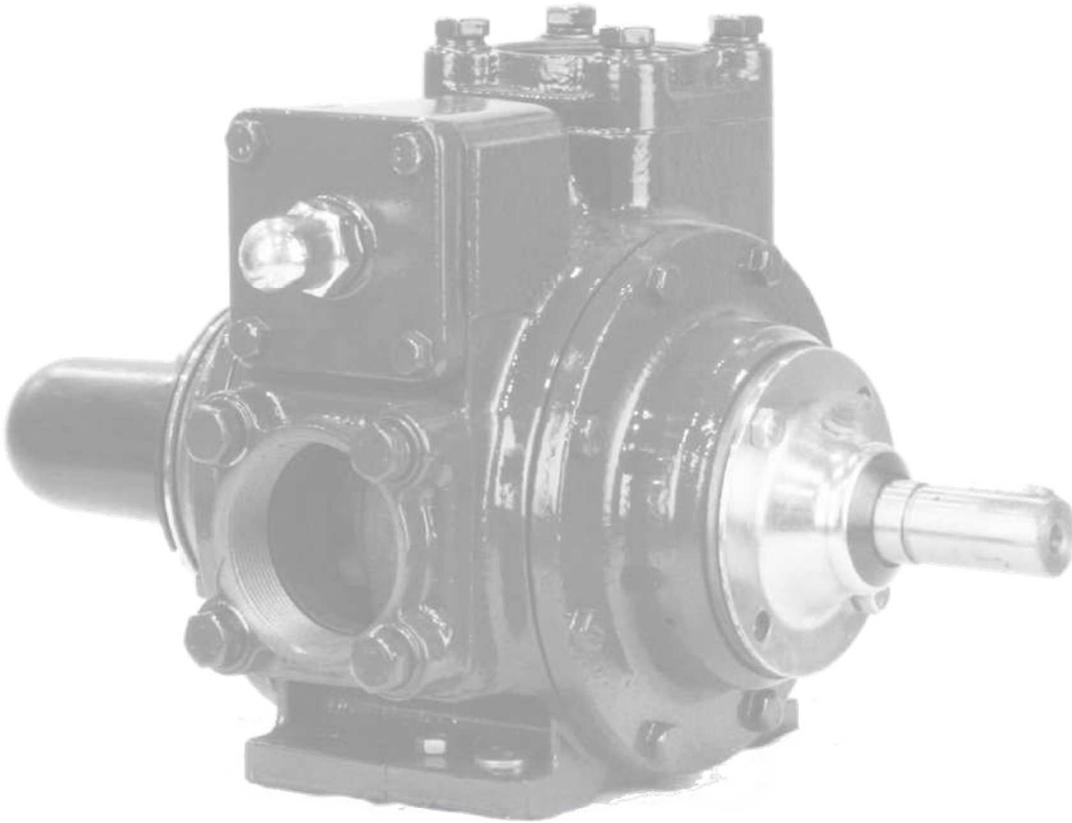


Installation and Operation Manual



PRGMAN-12
Version: A
January 31, 2024

Safety Notice

This manual is designed to be read to its entirety prior to installation or operation of this product.

Do NOT install or operate prior to reading this manual completely - injury or property damage can occur.

Use adequate protection and safety equipment while performing the steps indicated in this manual.

Protect against hazards involved during the installation and operation of this equipment.

Failure to read this manual completely or heed these warnings could result in serious bodily injury or loss of life.

For equipment covered specifically or indirectly in this operation manual, it is important that all personnel observe the appropriate safety precautions to minimize the chances of injury.

DO NOT....

- Attempt to install equipment with the truck engine running
- Allow the truck engine to be started while personnel are under the vehicle or working on any equipment
- Place any body part over any pneumatic (or hydraulic) leak or outlet while the equipment is in operation
- Engage or disengage driven equipment by hand from under the vehicle while the engine is running
- Use tools or equipment that are in poor or non-working condition
- Remove, obscure, cover, or paint over any warning labels

DO....

- Read and Understand all original equipment manufacturers manuals before installation or operation of any equipment installed in the Stainless Vane Pump
- Follow all safety rules and regulations as it applies to the equipment provided
- Immobilize truck wheels with suitable chocks before working under the truck
- Block any raised equipment before working on or under the equipment
- Obtain proper training on tools and equipment that are required
- Ensure all tools and components are in good working condition
- Use all tools and equipment for its intended purpose only
- Repair any leaks promptly
- Remain a safe distance away from any moving components during operation

Congratulations

on your new Paragon purchase

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Materials of Construction

Part Name	Standard Materials
Cylinder, Heads, Port Flanges, and R/V Cover	Cast Iron
Rotor, Shaft, and Push Rods	Ductile Iron
R/V Poppet and Cap	Cast Iron
R/V Spring and Seat	Plated Steel
Head, R/V Cap and R/V Cover O-Rings	Buna FKM
Gaskets	Garlock 700
Mechanical Seal Components	
Stationary and Rotating O-Ring	Buna FKM
Stationary Seat	Ductile Iron
Rotating Seal Face	Carbon
Spring	Plated Steel
Seal Housing	Cast Iron

Warnings



NOTICE

- Safety instruction tags and labels were attached to your unit prior to shipment. **DO NOT** remove, obscure, or cover in any manner
- Failure to heed these warnings could result in serious bodily injury to personnel operating or maintaining this equipment.

Good Practices

Note: These are general guidelines and do not cover all possible situations. It is the responsibility of the system integrator to install this product properly.

Plumbing

- The inlet pipe should be as short and straight as possible to minimize suction pressure losses.
- Slope the inlet plumbing appropriately to avoid air pockets.
- Plumbing must be properly supported and aligned with expansion joints, if required.
- A product relief valve should be installed as close to the pump outlet as possible and before any shut-off valves.

Driveline Guards

- Ensure adequate guards have been installed to prevent injury.
- Follow OSHA, Federal, State and Local codes.
- Check Alignment of Pump and Driveline (See Fig 1.)

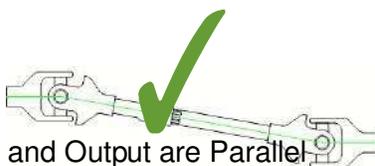
Note: PTO drive systems can be dangerous and when used, additional safety precautions, including guarding, may be required and must be provided by the drive system installer. Paragon Tank Truck Equipment has no responsibility for recommending or providing proper guarding or other safety measures in any particular application.

The installation of proper guards for the power take-off and its associated equipment is the responsibility of the drive system designer and the installer who knows the particular product application and the user's exposure to danger.

The ultimate responsibility for the safe application and installation is the user's.

Excessive misalignment can overload the pump input shaft and cause premature failure.

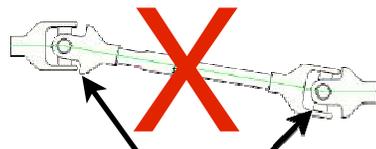
Fig.1



- Input and Output are Parallel
- Input
- Universal Joints are in Phase
- Universal Joint Angles are within specification (minimum of 1.5 degree working angle)



- Input and Output are NOT Parallel
- Universal Joint Angles are outside of specification



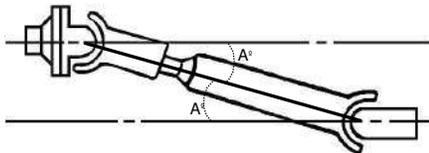
- Universal Joints are NOT in Phase

Good Practices / Continued

Pump Drive Guidelines

- **DO NOT** use square slip joints. Only use an even number of universal joints.
- Use an angular level measuring device to make sure that the pump shaft is parallel with the PTO shaft.
- The universal joint yokes must be parallel and in phase.
- Maximum drive angle between pump shaft and jackshaft is 15 degrees.

Fig. 2



Angle of Drive Shaft		
1° through 5°	6° through 10°	11° through 15°
Excellent	Good	Acceptable

Note: Failure to follow these guidelines will cause the pump rotor to turn unevenly. This will result in severe vibration to the liquid stream and piping system. This can also result in equipment damage or personnel injury.

Close Coupled Drives

Benefits of driven units where the driving equipment mounts directly to the product pump.

- Driveline is not exposed and does not require guards.
- Alignment between pump and drive line is maintained by the assembly.

Fig. 3

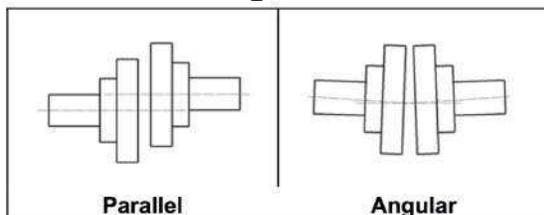
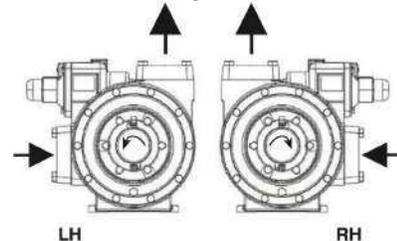


Fig. 4



Pump Rotation

- Check pump rotation arrows to confirm the correct rotation direction.
- To change pump rotation rotate the pump 180 degrees so the opposite shaft becomes the driven shaft. Relocate the shaft protector to the non driven shaft.

CAUTION: Operation without a shaft protector on double shaft models can cause serious injury, property damage, or death.

Mounting Base

- Mount the unit on a rigid, heavy base to provide support and absorb shock. Mounting bases should be designed for high rigidity and strength.
- When mounting to cement or concrete, use a steel base plate to distribute the mounting stress over an area large enough to prevent the cement from failing.

Note: See coupler manufacturer's specification for the operational limitations regarding angular and parallel mis-alignment.

Operation

CAUTION: Pump operation against a closed valve can cause serious injury and property damage.

CAUTION: Disconnecting fluid or pressure components during operation can cause serious injury, property damage, or death.

CAUTION: Flush system prior to pumping different chemicals.

CAUTION: Failure to relieve system pressure prior to pump operation can cause serious injury and property damage.

Pre-Start Check List

- Check piping alignment to the pump.
- Pipes must be supported so they remain intact when pump flanges or union joints are disconnected.
- Vacuum and pressure gauges must be installed in the pipework to monitor the suction and discharge conditions while the VP pump is in operation.
- Assure that the piping loading is not being placed on the pump.
- Secure all hose connections.

Start Up Procedures

1. Ensure appropriate valves in the inlet and discharge lines are open and the supply line is flooded.
2. Start the pump, priming should occur within one minute.
3. Check piping and system equipment for leaks and excessive vibration.
4. Ensure the product is not overheating.
5. Momentarily close a valve in the discharge line and check the anticipated relief valve pressure setting. Pressure relief valve should be 15-20 psi (1.0 - 1.4 bar) higher than the maximum system operating pressure. Do not operate the pump against a closed discharge valve for more than 15 seconds. Do not exceed max PSI rating for the pump.

Note: Product pump must never exceed the maximum RPM specifications.

If the product pump is to operate in reverse, a separate pressure relief valve must be installed to prevent excessive pressure.

Flushing the pump

1. Evacuate as much fluid from the pump as possible.
2. Run the cleaning fluid through the pump intake. Do not use a cleaning fluid that will solidify within the pump.
3. Operate the pump against a closed discharge for 15 seconds to allow the cleaning fluid to recirculate through the internal relief valve.

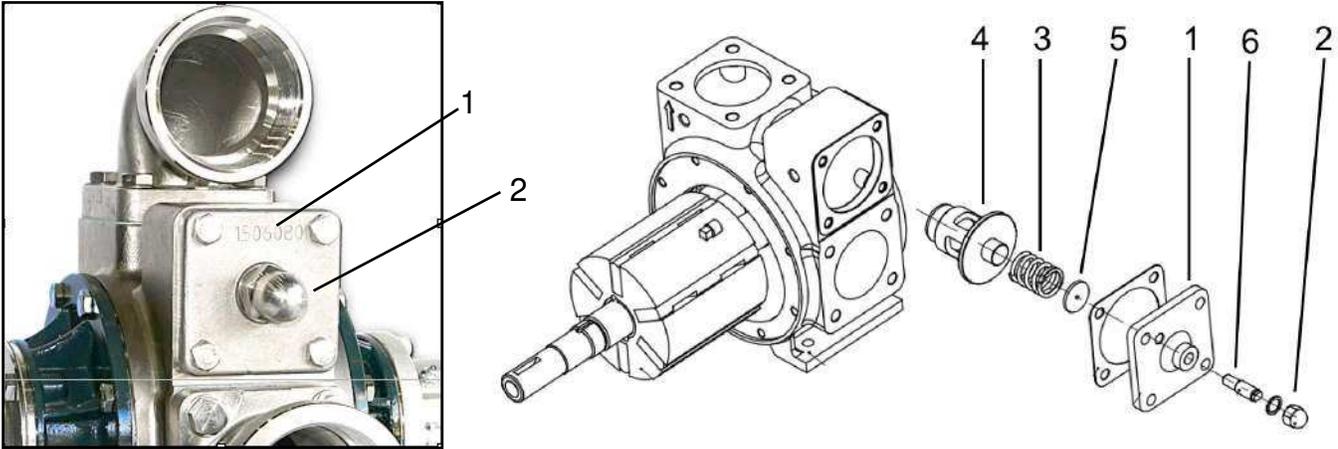
Note: If a corrosive or non-lubricating fluid is used when flushing the pump, it must be flushed from the pump immediately.

Operation / Continued

Relief Valve

Note: Relief valve is designed to protect the pump from excessive pressure. It should not be used as a system pressure control valve.

- Relief Valve should be set at least 15-20 psi (1.0 - 1.4 Bar) higher than the anticipated operating pressure or external bypass valve setting (if equipped).



TO ADJUST RELIEF SETTING:

DO NOT remove **Valve Cap (2)**, or adjust the pressure rating, while the pump is in operation.

To increase the pressure setting: Remove **Valve Cap (2)**, loosen locknut, turn **Adjusting Screw (6)** inward (clockwise). Re-tighten locknut and replace **Valve Cap (2)**.

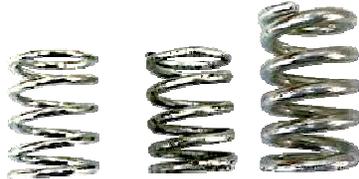
To decrease the pressure setting: Remove **Valve Cap (2)**, loosen locknut, turn **Adjusting Screw (6)** outward (counterclockwise). Re-tighten locknut and replace **Valve Cap (2)**.

VP80 (2" PUMP)

Standard spring (already in the pump)
76-110 psi rating

Extras:

- (1) Small spring
36-50 psi rating
- (2) Medium spring
(thicker)
51-75 psi rating
- (3) Big spring
111-125 psi rating



VP150 / VP270 (2.5" / 3" PUMP)

Standard spring (already in the pump)
51-110 psi rating

Extra:

- (1) Big spring
111-125 psi rating



TO REPLACE NEW BYPASS VALVE SPRING:

Remove **Bypass Valve Cover (1)** and **Valve Cap (2)**. Replace **Bypass Valve Spring (3)** in-between **Bypass Valve (4)** and **Spring Seat (5)**. Re-bolt **Bypass Valve Cover (1)** and **Valve Cap (2)**.

Required Fasteners for Industry Add-ons

- Paragon **DOES NOT** supply Product Strainers or Air Operated Bypass Valves.
- Alteration to any Non-Paragon equipment may be required.
- Any alterations not approved in writing from Paragon will **VOID** the equipment warranty.
- Bolts provided below are acceptable for the equipment specified and are not considered equipment alterations.

VP80 (2" PUMP)

2" T-Type Strainer
(4) M10 x 25mm
Part Number: 128-019



VP150 (2.5" PUMP)

2.5" T-Type Strainer
(4) M12 x 25mm
Part Number: 128-023

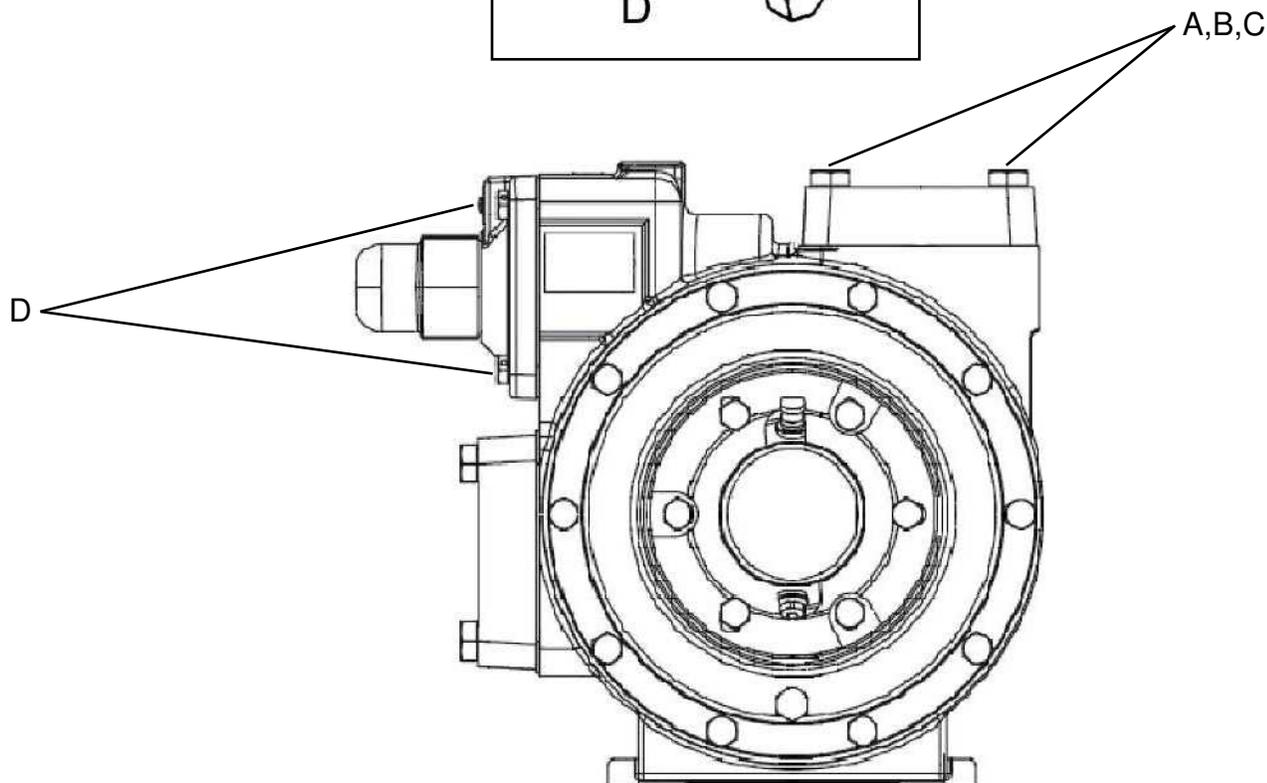


Air Operated Bypass Valve
(4) M10 x 70mm
Part Number: 128-004



VP270 (3" PUMP)

3" T-Type Strainer
(4) M12 x 30mm
Part Number: 128-019



Maintenance

- CAUTION:** Failure to relieve system pressure prior to performing pump service or maintenance can cause personal injury or property damage.
- CAUTION:** Failure to disconnect and lockout electrical power or engine drive before attempting maintenance can cause severe personal injury or death.
- CAUTION:** If pumping hazardous or toxic fluids, system must be flushed prior to performing service.
- CAUTION:** Do not lubricate pump bearings, hydraulic adapter coupling, or any other parts while the pump is running.

- Clean strainers regularly to avoid pump starvation
- Lubricate ball bearings and hydraulic motor couplings every three months.
Recommended grease: Mobile - Mobile Grease XHP 222

Vane Replacement

1. Remove the sideplate assembly from the drive non-drive side of the pump.
2. Turn the shaft by hand until a vane comes to the top (12 o'clock) of the rotor. Then remove the vane.
3. Install a new vane, ensuring that the rounded edge is pointing up and relief grooves are facing the direction of the rotation.
4. Repeat steps 2 and 3 until all vanes are replaced.

Pump Disassembly

1. On the drive-end of the pump, clean the pump shaft thoroughly, making sure the shaft is free of burrs.
2. Remove drive bearing capscrews and slide the drive bearing cover and gasket off the shaft. Discard the bearing cover gasket. The dirt shield will come off with the bearing cover.
3. Remove the non-drive bearing cover capscrews and slide the non-drive bearing cover and gasket off the shaft. Discard the bearing cover gasket.
4. Remove the sideplate capscrews and carefully ease the sideplate away from the body.
5. Slide the sideplate off of the shaft. The sideplate O-ring, bearing, and mechanical seal will come off with the sideplate assembly. Discard the sideplate O-ring.
 - A. After pulling the bearing from the sideplate, use two screw drivers to gently push the back of the seal jacket pushing the seal from the sideplate.
6. Pull the rotor and the shaft from the body.
7. Remove the remaining components from the non-drive side of the pump, as instructed in step 4 and step 5.

Maintenance / Continued

Pump Assembly

Note: Inspect all component parts before reassembling the pump.

1. Reassemble the non-drive side of the pump first:
 - A. For a **clockwise** rotation pump, position the pump body with the **intake** port to the **left**.
 - B. For a **counterclockwise** rotation pump, position the pump body with the **intake** port to the **right**.
2. Install a new sideplate O-ring in the groove in the sideplate. Lightly grease the outside circumference of the O-ring to facilitate sideplate installation.
3. **Mechanical Seal:** Apply a small amount of motor oil in the sideplate recess. Push the mechanical seal assembly into the recess of the sideplate with seal jacket drive tangs inward. The pin in the stationary seat must be between the lugs in the back of the sideplate recess.
4. Install the sideplate on the non-drive side of the body. Install and uniformly tighten four sideplate capscrews 90 degrees apart, torquing to 25 lbs. ft (34 Nm).
5. Pack the ball bearing with grease and install the bearing into the sideplate recess. Bearing should be squarely seated against the mechanical seal. The bearing balls should face outward and the grease shield should face inward.
6. Turn pump around and begin working on the drive end.
7. If needed, replace vanes and push rods as follows:
 - A. Partially install the non-driven end of the rotor and shaft into the open side of the pump body.
 - B. Leave part of the rotor outside of the body so that the bottom vanes can be installed and held in place as the push rods are installed in the push rod holes of the rotor. Insert the new vanes into the rotor slots with the rounded edges facing outward.
 - C. Once the push rods and vanes are installed, insert the rotor and shaft fully into the body.
 - D. Install the remaining vanes into the top positions of the rotor. Rotate the shaft by hand to engage the drive tangs of the seal jacket in the rotor slots.**
8. Install the drive sideplate, mechanical seal, and bearing as instructed in steps 2 through 6. Apply a thin coating of motor oil on the drive shaft to aid installation.
9. Rotate the shaft by hand to engage the mechanical seal drive tangs and to test for binding or tight spots. Install all of the remaining sideplate capscrews for each sideplate and uniformly torque to 25 lbs. ft. (34 Nm)
10. **Locknut Installation (if equipped):** Bearing locknuts and lockwashers must be installed and adjusted properly. Do not overtighten the locknuts, because this will cause bearing failure. If the locknuts are too loose, the rotor will shift against the heads, causing wear.
 - A. On both ends of the pump, install a lockwasher with the tangs facing outward, followed by a locknut with the tapered end inward. Ensure that the inner tang of the lockwasher is located in the slot in the shaft threads.
 - B. Tighten both locknuts to ensure that the bearings are bottomed in the sideplate recess. Do not overtighten or shear the lockwasher tang.
 - C. Loosen both locknuts one complete turn.
 - D. Tighten one locknut until a slight rotor drag is felt when turning the shaft by hand.

Maintenance / Continued

- E. Back off the nut the width of one lockwasher tang. Secure the nut by bending the closest aligned lockwasher tang into the slot in the locknut. The pump should turn freely when rotated by hand.
 - F. Tighten the opposite locknut by hand until it is snug against the bearing. Then, using a spanner wrench, tighten the nut the width of one lockwasher tang. Tighten just passed the desired tang, then back off the nut to align the tang with the locknut slot. Secure the nut by bending the aligned lockwasher tang into the slot in the locknut. The pump should continue to turn freely when rotated by hand.
 - G. To check the adjustments, try to rotate the nut and washer with fingers. If this cannot be done, one or both of the locknuts are too tight. Slightly loosen the locknuts one at a time beginning with the locknut that was adjusted last.
11. If needed, replace the grease seal for any wear or damage. Grease the outside diameter of the grease seal and push it into the bearing cover with the lip of the seal inward. The lip will face outward when the bearing cover is installed on the sideplate.
 12. Attach new bearing cover gasket and bearing cover to the sideplate. Install and torque the bearing cover capscrews to 15 lbs. (20nm).
 13. Follow steps 11 and 12 to install the grease seal and bearing cover on the opposite side of the pump.
 14. Push the dirt shield over the drive shaft and firmly against the bearing cover.

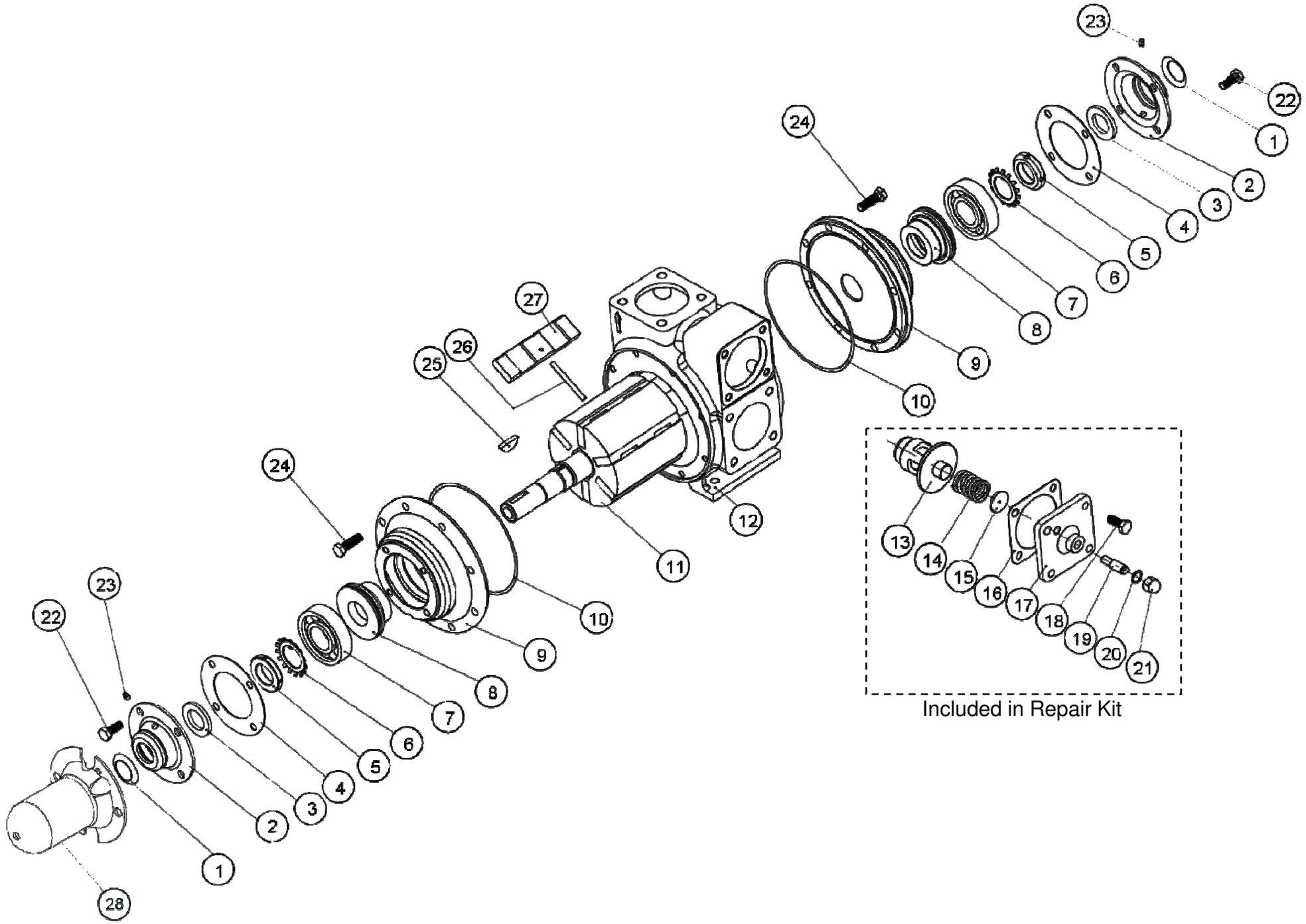
Relief Valve Assembly:

1. Insert the valve into the relief valve bore of the body with the fluted end inward.
2. Install the relief valve spring and spring guide against the valve.
3. Attach a new relief valve gasket and the valve cover on the body.
4. Screw the relief valve adjusting screw into the valve cover until it makes contact with the spring guide.

Trouble Shooting

Note: The relief valve setting must be tested and adjusted precisely before the pump is placed into service

Problem	Probable Cause
Noise	<ol style="list-style-type: none"> 1. Excessive pump vacuum resulting from: <ol style="list-style-type: none"> a. Improper or restricted suction line fittings. b. Excessive pump speed. c. Pump too far from fluid source. 2. Running the pump excessively with a closed discharge line. 3. Pump not securely mounted. 4. Bearings that are worn or damaged. 5. Piping not anchored properly. 6. Misaligned drive coupling or bent shaft. <ol style="list-style-type: none"> 7. Excessively worn rotor. 8. Malfunctioning valve. 9. Low relief valve setting. 10. Damaged vane.
Capacity Reduction	<ol style="list-style-type: none"> 1. Low pump speed. 2. Suction valves not fully open. 3. Suction line air leaks. 4. Discharge line restrictions. (i.e.:undersized piping, too many elbows & fittings, clogged strainer, etc.). 5. Parts damaged or worn. 6. Partial flow through the relief valve. 7. Relief valve improperly set up or worn. 8. Vanes installed incorrectly
Broken Shaft	<ol style="list-style-type: none"> 1. Foreign objects in the pump. 2. High viscosity. 3. Non-opening relief valve. 4. Pressure spikes (Hydraulic hammer). 5. Misaligned pump/driver. 6. Excessively worn vanes or vane slots. 7. Settled material in the pump. 8. Improper driveline.
Leak in Mechanical Seal	<ol style="list-style-type: none"> 1. Incompatible O-rings. 2. Cut, twisted, or nicked O-rings. 3. Damaged shafts at seal area. 4. Over-greased ball bearing. 5. Excessive cavitation. 6. Cracked, scratched, or pitted mechanical seal.
Pump Not Priming	<ol style="list-style-type: none"> 1. Non-wetted pump. 2. Worn vanes. 3. Closed suction valve. 4. Suction line leaks. 5. Clogged strainer. 6. Clogged suction line. 7. Broken drive train. 8. Pump vapor-locked. 9. Too low pump speed for priming. 10. Partially open relief valve - worn or not seating properly. 11. Vanes installed incorrectly.
Vanes Damaged	<ol style="list-style-type: none"> 1. Foreign objects in the pump. 2. Running the pump too extensively. 3. Cavitation 4. Viscosity too high for the vanes and/or the pump speed. 5. Incompatible with the liquids being pumped. 6. Excessive heat. 7. Push rods bent or worn. 8. Solidified material in the pump. 9. Pressure spikes (Hydraulic hammer). 10. Incorrectly installed vanes.



Parts List

Double Shaft Models					
Item	VP80	VP150	VP270	QTY	Description
1	524-003	524-003	524-004	2	Dirt Shield
2	523-020	523-020	523-009	2	Inboard Bearing Cover
3	555-000	555-000	555-001	2	Grease Seal
4	526-007	526-007	526-008	2	Bearing Cover Gasket
5	N/A	582-006	582-007	2	Bearing Locknut
6	N/A	582-004	582-005	2	Bearing Lockwasher
7	510-000	510-000	510-001	2	Ball Bearing
8	556-000	556-000	556-002	2	Mechanical Seal (Buna)
8	556-001	556-001	556-003	2	Mechanical Seal (Viton)
9	501-002	501-003	501-004	2	Sideplate
10	521-006	521-006	521-008	2	O-Ring (Buna)
10	521-007	521-007	521-009	2	O-Ring (Viton)
11	502-003	502-001	502-002	1	Rotor & Shaft Assy
12	500-002	500-003	500-004	1	Body
13	581-000	581-001	581-002	1	Bypass Valve
14	580-002	580-003	580-004	1	Bypass Spring (STD)
15	581-006	581-007	581-008	1	Spring Seat
16	526-012	526-013	526-014	1	Bypass Cover Gasket
16	521-015	521-011	521-017	1	Bypass Cover O-Ring (Buna)
16	-	521-016	-	1	Bypass Cover O-Ring (Viton)
17	523-013	523-014	523-015	1	Bypass Valve Cover
18	128-020	128-020	128-020	4	Screw M10x35
19	581-012	581-012	581-012	1	Adjusting Screw
20	526-018	526-018	526-019	1	Valve Cap Gasket
21	522-003	522-004	522-005	1	Valve Cap
22	-	-	-	8,8,12	M10X20
23	313-002	313-002	313-002	2	Grease Fitting
24	M10X30	M10X30	128-003 M10X40	16,16,20	Screw M10
25	298-000	298-000	298-000	1	Key
26	527-002	527-003	527-004	2,3,3	Push Rod
27	550-002	550-003	550-004	4,6,6	Vane
28	523-008	523-008	523-022	1	Shaft Protector
29	526-004	526-005	526-006	2	Flange Gasket
30	621-020	621-021	621-022	1	Bypass Valve Repair Kit
31*	N/A	N/A	N/A	1	End Cap
32	621-002	621-004	621-006	1	Maintenance Kit Buna
33	621-003	621-005	621-007	1	Maintenance Kit Viton

Single Shaft Models			
Item	VP150	QTY	Description
1	524-003	1	Dirt Shield
2	523-008	1	Inboard Bearing Cover
2	523-027	1	Inboard Bearing Cover (w/ blank)
3	555-000	2	Grease Seal
4	526-007	2	Bearing Cover Gasket
5	582-006	2	Bearing Locknut
6	582-004	2	Bearing Lockwasher
7	510-000	2	Ball Bearing
8	556-000	2	Mechanical Seal (Buna)
8	556-001	2	Mechanical Seal (Viton)
9	501-003	2	Sideplate
10	521-006	2	O-Ring (Buna)
10	521-007	2	O-Ring (Viton)
11	502-005	1	Rotor & Shaft Assy
12	500-002	1	Body
13	581-000	1	Bypass Valve
14	580-003	1	Bypass Spring (STD)
15	581-007	1	Spring Seat
16	526-013	1	Bypass Cover Gasket
16	521-011	1	Bypass Cover O-Ring (Buna)
16	521-016	1	Bypass Cover O-Ring (Viton)
17	523-014	1	Bypass Valve Cover
18	128-020	4	Screw M10x35
19	581-012	1	Adjusting Screw
20	526-018	1	Valve Cap Gasket
21	522-004	1	Valve Cap
22	-	8	M10X20
23	313-002	2	Grease Fitting
24	M10X30	16	Screw M10
25	298-000	1	Key
26	527-003	3	Push Rod
27	550-003	6	Vane
29	526-005	1	Flange Gasket
30	621-021	1	Relief Valve
31*	241-000	1	End Cap
32	621-004	1	Maintenance Kit Buna
33	621-005	1	Maintenance Kit Viton

VP80 Service Kits

Part#	Description
621-002	Maintenance Kit (all o-ring material is Buna)
621-003	Maintenance Kit (all o-ring material is Viton)



Each VP80 Maintenance Kit Includes the Following (see page 14 for part numbers and reference numbers):

Reference #	QTY	Description
1	2	Bearing Cover Dirt Shield
3	2	Grease Seal
4	2	Bearing Cover Gasket
7	2	Ball Bearing
8	2	Mechanical Seal
10	2	Sideplate O-Ring
16	1	Bypass Cover Gasket
20	1	Bypass Valve Cap Gasket
26	2	Push Rod
27	4	Vane
29	2	Flange Gasket

VP150 Service Kits

Part#	Description
621-004	Maintenance Kit (all o-ring material is Buna)
621-005	Maintenance Kit (all o-ring material is Viton)

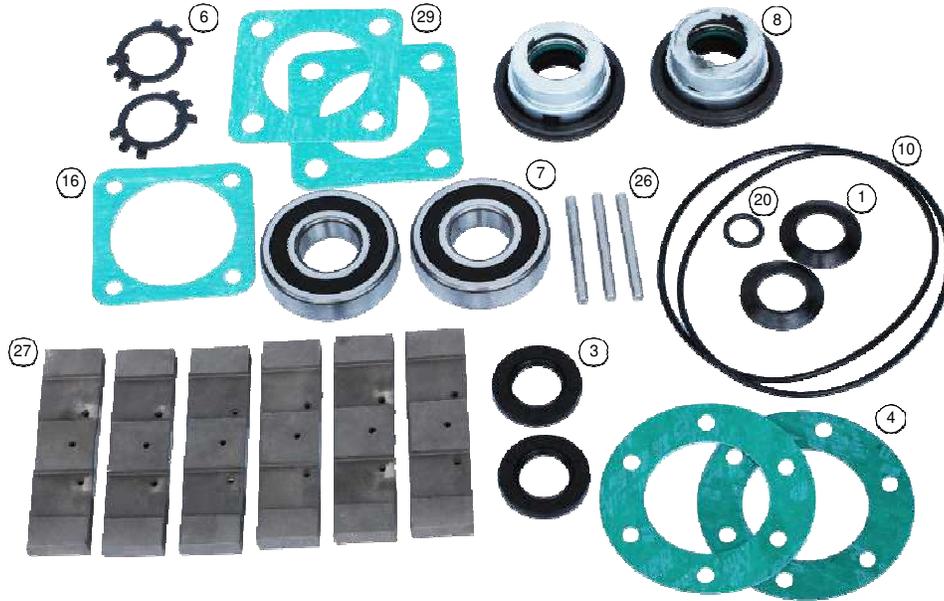


Each VP150 Maintenance Kit Includes the Following (see page 14 for part numbers and reference numbers):

Reference #	QTY	Description
1	2	Bearing Cover Dirt Shield
3	2	Grease Seal
4	2	Bearing Cover Gasket
6	2	Bearing Lockwasher
7	2	Ball Bearing
8	2	Mechanical Seal
10	2	Sideplate O-Ring
16	1	Bypass Cover Gasket
20	1	Bypass Valve Cap Gasket
26	3	Push Rod
27	6	Vane
29	2	Flange Gasket

VP270 Service Kits

Part#	Description
621-006	Maintenance Kit (all o-ring material is Buna)
621-007	Maintenance Kit (all o-ring material is Viton)



Each VP270 Maintenance Kit Includes the Following (see page 14 for part numbers and reference numbers):

Reference #	QTY	Description
1	2	Bearing Cover Dirt Shield
3	2	Grease Seal
4	2	Bearing Cover Gasket
6	2	Bearing Lockwasher
7	2	Ball Bearing
8	2	Mechanical Seal
10	2	Sideplate O-Ring
16	1	Bypass Cover Gasket
20	1	Bypass Valve Cap Gasket
26	3	Push Rod
27	6	Vane
29	2	Flange Gasket

Warranty

Subject to the terms and conditions hereinafter set forth in General Terms of Sale, Paragon Tank Truck Equipment LLC (the Seller) warrants products and parts of its manufacture, when shipped and its work (including installation and start-up) when performed, will be of good quality and will be free from defects in material and workmanship. This warranty applies only to Seller's equipment, under use and service of products, for a period as stated in the table below. Due to the varying condition of installation and operation, all performance claims are subject to a plus or minus 5% variation. (Non-standard materials are subject to a plus or minus 10% variation)

THIS WARRANTY EXTENDS ONLY TO BUYER AND/OR ORIGINAL END USER, AND IN NO EVENT SHALL THE SELLER BE LIABLE FOR THE PROPERTY DAMAGE SUSTAINED BY A PERSON DESIGNED BY THE LAW OF ANY JURISDICTION AS A THIRD PARTY BENEFICIARY OF THIS WARRANTY OR ANY OTHER WARRANTY HELD TO SURVIVE SELLER'S DISCLAIMER.

All accessories furnished by seller but manufactured by others bear only that manufacturer's standard warranty.

All claims for defective products, parts, or work under this warranty must be made in writing immediately upon discovery and, in any event within one year from the date of the shipment of the applicable item and all claims for defective work must be made in writing immediately upon discovery and in any event within one year from date of completion thereof by Seller. Unless done with prior written consent of Seller, any repairs, alterations, or disassembly of Seller's equipment shall void warranty. Installation and transportation costs are not included and defective items must be held for Seller's inspection and returned to Seller's ex works upon request.

THERE ARE NO WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE.

After Buyer's submission of claim as provided above and its approval, Seller shall either repair or replace its product, part, or work at the original ex works point of shipment, or refund an equitable portion of the purchase price.

The products and parts sold hereunder are not warranted for operation with erosive or corrosive materials or those which may lead to build up of materials within the product supplied, nor those which are incompatible with the materials of construction. The Buyer shall have no claim whatsoever and no product or part shall be deemed to be defective by reason of failure to resist erosive or corrosive action nor for problems resulting from build-up of material within the unit nor for problems due to incompatibility with the materials of construction.

Product Type	Warranty Duration
New	18 months from date of shipment, or 12 months after initial startup date, whichever occurs first.
Remanufactured	12 months from date of shipment.
Repair	12 month from date of shipment, or remaining warranty period, whichever occurs first.

Any improper use, operation beyond capacity, substitute of parts not approved by Seller, or any alteration or repair by others in such manner as in Seller's judgement affects the product materially and adversely shall void this warranty.

No employee or representative of Seller other than an Officer of the Company is authorized to change this warranty in any way or grant other warranty. Any such change by an Officer of the Company must be in writing.

The foregoing is Seller's only obligation and buyer's only remedy for breach of warranty, and except for gross negligence, willful misconduct and remedies permitted under the General Terms of Sale in the sections on **CONTRACT PERFORMANCE, INSPECTION AND ACCEPTANCE**, and the **PATENTS CLAUSE** hereof, the forgoing is **BUYER'S ONLY REMEDY HEREUNDER BY WAY OF BREACH OF CONTRACT TORT OR OTHERWISE, WITHOUT REGARD TO WORK WHETHER ANY DEFECT WAS DISCOVERED OR LATENT AT THE TIME OF DELIVERY OF THE PRODUCT OR WORK.** In no event shall Buyer be entitled to incidental or consequential damages. Any action for breach of this agreement must commence within one year after the cause of action has occurred.

Paragon Tank Truck Equipment LLC.

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