

balzer mfg
corp
mountain lake, mn. 56159



**OPERATORS & SERVICE MANUAL for
VACUUM MODELS 3200, 2200, 1500**

PN14027

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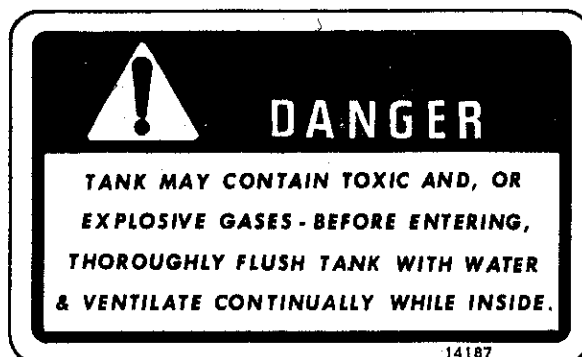
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Safety



OBSERVE AND FOLLOW ALL SAFETY PROCEDURES TO PREVENT INJURY OR DAMAGE TO THE MACHINE

1. When agitating a pit always be sure there is adequate ventilation in the confinement area.
2. Never enter a pit unless it is absolutely necessary. If a unit must be entered, take proper safety precautions. These include someone at the site, outside the unit and proper life support system. Contact your BALZER dealer for more information before you enter a tank.
3. Avoid excessive road speed.
4. Never operate this unit until user is familiar with all controls, and has read and understands operators manual.
5. Read and follow the instructions on all decals.
6. Never lubricate, adjust or repair unit while it is in operation. Power unit engine must be shut off and all movement stopped.
7. Never operate this unit with any guards or shields not in place. Replace any missing or damaged ones.
8. Keep hands and feet away from all moving parts.
9. Never wear loose clothing while working around moving parts.
10. Never leave unit running unattended.
11. Before loading make sure that the unit does not have any foreign objects or materials in it that can cause equipment damage or personal injury.
12. Never allow anyone to ride on the unit at anytime.
13. Be sure the rear of the unit has a clean SMV emblem properly displayed if towing less than 25 MPH on any public roadway. At night proper warning and running lights are necessary as required by state laws.
14. Always use a safety chain between the towing vehicle and tank on public roadways.
15. Hydraulic fluid pressure can be very dangerous and can cause serious personal injury and death. Be sure to relieve all pressure before disconnecting hydraulic lines.
16. Hydraulic fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, not your hands, to search for leaks.
17. If injured by escaping hydraulic fluid, seek medical attention immediately. Serious infection or reaction may develop.
18. Never assume that everybody is as safety conscious as you are.
19. Always use a hitch pin that has a safety clip pin.



To The Purchaser



⚠ This is the safety alert symbol, it is used to alert the operator to an instruction concerning the personal safety and risk factor of this equipment. Always observe and heed these very important instructions to promote a safe operation with good preventive maintenance habits.

This new BALZER product is designed and manufactured to give years of very dependable service when used for the purpose for which it is intended, and when properly maintained.

NEVER OPERATE THIS EQUIPMENT UNTIL USER FULLY UNDERSTANDS THE COMPLETE CONTENTS OF THIS MANUAL. FOR OWNERS WHO DO NOT OPERATE THIS EQUIPMENT, IT IS THE OWNERS RESPONSIBILITY THAT THE USER IS PROPERLY INSTRUCTED AND IS FULLY AWARE OF THIS MANUAL'S CONTENTS.

This is important in the safe handling of this equipment and promoting an efficient operation. If there are any questions about areas in this manual, it is important to contact your dealer for clarification.

This machine is warranted as stated on the rear outside cover. A registration card is to be filled in by your dealer with your name and address, and promptly returned to the factory. The card provides a ready reference to help you in securing warranty and in answering questions that you may have at some later date.

Operating instructions and parts book are shipped with this machine. If parts of this book are missing or become unreadable, contact your dealer for a new set.

The serial number and identification tag is located on the front of the right tank saddle, and on the outside of the right tongue tube of the running gear. Please refer to these numbers when parts or warranty communication is necessary.



PLEASE FILL IN THE FOLLOWING INFORMATION FOR YOUR RECORDS

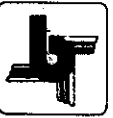
DATE OF PURCHASE _____

OWNERS NAME _____

DEALERS NAME _____

SERIAL NO. / IDENT. NO. _____

Operation



METHOD OF OPERATION

To load the tank the air pump removes some of the air from the inside of the tank creating a pressure differential between the atmospheric pressure outside and the area inside the tank. When the end of the suction hose is immersed into the liquid in the pit and the loading valve opened, the higher atmospheric pressure outside the tank pushes the material into the tank. The loading time will depend on the capacity of the pump, the weight of the material, the height the material must be lifted and the size of the suction hose.

To unload, the air pump moves air into the tank pressurizing it so the material is forced out.

Since the pump is designed to move only air, Balzer Mfg. has designed two means of protecting the pump from material entering it. Both are automatic but must be checked for proper operation each time unit is used.

The Primary Shut-off is located in the portal located on the top of the tank. The Moisture Trap, the secondary shut-off, is located on the front of the tank. Both valves function on the ball and seat principal, where the fluid raises a ball against a rubber valve seat. The Moisture Trap also has the function of removing any airborne foam or particals.

The dome on the Portal assembly acts as the pressure relief valve regulating the pressure inside the tank. The pressure is controlled by the bar spring that holds down the dome and is adjusted by tightening or loosening the nut holding the bar spring. The pressure inside the tank must not exceed 10 psi, 8 to 10 psi will give maximum spread pattern.

PRE-OPERATION CHECKS

Inspect moisture trap ball and valve seat to make sure they are clean and that ball moves freely.

Check all bolts and hardware to be sure they are tight and torqued properly. Refer to chart.

Torque Value Chart

RECOMMENDED TORQUE IN FOOT-POUNDS COARSE AND FINE THREAD		
BOLT MARKING	GRADE 5	GRADE 2
BOLT DIA.	TORQUE	TORQUE
1/4	10	6
5/16	18	10
3/8	39	22
7/16	58	32
1/2	87	44
9/16	111	58
5/8	173	86
3/4	290	152
7/8	500	222
1	620	250

Check the air pressure in the tires and adjust pressure if necessary to proper inflation.

Tire Size	Inflation Pressure
12.5L-15	48 PSI
16.5L-16.1	36 PSI
21.5L-16.1	32 PSI
66--43--25	18 PSI

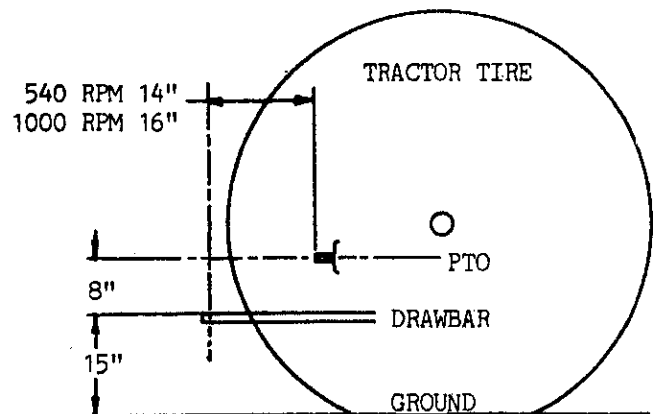
Move the front Load Level Indicator arrow from empty to full level to see that it moves freely.

Operation (continued)

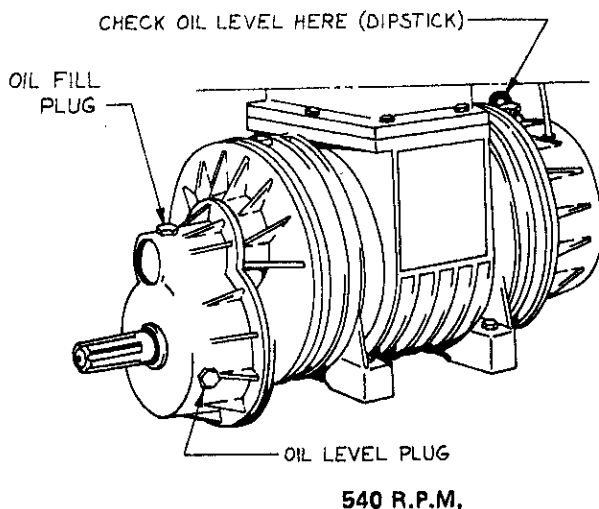


Operate all valves on pump and tank for proper operation. Refer to Service section if there is a problem.

Check oil level(s) in air pump reservoir(s). Use 90 wt. gear lubricant in front 540 RPM gearbox and 20 wt. nondetergent oil in rear reservoir. Before connecting P.T.O. to tractor, rotate pump input shaft to be sure pump rotor rotates freely.



SUGGESTED DRAWBAR ADJUSTMENT



⚠ Do not use a steel faced hammer to assist sliding P.T.O. shaft onto tractors splines. Damage to joints and bearings could result.

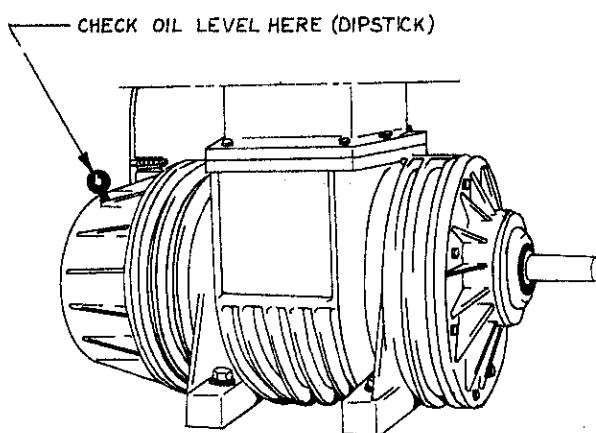
If the unit has injectors, check the hoses and tubes for plugs and breaks in them. If the shipping and storage rods are in place, they must be removed.

⚠ Use a jack or hoist to remove the shipping and storage rods because the tool bar may drop when the rods are removed, causing damage or personal injury.

OIL PUMP PRIMING PROCEDURE

When spreader has not been used for some time (i.e. 2 or 3 months) it may be necessary to use the (start) lubrication procedure to get oil from the rear reservoir to the oiler on the pumps. The procedure is as follows:

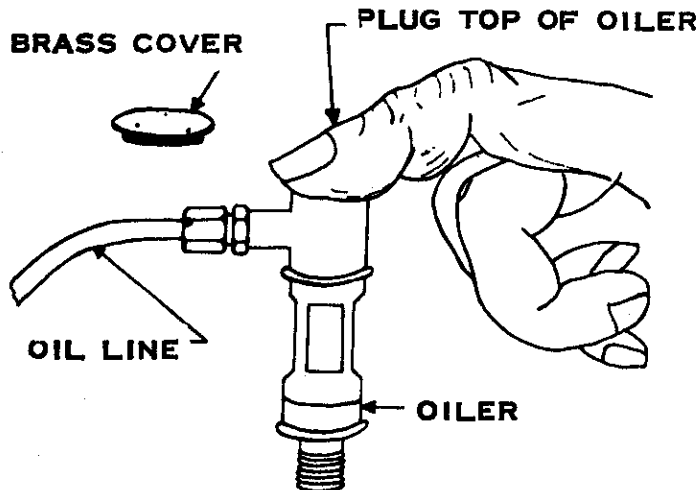
1. Before starting pump, remove the brass cover of the pump oiler. Fill oiler with SAE 20 nondetergent oil. (See illustration) Note: In extremely cold weather SAE 10 non-detergent oil must be used.



Operation (continued)



2. Start pump with valve in vacuum mode and plug the top of the oiler so oil is drawn into the pumps housing.



3. Continue this operation until oil is coming out of the plastic tube from the reservoir to the oiler. Replace cover on oiler.
4. The rate of 40 drops of oil per minute should be observed in oilers sight glass.

LOADING

Connect Suction Hose from manure pit to tank intake port and open intake valve. Suction hose should be resting on bottom of manure pit.

Move pump Vacuum/Pressure Selector handle to Vacuum position. Start tractor P.T.O., pump will operate at maximum efficiency at 75% of rated tractor P.T.O. speed.

When pump begins to labor, the tank has filled. Shut intake valve and then shut off tractor P.T.O. Move pump selector lever between Vacuum and Pressure positions, this will equalize the pressure inside tank to atmospheric pressure. Disconnect suction hose from tank inlet. Move pump selector lever to pressure position before getting on tractor.

During operation check sight glass on oiler to be sure pump vanes are being oiled. If oil is not visible, refer to trouble shooting section.



AVOID SHARP TURNS AND EXCESSIVE SPEED WHEN TANK IS LOADED

Sharp turns cause excessive tire sidewall buckle, reducing tire life, and adds to control difficulty of the tractor.

Excessive speed is very dangerous when the tank is loaded. Remember that in many cases the tank will weigh more than the tractor pulling it. The optional brake system will help with some control problems, but not in all cases.

UNLOADING

SURFACE BROADCAST

Start P.T.O. with pump selector lever in Pressure Position, open unloading valve. Area and density of coverage will depend upon pressure in the tank, ground speed, rubber orifice shape and opening size, and material consistency. Refer to sketch for suggested procedure for cutting rubber orifice.



⚠ Never try to put the injectors into the ground unless the tank is moving forward. Never turn a corner or back up with the injectors down.

STORAGE

Remove the Portal Dome and flush the inside of the tank or fill tank with water, aggitate and discharge.

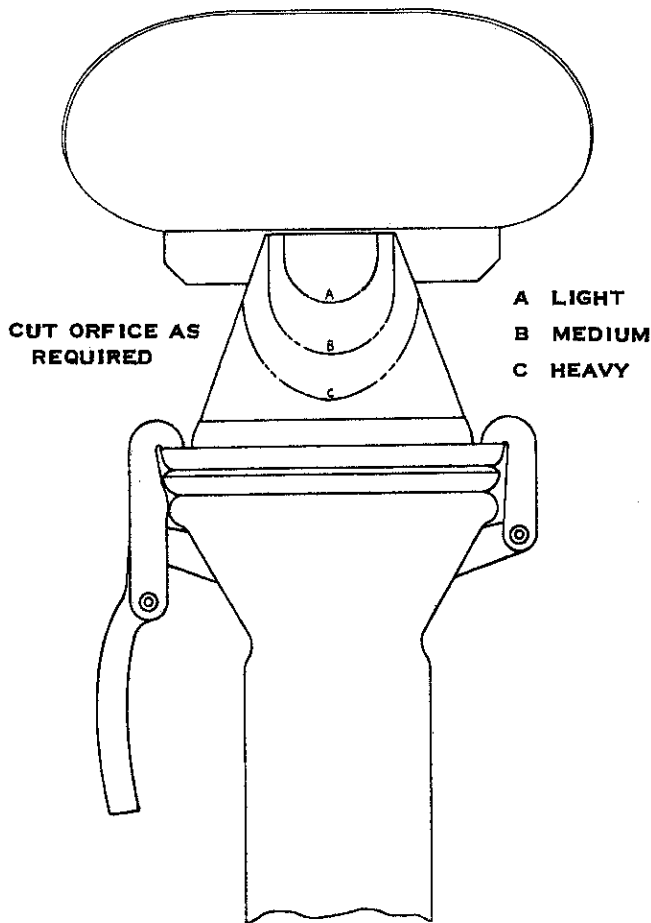
Before disconnecting PTO, run pump slowly with selector valve in vacuum position. Remove plug in vacuum line between moisture trap and pump slowly pour about a pint of diesel fuel into pump. Shut off PTO and pour another 2 cups of fuel into pump. This procedure will clean and lubricate the inside of the pump.

Open all valves to prevent them from coroding tight. Put a block under jack and raise front of tank allowing it to drain to the back of tank.

Drain moisture from moisture trap, remove and drain surface broadcaster or injector manifold.

Retouch paint as required, store out of the elements if possible. Suction hose should be stored out of direct sunlight.

⚠ To prevent a sudden lowering of injectors, causing possible personal injury or equipment damage, injectors must be stored with transport brackets in place, OR in lowered position.



⚠ Pressure in tank must not exceed 10 P.S.I. Never attempt to open tank while pressure exists in tank.

INJECTION

The rate of application with injectors can be controlled by ground speed or the amount of pressure in the tank. 4 to 6 psi is usually adequate pressure for injecting. Tank pressure can be adjusted by increasing or decreasing the bar spring tension on the relief dome on top of the tank portal. If material is extremely watery and thin, the optional manifold choke, P.N. 13155 may be required for disired rate of application.



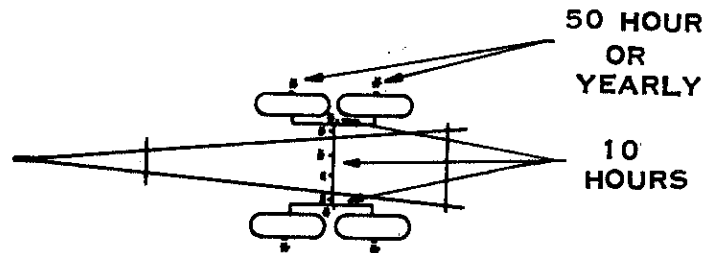
LUBRICATION

Be sure grease fittings function. If damaged or broken fittings exist, replace them with standard farm hardware store fittings. Use lithium base #2 multi-purpose grease for all fittings.

Wipe all fittings prior to greasing and remove excess grease after greasing.

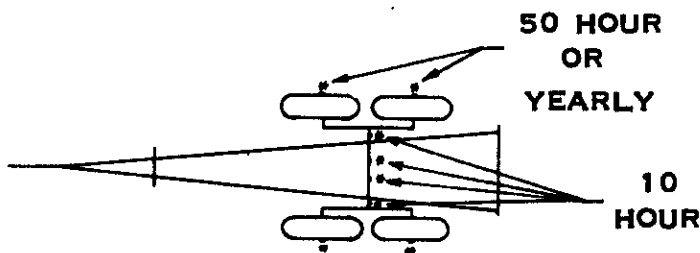
⚠ Never attempt to lubricate any piece of machinery with it operating. Always shut off tractor and remove ignition key.

Grease PTO shaft joints every 10 hrs. of operation, slide shaft and take halves apart, clean and re-grease every 20 hrs. Load Level Indicator bushing every 10 hrs. Trailer bushings every 10 hrs.



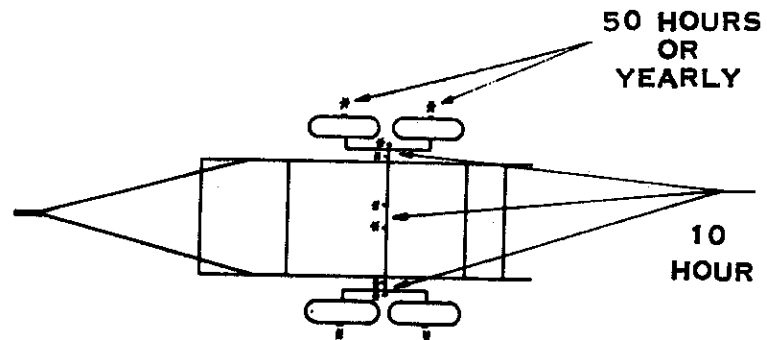
ZERK LOCATION, 2200

NOTE
ZERKS ARE LOCATED
BY * 10 PLACES



ZERK LOCATION, 1500

NOTE
ZERKS ARE LOCATED
BY * 8 PLACES



ZERK LOCATION, 3200

NOTE
ZERKS ARE LOCATED
BY * 10 PLACES

Pump Disassembly



NOTE: All bolts used on pumps are metric bolts. Do not use ASAE bolts in tapped holes in pump, use correct size metric bolts.

Only if pump is going to be completely disassembled does it have to be removed from machine.

Mark on rotor housing which end is the front.

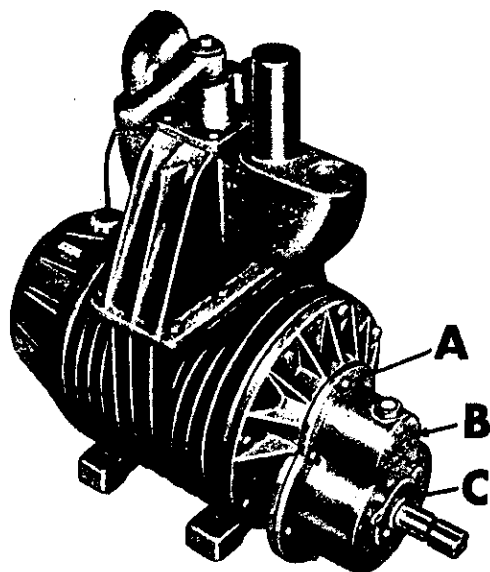


FIG. 1

STEP 1 - 540 RPM FIGURE 1 AND 2

Remove bolts 'A'. Remove gear cover 'B', being careful not to damage oil seal 'C'. Remove cotter pin and nut 'D' using Shaft Saver PN 13906, if available, and a gearpuller, remove gear 'E'. Shaft assembly 'F' can now be removed. Remove bolts 'G'.

STEP 1 - 1000 RPM

Remove 3 bolts and seal plate around P.T.O. shaft being careful not to damage seal. Remove socket head capscrew from end of P.T.O. shaft and remove shaft by tapping with soft faced hammer. Remove bolts 'G'.

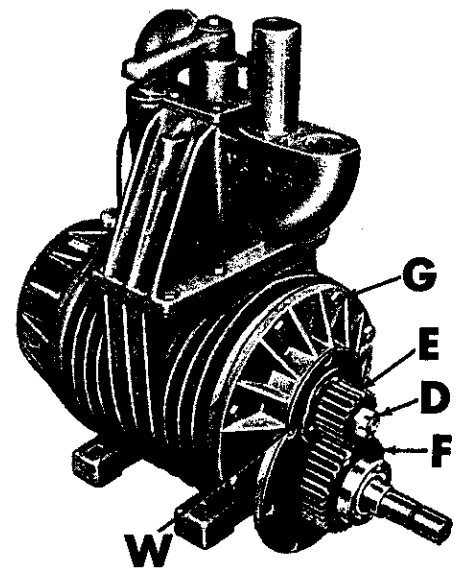


FIG. 2

STEP 2 - FIG. 3

Attach Puller Plate 'H'. PN 13905, to housing by using bolts provided with puller or bolts 'A' removed in Step 1. Be sure to use Shaft Saver between gear puller and shaft end. Pull housing assembly from pump.

NOTE: Do not use a pry bar to remove housing from pump.

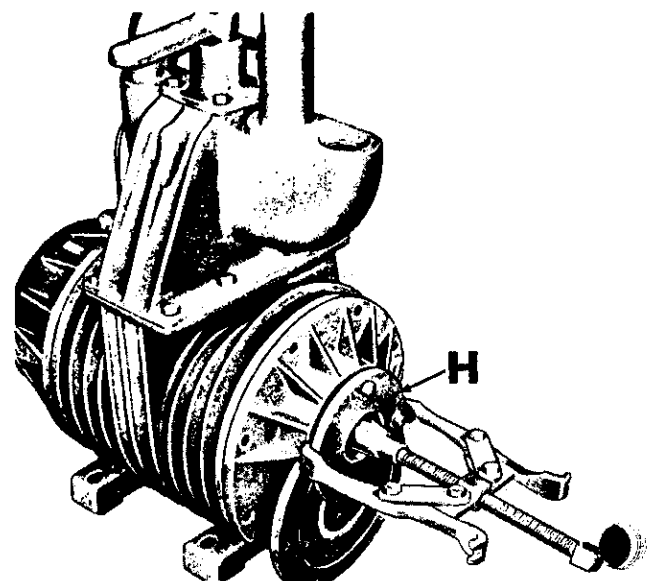


FIG. 3

Pump Disassembly (continued)



STEP 3 - FIGURE 4

Pull vanes from pump and check them for wear. Clean vanes with fuel oil. Vanes that measure 1-5/8" or less should be replaced with a new set.

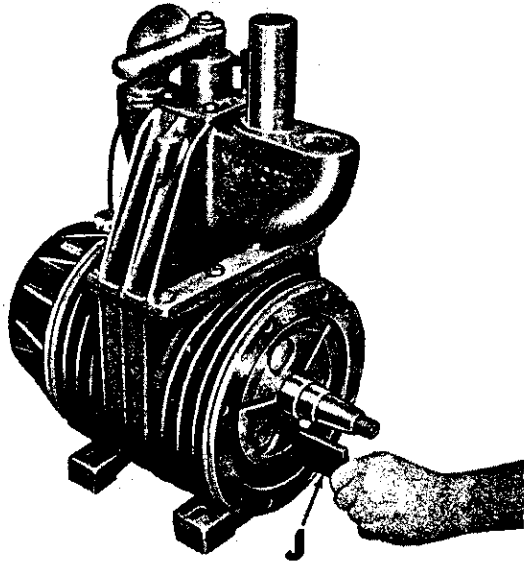


FIG. 4

STEP 4 - FIGURES 5 AND 6

If pump must be completely disassembled remove end cap 'K'. Disconnect oil line from oil pump at 'L'. Remove oil pump fitting 'L' finger tight to prevent loss of ball check valve. Remove oil pump.

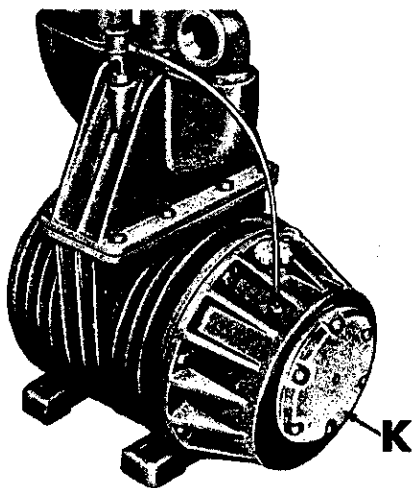


FIG. 5

STEP 5 - FIGURE 6 AND 7

Place wood strips 'N' between rotor and housing to prevent damage to either part.

Remove bolts 'P' and pull rotor and rear housing out of rotor housing being careful not to damage machined surfaces.

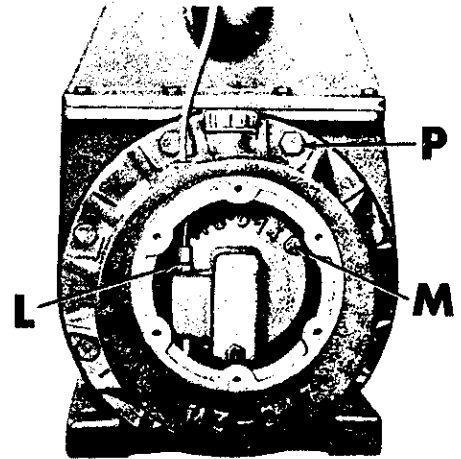


FIG. 6

STEP 6 - FIGURE 7

Attach Puller Plate 'R', PN 13905, (same plate as used in Step 2) using bolts provided with puller or 'M' bolts from Step 4. Be sure to use Shaft Saver PN 13906 between shaft and puller bolt. Separate rear housing from rotor.

Replace any damaged or worn parts. Reverse Steps 1 through 6 to reassemble pump remembering tapered shaft on rotor goes to the front. Reset bearings in place by using a piece of pipe on the inner race to drive bearings into place.

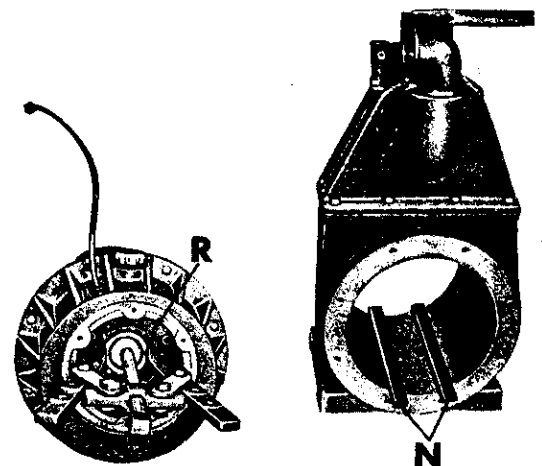


FIG. 7

Trouble Shooting



PROBLEM	PROBABLE CAUSE	CORRECTIVE MEASURE
Hydraulic unloading valve doesn't open.	<ol style="list-style-type: none">1. Hydraulic hose connected incorrectly to tractor.2. Bolt sheared holding valve gate to cylinder rod.3. Valve corroded shut. 4. Relief valve not functioning. 5. Threaded rods holding cylinder not tensioned evenly.	<ol style="list-style-type: none">1. Connect hoses correctly.2. Disassemble valve & replace 1/4" bolt.3. Remove the socket hex cap screws holding valve top to lower section. Grip top of cylinder move it back & forth loosening gate in valves seat.4. Remove relief valves and check valve springs.5. Loosen nuts and tension evenly so nuts are snug.
Pump rotor turns but little vacuum or pressure. Pump running smooth, not laboring.	<ol style="list-style-type: none">1. Vanes stuck in rotor grooves. 2. Check valve in pump not seating. 3. Loading or unloading valve not shut.	<ol style="list-style-type: none">1. Pour about 1/2 pint of diesel fuel slowly into the vacuum line with pump running slowly on vacuum.2. Drain as much vacuum as possible in tank, shut off machine. put finger over holes in oiler and listen for air leaking through breather. If leaking, clean or replace check valve(s).3. If obstruction in valve seat, remove.

Trouble Shooting (continued)



PROBLEM	PROBABLE CAUSE	CORRECTIVE MEASURE
Low vacuum with pump laboring. Pressure good.	<ol style="list-style-type: none">1. Shut-off ball stuck in portal or moisture trap.2. Obstruction in vacuum line between pump and portal	<ol style="list-style-type: none">1. Neutralize tank pressure and check ball position.2. To test, remove vacuum line next to pump and check vacuum at pump. If OK find and remove obstruction in pipes.
Good vacuum, Low pressure.	<ol style="list-style-type: none">1. Obstruction in pressure or sparger tube.2. Dome on portal not set correctly.	<ol style="list-style-type: none">1. Locate and remove obstruction.2. Adjust to proper setting.
Pump rotor doesn't turn freely.	<ol style="list-style-type: none">1. Condensed moisture frozen between bottom of housing and rotor.2. Vane broken inside pump.	<ol style="list-style-type: none">1. Thaw moisture out and clean pump with diesel fuel. (Do not use direct flame or high intensity heat on pump housing).2. Disassemble pump and replace vanes.
Tank doesn't fill good Good pressure & vacuum.	<ol style="list-style-type: none">1. Obstruction in suction hose.2. Inside liner of suction hose collapsing.	<ol style="list-style-type: none">1. Remove obstruction from hose.2. Replace damaged suction hose.

Parts Policy



It is the policy of the Balzer Mfg. Corp. to constantly improve its products whenever it is practical to do so.

The Balzer Mfg. Corp. must therefore reserve the right to redesign or change its equipment or component parts thereof without incurring obligation to install or furnish such changes on equipment previously delivered.

INSTRUCTIONS FOR ORDERING PARTS

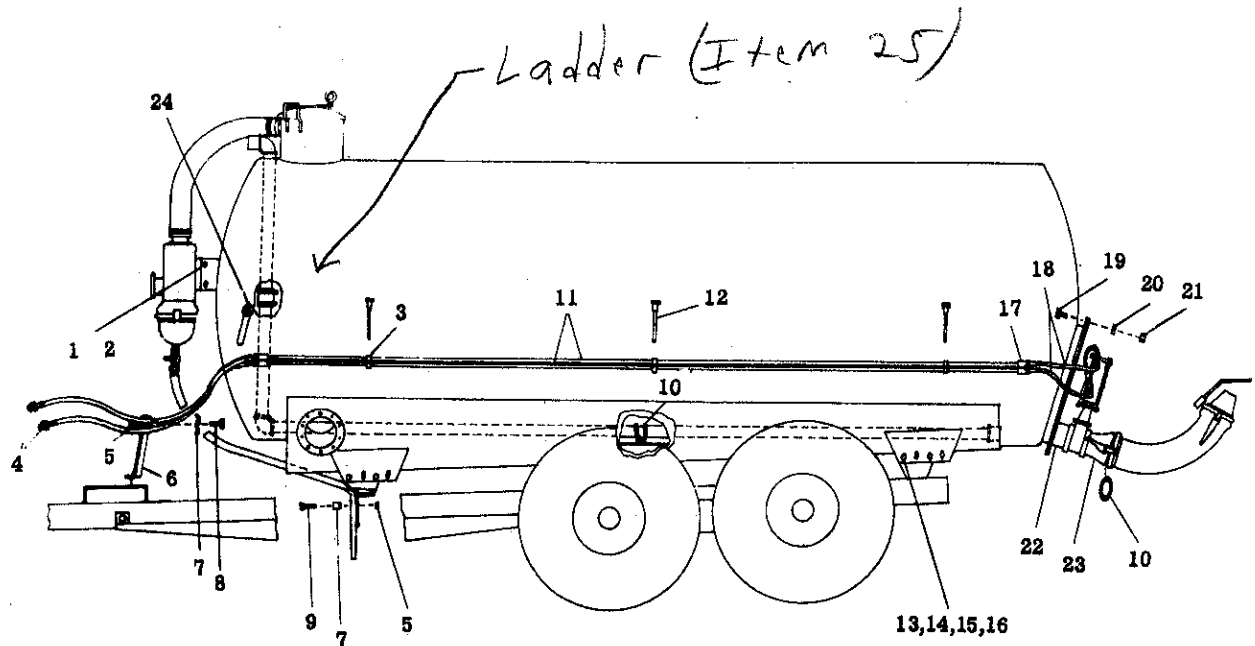
1. Order all parts by their part number and name.
2. Parts should never be ordered from item numbers only.
3. Always mention the model and serial numbers found on name plate of unit on which part is to be used. Much delay and confusion can be avoided when correct model and serial numbers are specified on parts order and correspondence.
4. Owners, order all parts thru your local dealer.
5. Dealers must indicate how to ship: whether by truck, rail freight, express or parcel post.
6. Collect phone calls will not be accepted.
7. Address all orders for parts as follows:

balzer mfg
corp
highway 60 east
mountain lake, mn. 56159
phone (507) 427-3133

INSTRUCTIONS FOR RETURNING PARTS FOR ADJUSTMENT

1. To assure prompt handling of claims, your dealer or distributor should follow standard claim procedure and forward claim within thirty (30) days of any part failure or malfunction believed to be a warranty claim to the Balzer Mfg. Corp. service department for processing.
2. No returned parts will be accepted unless they are transportation prepaid and accompanied by the packing list copy.
3. Parts returned should have a tag attached with senders name and address clearly printed.

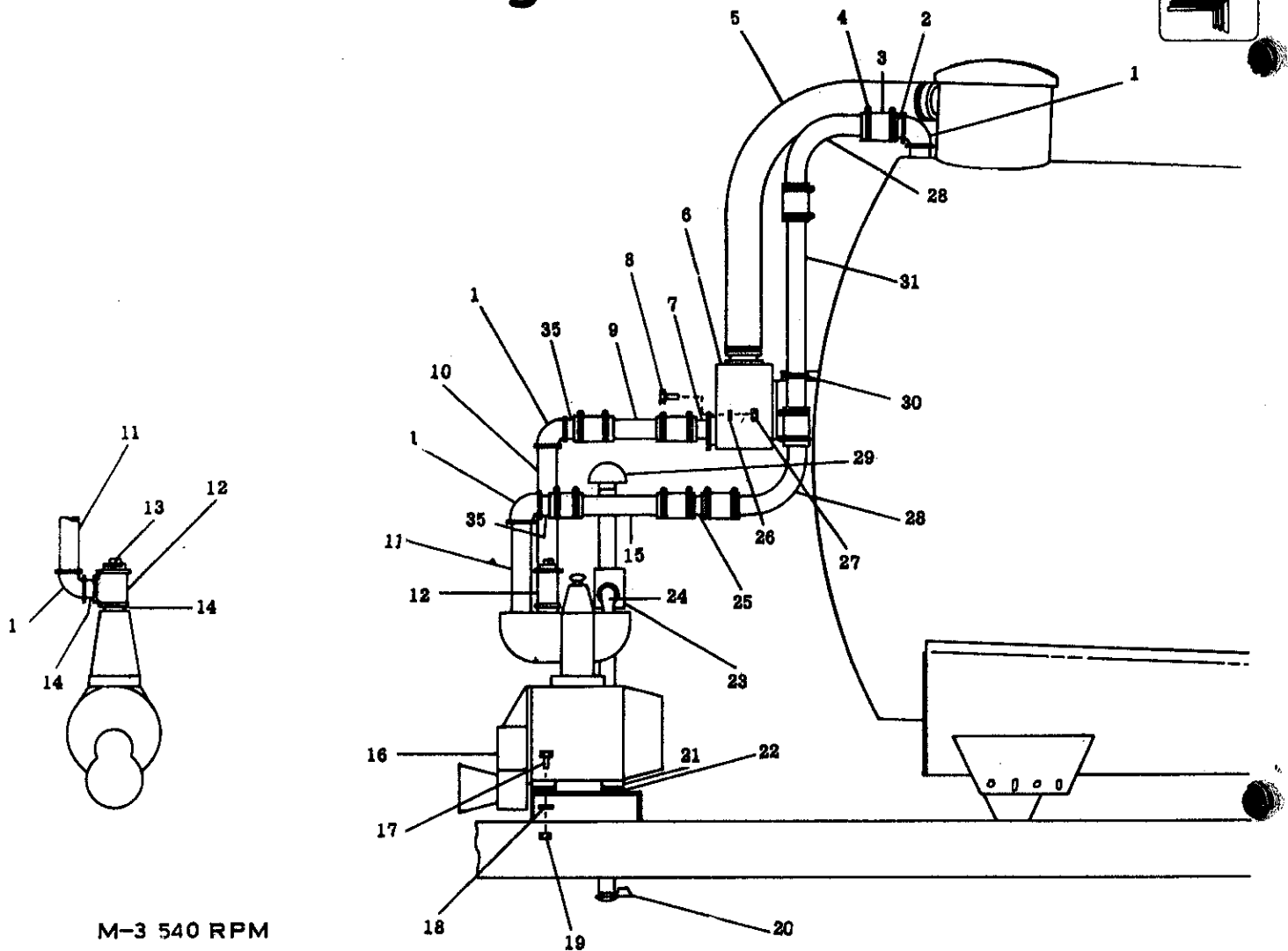
Common Parts



COMMON PARTS

ITEM	P/N	NAME
1	1248	Bolt, Hex Head 1/2 x 1
2	2539	Nut, Hex, Unitorque 3/8
3	10997	Clamp, Pipe 1/4
4	10993	Hydraulic Hose
5	2081	Nut, Hex Hd 5/16
6	13406	Bracket Hose
7	8214	Clamp, Pipe
8	1499	Bolt, Truss Head 5/16 x 1-1/2
9	1496	Bolt, Truss Head 5/16 x 1
10	10913	'O' Ring 4"
11	13403	Pipe, Hydraulic (Model 1500)
	12826	Pipe, Hydraulic (Model 2200)
	13491	Pipe, Hydraulic (Model 3200)
12	10954	'J' Hook
13	1289	Bolt, Hex Hd 5/8 x 1-1/2
	1302	Bolt, Hex Hd 5/8 x 5-1/2 (3200)
14	1602	Washer, Flat 5/8
15	1640	Lockwasher 5/8
16	1696	Nut, Hex Hd 5/8
17	10996	Coupler, Pipe 1/4
18	11892	Hose, Hydraulic
19	1249	Bolt, Hex Hd 1/2 x 1-1/4
20	1638	Lockwasher 1/2
21	1694	Nut, Hex Hd 1/2
22	13397	Manhole Cover Weldment
23	10983	Connector, Female 4"
24	2288	Zerk, 3/16 Drive-in
25	12017	Ladder

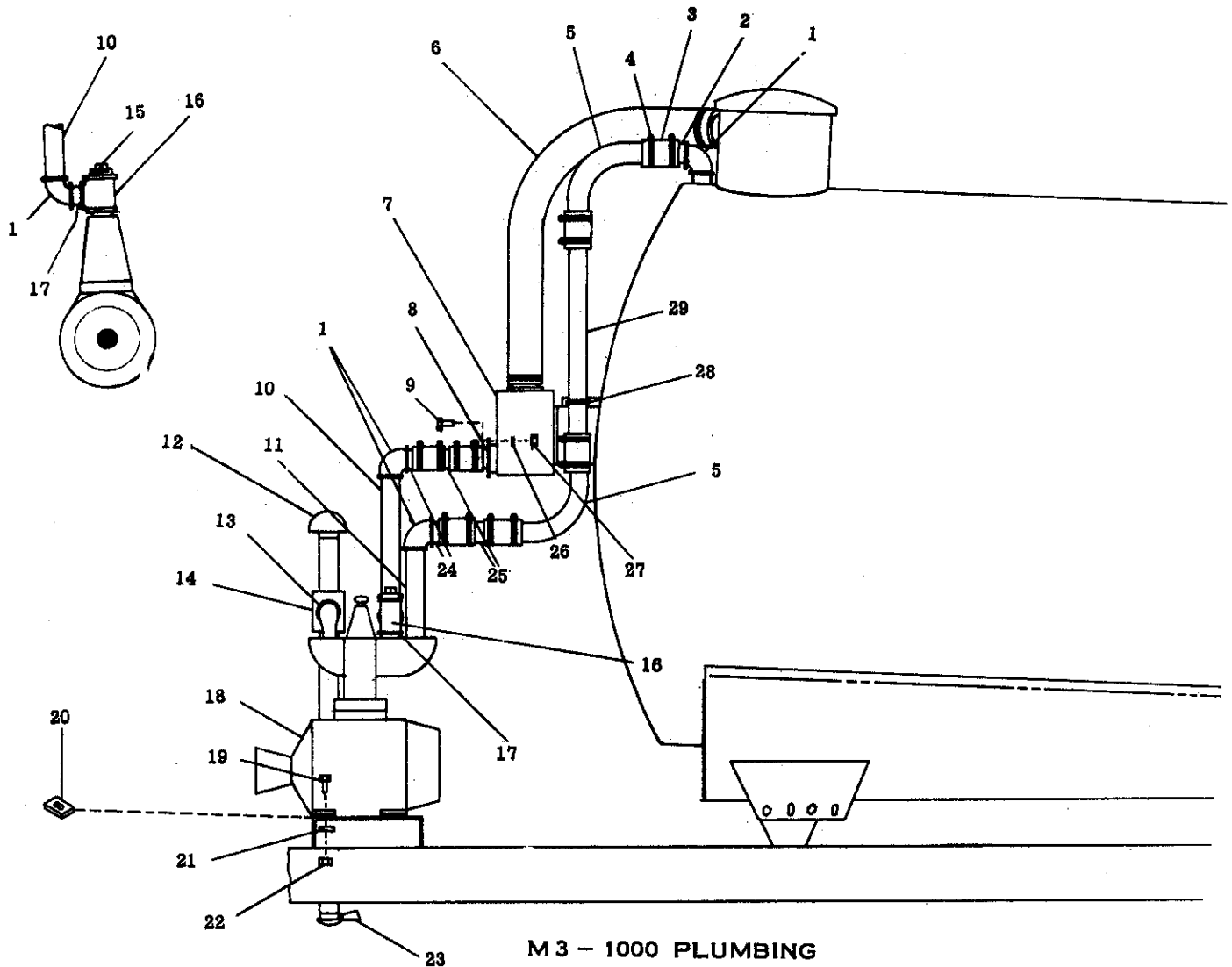
M 3 - 540 Plumbing



M-3 540 RPM

ITEM	P/N	NAME	ITEM	P/N	NAME
1	10915	Elbow, Pipe 1½"	18	1600	Washer, Flat 1½"
2	10971	Pipe, 1½" x 3"	19	2539	Nut, Hex HD ½" Unitorque
	13410	Pipe, 1½" x 4" (3200 Only)	20	12943	Exhaust Cap
3	10967	Sleeve, Hose	21	13094	Spacer, Pump Mount
4	10953	Clamp, Hose	22	10966	Pump Mount, Rubber
5	13396	Hose, Vacuum, Upper (1500)	23	11687	Manifold Weldment
	13462	Hose, Vacuum, Upper (2200)	24	10909	Elbow, Street 1½"
	13490	Hose, Vacuum, Upper (3200)	25	11689	Pipe Pressure 4" (2200 Only)
6	13385	Moisture Trap	26	1638	Lockwasher ½"
7	13418	Flange Weldment 2"	27	1694	Nut, Hex. HD ½"
8	1249	Bolt, Hex. HD ½" x 1½"	28	13395	Pipe, Elbow, Pressure
9	11689	Pipe, Pressure 4"	29	11697	Cap, Precleaner
	13416	Pipe, Pressure 8" (2200)	30	13394	"U" Bolt
	13415	Pipe, Pressure 10-3¼" (1500)	31	10972	Pipe, Pressure 18½" (1500)
10	13408	Pipe, 1½" x 13-3/4"		13412	Pipe, Pressure 24" (2200)
11	13407	Pipe, 1½" x 10½"		13411	Pipe, Pressure 31½" (3200)
12	11684	Tee, 1½"	32	11064	Decal "SAE 90"
13	11685	Plug, Pipe, Plastic, 1½"	33	11036	Decal "PRESSURE - VACUUM"
14	11688	Nipple, Close 1½"	34	11063	Decal "SAE 20"
15	13414	Pipe, Pressure 12"	35	13409	Pipe, 1½" x 2½"
16	10771	M-3, Vacuum Pump - 540 RPM			
17	1260	Bolt, Hex. HD 1½" x 4"			

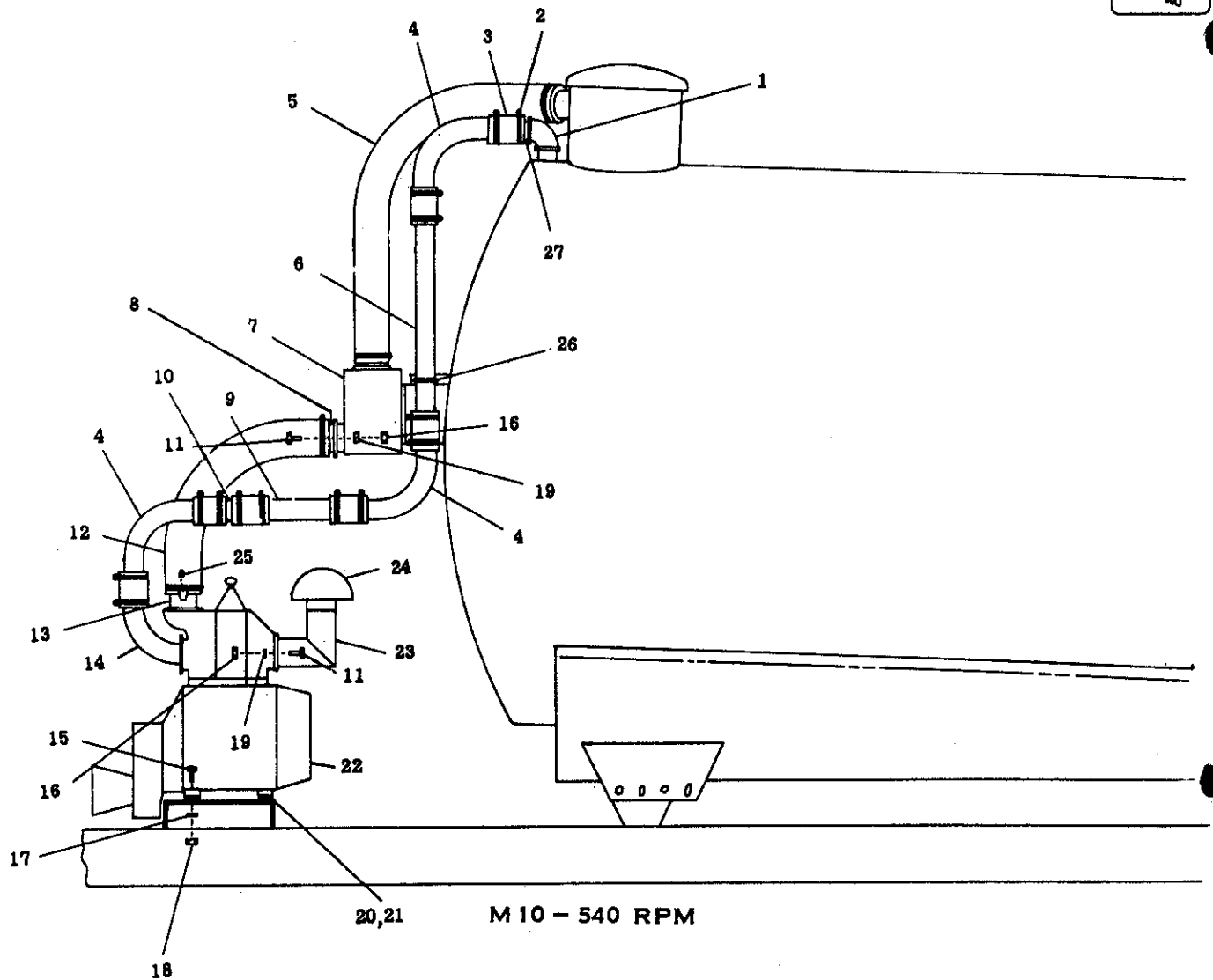
M3-1000 Plumbing



M3 - 1000 PLUMBING

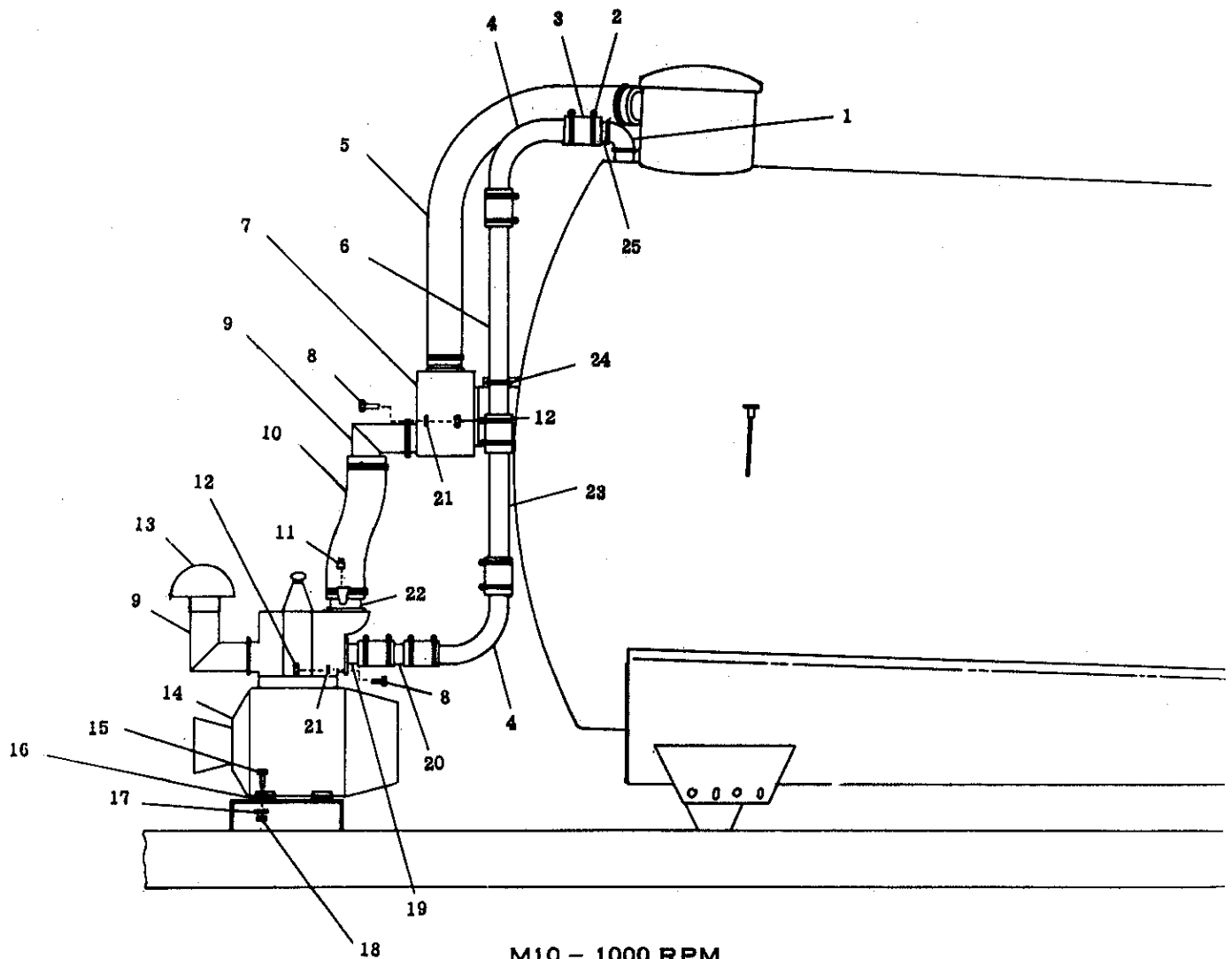
ITEM	P/N	NAME	ITEM	QTY	P/N	NAME
1	10915	Elbow, Pipe 1½	16	11684	Tee, 1½	
2	10971	Pipe, 1½ x 3	17	11688	Nipple, Close 1½	
	13410	Pipe, 1½ x 4 (3200 Only)	18	10825	M-3 Vacuum Pump 1000 RPM	
3	10967	Sleeve, Hose	19	1258	Bolt, Hex. HD ½ x 3½	
4	10953	Clamp, Hose	20	10966	Pump Mount, Rubber	
5	13395	Pipe, Elbow, Pressure	21	1600	Washer, Flat ½	
6	13396	Hose, Vacuum, Upper (1500)	22	2539	Nut, Hex. HD ½	
	13462	Hose, Vacuum, Upper (2200)	23	12943	Exhaust Cap	
	13490	Hose, Vacuum, Upper (3200)	24	13409	Pipe, 1½ x 2½	
7	13385	Moisture Trap	25	11689	Pipe, Pressure 4" (2200 Only)	
8	13423	Flange Weldment 2" Short	26	1638	Lockwasher ½	
9	1249	Bolt, Hex. HD ½ x 1¼	27	1694	Nut, Hex. HD ½	
10	13408	Pipe, 1½ x 13-3/4	28	13394	"U" Bolt	
11	13407	Pipe, 1½ x 10½	29	10972	Pipe, Pressure 18½ (1500)	
12	11697	Cap Precleaner		13412	Pipe, Pressure 24 (2200)	
13	10909	Elbow, Street 1½		13411	Pipe, Pressure 31½ (3200)	
14	11687	Manifold Weldment	30	11063	Decal "SAE 20"	
15	11685	Plug, Pipe, Plastic, 1½	31	11036	Decal "Pressure - VACUUM "	

M 10 - 540 RPM



ITEM	P/N	NAME	ITEM	P/N	NAME
1	10915	Elbow, Pipe 1½"	15	1260	Bolt, Hex. HD ¼ x 4
2	10953	Clamp, Hose	16	1694	Nut, Hex HD ½"
3	10967	Sleeve Hose	17	1600	Washer, Flat, ½"
4	13395	Pipe, Elbow, Pressure	18	2539	Nut, Hex. HD ½" Unitorque
5	13396	Hose, Vacuum, Upper (1500)	19	1638	Lockwasher, ½"
	13462	Hose, Vacuum, Upper (2200)	20	13094	Spacer, Pump Mount
	13490	Hose, Vacuum, Upper (3200)	21	10966	Pump Mount, Rubber
6	10972	Pipe, Pressure, 18½" (1500)	22	10829	M10 Vacuum Pump 540 RPM
	13412	Pipe, Pressure, 24" (2200)	23	13433	Elbow Flange Weldment 3"
	13411	Pipe, Pressure, 31½" (3200)	24	13306	Cap Precleaner
7	13385	Moisture Trap	25	9863	Plug Pipe ¾"
8	13102	Flange Weldment	26	13394	"U" Bolt
9	13415	Pipe Pressure 10-3/4"	27	10971	Pipe, 1½ x 3
10	11689	Pipe Pressure 4" (2200 Only)		13410	Pipe, 1½ x 4 (3200 Only)
11	1249	Bolt, Hex. HD ½ x 1¼"	28	11064	Decal "SAE 90"
12	13430	Hose, Vacuum Lower	29	11063	Decal "SAE 20"
13	13431	Flange, Oil, Weldment	30	11036	Decal "Pressure - Vacuum"
14	13427	Elbow, Flange, Weldment 2"			

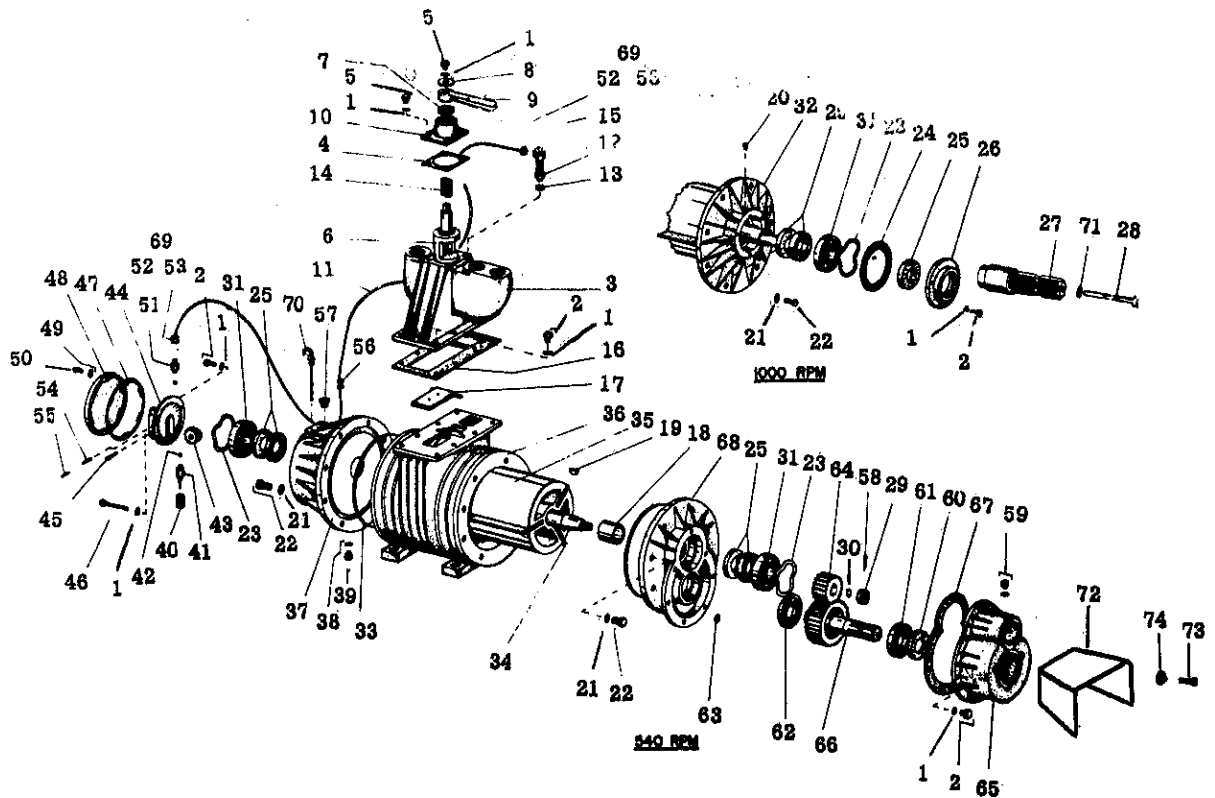
M10 - 1000 RPM



M10 - 1000 RPM

ITEM	P/N	NAME	ITEM	QTY	P/N	NAME
1	10915	Elbow, Pipe 1½"	13	13306		Cap, Precleaner
2	10953	Clamp, Hose	14	10848		M10 Vacuum Pump 1000 RPM
3	10967	Sleeve, Hose	15	1258		Bolt, Hex HD ½ x 3½"
4	13395	Pipe, Elbow, Pressure	16	10966		Pump Mount, Rubber
5	13396	Hose, Vacuum Upper (1500)	17	1600		Washer, Flat, ½"
	13462	Hose, Vacuum Upper (2200)	18	2539		Nut, Hex. HD ½ Unitorque
	13490	Hose, Vacuum Upper (3200)	19	13418		Flange Weldment 2"
6	10972	Pipe, Pressure 18½" (1500)	20	11689		Pipe, Pressure 4" (2200 Only)
	13412	Pipe, Pressure 24" (2200)	21	1638		Lockwasher, ½"
	13411	Pipe, Pressure 31½" (3200)	22	13431		Flange, Oil, Weldment
7	13385	Moisture Trap	23	13413		Pipe Pressure 15½"
8	1249	Bolt, Hex. HD ½ x 1¼"	24	13394		"U" Bolt
9	13433	Elbow Flange Weldment 3"	25	10971		Pipe 1½ x 3"
10	13437	Hose Vacuum Lower		13410		Pipe 1½ x 4 (3200 Only)
11	9863	Plug, Pipe 3/4"	26	11603		Decal "SAE 20"
12	1694	Nut, Hex. HD ½"	27	11036		Decal "PRESSURE - VACUUM"

M3 Vacuum Pump



M3 VACUUM PUMP

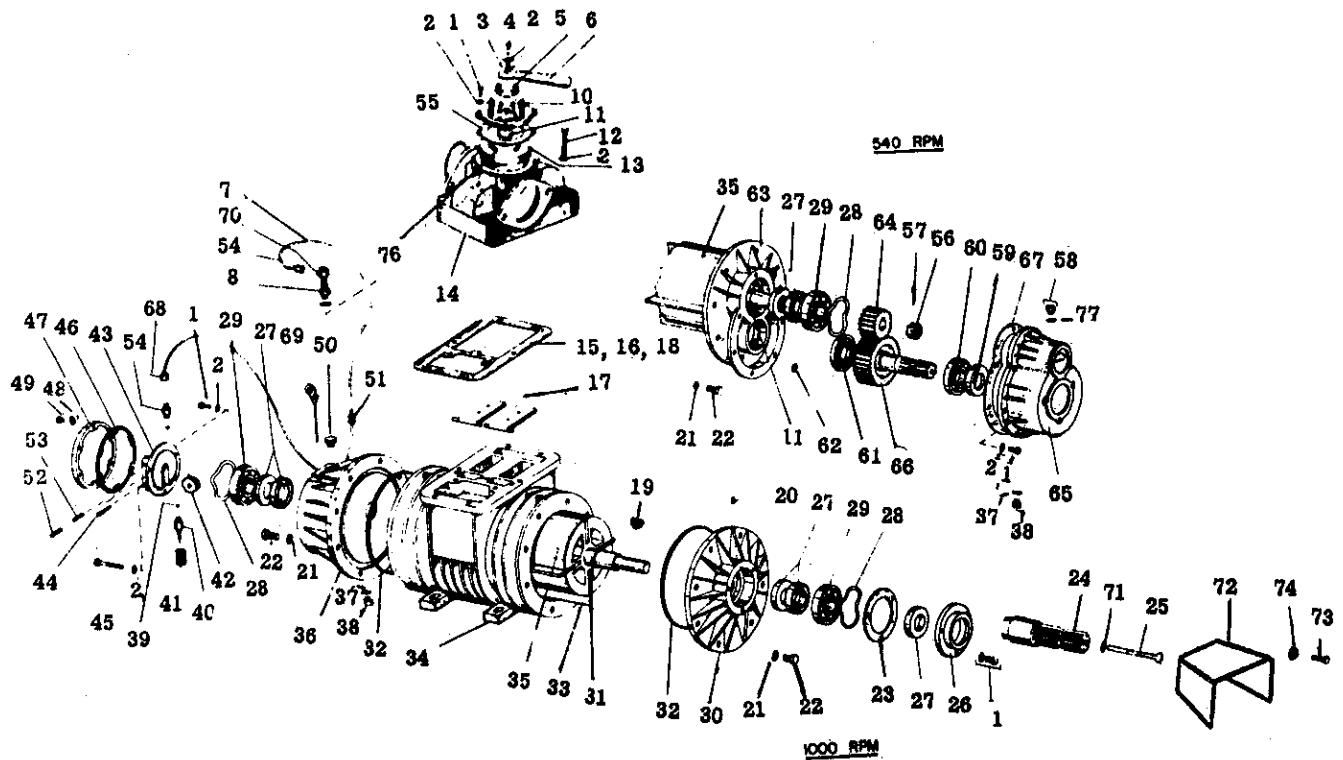
ITEM	P/N	NAME
1	3095	Lockwasher
2	3021	Cap Screw, Hex Hd 8 x 25 MM
3	10808	Manifold
4	10812	Gasket
5	3020	Capscrew, He: Hd 8 x 20 MM
6	10813	Valve Stem
7	10814	Seal
8	3054	Washer Flat 8 MM
9	10816	Lever
10	10811	Cover Valve
11	10817	Tube Nylon
12	10818	Oiler
13	14013	Spacer Aluminum
14	10815	Spring
15	13075	Oiler Cap
16	10809	Gasket
17	10826	Check Valve
18	10776	Bushing, Rotor Shaft
19	13076	Key, Woodruff
20	3102	Zerk
21	3096	Lockwasher, Internal 10 MM
22	3033	Capscrew, Hex Hd 10 x 25 MM
23	10782	Spring Washer
24	10821	Gasket, 1000 RPM
25	10780	Seal

M3 Vacuum Pump (continued)



ITEM	P/N	NAME
26	10822	Flange, 1000 RPM
27	10823	Shaft, 1000 RPM
28	10824	Screw Shaft
29	10828	Nut, Lock, Rotor Shaft
30	3100	Washer
31	10781	Bearing
32	10820	Front Cover 1000 RPM
33	10779	"O" Ring
34	10777	Vane
35	10775	Rotor
36	10774	Block, Cylinder
37	10792	Cover Housing
38	11158	Washer Plastic
39	10790	Plug Drain
40	10799	Filter, Oil
41	10798	Fitting Brass
42	10800	Ball
43	10795	Gear, Oil Pickup
44	10796	Pump
45	10797	Pin, Gear Holder
46	3029	Capscrew, Hex Hd 8 x 65 MM
47	10807	Gasket, End Plate
48	11153	End Plate, Metal
49	3052	Washer Flat
50	3009	Cap Screw Hex Hd 6 x 20 MM
51	10804	Connector
52	10803	Fitting Tube
53	10805	Fitting, Compression
54	10801	Piston
55	10802	Spring
56	10793	Grommet
57	10794	Plug Plastic
58	3086	Cotter Pin 3 x 35 MM (540)
59	10791	Plug (540)
60	10789	Front Seal 540 RPM
61	10786	Bearing Front Gear Shaft 540 RPM
62	10785	Bearing Rear Gear Shaft 540 RPM
63	10827	Spacer, Aluminum (540)
64	10783	Gear 540 RPM
65	10787	Cover Gear Box
66	10784	Gear With Shaft
67	10788	Gasket
68	10778	Front Cover 540 RPM
69	10833	Nut
70	11035	Dipstick
71	3101	Washer Flat (1000)
72	14180	Safety Shield PTO
73	3008	Capscrew Hex Hd 6 x 16 MM
74	3059	Lockwasher 6 MM
75	6749	M3 Vane Repair Kit

M10 Vacuum Pump



M 10 VACUUM PUMP

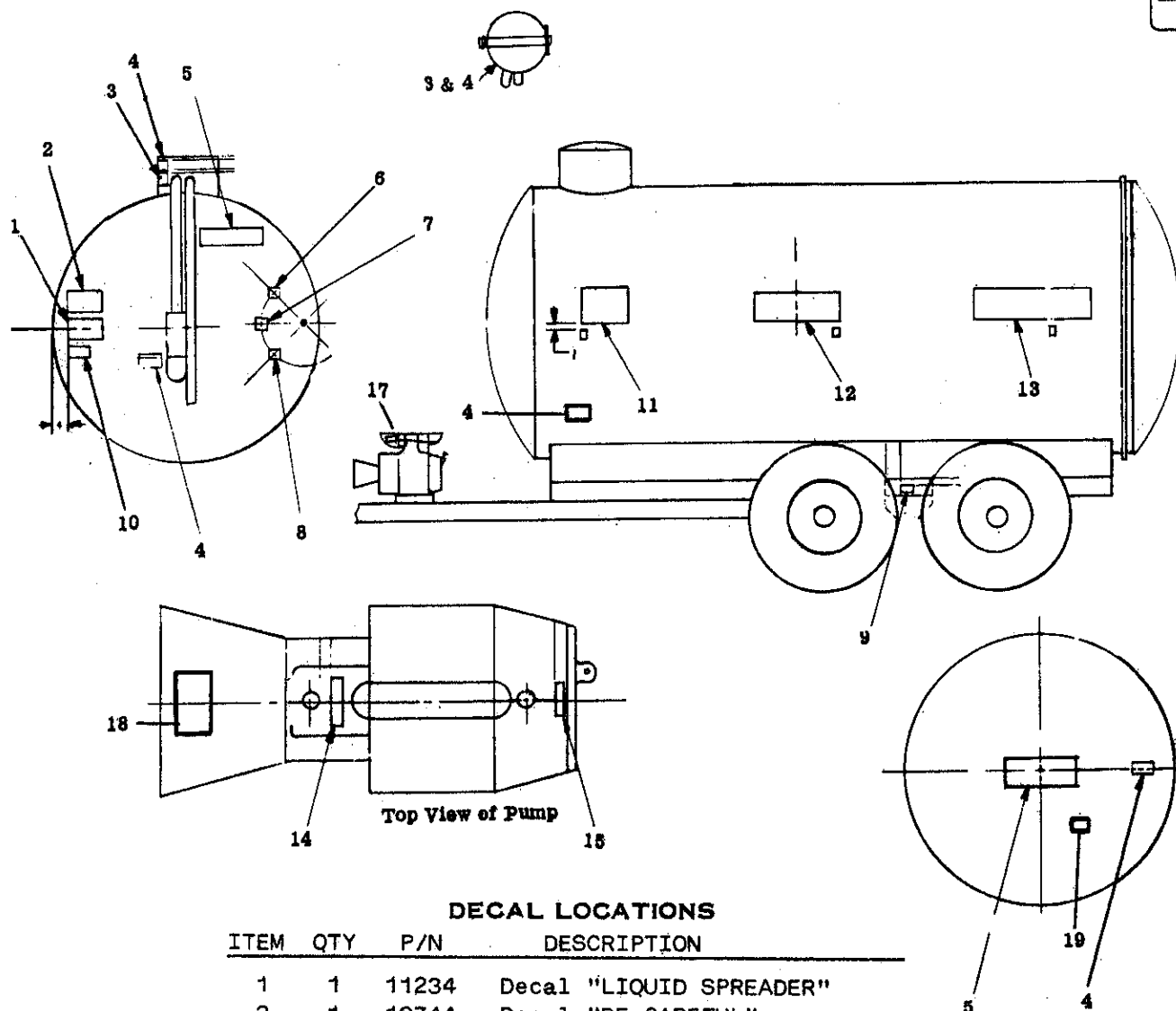
ITEM	P/N	NAME
1	3021	Cap screw, Hex Hd 8 x 25 MM
2	3061	Lockwasher 8 MM
3	3054	Flat Washer 8 MM
4	3020	Cap Screw Hex Hd 8 x 20
5	12963	Seal
6	12964	Lever
7	11427	Nylon Tube
8	10818	Oiler
9	10827	Washer
10	12965	Cover
11	12966	Spring
12	3031	Cap Screw Hex Hd 8 x 75 MM
13	12962	Valve, Change Over
14	12960	Manifold
15	10835	Gasket
16	10836	Plate (Not Shown)
17	10826	Valve, check
18	10837	Gasket (Not Shown)
19	13076	Key
20	3102	Zerk (1000)
21	3062	Lockwasher 10 MM
22	3033	Cap Screw Hex Hd 10 x 25 MM
23	10821	Gasket, 1000 RPM

M10 Vacuum Pump (continued)



ITEM	P/N	NAME
24	10823	Shaft, 1000 RPM
25	10824	Screw, Shaft
26	10822	Flange 1000 RPM
27	10780	Seal
28	10782	Spring Washer
29	10781	Bearing
30	10820	Front Cover 1000 RPM
31	10776	Bushing, Rotor Shaft
32	10779	"O" Ring
33	10832	Vane
34	10830	Block, Cylinder
35	10831	Rotor
36	10792	Cover, Housing
37	11158	Washer, Plastic
38	10790	Plug, Drain
39	10800	Ball
40	10798	Fitting, Brass
41	10799	Filter, Oil
42	10795	Gear, Oil Pickup
43	10796	Pump
44	10797	Pin, Gear Holder
45	3029	Cap Screw Hex Hd 8 x 65 MM
46	10807	Gasket, End Plate
47	11153	End Cap Metal
48	3052	Washer, Flat 6 MM
49	3009	Cap Screw, Hex Hd 6 x 20 MM
50	10794	Plug, Plastic
51	10793	Grommet, Oil Line
52	10802	Spring
53	10801	Piston
54	10804	Connector
	10805	Fitting, Compression
	10803	Fitting, Tube
55	12961	Gasket
56	10828	Nut, Lock, Rotor Shaft
57	3086	Cottor Pin 3 x 35 MM
58	10791	Plug
59	10789	Front Seal, 540 RPM
60	10786	Bearing, Front, Gear Shaft, 540 RPM
61	10785	Bearing, Rear Gear Shaft, 540 RPM
62	10827	Spacer Aluminum
63	10778	Front Cover 540 RPM
64	10783	Gear 540 RPM
65	10787	Cover, Gear Box
66	10784	Gear W/Shaft
67	10788	Gasket
68	10833	Nut
69	11035	Dip Stick
70	13075	Oiler Cap
71	3101	Washer (1000)
72	14180	Safety Shield PTO
73	3008	Cap Screw, Hex HD 6 x 16 MM
74	3059	Lockwasher 6 MM
75	6753	M 10 Valve Repair Kit (Not Shown)
76	14016	Valve Stem
77	3100	Washer Flat

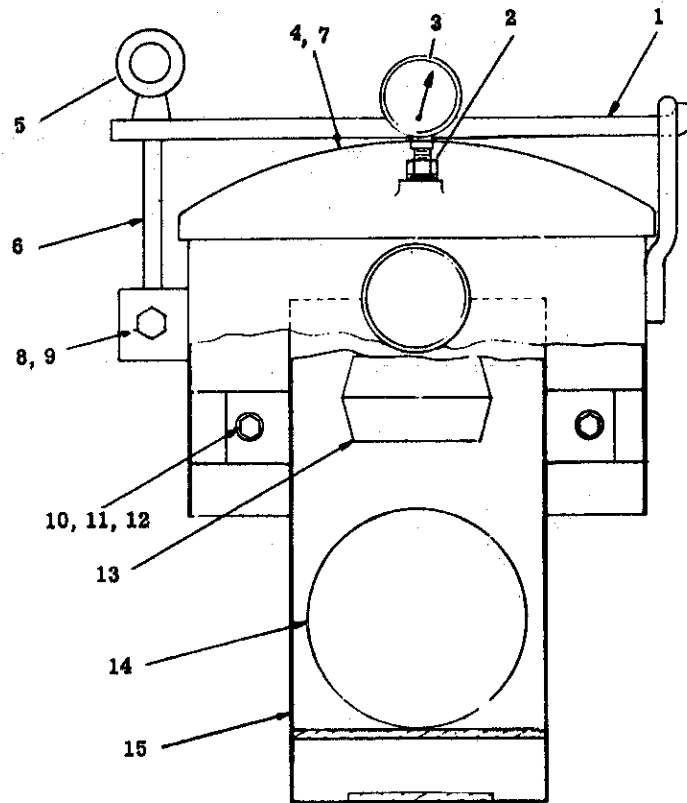
Decal Locations



DECAL LOCATIONS

ITEM	QTY	P/N	DESCRIPTION
1	1	11234	Decal "LIQUID SPREADER"
2	1	10744	Decal "BE CAREFUL"
3	1	11230	Decal "WARNING" DOME LID
4	4	11231	Decal "WARNING" RELIEVE PRESSURE
5	2	12286	Decal "BALZER"
6	1	11039	Decal "FULL"
7	1	11630	Decal "1/2"
8	1	11038	Decal "EMPTY"
9	1	11233	Decal "IMPORTANT" WHEEL BOLTS
10	1	11234	Decal "DRAWBAR ADJUSTMENT"
11	2	12284	Decal "LOGO"
12	2	11236	Decal "1500"
	2	11237	Decal "2200"
	2	11616	Decal "3200"
13	2	12287	Decal "BALZER" (1500)
	2	12288	Decal "BALZER" (2200-3200)
14	1	11064	Decal "SAE 90"
15	1	11063	Decal "SAE 20"
16	1	11036	Decal "Pressure-Vacuum" (Not Shown)
17	1	14255	Decal "540"
	1	14256	Decal "1000"
18	1	8154	Decal "Caution"
19	1	14187	Decal "Danger Gases"

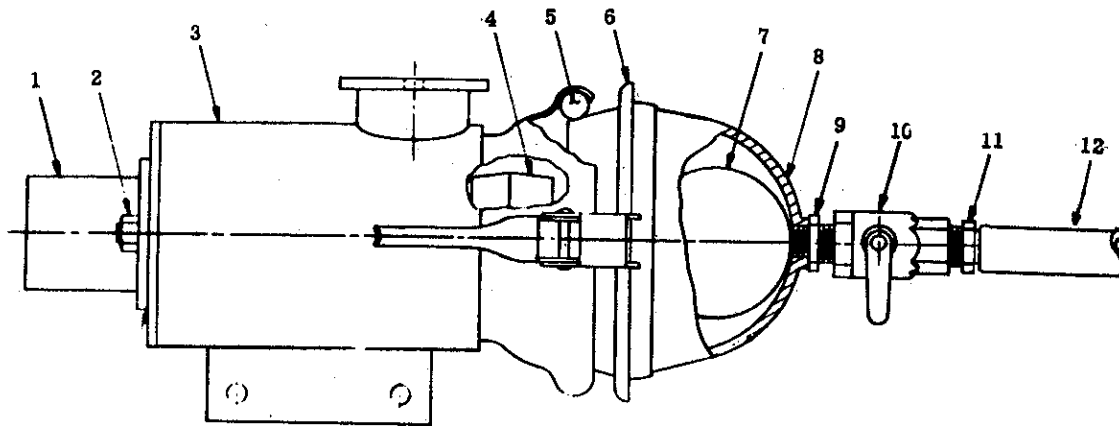
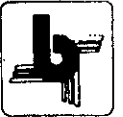
Tank Portal



TANK PORTAL

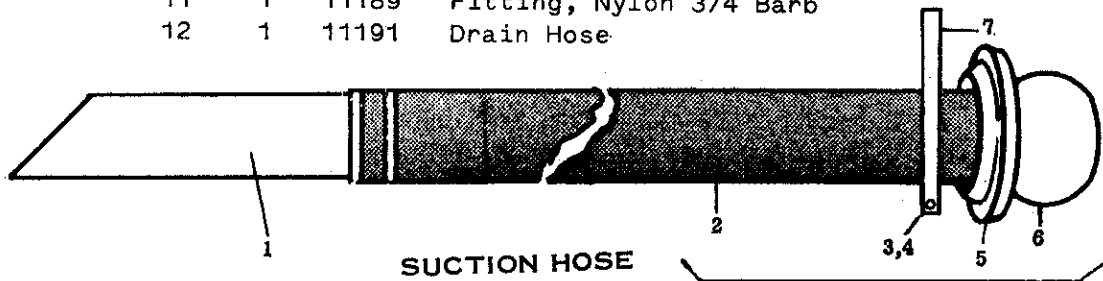
ITEM	QTY	P/N	NAME
1	1	10899	Spring Bar
2	1	9862	Reducer Bushing
3	1	10964	Guage, Vacuum/Pressure
4	1	10903	Cover
5	1	10900	Eye Ring Nut
6	1	10902	Portal Bolt
7	1	10904	Gasket
8	1	1254	Bolt, Hex. HD $\frac{1}{2}$ x $2\frac{1}{2}$ GR 5
9	1	2539	Nut Hex. HD $\frac{1}{2}$ Unitorque
10	2	1206	Bolt, Hex. HD $\frac{3}{8}$ x 1
11	4	1598	Washer, Flat $\frac{3}{8}$
12	2	2496	Nut, Hex HD $\frac{3}{8}$ Unitorque
13	1	10866	Valve Seat
14	1	13309	Ball, Check Valve
15	1	13374	Retainer Weldment

Moisture Trap and Hose



MOISTURE TRAP

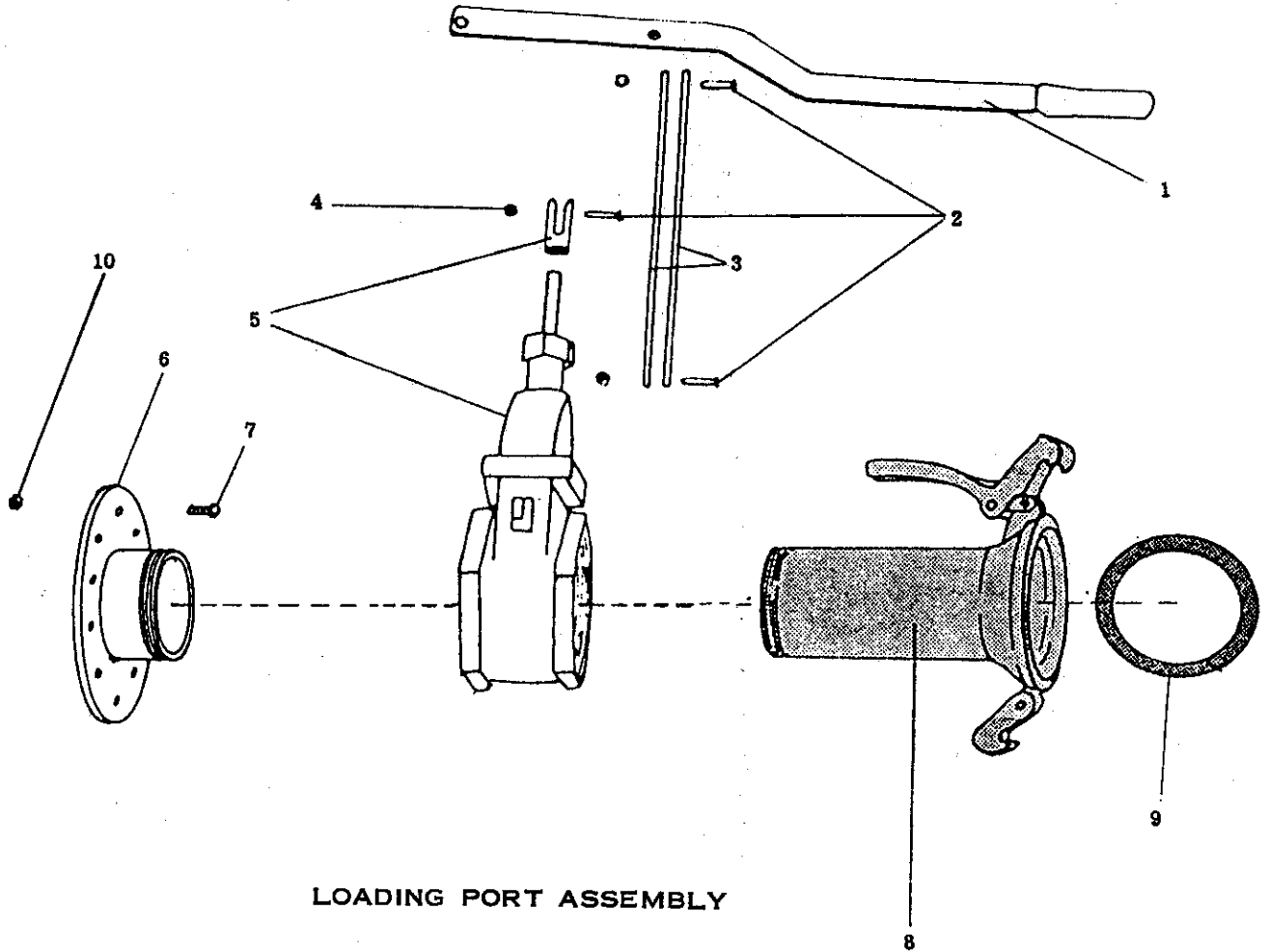
ITEM	QTY	P/N	NAME
1	1	13102	Flange 3"
2	2	1694	Nut, Hex. HD ½
3	1	13385	Moisture Trap
4	1	10866	Valve Seat
5	1	11979	"O" Ring
6	1	11977	Ring Male Coupler
7	1	10867	Ball, Check Valve
8	1	10865	Sight Glass
9	1	11190	Close Nipple, Nylon 3/4
10	1	11188	Ball Valve
11	1	11189	Fitting, Nylon 3/4 Barb
12	1	11191	Drain Hose



SUCTION HOSE

ITEM	QTY	P/N	NAME
1	1	11051	Pipe, Suction (4")
	1	13228	Pipe, Suction (6")
2	1	11050	Hose, Suction (4")
	1		Hose, Suction (6") x 16 Feet (Contact Balzer)
3	1	1187	Bolt, Hex. HD 5/16 x 1½ (4" & 6")
4	1	2081	Nut, Hex HD 5/16 (4" & 6")
5	1	11052	Ring, Connector (4")
	1	11977	Ring, Connector (6")
6	1	13226	Male, Connector, Hose, End (4")
	1	13227	Male, Connector, Hose, End (6")
7	1	13212	Strap Handle Weldment (4")
	1	13230	Strap Handle Weldment (6")
8	1	11047	4" Suction Hose Assembly
	1	13233	6" Suction Hose Assembly

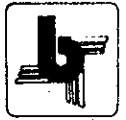
Loading Port Assembly



LOADING PORT ASSEMBLY

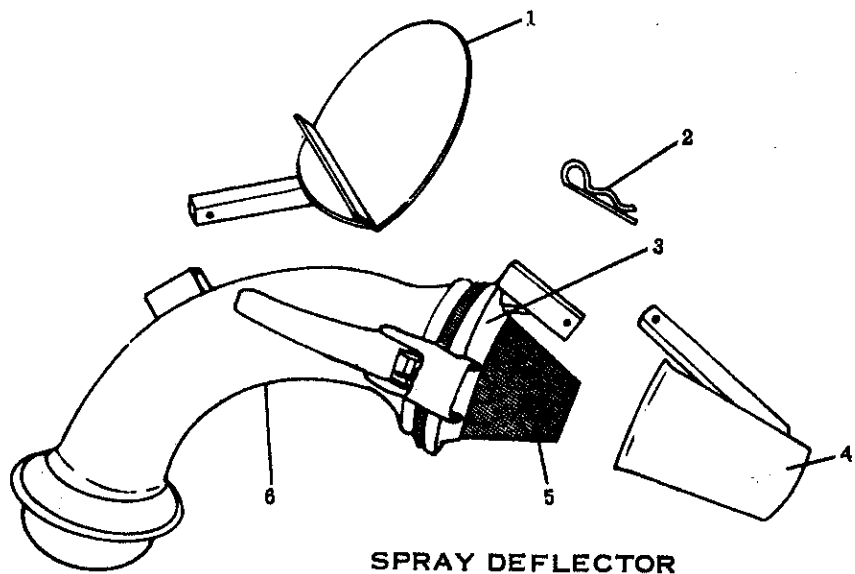
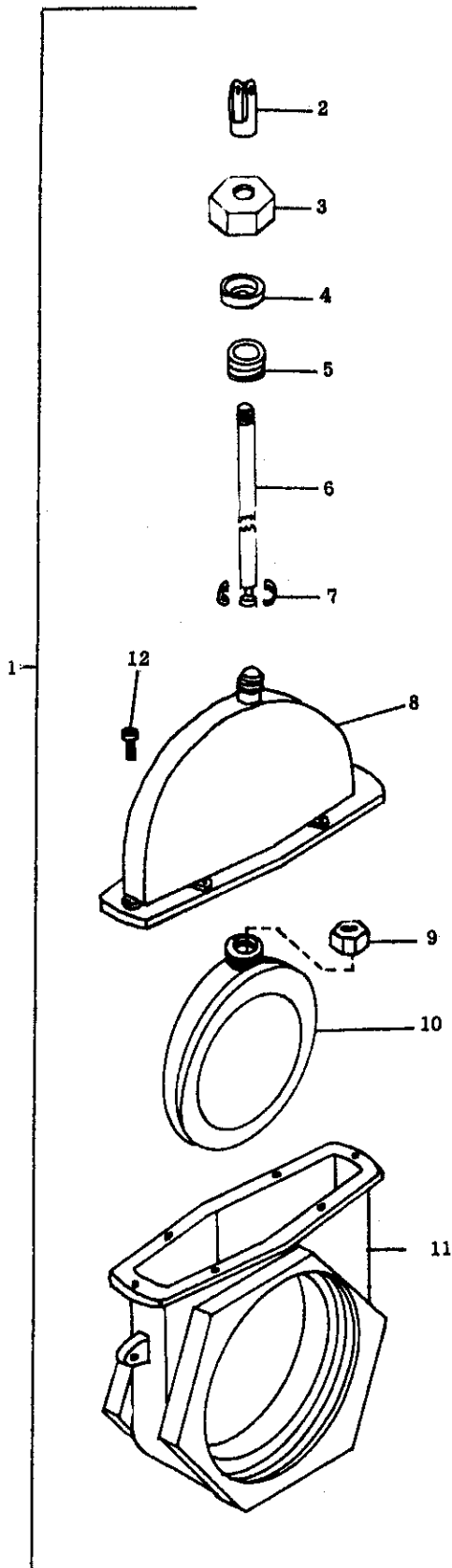
ITEM	QTY	P/N	NAME
1	1	13301	Valve Lever (4" Piston Valve)
	1	13310	Valve Lever (6" Piston Valve)
2	3	1208	Bolt, Hex. HD 3/8 x 1 1/2 GR 5
3	2	13300	Connector Rods (4" Piston Valve)
	2	13234	Connector Rods (6" Piston Valve)
4	3	2496	Nut, Hex. HD 3/8 Unitorque
5	1	12946	4" Piston Valve Assembly
	1	13215	6" Piston Valve Assembly
6	1	10987	Flange Weldment (4" Valve)
	1	12738	Flange Weldment (6" Piston Valve)
7	10	1207	Bolt, Hex. HD 3/8 x 1 1/2
8	1	10983	Female Couple Threaded (4" Valve)
	1	13014	Female Couple Threaded (6" Piston Valve)
9	1	10913	"O" Ring 4" (4" Valve)
	1	11979	"O" Ring 6" (6" Piston Valve)
10	10	2082	Nut, Hex. HD 3/8

Manual Valve and Spray Deflector



MANUAL VALVE

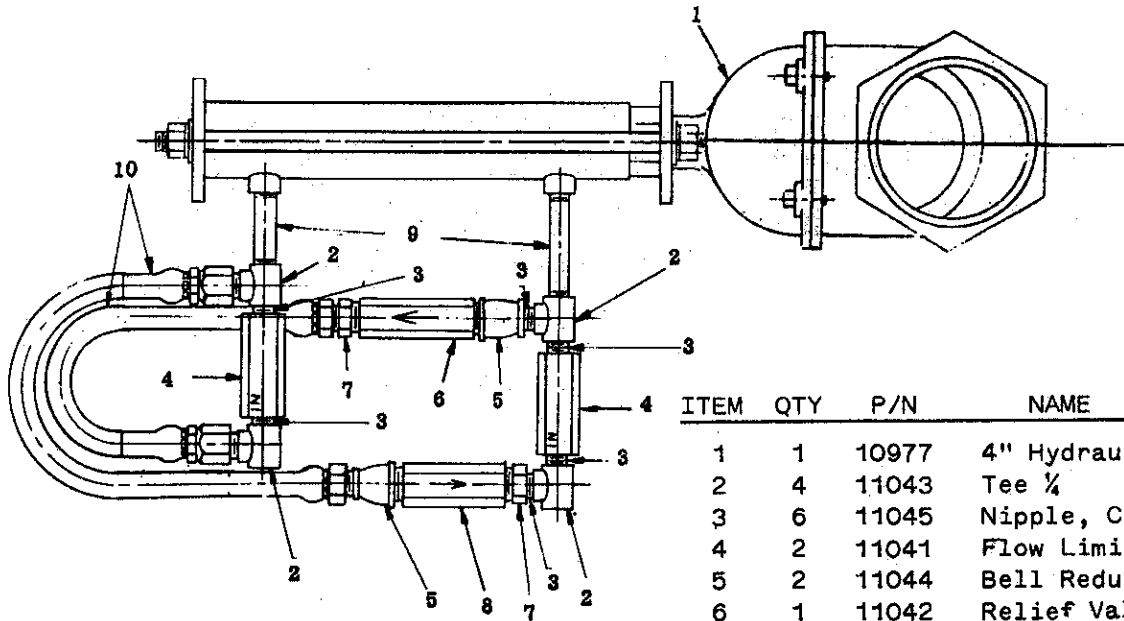
ITEM	QTY	P/N	NAME
1	1	12946	4" Piston Valve Assembly
	1	13215	6" Piston Valve Assembly
2	1	13011	Yoke, Piston Valve (4" Valve)
	1	13216	Yoke, Piston Valve (6" Valve)
3	1	11700	Nut Packing (4" Valve)
	1	13217	Nut Packing (6" Valve)
4	1	12947	Sleeve Packing (4" Valve)
	1	13218	Sleeve Packing (6" Valve)
5	1	12948	Packing (4" Valve)
	1	13219	Packing (6" Valve)
6	1	13012	Stem, Piston Valve (4" Valve)
	1	13220	Stem, Piston Valve (6" Valve)
7	2	13013	Retainer, Piston Valve (4" Valve)
	2	13221	Retainer, Piston Valve (6" Valve)
8	1	11699	Valve, Upper Body (4" Valve)
	1	13222	Valve, Upper Body (6" Valve)
9	1	12949	Nut, Gate (4" Valve)
	1	13223	Nut, Gate (6" Valve)
10	1	10978	Valve, Gate (4" Valve)
	1	13224	Valve, Gate (6" Valve)
11	1	11701	Valve, Lower Body (4" Valve)
	1	13225	Valve, Lower Body (6" Valve)
12	4	3020	Capscrew, Socket HD (4" Valve)
	6	3020	Capscrew, Socket HD (6" Valve)



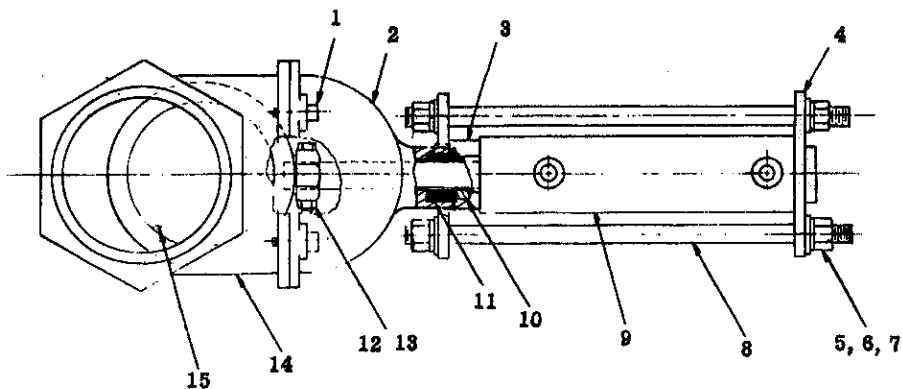
SPRAY DEFLECTOR

ITEM	QTY	P/N	NAME
1	1	11058	Deflector Plate Assembly
2	2	11059	Hair Pin Clip
3	1	11056	Nozzle Clamp Assembly
4	1	11057	Deflector Nozzle Assembly
5	1	11055	Rubber Nozzle
6	1	13010	Deflector Tube Assembly

Hydraulic Valve

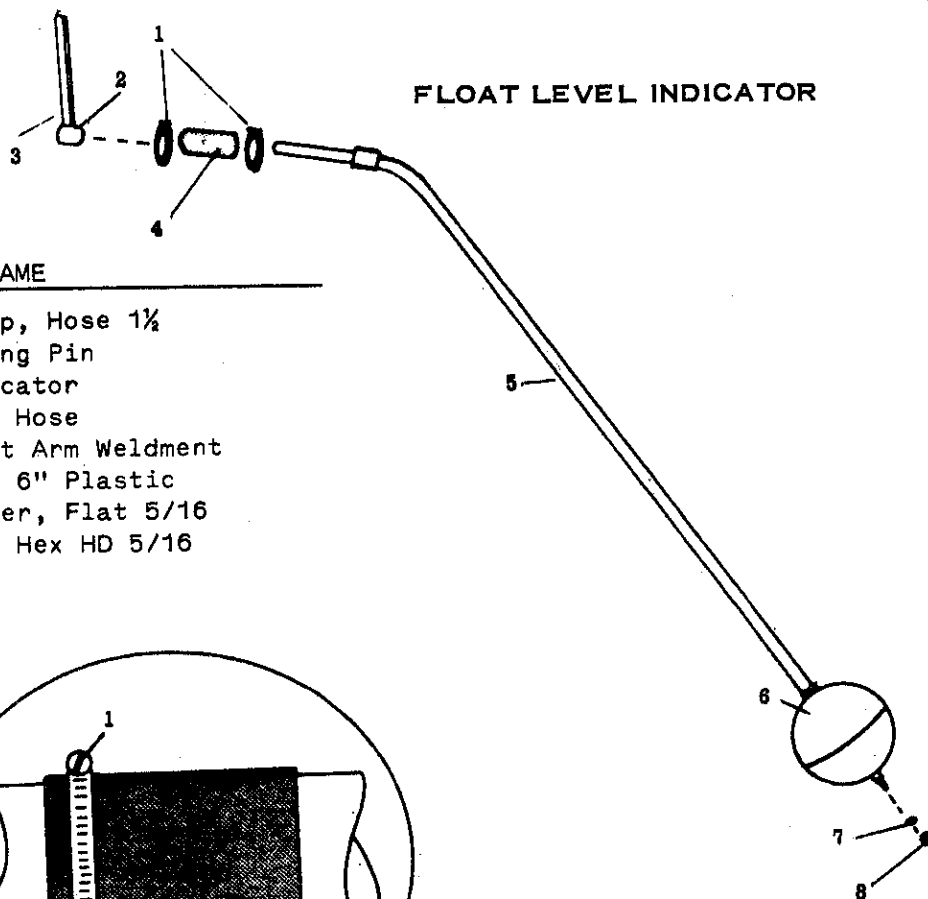


ITEM	QTY	P/N	NAME
1	1	10977	4" Hydraulic Piston Valve
2	4	11043	Tee ¼
3	6	11045	Nipple, Close ¼
4	2	11041	Flow Limiter
5	2	11044	Bell Reducer
6	1	11042	Relief Valve 250 PSI
7	2	9862	Reducer Bushing 3/8 to ¼
8	1	11216	Relief Valve 60 PSI
9	2	11155	Nipple ¼ x 1½
10	2	11156	Hydraulic Hose



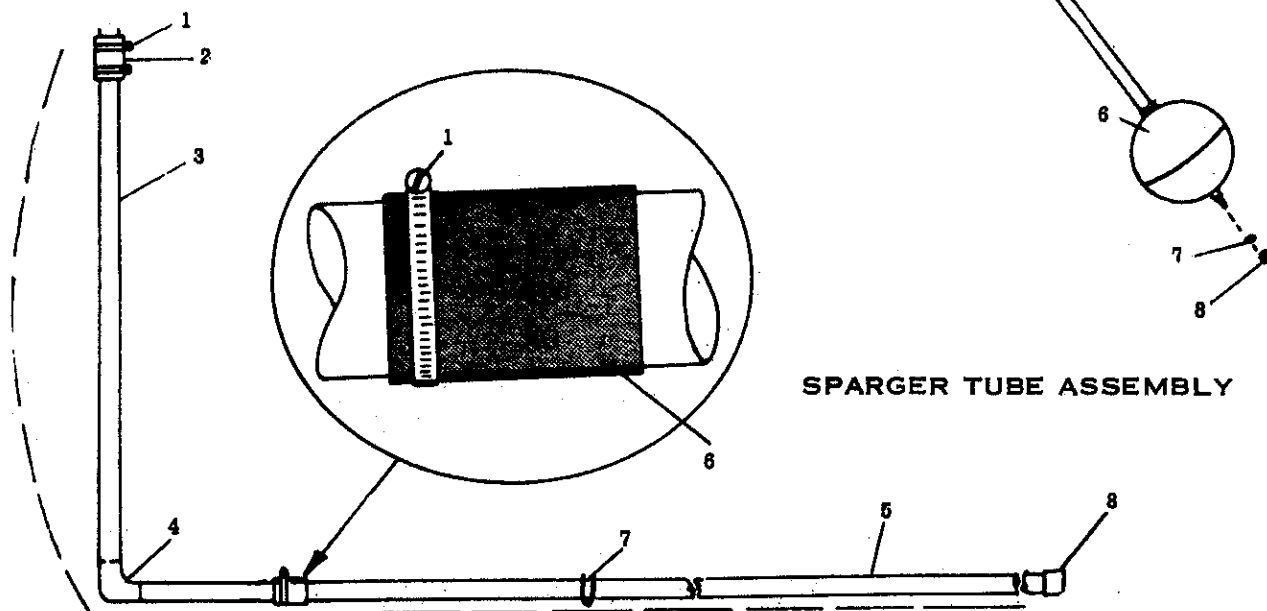
ITEM	QTY	P/N	NAME
1	4	3020	Capscrew Socket HD
2	1	11699	Valve, Upper Body
3	1	11700	Nut Packing
4	2	10982	Plate, Cylinder Support
5	4	1693	Nut, Hex. HD 7/16
6	4	1637	Lockwasher 7/16
7	4	1599	Washer, Flat 7/16
8	2	10980	Threaded Rod 7/16
9	1	10979	Cylinder, Hydraulic Valve
10	1	12947	Sleeve, Packing
11	1	12948	Packing
12	1	11354	Locknut ¼
13	1	11352	Capscrew, Hex. HD ¼ x 1½
14	1	11701	Valve, Lower Body
15	1	12945	Valve, Gate Hydraulic, (Rework)

Float Level Indicator & Sparger Tube



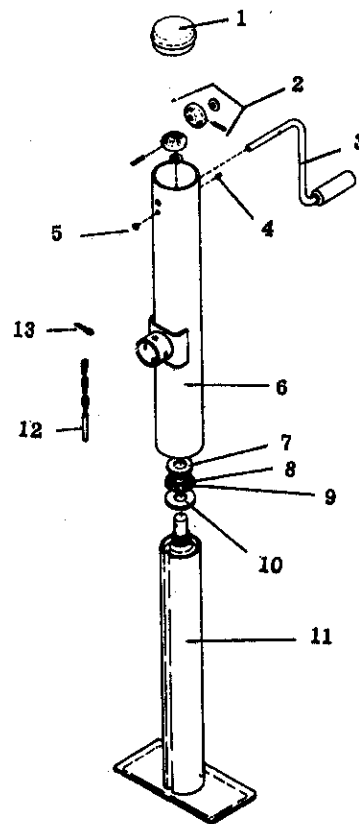
FLOAT LEVEL INDICATOR

ITEM	QTY	P/N	NAME
1	2	10912	Clamp, Hose 1½
2	1	1908	Spring Pin
3	1	10949	Indicator
4	1	10952	Seal Hose
5	1	11905	Float Arm Weldment
6	1	10948	Ball 6" Plastic
7	1	1597	Washer, Flat 5/16
8	1	2081	Nut, Hex HD 5/16



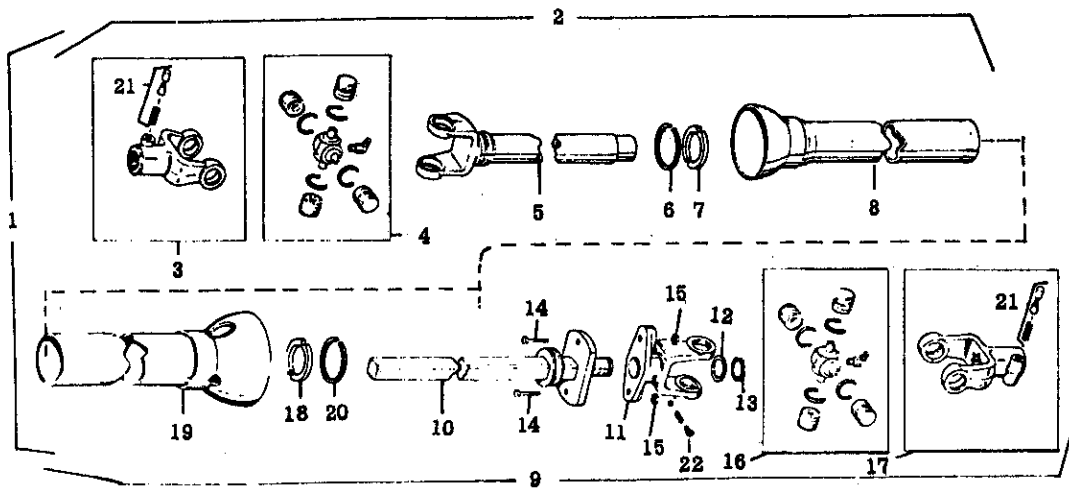
SPARGER TUBE ASSEMBLY

ITEM	QTY	P/N	NAME
1	9	10953	Clamp Hose (1500)
	10	10953	Clamp Hose (2200)
	12	10953	Clamp Hose (3200)
2	1	10967	Sleeve Hose
3	1	13383	Sparger Vertical Lower (1500)
	1	13461	Sparger Vertical Lower (2200)
	1	13489	Sparger Vertical Lower (3200)
4	1	10915	Elbow, 1½
5	1	13382	Sparger Horizontal (1500)
	1	11721	Sparger Horizontal (2200)
	1	13488	Sparger Horizontal (3200)
6	7	10911	Sleeve Hose, Split (1500)
	8	10911	Sleeve Hose, Split (2200)
	10	10911	Sleeve Hose, Split (3200)
7	3	10913	"O" Ring
8	1	10910	Cap, Pipe



JACK

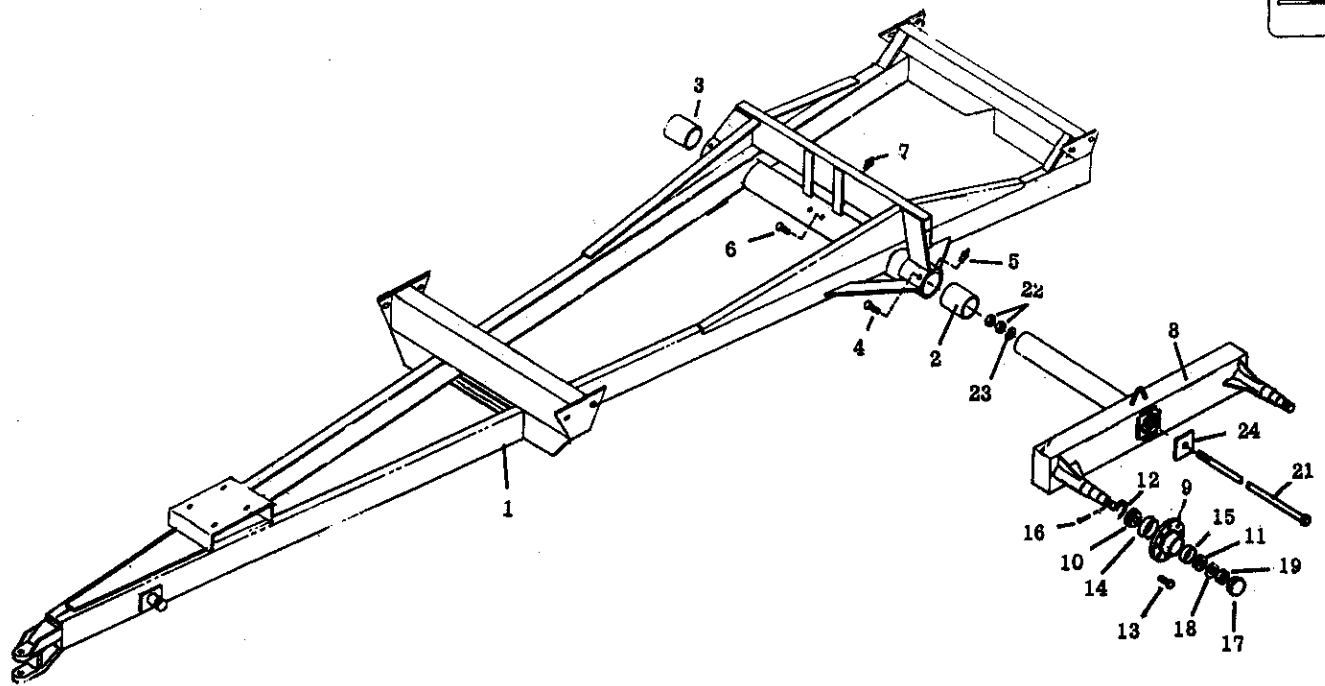
ITEM	QTY	P/N	NAME
1	1	13047	SW Tube Cap
2	1	13046	Bevel Gear Kit
3	1	13045	Crank Assembly
4	1	2288	Zerk, 3/16 Drive-in
5	1	13048	Rubber Grommet
6	1	13055	Outer Tube Assembly
7	1	13054	Thrust Washer
8	1	13053	Ball & Cage Bearing
9	1	13052	Felt Spacer
10	1	13051	Support Washer
11	1	13050	Inner Tube Assembly
12	1	13049	Pull Pin & Chain
13	1	13172	Drive Screw
14		10629	Trailer Jack Complete



PTO

ITEM	QTY	P/N	NAME
1	1	11034	PTO "L6W" (1000 RPM)
	1	11046	PTO "L6W" (540 RPM)
2	1	11361	Joint & Tube Half W/Q DFWG (1000 RPM)
	1	11342	Joint & Tube Half W/Q DFWG (540 RPM)
3	1	11343	Q.D. Yoke Assembly
4	1	11344	Cross "L6W"
5	1	11362	Yoke and Tube (1000 RPM)
		11345	Yoke and Tube (540 RPM)
6	1	11346	Bearing Retainer
7	1	11347	Nylon Bearing
8	1	11363	Male Guard Tube (1000 RPM)
	1	11348	Male Guard Tube (540 RPM)
9	1	11364	Joint and Shaft Shear W/Q DFWG (1000 RPM)
	1	11350	Joint and Shaft Shear W/Q DFWG (540 RPM)
10	1	11351	Shaft with Shear Flange
11	1	11353	Shear Yoke
12	1	11355	Washer
13	1	11356	Retaining Ring
14	2	11352	HHCS $\frac{1}{4}$ - 20 x $1\frac{1}{2}$
15	2	11354	Lock Nut, $\frac{1}{4}$ x 20
16	1	11344	Cross "L6W"
17	1	11365	Q.D. Yoke Assembly (1000 RPM)
		11343	Q.D. Yoke Assembly (1 on 1000 RPM) (2 on 540 RPM)
18	1	11357	Nylon Bearing
19	1	11349	Female Guard Tube
20	1	11353	Bearing Retainer
21		11366	Saf-T-Pin & Spring Kit (1000 RPM)
		11359	Saf-T-Pin & Spring Kit (540 RPM)
22		11360	Instamatic Lube Kit (Not Shown)

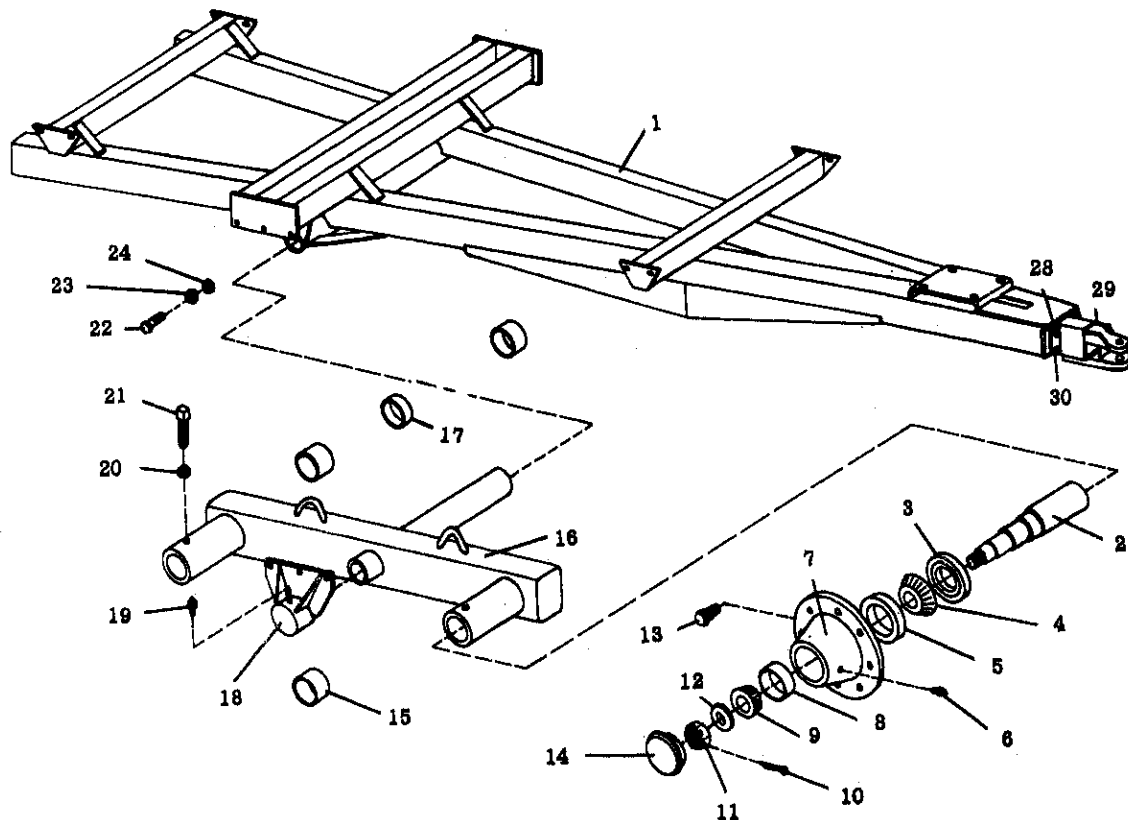
Model 1500



MODEL 1500

ITEM	QTY	P/N	NAME
1	1	10766	Trailer, 1500 Gal Liquid Spreader
2	2	7953	Bearing, Outside
3	1	7954	Bearing, Inside
4	2	1246	Bolt, Hex. HD 1/2 x 3/4
5	2	11247	Bolt Zerk Assembly
6	2	1245	Bolt, Hex. HD 1/2 x 1/2
7	2	11221	Bolt Zerk Assembly
8	2	7992	2 Wheel Tandem Axle
9	4	7516	Hub 8-Bolt
10	4	7518	Bearing Cone Inside
11	4	7519	Bearing Cone Outside
12	4	7520	Seal
13	32	7523	Bolt, Wheel
14	4	8491	Bearing Cup Inside
15	4	8492	Bearing Cup Outside
16	4	2045	Cotter Pin 5/32 x 1 1/2
17	4	7522	Hub, Cap
18	4	1604	Washer Flat
19	4	1753	Nut, Hex. Castle 7/8
20	4	2292	Zerk 1/8 Pipe Elbow (Not Shown)
21	1	8012	Axle Holding Rod
22	2	1696	Nut, Hex. HD 5/8
23	1	1640	Lockwasher 5/8
24	2	7990	Plate, Retainer Axle
25	4	7521	Wheel 15 x 10
26	4	10562	Tire 12.5 x 15
27	4	8842	Valve Stem

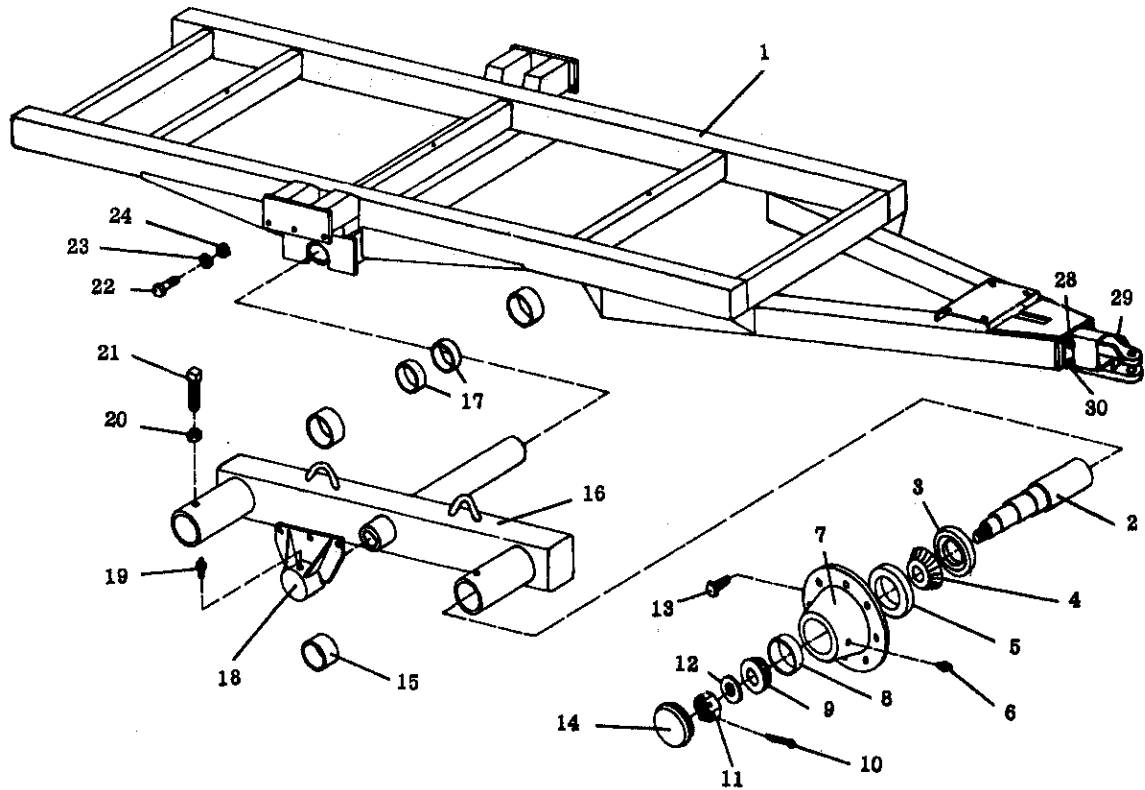
Model 2200



MODEL 2200 RUNNING GEAR

ITEM	QTY	P/N	NAME	ITEM	QTY	P/N	NAME
1	1	11429	Main Frame, Trailer	17	1	7954	Bearing, Inside
2	4	13153	Spindle 2200	18	2	11467	Cap, Axle
3	4	13142	Grease Seal	19	6	11221	Bolt, Zerk Assembly
4	4	13138	Bearing Cone, Inner	20	4	1697	Nut, Hex. 3/4 NC
5	4	13139	Bearing Cup, Inner	21	4	2513	Set Screw, Sq. Hd. 3/4
6	4	2286	Zerk (Short)	22	6	1291	Bolt, Hex Hd. 5/8 x 2 Gr 5
7	4	13137	Hub 2200	23	6	1640	Lockwasher 5/8
8	4	13141	Bearing Cup, Outer	24	6	1696	Nut, Hex 5/8
9	4	13140	Bearing Cone, Outer	25	4	11494	Wheel W11C x 16.1
10	4	2045	Cotter Pin	26	4	11495	Tire 16.5 x 16.1
11	4	13144	Nut, Castle 7/8	27	4	8842	Valve System
12	4	1605	Washer, Flat 7/8	28	8	2538	Bolt, Hex. Hd 3/4 x 1 1/2 Gr 5
13	32	13152	Bolt, Wheel	29	1	12624	Dummy Hitch
14	4	13143	Grease Cap	30	8	1641	Lockwasher, 3/4
15	4	12290	Bearing, Outside	31	32	13496	Nut, Wheel (not shown)
16	2	11490	Oscillating Arm	32	2	1245	Bolt, Hex. Hd 1/2 x 1/2 (not shown)

Model 3200

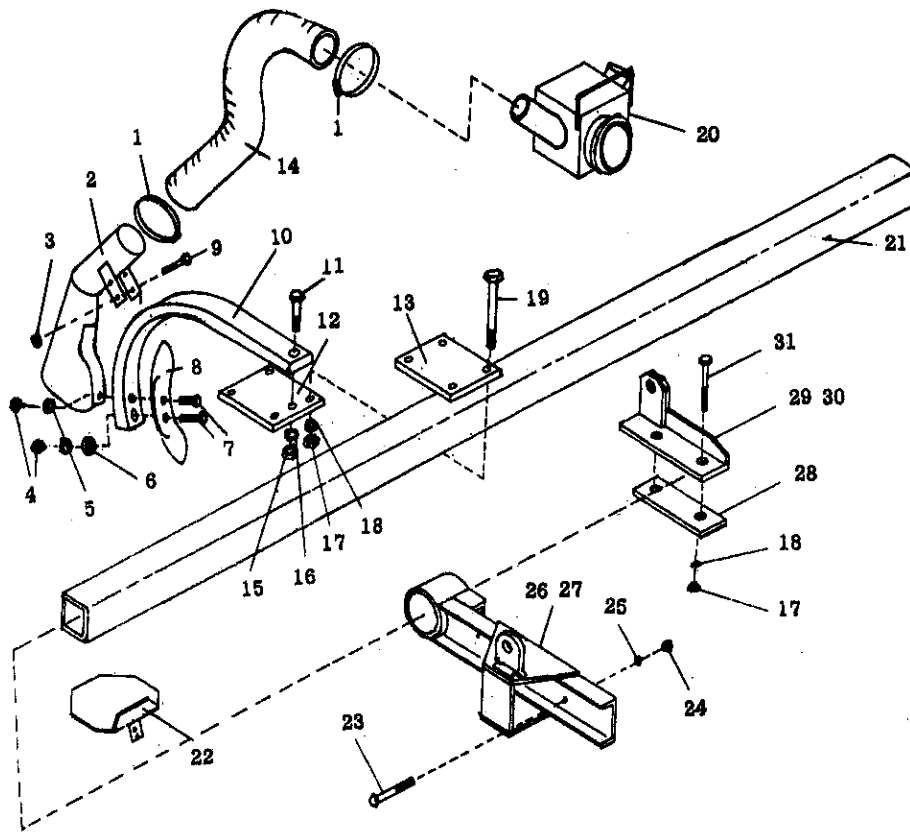


MODEL 3200 RUNNING GEAR

ITEM	QTY	P/N	NAME	ITEM	QTY	P/N	NAME
1	1	*	Main Frame, Trailer	17	2	8493	Bearing, Inside
2	4	13154	Spindle 3200	18	2	11467	Cap, Axle
3	4	13151	Grease Seal	19	6	11221	Bolt, Zerk Assembly
4	4	13150	Bearing Cone, Inner	20	4	1697	Nut, Hex 3/4 NC
5	4	13149	Bearing Cup, Inner	21	4	2513	Set Screw, Sq. Hd. 3/4
6	4	2286	Zerk (Short)	22	6	2514	Bolt, Hex Hd. 5/8 x 2 Gr 5
7	4	13146	Hub 3200	23	6	1640	Lockwasher 5/8
8	4	13147	Bearing Cup, Outer	24	6	1696	Nut, Hex 5/8
9	4	13148	Bearing Cone, Outer	25	4	11473	Wheel 18 x 16.1
10	4	2045	Cotter Pin	26	4	11472	Tire 21.5 x 16.1
11	4	13144	Nut	27	4	8842	Valve Stem
12	4	1605	Washer	28	8	2538	Bolt, Hex Hd. 3/4 x 1 1/2, Gr 5
13	32	13152	Bolt, Wheel	29	1	12624	Dummy Hitch
14	4	13143	Grease Cap	30	8	1641	Lockwasher, 3/4
15	4	12290	Bearing, Outside	31	32	13496	Nut, Wheel (not shown)
16	2	*	Oscillating Arm				

* Contact Balzer Manufacturing
for parts

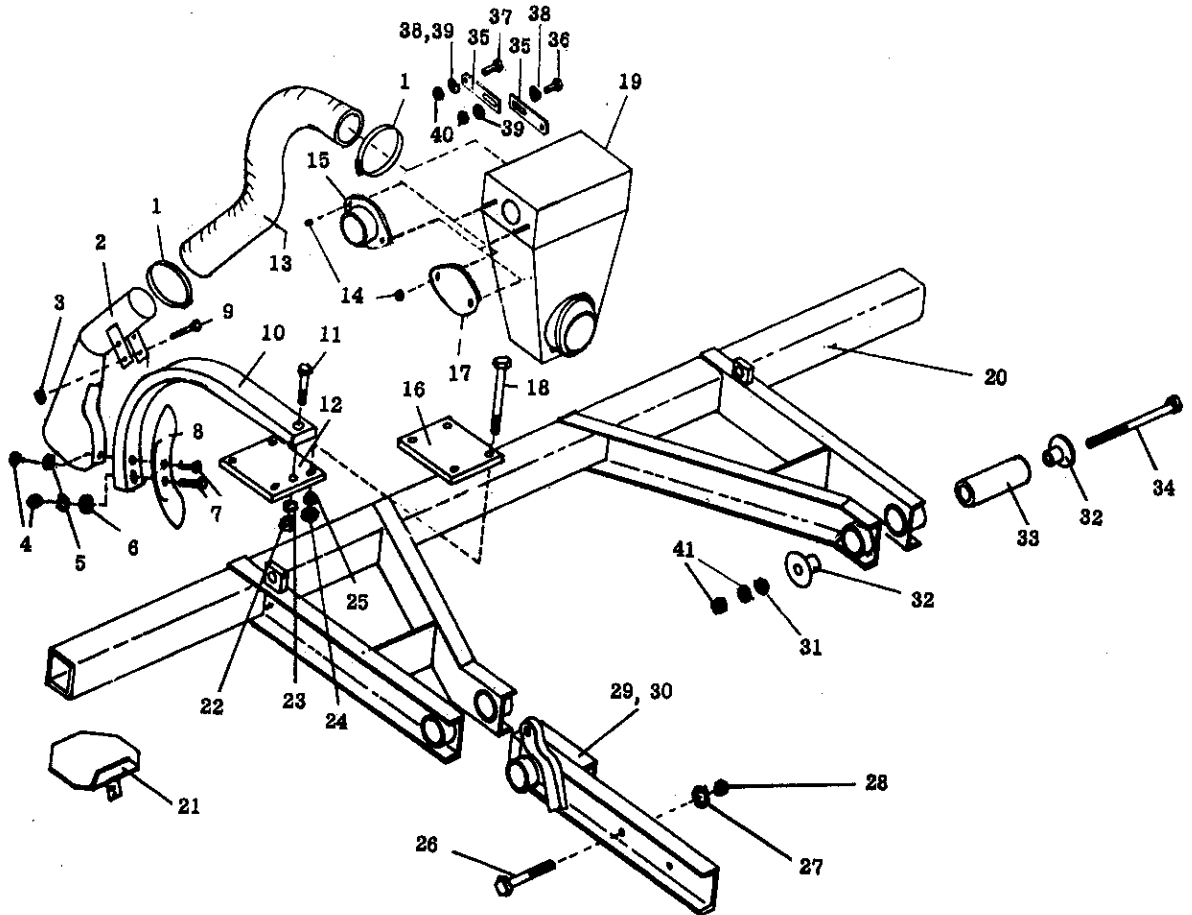
1500 Injector



1500 INJECTOR

ITEM	QTY	P/N	NAME	ITEM	QTY	P/N	NAME
1	4	10953	Hose, Clamp 3"	16	2	1642	Lockwasher 7/8
2	2	11963	Injector Tube	17	12	1697	Nut, Hex 3/4
3	4	2475	Nut, Hex Hd 5/16 Unitorque	18	12	1641	Lockwasher 3/4
4	4	1694	Nut, Hex Hd 1/2	19	8	2520	Bolt, Hex 3/4 x 7 1/2 Gr 5
5	4	1638	Lockwasher 1/2	20	1	12715	Manifold
6	2	1600	Washer, Flat 1/2	21	1	12081	Injector Bar
7	4	1254	Bolt, Hex 1/2 x 2 1/2	22	2	12074	Deflector Attachment
8	2	11962	Injector Knife	23	8	1302	Bolt, Hex 5/8 x 5 1/2
9	4	1505	Bolt, Truss 5/16 x 3	24	8	1696	Nut, Hex 5/8
10	2	11961	Injector Shank	25	8	1640	Lockwasher 5/8
11	2	1330	Bolt Hex 7/8 x 2-3/4	26	1	12699	Injector Mount, Right
12	2	11960	Mounting Plate, Bottom	27	1	12705	Injector Mount, Left
13	2	11959	Mounting Plate, Top	28	2	12710	Plate, Lift Arm, Lower
14	2	11967	Injector Hose, Mid	29	1	12709	Lift Arm, Hydraulic Right
15	2	1698	Nut, Hex 7/8	30	1	12713	Lift Arm, Hydraulic Left
				31	4	1322	Bolt, Hex 3/4 x 6 Gr 5

2200 and 3200 Injectors

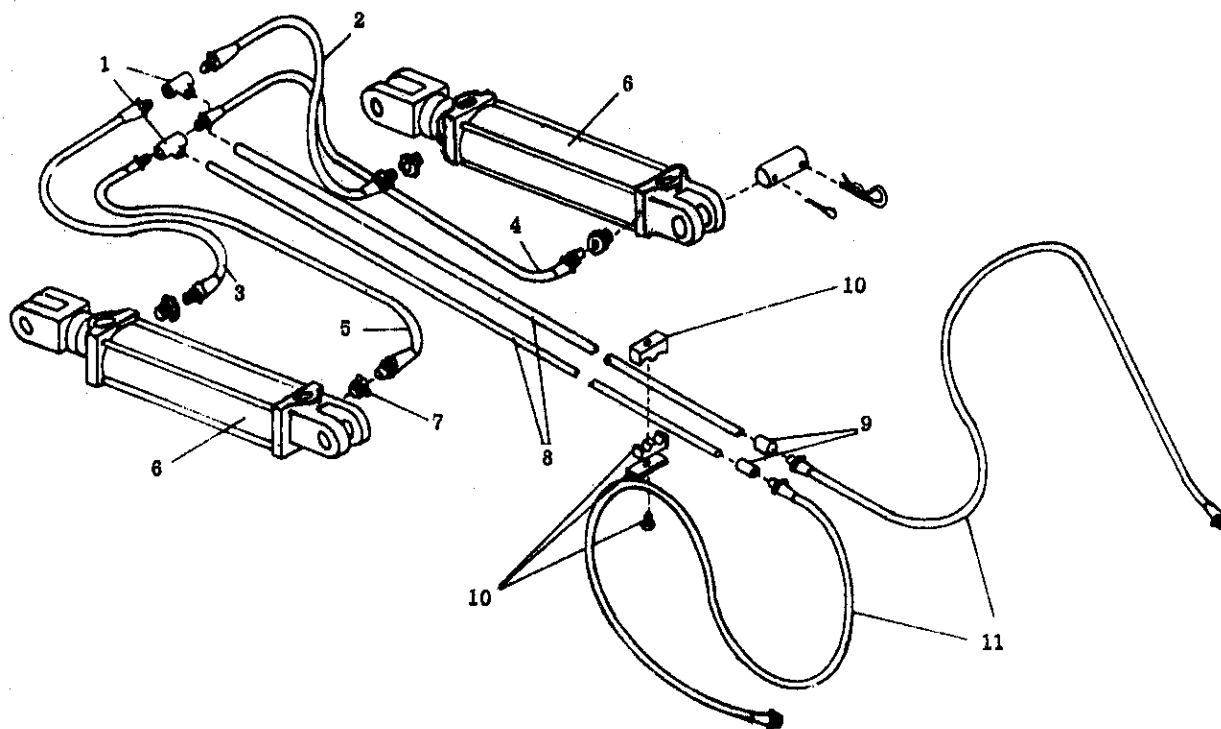


2200 AND 3200 INJECTORS

ITEM	QTY	P/N	NAME	ITEM	QTY	P/N	NAME
1	* 2	10953	Hose Clamp 3"	21	* 1	12074	Deflector Attachment
2	* 1	11963	Injector Tube	22	* 1	1698	Nut, Hex 7/8
3	* 2	2475	Nut, Hex 5/16 Unitorque	23	* 1	1642	Lockwasher 7/8
4	* 2	1694	Nut, Hex Hd 1/2	24	* 4	1697	Nut, Hex Hd 3/4
5	* 2	1638	Lockwasher 1/2	25	* 4	1641	Lockwasher 3/4
6	* 1	1600	Washer, Flat 1/2	26	8	1302	Bolt, Hex Hd 5/8 x 5 1/2 Gr 5
7	* 2	1254	Bolt, Hex Hd 1/2 x 2 1/2	27	8	1640	Lockwasher 5/8
8	* 1	11962	Injector Knife	28	8	1696	Nut, Hex Hd 5/8
9	* 2	1505	Bolt Truss 5/16 x 3	29	1	12082	Injector Mount, Right 2200
10	* 1	11961	Injector Shank		1	12024	Injector Mount, Right 3200
11	* 1	1330	Bolt, Hex 7/8 x 2-3/4	30	1	12083	Injector Mount, Left 2200
12	* 1	11960	Mounting Plate, Bottom		1	12025	Injector Mount, Left 3200
13	AR	11967	Injector Hose, Mid 72"	31	2	1638	Lockwasher 1/2
	AR	11968	Injector Hose 90"	32	4	11954	Retainer
14	12	1694	Nut, Hex Hd 1/2	33	2	11953	Pivot Pipe
15	* 1	13102	Flange	34	2	11981	Bolt Weldment 1/2
16	* 1	11959	Mounting Plate, Top	35	2	13253	Bracket, Support
17	2	13101	Plate, Blank	36	1	1207	Bolt, Hex Hd 3/8 x 1 1/4
18	* 4	2520	Bolt, Hex Hd 3/4 x 7 1/2 Gr 5	37	2	1206	Bolt, Hex Hd 3/8 x 1
19	i	13240	Manifold	38	2	1598	Washer, Flat 3/8
20	1	12088	Injector Bar (2200)	39	3	1636	Lockwasher 3/8
	1	12077	Injector Bar (3200)	40	3	1692	Nut, Hex Hd 3/8
				41	4	1694	Nut, Hex Hd 1/2

* Per Knife

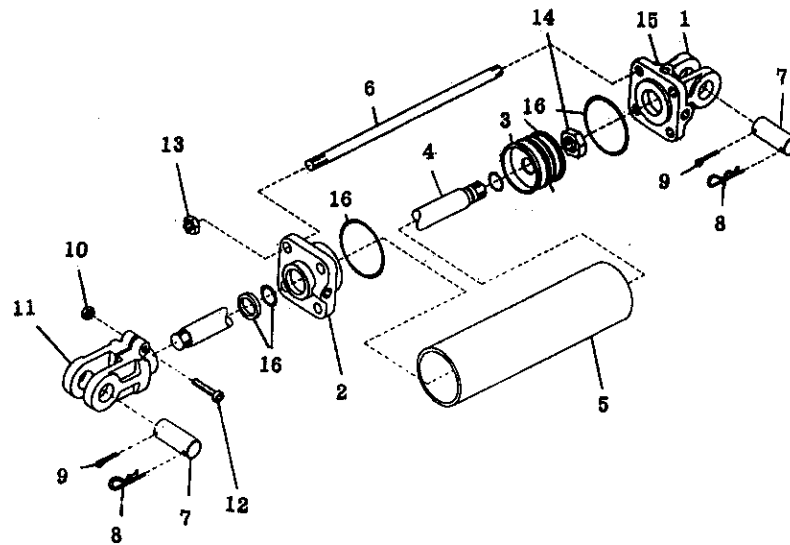
Injector Hydraulics



INJECTOR HYDRAULICS

ITEM	QTY	P/N	NAME
1	2	11043	Tee
2	1	10989	Hydraulic Hose
3	1	11997	Hydraulic Hose (1500)
4	1	10989	Hydraulic Hose
5	1	11997	Hydraulic Hose
6	2	8210	Cylinder
7	4	9862	Reducer 3/8-1/4
8	2	12746	Hydraulic Pipe (1500)
	2	12089	Hydraulic Pipe (2200)
	2	12020	Hydraulic Pipe (3200)
9	2	10996	Coupler
10	3	10997	Pipe Clamp Assembly
11	2	11930	Hydraulic Hose
12	4	11631	Street Elbow 1/4 (Not Shown)
13	1	12747	Transport Bracket (1500) (Not Shown)
	2	13105	Transport Bracket (2200) (Not Shown)
	2	12747	Transport Bracket (3200) (Not Shown)
14	2	13106	Cylinder Spacer (2200) (Not Shown)
	2	13114	Cylinder Spacer (3200) (Not Shown)
15	4	1172	Bolt, Hex. Hd. 1/4x3 (Not Shown)
	4	2080	Nut, Hex Hd. 1/4 (Not Shown)
16	2	12863	Decal "Remove Before Using" (Not Shown)

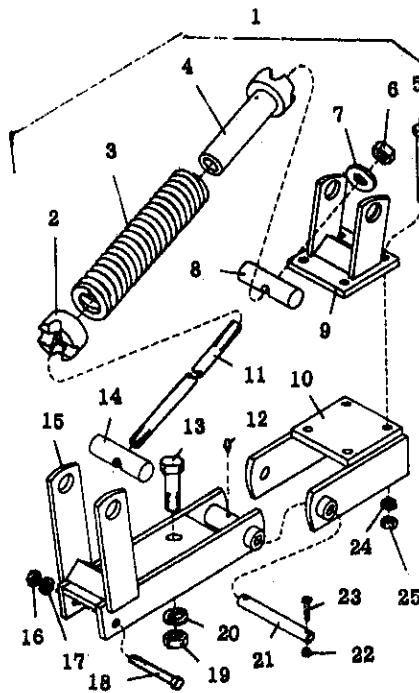
Hydraulic Cylinder



HYDRAULIC CYLINDER

ITEM	QTY	P/N	NAME
1	1	13329	Clevis Cap (2 x 10)
	1	13873	Clevis Cap (2½ x 10)
2	1	13334	Rod Cap (2 x 10)
	1	13876	Rod Cap (2½ x 10)
3	1	13331	Piston (2 x 10)
	1	13878	Piston (2½ x 10)
4	1	13333	Rod (2 x 10 2½ x 10)
5	1	13330	Cylinder Tube 2 x 10
	1	13885	Cylinder Tube 2½ x 10
6	4	13327	Tie Rod 2 x 10 2½ x 10
7	2	8802	Pin 1"
8	2	8812	Clip Pin
9	2	2053	Cotter Pin 3/16 x 1½
10	1	8813	Nut, Hex 3/8
11	1	13325	Rod Clevis
12	1	13326	SHCS 3/8 x 3/4
13	8	8813	Nut, Hex 3/8
14	1	13328	Nut, Piston 3/4 UNF
15	1	13892	Plug 3/8 NPT
16	1	13332	Seal Kit (2 x 10)
	1	13891	Seal Kit (2½ x 10)

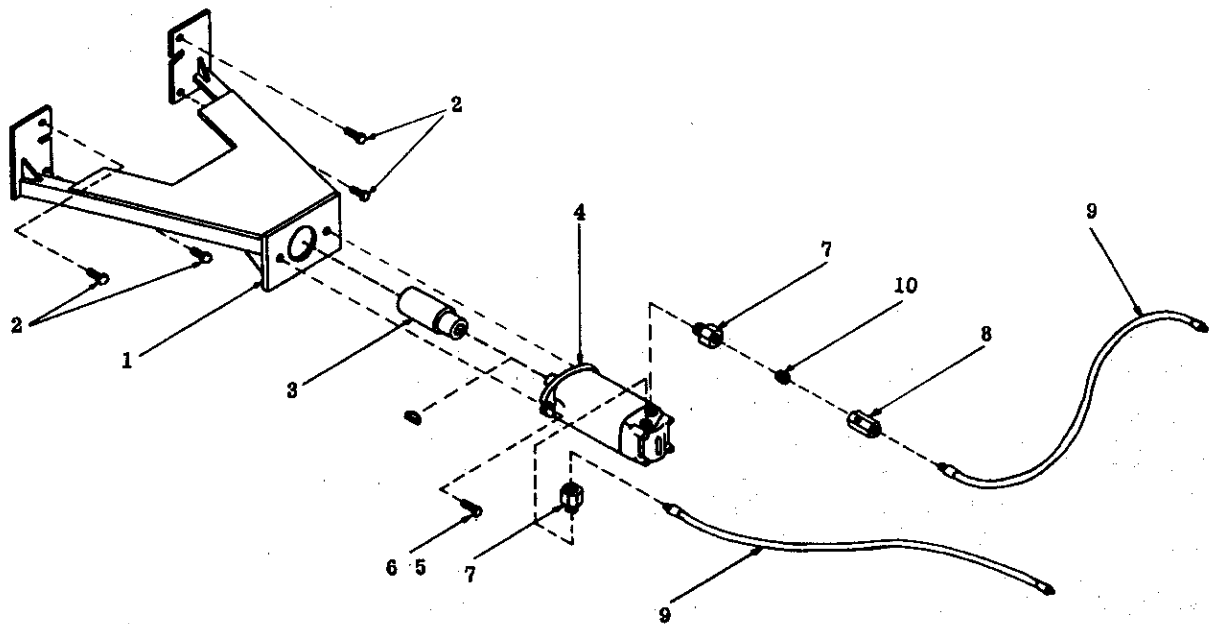
Spring Clamp Assembly



SPRING CLAMP ASSEMBLY

ITEM	QTY	P/N	NAME
1		12063	Spring Clamp Assembly Complete
2	1	12073	Adjustment Clamp
3	1	12070	Spring
4	1	12072	Spring Clamp Casting
5	4	2516	Bolt, HHCS 5/8 x 6 Gr 5
6	1	1777	Nut, Hex Hd 3/4 (Lock)
7	1	1603	Washer, Flat 3/4
8	1	12069	Spring Clamp Pin
9	1	12066	Top Clamp
10	1	12065	Bottom Clamp
11	1	12071	Spring Rod
12	1	2286	Grease Zerk 1/4 - 28
13	1	2524	Bolt, HHCS 7/8 x 2-3/4 Gr 5
14	1	12068	Rear Pin
15	1	12064	Shank Mounting Assembly
16	1	1694	Nut, Hex Hd 1/2
17	1	1638	Lockwasher 1/2
18	1	2523	Bolt, HHCS 1/2 x 4 Gr 5
19	1	1698	Nut, Hex Hd 7/8
20	1	1642	Lockwasher 7/8
21	1	12067	Spring Shank Pivot Pin
22	2	1770	Nut, Hex Hd 1/4 (Lock)
23	2	2525	Bolt, Hex Hd 1/4 x 2 Gr 5
24	4	1640	Lockwasher 5/8
25	4	1696	Nut, Hex Hd 5/8

Hydraulic Drive



HYDRAULIC DRIVE

ITEM	QTY	P/N	NAME
1	1	14020	Motor Bracket, Vacuum Pump
2	4	3034	Bolt, Hex Hd. 10 x 30MM
3	1	14019	Coupler, Pump to Motor
4	1	10565	Motor, Hydraulic 6.2
5	2	1249	Bolt, Hex Hd. 1/2 x 1 1/4
6	2	2084	Nut, Hex Hd. 1/2
7	2	10460	Adapter 7/8 - 1/4 O-Ring
8	1	10459	Check Valve
9	2	11303	Hydraulic Hose, 1/2 x 50
10	1	8220	Nipple, Close 1/2
11	1	14018	Hydraulic Drive, Vacuum Pump (Complete)

Brake Installation and Adjustment



1. Jack and block one end of an oscillating arm assembly. Remove tire and wheel assembly. Remove complete hub and spindle assembly from tandem arm.
2. Mount brake drum to hub using 1/2 - 20 bolts provided.
3. Mount brake assembly to flange welded to spindle tube on arm assembly, using the bolts with ground off heads in mounting, be sure hydraulic wheel cylinder is at the top.

CAUTION: The brake assemblies are marked right and left. Brake assemblies must be put on the correct corresponding side, this is because of the back-up feature of the brakes. To determine right and left sides of tank, stand behind tank facing back of unit, tongue end in front.

4. Install hub and spindle assembly with brake drum on it, locking spindle in place with set screw and locking nut. It may be necessary to back off brake linings to get them inside brake drum.
5. Replace tire and wheel assembly on to hub.
6. Before removing jack and blocks, brakes must be adjusted. The back up feature of the brakes makes it necessary to rotate wheels in forward direction only when adjusting, the adjusting nut is located behind a slot at the bottom of the brake backing plate. Tighten until linings slightly drag on drum, then back off the adjustment nut 10 to 12 notches.

7. Repeat steps 1 to 6 until the required number of brakes have been installed (two - 2200, four - 3200).
8. Install brake lines per diagram for your unit, 11/64" holes must be drilled for screws holding brake tubes to trailer frame. Place actuator assembly on trailer. Refer to pages 45 & 46.
9. Bleeding the system. Use only SAE 70R1 or 70R3 heavy duty brake fluid.

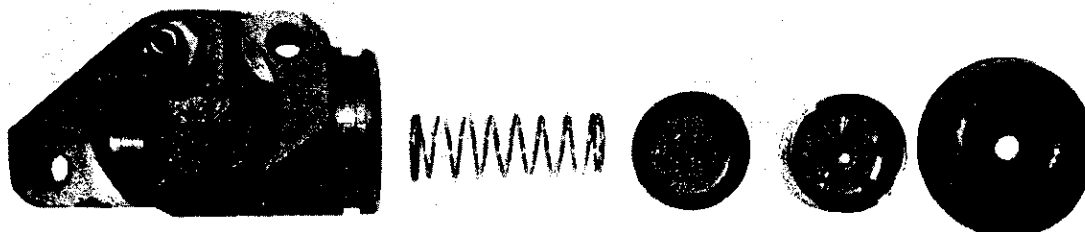
If pressure bleeding equipment is available, follow the manufacturers instructions in bleeding the system.

If system is to be bled manually, proceed as follows:

1. Remove damper pin from actuator to facilitate bleeding.
2. Fill master cylinder with fluid. Install bleeder hose on wheel farthest from master cylinder. Have loose end of hose submerged in brake fluid in a glass container to observe bubbling.
3. By loosening the bleeder screw located in the wheel cylinder one turn, the system is open to the atmosphere. Pump the actuator with long steady strokes. The bleeding operation for that wheel is complete when bubbles no longer rise to the surface of the fluid in container. Close bleeder screw securely.
4. Repeat bleeding operation at each wheel cylinder. During the operation replenish brake fluid in master cylinder so the fluid level does not fall below 1/2 full.
5. After bleeding is completed, make sure master cylinder is filled and filler cap is securely in place. Replace damper pins in actuator and secure with cotter pins.



TYPICAL WHEEL CYLINDER PARTS



In overhauling wheel cylinders, it is best to remove the cylinder from the brake cluster assembly in order to facilitate repair.

TO DIS-ASSEMBLE

To remove the cylinder, unhook the brake shoe lever retracting spring and expand the shoe levers by hand. Disconnect hydraulic line, remove cylinder mounting bolts and lift cylinder from mount. If cylinder is connected with brake hose, loosen, but do not twist hose connection. Lift cylinder free of mount, pulling hose through mounting bracket then unscrew cylinder from hose end.

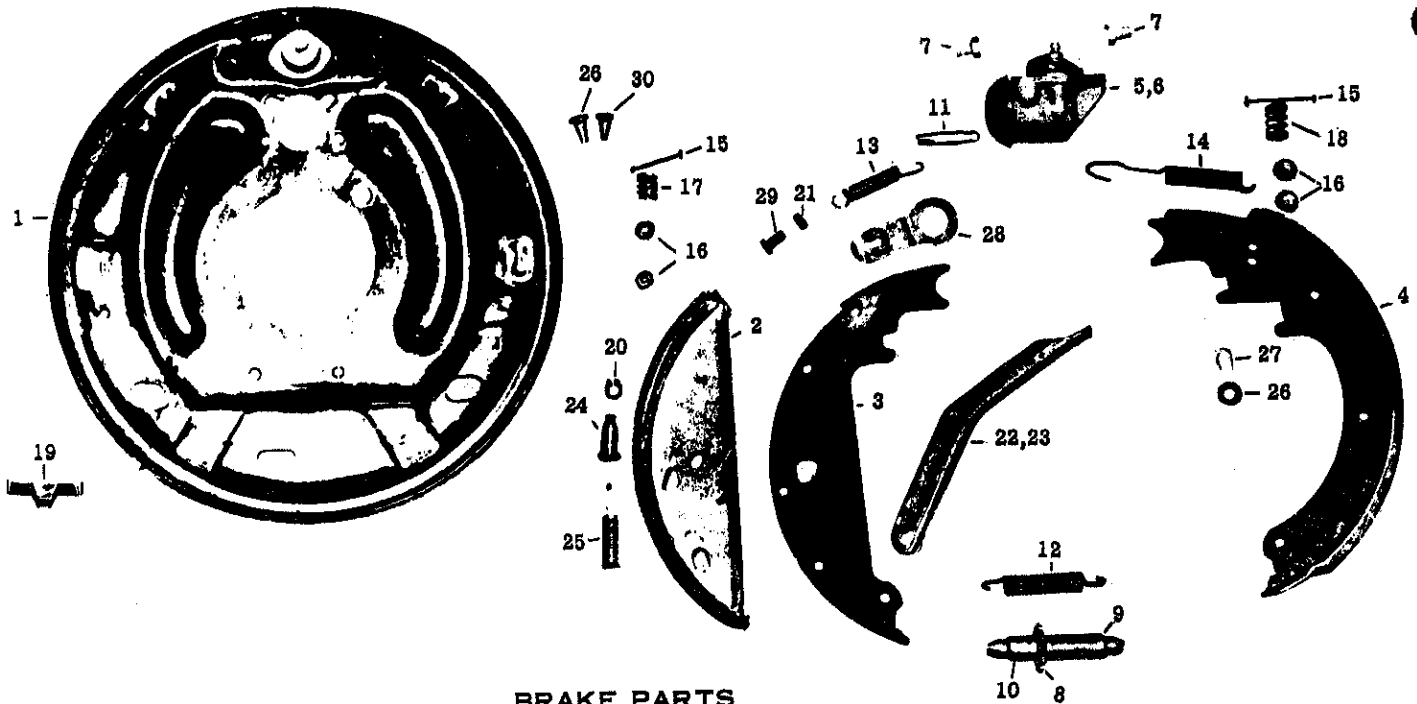
Remove the rubber boot. Push out internal parts or apply low pressure compressed air to fluid inlet, blowing parts from cylinder.

Clean parts well and keep them clean. There must be no trace of dirt, metal filings, sludge, or other deposits when the unit is ready for assembly. Use lint-free cloth in cleaning. Internal parts must be cleaned in denatured alcohol or hydraulic brake fluid. Cylinder castings may be cleaned with your usual cleaning methods but must be finish cleaned with denatured alcohol or hydraulic brake fluid to remove all traces of solvent. Mineral base solvents deteriorate rubber parts.

TO RE-ASSEMBLE

To re-assemble, lubricate parts and cylinder wall with clean brake fluid. Push in spring, rubber cup and one piston. To assemble the rubber cup, cock it slightly so the flange will not bind. A slight vacuum applied to the fluid inlet will prevent the spring from forcing out the cup. Install boot making certain it is seated into the boot grooves provided on cylinder.

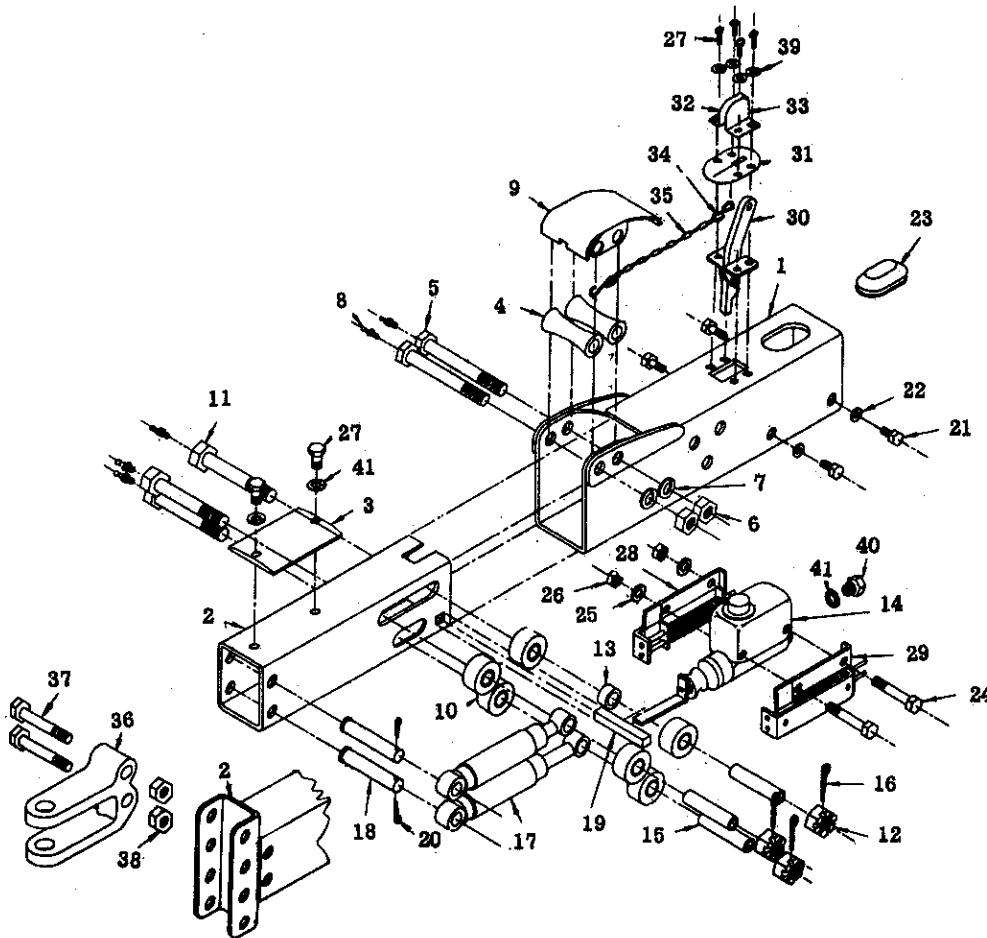
Brake Parts



BRAKE PARTS

ITEM	QTY	P/N	NAME
1	1	12633	Back Plate Assembly
2	1	12634	F Brake Shoe Assembly
3	1	12635	F Shoe Lever
4	1	12636	R Shoe Assembly
5	1	12637	Wheel Cylinder Assembly - Right
6	1	12638	Wheel Cylinder Assembly - Left
7	2	12639	Screw and Lockwasher
8	1	12640	Adjusting Screw
9	1	12641	Pivot Nut
10	1	12642	Socket - Adjusting Screw
11	1	12643	Push Rod - Wheel Cylinder
12	1	12644	Spring - Adjusting Screw (Yellow)
13	1	12645	Spring - Front Lever (Red)
14	1	12646	Spring - Rear Shoe (Orange)
15	2	12647	Pin - Shoe Hold Down
16	4	12648	Cup - Shoe Hold Down
17	1	12649	Spring - Front Hold Down (Yellow)
18	1	12650	Spring - Rear Hold Down (Black)
19	1	12651	Cover Plate - Adjusting hole
20	1	12652	Retaining Ring (Truarc)
21	1	2475	Hex-Locknut 5/16" NC
22	1	12659	Travel Link
23	1	1182	Travel Link Bolt-Hex Cap Screw 5/16" NC x 5/8"
24	1	12662	Pin - Front Shoe - Without Park Linkage
25	1	12663	Spring - Front Shoe
26	1	12664	Plug - Plastic
27	1	1704	Hex Nut 1/2" NF Back Plate Mtng. Bolts
28	1	2542	Cap Screw 1/2" NF x 1" (not illus.)
29	1	1638	Lockwasher 1/2" (not illus.)
30	1	12665	Plug - Plastic

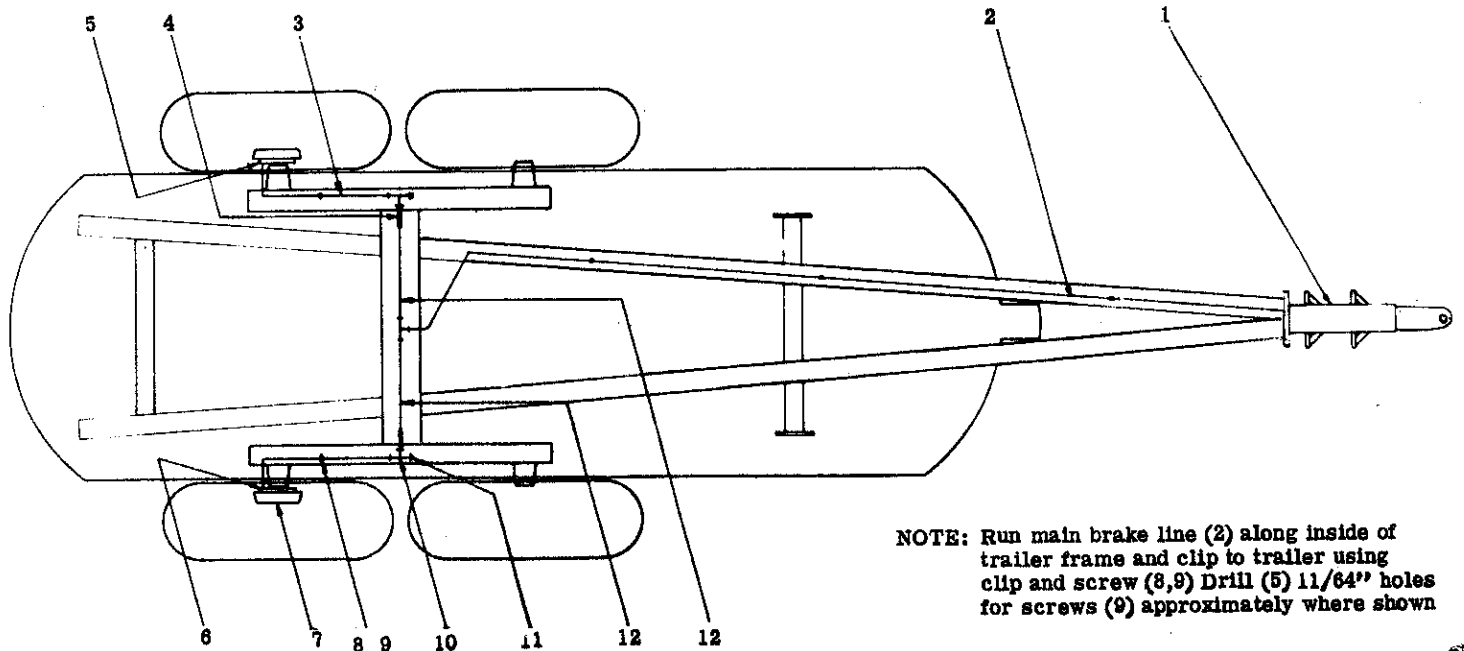
Actuator Assembly



ACTUATOR ASSEMBLY

ITEM	QTY	P/N	NAME	ITEM	QTY	P/N	NAME
1	1	12668	Outer Case Assembly	22	4	1654	Lockwasher 5/16 External
2	1	12693	Inner Slide Assembly	23	1	12683	Cylinder Cover
3	1	12670	Centering Rail	24	2	1214	Bolt, Hex 3/8 NC x 3
4	2	12671	Front Roller Assembly	25	2	1655	Lockwasher 3/8 External
5	2	12672	Shoulder Bolt 5/8x4-3/8 1/2 NC	26	2	1692	Nut, Hex 3/8 NC
6	2	1694	Nut, Hex 1/2 NC	27	6	1182	Bolt, Hex 5/16 NC x 5/8
7	2	1638	Lockwasher, 1/2 Std.	28	1	12684	Cylinder Bracket Asmby., R
8	5	2286	Grease Fitting	29	1	12685	Cylinder Bracket Asmby., L
9	1	12673	Front Roller Cover	30	1	13250	Brake Lever
10	6	12674	Rear Roller Assembly	31	1	12687	Weather Seal
11	3	12675	Rear Roller Bolt 5/8 NFx5/8	32	1	12688	Breakaway Lock, Right
12	3	1726	Slotted Nut 5/8 NF	33	1	12689	Breakaway, Lock, Left
13	1	12676	Spacer	34	2	12690	S Hook
14	1	12678	Master Cylinder Assembly 1 1/4"	35	1	12691	Chain
15	3	12679	Spacer	36	1	12694	Clevis
16	3	2036	Cotter Pin 1/8x1 1/4	37	2	1300	Bolt, Hex 5/8 NC x 4 1/2
17	2	12680	Damper	38	2	1776	Lock Nut, Hex 5/8 NC
18	2	12681	Damper Bar	39	6	1635	Lockwasher 5/16 Std.
19	1	12682	Push Rod Block	40	1	12695	Connector
20	2	2034	Cotter Pin 1/8x3/4	41	1	12696	Gasket
21	4	1181	Bolt, Hex 5/16 NC x 1/2				

Brake Kit 2200

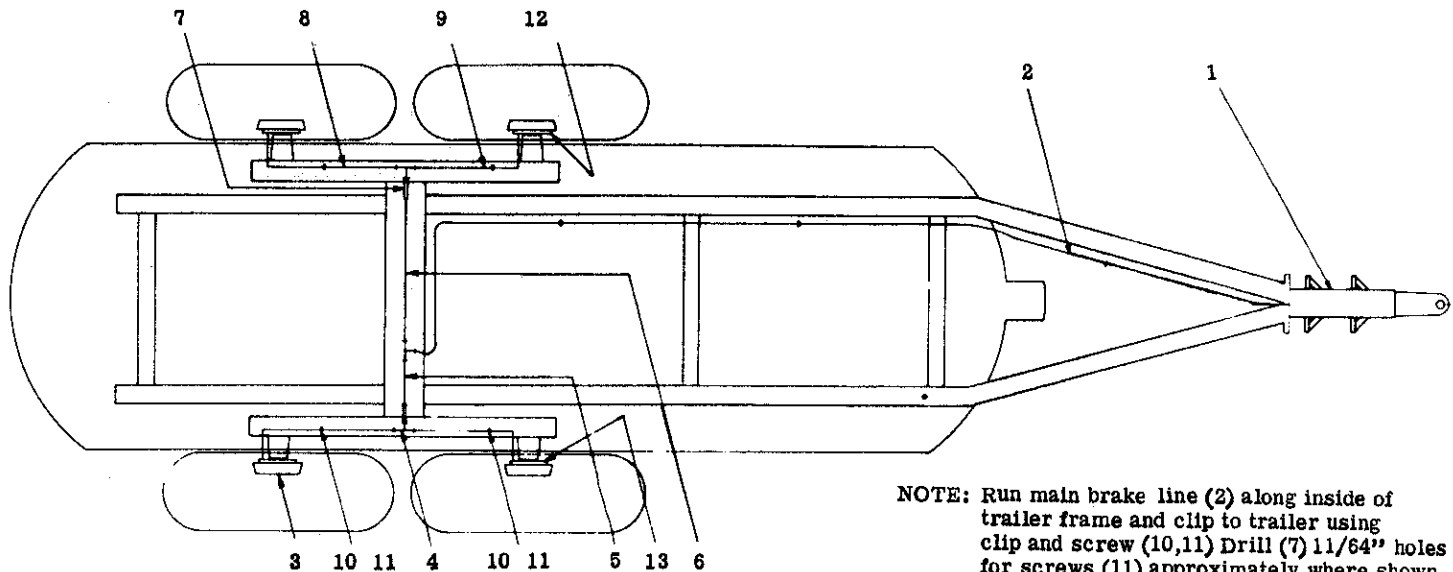
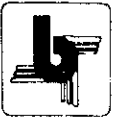


NOTE: Run main brake line (2) along inside of trailer frame and clip to trailer using clip and screw (8,9) Drill (5) 11/64" holes for screws (9) approximately where shown

BRAKE KIT 2200

ITEM	QTY	P/N	NAME
1	1	12631	Actuator (Weldment)
2	1	12577	Brake Line, Main
3	2	12581	Brake Line, Rear
4	2	13927	Hose, 13"
5	1	13041	13" Brake Parts, L.H. (Diagram)
6	1	12632	13" Brake Parts, R.H. (Diagram)
7	2	12660	Eight Bolt Drum, 5-1/2 B.C., 17/32 Holes
8	5	13928	Clip
9	5	13931	Screw
10	3	13926	Tee
11	2	13929	Plug
12	2	12579	Brake Line, Center
13	16	2543	Bolt, Hex Hd 1/2-20 x 1, Gr. 5 (Not Shown)
14	16	1638	Lockwasher, 1/2 (Not Shown)
15	3	1493	Bolt, Truss HD 5/16 x 5/8 L.G. (Not Shown)
16	3	2081	Nut, Hex 5/16 Whizlock (Not Shown)
17	1	12957	Brake Kit 2200 (Complete)
18	1	13904	Puller Plate Kit

Brake Kit 3200



NOTE: Run main brake line (2) along inside of trailer frame and clip to trailer using clip and screw (10,11) Drill (7) 11/64" holes for screws (11) approximately where shown.

BRAKE KIT 3200

ITEM	QTY	P/N	NAME
1	1	12631	Actuator (Weldment)
2	1	12530	Brake Line, Main
3	4	12660	Eight Bolt Drum, 5-1/2 B.C., 17/32 Holes
4	3	13926	Tee
5	1	12526	Brake Line, Short
6	1	12527	Brake Line, Long
7	2	13930	Hose, 18-7/8
8	2	12528	Brake Line, Rear
9	2	12529	Brake Line, Front
10	7	13928	Clip
11	7	13931	Screw
12	2	13041	13" Brake Parts, L.H. (Diagram)
13	2	12632	13" Brake Parts, R.H. (Diagram)
14	32	2543	Bolt, Hex Hd 1/2-20 x 1, Gr 5 (Not Shown)
15	32	1638	Lockwasher 1/2 (Not Shown)
16	3	1493	Bolt, Truss HD 5/16 x 5/8 LG (Not Shown)
17	3	2081	Nut, Hex, 5/16 Whizlock (Not Shown)
18	1	12958	Brake Kit 3200 (Complete)
19	1	13904	Puller Plate Kit

WARRANTY

WARRANTY BY MANUFACTURER

Dealer or Distributor understands and agrees that Manufacturer extends only the following Warranty to customers. In the event dealer or Distributor extends any additional warranty (such as by enlarging the scope or period of warranty or undertaking a warranty of merchantability or fitness for any particular purpose) or any other, obligation whatsoever, Dealer or Distributor shall: (1) be solely responsible therefor; (2) have no recourse against Manufacturer thereof; and (3) defend, indemnify and hold Manufacturer harmless against any claim or cause of action whatsoever arising out of, or occasioned by, Dealer or Distributor's extension of said additional warranty or obligation.

CERTIFICATE OF GENERAL EQUIPMENT WARRANTY

"Balzer Mfg. Corp. warrants new Products sold by it to be free from defects in material or workmanship for a period of one (1) year after date of delivery to the first user and subject to the following conditions: Balzer Mfg. Corp's obligation and liability under this Warranty is expressly limited to repairing or replacing at Balzer Mfg. Corp's option, any parts which appear to Balzer Mfg. Corp. upon inspection to have been defective in material or workmanship. Such parts shall be provided at no cost to user, at the business establishment of the authorized Balzer Mfg. Corp. dealer or distributor of the Product during regular working hours. This Warranty shall not apply to component parts or accessories of Products not manufactured by Balzer Mfg. Corp. and which carry the warranty of the manufacturer thereof, or to normal maintenance (such as tune-up) or normal maintenance parts (such as oil filters). Replacement or repair parts installed in the Product covered by this Warranty are warranted only for the remainder of this Warranty as if such parts were original components of said Product. **BALZER MFG. CORP. MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.**

"Balzer Mfg. Corp's. obligation under this Warranty shall not include any transportation charges, cost of installation, duty taxes or any other charges whatsoever, or any liability for direct, indirect, incidental or consequential damage or delay. If requested by Balzer Mfg. Corp. Products or parts for which a warranty claim is made are to be returned transportation prepaid to Balzer Mfg. Corp. Any improper use, including operation after discovery of defective or worn parts, operation beyond rated capacity, substitution or parts not approved by Balzer Mfg. Corp. or any alteration or repair by others in such manner as in Balzer Mfg. Corp's. judgment affects the Product materially and adversely, shall void this Warranty.

"NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY AN OFFICER OF BALZER MFG. CORP. AT ITS HOME OFFICE."

LIABILITY FOR DELAYS

No liability shall attach to Manufacturer or direct, indirect, incidental, or consequential damages or expenses due to loss, damage, detention or delay in delivery of Products resulting from acts or delays beyond its control.

balzer mfg
corp

highway 60 east
mountain lake, mn. 56159
phone (507) 487-3133

WARRANTY CLAIMS AND RETURN OF GOODS

1. The dealer shall submit each warranty claim to the company within 30 days after the defective part has been replaced.
2. The dealer shall furnish the Company definite proof of delivery date of the machine to the purchaser prior to the Company's honoring any warranty claim.
3. All parts alleged to be defective under the Company's warranty policy shall be made available for examination by the Company, either at the dealer's place of business or factory of the Company, at the Company's option. If examination is to be made at factory, the part shall be returned to the Company with transportation charge prepaid, only after receipt of the dealer of written shipping instructions from the Company.
4. Goods authorized for return to the factory are to be returned by dealer within 30 days from authorization date. Failure to return within the 30 day period will invalidate the warranty claim.

In order to be protected under the terms of the BALZER MANUFACTURING CORPORATION warranty, and to avoid delay in processing warranty claims, the original owner's name and address and the identification numbers of the machine should be registered at the BALZER MANUFACTURING CORPORATION factory within thirty (30) days from the date of purchase. A registration card is furnished with each machine.