

NVE

National Vacuum Equipment



43 SERIES TRI-LOBE BLOWER **OPERATIONS/MAINTENANCE MANUAL**

800-253-5500 | www.natvac.com

SAFETY INSTRUCTIONS

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a hazardous situation which can cause damage to machine, personal property, and/or the environment, or cause the equipment to operate improperly.

 	<div style="background-color: red; color: white; padding: 5px; text-align: center;">  DANGER </div> <p>Lock out equipment before beginning any maintenance procedure. Rotating equipment can cause entanglement, injury and/or death.</p> <p>Allow all system components to cool below 100 °F before beginning any maintenance procedure. Severe burns are possible.</p> <p>Safely remove all pressure/vacuum from the system before beginning any maintenance procedure. Injury/death can occur.</p>
	<div style="background-color: orange; color: black; padding: 5px; text-align: center;">  WARNING </div> <p>Ensure system is free of vacuum and pressure before beginning any maintenance.</p> <p>Allow blower and system components to cool below 100 °F before beginning any maintenance.</p>
	<div style="background-color: orange; color: black; padding: 5px; text-align: center;">  WARNING </div> <p>Before performing inspection operators must wear PPE including, but not limited to, eye and hearing protection as noises levels can exceed 85 dB.</p>
	<div style="background-color: blue; color: white; padding: 5px; text-align: center;"> NOTICE </div> <p>Only properly trained personnel should service systems containing NVE components.</p>

1. The package is equipped with a temperature gauge on the front panel.
 - Maximum operating temperature is 280° over ambient.

For example:

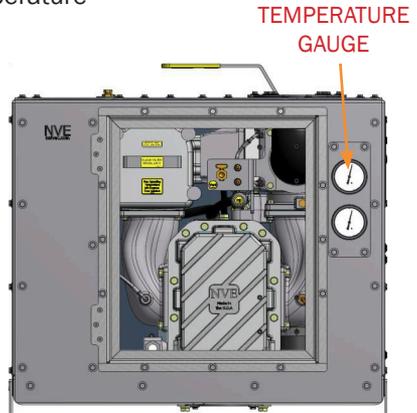
- If ambient is 100° the blower may see the max temp of 380°.
- If the blower is at or over 380° in the vacuum mode and the ambient temperature is below 100°, shutdown the blower.
- This blower should not overheat in the vacuum mode because of the air ballast cooling.
- If the blower is running over 380° in the pressure mode, check the filter. In most cases the filter is dirty and not allowing enough air to the blower.

Remember:

- The filter must be clean when operating the blower in the pressure mode
- When operating in the pressure mode, the air ballast cooling doesn't function.

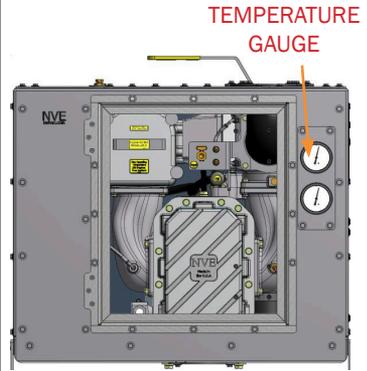
[SEE FIGURE 1]

2. Operating in vacuum mode.
 - It is recommended to run the blower at 4000 rpms.
3. Operating in pressure mode.
 - It is recommended to run the blower between 2400-2500 rpms.
 - Pressure should not exceed 15 psig.
 - Multiple pressure reliefs should be in place to limit the pressure on the blower.



[FIGURE 1]

	<p>! WARNING</p>
	<p>Pressure relief valves should only be adjusted and/or serviced by trained individuals.</p>
	<p>Improperly set/installed pressure relief valves can cause potentially dangerous system pressures to be generated.</p> <p>NVE assumes no responsibility of quantity and/or setting of any pressure relief valves on any associated system.</p>



[FIGURE 1]

	<p>NOTICE</p>
	<p>Only properly trained personnel should service systems containing NVE components.</p>

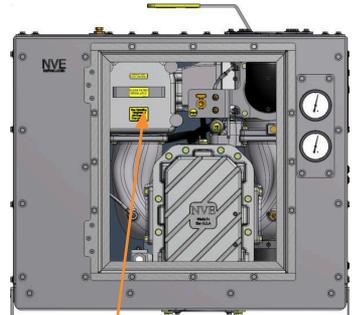
Remember:

- The ballast cooling doesn't function in pressure mode.
- Before off-loading in pressure mode, check to make sure the filter is clean.
- If the blower is running hot (280° over ambient), the filter is most likely dirty and not allowing enough air to the blower. This will cause the blower to over heat.

[SEE FIGURE 1]

4. Filter should be inspected and cleaned weekly for use in vacuum mode. Clean daily if using in pressure mode.
 - Clean with soap and water.
 - Make sure the filter end caps are wiped off after cleaning.

[SEE FIGURE 2]



INLET FILTER

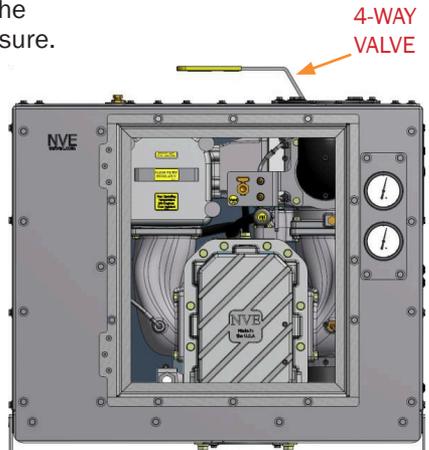


[FIGURE 2]

5. Never feather the 4-way valve on the blower to regulate vacuum or pressure.
 - Feathering the 4-way valve will cause the blower to over-heat.

[SEE FIGURE 3]

6. The operation of the 4-way valve is exactly the same as a rotary vane pump. *I dont think this part should be worded like this. What if they don't know what the operation is for the rotary vane pump??*



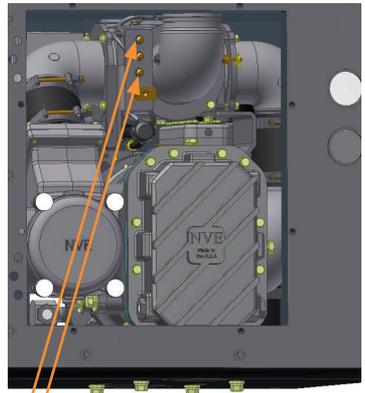
[FIGURE 3]

There are three positions:

- Full vacuum.
- Full pressure.
- Center - to relieve vacuum or pressure from the tank.

[SEE FIGURE 3]

7. The blower has three (3) grease zerks on the 4310 and two (2) on the 4307 for the 4-way valve assembly.
 - If the valve handle is hard to move grease the 4-way.
 - The top zerk on the 4310 will take very little grease.
 - Do not over grease. The grease will end up in your final filter. If this happens, please clean out filter.



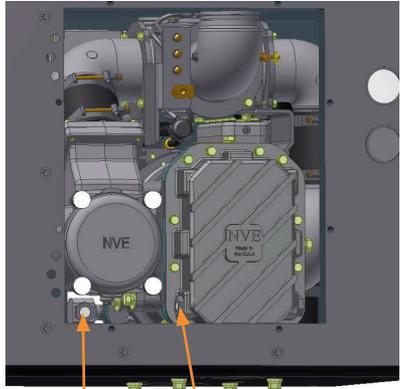
[FIGURE 4]

[SEE FIGURE 4]

- 8. Check oil level in sight glasses weekly.
 - Oil level should be to the center of the sight glass.
 - To check oil level, make sure the truck is on level ground.

Remember:

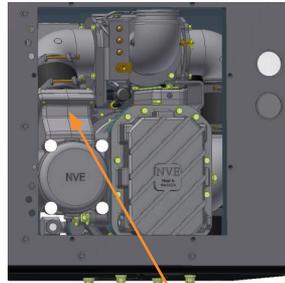
- The blower should not use any oil.
- Adding oil to the blower may cause it to become over filled.
- If the blower is overfilled, the end plates have weep holes to allow the oil to escape.



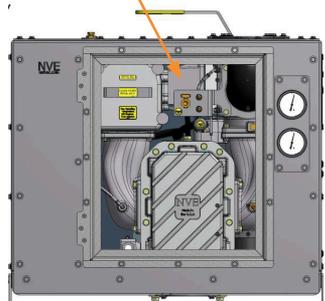
DRIVE END SIGHTEYE NON-DRIVE END SIGHTEYE [FIGURE 5]

[SEE FIGURE 5]

- 9. If the blower spins backwards when disengaged, the check valve needs to be replaced.
 - Allowing the blower to spin backwards will cause damage to the blower.
 - The blower can still be used by relieving the vacuum from the tank before disengaging the PTO.



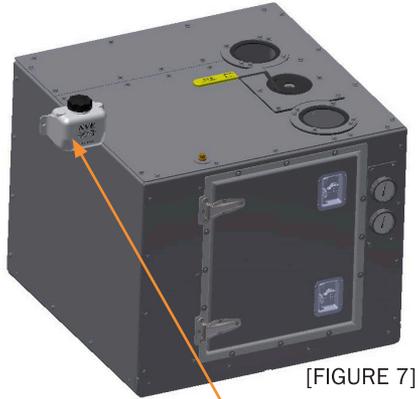
CHECK VALVE



[FIGURE 6]

13. Flush procedure.

- Pour 6 to 8 ounces of flushing fluid into your flush tank.
- Engage blower and run truck at idle.
- Move valve handle to pressure mode.
- Open flush valve and allow 6 to 8 ounces to move through the blower. This just takes seconds.
- Disengage blower and move valve handle to neutral position.
- This procedure is normally done at the end of the day.
- Open the drain on the moisture trap to drain flushing fluid fuel and carry over from the day's work.



[FIGURE 7]

FLUSHING FLUID TANK

[SEE FIGURE 7]

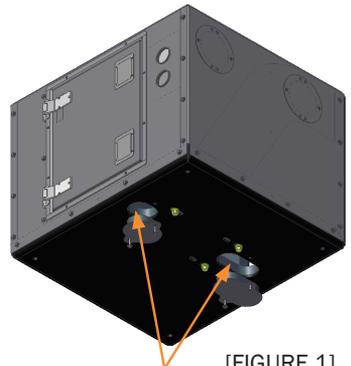
	<p>NOTICE</p> <p>Dispose of used fluid according to local and EPA regulations in an environmentally friendly manner.</p>
--	---

43 SERIES CHANGING GEAR CASE OIL

14. Position truck/unit on a level surface.

	<p>WARNING</p> <p>Lock-out / tag-out unit so it cannot be started/engaged during the maintenance procedure.</p>
--	--

15. Remove the two panel covers on the bottom of the package stand. This gives access to the blower oil sump drain plugs. (7/16" wrench or socket).



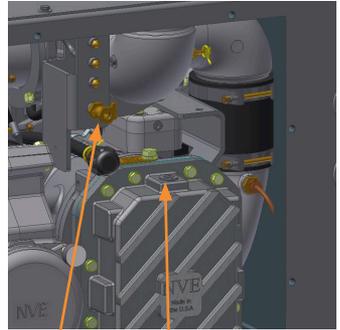
[FIGURE 1]

REMOVE PANEL COVERS

[SEE FIGURE 1]

- Open door to package and vent both oil sumps. The drive end vent is opened with a petcock, while the non-drive vent requires a plug be taken out. (9/16" Allen head).

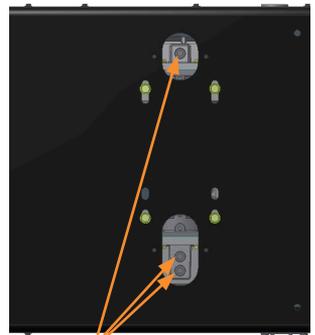
[SEE FIGURE 2]



OPEN PETCOCK REMOVE THIS PLUG [FIGURE 2]

- Obtain an oil catch pan and place under drain plugs. Remove drain plugs one at a time and drain the sumps completely of oil. Remove both drive end drain plugs. NOTE: One is magnetic and needs to be cleaned. (9/16" Allen head).

[SEE FIGURE 3]



REMOVE DRAIN PLUGS [FIGURE 3]

NOTICE

The condition of the oil excessive metallic presence can signal internal blower issues.

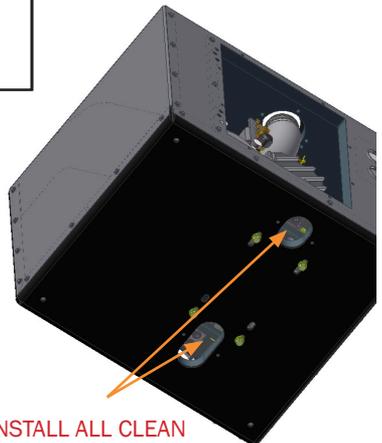
Contact NVE if this occurs.

NOTICE

Dispose of used oil according to local and EPA regulations in an environmentally friendly manner.

- Once all gear case oil has drained, reinstall the drain plugs. A sealant is recommended, but ensure none is allowed into the sump. *Use caution if using teflon tape.

[SEE FIGURE 4]



REINSTALL ALL CLEAN DRAIN PLUGS [FIGURE 4]

19. Obtain proper type & quantity of gear lube according to the tables below:

TABLE 1: RECOMMENDED OIL TYPES

Ambient Temp °F (°C)	Recommended Oils for Blowers (Synthetic Only)			
	Type	Viscosity	Pour Point	Color
Above 90°F (32°C)	Summit Syngear Sh-7320	ISO 320	-40 (-40)	Clear
	Mobile SHC 632		-40 (-40)	Orange
32° to 90° (0° to 32°)	Summit Syngear Sh-7220	ISO 220	-45 (-43)	Clear
	Mobile SHC 630		-41 (-42)	Orange
0° to 32° (-18° to 0°)	Summit Syngear Sh-7150	ISO 150	-60 (-51)	Clear
	Mobile SHC 629		-45 (-43)	Orange
Below 0° (-18°)	Summit Syngear Sh-7100	ISO 100	-60 (-51)	Clear
	Mobile SHC 627		-45 (-43)	Orange

*Ambient temp is the temperature of the space where the blower is located or enclosed

TABLE 2: BLOWER OIL CAPACITIES

Size	Blower Oil Capacity - DO NOT OVERFILL		
	Drive Side Oz (Liters)	Non-Drive Side Oz (Liters)	Total
4307 4310	18 (.53)	8 (.24)	26 (.77)

- Excessive or insufficient gear lube levels can cause catastrophic blower failure.
- Blower oil capacities do not account for fill lines/external sighteyes if present (actual quantities may vary slightly - oil should be centered in the sighteyes).

20. Unhook drive end fill line from holder and carefully pull outside the door (do not apply too much pulling force as this can kink the line and cause a restriction). Remove the plastic cap from the line.

[SEE FIGURE 5]



[FIGURE 5]

21. After ensuring the petcock vent is still open, insert a funnel into the open fill line fitting and slowly pour required oil quantity into sump (See table on page 10 for approximates).

- Do not fill too fast. This can cause fill line to vapor-lock fill to mid-point of sighteye. It takes time for fluid to travel into sump. Allow oil to drain and settle in sump before adding more.

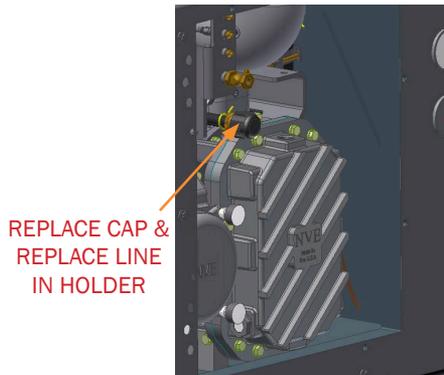
[SEE FIGURE 6]



[FIGURE 6]

22. After verifying drive end gear case oil is at appropriate level, replace cap on the fill line and hook line back on clamp. Leave vent petcock open for now.

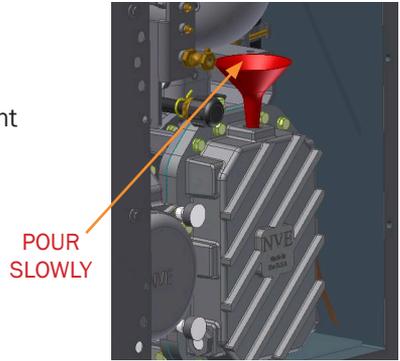
[SEE FIGURE 7]



[FIGURE 7]

- 26. Insert a funnel into the non-drive oil sump fill hole and slowly pour required oil quantity into sump. It helps to position the funnel up slightly so air can vent fill to mid-point of sighteye. It takes time for fluid to travel into sump. Allow oil to drain and settle in sump before adding more.

[FIGURE 8]

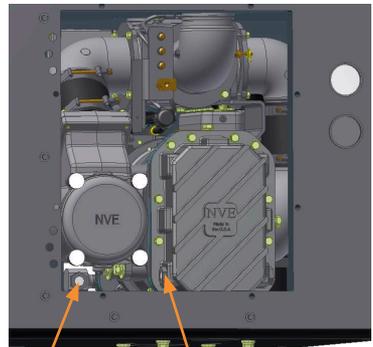


[FIGURE 8]

- 27. Remove funnel and allow unit to sit for several minutes. This allows the oil to drain into the sump to ensure an accurate reading in the sighteyes.

- 28. Verify oil level is at the mid-point of both sighteyes (unit must be level). If necessary add/drain oil using aforementioned procedure.

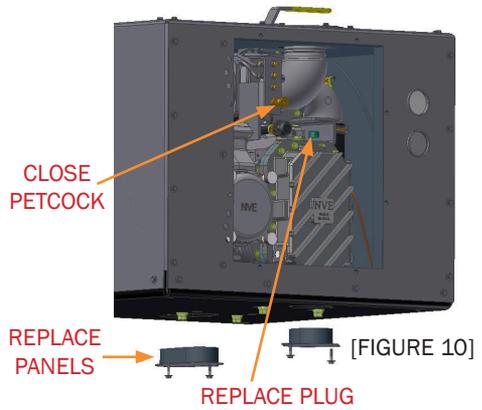
[SEE FIGURE 9]



DRIVE END SIGHTEYE NON-DRIVE END SIGHTEYE [FIGURE 9]

- 29. Once oil is within specifications, the vent petcock must be closed and the non-drive vent plug must be replaced. Be sure petcock is closed and vent plug replaced before operating machine. Check for any leaks through the open panel covers and replace the panel covers under package.

[SEE FIGURE 10]



	<p>NOTICE</p> <p>Dispose of used oil according to local and EPA regulations in an environmentally friendly manner.</p>
--	---



National Vacuum Equipment

P.O. Box 685
Traverse City, MI 49685 USA

231.941.0215 Phone
231.941.2354 Fax

sales@natvac.com | www.natvac.com | 800.253.5500