
**INSTALLATION, OPERATION,
AND MAINTENANCE MANUAL**
WITH PARTS LIST



UNIT SERIES PUMP

MODEL
UNIT 608 tankleenor[®]

THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO

www.grpumps.com

GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA

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Register your new
Gorman-Rupp pump online at
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Valid serial number and e-mail address required.

RECORD YOUR PUMP MODEL AND SERIAL NUMBER

Please record your pump model and serial number in the spaces provided below. Your Gorman-Rupp distributor needs this information when you require parts or service.

Pump Model: _____

Serial Number: _____

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INTRODUCTION

Thank You for purchasing a Gorman-Rupp pump. **Read this manual** carefully to learn how to safely install and operate your pump. Failure to do so could result in personal injury or damage to the pump.

The Unit 608 tankleenor[®] is designed to permit quick, efficient cleaning of below-ground petroleum storage tanks without disturbing the product or disrupting service. The cleaning system is capable of extracting gel precipitates, rust, water or other contaminants that present problems in fuel storage.

The tankleenor[®] incorporates portable, light-weight components allowing one man operation. The system utilizes an O-Series self-priming centrifugal pump that is close-coupled to a single-phase explosion-proof electric motor equipped with 50 feet of grounded power cable.

If there are any questions regarding the pump or its application which are not covered in this manual or in other literature accompanying this unit, please contact your Gorman-Rupp distributor, or:

The Gorman-Rupp Company
P.O. Box 1217
Mansfield, Ohio 44901-1217
Phone: (419) 755-1011

or:

Gorman-Rupp of Canada Limited
70 Burwell Road
St. Thomas, Ontario N5P 3R7
Phone: (519) 631-2870

For information or technical assistance on the electric motor, contact the motor manufacturer's local dealer or representative.

Because pump installations are seldom identical, this manual cannot possibly provide detailed instructions and precautions for every aspect of each specific application. Therefore, it is the responsibility of the owner/installer of the pump to ensure that applications not addressed in this manual are performed **only** after establishing that

neither operator safety nor pump integrity are compromised by the installation. Pumps and related equipment **must** be installed and operated according to all national, local and industry standards.

The following are used to alert maintenance personnel to procedures which require special attention, to those which could damage equipment, and to those which could be dangerous to personnel:



Immediate hazards which WILL result in severe personal injury or death. These instructions describe the procedure required and the injury which will result from failure to follow the procedure.



Hazards or unsafe practices which COULD result in severe personal injury or death. These instructions describe the procedure required and the injury which could result from failure to follow the procedure.



Hazards or unsafe practices which COULD result in minor personal injury or product or property damage. These instructions describe the requirements and the possible damage which could result from failure to follow the procedure.

NOTE

Instructions to aid in installation, operation, and maintenance, or which clarify a procedure.

SAFETY - SECTION A

This information applies to operation and maintenance of the UNIT 608 tank-leenor®. Refer to the manual accompanying the electric motor before attempting to begin operation.

Because pump installations are seldom identical, this manual cannot possibly provide detailed instructions and precautions for each specific application. Therefore, it is the owner/installer's responsibility to ensure that applications not addressed in this manual are performed only after establishing that neither operator safety nor pump integrity are compromised by the installation.



Before attempting to open or service the pump:

1. Familiarize yourself with this manual.
2. Unplug the motor to ensure that the pump will remain inoperative.
3. Allow the pump to completely cool if overheated.
4. Check the temperature before opening any covers, plates, or plugs.
5. Vent the pump slowly and cautiously.
6. Drain the pump.



This pump is designed to handle water, gasoline or other petroleum products. Do not attempt to pump corrosive or highly volatile liquids which may damage the pump or endanger personnel as a result of pump failure.



Before operating or servicing the pump, be certain proper safety practices are followed. Provide adequate ventilation, prohibit smoking, wear static-resistant clothing and shoes. Clean up all fuel spills immediately after occurrence.



Connect the ground wire to the tank fill pipe or other ground connection before operating the unit. Static electric build-up could develop during cleaning operation, causing hazardous sparks.



Do not operate the pump against a closed eductor control valve for long periods of time. This could bring the liquid to a boil, build pressure, and cause the pump casing to rupture or explode.



Overheating may produce dangerous fumes. Use extreme caution when venting the pump, or when removing covers, plates, plugs or fittings.



Overheated pumps can cause severe burns and injury. If overheating of the pump occurs:

1. Stop the pump immediately.
2. Allow the pump to completely cool if overheated.
3. Refer to instructions in this manual before re-starting the pump.

**WARNING!**

The electrical power used to operate this unit is high enough to cause injury or death to personnel. Connect the electrical plug to a grounded power supply; **never** use gas piping as an electrical ground. Be sure the power supply is of the correct voltage and phase. Do not run the motor if the power supply is not within acceptable limits. If a circuit breaker or fuse is tripped, examine and correct the problem before re-starting the unit.

**WARNING!**

Inspect the suction hose regularly for cuts, punctures or severe abrasion before operation. Replace the entire hose assembly if there is any possibility of leakage or exposure of the integral spring steel strap inside the hose.

**WARNING!**

Never attempt to change the electrical plug or alter the length of the power cord with a splice. Equipment failure or personal injury could result if all connections are not waterproof and compatible with the current used.

INSTALLATION – SECTION B

Review all SAFETY information in Section A.

Since pump installations are seldom identical, this section offers only general recommendations and practices required to inspect, position, and arrange the pump and piping.

Pump Dimensions

See Figure 1 for the approximate physical dimensions of this pump.

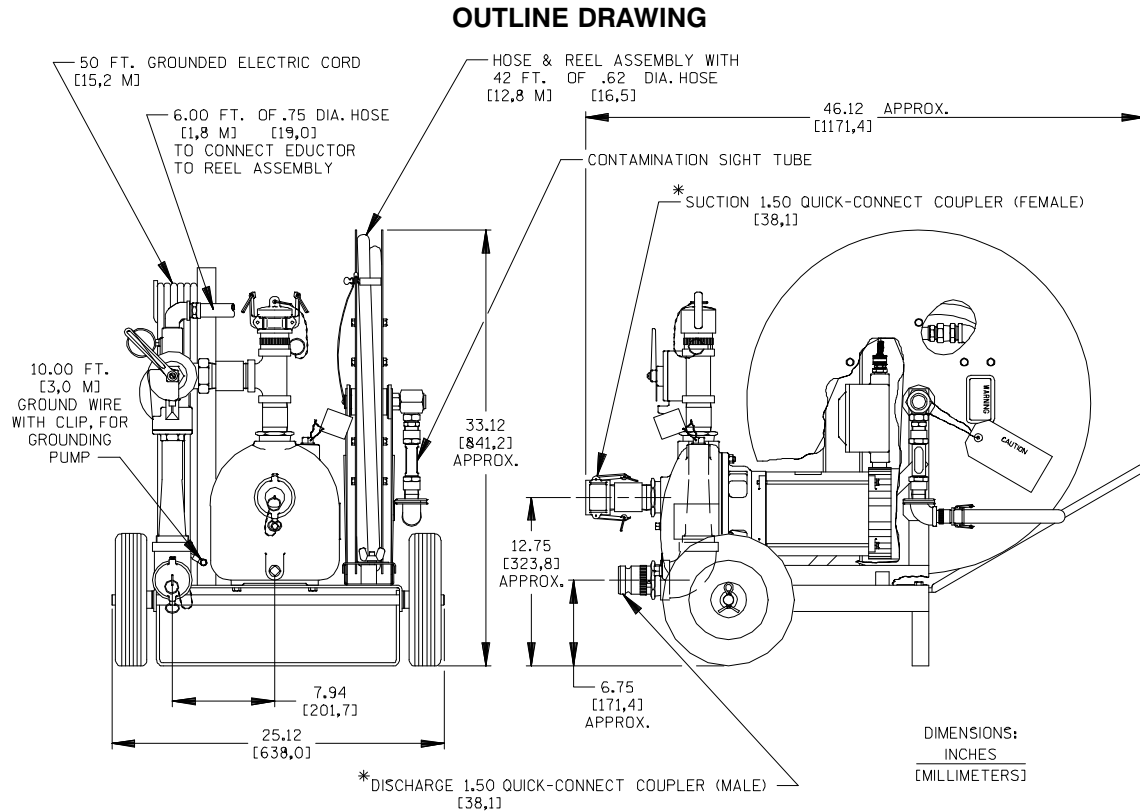


Figure 1. Pump Model UNIT 608

PREINSTALLATION INSPECTION

The pump assembly was inspected and tested before shipment from the factory. Before installation, inspect the unit for damage which may have occurred during shipment. Check as follows:

- a. Inspect the pump, reel assembly, hose and motor for cracks, dents, damaged threads, and other obvious damage.
- b. Check for and tighten loose attaching hardware. Since gaskets tend to shrink after drying, check for loose hardware at mating surfaces.
- c. Carefully read all tags, decals, and markings on the unit, and perform all duties indicated.
- d. If the pump and motor have been stored for more than 12 months, some of the compo-

nents or lubricants may have exceeded their maximum shelf life. These **must be inspected or replaced** to ensure maximum pump service.

- e. Check to ensure the following standard equipment items are included with the pump assembly:
 - Detachable reel assembly.
 - 42 foot long hydrocarbon-resistant hose.
 - 8 foot long connector hose.
 - 15 foot long suction and discharge hose.
 - 12 foot long stainless steel standpipe.
 - 10 foot long ground wire.

If the maximum shelf life has been exceeded, or if anything appears to be abnormal, contact your

Gorman-Rupp distributor or the factory to determine the repair or updating policy. **Do not** put the pump into service until appropriate action has been taken.

good repair and with adequate capacity to prevent injuries to personnel or damage to equipment.

UNIT INSTALLATION

Lifting

This unit is mounted on a two-wheel moveable base. It weighs approximately 260 pounds (118 kilograms) including suction and discharge hoses and the standpipe. If it is necessary to lift the unit, use lifting equipment with a capacity of 5 times the weight of the unit to ensure safe lifting.

Mounting

Locate the pump in an accessible place as close as practical to the liquid being pumped. Level mounting is essential for proper operation.

The pump may have to be supported or shimmed to provide for level operation or to eliminate vibration.



Use lifting and moving equipment in

Specifications

See Table 1 for typical pump specifications.

Table 1. Pump Specifications

Pump Model	Voltage	Phase	Horsepower	Motor RPM	Cycle	Suction Coupler	Discharge Coupler
02D3	115/230	1	1	3450	60 Hz	1-1/2"	1-1/2"

See Table 1 for typical pump specifications.

Table 2. Unit Specifications

Power Cable	Reel Assembly	Suction Hose	Discharge Hose	Ground Wire	Standpipe Length (Min) – (Max)
50 Ft. (15,2 M.)	42 Ft. (12,8 M.)	1-1/2" x 15 Ft. 38,1 MM x 4,6 M	1-1/2" x 15 Ft. 38,1 MM x 4,6 M	10 Ft. (3,1 M.)	7.25 Ft. – 12 Ft. 2,2 M – 3,7 M

Positioning Unit and Setup

Figure 2 shows a typical installation of the tank-leenor™ system.

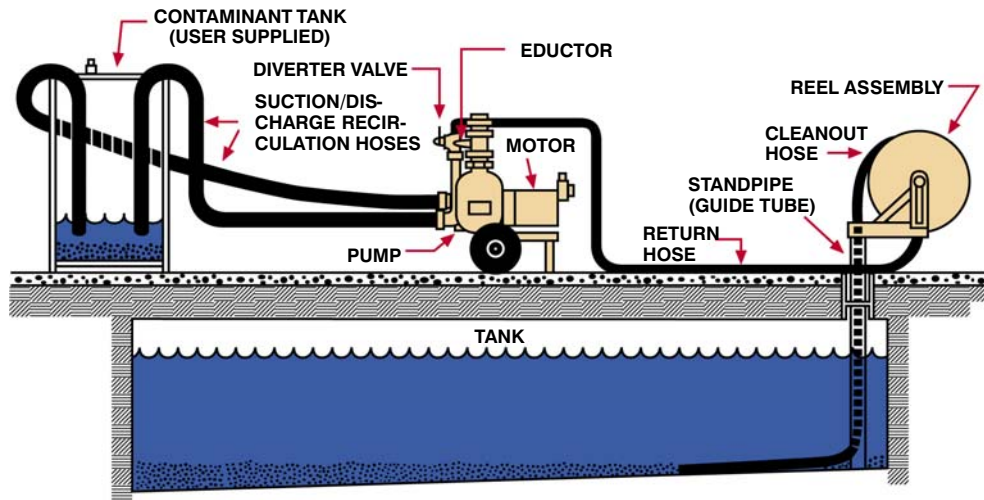


Figure 2. Typical Installation

Perform the following steps, which are illustrated by Figures 3 through 10, to set up the tankleenor™ system for operation.

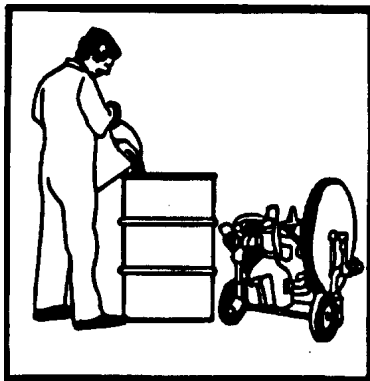


Figure 3.

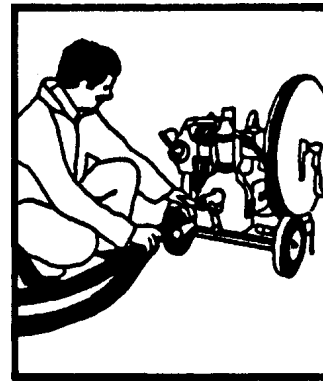


Figure 4.

See Figure 3 and fill a 55 gallon (208 L) drum (not supplied) or other ventilated container with approximately 20 gallons (76 L) of operating liquid (water). Depending on the size and contamination of the tank being cleaned, more than one drum may be required.

See Figure 4 and install the quick-connect fittings on the suction and discharge hoses to the eductor discharge and pump suction. Submerge the other ends of the hoses in the drum containing the operating liquid (shown in Figure 2).

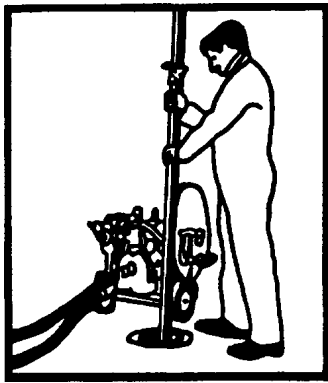


Figure 5.

See Figure 5 and lower the telescopic standpipe through the tank fill pipe until it reaches the bottom of the tank. Adjust the length of the standpipe as necessary.

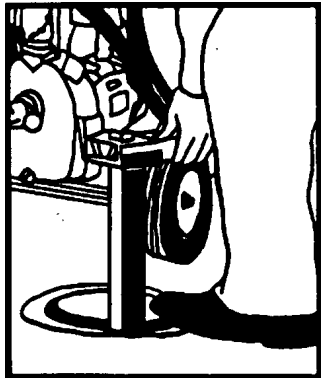


Figure 6.

See Figure 6 and remove the hose reel assembly from the pump base and attach it to the standpipe. Secure it in place with the spring clip on the reel assembly. Align the reel assembly with the direction of the first cleaning path (see **OPERATION**, Section C).

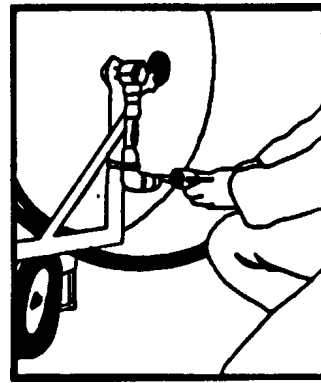


Figure 7.

See Figure 7 and position the pump close to the reel assembly and attach the 8-foot hose from the top of the eductor to the hose reel.

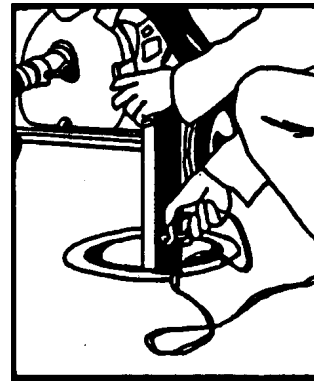


Figure 8.

See Figure 8 and attach the unit ground wire clip to the tank fill pipe or other ground connection.



WARNING!

Connect the ground wire to the tank fill pipe or other ground connection before operating the unit. Static electric build-up could develop during the cleaning operation causing hazardous sparks.

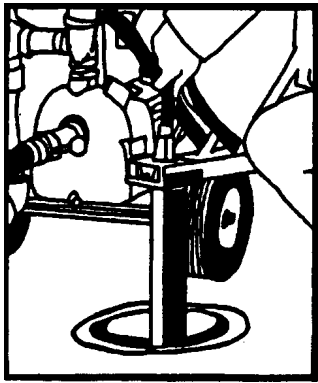


Figure 9.

See Figure 9 and remove the clip that holds the hose assembly on the reel and insert the nozzle into the standpipe. Push the hose down the standpipe until a slight resistance is felt. This occurs when the suction nozzle travels over the rollers at the end of the standpipe.

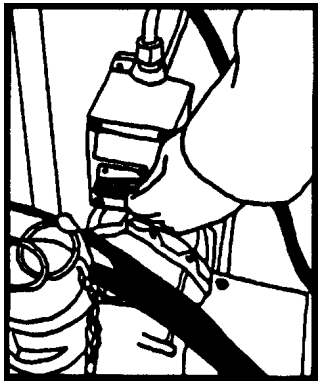


Figure 10.

See Figure 10 and **make sure** the motor switch is **OFF**. Plug the power cable into a 20 amp/120 volt grounded outlet.



The electrical power used to operate this unit is high enough to cause injury or death to personnel. Connect the electrical plug to a grounded power supply; never use gas piping as an electrical ground. Be sure the power supply is of the correct voltage and phase. Do not

run the motor if the power supply is not within acceptable limits. If a circuit breaker or fuse is tripped, examine and correct the problem before re-starting the unit.

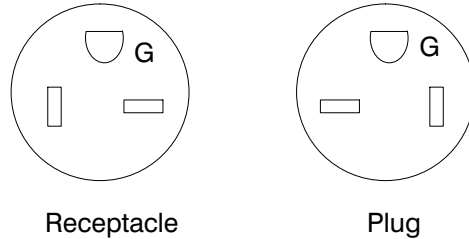


Figure 11.

This pump is furnished with a grounded, 20 amp/120 Volt electrical plug as required by the National Electric Code (see Figure 11). No cord or plug substitution is authorized by the Gorman-Rupp Company.



Never attempt to change the electrical plug or alter the length of the power cord with a splice. Equipment failure or personal injury could result if all connections are not waterproof and compatible with the electrical current used.

Refer to **OPERATION**, Section C before starting the pump.

Line Configuration

Keep suction and discharge lines as straight as possible to minimize friction losses.

Hose Connections

Check all hose and pump connections to be sure the quick-connect couplers and joints are completely sealed. Hose lines may have to be supported and secured when filled and operated under pressure.

SUCTION LINES

Position the suction hose as far away as possible from the discharge hose. The two hoses must be on opposite sides of the drum.

Suction Line Positioning

The depth of submergence of the suction line is critical to efficient pump operation. Figure 12

shows recommended minimum submergence vs. velocity.

NOTE

The pipe submergence required may be reduced by installing a standard pipe increaser fitting at the end of the suction line. The larger opening size will reduce the inlet velocity. Calculate the required submergence using the following formula based on the increased opening size (area or diameter).

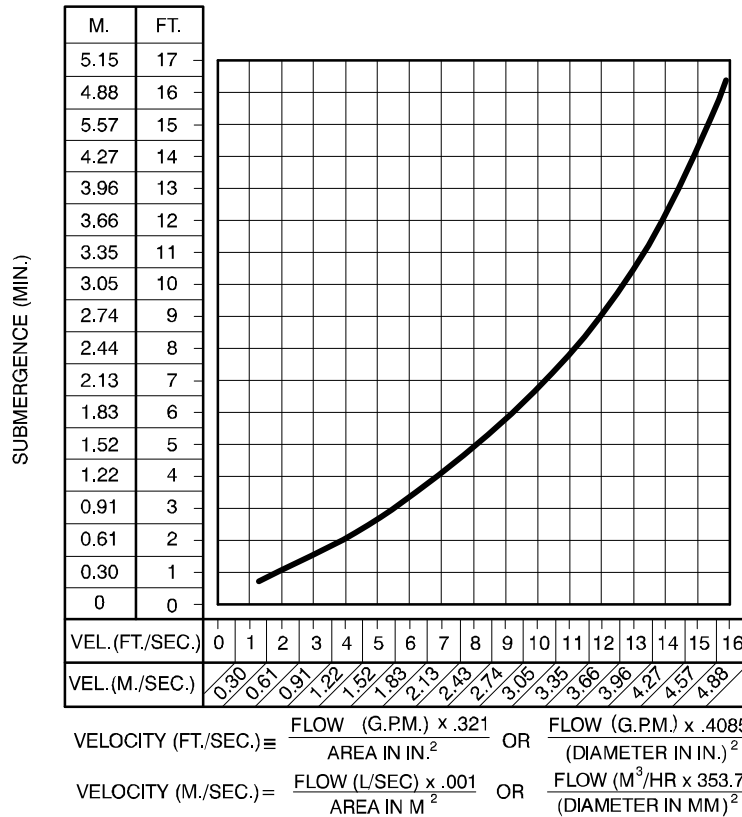


Figure 12. Recommended Minimum Suction Line Submergence vs. Velocity

DISCHARGE LINES

Siphoning

Do not terminate the discharge line at a level lower than that of the liquid being pumped. Otherwise, a siphoning action causing damage to the pump could result.

Valves

This unit is equipped with an eductor control valve on the discharge side of the pump. The eductor has a 3-position valve for vacuum, backflush or

shutoff of the system. Make sure this valve is in the shutoff position after turning the pump off.



If the eductor valve is not in the shutoff position when turning the pump off, a siphoning action could be created, draining the pump casing, the suction and discharge lines, and the contaminated liquid in the drum back into the tank.

OPERATION – SECTION C

Review all SAFETY information in Section A.

Follow the instructions on all tags, labels and decals attached to the pump.



This pump is designed to handle water, gasoline or other petroleum products. Do not attempt to pump corrosive or highly volatile liquids which may damage the pump or endanger personnel as a result of pump failure.

The following information must be established prior to beginning a cleaning job:

- a. The size of the tank to be cleaned.
- b. The direction of the tank's longitudinal axis.
- c. The diameter of the tank's fill pipe through which the standpipe is inserted.
- d. The location of the fill pipe with respect to the length of the tank.
- e. Availability of the proper electrical service and receptacle required for safe operation of the unit.

This information is necessary to properly install and operate the pump and to direct the hose assembly within the tank. The hose assembly **must** be directed along the bottom of a horizontal, cylindrical tank, and **centered within an 18 to 24 inch wide (457 to 610 mm) cleaning path.**

The hose assembly is designed so that the hose nozzle travels straight out from the standpipe and along the bottom of the tank. The direction of nozzle travel is adjusted to the tank by rotating the reel and standpipe assembly to align the cleaning path with the longitudinal axis of the tank.



Attempting to climb a side or end wall will cause the hose and nozzle assembly to flip over and create a severe tangling situation. Therefore, it is essential to establish the relative size and position of the underground tank to properly operate the hose assembly.

The nozzle will precisely follow any horizontal irregularities of the tank bottom. The hose assembly is not, however, capable of climbing the side or end walls of the tank.



After the pump has been installed, make certain that the pump and all piping or hose connections are secure before operation.

PRIMING

Install the pump and piping as described in **INSTALLATION**. Make sure that the piping connections are tight, and that the pump is securely positioned.

Remove the dust cap on top of the discharge port and fill the pump casing with liquid. Be sure to reinstall the dust cap after filling the pump casing.

Once filled, the pump will prime and reprime. Between operations, liquid in the pump may be lost through evaporation or by spillage if the pump has been moved. Check the priming chamber to see if it is full before the pump is started.

Leakage

No leakage should be visible at pump mating surfaces, or at pump connections or fittings. Keep all line connections and fittings tight to maintain maximum pump efficiency.

Liquid Temperature And Overheating

The **maximum** liquid temperature for this unit is 160° F (71°C). Do not apply it at a higher operating temperature.

Overheating can occur if operated with the eductor valve in the shutoff position for an extended period of time. Operating against a closed valve could bring the liquid to a boil, build pressure, and cause the pump to rupture or explode. If overheating occurs, stop the pump and allow it to completely cool before servicing it. Refill the pump casing with cool liquid.



Do not operate the pump against a closed eductor control valve for long periods of time. If operated against a closed eductor control valve, pump components will deteriorate, and the

liquid could come to a boil, build pressure, and cause the pump casing to rupture or explode.

OPERATION

Refer to **INSTALLATION**, Section B for proper set-up of the cleaning system.

Turn the eductor valve to the shutoff position See Figure 1 for the three positions of the eductor valve.



Do not operate the pump against a closed eductor control valve for long periods of time. If operated against a closed eductor control valve, pump components will deteriorate, and the liquid could come to a boil, build pressure, and cause the pump casing to rupture or explode.

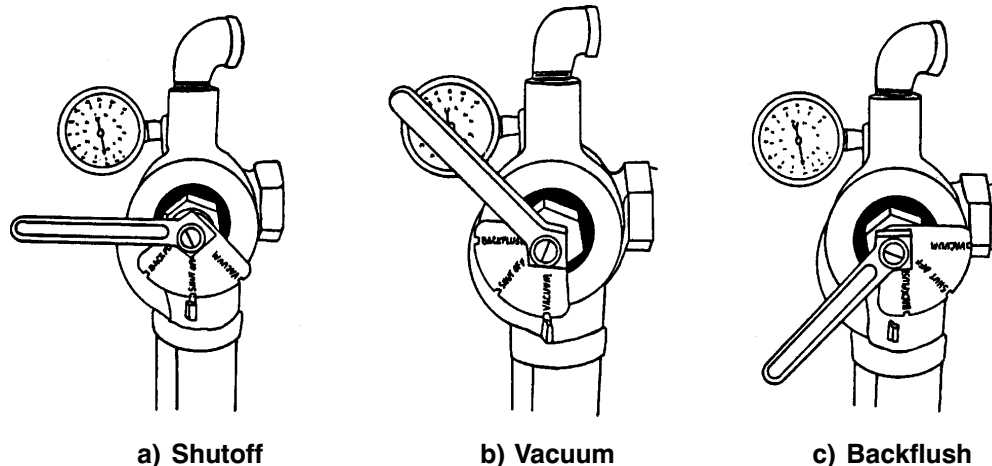


Figure 1. Eductor Valve Positioning

Turn the power switch on and rotate the eductor valve to the vacuum position (Figure 1-b). Observe the sight glass on the reel assembly. As soon as liquid appears, the tankleenor™ is ready for operation. **Slowly** push the hose along the bottom of the tank. Dirt and contaminants will appear in the sight glass as they are removed. **Stop** feeding the hose into the tank until the sight glass clears, then continue feeding the nozzle along the bottom of the tank until resistance is felt, indicating that the nozzle has contacted the end of the tank.



A very slight movement of the reel and standpipe assembly results in much greater movement of the hose and nozzle. Use extreme caution when repositioning the reel and standpipe to prevent tangling the hose.

With experience, the operator will learn how to move the hose to achieve thorough cleaning. The nozzle should be run to the end of the tank, then retracted to the standpipe while observing the sight gauge for additional contaminants during the return path.



The hose and nozzle cleaning path must be centered within an 18 to 24 inch wide (457 to 610 mm) strip, running longitudinally (lengthwise) in the bottom of a cylindrical tank. Prior knowledge of the tank size and direction are essential to ensure proper hose travel and direction. If the hose does not traverse the bottom of the tank within the 18 to 24 inch wide (457 to 610 mm) strip, the nozzle may run up the tank side wall and cause the hose to flip over, creating a severe tangling situation. Tangling the hose will result in great difficulty in retrieving the hose through the standpipe and probable destructive damage to the hose. Damage to the hose or nozzle caused by improper use will **not** be covered by the pump warranty. If the hose becomes tangled, see **TROUBLESHOOTING**, Section D.

If the suction nozzle becomes clogged with debris, as evident when product is present in the sight glass but no movement is observed, the obstruction can normally be flushed from the hose by reversing the liquid flow for a few seconds (see Figure 1-c). After backflushing, return the valve to the vacuum position (Figure 1-b) and resume the cleaning process.



When performing the cleaning operation, keep the suction and discharge hoses submerged and off the bottom of the container. Otherwise, spillage or flow shutoff could occur.

STOPPING

When the cleaning job is completed or the cleaning drum becomes full, turn the switch to the pump off and turn the eductor valve in the shutoff position (Figure 1-a). This will prevent the liquid in the drum and pump from siphoning back into the tank.

When the cleaning job is completed, clean the system for storage as follows:

- Wipe the hose assembly as it is reeled up from the tank.
- Place the suction nozzle of the hose assembly in a container of clean water and pump water until the liquid being discharged appears clear.



Use caution when winding the hose assembly onto the reel to ensure that the hose assembly doesn't "kink" or twist. This could result in permanent damage to the hose assembly. Damage resulting from improperly winding the hose onto the reel will not be covered by the pump warranty.

- Rewind the hose assembly onto the reel. Use caution when winding the hose onto the reel to ensure that the hose doesn't "kink" or twist, which can result in permanent damage to the hose.
- When the hose is fully wound onto the reel, anchor it in place with the retaining clip. Rotate the reel several times to drain excess liquid from the hose.
- Disconnect the reel assembly from the standpipe and secure it on the base. Disconnect the power cable and ground wire. Coil and stow them on the cable retaining rack.
- Disconnect and drain the suction and discharge hoses.

If the unit will be stored for an extended period, remove the drain plug from the pump casing and drain any remaining liquid. Clean and reinstall the drain plug.

Cold Weather Preservation

In below freezing conditions, drain the pump to prevent damage from freezing. Also, clean out any solids by flushing with a hose. Operate the pump for approximately one minute; this will remove any remaining liquid that could freeze the pump rotating parts.

TROUBLESHOOTING – SECTION D

Review all SAFETY information in Section A.



Before attempting to open or service the pump:

- 1. Familiarize yourself with this manual.**
- 2. Unplug the motor to ensure that the pump will remain inoperative.**
- 3. Allow the pump to completely cool if overheated.**
- 4. Close the eductor control valve.**
- 5. Check the temperature before opening any covers, plates, or plugs.**
- 6. Vent the pump slowly and cautiously.**
- 7. Drain the pump.**

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
UNIT FAILS TO PRIME	Pump fails to start. Air leak in suction line. Lining of suction hose collapsed. Leaking or worn seal or pump gasket.	Check electrical connections. Correct leak. Replace suction hose. Check pump vacuum. Replace leaking or worn seal or gasket.
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE	Air leak in suction line. Suction intake not submerged at proper level or sump too small. Lining of suction hose collapsed. Impeller or other wearing parts worn or damaged. Impeller clogged. Leak in hose assembly above product level. Clogged nozzle and/or hose assembly. Open circuit in motor windings or power cable.	Correct leak. Check installation and correct submergence as needed. Replace suction hose. Replace worn or damaged parts. Check that impeller is properly centered in the pump casing and that it rotates freely. Free impeller of debris. Replace hose. Backflush system. Check motor continuity.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP REQUIRES TOO MUCH POWER	Liquid solution too thick. Low or incorrect voltage.	Dilute if possible. Measure voltage, both when pump is running and when shut off.
UNIT CLOGS FREQUENTLY	Liquid solution too thick. Discharge line clogged or restricted; hose kinked. Feeding hose assembly into tank too fast.	Dilute if possible. Check discharge lines; straighten hose. Feed hose assembly slowly and watch flow through sight glass.
EXCESSIVE NOISE	Cavitation in pump. Pumping entrained air. Pump or drive not securely mounted. Impeller clogged or damaged.	Reduce suction lift and/or friction losses in suction line. Record vacuum and pressure gauge readings and consult local representative or factory. Locate and eliminate source of air bubble. Secure mounting hardware. Clean out debris; replace damaged parts.
HOSE ASSEMBLY WILL NOT REEL BACK UP THE STANDPIPE. HOSE SEEMS STUCK IN STANDPIPE.	Hose assembly has become tangled and the flat spring strap inside the hose will not allow the assembly to easily slide back through the bottom opening of the standpipe. Tangling has occurred due to improperly directing the hose inside the tank or by continuing to feed the hose assembly after the nozzle has contacted the end of the tank.	Shutoff unit and drain hose assembly back into the tank. Remove reel from the standpipe. Do not force the hose assembly through the standpipe. Carefully raise the standpipe (with the hose assembly still inside) out of the tank fill pipe, then carefully feed the hose assembly back through the standpipe. Roll the hose assembly back into the reel, making sure the steel strip inside the hose is not twisted. The steel strip must roll parallel to the axis of the reel (similar to the tape in a measuring tape ruler). Set up the equipment again, this time being careful to properly feed the hose assembly into the tank.

PREVENTIVE MAINTENANCE

Since pump applications are seldom identical, and pump wear is directly affected by such things as the abrasive qualities, pressure and temperature of the liquid being pumped, this section is intended only to provide general recommendations and practices for preventive maintenance. Regardless of the application however, following a routine preventive maintenance schedule will help assure trouble-free performance and long life from your Gorman-Rupp pump. For specific questions concerning your application, contact your Gorman-Rupp distributor or the Gorman-Rupp Company.

Record keeping is an essential component of a good preventive maintenance program. Changes in suction and discharge gauge readings (if so

equipped) between regularly scheduled inspections can indicate problems that can be corrected before system damage or catastrophic failure occurs. The appearance of wearing parts should also be documented at each inspection for comparison as well. Also, if records indicate that a certain part (such as the seal) fails at approximately the same duty cycle, the part can be checked and replaced before failure occurs, reducing unscheduled down time.

For new applications, a first inspection of wearing parts at 250 hours will give insight into the wear rate for your particular application. Subsequent inspections should be performed at the intervals shown on the chart below. Critical applications should be inspected more frequently.

Preventive Maintenance Schedule					
Item	Service Interval*				
	Daily	Weekly	Monthly	Semi-Annually	Annually
General Condition (Temperature, Unusual Noises or Vibrations, Cracks, Leaks, Loose Hardware, Etc.)	I				
Pump Performance (Gauges, Speed, Flow)	I				
Impeller Clearance				I	
Piping					I

Legend:

I = Inspect, Clean, Adjust, Repair or Replace as Necessary

C = Clean

R = Replace

* Service interval based on an intermittent duty cycle. Adjust schedule as required for lower or higher duty cycles or extreme operating conditions.

PUMP MAINTENANCE AND REPAIR - SECTION E

MAINTENANCE AND REPAIR OF THE WEARING PARTS OF THE PUMP WILL MAINTAIN PEAK OPERATING PERFORMANCE.

LIFT (FT./M)	EDUCTOR CAPACITY (GPM/LPH)	VACUUM (IN. OF HG./BAR)
5 / 1,5	3.25 / 738	15 / 1,03
10 / 3,0	2.70 / 613	16 / 1,10
15 / 4,6	1.84 / 418	16 / 1,10
20 / 6,1	0.60 / 137	18 / 1,24

BACKFLUSH = 7.5 GPM (28,4 LPM) @25 PSI (1,7 BAR).

TRANSFER FLOW = 81 GPM (307 LPM) THROUGH PUMP WITH 1-1/2 INCH HOSE.

*** STANDARD PERFORMANCE FOR UNIT 608 tankleonor[®]**

* Based on 70° F (21° C) clear water at sea level with minimum suction lift. Since pump installations are seldom identical, your performance may be difference due to such factors as viscosity, specific gravity, elevation, temperature, and impeller trim.

If your pump serial number is followed by an "N", your pump is **NOT** a standard production model. Contact the Gorman-Rupp Company to verify performance or part numbers.

SECTION DRAWING

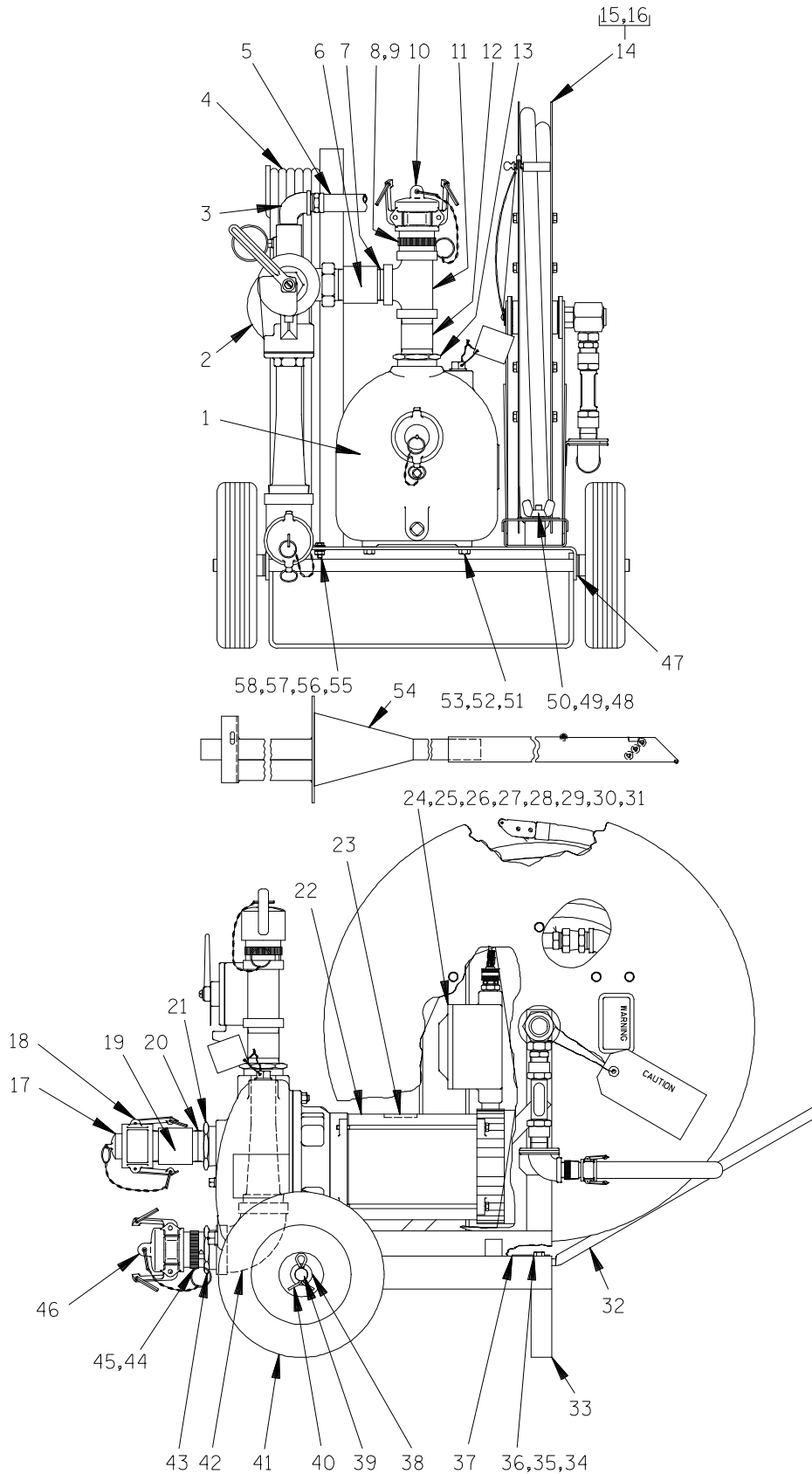


Figure 1. UNIT 608 tankleenor®

PARTS LIST
UNIT 608 tankleenor®
(From S/N 1347755 Up)

If your pump serial number is followed by an "N", your pump is **NOT** a standard production model. Contact the Gorman-Rupp Company to verify part numbers.

ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY	ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY
1	PUMP PARTS ONLY	PPO (UNIT 608)	----	1	32	HANDLE	5438A	15990	1
2	EDUCTOR VALVE ASSY	13559	----	1	33	BASE	13832	24000	1
3	STREET ELBOW	RS12	11999	1	34	HEX HD CAPSCREW	B0605	15991	2
4	CORD ASSY	7987F	----	1	35	HEX NUT	D06	15991	2
5	HOSE ASSEMBLY	46341-012	----	1	36	LOCK WASHER	J06	15991	2
6	PIPE COUPLING	AE24	15079	1	37	NAME PLATE	38818-016	----	1
7	PIPE NIPPLE	T24	15079	1	38	SPACER WASHER	5382	15991	4
8	ADAPTOR	S1294	----	1	39	AXLE	6158D	15990	1
9	CABLE TIE	27111-222	----	2	40	HAIR PIN CLIP	21183-010	----	2
10	DUST CAP	S1296	----	1	41	TIRE	S752	----	2
11	PIPE TEE	U24	11999	1	42	PIPE ELBOW	R32	11999	1
12	PIPE NIPPLE	T2414	16079	1	43	RED PIPE BUSHING	AP3224	11999	1
13	RED PIPE BUSHING	AP3224	11999	1	44	ADAPTOR	S1294	----	1
14	HOSE AND REEL ASSY	41331-011	----	1	45	CABLE TIE	27111-222	----	2
15	-HOSE REEL ASSY	41331-009	----	1	46	DUST CAP	S1296	----	1
16	-HOSE ASSY	46341-428	----	1	47	SPACER WASHER	5382	15991	4
17	DUST PLUG	S1295	----	1	48	WING NUT	BB06	15991	1
18	COUPLER	S1293	----	1	49	LOCK WASHER	J06	15991	1
19	PIPE COUPLING	AE24	15079	1	50	WASHER	31131-011	17040	1
20	PIPE NIPPLE	T24	15079	1	51	HEX HD CAPSCREW	B0606	15991	4
21	RED PIPE BUSHING	AP3224	11999	1	52	T-TYPE LOCK WASHER	BL06	15991	8
22	1HP 1P X-PROOF MOTOR	M13	----	1	53	HEX NUT	D06	15991	4
23	WARNING DECAL	2613FE	----	1	54	STANDPIPE ASSY	46312-009	----	1
24	X-PROOF SWITCH	S2219	----	1	55	GROUND WIRE ASSY	13830	----	1
25	PIPE NIPPLE	T08	15079	1	56	HEX HD CAPSCREW	B0403	15991	1
26	RED PIPE BUSHING	AP1208	15079	2	57	T-TYPELOCK WASHER	BL04	15991	2
27	PIPE NIPPLE	T12	15079	1	58	HEX NUT	D04	15991	1
28	PIPE COUPLING	AE1612	15079	1	NOT SHOWN:				
29	CABLE GRIP ASSY	27111-622	----	1		SUCTION HOSE ASSY	46341-013	----	1
30	FORK TERMINAL	27215-061	----	1		DISCHARGE HOSE ASSY	46341-014	----	1
31	CONNECTOR	27284-003	----	4					

SECTION DRAWING

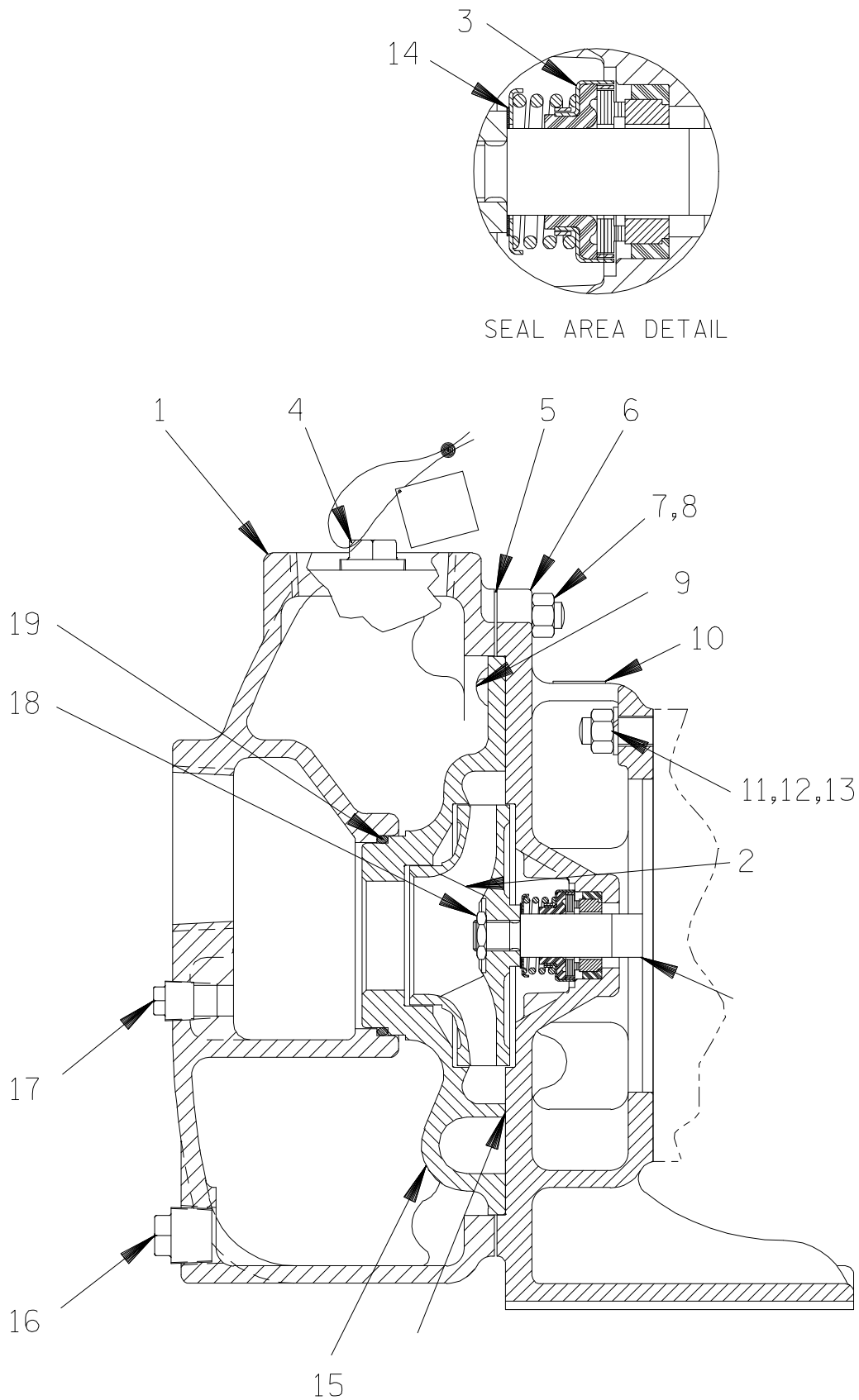


Figure 2. PPO (UNIT 608)

**PARTS LIST
PPO (UNIT 608)**

ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY
1	PUMP CASING	6366	10010	1
2	* IMPELLER	6594	14000	1
3	* MECHANICAL SEAL	25271-821	---	1
4	FILL PLUG ASSEMBLY	48271-060	---	1
5	* PUMP CASING GASKET	2958GB	20000	1
6	INTERMEDIATE BRACKET	6367	10010	1
7	STUD	C0606	15991	8
8	HEX NUT	D06	15991	8
9	RD HD MACHINE SCREW	X0402	14990	3
10	ROTATION DECAL	2613M	---	1
11	STUD	C0606	15991	4
12	LOCK WASHER	J06	15991	4
13	HEX NUT	D06	15991	4
14	* IMPELLER ADJUSTING SHIM SET	5889	170001	1
15	VANE PLATE	6378	10010	1
16	PIPE PLUG	P08	15079	1
17	PIPE PLUG	P04	15079	1
18	* IMPELLER NUT	AT07S	15991	1
19	* VANE PLATE O-RING	S1487	---	1
NOT SHOWN:				
	NAME PLATE	38818-020	13990	1
	DRIVE SCREW	BM#04-03	17000	4
	REDUCWER COUPLING	AE1208	15079	1

* INDICATES PARTS RECOMMENDED FOR STOCK

SECTION DRAWING

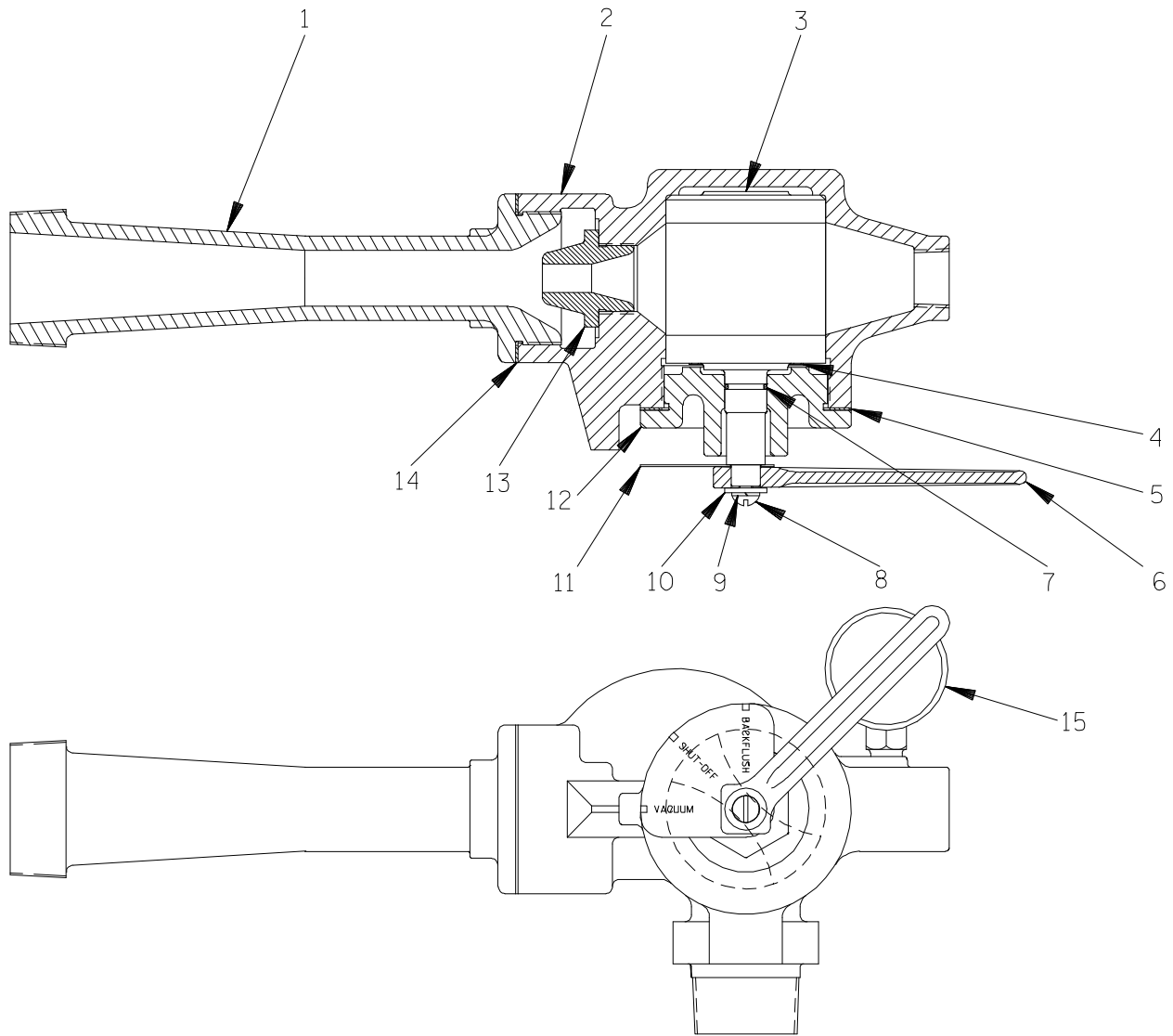


Figure 3. 13559 Eductor Valve Assembly

PARTS LIST
13559 Eductor Valve Assembly

ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY
1	VENTURI	13562	13040	1
2	VALVE EDUCTOR BODY	13560	13047	1
3	VALVE PLUG	13563	14004	1
4	WAVE WASHER	S1592	---	1
5	* GASKET	13564G	20000	1
6	HANDLE	13777	11000	1
7	* O-RING	S2120	---	1
8	RD HD MACHINE SCREW	X0402	15991	1
9	LOCK WASHER	J04	15991	1
10	FLAT WASHER	K04	15991	1
11	INDEX PLATE	13565	17990	1
12	VALVE CAP	13564	13040	1
13	NOZZLE	13561	13040	1
14	* GASKET	13562G	20000	1
15	* COMPOUND GAUGE	S155	---	1

* INDICATES PARTS RECOMMENDED FOR STOCK

SECTION DRAWING

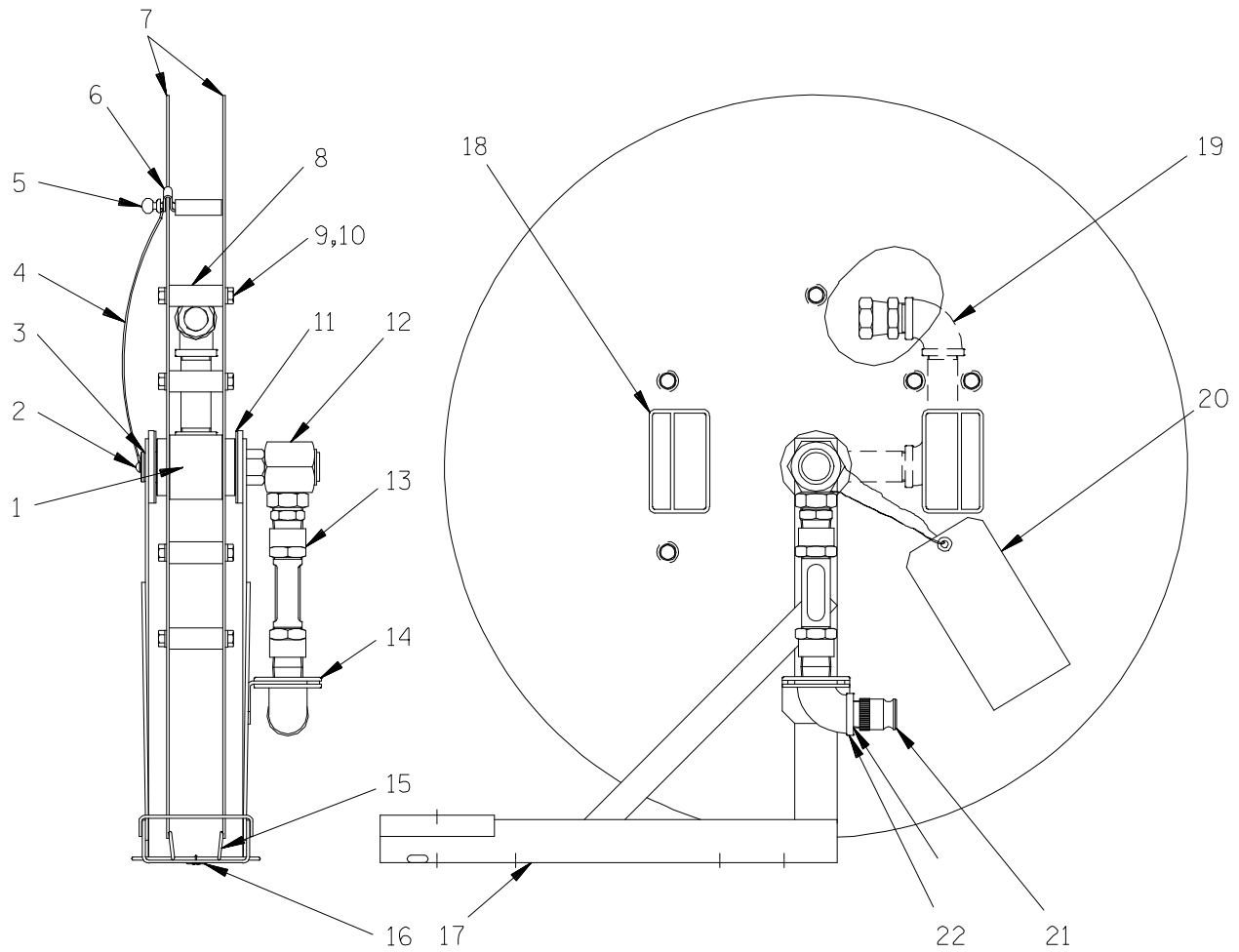


Figure 4. 41331-009 Reel Assembly

PARTS LIST
41331-009 Reel Assembly

ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY
1	REEL SPINDLE	31781-009	14100	REF
2	RD HD NYLOCK MACHINE SCREW	XA#10-01-1/2	15991	1
3	SNAP RING	24124-134	----	1
4	RETAINING WIRE ASSEMBLY	41158-804	----	1
5	THUMB SCREW	BH0401-1/2	15991	1
6	CLAMP ASSEMBLY	41125-803	----	1
7	REEL DISC	31281-031	13090	2
8	SPACER	31481-001	13150	7
9	HEX HD CAPSCREW	B0503	15991	14
10	LOCK WASHER	J05	15991	14
11	WASHER	31131-061	19210	2
12	SWIVEL	46381-102	----	1
13	SIGHT TUBE ASSEMBLY	46311-015	----	1
	-SIGHT TUBE	26867-105	----	1
	-MALE ADAPTOR	26525-302	----	1
	-CLOSE NIPPLE	T12	15079	1
14	GROMMET	27135-081	----	1
15	SPRING	31977-002	15091	1
16	COTTER PIN	M0303	15991	1
17	HOSE BASE ASSEMBLY	41583-551	24151	1
18	WARNING DECAL	38816-126	----	2
19	PIPE ASSEMBLY	46335-046	----	1
20	CAUTION TAG	38816-124	----	1
21	ADAPTOR	S2237	----	1
22	PIPE ELBOW	R12	11999	1

SECTION DRAWING

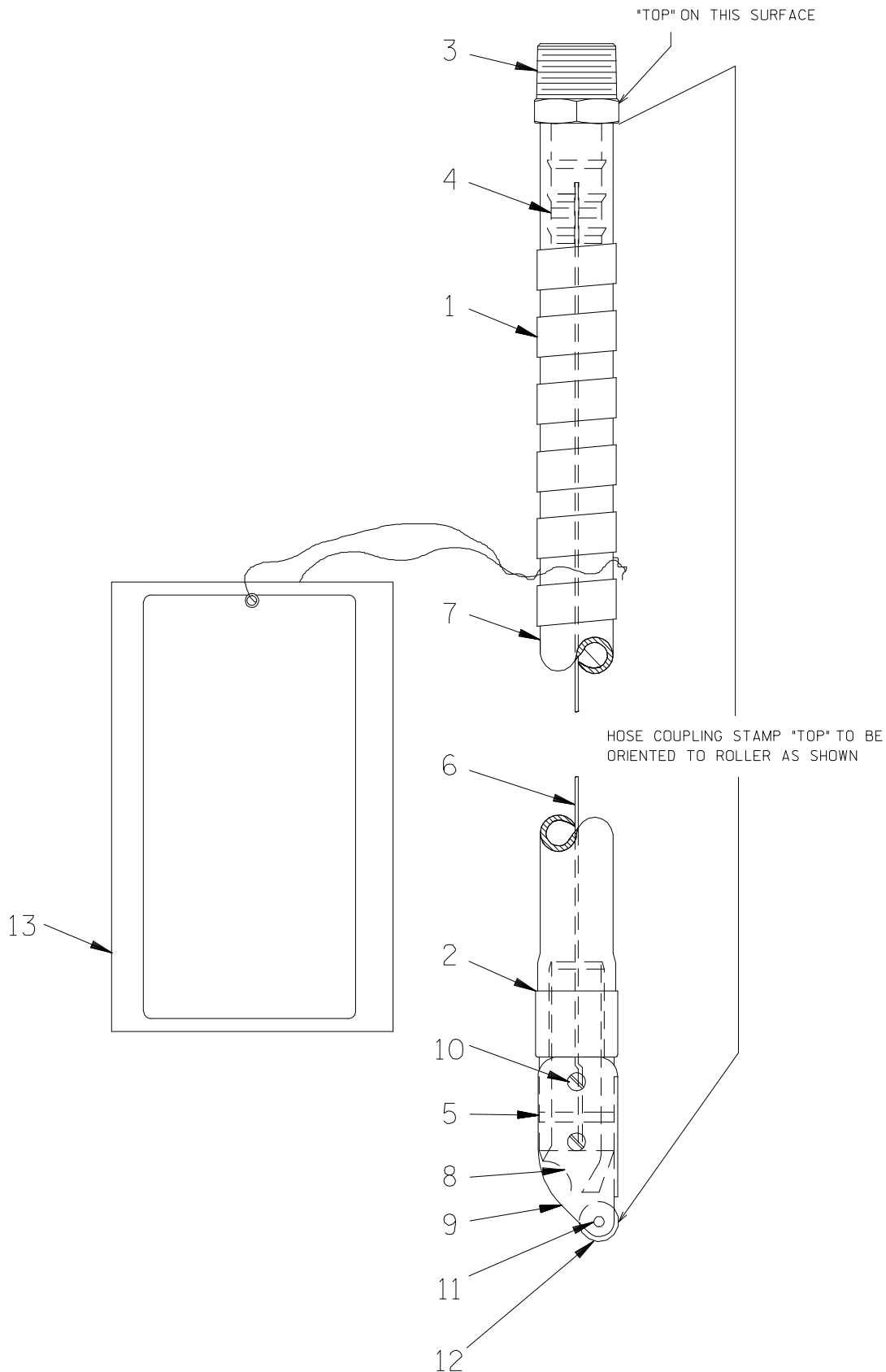


Figure 5. 46341-428 Hose Assembly

PARTS LIST
46341-428 Hose Assembly

ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY
1	HOSE GUARD	NOT AVAILABLE	---	1
2	FERRULE	26526-307	---	1
3	HOSE COUPLING	31874-018	14990	1
4	ROLL PIN	S2196	---	1
5	ROLL PIN	21154-673	---	1
6	TAPE	NOT AVAILABLE	---	1
7	HOSE	NOT AVAILABLE	---	1
8	HOSE NOZZLE	38634-015	14100	1
9	HOSE NOZZLE GUARD	34875-003	17000	1
10	FLAT HEAD MACHINE SCREW	21516-002	---	4
11	ROLLER PIN	31312-015	14100	1
12	ROLLER	31411-086	23050	1
13	INSTALLATION TAG	38817-086	---	1

SECTION DRAWING

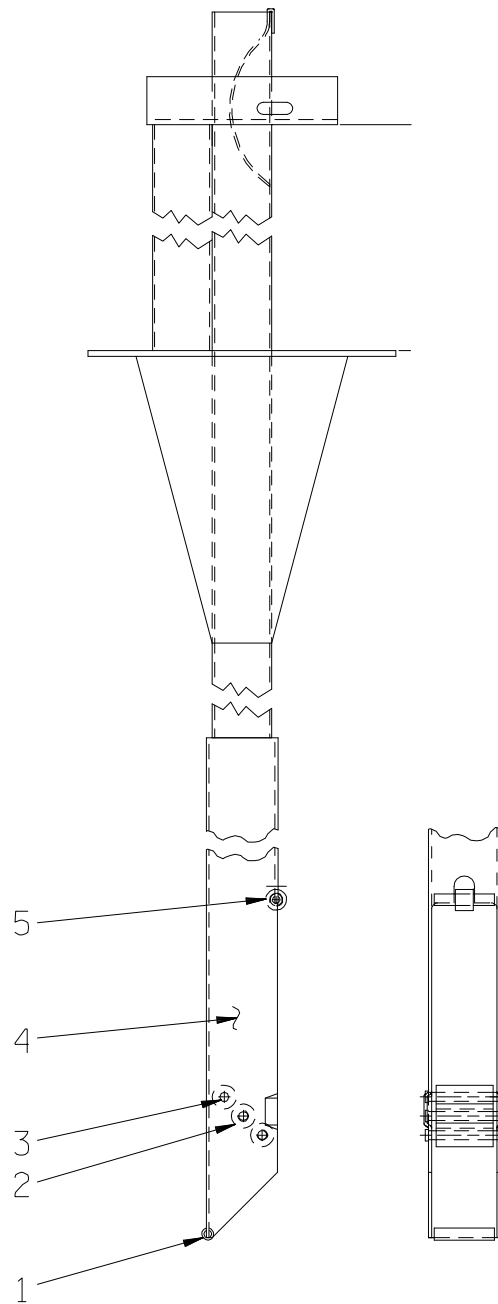


Figure 6. 46312-009 Standpipe Assembly

PARTS LIST

ITEM NO.	PART NAME	PART NUMBER	MAT'L CODE	QTY
1	ROLL PIN	S1611	---	2
2	ROLLER	31411-099	23050	3
3	ROLLER PIN	31312-014	14100	3
4	INNER/OUTER STAND ASSEMBLY	46312-011	24170	1
5	ROLLER	31141-022	23050	1

PUMP AND SEAL DISASSEMBLY AND REASSEMBLY

Review all SAFETY information in Section A.

Follow the instructions on all tags, label and decals attached to the pump.

This pump requires little service due to its rugged, minimum-maintenance design. However, if it becomes necessary to inspect or replace the wearing parts, follow these instructions which are keyed to the sectional views (see Figures 1, 2 and 3) and the accompanying parts lists.

This manual will alert personnel to known procedures which require special attention, to those which could damage equipment, and to those which could be dangerous to personnel. However, this manual cannot possibly anticipate and provide detailed precautions for every situation that might occur during maintenance of the unit. Therefore, it is the responsibility of the owner/maintenance personnel to ensure that **only** safe, established maintenance procedures are used, and that any procedures not addressed in this manual are performed **only** after establishing that neither personal safety nor pump integrity are compromised by such practices.

Before attempting to service the pump, disconnect the power source to ensure that the pump will remain inoperative. Close all valves in the suction and discharge lines.

For motor service and repair, consult the literature supplied with the motor, or contact your local motor representative.



Before attempting to open or service the pump:

1. Familiarize yourself with this manual.
2. Unplug the motor to ensure that the pump will remain inoperative.
3. Allow the pump to completely cool if overheated.

4. Check the temperature before opening any covers, plates, or plugs.

5. Vent the pump slowly and cautiously.

6. Drain the pump.



Before operating or servicing the pump, be certain proper safety practices are followed. Provide adequate ventilation, prohibit smoking, wear static-resistant clothing and shoes. Clean up all fuel spills immediately after occurrence.

Pump Disassembly

(Figure 2)

Before attempting to service the pump, remove the pump housing drain plug (16) and drain the pump. Clean and reinstall the drain plug.

If installed, disconnect the suction and discharge hoses from the pump. See Figure 1 and install the dust cap (10) and dust plug (17) to protect the suction and discharge ports from damage or contamination. Unscrew the hose assembly (5) from the elbow (3).

To service the impeller (2), seal assembly (3), or vane plate (15), the pump casing (1) must be separated from the intermediate (6). See Figure 1 and remove the hardware (51, 52 and 53) securing the pump casing to the base (33).

Remove the nuts (8) and separate the pump casing and gasket (5) from the intermediate bracket (6).

It is not necessary to remove the piping for the eductor (2, Figure 1) from the pump casing unless the eductor requires service. If the eductor requires service, disengage only enough piping to allow removal of the eductor.

Impeller Removal

(Figure 2)

For access to the impeller (2), disengage the machine screws (9) and remove the vane plate (15).

Clean the adhesive sealant from the faces of the vane plate and the intermediate. Remove the vane plate O-ring (19).

Insert a large flat head screwdriver in the slot in the end of the shaft of the motor (22, Figure 1) to prevent shaft rotation and remove the impeller nut (18).

Insert a soft metal bar between the vanes of the impeller and use the bar to unscrew the impeller from the motor shaft in a counterclockwise direction. **Use caution** not to damage the impeller vanes. Use caution when removing the impeller; tension on the seal spring will be released as the impeller is removed.

Remove the impeller adjusting shims (14). Tie and tag the shims or measure and record their thickness for ease of reassembly.

Seal Removal and Disassembly

(Figure 2)

Remove the seal spring. Apply oil to the shaft and work it up under the rubber bellows. Slide the rotating portion of the seal off the shaft.

Remove the hardware (12 and 13) securing the intermediate bracket (6) to the motor, and slide the intermediate bracket and stationary seal components off the shaft as a unit. Use a suitably sized dowel to press the seal stationary element and seat out of the intermediate from the back side.

Seal Reassembly and Installation

(Figure 2)

Clean the seal cavity and shaft with a cloth soaked in fresh cleaning solvent.



Most cleaning solvents are toxic and flammable. Use them only in a well ventilated area free from excessive heat, sparks, and flame. Read and follow all precautions printed on solvent containers.

The seal is not normally reused because wear patterns on the finished faces cannot be realigned during reassembly. This could result in premature failure. If necessary to reuse an old seal in an emergency, **carefully** wash all metallic parts in fresh cleaning solvent and allow to dry thoroughly.

Handle the seal parts with extreme care to prevent damage. Be careful not to contaminate precision finished faces; even fingerprints on the faces can shorten seal life. If necessary, clean the faces with a non-oil based solvent and a clean, lint-free tissue. Wipe **lightly** in a concentric pattern to avoid scratching the faces.

Inspect the seal components for wear, scoring, grooves, and other damage that might cause leakage. If any components are worn, replace the complete seal; **never mix old and new seal parts.**

If a replacement seal is being used, remove it from the container and inspect the precision finished faces to ensure that they are free of any foreign matter.

To ease installation of the seal, lubricate the bellows with water or a very **small** amount of light lubricating oil, and apply a drop of light lubricating oil on the finished faces. Assemble the seal as follows, (see Figure 7).

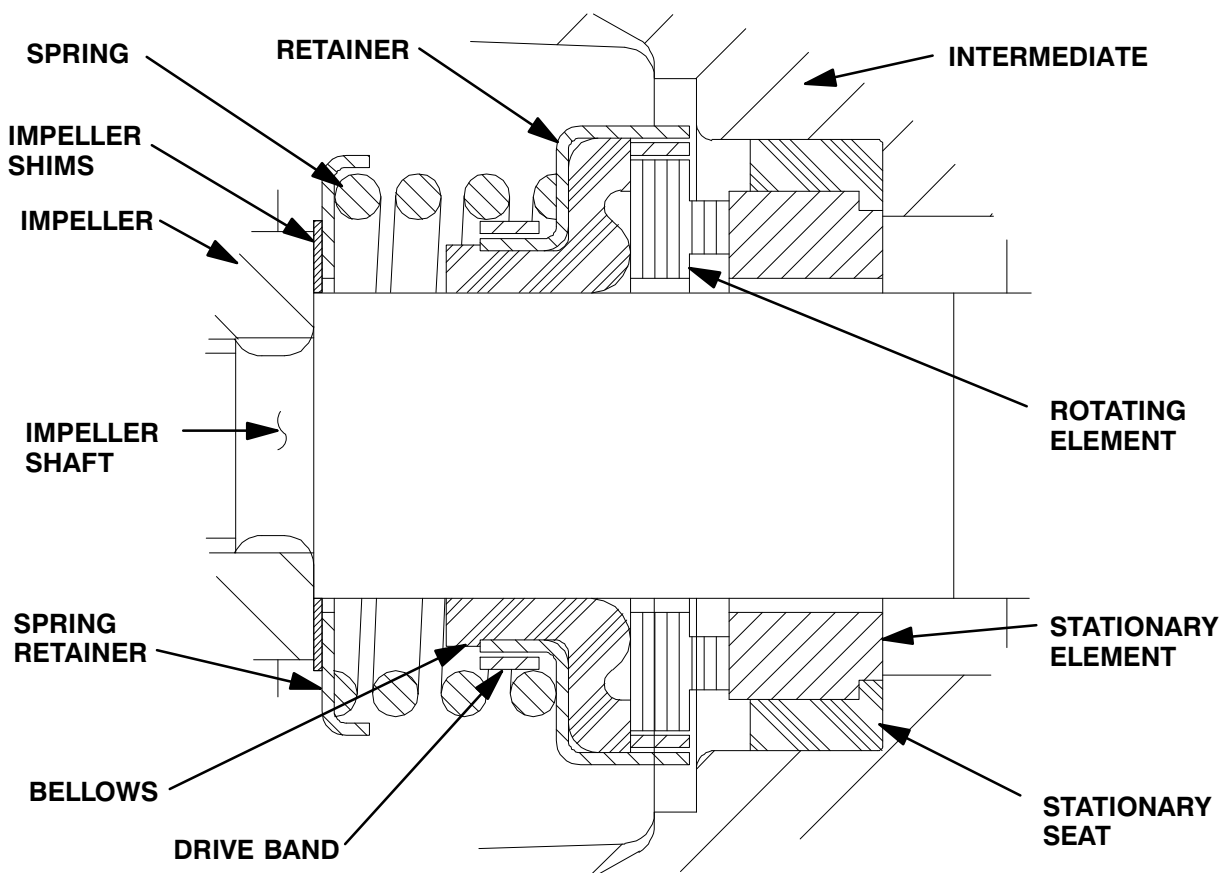


Figure 7. 25271-821 Seal Assembly



This seal is not designed for operation at temperatures above 160°F (71°C). Do not use at higher operating temperatures.

Position the intermediate bracket (6) on a flat surface with the impeller side facing up. Subassemble the stationary element and seat, and use even pressure to press this subassembly into the intermediate bracket until squarely seated in the intermediate bore.

Carefully slide the assembled intermediate and stationary seal components over the motor shaft and secure the intermediate to the motor with the hardware (12 and 13).

Subassemble the rotating element into the retainer and bellows. Lubricate the I.D. of the bellows with

water, and slide this subassembly onto the shaft until the polished faces contact. Install the seal spring and spring retainer.

Impeller Installation

(Figure 2)

Inspect the impeller and replace it if cracked or badly worn.

For maximum pump efficiency, the impeller should be centered within the vane plate scroll.

To verify the impeller positioning, measure the vane plate and impeller as shown in Figure 8. Use these measurements to calculate the required impeller location (dimension E). Add or remove impeller adjusting shims (14) until dimension E is obtained.

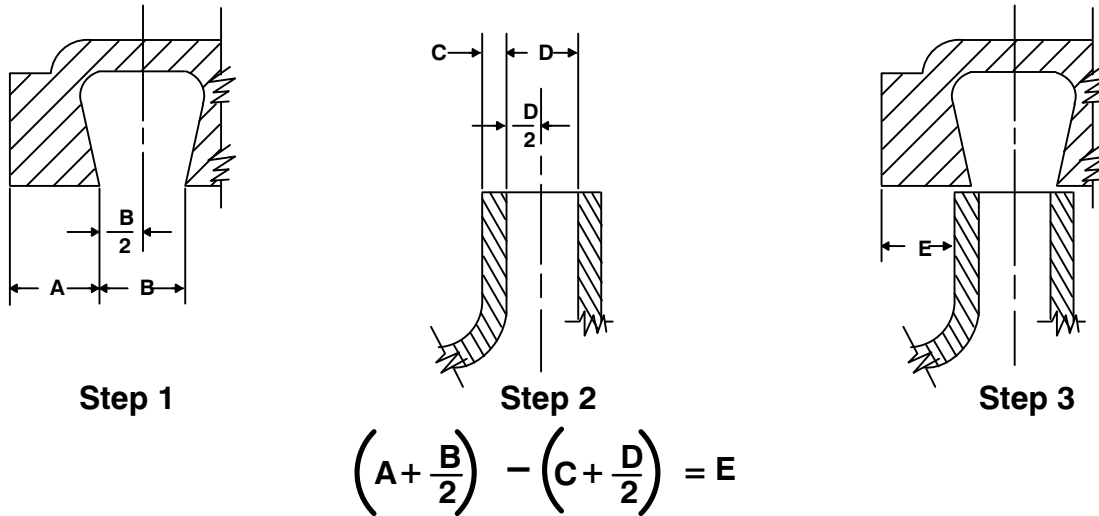


Figure 8. Centering Impeller Within Vane Plate Scroll

Install the correct thickness of impeller shims and screw the impeller onto the shaft until fully seated.

NOTE

At the slightest sign of binding, immediately back the impeller off, and check the threads for dirt. Do not try to force the impeller onto the shaft.

When the impeller is properly positioned, apply 'Loctite Threadlocker No. 242' or equivalent compound to the shaft threads and screw the impeller nut (18) onto the shaft until tight.

NOTE

After the impeller has been properly positioned, check for free rotation. Correct any scraping binding before further reassembly.

Clean any remaining adhesive sealant from the faces of the vane plate (15) and intermediate. Apply a thin coating of '3-M Scotch Grip Adhesive No. 847' or equivalent compound to the face of the intermediate. Secure the vane plate to the intermediate bracket using the machine screws (9).

Pump Reassembly

(Figure 2)

Install the vane plate O-ring (29) into the groove in the vane plate. Install the pump casing gasket (5).

Ease the pump housing over the vane plate. **Be careful** not to damage the vane plate O-ring. Secure the housing to the intermediate bracket with the nuts (8).

Final Pump Assembly

(Figure 1)

Secure the pump casing to the base (33) with the previously removed hardware (51, 52 and 53). If removed, reinstall the eductor (2) and piping. Install the hose (5) in the elbow (3). Make certain that all piping connections are tight, properly supported and secure.

(Figure 2)

Fill the pump casing with clean liquid. Reinstall the fill plug (4) and tighten it.

Refer to **OPERATION**, Section C, before putting the pump back into service.

LUBRICATION

Seal Assembly

The seal assembly is lubricated by the medium being pumped and no additional lubrication is required.

EDUCTOR VALVE DISASSEMBLY AND REASSEMBLY

All instructions in this section are keyed to Figure 3 and the accompanying parts list.

Eductor Valve Disassembly

Unscrew the hose assembly (5, Figure 1) and disconnect the valve assembly from the pump. Remove the pressure gauge (15) and disengage the piping from the eductor valve.

Secure the valve in a vice and unscrew the venturi (1) from the valve body (2). Remove the gasket (14) and clean the mating surfaces.

Use a socket wrench to unscrew the eductor nozzle (13) from the valve body.

To service the valve plug (3), remove the valve handle (6) and index plate (11) by removing the hardware (8, 9 and 10). Unscrew the valve cap (12) from the valve body. Remove the gasket (5) and clean the mating surfaces.

Remove the wave washer (4) and pull the valve plug from the valve body. Remove the O-ring (7) from the groove in the valve plug shaft.

Eductor Valve Reassembly

Clean the valve plug (3), valve cap (12) nozzle (13) and valve body (2) with a cloth soaked in fresh cleaning solvent.



Most cleaning solvents are toxic and flammable. Use them only in a well ventilated area free from excessive heat, sparks, and flame. Read and follow all precautions printed on solvent containers.

Inspect all eductor valve components and replace them as required.

Apply a small amount of light oil to the O-ring (7) and install it in the groove on the valve plug shaft.

Slide the valve plug into the valve body and install the wave washer (4).

NOTE

Apply "Never-Seez" or equivalent compound on all eductor threads before reassembly.

Replace the cap gasket (5) and screw the cap into the valve body until fully seated.

Position the index plate (11) on the plug shaft with the words "SHUT-OFF" at the indicator on the valve body. Reassemble the handle (6) at the 9 o'clock position and secure it with the attaching hardware (8, 9 and 10).

Screw the valve nozzle (13) into the valve body until fully seated.

Install the venturi gasket (14) and screw the venturi into the valve body until fully seated.

Install the pressure gauge (15).

Check the operation of the valve handle for free movement in all positions.

Reinstall the valve piping and secure it to the pump assembly. See Figure 1 and reconnect the hose (5) to the elbow (3).

HOSE AND REEL DISASSEMBLY AND REASSEMBLY

Hose Disassembly

(Figure 5)

Remove the hose and reel assembly from the unit base. See Figure 4, loosen the thumbscrew (5), remove the clamp (6) and unwind the hose assembly from the reel. Reach through the hole in the side of the reel disc (7) and use a wrench to unscrew the hose assembly from the pipe assembly (19).

Inspect the nozzle end of the hose assembly. Disassembly in the field is not recommended; however, if the nozzle or other parts require replacement, individual parts are available.

To remove the nozzle (8), remove the screws (10) and separate the guard (9) from the hose end.

If the roller (12) requires replacement, grind the head off the roller pin (11), tap the pin out of the guard and remove the roller.

To remove the nozzle (8) from the hose, tap the roll pin (5) out of the nozzle and separate the nozzle from the hose and strap (6).



Inspect the hose assembly for cuts, punctures or severe abrasion. Replace the complete hose assembly if there is any possibility of leakage or exposure of the integral steel tape.

Do not try to separate the tape or hose guard from the hose. If the hose, tape or guard are damaged, the complete hose assembly must be replaced; individual parts are not available.

Reel Disassembly

(Figure 4)

With the hose assembly (5, Figure 1) removed, use an open ended wrench on the hex fitting on the bottom of the swivel (12) while using another open ended wrench to unscrew the sight tube assembly from the swivel. Slide the sight tube assembly down through the grommet (14).

It is not necessary to disassemble the sight tube assembly unless the glass gauge is broken. If the glass gauge is to be replaced, unscrew the elbow (22) from the close nipple in the bottom of the gauge. Unscrew the close nipple from the bottom of the gauge and the adaptor from the top of the gauge.

Disengage the machine screw (2) from the reel spindle (1) and remove the thumbscrew (5) clamp (6) and wire (4).

To remove the swivel (12), immobilize the reel spindle and unscrew the swivel from the spindle.

To remove the reel discs (7) from the base (17), remove the snap ring (3), spread the top of the base assembly slightly, and lift the assembled spindle and discs from the base. Remove the washers (11) from the spindle.

If replacement of the pipe assembly (19) or reel spindle is required, remove the hardware (9 and 10) and separate the discs and spacers (8). Remove the internal pipe fittings as required.

If the spring (15) requires replacement, remove the cotter pin (16) from the base assembly (17) and pull the clip from the base.

Reel Reassembly

(Figure 4)

If removed, position the spring (15) in the base and secure it by sliding the cotter pin (16) over the clip, then through the hole in the bottom of the base. Spread the end of the cotter pin.

Clean the sight tube assembly parts, pipe assembly parts, spindle and swivel fitting with fresh cleaning solvent.



Most cleaning solvents are toxic and flammable. Use them only in a well ventilated area free from excessive heat, sparks, and flame. Read and follow all precautions printed on solvent containers.

NOTE

Apply "Loctite Pipe Sealant with Teflon" or equivalent compound to all pipe thread connections before reassembly.

If removed, reassemble the pipe assembly (19) to the spindle (1). Position the two discs (7) on the spindle and secure them with the spacers (8) and hardware (9 and 10).

Position the washers (11) on the spindle. Slightly spread the top of the base assembly and position the reel in the holes in the sides of the base. Screw the swivel (12) into the spindle.

Secure the reel to the base with the snap ring (3). Secure the clamp (6, thumbscrew (5) and wire assembly (4) to the spindle with the machine screw (2).

If the glass sight gauge is being replaced, hand tighten the brass fittings on the ends of the tube to

make certain the gaskets inside the brass end nuts seal the glass tube. **Use caution** not to break the glass tube. After tightening the fittings, apply 3–4 drops of ‘Loctite Threadlocker No. 242’ or equivalent compound to each threaded joint. The threadlocker will “leach” into the threads to prevent loosening of the sight glass tube. Install the male adaptor and close nipple in the ends of the sight gauge.

NOTE

When tightening the sight tube adaptor and close nipple, hold the hex fittings on either end of the sight tube assembly with an open ended wrench to prevent the end fittings of the sight tube assembly from tightening and breaking the sight gauge.

Slide the sight tube assembly up through the grommet (14) with the male adaptor fitting toward the swivel (12). Screw the sight tube assembly into the swivel, then reinstall the elbow (22).

See **Hose Reassembly** when connecting the hose to the reel.

Hose Reassembly

(Figure 5)

Clean the nozzle parts in fresh cleaning solvent.



Most cleaning solvents are toxic and flammable. Use them only in a well ventilated area free from excessive heat, sparks, and flame. Read and follow all precautions printed on solvent containers.

Insert the hose nozzle (8) into the end of the hose assembly so the hole in the metal tape inside the hose aligns with the hole in the nozzle and secure it with the roll pin (5).

Install the nozzle guard (9) over the nozzle and secure with the machine screws (10).

Assemble the roller (12) in the nozzle guard and install with the roller pin (11). Peen the end of the pin to retain the roller.

Connect the other end of the hose assembly to the reel assembly. Reach through the access hole in the reel discs with two open end wrenches and tighten the fittings.

NOTE

The reel end of the hose assembly must be positioned so the word “TOP” on the hose fitting is visible when looking down at the fitting between the reel discs.

Coil the hose into the reel assembly and check the position of the hose nozzle. The nozzle **must** be positioned as shown in Figure 4 with the roller away from the center of the reel.

STANDPIPE DISASSEMBLY AND REASSEMBLY

Standpipe Disassembly

(Figure 6)

If the rollers (2) require replacement, grind off the ends of the roller pins (3) and tap the pins from the standpipe.

The roller (5) can be removed by removing the roll pin from the roller and standpipe wall.

Standpipe Reassembly

(Figure 6)

If removed, position the roller (5) between the walls of the standpipe and secure it with the previously remove roll pin.

Align the rollers (2) with the holes in the tubing wall and tap the roller pins (3) through the walls and roller. Peen the end of the roller pins to secure.

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