PFLOW INDUSTRIES MATERIAL HANDLING SOLUTIONS
www.pflow.com
P 414 352 9000
F 414 352 9002
6720 N. Teutonia Ave.
Milwaukee, WI 53209

The VRC requires minimal attention on a regular basis to prevent equipment failures or accelerated wear and tear. This section is provided for the assistance of qualified and trained service technicians only and is not intended for use by untrained or unauthorized service personnel. Make sure all steps are completed. A record of regular, properly conducted preventive maintenance provides a running history of any issues the VRC may have. The reports will identify trends, and helps anticipate expected wear and tear repairs. Sign and return to PFlow Industries, Inc. Customer Support Department via e-mail to csd@pflow.com

NOTICE

A qualified person is defined as a person who, by possession of a recognized degree or certificate of professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve problems relating to the subject matter and work.

⚠WARNING

- If any defects relating to operating safety and reliability are detected or if any damage occurs, the VRC must be taken out of operation immediately.
- Lockout/tagout the VRC before performing maintenance on electrical components. De-energize any circuit before work is begun.
- Take appropriate measures for safely working at heights.

- Make sure that no persons or objects are within the range of any moving parts of the VRC.

- Climbing, sitting, walking, or riding on equipment while the equipment is in operation could result in death or serious injury.
- If this VRC needs to be modified in any way, contact PFlow Industries, Inc. for assistance. Do not make any unauthorized changes.
- Before the VRC is put into operation, all VRC parts must comply with all relevant health and safety directives and regulations.

- Falling hazard! Close all gates before the carriage is moved. Never leave the lift unattended with the gates in the open position. Never close gates when a person is on the carriage or within the fenced area.

⚠CAUTION

- Paint overspray on the hydraulic cylinder rod will damage the packing seals and void the manufacturer's warranty. Cover exposed rods with removable plastic or soluble grease while painting or touching up the VRC.

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Hydraulic Safety Precautions

⚠ WARNING

- Wear personal protective equipment, such as gloves and safety glasses, whenever installing, servicing, or checking a hydraulic system.
- Assume that all hydraulic hoses and components are pressurized. Relieve all hydraulic pressure before disconnecting any hydraulic line.
- Never try to stop or check for a hydraulic leak with any part of your body; use a piece of cardboard to check for hydraulic leaks.
- Small hydraulic hose leaks are extremely dangerous, and can inject hydraulic oil under the skin, even through gloves.
- Infection and gangrene are possible when hydraulic oil penetrates the skin. See a doctor immediately to prevent loss of limb or death.

- Ingesting hydraulic fluid is toxic and hazardous to people and wildlife. Symptoms may be skin irritation, weakness in the hands, intestinal bleeding, pneumonia, or death. Seek first aid immediately. Dispose of spilled fluids appropriately.

- Hydraulic fluid is flammable. Make sure you know where fire extinguishers are kept and how to use them. Do not weld on or near pipes, tubes, or hoses that are filled with fluid.
- Do not overfill the hydraulic oil tank. Any overflow could cause a fire. Immediately repair any hydraulic oil leaks and clean up any spills.
- Shut off all electrical power to the Vertical Reciprocating Conveyor (VRC) while filling the hydraulic oil tank.
- Materials and fluids soaked in hydraulic fluid should be stored in sealed metal containers and disposed of at proper places.

- Hydraulic fluid is slippery. Wipe up spills immediately to reduce the risk of falls or slips.

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√	Action	How Often
	Verify overall operation.	monthly
	Verify that the carriage deck is flush with the floor level and every level. Adjust as necessary.	monthly
	Verify that all electrical components are undamaged. Repair or replace as needed.	monthly
	Verify that all gates and enclosures are undamaged and properly installed.	monthly
	Verify that all gate interlocks are functioning properly.	monthly
	Verify that all push-button stations and e-stops are functioning correctly on each level.	monthly
	Identify any unsafe condition. Document and report the condition immediately to the customer and then PFlow Industries, Inc. Customer Support Department. Do not allow the lift to operate when unsafe conditions arise.	monthly
	Inspect hoses and fittings for fraying and leaks.	monthly
	Review the hydraulic fluid for color changes or cloudiness. Replace the fluid as needed.	monthly
	Verify that there is sufficient hydraulic fluid for operation. Add hydraulic fluid as needed.	monthly
	Inspect all welding, bracing, and anchoring for structural integrity.	3 months
	Verify that all nuts and bolts are tight. Adjust as necessary.	3 months
	Visually inspect all gate chains, and lubricate when dry.	3 months
	Verify that all moving components are functioning properly.	3 months
	Inspect all additional options and accessories (e.g., DeckLocks, maintenance pins) and operation. Adjust as necessary	3 months
	Visually inspect the wheelblocks and roller guides for rotation interference and wear.	3 months
	Verify that all electrical connections are tight.	3 months
	Verify that the carriage is level. Adjust as necessary.	6 months
	Inspect the hydraulic pump and motor operation, pressure switch setting, relief valve, and velocity fuses.	12 months
	Replace the hydraulic oil and oil filter.	12 months
	Inspect the wheelblock roller guides for deterioration.	12 months
	Replace all hoses and fittings.	5 years

Customer signature:	Date work completed:
Name/Phone:	Authorized Technician(s):
Title:	Name:
E-mail:	Name:

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Oil Environment

Hydraulic oil with a Saybolt viscosity of between 100 and 150 SSU or ISO 32 at operating temperatures should be used.

Extreme temperatures below 32°F (0°C) or above 100°F (38°C) and corrosive atmosphere may affect oil requirements. Consult PFlow Industries, Inc. Customer Support Department for assistance.

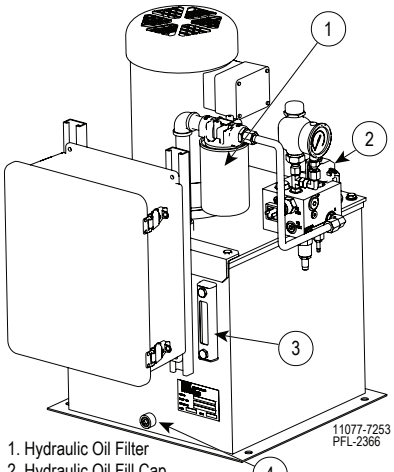
Tools Needed

- 5 - 10 gallons (19 - 38 liters) of ISO 32 hydraulic oil with a non-foaming additive
- Funnel with a screen
- Clean, lint-free cloth
- Hydraulic oil filter PFlow part #9760-0010

Change the Oil

Contamination must be periodically removed from the hydraulic system. It is advisable to drain the hydraulic oil after the oil is warmed to about 150°F (66°C). When doing this, the oil impurities have not yet settled and can be removed along with the drained oil.

1. Lower the carriage to the floor. Make sure the cylinders are fully extended.
2. Remove power, and follow OSHA electrical lockout/tagout requirements.
3. Place a catch basin below the hydraulic oil drain plug.
4. Remove the drain plug to drain the hydraulic fluid system.
5. Open the reservoir tank and wipe the inside of the reservoir tank with a clean, lint-free cloth.
6. Replace the rubber gasket seal on the reservoir tank lid.
7. Replace the top of the reservoir tank and close tightly.
8. Wipe the drain plug with a clean, lint-free cloth and replace.
9. Replace the oil filter with a new, factory-authorized oil filter replacement.
10. Remove the fill cap.
11. Use a funnel with a screen and pour ISO 32 hydraulic oil with a non-foaming additive into the reservoir tank. The tank capacity may be 5 - 10 gallons (19 - 38 liters).
12. Replace the fill cap and tighten.
13. Remove OSHA electrical lockout/tagout requirements and restore power.



1. Hydraulic Oil Filter
2. Hydraulic Oil Fill Cap
3. Hydraulic Oil Sight Glass
4. Hydraulic Oil Drain Plug

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Clean the Reservoir

The reservoir is a settling basin for any contamination. It is important to remove all accumulated sediment from the bottom. Wipe down the interior to remove any further impurities. The inside cover of the reservoir should also be inspected. Large reservoirs can be a source of rust contamination due to condensation. The vibration of the pump unit results in rust flaking off into the fluid.

Flush the Reservoir

If contamination is evident in fluid samples, there is a good chance that accumulation has occurred somewhere within the system "plumbing". These deposits can score the cylinder rods, damage the seals, and interfere with the operation of the VRC. To prevent this type of damage, flush the system with a light viscosity oil containing a rust inhibitor to protect the metal surfaces from rust formation. It is advisable to drain the hydraulic oil after the oil is warmed to about 150°F (66°C). When doing this, the oil impurities have not yet settled and can be removed along with the drained oil.

1. Follow steps 1-10 in ***Change the Oil*** instructions.
2. Use a funnel with a screen and pour ISO 32 hydraulic oil with a non-foaming additive into the reservoir tank. The tank capacity may be 5 - 10 gallons (19 - 38 liters).
3. Add a small percentage of special petroleum solvent cleaner into the reservoir tank.

NOTE

Fluid suppliers are the best source for solvents. Solvents such as alcohol, kerosene, and carbon tetrachloride are low in viscosity and tend to reduce the viscosity of the new fluid. Those solvents may not hold the washed out contaminants in suspension and may deposit them in another part of the system.

4. Replace the fill cap and tighten.
5. Remove OSHA electrical lockout/tagout requirements and restore power.
6. Flush the system by operating the VRC up and down between floor levels. 10 - 50 hours of operation should be sufficient to loosen and remove the contaminated deposits.
7. Follow steps 1-10 in ***Change the Oil*** instructions.
8. Use a funnel with a screen and pour ISO 32 hydraulic oil with a non-foaming additive into the reservoir tank. The tank capacity may be 5 - 10 gallons (19 - 38 liters).
9. Replace the fill cap and tighten.
10. Remove OSHA electrical lockout/tagout requirements and restore power.

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