

PFLOW VERTICAL LIFTS

The Nation's Largest Manufacturer of Vertical Lifts

PFLOW
Industries, Inc.



THE ILLUSTRATIONS IN THIS
MANUAL ARE NOT TO SCALE OR
DETAIL AND ARE FOR REFERENCE
ONLY

OWNER'S MANUAL

SERIES 21

WITHOUT DECKLOCKS

PFLOW INDUSTRIES, INC.
6720 North Teutonia Avenue
Milwaukee, WI 53209

Phone (414) 352-9000

Fax (414) 352-9002

Email Info@pflow.com



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PFlow Industries, Inc.
6720 N. Teutonia Avenue
Milwaukee, Wisconsin, 53209
www.pflow.com

Main Office Phone ----- 414-352-9000

Main Office Fax ----- 414-352-9002

Product Support Department Fax ----- 414-247-9834

e-mail:

Product Support Department: psd@pflow.com

Sales: sales@pflow.com

		Phone Extension	Mobil Phone
Senior Technical Advisor	Jay Winston	167	414-915-3968
Senior Field Service Supervisor	Kevin Sprong	178	414-807-0336
Technical Support	Jeff Bittner	105	-
Field Service Technician	Kevin Vaile	181	414-915-3732
Field Service Technician	Fred Freeman	279	414-322-3253

Product Support Manager	Pat Herrmann	126	414-745-5813
Electrical Engineering	Jonathan Kumbera	111	-
Mechanical Engineering	Mike Reilly	184	-
Director of Sales Engineering	Brent Bayer	173	-

DOCUMENTATION

PFlow Industries reserves the right to make changes or improvements to the standard VRC model line at any time.

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SYSTEM MODIFICATIONS/DISCLAIMER

Mechanical or electrical modifications performed on the VRC not approved by PFlow Industries, Inc. may also void any warranty and/or service agreements. Please contact the PFlow Sales or Service Department at one of the numbers listed above for assistance with service modifications.

Notes

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MATERIAL SAFETY DATA SHEETS

Sherwin Williams, Fast Dry Acrylic Enamel, FDA Pflow Blue VOC

Sherwin Williams, Universal Primer, White

Sherwin Williams, Blue Aerosol

Moore Flo Hydraulic - Product Data

Moore Oil Company - Homan AW 32 Hydraulic

INTRODUCTION

Thank you for purchasing a PFLOW INDUSTRIES, INC., Series 21, Vertical Reciprocating Conveyor (VRC). As the nation's largest manufacturer of VRCs, we are confident that your unit will provide you with many years of reliable service.

CODE REQUIREMENTS - VRCs are NOT elevators. Your unit is designed for the movement of materials only, up to its rated capacity, from one level to the next. VRCs have their own national code (ANSI/ASME B20.1) and are specifically exempt from the National Elevator Code. All electrical designs and components are in accordance with National Electric Code (NEC) requirements. Local codes may require initial inspection of the installation and periodic inspection and testing of the unit.

Some states require special components and have specific guidelines regarding how the equipment must be installed, inspected, and tested. If we know in which state the equipment will be located, and if we are kept informed of state and local requirements, Pflow will incorporate the components into the order, as approved by the customer, and also provide any pertinent information, as called out on the general arrangement drawing, related to the installation of the equipment. We will not be on site for the testing, but we strongly advise that the installer be there.

If at any time you have questions about your state's requirements, please feel free to call.

NOTE

The information and illustrations in this manual are intended only as an aid to understanding the VRC's general installation. It does not cover every possible contingency or circumstance regarding non-standard options or site conditions.

If you have a problem, call Pflow at (414) 352-9000, between 8:30 A.M. and 5:00 P.M., CST, Monday through Friday. Ask for the Product Support Department and have your serial number ready.

Parts - Pflow Industries maintains a complete stock of, or has access to, all replacement components. We keep detailed records of all equipment sold. If something is damaged in shipment, is defective or missing, contact us immediately.

Service - Our Product Support Department is available to assist your maintenance personnel with any questions or problems they may have regarding the equipment.

Warranty - Our warranty procedures can be found in the back of this manual. Prior authorization must be obtained from Pflow before commencing work of any kind.

Feedback - Let us know how we are doing. A questionnaire is included in the installation manual. Please fill it out and return it to us. We can't prevent a problem if we are not aware of it.

PFLOW INDUSTRIES, INC.,
6720 North Teutonia Avenue
Milwaukee, WI 53209
Phone: (414) 352-9000
Fax: (414) 352-9002
E-mail: info@pflow.com
Website: www.pflow.com

21 Series

SAFETY

To ensure your safety and the safety of those around you, it is important that you read, understand, and follow ALL the safety precautions relative to a particular task. Safety precautions in this manual are labeled with the alert symbol followed by the word DANGER, WARNING or CAUTION.

DANGER

When you see this symbol, it means that serious injury or death is likely to occur if the instructions are not followed carefully.

WARNING

When you see this symbol, it means that the potential for personal injury is high if directions are not followed carefully.

CAUTION

When you see this, it means that the potential for damage to the equipment is high if directions are not followed carefully.

NOTE

This term is used to provide additional information to help clarify instructions.

DANGER

HIGH VOLTAGE. Failure to follow proper procedures when performing electrical installation or service may result in serious injury or death.

DANGER

DO NOT ride this equipment. Riding may result in injury or death. VRCs ARE NOT ELEVATORS.

DANGER

DO NOT walk or work under a raised platform.

DANGER

If you can open a gate when the unit is not at that level, or the unit will operate with a gate open, a safety device is not working and could result in serious injury or death.

WARNING

DO NOT operate the unit if either the gates or interlocks are not functioning properly.

CAUTION

Paint overspray on cylinder rod will damage seals and void warranty.

CAUTION

DO NOT exceed rated capacity.

WARNING

If your Series 21 VRC is not equipped with decklocks, do not leave the carriage at the upper level when you have finished using the VRC.

Electrical Safety Precautions

DANGER

Always assume that a circuit is not safe until you are sure that it is dead. Make sure that it cannot be energized after you start working on it. Follow OSHA procedures for locking out the control panel ANYTIME maintenance or service is being performed on the unit. Put a lock and tag on disconnects, breakers, and/or pulled fuses.

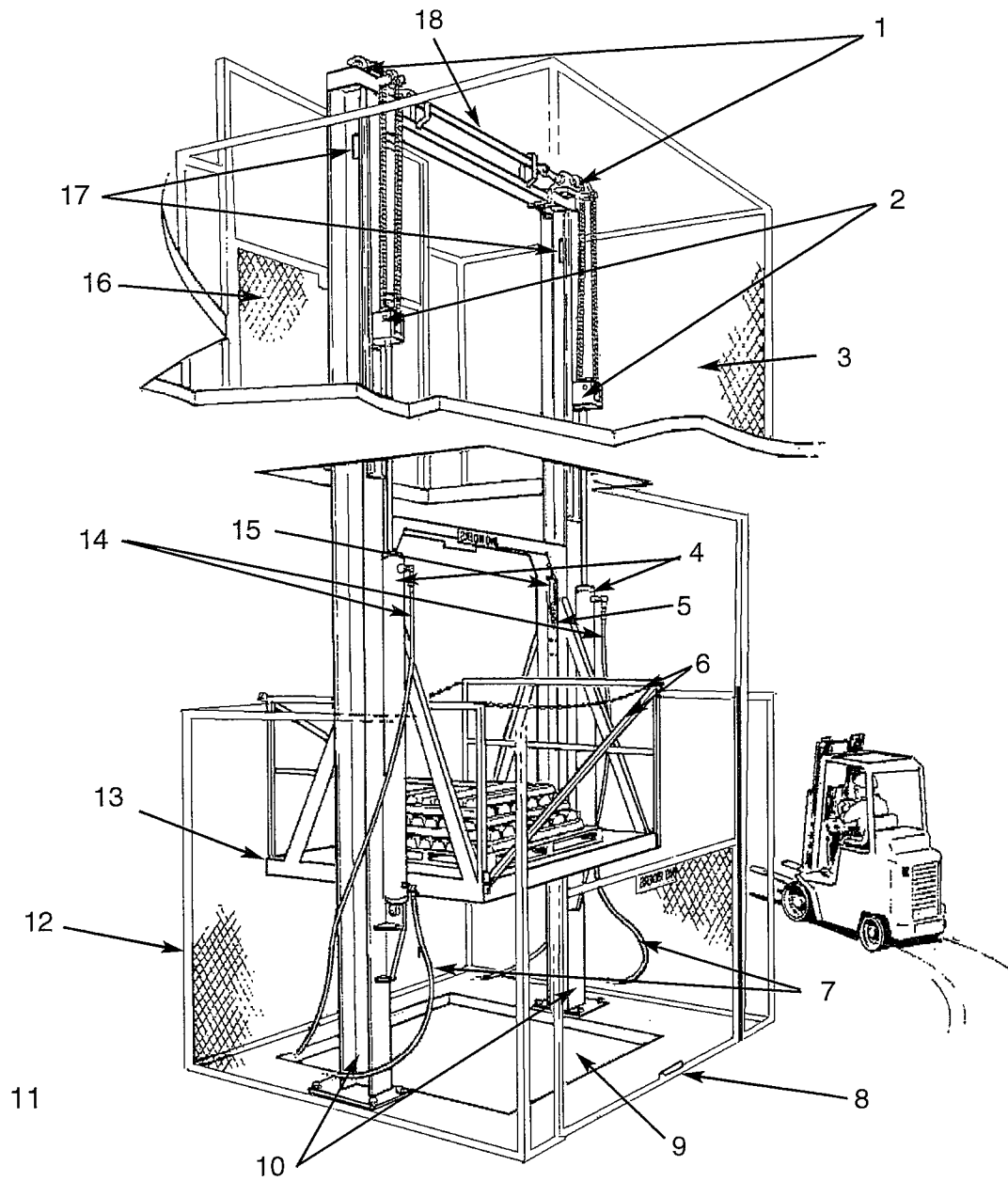
- Use a voltage tester on circuits - **DO NOT USE YOUR FINGERS.** Use fuse pullers to change a fuse; **NEVER** use fingers, pliers or screwdrivers. Covers on exposed electrical devices or wires **MUST** be installed to protect personnel from injury or shock.
- **ALL** metal connection boxes, switch boxes, starting boxes, transformer shells, and motor frames must be grounded to prevent shock to personnel.
- When using a portable electric meter, **DO NOT** connect one wire and leave other wires dangling loose. Anyone touching it will receive a shock through the meter.
- Before powering a circuit on, make sure that all is clear. This is necessary in order to protect personnel from injury and to prevent damage to the equipment.
- Avoid accidental contact with equipment or conductors which are known to be live or are **NOT** known to be dead. If it is necessary to work on equipment while it is hot, extra care must be observed. Always test and repair equipment that indicates a warning of unsafe conditions by giving a nonfatal shock. **NEVER** assume that because the warning shock is nonfatal, the next shock will also be nonfatal.
- **TAKE TIME TO BE CAREFUL!** Following safety precautions and using common sense will prevent injury, mutilation, or death.

Safety Precautions When Working on Live Circuits or Equipment:

When electrical repair or maintenance work is required that prohibits de-energizing the circuits involved, extreme measures of safety must be used. The work should be accomplished only by well-supervised personnel who are fully aware of the dangers involved. Every care should be taken to protect the person performing the work and to use all practical safety measures. The following precautions **MUST** be taken:

- The person doing the work should not wear a wristwatch, rings, watch chain, metal articles, necklaces or loose clothing which might make accidental contact with live parts or throw some part of his body into contact with live parts.
- Clothing and shoes should be as dry as possible.
- Insulate the worker from ground by covering any adjacent grounded metal, with which he might come in contact, with insulating material. Suitable insulating materials are dry wood, rubber mats, dry canvas, dry phenolic material, or even heavy, dry paper in several thickness. Be sure that it has no holes and no conducting materials embedded in it. Cover sufficient area so that adequate space is permitted for worker movement.
- Cover working metal tools with an insulating rubber tape (not friction tape) as much as is practical.
- **DO NOT** stick a bare screwdriver or other tool into a hot fuse box.

COMPONENT LAYOUT - STRADDLE



PFL-1054

- | | |
|---------------------------------|---|
| 1. Drive Sprocket Assembly | 10. Beam Assemblies |
| 2. Clevis Assemblies | 11. Motor Pump Unit (Not Shown in View) |
| 3. Enclosures | 12. Enclosures |
| 4. Cylinders | 13. Carriage |
| 5. Wheelblock | 14. Hose Assembly (High Pressure) |
| 6. Loadsafes | 15. SafeDeck Adjustable Stop |
| 7. Hose Assembly (Low Pressure) | 16. Gate |
| 8. Gate | 17. SafeDeck Beam Openings |
| 9. Pit | 18. Torsion Bar |

Figure 1

MECHANICAL OVERVIEW

Each unit is a customized application of the product. Individual components will vary according to the capacity of the unit, customer's specification, and options chosen.

The following is an overview of the various components and their purpose. Exploded view illustrations are shown in other sections of this manual.

The **FRAME** consists of two vertical upright beams. These beams are anchored at the base plates to the first level and positioned by the header/torsion bar assembly at the top and bracing at other levels.

The **LEVELDECK** feature consists of a torsion bar and header across the top of the beams.

The **CARRIAGE** consists of a platform, framing, four wheelblocks, and either railings, enclosures, or sides.

LOADSAFE, our exclusive safety barrier, is secure, easy-to-position, and self-storing.

A **SAFETY GATE** or door must be provided at each level and opening. Whether a Pflow Industries product or existing door or gate, they must be interlocked, both mechanically and electrically, with the operation of the unit. This is to prevent movement of the platform when a gate is open or opening of a gate or door when the lift is not at that level.

In accordance with ANSI B20.1, Pflow Industries supplies standard **ENCLOSURE PANELS** to be installed around the unit as required by site conditions. Our panels are manufactured of 1 1/2" angle frames and 15 gauge flattened expanded metal which will reject a ball 2" in diameter. Our standard panels are 8 feet high. Total height includes 1 1/2" legs for mounting to the floor. Extended height applications are available.

There are two configuration types available for this model. "Straddle" is when a column is located on each side of the carriage. This is shown in Figure 1.

"Cantilever" is when both columns are at the back. There is no difference in the operation or maintenance of the two models.

Pflow Industries provides a "NO RIDER" sign for each gate and the carriage. A "CAPACITY" sign shows the maximum allowed load that this model is designed to accept. As a reminder, i.e., 'SAFETY SYSTEM DOES NOT INCREASE OPERATING CAPACITY' and 'DO NOT EXCEED RATED CAPACITY' signs are also provided.

The **HYDRAULIC MOTOR/PUMP UNIT** consists of a motor, gear pump, flow control valve, relief valve, reservoir, accumulator, air and oil filters. This unit is located separately from the lift and connects by hoses to the cylinders mounted on the beam. Recommended placement is within 10' of the unit. See Figure 2.

NOTE

For servicing and safety purposes, we recommend locating the pump unit outside of the enclosures.

NOTE

The location of the pump unit may present a problem with the operation. Please consult our Product Support Department before making a change.

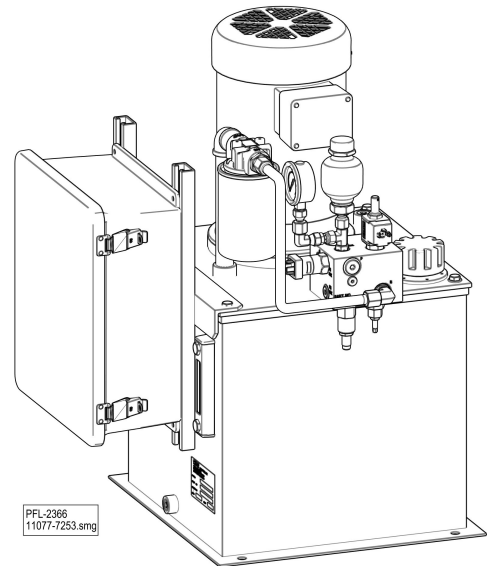


Figure 2

21 Series

The **LIFTING COMPONENTS** consist of two hydraulic cylinders, each with a clevis sprocket assembly attached to the piston of the cylinder. A second drive sprocket assembly is mounted at the top of each beam.

The lift chain is connected at the deadhead, loops around the clevis sprocket, up to the drive sprocket, and connects to a wheelblock assembly bolted to the carriage. See Figure 3.

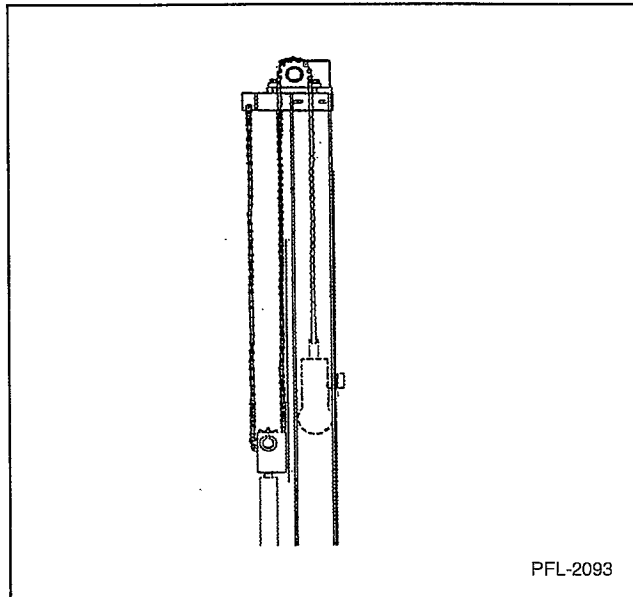


Figure 3

The **WHEELBLOCKS** are bolted to the carriage uprights. During travel the wheels ride inside the beams and guide the carriage. See Figure 4.

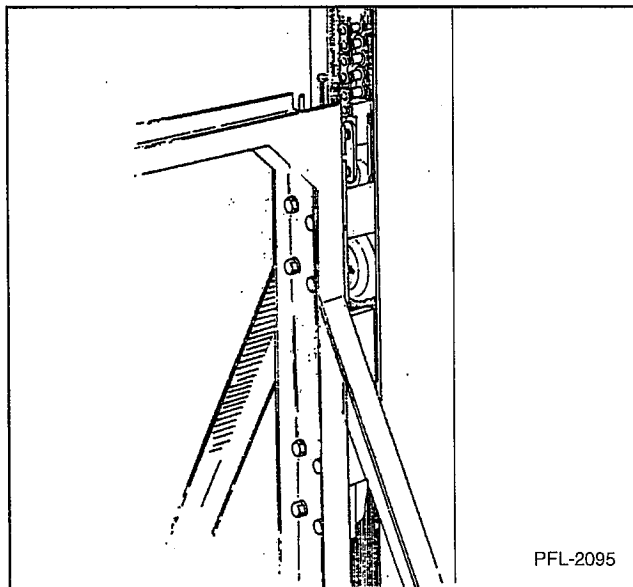


Figure 4

Each wheelblock has a mounting block, a wheel, and two guide rollers. See Figure 5.

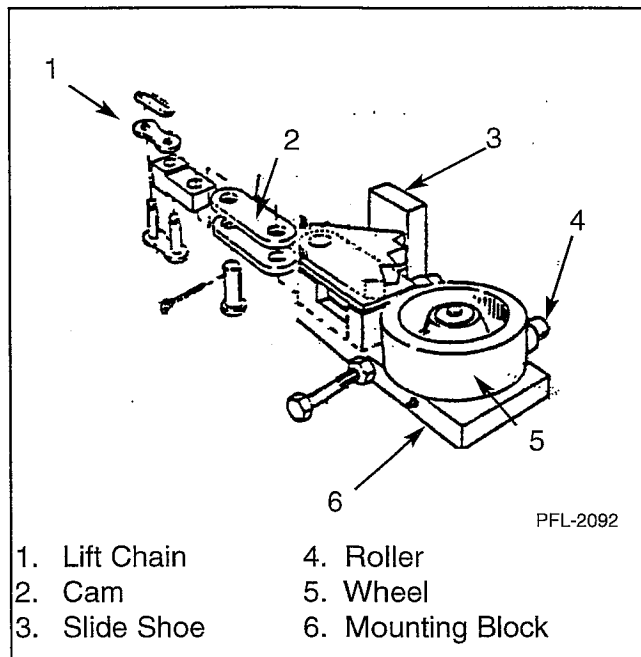


Figure 5

Each upper wheelblock also has a steel **SAFETY CAM** with teeth cut into it and a shoe. This cam is pivoted on the mounting block and is spring loaded. The lift chain connects to this safety cam, and all lifting action is through it. Should the chain break or go slack, the cam will be pivoted by its spring into a jam position with the track to stop the carriage from falling. The guide shoe on the outside of the track helps to wedge the track between the shoe and cam teeth.

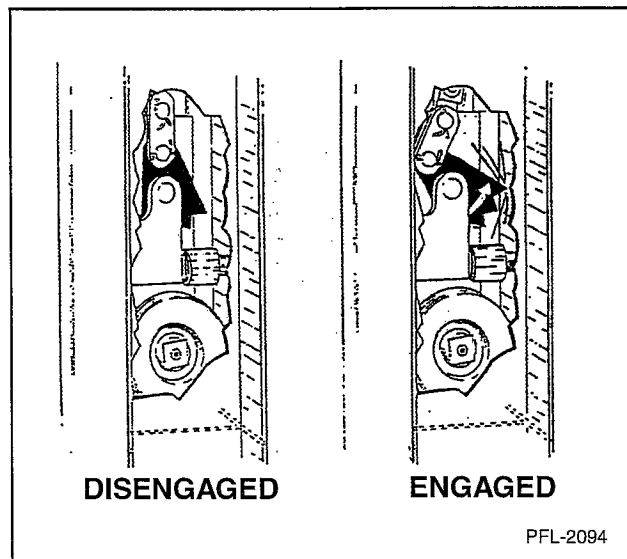


Figure 6

SAFEDECK is Pflow Industries, Inc. exclusive design for locking the carriage at an upper level. When the carriage is sent to the upper level, it proceeds past that level and activates the level limit switch. The motor shuts off, the dump valve opens, downward travel begins, and the DeckLocks engage.

When the unit is called to return to the first floor, the carriage will raise to unlock the DeckLocks and proceed to the first floor.

In accordance with ANSI/ASME B20.1, Pflow Industries supplies standard **ENCLOSURE PANELS** to be installed around the unit as required by site conditions. See Figure 7.

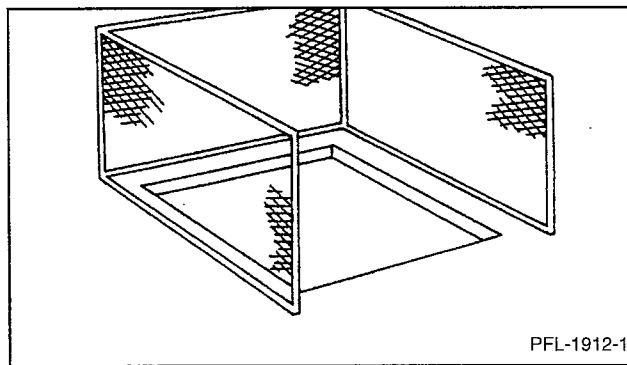


Figure 7

The panels are manufactured of 1-1/2" angle iron frames and 15-gauge flattened expanded metal which will reject a ball 2" in diameter. Our standard panels are 8' tall.

A safety **GATE** or door must be provided at each opening in the lift area at each level. The gate must be interlocked both mechanically and electrically with the operation of the unit. This prevents movement of the platform when a gate is open and the opening of a gate when the lift is not present at that level. See Figure 8.

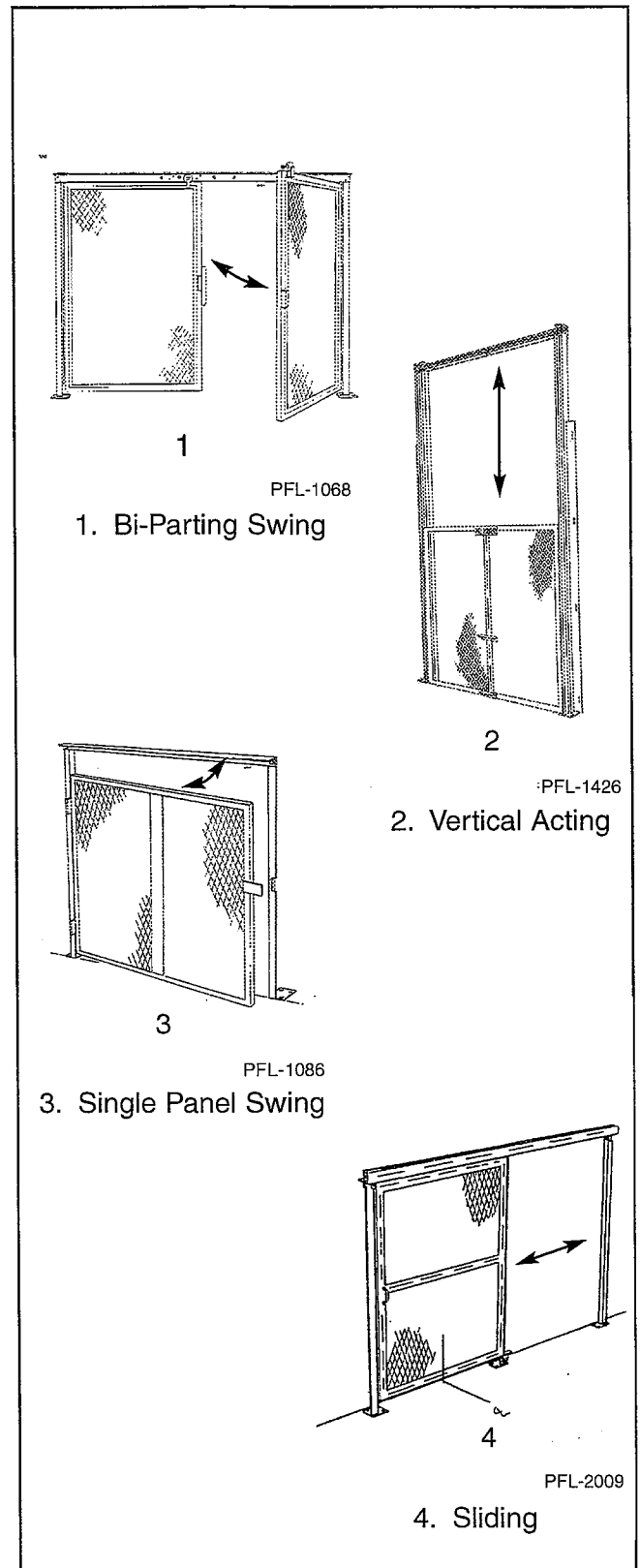
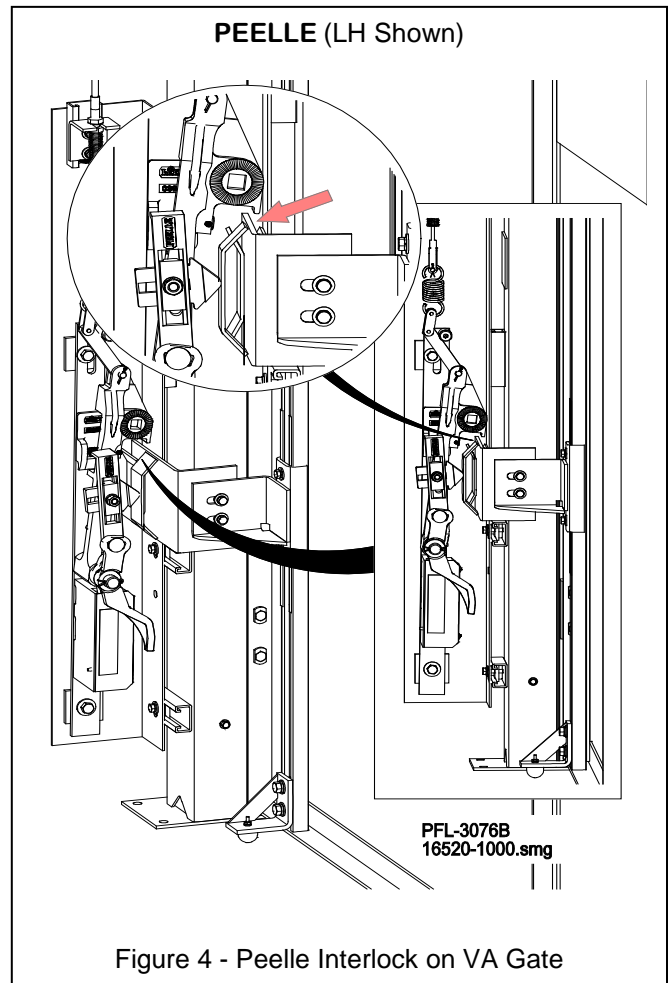
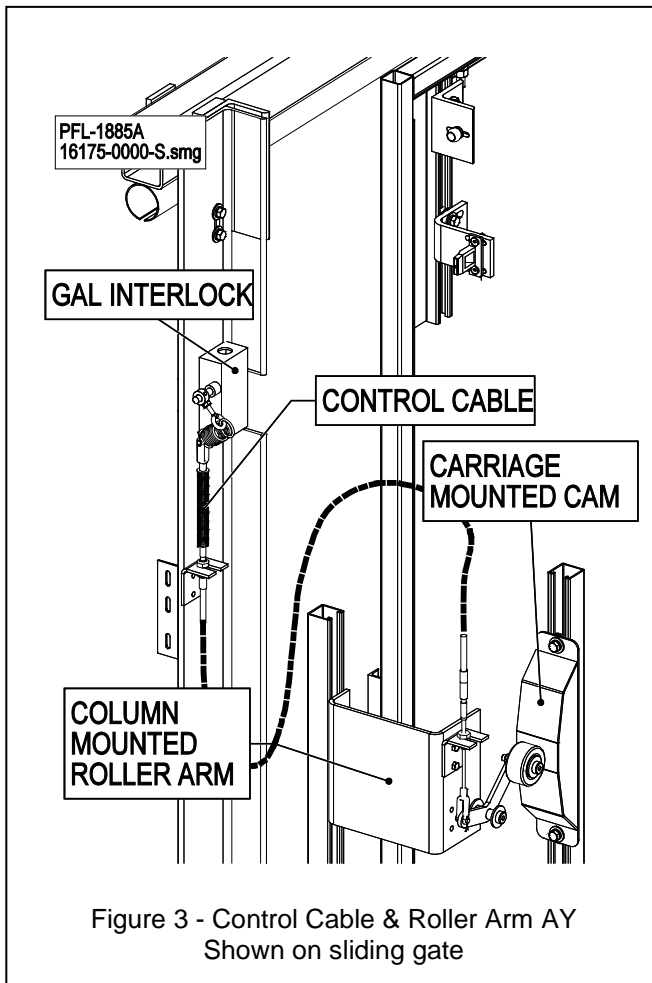
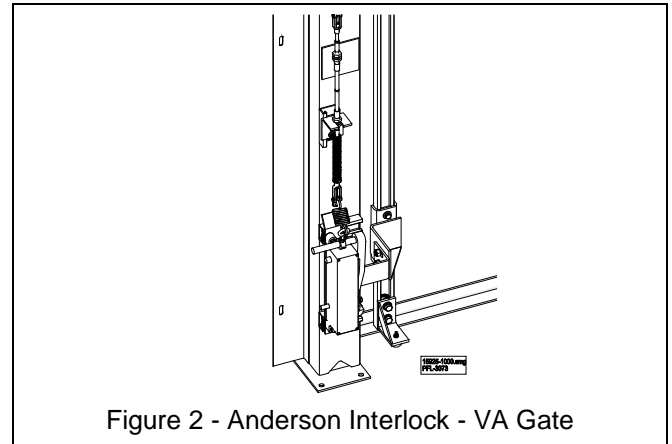
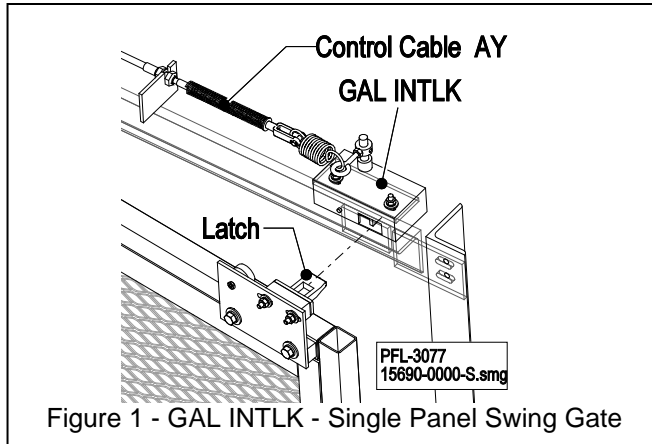


Figure 8

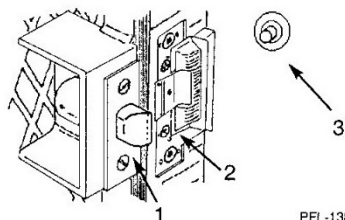
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INTERLOCKS & GATE SWITCHES

The Interlock is a device used to mechanically prevent the gate from opening. Below are the standard types of interlocks supplied. As this is a safety device, replacement components are only available as shown below. Some configurations may vary by application.



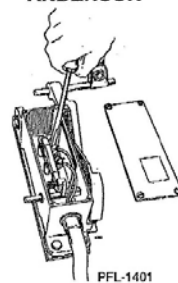
ELECTRIC STRIKE



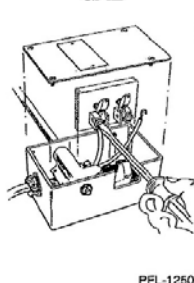
1. Spring Latch
2. Strike
3. Button

Figure 5 - Electric Strike - Swing Gate

ANDERSON



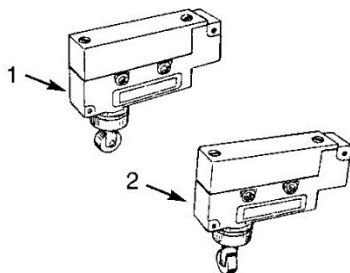
GAL



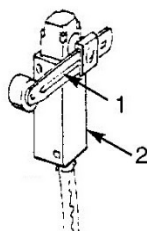
See schematic for proper wiring instructions.

Figure 6 - Interlock internal electrical contacts

A **GATE STATUS SWITCH** is supplied when the contacts are not being used. If required, it will be mounted to the gate post or header. Normally the GAL and Anderson interlocks do not use this switch. Specific order requirements may dictate otherwise.



1. Roller Plunger (parallel)
2. Roller Plunger (perpendicular)



1. Arm
2. Switch

Figure 7 - Gate panel electrical limit switch (when supplied)



15870-0001

PFlow Industries, Inc.

6720 N. Teutonia Avenue • Milwaukee, WI. 53209

Phone - Main Switchboard: (414) 352-9000

Product Support Dept: Fax - (414) 247-9834

email: psd@pflow.com

Electrical Overview Series 21 - Without DeckLocks

ELECTRICAL OVERVIEW

NOTE

The following is a standard description of the electrical wiring of the VRC ONLY. It DOES NOT include specifics on options available or ordered. A copy of the schematic can be found in a manila envelope in the parts crate.

All electrical devices are tied into the **MAIN CONTROL PANEL**. It contains a fused transformer, which reduces the high voltage needed for the motor down to the voltage required to operate the control circuit, motor starter and push button stations. Overload heaters are provided to protect the motor should excessive current draw cause overheating. The fixed timing relay is used to time the solenoid to lower the lift to the first level. See Figure 10.

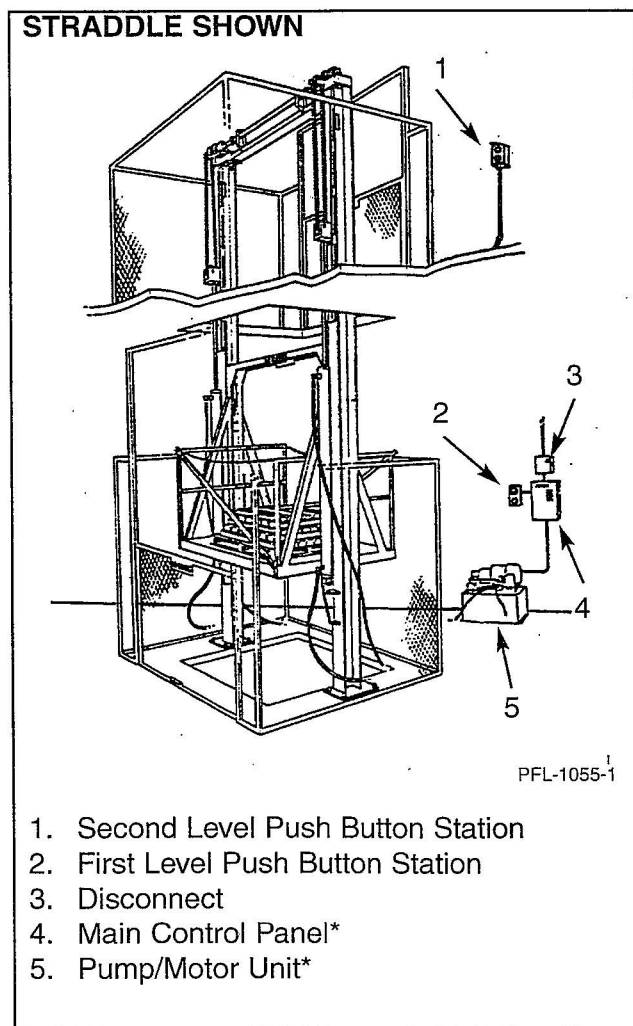


Figure 10

PUSH BUTTON STATIONS. One station is normally supplied for each level. ANSI/ASME B20.1 code requires that they be remotely located so they cannot be activated by someone standing on the carriage. Each station has an UP, DOWN, and EMERGENCY STOP button.

The UP and DOWN switches are momentary contact. This allows the operator to depress the button and let go. The EMERGENCY STOP button is pushed to activate but will stay in and must be pulled back out for the unit to operate.

Required by NEC code, the **MAIN DISCONNECT** should be fused, lockable, and located within line of sight of the control panel. (Not supplied by Pflow.)

The **MOTOR/PUMP** unit has two electrical components: a motor and an electrically actuated solenoid valve. We recommend the pump/motor unit be located within 6' of the unit.

⚠ WARNING

All gates or doors accessing the lift area must be electro-mechanically INTERLOCKED. This requires electrical contacts to prevent the lift from operating if a gate is open when the carriage is at that level and mechanical locks to lock the gate until the carriage is at that landing.

Different types and styles of interlocks are supplied depending upon the type of gate and on-site conditions. Standard styles incorporate from one to four electrical components per gate.

*NOTE

On Pflow's standard product line, the control panel is mounted to the motor/ pump unit stand.

OPERATION

BEFORE OPERATING THE LIFT, PLEASE READ, UNDERSTAND AND FOLLOW ALL THE SAFETY PRECAUTIONS LISTED BELOW.

⚠ DANGER

Malfunctioning interlocks may allow the door to be opened when the carriage is not present. **YOU MUST MAKE SURE CARRIAGE IS PRESENT BEFORE WALKING THROUGH DOORWAY.** If the carriage is not present, you could fall into the empty shaftway and be seriously injured or die!

⚠ DANGER

Door must be closed and locked unless carriage is present. Door interlock must be operational. It prevents door from being opened when carriage is not present. Door restricts personnel from falling into opening or from being struck by moving parts that could result in serious injury or death!

⚠ DANGER

DO NOT ride this equipment. Riding may result in serious injury or death! VRCs ARE NOT ELEVATORS.

⚠ DANGER

DO NOT walk or work under a raised platform.

⚠ WARNING

Only trained persons shall be permitted to operate or maintain this equipment. Improper operation or maintenance may cause serious injury or death!

⚠ WARNING

If at any time proper operation or performance of your Pflow VRC is in question, DO NOT USE IT! Notify your supervisor or the proper maintenance people immediately.

⚠ WARNING

Always return the carriage to the lowest level when the VRC is not in use.

CAUTION

DO NOT allow loads to overhang the sides of the carriage. This will result in damage to the equipment and merchandise.

CAUTION

DO NOT exceed the rated capacity.

TO OPERATE LIFT

- Close gate.
- Depress and release the appropriate push button to move the carriage to the desired floor. The carriage will stop when it reaches the appropriate level.
- When the unit has arrived at the appropriate level and comes to a complete stop, open the gate.
- If an emergency occurs when the carriage is moving, push the EMERGENCY STOP button. The button will keep the lift inoperative until the button is pulled back out. See Figure 14.

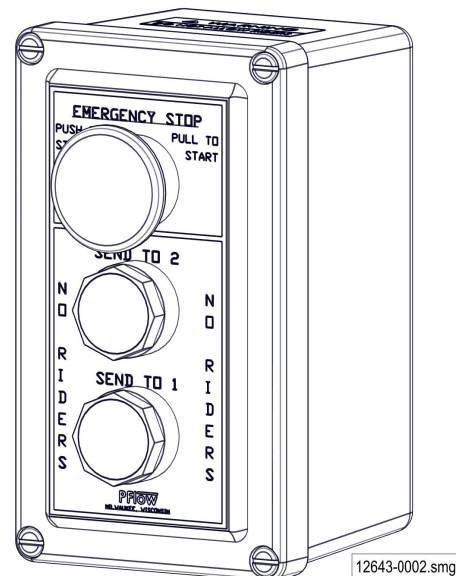


Figure 14

NOTE

Service must be performed by authorized personnel only. Read the Owner's Manual before operating the equipment. For service, contact your local representative.

SERVICE

Maintenance of Pump Unit

NOTE

The life of the hydraulic components is directly proportional to system cleanliness. If the oil is kept clean, is in good chemical condition, and its viscosity meets the operating temperature range, it will increase unit life.

MAINTENANCE CHECK

1. Reservoir - Check the fluid level and make sure it is up to the full mark.
2. Inlet Line - Check for frays and kinks. Make sure the connections are secure and leak-proof.
3. Oil Viscosity - Do not use fluid that is too thick. Heat, high pressure, and contamination all speed up oxidation which results in gum, sludge, plugged valves, and excessive wear on the components.
4. Fluid - If it is cloudy, off-color, contains suspended sediment, or liquid layers, then changing the fluid is recommended.
5. Check and/or change the oil filter. Ten microns or less is recommended.

FILLING THE RESERVOIR

NOTE

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

Extreme temperatures below 32°F or above 100°F and corrosive atmosphere may affect oil requirements. Consult Pflow Industries for assistance.

1. Wipe off the fill plug and the filler nozzle with a clean, lint-free cloth.
2. Watch for metallic chips, bits of waste, and other contaminants that may cause damage to the system.

3. Use a ten micron filter on the filler nozzle when adding oil.
4. The reservoir should be tightly closed after filling the system.

CLEANING THE RESERVOIR

NOTE

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 checked. Large reservoirs can be a source of rust contamination due to condensation. The vibration of the pump unit results in the rust flaking off into the fluid.

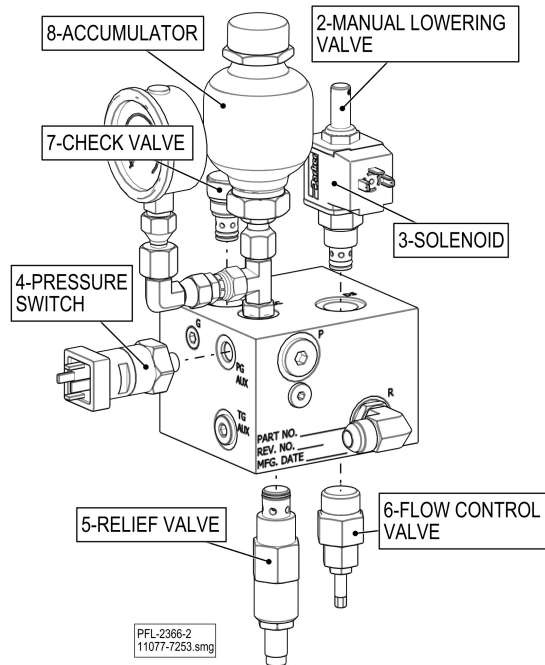
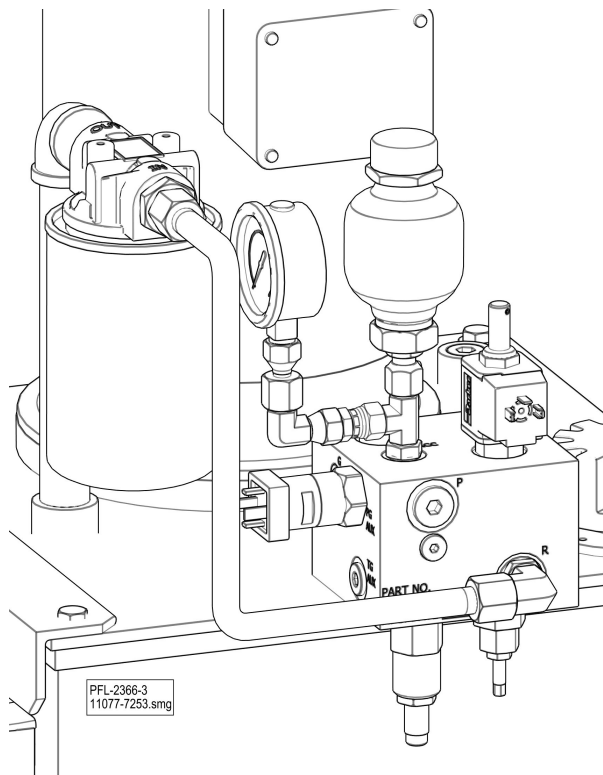
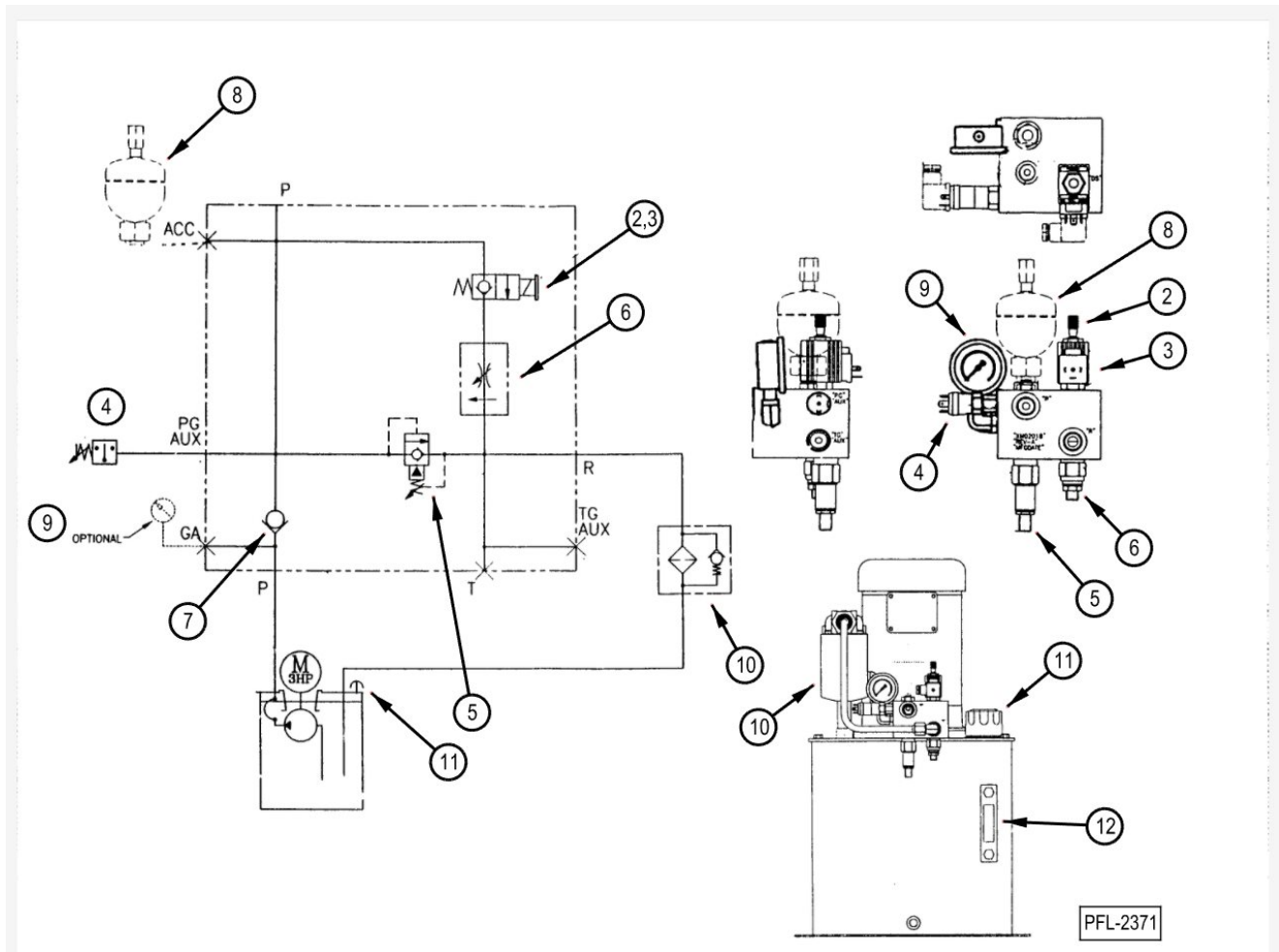
Maintenance Schedule

Your VRC requires consistent minimal and basic periodic attention. It is recommended that you keep a record during inspection and make a periodic evaluation of lubricating needs to reflect any increase in service that may be required. Problems must be addressed immediately as they may affect the safety devices.

NOTE

Observe cycle day's schedule based on whichever comes first. High usage and corrosive environments will require more frequent maintenance and possibly different lubricants. (Check with your lubrication supplier for your particular needs.) Additional options, as ordered by the customer, may require maintenance and are not included in this information.

If you have any questions or problems, please feel free to contact either your local service representative or our Product Support Department for assistance.



Hydraulic Installation Instructions

Safety

⚠ DANGER

Hydraulic oil under pressure is extremely dangerous.

Never loosen any hydraulic fitting or hydraulic control component when the hydraulic unit is under pressure.

Never attempt to loosen or remove any component of the hydraulic system when the carriage platform is raised from the ground; it will be under pressure.

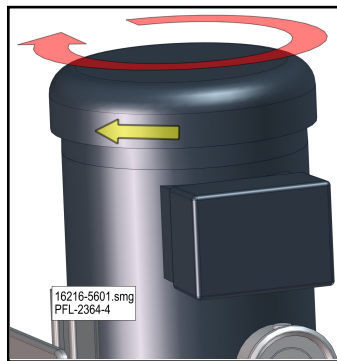
Never step under a raised carriage.

If the lift carriage cannot be lowered by gravity, secure the carriage at its stuck position before attempting to walk on or under the carriage. After the carriage is secured, open the manual-lowering valve to release the pressure; the hydraulic system may be under pressure.

At Startup

At startup, be sure there is oil in the hydraulic tank and that the motor is operating in the correct rotation. If the motor is not operating in the correct rotation, stop the motor immediately. Have a qualified electrician inspect and correct the wiring of the motor.

**FIGURE 2-B
VERIFY MOTOR
ROTATION &
MOTOR ARROW**



Run the lift up. This is not a one-person operation. Pay very close attention to the pressure gauge (optional on some units). Be prepared to stop the lift if there are any indications of leaks, binding, or overtravel. Take your time; doing things correctly during initial startup will reduce your troubleshooting time if any problem should exist.

IF YOU EXPERIENCE A PROBLEM, DO NOT START ADJUSTING THE PRESSURE SWITCH OR PRESSURE RELIEF VALVE.

Do the following troubleshooting checklist items first. Call Pflow Industries Product Support Department for assistance.

Check for binding of the carriage, rollers, wheels, or other obstructions:

- Are the beams plumb, true, and square?
- Are the cylinder rods moving smoothly?

Check for less obvious causes:

- Is there paint on the cylinder piston rod?
- Are the hydraulic hoses connected correctly?
- Is the velocity fuse in the correct position (arrow pointing away from cylinder)?
- Are there leaks at the joint connections?
- On the hydraulic fittings that have O-rings, are the O-rings present?
- O-ring face seal fittings are sensitive to over- and under-torque. Refer to torque spec on page 22.
- Is there contamination in the oil?
- Is the correct voltage at the hydraulic manifold solenoid?
- Is the correct voltage at the motor?
- Is the manual down valve open or partially open? For proper operation, the manual down valve needs to be completely closed.

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INSPECT	NO. OF CYCLES/DAYS	ITEM	ACTION	REFERENCE
	1000/90	Bolts	Check for any loose bolts and tighten	Parts
	1000/90	Chains	Inspect for wear and alignment	Parts
	2000/90	Cylinder Fittings/ Hoses	Inspect for leaks	Parts
	2000/90	Wheelblock Wheels	Inspect for wear	Parts
	2000/90	Guide Rollers	Inspect for wear and rotation interference	Parts
	2000/90 6000/360	Hydraulic Oil Filter	Change after first 1000/30 then 6000/360 thereafter	Parts
	1 year	Reservoir	Drain and clean tank; Change oil and filter	Flushing Hydraulic System
	1000/90	Gates/Interlocks	Inspect for proper operation	
	1000/90	Sprockets	Inspect for wear and tighten set screws to 350 in/lbs.	
	1000/90	LevelDeck Bearings	Inspect for wear	

Manual Release Valve

CAUTION

For Emergency Use Only!

The down solenoid, also referred to as a dump valve, is equipped with a manual release valve. See Figure 15. This is to be used only in emergency situations when a load is stuck in upward mid-travel and the only way to free the load is to bring the unit down.

WARNING

Make sure that NO ONE is present in the enclosed area beneath the lift when operating this valve.

1. To open or operate the manual release valve, turn it counterclockwise. This will allow the unit to descend.

2. Once the platform has reached the floor, turn the valve clockwise and close snugly.

If you have any questions or problems, please feel free to contact either your local service representative or our Product Support Department for assistance.

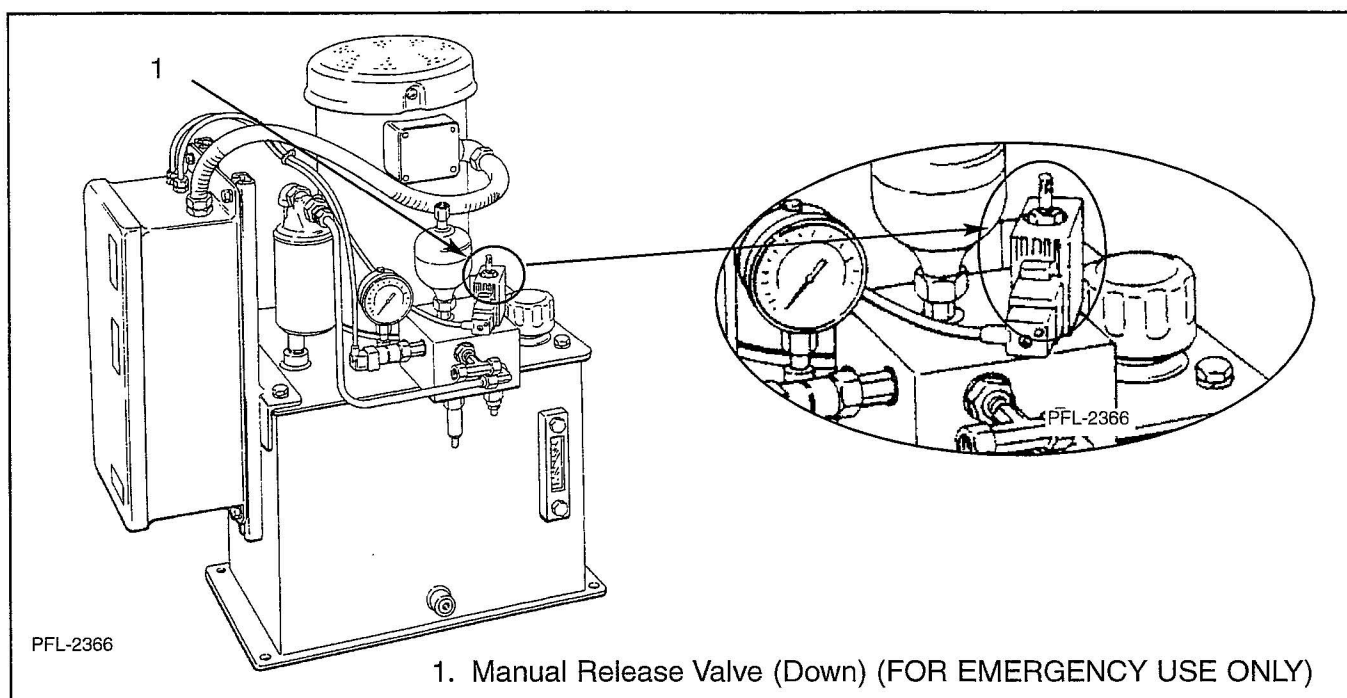


Figure 15

Flushing Hydraulic System

NOTE

For prolonged service life, contamination must be periodically removed from hydraulic systems. Taking steps during the installation and daily operations to prevent contaminants from entering the system will help to prevent component failure and system down time.

If contamination is evident in fluid samples, there is a good chance that accumulation has occurred somewhere within the system "plumbing." These deposits interfere with the operation of the unit and must be flushed with a light viscosity oil containing a rust inhibitor to protect the metal surfaces from rust formation after the hot flushing oil has been drained out.

1. Lower the carriage to the floor. Make sure the cylinders are fully extended.
2. Turn off power and lock out the disconnect.
3. Drain the system by removing plug near bottom of reservoir. See Figure 16. When draining the system, it is desirable to remove ALL of the used oil. Allow sufficient time for thorough draining so that a minimum of the old oil remains in the system. In most cases, bleeding at the lowest point in the system will help. It is also advisable to drain only after the oil is

fully warmed up (about 150°F). By doing this, oil impurities do not have a chance to settle and can be removed with the drained oil. The fluid should then be drained while it is hot.

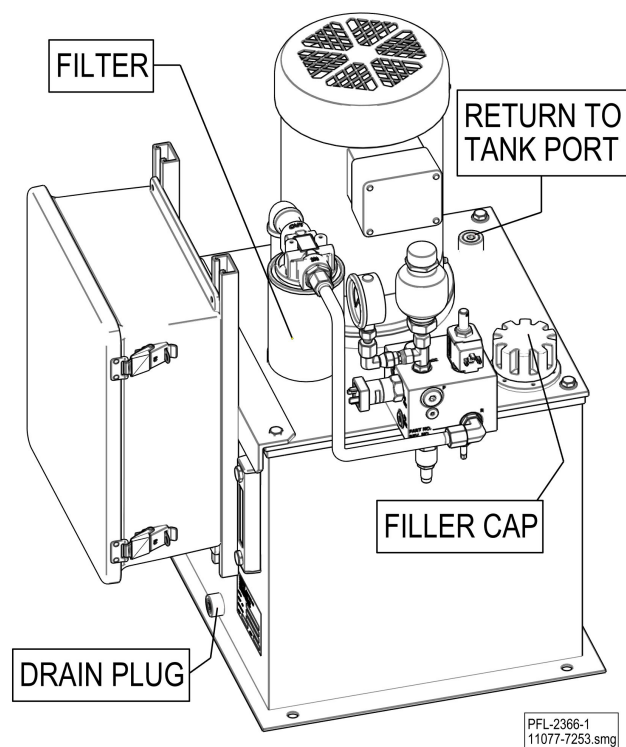


Figure 16

21 Series

4. Clean out the reservoir.
5. Refill the unit with oil. Before removing the filler cap to add oil to the hydraulic system, wipe off the fill plug and the filler nozzle with a clean, lint-free cloth. The safest way to pour oil from a container into a reservoir is to use a 10-micron filter on the filler nozzle. It is especially important to watch for metallic chips, bits of waste and other contaminants that may cause damage to the hydraulic system. The reservoir should be tightly closed after filling the system.
6. Remove lock and restore power.
7. Flush system. This is done by circulating a small percentage of special petroleum solvent cleaner with the fluid charge long enough to loosen and remove the deposits (10 to 50 hours depending on the condition). A careful watch on the filters will indicate when the system is clean.

NOTE

Hydraulic oil with a Saybolt viscosity of 150 SSU or ISO 32 at operating temperatures with a non-foaming additive should be used.

- Solvents - Fluid suppliers are the best source for solvents. Solvents such as alcohol, kerosene, and carbon tetrachloride are low in viscosity and tend to: a) reduce the viscosity of the new fluid, b) may not hold the washed out contaminants in suspension and may deposit them in another part of the system.
8. Repeat steps 1 to 5.
 9. Replace the oil filter.
 10. Take all necessary steps to put the unit back into operation.

If you have any questions or problems, contact our Product Support Department for further assistance.

SAFETY CAM INSPECTION

Routine inspection of the safety cams is extremely important as it is one of the major safety devices of our product.

Visual

The cam should be checked for visual signs of wear. These include, but are not limited to, wear signs on the sides and chips in the teeth.

Rotation

Rotation is important because it checks the actual operation of the cam.

1. Lower the carriage to the bottom level.
2. Shut off power at the main disconnect.
3. Open the manual release valve. (See Manual Release Valve, Page 16.) If your unit does not have a manual release valve, please contact Pflow Industries for further assistance.
4. Step onto the carriage. Slacken the cable or chain on each cylinder. Pull enough cable or chain to allow the safety cams to engage. Usually one to two feet is sufficient. (This will take considerable force as you are also extending the cylinders.) Check to see that the safety cams rotate freely and they are touching the column without obstructions.
5. Close the manual release valve. Reassemble the caution label with the nut.
6. Check to make sure that the cables or chains are properly aligned on all sprockets and sheaves.
7. Turn main disconnect back on.
8. Cycle lift several times to check for proper operation.

If you have any questions or concerns during the course of the inspection, please feel free to contact the Product Support Department.

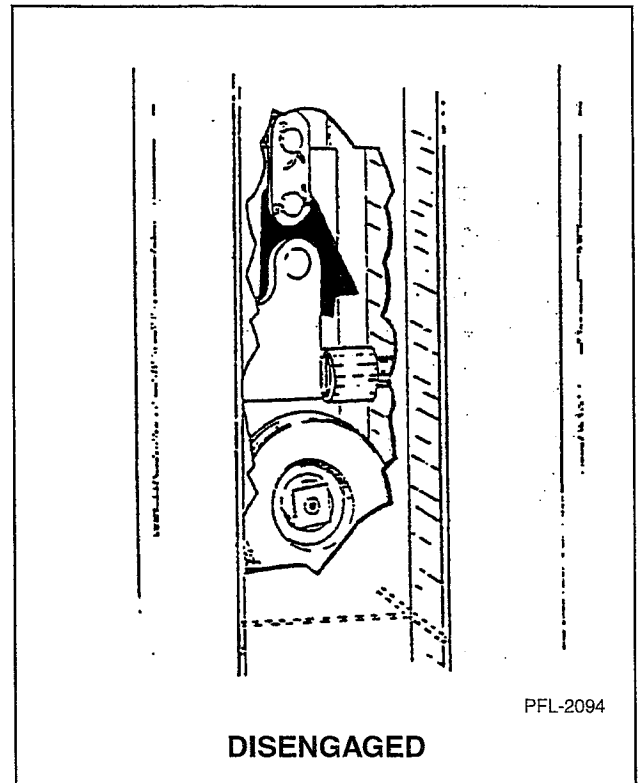


Figure 17

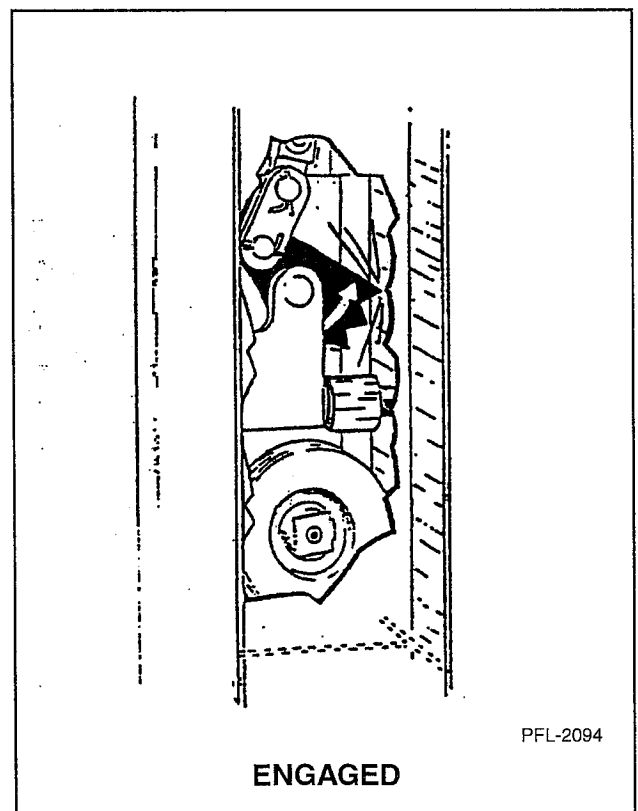


Figure 18

TROUBLESHOOTING

Before troubleshooting, please observe all of the precautions in the Safety section at the front of this manual.

The following is a list of common problems and solutions:

SYMPTOM	POSSIBLE CAUSE	SUGGESTED SOLUTION	REF.
Lift doesn't operate when controls (push buttons) are activated.	Gate or door is open or ajar.	Check all gates/doors to make sure they are closed.	Mechanical Overview
	Main disconnect is off.	Check to see if there is a reason before turning on.	
	Thermal overload has tripped.	Press reset button. If it trips again, determine cause. Motor is overheating.	
	Control fuse is blown.	Replace fuse after determining cause.	
	Power circuit between disconnect and starter is dead.	Use a voltmeter to check voltage. Repair as needed.	
Motor starts and carriage raises, but motor stops before second level.	Safety gate has been opened.	Close gate. Check to see why this has happened.	Mechanical Overview
	Object encountered.	Identify the problem. Remove or repair as needed.	
	Piston (cylinder) interference.	Remove object. Repair if needed.	
	Thermal overload has tripped.	Check for pump binding.	
	Carriage is overloaded.	Lower, and remove excess weight.	Parts
Motor/pump runs but carriage does not raise, and there is no pressure shown on gauge.	Oil in reservoir is less than 3/4 full.	Add oil to proper level.	Maintenance and Troubleshooting of Pump Unit
	Motor rotation is incorrect.	Contact your electrician.	
	Relief valve setting is too low.	Increase spring pressure by turning stem clockwise a few times. DO NOT OVER or FULLY TIGHTEN. Damage will result. A few turns should show pressure on the gauge.	
	Pump cavitating.	Oil supply is low. Fill reservoir. Oil is too heavy. Change to proper viscosity oil.	
	Accumulator is plugged.	Open reservoir; inspect pickup tube, clean if required.	
Pump is not working or turning.	Motor/pump coupling broken. Pump impeller not turning.	Call Pflow Industries.	

Troubleshooting

SYMPTOM	POSSIBLE CAUSE	SUGGESTED SOLUTION	REF.
Motor/pump runs, but carriage does not raise, and there is erratic or low pressure shown on gauge.	Oil is foaming	Air is leaking into suction line because of loose fittings. Check all fittings. Water or incompatible oils causing foaming. Drain and replace with proper type oil.	Maintenance and Trouble-shooting of Pump Unit
	Low oil level.	Add to proper level.	
Carriage raises but will not lower.	Mechanical interference.	Identify the problem. Remove and repair as needed.	Parts-Hydraulic Layout
	Dump valve not actuating.	Depress the DOWN button and listen carefully. If it does not click, it is not operating. Then proceed with: 1. Using a voltmeter, determine that the solenoid is receiving current when the button is pressed. If it is not, check the operation of the timing relay and then the motor starter (contacts in the control circuit). 2. If the solenoid is receiving current, check the end of the solenoid coil with a screw-driver. When energized, there will be a magnetic pull. If no magnetic pull is present, replace the solenoid.	
	Velocity fuse triggered.	Check for hose break or fitting leak. If none found, attempt to increase pressure in cylinders by pressing UP button.	
Motor/pump keeps running after pressure reaches the relief valve setting	Relief valve set too low.	Readjust relief valve. Consult Product Support Department for instructions.	Parts
	Bad pressure relief valve.	Replace relief valve.	
	Upper limit switch is not activating.	Check for possible adjustment.	
Pump stops suddenly.	Major internal pump has failed.	Examine the pump and rebuild or replace as necessary.	Maintenance and Trouble-shooting of Pump Unit.
Carriage drifts down from raised position. (NOTE: 3-4 inches overnight is normal.)	Internal leakage.	Contamination is keeping the dump valve from seating. Remove solenoid coil and valve spool. clean spool and seat with the recommended solvent or cleaner. Dry with a lint-free cloth. Replace coil and spool. Test. Inspect oil in reservoir.	
		Oil is bypassing the piston seals. Remove and clean seals. If worn, replace. Inspect breather for leakage.	

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SYMPTOM	POSSIBLE CAUSE	SUGGESTED SOLUTION	REF.
Carriage lowers but stops early.	Debris in the pit.	Clean out pit.	Maintenance and Trouble-shooting of Pump Unit
	Dump valve not working properly.	See "Carriage raises but it will not lower" for instructions.	
	Faulty timer	Replace.	
Rough or noisy operation.	Travel interference.	Identify. Remove or repair as needed.	Parts
	Drive component interference.	Identify. Remove or repair as needed.	
	Wheel guide rollers worn.	Inspect, lubricate, and replace as needed. Determine why they wore out.	
	Carriage is not level.	Determine cause and correct.	
Carriage binding.	Cylinders operating out of sequence. Seal bad in one cylinder.	Inspect cylinders and hoses.	
Carriage is spongy or bouncy.	Air in cylinders.	Run unit numerous times to remove air. Bleed cylinders. If you do not know how to do this, contact the Product Support Department, Pflow Industries.	Maintenance and Trouble-shooting of Pump Unit
	Binding	Check mechanical and hydraulic components.	
Excessive temperature and pump noise.	Defective, damaged or worn pump.	Contact Product Support Department, Pflow Industries.	
	Cavitation*	Add hydraulic fluid to reservoir.	
	Aeration**	Air is leaking into suction line because of loose fittings. Check all fittings.	

NOTE

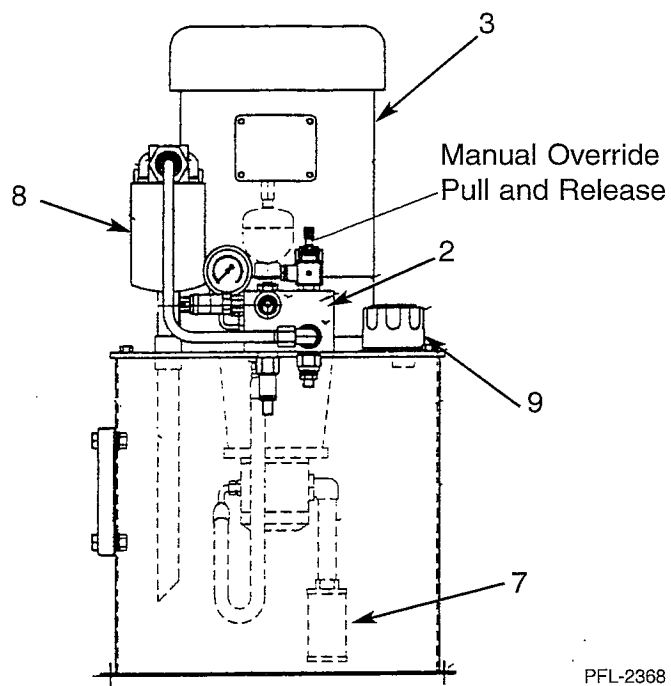
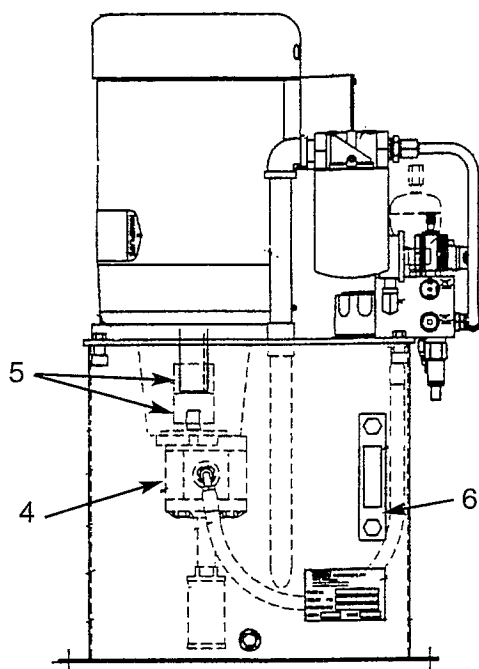
* **Cavitation** is a vacuum in the fluid caused by a restricted or sharp bend in the inlet line, a clogged filter, or by fluid that is too high in viscosity. The characteristic sound of cavitation is a high-pitched "scream." The noise increases with the degree of cavitation and with increased operating pressure.

** **Aeration** is the presence of excessive air, usually in the form of bubbles, disbursed through the fluid caused by a damaged inlet or return line; a loose or defective fitting(s) or seal(s); damaged or worn cylinder rod, packing, or seals; cracked junction blocks, tees, or piping; fluid level too low; air trapped in filter or excessive air trapped after adding fluid. Overheating or jerky and uneven movement in the pump or cylinders are the obvious symptoms of aeration.

If you need further assistance, please call the Product Support Department of PFLOW INDUSTRIES, INC.; (414) 352-9000.

PARTS

Motor Pump and Motor Assembly

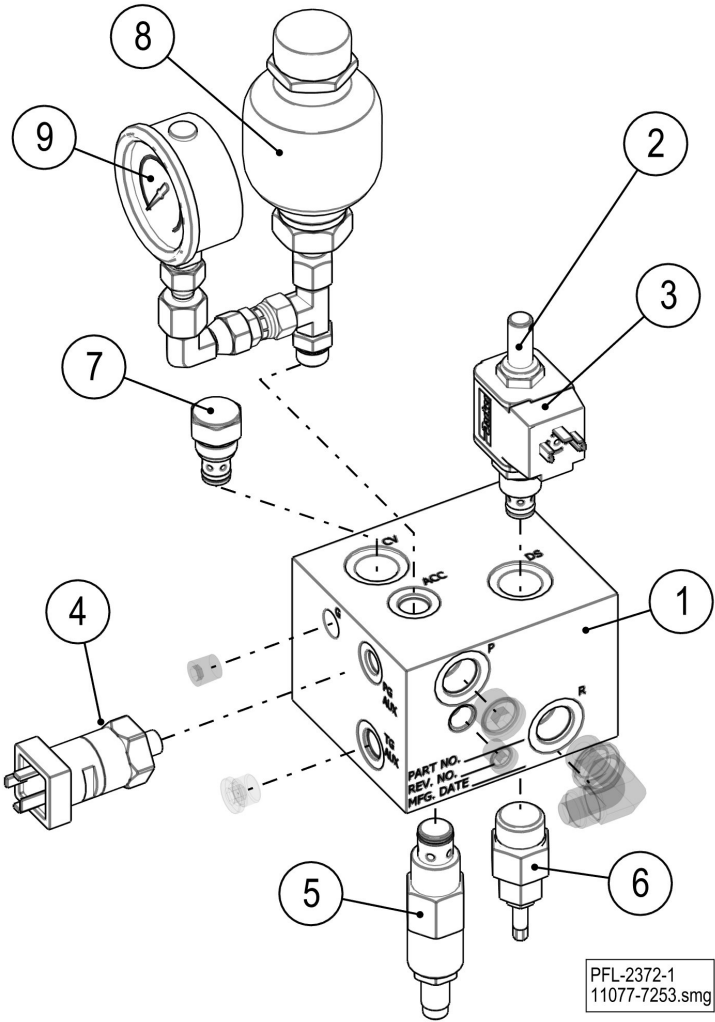


PFL-2368

Item	Qty.	Part No.	Description
1	1	Contact Factory	Hydraulic Pump and Motor Assembly
2	1	11078-0016	Manifold Block Assembly
3	1	Contact Factory	Motor Assembly, Pump
4	1	Contact Factory	Pump Assembly, Hydraulic
5	1	11078-0020	Coupling, Motor Half
		11078-0021	Coupling, Pump Half
		11078-0022	Insert, Coupling
6	1	11078-0013	Gauge, Oil Sight
7	1	11078-0012	Strainer, Hydraulic Oil
8	1	11078-0011	Filter, Hydraulic Oil
9	1	11078-0007	Breather, Oil Fill

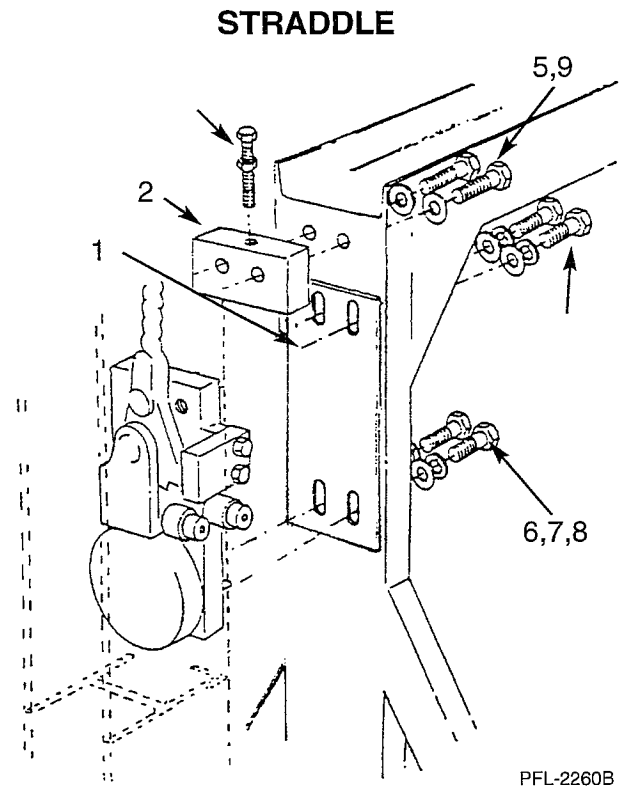
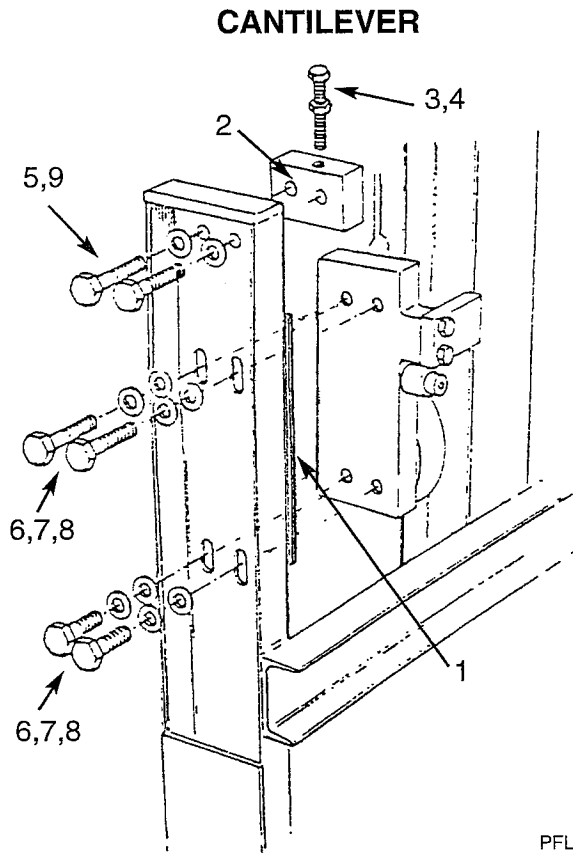
21 Series

Parts Manifold Block Assembly



Item	Qty.	Part No.	Description
1	1	11078-0016	Manifold Block Assembly
2	1	11078-0002	Valve, Down with Manual Release
3	1	11078-0005	Coil, Down Valve - 24 V
4	1	11078-0006	Switch, Pressure
5	1	11078-0004	Valve, Relief
6	1	11078-0001	Valve, Flow Control
7	1	11078-0003	Valve, Check
8	1	11078-0014	Accumulator
9	1	11078-0015	Gauge, Pressure (Optional)

Adjustable Wheelblock Assembly



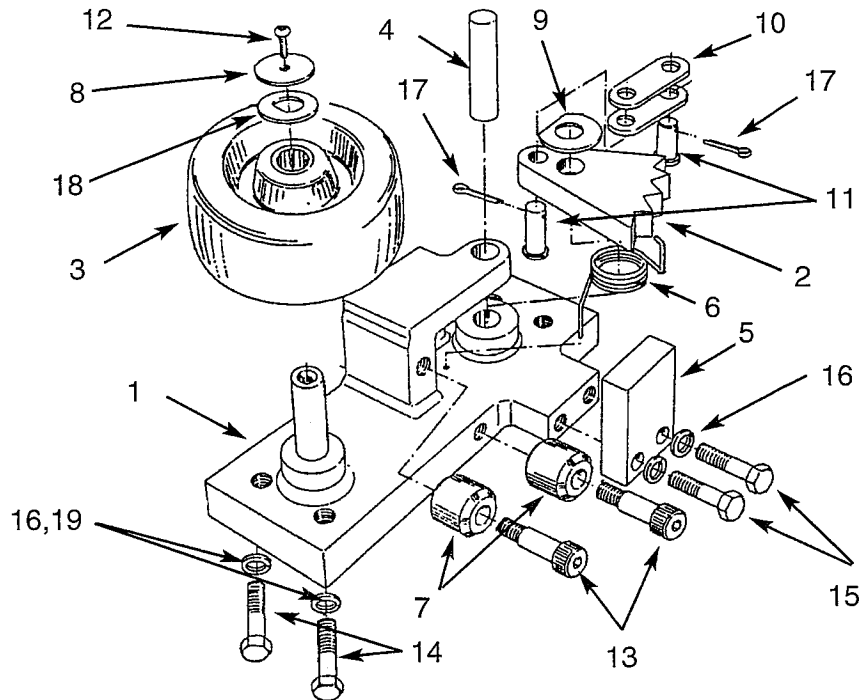
Item	Qty.	Part No.	Description
1	1	2377-0001	Spacer (welded to carriage), Wheelblock, 1/8" (Not used on 4" upright)
2	1	9677-0000	Block, Adjuster
3	1	8872-0088	Screw, HHC, 1/2-13, UNC 5-1/2
4	1	6358-0013	Nut, Hex, 1/2-13
5	2	9237-0020	Screw, HHCS, 1/2-13
6	4	5858-0015	Lockwasher, STD 5/8
7	4	6296-0015	Washer, Flat, 5/8
8	4	6758-0020	Screw, 5/8-11 UNC x 1 1/4
9	2	5858-0013	Lockwasher, STD 1/2

21 Series

Upper Wheelblock Assembly - Phenolic

Complete Assembly (5-1/4) - Part No. 6196-0000 / Part No. 6197-0000

Complete Assembly (5-3/8) - Part No. 6196-1000 / Part No. 6197-1000



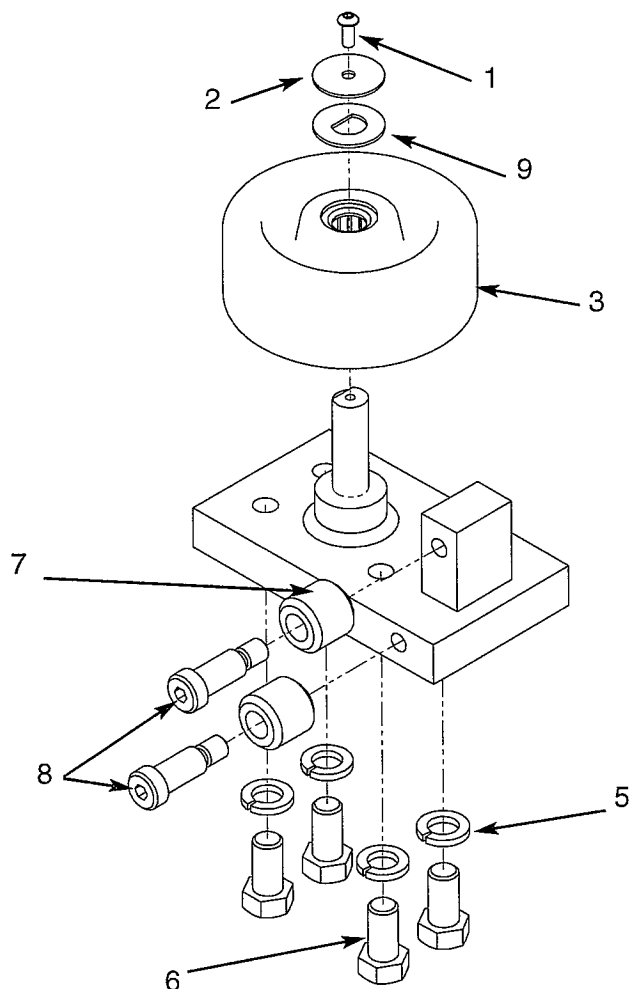
PFL-1605

Item	Qty.	Part No.	Description
1	1	Consult Factory	Wheelblock Weldment, RH or LH
2	1	6186-0000	Cam, Safety
3	1	2591-0000	Wheel, Phenolic (5-1/4)
	1	2591-1001	Wheel, Phenolic (5-3/8)
4	1	5230-0000	Pin, Cam
5	1	2754-0000	Shoe
6	1	2443-0000	Spring, Cam, RH, or
	1	2127-0000	Spring, Cam, LH
7	2	5221-0000	Roller, Guide
8	1	5222-0000	Washer, Flat 9/32 ID x 1-1/2 OD
9	1	8339-0000	Bearing Thrust
10	2	6187-0000	Link, Safety Cam to Toggle
11	2	2521-0000	Pin, Clevis 3/4 x 2
12	1	2888-0010	Screw, BHC, 1/4-20 x 5/8
13	2	5874-0020	Bolt, Shoulder, 5/8 x 1-1/4
14	4	6758-0020	Screw, HHC, 5/8-1 x 1-1/4
15	2	2198-0040	Screw, HHC, 5/8-11 x 2-1/4, Grade 8
16	6	5858-0015	Lockwasher, STD 5/8
17	2	2522-0000	Pin, Cotter
18	1	8774-0000	Washer, D
19	4	7768-0015	Washer, Flat, 5/8 SAE

Lower Wheelblock Assembly - Phenolic

Complete Assembly (5-1/4) - Part No. 2721-0000 / Part No. 2089-0000

Complete Assembly (5-3/8) - Part No. 2721-1000 / Part No. 2089-1000



2721-0000-XV-N

Item	Qty.	Part No.	Description
1	1	2888-0010	Screw, BH/SC, 1/4-20 x 5/8
2	1	5222-0000	Washer, Flat, 9/32 ID x 1 1/2 OD
3	1	2591-0001	Wheel, Phenolic (5-1/4)
	1	2591-1001	Wheel, Phenolic (5-3/8)
4	1	Consult Factory	Wheelblock Weldment, RH or LH
5	4	5858-0015	Lockwasher, STD 5/8
6	4	6758-0020	Screw, HHC, 5/8-11 x 1 1/4
7	2	5221-0000	Guide Roller, Assembly
8	2	5874-0020	Bolt, Shoulder, SOC HD, 5/8 x 1 1/4
9	1	8774-0000	Washer, D, 3/4 ID x 1 1/2 OD

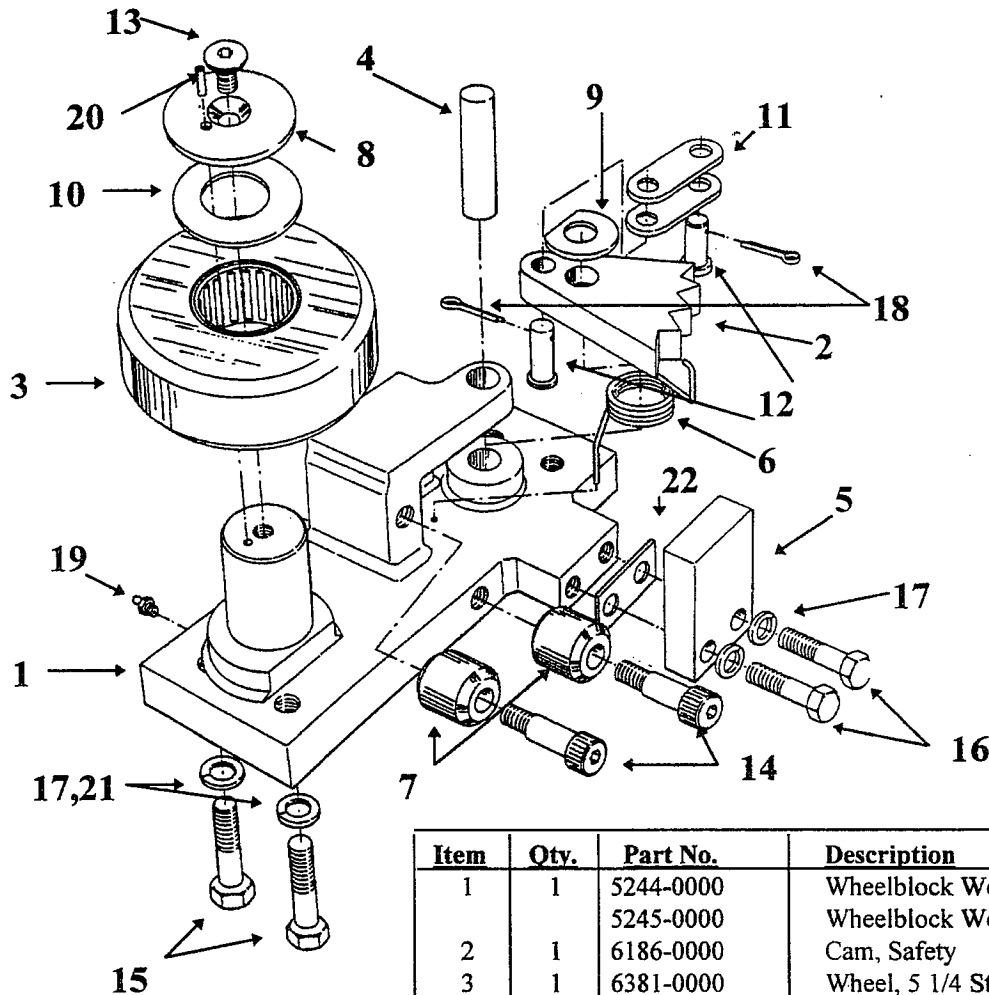
21 Series

Upper Wheelblock Assembly

5 1/4 Steel Wheel w/Roller Bearing

Complete Assembly - Part No. 6492-0000, Left Hand

Complete Assembly - Part No. 6491-0000, Right Hand



PFL-2100

* number of spacers dependent
on beam size: #15=0; #20=1;
#25=2;

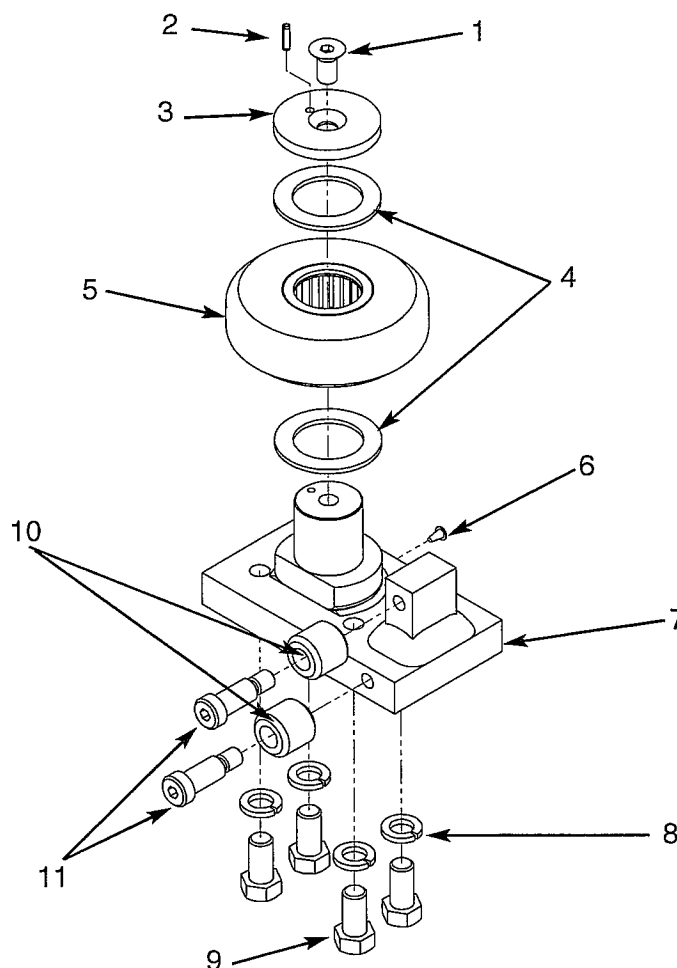
Item	Qty.	Part No.	Description
1	1	5244-0000	Wheelblock Weldment, RH, or
		5245-0000	Wheelblock Weldment, LH
2	1	6186-0000	Cam, Safety
3	1	6381-0000	Wheel, 5 1/4 Steel w/ Roller Bearing
4	1	5230-0000	Pin, Cam
5	1	2754-0000	Shoe
6	1	2443-0000	Spring, Cam, RH, or
		2127-0000	Spring, Cam, LH
7	2	5221-0000	Roller, Guide
8	1	3629-0000	Retainer, Steel Wheel
9	1	8339-0000	Bearing, Thrust
10	1	3622-0000	Washer, Thrust, 1 3/4 Whl Stud
11	2	6187-0000	Link, Safety Cam to Toggle
12	2	2521-0000	Pin, Clevis, 3/4 x 2
13	1	4299-0016	Screw, FHSC, 1/2-13 x 1
14	2	5874-0020	Bolt, Shoulder, 5/8 x 1 1/4
15	4	6758-0020	Screw, HHC, 5/8-1 x 1 1/4
16	2	2198-0040	Screw, HHC, 5/8-11 x 2 1/4, Grade 8
17	6	5858-0015	Lockwasher, STD 5/8
18	2	2522-0000	Pin, Cotter
19	1	2590-0000	Fitting, Zerk, 3/16 Drive Type
20	1	5209-0012	Pin, Roll
21	4	7768-0015	Washer, Flat, 5/8 SAE
22	*	2767-0000	Spacer, Wheelblock Shoe, .08 thick

Lower Wheelblock Assembly

5 1/4 Steel Wheel w/Roller Bearing

Complete Assembly, Part No. 6493-0000, Right Hand

Complete Assembly, Part No. 6494-0000, Left Hand



6493-0000-XV-N

Item	Qty.	Part No.	Description
1	1	4299-0016	Screw, FHSC, 1/2 x 1 LG w/Nylock
2	1	5209-0012	Pin, Roll - 3 1/16 DIA X 3/4 LG
3	1	3629-0000	Retainer, Steel Wheel
4	2	3622-0000	Washer, Thrust
5	1	6381-0000	Wheel, Steel, 5 1/4 w/Roller Bearing
6	1	9975-0006	Plug/Cap, Plastic, Tapered
7	1	2400-0000	Whlblk Widm, Lower RH
		2453-0000	Whlblk Widm, Lower LH
8	4	5858-0015	Lockwasher, STD 5/8
9	4	6758-0020	Screw, HHC, 5/8-11 x 1 1/4 LG
10	2	5221-0000	Roller Guide Assembly, 1 1/8 LG
11	2	5874-0020	Bolt, Shoulder, SH, 5/8 x 1 1/4

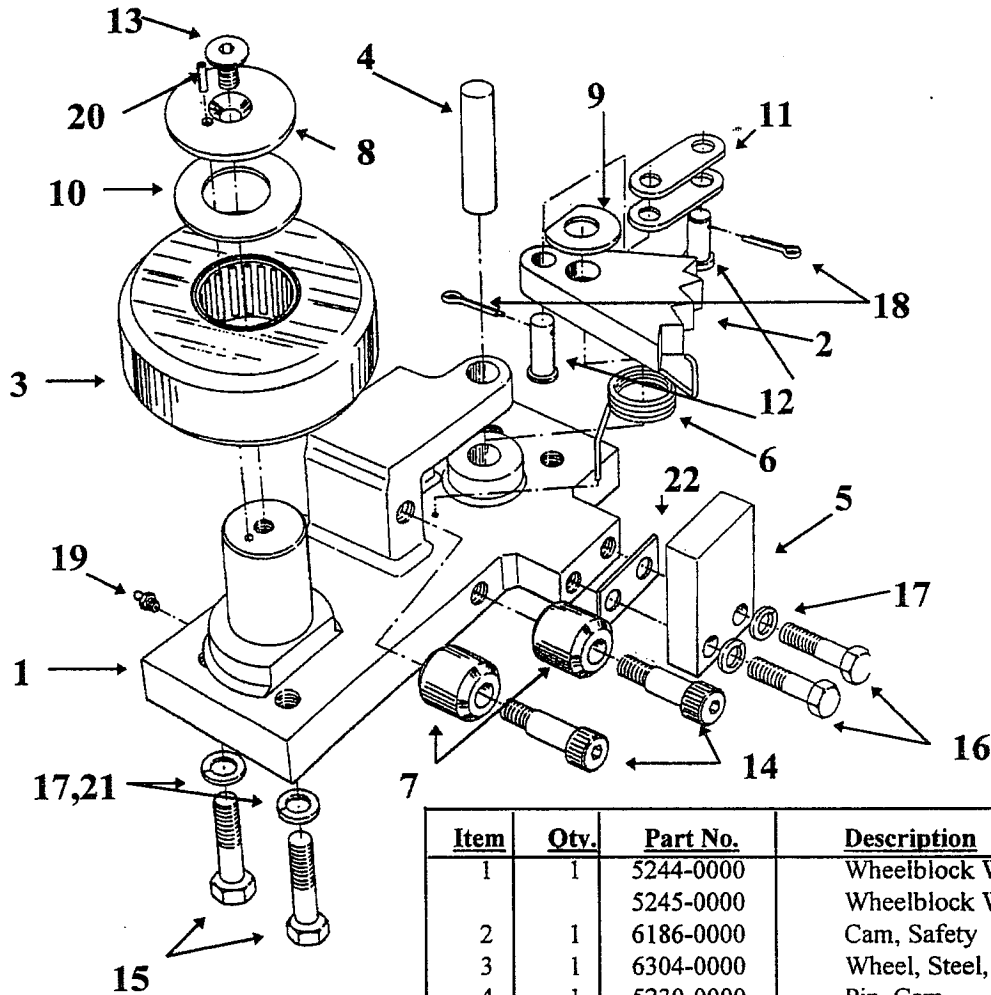
21 Series

Upper Wheelblock Assembly

5 3/8 Steel Wheel w/Roller Bearing

Complete Assembly - Part No. 6198-0000, Left Hand

Complete Assembly - Part No. 6199-0000, Right Hand



PFL-2104

* Number of spacers dependent
on beam size: #15 = 0; #20 = 1;
#25 = 2.

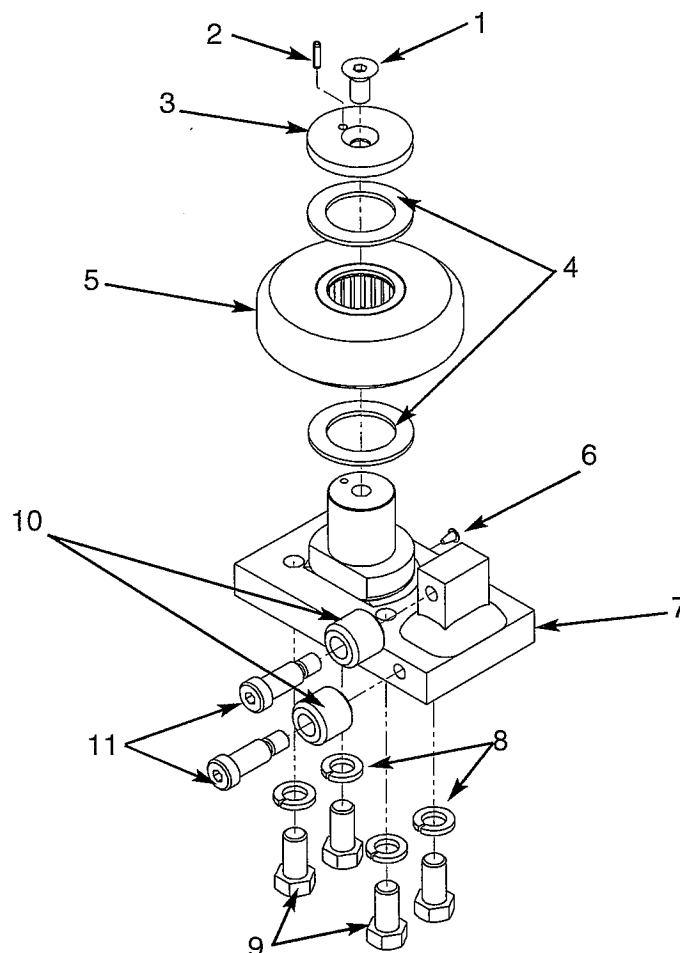
Item	Qty.	Part No.	Description
1	1	5244-0000 5245-0000	Wheelblock Weldment, RH, or Wheelblock Weldment, LH
2	1	6186-0000	Cam, Safety
3	1	6304-0000	Wheel, Steel, 5 3/8 w/ Roller Bearing
4	1	5230-0000	Pin, Cam
5	1	2754-0000	Shoe
6	1	2443-0000 2127-0000	Spring, Cam, RH, or Spring, Cam, LH
7	2	5221-0000	Roller, Guide
8	1	3629-0000	Retainer, Steel Wheel
9	1	8339-0000	Bearing, Thrust
10	1	3622-0000	Washer, Thrust, Wheel Stud
11	2	6187-0000	Link, Safety Cam to Toggle
12	2	2521-0000	Pin, Clevis, 3/4 x 2
13	1	4299-0016	Screw, FHSC, 1/2-3 x 1
14	2	5874-0020	Bolt, Shoulder, 5/8 x 1 1/4
15	4	6758-0020	Screw, HHC, 5/8-1 x 1 1/4
16	2	2198-0040	Screw, HHC, 5/8-11 x 2 1/4, Grade 8
17	6	5858-0015	Lockwasher, STD 5/8
18	2	2522-0000	Pin, Cotter
19	1	2590-0000	Fitting, Zerk, 3/16 Drive Type
20	1	5209-0012	Pin, Roll
21	4	7768-0015	Washer, Flat, 5/8 SAE
22	*	2767-0000	Spacer, Wheelblock Shoe, .08 thick

Lower Wheelblock Assembly

5 3/8 Steel Wheel w/Roller Bearing

Complete Assembly - Part No. 2403-0000, Right Hand

Complete Assembly - Part No. 2474-0000, Left Hand



2403-0000-XV-N

Item	Qty.	Part No.	Description
1	1	4299-0016	FHSMS, 1/2-13 x 1
2	1	5209-0012	Pin, Roll 3/16 x 3/4
3	1	3629-0000	Washer, Retainer STL
4	2	3622-0000	Washer, Thrust, 2-3/4 STL
5	1	6304-0000	Wheel Assy, STL, 5 3/8
6	1	9975-0006	Plug/Cap, Plastic
7	1	2400-0000	Whlblk Wldm, Lower RH
		2453-0000	Whlblk Wldm, Lower LH
8	4	5858-0015	Lockwasher, STD 5/8
9	4	6758-0020	Screw, HCS, 5/8-11 x 1 1/4 GR 2
10	2	5221-0000	Roller, Guide, Plastic 1
11	2	5874-0020	Bolt, Shoulder, SH, 5/8 x 1 1/4 x 1/2-13

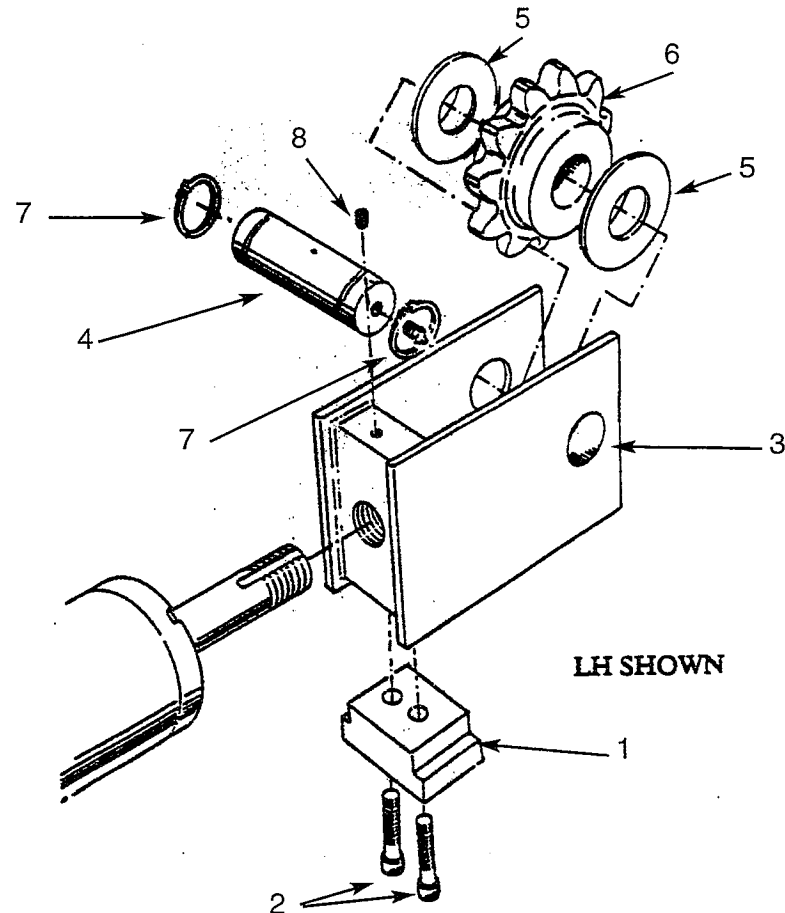
21 Series

Clevis Assembly

Complete Assembly - Part No. 9380-0000, Right Hand, #80 Chain

Complete Assembly - Part No. 9380-0001, Left Hand, #80 Chain

Complete Assembly - Part No. 9381-0000, Right Hand, #100 Chain

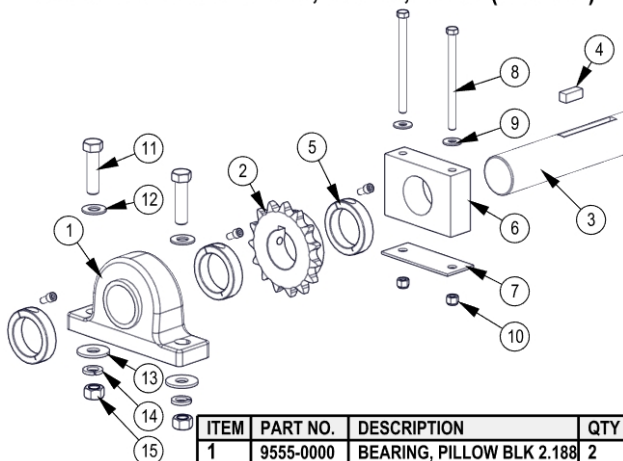


PFL-2108

ITEM	QTY.	PART NO.	DESCRIPTION
1	1	8761-0000	Slide Block, UHMW
2	2	3666-0024	Screw, SHC, 5/16-18 x 1 1/2" LG
3	1	9376-0000	Clevis Weldment, Right Hand
3	1	9376-0001	Clevis Weldment, Left Hand
4	1	9375-0000	Clevis Pin, 1 3/4" Dia.
5	2	8760-0000	Thrust Washer, UHMW
6*	1	8823-0000	Sprocket, #80 Chain
6*	1	8824-0000	Sprocket, #100 Chain
7	2	7993-0028	Snap Ring, 1 3/4" Dia.
8	1	8399-0016	Screw, BHSCS 3/8-16 x 1

*Applicable to lift chain size.

9558-0080 HEADER ASY, STRDL, 2-3/16 (Rev -.02)



9558-0080-S.SMG
PFL-2082-9558-0080

ITEM	PART NO.	DESCRIPTION	QTY
1	9555-0000	BEARING, PILLOW BLK 2.188	2
2	12813-0001	SPRKT, 80B15, 2.188 BORE	2
3	9560-1000	DRIVESHAFT, STRADL, 2 3/1	1
4	5815-0020	KEY, SQ, 1/2 X 1 1/4 LG	2
5	9101-0034	COLLAR, SHAFT, 1-PC SPLIT	6
6	9537-0000	SPRT, SHAFT, 2 3/16	1
7	9554-0000	SHIM, SHAFT SPRT, 1/8	1
8	5927-0088	SCREW,HHC,3/8-16X5.5,GR2	2
9	6296-0011	WASHER, FLAT, STD 3/8	2
10	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
11	6758-0040	SCREW,HHC,5/8-11X2.5,GR2	4
12	7768-0015	WASHER, FLAT, 5/8, SAE	4
13	9234-0015	WASHER, FLAT, STD 5/8	4
14	5858-0015	LOCKWASHER, STD, 5/8	4
15	6358-0015	NUT, HEX, 5/8-11, GR2	4

Field verify that the sprockets are properly aligned. The chain must clear all the drivebase structure.

Sprockets are secured on the shaft with keys. Shaft collars secure the sprocket and shaft.

CAUTION

- Field verify that the sprocket is aligned correctly
- Verify sprocket setscrew is torqued properly.
- Secure and torque shaft collars.

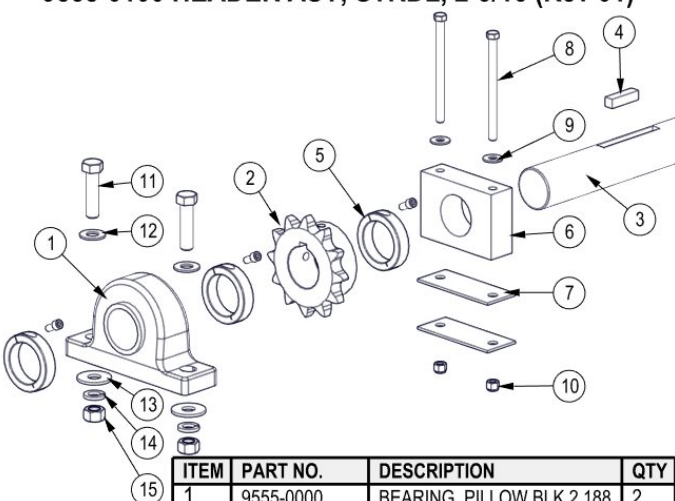
Sprocket Setscrew Torque

Setscrew	inch	3/8	1/2	5/8	3/4
Torque	in-lbs.	273	615	1315	2150

Shaft Collar Clamp Screw Torque

Clamp Screw	5/16"-24
Torque (in-lbs.)	340

9558-0100 HEADER ASY, STRDL, 2-3/16 (Rev 01)

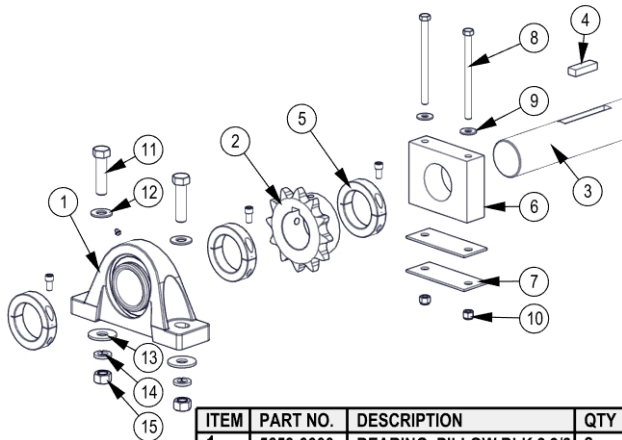


9558-0100-S.SMG
PFL-2082-9558-0100

ITEM	PART NO.	DESCRIPTION	QTY
1	9555-0000	BEARING, PILLOW BLK 2.188	2
2	12814-0001	SPRKT, 100B12, 2.188 BORE	2
3	9560-1000-xxxx	DRIVESHAFT, STRADL, 2 3/16	1
4	5815-0030	KEY, SQ, 1/2 X 1 7/8 LG	2
5	9101-0034	COLLAR, SHAFT, 1-PC SPLIT	6
6	9537-0000	SPRT, SHAFT, 2 3/16	1
7	9554-0000	SHIM, SHAFT SPRT, 1/8	2
8	5927-0088	SCREW,HHC,3/8-16X5.5,GR2	2
9	6296-0011	WASHER, FLAT, STD 3/8	2
10	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
11	6758-0040	SCREW,HHC,5/8-11X2.5,GR2	4
12	7768-0015	WASHER, FLAT, 5/8, SAE	4
13	6296-0015	WASHER, FLAT, STD 5/8	4
14	5858-0015	LOCKWASHER, STD, 5/8	4
15	6358-0015	NUT, HEX, 5/8-11, GR2	4

Parts

9559-0000 HEADER ASSY, STRDL, 2-3/8 (Rev 05)



ITEM	PART NO.	DESCRIPTION	QTY
1	5653-0000	BEARING, PILLOW BLK 2 3/8	2
2	12814-0002	SPRKT, 100B12, 2.375 BORE	2
3	9560-1001	DRIVESHAFT, STRDL, 2 3/8	1
4	7414-0030	KEY, 7/16 X 5/8 X 1 7/8	2
5	9101-0038	COLLAR, SHAFT, 1-PC SPLIT	6
6	9541-0000	SPRT, SHAFT, 2-3/8 DIA	1
7	9554-0000	SHIM, SHAFT SPRT, 1/8	2
8	5927-0088	SCREW,HHC,3/8-16X5.5,GR2	2
9	6296-0011	WASHER, FLAT, STD 3/8	2
10	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
11	6758-0040	SCREW,HHC,5/8-11X2.5,GR2	4
12	7768-0015	WASHER, FLAT, 5/8, SAE	4
13	6296-0015	WASHER, FLAT, STD 5/8	4
14	5858-0015	LOCKWASHER, STD, 5/8	4
15	6358-0015	NUT, HEX, 5/8-11, GR2	4

9559-0000-S.SMG
PFL-2082-9559-0000

Field verify that the sprockets are properly aligned. The chain must clear all the drivebase structure.

Sprockets are secured on the shaft with keys. Shaft collars secure the sprocket and shaft.

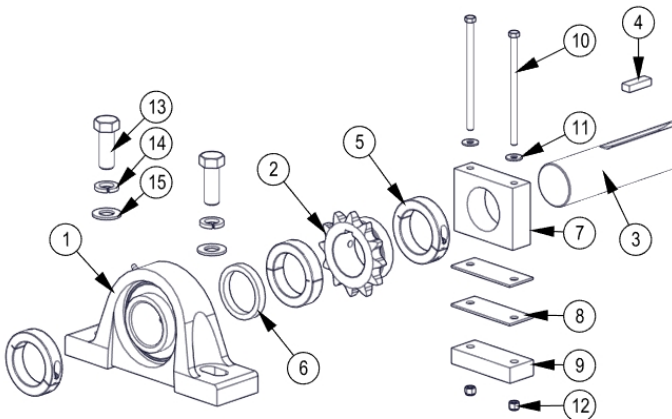
CAUTION

- Field verify that the sprocket is aligned correctly
- Verify sprocket setscrew is torqued properly.
- Secure and torque shaft collars.

Sprocket Setscrew Torque

Setscrew	inch	3/8	1/2	5/8	3/4
Torque	in-lbs.	273	615	1315	2150

12855-0000 HEADER ASY, STRDL, 2-3/4 (Rev 03)



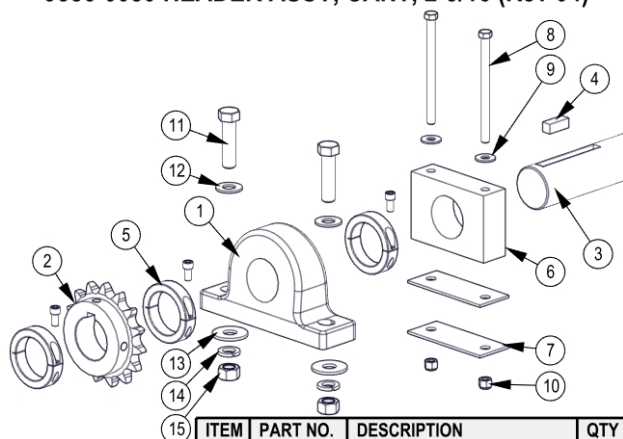
ITEM	PART NO.	DESCRIPTION	QTY
1	12853-0000	BEARING, PILLOW BLK 2.75	2
2	12814-0003	SPRKT, 100B12, 2.75 BORE	2
3	12852-1000	DRIVESHAFT, STRDL, 2.75"	1
4	7414-0030	KEY, 7/16 X 5/8 X 1 7/8	2
5	9101-0044	COLLAR, SHAFT, 1-PC SPLIT	6
6	12854-0000	SPACER, UHMW, 2.75 SHAFT	2
7	10190-0000	SUPPORT, SHAFT, 2 3/4	1
8	9554-0000	SHIM, SHAFT SPRT, 1/8	2
9	10189-0000	SPACER, SHAFT SUPPORT,	1
10	5927-0112	SCREW,HHC,3/8-16X7.0,GR2	2
11	6296-0011	WASHER, FLAT, STD 3/8	2
12	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
13	6094-0040	SCREW,HHC,7/8-9X2.5,GR2	4
14	5858-0019	LOCKWASHER, STD, 7/8	4
15	7768-0019	WASHER, FLAT, 7/8, SAE	4

12855-0000-S.SMG
PFL-2082-12855-0000

Shaft Collar Clamp Screw Torque

Clamp Screw	5/16"-24
Torque (in-lbs.)	340

9556-0080 HEADER ASSY, CANT, 2-3/16 (Rev 04)



ITEM	PART NO.	DESCRIPTION	QTY
1	9555-0000	BEARING, PILLOW BLK 2.188	2
2	12813-0001	SPRKT, 80B15, 2.188 BORE	2
3	9560-2000	DRIVESHAFT, CANT, 2 3/16	1
4	5815-0021	KEY, SQ, 1/2 X 1 5/16 LG	2
5	9101-0034	COLLAR, SHAFT, 1-PC SPLIT	6
6	9537-0000	SPRT, SHAFT, 2 3/16	1
7	9554-0000	SHIM, SHAFT SPRT, 1/8	2
8	5927-0088	SCREW,HHC,3/8-16X5.5,GR2	2
9	6296-0011	WASHER, FLAT, STD 3/8	2
10	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
11	6758-0040	SCREW,HHC,5/8-11X2.5,GR2	4
12	7768-0015	WASHER, FLAT, 5/8, SAE	4
13	9234-0015	WASHER, FLAT, STD 5/8	4
14	5858-0015	LOCKWASHER, STD, 5/8	4
15	6358-0015	NUT, HEX, 5/8-11, GR2	4

9556-0080-S.SMG
PFL-2082-9556-0080

Field verify that the sprockets are properly aligned. The chain must clear all the drivebase structure.

Sprockets are secured on the shaft with keys. Shaft collars secure the sprocket and shaft.

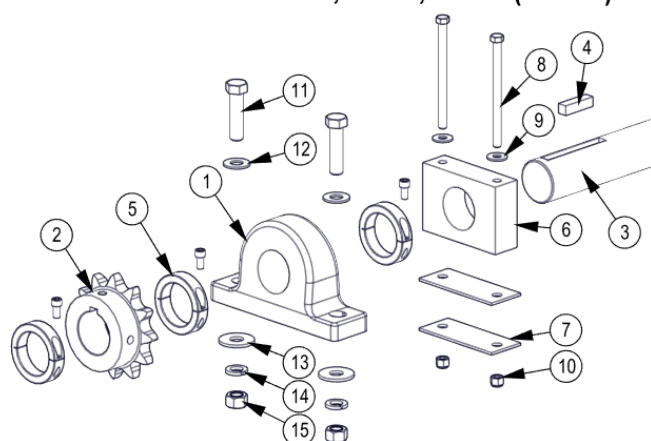
CAUTION

- Field verify that the sprocket is aligned correctly
- Verify sprocket setscrew is torqued properly.
- Secure and torque shaft collars.

Sprocket Setscrew Torque

Setscrew	inch	3/8	1/2	5/8	3/4
Torque	in-lbs.	273	615	1315	2150

9556-0100 HEADER ASSY, CANT, 2-3/16 (Rev 03)



ITEM	PART NO.	DESCRIPTION	QTY
1	9555-0000	BEARING, PILLOW BLK 2.188	2
2	12814-0001	SPRKT, 100B12, 2.188 BORE	2
3	9560-2000	DRIVESHAFT, CANT, 2 3/16	1
4	5815-0030	KEY, SQ, 1/2 X 1 7/8 LG	2
5	9101-0034	COLLAR, SHAFT, 1-PC SPLIT	6
6	9537-0000	SPRT, SHAFT, 2 3/16	1
7	9554-0000	SHIM, SHAFT SPRT, 1/8	2
8	5927-0088	SCREW,HHC,3/8-16X5.5,GR2	2
9	6296-0011	WASHER, FLAT, STD 3/8	2
10	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
11	6758-0040	SCREW,HHC,5/8-11X2.5,GR2	4
12	7768-0015	WASHER, FLAT, 5/8, SAE	4
13	9234-0015	WASHER, FLAT, STD 5/8	4
14	5858-0015	LOCKWASHER, STD, 5/8	4
15	6358-0015	NUT, HEX, 5/8-11, GR2	4

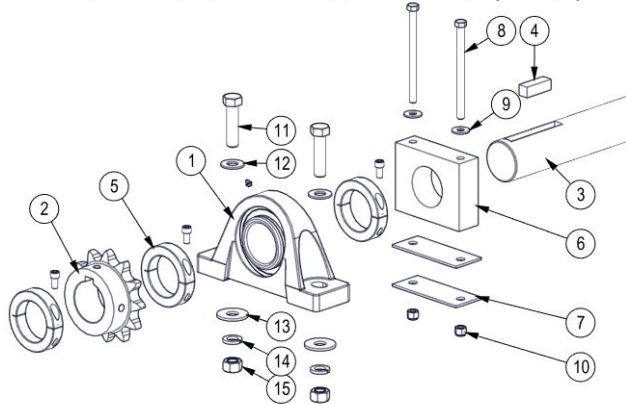
9556-0100-S.SMG
PFL-2082-9556-0100

Shaft Collar Clamp Screw Torque

Clamp Screw	5/16"-24
Torque (in-lbs.)	340

Parts

9557-0000 HEADER ASSY, CANT, 2-3/8 (Rev 02)



ITEM	PART NO.	DESCRIPTION	QTY
1	5653-0000	BEARING, PILLOW BLK 2 3/8	2
2	12814-0002	SPRKT, 100B12, 2.375 BORE	2
3	9560-2001	DRIVESHAFT, CANT, 2 3/8	1
4	5814-0030	KEY, SQ. 5/8" X 1-7/8"	2
5	9101-0038	COLLAR, SHAFT, 1-PC SPLIT	6
6	9541-0000	SPRT, SHAFT, 2-3/8 DIA	1
7	9554-0000	SHIM, SHAFT SPRT, 1/8	2
8	5927-0088	SCREW,HHC,3/8-16X5.5,GR2	2
9	6296-0011	WASHER, FLAT, STD 3/8	2
10	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
11	6758-0040	SCREW,HHC,5/8-11X2.5,GR2	2
12	7768-0015	WASHER, FLAT, 5/8, SAE	2
13	6296-0015	WASHER, FLAT, STD 5/8	2
14	5858-0015	LOCKWASHER, STD, 5/8	2
15	6358-0015	NUT, HEX, 5/8-11, GR2	2

9557-0000-S.SMG
PFL-2082-9557-0000

Field verify that the sprockets are properly aligned. The chain must clear all the drivebase structure.

Sprockets are secured on the shaft with keys. Shaft collars secure the sprocket and shaft.

CAUTION

- Field verify that the sprocket is aligned correctly
- Verify sprocket setscrew is torqued properly.
- Secure and torque shaft collars.

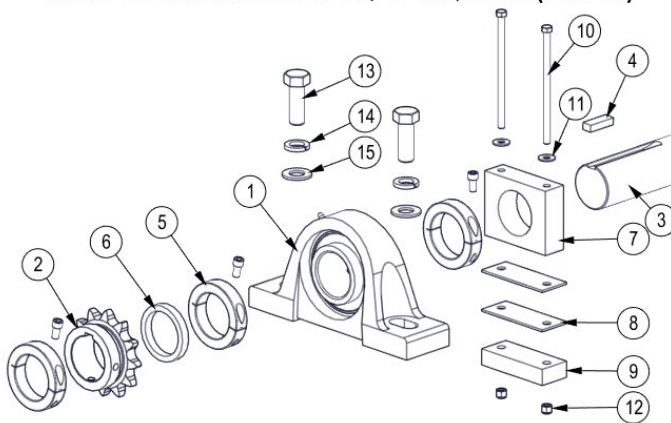
Sprocket Setscrew Torque

Setscrew	inch	3/8	1/2	5/8	3/4
Torque	in-lbs.	273	615	1315	2150

Shaft Collar Clamp Screw Torque

Clamp Screw	5/16"-24
Torque (in-lbs.)	340

12856-0000 HEADER ASSY, CANT, 2-3/4 (Rev 03)



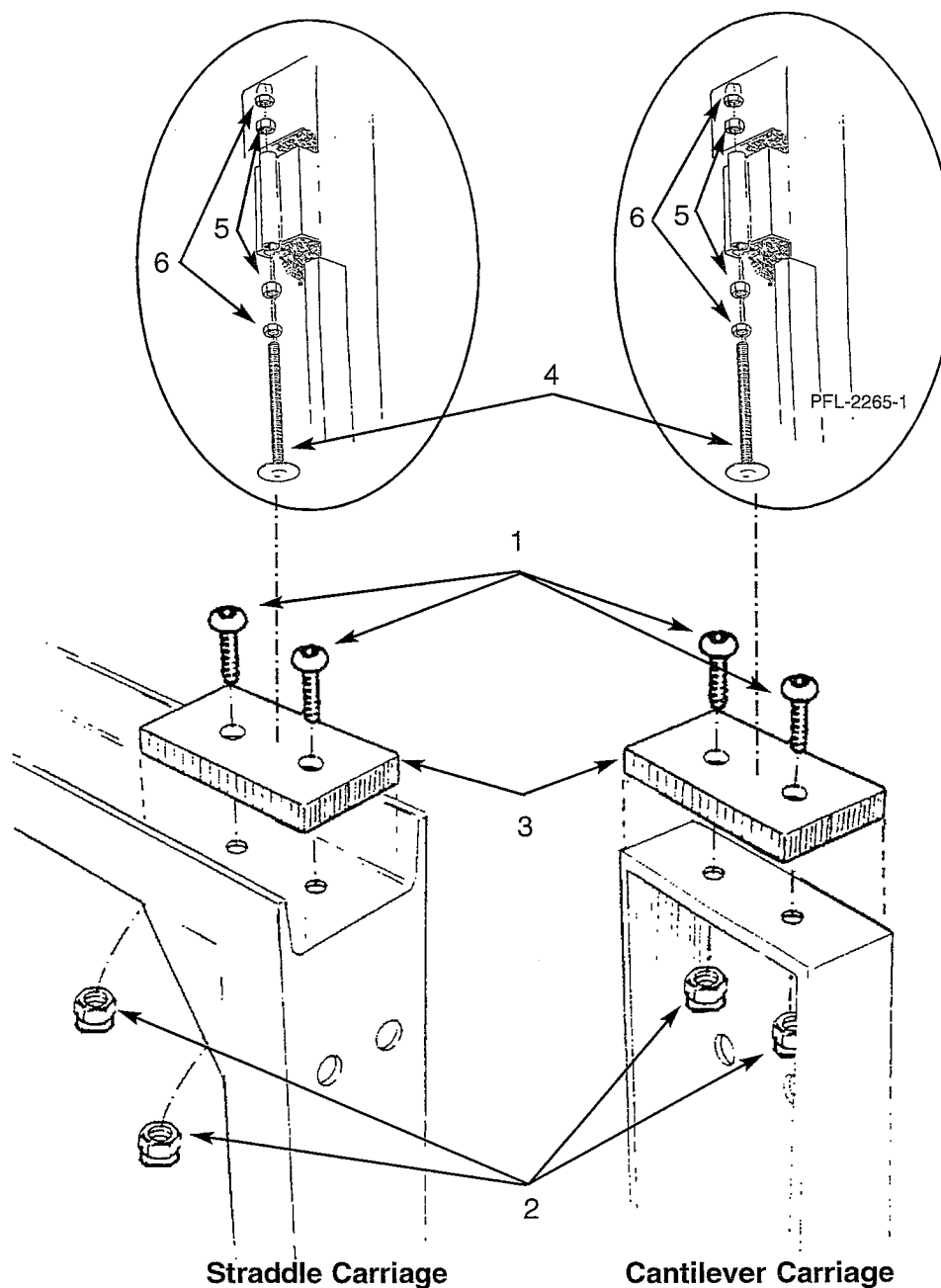
ITEM	PART NO.	DESCRIPTION	QTY
1	12853-0000	BEARING, PILLOW BLK 2.75	2
2	12814-0003	SPRKT, 100B12, 2.75 BORE	2
3	12852-2000	DRIVESHAFT, CANT, 2.75"	1
4	7414-0030	KEY, 7/16 X 5/8 X 1 7/8	2
5	9101-0044	COLLAR, SHAFT, 1-PC SPLIT	6
6	12854-0000	SPACER, UHMW, 2.75 SHAFT	2
7	10190-0000	SUPPORT, SHAFT, 2 3/4	1
8	9554-0000	SHIM, SHAFT SPRT, 1/8	2
9	10189-0000	SPACER, SHAFT SUPPORT,	1
10	5927-0112	SCREW,HHC,3/8-16X7.0,GR2	2
11	6296-0011	WASHER, FLAT, STD 3/8	2
12	6708-0011	NUT, LOCK, NYLON, 3/8-16	2
13	6094-0040	SCREW,HHC,7/8-9X2.5,GR2	4
14	5858-0019	LOCKWASHER, STD, 7/8	4
15	7768-0019	WASHER, FLAT, 7/8, SAE	4

12856-0000-S.SMG
PFL-2082-12856-0000

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21 Series

Adjustable Carriage Stop



PFL-1301-1

Item	Qty.	Part No.	Description
1	1	8399-0016	Screw, BHSC 3/8-16 UNC 1"
2	2	6708-0011	Nut, Lock, Nylon, 3/8
3	1	10414-0000	Pad, UHMW
4	1	6140-0000	Jackscrew, Adjustable Carriage Stop
5	2	6358-0018	Nut, Hex, 1-8 UNC
6	2	8326-0018	Nut, Hex, Jam, 1-8 UNC

Cylinder Assembly

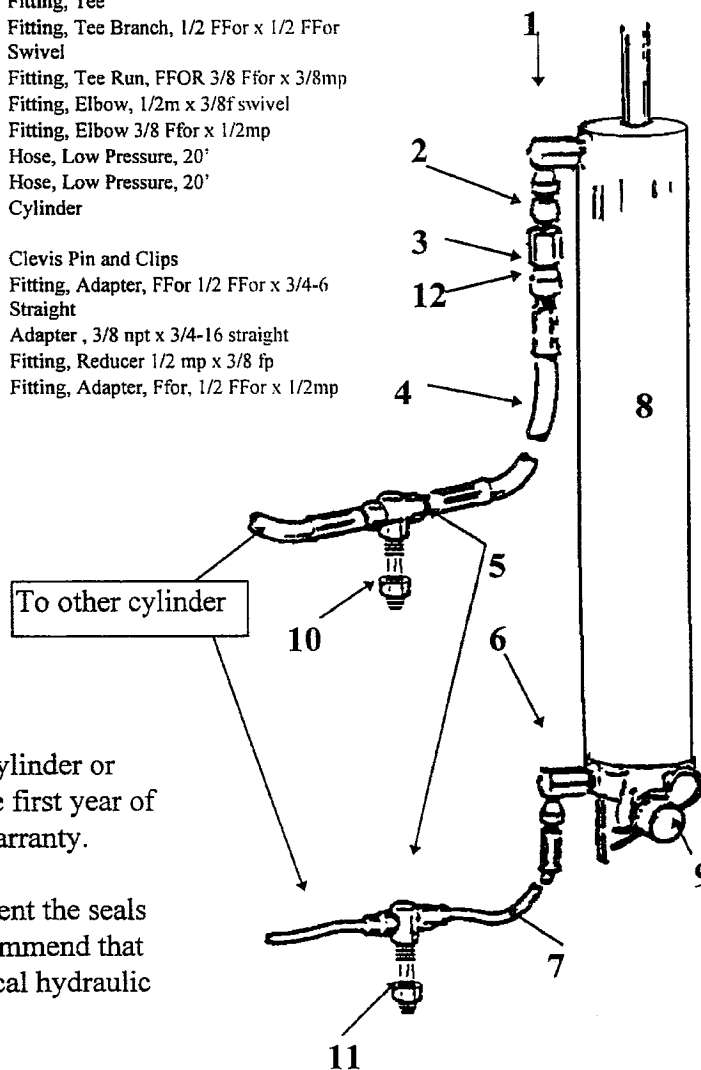
ITEM NO.	H	H	H	H	2	2	2	Model Used (typical)
1	1	3	5	2	1	1	1	
2								
3	H	4	6	3				
4	P	/	/	H				
5		5	7	P				
6		H	5					
7		P	H					
8								
9								
10								
11								
12								

Part Numbers
2576-0000
8988-0010
2573-0000
8893-0010
2574-0000
8877-0013
2575-0000
8877-0009
3436-0000
8892-0009
8623-0000
2577-0000
2579-0024
8625-0024
2580-0000
9679-0008
8629-0000
2581-0000
8628-0000
8626-0020
2578-0020
Consult Factory
4544-0000
9266-0008
7216-0006
7260-0006
8624-0000

Velocity Fuse
 Fitting, Elbow #10 O-ring x 1/2 fp
 Fitting, Elbow, 1/2m x 1/2f swivel
 Fitting, Elbow, STR THD 7/8-14
 Velocity Fuse
 Velocity Fuse
 Velocity Fuse
 Velocity Fuse
 Velocity Fuse
 Velocity Fuse
 Fitting, Coupling, Hex 1/2fp x 1/2fp
 Fitting, Reducer 1/2 x 3/8 f swivel
 Hose, High Pressure, 24'
 Hose, High Pressure, 24'
 Fitting, Tee
 Fitting, Tee Branch, 1/2 FFor x 1/2 FFor Swivel
 Fitting, Tee Run, FFOR 3/8 Ffor x 3/8mp
 Fitting, Elbow, 1/2m x 3/8f swivel
 Fitting, Elbow 3/8 Ffor x 1/2mp
 Hose, Low Pressure, 20'
 Hose, Low Pressure, 20'
 Cylinder
 Clevis Pin and Clips
 Fitting, Adapter, FFor 1/2 FFor x 3/4-6 Straight
 Adapter, 3/8 npt x 3/4-16 straight
 Fitting, Reducer 1/2 mp x 3/8 fp
 Fitting, Adapter, Ffor, 1/2 FFor x 1/2mp



DS5



Note: Tampering with the cylinder or changing the seals within the first year of operation may void your warranty.

After the first year, in the event the seals need to be replaced, we recommend that you take the cylinder to a local hydraulic repair shop.

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RECOMMENDED STORAGE REQUIREMENTS

ENVIRONMENT

All components should be stored indoors. The area of storage should be kept at a constant temperature above 55° F and relative humidity of approximately 40%, free from heavy dust and contaminants.

NOTICE

Outdoor storage is NOT recommended.

STACKING

Except for placing the parts container (crate) and bracing on the empty carriage, stacking of the various gate components is strictly forbidden. Enclosure and gate panels will warp. Objects stacked on top of the columns, drivebase assembly and/or hydraulic cylinders may cause severe damage.

LONG-TERM STORAGE

More than two months after shipment, will require that the following maintenance procedures be performed every sixty days from date of shipment:

1. If ROLLER CHAINS are stored for an extended period of time or in a corrosive environment, they may need to be dipped or stored in a non-detergent oil to retain their original condition.
2. SPROCKETS should be coated lightly with a non-detergent oil to prevent corrosion.
3. If the WHEELBLOCK ASSEMBLIES are exposed and the SAFETY CAMS are a part of the wheelblocks the safety cams should be lubricated with a non-detergent oil and rotated to ensure free operation.
4. DRIVEBASE ASSEMBLY. The drivebase assemblies should be elevated off the ground and tarped. Allow adequate ventilation to minimize condensation. Periodically the drivebase shaft should be rotated. With the vent plug installed in the reducer, the drivebase will need to have the motor/brake powered with temporary power of the correct voltage and the correct brake wiring configuration. This will rotate the drive shaft and cycle the brake once. The brake should also be cycled manually several times using the lever on the side of the motor. After rotating with temporary power, the vent plug should be removed and the original plug installed to prevent contamination of the reducer oil. Before initial use, the reducer oil should be drained and replaced.
5. PILLOWBLOCK and BEARINGS are greased with lithium-type grease. Do not allow the pillowblocks to be exposed to contaminants. Wrap or trap as necessary.
6. ELECTRICAL. If exposed, the electrical component inlets should be plugged to prevent moisture and other contaminants from entering them. Store in a dry, temperature controlled location to prevent corrosion. Silica gel desiccant should be placed inside the control enclosure. Periodically check inside of the control enclosure for any moisture build up.
7. PARTS CRATE must remain sealed and dry.



For units stored **longer than six months**, it is recommended that you contact the PFlow industries, Inc. Product Support Department for additional information that may be available prior to starting up your unit.

NOTICE

Our warranty policy does not cover damage as a result of improper storage.

INSTALLATION, ELECTRICAL AND OWNER'S MANUAL

The VRC installation manual, electrical and owner's manuals are located in the parts container (crate). As not to open the manual envelope, if the manuals are required contact the PFlow Industries, Inc. Product Support Department for an electronic copy (.pdf).

If you need assistance, please call PFlow Industries, Inc. Product Support Department.



15870-0001

PFlow Industries, Inc. • 6720 N. Teutonia Avenue • Milwaukee, WI. 53209

Phone - Main Switchboard: (414) 352-9000 • Product Support Dept: Fax - (414) 247-9834; email: psd@pflow.com

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ELECTRICAL TERMINOLOGY AND APPLICATIONS

Ruling Bodies:

NEMA - National Electrical Manufacturers Association - (National testing and manufacturing standards body of electrical apparatus.)

UL - Underwriters Laboratories, Inc. - (Independent testing laboratory - some cities require UL control panels and electrical apparatus.)

JIC - Joint Industry Council - (Advisory group to provide standards for production equipment, safety and dependability.)

NFPA - National Fire Protection Association - (Ruling board of NEC - sets national fire/safety standards for equipment/plants.)

CSA - Canadian Standards Association - (Regulatory agency of Canada - CSA required stamp on electrical devices in Canada.)

ANSI - American National Standards Institute - (Adopts code; sets committees.)

ASME - American Society of Mechanical Engineers - (Writes codes - Secretariat for ANSI.)

NEC - National Electrical Code - (Advisory board to NFPA - their recommendation/codes are usually adopted throughout the USA.)

OTHERS - GM, Ford, Dupont, etc.
Customers may have special plant specifications incorporating several ruling bodies or their own electrical code specifications.

Pflow's Standard

NEMA type 1 classification is a general purpose, indoor only, usage. Only COMMERCIAL users generally accept this type: i.e., retail stores, mini storage, warehouses, etc.

NOTE

INDUSTRY does not accept (this NEMA type 1): i.e., auto manufacturing, chemical manufacturing, and paper manufacturing.

All other Pflow units are NEMA 12 classification in regard to the controls, push button stations, and electrical design built under the following standards:

JIC: EMP-1 Electrical standards for mass production equipment.

JIC: Electrical standards for general purpose machine tools.

NFPA 79: Electrical standard for industrial machinery

NEMA type 12 classification is an indoor only usage with gasket protection from dust, dirt, fiber flyings, dripping water, and external condensation of non-corrosive liquids.

NOTE

If JIC is to be strictly adhered to, they require that all devices be minimum NEMA 12, rigid conduit, specific wire coloring, etc. (controls and field wiring).

NOTE

You should note that the NEMA rating of equipment is based on the electrical device(s) with the lowest NEMA type.

EXAMPLES: 1) If we provide a JIC NEMA 12 standard control package with an Anderson or VA gate interlock, our NEMA rating goes to NEMA type 1; and we lose our JIC rating. 2) If we provide a GAL interlock, which has exposed electrical contacts, we rate no NEMA rating and lose our JIC rating. 3) If we provide EMT conduit or don't provide the proper JIC electrical field wiring techniques, we lose our JIC rating.

Outdoor Application

Outdoor units or electrical devices exposed to severe weather conditions should not be rated less than NEMA type 4. This is a watertight, dust-tight indoor-outdoor classification that will provide protection against splashing water, seepage of water, falling or hose-directed water, and severe external condensation.

Corrosive Application

The Chemical Industry on the whole usually specifies a minimum NEMA type 4X. A NEMA 4X rating is similar to a NEMA 4 with added corrosion resistance.

Hazardous Locations

Hazardous locations are an extremely specialized electrical classification. Few electrical experts exist in this field. All explosion-proof hazardous locations must be handled on an individual job site condition.

The NEC has three classes (I, II, III), - two divisions, (1 and 2) and seven group designations (A, B, C, D, E, F, and G).

Class Definitions:

CLASS I Locations: Those in which flammable gasses or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

CLASS II Locations: Those where the presence of combustible dust presents a fire or explosion hazard.

CLASS III Locations: Those where easily ignitable fibers or flyings are present but not likely to be suspended in the air in quantities sufficient to produce ignitable mixtures.

Division Definitions:

DIVISION 1 is an extremely dangerous explosive condition that exists normally.

DIVISION 2 is a dangerous explosive condition that could exist but usually does not.

GROUP designations are given by the NFPA, State Fire Marshals, insurance companies or consulting engineering firms according to the gasses/dust, etc. in the area and the spark or temperature needed to produce an explosion.

Currently, in order to provide competitive pricing in the hazardous location area, we are producing "intrinsically safe" control packages. Intrinsically safe is defined as: electrical devices provided cannot produce a spark or temperature hot enough to ignite the surrounding gasses/dust, etc.

Optional Control Packages and Devices for Hazardous Locations

NEMA type 7, Class I, Division 1 and 2, Group A, B, C, or D enclosures shall be capable of withstanding the pressures resulting from an internal explosion of specified gas and shall contain such an explosion sufficiently so that an explosive gas mixture existing in the atmosphere will not be ignited.

NEMA type 9 is similar to NEMA type 7 but is rated for dust ignition-proof - Class II, Division 1 and 2, Groups E, F, or G.

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Thank you for giving us the opportunity to serve you. We appreciate your business and want to make sure we meet your expectations. Please help us by taking a few minutes to tell us about the equipment and service that you have received so far. Please answer the questions and return this form to PFlow Industries, Inc. Product Support Department. If more space is needed, please use the reverse side of this page.

1	Did you receive the equipment in good condition? If No, please describe any damage.	Yes	No
2	Did you receive the equipment shipment complete as expected? If No, what was missing?	Yes	No
3	Was the equipment manufactured correctly? If No, describe concerns in the workmanship.	Yes	No
4	Did it match the General Arrangement (GA) drawing?	Yes	No
5	Was the unit (i.e., lift, gates, and enclosures) dimensionally correct (did it fit)? If No, describe in detail any problem areas	Yes	No
6	After the completion of the electrical installation was it necessary to return for final adjustments, testing, and training? If No, were you able to hook up temporary power to test the unit and make all final adjustments? If Yes, were there any electrical problems that you were made aware?	Yes	No
7	Were the electrical components a concern? If Yes, describe	Yes	No
8	Was the electrical field wiring completed as required? If No, describe	Yes	No
9	Where you able to test the unit at full capacity?	Yes	No
10	Did you test all the gates to ensure proper operation and interlock operation?	Yes	No
11	Comments:		
PFlow Job Number		Date	
Customer/User			
Questionnaire completed by		email	
Company		Phone	

PFlow Industries, Inc. • 6720 N. Teutonia Avenue • Milwaukee, WI. 53209
Phone - Main Switchboard: (414) 352-9000 • Product Support Dept: Fax - (414) 247-9834; email: psd@pflow.com

Questionnaire

Notes

PARTS AND LABOR

Parts:

Structure..... Lifetime
Manufactured Components..... 1 Year
Purchased Components..... 1 Year

Labor:

Structure.....Lifetime
Manufactured Components..... 1 Year
Purchased Components..... 90 Days

WARRANTY

The warranty period begins 30 days after shipment. All warranty work must be pre-authorized by PFlow Industries' Product Support Department prior to starting work. All billing must be in accordance with our Warranty Procedures. Replacement of defective parts will be handled in accordance with PFlow's Return Goods Authorization policy. If PFlow Industries determines that equipment failures were caused by abuse, improper installation, or lack of maintenance, they will not be covered. PFlow Industries will not accept consequential losses (missed production, etc.), premium time labor, or air freight charges. Manufactured items are defined as those components manufactured and/or assembled by PFlow. Structure is defined as columns and carriage (excluding carriage side guards). Purchased items are those components that are used as supplied by vendors. Gates and enclosures are excluded and covered for 90 days parts and labor. This warranty applies to all models and may not be modified or extended except by written authorization from PFlow Industries, Inc.

- Manufactured items are defined as those components manufactured and or assembled by PFlow.
- Structure is defined as a columns and carriage.
- Purchased items are those components that are used as supplied by vendors.

PRE-AUTHORIZATION

PFlow Industries must be notified of the problem before we can authorize the repair. We need to determine the cause of the problem, who should be doing the work and what is involved. If it is our decision to have your organization or your subcontractor do the work, you will be given an authorization number which must be referenced on all subsequent paperwork. During our non-working hours, we ask that you notify us by phone or FAX during the next business day. Issuance of an authorization number does not guarantee approval and or payment.

INVOICES

1. You have 30 days past the date the work was completed to submit an invoice for approval. If approved, payment is made 30 days from the date of approval.
2. A deduction from outstanding payments to PFlow for warranty is NEVER authorized and will result in a 10% processing fee.
3. Invoices received without sufficient information will be returned. They will be reconsidered for approval when complete documentation is received. All invoices must include, in detail, the following:
 - Description of the problem.
 - PFlow serial number.
 - Labor hours expended resolving the problem.
 - Rater per hour.
 - Travel time incurred.
 - Date the work was performed.
 - Copies of receipts for materials purchased locally or labor sub-contracted.

COMMENTS

- PFlow Industries is not responsible for payment made on claims prior to our approval.
- Local purchase of components must be pre-authorized.
- Where distance and or experience may be more cost-effective, PFlow Industries reserves the right to use alternate organizations.
- Labor is defined as a maximum of two hours travel per call, plus reasonable onsite repair time as determined by PFlow Industries

Notes

Acceptance Certification - VRC

We accept the above equipment as being properly installed, tested, and performing to our satisfaction. This form covers both the mechanical and electrical installation of the equipment for the purpose of quality assurance by PFlow Industries, and in no way releases either PFlow Industries, Inc. or the installing contractor(s) of their warranty obligations. If there are any exceptions or unresolved items, please note.

PFlow Unit Number:	Job Name:	Date:
Site Mailing Address:		
Site City:	Site State:	Site Zip Code:
Customer Contact Name:	Contact Title:	
Customer Contact Phone: () - Ext.	Customer contact e-mail:	

Tests Successfully Performed: Yes <input type="checkbox"/> No <input type="checkbox"/>		Customer Initials	Equipment start-up date:
Load test: _____ at _____ % of lift capacity		Operation Test Yes <input type="checkbox"/> No <input type="checkbox"/>	
Gate/Interlock Operation: Yes <input type="checkbox"/> No <input type="checkbox"/>		Other: _____	
Comments: _____ _____ _____			

Personnel Instructed on the Operation	
Name:	Company:
Name:	Company:

Accepted By		Acceptance Date:
Name:	Name:	
Title:	Title:	
Company:	Company:	
Phone:	Phone:	
PFLOW PERSONNEL / REPRESENTATIVE / INSTALLER PRESENT:		
Name:		Company:

Please return a copy of this form to the PFlow Product Support Department.

PFlow Industries, Inc. • 6720 N. Teutonia Avenue • Milwaukee, WI. 53209
Phone - Main Switchboard: (414) 352-9000 • Product Support Dept: Fax - (414) 247-9834; email: psd@pflow.com

Notes

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MATERIAL SAFETY DATA SHEET

F78XXL13851-4357
00 01

DATE OF PREPARATION
Dec 21, 2013

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

F78XXL13851-4357

PRODUCT NAME

Fast Dry Acrylic Enamel, FDA PFlow Blue VOC

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

Telephone Numbers and Websites

Regulatory Information	(216) 566-2902
Medical Emergency	(216) 566-2917
Transportation Emergency*	(800) 424-9300
<i>*for Chemical Emergency ONLY (spill, leak, fire, exposure, or accident)</i>	

SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

% by Weight	CAS Number	Ingredient	Units	Vapor Pressure
4	64742-89-8	V. M. & P. Naphtha		
		ACGIH TLV	300 PPM	12 mm
		OSHA PEL	300 PPM	
		OSHA PEL	400 PPM STEL	
9	108-88-3	Toluene		22 mm
		ACGIH TLV	20 PPM	
		OSHA PEL	100 ppm (Skin)	
		OSHA PEL	150 ppm (Skin) STEL	
4	100-41-4	Ethylbenzene		7.1 mm
		ACGIH TLV	20 PPM	
		OSHA PEL	100 PPM	
		OSHA PEL	125 PPM STEL	
22	1330-20-7	Xylene		5.9 mm
		ACGIH TLV	100 PPM	
		ACGIH TLV	150 PPM STEL	
		OSHA PEL	100 PPM	
		OSHA PEL	150 PPM STEL	
24	67-64-1	Acetone		180 mm
		ACGIH TLV	500 PPM	
		ACGIH TLV	750 PPM STEL	
		OSHA PEL	1000 PPM	
4	110-19-0	Isobutyl Acetate		12.5 mm
		ACGIH TLV	150 PPM	
		OSHA PEL	150 PPM	
1	108-65-6	1-Methoxy-2-Propanol Acetate		1.8 mm
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	
3	112926-00-8	Amorphous Precipitated Silica		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	6 mg/m3 as Dust	
2	14807-96-6	Talc		
		ACGIH TLV	2 mg/m3 as Resp. Dust	
		OSHA PEL	2 mg/m3 as Resp. Dust	
4	13463-67-7	Titanium Dioxide		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	
0.3	1333-86-4	Carbon Black		
		ACGIH TLV	3.5 MG/M3	
		OSHA PEL	3.5 MG/M3	

SECTION 3 — HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

Prolonged overexposure to hazardous ingredients in Section 2 may cause adverse chronic effects to the following organs or systems:

- the liver
- the urinary system
- the hematopoietic (blood-forming) system
- the cardiovascular system
- the reproductive system

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

HMIS Codes

Health	2*
Flammability	3
Reactivity	0

SECTION 4 — FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and laundry before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

SECTION 5 — FIRE FIGHTING MEASURES

FLASH POINT

1 °F TCC

LEL

0.9

UEL

13.1

FLAMMABILITY CLASSIFICATION

RED LABEL -- Extremely Flammable, Flash below 21 °F (-6 °C)

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

SECTION 6 — ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

SECTION 7 — HANDLING AND STORAGE

STORAGE CATEGORY

DOL Storage Class IB

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are EXTREMELY FLAMMABLE. Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	7.84 lb/gal	939 g/l
SPECIFIC GRAVITY	0.94	
BOILING POINT	132 - 325 °F	55 - 162 °C
MELTING POINT	Not Available	
VOLATILE VOLUME	77%	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	Not Available	
VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)		
4.90 lb/gal	588 g/l	Less Water and Federally Exempt Solvents
3.52 lb/gal	422 g/l	Emitted VOC

SECTION 10 — STABILITY AND REACTIVITY

STABILITY — Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

SECTION 11 — TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

IARC's Monograph No. 93 reports there is sufficient evidence of carcinogenicity in experimental rats exposed to titanium dioxide but inadequate evidence for carcinogenicity in humans and has assigned a Group 2B rating. In addition, the IARC summary concludes, "No significant exposure to titanium dioxide is thought to occur during the use of products in which titanium is bound to other materials, such as paint."

Carbon Black is classified by IARC as possibly carcinogenic to humans (group 2B) based on experimental animal data, however, there is insufficient evidence in humans for its carcinogenicity.

TOXICOLOGY DATA

CAS No.	Ingredient Name			
64742-89-8	V. M. & P. Naphtha	LC50 RAT LD50 RAT	4HR	Not Available Not Available
108-88-3	Toluene	LC50 RAT LD50 RAT	4HR	4000 ppm 5000 mg/kg
100-41-4	Ethylbenzene	LC50 RAT LD50 RAT	4HR	Not Available 3500 mg/kg
1330-20-7	Xylene	LC50 RAT LD50 RAT	4HR	5000 ppm 4300 mg/kg
67-64-1	Acetone	LC50 RAT LD50 RAT	4HR	Not Available 5800 mg/kg
110-19-0	Isobutyl Acetate	LC50 RAT LD50 RAT	4HR	Not Available 13400 mg/kg
108-65-6	1-Methoxy-2-Propanol Acetate	LC50 RAT LD50 RAT	4HR	Not Available 8500 mg/kg
112926-00-8	Amorphous Precipitated Silica	LC50 RAT LD50 RAT	4HR	Not Available 4500 mg/kg
14807-96-6	Talc	LC50 RAT LD50 RAT	4HR	Not Available Not Available
13463-67-7	Titanium Dioxide	LC50 RAT LD50 RAT	4HR	Not Available Not Available
1333-86-4	Carbon Black	LC50 RAT LD50 RAT	4HR	Not Available Not Available

SECTION 12 — ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL INFORMATION**

No data available.

SECTION 13 — DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

SECTION 14 — TRANSPORT INFORMATION

Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (ocean, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport.

US Ground (DOT)

5 Liters (1.3 Gallons) and Less may be Classed as LTD. QTY. OR ORM-D

Larger Containers are Regulated as:

UN1263, PAINT, 3, PG II, (ERG#128)

DOT (Dept of Transportation) Hazardous Substances & Reportable Quantities

Acetone 5000 lb RQ

Ethylbenzene 1000 lb RQ

Toluene 1000 lb RQ

Xylenes (isomers and mixture) 100 lb RQ

Bulk Containers may be Shipped as (check reportable quantities):

RQ, UN1263, PAINT, 3, PG II, (XYLENES (ISOMERS AND MIXTURE)),

(ERG#128)

Canada (TDG)

UN1263, PAINT, CLASS 3, PG II, (ERG#128)

IMO

5 Liters (1.3 Gallons) and Less may be Shipped as Limited Quantity.

UN1263, PAINT, CLASS 3, PG II, (-17 C c.c.), EmS F-E, S-E**IATA/CAO**

UN1263, PAINT, 3, PG II

SECTION 15 — REGULATORY INFORMATION**SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION**

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
108-88-3	Toluene	9	
100-41-4	Ethylbenzene	4	
1330-20-7	Xylene	22	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

SECTION 16 — OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

B50XXW10463-4357
00 01

DATE OF PREPARATION
Dec 21, 2013

SECTION 1 — PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

B50XXW10463-4357

PRODUCT NAME

UNIVERSAL PRIMER, White B50-WZ1

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

Telephone Numbers and Websites

Regulatory Information	(216) 566-2902
Medical Emergency	(216) 566-2917
Transportation Emergency*	(800) 424-9300
<i>*for Chemical Emergency ONLY (spill, leak, fire, exposure, or accident)</i>	

SECTION 2 — COMPOSITION/INFORMATION ON INGREDIENTS

% by Weight	CAS Number	Ingredient	Units	Vapor Pressure
2	108-88-3	Toluene		
		ACGIH TLV	20 PPM	22 mm
		OSHA PEL	100 ppm (Skin)	
		OSHA PEL	150 ppm (Skin) STEL	
1	100-41-4	Ethylbenzene		
		ACGIH TLV	20 PPM	7.1 mm
		OSHA PEL	100 PPM	
		OSHA PEL	125 PPM STEL	
7	1330-20-7	Xylene		
		ACGIH TLV	100 PPM	5.9 mm
		ACGIH TLV	150 PPM STEL	
		OSHA PEL	100 PPM	
		OSHA PEL	150 PPM STEL	
2	64742-95-6	Light Aromatic Hydrocarbons		
		ACGIH TLV	Not Available	3.8 mm
		OSHA PEL	Not Available	
2	95-63-6	1,2,4-Trimethylbenzene		
		ACGIH TLV	25 PPM	2.03 mm
		OSHA PEL	25 PPM	
35	67-64-1	Acetone		
		ACGIH TLV	500 PPM	180 mm
		ACGIH TLV	750 PPM STEL	
		OSHA PEL	1000 PPM	
3	14807-96-6	Talc		
		ACGIH TLV	2 mg/m3 as Resp. Dust	
		OSHA PEL	2 mg/m3 as Resp. Dust	
25	471-34-1	Calcium Carbonate		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	15 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	
7	13463-67-7	Titanium Dioxide		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	

SECTION 3 — HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

Prolonged overexposure to hazardous ingredients in Section 2 may cause adverse chronic effects to the following organs or systems:

- the liver
- the urinary system
- the cardiovascular system
- the reproductive system

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

HMIS Codes

Health	2*
Flammability	3
Reactivity	0

SECTION 4 — FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.

SKIN: Wash affected area thoroughly with soap and water.

Remove contaminated clothing and laundry before re-use.

INHALATION: If affected, remove from exposure. Restore breathing. Keep warm and quiet.

INGESTION: Do not induce vomiting. Get medical attention immediately.

SECTION 5 — FIRE FIGHTING MEASURES**FLASH POINT**

-2 °F TCC

LEL

0.7

UEL

12.8

FLAMMABILITY CLASSIFICATION

RED LABEL -- Extremely Flammable, Flash below 21 °F (-6 °C)

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

SECTION 6 — ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

SECTION 7 — HANDLING AND STORAGE**STORAGE CATEGORY**

DOL Storage Class IB

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Contents are EXTREMELY FLAMMABLE. Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally.

Keep out of the reach of children.

SECTION 8 — EXPOSURE CONTROLS/PERSONAL PROTECTION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m³ (total dust), 3 mg/m³ (respirable fraction), OSHA PEL 15 mg/m³ (total dust), 5 mg/m³ (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	9.62 lb/gal	1153 g/l
SPECIFIC GRAVITY	1.16	
BOILING POINT	132 - 360 °F	55 - 182 °C
MELTING POINT	Not Available	
VOLATILE VOLUME	73%	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	Not Available	
VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)		
	3.28 lb/gal 394 g/l	Less Water and Federally Exempt Solvents
	1.58 lb/gal 190 g/l	Emitted VOC

SECTION 10 — STABILITY AND REACTIVITY

STABILITY — Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

SECTION 11 — TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Ethylbenzene is classified by IARC as possibly carcinogenic to humans (2B) based on inadequate evidence in humans and sufficient evidence in laboratory animals. Lifetime inhalation exposure of rats and mice to high ethylbenzene concentrations resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations. There is no evidence that ethylbenzene causes cancer in humans.

IARC's Monograph No. 93 reports there is sufficient evidence of carcinogenicity in experimental rats exposed to titanium dioxide but inadequate evidence for carcinogenicity in humans and has assigned a Group 2B rating. In addition, the IARC summary concludes, "No significant exposure to titanium dioxide is thought to occur during the use of products in which titanium is bound to other materials, such as paint."

TOXICOLOGY DATA

CAS No.	Ingredient Name			
108-88-3	Toluene	LC50 RAT LD50 RAT	4HR	4000 ppm 5000 mg/kg
100-41-4	Ethylbenzene	LC50 RAT LD50 RAT	4HR	Not Available 3500 mg/kg
1330-20-7	Xylene	LC50 RAT LD50 RAT	4HR	5000 ppm 4300 mg/kg
64742-95-6	Light Aromatic Hydrocarbons	LC50 RAT LD50 RAT	4HR	Not Available Not Available
95-63-6	1,2,4-Trimethylbenzene	LC50 RAT LD50 RAT	4HR	Not Available Not Available
67-64-1	Acetone	LC50 RAT LD50 RAT	4HR	Not Available 5800 mg/kg
14807-96-6	Talc	LC50 RAT LD50 RAT	4HR	Not Available Not Available
471-34-1	Calcium Carbonate	LC50 RAT LD50 RAT	4HR	Not Available Not Available
13463-67-7	Titanium Dioxide	LC50 RAT LD50 RAT	4HR	Not Available Not Available

SECTION 12 — ECOLOGICAL INFORMATION**ECOTOXICOLOGICAL INFORMATION**

No data available.

SECTION 13 — DISPOSAL CONSIDERATIONS**WASTE DISPOSAL METHOD**

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

SECTION 14 — TRANSPORT INFORMATION

Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (ocean, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport.

US Ground (DOT)

5 Liters (1.3 Gallons) and Less may be Classed as LTD. QTY. OR ORM-D

Larger Containers are Regulated as:

UN1263, PAINT, 3, PG II, (ERG#128)

DOT (Dept of Transportation) Hazardous Substances & Reportable Quantities

Acetone 5000 lb RQ

Xylenes (isomers and mixture) 100 lb RQ

Bulk Containers may be Shipped as (check reportable quantities):

RQ, UN1263, PAINT, 3, PG II, (XYLENES (ISOMERS AND MIXTURE)), (ERG#128)

Canada (TDG)

UN1263, PAINT, CLASS 3, PG II, (ERG#128)

IMO

5 Liters (1.3 Gallons) and Less may be Shipped as Limited Quantity.

UN1263, PAINT, CLASS 3, PG II, (-19 C c.c.), EmS F-E, S-E**IATA/ICAO**

UN1263, PAINT, 3, PG II

SECTION 15 — REGULATORY INFORMATION**SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION**

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
108-88-3	Toluene	2	
100-41-4	Ethylbenzene	1	
1330-20-7	Xylene	7	
95-63-6	1,2,4-Trimethylbenzene	2	
	Zinc Compound	1	0.7

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

SECTION 16 — OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

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Material Safety Data Sheet

IDENTIFICATION
Effective Date: January 1, 2013

Manufactured By: Sherwin Williams
6125 W. Douglas Avenue
Milwaukee, WI 53218 1596 USA

24-Hour Emergency Telephone

Domestic US: 1-800-373-7542 International: 1-484-951-2432 Haz Mat Services

Trade Name:

F78XXL13851-4357 2871-0003 PFLOW BLUE PAINT

Mfg. Part Number:

20016 00341 F78XXL13851-4357 2871-0003 PFLOW BLUE PAINT

II. HAZARDOUS INGREDIENTS

CAS #67-64-1 Acetone	Weight %: 20 – 50 Footnote (1)
ACGIH TLV: 500 ppm TWA OSHA PEL: 1000 ppm TWA VAPOR PRESSURE: 185 MM Hg60F	ACGIH STEL: 1000 ppm OSHA CEILING: LEL: 2.6% OSHA PEAK:
CAS #75-28-5 Isobutane	Weight %: 5 - 20
ACGIH TLV: NE OSHA PEL: NE VAPOR PRESSURE: 3.1 atm	ACGIH STEL: OSHA CEILING: LEL: 1.6% OSHA PEAK:
CAS # 74-98-6 Propane	Weight %: 5 -20
ACGIH TLV: 2500 ppm TWA OSHA PEL: 1000 ppm TWA VAPOR PRESSURE: 7150mmHg@20c	ACGIH STEL: OSHA CEILING: LEL: OSHA PEAK:
CAS # 1330-20-7 Xylene	Weight %: 5 – 20 Footnote (1)
ACGIH TLV: 100 ppm TWA OSHA PEL: 100 ppm TWA VAPOR PRESSURE: 6.6mmHg@20c	ACGIH STEL: 150 ppm OSHA CEILING: LEL: 1% OSHA PEAK:
CAS # 100-41-4 Ethyl Benzene	Weight %: 1 - 5
ACGIH TLV: 100 ppm TWA OSHA PEL: 100 ppm TWA VAPOR PRESSURE:	ACGIH STEL: 125 ppm OSHA CEILING: LEL: OSHA PEAK:
CAS # 123-42-2 Diacetone Alcohol	Weight %: 1 - 5 Footnote (1)
ACGIH TLV: 50 ppm TWA OSHA PEL: 50 ppm TWA VAPOR PRESSURE: 1 mm	ACGIH STEL: 75 ppm OSHA CEILING: LEL: 1.8% OSHA PEAK:
CAS #64742-95-6 Aromatic 100	Weight %: 1 - 5 Footnote (1)
ACGIH TLV: OSHA PEL: VAPOR PRESSURE: 2.7 mmHg@20c	ACGIH STEL: OSHA CEILING: LEL: 0.9% OSHA PEAK:

Warning Messages:

- (1) Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Chronic exposure may cause damage to the central nervous system, respiratory system, lung, eye, skin, liver, gastro intestinal tract, spleen, kidneys and blood.
- (2) See Section IX for reportable Hazardous Air Pollutants.

III. PHYSICAL DATA

BOILING RANGE: -43-356 degree Farenheight

EVAPORATION RATE: Propellant: Faster then ether SOLVENT: Slower than ether

PERCENT VOLITILE BY VOLUME: 87.34% WEIGHT PER GALLON: 6.64 LBS.

VAPOR DENSITY: Propellant is lighter than air Solvent is heavier than air

ACTUAL VOC (lb/gal): 3.59

EPA VOC (lb/gal): 4.59

EPA VOC: (g/L): 550.07

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: -156 Degree Farenheight
 - 105 Degree Celsius

LEL: Refer to Section II

FLAMMABILITY CLASSIFICATION: CLASS 1A

HAZARD CLASSIFICATION: FLAMMABLE

CONSUMER COMMIDTY: ORM-D

EXTINGUISHING MEDIA: *carbon dioxide, dry chemical, or fire foam”

UNUSUAL FIRE AND EXPLOSION HAZARDS: With excessive heat, can will rupture from internal pressure and discharge flammable contents. Vapors may ignite explosively. Keep away from heat, sparks and flame. Do not smoke. Extinguish all flames and pilot lights, turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone. Prevent build up of vapors by opening all windows and doors to achieve cross-ventilation.

SPECIAL FIRE FIGHTING PROCEDURES: Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible auto ignition or explosion when exposed to extreme heat.

V. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF OVEREXPOSURE:

Inhalation – Anesthetic

Irritation of the respiratory tract or acute nervous system. Depression caused by headache, dizziness, staggering gait, confusion, unconsciousness, dizziness

Acute – High vapor concentrations are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death. Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

Chronic- Xylene contains ethyl benzene which has been classified as a possible carcinogen to humans, group 2B, by the International Agency for the Research on Cancer (IARC), based on sufficient evidence in laboratory animals but inadequate evidence for cancer in humans. Prolonged or repeated overexposure to ethyl benzene may cause the following: kidney effects, liver effects, lung effects, thyroid effects, testicular effects, pituitary effects.

MEDICAL CONDITIONS PRONE TO AGGRAVATION BY EXPOSURE: consult physician

PRIMARY ROUTE (S) OF ENTRY: Eyes, Ingestion, Skin and Inhalation

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove to fresh air.

EYES: Flush immediately with large amounts of water for at least 15 minutes. Talk to a physician for medical treatment.

SKIN: Wipe off with towel. Wash with soap and water. Remove contaminated clothing.

INGESTION: If swallowed, call a physician immediately. Remove stomach contents by gastric suction or induce vomiting only as directed by medical personnel. Never give anything by mouth to an unconscious person.

HMIS Rating

Health 3, Flammability 4, Physical Hazard 0, Personal Protection G

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks.

VI. Reactivity Data

STABILITY: STABLE

Hazardous Polymerization: *will not occur*

INCOMPATIBILITY: oxidizing agents, halogens, strong reducing agents and strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS: When heated to decomposition, toxic fumes are formed.

CONDITIONS TO AVOID: Fire, burning, and welding

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Remove all sources of ignition (flames, hot surfaces and electrical, static or frictional sparks). Avoid breathing vapors. Ventilate area. Use non-sparking tools. Remove with inert absorbent.

WASTE DISPOSAL METHOD: Dispose of in accordance with local, state, and federal regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: For casual use none required. To avoid breathing vapors or spray mist, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches or dizziness, increase fresh air or wear respiratory protection (NIOSH/MSHA approved) or leave the area. Avoid contact with eyes, skin and clothing.

VENTILATION: Provide general dilution or local exhaust ventilation in volume and pattern to keep TLV and LEL of most hazardous ingredients in Section II, below acceptable limits.

PROTECTIVE GLOVES: Permeation resistant gloves (butyl rubber, nitrile rubber) should be used. Cover as much of the exposed skin area as possible with appropriate clothing.

EYE PROTECTION: Splash proof eye and goggles. In emergency situations, use eye goggles with a full-face shield.

OTHER PROTECTIVE EQUIPMENT: Protective clothing such as coveralls or lab coats must be worn

HYGENIC PRACTICES: See section V

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Do not store above 120 degrees F. Store large quantities in buildings designed and protected for storage of NFPA Class 1A flammable liquids.

OTHER PRECAUTIONS: Do not spray in eyes. Do not puncture or incinerate cans. Do not stick a pin or any sharp objects into opening of can. Finger must not protrude over spray button.

LIST OF HAZARDOUS AIR POLLUTANTS SUBJECT TO THE PROVISIONS OF THE CLEAN AIR ACT, TITLE I SECTION 112 'National Emission Standards for Hazardous Air Pollutants':

Ingredient	CAS#	Wt% of HAPS In product	Pounds HAPS/ Gal product
Xylene	1330-20-7	15.0 %	1.0
Ethyl Benzene	100-41-4	3.4 %	0.2

X. STABILITY & REACTIVITY

Not available at this time

XI. TOXICOLOGICAL INFORMATION

No information available at this time

XII. ECOLOGICAL INFORMATION

No information available at this time.

XIII. DISPOSAL INFORMATION

Disposal should be made in accordance with local, state and federal regulations.

XIV. TRANSPORTATION INFORMATION

US Department of Transportation

Proper shipping name: Aerosols Flammable

UN ID Number: UN1950

International Air Transport Association

Proper Shipping name: Aerosols, Flammable

Hazardous Class: 2.1

UN ID Number: UN1950

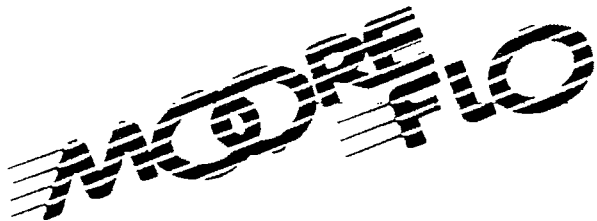
International Maritime Organization

Proper Shipping name: Aerosols, Flammable

Hazardous Class: 2

UN ID Number: UN1950

Please consult 49CFR to ensure that shipments comply with regulations. Exceptions may be applied and can be found in 49CFR subchapter C.



HYDRAULIC OIL AW

MOORE FLO HYDRAULIC OIL AW is formulated for use in industrial and mobile equipment hydraulic systems. It exceeds the requirements of hydraulic equipment manufacturers such as Cincinnati Milacron P68, P69, P70; Denison HF-1, HF-2, HF-0, Vickers 35VQ25, Sperry Vickers 1-286-S, and Ford M6C32.

MOORE FLO FEATURES

- . Contains a premium anti-wear additive.
- . Includes a demulsifying additive to separate water rapidly.
- . Combats rust corrosion and oxidation.
- . Contains zinc-type anti-wear agents to help minimize wear in high-speed, high-pressure vane, gear and piston pumps.
- . Remains stable even when exposed to moisture or extreme temperatures.
- . Contains anti-foam agents for controlled release of entrained air.
- . Compatible with common filter media.

BENEFITS

- . Prolongs hydraulic system life.
- . Reduces maintenance costs.
- . Available in five grades to meet requirements for most hydraulic systems.

TYPICAL PROPERTIES

ISO GRADE

	32	46	68
Density, kgfm ³ @ 15oc	865	868	870
Kinematic Viscosity (D445)			
eSt@ 40°C	33	46	70
@ 100°C	5.2	6.4	8.2
Viscosity Index (D2270)	95	95	95
Flash Point (COG), oc	190	200	214
Pour Point, °C	-36	-33	-30
Color (ASTM)	2.5	3.0	3.5
Vickers 35VQ25	Pass	Pass	Pass
Denison HF-0	Pass	Pass	Pass
Rust Protection			
Distilled Water	Pass	Pass	Pass
Syn. Sea Water	Pass	Pass	Pass
Oxidation, (D943), hr	2100+	2100+	2100+
Demulsibility (D1401)			
oil/water/cuff (minutes)		40/37/3(20)	
Copper Corrosion (D130)	1	1	

HOMAN AW HYDRAULIC OILS

DESCRIPTION

Homan AW Hydraulic Oils contain the latest thermally stable zinc antiwear additive system. They are non-foaming and provide superior protection against rust and oxidation. Their temperature performance is excellent.

BENEFITS

Homan AW Hydraulic Oils will provide long-term, trouble-free service in high output hydraulic systems operating at high temperatures, pressures, and speeds.

APPLICATIONS

Homan AW Hydraulic Oils may be used in general purpose lubricant applications where straight mineral oils and conventional rust and oxidation inhibited oils are recommended.

Properties	Typical Values				
ISO GRADE	32	46	68	100	150
API Gravity	31.4	30.2	29.8	29.4	28.4
Flash Point, 0°F	403	420	450	490	478
Viscosity, eSt @ 1000	5.35	6.54	8.35	11.8	14.4
Viscosity, SUS @ 210°F	44.2	48.1	54.3	64.4	77.1
Viscosity, eSt @ 40°C	32.2	44.4	65.2	101	149
Viscosity, SUS @ 100°F	164	227	338	526	782
Viscosity Index	98	97	96	95	94
Color, ASTM	1.0	1.0	3.0	3.0	3.5
Pour Point, 0°F	-25	-30	-15	-10	-5

Homan AW Hydraulic Oils exceed the following requirements:

Cincinnati Milacron Specifications: P-68, P-70, and P-69

Denison Requirement: HF-0

Vickers Requirements: 1-286-S Data Sheet & M2950-S

spec132

MOORE OIL COMPANY, INC.

4033 W. CUSTER AVENUE
MILWAUKEE, WI 53209-9247

MATERIAL SAFETY DATA SHEET NUMBER 122

IDENTITY: HOMAN AW32 HYDRAULIC

SECTION I

MANUFACTURER NAME: Homan Corporation
ADDRESS: 3650 South Homan Avenue
Chicago, Illinois 60632

TELEPHONE NUMBER: (773) 523-0250
EMERGENCY NUMBER: Chemtrac 24 Hours (800) 424-9300

DATE PREPARED: JANUARY 7, 2001

SECTION II-HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS: Not applicable for this product.

National Fire Protection Association (NFPA) - Hazard Identification

Health	<u>Flammability</u>	Reactivity	Basis
1	1	0	Recommended Homan Corp.

SECTION 111-PHYSICAUCHEMICAL CHARACTERISTICS

BOILING POINT: IBP Approximately 555 F

SPECIFIC GRAVITY (H2O-1): 0.87-0.88

VAPOR PRESSURE (mm Hg): Less than 0.1 mm @ 20 C

MELTING POINT: Pour Point approximately -36°C

VAPOR DENSITY (AIR-1): Greater than 5

N: 15713-0020

MSD 122

msd122

EVAPORATION RATE: (Butyl Acetate=1) Less than 0.01

SOLUBILITY IN WATER: Negligible; less than 0.1% @ 1 atmosphere and 25 C

APPEARANCE AND ODOR: Light yellow liquid nil to bland odor

SECTION IV-FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 410° F Cleveland Open Cup

FLAMMABLE LIMITS: Estimated Values LEL: 0.7% UEL: 7.0%

EXTINGUISHING MEDIA: Foam water spray (fog), dry chemical carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES: Use water spray, dry chemical foam or carbon dioxide. Use water to keep fire-exposed containers cool.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Treat as a petroleum oil fire.

SECTION V-REACTIVITY DATA

STABILITY: _____ Unstable _____X_____ Stable

Conditions to Avoid:

INCOMPATIBILITY: Strong Oxidizing agents-liquid Chlorine, Concentrated oxygen, Sodium & Calcium Hypochlorites.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Combustion may yield fumes, smoke, oxides of sulfur & nitrogen carbon monoxide & HCl.

HAZARDOUS POLYMERIZATION: _____ May Occur _____X_____ Will Not Occur

Conditions to Avoid:

SECTION VI-HEALTH HAZARD DATA

HEALTH HAZARDS (ACUTE OR CHRONIC): Minimal Toxicity.

MSD122

MSD122

ROUTES OF ENTRY/SIGNS AND SYMPTOMS:

EYE CONTACT: May cause slight irritation but does not cause permanent damage.

SKIN CONTACT: Contact with hot material may cause thermal burns.

INHALATION: Exposure to high oil mist concentrations may lead to oil pneumonia.

INGESTION: May cause nausea and vomiting. May act as a laxative. May irritate gastrointestinal tract. Does not cause permanent damage.

CARCINOGENICITY: Non-carcinogenic

WTP?:

IARC MONOGRAPHS?:

OSHA REGULATED?:

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None Known

SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TAKEN FOR RELEASE OR SPILL OF MATERIAL: Contain spill, absorb, pump or wipe up. Remove remainder with solvent or detergent and water. Keep out of sewers and waterways.

WASTE DISPOSAL METHOD: May be given to an approved waste hauler. Observe local, state, and federal regulations for disposal of petroleum lubricant.

PRECAUTIONS IN HANDLING AND STORING: Do not store near heat, sparks, flame or strong oxidants.

OTHER PRECAUTIONS: If misting occurs, control of exposures to 5 mg/m³ or less is recommended.

SECTION VIII-CONTROL MEASURES

RESPIRATORY PROTECTION: Use supplied-air protection in confined or enclosed spaces, if needed.

N: 15713-0020

MSD 122

MSD122

VENTILATION:

LOCAL EXHAUST: Use to capture vapor/mist if necessary.

SPECIAL: No smoking or open lights.

MECHANICAL: Use in confined areas.

OTHER: Use explosion-proof machinery.

PROTECTIVE GLOVES: Use chemical-resistant gloves.

EYE PROTECTION: Use splash goggles or face shield.

PROTECTIVE CLOTHING OR EQUIPMENT: Use chemical-resistant apron or impervious clothing.

WORK/HYGIENIC PRACTICES: Minimize breathing mists. Practice good personal hygiene.