. Operate bucket control lever, then operate boom control lever allowing cylinders to completely open and close several times, rechecking oil level and refilling reservoir as required, always refilling with cylinders fully collapsed (closed). Work both boom and bucket a number of times to allow all air in system to evacuate into reservoir. Final oil level should be approximately two (2) inches below fill port.

K. LUBRICATION OF LOADER

The 420A and 320 loader require lubrication (both sides) at the points where boom swivel on uprights, where boom cylinder attaches to uprights, at points where bucket cylinder attaches to bucket, and where bucket attaches to boom. (10 places) Lubrication should be accomplished in accordance with maintenance instructions, page 18.

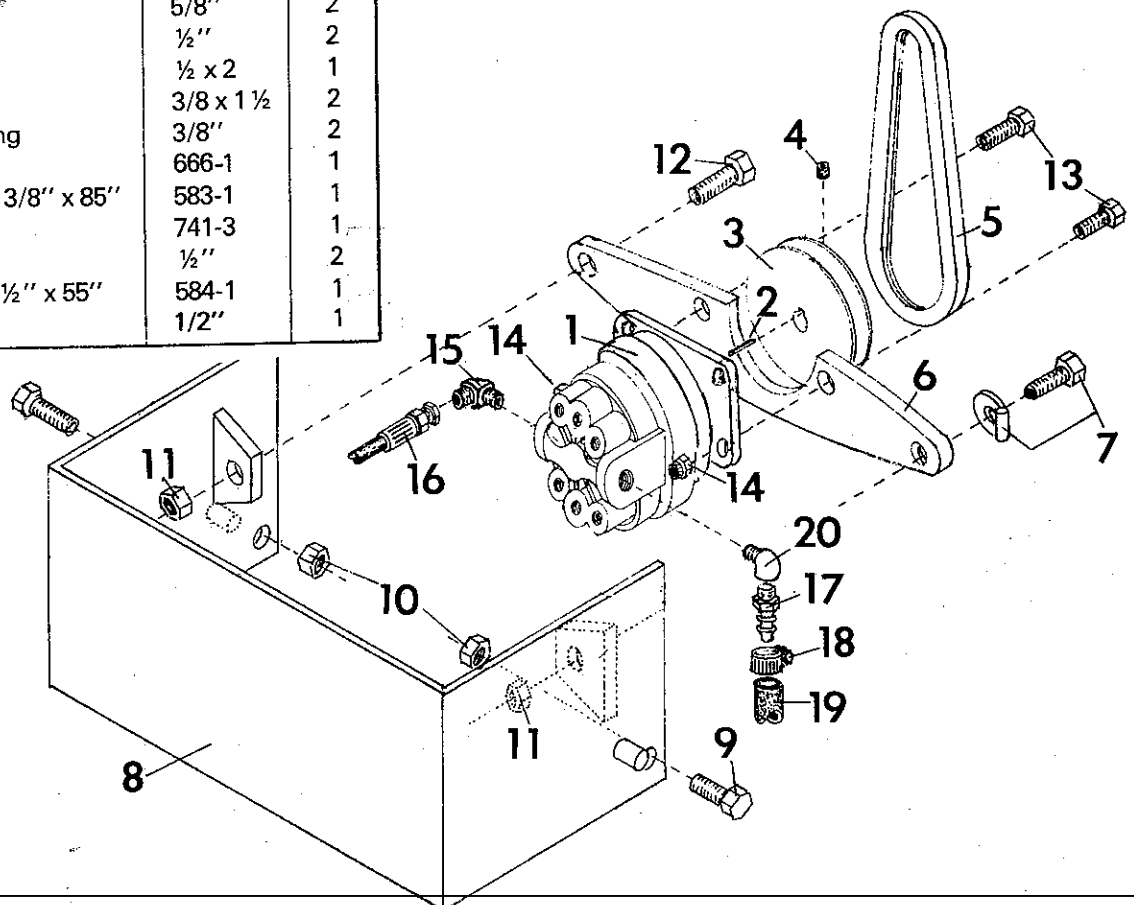
400A Pump Assembly



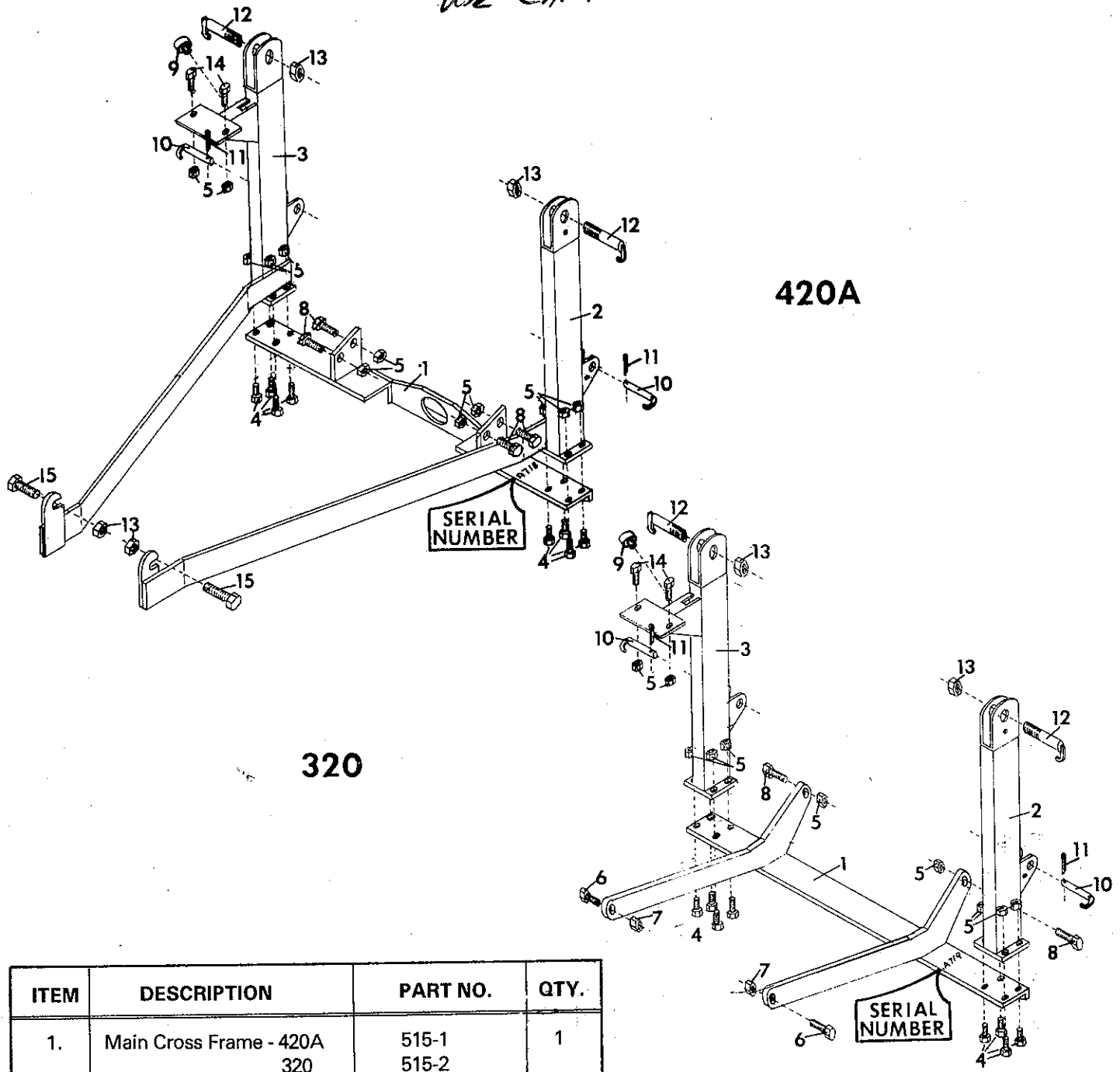
ITEM	DESCRIPTION	PART NO.	QTY.
1.	Pump, Hydraulic	667	1
2.	Bracket, Mounting	778-1	1
3.	Clip, Retaining	790-1	2
4.	Coupling Half, Pump	764-1	1
5.	Chain, Coupling	767-1	1
6.	Coupling Half, P.T.O.	769-1	1
7.	Coupling Flex (Complete)	794-1	1
8.	Bolt, Machine	3/8" x 1 1/4"	2
9.	Bolt, Machine	5/16" x 1"	2
10.	Nut, Self Locking	3/8"	2
11.	Adapter, O-Ring	738-1	1
12.	Hose, Pressure, 3/8" x 85"	583-1	1
13.	Adapter, Hose	741-3	1
14.	Clamp, Hose	1/2"	2
15.	Hose, Suction, 1/2" x 55"	584-1	1
16.	Ell, Street	1/2"	1
17.	Adapter	742-6	1

ITEM	DESCRIPTION	PART NO.	QTY.
1.	Pump, Hydraulic	516-1	1
2.	Key	1/8	1
3.	Pulley, 7"	2258-1	1
4.	Set Screw, Hex Socket	1/4-20	1
5.	Belt	2259-1	1
6.	Bracket, Pump Mounting	789-1	1
7.	Bolt, Special	2257-1	1
8.	Frame, Pump Guard	514-1	1
9.	Bolt, Machine	5/8 x 1 1/2	2
10.	Nut, Hex	5/8"	2
11.	Nut, Hex	1/2"	2
12.	Bolt, Machine	1/2 x 2	1
13.	Bolt, Machine	3/8 x 1 1/2	2
14.	Nut, Self-Locking	3/8"	2
15.	Adapter	666-1	1
16.	Hose, Pressure, 3/8" x 85"	583-1	1
17.	Adapter, Hose	741-3	1
18.	Clamp, Hose	1/2"	2
19.	Hose, Suction, 1/2" x 55"	584-1	1
20.	Ell, Street	1/2"	1

300 Pump Assembly



HYDRAULIC FILTER:
USE CAN FLO # RSE 35-10

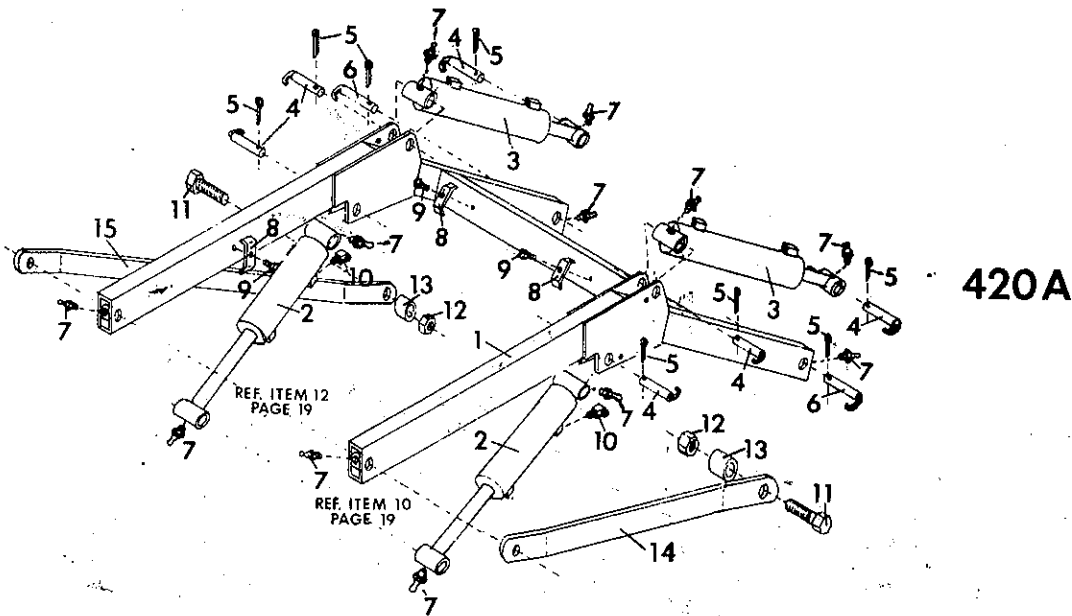


420A

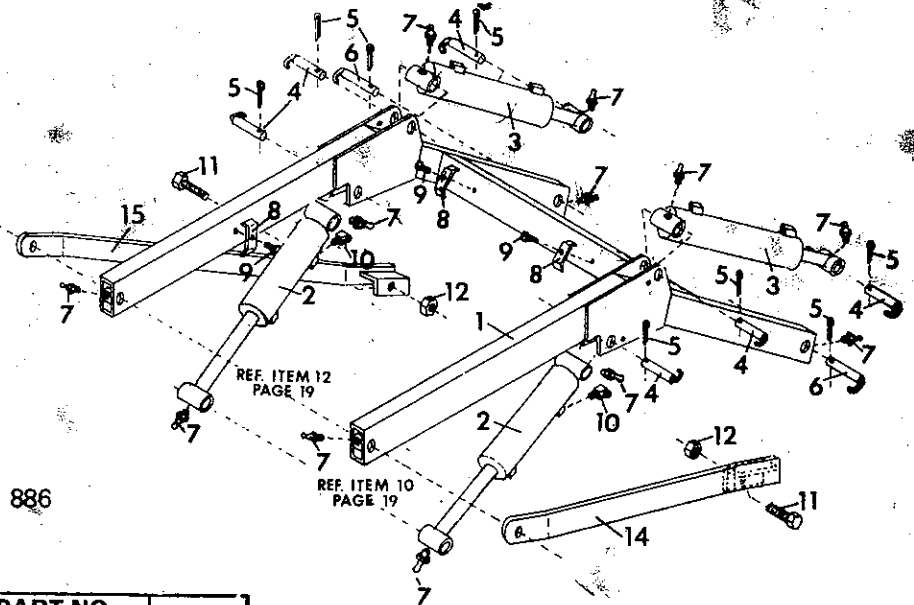
320

**MAIN CROSSFRAME
ASSEMBLY**

ITEM	DESCRIPTION	PART NO.	QTY.
1.	Main Cross Frame - 420A 320	515-1 515-2	1
2.	Frame, Right Side - 420A 320	507-1 507-2 508-1 508-2	1 1 1
4.	Bolt, Machine	3/8" x 1 1/4"	8
5.	Nut, Hex	3/8"	12
6.	Bolt, Machine	5/16" x 1 1/2"	2
7.	Nut, Hex	5/16"	2
8.	Bolt, Machine	3/8" x 1 1/2"	2
9.	Cap, Breather	558-1	1
10.	Pin, Self-Locking (Short)	521-1	1
11.	Pin, Cotter	1/8" x 1 1/4"	2
12.	Pin, Boom Swivel	520-1	2
13.	Nut, Self-Locking	1/2"	2
14.	Bolt, Machine	3/8" x 1"	2



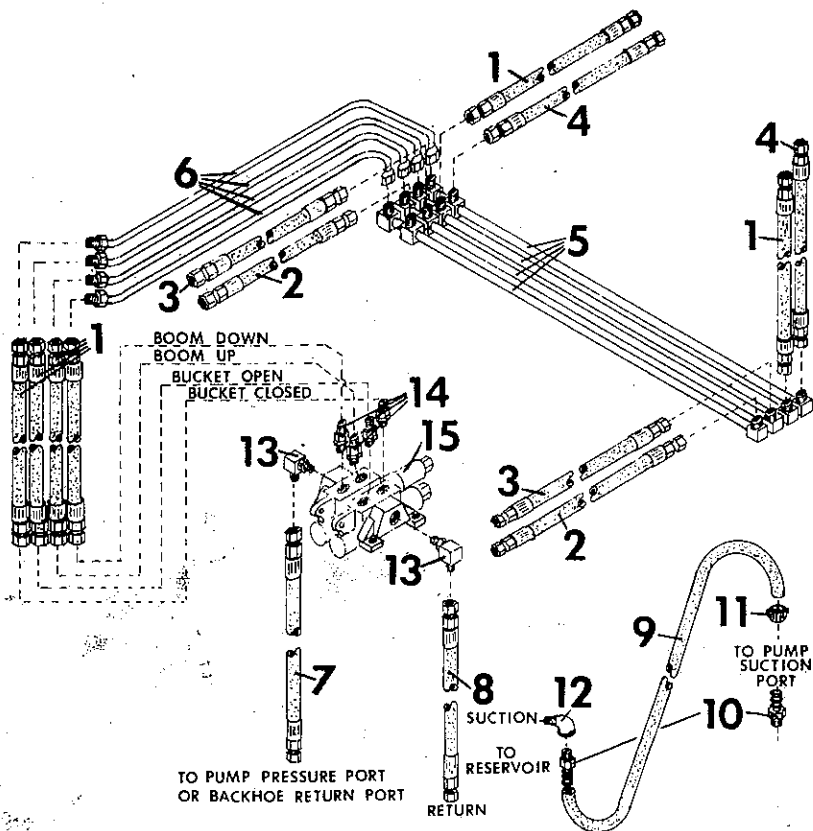
320



*NOTE: Design change at Serial Number 886

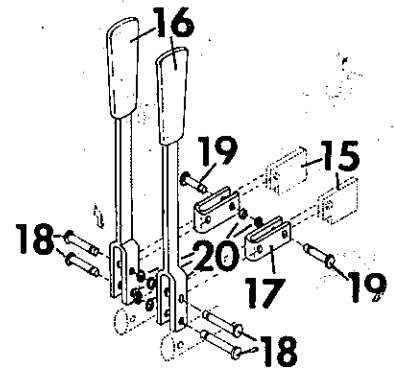
ITEM	DESCRIPTION	PART NO.		QTY.
		0-885	886-UP	
1.	Boom, Main	511-1	511-2	1
2.	Cylinder, Hyd., Boom	523-1	523-2	2
3.	Cylinder, Hyd., Bucket	522-1	522-2	2
4.	Pin, Self-Locking (short)	521-1	521-3	6
5.	Pin, Cotter	1/8 x 1 1/4		8
6.	Pin, Self-Locking (Long)	521-2	521-3	2
7.	Fitting, Grease, Straight	648-1		10
8.	Clamp, Tubing	524-1		3
9.	Bolt, Machine	1/4" x 1"		3
10.	Adapter, 45°	665-1		8
11.	Bolt, Machine	320	5/8 x 1 1/2	2
		420A	5/8 x 3/4	
12.	Nut, Hex	5/8		2
13.	Bushing	527		2
14.	Brace, Right Side	420A	526-1	1
		320	526-2	
15.	Brace, Left Side	420A	525-1	1
		320	525-2	

MAIN BOOM ASSEMBLY



ITEM	DESCRIPTION	PART NO.	QTY
1.	Hose, Hyd., 24 inch (60.96 CM)	503-2	6
2.	Hose, Hyd., 36 inch (91.44 CM)	504-2	2
3.	Hose, Hyd., 16 inch (40.64 CM)	505-2	2
4.	Hose, Hyd., 21 inch (53.34 CM)	506-2	2
5.	Tube, Hyd., Front	533-4	4
6.	Tube, Hyd., Side	533-6	4
7.	Hose., 85 inch (21.9 CM)	583-1	1
8.	Hose, Hyd., 22 inch (55.88 CM)	559-1	1
9.	Hose, Hyd., 55 inch (139.7CM)	584-1	1
10.	Adapter, Special	741-3	2
11.	Clamp, Hose	1/2"	2
12.	Elb Street	1/2"	1
13.	Adapter, 90°	738-1	2
14.	Adapter	740-1	4
15.	Valve, Control	501-1	1
16.	Handle, Control	502-1	2
17.	Link, Valve	664-1	2
18.	Pin, Handle, Long	662-2	2
19.	Pin, Handle, Short	662-1	4
20.	Clip, C-Ring	663-1	6

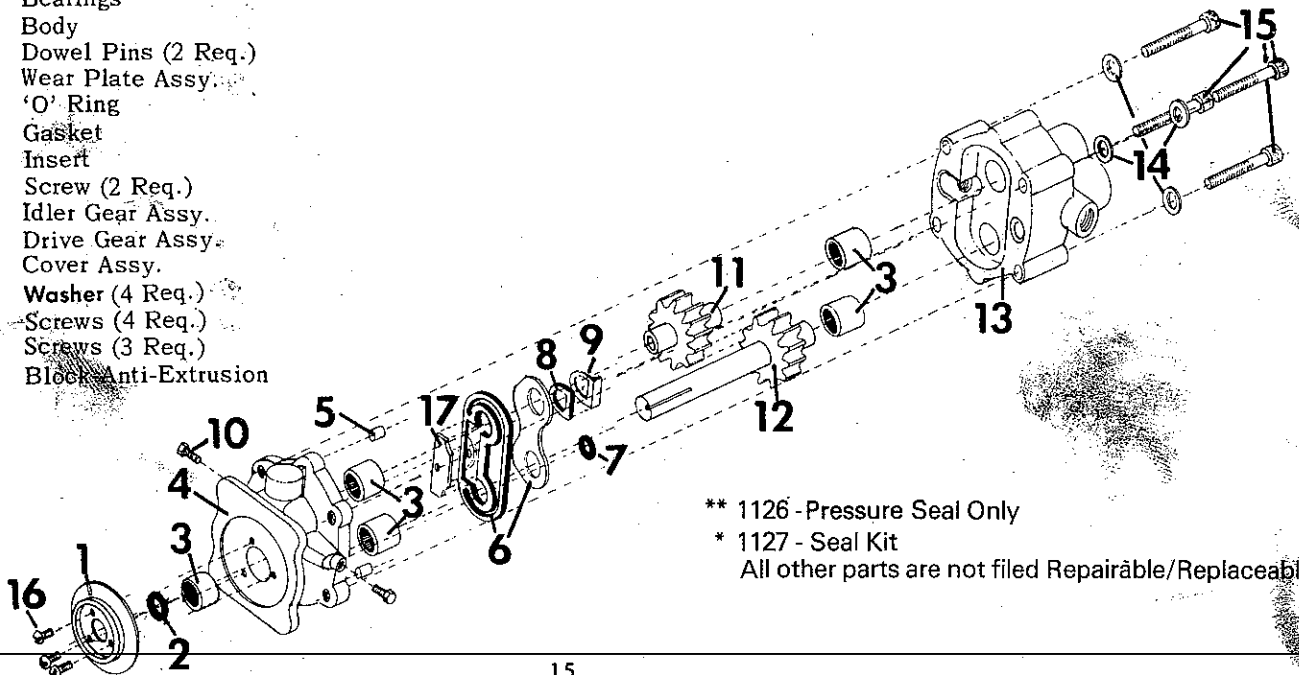
HOSE AND VALVE ASSEMBLY



516-1 PUMP (300)

MFR. P/N (Stamped on Flange): 43YB032-2R

- * 1 Seal Plate Assy.
- * 2 'O' Ring
- 3 Bearings
- 4 Body
- 5 Dowel Pins (2 Req.)
- * 6 Wear Plate Assy.
- ** 7 'O' Ring
- * 8 Gasket
- * 9 Insert
- 10 Screw (2 Req.)
- 11 Idler Gear Assy.
- 12 Drive Gear Assy.
- 13 Cover Assy.
- 14 Washer (4 Req.)
- 15 Screws (4 Req.)
- * 16 Screws (3 Req.)
- * 17 Block Anti-Extrusion



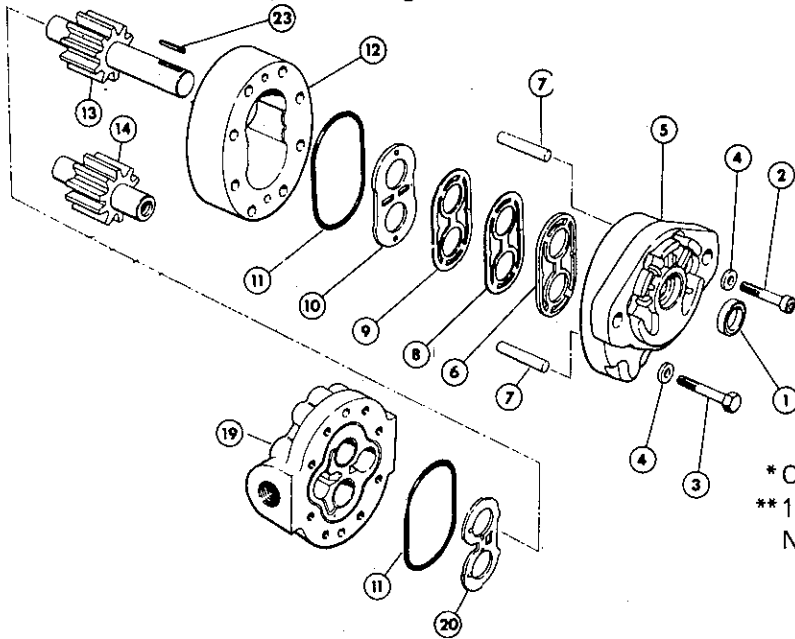
** 1126 - Pressure Seal Only

* 1127 - Seal Kit

All other parts are not filed Repairable/Replaceable.

667-1 PUMP(400)

MFR. P/N (Stamped on Flange): H25AA2B



- **1. Shaft Seal
- 2. Cap Screws
- 3. Hex Screws
- 4. Washers
- 5. Front Cover
- * 6. V-Seal
- 7. Dowel Pins
- * 8. Gasket
- * 9. Heat Shield
- *10. Wear Plate
- *11. "O" Rings
- 12. Center Section
- 13. Drive Gear Assembly
- 14. Driven Gear Assembly (includes 15, 16, 17, 18)
- 19. Back Cover
- 20. Thrust Plate (H&M only)
- 21. Key (Where Required)

* Order 1125 Seal Kit (Includes 1124 Shaft Seal)

** 1124 Shaft Seal (Only)

Note: Balance of parts not filed Repairable/Replaceable

PUMP TROUBLE SHOOTING

Before the pump is removed or disassembled, check the following list of common troubles and remedies. It could save time, effort, and money.

TROUBLE	PROBABLE CAUSE	REMEDY	TROUBLE	PROBABLE CAUSE	REMEDY
1. Noisy Pump	a. Low oil supply	a. Fill reservoir	4. Low Flow	a. Pump cavitating	a. See 1a, 1b, 1c, 1d
	b. Oil too heavy, (i.e. viscous)	b. Change to proper viscosity		b. Foaming oil	b. See 2a, 2b
c. Air leak in inlet line	c. Check plumbing	c. Relief valve leaks or set too low		c. Check relief valve for foreign particles	
d. Partly blocked inlet line	d. Check for foreign object and/or clean	d. Speed too low		d. Check prime mover speed	
		e. Oil too hot		e. Check temperature (see 3a, 3b, 3c, 3d, & 3e)	
2. Foaming Oil	a. Pump cavitating	a. See 1a, 1b, 1c, 1d	5. Failure to build pressure	a. Defective Relief Valve	a. Check and reset or replace
	b. Water in the oil	b. Check reservoir and/or heat exchange		b. Low oil supply	b. Fill reservoir
3. Pump or oil overheating	a. Oil supply too thin	a. Drain & fill with proper viscosity oil			
	b. Oil supply contaminated	b. Drain, clean filter, & fill with clean oil			
	c. Pump cavitating	c. See 1a, 1b, 1c, 1d			
	d. Pump drive shaft excessively misaligned with pump driven shaft	d. Check alignment			
	e. Pump drive shaft axially loaded by driving shaft (Prime Mover)	e. Check for clearance at ends of shafts, for shaft misalignment or worn driving keys, keyways or splines. If pulley drive check for belt alignment			
	f. System relief valve bypassing	f. Check relief valve setting (see 4c)			



Do not over torque housing retaining screws. These screws should be torqued to 190-210 inch pounds.

SYSTEM TROUBLE SHOOTING

<u>TROUBLE</u>	<u>POSSIBLE CAUSE</u>	<u>POSSIBLE REMEDY</u>
A. Loader Will Not Operate	<ol style="list-style-type: none"> 1. Bucket overloaded, hooked on underground obstruction. 2. Jammed linkage. 3. Bent piston rod. 4. Low hydraulic fluid level. 5. Hoses assembled incorrectly. 6. Broken or blocked lines. 7. Low fluid flow; low pressure. 	<p>Clear obstruction.</p> <p>Clear obstruction. Replace rod/seals. Add oil; check for leaks. Ref. page 13 and 24.</p> <p>Replace. Pump damaged or PTO coupling broken. Replace damaged part.</p>
B. Loader Operates Erratically	<ol style="list-style-type: none"> 1. Pump slipping. 2. Hydraulic oil level low. 3. Air in hydraulic system. 	<p>Replace pump or PTO coupling. Add oil. Evacuate system of air.</p>
C. Oil Overheating.	<ol style="list-style-type: none"> 1. Tractor r.p.m. too high. 2. Obstruction in system. 	<p>1200-1600 r.p.m. normal. By-pass suspected components to determine cause, then clean or replace restricting unit.</p>
D. Cylinder Leaking.	<ol style="list-style-type: none"> 1. Damaged seals. 	<p>Install new seal kit. NOTE: Improper operation can cause damage to seals.</p>
E. Operation Slow	<ol style="list-style-type: none"> 1. Low pressure. 2. Internal seals leaking. 3. Obstruction in system. 	<p>Check relief valve setting and pump performance. Install new seal kit. See C.2. above.</p>
F. Valve Sticking.	<ol style="list-style-type: none"> 1. Control valve tie bolts too tight. 2. Dirty valve. 3. Valve spring binding or broken. 	<p>Loosen tie bolts slightly, watch for leakage. Clean valve, change oil. Replace spring or valve section.</p>
G. Excessive Wear.	<ol style="list-style-type: none"> 1. Improper lubrication. 2. Misalignment. 	<p>Ref. page 11 for proper lubrication procedures. Check for binding or bent parts, replace or repair as required.</p>
H. Excess Wear Or Breakage.	<ol style="list-style-type: none"> 1. Pressure too high. 	<p>Check relief valve. Set for 900 P.S.I., (one turn equals approximately 700 P.S.I.)</p>

GENERAL MAINTENANCE

Regular maintenance is the key to long equipment life and safe operation.

Maintenance requirements on the 320 and 420A loaders have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

EVERY EIGHT (8) HOURS OF OPERATION

- A. Grease all swivel points (Ram and base end of all cylinders.) thoroughly. Excessive wear and even mechanical damage to pins and cylinders can result from inadequate points. Only an S.A.E. multi-purpose type grease (John Deere Multi-Purpose Lubricant).
- B. Make a thorough check (Prior to start of work each day) for obvious signs of wear, leakage, loose fitting/pins, etc. Careful, routing visual checks can provide valuable forwarning of impending failures allowing sufficient time to acquire replacement parts and thus reducing down time to a minimum.

EVERY FORTY (40) HOURS OF OPERATION

- A. Check hydraulic reservoir fluid level. If oil is low, check all lines, fittings, and control valve for signs of leakage. Refil in accordance with instructions on page 11 of this manual.



Note: Escaping hydraulic fluid, under pressure, can be dangerous. Hydraulic fluid escaping under pressure can have enough force to penetrate the skin or destroy eye-sight. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by hydraulic fluid, seek medical attention at once. Make sure all connections are tight and that hoses are in good condition before applying pressure to system. Relieve all pressure to system [Stop Engine] before disconnecting lines or attempting to perform other work on the system. To locate small leaks, use a small piece of cardboard, paper, or wood... never use your hands.

- B. Physically check all pins, cotter pins, nuts, etc., for signs of wear or loose fit. Tighten as required, replacing where necessary. (Bolts, pins, may vibrate loose during operation). Clean equipment of all dirt, oil, and excess grease. This will assist you in making usual inspection and help avoid dangerous slips.

EVERY TWO HUNDRED (200) HOURS OF OPERATION

Hydraulic oil should be drained out of system and replaced with clean Type "F" Automotive Transmission Fluid (John Deere All-Weather Hydrostatic Fluid). Pressure relief valve operation should be checked to assure operation at designated level.

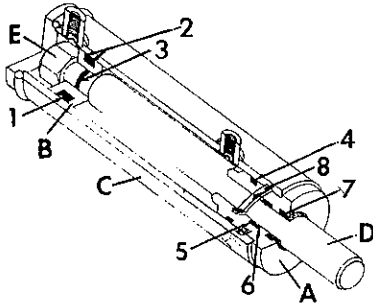
CHECKING RELIEF VALVE OPERATION

An In-Line type pressure meter should be used (One which measures pressure while allowing fluid to flow on thru for system operation). Insert pressure meter in input pressure line between pump pressure output and loader input. With pressure meter in-line, "Bottom out" either bucket or boom cylinders (fully extended or fully retracted) to force relief valve operation (A slight squealing sound can usually be heard when relief valve operates). Pressure should rise as cylinders are actuated and should peak out at between 850 and 950 pounds per square inch (PSI). If pressure level is too low or high adjust relief valve setting as required to bring within these limits. (Reference page 20 for details on control valve.)



Note: Do not attempt to increase pressure to obtain greater lift [Bucket] capacity. Serious damage to loader or tractor front axle can occur and warranties voided. It is the owner's Responsibility to maintain designated fluid levels and pressure relief settings.

CYLINDER MAINTENANCE



ITEM	DESCRIPTION	PART NO.		QTY
		A	B*	
A.	Gland, Cylinder	1043	1043	1
B.	Piston, Cylinder	1044	1044	1
C.	Barrel Assemblv 522	1082	1168	1
		523		
		1084	1169	
		1083	1170	
D.	Rod, Cylinder 522	1085	1171	1
		1083	1170	
		1085	1171	
E.	Locknut	1047	1172	1
F.	Seal Kit, Consisting of	1017	1017	1
		1. Piston Seal		
		2. Piston Back-up Seal		
		3. Rod Static Seal		
		4. Gland Static Seal		
		5. Rod Seal		
		6. Rod Back-Up Seal		
		7. Rod Wiper		
		8. Lockwire		

Parts (Items 1-8)
not supplied separately.

All seals, wipers, lockwire should be replaced whenever a cylinder is disassembled.

*All Loaders After Serial No. A886

A. DISASSEMBLY - PROCEDURES SHOULD BE FOLLOWED STEP - BY - STEP BEGINNING WITH:

1. (a) Protect chrome finish on rod at all times.
- (b) Note: Direction of rotation for removal of lockwire depends on prior installation. Check lockwire position for correct rotation.
- (c) A sharp object, such as a small screwdriver must be used to get under the lockwire to start it out of the cylinder.
- (d) Locate spanner wrench in drilled holes in gland and rotate 360 degrees.



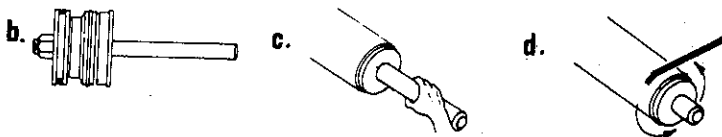
2. (a) Pull on rod to remove the piston and gland.
- (b) Remove nut from end of rod.
- (c) Remember, all seals must be replaced once cylinder is disassembled.

B. CLEANING AND INSPECTION

1. Check rod and barrel bore for nicks, burrs, scratches, or rust. Slight defects may be removed with fine sand paper. Badly pitted barrel bore or rod may indicate replacement of the damaged part.
2. All parts should be thoroughly cleaned using clean solvent. Be sure to carefully clean all cavities and grooves thoroughly prior to reassembly. (Only a cleaning solvent should be used.)

C. ASSEMBLY

1. (a) Install all seals. Do not over stretch seals to facilitate easier installation.
- (b) Make sure all seals are not twisted or distorted in grooves.
- (c) be careful not to nick or damage seals with fingernails or tools.
2. (a) Install gland on rod
- (b) Install piston on rod "turn down".
- (c) Install locknut and torque to 150 ft. lbs.
3. (a) Lubricate all parts and inside of cylinder with hydraulic oil.
- (b) Push the piston into cylinder bore with a steady, even pressure.
- (c) Push gland into bore until shoulder or gland butts up against barrel.

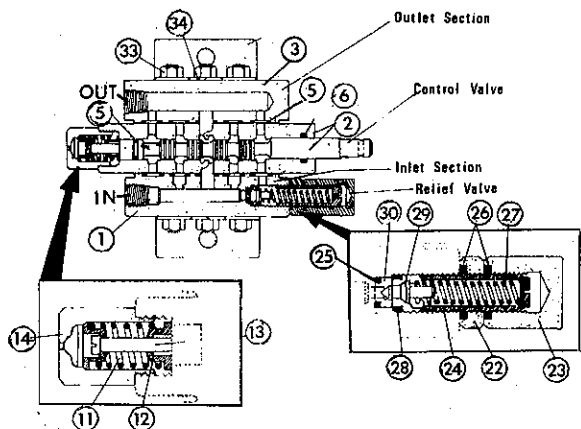


- (d) Locate drilled hole in gland through milled slot in the barrel and insert lockwire. Rotate the gland 360 degrees to "feed" lockwire into "lock" position.

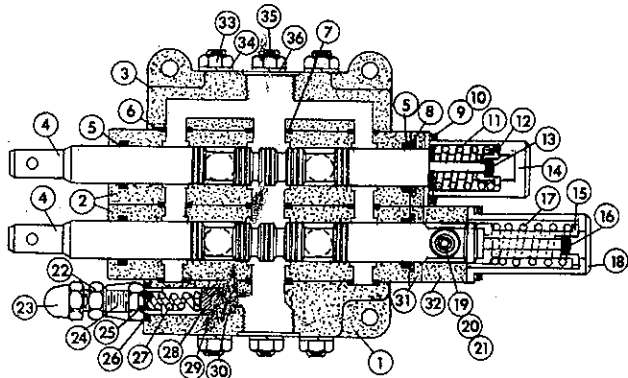
VALVE MAINTENANCE

MYLAR SHIMS ARE USED BETWEEN SECTIONS TO RELIEVE DISTORTION OF CASTING WHICH MAY CAUSE BINDING OF VALVE SPOOLS. ONE SHIM OVER EACH TIE ROD BETWEEN SECTION IS USUALLY SUFFICIENT.

501-1 LOADER VALVE (WITHOUT FLOAT POSITION)



501-2 LOADER VALVE (WITH FLOAT POSITION)



ITEM	DESCRIPTION	501-2 VALVE	501-1 VALVE
1.	Inlet Section	1135	1065
2.	Valve Section	1136	721
3.	Outlet Section	1137	1057
4.	Spool	1138	
5.	O-Ring	1139	1058
6.	O-Ring	1140	1058
7.	O-Ring	1141	1059
8.	Washer	1142	
9.	Fillester Head	1143	
10.	Lockwasher	1144	
11.	Spring	1145	1063
12.	Retainer	1146	1064
13.	Screw, Socket Head	1147	1062
14.	Cap	1148	1061
15.	Retainer	1149	
16.	Screw, Socket Head	1150	
17.	Spring	1151	
18.	Cap	1152	
19.	Set Screw	1153	
20.	Spring, Detent	1154	
21.	Ball, Detent	1155	
22.	Jam Nut	1156	1071
23.	Acorn Nut	1157	1073
24.	Plug	1158	1069
25.	O-Ring	1159	1058
26.	O-Ring	1160	1070
27.	Spring, Relief	1161	1072
28.	Guide	1162	1067
29.	Ball, Relief	1163	1068
30.	Seat	1164	1066
31.	Spacer	1165	
32.	Detent Spacer	1166	
33.	Nut, Hex	5/16-24	
34.	Lockwasher	5/16	
35.	Tie Rod	5/16-24 x 5 5/16	
36.	*Shim, Mylar	1167	1079
	Seal Kit, Control Valve Section	1175	1060
	Seal Kit, Relief Valve	1178	1077

A. DISASSEMBLY

1. Remove nuts, mounting bracket, washer from inlet end of valve bank.
2. Remove inlet section. (Note: In between the inlet, each center valve section, and outlet are three mylar shims, one over each tie rod. Keep these shims, as they will be required during reassembly.)
3. Remove valve sections one at a time, removing o-rings and mylar shims from between each section.
4. Remove spring cap from valve section.
5. Remove inner spool from valve body by pushing on handle end, removing from spring end. (Note: Keep body and spool together; they are a matched set.)
6. Remove o-ring from inside bore on handle end of valve body.
7. Remove o-ring by removing spring centering assembly from spool.
8. Wash all parts in clean solvent; dry with low pressure air hose.

B. ASSEMBLY

1. Inspect all parts for nicks, burrs, cracks, etc. Clean pipe dope or tape from ports.
2. Lubricate all parts, especially o-ring, with hydraulic oil.
3. Replace o-ring in bore of body using spool in body to guide o-ring into groove.
4. Replace o-ring on spool. (Note: Always make sure o-rings are not twisted in grooves.)
5. Replace spring centering assembly on end of spool. Torque to 30.0 inch pounds.
6. Replace lubricated spool in body using slight twisting motion to avoid unseating or shearing o-rings and
7. Replace spring centering cap.
8. Install one nut on each tie rod. Place two tie rods thru the mounting bracket. Place one flat washer on third tie rod. Push all three rods thru outlet section. Place one mylar shim over each tie rod pushing them down onto the outlet section.
9. Install a valve section over tie rods. Replace the o-rings and mylar shims on this section.
10. Repeat step nine as required for valve assemblies having more than one valve.
11. Install the inlet section. Place mounting bracket over lower tie rods and install hex nuts (1). Place flat washer over top tie rod and install hex nut.
12. Torque tie rods in steps:

501-1 Valve: 75 inch lbs., 100 inch lbs., and finally 125 inch lbs.

501-2 Valve: 50 inch lbs., 75 inch lbs.