LAY-MOR®

Discount Equipment

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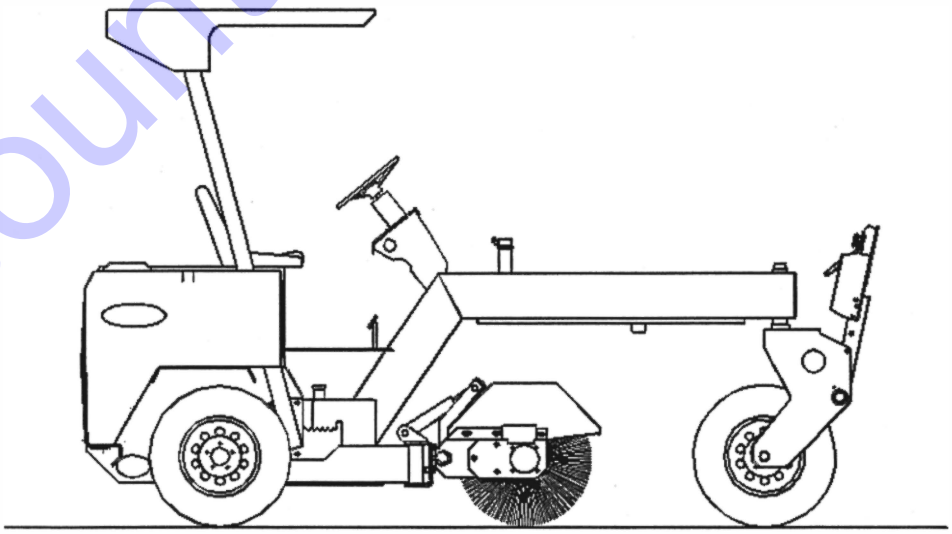
6HC/8HC
Self Propelled Sweeper
SERVICE MANUAL



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Warranty
Mobile Products, Inc.

1. **What is Covered By This Warranty.** Mobile products, Inc. (Mobile) warrants, to the original purchaser only that the equipment that is the subject of this sale is free from defects in material and workmanship. The duration of this warranty is one year from the date of delivery or 1500 hours of use, whichever comes first. If the purchaser discovers within the applicable period a defect in material or workmanship, it must promptly notify Mobile in writing. In any event such notification shall be received by Mobile no later than 13 months from the date of delivery or one month after the first 1500 hours of use, whichever comes first. Within a reasonable time after such notification, Mobile will correct any defect in material or workmanship, with either new or used replacement parts, at Mobile's option. Mobile will pay for the costs of correcting defects in materials or workmanship of all parts and components manufactured by Mobile discovered during the first 12 months from the date of delivery or the first 1500 hours of use, whichever comes first, both parts and labor at Mobile's expense. All warranty work is subject to Mobile's prior examination and approval and will be preformed by Mobile or at service centers designated by Mobile. All transportation to and from the designated service center will be at the purchaser's expense and is not included as a cost of repair covered by this warranty. These remedies are the purchaser's exclusive remedies for breach of warranty.

2. **What is Not Covered By This Warranty.** Mobile does not warrant (a) any product, components or parts not manufactured by Mobile, (b) damage caused by use of the equipment for purposes other than those for which it was designed, (c) damage caused by accident or the negligence of the purchaser or any third party or by disasters such as fire, flood, wind and lightning, (d) damage caused by the purchaser's failure to provide normal maintenance as customarily accepted in the industry or as set forth in maintenance guidelines, (e) filters, belts, lubricants, fuses, lights or other parts which are a part of normal maintenance replacement, (f) damage caused by unauthorized or improper installation of attachments, repairs, modifications or alterations, (g) damages caused by replacement of original parts or components with unauthorized substitutes, (h) damage during shipment, or (i) any other abuse or misuse by the purchaser.

3. **Disclaimer of Warranty.** THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

4. **Limitation of Remedies.** In no case shall Mobile be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict tort, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of savings or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of any substitute equipment, equipment, facilities or services, downtime, the claims of third parties including customers, and injury to property. This limitation does not apply to claims for personal injury. Some states do not allow limits on warranties, or on remedies for breach in certain transactions. In such states, the limits in this paragraph and in paragraph (3) may not apply.

5. **Warranty Claim Procedures.** The purchaser must notify Mobile in writing of a warranty claim prior to any warranty work. Mobile will provide the purchaser with further instructions on how to proceed with such warranty claim. Any notice of a warranty claim and all other warranty correspondence must be sent to Mobile Products, Inc. 401 Capacity Dr., Longview, Texas 75604. Mobile may designate new or additional addresses.

6. **Time Limit for Bringing Suit.** Any action for breach of warranty as to any part or component must be commenced within 15 months following delivery of the equipment or within the first three months following the first 1500 hours of use, whichever comes first.

7. **No Other Warranties.** Unless modified in a writing signed by both parties, this agreement is understood to be the complete and exclusive agreement between the parties, superseding all prior agreements, oral or written, and all other communications between the parties (including without limitation any terms and conditions contained in any purchase order or sales invoice issued pursuant to the sale of this equipment) relating to the subject matter of this agreement. No employee of Mobile or any other party is authorized to make any warranty in addition to those made in this agreement.

8. **Warranty Registration.** This warranty is conditioned upon receipt by Mobile of a completed and signed customer acceptance card within 30 days of delivery. It is the obligation of the purchaser to sign customer acceptance card and return it to Mobile within the 30 days following delivery. The customer acceptance card must be on file for any warranty claim to be considered.

Effective September 12, 2000

FORWARD

This Service Manual has been prepared by Mobile Products, Inc., using the latest service information available for use on the Lay-Mor Sweeper. All information, illustrations, and data contained in this manual are current at the time of publication.

The information is grouped according to general classifications. A Table of Contents is placed at the beginning of each major section. Where necessary, information is further broken down by sweeper Serial No., Engine Serial No., or Revision Code. The terms "right", "left", "front", or "rear" are determined from looking forward in the operator's seat, unless otherwise noted. This arrangement will aid you in locating the desired information.

Special tools, specifications, troubleshooting, and illustrations are presented in step-by-step procedures to help you properly service the sweeper.

The Service Manual, Parts Manual, Operator's Manual and Engine Manual will provide you with the necessary information to maintain or restore the sweeper to the fine performance and reliable characteristics to which it was designed. The Service Manual is arranged similar to the Parts Manual to save time and avoid costly errors when ordering "Genuine Waldon/ Lay-Mor Service Parts". The Operator's Manual provides information on the proper operation, lubrication, and periodic maintenance of the entire sweeper. The Engine Manual gives you the needed information to maintain the engine in its best operation condition.

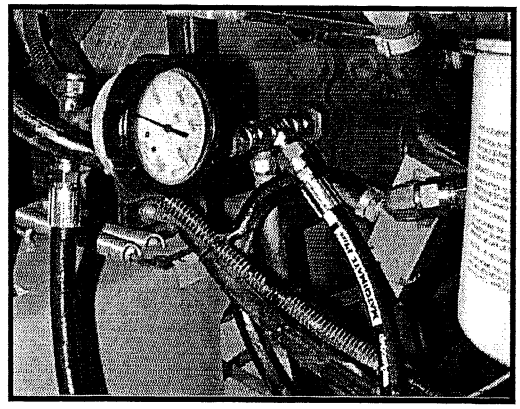
IMPORTANT

The data and information listed herein is correct to the best of our knowledge and belief, having been compiled from reliable and official sources of information. However, WE CANNOT ASSUME ANY RESPONSIBILITY for possible error.

CONTENTS

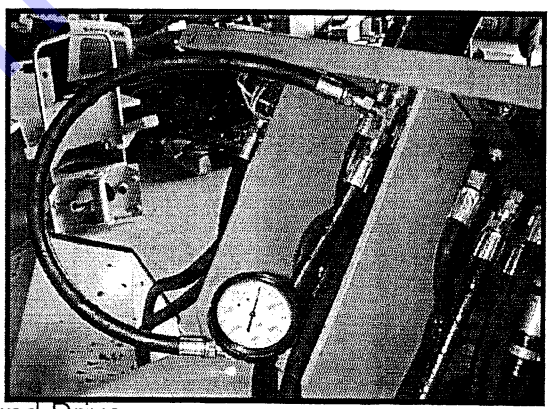
PRESSURE CHECK LOCATIONS:

A. Hydrostatic Pump



B. Broom Rotation Valves

C. Steering Orbitrol



Hydrostatic Ground Drive ..... 3000 psi

Broom Rotation ..... 2500 psi

Broom Lift & Angle ..... 1500 psi

Steering ..... 1400 psi

SAFETY PRECAUTIONS:

1. Always wear safety goggles when working with or testing Hydraulic System.

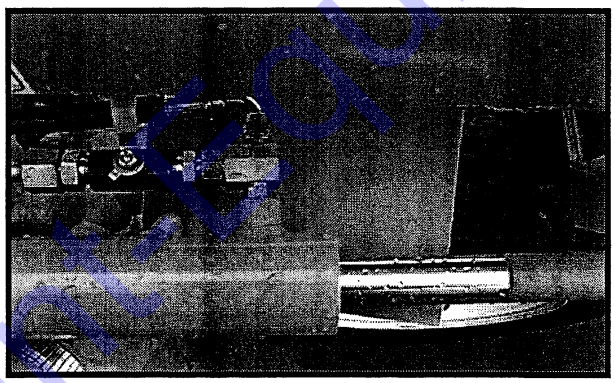
2. When working with Hydraulic Systems always remember to relieve pressure from all lines, valves, cylinders and motors before attempting to remove them.

3. Hydraulic systems run at very high temperatures. Always check temperature of hydraulic oil before removing lines or components that could spill hot oil and cause severe burns.

4. While working on or testing components always set Parking Brake, or block wheels to prevent machine from rolling.

5. While performing any test with the engine running, always have an operator in the seat.

6. Use a piece of cardboard or paper to try and find hydraulic leaks, do not use your hand. Oil under pressure can penetrate the skin and cause severe injury.



TOWING INSTRUCTIONS

Before Towing:

1. Securely fasten hitch to tow vehicle.
2. Attach safety chains, electrical, and breakaway cable to tow vehicle.
3. Set Steering Valve to tow position.
4. Disengage rear wheels. (Pull out and turn Hub Disconnect Handle.)
5. Disengage Parking Brake.
6. Check hitch and lights for proper operation and local code compliance.

After Towing:

1. Set Parking Brake.
2. Engage rear wheels. (Turn Hub Disconnect Handle and let handle spring return to engage position.)
3. Set Steering Valve to operation position.
4. Disconnect hitch, safety chains, breakaway cable, and electrical from tow vehicle.

SPECIFICATIONS:

ENGINE

Make & Model	Kubota, V1505-EI
Displacement	1498 cm (91.41 cu.in.)
Number of Cylinders	4
Type of Engine	Vertical
Fuel	Diesel
Cooling System	Water Cooled
Gross Intermittent H.P. (kw)/RPM	37.5 (28.0)/3000
High Idle	3000 RPM
Low Idle	800-900 RPM
Electrical System	12V
Battery CCA (Group Size)	675 (78-60)

HYDRAULIC SYSTEM

Hydraulic Oil Type	10W-20

HYDRAULIC CYLINDERS

Steering:

Size	1.75" (mm) x 21.25"
Stroke	8.00" (mm)

Broom Angle:

Size	1.75" (mm) x 19.50
Stroke	9.00" (mm)

Broom Lift:

Size	2.00" (mm) x 11.50"
Stroke	6.00" (mm)

AUXILIARY PUMP

Type	Gear
Displacement	15 cc/rev (in./rev)
Pressure Maximum	psi (250 bar)
Maximum Speed	4000 RPM

BROOM MOTORS

Displacement	15.3 cu.in./rev (251 cu.cm/rev)
Maximum Pressure	2250 psi (155 bar)
Maximum Speed	200 RPM

SPECIFICATIONS CONT'D.:

TRANSMISSION

Hydrastatic Pump Description	Piston Type
Displacement	0-1.25 cu.in./rev (0-20.3 ml/rev)
Maximum Speed	3600 RPM
Maximum PSI	5000 lbf/in^2 (345 bar)

WHEEL MOTOR

Description	Roller Stator Type
Displacement	18.3 cu.in. (300 cc)
Speed @ Max. RPM	12.6 gal. (3.3 lit)

STEERING

Description	Single Front Wheel with Hydraulic Power Steering
Minimum Turning Radius	

BRAKES

Service	Hydrostatic
Secondary	Single Drum Brake Mechanically actuated with an adjustable over center locking hand lever.
Towing	Hydraulic Drum Brakes on both Rear Wheels Hydraulic supplied by torque mounted Surge Actuator.

SERVICE CAPACITIES

Fuel Tank	9 gal.
Hydraulic System	21 gal.
Engine Crankcase	1.59 gal. (6.0 lit.)
Engine Coolant	1.06 gal. (4.0 lit.)
Wheel Disconnects 50/50 Antifreeze/Water	8 oz. each

TIRES

Tire Size	P205/75R-15
Tire Inflation Pressure (Cold)	35 psi
Wheel Size	14" x 6"
Loaded Radius	10.8"

SPECIFICATIONS CONT'D.:

Length ..... 138.0"
Width:

Dual Motors
- 6' ..... 81.0"
- 8' ..... 102.0"

Single Motor
- 6' ..... 77.0"
- 8' ..... 98.0"

Height ..... 91.0"
Weight ..... 3460 lbs.
Speed ..... 0 - 6.5 mph
Steering ..... 90^0 Total
Angle of Broom ..... 40^0 Both Ways

OPTIONS

- 6' Broom Assembly
- 8' Broom Assembly

Brush Options:

- 1/2 Poly - 1/2 Wire
- All Poly
- All Wire

Tow Hitch Options:

- 2" Ball
- 2-5/16" Ball
- 3" Pintle Eye
- No Tongue
- Universal Hitch

Cab Options:

- Cab Assembly
- Heater
- Defroster
- Folding ROPS

Miscellaneous Options:

- Engine Shut-Down Protection System
- Variable Brush Speed Control
- Dual Rear View Mirrors
- Dual Front & Rear Halogen Light
- Rotating Beacon
- Flashing Strobe Beacon
- Turn Signal & Emergency Light

TIGHTENING REFERENCE

	LBS. FT.
CHASSIS	
Front Fork Retaining Bolt	100 (Use Loctitie)
Lug Nuts	60
HYDRAULIC COMPONENTS	
Hydrostatic Pump	
Mounting Capscrews	75
Hydrostatic Motor	
Mounting Capscrews	75
Hydraulic Pump Auxiliary	
Mounting Capscrews	75
Power Steering	
Steering Wheel Nut	30-35
HYDRAULIC CYLINDERS	
Cylinders	
Piston Nut	160-180
GROUND DRIVE	
Hydraulic Motor to Lockout Hub	100
Lockout Hub to Frame	100
Lockout Hub to Drum Nut	250

APPROVED TORQUE VALUES:

Use Torque Values listed below unless otherwise specified.

	Ult. Tensile = 120,000 SAE Gr-5 Bolts (Fine or Coarse Thread) 1/4 to 1 Yield = 92,00											
Bolt & Nut Detail	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1-1/8	1-1/4
	(FT. LBS. TORQUE)											
Regular hex nuts or regular hex bolt heads torqued into regular nut, flange nut, or drilled & tapped holes.	12	25	40	65	100	150	200	350	560	840	1030	1460
Hex section top deflected locknuts.	8	15	25	40	60	90	120	210	340	500	620	880
Flanged section with flange teeth nuts* or flange teeth bolt heads torqued into flange nuts or drilled and tapped holes.	12	45	75	125	190	270	370	650	1050	1580	1950	2760
	Ult. Tensile = 150,000 SAE Gr-8 Bolts (Fine or Coarse Thread) 1/4 to 1-1/2 Yield = 13,000											
Bolt and Nut Detail	1/4	5/16	3/8	7/16	Diameter (In Inches) 1/2	9/16	5/8	3/4	7/8	1	1-1/8	1-1/4
	(FT. LBS. TORQUE)											
Grade "C" regular hex nuts** or regular hex bolt heads torqued into grade "C" regular nuts** flange nuts, or drilled and tapped holes.	14	30	55	85	130	190	260	450	730	1090	1550	2180
Grade "C" hex section top deflected locknuts.**	10	18	35	50	80	110	160	270	440	650	930	1310
Flanged section with flange teeth nuts** or flange teeth bolt heads* torqued into flange nuts or drilled and tapped holes.	24	50	90	140	220	310	430	750	1210	1820	2580	3640

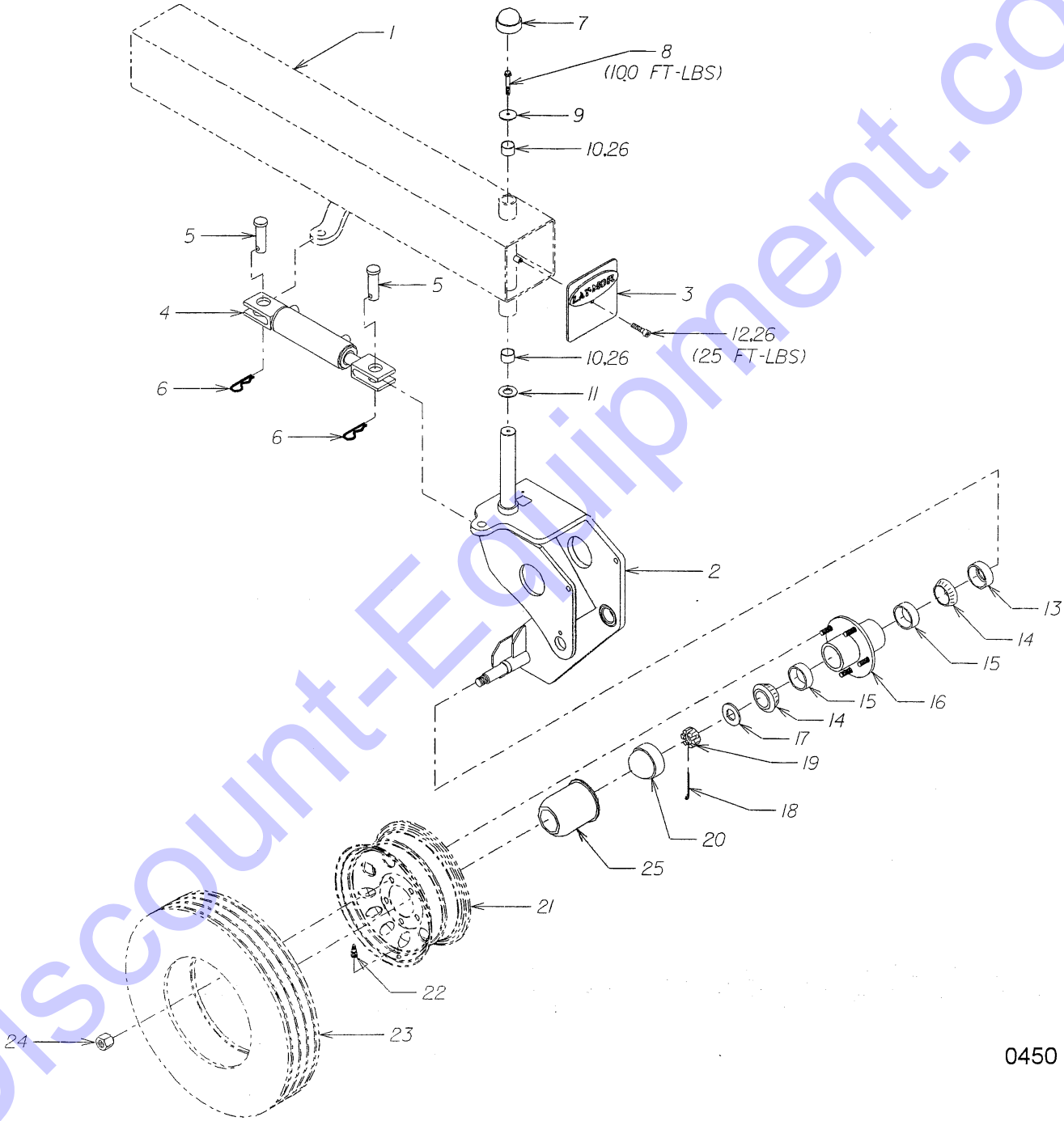
Metric: 8.8 = to Gr-5 10.9 = to Gr-8 12.9 = to 10% over Gr-8

* For flange sections without flange teeth use values for regular nuts and bolt heads.
** For nuts that are not Grade "C" use values for Gr-5.

SECTION 1

CHASSIS/BROOM

FORK ASSEMBLY



FORK ASSEMBLY

ITEM	QTY		DESCRIPTION
1	1		Weldment, Frame
2	1		Weldment, Front Fork
3	1		Emblem, Lay-Mor
4	1		Cylinder, Steering
5	2		Pin, Clevis 1" OD x 2.75"
6	2		Cotter Pin, 3/16" Hair
7	1		Cap, Grease
8	1		Capscrew, .50-13NC x 1.00" Flange Whizlock
9	1		Washer, Pin Retainer
10	2		Bushing, 2" OD x 1.75" ID x 2" Long Bronze
11	1		Thrust Washer, .125 x 2.50 x 1.765"
12	1		Capscrew, 5/16-18NC x 1.00" Socket Hd. Stainless
13	1	*	Seal, Front Wheel
14	2	*	Cone, Front Wheel Bearing
15	2	*	Cup, Front Wheel Bearing
16	1		Hub, Front Wheel
17	1		Washer, 1" ID (Front Axle Nut)
18	1		Pin, Cotter 1/8 x 1.75" (Front Axle Nut)
19	1		Hex Nut, 1-14NF (Front Axle)
20	1		Cap, Dust
21	1		Rim, Wheel
22	1		Stem, Valve
23	1		Tire, P20575R14
24	5		Hex Nut, Lug 1/2-20NF 60^0 13/16"
25	1		Cover, Dust Cap
26	A/R		Loctite, Red #271

* Included with Hub, Front Wheel

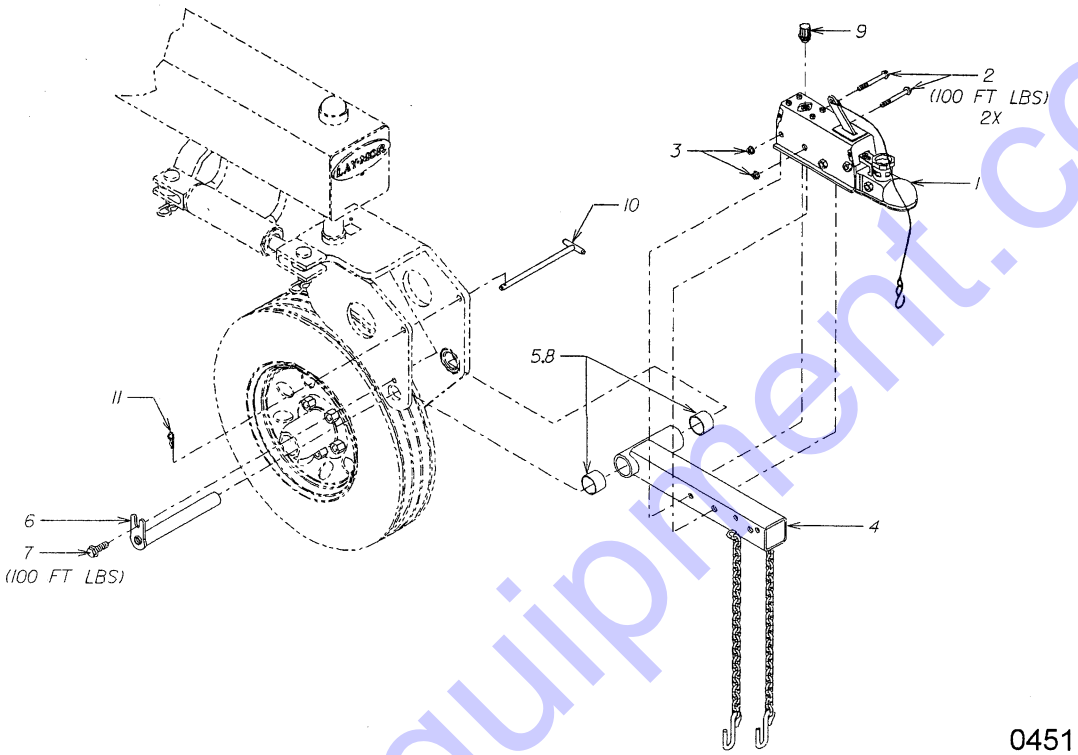
NOTE:

Be sure to replace Dust Cover (Item #25) when servicing front hub or wheel to prevent Dust Cap damage or loss.

When installing Bushing (Item #10) use Loctite to retain.

Check wheel seals and hubs for material wraping etc.

TOW BAR ASSEMBLY (OPTIONAL)



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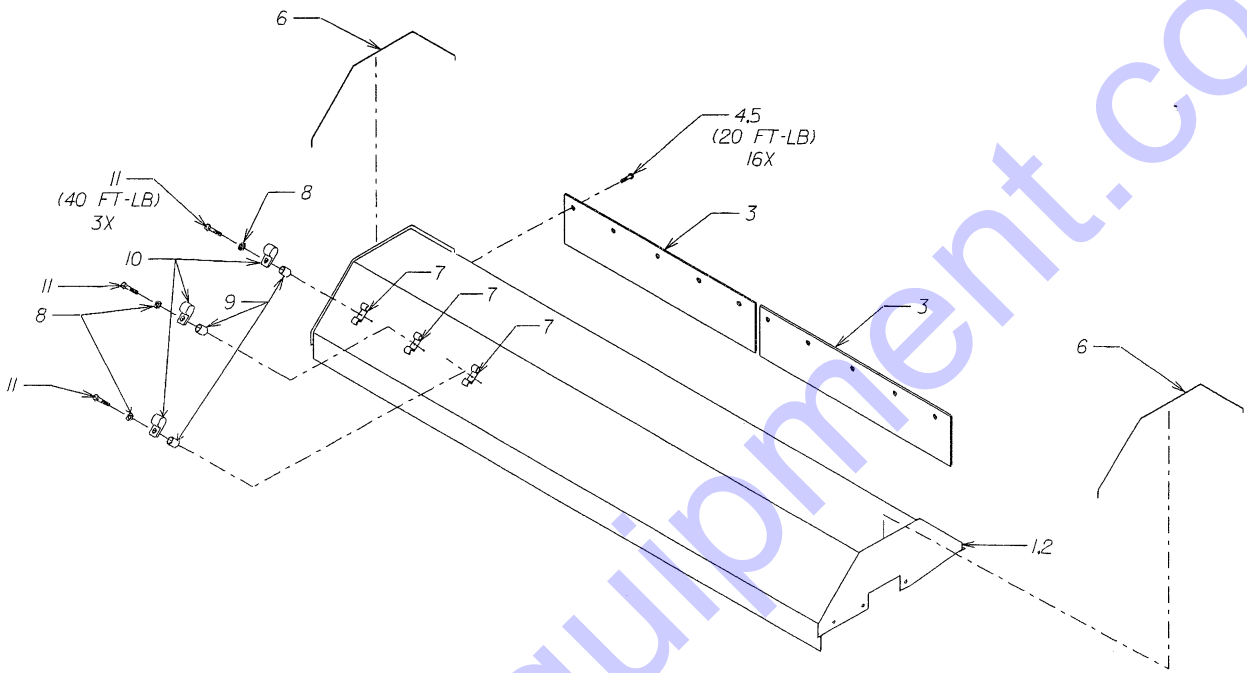
ITEM	QTY	DESCRIPTION
1	1	Actuator, Surge Brake
2	2	Capscrew, 1/2-13NC x 4.00" Pl.
3	2	Lock Nut, 1/2-13NC Nylon Insert
4	1	Str., Tow Bar
5	2	Bushing, 2" OD x 1.75 ID x 2.00" Long Bronze
6	1	Str., Pin 1.75" Dia. x 9.25"
7	1	Capscrew, 1/2-13NC x .75" Flange Whizlock
8	A/R	Loctite, Red #271
9	1	Cap, Modified - Master Cylinder
10	1	Pin, Tow Bar Stow
11	1	Hair Pin, Cotter 1/8"

NOTE:

When installing Bushing (Item #5) use Loctite to retain.

HOOD ASSEMBLY



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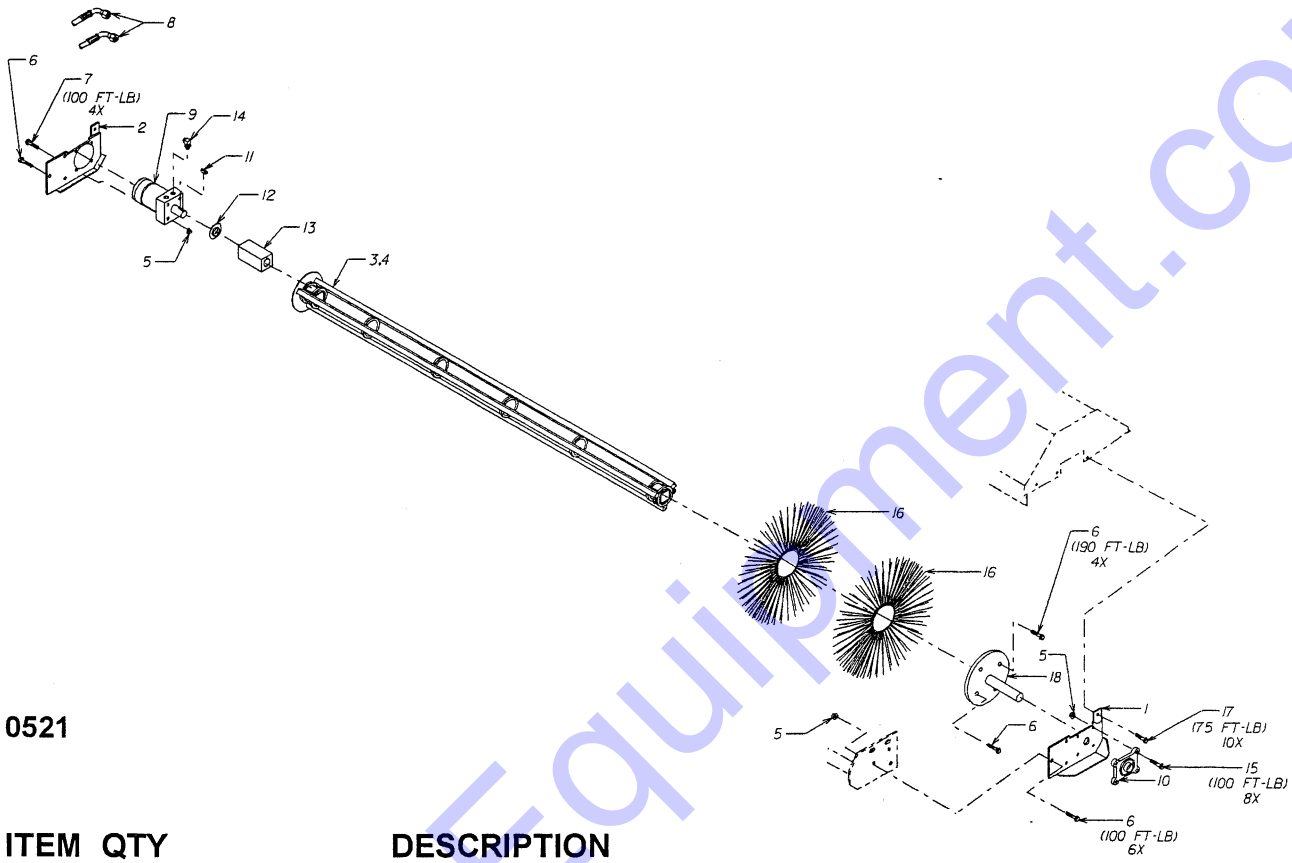
ITEM	QTY	DESCRIPTION
1	1	Weldment, 6' Broom Hood
2	1	Weldment, 8' Broom Hood
3	2	Deflector, Dirt Belt (48")
	2	Deflector, Dirt Belt (30")
4	16	Capscrew, .25-20NC x 1.00" Flange Whizlock
	12	Capscrew, .25-20NC x 1.00" Flange Whizlock
5	16	Hex Nut, .25-20NC Flange Whizlock Gr. G
	12	Hex Nut, .25-20NC Flange Whizlock Gr. G
6	8.2'	Trim, Flex Core .06
7	3	Clamp, Hose (8')
	2	Clamp, Hose (6')
8	3	Lock Washer, .38 Pl. (8')
	2	Lock Washer, .38 Pl. (6')
9	3	Tube, 3/8 Sch. 40 x 5/8" (8')
	2	Tube, 3/8 Sch. 40 x 5/8" (6')
10	3	Clamp, .50 ID (8')
	2	Clamp, .50 ID (6')
11	3	Capscrew, 3/8-16NC x 1.50" Zink Gr. 5
	2	Capscrew, 3/8-16NC x 1.50" Zink Gr. 5

BROOM ASSEMBLY



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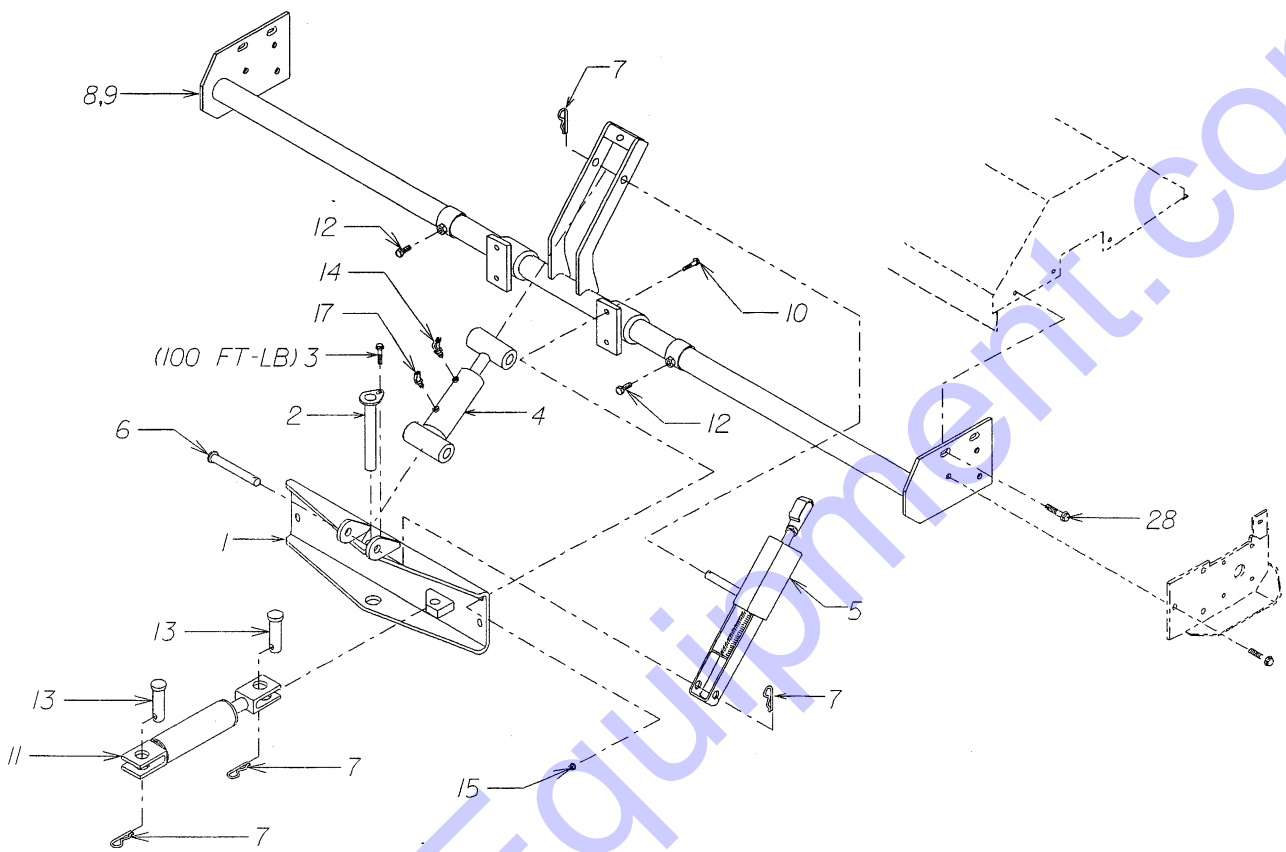
ITEM	QTY	DESCRIPTION
1	1	Weldment, Right Broom Bearing Mount
2	1	Weldment, Left Broom Motor Mount
3	1	Weldment, 6' Broom Core (Double Drive)
4	1	Weldment, 8' Broom Core (Double Drive)
5	14	Hex Nut, .50-13NC Flange Whizlock
6	10	Capscrew, .50-13NC x 1.25" Flange Whizlock
7	4	Capscrew, .50-13NC x 2.50" Pl.
8	2	Hose, 08-08JS08J9 x 100.00" 100R2 (6')
	2	Hose, 08-08JS08J9 x 110.00" 100R2 (8')
9	1	Motor, Broom
10	1	Bearing, Broom Carrier
11	1	Key, Special (Roller Stator Motor)
12	1	Guard, Seal Broom Drive Motor
13	1	Block, Broom Motor Drive with Setscrew
14	2	Adapter, 90^0 -8 JICM x 10 SAEM
15	4	Capscrew, .50-13NC x 1.50" Flange Whizlock
16	1	Kit, Brush 6' (1/2 Poly and 1/2 Wire)
	1	Kit, Brush 8' (1/2 Poly and 1/2 Wire)
	1	Kit, Brush 6' (All Poly)
	1	Kit, Brush 8' (All Poly)
	1	Kit, Brush 6' (All Wire)
	1	Kit, Brush 8' (All Wire)
17		Capscrew, 3/8-16NC x 1.25" Flange Whizlock
18	1	Weldment, Broom Core Mount

BROOM FRAME ASSEMBLY



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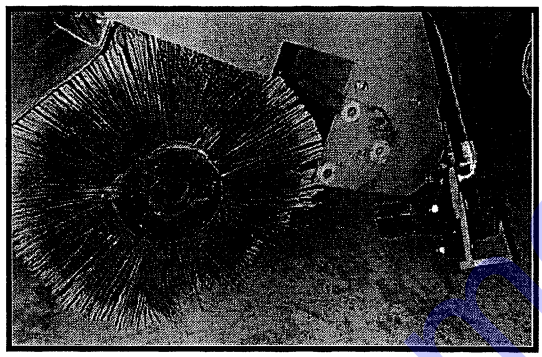
ITEM	QTY	DESCRIPTION
1	1	Weldment, Broom Mount
2	1	Str., Pin 1.75 x 8.25”
3	1	Capscrew, 1/2-13NC x .75” Flange Whizlock
4	1	Cylinder, Lift
5	1	Assy., Down Pressure Spring
6	1	Str., Pin 1.00 x 8.87
7	4	Pin, 3/16” Hair Cotter
8	1	Weldment, 6’ Broom Mount
9	1	Weldment, 8’ Broom Mount
10	4	Capscrew, 1/2-13NC x 1.50” Flange Whizlock
11	1	Cylinder, Broom Angle (See Page 3-27)
12	2	Capscrew, 1/2-13NC x 1.25” Hex Hd. Gr. 5 Zink
13	2	Pin, Clevis 1.00 x 2.75”
14	1	Adapter, 90^0 -6 SAEM x -6 JICM
15	4	Hex Nut, 1/2-13NC Flange Whizlock Gr. G
16	4	Capscrew, 3/8-16NC x 1.25” Flange Whizlock
17	1	Adapter, 45^0 -6 SAE x -6 JIC

BROOM CORE REMOVAL AND REPLACEMENT

To remove Broom Core Assembly from sweeper, lower the broom till the broom just touches the ground. Remove the (3) 1/2" capscrews and (1) 3/8" capscrew from the front of Broom Motor Mount Assembly then repeat this procedure removing the Broom Bearing Carrier Assembly. Then grasp the Motor Mount Assembly by the motor and hoses and pull the entire assembly out of the square hole in the end of the core and lay it aside with hoses left hooked up. Clean debris if any from the seal area of the broom motor.

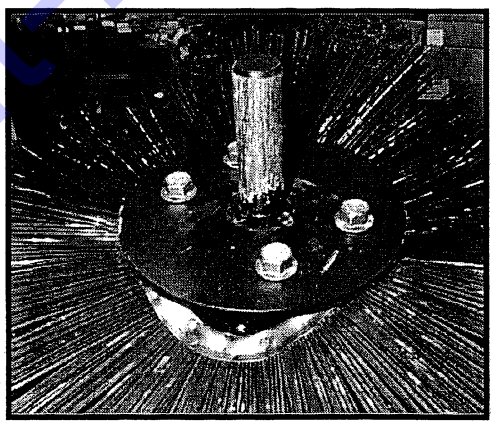


Start the machine and raise the broom head. Pull the Core Assembly from under the broom hood.

To Replace Wafers:

1. Remove (2) 1/2" flat head socket capscrews from the removable cap plate (dual motor applications) or the (4) 1/2" flange head capscrews that bolt the idler bearing shaft to the core.

2. Stand core on end with removable cap plate or the idler bearing shaft end up. Clean debris if any from bearing.



To reinstall broom core reverse above steps, torque capscrews to 190 ft.lbs.

Start unit and engage broom rotation. Check rotation of Core Assembly before putting unit back into service.

REPLACEMENT OF CONVOLUTED (SPACER-LESS) WAFERS

1. Remove worn wafers from the core. If the wafers are unable to be slipped off of the core cut the wafer center ring between the core tube with a torch.

2. Install a new wafer onto the core with the drive pins straddling one of the core tubes. (See illustration below.)

   Note:

   When installing a 1/2 wire and 1/2 poly wafer mix, be sure that a poly wafer is on each end.

3. Install the next wafer on the core by flipping it over and rotating the wafer 1/3 of a turn. See illustration below, if the proceeding wafer installed was number (2) in the illustration, then the next wafer to go on the core would be placed with the drive pins as shown in No. 3. Use a rubber mallet to tap the wafers together to insure installing the proper quantity of wafers on the core.

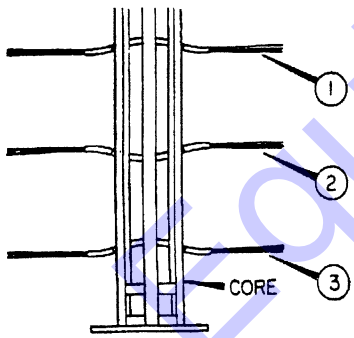


FIGURE 1

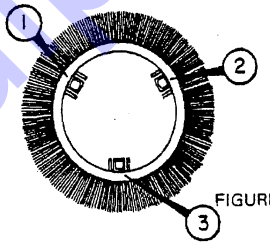
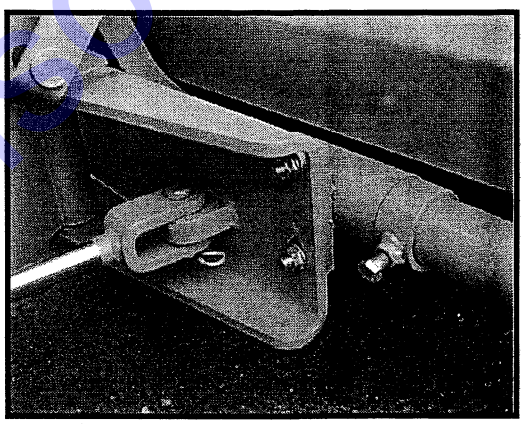


FIGURE 2

BROOM LEVEL ADJUSTMENT

Set the broom horizontal level contact (see front view - Fig. 3). Loosen the (4) 1/2" bolts (two on each side of the pivot bearings (see Fig. 1). Lift up or push down on Broom Motor to achieve uniform brush contact to the surface across entire length of broom.



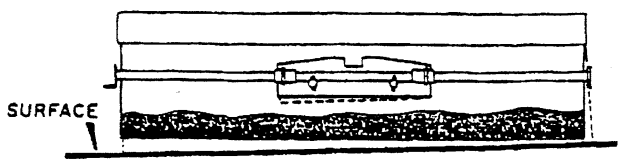
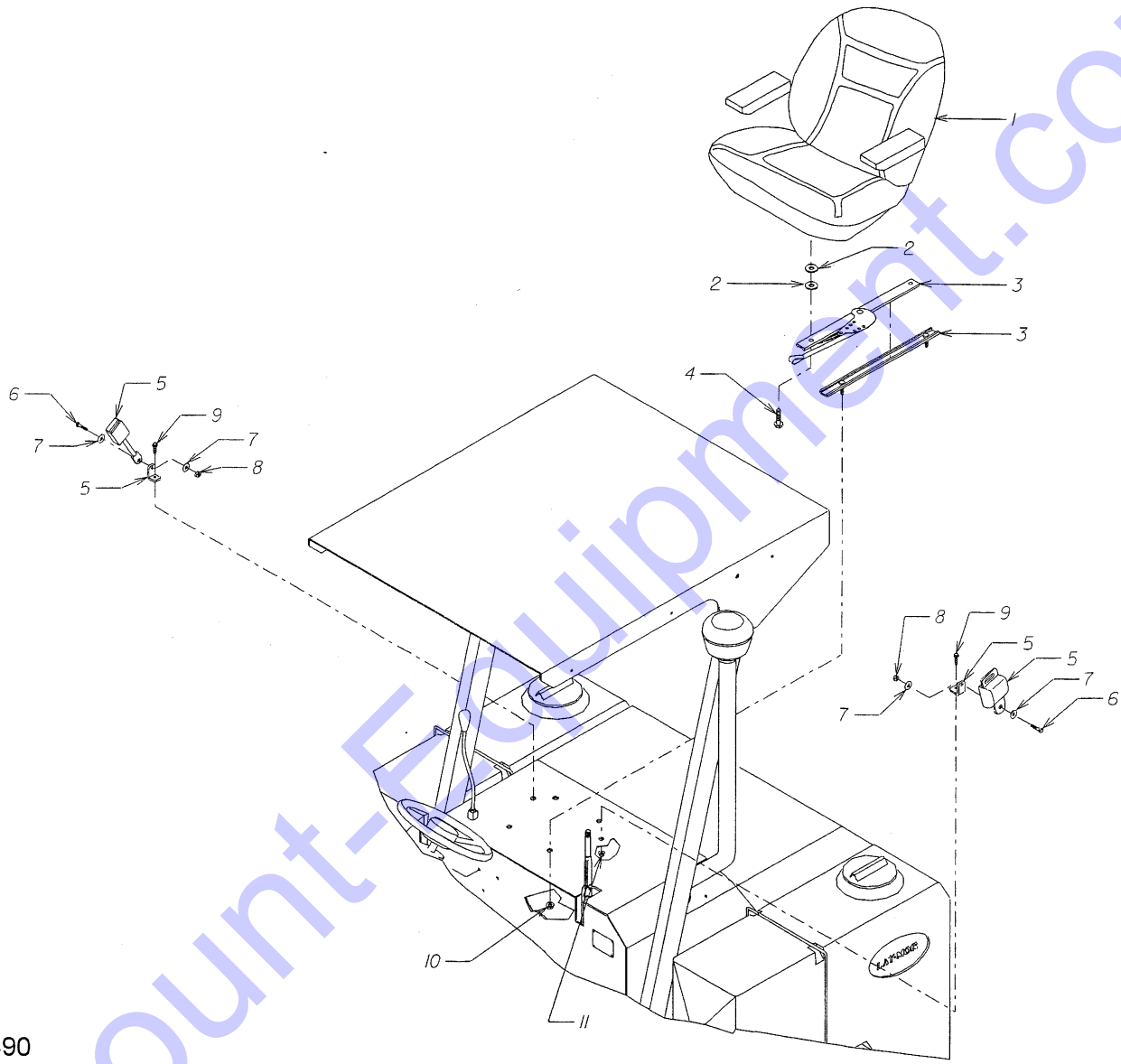


FIGURE 3
FRONT VIEW, looking through broom

SECTION 2

OPERATORS STATION & CONTROLS

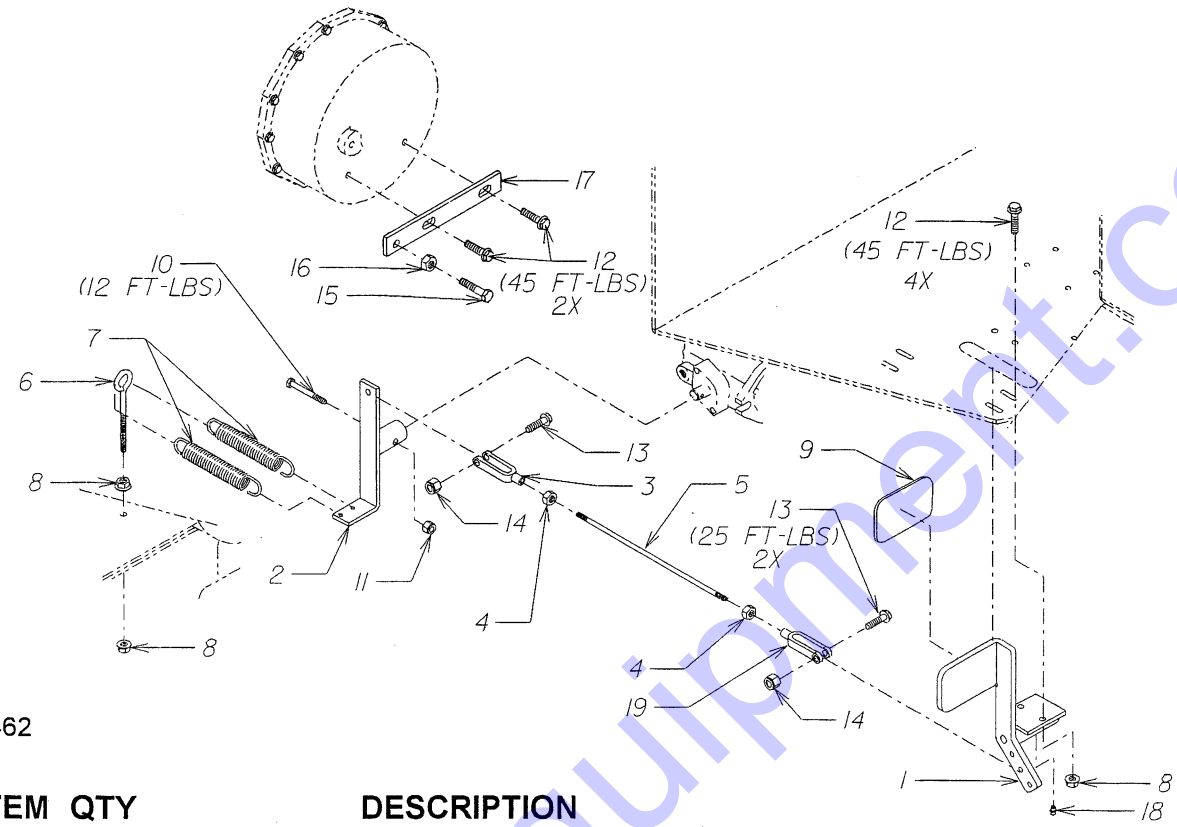
SEAT ASSEMBLY



0490

ITEM	QTY	DESCRIPTION
1	1	Assy., Seat with Armrest
2	8	Flat Washer, 5/16" Pl.
3	1	Assy., Seal Slide Adjustment
4	4	Capscrew, 5/16-18NC x 1.00" Pl.
5	1	Assy., Retractable Seat Belt
6	2	Capscrew, 3/8-16NC x 1.00" Pl.
7	4	Flat Washer, .38" Pl.
8	2	Lock Nut, 3/8-16NC Two-Way
9	2	Capscrew, 3/8-16NC x 1.00" Flange Whizlock
10	4	Nut, 5/16-18NC Flange Whizlock Gr. G
11	2	Hex Nut, 3/8-16NC Flange Whizlock

PEDAL/PUMP CONTROL ASSEMBLY



0462

ITEM	QTY	DESCRIPTION
1	1	Weldment, Variable Speed Pedal
2	1	Assy., Pump Arm
3	1	Yoke, Adjustable
4	2	Hex Nut, 5/16-24NF
5	1	Rod, Variable Speed Control
6	1	Eye Bolt, 5/16 x 1.00”
7	2	Spring, Variable Speed Pedal
8	4	Nut, 5/16-18NC Flange Whizlock Gr. G
9	1	Pad, Pedal
10	1	Bolt, Pump Arm
11	1	Lock Nut, Nylon
12	4	Capscrew, 5/16-18NC x 1.00” Flange Whizlock
13	2	Capscrew, 5/16-18NC x 1.25” Pl.
14	2	Lock Nut, 5/16-18NC Nylon Insert
15	1	Capscrew, 1/2-13NC x 2.25 HHCS
16	1	Jam Nut, 1/2-13NC
17	1	Bar, Pump Arm Stop
18	1	Lube Fitting, 1/4-28 Straight
19	1	Yoke, Adjustment

NEUTRAL ADJUSTMENT

To set neutral position, raise rear tires off the ground and block unit. Loosen the (1) jam nut on the pump art stop bolt. Start unit screw stop bolt in or out until wheels stop turning. Shut off unit, set (1) jam nut. Start unit and recheck adjustment readjust if necessary.

SECTION 3
HYDRAULIC COMPONENTS

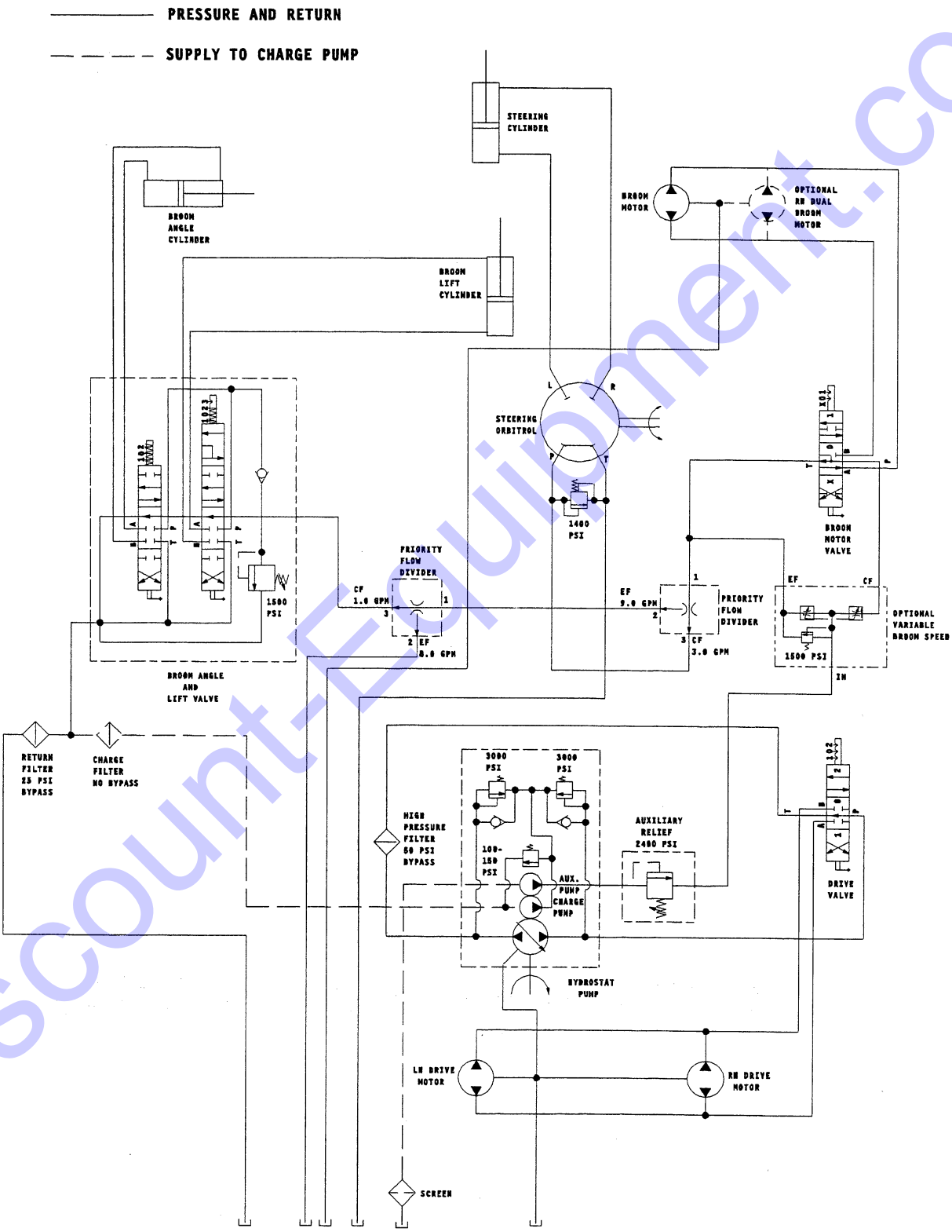
INTRODUCTION:

This section is intended to provide the information required to successfully start up, adjust, troubleshoot and service the hydrostatic and hydraulic systems.

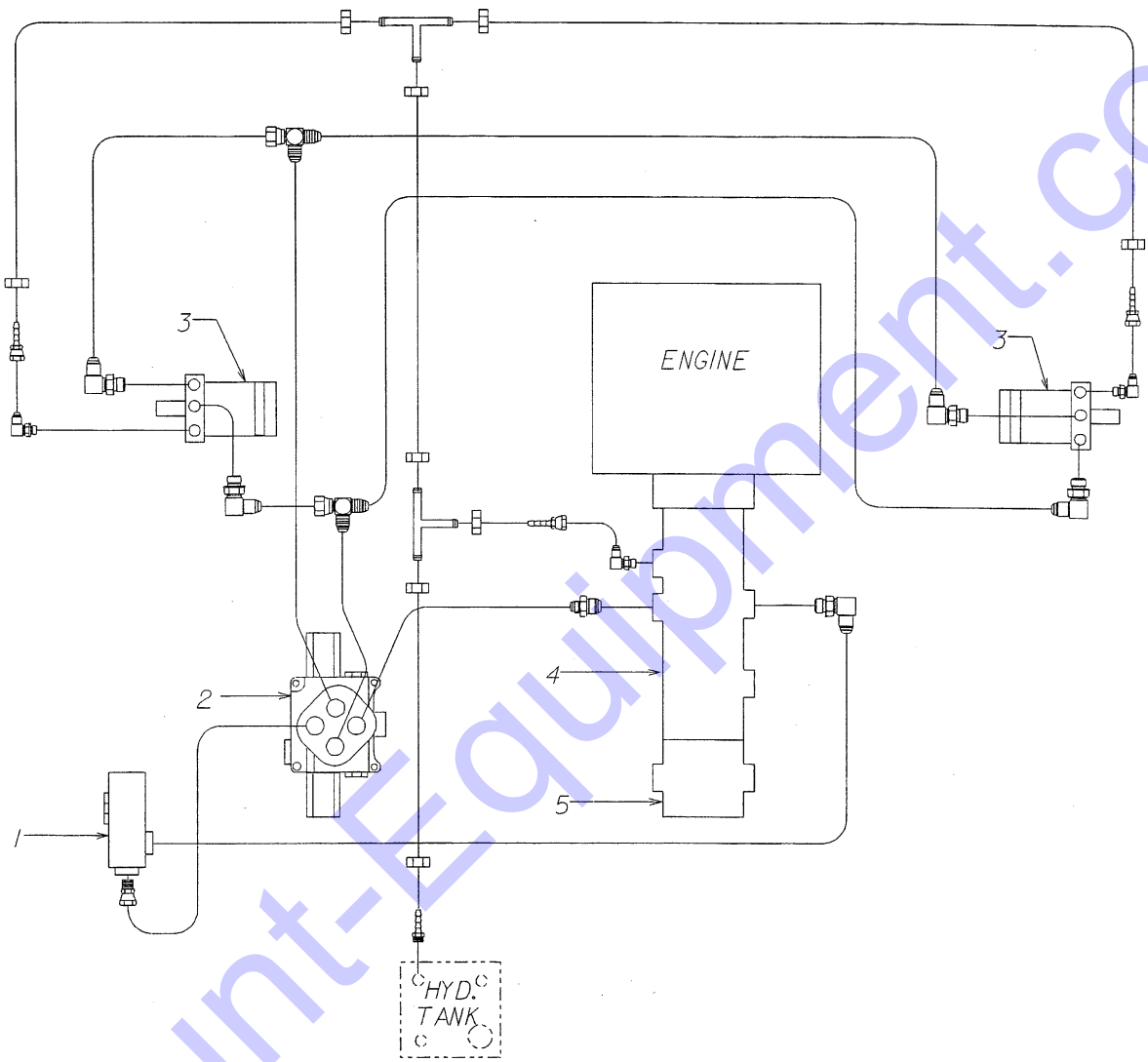
The adjustment and disassembly procedures described herein may be performed in clean conditions without affecting the warranty. Dismantling the units beyond the stages described in this section without the express permission of Lay-Mor may void the warranty.

When performing any type of service or conversion to these pumps, the utmost cleanliness of work area, tools, cleaning rags, and the components is required. Dirt and contamination introduced during assembly and service is a major cause of failure in high pressure piston equipment. Therefore, the importance of cleanliness cannot be over emphasized.

HYDRAULIC SCHEMATIC



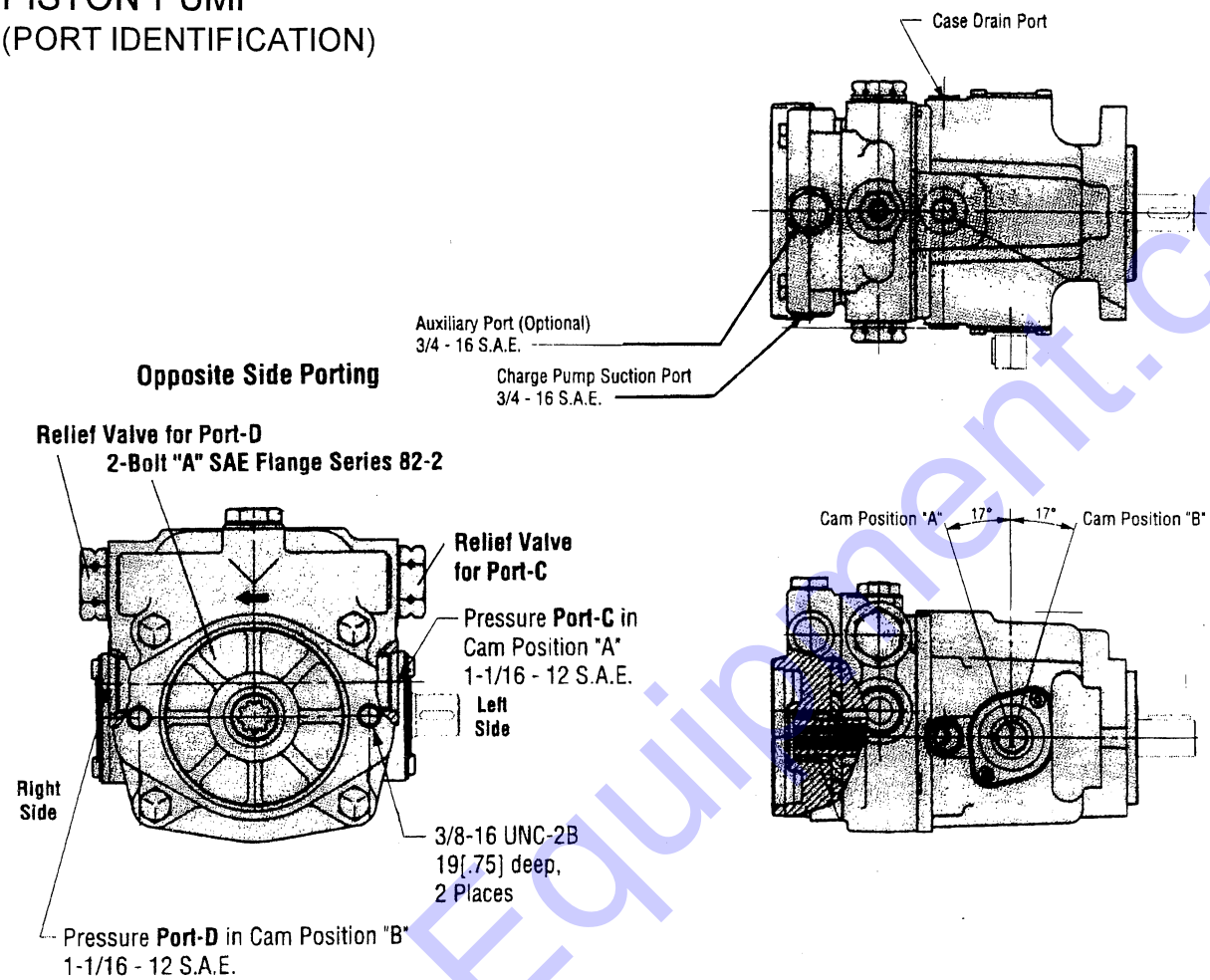
GROUND DRIVE CIRCUIT



0523

ITEM	QTY	DESCRIPTION
1	1	Assy., High Pressure Filter (See Page 3-18)
2	1	Assy., Drive Valve (See Page 3-12)
3	2	Assy., Hydraulic Drive Motor (See Page 3-14)
4	1	Pump, Main
5	1	Pump, Auxiliary (See Page 3-28)

PISTON PUMP
(PORT IDENTIFICATION)



HYDROSTATIC PUMP SPECIFICATION
GENERAL SPECIFICATIONS PUMP

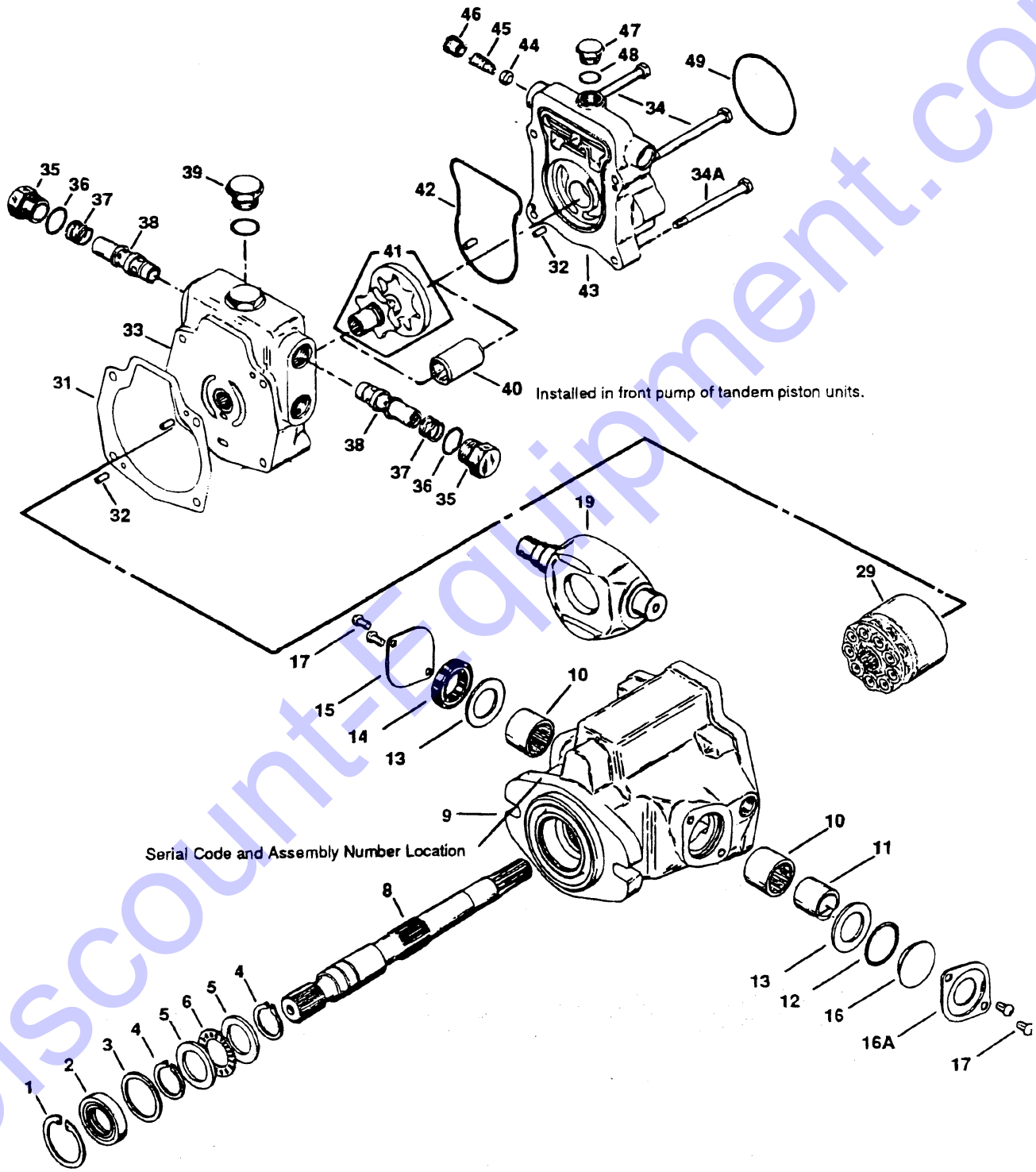
SPECIFICATION

Displacement	1.24 in^3/rev. 20.3 cm^3/rev.
Maximum Drive Speed	3600 r.p.m.
Minimum Drive Speed	500 r.p.m.
Maximum Pressure	5000 p.s.i. (345 bar)
Relief Setting	3000 p.s.i. (241 bar)
Weight	21 lbs.
(Approx. varies w/control)	9.5 Kg
Maximum Case Pressure	25 p.s.i. (1.7 bar)

CHARGE PUMP:

Operating Pressure	100-150 p.s.i. (6.9-10 bar)
Maximum Inlet Vacuum	6 in.Hg. .8 bar (absolute)

PISTON PUMP



PISTON PUMP

ITEM	QTY	DESCRIPTION
1	1	+ Ring, Retaining
2	1	+ Seal, Shaft
3	1	Washer
4	2	+ Ring, Retaining
5	2	Bearing Race
6	1	Bearing
8	1	Shaft, Drive (Splined)
9	1	Assy., Housing
10	2	Bearing
11	1	Inner Race
12	1	+ O-Ring, 3/32 x 1-5/16 I.D.
13	2	Washer
14	1	+ Seal, Shaft
15	1	Cover, Seal
16	1	Cover, O-Ring
16A	1	Cover, Trunnion
17	4	Screw
19	1	Camplate
29	1	Assy., Rotating Kit
31	1	+ Gasket, Housing
32	4	Pin, Dowel
33	1	Assy., Backplate
34	2	Capscrew
34A	2	Capscrew
35	2	Assy., Plug
36	2	+ O-Ring, 3/32 x 7/8 I.D.
37	2	Spring
38	2	Assy., Relief Valve
39	1	Assy., Plug (Includes O-Ring)
40	1	Coupler
41	1	Assy., Gerotor & Coupler
42	1	+ O-Ring, Molded
43	1	Assy., Adapter
44	1	Poppet Filter Relief
45	1	Spring
46	1	Retainer, Spring
47	1	Assy., Plug
48	1	+ O-Ring, 3/32 x 41/64 I.D.
49	1	+ O-Ring, 1/16 x 3-1/4 I.D.
	1	+ Included in Seal Repair Kit.

* Parts available from Lay-Mor other parts are listed for identification reasons only.

PISTON PUMP

Tools Required for Disassembly & Reassembly:

- 1/2 in. Socket
- 1 in. Socket
- 1 1/8 in. Socket
- Ratchet Wrench
- Torque Wrench (100lb.ft.)
- 7/16 in. Hex Key
- 9/16 End Wrench
- T-25 Torx Screwdriver
- Internal Retaining Pliers (straight .090 Tip)
- External Retaining Pliers (straight .070 Tip)
- Regular or Locking Pliers
- Seal Driver or Similar Tool
- Arbor Press
- Petroleum Jelly (Such as Vaseline)
- Soft Face Hammer

Note: The following information has been provided for seal replacement. Waldon/Lay-Mor does not provide repair parts for these pump. Call the factory for the authorized Eaton Service Center near you.

Disassembly:

Work in a clean area; cleanliness is extremely important when repairing hydraulic pumps. Before disconnecting the lines, clean port area of pump. Disconnect hydraulic lines, removing pump assembly from vehicle and plugging ports. Thoroughly clean the outside of pump. After cleaning, remove port plugs and drain oil.

1. Clamp the end of the drive shaft in a protected jaw vise with the body of the pump up and remove the four capscrews (34) from the pump assembly.

2. Use a plastic mallet and tap the adapter assembly (43) to loosen it, then pull the adapter straight up until it is free.

3. Remove retainer (46), spring (45), and poppet (44) from adapter assembly.

4. Remove gerotor and coupler assembly (41) from backplate (33). Further disassembly of gerotor and coupler assembly is not required. See Figure 1.

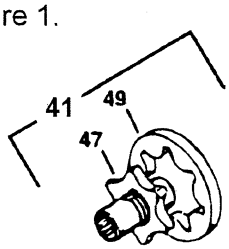


Figure 1

5. Use screwdriver slots in housing and pry up on backplate (33) or tap with plastic mallet to loosen, then pull the backplate straight up to remove. Remove gasket (31).

6. Remove plug assembly (35), spring (37), and relief valve assembly (38).

7. Remove retaining ring (1) from housing. Press shaft (8) from housing (9) and remove shaft seal (2), and washer (3).

8. Remove retaining ring (4) from shaft and remove thrust washer (5) and thrust bearing (6).

9. To remove the camplate (19) from housing, remove the four screws (17) from the sides of the housing. Remove tow covers (15 or 16A), o-ring cover (16), o-ring (12), seal (14), washer (13). Now remove the inner race (11) and needle bearings (10). The two camplate pivot bearings are a loose fit into the housing; do not be concerned if they are not tight.

10. Replace the shaft seal, gasket, backup washers and all o-rings with new items upon reassembly.

Inspection:

1. Inspect the charge pump relief valve seat inside the charge pump adapter. Check to insure that the seat is smooth and free of burrs or other defects.

2. Inspect the charge pump relief valve spring (45).

3. Inspect the gerotor pocket inside the charge pump adapter housing (43). It should not be scored excessively.

4. Inspect the needle bearing inside the charge pump adapter housing, making sure that needles remain in the bearing cage.

5. Inspect the flat surface of the backplate (33), the finish on the gerotor side should show no galling. The finish on the piston block side should be smooth and free of grooves. Replace the backplate if it shows any of the wear characteristics outlined above. Insure that the cam stop is tight in the specific backplate (33) design.

6. The finish on polished shoe surface of the camplate (19) should show no signs of scoring.

7. Inspect the shaft (8) for fretting in the bearing and spline areas.

8. Inspect thrust bearing (6) and washer (5) for wear.

9. Inspect the needle bearings in the housing assembly, making sure needles remain in bearing cage.

Reassembly:

1. Clean all parts in suitable solvent, lubricate all critical moving parts before reassembly.

2. Place the camplate (19) into the housing with the long trunnion down and to the appropriate side of linkage on the machine. Follow step 3 or 4 for retaining the specific design of unit.

3. Installing the camplate seals. Install washer (13) to both trunnion areas. Insert new o-ring (12), o-ring cover (16) and retain with trunnion cover (16A) and screws (17). On the linkage side of the camplate install needle bearing (10), washer (13), seal (14) and retain with seal cover (15) and screws (17). Torque screws (17) 36 to 48 lbs. in. [4 to 5 Nm].

4. Install retaining ring (4) on shaft (8). Install thrust washer (5), thrust bearing (6), and second thrust washer (5). Secure with second retaining ring (4).

5. Install shaft in housing. Install washer (3), new shaft seal (2), and retain with retaining ring (1).

6. Clamp pump assembly in a protected jaw vise with the open end of the housing up.

7. Install new gasket (31) over dowel pins (32) installed in housing.

8. Place backplate (33) over shaft and on housing with gasket in place.

9. Install outer gerotor ring (49) into adapter assembly (43). Lubricate ring to hold in place. See Figure 1.

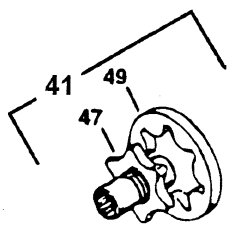


Figure 1

10. Install inner gerotor and coupler assembly (41) onto shaft (8) and backplate (33). Lubricate inner gerotor. See Figure 4.

11. Install new o-ring (51) in groove, hold in place with clean clear grease. Place adapter plate assembly (43) on pump backplate. Install four capscrews (34 & 34A) and torque to 17 to 20 lbs.ft. [23 to 27 Nm].

Reassembly Cont'd.:

12. Place new o-ring (36) on plug (35) and retain spring and relief valve. Torque plug (35) 95-105 lbs.ft. [129 to 142 Nm].

13. Remove pump from vise and install poppet (44), spring (45), and spring retainer (46). Torque spring retainer (60) 5 to 7 lbs.ft. [7 to 10 Nm].

Start-up Procedure

When initially starting a new or a rebuilt propulsion system, it is extremely important that the start-up procedure be followed. It prevents the chance of damaging the unit which might occur if the system was not properly purged with oil before start-up.

1. After the propulsion components have been properly installed, fill the pump housing at least half full with filtered system oil. Connect all hydraulic lines and check to be sure they are tight.

2. Install and adjust all control linkage.

3. Fill the reservoir with an approved oil that has been filtered through a 10 micron filter.

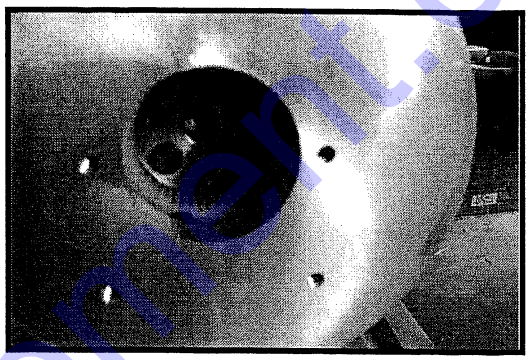
4. Disconnect Fuel Solenoid wire to shut off the fuel flow to the injectors and turn the engine over 15 seconds.

5. Reconnect Fuel Solenoid wire to return the fuel flow to the injectors. Place the Direction Control in the neutral position, start the engine and run it at a low idle. The charge pump should immediately pick up oil and fill the system. If there is no indication of fill in 30 seconds, stop engine and determine the cause.

6. After the system starts to show signs of fill, disconnect lockout hubs and slowly move pump camplate to a slight cam angle. Continue to operate system slowly with no load on motors until system responds fully.

7. Check fluid level in the reservoir and refill if necessary to the proper level with an approved filtered oil.

8. With Foot Pedal released, check for creep in neutral. If evident, adjust pump control arm stop bolt till unit stops.



9. Check that the hoses are connected so that the transmission operates in the correct direction as the Direction Control Lever.

10. Check all line connections for leaks and tighten if necessary.

11. The machine is now ready to be put into operation.

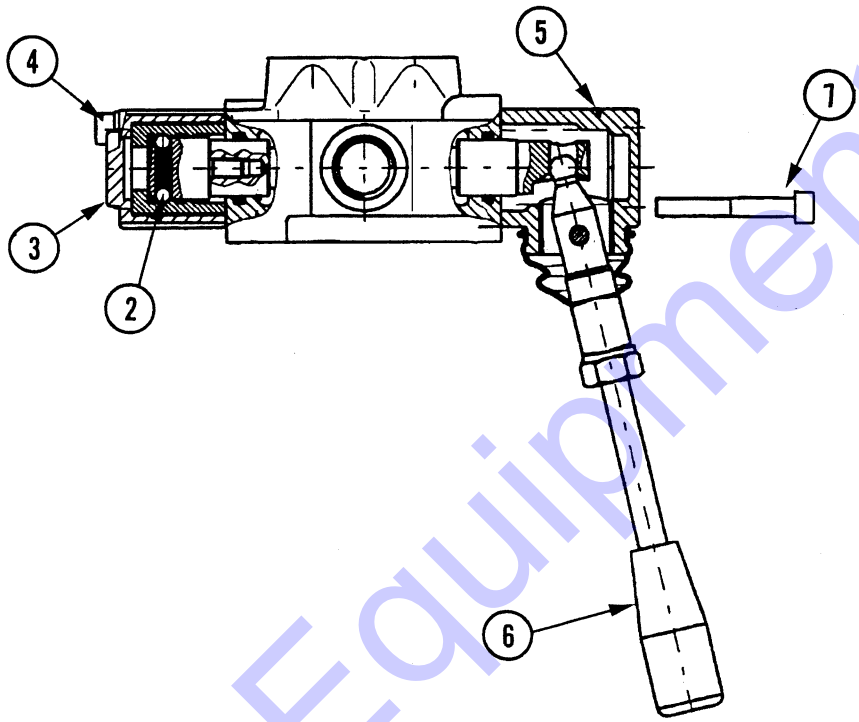
12. Short hour filter changes are recommended for the first two changes after placing the machine back into operation. The first filter would be changed in 3-5 hours and the second at approximately 50 hours. Routine scheduled filter changes are recommended for maximum life of the hydraulic system.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
1. System will not operate in either direction.	a. Oil supply low.	a. Check oil level, fill.
	b. Oil filter clogged.	b. Replace filter element.
	c. Oil too heavy.	c. Use proper viscosity oil.
	d. Control linkage misadjusted or unfastened.	d. Check to see if control linkage is binding.
	e. Low charge pressure should be 60-100 psi.	e. See below: f, g, h, & i
	f. Charge pump key sheared.	f. Inspect charge pump for damage.
	g. Charge pump relief valve damaged.	g. Remove relief valve parts, examine parts and seat. Replace necessary parts.
	h. Charge pump gears worn or scored.	h. Remove parts and examine. Replace defective parts. If severe scoring is indicated, remove complete pump disassemble, clean, and inspect for damage.
	i. Internal charge pump damage.	i. Disassemble pump, inspect for damage.
	j. Drive coupling broken.	j. Inspect coupling for sheared spline, key or broken chain.
	k. Relief valve stuck open.	k. Remove relief valve, clean or replace.
	l. Damaged check valve.	l. Disassemble and check if check valve is faulty or damaged.
2. System Noisy	a. Air in system.	a. Low oil level in reservoir.
	b. Loose suction line.	b. Tighten fittings.
	c. Clogged suction filter.	c. Replace filter element.
	d. Internal pump or motor damage.	d. Disassemble, inspect and repair.
3. Sluggish response to acceleration or deceleration.		a. See step 1-A, 1-B, 1-C, 2-B.
	a. Air in system.	b. See step 1-F, 1-G, 1-L
	b. Low charge pressure.	c. Test motor/pump - block pump lines and check pump pressure, if ok replace or repair motor. If bad replace or repair pump and motor.
	c. Internal pump or motor wear or damage.	
	d. Relief valve dirty or damaged.	d. Remove, clean or replace.

VALVE ASSEMBLY

BROOM MOTOR
DRIVE
BROOM ANGLE/RAISE & LOWER



ITEM	QTY	DESCRIPTION
1	1	Kit, Seal
2	1	Kit, Detent L
3	1	End Cap, Spool Action
4	2	Hex Screw, 6 x 40 Socket
5	1	Assy., Lever End Cap
6	1	Assy., Lever
7	2	Hex Screw, 6 x 45 Socket

PROCEDURE TO CHANGE SPOOL SEALS

1. Clean outside of valve to remove all dirt and loose paint. Ports must be covered to prevent contamination inside the valve.

2. Remove spool control end cap (3) by unscrewing capscrews.

3. Remove spool control kit (2). Pay attention to the positions of the parts for reassembly.

4. Remove handle end cpa (5) by unscrewing capscrews. Shift handle back and twist the bottom upard to remove end cap.

5. Carefully slide spool toward handle end just enough to uncover spool seal on opposite end of spool Remove spool seal with an o-ring pick.

6. Slide spool to other end of valve body just enough to uncover spool seal on handle end. Remove spool seal with an o-ring pick.

7. While wearing safety glasses, clean the o-ring groove with compressed air.

8. Lubricate new spool seal with clean oil and insert into o-ring groove. Check that seal is completely in the groove.

9. Slide spool toward handle end of valve until spool contacts new seal. Insert a punch into hole on handle end of spool. Carefully slide spool through new seal by gently twisting and pulling on punch. Pull spool through just enough to uncover o-ring groove on opposite end of spool. Be carefule not to pull spool too far and risk damaging the new seal.

10. While wearing safety glasses, clean the o-ring groove with compressed air..

11. Lubricate new spool seal with clean oil and insert into o-ring groove. Check that seal is completely in the groove.

12. Carefully slide spool through seal and into original center position. Be careful not to move spool too far and risk damaging the new spool.

13. Assemble spool control kit (5) onto end of spool. Keep spool from rotating by inserting a punch into hole on handle end of spool. Tighten spool control kit to spool by hand..

14. Assemble spool control end cap (3) onto valve. Tighten capscrews by hand.

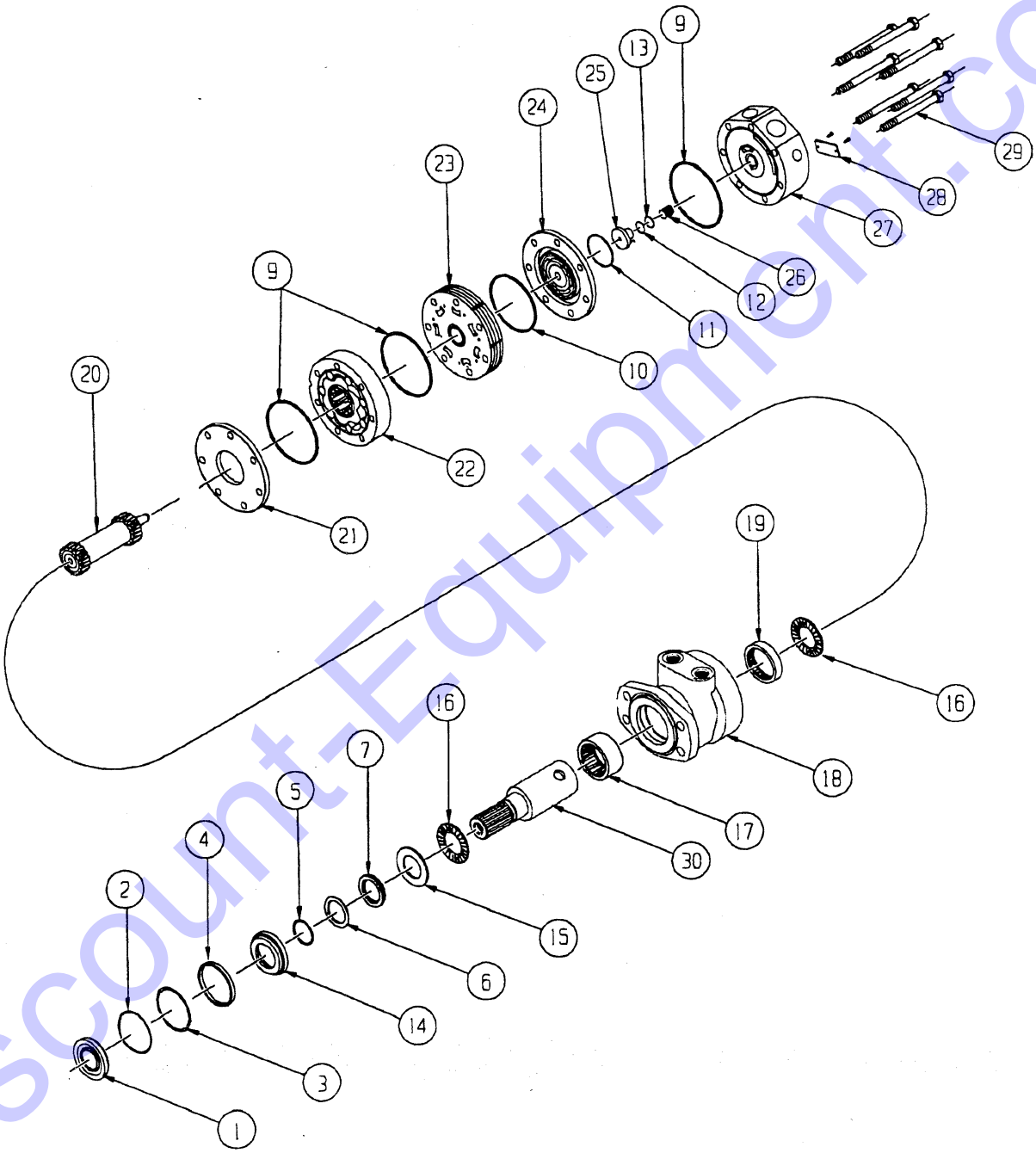
15. Rotate spool so the hole for the handle end cap is positioned straight as found in step 4.

16. Assemble handle end cap (5) onto hande end of valve. Tighten capscrews by hand.

17. Shift handle to check for smooth spool movement and proper spool control action. If problems occur, then eigher the spool control kit is improperly assembled or the capscrews are over-tightened. Repeat steps 2 through 4 and 13 through 17 to correct.

18. Test for leaks.

HYDRAULIC DRIVE MOTOR ASSEMBLY



HYDRAULIC DRIVE MOTOR ASSEMBLY

ITEM	QTY	PART NO.	DESCRIPTION
1	1		* Seal, Dust
2	1		* Ring, Wire
3	1		* Shim, Backup
4	1		* Seal, Carrier
5	1		* Shim, Backup
6	1		* Seal, Teflon Backup
7	1		* Seal, Shaft
9	3		* Seal, Manifold
10	1		* Seal, Body
11	1		* Seal, Commutator
12	1		* Seal, O-Ring
13	1		* Seal, Teflon
14	1		* Seal, High Pressure
15	1		* Washer, Thrust
16	2		+ Bearing, Thrust
17	1		Bearing, Front Shaft
18	1		Housing
19	1		Bearing, Rear Shaft
20	1		+ Link, Drive
21	1		Plate, Wear
22	1		Rotor Set
23	1		Manifold
24	1		Assy., Commutator
25	1		Piston, End Cover
26	1		Spring, Piston
27	1		Cover, End
28	1		Tag, I.D.
29	7		Bolt
30	1		+ Shaft

+* Included in the Seal Kit.

+ Parts available from Lay-Mor other parts are listed for identification reasons only.

PROCEDURE FOR REPLACING HYDRAULIC DRIVE MOTOR SEALS

Disassembly:

1. Remove motor from sweeper. To aid in reassembly of the motor, make a "V" shaped set of lines from the end cover to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to housing (18).

2. Loosen and remove seven bolts (29) holding Motor Assembly together. Remove end cover (27) carefully as piston (25) and spring (26) may fall out, If piston does not come out, carefully pry piston (25) out of end cover (27) and lay aside. Remove o-ring seal (12) and teflon backup seal (13) from end cover and discard seals. Remove spring (26) and lay aside.

3. Lift commutator container and commutator (24) from motor and lay aside. Place commutator on a flat, clean surface with the seal (11) facing up. Place the tip of a small screwdriver on the seal (11) and gently tap until opposite side of seal lifts from groove. Remove seal (11) and discard.

4. Remove manifold (23), rotor set (22) and divider plate (21) from motor. Remove all seals (9 & 10) from components and discard. (Caution: Do not allow rolls to drop from Rotor Assembly (22) when removing Rotor Assembly from motor.) Remove drive link (20) and thrust bearing (16) from motor and lay aside.

5. Gently tap shaft (30) upward from housing (18) and remove through rear of housing and lay aside. Remove housing (18) from vise and turn over. Pry dust seal (1) from housing. Push the seal carrier (14), thrust washer (15) and thrust bearing (16) down until they make contact with the roller bearing (17) located in the housing bore.

6. Remove wire ring (2), install backup shim (3) and lathe cut seal (4) from inner bore groove with a small screwdriver. Lift out seal carrier (14) thrust washer (15) and thrust bearing (16) from the housing bore. Using a small screwdriver, carefully pry shaft seal (7), teflon backup seal (6) and metal backup shim (5) from seal carrier (14) and discard. Lay seal carrier, thrust washer and thrust bearing aside.

7. At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air (for safety, observe all OSHA Safety Guidelines). All new seals should be lightly coated in clean oil prior to installation.

Reassembly:

1. Place housing (18) on a clean work surface with the mounting flange up. Place shaft (30) in housing (18). Place thrust bearing (16) on shaft, then place thrust washer (15) on shaft. Install lathe cut seal (4) into seal groove in bore of housing (18). Lightly coat seal area of shaft with clean oil and place plastic installation sleeve with shaft seal (7) down onto shaft covering all splines, keyways and wire ring grooves. Slide shaft seal (7) down onto shaft (30) until it contacts thrust washer (15). Remove plastic installation sleeve. Carefully install the teflon backup seal (6) onto the shaft (30) with the flat side up and the seal lip facing the shaft seal (7). Place the metal backup shim (5) onto the shaft and against the teflon backup seal (6).

Reassembly Cont'd.:

2. Place the seal carrier (14) onto the shaft (large end down) and carefully press the seal carrier (14) down onto the Seal Assembly using an arbor press and sleeve. Install metal backup shim (3) against lathe cut seal (4) in groove in housing bore by squeezing the shim (3) between thumb and forefinger to bow shim. While maintaining bow in shim, start the shim into the groove and use a small screwdriver to push the shim into groove. Install wire ring (2) into the groove making sure that the ends are butted.

3. While holding shaft into housing, place Housing/Shaft Assembly in vise with shaft end down. Install drive link (20) into shaft and tap lightly to seat the Seal Carrier Assembly against the wire ring (2). Place thrust bearing (16) over drive link (20). If shaft is properly seated against wire ring, thrust bearing (16) will be flush with rear of housing.

4. Place divider plate (21) onto housing (18) aligning bolt holes. Place body seals (9) in grooves in both sides of rotor (22). Place rotor (22) onto divider plate (21) with side of rotor with chamber in splines facing divider plate (21). Place manifold (23) over rotor (22) with seal groove side up. Install manifold seal (9).

5. Install the commutator seal (11) into the commutator (24) with the metal side facing up. Use finger pressure to press the seal down flush with the surface of the commutator. Place the commutator container onto the manifold (23) and then place the commutator onto the protruding end of the drive link (20) making sure that the seal side faces up.

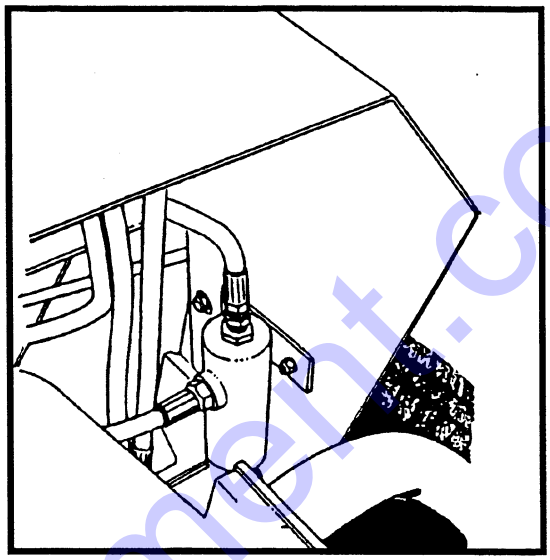
6. Install the remaining body seal (10) in the groove in the face of the end cover (27). Install piston spring (26) into end cover (27), then the white teflon backup seal (13) followed by the o-ring seal (12). Lining up the alignment pin with the hole in the end cover, press piston (25) into the end cover (27). While holding the piston (25) in the end cover, lower the End Cover Assembly onto the motor. Check to make sure that the end cover ports are in their original position.

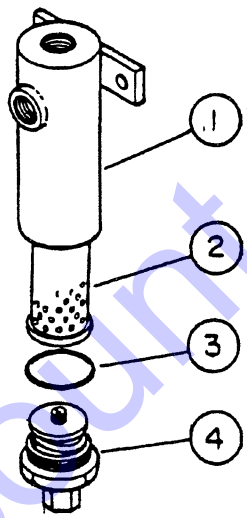
7. Install the seven assembly bolts (29) and pre-torque to 10 ft.lbs. final torque all bolts to 50 ft.lbs.

8. Install dust seal (1) flush with the pilot face of the housing (18) making sure that the lip side of the seal faces out.

HIGH PRESSURE FILTER

To locate the High Pressure Filter raise the engine hood and look to the right side of the engine in front of the battery. The Filter Assembly is bolted to the inside of the frame cowl.





ITEM	QTY	DESCRIPTION
1	1	Filter, Housing
2	1	Filter, Element
3	1	Filter, O-Ring
4	1	Filter, Relief Nut Assembly

The high pressure filter element should be changed twice per year and any time a main pump or either rear wheel drive motor is replaced. Remove bottom Cap/Nut Assembly (4) to gain access into the filter housing (1) to remove the filter element (2). Be sure the o-ring (3) is in place before reassembly.

TROUBLESHOOTING HYDRAULIC DRIVE SYSTEM

Symptoms of Hydrostatic Drive System failures on Lay-Mor 6HC sweepers fall into three basic categories. These symptoms and their most common causes are listed below. Before testing any hydraulic components check oil level and bring oil temperature up to 20^0 above ambient.

Symptom 1:

Sweeper lacks power or speed in both forward and reverse. This can be caused by insufficient Charge Pump pressure, bad Relief Valves, failed Pump or failed Hydraulic Motor. See **Charge Pressure Relief Valve Test** Page 3-24**, Hydrostatic Drive Relief Valve Test Procedures** Page 3-25 **and Hydrostatic Drive Motor Test**. Page 3-26

Symptom 2:

Sweeper will not move in forward or reverse and Auxiliary Hydraulic functions do not work. This is caused by a failed Pump Drive Coupler. See **Inspecting Hydraulic Pump Drive Coupler.** Page 3-28

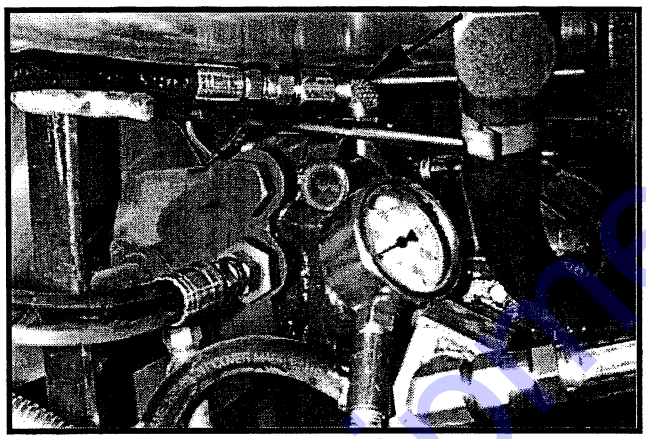
Symptom 3:

Sweeper creeps in both directions with engine running and Directional Control Lever in forward or reverse. Pump stroking lever stop bolt needs to be adjusted.

The following Hydrostatic Drive Test Procedures can be used to correctly diagnose the Hydrostatic Drive System failures on Lay-Mor 6HC sweepers.

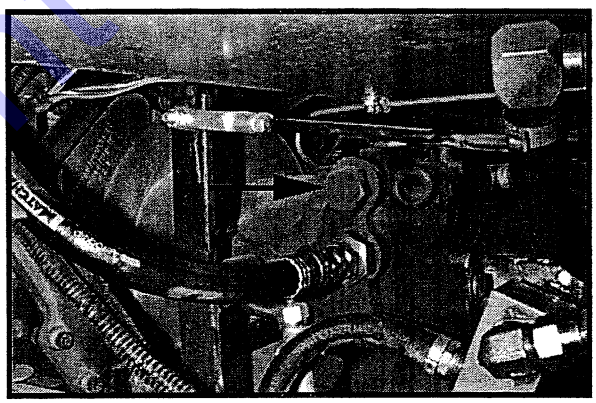
CHARGE PRESSURE RELIEF VALVE TEST:

1. Remove plug from top of Charge Pump Housing and install a 200 psi gauge on hydrostatic pump.



2. Start engine and run it at 3,000 R.P.M. and check charge pressure at gauge. Pressure should read 60-100 psi.

3. If pressure is incorrect remove Relief Valve parts, examine parts and seals. Replace necessary parts.



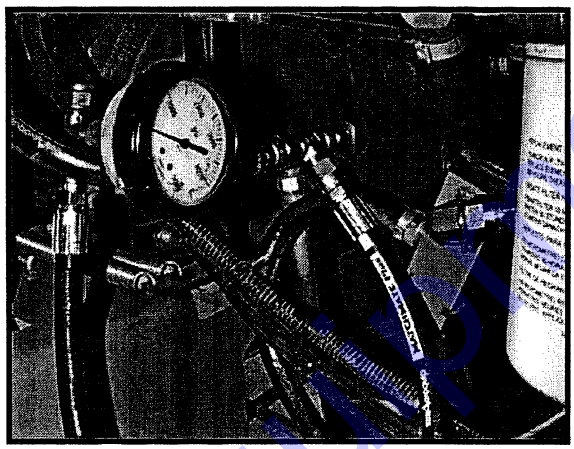
If Relief Valve is ok Charge Pump has failed and Hydrostatic Pump should be replaced.

HYDROSTATIC DRIVE RELIEF VALVE TEST:

Prior to testing Main System Relief pressure always make sure that the Charge Pressure Relief Valve is good. Page 3-24

To perform the following test make sure that the Park Brake is set or wheels blocked to keep machine from rolling.

1. Remove the hydraulic hose from the side of the Hydrostatic Pump and cap the hose with a No. 12-JIC plug. Attach a hose end 5000 psi pressure gauge to the pump fitting.



2. Start engine and run at high idle. Depress Pump Control Pedal, check relief pressure. Pressure should read approximately 3,000 psi. Check pressure for only a few seconds the oil is going over relief and will get extremely hot very quickly.

4. If relief pressure cannot be obtained, switch Relief Valves from one side of the pump to the other. If the pressure reading changes when the Relief Valves are switched, the Relief Valve with the low reading should be replaced or it can be left on the "off" side of the pump. The pump is only stroked one direction. The Direction Valve is used to redirect the oil flow for reverse. If the pressure readings do not change when the Relief Valves are switched, the Hydrostatic Pump has internal problems and should be replaced.

HYDROSTATIC PUMP FLOW TESTING

The pump can be tested two ways, with a Flow Meter test device that measures flow and pressure as pressure is increased, checking speed over a distance.

To check flow with a meter install the meter between the right hand side of the pump and the Directional Valve. The pump should produce a maximum of 15 gpm and approximately 3,000 psi with the engine at full throttle (3000 rpm).

To check speed mark off a distance of 100 ft. and time the sweeper as it passes through the 100 ft. mark. 6.5 mph over 100 ft. should take 11-12 seconds.

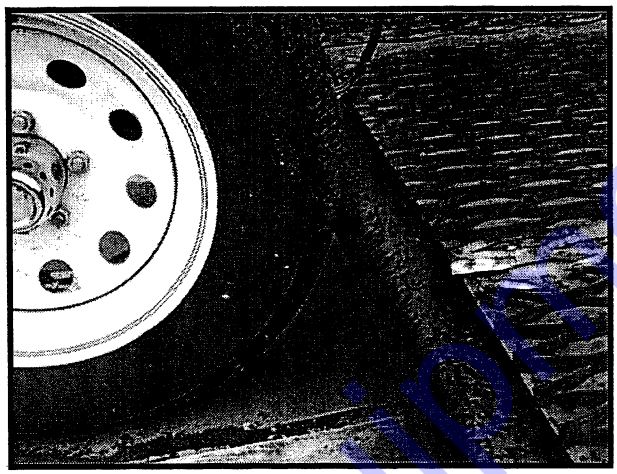
$$\frac{\frac{6.5 \text{ miles}}{\text{Hour}} \quad \frac{5280 \text{ ft.}}{1 \text{ Mile}} \quad \frac{1 \text{ Hour}}{1} \quad \frac{\quad}{60 \text{ min.}} \quad \frac{1 \text{ min.}}{60 \text{ seconds}}}{} = 9.5 \text{ ft./sec.}$$

HYDROSTATIC DRIVE MOTOR PERFORMANCE TEST:

1. Perform the Hydrostatic Drive Relief Valve Test to make sure that pump and reliefs are in good condition. See Page 3-25

2. Reinstall hose with a test hose and tee for a pressure gauge.

3. Stall sweeper by placing front of sweeper against an immovable object.

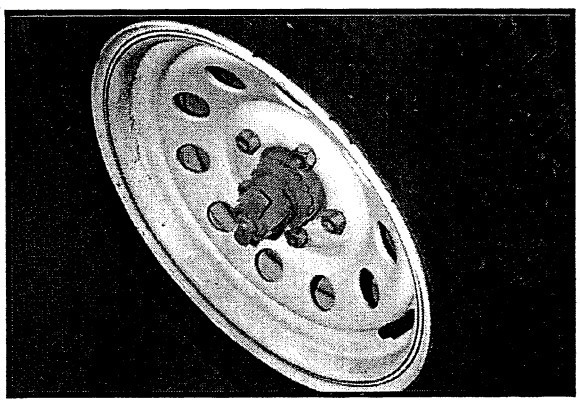


4. Start engine and run at 3,000 R.P.M.

5. Move Directional Control Lever to forward and depress Pump Control Pedal and read gauge. Pressure should be 3,000 psi. If 3,000 psi cannot be maintained one or both of the Drive Motors are leaking internally and should be replaced.

6. To determine which motor is defective. Remove the hoses going to one of the motors and plug the hoses and cap the fittings.

7. Disconnect the lock-out hubs (pull out) for the above motor.

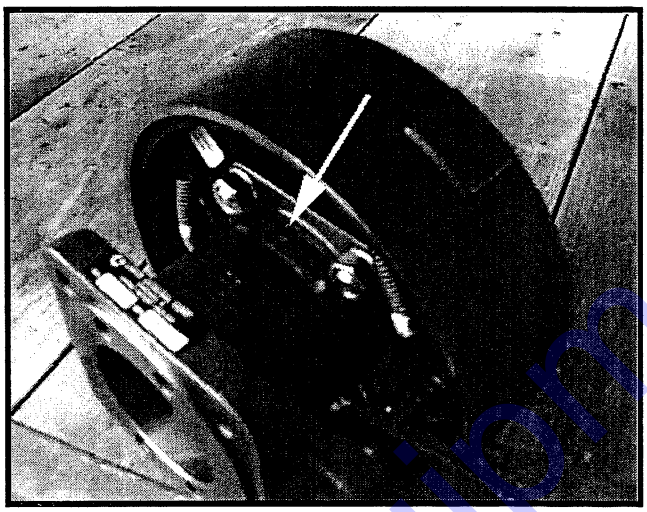


8. Start and drive unit on a level surface with the one remaining Drive Motor. The machine should be able to pull itself, if not then the motor hooked up is defective.

9. Repeat process for the other motor to determine if its defective.

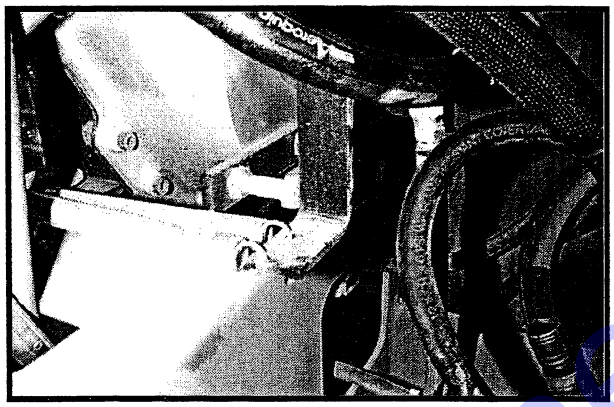
DRIVE MOTOR SEAL TEST:

To check for seal failure on the Drive Motors, remove the "level" plug from the lock-out hub excessive oil or oil under pressure would indicate the motor seal is defective allowing hydraulic oil to leak into the hub.



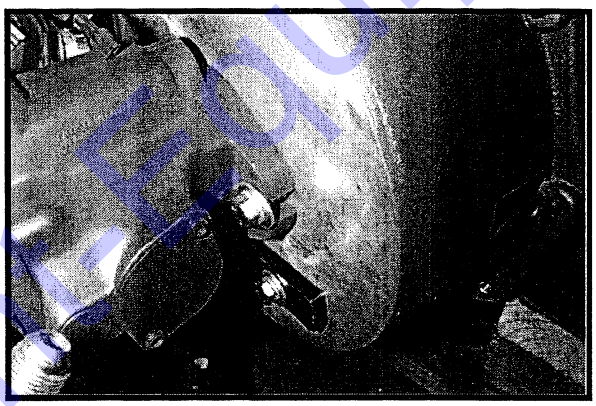
INSPECTING HYDRAULIC PUMP DRIVE COUPLER:

1. Remove control linkage from Hydrostatic Pump.

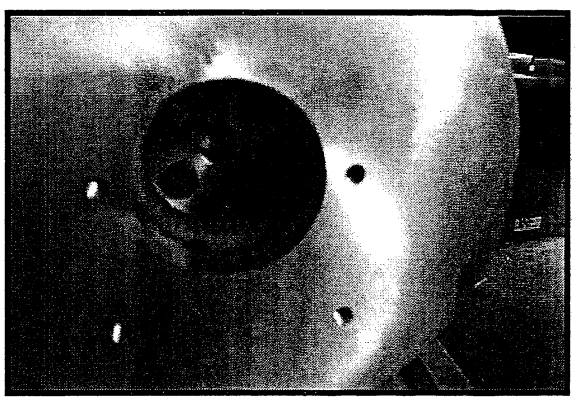


2. Remove hoses from Auxiliary Gear Pump and Hydrostatic Pump. Cap and plug all open fittings and hoses.

3. Remove Hydrostatic Pump mounting bolts and pull Hydrostatic Pump Assembly out of pump drive housing.



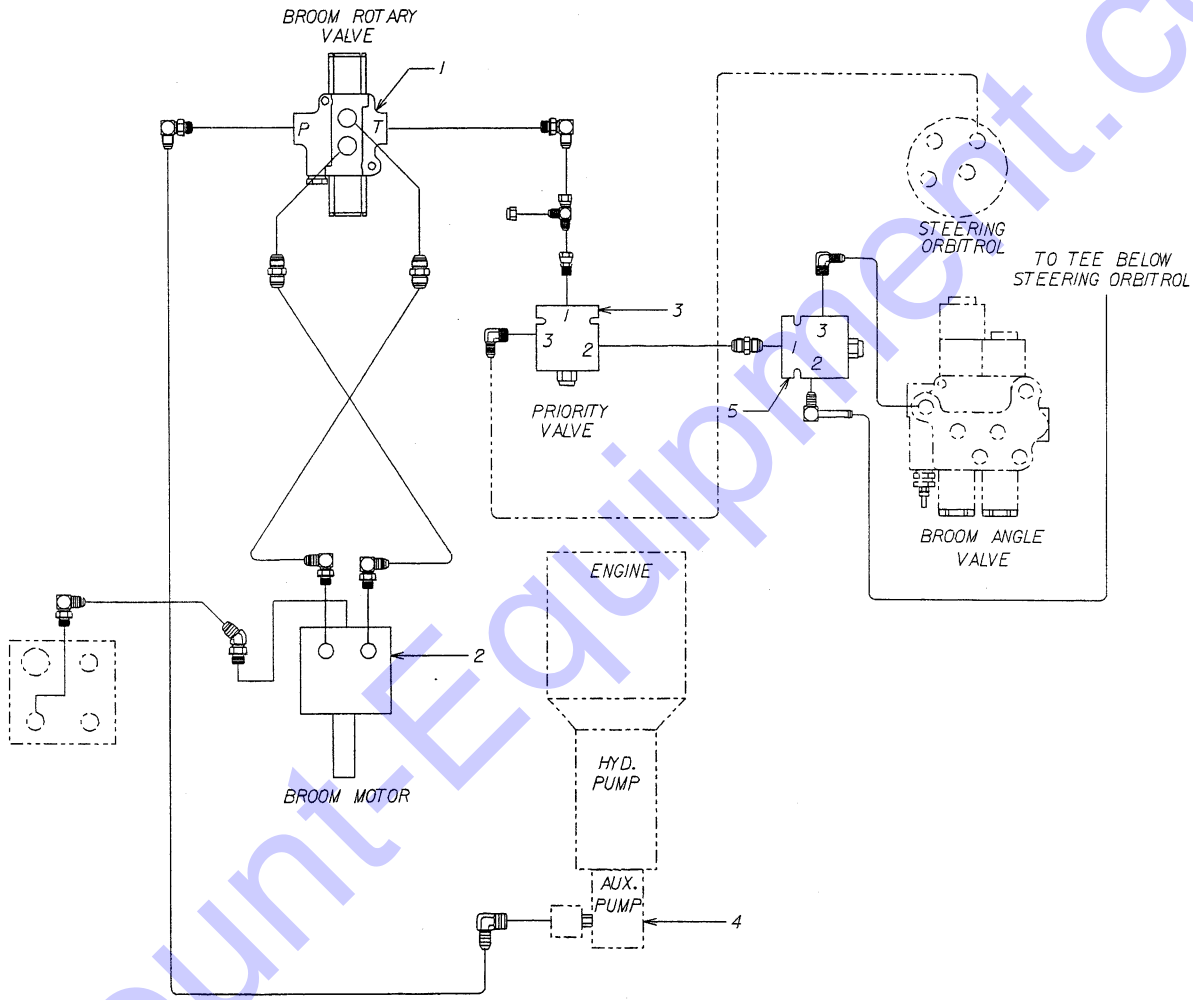
4. Look into mounting hole on pump drive housing to examine Drive Flange Teeth. If drive flange teeth are destroyed remove pump drive housing and replace drive flange. Torque drive flange bolts to 40 ft.lbs.



5. If drive hub is damaged, replace hub and torque hub clamp bolt to 55 ft.lbs.

BROOM ROTARY VALVE CIRCUIT

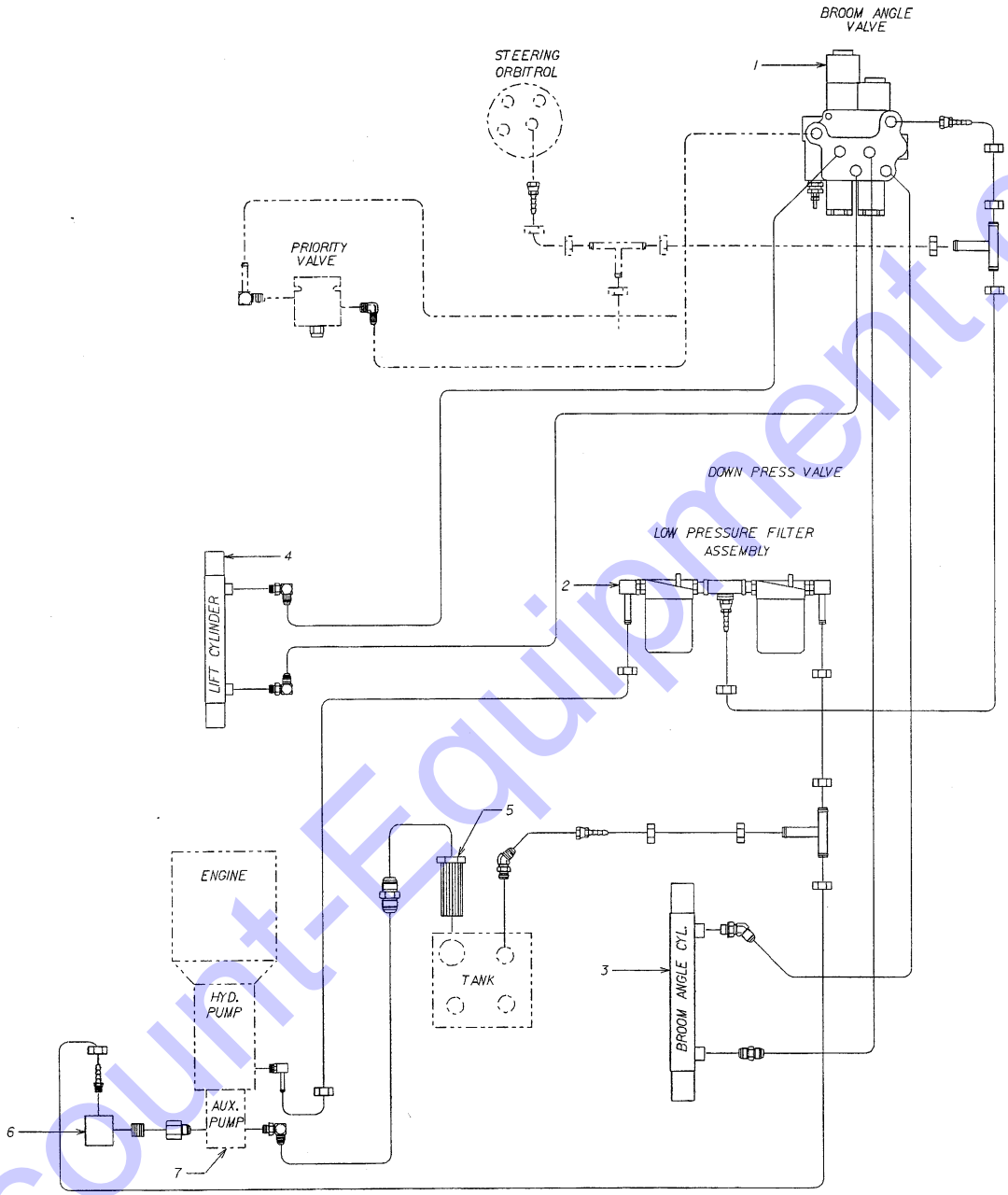
FIXED SPEED



0524

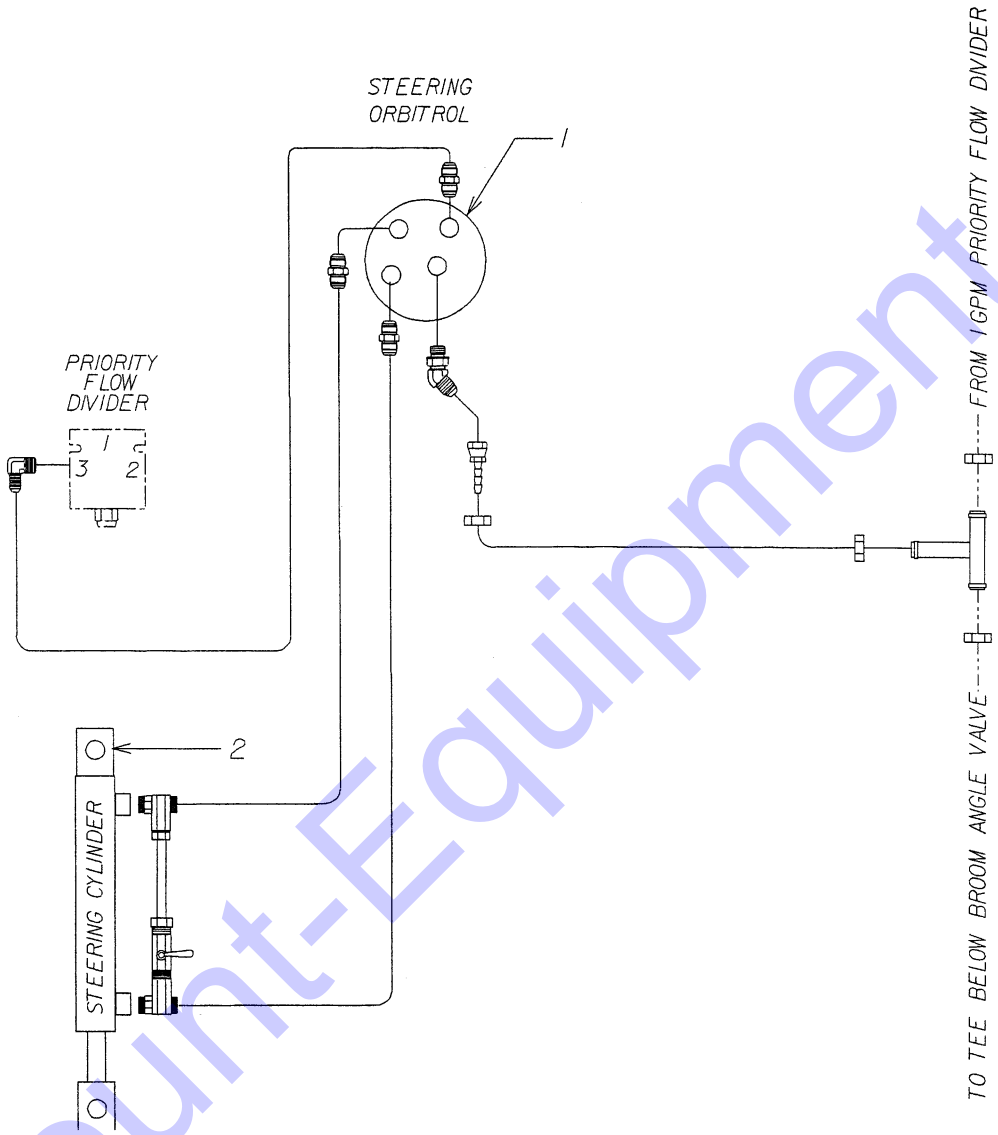
ITEM	QTY	DESCRIPTION
1	1	Valve, 1 Spool 2-Position Detent with 1-Handle
2	1	Motor, Broom
3	1	Divider, Priority Flow (3 GPM)
4	2	Pump, Auxiliary
5	1	Valve, Priority Flow

BROOM ANGLE CIRCUIT



ITEM	QTY	DESCRIPTION
1	1	Valve, 2-Spool Broom Angle
2	1	Assy., Low Pressure Filter (See Page 3-36)
3	1	Cylinder, Broom Angle (See Page 3-32)
4	1	Cylinder, Broom Lift (See Page 3-33)
5	1	Screen, Hydraulic Tank Filter
6	1	Valve, Inline Relief
7	1	Pump, Auxiliary

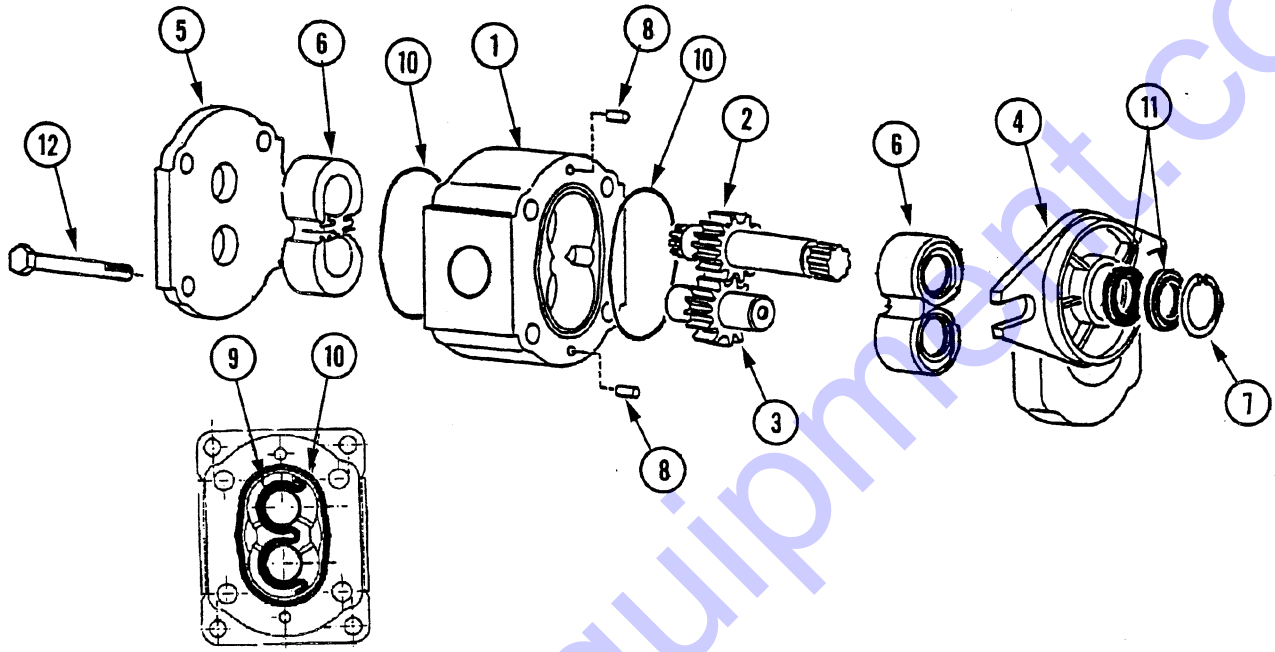
STEERING CIRCUIT



0527

ITEM	QTY	DESCRIPTION
1	1	Orbitrol, Steering
	1	Kit, Seal
2	1	Cylinder, Steering (See Page 3-39)

AUXILIARY PUMP



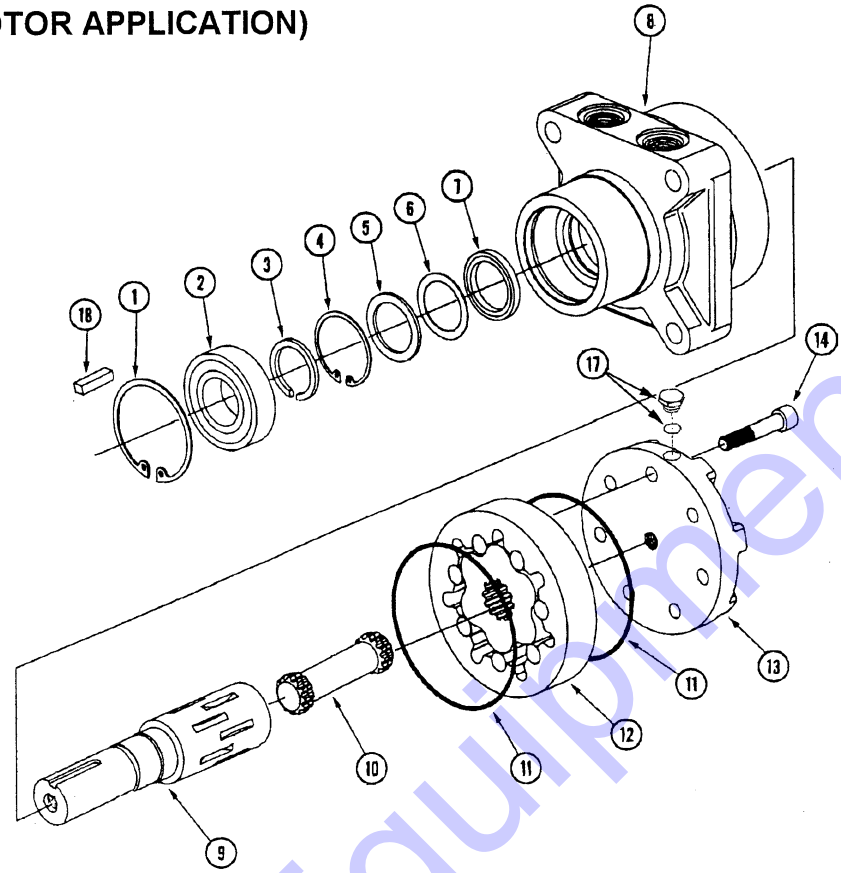
ITEM	QTY		DESCRIPTION
1	1		Housing
2	1		Shaft, Driver Gear
3	1		Shaft, Short Gear
4	1		Cover, Front Mount
5	1		Cover, Rear, Single Pump
6	2		Bearing Block, High
7	1		Snap Ring, Int. Dia. .29”
8	2		Pin, 6 X 12
9	2	*	Seal
10	2	*	O-Ring, 313
11	2	*	Shaft Seal, BAB 17.46 x 28.58”
12	4		Bolt, Hex M20 x 110

* Kit, Complete Seal

PROCEDURE FOR REPLACING SEALS IN PUMP

1. Clean outside of pump to remove all dirt and loose paint.
2. Unscrew bolts that hold pump together. (12)
3. Mark front cover (4), housing (1), and rear cover (5) to indicate correct positions for reassembly. Remove front and rear covers from housing.
4. Mark front and rear bearing block (6) and housing (1) to indicate correct positions for reassembly. Extract front and rear bearings (6) by pushing and pulling on the shaft. Do not force out by hitting with a hammer or on a table.
5. Remove all internal seals (9 & 10). Remove snap ring (7) and shaft seals (11) from front cover (4).
6. Clean all parts and dry with compressed air.
7. Lubricate bearing blocks (6), gears (2 & 3), and inside of housing (1) with clean oil.
8. Insert gears (2 & 3) into housing.
9. Insert front and rear bearing blocks (6) into housing (1).
10. Place rear cover against housing and lay unit on table with the rear cover down.
11. Insert new seals (9 & 10) into front of housing and front bearing.
12. Lightly grease one shaft seal (11) and press into front cover (4) with the internal lip facing down (toward the inside of the pump).
13. Lightly grease second shaft seal (11) and press into front cover (4 with the internal lip facing up (toward the outside of the pump). Press shaft seal in just beyond the snap ring groove.
14. Insert snap ring (7) into snap ring groove on front cover (4).
15. Assemble front cover (4) onto housing (1) and press down by hand for a tight fit.
16. Hold pump together, turn pump over, and place in a vise or stand with rear cover facing up.
17. Insert new seals (9 & 10) into rear of housing and rear bearing.
18. Place rear cover (5) onto housing (1) and insert bolts (12) that hold pump together.
19. Tighten the bolts to the following torque: 30 Ft.Lbs. (35-40 Nm)
20. Check that the pump rotates and is not bound by turning shaft with pliers. Use caution to not damage shaft with pliers. If shaft does not turn easily, then pump is not assembled correctly. The most probable cause is a seal not completely in its groove.
21. Test for leaks.

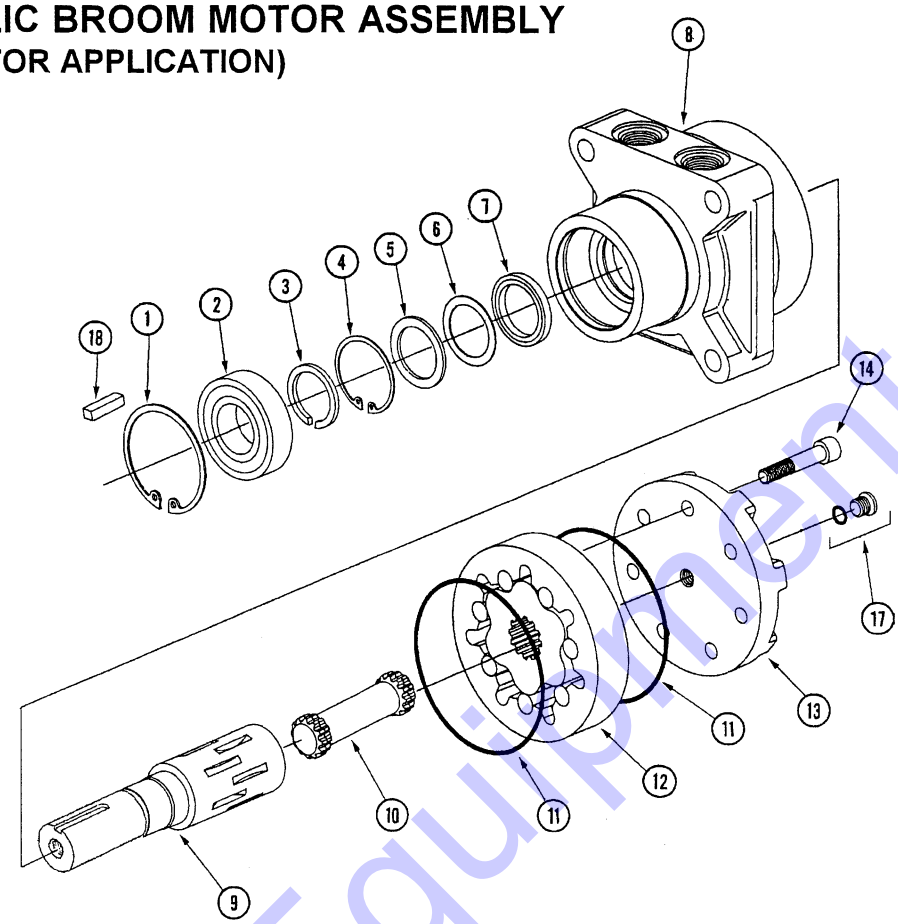
HYDRAULIC BROOM MOTOR ASSEMBLY
(SINGLE MOTOR APPLICATION)



ITEM	QTY	DESCRIPTION
1	1	* Ring, Retaining
2	1	* Bearing, Ball
3	1	* Ring, Retaining
4	1	* Ring, Retaining
5	1	* Washer
6	1	* Washer, Backup
7	1	* Seal, Pressure
8	1	+ Housing
9	1	Shaft, Output w/Internal Check Valve
	2	Poppet (Shaft Output)
10	1	Drive
11	2	* Seal
12	1	Geroter
13	1	+ Cap, End
14	7	Capscrew, Internal Hex Head
15		
16		
17	1	Plug/O-Ring, 7/16-20 UNF
18	1	Key, Straight
19	1	Nut, Hex (Not Used)

* Included in Seal Kit
+ Not available order complete motor. Edge Port End Cap shown, early units have End Ported End Cap.

HYDRAULIC BROOM MOTOR ASSEMBLY
(DUAL MOTOR APPLICATION)

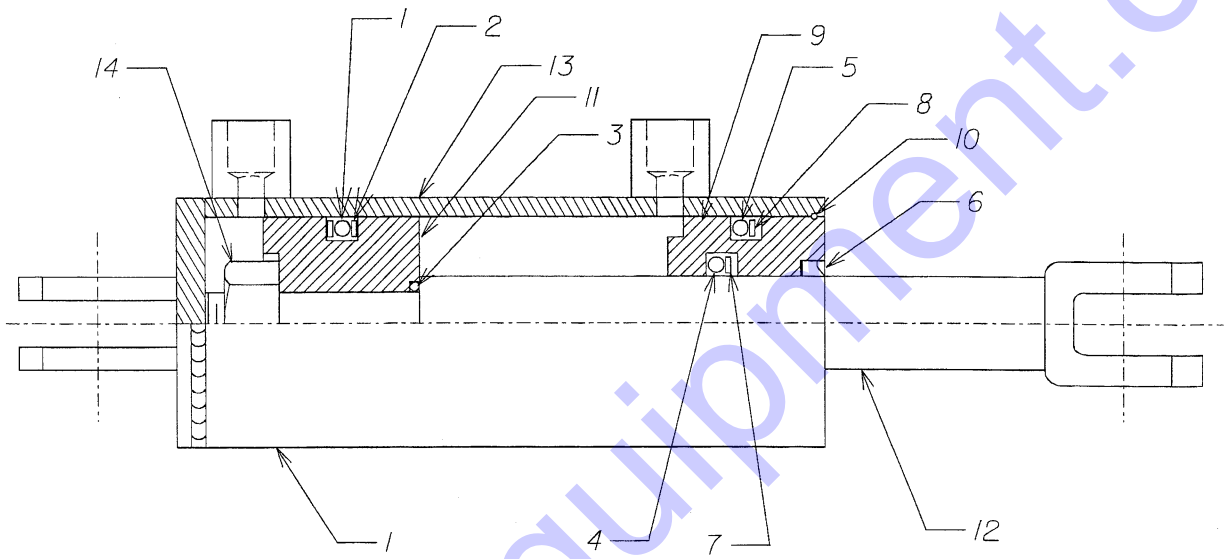


ITEM	QTY	DESCRIPTION
1	1	* Ring, Retaining
2	1	* Bearing, Ball
3	1	* Ring, Retaining
4	1	* Ring, Retaining
5	1	* Washer
6	1	* Washer, Backup
7	1	* Seal, Pressure
8	1	+ Housing
9	1	Shaft, Output w/Internal Check Valve
	2	Poppet (Shaft Output)
10	1	Drive
11	2	* Seal
12	1	Geroter
13	1	+ Cap, End
14	7	Capscrew, Internal Hex Head
15		
16		
17	1	Plug/O-Ring, 7/16-20 UNF
18	1	Key, Straight
19	1	Nut, Hex (Not Used)

* Included in Seal Kit.
\+ Not available order complete motor.

BROOM ANGLE CYLINDER

2.00" BORE X 9.00" STROKE

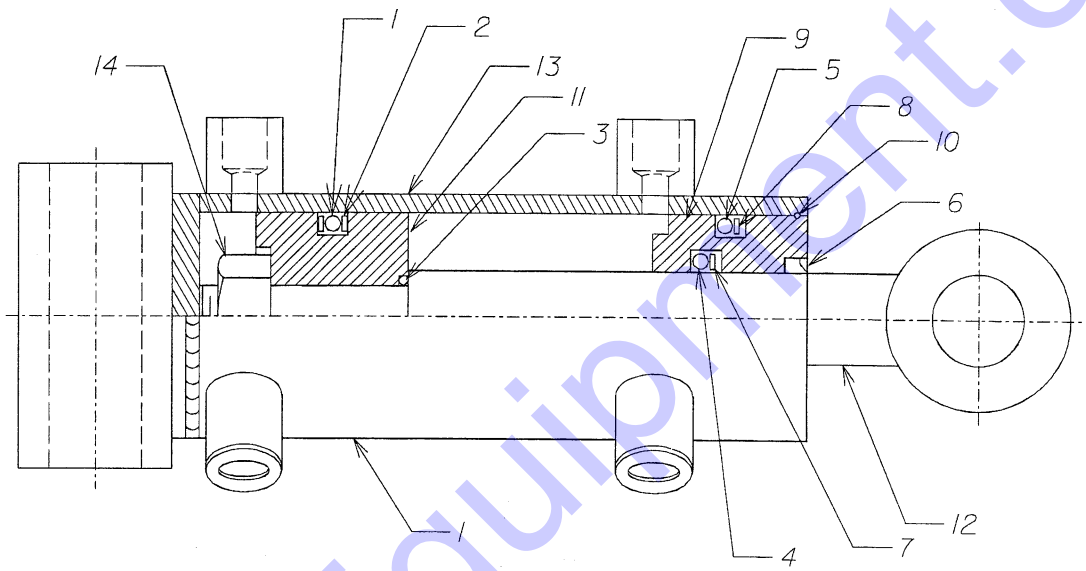


ITEM	QTY		DESCRIPTION
1-8	1		Kit, Seal
9	1		Gland, Head
10	1		Retainer, Round
11	1		Piston, Cylinder
12	1		Rod, Piston
13	1	*	Tube, Cylinder
14	1		Nut, Jam

* Not Serviced Separately

BROOM LIFT CYLINDER

2.00" BORE X 6.00" STROKE



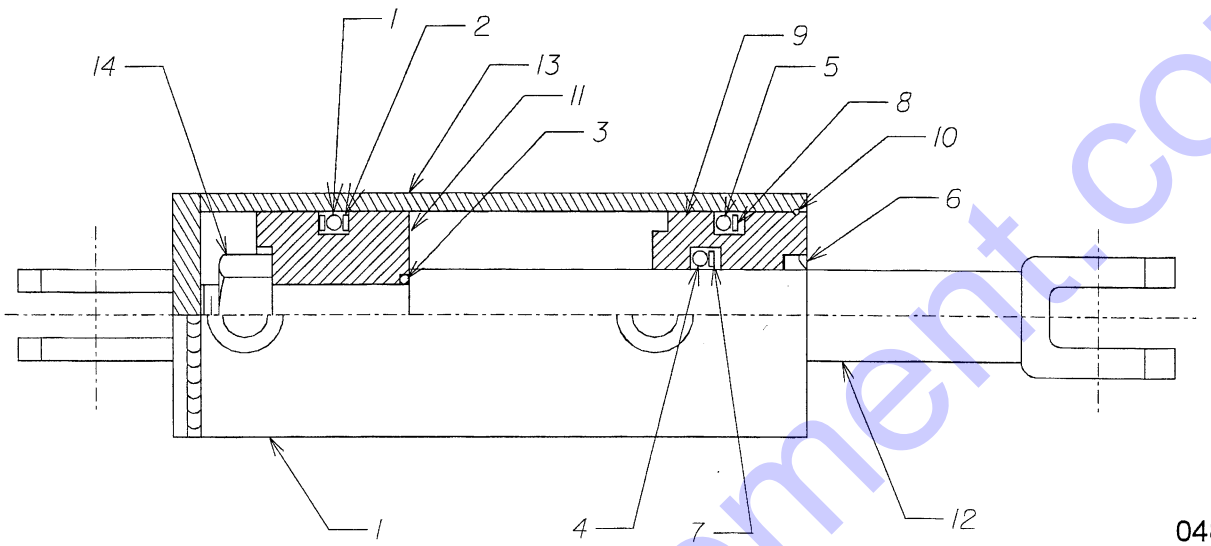
0481

ITEM	QTY		DESCRIPTION
1-8	1		Kit, Seal
9	1		Gland, Head
10	1		Retainer, Round
11	1		Piston, Cylinder
12	1		Rod, Piston
13	1	*	Tube, Cylinder
14	1		Nut, Jam .75-16NF

* Not Serviced Separately

STEERING CYLINDER

2.00" DIA. BORE X 8.00" STROKE



ITEM	QTY	DESCRIPTION
1-8	1	Kit, Seal
9	1	Gland, Head
10	1	Retainer, Round
11	1	Piston, Cylinder
12	1	Rod, Piston
13	1	* Tube, Cylinder
14	1	Nut, Jam .75-16NF

Not Serviced Separately

SERVICING HYDRAULIC CYLINDERS

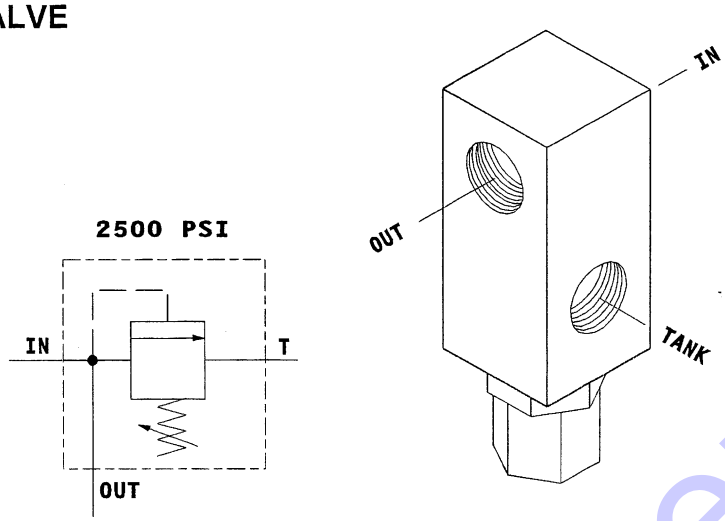
To disassemble cylinders push gland back into cylinder and remove retaining ring collar. Grasp the rod (making sure not to scratch or damage it) and pull from cylinder barrel. The end gland will come out with the rod and piston assembly. Loosen and remove locknut on the end of rod. Remove piston and gland. Clean and inspect all parts for wear. Install cylinder repair kit plus any other parts that need to be replaced.

Note: It is recommended that all seals and o-rings be expanded in warm oil before installation.

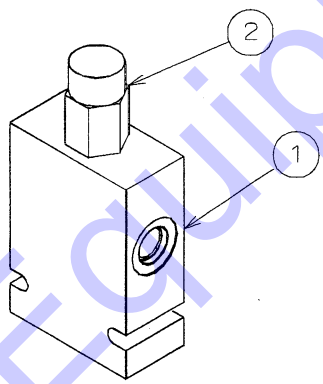
After seals are in place coat seals with grease prior to assembling cylinder components. Torque piston nut to 210 ft.lbs.

Reassemble cylinder. Pressure check cylinder prior to installation on units if possible.

MAIN RELIEF VALVE



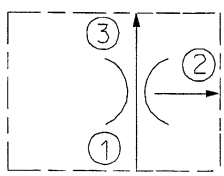
PRIORITY FLOW DIVIDER



0484

ITEM	QTY	DESCRIPTION
1	1	* Body, Valve
2	1	Cartridge, Valve - 1 GPM (Broom Angle Lift)
	1	Cartridge, Valve - 3 GPM (Steering)
3	1	Kit, Seal

* Not available order complete valve.



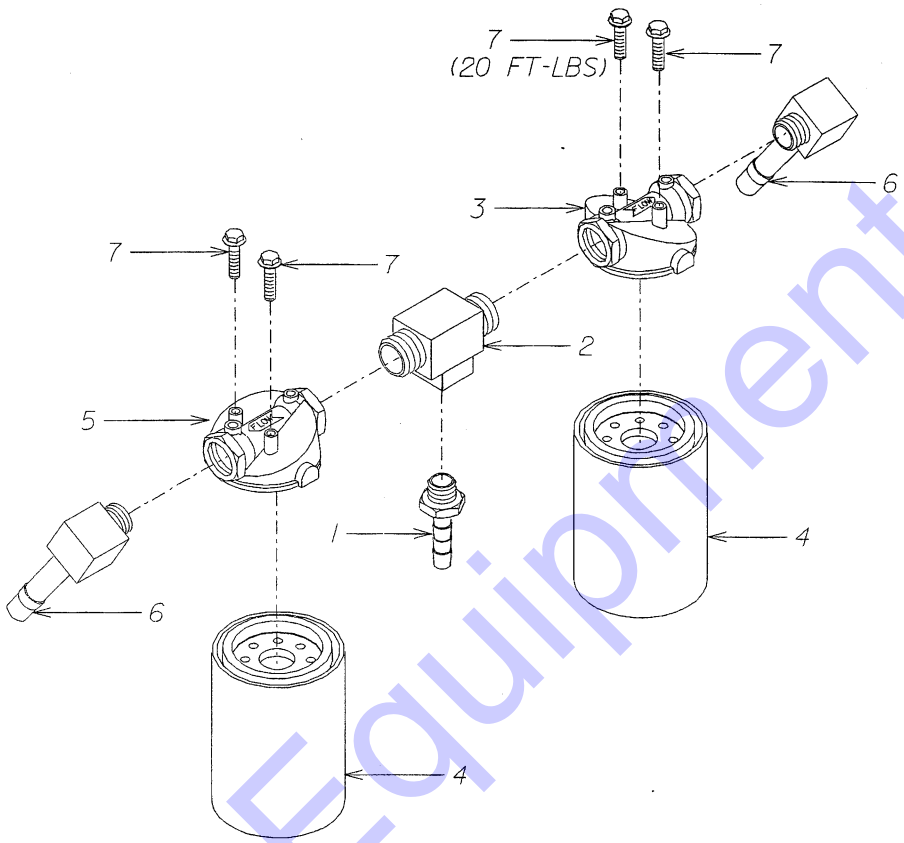
OPERATION - This cartridge maintains a constant flow rate of 1 gpm from (3) regardless of load pressure changes in the system downstream of (3), or in the bypass leg at (2).

The valve's spool maintains a constant differential pressure of 95 psi (6.5 bar) across a fixed internal orifice, thereby regulating the hydraulic flow rate from (1) to (3).

The cartridge is a priority type regulator, delivering the pump flow to (3) first, then bypassing excess to (2). All ports may be fully pressurized.

Operating Pressure: 3,000 psi (207 bar)
Flow Rate: 6.0 gpm (22.7 bar) max. regulated: 10.0 gpm (37.8 lpm) max. input

LOW PRESSURE FILTER ASSEMBLY



0460

ITEM	QTY	DESCRIPTION
1	1	Adapter, Str. -12 NPTM x .50" Hose Barb
2	1	Adapter, Tee -12 NPTM -12 NPTM -12 NPTFM
3	1	Head, Filter w/25 PSI Relief
4	2	Element, Filter - 10 Micron
5	1	Head, Blocked Bypass Filter
6	2	Adapter, 90^0 -12 NPTM x .50" Hose Barb
7	4	Capscrew, .25-20NC x .75" Flange Whizlock

TROUBLESHOOTING AUXILIARY HYDRAULIC SYSTEM

Symptoms of Auxiliary Hydraulic System failures on Lay-Mor 6HC sweepers fall into five basic categories. These symptoms and their most common causes are listed below.

Symptom 1

Sweeper loses all Auxiliary Hydraulic Functions (lift, angle and broom rotation) and all Hydrostatic Drive Functions. This is caused by a failed Pump Drive Coupler. See **Inspecting Hydraulic Pump Drive Coupler**. Page 3-9

Symptom 2

Sweeper loses all Auxiliary Hydraulic Functions but Hydrostatic Drive Functions work properly. This is most commonly caused by a failed Auxiliary Hydraulic Pump. See **Auxiliary Hydraulic Pump Test Procedure**. Page 4-2

Symptom 3

All Auxiliary Hydraulic Functions work but seem weak. This is usually caused by a faulty or improperly adjusted Relief Valve. See **Relief Test Procedure**. Page 3-46

Symptom 4

Auxiliary Hydraulic Pump is in good condition and Relief Valve is properly adjusted but broom rotation is very slow. This is usually caused by internally leaking Broom Drive Motor, or you can have these same symptoms with a broken male Broom Drive Coupler. See **Broom Drive Motor Test.** Page 3-48

Symptom 5

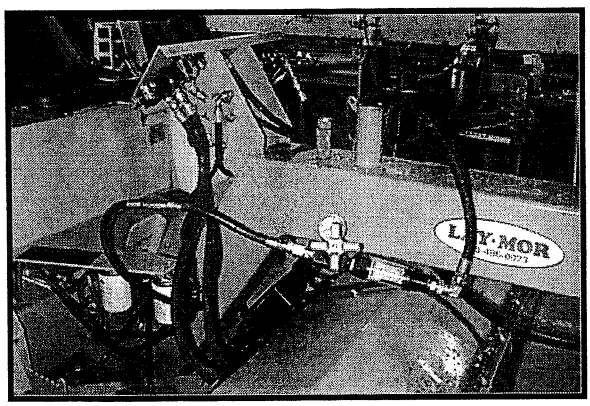
Broom Lift and Angle Functions do not Work. This is caused by a failed or stuck Priority Valve. See Priority Valve. Page 3-39

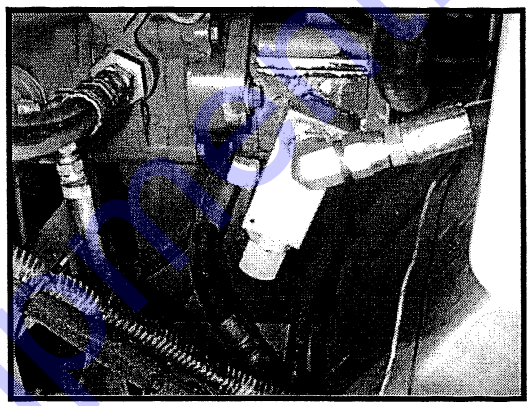
MACHINE AND HYDRAULIC COMPONENT TROUBLESHOOTING

Before testing any hydraulic component always check the hydraulic oil level. Bring the hydraulic oil temperature up to 20^0 over ambient. Place the machine on a flat surface. The hydraulic oil level should be in center of the "eye" indicator.

HYDRAULIC PUMP TEST:

1. Remove hose to the Broom Rotation Valve and install Flow Meter. Route return oil from Flow Meter to Reservoir. Remove hose and cap fitting from Relief Valve return line.



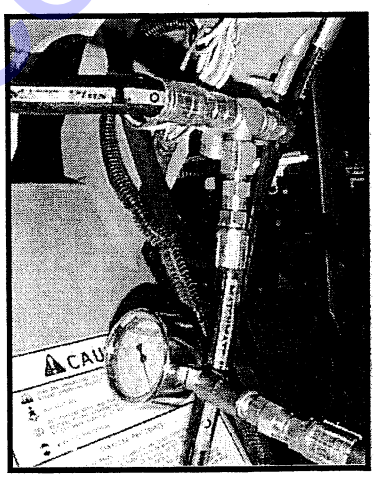


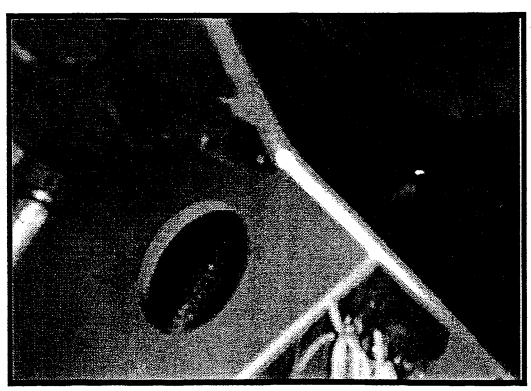
2. With engine running at 3,000 R.P.M. and pressure controls on the Flow Meter adjusted to 2,250 psi flow should be at least 9.5 - 10.5 G.P.M. If pump cannot maintain this flow it should be replaced.

RELIEF VALVE TEST PROCEDURE:

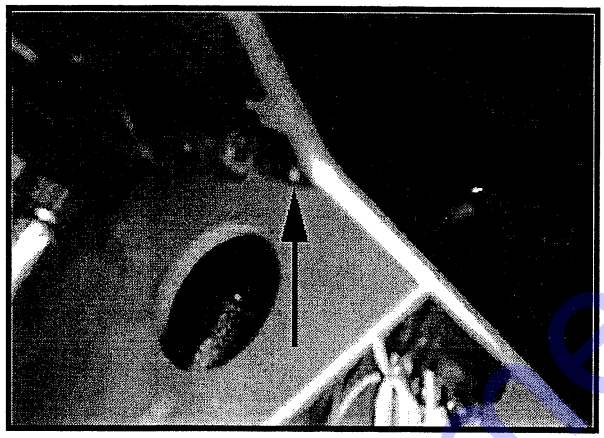
1. With engine shut off and broom setting on the ground move the broom raise and lower lever back and forth to release any system pressure.

2. Remove the inlet hose from the Broom Control Valve and install a tee and a 3,000 psi gauge. Screw in the Relief Valve adjustment screw on Broom Lift and Angle Valve until it is flush with the jam nut.





3. With engine running at 3,000 R.P.M. raise the broom completely until Relief Valve opens. Pressure should read 2,500 psi. If pressure is to low or to high adjust relief pressure by turning adjusting screw in to raise pressure or out to lower pressure. This sets the broom rotation relief pressure.



4. Lock down jam nut and install acorn nut and recheck gauge reading.

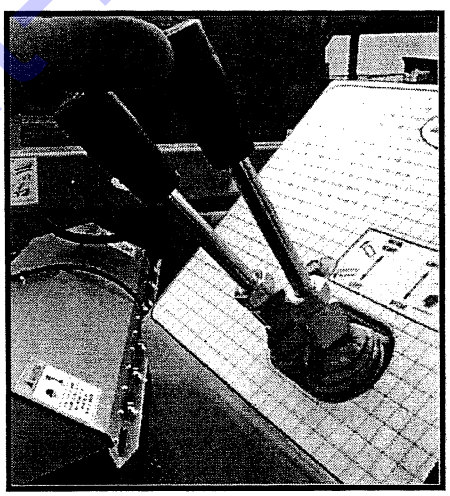
5. To set Broom Lift and Angle Relief pressure, lift broom until relief opens the back out relief until pressure gauge reads 1,500 psi. Lock down jam nut and recheck gauge reading, before removing pressure gauge.

BROOM DRIVE MOTOR TEST:

Prior to testing Hydraulic Motor check the Auxiliary Relief pressure and make sure it is set at 2,500 psi. For Single Broom Drive follow the procedure outline below. For Dual Broom Drive, disconnect the hoses going to one of the motors and plug the hoses. Loop a hose between the motor's fittings to prevent oil from squirting out. Follow the procedure outlined below to test the motor then reconnect hoses and disconnect the other motor and test again.

1. Remove the inlet hose to the Broom Rotation Valve and install a 7/8" JIC tee fitting between the hose and the Broom Drive Valve, then install a 3,000 psi gauge to the tee fitting.

2. Start the engine and run it at half throttle, move the broom raise and lower lever in the lower position and force the broom onto the ground. When broom is forced onto the ground, center the broom raise and lower lever so that down pressure is maintained on the broom.



3. Ease the Broom Rotation Lever into detent and raise the engine rpm to 3,000. Pressure reading on the gauge should be 2,250 psi. If the Broom Drive Motor cannot maintain this pressure, remove it and check for a failed output shaft, worn drive coupling, or a sheaved or missing square key on the Broom Motor Shaft. If none of the above failures have occurred the motor is leaking internally and should be replaced.

PRIORITY VALVE

Remove the cartridge from the aluminum body of the Priority Valve, clean and replace. The Priority Valve is located on left side of Broom Rotation Valve.

TROUBLESHOOTING STEERING SYSTEM

Symptoms of Steering System Failure on Lay-Mor sweepers fall into three basic categories. These symptoms and their most common causes are listed below.

Symptom 1

Sweeper will steer but steering is hard in both directions. This is most commonly caused by a sticking Flow Divider or a faulty or improperly adjusted Steering Relief Valve. See **Relief Valve Test Procedure**. Page 3-51

Symptom 2

Sweeper will steer in one direction only. This condition is caused by a defective Steering Orbitrol or Steering Cylinder. See **Steering Orbitrol and Cylinder Test**. Page 3-52

Symptom 3

Sweeper will not steer. This can be cause by a failed Hydraulic Pump, a failed Steering Orbitrol, or Steering Cylinder. See **Steering Orbitrol and Cylinder Test** Page 3-52, **or Section 4 - Auxiliary Hydraulic Pump Test**. Page 3-44

STEERING CONTROL SPECIFICATIONS:

Max. System Pressure ..... 124 bar (1800 psi)
Relief Pressure ..... 1400 psi
Max. Back Pressure ..... 10 bar (150 psi)

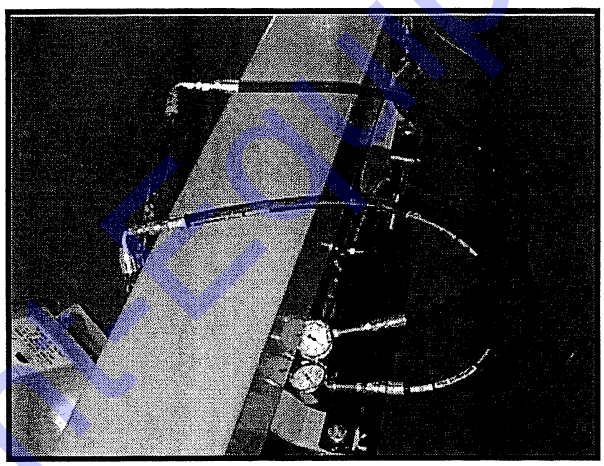
Input
Effort - Powered ..... 0,8-1,8 Nm (7-13 lb.in.)
Un-powered ..... 81,4 Nm (60 lb.ft.) Max.

RELIEF VALVE STEERING SYSTEM TEST PROCEDURE:

Before checking steering relief pressure, remove the Flow Divider Cartridge and make sure the spool is free to move. Clean and reinstall.

The Steering Relief Valve can be tested as follows:

1. Remove both hoses from the Steering Cylinder and install 3,000 psi gauges into the end of both hoses.



2. Start the engine and run it at 3,000 R.P.M., turn the Steering Wheel in either direction and hold it against relief. Your pressure gauge should read 1,400 psi. The Steering Relief Valves are non adjustable. Replace Steering Orbitrol if valves are not set properly.

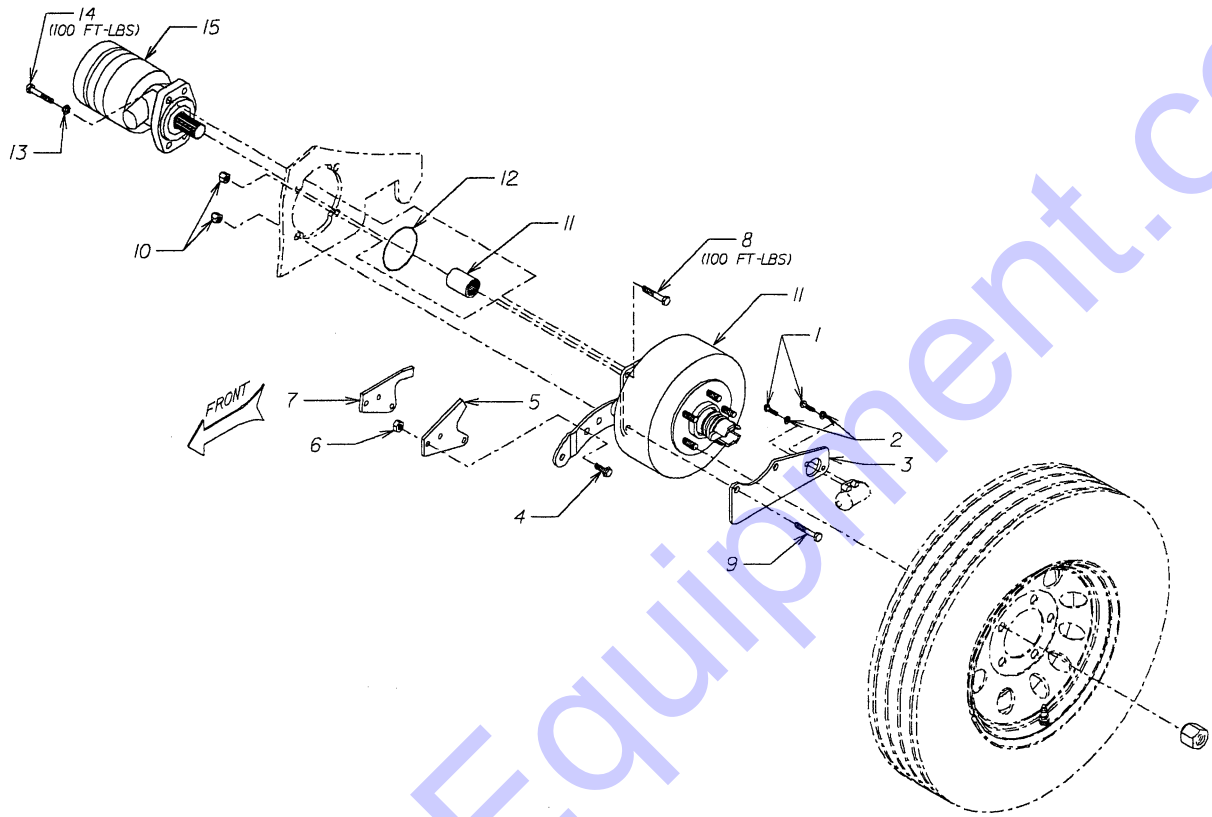
3. If you must continually turn steering wheel to hold Relief Pressure, the steering orbitrol is internally leaking and should be replaced.

4. If Steering Orbitrol tests good and sweeper turns only in one direction, you have a damaged Steering Cylinder. If the Steering Orbitrol test good and you must continually move Steering Wheel to maintain straight ahead steering your Steering Cylinder is internally leaking.

SECTION 4

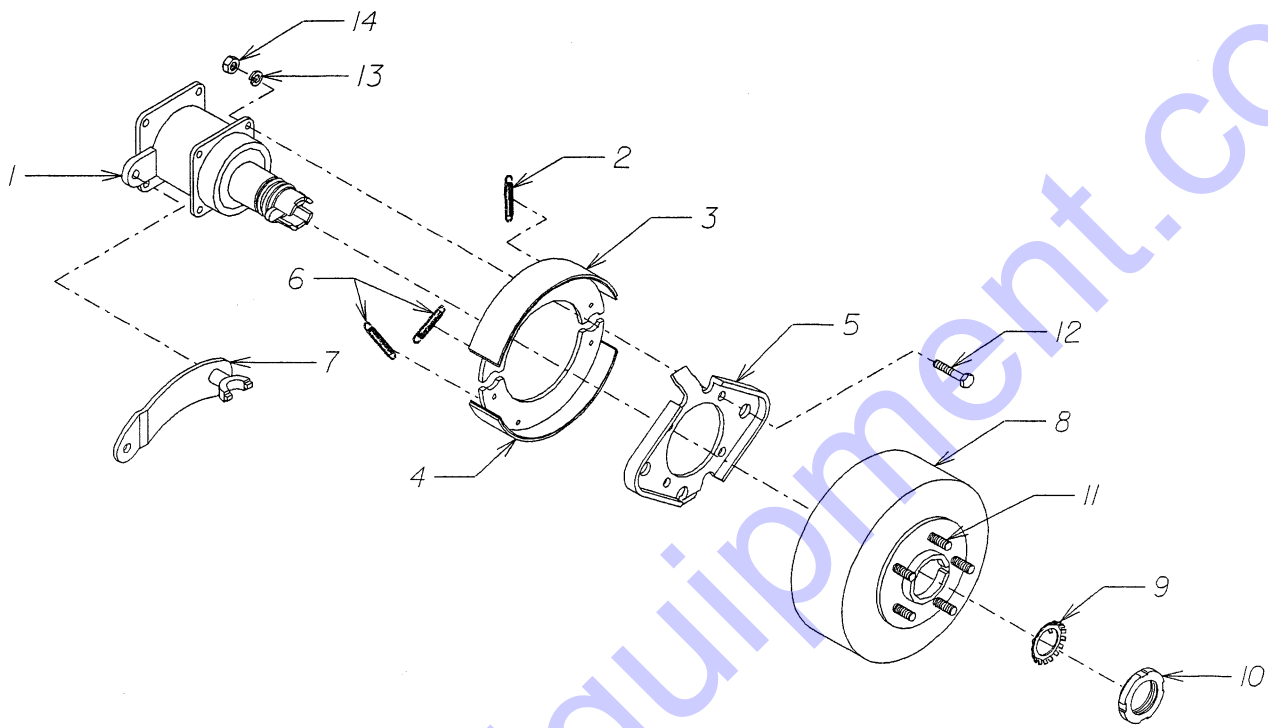
BRAKES

GROUND DRIVE ASSEMBLY



ITEM	QTY	DESCRIPTION
		Note: Quantities are shown per side.
1	4	Capscrew, .31-18NC x .75”
2	4	Lock Washer, .31
3	1	Plate, Wheel Cylinder Mount
4	4	Capscrew, .37-16NC x 1.00”
5	1	Lever, R.H. Brake
6	4	Lock Nut, .37-16NC
7	1	Lever, L.H. Brake
8	2	Capscrew, .50-13NC x 2.25”
9	2	Capscrew, .50-13NC x 2.50” Pl.
10	4	Lock Nut, .50-13NC Nylon Insert
11	1	Disconnect Complete w/Brake
12	1	O-Ring
13	4	Lock Washer, .50”
14	4	Capscrew, .50-20NF x 1.25”
15	1	Motor, Hydraulic Drive (See Page 3-14)

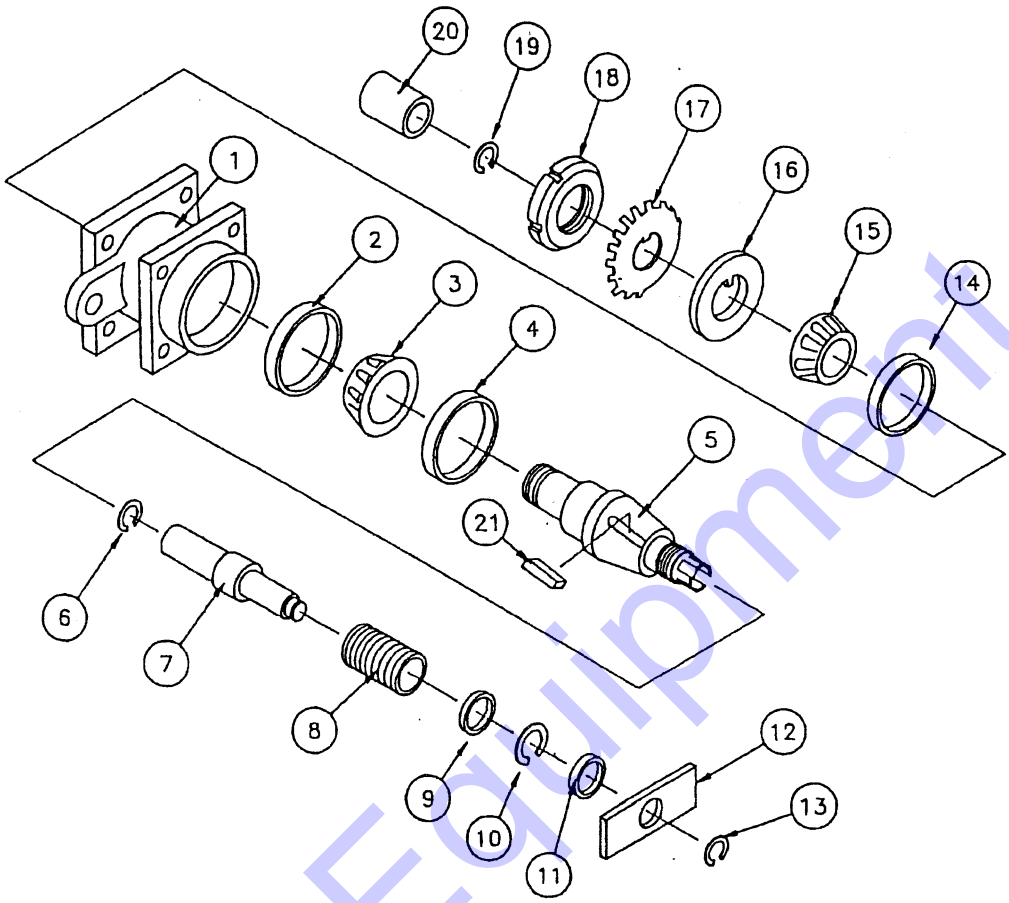
HYDRAULIC DISCONNECT WITH BRAKE ASSEMBLY



0491

ITEM	QTY	DESCRIPTION
1	1	Hub (See Page 4-4)
2	1	Spring
3	2	Pad, Brake
4	1	Assy., Brake Pad (Includes Item's 2,3,5 & 6)
5	1	Plate, Backing
6	2	Spring
7	1	Disconnect Brake Arm
8	1	Disconnect Brake Drum
9	1	Disconnect Lock Ring
10	1	Disconnect Lock Nut
11	1	Stud, Wheel
12	4	Capscrew, 1/2-20NF x 1.25"
13	4	Lock Washer, 1/2"
14	4	Nut, 1/2-20NF

WHEEL DISCONNECT W/BRAKE ASSEMBLY



ITEM	QTY	DESCRIPTION
1	1	Housing with Brake
2	1	Cup, Outer Bearing
3	1	Cone, Outer Bearing
4	2	Seal, Inner Bearing
5	1	Spindle Shaft, Disconnect
6	1	Ring, Snap O.D.
7	1	Shaft, Internal Small
8	1	Spring, Hydraulic Disconnect
9	1	Washer, Hydraulic Disconnect
10	1	Snap Ring, Hydraulic Disconnect
11	1	Outer Seal, Disconnect Small
12	1	Disconnect, Ear/Handle
13	1	Disconnect, Ear/Handle Snap Ring
14	1	Disconnect, Inner Bearing Cup
15	1	Disconnect, Inner Bearing Cone
16	1	Disconnect, Inner Bearing Tongue Washer
17	2	Disconnect, Lock Ring
18	2	Disconnect, Lock Nut
19	1	Disconnect, Spline Coupler Snap Ring
20	1	Disconnect, Spline Coupler
21	1	Disconnect, Wheel Hub Key

1. To ensure maximum bearing life, install the unit in a clean environment and make sure that it is free from any contaminates.

2. The chamfered end of the sleeve is to be assembled to the chamfered end of the lock-out shaft. The non-chamfered end of the sleeve assembles onto the hydraulic motor shaft.

   An o-ring, (item #12 page 4-2) is to be installed between the hydraulic motor and the unit.

3. To lubricate unit prior to operation, remove oil plugs and fill 10W40 motor oil through top hole until the oil overflows through second hole located 90^0 from top. Install oil plugs after filling with oil. Approximately 1/2 pint of 10W40 oil will be required. At low temperatures, disengagement and engagement may be more difficult. Running the unit to warm the oil will allow engagement to occur in a normal manner.

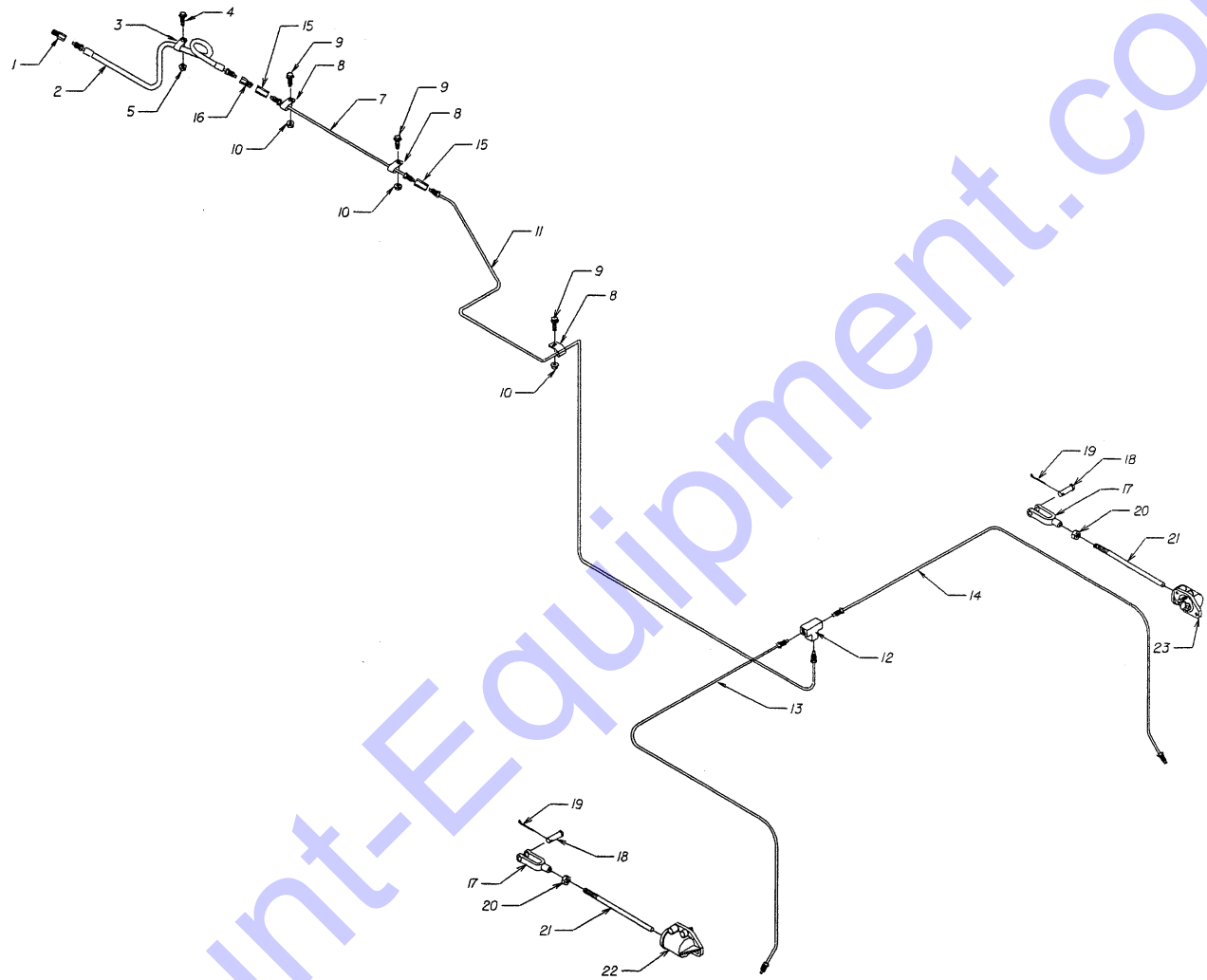
4. To install the wheel hub (item #8 page 4-3) the handle (item #12 page 4-4) must be removed. A standard tool for removal of the snap ring (item #13 page 4-4) must be used. For positive locking of the hub, a locknut (item #10), and lock washer (item #9 page 4-3) are used. Make sure the hub is fully seated on the spindle to prevent damage to the keyway, tighten to 250 ft.lbs. Reinstall the handle and snap ring prior to operation.

5. The sweeper should be properly braked or blocked when the operator or installer is working with the bearing package.

6. To engage the unit, the operator must jog the hydraulic motor forward and backward with a quick stop/start motion. Full engagement occurs when the handle is within 1/16" of the bottom of the slot in the spindle. The wheel must rotate slightly for the shaft to spring into the correct position. The operator should ensure that full engagement has occurred before the sweeper is placed back in service. Failure to do this may damage the splines.

7. To disengage the unit, the hydraulic motor must be off. The handle is to be pulled and rotated 90^0 and inserted into the slot in the upper portion of the spindle. If the handle will not easily disengage, the motor should be jogged rapidly back and forth in the same manner as for engagement. In some conditions, it may be necessary to move the sweeper by hand so there is a slight wheel rotation.

BRAKE LINE ASSEMBLY



0483

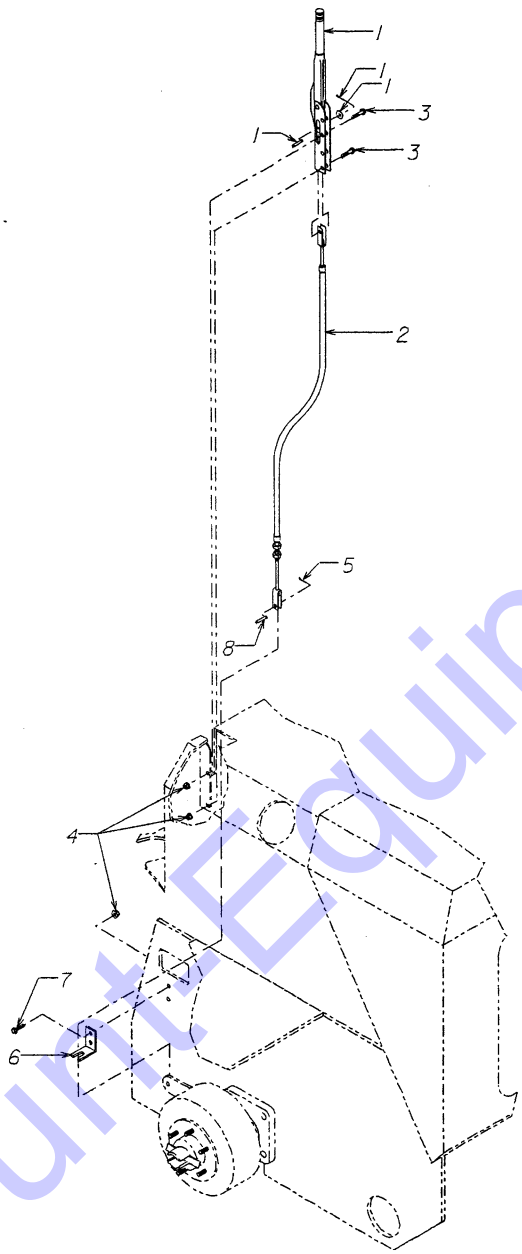
ITEM	QTY	DESCRIPTION
1	1	Connector, .187 Male Inverted Flare to .25 Female Inverted Flare
2	1	Hose, 04-04MF04MF x 47.00" 100R1
3	1	Clamp, .50" Dia.
4	1	Capscrew, .31-18NC x 1.25" Flange Whizlock
5	1	Nut, .31-18NC Flange Whizlock Gr. G
6	2	Fitting, .18 Tube x .18 Tube Union FM
7	1	Tube, .18 Steel Brake x 51.00"
8	5	Clamp, .25" Dia.
9	5	Capscrew, .25-20NC x .50" Flange Whizlock
10	5	Hex Nut, .25-20NC Flange Whizlock Gr. G
11	1	Tube, .18 Steel Brake x 60.00"
12	1	Adapter, Tee .18 Female

BRAKE LINE ASSEMBLY

ITEM	QTY	DESCRIPTION
13	1	Tube, .18 Steel Brake L.H. x 40.00"
14	1	Tube, .18 Steel Brake R.H. x 40.00"
15	1	Union, .25 Tube Inverted Flare
16	1	Fitting, .187" Tube to .25" Tube
17	2	Clevis, Rod End .37-24NF
18	2	Pin, Clevis .31 x 1.125"
19	2	Pin, Cotter .125 x .75" Steel Pl.
20	2	Hex Nut, 3/8-24NF
21	2	Rod, Push - Wheel Cylinder
22	1	Cylinder, L.H. Wheel
23	1	Cylinder, R.H. Wheel

Note: Adjust Tow Brakes by adjusting length of Push Rod (18) and Clevis (15).

PARKING BRAKE ASSEMBLY

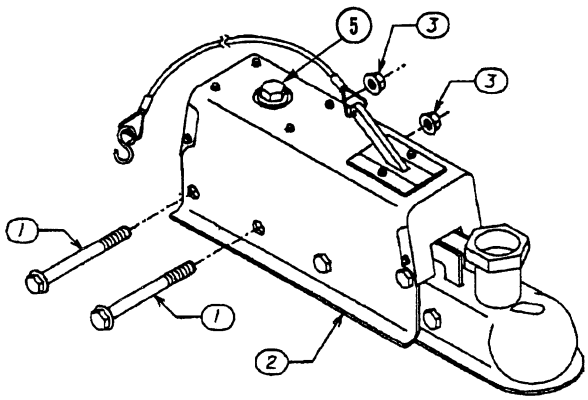


0476

ITEM	QTY	DESCRIPTION
1	1	Assy., Handle
2	1	Assy., Cable
3	2	Capscrew, 5/16-18NC x 1.75" Flange Whizlock
4	4	Nut, 5/16-18NC Flange Whizlock Gr. G
5	1	Cotter Pin, 1/8 x .75" Steel Pl.
6	1	Mount, Brake Cable
7	2	Capscrew, 5/16-18NC x 1.00" Flange Whizlock
8	1	Clevis Pin, 3/8 Dia. x 1-1/8

Adjust Parking Brake by turning end of handle (1). Additional adjustment can be made by repositioning cable (2) anchor position.

SURGE BRAKE ACTUATOR



The "surge" or "push" of the sweeper toward the tow vehicle during deceleration automatically synchronizes the sweeper brakes with the tow vehicle brakes. As the sweeper pushes against the vehicle, the actuator telescopes together and applies force to its Master Cylinder, supplying hydraulic pressure to the sweeper brakes.

To get the most benefit from your surge actuator, follow a few simple precautions and common sense in caring for the surge actuator and your entire sweeper brake system.

- **DO NOT** submerge the actuator. Internal corrosion may result and cause brake failure. Salt water, granular fertilizers, and other corrosive materials are destructive to metal. To minimize the damaging effect of corrosion on the braking system used under corrosive conditions, we recommend that the actuator be externally flushed after use with a high pressure water hose. Be sure to lubricate all moving parts after the unit has dried.

- Whenever the unit will be out of service for an extended period of time, or after hard use, remove the brake drums and clean inside the brakes.

- Use only fresh brake fluid from a sealed container. **DO NOT** reuse fluid. After filling and bleeding, remember to refill the actuator. Failure to maintain an adequate fluid level may cause brake failure.

- Lubricate actuator by applying motor oil to the coupler components and internal rollers to keep them moving freely and to prevent corrosion.

BEFORE EACH TOWING, PERFORM THE FOLLOWING STEPS:

1. With the tongue horizontal check that the brake fluid reservoir is three-quarters full of DOT-3 brake fluid. Check for leaks and repair as required.

   Examine the actuator for wear, bent parts, corroded/seized parts, or other damage. Have the affected components replaced. Check to determine that the actuator mounting bolts are tightened to eighty (80) ft.lbs. torque using a torque wrench.

   Test the actuator and brake function. Actuator travel over one inch indicates that the brakes need adjustment, the Master Cylinder is bad, there is a leak in the brake system, or the actuator has been structurally damaged. Actuator travel is the distance the coupler case assembly moves relative to the outer case during backing. Fix or adjust brakes as required.

BEFORE EACH TOWING CONT'D.:

2. The only adjustments on the 2" actuator itself are the self-locking nuts on the two roller bolts. Tighten the locknuts just to zero free-ply between the outer case and the coupler case, and then back the locknuts off one half turn. Over tightening will restrict proper surge operation.

3. A film of clean grease on the ball will minimize squeaking. Wipe the ball clean and renew film each time the sweeper is used.

BRAKE FLUID FILLING AND BLEEDING:

1. Remove the master cylinder's cap and fill the reservoir to three-quarters full with DOT-3 brake fluid. DO NOT allow brake fluid to contact painted surfaces since it will damage the finish. Wipe up any spills immediately and wash the area with water.

2. Bleed the brake system with a pressure bleeder. Pressure bleeding equipment simplifies the process and is available at your local automotive supply store. Use the instructions provided with the pressure bleeder.

   DO NOT use the actuator's break-away lever or cable to bleed the brake system.

3. Install a bleeder hose on the bleeder screw of the right hand Wheel Cylinder from the actuator. Submerge the other end of the hose in a glass container of brake fluid, so that air bubbles can be observed.

4. Open the bleeder screw. Brake fluid and or air bubbles will flow into the jar. Let brake fluid flow until no more bubbles are observed. Close the bleeder screw.

5. Repeat the above process on the left hand Wheel Cylinder until no more bubbles are observed. Air trapped in the brake lines will greatly reduce your braking efficiency. Be sure to close the bleeder screw securely when the Wheel Cylinders are fully bled.

6. During the bleeding process, replenish the master cylinder reservoir's brake fluid so that level does not fall below half full. This will ensure that no air is drawn into the system.

7. After all brakes are bled, again make sure that the master cylinder reservoir is filled to three-quarters full before operating. Check that the filler cap gasket is not torn or damaged. Screw the filler cap and gasket into the master cylinder cover. The filler cap only needs to be finger tight.

MASTER CYLINDER

DISASSEMBLY

1. Refer to parts breakdown for disassembly and assembly.
2. Disconnect brake line and remove Master Cylinder.
3. Clean the outside of the cylinder, and remove the filler cap and diaphragm. Pour out any brake fluid that may remain the cylinder or reservoir.
4. Remove the brake line fitting from the forward end of the cylinder.
5. Remove the Piston Assembly, cup, spring, check valve, and valve seat from the cylinder bore.

CLEANING, INSPECTION & REPAIR

1. Clean all Master Cylinder parts in clean denatured alcohol, and inspect the parts for wear or damage, replacing them as required. When using a Master Cylinder repair kit, install of the parts supplied.
2. Check the ports and vents in the Master Cylinder to make sure that all are open and free of foreign matter.
3. A leaf-type valve is revetted to the front end of the piston. If this valve is loose or has moved so that the piston ports are open, replace the piston.
4. Inspect the cylinder walls for scores or rust, and recondition them if necessary. Hone the cylinder walls no more than necessary (0.003" maximum). Oversize pistons and cups are not available for excessively honed cylinders.
5. Remove any burrs or loose metal that may have resulted from the honing operation, and clean the cylinder with denatured alcohol.

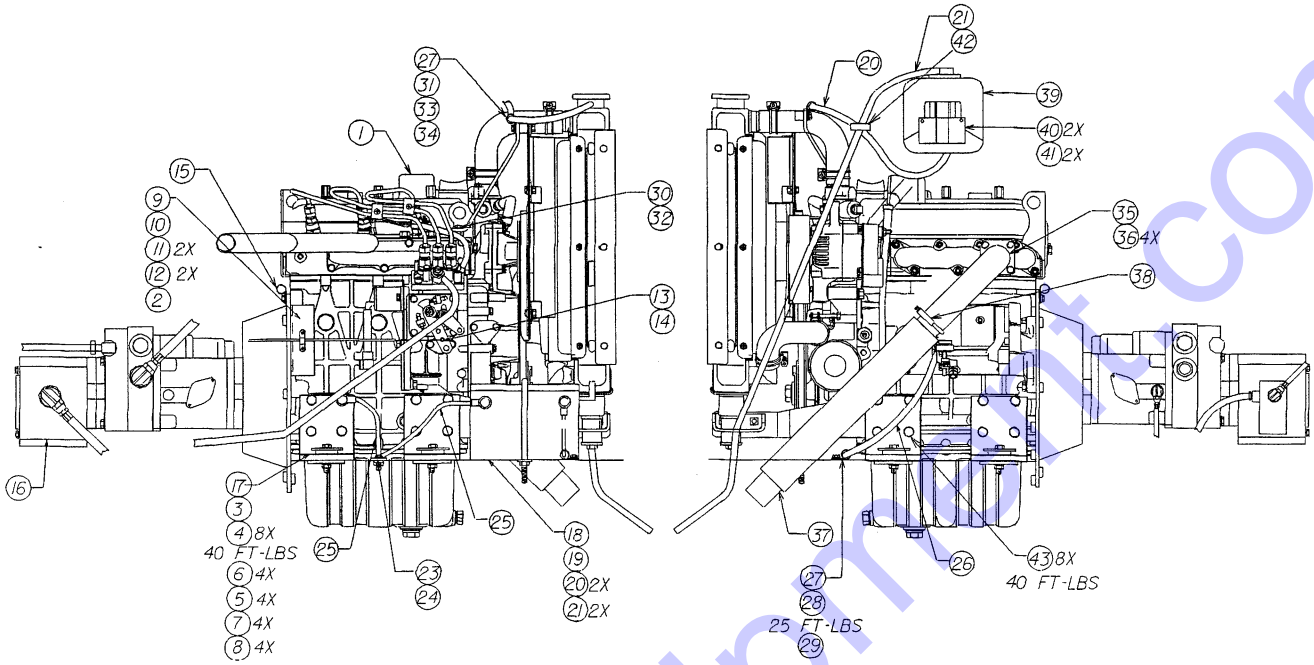
ASSEMBLY

1. Dip all parts except the Master Cylinder body in clean heavy duty brake fluid.
2. Install the brake line fitting on the cylinder and tighten securely.
3. Install the valve seat, check valve, spring, cup, and Piston Assembly in the cylinder bore.
4. Mount Master Cylinder on tractor and connect brake line.
5. Bleed Master Cylinder and entire system of entrapped air. (See Brake Bleeding Procedures in this section)

SECTION 5

ENGINE

ENGINE ASSEMBLY



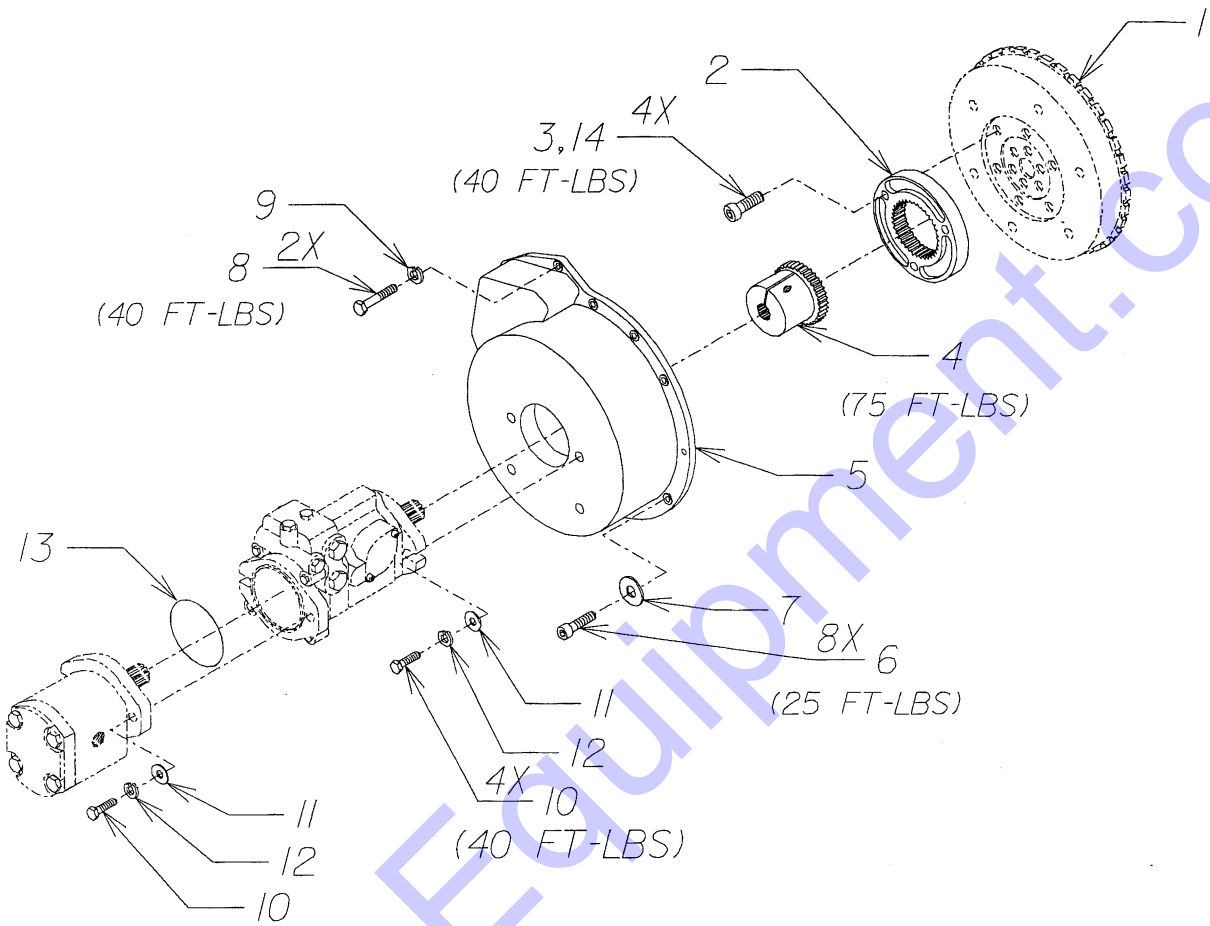
0486

ITEM	QTY	DESCRIPTION
1	1	Assy., Engine (Kubota V-1505)
2	1	Handle, Throttle w/Cable
3	4	Bracket, Engine Mount
4	8	Bolt, M10 x 1.25 - 20MM Hex Hd.
5	4	Mount, Motor
6	4	Capscrew, 7/16-14NC x 2.50" Gr. 5
7	4	Washer, Snubbing
8	4	Hex Nut, 7/16-14NC Whizlock Zink
9	1	Bracket, Throttle Cable
10	1	Clamp, Throttle
11	2	Capscrew, 10-24NC x .50" Flange Whizlock
12	2	Hex Nut, 10-24NC
13	1	Pivot, Throttle Cable
14	1	Hair Pin, 5/64" Dia.
15	1	Clamp, .50" ID
16	1	Assy., Hydraulic Pump
17	A/R	Loctite Red 271
18	1	Battery, 12V
19	1	U-Bolt, Battery Hold-Down
20	1	Hose, Fuel Line 5/16 x 38.00"
21	1	Hose, Fuel Line 5/16 x 30.00"
22	1	Clamp, Throttle
23	1	Capscrew, 3/8-16NC x 1.00" Flange Whizlock
24	1	Hex Nut, 3/8-16NC Flange Whizlock

ENGINE ASSEMBLY

ITEM	QTY	DESCRIPTION
25	2	Cable, Battery - Negative
26	1	Cable, Battery - Positive
27	3	Clamp, .75" ID Cable
28	1	Capscrew, 5/16-18NC x 1.00" Flange Whizlock
29	1	Nut, 5/16-18NC Flange Whizlock Gr. G
30	1	Bolt, Cylinder Head Support
31	1	Bracket, Radiator
32	1	Bolt, M8 x 1.25 - 16MM Hex Hd.
33	1	Isolator, Radiator
34	2	Nut, Hex 1/4-20 Zink
35	1	Str., Exhaust
36	4	Capscrew, M8 x 1.25Cp-6g x M30 Socket Hd.
37	1	Muffler
38	1	U-Bolt, 2" Muffler Clamp
39	1	Tank, Coolant
40	2	Capscrew, .25-20NC x 1.00" Flange Whizlock
41	2	Hex Nut, .25-20NC Flange Whizlock Gr. G
42	1	Tie, Cable
43	8	Bolt, M10 x 35MM Hex Hd.

HYDRAULIC PUMP DRIVE ASSEMBLY



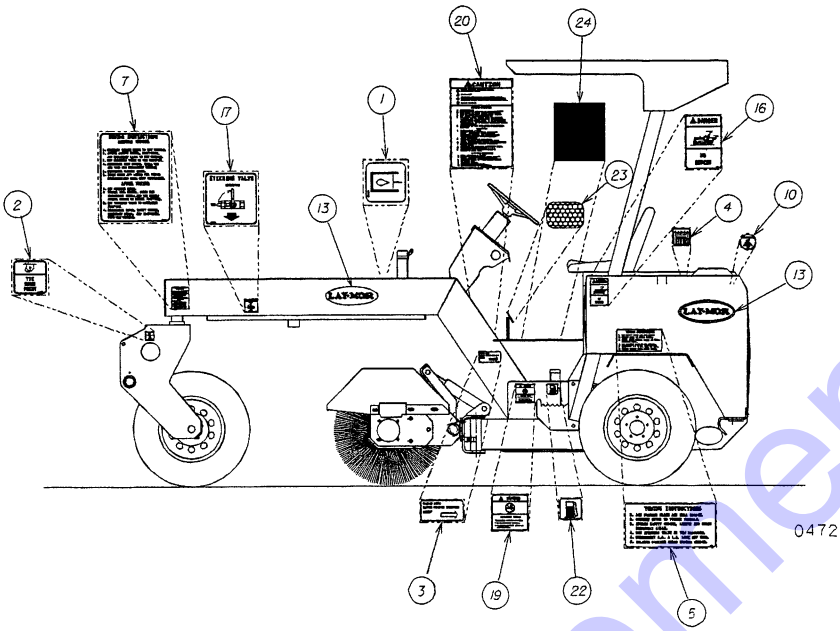
0479

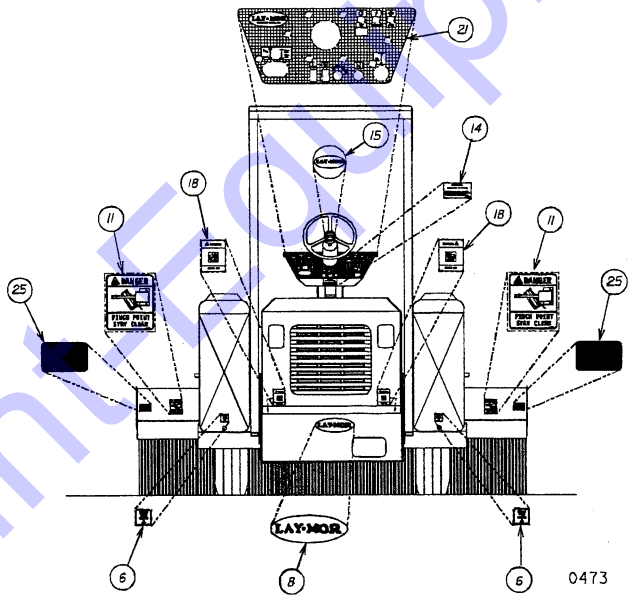
ITEM	QTY		DESCRIPTION
1	1		Flywheel
2	1	*	Adapter, Flywheel
3	4	*	Capscrew, M10 x 1.25 x M30 Socket Hd.
4	1	*	Gear, Pump Drive
5	1	*	Flywheel Housing/Pump Mount
6	8	*	Capscrew, M8 x 1.25 x M30 Socket Hd.
7	8	*	Flat Washer, M8
8	2	*	Bolt, M10 x 1.25-35mm Hex Hd.
9	2	*	Lock Washer, M10
10	4		Capscrew, 3/8-16NC x 1.50" Zink Gr. 5
11	4		Flat Washer, .38" PI.
12	4		Lock Washer, .38" PI.
13	1		O-Ring
14	A/R		Locktite, Red
		*	Included in the following kit:
	1		Bell Housing with Pump Drive

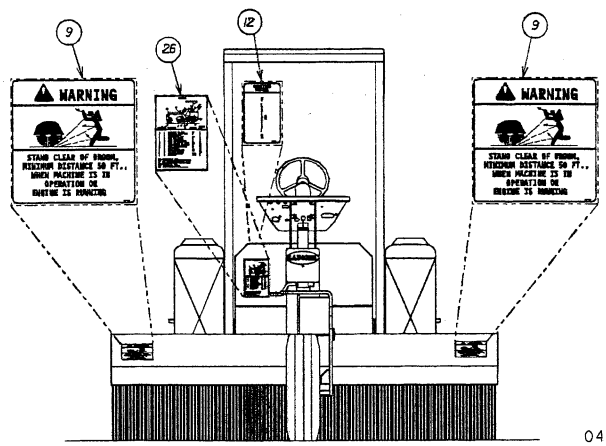
SECTION 6

DECALS

DECAL KIT







DECAL KIT

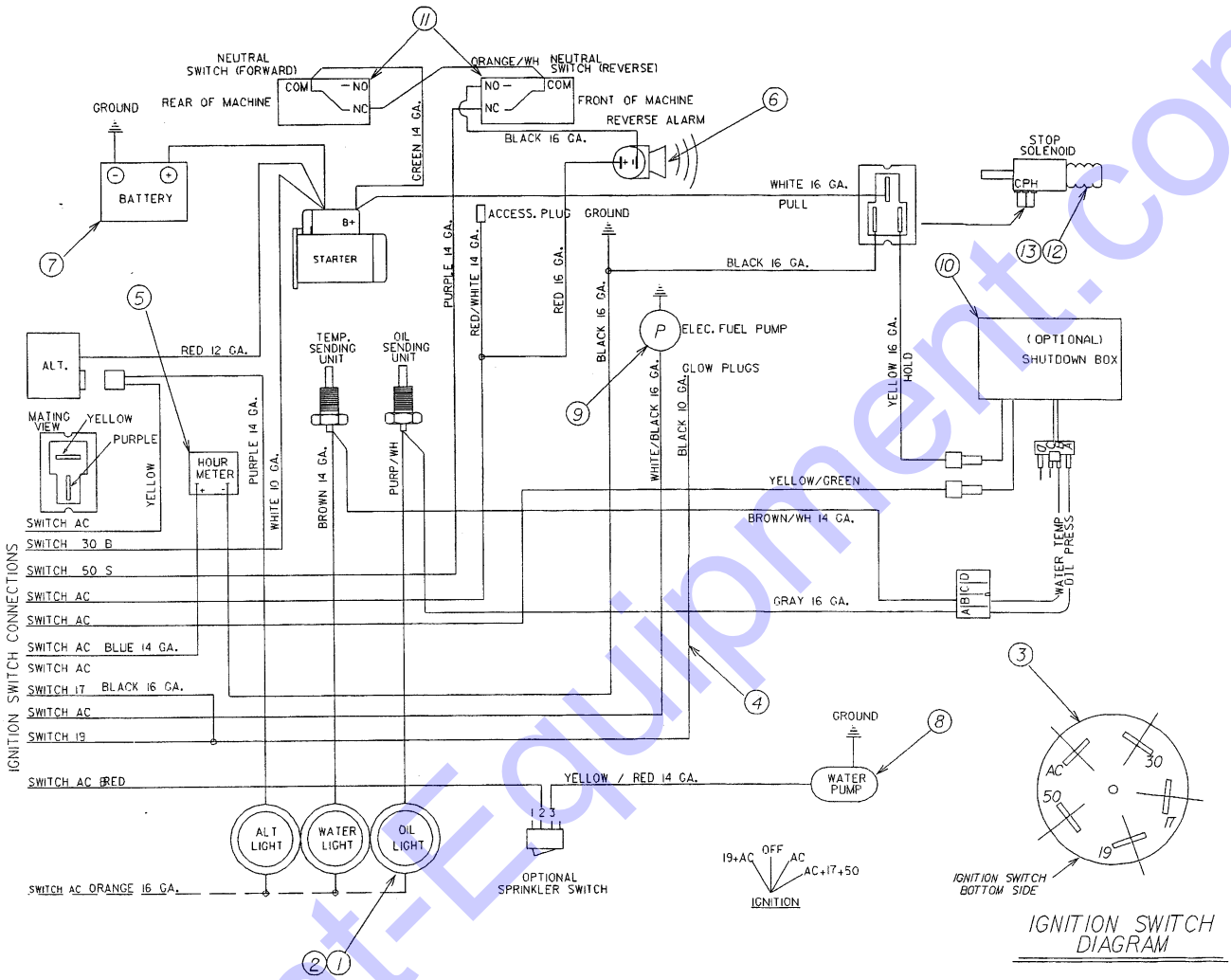
ITEM	QTY	DESCRIPTION
1	1	Decal, Hydraulic Oil
2	2	Decal, Tie Down
3	1	Decal, Filter Screen
4	2	Decal, Water Tank
5	2	Decal, Towing Instructions
6	2	Decal, Water Tank Drain
7	2	Decal, Towing Instruction (Before & After)
8	1	Decal, Lay-Mor (3.37" x 9.25")
9	2	Decal, Warning "Stand Clear of Broom"
10	1	Decal, Radiator Cap
11	2	Decal, Danger Pinch Point
12	1	Decal, Direction Control
13	4	Decal, Lay-Mor
14	1	Decal, California Warning
15	1	Decal, Lay-Mor Steering Cap
16	2	Decal, Danger No Riders
17	1	Decal, Steering Valve
18	2	Decal, Danger "Rotating Fan"
19	1	Decal, Danger "Explosion Hazard"
20	1	Decal, Operating Instructions
21	1	Decal, Dash
	1	Decal, Dash (Optional)
22	1	Decal, Diesel Only
23	1	Pad, Pedal (Honeycomb Rubber)
24	1	Safety Walk, (11.00" x 12.50")
25	2	Tape, Reflector (Red)
26	1	Decal, Lubrication & Maintenance Schedule

To order replacement decals call Waldon/Lay-Mor at 1-800-227-3711.

SECTION 7

ELECTRICAL

ELECTRICAL WIRING HARNESS



IGNITION SWITCH DIAGRAM

0493

ITEM	QTY	DESCRIPTION
1	3	Light, Red Indicator
2	3	Bulb, 12V 2-Watt
3	1	Switch, Ignition
	1	Key (Set of 2 included with Switch)
4	1	Assy., Main Wiring
5	1	Meter, Hour
6	1	Alarm, Reverse
7	1	Battery, 12C Group 78-60
8	1	Pump, Water
9	1	Pump, Electric Fuel
10	1	Module, Engine Protection
11	2	Switch, Forward/Reverse
12	1	Solenoid, Fuel Shut-off
13	1	Gasket, Fuel Solenoid

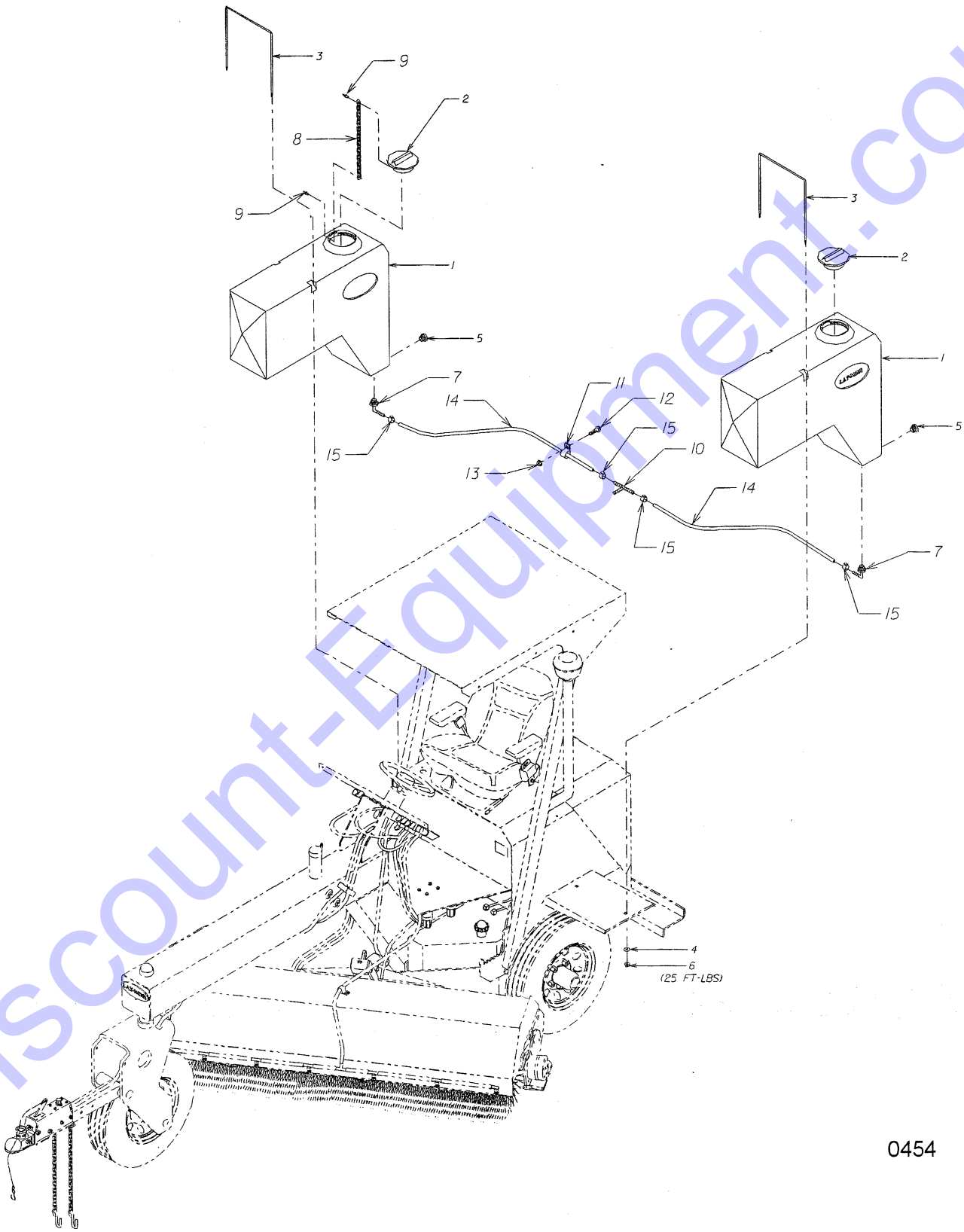
SECTION 8

OPTIONS

WATER TANK ASSEMBLY

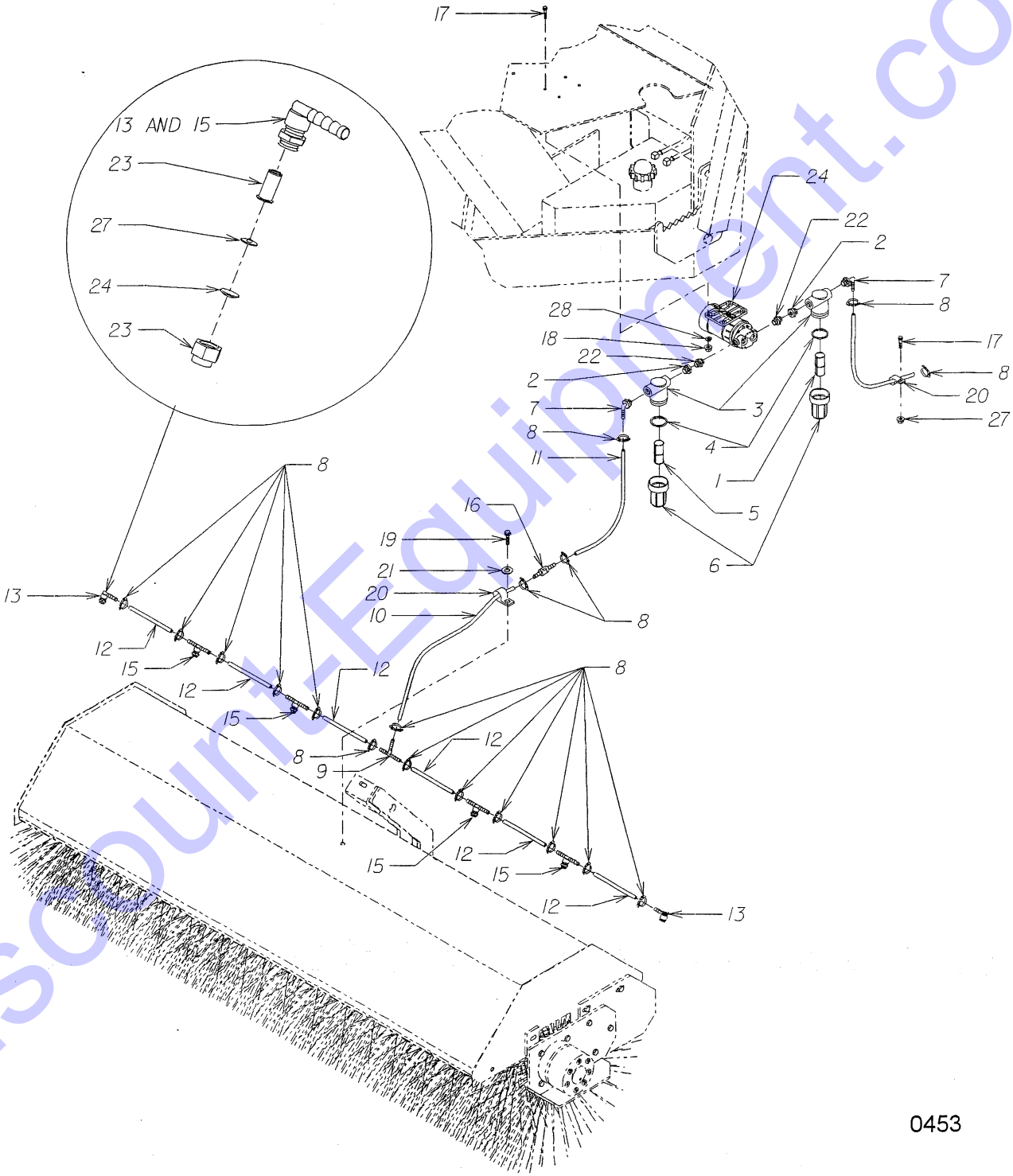
ITEM	QTY	DESCRIPTION
1	2	Tank, Water
2	2	Lid, Water Tank (Included with Item #1)
3	2	Rod, Water Tank Hold-Down
4	4	Flat Washer, 5/16" Pl.
5	2	Plug, Drain - Water Tank
6	4	Lock Nut, 5/16-18 Nylon Insert
7	2	Elbow, 3/4-NPTM x 3/8 Barb 90^0 (Plastic)
8	2	Chain, #16 Jack x 18.00"
9	4	Rivet, Pip 1/8" Dia.
10	1	Tee, .37 ID Hose Barb
11	1	Clamp, .812 ID with .406 Bolt Hole Vinyl
12	1	Capscrew, 3/8-16NC x 1.00" Flange Whizlock
13	1	Hex Nut, 3/8-16NC Flange Whizlock
14	A/R	Hose, .375" ID Low Pressure
15	4	Clamp, Crimping Band -6 Hose

WATER TANK ASSEMBLY



SPRINKLER ASSEMBLY

PART NO. 374645 - 6'
PART NO. 376921 - 8'



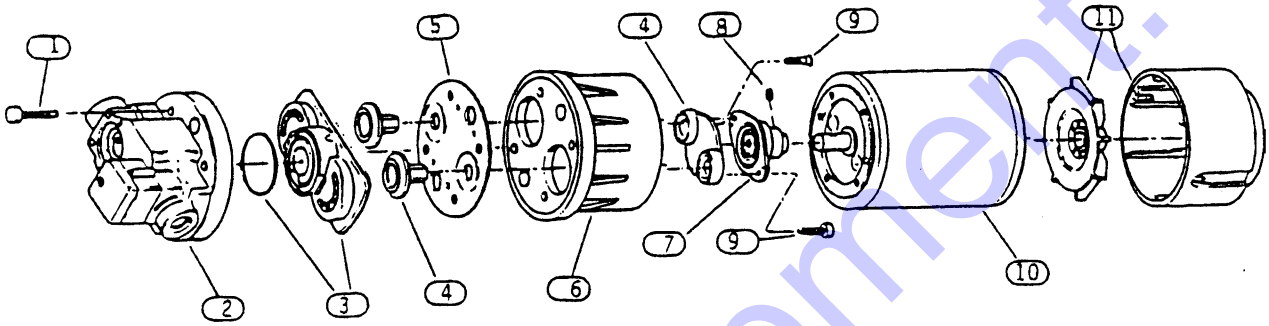
0453

SPRINKLER ASSEMBLY

ITEM	QTY	DESCRIPTION
1	1	Screen, Suction Filter (Green)
2	2	Bushing, 1/2-MNPT x 1/4-FNPT Nylon
3	2	Head, Filter
4	2	Gasket, Filter Head
5	1	Screen, Pressure Filter
6	2	Bowl, Filter
7	2	Barb, 1/2-MNPT x 90^0 x 3/8" Plastic
8	20	Clamp, Crimping Band -6 Hose (6') (Included w/Kit 9101507)
	24	Clamp, Crimping Band -6 Hose (8') (Included w/Kit 9101588)
9	1	Tee, .37 ID Hose Barb
10	A/R	* Hose, .375" ID Low Pressure
11	A/R	* Hose, .375" ID Low Pressure
12	A/R	* Hose, .375" ID Low Pressure
13	2	Body, 90^0 Spray Nozzle (Brass)
14	A/R	* Hose, .375" ID Low Pressure
15	5	Body, Tee Spray Nozzle (Brass) (6')
	7	Body, Tee Spray Nozzle (Brass) (8')
16	1	Valve, Anti-Leak Check
17	4	Capscrew, 1/4-20NC x 1.00" Flange Whizlock
18	4	Hex Nut, 1/4-20NC Flange Whizlock Gr. G
19	2	Capscrew, 3/8-16NC x 1.00" Flange Whizlock
20	2	Clamp, .812 ID with .406 Bolt Hole Vinyl
21	1	Flat Washer, 3/8" Pl.
22	2	Nipple, .25 x 1.25" Plastic
23	7	Screen (6')
	9	Screen (8')
24	7	Orifice, (6') (D-2) Standard
	9	Orifice, (8') (D-2) Standard
	7	Orifice, (6') (D-5) More Water
	9	Orifice, (8') (D-5) More Water
	7	Orifice, (6') (D-8) Most Water
	9	Orifice, (8') (D-8) Most Water
25	7	Cap, Brass (6')
	9	Cap, Brass (8')
26	1	Pump, Water (See Page 8-6)
27	7	Seal, Orifice Core (6')
	9	Seal, Orifice Core (8')
28	4	Lock Washer, 1/4"
29	1	Hex Nut, 3/8-16NC Flange Whizlock

* Sold as Kit Only

WATER PUMP



ITEM	QTY	DESCRIPTION
1	6	Screws, Pump
2	1	Assy., Housing Switch
3	1	Valve, Check (No Slot)
4	1	Piston, Inner and Outer
5	1	Diaphragm
6	1	Cover, Bearing
7	1	Bearing, Cam
8	1	Set Screw, Cam Bearing
9	1	Screws, Cam Bearing
10	1	Motor
11	1	Shroud, Fan

WATER PUMP TROUBLESHOOTING

Motor Operates, but No Pump Discharge.

1. Restricted intake or discharge line. Check for "jammed" check valve poppets and clean clogged lines.
2. Air leak in intake line.
3. Punctured pump diaphragm.
4. Defective pump check valve.
5. Crack in pump housing.

Motor Fails to Turn On

1. Pump or equipment not plugged in electrically. Loose wiring connection.
2. Defective motor or rectifier.

Low Flow and Pressure

1. Air leak at pump intake.
2. Accumulation of debris inside pump and plumbing.
3. Worn pump bearing (excessive noise).
4. Punctured pump diaphragm.
5. Defective rectifier or motor.

Pulsating Flow - Pump Cycling On and Off

1. Restricted pump delivery. Check discharge lines, fittings, valves and spray nozzles for clogging or undersizing.

SERVICE

Refer to the exploded view for key number.

Disassemble

1. Remove six pump head screws (1), rotate bearing cover (6) so drain notch is aligned with can/ bearing assembly set screw (8).

2. Loosen set screw (use 1/8" size Allen Wrench) and slide pump head off shaft.

3. Pistons (4) should always be replaced when new diaphragm is installed.

4. Replace worn parts and reassemble. Be sure raised side of diaphragm faces the motor and flat side outer piston faces motor (coat motor shaft with grease prior to assembly).

Reassembly

1. Hex stem of piston (4) must be aligned (free to enter) into hex hole in cam bearing assembly (7), otherwise diaphragm will leak.

2. Tighten screws (9) partially, center pistons in diaphragm, then tighten screws securely.

3. Reassemble bearing cover and cab/bearing assembly to motor and retighten the set screw securely. Set screw MUST be positioned in shaft indentation. Positioning of this screw is critical to avoid mis-alignment and subsequent diaphragm damage.

4. Reassemble remaining pump head parts, using care to properly seat seal ring (3) in check valve assembly and tighten pump head screws evenly.

PRE-DELIVERY CHECKLIST
6HC/8HC

GENERAL INSPECTION:

____ Inspect for damaged or missing components.

____ Paint and overall appearance.

____ Operation and Hazard Alert decals legible and in place.

____ Lights and horn operate.

____ Operators manual in compartment.

____ Grease all lube points.

____ Seat, Seat Belt, slides, and pivot work smoothly and are in good condition.

FLUID LEVELS:

____ Engine Oil

____ Hydraulic Oil

____ Rear Wheel Disconnect Oil

____ Fuel

DRIVE TRAIN:

____ Parking Brake Adjusted

____ Wheel Disconnect Mounting Bolts Tight

____ Drive Motor Mount Bolts Tight

____ Lug Nuts Tight

____ Tire Pressure: 35 psi

____ Engine mounting bolts tight.

ENGINE:

____ Air Cleaner

____ High and low idle speeds

____ Fuel lines and connectors tight and mounted properly and not leaking.

____ Electrical connections good and wires routed properly.

HYDRAULICS:

____ Inspect unit for leaks.

____ Inspect unit for frayed or damaged hoses and fittings.

____ Steer unit stop to stop and make sure relief opens and unit steers smooth.

CONTROLS:

____ Forward/Reverse Valve operate properly and handles are tight.

____ Foot pedal works freely and returns to neutral.

____ Broom Raise and Lower Valve works freely, goes into float, and handle is tight.

____ Broom Motor Valve Handle work freely and return to neutral.

BROOM:

____ Broom installed properly and bolts are tight.

____ Pins and Pin Retainer bolts in place and tight.

____ Hoses properly routed.

____ Cycle cylinders full stroke. Check that relief opens and inspect for leaks.

SPRINKLER SYSTEM:

____ Sprinkler tanks are in good condition and not leaking.

____ Retainer bolts in place and tight.

____ Hoses properly routed. Sprinkler nozzles installed and spray properly. Make sure nozzles do not leak when shut-off.

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