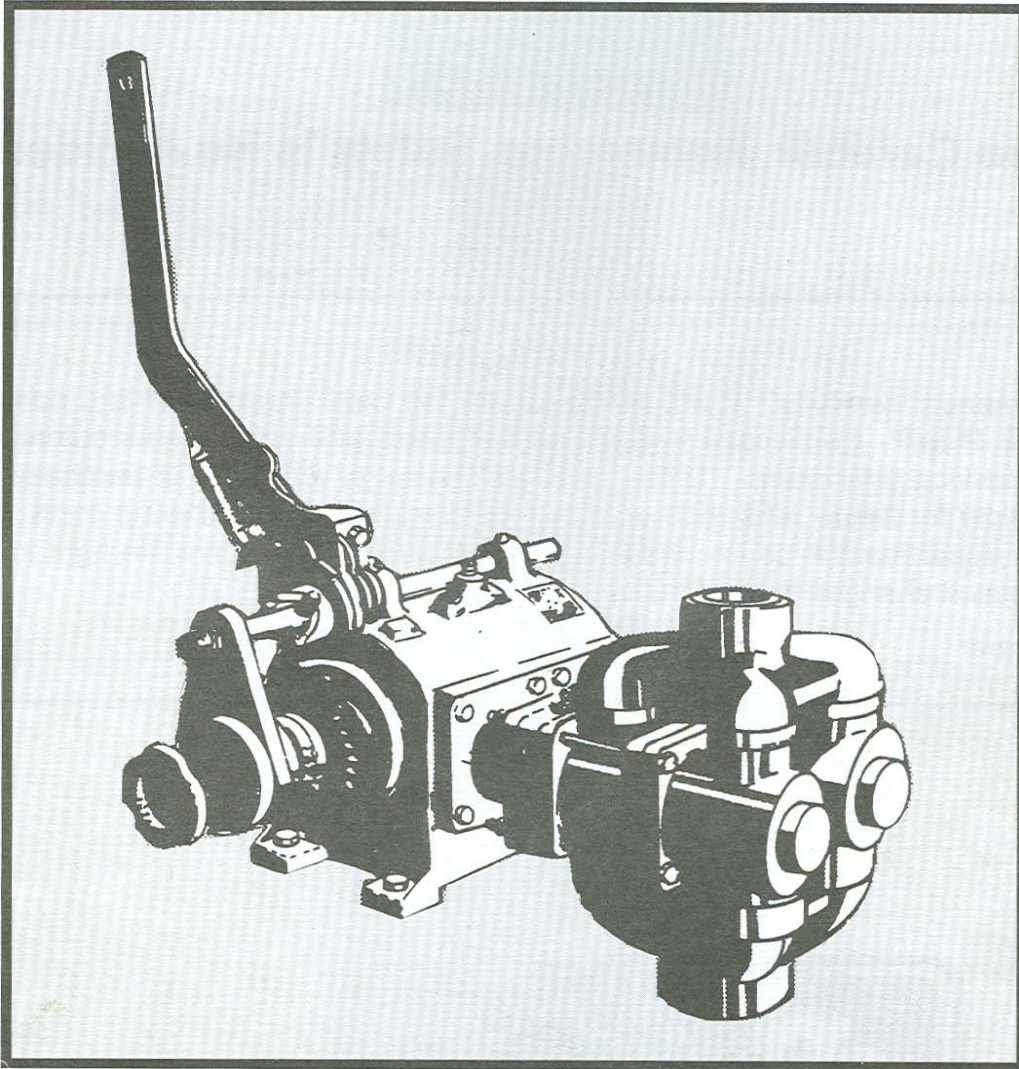


L-4900 SERIES METERING PUMP

PARTS AND INSTRUCTION MANUAL



Price \$10.00



THE PUMP COMPANY

290 Pinehurst Drive • Huntsville, Alabama 35806
P.O. Box 1607 • Huntsville, Alabama 35807
Telephone: (205) 721-9090 • FAX: (205) 721-9091
Toll Free: 1-800-253-2583

SAFETY PRECAUTIONS

- Equipment should be operated only by responsible people.
- A careful operator is the best insurance against an accident.
- Fill system with WATER first and check output.
- Check all valves, fittings, hose clamps, etc. for tightness and soundness before admitting fluid to system.
- Replace hoses when worn, cracked or if leaking.

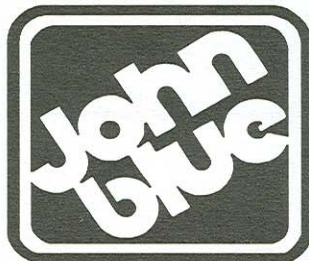
Be Careful! Remember, Safety Is No Accident

To The Owner

Study this manual carefully. It will assist you in the care, installation and operation of your JOHN BLUE PUMP. Familiarize yourself with all parts and adjustments before attempting to operate or service your pump. Enter your serial number and date of purchase in the space provided below for future reference in service information or for ordering parts. Because our engineering department is constantly improving products, we reserve the right to make design and specification changes without notice.

Serial Number _____

Purchase Date _____



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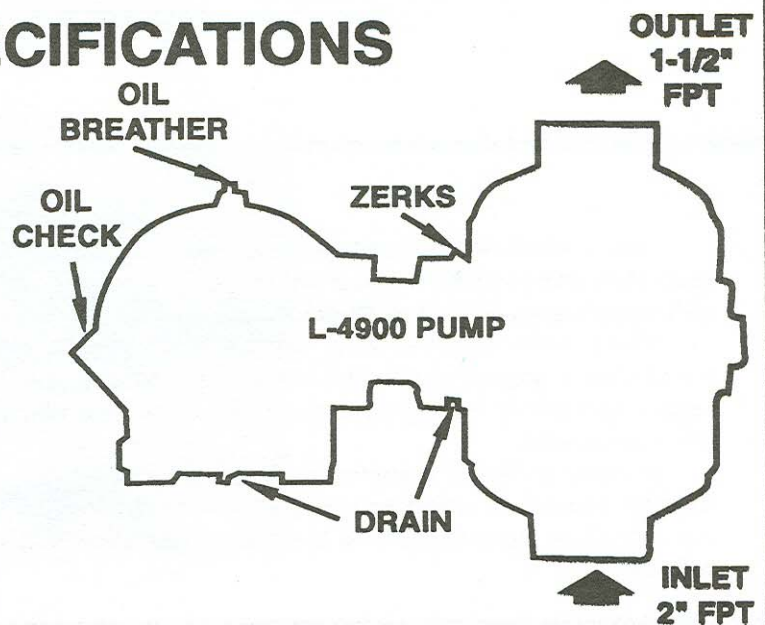
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PUMP SPECIFICATIONS

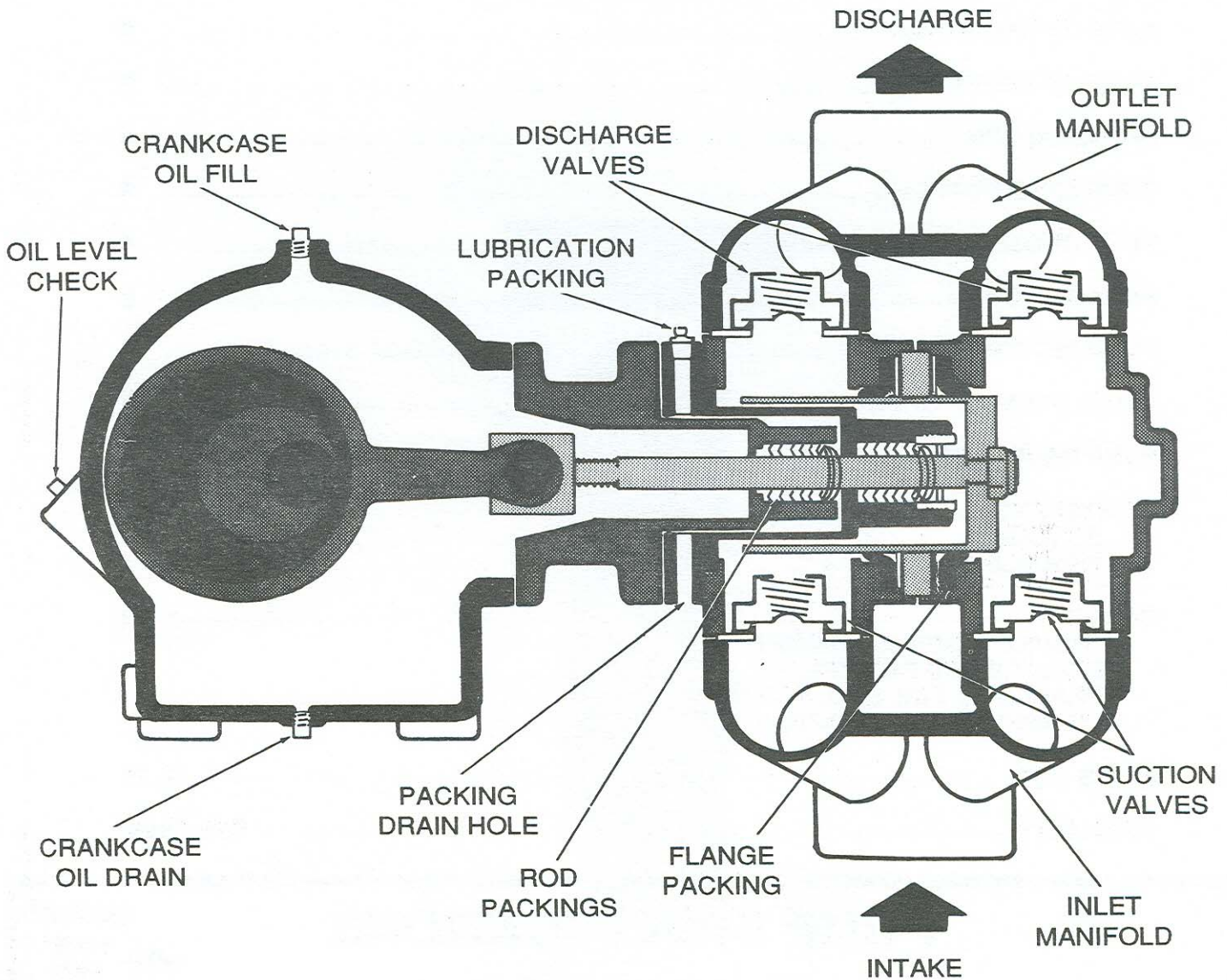
- DISPLACEMENT: Max. 53.2 Gal. Per Minute
Max. .152 Gal. Per Revolution
- OPERATING PRESSURE: Max-60 Lb. Min-10 Lb. psi
- OPERATING SPEED: Max 350 RPM
- ROTATION: Clockwise or Counter Clockwise
- REQUIRED HP: (theoretical) 2 1/2
- PLUMBING: 2" FPT (female pipe thread) Inlet
1 1/2 FPT Outlet
- DRIVE: No. 50 Roller Chain
- PHYSICAL DIMENSIONS: 17"L x 14"W x 9"H
- WEIGHT: 136 Lbs.

LUBRICATION

- CRANKCASE: SAE 90 Gear Oil
- ZERKS: Multipurpose Grease



PUMP CROSS-SECTION



INTRODUCTION

The L-4900 series pump is a two piston, variable stroke metering pump. It is specifically designed to accurately meter liquid fertilizer solutions. The pump's cast iron construction has stainless steel working parts with components subject to abrasion hard chrome plated.

The L-4900 functions as a positive displacement, chain driven metering device which operates in direct relation to a ground drive. The output rate can be set (covered under PUMP SETTING) before application begins and the G P A (gallons per acre) application will be accurate regardless of the varying speeds of the drive mechanism.

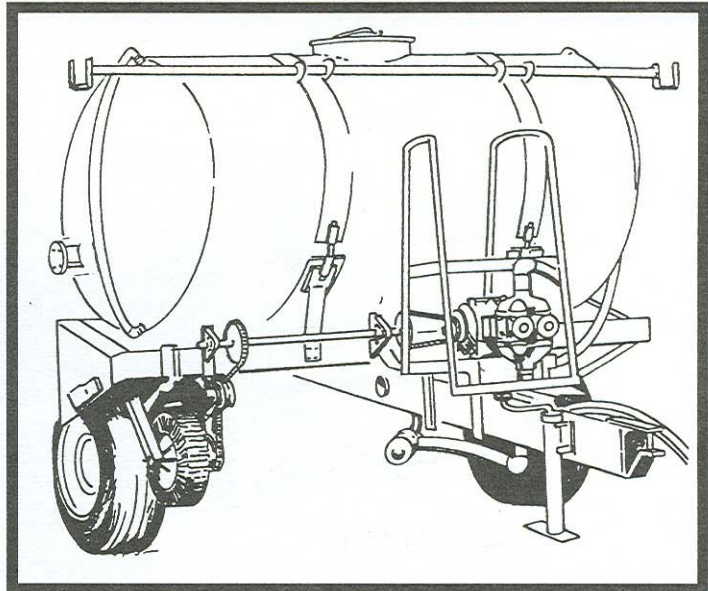
In many pumping systems the flow rate is controlled by the orifice size. The L-4900 pump is designed to function accurately within normal pressure parameters of orifice selection. The only function of an orifice with the John Blue pump systems is to spread material properly over an area. The pump controls the metering of the solution.

INSTALLATION

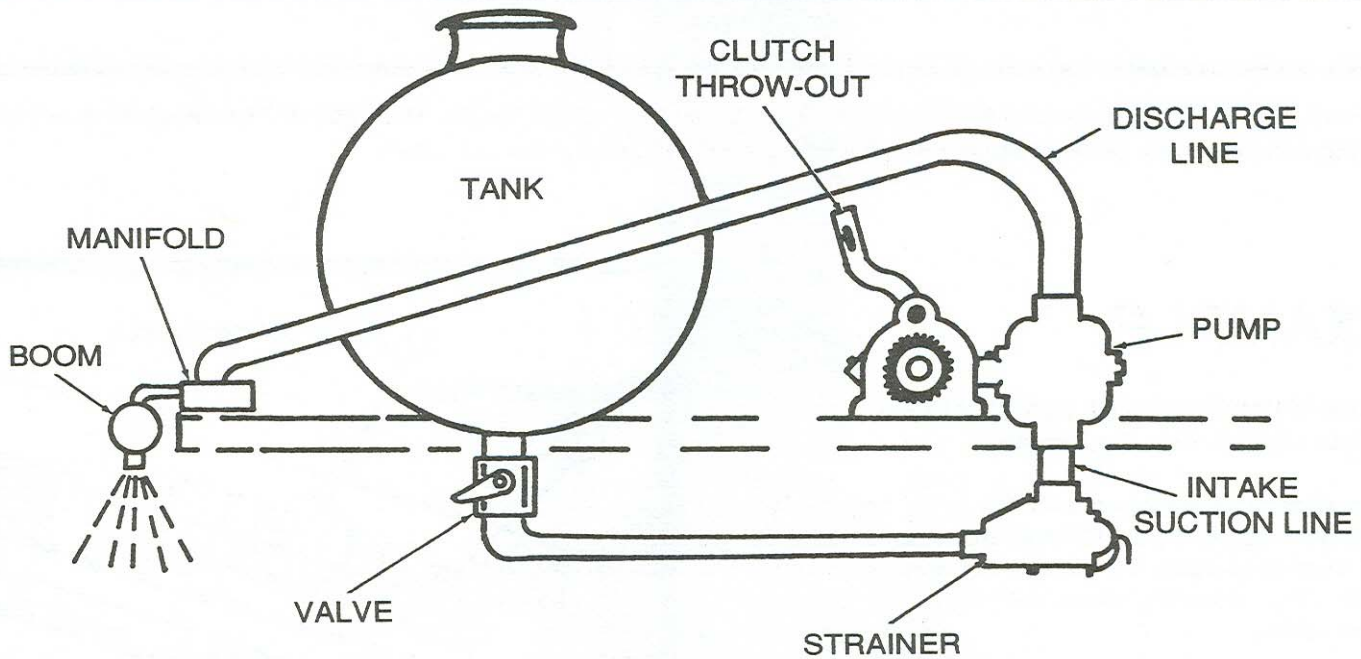
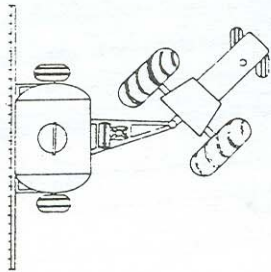
The pump should be mounted on a rigid base in a horizontal position in a location which allows drive chain alignment.

Rubber washers are supplied with your pump. Install these between the pump and mounting surface.

Install the chain idler to run on the slack side of the drive chain.



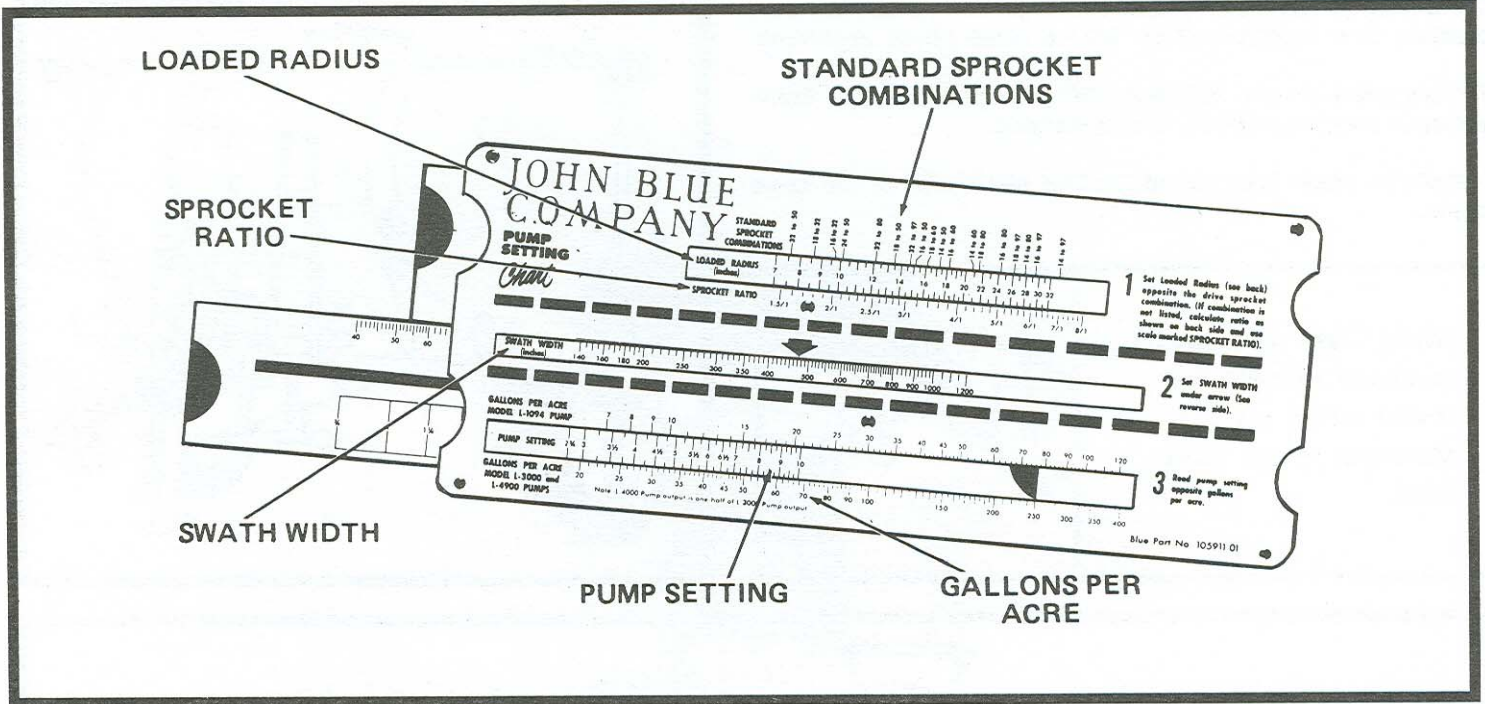
NOTE: Take precaution to assure that the rear tractor wheel will clear the pump during sharp turns.



PLUMBING ACCESSIBILITY

- Before mounting the pump on any chassis, give special attention to the plumbing arrangement.
- The strainer is to be installed on the suction side of pump.
- We recommend that the pump be mounted below or level with the tank fluid.
- Install the solution intake line as straight as possible, and without restrictions from kinks or extremely sharp turns. This will assure even flow during maximum pump output.
- Install drive chain with proper tightness and alignment.
- Check clutch throw-out- yoke clearance to avoid premature wear.

PUMP SETTING



Pump output is determined by the drive sprocket ratio and the stroke length. The 105911-01 slide chart is used to determine the scale setting required to adjust the stroke length for a desired output.

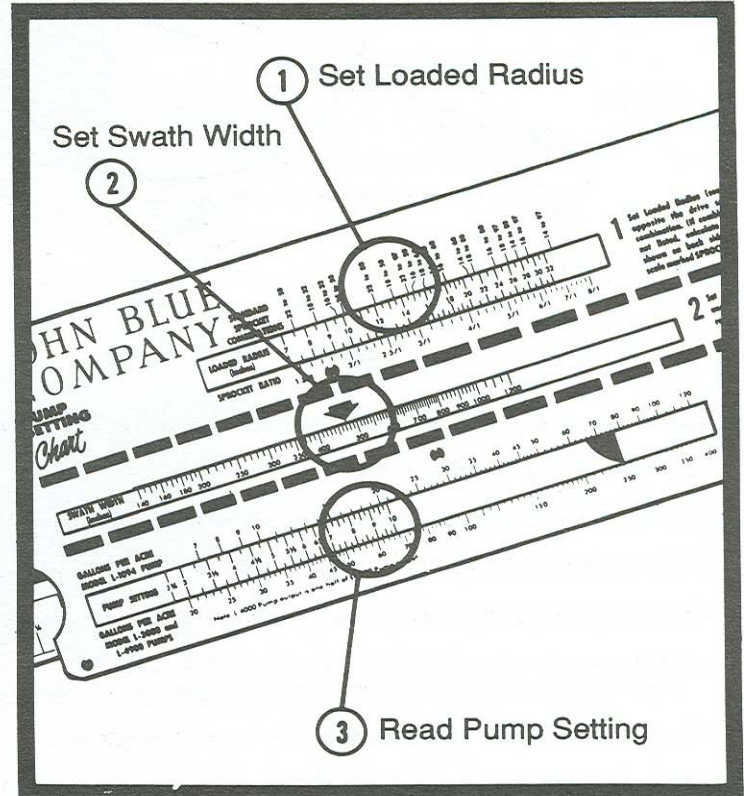
EXAMPLE:

STANDARD** SPROCKET COMBINATIONS
(**Ones used on Blue Equipment)

An applicator is equipped with 11L x 15" tires, a 50 tooth drive sprocket, an 18 tooth pump sprocket and it is desired to apply 60 gallons per acre on a 480" swath. The following steps will determine correct pump setting:

1. Set loaded Radius of tire (13.5") under the sprocket combination of 18 to 50 in the top window.
2. Set the swath width (480") under the arrow in the middle window.
3. Read the pump setting of 8.75 above 60 gallons per acre on the bottom scale.

The correct pump setting is 8.75.



DRIVE RATIO

EXAMPLE:

NONSTANDARD SPROCKET COMBINATIONS

If you are using sprocket combinations other than the standards given on the pump chart, use the following formula to determine the drive ratio:

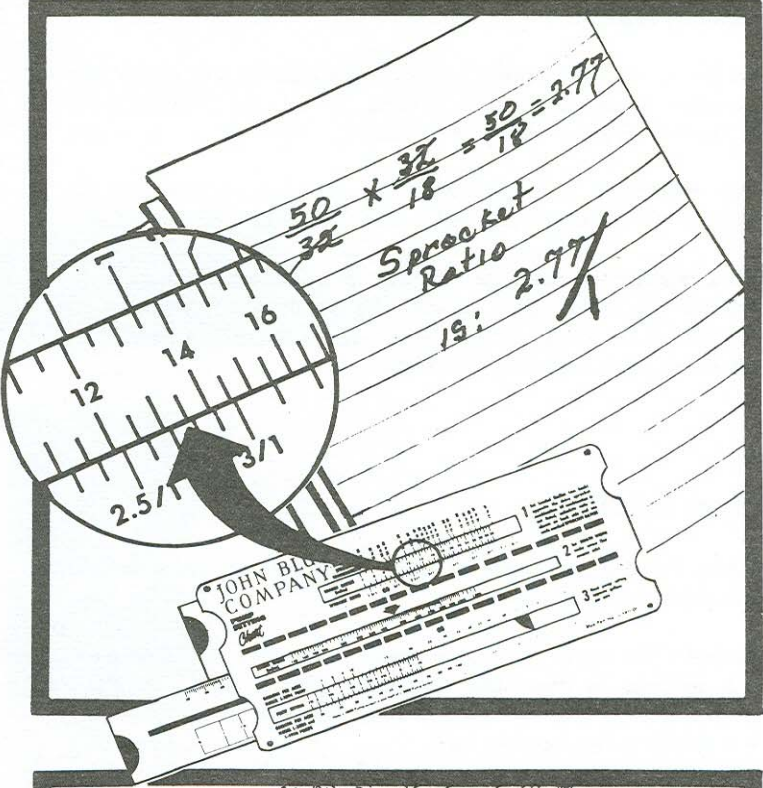
$$\frac{\text{Drive Sprocket}}{\text{Driven Sprocket}} = \text{DRIVE RATIO}$$

$$\frac{50 \text{ tooth (@ drive wheel)}}{32 \text{ tooth (@ driven shaft)}} \times \frac{32 \text{ T (@ drive shaft)}}{18 \text{ T (@ driven pump)}}$$

The drive ratio is: $\frac{50 \text{ T}}{18 \text{ T}} = 2.77$

The sprocket ratio is shown as the third line of figures on the slide chart and can be used on any drive arrangement.

The 2.77 sprocket ratio is projected across the slide box, it aligns with the 18 to 50 point on the standard sprocket combination. From this point, the calculations are the same for all ground wheel drive units.



LOADED RADIUS

The measurement for the loaded radius must be from the manufacturer of the tire or be measured under loaded conditions.

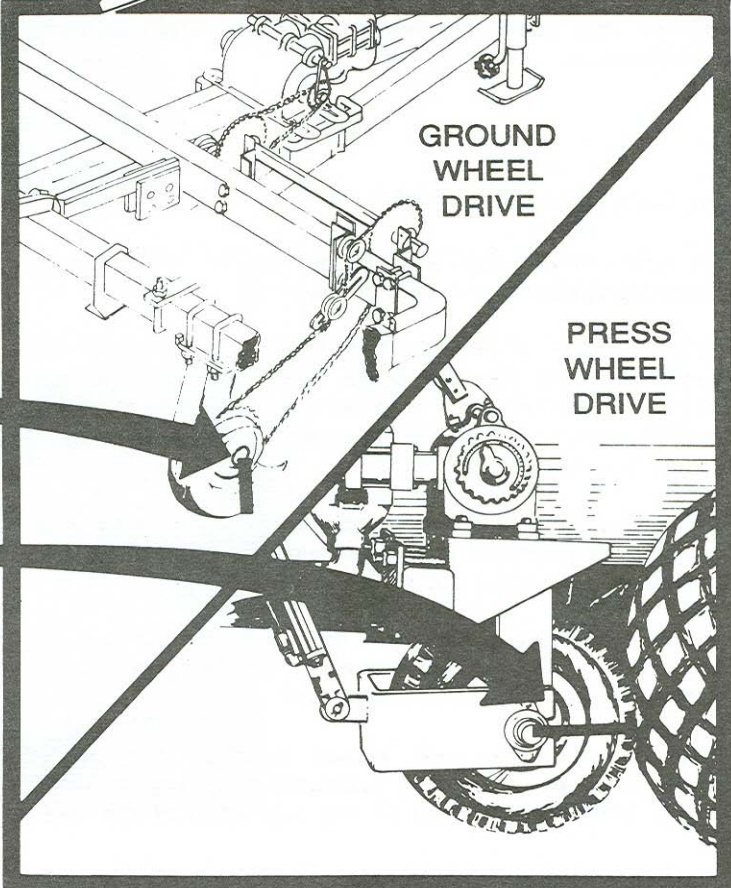
GROUND WHEEL DRIVE ARRANGEMENT

Measure the loaded radius from the center of hub to bottom of tire where it rests on the ground.

PRESS WHEEL DRIVE ARRANGEMENT

Measure the loaded radius from the center of the press wheel shaft to the position where the wheel rests against the tire which carries the unit. The press wheel must be engaged for normal operation to give an accurate reading.

The calculation for sprocket ratio is the same for ground drive or press wheel, once the proper measurement is made for the loaded radius.



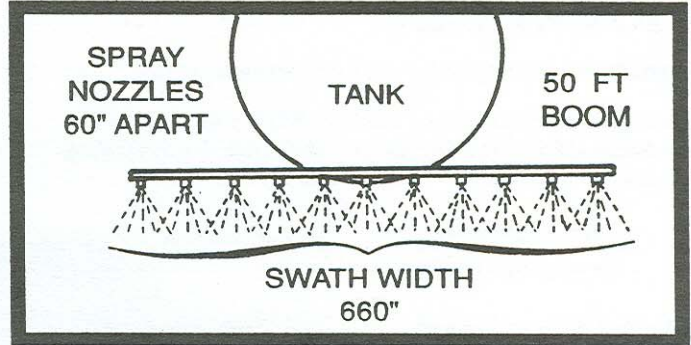
INITIAL START-UP

SWATH WIDTH

To determine the swath width of the applicator, count the number of outlets and multiply times the distance (in inches) between any two outlets, nozzles or shanks.

For example: a Boom with 11 nozzles spaced at 60 inches would have a swath width of 660" NOT 50 feet.

This assumes that all outlets are equally spaced. If outlets are not evenly spaced figure the entire length of the boom or toolbar from end nozzle to end nozzle and allow for coverage beyond ends.

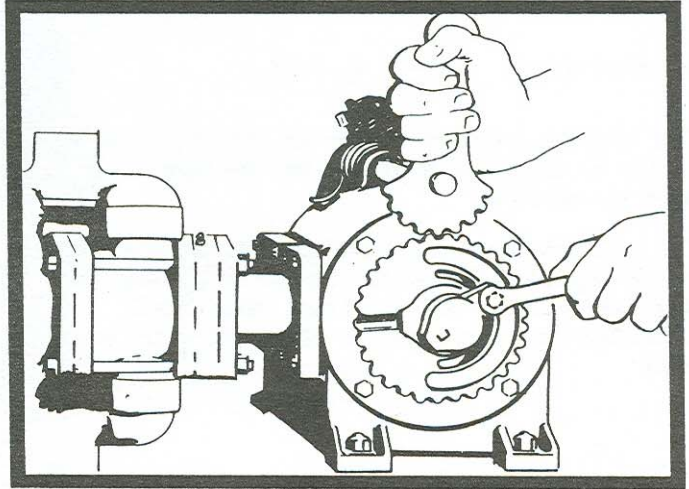


PUMP SETTING

Read the desired pump setting from the bottom scale on the pump setting chart.

Loosen the scale setting nut and rotate the dial disc until the pointer is over the desired setting. The L-3092-A pump setting wrench will facilitate rotation of the dial disc if it tends to be hard to turn.

Tighten the scale setting nut, being careful not to over-torque it.



INITIAL START-UP OF PUMP

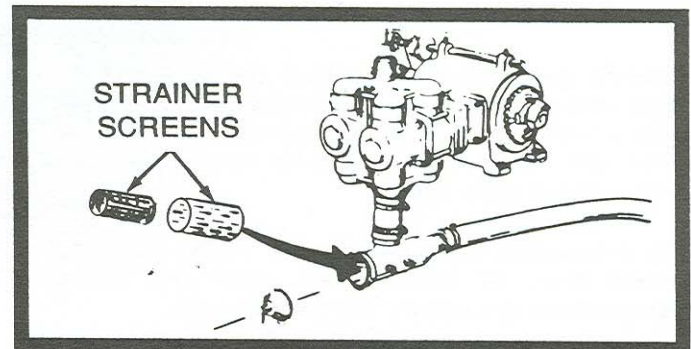
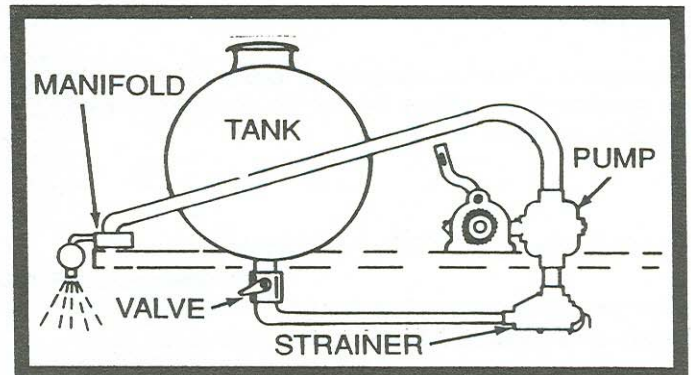
Fill tank one-half full of water to test for leaks in the plumbing system and output of the pump.

Fully open the valve at the tank allowing water to fill the suction line and check for leaks. Your pump is factory set at 10. You will not need to re-set it for this test run. If the system includes a flow divider, open this and relieve back pressure or remove hose.

Before installing nozzles or orifices, prime the pump and purge the system of air and foreign material by slowly pulling the applicator 100 to 200 yards.

Turn off the valve at the tank, open strainer and remove screens. Visually check and remove foreign materials. Install proper orifices and set pump.

Pull the machine over known acreage and verify accuracy of application by subtracting amount of water left in tank from amount at the beginning of the test.



PUMP CALIBRATION

If the pump setting scale becomes lost or loose use the following procedure to calibrate the pump output with dial readings.

Remove the outboard cylinder and replace the bolts and washers to hold the inboard cylinder and stuffing boxes in place.

With the scale attached to the dial disc, loosen the pointer setting nut and move the pointer to 5. Tighten the pointer nut.

Rotate the crankshaft until the exposed piston is as far in the inboard cylinder toward crankcase as it will go.

With a tri-square or straight edge and rule, measure the distance from the end of the piston to the cylinder flange.

Rotate the crankshaft until the piston is as far out as it will go and measure again to the same place.

The difference in the measurements is the stroke length, which @ 5 should be $15/16$ ". If the distance is less than $15/16$ ", reset the pointer at a higher setting.

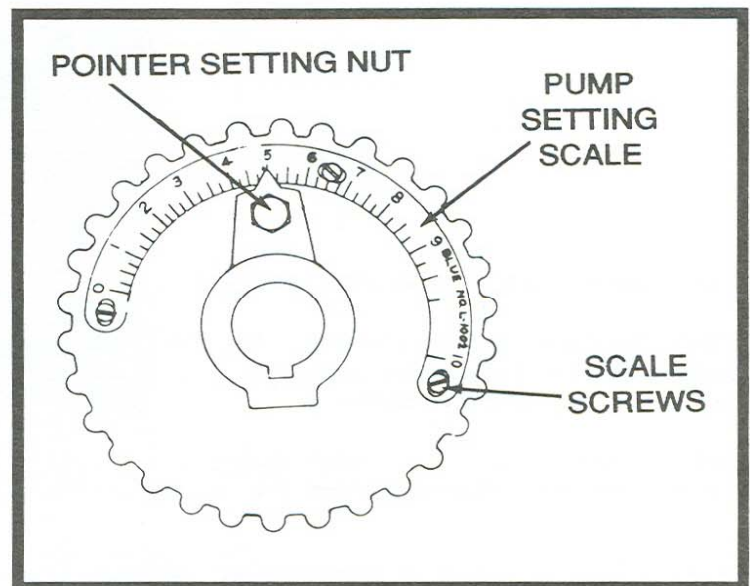
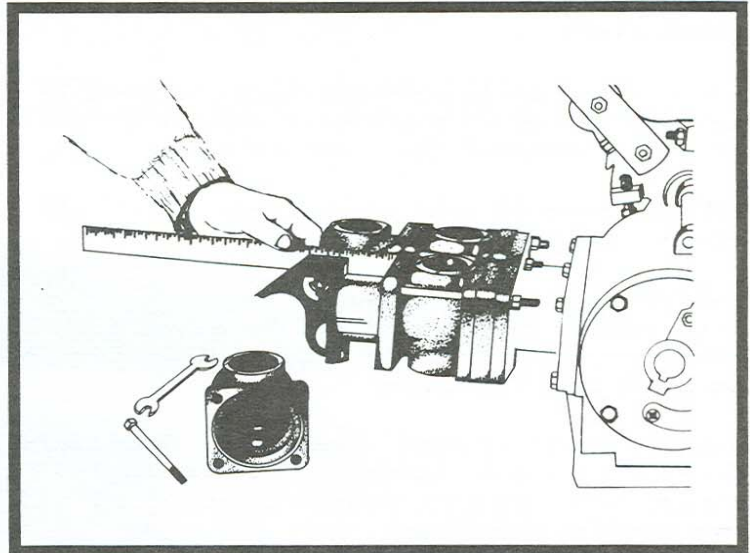
If the difference is greater than $15/16$ ", reset the pointer less than 5.

Repeat this procedure as many times as necessary to obtain the $15/16$ " stroke length.

When the $15/16$ " stroke is obtained, tighten the pointer nut, locking it in position.

Loosen the three scale screws and move the setting scale until the 5 is directly under the pointer. Secure the scale in position.

This completes the calibration. Replace the outboard cylinder.



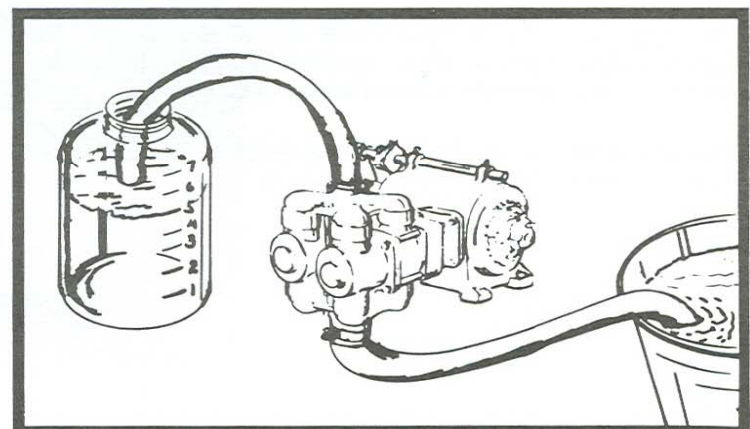
PUMP ACCURACY

Check pump displacement by measuring output of water for a known number of strokes.

Disconnect suction hose and insert in a container of water. Thoroughly flush and prime pump.

Set pump at $8-1/4$ and turn exactly 10 revolutions. The amount of water discharged should be 5 quarts.

This test should be used only to verify pump output, not as a calibration method.



MAINTENANCE

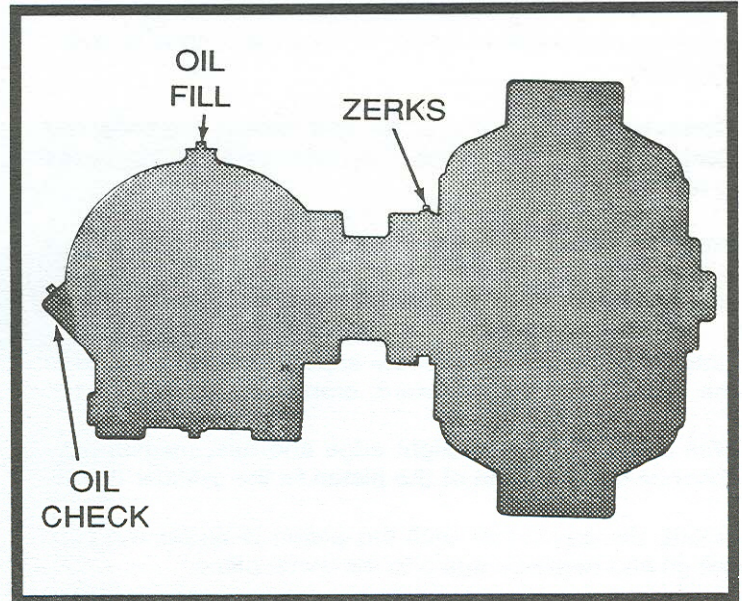
LUBRICATION

Check oil daily and fill crankcase with a good grade 90 weight EP gear oil. Oil level must be visible at oil check on back of crankcase for proper operation of pump.

Lubricate zerks on roller chain sprocket, clutch and throw-out cam daily.

Lubricate daily, the automatically tensioned stuffing boxes between the crankcase and discharge manifold. Fill zerks until packing lubricant seeps out of drain hole in the bottom of the stuffing box.

Visually inspect sprocket, drive chain, clutch and throw-out yoke daily. Lubricate drive chain with oil regularly. Chain alignment and throw-out yoke clearance must remain as originally set.



REVERSING CLUTCH THROWOUT LEVER

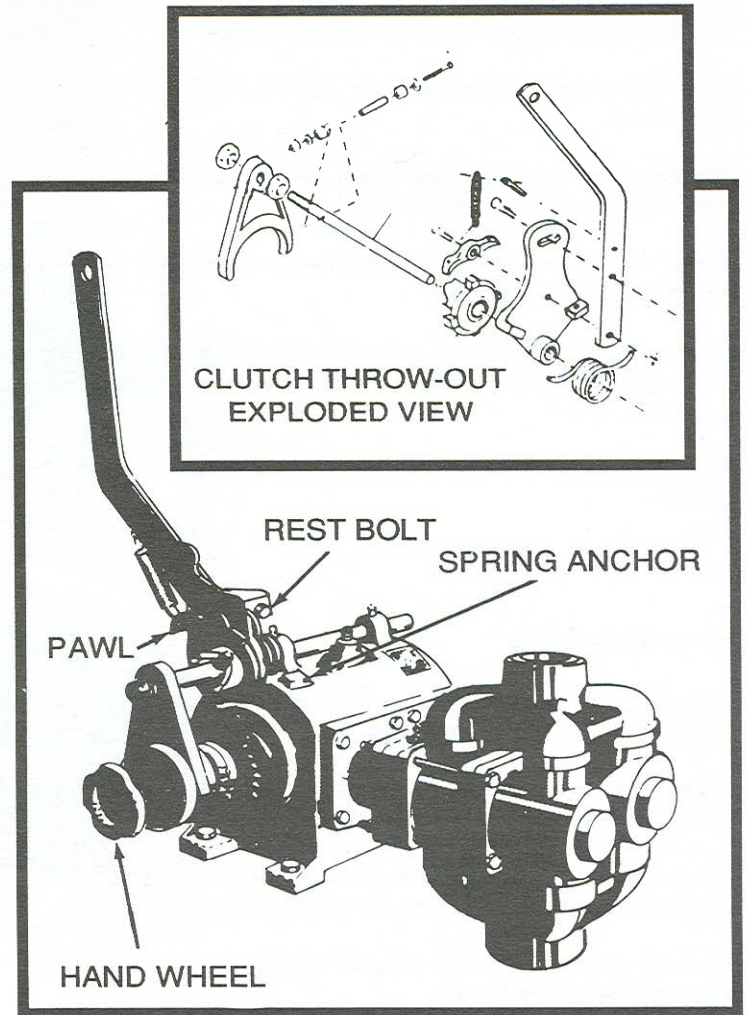
Disengage throw-out lever spring from the pawl. Remove capscrew from handwheel assembly and slide off handwheel and its tension spring.

Relieve tension from the torsion spring and remove clutch throw-out assembly from the throw-out rod.

Remove torsion spring (L-3076-R) and replace with L-3076-L opposite wound spring. (Not supplied with pump, may be ordered).

Relocate the spring anchor block and anchor spring on opposite side of pump. Reassemble clutch and throw-out assembly. Reassemble handwheel assembly.

Reverse direction of the throw-out lever and attach the throw-out lever spring on the opposite end of the pawl.



STORAGE

KEEP AIR OUT

KEEP FROM FREEZING

RECOMMENDED STORAGE PROCEDURES

KEEP AIR OUT OF PUMP! This is the only way to prevent corrosion. Even for short periods of storage, the entrance of air into pump, will cause RAPID AND SEVERE CORROSION.

OVERNIGHT

SUSPENSION FERTILIZER must be flushed from the pump for ANY storage period.

FOR CLEAR LIQUIDS:

1. Steady or rising temperatures; leave pump and hoses filled with solution. Do NOT drain nor admit air to the pump.
2. Cooling weather, (solution likely to salt out), fill pump with water and leave filled. Do NOT admit air.

ONE TO TWO WEEKS

ACCEPTABLE: Draw in fresh water - - diluting and flushing out solution. Do NOT drain. Keep pump sealed to exclude air.

RECOMMENDED: Flush pump thoroughly with 5 to 10 gallons of fresh water by drawing in through suction lines. IMMEDIATELY fill all passages in pump with motor oil, OR half diesel and half motor oil mixture, replace the manifold and close inlet and outlet with oily cloth or stopper to exclude air.

WINTER STORAGE

Flush pump thoroughly with 5 to 10 gallons of fresh warm water and circulate until all corrosive salts are dissolved in the pump.

With pump set on 10, draw in a mixture of half diesel fuel and half 10 weight oil until the discharge is clean. Then plug inlet and outlet.

TROUBLE CHART

TROUBLE	PROBABLE CAUSE	CORRECTION
1. Pump hard or impossible to prime	a. Valves fouled or in wrong place	Page 12
	b. Air leak in suction line	Page 5
	c. Pump set too low	Page 8
	d. Packings worn out	Page 13
2. Low metering	e. See a. b. c., above	
	f. Broken valve spring	Page 12
3. Over meters	g. Broken discharge valve spring	Page 12
	h. Trash under valves	Page 12
	i. Improper setting	Page 8
4. Leaks through when stopped	j. See g. and h.	
5. Fertilizer solution leaking under stuffing box	k. Rod packings worn out	Page 13
6. Pump using excessive oil	l. Oil seals or O'Ring worn and leaking	Page 12/14
7. Pump operates noisily	m. Crankcase components worn excessively	Page 14

PUMPING CHAMBER REBUILD

Pumping chamber rebuilding is an economical way to assure that your pump will give optimum service for several years. This type of rebuilding is simple, and can be done by almost all end users. The L-4900 pump repair kit includes all seals and gaskets needed for normal rebuilding and can be ordered by stock number L-3090.

CLEAN AND CHECK VALVES

Remove suction and discharge (top) manifolds and notice that all valve spring cages are turned upward and valves with stronger spring belong in the discharge manifold.

Do not remove valves. Many valves are damaged beyond use by needlessly removing them from the manifold.

Push each valve disc off its seat, check for trash and assure that the spring re-seats each valve disc evenly. Inspect for damage such as cracks or chips in the seating rim of the valve.

Check the condition of the O'ring seals, replace if broken or cracked. An air leak will cause the pump to meter low.

Once all valves are check and O'rings are in position, replace manifolds using care to tighten bolts evenly.

REPLACE PISTON SEAL FLANGE PACKINGS

With both intake and discharge manifolds removed, remove outboard cylinder and remove flange packing from packing recess.

Notice the position of the 2 flange seals and the fibre shims as you remove them.

Remove the metal washer and then remove the other flange packings from the inboard cylinder recess. The flange seal must be pliable and without cracks or nicks to perform properly. Inspect the seals and replace if necessary.

Clean cavities in both the inboard and outboard cylinders.

Inspect piston for scratches, indentation, or severe abrasion. Discoloration of the plunger can be deceiving. The best way to check is by feel. Indentions around piston may be more detrimental than one running horizontally. Indentions may indicate a need for replacement.

Re-install the inboard flange seal using one or more fiber shims over lip to make packing seat firmly.

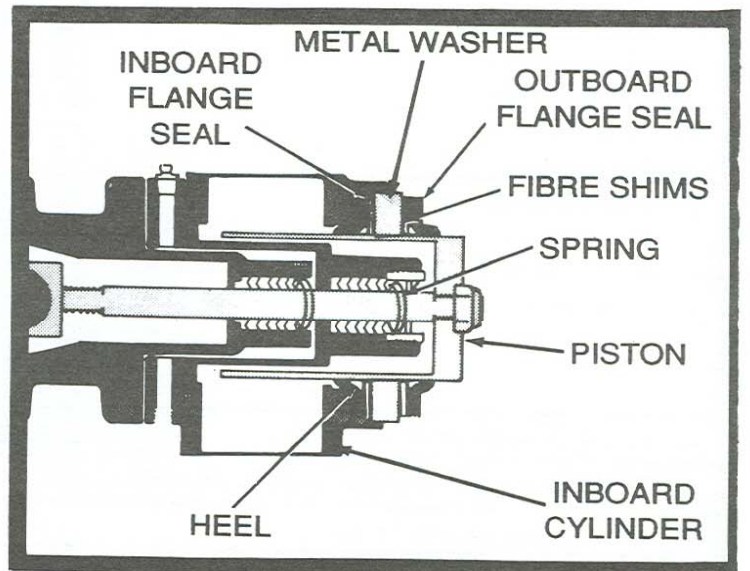
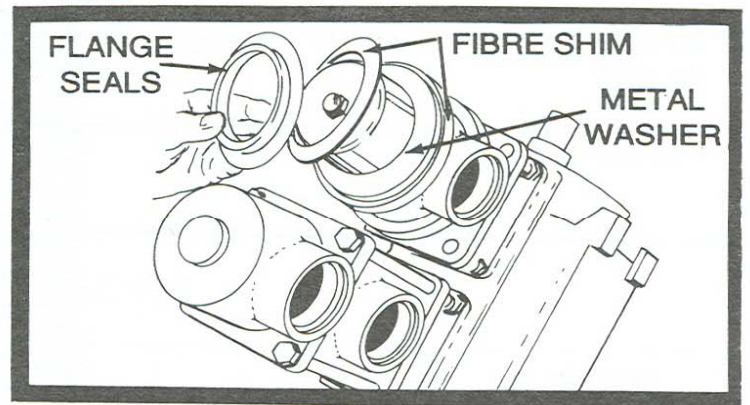
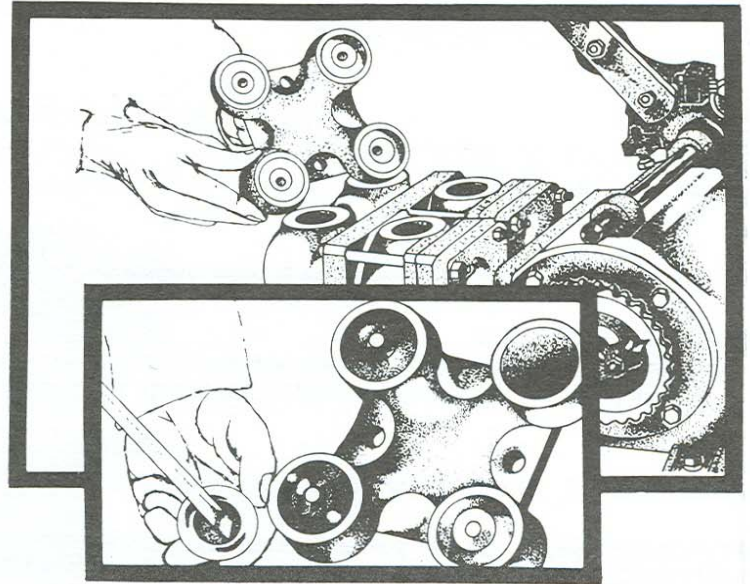
These flange seals should have clearance between heel of flange and piston. However, make sure lips seal and fit snugly around piston completely.

Place the metal washer on the piston and replace outer flange packing as above.

Use the same quantity of fibre shims as were removed.

Re-assemble outboard cylinder assuring that the inboard and outboard cylinder do not touch without considerable compression. If these parts fit together too easily, disassemble and add more fibre shims.

Repeat the process for other cylinder.



REPLACE ROD PACKING

REPLACE PISTON ROD VEE PACKINGS

The rod packings are 2 sets of self-tightening "vee" rings which seal around the piston rod to prevent contamination of the crankcase. Virtually any leakage of the fertilizer material being pumped, through the drain under stuffing box is an indication that these rod packings need replacement. However, it is not uncommon for oil to drip from this drain.

With both manifolds removed, remove the outboard and inboard cylinder. Then remove the stainless steel hex nut from piston.

Remove piston by rotating counter-clockwise. If piston is hard to turn, use a belt wrench or pipe wrench over cloth to prevent damage to the piston. Grip the piston as near to end as possible.

Remove the stuffing box and crosshead guide which house the rod and packing set.

Remove the snap-ring from the end of the stuffing box, allowing washer and spring to slip out.

Remove first packing set with a hook or other metal prying instrument.

There is no snap-ring on the second packing set. Remove this in the same manner.

Inspect the rod and bushing at the connecting rod. If bushing replacement is needed, refer to page 16 of this manual for instructions.

Carefully re-install the crosshead guide and bolt to crankcase.

Lubricate rod and carefully install the first "vee" packing set. (Check drawing for proper orientation of rod "vee" packing.) Install washer and spring.

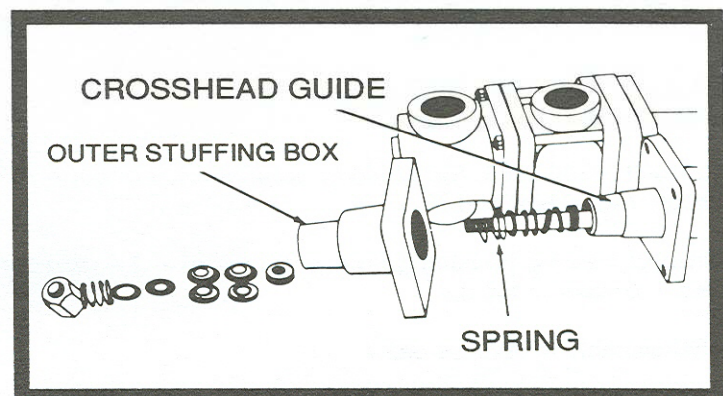
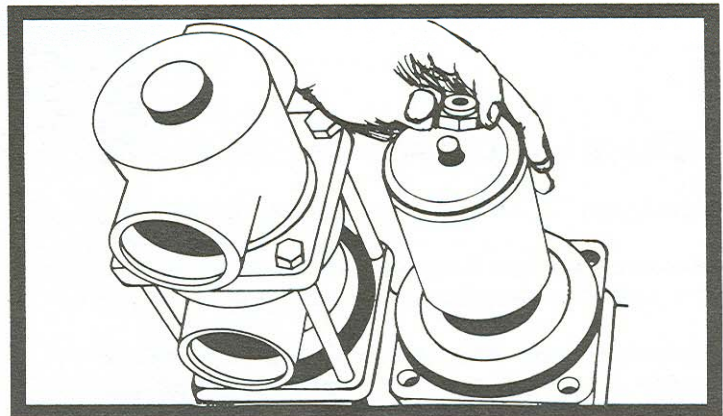
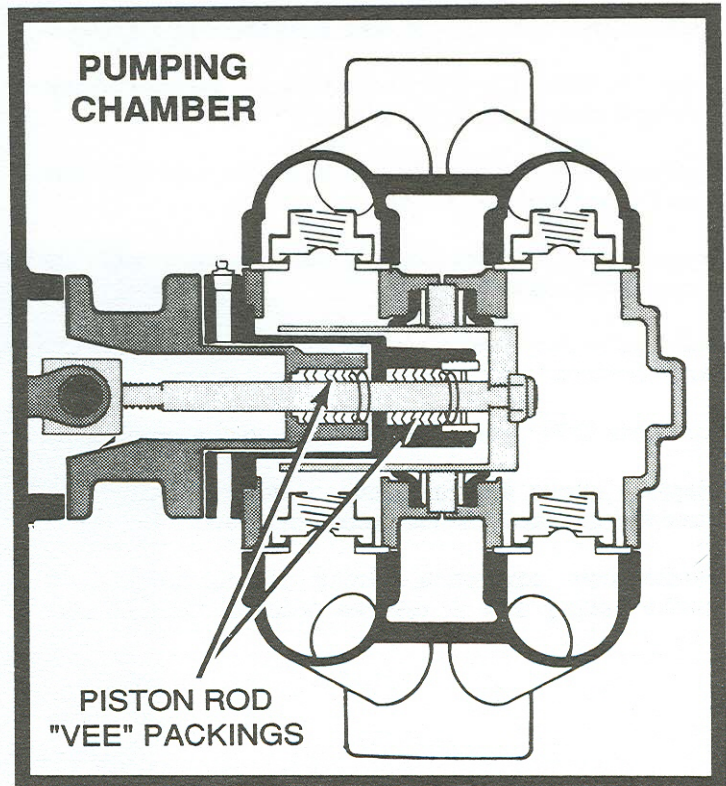
Install second packing set, washer, spring and snap ring retainer in stuffing box. (Check drawing for proper orientation.)

Lubricate piston rod and stuffing box, then slide stuffing box carefully back over rod.

Reassemble piston, inboard and outboard cylinders and manifolds in reverse order. Install bolts.

Lubricate stuffing box until lubricant seeps out of drain hole in the bottom.

Repeat the process for the other cylinder.



CRANKSHAFT OIL SEAL REPLACEMENT

REPLACING OIL SEALS AND CRANKSHAFT O'RING

From the setting end of the crankcase, remove stroke setting arm and stroke setting flange.

Remove cover plate and replace grease seal with new seal from L-3090 seals kit.

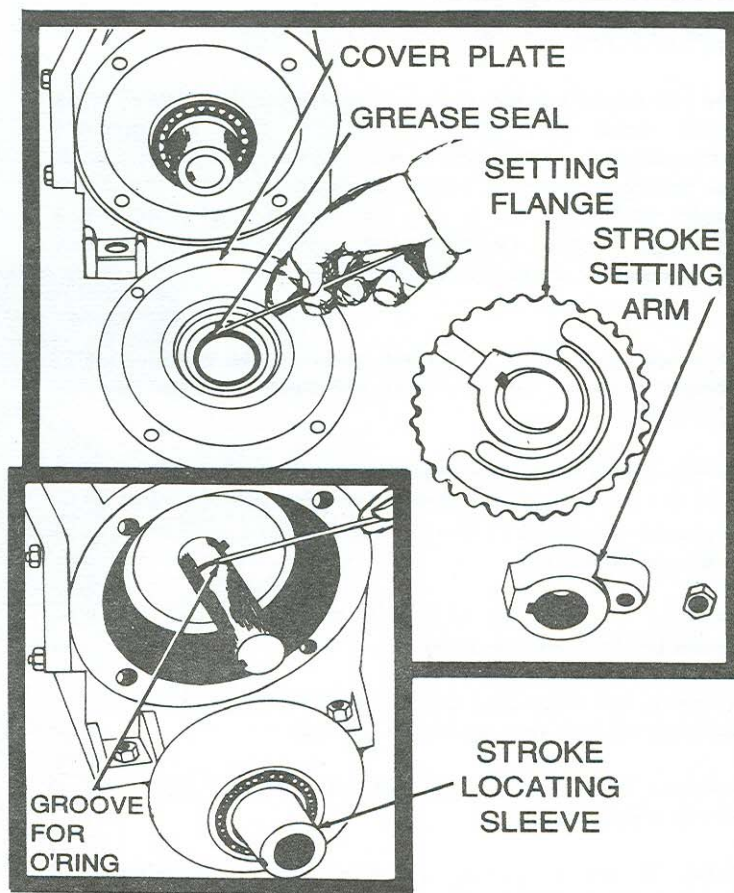
Inspect gasket for breaks and tears on coverplate and replace if necessary.

Remove stroke setting sleeve and inspect for obvious wear or "nicks" which might cause seal failure.

Lubricate O'Ring and place it back on the crankshaft.

Replace stroke setting sleeve, making sure that the eccentric pin slips into the groove of sleeve.

Reassemble coverplate, stroke setting flange and stroke setting arm in reverse order of disassembly.



REPLACE SEAL AT THROW-OUT END OF CRANKCASE

Disengage throw-out lever spring from the pawl.

Remove capscrew from handwheel assembly and slide the handwheel and its tension spring off the crankshaft.

Relieve tension from the torsion spring and remove clutch throw-out assembly from the throw-out rod.

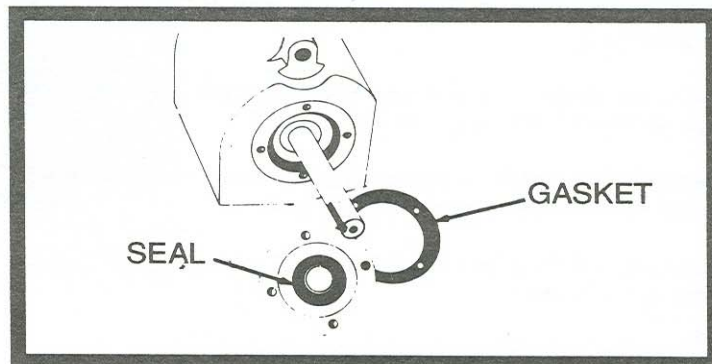
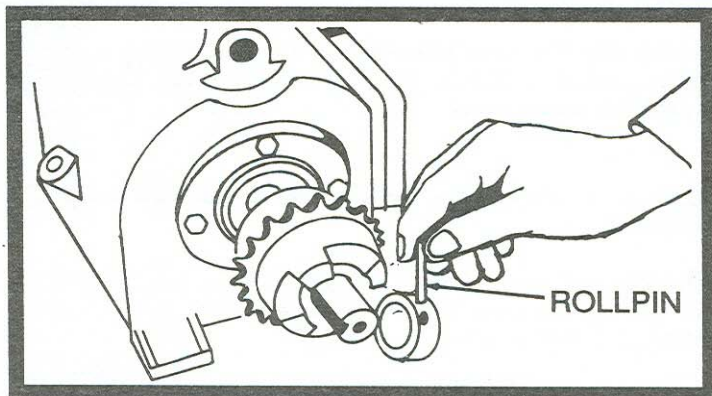
Remove rollpin from collar, and remove collar and sprocket from crankshaft.

Remove bearing housing and seal from crankshaft and replace seal.

Inspect crankshaft for obvious wear or nicks which might cause seal failure.

Inspect bearing housing gasket and replace if it shows wear, breaks or tears.

Reassemble in reverse order.



CRANKCASE DISASSEMBLY

Major pump repair requires some indepth knowledge on working tolerances for internal parts. We recommend that you contact your nearest John Blue Sales and Service dealer for the best results in major pump repair.

With pumps which have been in service for several years, a history of use is helpful. If a pump has been in use by a farmer for 5 to 10 years without any repair, a slight wear on internal parts will probably give another 5 years of good service before wear would justify other parts replacement.

However, if a pump is being used by a dealer using suspension fertilizers, one more year may result in additional parts failing and replacement of drive line components would be justified.

CRANKCASE DISASSEMBLY

Remove pumping chamber components in the following order:

1. Upper and lower Manifolds
2. Outboard cylinder
3. Cylinder packing
4. Inboard cylinder
5. Piston assembly
6. Rod packing
7. Outboard stuffing box
8. Crosshead guide
9. Crosshead pin, bushing and rod

Examine sediment in the crankcase. There will always be a small amount of metal wear and "grit" in the oil.

Check for metal and/or fertilizer discoloration to the oil.

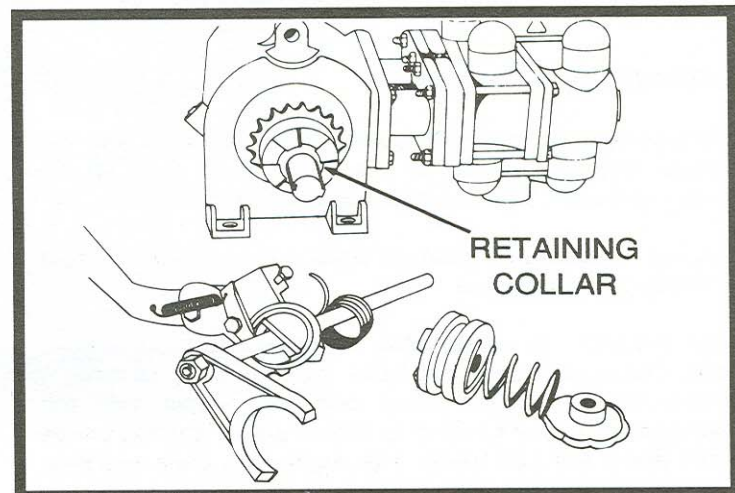
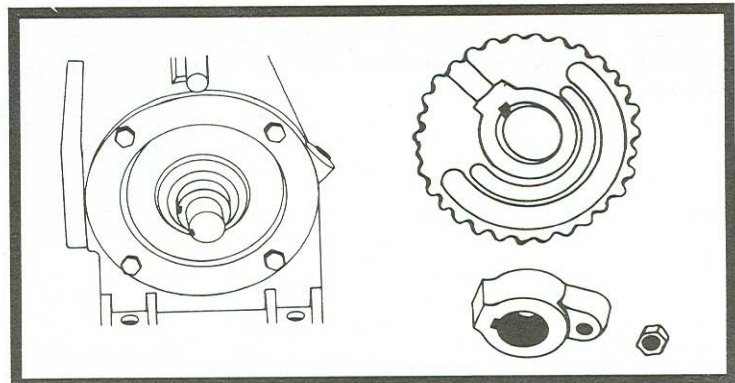
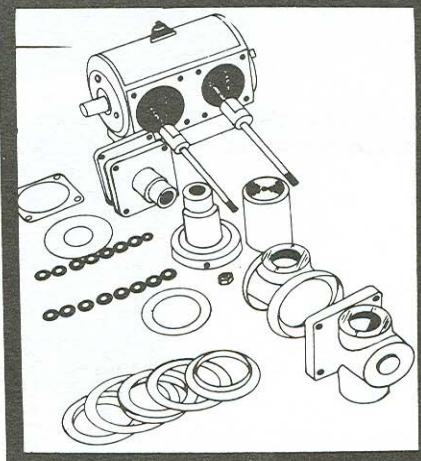
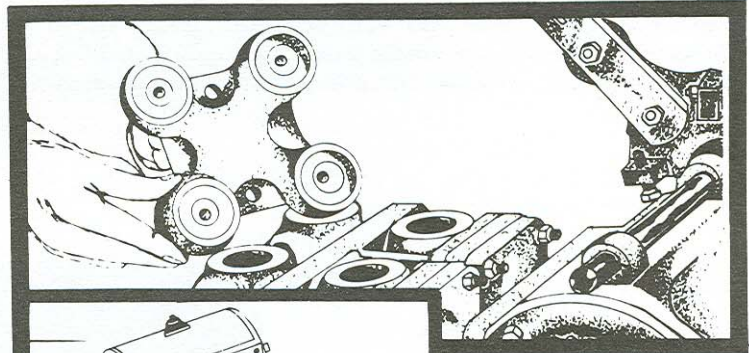
If oil shows fertilizer present, the crankcase should be disassembled and each component examined for rust pitting or deterioration.

Holding the crankcase firmly, take hold of the connecting rod and push and pull. If you feel obvious end play, disassemble all components and examine for wear.

When examining components, give more attention to ones showing "galling" than to ones which are undersized yet smooth.

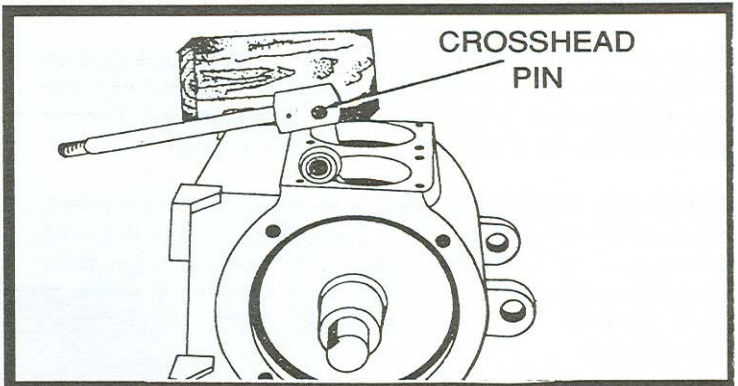
Remove stroke setting and flange.

Remove Clutch and throw-out assembly in the following order: 3/8" nut, handwheel and spring, clutch throw-out assembly, including rod.

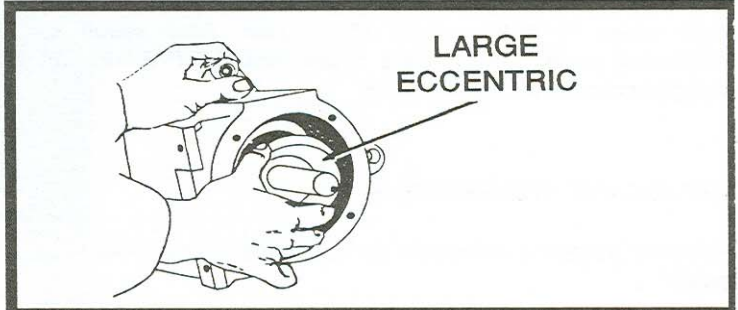


CRANKCASE DISASSEMBLY

Supporting the piston rod with a wood block, locate crosshead pin which connects piston rod and connecting rod and carefully drive pin out with a hammer and punch.

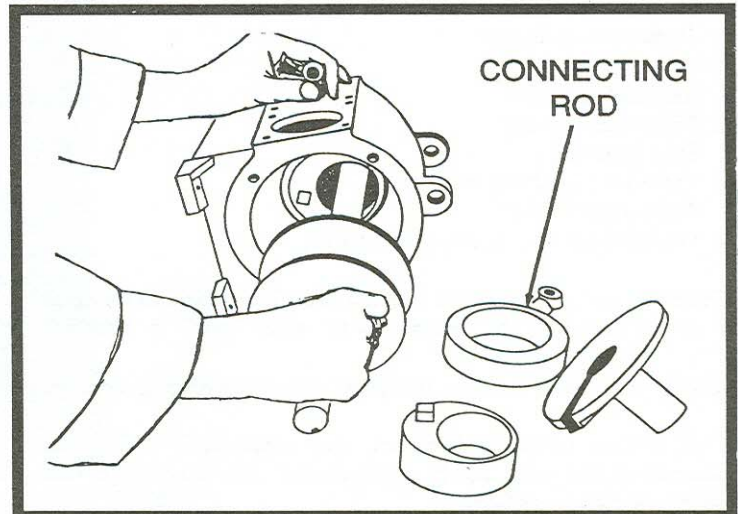


Unbolt end plate from crankcase, slide stroke locating sleeve out and pull large eccentric out of connecting rod and off small eccentric.



Remove connecting rod and pull crankshaft out.

Examine all components, giving more attention to ones showing "galling" than to ones which are undersize, yet smooth.

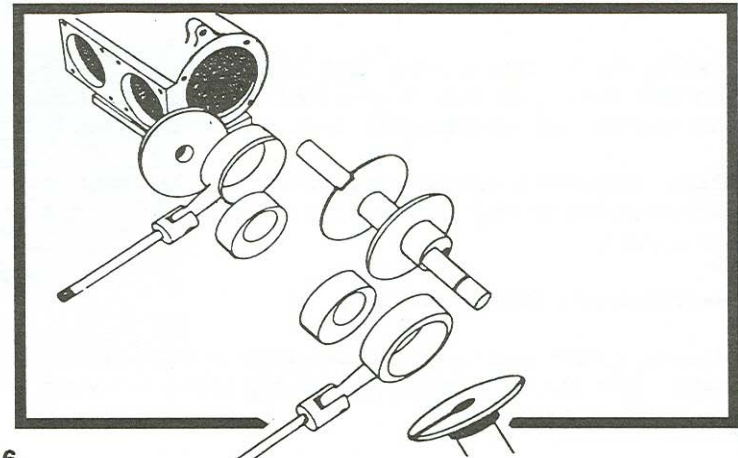


CRANKCASE RE-ASSEMBLY

Reassemble in reverse order. When assembling the stroke locating sleeve, oil the O'Ring and twist sleeve onto crankshaft to prevent damage to O'Ring.

During re-assembly, coat all bolts with permatex before installing on crankcase.

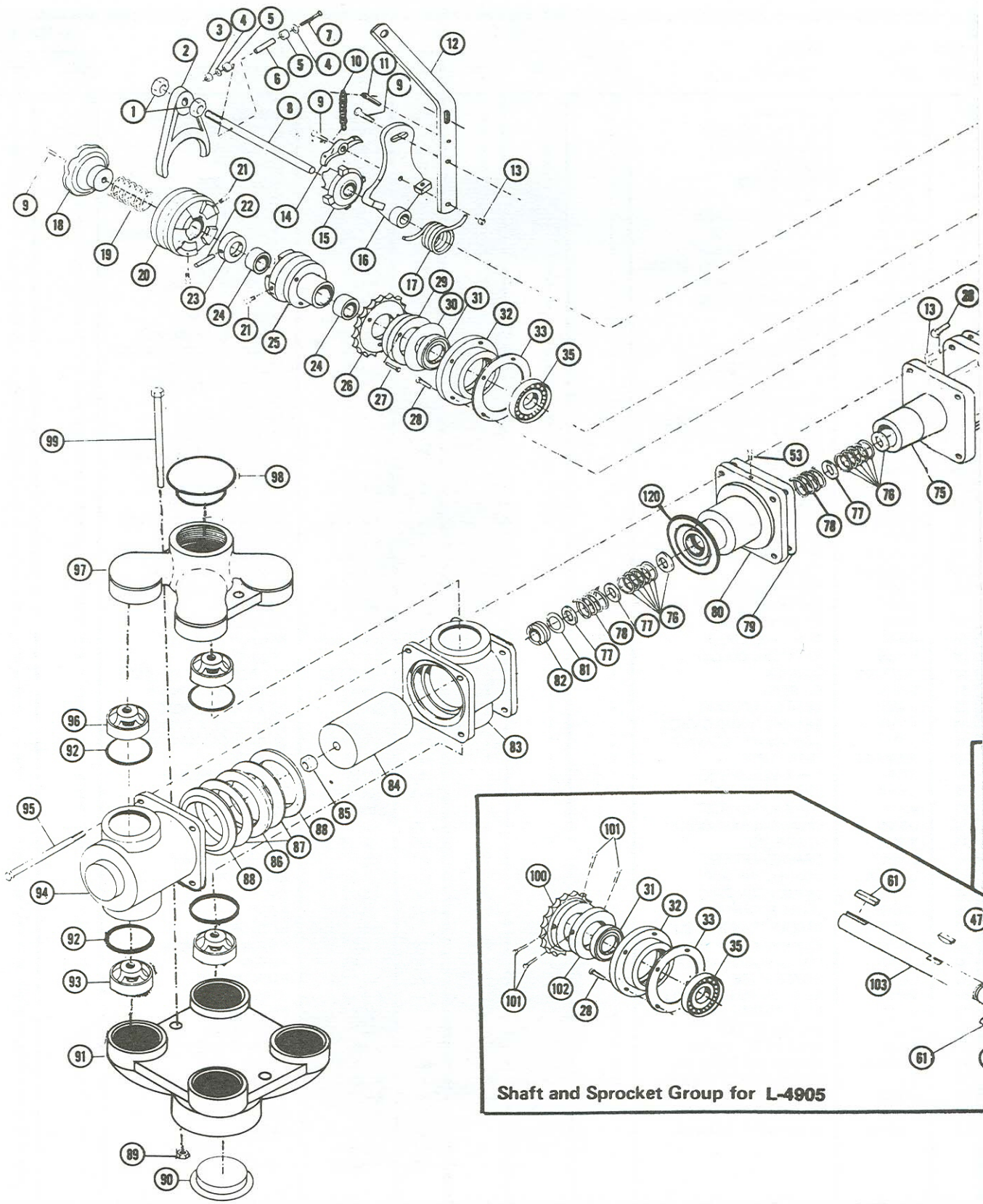
IMPORTANT: In reassembly of stuffing boxes, cylinders and manifolds, leave all bolts loose until assembly is complete. Then turn pump over one cycle with the handwheel. If any binding is noted, adjust stuffing boxes until pump will turn freely, then tighten all bolts securely.



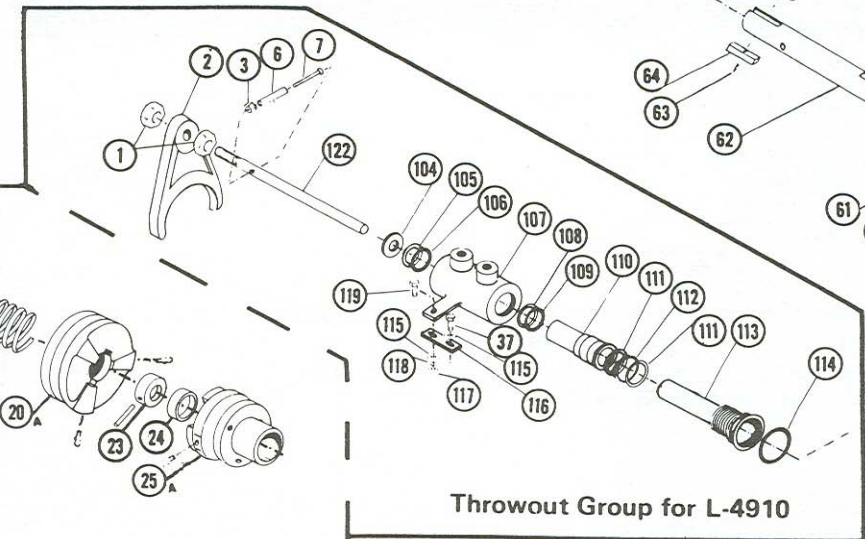
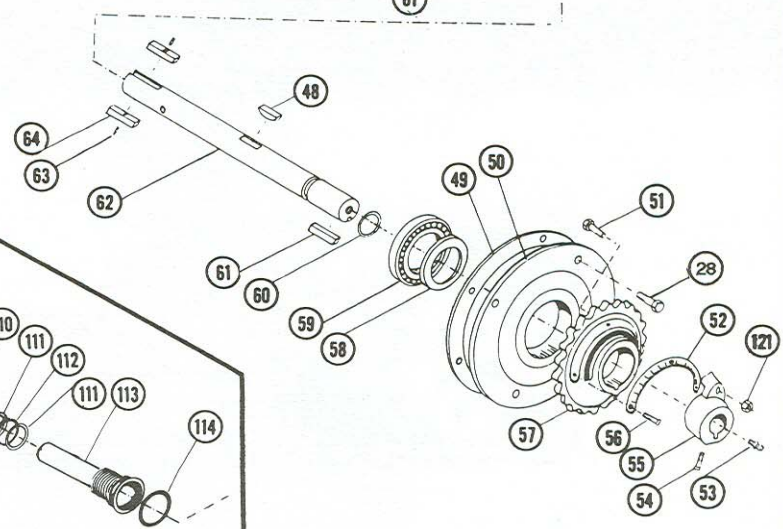
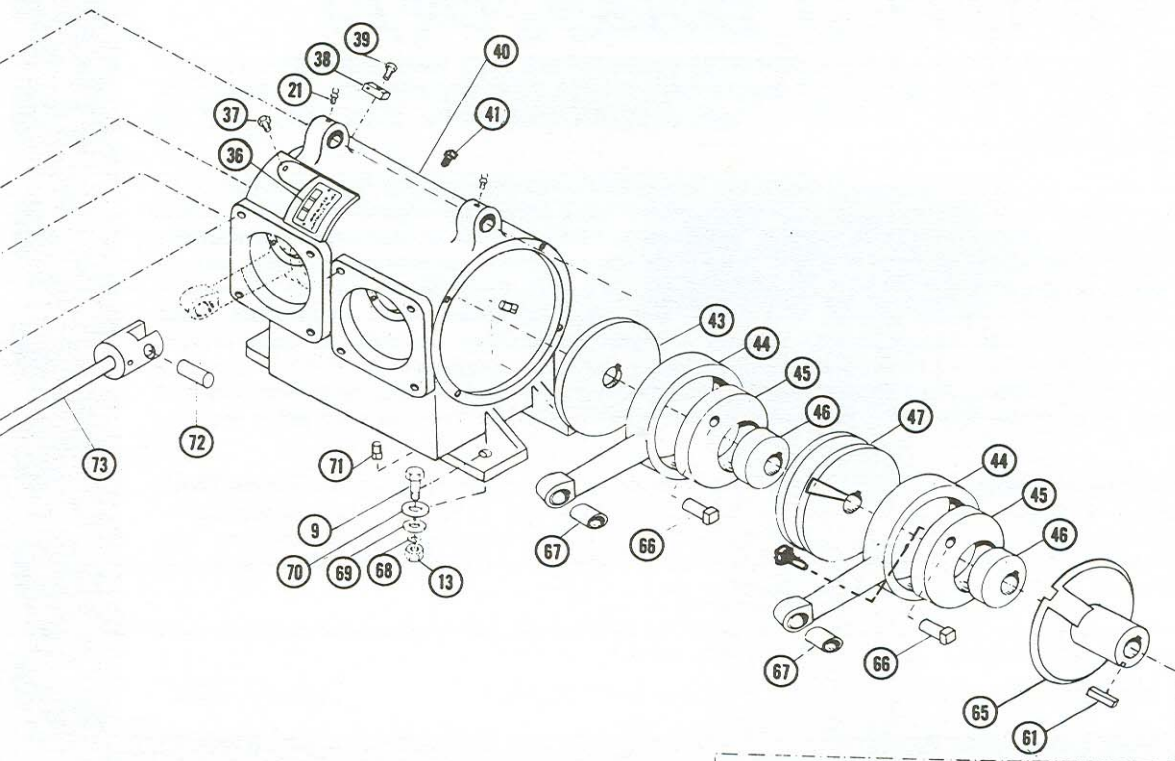
L-4900 SERIES PUMP PARTS LIST

PARTS FOR L-4900, L-4905, L-4910

REF. NO.	PART NO.	ITEM DESCRIPTION	L-4900 SERIES			REF. NO.	PART NO.	ITEM DESCRIPTION	L-4900 SERIES		
			L-4900 QTY	L-4905 QTY	L-4910 QTY				L-4900 QTY	L-4905 QTY	L-4910 QTY
1	92037	5/8" JAM NUT	2	0	2	60	L-1022	CRANKSHAFT O'RING	1	1	1
2	L-3065	THROW-OUT YOKE	1	0	1	61	L-1020	SETTING ARM KEY	2	3	2
3	92014	#10 SQUARE NUT	1	0	1	62	L-3013	CRANKSHAFT	1	0	1
4	A-697	WASHER	2	0	2	63	A-3314	KEY PIN	2	0	2
5	A-2762	CAM ROLLER	2	0	0	64	A-261	SQUARE KEY	2	0	2
6	A-2763	ROLL PIN	1	0	1	65	L-3056	STROKE LOCATING SLV.	1	1	1
7	90953	2 1/4 RD HD SCREW	1	0	1	66	L-3004	ECCENTRIC PIN	3	3	3
8	L-3006	THROW-OUT ROD	1	0	0	67	L-1065	CONNECTOR ROD BUSHING	2	2	2
9	90655	3/8 X 1 1/2 HEX BOLT	6	4	5	68	93024	3/8 LOCK WASHER	4	4	4
10	F-48	THROW-OUT LEVER SPRING	1	0	0	69	93011	3/8 FLAT WASHER	4	4	4
11	94010	5/32 X 1 COTTER PIN	1	0	0	70	A-147	LEG MOUNTING PAD	4	4	4
12	L-3064	THROW-OUT LEVER	1	0	0	71	C-431-B	PLUG	3	3	3
13	92024	3/8 HEX NUT	11	10	10	72	105895-01	CROSSHEAD PIN	2	2	2
14	A-2758-A	PAWL	1	0	0	73	105900-91	PISTON ROD ASSEMBLY	2	2	2
15	A-2757-A	THROW-OUT CAM	1	0	0	74	L-3052	CROSSHEAD GDE. GASKET	2	2	2
16	L-3007	THROW-OUT BRACKET	1	0	0	75	L-4022	CROSSHEAD GUIDE	2	2	2
17	L-3076-R	R H TORSION SPRING	1	0	0	76	L-1109	ROD VEE PACKING SET	4	4	4
18	A-50	HANDWHEEL	1	0	1	77	L-1041	WASHER	6	6	6
19	HA-57	SAFETY CLUTCH SPRING	1	0	0	78	L-1063	PACKING SPRING	4	4	4
19A	108907-01	SAFETY CLUTCH SPRING	0	0	1	79	L-3074	STUFFING BOX GASKET	2	2	2
20	A-260	CLUTCH	1	0	0	80	L-3049	OUTBOARD STUFFING BOX	2	2	2
20A	108905-91	CLUTCH	0	0	1	81	L-1042	RETAINING RING	2	2	2
21	H-28	GREASE FITTING	5	2	5	82	L-1031-2	STUFFING BOX INSERT	2	2	2
22	L-4249	DRIVE PIN	1	0	1	83	L-3055	INBOARD CYLINDER	2	2	2
23	105373-01	CLUTCH COLLAR	1	0	1	84	112816-91	PISTON PLUNGER AS'MBLY	2	2	2
24	A-116	OILITE BUSHING	2	0	2	85	L-1047	SELF-LOCKING NUT	2	2	2
25	L-4008-A	CARRIER	1	0	0	86	L-1044	FLANGE PACKING WASHER	2	2	2
25A	108906-01	CARRIER	0	0	1	87	L-1098	PACKING ADJ. GASKET	4	4	4
26	L-4006	16T SPROCKET (OR)				88	L-1045-V	FLANGE PLUNGER PACKING	4	4	4
	L-4007	18T SPROCKET	1	0	1	89	92029	1/2 HEX NUT	2	2	2
27	90993	1/4 X 1 1/2 BOLT	3	0	3	90	C-3519	1/2 PLASTIC PLUG	1	1	1
28	90637	5/16 X 1 HEX BOLT	16	16	16	91	105899-02	SUCTION MANIFOLD	1	1	1
29	L-4009	RETAINING COLLAR	1	0	1	92	L-3031	VALVE O'RING	8	8	8
30	110155-01	WASHER	1	1	1	93	106489-92	SUCTION VALVE ASSEMBLY	4	4	4
31	L-1018	OIL SEAL	1	1	1	94	L-3045	OUTBOARD CYLINDER	2	2	2
32	L-3023	BEARING HOUSING	1	1	1	95	90669	3/8 X 5 1/2 HEX BOLT	8	8	8
33	L-3021	BEARING H'SING CASKET	1	1	1	96	106490-92	DISCHARGE VALVE ASSEMBLY	4	4	4
35	L-3019	CRANKSHAFT BEARING	1	1	1	97	L-3027-A	DISCHARGE MANIFOLD	1	1	1
36	105901-01	NAME PLATE	1	1	1	98	L-3115	PLASTIC PLUG	1	1	1
37	90634	5/16 X 1/2 HEX BOLT	1	2	2	99	90708	1/2 X 7 1/2 HEX BOLT	2	2	2
38	L-4014	SPRING ANCHOR	1	0	0	100	106532-01	SPROCKET	0	1	0
39	90636	5/16 X 3/4 HEX BOLT	1	0	0	101	90986	3/8 X 5/8 SCREW	0	4	0
40	L-3025	CRANKCASE ASSEMBLY	1	1	1	102	110147-01	SPACER	0	1	0
41	S-350	VENT PLUG	1	1	1	103	106533-01	CRANKSHAFT	0	1	0
43	L-3020	CRANKSHAFT DISC	1	1	1	104	93016	SAE FLAT WASHER	0	0	1
44	L-3026-A	CONNECTING ROD	2	2	2	105	105448-01	BACK UP RING	0	0	1
45	L-3016	LARGE ECCENTRIC	2	2	2	106	A-3776	O'RING	0	0	1
46	L-3017	SMALL ECCENTRIC	2	2	2	107	105447-01	BODY	0	0	1
47	L-3018	STROKE TRANSFER SLV.	1	1	1	108	105452-01	BACK-UP RING	0	0	1
48	A-4333	#808 WOODRUFF KEY	2	2	2	109	105461-01	PISTON ROD O'RING	0	0	1
49	L-3002	COVER PLATE GASKET	1	1	1	110	105449-01	PISTON	0	0	1
50	L-3001	COVER PLATE	1	1	1	111	105462-01	BACK-UP RING	0	0	2
51	91017	3/8 X 1 3/4 SQ HEAD BOLT	1	1	1	112	A-2849	O'RING	0	0	2
52	L-1002	PUMP SETTING SCALE	1	1	1	113	105463-01	CYLINDER	0	0	1
53	H-30	GREASE FITTING	3	3	3	114	105500-01	BODY O'RING	0	0	1
54	90532	5/16 X 3/8 SET SCREW	3	3	3	115	93010	5/16 FLAT WASHER	0	0	4
55	105933-91	STROKE SETTING ARM	1	1	1	116	105501-01	STRAP	0	0	2
56	A-368	SETTING SCALE SCREW	3	3	3	117	92020	5/16 HET NUT	0	0	2
57	105932-91	STROKE SETTING FLANGE	1	1	1	118	93023	5/16 LOCK WASHER	0	0	4
58	L-1021	OIL SEAL	1	1	1	119	90635	HEX HEAD BOLT	0	0	2
59	L-1007-A	CRANKSHAFT BEARING	1	1	1	120	L-3035	GASKET	2	2	2
						121	A-3097	SELF-LOCKING NUT	1	1	1
						122	113456-01	THROW-OUT ROD	0	0	1



Shaft and Sprocket Group for L-4905



Throwout Group for L-4910

Clutch Group for L-4910

LIMITED WARRANTY

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND REPRESENTATIONS. ANY IMPLIED WARRANTIES INCLUDING MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. BLUE SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES.

Each new machine or component (hereafter called the "equipment") manufactured by Blue is warranted by Blue to buyer and to any parts or parties to whom buyer may resell, lease or lend the equipment to be free from defects in material and workmanship under normal use and service. The obligation of Blue under this warranty is limited to the repair or replacement of defective parts or correction of improper workmanship of any parts of such equipment which shall within ninety days from the date of Blue's original delivery thereof, be returned to Blue's factory, transportation charges prepaid and which Blue shall determine to its satisfaction upon examination thereof to have been thus defective. When it is impractical to return the defective parts of such equipment to Blue's factory, then Blue shall have no liability for the labor cost involved in repairing or replacing any such parts and shall be liable solely for supplying the material necessary to replace or repair the defective parts, provided that prior thereto Blue shall have determined to its satisfaction that any such parts are thus defective.

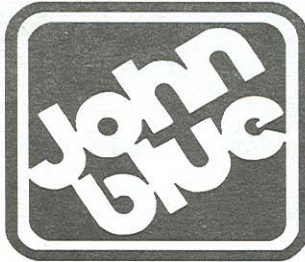
This warranty shall not apply to any equipment which shall have been repaired or altered outside Blue's factory in any way so as to affect its durability, nor which has been subjected to misuse, abuse, negligence or accident or operated in any manner other than in accordance with operating instructions provided by Blue. This warranty does not extend to repairs made necessary by the use of inferior or unsuitable parts or accessories, or parts or accessories not recommended by Blue.

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