

# NVE

National Vacuum Equipment



## Owner's Manual

### 887 PRO Challenger Rotary Vane Pump

800-253-5500 | [natvac.com](http://natvac.com)



MADE IN THE USA

# 887 PRO CHALLENGER

## Owner's Record

Date of Purchase: \_\_\_\_\_

Purchased from: \_\_\_\_\_

Serial Number: \_\_\_\_\_

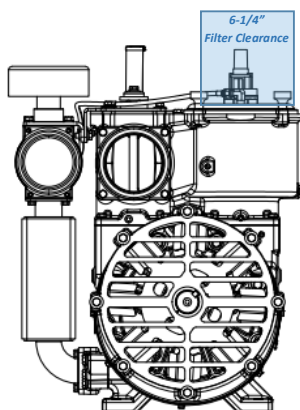
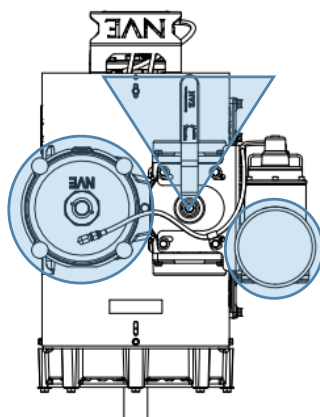
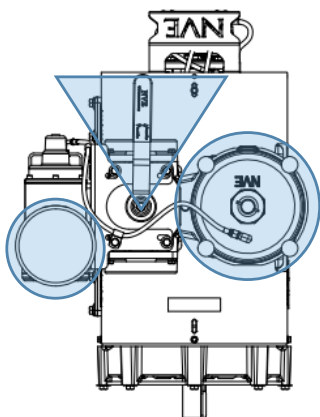
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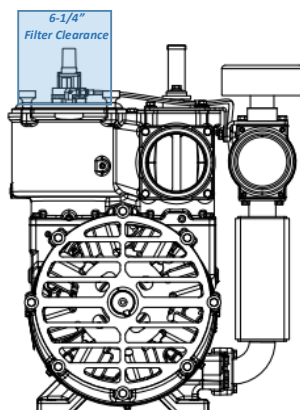
# **IMPORTANT INFORMATION FOR INSTALLING PUMP**

## **887 PRO CHALLENGER SERIES PUMPS AERIAL VIEW**

**SHADED AREAS MUST BE KEPT CLEAR  
FOR SERVICING THE FILTERS & CHECKING VANES**



**Clockwise  
Rotation**



**Counter Clockwise  
Rotation**

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# INTRODUCTION

## General Information



### About National Vacuum Equipment

***Congratulations!*** You now own a quality vacuum/pressure pump proudly manufactured in the U.S.A. by National Vacuum Equipment, Inc. You have not only acquired a superior piece of equipment from a qualified dealer, you have hired a team of vacuum experts. We stand ready to work with your dealer to answer your questions and provide you with the information necessary to keep your equipment in peak working condition.

Thank you for putting your trust in National Vacuum Equipment.

### Our Mission

We are dedicated to the production and wholesale distribution of quality vacuum system products at a reasonable price, on a timely basis. We are a “one-stop shop” for manufacturers and distributors of vacuum equipment.

### Our History

National Vacuum Equipment, Inc. was founded in 1980 by Bruce Luoma. The Company started as a retailer of vacuum pumps. Soon after it started, the Company secured the rights to exclusive distribution of the Battioni vacuum pumps in North America. This helped the Company to evolve into its current status as a wholesale supplier.

To reach the goal of becoming a full service supplier of vacuum system components, the Company began fabrication of its own line of componentry, purchased and developed its own line of vacuum pumps, and began purchasing for resale, various valves and accessories.

Today, NVE has full service machine, fabrication and powder-coating shops complete with CNC-controlled production equipment designed for close tolerance work. The company has a highly trained staff, all of whom are dedicated to quality.

# LIMITED WARRANTY

## **NVE PRO 887 Vacuum Pump**



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### **Warranty**

#### **National Vacuum Equipment, Inc.**

Guarantees that the product it provides is free of manufacturer's defects, including materials and workmanship. Properly installed and maintained product is warranted for a period of two (2) year subject to the following conditions:

1. A properly completed warranty registration card must be received by us within 30 days of sale to end user for pump sales to be considered warrantable. All pumps received for warranty consideration must retain the original NVE serial number tag.
2. The two (2) year period shall begin the day the product is shipped from our warehouse, unless we are provided with an authentic copy of the original resale invoice, in which case the two (2) year period shall begin at such invoice date.
3. The covered product must be used in an application for which it was intended. We do not recommend our product for particular uses or applications.
4. Vane breakage, or damage caused by vane breakage, is not warrantable.
5. Damage caused by improper use or lack of proper maintenance is not warrantable.
6. Manufacturer's liability under this or any other warranty, whether express or implied, is limited to repair of or, at the manufacturer's option, replacement of parts which are shown to have been defective when shipped.

7. Manufacturer's liability shall not be enforceable for any product until National Vacuum Equipment, Inc. has been paid in full for such product.
8. Except to the extent expressly stated herein, manufacturer's liability for incidental and consequential damage is hereby excluded to the full extent permitted by law.
9. Manufacturer's liability as stated herein cannot be altered except in writing signed by an officer of National Vacuum Equipment, Inc.
10. Certain products provided by National Vacuum Equipment, Inc. are covered by their respective manufacturer's warranties (e.g., engines used in the NVE engine drive packages). These products are not covered by the National Vacuum Equipment, Inc. Manufacturer's Warranty.
11. Final assemblers responsibility. NVE goes to great lengths to insure the quality and proper functionality of the products it supplies. Many products we supply are purchased for resale or are impossible or impractical to test prior to the installation of the item in a vacuum system. It is therefore the responsibility of the final assembler to thoroughly test the vacuum system and components supplied to the assembler by NVE prior to the delivery of the final product to the end user.

*Any items found to be defective after delivery to the end user that should have been discovered prior to deliver will qualify replacement of the defective part only with absolutely no compensation for outside labor or travel expenses. Any subsequent damage to other components caused by the defective part will be the sole responsibility of the assembler.*

## Warranty Procedures

Should a potential warranty situation arise, the following procedures must be followed:

- **Contact your dealer or NVE immediately upon the occurrence of the event and within the warranty period.**
- **Customer must receive a return goods authorization (RGA) before returning product.**
- **All serial-numbered products must retain the NVE serial number tag to be qualified for warranty.**
- **Product must be returned to NVE intact for inspection before warranty will be honored.**
- **Product must be returned to NVE freight prepaid in the most economical way.**
- **Credit will be issued for material found to be defective upon our inspection, based upon prices at the time of purchase.**

The maximum allowable operating vacuum will vary depending on R.P.M., ambient temperature, altitude and time running. The basic principle to keep in mind is - faster R.P.M., higher air temperature and longer run time all equal more heat in pump. When installing an NVE 887 Pro pump we recommend a normal R.P.M. of 1100. Other speeds are ok as long as exhaust gas temperatures read on the supplied thermometer do not exceed 380 degrees F.

Weights and measurements are for reference only.



# 887 PRO CHALLENGER

## Model-Specific Information



## Application

Designed for extended operation

- Duty cycle will vary depending on several factors, such as altitude, RPM, ballast opening level & ambient temperature.
- The 887 PRO Challenger is a severe duty vacuum pump, designed to be used in liquid waste pumping systems where extended operation is desired.
- Proven applications are:
  - Oil Field
  - Restaurant Grease
  - Septic
  - Industrial Waste

## Pump Specifications

887 PRO Challenger HP & Calculated Flow Data

RPM		Pressure (PSI)						Free Flow	Vacuum (in Hg)						
		30	25	20	15	10	5	0	6	12	15	18	21	25	MAX
1200	HP	54	48	42	36	31	24	21	21	21	22	25	28	32	33
	CFM							530							
1100	HP	50	44	38	33	27	21	18	18	18	19	23	25	29	30
	CFM							486							
1000	HP	45	40	35	30	24	19	16	16	16	17	21	23	26	27
	CFM							441							
900	HP	41	37	31	27	22	17	14	14	14	15	19	21	24	25
	CFM							400							

Note: These values may vary based upon application specifics (mainly ballast valve opening level).

# System Requirements

## High Quality Components

- The 887 PRO Challenger is a high performance vacuum pump and requires compatible, high quality components as manufactured by NVE.

## Shutoffs

- We recommend the use of our portal/portal shutoff and our 12 gallon scrubber/secondary shutoff.

## Integral Final Filter

- The 887 PRO Challenger is fully equipped with a high strength, easily serviceable final filter.

## Hose

- Use 4" or larger hose to pump your system. We recommend you use a hose that can withstand high temperatures such as hot tar-asphalt hose.

## Pressure Relief and Vacuum Relief Valves

- Pressure and vacuum relief valves ARE NOT PRE SET. They must be properly adjusted at the time of installation.
- Working vacuum level for your pump will vary depending on a myriad factors. Some of these factors are size of tank, length of run time, type of product being pumped, altitude and ambient conditions of pumping location, etc. Your vacuum pump should be set up to operate at the maximum vacuum you require to pump your jobs and that will not cause your vacuum pump temperature to exceed 375 degrees F. For this purpose and for monitoring your pumps performance, we install an exhaust gas temperature gauge.
- Use a vacuum relief valve of sufficient size and properly set to introduce the amount of fresh air required to keep your vacuum pump at your desired working vacuum level. With all valves closed, you should be able to run your vacuum system for ½ hour at your desired vacuum level without the pump overheating.
- Since all vacuum tanks should be able to operate at full vacuum, the purpose of the vacuum relief valve is to protect the vacuum pump from overheating. Therefore the vacuum relief valve should be placed as close to the vacuum pump as possible, and always between the vacuum pump and the secondary shut off. A properly functioning

secondary shut off will shut off the air flow to the vacuum pump when activated which will render the vacuum relief valve ineffective unless it is installed downstream of the secondary shut off.

- Your vacuum pump will potentially produce more pressure than is safely allowed for your vacuum tank. Consult with your tank manufacturer to determine the appropriate pressure rating. A properly sized and adjusted pressure relief valve must be placed between the vacuum pump and the tank. Placing a pressure relief in the tank can cause the spraying of product down the side of your tank. Be sure to place the pressure relief in a location that will not blow towards the vacuum pump operator. Never operate your vacuum pump under pressure without an open valve in the system. The pressure relief should be set such that the pressure level on the tank will not exceed the tank manufacturer's recommendation and the vacuum pump will not overheat.
- Both vacuum and pressure relief valves should be checked and cleaned periodically to ensure they are functioning properly.

***WARNING: The vacuum pump will likely put up far more pressure than your vacuum pressure tank is designed to withstand. Over pressuring your vacuum/pressure tanks can cause an explosion resulting in serious injury or death.***

## **Drive System**

- The pump should be mounted on a level, horizontal surface, secured with grade 8 fasteners.
- The drive system should be sized to supply the required horsepower to the pump plus a reserve to insure long life.
- Make certain that all shafts, pulleys or turning parts are properly guarded.
- Check the ratio of the drive system prior to installation to verify that the pump will be turning at the proper speed and direction.
- Immediate engagement at working rpm for any rotating equipment will cause failure or premature wear. It is the responsibility of the installer and user to ensure the vacuum pump or blower is not being over torqued at start up.
- The pump should be set up to engage slowly to avoid initial torque damage.

## **Direction of Rotation**

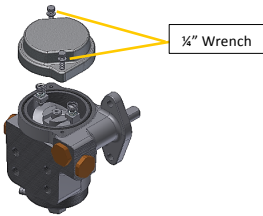
- The direction of rotation and RPM are marked on the front of the pump. It can also be determined by looking at the drive end of the pump. From top dead center, the pump shaft always spins towards the filter.
- The direction of rotation required by your drive system should be determined prior to ordering the pump.
- If during assembly of your unit you find you need the opposite rotation, call the factory for instructions.

## **Factory Settings**

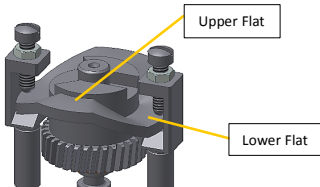
- The automatic lubrication pumps are set at the factory during pump testing and should require no further adjustment during pump installation. The pump should consume 10-14 oz. (depending on RPM of the Vacuum Pump) of oil per hour depending on pump RPM. Please contact NVE if oil usage is outside of these parameters.
- It is the responsibility of the installer to ensure proper vacuum and pressure settings and RPM.

# Oil Pump Flow Rate Adjustment Procedures

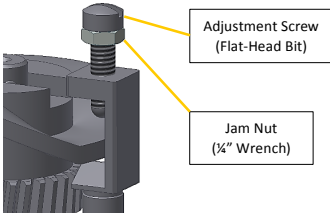
1. Remove oil pump cap (1/4" wrench)



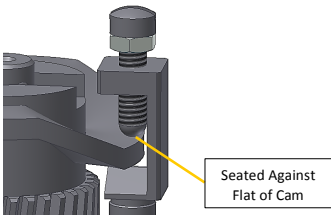
2. Position cam so adjustment screws are resting on lower flats



3. Hold adjustment screw stationary (flat-head bit) while loosening jam nut (1/4" wrench). Spin jam nut all the way to the head of the bolt



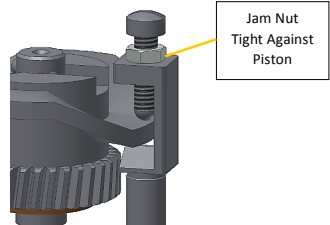
4. Tighten adjustment screw (turn CW) until it seats on the lower flat of the cam (do **NOT** force!)



5. Back the adjustment screw off the desired number of turns (CCW):  
- 887 PRO factory setting = 5.50 Turns (CCW)

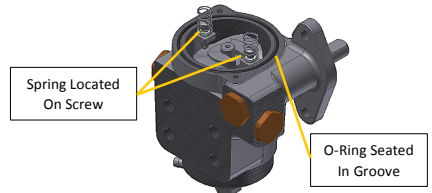
- More turns out (CCW) equals less oil flow
- Fewer turns out (CCW) equals more oil flow

6. Retighten jam nut against piston while holding adjustment screw stationary

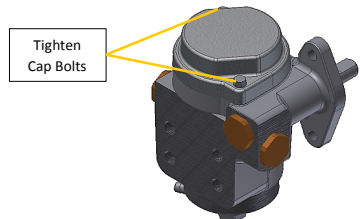


7. Repeat process for other adjustment screw

8. Ensure the O-Ring is properly positioned in the housing groove, and that a spring is located over each adjustment screw.



8. Reassemble the cover to the oil pump and properly tighten bolts (1/4" wrench – 20 in-lbs.)



# Adjusting Factory Oil Settings Continued

NVE 4 Port Oil Pump Adjustment Rate Chart  
Tested at 1100 RPM

Turns From Bottom	Ounces Per Hour
7.5	6
7.25	7
7	8
6.75	9
6.5	10
6	11
5.5	12
5	13
4.75	14
4.5	15
4.25	16

# OPERATING INSTRUCTIONS

## NVE PRO 887 Vacuum Pump



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## Normal Operation

### Oil Reservoir

- Check oil reservoir daily and fill as required.
- Drain and clean periodically depending on service.

### Recommended RPM

- The 887 PRO vacuum/pressure pump operates in a range between 900 and 1,200 RPM. Lower RPM's will result in less air flow (approximately 400 CFM at 900 RPM) but will allow a higher working vacuum level where a higher RPM will result in increased air flow (over 500 CFM at 1,200 RPM) but a more limited working vacuum level. RPM should be established based on the needs and the expectations of the operator and vacuum/pressure relief valves should be adjusted for maximum working exhaust temperature of 375 degrees F and maximum pressure no more than allowed by tank manufacturer.

### 4-Way

- To operate the 4-way valve, move the handle in the appropriate direction for either vacuum or pressure; center is neutral.

### Vacuum Levels

- Do not operate your pump for extended periods of time at vacuum levels which cause the pump to exceed 375 degrees Fahrenheit exhaust gas temperature.

### Guards

- Make certain all guards are in place prior to running your pump.  
**Think Safety!**

## **Recommended Lubricant**

- We recommend that turbine oil be used in our pumps. Turbine oil is much more resistant to breakdown due to heat than normal motor oil, thereby avoiding the problems associated with motor oil such as lacquering and excessive wear.
- NVE ISO 150 Oil is our recommended pump oil for the Challenger series vacuum pumps. Challenger Vacuum Pump Oil is sold by the case, six-1 gallon containers of oil per case.

## **Ballast Valve System**

- The Challenger 887 PRO Vacuum Pump features an integral ballast air cooling system. It works by allowing cooling air to enter the pump at higher vacuum levels just prior to the exhaust port. This allows the pump to dissipate the heat produced by friction. The overall result is cooling of the housing and rotor with no appreciable drop in vacuum level. At lower vacuums, sufficient air is moving through the pump to accommodate heat dissipation. The ballast valve features an integral check system that automatically opens once a predetermined vacuum level has been reached (usually between 13" Hg and 15" Hg). An integral ballast silencer is included on the Challenger 887 PRO to significantly reduce the enhanced pump noise produced when the ballast valve is open. Inclusion of the ballast system greatly enhances the 887 PRO's duty cycle.



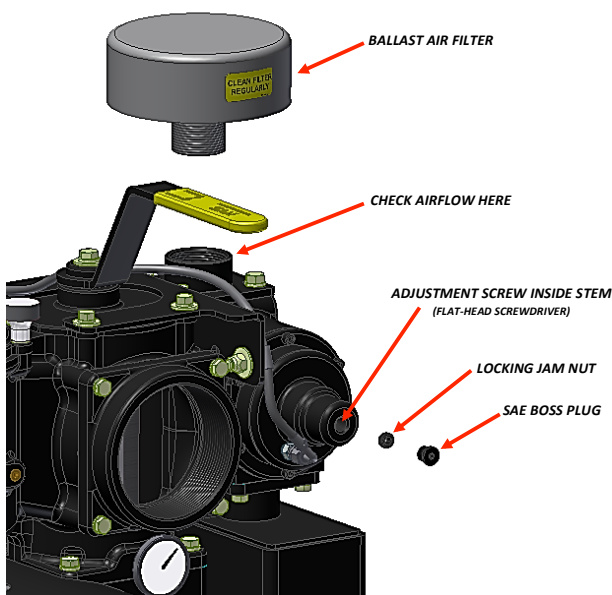
## **Ballast Valve Troubleshooting**

- **Ballast valve not opening**
  - Ballast valve adjustment screw set to open too high  
(see next section)
  - Clogged ballast air filter
  - Loose vacuum line fitting/leaking vacuum line
  - Vacuum line blockage
  - Torn ballast valve diaphragm  
(see ballast valve rebuilding section)
  - Defective O-Ring on Boss plug in ballast valve cover
- **Ballast valve stays open**
  - Ballast valve adjustment screw set to open too low  
(see next section)
  - Debris caught in ballast valve plunger  
(see ballast valve rebuilding section)
  - Worn ballast valve plunger pilot  
(see ballast valve rebuilding section)

## **Adjusting Ballast Valve Opening Level**

- The following tools will be required to adjust the ballast valve opening level:
  - 7/32" hex drive
  - 1/4" hex drive
  - Flat head screwdriver
- Using the 7/32" hex drive, remove the boss plug from the cover of the ballast valve.
- Using the 1/4" hex drive, remove the locking jam nut.
- The ballast valve opening adjustment screw lies under the locking jam nut.
- Remove the ballast air filter from the top of the ballast valve.

- Run pump to desired ballast opening vacuum level (recommend 13" – 18" Hg).
  - If ballast is not open (and should be), turn adjustment screw CCW slowly with flat-head screwdriver until air just begins to flow.
  - If ballast opens before desired vacuum has been reached, turn adjustment screw CW slowly with flat-head screwdriver until air is just flowing.
  - Place thumb over adjustment hole and ensure opening level is accurate.
- \*Without the boss plug, vacuum chamber is not fully sealed, thus opening level may vary slightly.*
- If adjustment holds accurate, replace locking jam nut, boss plug, and the ballast air filter.



**CAUTION: WHILE THE BALLAST AIR FILTER IS REMOVED, ENSURE NOTHING CAN BE PULLED INTO THE PUMP. PUMP DAMAGE CAN RESULT**

## Ballast Valve Rebuilding

If, from the troubleshooting guide shown previously, a ballast valve is determined to require rebuild, a rebuild kit can be obtained from NVE. This kit will include all the components necessary to rebuild the ballast valve. The ballast valve has been designed to be field rebuild-able. The procedure is shown below:

1. Remove the ballast valve vacuum line from the ballast valve cover (9/16" Wrench).
2. Remove the six socket head bolts from the ballast valve cover.

*Caution: The cover will be under slight spring tension*

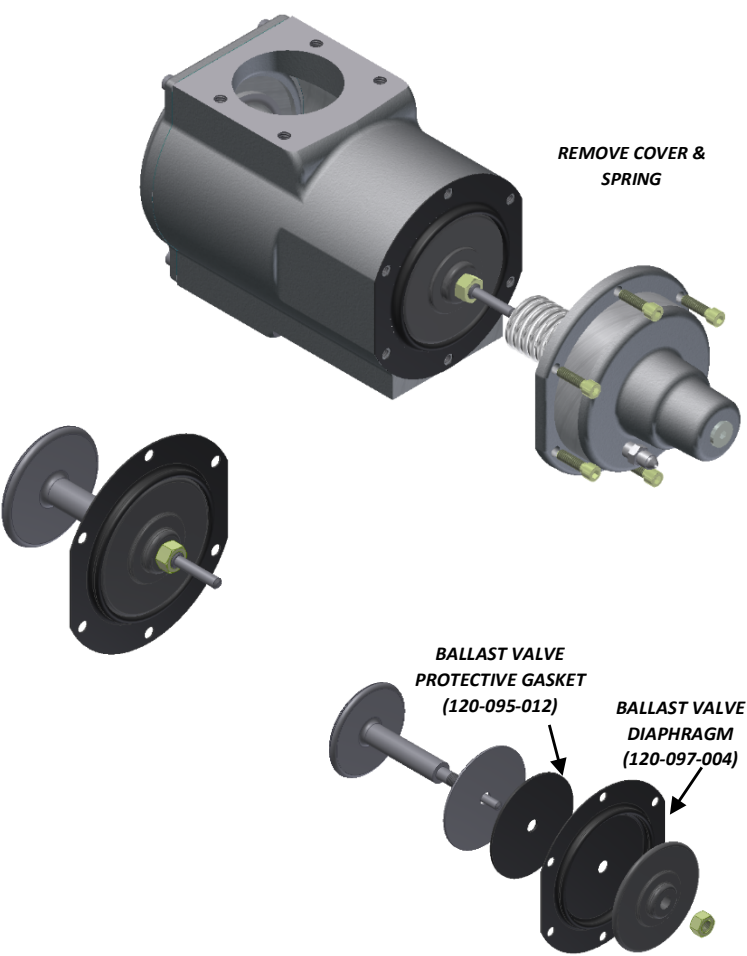
3. Remove cover carefully (spring should stay in cover).
4. Remove plunger assembly from ballast valve.
5. Ensure plunger sealing face and internal housing sealing face are free of burrs.
6. Insert new plunger assembly back into ballast valve housing.
7. Place spring in the cover pilot, align JIC fitting downward and close to the pump, and replace cover.

**Note:** Spring tension will have to be overcome to start bolts

**Important:** The shorter bolt goes in the 6 o'clock position

11. Tighten bolts evenly.
12. Remove and replace the boss plug in the ballast valve cover.

# Ballast Valve Rebuilding



\*Since adjustment wasn't altered, ballast valve should retain previous opening level

## **Maintenance**

### **Flushing**

We recommend periodic flushing of your pump. To do this:

1. Connect the hose to the flush valve located on the non-drive side of the inlet port.
2. Put the end of the hose in a one pint container of flushing fluid.
3. Start your pump and run as slow as possible.
4. With the 4-way valve in the vacuum position, open the flush valve and monitor the flushing fluid flow to your pump.
5. When the flushing fluid is gone, switch the 4-way valve to neutral and run the pump for 2 minutes.
6. Remove the hose and close the valve.
7. Drain oil catch muffler and properly dispose of used oil and flushing fluid.

## Maintenance

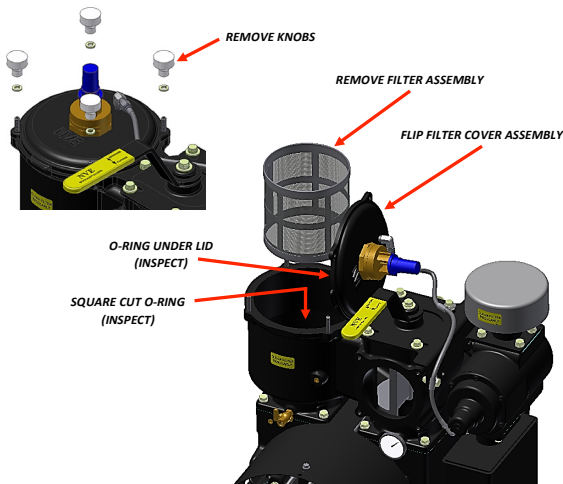
We recommend regularly checking/cleaning both the inlet final filter and the ballast valve filter. Restrictions in either filter can significantly increase the operating temperature of the pump due to loss of efficiency. If either filter is damaged, it must be replaced immediately.

### Inline Final Filter

- Periodically remove the filter cover and inspect the final filter
  1. Remove the four knobs on top of the filter housing
  2. Lift the cover off and flip towards four-way valve
  3. Remove filter for inspection/cleaning
- This filter can be cleaned in most any solvent compatible with stainless steel
- Solvent should be removed before reassembly
- Check condition of square O-Ring located in the manifold under the filter and replace if necessary (120-064-030) Be sure square cut O-Ring and O-Ring under filter cover are both present at reassembly

### Ballast Air Filter

- Periodically remove the ballast air filter cover (secured with a wingnut)
- Remove filter element and clean with compressed air (solvents should not be used aside from soap and water on this filter)

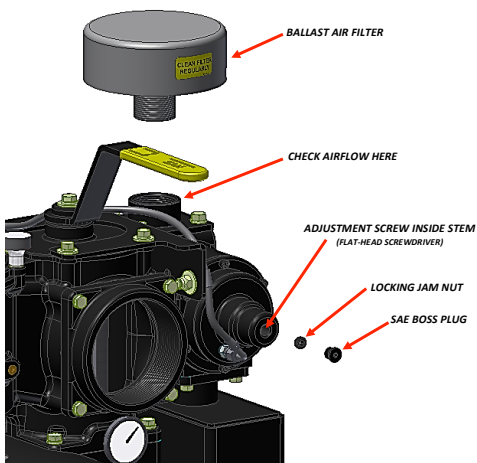


## Maintenance

### Checking Vane Wear

The sliding vanes in the 887 PRO are made of a very durable Kevlar material. Their wear and related estimated useful life are dependent on many factors, such as RPM, operating vacuum/pressure level, type of material being pumped and hours of service. We recommend at least an annual inspection of the vanes, which is easily performed through the vane inspection port located on the intake side of the pump housing. The process is outlined below:

1. Be sure the pump is cool, the drive system is off, and locked out so that it cannot be accidentally engaged. **Think Safety!**
2. Remove the 1/8" NPT plug from the vane inspection port (7/16" Wrench)
3. A new vane will be flush with the OD of the rotor. Vane wear is gauged based upon the recess of the vane relative to the OD of the rotor
4. Insert a rod into the vane inspection port until it touches the OD of the rotor. Mark on the rod how deep the rotor OD is relative to the outside of the inspection port
5. Slowly rotate the rotor, while keeping slight inward tension on the rod, until the rod falls into one of the vane slots. If the rod falls more than 1/4" into any of the seven vane slots, it's time to replace the vanes
6. Vanes should be replaced in sets and it's always a good idea to have an extra set of vanes on hand for emergencies



# Maintenance

VANE ANALYSIS TRACKING SHEET			
DATE	WEAR (IN)	REPLACEMENT?	COMMENTS

## Washing

- Periodically wash the mud and dirt off of your pump as it must be clean to allow heat to radiate from it.

## Cold Weather Operation

### Confirm pump is not frozen

- Prior to engaging the pump, turn by hand to confirm it is not frozen.

### If pump is frozen, thaw it.

- If the pump is frozen, move the truck into a heated building.

## Avoid freezing problems

- You can avoid freezing problems by putting a small amount of diesel fuel into the pump at the end of the day.



# TROUBLESHOOTING

## NVE 887 PRO Vacuum Pump



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### Pump overheats

- No oil in pump
- Oil adjustment set too lean
- RPM too fast
- Prolonged operation at excessive vacuum or pressure levels,
- Pump is dirty
- Ballast filter is clogged or dirty.
- Inlet filter is clogged or dirty.
- Incorrect oil specification

### Pump uses too much oil

- Oil pump set too rich
- Leaving pump under vacuum between jobs
- Product running through pump
- Incorrect oil specification

### Pump doesn't turn

- Broken vane or bearing
- Pump is frozen
- Problem in the drive train

## **No/Low Vacuum**

- 4-way valve is in neutral
- Worn seals or vanes
- Pump is not turning fast enough
- Check valve or suction valve is clogged
- Leak in the tank or fittings
- Collapsed hose between the pump and shutoffs
- Ballast filter clogged

## **System Troubleshooting**

### *Locating the source of the trouble*

If you notice a decrease in pump performance, start troubleshooting at the pump.

- Remove the suction and discharge hoses at the pump
- Start the pump and run it in vacuum only at its normal rpm
- Check the vacuum level at the pump inlet. The 887 PRO Challenger in new condition will develop 27-28.5" hg.
- If the pump checks out OK, check the vacuum level at the secondary, then the primary shutoff. Keep working your way back until you find the problem.

For rebuild instructions please visit our website at [www.nvepump.com](http://www.nvepump.com) or call us at 800-253-5500.

## **Making a Vacuum Tester**

- 1. Procure a flange to mount on your four-way valve, a short 4" pipe nipple, a 4" pipe cap and a vacuum gage.**
- 2. Drill and tap a 1/4" N.P.T. thread in the pipe cap.**
- 3. Assemble the flange, nipple, pipe cap and vacuum gage.**
- 4. Remove a flange from the four-way valve on your pump.**
- 5. Start the pump and confirm the location you have chosen to test from is at vacuum.**
- 6. Using the existing O-ring, fasten the testing flange to your pump.**
- 7. Start your pump and read the vacuum level on the gauge.**

## NVE 887 PRO Challenger Fan Cooled | Parts Diagram



# NVE 887 PRO Challenger Fan Cooled I Parts List

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	120-001-009	HOUSING 887 PRO MACHINED
2	1	120-003-008	887 ENDPLATE [CW DRIVE / CCW NON DRIVE], MACHINED
3	1	120-003-009	887 ENDPLATE [CW NON DRIVE / CCW DRIVE], MACHINED
4	2	120-004-001	GASKET 887 ENDPLATE
5	1	120-005-008	887 ROTOR ASSEMBLY
6	1	120-006	KEY 3/8" X 3/8" X 2"
7	7	120-007-887	VANE 887
8	2	120-009-004	SEAL SLEEVE 887
9	4	120-018-001	SEAL 70 X 85 X 08A VITON SGL LIP
10	1	120-019-001	BEARING BALL 887 DRIVE END
11	1	120-019-002	BEARING ROLLER 887 NON DRIVE END
12	2	120-039-007	GASKET 887 PRO INTAKE/EXHAUST
13	1	120-041-887	CHECK VALVE 887 PRO
14	1	120-042-887	RETAINER RING CHECK VALVE 887 MACHINED
15	1	120-045	SPRING 4-WAY FTR VALVE
16	2	120-053-506	SEAL 45 X 62 X 8 VITON
17	1	120-054-005	COVER BRNGS NON DRIVE END 887
18	1	120-054-006	COVER BRNGS DRIVE END 887
19	2	120-055-001	GASKET 887 BEARING COVER
20	1	120-058	PLUG BRASS HEX HEAD 1/8" NPT
21	2	120-060-002	GRIP, HANDLE W/ LOGO
22	1	120-062-009	887 PLUG, MACHINED ASSY
23	2	120-063-506	FLANGE 4" NPT
24	1	120-064-004	O-RING, 2-265 VITON
25	2	120-064-017	O-RING 2-216-VITON
26	1	120-064-030	O-RING SQUARE VITON 436
27	1	120-064-032	O-RING 2-230 VITON
28	2	120-064-506	ORING, 2-158 SILICONE
29	1	120-065-009	TOWER 887 MACHINED
30	1	120-068	ORING, 2-252 VITON
31	1	120-070-001	TIN LOWER ROLLED 887
32	1	120-071-001	TIN UPPER ROLLED 887
33	1	120-073-E	FAN COVER 607/866 E-COAT
34	1	120-074-002	FAN SHROUD 868/607 PRO
35	1	120-076	KEY 3/8" X 3/8" X 1"
36	1	120-077-001	SHROUD SUPPORT PLATE 887
37	1	120-079-008	GUARD NVE OIL PUMP 607/887 W/ SN TAG MOUNT
38	1	120-084-003	FAN ASSY CW 887
39	1	120-090-009	BALLAST MANIFOLD 887
40	2	120-095-100	CHECK VALVE ASSEMBLY VAC OPERATED
41	1	120-097-002	GASKET 887 BALLAST MANIFOLD
42	1	120-097-003	GASKET BALLAST VALVE LOWER
43	2	120-097-006	GASKET BALLAST VALVE TOP
44	2	120-099-506-4	BALLAST FILTER ASSEMBLY, REMOTE

# NVE 887 PRO Challenger Fan Cooled I Parts List

ITEM	QTY	PART NUMBER	DESCRIPTION
45	2	120-100-012	DECAL CLEAN FILTER REGULARY YELLOW
46	1	120-100-014	TOE TAG DECAL RELIEF MUST BE SET
47	2	120-100-053	DECAL, 887 PRO CHALLENGER HD
48	1	120-101-003	DECAL CW ROTATION ARROW
49	1	120-102	VALVE, DRAIN 1/8" NPT
50	1	120-105-887	NAME PLATE SS, 887
51	1	120-107-001	SERIAL TAG SS
52	1	120-220	THERMOMETER, 50- 400 DEG, 2" FACE
53	1	120-310-002	COVER FILTER 887 WITH 1-1/2 NPT
54	4	120-312-002	KNOB, 5/16-18UNC
55	1	120-314-005	INTAKE FILTER 887 PRO
56	1	120-320-005	MANIFOLD 887 PRO MACHINED
57	2	120-406-002	WASHER WAVE, 887
58	1	120-645-001	LOCK NUT 887
59	1	123-000-004	OIL PUMP 4 PORT NVE
60	12	123-013-001	WASHER 3/8" SEALING NBR
61	6	123-408-014	BANJO BOLT 1/8" BSPP
62	1	124-360-001	BALLAST SILENCER IN-LINE 887
63	1	150-220-VPOIL-150	OIL VACUUM PUMP R&O ISO 150/SAE 40
64	2	280-355-196	BALLAST VALVE CONNECTOR FLANGE
65	1	280-355-197	BALLAST VALVE PUMP BRACKET
66	1	320-081	REMOTE OIL TANK KIT
67	1	320-083-011	CAP OIL PUMP FEED LINE FITTING
68	1	320-407-017	OIL LINE -3 SST FEMALE JIC TO BANJO 8.5"
69	1	320-407-029	OIL LINE -3 SST 90 DEG JIC TO BANJO 37.125"
70	1	320-407-030	OIL LINE -3 SST BANJO TO BANJO 32.00"
71	1	320-407-031	OIL LINE -3 SST BANJO TO BANJO 11.50"
72	1	320-407-038	OIL LINE -4 SST 90 DEG JIC TO FEMALE JIC 22.750"
73	2	320-408-016	FITTING STR -3 MJIC X 1/8 MNPT
74	1	320-408-035	FITTING STR -4 MJIC X 1/8 MNPT
75	1	320-408-036	FITTING ELBOW -4 MJIC X 1/4 MNPT
76	2	320-409-017	P-CLIP 3/8" ID 13/32" HOLE GALV
77	1	320-LF8	DRIVE TAB
78	1	320-R31	GASKET, OIL PUMP
79	1	366-150	VACUUM RELIEF, 1 1/2" NPT
80	1	400-026-887	EXTERNAL RETAINING RING, 887
81	1	412-020-003	WASHER, CUP 4-WAY
82	2	412-060-009	HANDLE 4310 ENCLOSED
200	1	OWNERS MANUAL - 887	OWNERS MANUAL 887
201	1	320-082-001	OIL TANK, 5QT, W/LOGO

# NVE 887 PRO Challenger Fan Cooled I Parts List

ITEM	QTY	PART NUMBER	DESCRIPTION
202	1	320-083-009	OIL TANK FILTER, 100 MESH
203	1	320-083-010	FILTER FITTING, OIL TANK 1/4 NPT
204	5 FT	320-407-003	OIL LINE, BLK 1/4" ID 30R7
205	2	416-025-1WC	CLAMP, WORM, 1/4" DIA
206	6 IN	320-R102	OIL LINE, 3/8" X 1/4" ID X 6" LG
207	1	310-LP5	HOSE BARB, 1/4" X 1/8" NPT STRAIGHT
300	4	HHCS - 1/2-13 UNC X 1.25	HEX HEAD CAP SCREW - 1/2-13 UNC X 1.25
301	4	HHCS - 1/2-13 UNC X 1.75	HEX HEAD CAP SCREW - 1/2-13 UNC X 1.75
302	1	HHCS - 3/8-16 UNC X 0.50	HEX HEAD CAP SCREW - 3/8-16 UNC X 0.50
303	16	HHCS - 3/8-16 UNC X 0.75	HEX HEAD CAP SCREW - 3/8-16 UNC X 0.75
304	1	HHCS - 3/8-16 UNC X 0.875	HEX HEAD CAP SCREW - 3/8-16 UNC X 0.875
300	4	HHCS - 1/2-13 UNC X 1.25	HEX HEAD CAP SCREW - 1/2-13 UNC X 1.25
301	4	HHCS - 1/2-13 UNC X 1.75	HEX HEAD CAP SCREW - 1/2-13 UNC X 1.75
302	1	HHCS - 3/8-16 UNC X 0.50	HEX HEAD CAP SCREW - 3/8-16 UNC X 0.50
303	16	HHCS - 3/8-16 UNC X 0.75	HEX HEAD CAP SCREW - 3/8-16 UNC X 0.75
304	1	HHCS - 3/8-16 UNC X 0.875	HEX HEAD CAP SCREW - 3/8-16 UNC X 0.875
305	5	HHCS - 3/8-16 UNC X 1.00	HEX HEAD CAP SCREW - 3/8-16 UNC X 1.00
306	4	HHCS - 3/8-16 UNC X 1.125	HEX HEAD CAP SCREW - 3/8-16 UNC X 1.125
307	8	HHCS - 3/8-16 UNC X 1.25	HEX HEAD CAP SCREW - 3/8-16 UNC X 1.25
308	16	HHCS - 3/8-16 UNC X 1.75	HEX HEAD CAP SCREW - 3/8-16 UNC X 1.75
309	8	HHCS - 3/8-16 UNC X 2.50	HEX HEAD CAP SCREW - 3/8-16 UNC X 2.50
310	4	HHCS - 5/16-18 UNC X 0.875	HEX HEAD CAP SCREW - 5/16-18 UNC X 0.875
311	8	HHCS - 5/16-18 UNC X 1.50	HEX HEAD CAP SCREW - 5/16-18 UNC X 1.50
312	12	HHCS - 5/16-18 UNC X 1.25	HEX HEAD CAP SCREW - 5/16-18 UNC X 1.25
313	8	LW - 1/2	LOCK WASHER, 1/2
314	51	LW - 3/8	LOCK WASHER, 3/8
315	28	LW - 5/16	LOCK WASHER, 5/16
316	2	LW - 1/4	LOCK WASHER, 1/4
317	14	FW - 3/8	FLAT WASHER, 3/8
318	4	FW - 5/16	FLAT WASHER, 5/16
319	1	NYLOCK NUT - 3/8 UNC	NYLOCK NUT - 3/8 UNC
320	2	SHCS - 1/4-20 UNC X 0.75	SOCKET HEAD CAP SCREW - 1/4-20 UNC X 0.75
321	4	SS - 5/16-18 UNC X 2.00	HEXAGON SOCKET SET SCREW - 5/16-18 UNC X 2.00 SS
322	9	TAPSCR - 1_4-14 X 0.75	HEX HEAD SELF TAPPING SCREW 1/4-14
323	6	RVT 3/32 D X 1/4L SS	BLIND RIVET, 3/32 DIA X 1/4 GRIP, SS
324	6	PLUG - 1/8 NPT SH	SOCKET HEAD PLUG - 1/8 NPT
325	3	PLUG - 1/4 NPT SH	SOCKET HEAD PLUG - 1/4 NPT



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