

# PFLOW VERTICAL LIFTS

The Nation's Largest Manufacturer of Vertical Lifts

**PFlow**  
Industries, Inc.

## INSTALLATION INSTRUCTIONS

### SERIES 21



13871-021S

READ THIS MANUAL IN ITS ENTIRETY AND  
VERIFY JOB SITE DIMENSIONS AGAINST  
GENERAL ARRANGEMENT DRAWING  
BEFORE STARTING INSTALLATION

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

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## 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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B139	Sliding Gate	-

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Bulletin # / Drawing #	Description	Rev.
B284	Gate Cable Interlock Installation Instructions	-
B263	Anderson Interlock	-
B264	Anderson Cable Interlock	-

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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). 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. Call Pflow Industries for more information in the event an inspection is required for your equipment.

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 this manual. Prior authorization must be obtained from Pflow before commencing work of any kind.

**Feedback** - Let us know how we are doing. Each installation manual contains a questionnaire. Please fill it out and return it to us. We can't prevent a problem if we are not aware of it.

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# 21 Series

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## 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 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.**

# Equipment Arrival and Unpacking

## EQUIPMENT ARRIVAL AND UNPACKING

You will need a fork truck capable of lifting approximately 2,000 lbs. Larger units may require a higher lifting capacity fork truck. To ensure complete shipments, Pflow Industries takes pictures of the unit, contents of the parts crate, and individual boxes. See Figures 1-3.

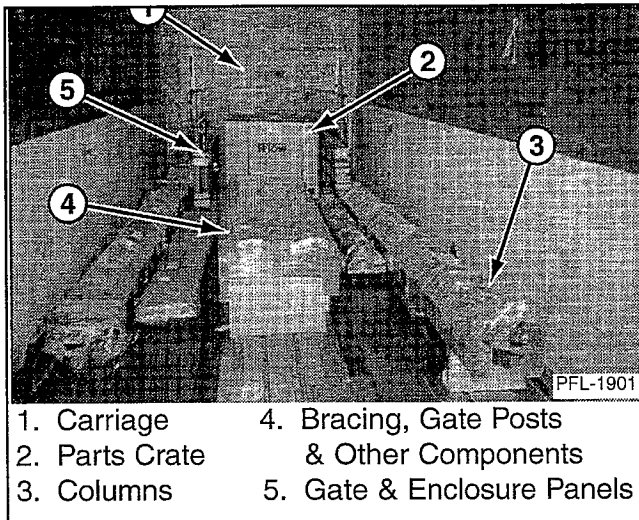


Figure 1

### NOTE

*The material in the boxes, cartons, etc. was loaded complete, in good condition and so delivered to the carrier agent.*

Verify that the number of items on the Bill of Lading agrees with the number of items delivered to you. Check all pieces to determine if damage has occurred during transit. The carrier agent is responsible for, and should be notified immediately of, any visible loss or damage that has occurred. If damaged, the shipment must be signed for as such. Where loss or damage appears, call on the carrier agent to inspect the shipment before unloading it and make notation of condition of contents on freight bill. A claim for loss or damage should be presented to the carrier agent without delay, and a complete statement of facts should be in your possession. All hidden damage must be reported directly to the freight carrier within seven days of delivery. Pflow Industries is not responsible for shipping / receiving damage once the equipment has left the factory nor will we file any claims for damage that may occur.

If you believe anything is missing, contact our Product Support Department immediately. Failure to notify us may affect completion time of the installation. Our warranty does not cover lost time and/or additional trips for missing or damaged components.

All replacement components or labor that may be needed as a result of any damage will require a purchase order and compliance with our RGA procedures. This number should be obtained from Pflow Industries.

Figure 2 shows the typical contents of the parts crate.

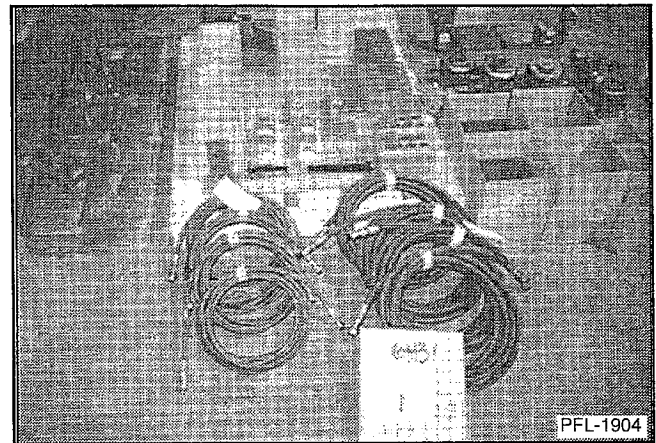


Figure 2

The shipping packet can be found inside the parts crate. This packet contains the owner's manual, installation instructions, general arrangement drawing, a copy of the schematic, and additional information as may be applicable to the installation.

An additional copy of the schematic can be found inside the control panel. See Figure 3.

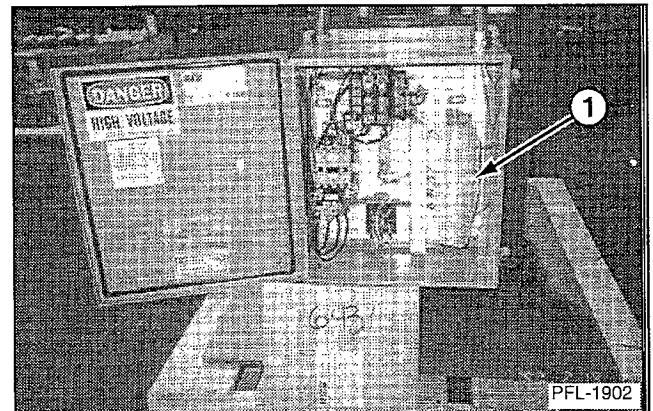


Figure 3

## PRE-INSTALLATION CHECKLIST

Site conditions can mean the difference between an installation that is smooth and one that is difficult.

We have provided a general checklist to help set up your installation. We recommend that the installer, or someone with installation experience, discuss not only these items but all other concerns directly with the people on site.

A pre-installation visit is always recommended and considered to be included in the responsibilities of the mechanical installer.

### **WARNING**

**Safety should always be first and foremost in your mind on this or any job. Besides following safe working procedures, items required by OSHA may include: a hard hat, safety shoes, safety glasses and belt, fire extinguisher, and other safety equipment.**

### **Mechanical Installer Responsibilities**

- Complete mechanical erection of the equipment as sold by Pflow, called out on the general arrangement (GA) drawing and in accordance with all instructions within this installation manual.
- Return trip upon completion of the electrical installation for final checkout, adjustments and training. (See Completion Checklist.)
- On non-union sites, mounting of all electrical devices.

### **Customer Responsibilities**

- Unloading and transportation of the equipment to the installation area.
- Storage (if applicable). If unit is stored indoors or long-term storage is required, consult Pflow Industries for storage procedures required to keep warranty in effect.
- All necessary site work to prepare for the installation such as pit, floor opening, adequate bracing locations, and shaftway openings.
- Any site/building modifications necessary to get the equipment to the installation area.

- Adequate pick point or lifting mechanism capable of lifting the heaviest load. If weight of load is in question, please call Pflow Industries.

If you have any questions or concerns, please contact our Product Support Department prior to start of work.

- \_\_\_ Can the equipment pass through all doorways, hallways, etc.?
- \_\_\_ Can you use the customer's fork truck? Is the truck's capacity sufficient?
- \_\_\_ Are safety meetings required?
- \_\_\_ Are there any work procedure/safety guidelines particular to the job site?
- \_\_\_ Is welding permitted? Is a "hot permit" required? Is a fire watch required?
- \_\_\_ Is there a pick point capable of lifting the necessary components?
- \_\_\_ What hours are you allowed to work on site?
- \_\_\_ Who is the authorized site contact?
- \_\_\_ Is this a union or non-union site?
- \_\_\_ Bracing requirements - Will additional materials be required?
- \_\_\_ Is temporary power available within 10 ft. of the unit?
- \_\_\_ Do you have a well-lit area to work in?
- \_\_\_ Is the installation area ready (pit complete, floor opening cut and/or finished, etc.)?
- \_\_\_ Are shaftway openings complete?
- \_\_\_ Are there any discrepancies between the site dimensions/application and the Pflow GA drawings? Has this information been provided to Pflow?
- \_\_\_ Will customer doors and/or shaftway openings be completed prior to your arrival?
- \_\_\_ Will other trades or in-plant production cause conflict with your proposed work schedule?
- \_\_\_ Special welding requirements if you have special coatings, i.e., epoxy paint, hot galvanized, etc.

## SITE VS. GENERAL ARRANGEMENT

### Comparison Check

1. Check your shipment to make sure that nothing is damaged or missing. Missing components must be reported to Pflow Industries immediately per instructions in the introduction of this manual.
2. The shipping packet found inside the parts crate contains a copy of the general arrangement drawing. See Figure 4.
3. Compare the dimensions as called out on the general arrangement drawing to actual site conditions. Report any discrepancies to Pflow immediately. The following are just a few of the dimensions that could be a problem if they do not match:

Pit Length  
Pit Width  
Pit Depth  
Is Pit Square?  
Overhead Clearance

Gate Clearance - Level 1

Gate Clearance - Level 2

Are there any protrusions from the floor level or wall that could interfere with either the installation or operation?

Floor-to-Floor Clearance - Upper Level

Floor Opening - Length

Floor Opening - Width

Is Floor Opening Square?

Is the Floor Opening Properly Aligned Above the Pit?

### CAUTION

**Discrepancies between the general arrangement drawing and site conditions must be addressed immediately. Contact the Product Support Department (414) 352-9000 for assistance.**

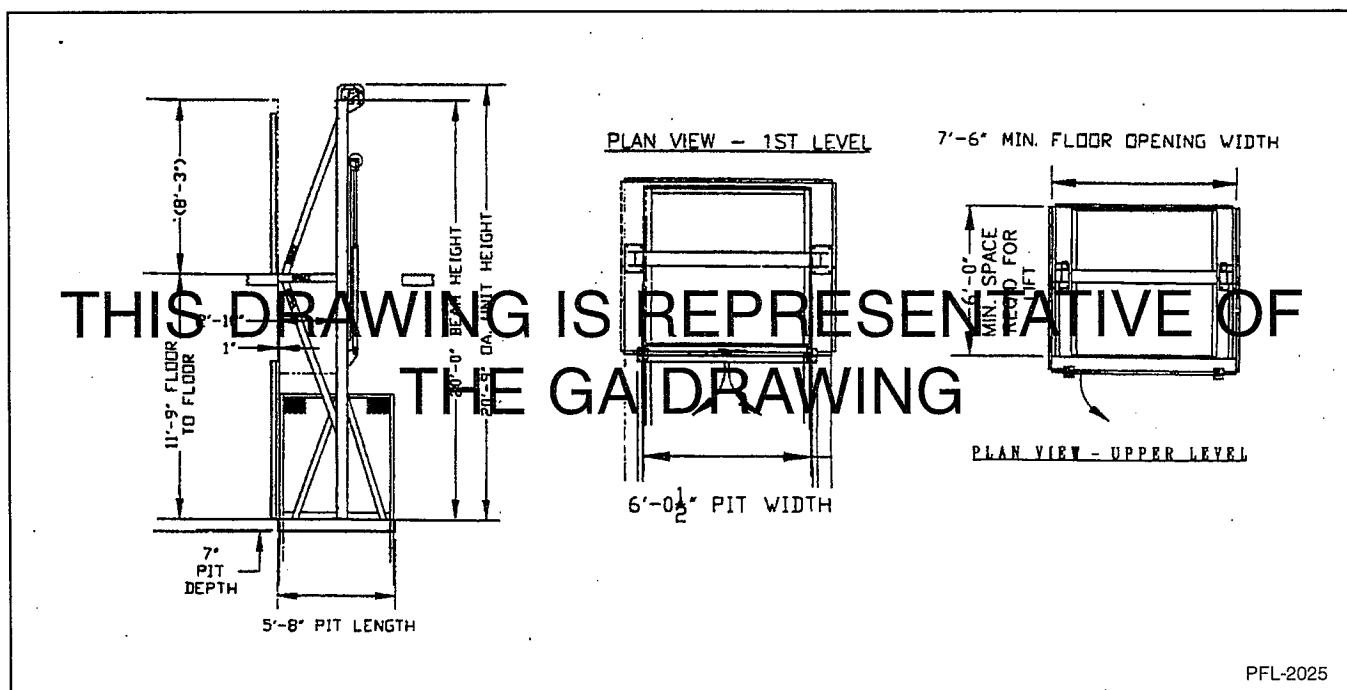


Figure 4

### NOTE

*The model and dimensions shown in Figure 4 are not applicable to your unit. This drawing is for illustrative purposes only.*

## 21 Series

### TOOLS REQUIRED FOR VRC INSTALLATION

The following is a list of tools we feel are necessary to install a VRC in a professional and expedient manner. This is only a guideline. Individual sites and applications may require additional items as needed. If you have any questions regarding these items, contact Pflow Industries.

Welding machine and equipment. (i.e., helmet, gloves, rods, etc.)	Socket set - 1/2" drive, sockets to 1-1/8"
Cutting torch with tanks	Hammer drill and bits for 1/4", 3/8", and 1/2" anchors, 4" min.
Fire extinguisher	Hack saw, reciprocating saw, or portable band saw
Forklift - 2,000# capacity or alternative	Drill and drill bits
Chain fall - 2,000# capacity minimum	Extension cords
Come-A-Long	Portable light
Cables or hook chains with 1,000# or greater capacity	Sledge hammer
Disk grinder	Allen wrenches to 3/8"
"C" clamps	Open or box end wrenches to 1-1/4"
Drift punch	Chalk line
5/8"-11 N.C. tap	Plumb bobs
Carpenter's square	Grease gun
4' Level	25' Measuring tape
SAE 30W non-detergent motor oil	Rags



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## INSTALLATION INSTRUCTIONS

### Unit Placement

1. The load/unload edges of the carriage should be 1" away from the edge of the upper floor level; and if there is a pit, the same dimensions apply (unless otherwise noted on GA). See Figure 1.

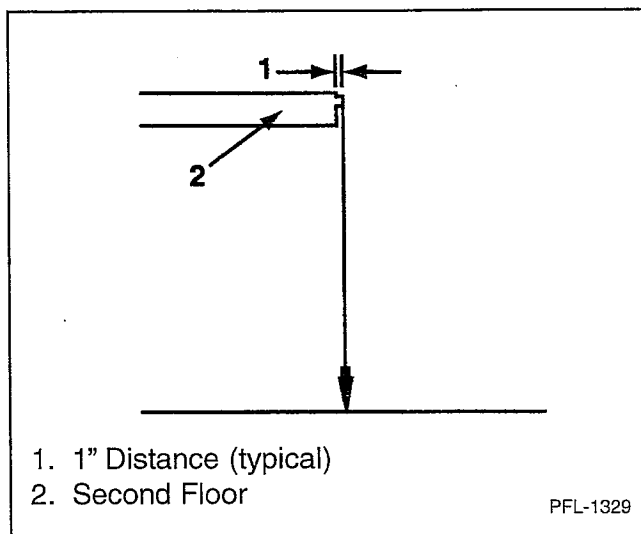


Figure 1

2. To verify this location on the lower level, drop a plumb bob 1" away from the edge and mark that point on the lower floor. Do this for each load/unload side.

### CAUTION

If there are any protrusions (from floor, wall, etc.), they will have to be removed. Plumb lines have to be positioned beyond the protrusion or the carriage WILL NOT clear after installation. Floor may have to be extended to get the proper distance from floor to carriage.

3. Mark the center of the opening. See Figure 2.
4. Drop a plumb bob from point A and mark point B. See Figure 3.
5. Drop a plumb bob and mark points C and D. See Figures 4, 5, and 6

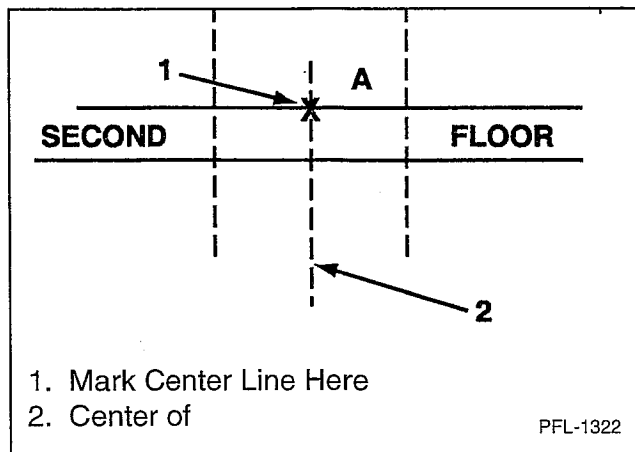


Figure 2

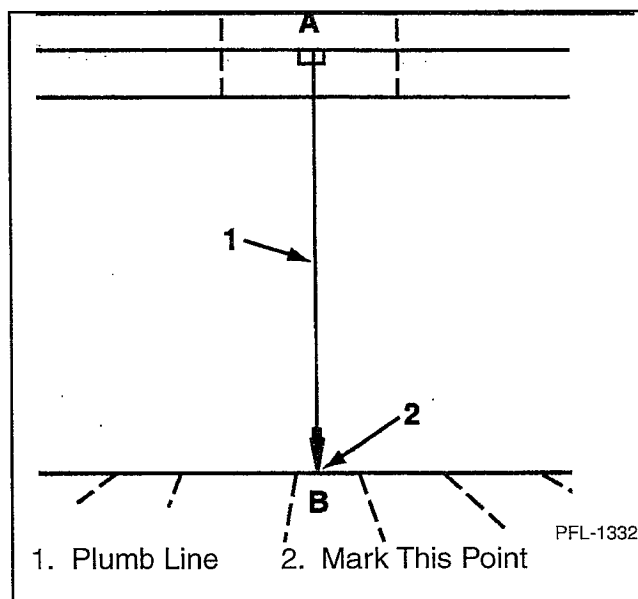


Figure 3

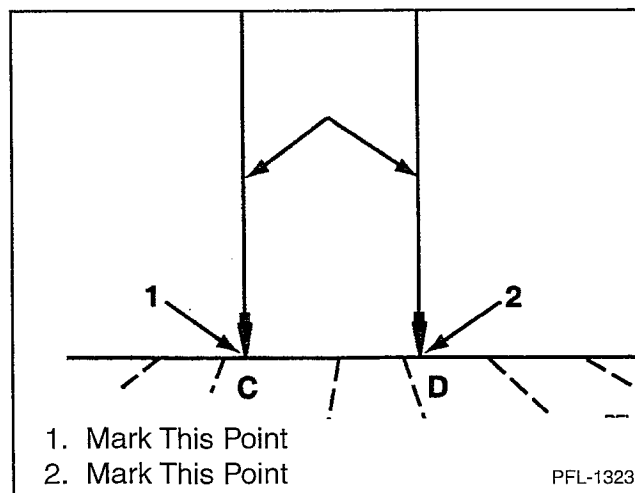
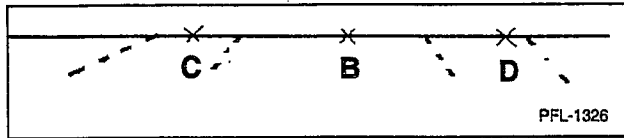


Figure 4

# Installation Instructions

6. Locate three (3) marks C, B, and D. See Figure 5.



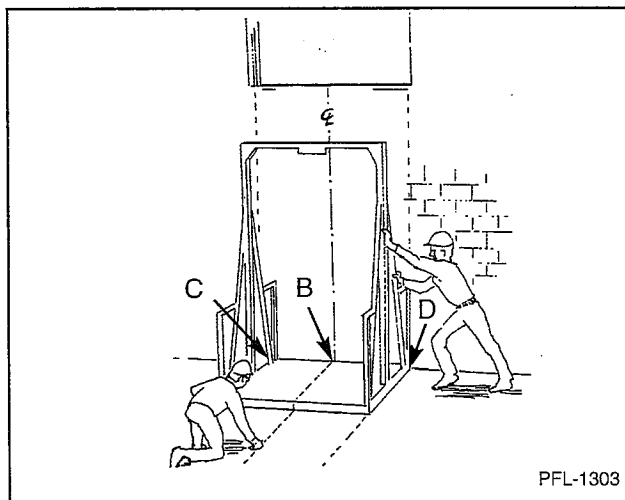
**Figure 5**

7. Snap a chalk line between marks C and D and through mark B.
8. Align rear of the carriage with line C, B, and D. See Figure 6. See GA drawing for orientation of carriage.

## NOTE

*If carriage goes through a floor and clearances are tight, you might want to position the carriage AFTER the columns have been assembled and raised into place.*

*In some applications with taller units, spliced columns, restricted shaftways, etc., it may be necessary to raise the columns before positioning the carriage.*



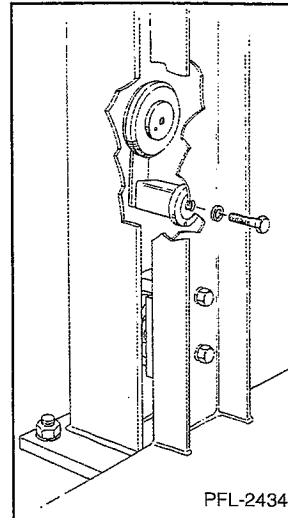
**Figure 6**

## Wheelblocks

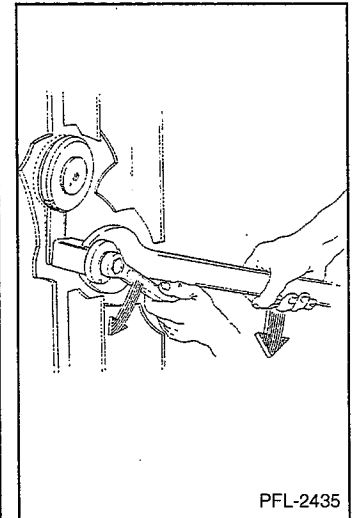
### NOTE

*If you have green tensioner wheels, install them now. See Figure 7.*

*After all wheelblocks are installed, tension wheels against columns to prevent carriage from rocking. Tighten mounting bolts securely. See Figure 7A.*



**Figure 7**

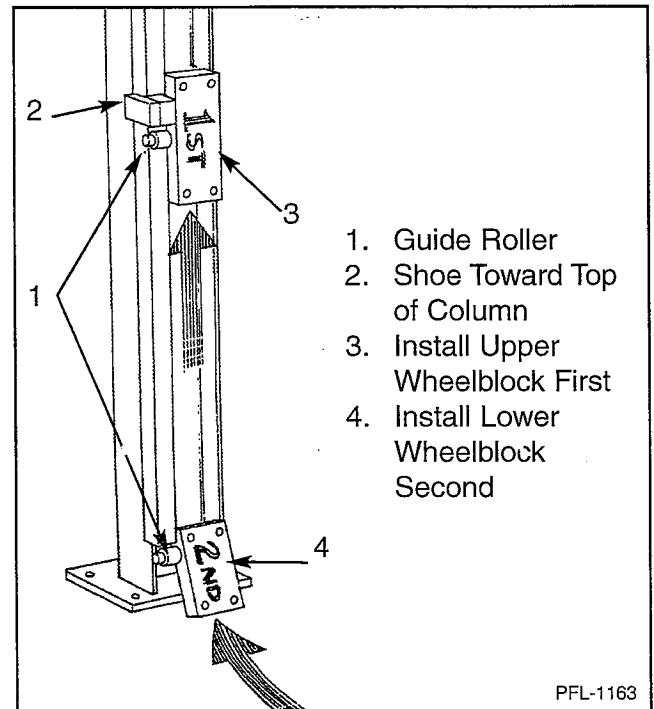


**Figure 7A**

1. Remove all 5/8" hex head screws from the four wheelblocks. Insert wheelblocks in the columns through the notch in the guide angle at the base of the beam. The upper wheelblocks are longer and are installed with the shoe toward the top of the column. Insert lower wheelblock after upper wheelblock has been inserted. See Figure 7B.

## NOTE

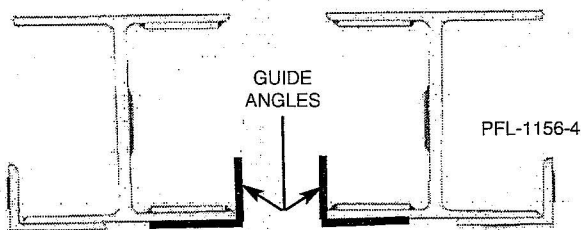
*Wheelblocks may have to be partially disassembled for insertion into columns (removal of outside guide roller and shoe on upper wheelblock.)*



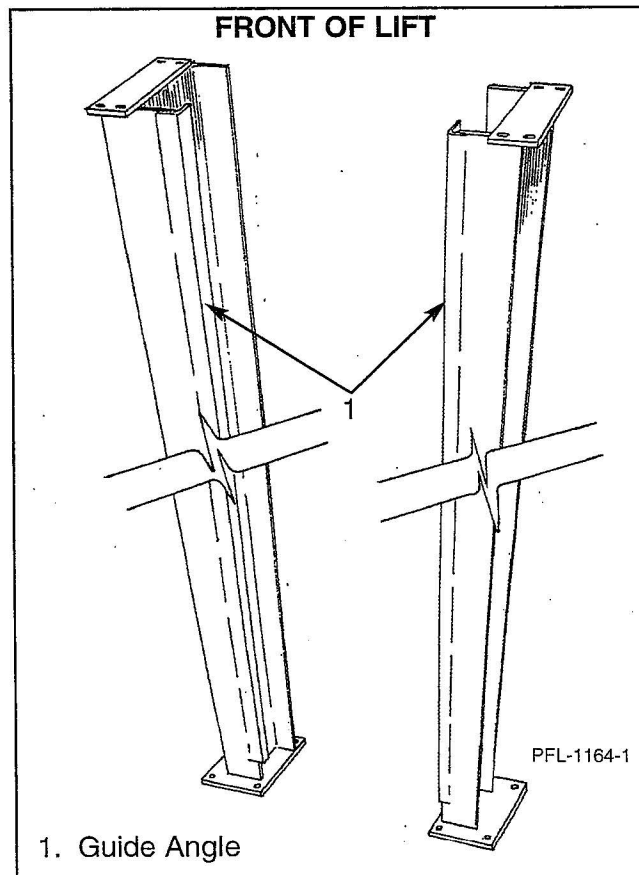
# 21 Series

## Columns

1. Each column must be correctly installed. There is only one right way. The front of the lift for orientation is as follows: The face of the column with the guide angle to the inside of the column should be positioned toward the front of the lift.



**FRONT OF LIFT  
STRADDLE CONFIGURATION**  
(If Cantilever configuration -  
See Service Bulletin 15709-0027  
Cantilever Guidelines)



**Figure 8**

### NOTE

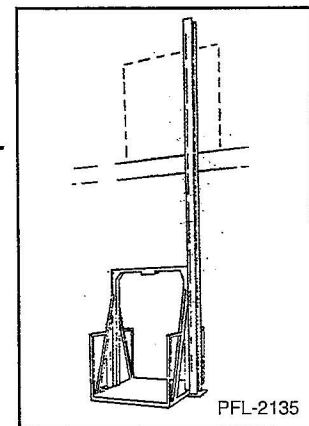
*If your VRC has spliced columns, refer to Bulletin 163-1 to 3, Spliced Column Assembly, NOW. If columns are not spliced, proceed to #2 and continue installation of the VRC.*

### NOTE

*In some applications with taller units, spliced beams, restricted shaftways, etc., it may be necessary to raise the beams before positioning the carriage.*

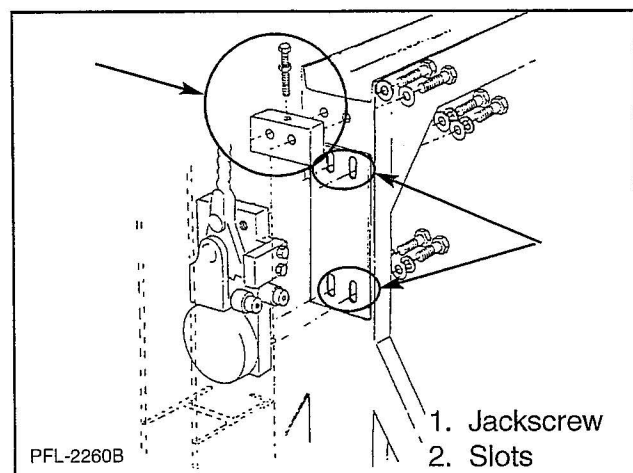
2. Raise right hand column into position. See Figure 9.

**CAUTION**  
*Do not use the carriage and wheel-blocks to support columns!*



**Figure 9**

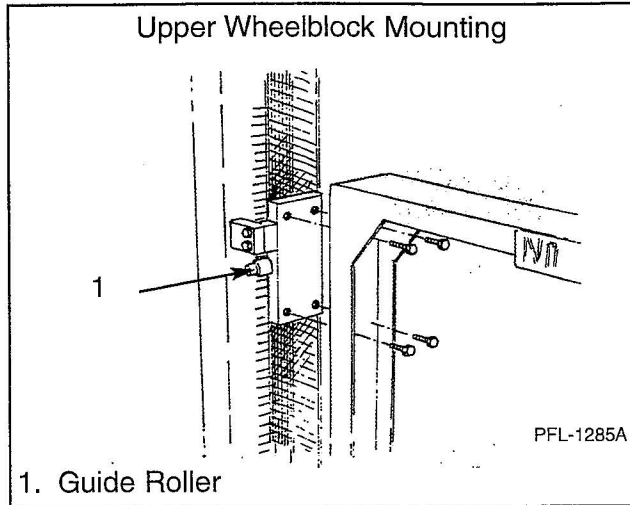
Upper wheelblock should be installed at the middle of the slots in the upright. Install jackscrew above upper wheelblock on side of carriage that has slots in the upright. See Figure 10.



**Figure 10**

# Installation Instructions

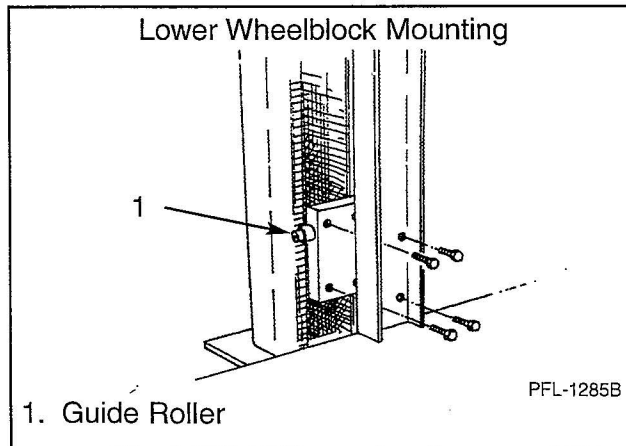
- Slide column alongside carriage so that the wheelblocks align with mounting holes. Bolt the carriage to the upper and lower wheelblocks using the screws previously removed. Make sure column is secured to the carriage. See Figures 11 and 12.



**Figure 11**

## NOTE

*Safety cams need to be held in the disengaged position to ease alignment and assembly.*

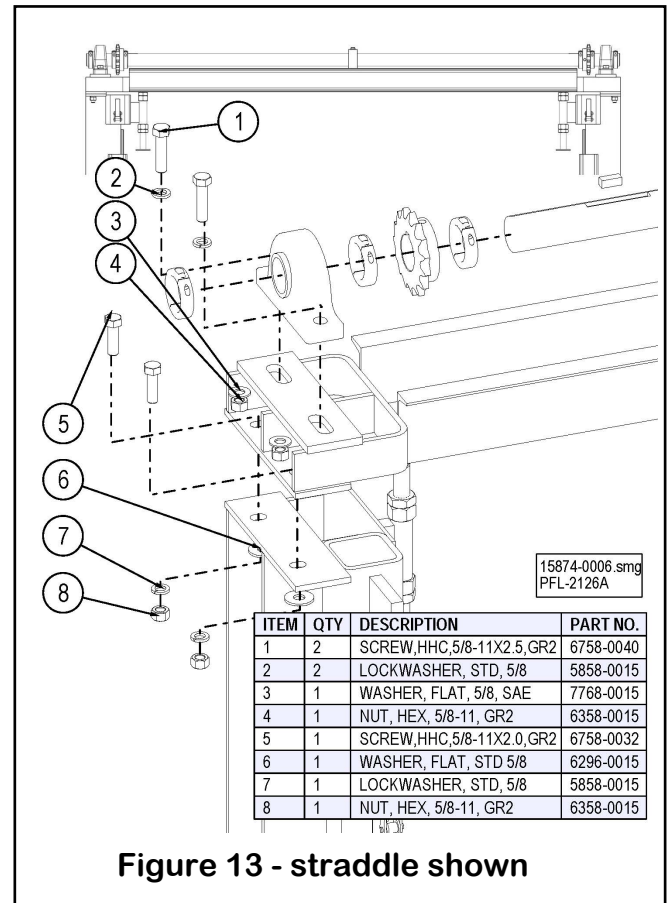


**Figure 12**

## NOTE

*Running a tap through all the threaded holes in the wheelblocks to clean them out should make bolting the wheelblock to the carriage much easier.*

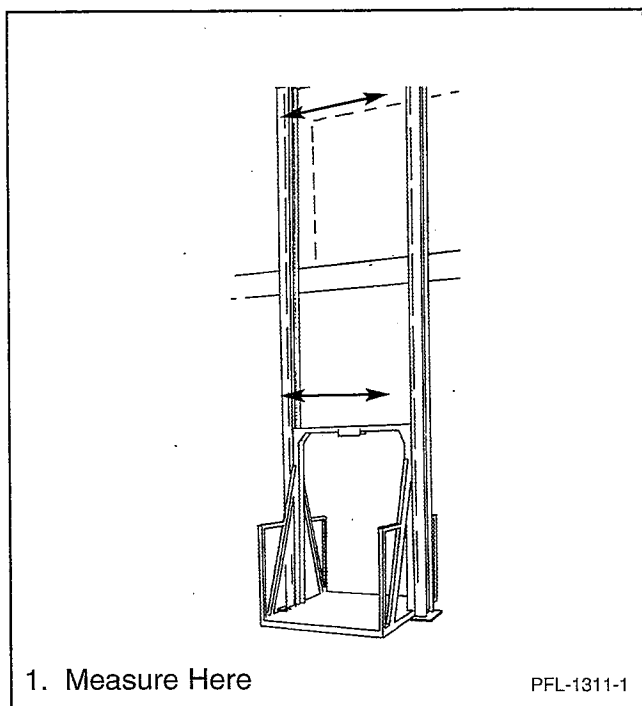
- Raise the left column. Follow the same procedures as outlined in Steps 2 and 3 to install the left beam.
- Raise the header assembly and place it into position on the mounting pads at the top of each column.
- Install bolts as illustrated. Snug bolts down. Tighten enough to allow for adjustment. See Figure 13.



**Figure 13 - straddle shown**

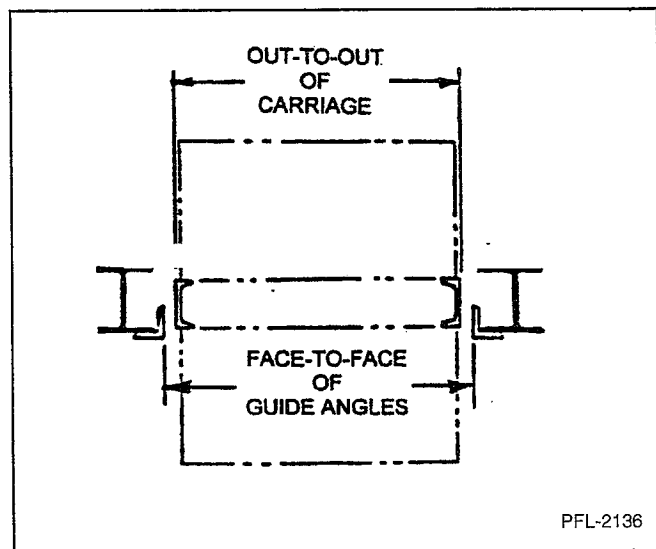
- Alignment of the main columns is important. It is most easily accomplished as follows:

Take the guide angle-to-guide angle dimension off of the general arrangement drawing. Verify by measuring the out-to-out dimension of the carriage uprights including shims, if applicable, plus 2 5/8". If your dimensions vary more than 1/8", contact the factory. See Figures 14 and 15.



**Figure 14**

8. Another way of setting the spacing of the columns is to tape a 1/8" shim onto the guide angle and move the lower guide roller tight to the 1/8" shim.

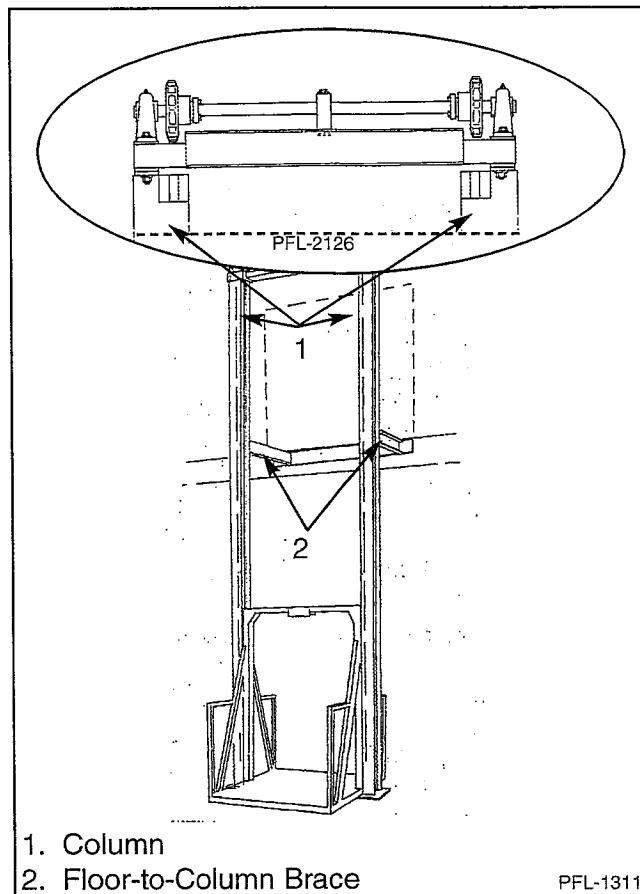


**Figure 15**

9. Plumb left column. Recheck spacing and lag or tack weld left floor-to-column brace. Make sure braces clear decklock arms, cylinder travel, etc. See Figure 16.

**NOTE**

*Make sure there is no column twist.*



**Figure 16**

10. Recheck left column to make sure it is plumb and anchor to floor.
11. Plumb right column. Recheck spacing and lag or tack weld right floor-to-column brace. Be sure that horizontal braces are parallel to each other and level.

**NOTE**

*Again, make sure you do not allow column to twist.*

12. Recheck right column and anchor to floor if column is plumb. Recheck dimensions before fully welding column braces.
13. Add side bracing as necessary. See Figure 17.

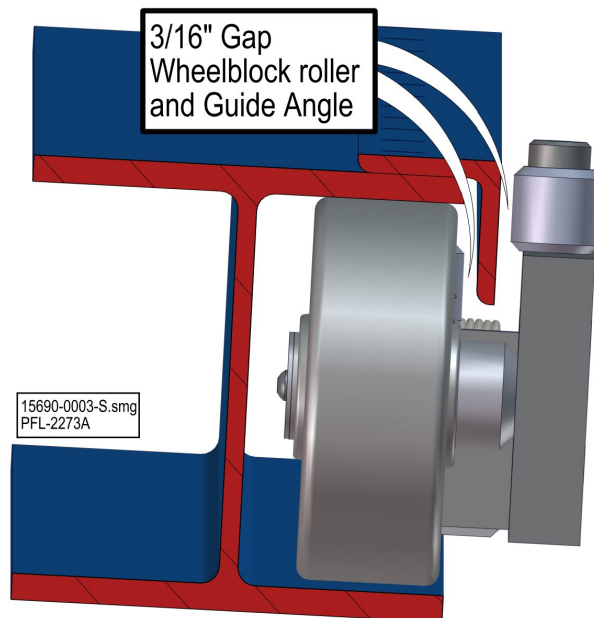
**NOTE**

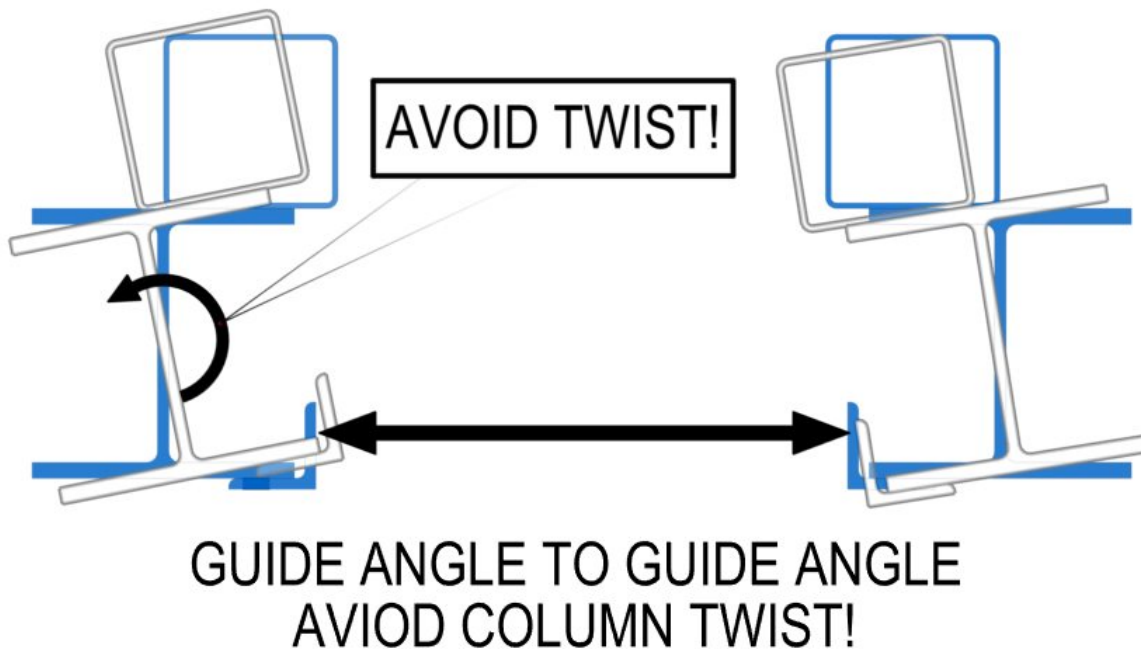
*Columns should be supported in at least two directions which are perpendicular (90 degrees) to each other.*

## SETTING WHEELBLOCKS - GUIDE ANGLE

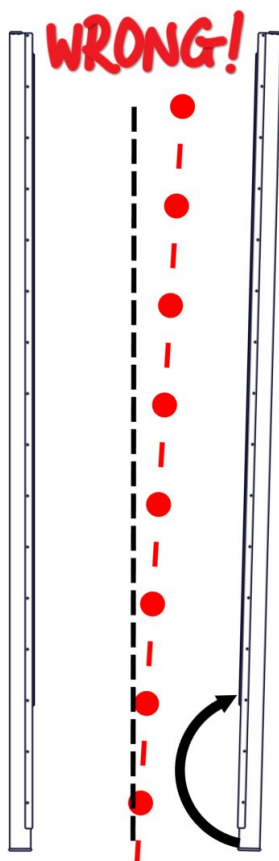
In aligning the guide angle to guide angle (see PFlow Industries, Inc. General Arrangement drawing) verify the 3/16" (+/- 1/16") gap between wheelblock roller and the guide angle. Too large or small and the carriage will "bind" on the guide angles.

If the guide angle to guide angle is different than the dimension shown on the general arrangement drawing, add or remove a shim.





10527-2800-S.SMG  
PFL-1156-5



15027-2800-S.smg  
PFL-1156-6

WRONG COLUMN ALIGNMENT  
OUT-OF-PLUMB

### IMPORTANT !



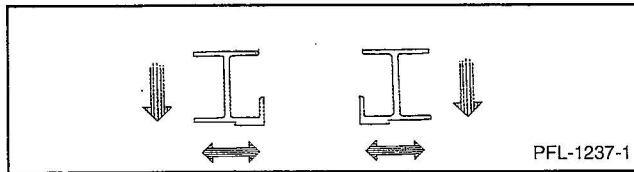
Column alignment is critical for proper carriage travel. Alignment between the column guide column angles must be checked during and after column installation.

VERIFY that the guide angles are parrallel and aligned between each other. Column twist needs to be avoided.

If there are field installation concern contact PFlow Industries, Inc. Service department.

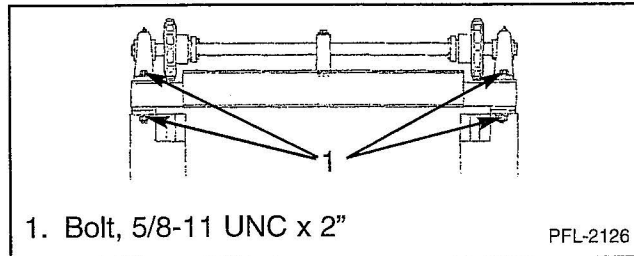


# Installation Instructions



**Figure 17**

14. Tighten bolts on header assembly. See Figure 18.



**Figure 18**

## Header/Chain Installation

1. Remove chain from parts crate and assemble into two equal lengths. Attach one length of chain to each wheelblock as shown. You should be able to do this without removing the wheelblock. See Figure 19.

You may have to remove plugs from the cylinder ports to extend the rod. Assemble the chain as shown in Figure 19. Check header sprocket alignment with cylinder rod. Adjust if needed.

### NOTE - ATTENTION INSTALLERS!

Your Pflow Industries, Inc. hydraulic vertical conveyor includes two extra small pieces of chain that can be added if needed.

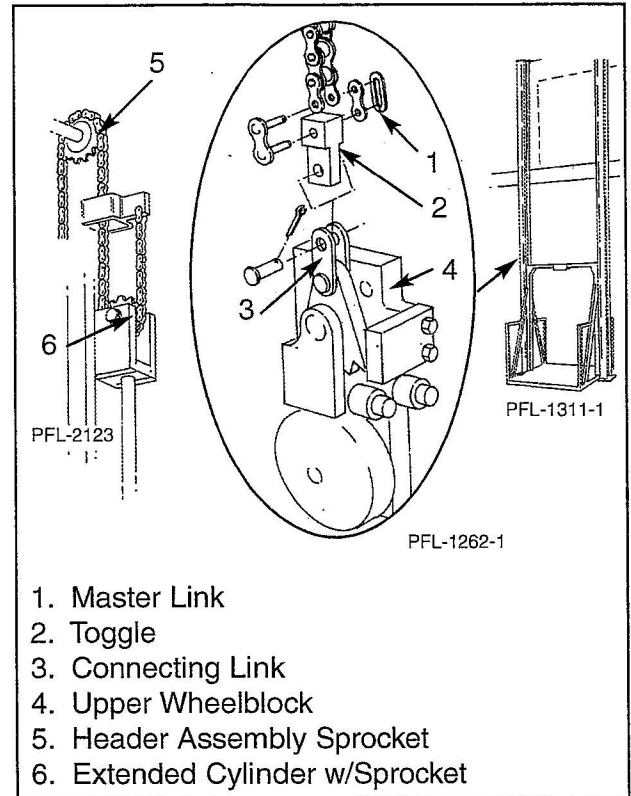
Typically, these additional links are not necessary. They have been included to ensure flexible installation of your Pflow equipment.

### CAUTION

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

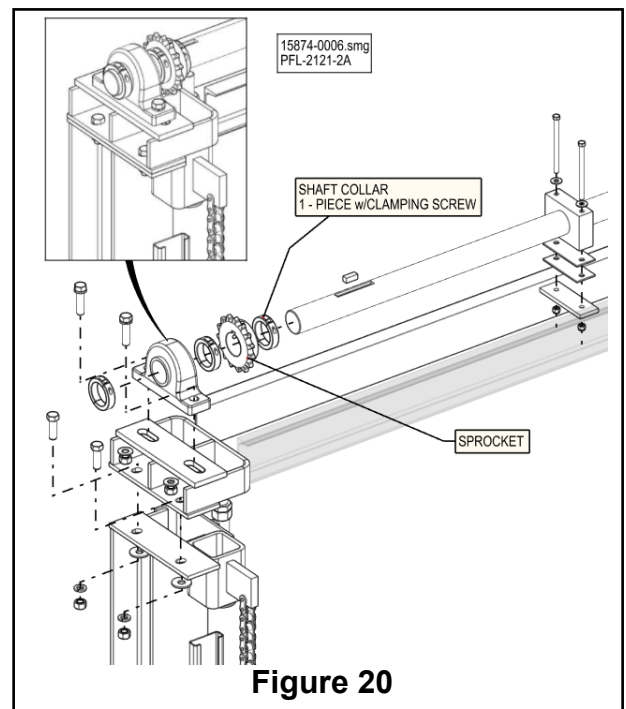
Sprocket Setscrew Torque					
Setscrew	inch	3/8	1/2	5/8	3/4
Torque	in-lbs.	273	615	1315	2150

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



**Figure 19**

2. Attach lift chain to chain pre-attached to columns. If cylinders bottom out before lift gets to upper level, remove the sections of pre-assembled chains to gain cylinder stroke. (The carriage must be solidly sitting on the floor and the power locked out before removing chains.) See Figure 20.



**Figure 20**

# 21 Series

## Hydraulic Connections

### NOTE

The use of teflon tape or paste on all fittings prior to assembly is required. Excessive amounts may get into the system and void applicable portions of your warranty. This is not required on flat faced O-ring fittings.

1. Attach hydraulic hoses and fittings. Do not overtighten.

### UPPER CYLINDER PORT

- A. Install 1/2" x 1/2" (60" cylinder) or 7/8" x 7/8" (larger cylinder) right angle swivel fittings.
- B. Install velocity fuses with arrow pointing away from cylinder.
- C. Connect 3/8" wire braid hose to velocity fuse.

### LOWER CYLINDER PORT

- D. Install 1/2" x 3/8" elbow.
- E. Connect 1/4" hose to elbow.

### MOTOR/PUMP UNIT

- F. Install 1/2" tee to valve block assembly.
- G. Install 3/8" tee to reservoir. Connect 3/8" wire braid hoses from upper cylinder ports to tee on the valve block. Connect 1/4" hoses from lower cylinder ports to tee on reservoir.

Make sure the placement of the hoses does not interfere with operation of the unit.

2. Check oil in reservoir. (Use sight glass.) Fill with oil as needed.

### NOTE

To complete installation of the unit, power to the motor/pump and controls will be needed, even if temporary.

### CAUTION

If temporary power is connected to run lift, extreme caution should be used since all safety devices are bypassed. The use of temporary power is not recommended for inexperienced installers.

3. Push "GO" button momentarily to check motor rotation against arrow on motor (ignore arrow on pump). If rotation is incorrect, have electrician reverse leads. Hydraulic pressure gauge will show pressure if pump is working correctly.

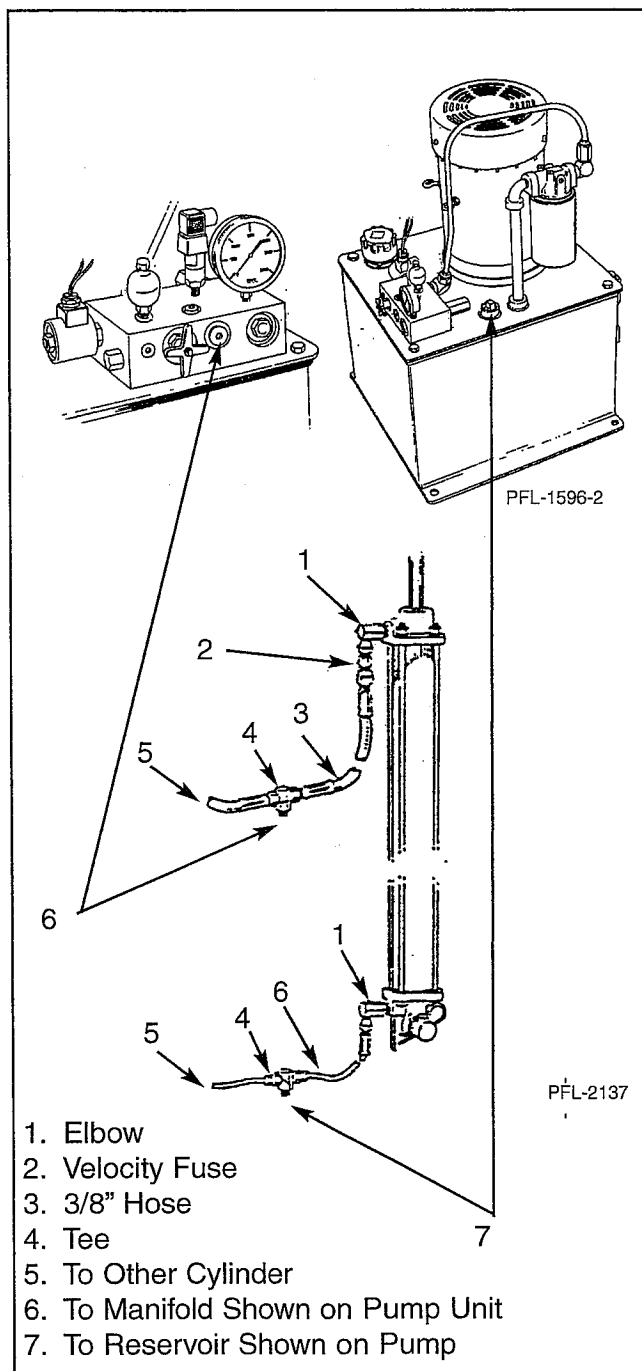


Figure 21

### CAUTION

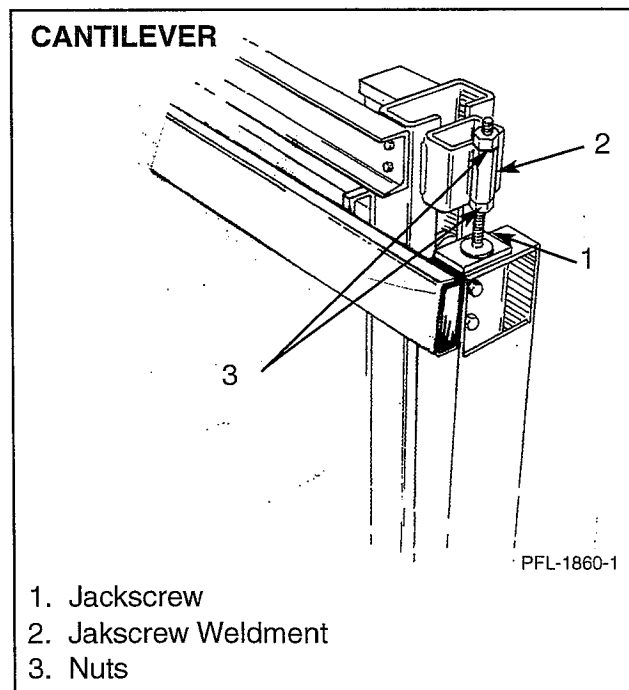
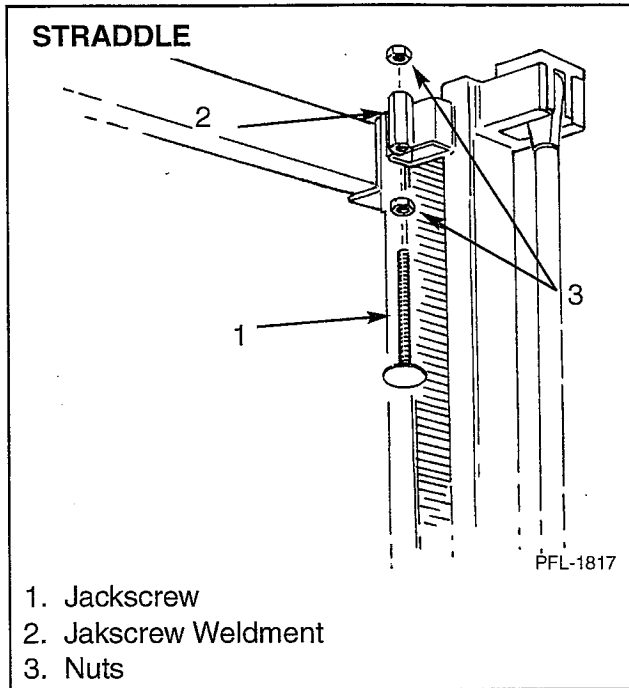
Paint overspray on cylinder rod will damage seals and void warranty!

### NOTE

Pressure switch used only when decklocks are not present.

## For Units Without DeckLocks

Screw liberally greased jackscrew into the factory-mounted jackscrew weldment on each column. See pictures below.



# 21 Series

## Anchoring and Bracing

### NOTE

*The following illustrations are for reference only. Site conditions may require a different alternative to the ones we suggest.*

Side-to-side and front-to-back bracing of the unit is required. Seismic requirements will be different, and a separate drawing is usually provided in the shipping packet. Bracing of the unit and enclosures is the responsibility of the installer.

It is the customer's responsibility to make sure that the site conditions have a structure of adequate strength to brace to, to withstand the forces.

For a two-level unit, Pflow will supply:

- (2) 10' lengths of 4" channel (unpainted)
- (2) 4-hole pads (unpainted)
- (1) 10' length of 1-1/2" x 1-1/2" x 3/16" angle per gate (unpainted)
- (2) Cans of spray paint

Each additional level will be supplied with the following:

- (1) 10' length of channel
- (1) 10' length of angle per gate
- (2) 4-hole pads

We do not supply bolts nor guarantee that the above material will be sufficient for the application. It is the installer's responsibility to check the information included in the shipping packet prior to commencing work. Specific bracing instructions may be provided.

1. Make sure the carriage is level on the floor. Recheck column spacing and wheelblock clearance. If everything checks out, anchor the base plates to the floor using 3/8" anchors. (Depth of holes should always be deeper than anchor bolts.)

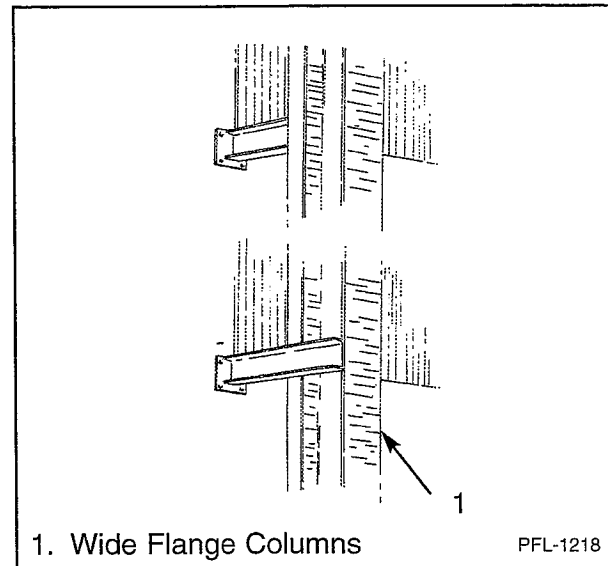


Figure 22

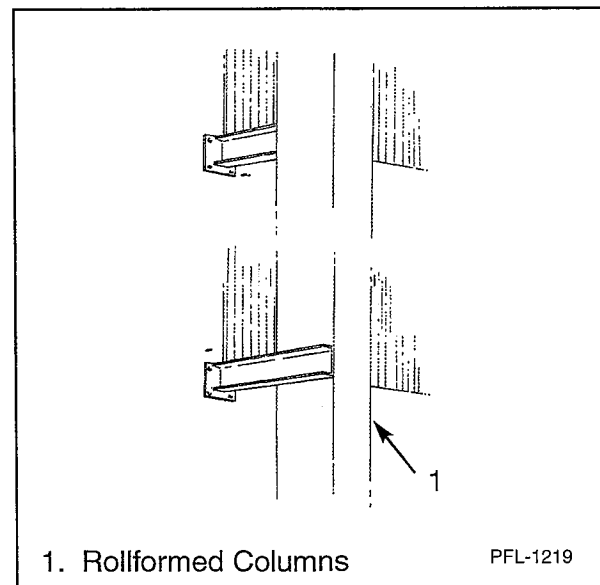
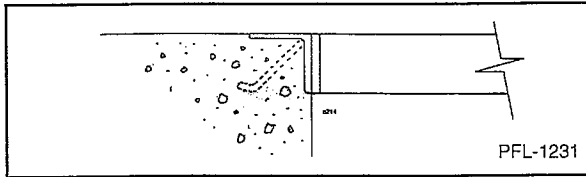


Figure 23

# Installation Instructions

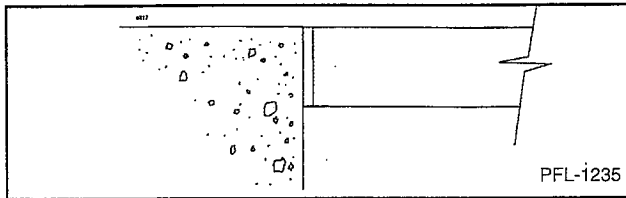
## Guidelines for Anchoring

Welding to a Curb Angle (Figure 24)



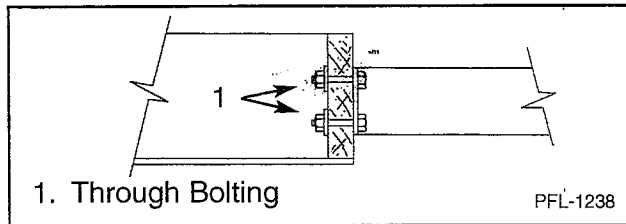
**Figure 24**

Using a Tie Plate (Figure 25)

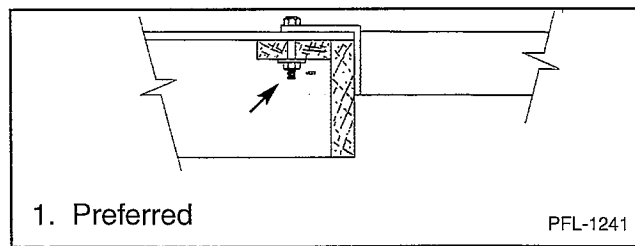


**Figure 25**

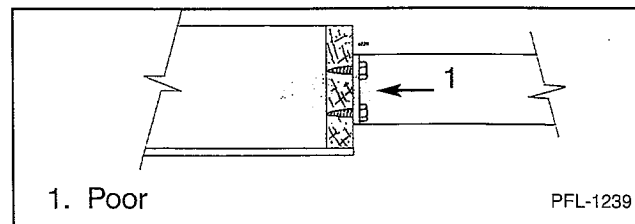
Anchoring to Wooden Floors (Figures 26, 27, and 28)



**Figure 26**

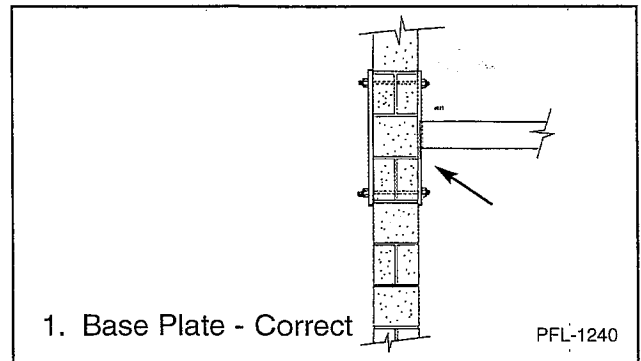


**Figure 27**

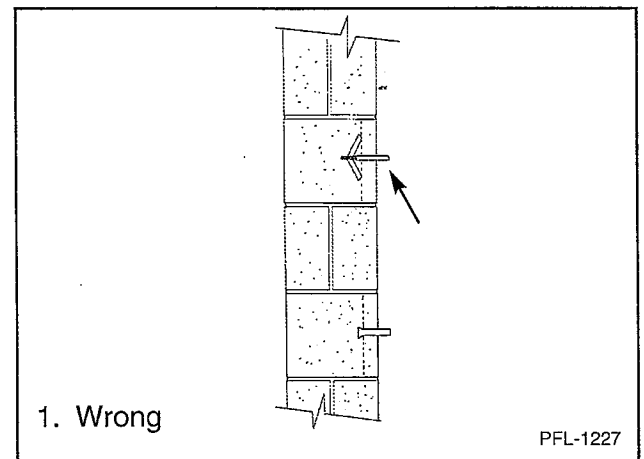


**Figure 28**

Anchoring to Block Walls (Figures 29 and 30)

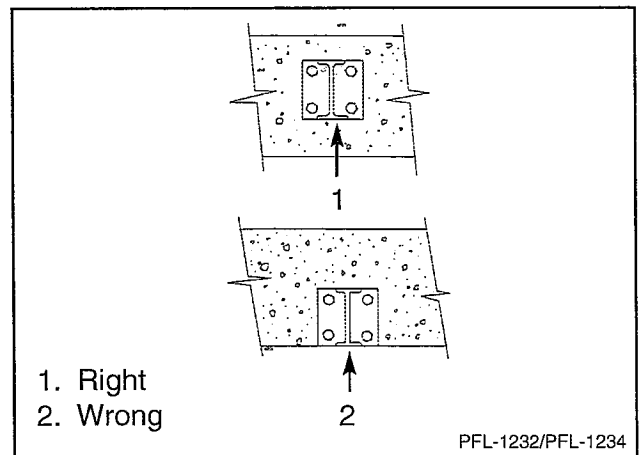


**Figure 29**



**Figure 30**

Anchoring Base Plate to Solid Floor (Figure 31)



**Figure 31**

1. The following Guidelines for Bracing page shows how to attach bracing to the building. Proceed with the final bracing. Tack bracing into position.

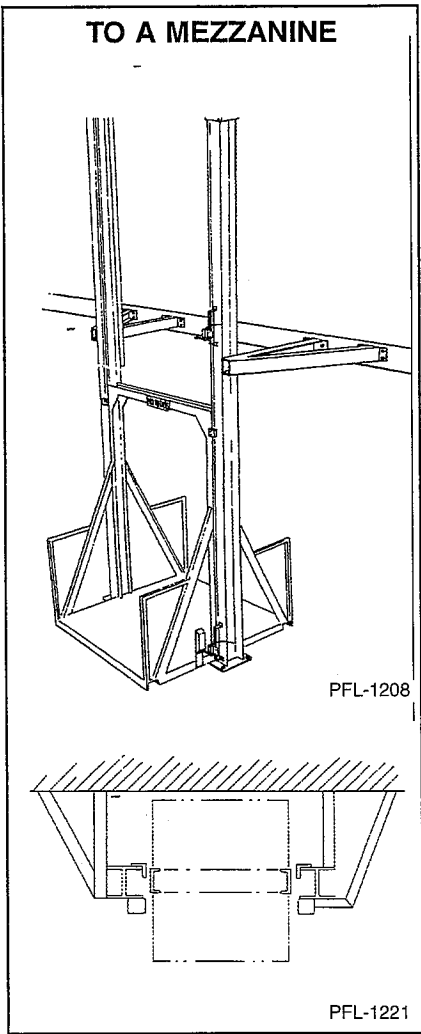


Figure 32

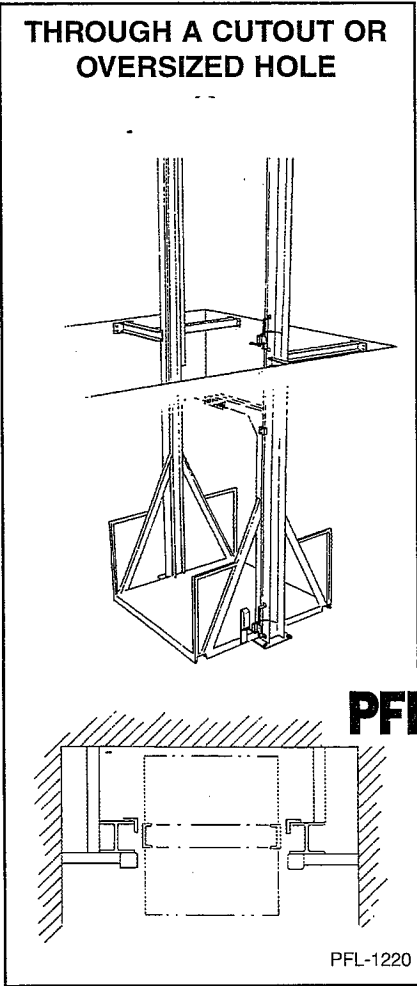
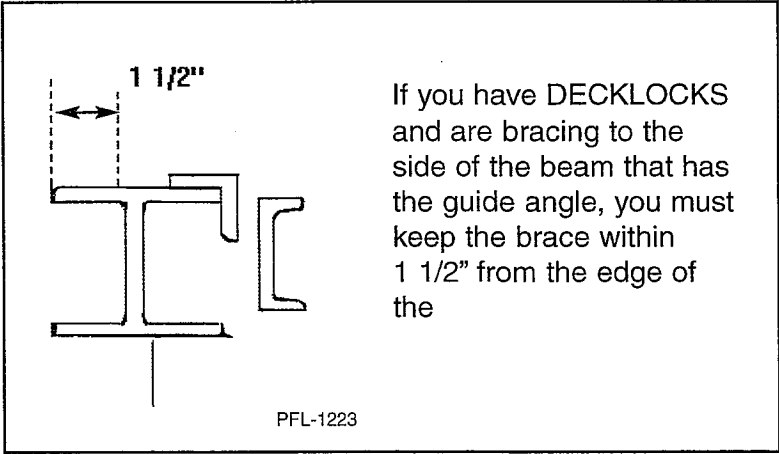


Figure 33

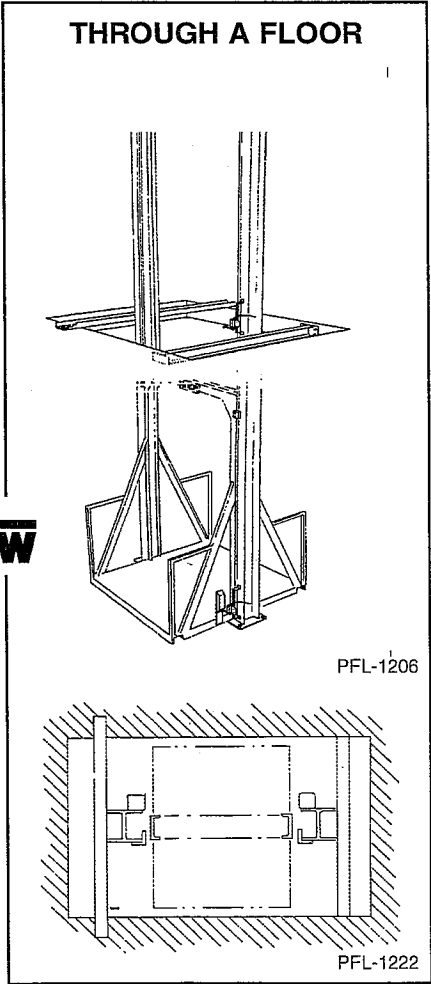


Figure 34

## Installation Notes - Anchoring & Bracing

1. Field locate and weld in the straight brace. Again, make sure brace doesn't interfere with decklock arm, cylinder travel, etc.
2. Bolt mounting plates to diagonal brace. These bolts are for installation only.
3. Align the mounting plates to the lift column.
4. Field weld the mounting plates to the straight brace and lift column.
5. Field weld the diagonal brace to the mounting plates.
6. Welding notes:
  - a. All welding per latest edition AWS D1.1.
  - b. Weld filler material to be min. E60XX.
  - c. Unless indicated otherwise, all welds are min. 3/16" cont. fillet.

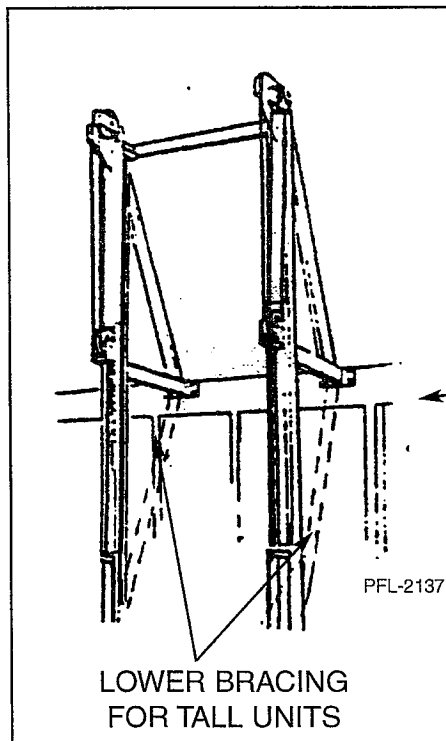


Figure 35

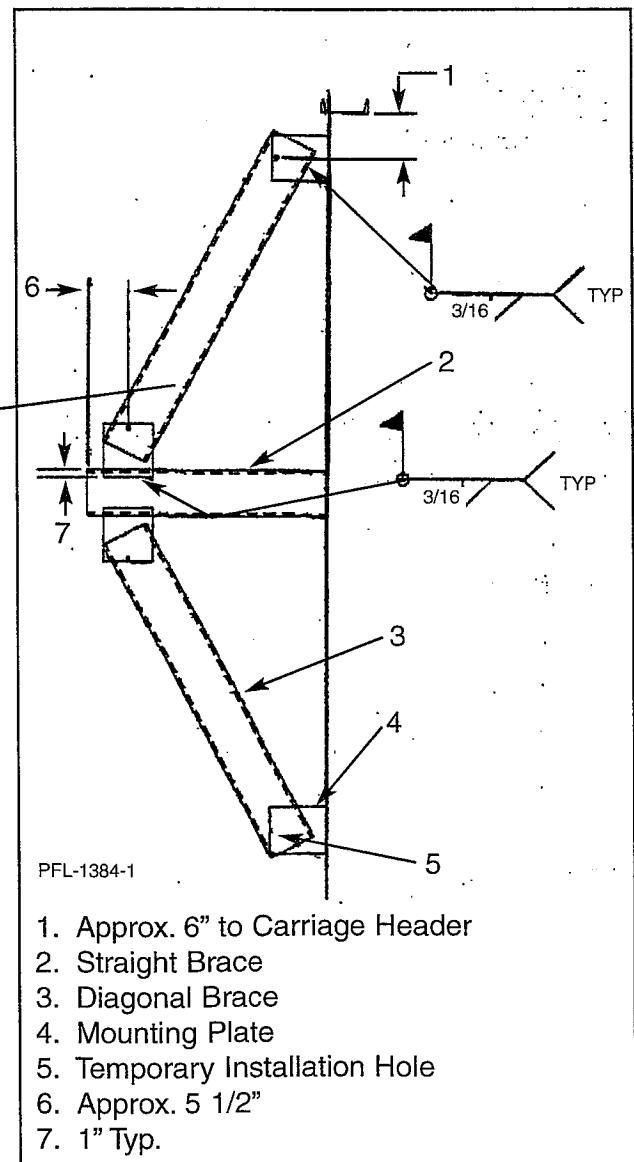


Figure 36

### INSTALLATION COMPLETION CHECKLIST

Please make sure all of the following steps are complete:

- |   |   |
|---|---|
| <input type="checkbox"/> The VRC is braced from front to back and from side to side.  | <input type="checkbox"/> Safety Check #1 -  |
| <input type="checkbox"/> The gates and enclosures are braced.                         | <input type="checkbox"/> You should not be able to open a gate when the unit is not present.                                    |
| <input type="checkbox"/> Touch up all welds, marks, scrapes, etc. with paint.         | <input type="checkbox"/> You should not be able to operate the unit with a gate open.   |
| <input type="checkbox"/> Route hoses to prevent interference during travel.           | <input type="checkbox"/> Did you check each level for the above items?  |
| <input type="checkbox"/> Check fittings and hoses for leakage.                        | <input type="checkbox"/> Are there any unsafe conditions that exist?  |
| <input type="checkbox"/> Make sure that all electrical connections are properly made. | <input type="checkbox"/> If so, please contact Pflow Industries immediately and report them.                                    |
| <input type="checkbox"/> Check that the unit stops level at each floor.               | <input type="checkbox"/> Post all operational signs.  |
| <input type="checkbox"/> Is there excessive noise during travel?                      | <input type="checkbox"/> Remove all debris.   |
| <input type="checkbox"/> Does the carriage "rock" during travel?                      | <input type="checkbox"/> Instruct the customer on the proper operation.   |
| <input type="checkbox"/> Do a full load test.   | <input type="checkbox"/> Instruct the user on proper loading.   |
|   | <input type="checkbox"/> Instruct the customer on procedures if there is a problem.   |
|   | <input type="checkbox"/> Complete the Installation Questionnaire and Acceptance Certification. Return both to Pflow Industries. |



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	<b>Comments:</b>		
PFlow Job Number		Date	
Customer/User			
Questionnaire completed by		email	
Company		Phone	

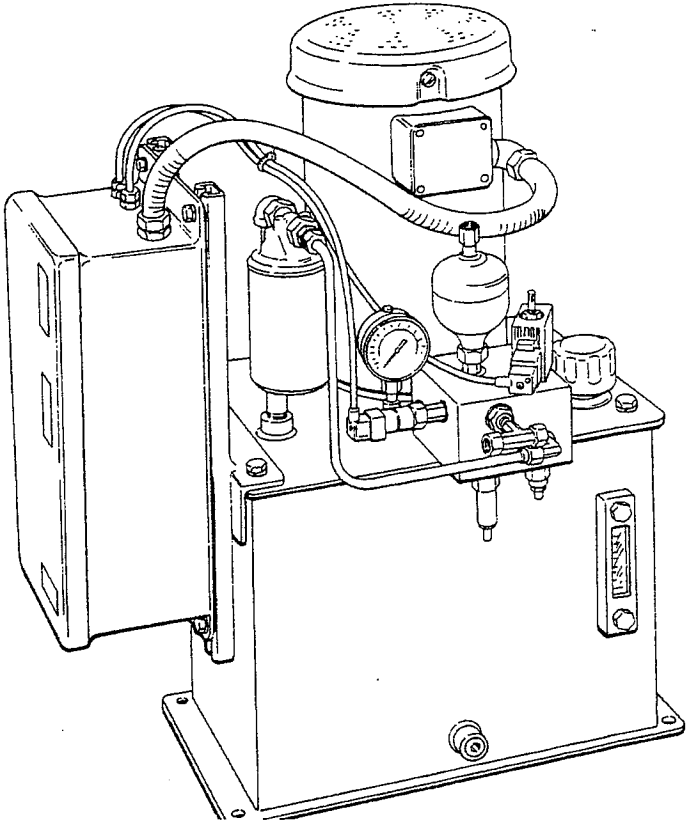
**PFlow Industries, Inc.** • 6720 N. Teutonia Avenue • Milwaukee, WI. 53209  
Phone - Main Switchboard: (414) 352-9000 • Product Support Dept: Fax - (414) 247-9834; email: psd@pflow.com

## ***Questionnaire***

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Notes

## PARTS Motor Pump Unit

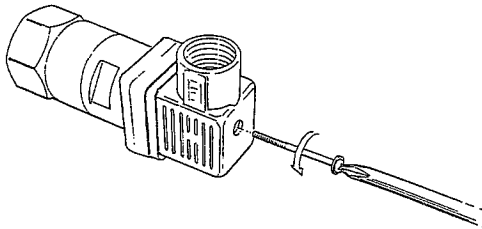


PFL-2366

Figure 37

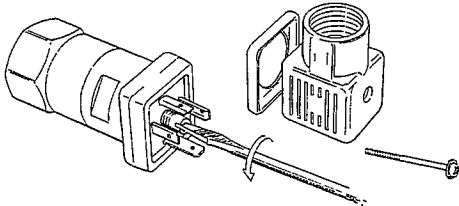
**SET PRESSURE TO FACTORY SETTINGS. DO NOT EXCEED  
FACTORY SETTINGS WITHOUT FACTORY AUTHORIZATION.**

1. Remove DIN adaptor.



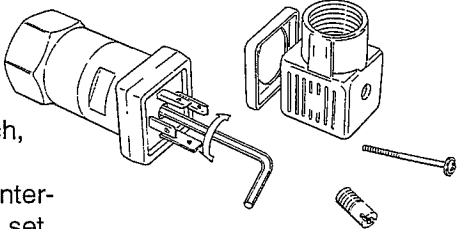
PFL-2132

2. Remove small brass screw.



PFL-2133

3. Using 1/8" Allen wrench, adjust clockwise to increase set point/counter-clockwise to decrease set point.



Two wires  
connect to  
terminals 1  
& 2 inside.

PFL-2134

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## 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

## OPTIONS

### Gate Identification

Prior to shipment, all gate panels, posts, interlock components, etc., are color coded for each level. When two (2) gates are on one level, they will be coded with the same color. Please use the information available on the general arrangement drawing and in your installation manual to separate the components.

The colors per level will always remain the same. They are:

LEVEL	COLOR
1st (bottom)	Green
2nd	Yellow
3rd	Red
4th	Blue
5th	Orange
6th and higher	White

Each tag will be marked with the following:

- A. Pflow Serial Number
- B. Customer Project Number
- C. Pflow Part Number and Description
- D. Initials of Inspector
- E. Levels higher than 6 will include the number of the appropriate level

If you have any questions, please feel free to contact the Product Support Department for assistance.

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## BI-PARTING SWING GATE INSTALLATION INSTRUCTIONS

### IDENTIFY COMPONENTS

Gate components, posts, panels, header assembly, interlocks, will have color coded tags. Each gate tag will be a different color:

Level	Tag Color
1 <sup>st</sup> (Bottom)	Green
2 <sup>nd</sup>	Yellow
3 <sup>rd</sup>	Red
4 <sup>th</sup>	Blue
5 <sup>th</sup>	Orange
6 <sup>th</sup> and higher	White

### INSTALLATION



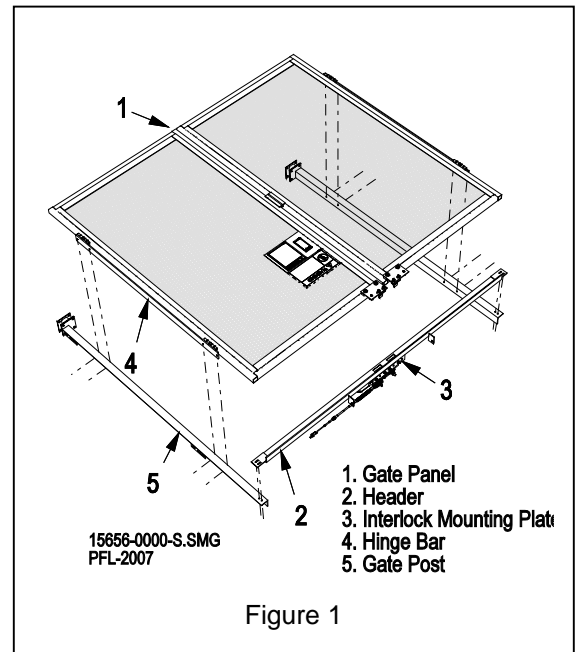
**DANGER**

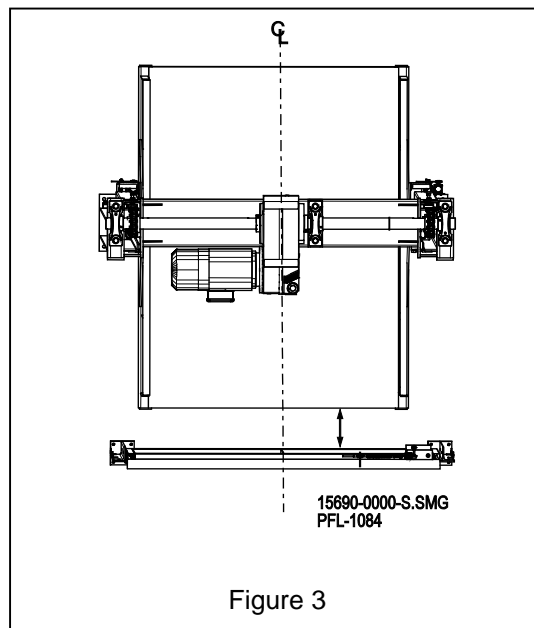
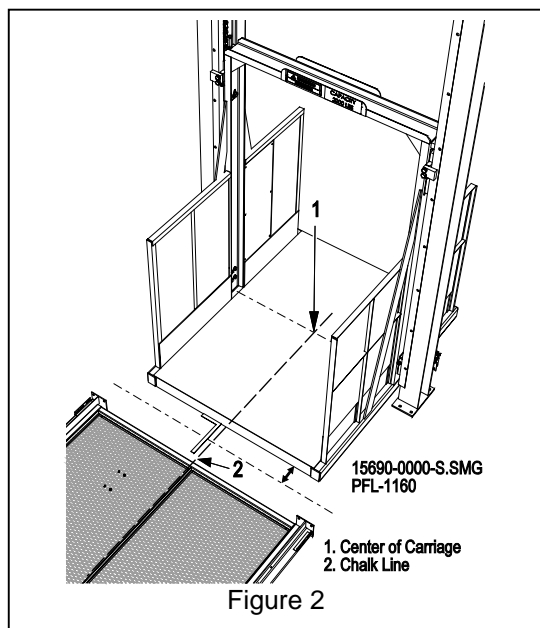
**During the gate installation the gate panel safety latch may not be operational. At gate locations take all necessary site precautions to protect site personnel from falls.**

**Never leave a gate or gate panel unattended without proper protection and warning for site personnel.**

The preferred method of installing a bi-parting swing-type gate is to pre-assemble the gate on the floor and then stand it up. The following instructions are for pre-assembly of the gates. If for some reason pre-assembly is not possible, use these instructions as a general guide for the assembly, positioning, and securing the gates.

1. Lay the gate posts on the floor parallel to each other. **See Figure 1.**
2. Place the angle iron "header" at the top of the gate posts and bolt in position with hardware provided.
3. Place the gate panels in position between the gate posts and hinge bars.
4. Locate and mark the center of the gate panel (where panels meet in the center.)
5. Locate and mark center of the carriage. Using a carpenter square held on the front edge of the carriage, mark a chalk line on the floor to assure the center of the gate is on the center line of the carriage. **See Figure 2.**





6. The ideal position of the gate is 6" from inside of gate panels to carriage. However, the gate can be located anywhere within a range of 4" minimum from inside of gate panel to carriage and a maximum of 6" from inside of gate panels to carriage. Individual state code requirements may apply. **See Figure 3.**
7. When the gate panel to carriage measurement has been determined, snap a chalk line to identify gate position parallel to the carriage.

## NOTICE

**The length of enclosure panels may be the determining factor in gate location.**

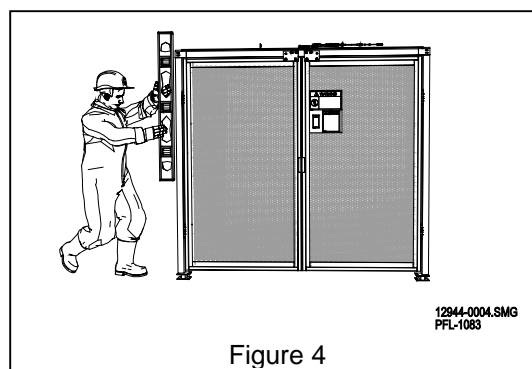
8. Raise the gate assembly. Position the gate assembly so the center of the gate is located on the center of the carriage line and the inside of gate panel is on the chalk line parallel to the carriage.

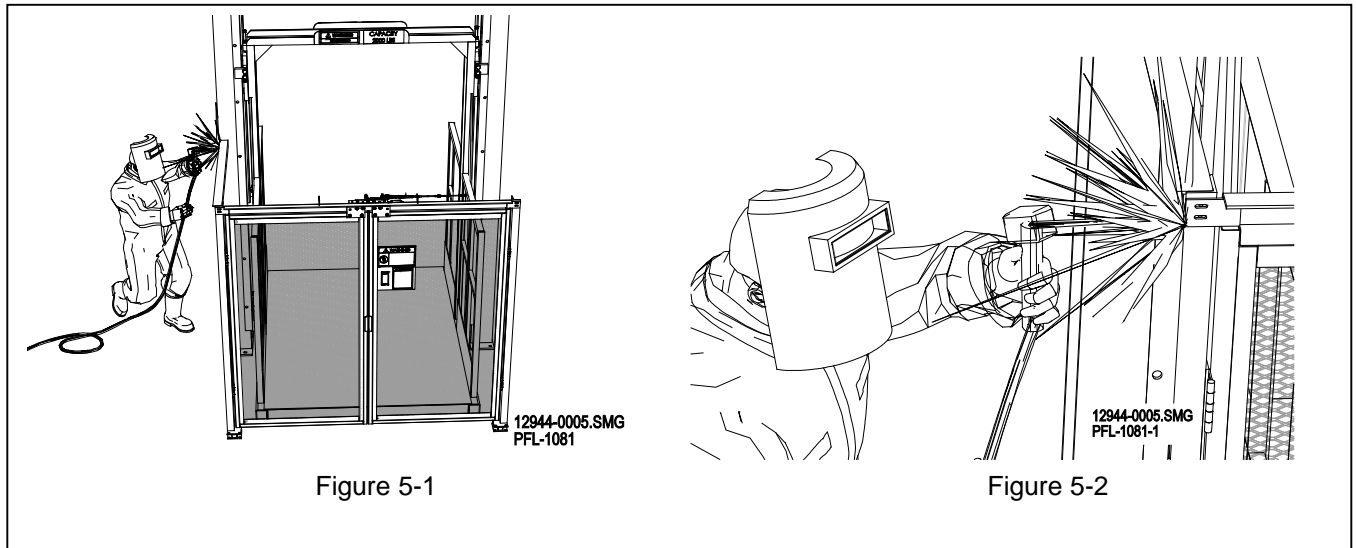
## NOTICE

**Anchor hole should always be deeper than the length of the anchor bolt.**

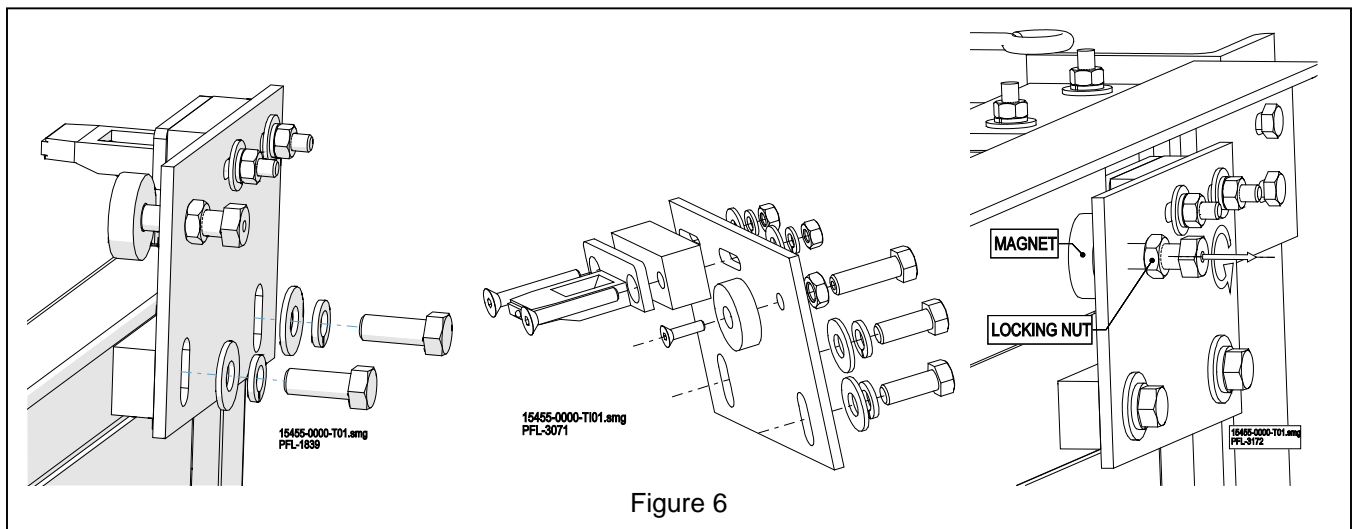
**Recommended wedge anchor size: 3/8" dia. x 3 1/2 long.**

9. Using 3/8" anchors 3 1/2" long, drill and anchor gate post base plates to the floor.
10. Plumb the gate using a plumb bob or a four foot or longer level. **See Figure 4.**
11. With the gate posts plumb, measure from gate post to VRC column. Cut two support braces and install as illustrated (1 1/2" x 1 1/2" x 1/4" steel angle or similar). **See Figure 5-1.**





12. Tighten all gate panel and header bolts.
13. Verify gate panel swing for proper operation and site operational clearance.
14. Weld steel angle header to gate posts. **See Figure 5-2.**
15. Install the gate interlock.
16. Install the interlock keeper assembly. Field align the interlock keeper latch to properly engage the internal interlock contacts and latch. Each panel requires an interlock keeper assembly.
17. With the lift carriage present at the gate check that the interlock keeper assembly magnet holds the panel closed until the operator pulls open the panel. The magnet will require field adjustment to fine tune the panel "held closed" force. Adjust the panel position by backing off the magnet locking nut. Rotate the magnet hex head bolt to position the panel. Secure the magnet position by turning down and locking the magnet locking nut. **See Figure 6.**
18. Verify gate interlock operation with the lift carriage present and with the lift carriage not present.



## ***Bi-Parting Swing Gate Installation Instructions***

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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](mailto:psd@pflow.com)

## SWING GATE INSTALLATION INSTRUCTIONS

### IDENTIFY COMPONENTS

Gate components, posts, panels, header assembly, interlocks, will have color coded tags. Each gate tag will be a different color.

Level	Tag Color
1 <sup>st</sup> (Bottom)	Green
2 <sup>nd</sup>	Yellow
3 <sup>rd</sup>	Red
4 <sup>th</sup>	Blue
5 <sup>th</sup>	Orange
6 <sup>th</sup> and higher	White

### INSTALLATION



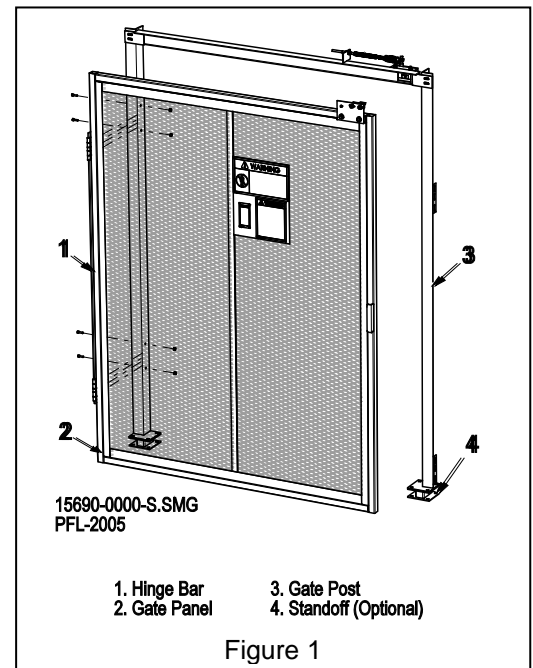
**DANGER**

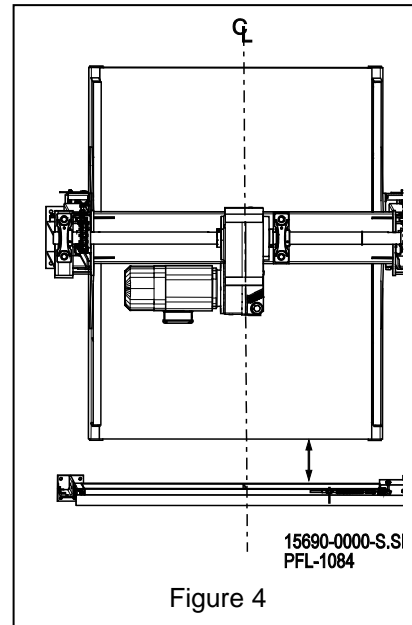
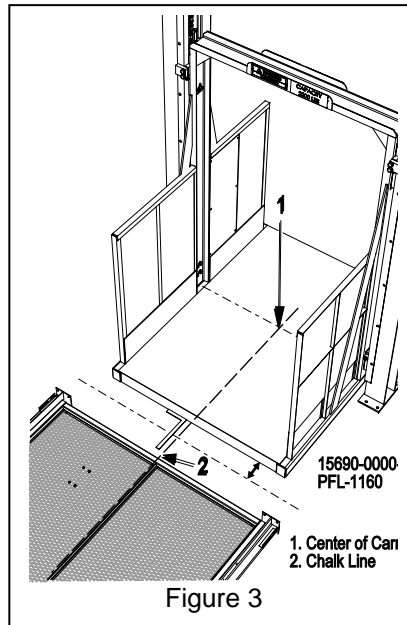
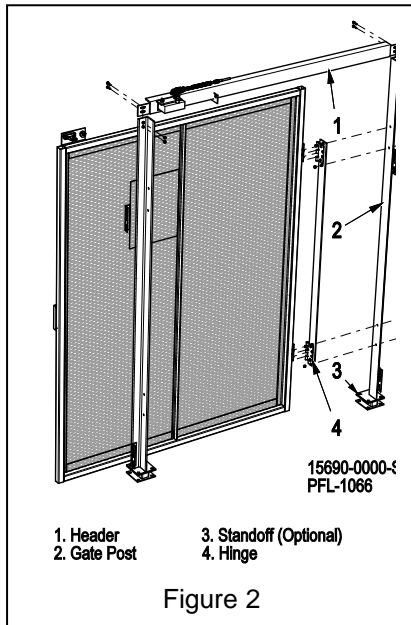
**During the gate installation the gate panel safety latch may not be operational. At gate locations take all necessary site precautions to protect site personnel from falls.**

**Never leave a gate or gate panel unattended without proper protection and warning for site personnel.**

The preferred method of installing a swing gate is to pre-assemble the gate on the floor and then stand it up. The following instructions are for pre-assembly of the gates. If for some reason pre-assembly is not possible, use these instructions as a general guide for the assembly, positioning, and securing the gates.

1. Lay the gate posts on the floor parallel to each other. **See Figure 1.**
2. Place the steel angle "header" at the top of the gate posts and bolt in position with hardware provided. **See Figure 2.**
3. Place the gate panels in position between the gate posts and hinge bars. **See Figure 2.**
4. Locate and mark the center of the gate panel (where panels meet in the center.)
5. Locate and mark center of the carriage. Using a carpenter square held on the front edge of the carriage, mark a chalk line on the floor to assure the center of the gate is on the center line of the carriage. **See Figure 3.**





6. The ideal position of the gate is 6" from inside of gate panels to carriage. However, the gate can be located anywhere within a range of 4" minimum from inside of gate panel to carriage and a maximum of 6" from inside of gate panels to carriage. **See Figure 4.**
7. When the gate panel to carriage measurement has been determined, snap a chalk line to identify gate position parallel to the carriage.

## NOTICE

**The length of enclosure panels may be the determining factor in gate location.**

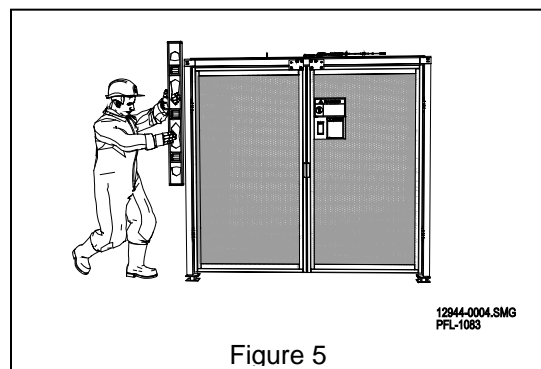
8. Raise the gate assembly. Position the gate assembly so the center of the gate is located on the center of the carriage line and the inside of gate panel is on the chalk line parallel to the carriage.

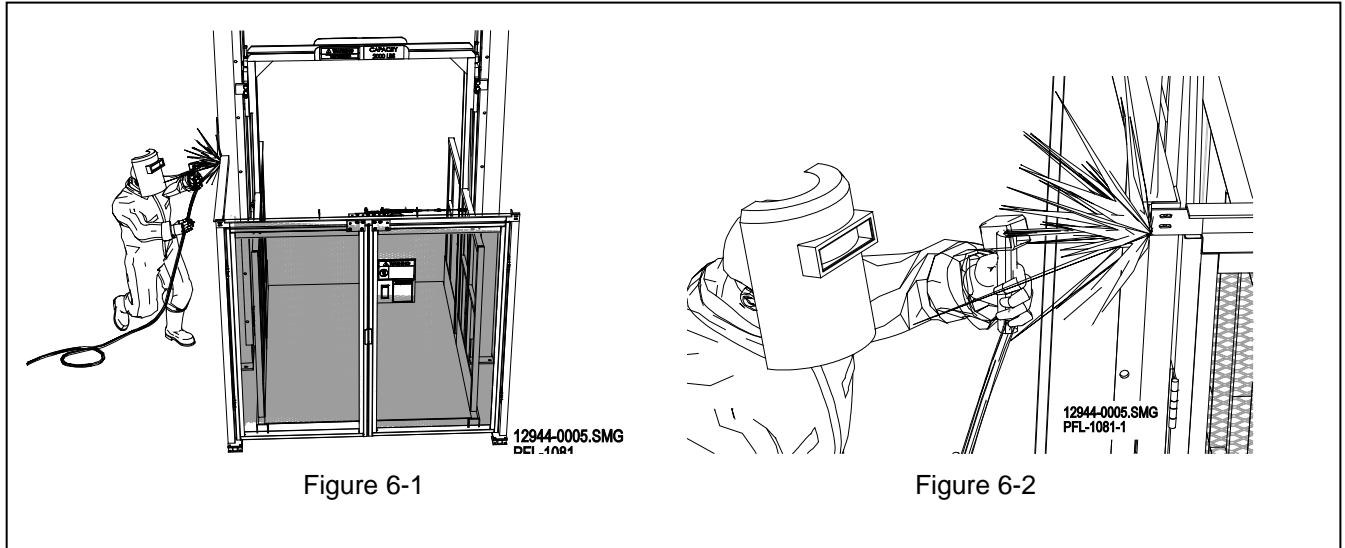
## NOTICE

**Anchor hole should always be deeper than the length of the anchor bolt.**

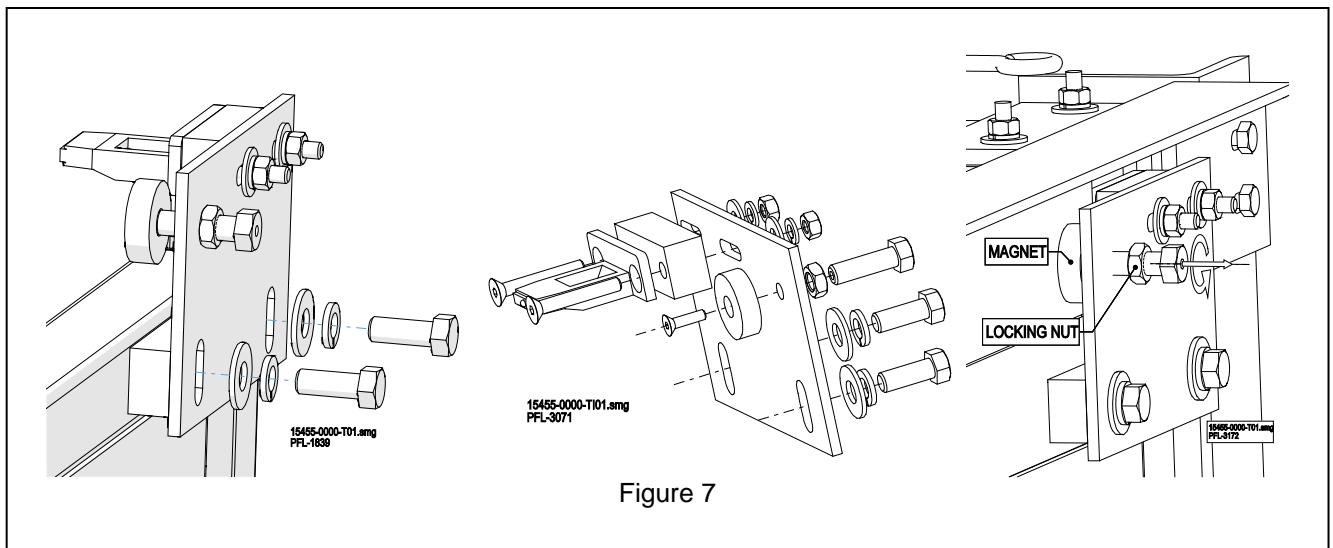
**Recommended wedge anchor size: 3/8" dia. x 3 1/2" long.**

9. Using 3/8" anchors 3 1/2" long, drill and anchor gate post base plates to the floor.
10. Plumb the gate using a plumb bob or a four foot or longer level. **See Figure 5.**
11. With the gate posts plumb, measure from gate post to VRC column. Cut two support braces and install as illustrated (1 1/2" x 1 1/2" x 1/4" steel angle or similar). **See Figure 6-1**





12. Tighten all gate panel and header bolts.
13. Verify gate panel swing for proper operation and site operational clearance.
14. Weld steel angle header to gate posts. **See Figure 6-2.**
15. Install the gate interlock.
16. Install the interlock keeper assembly. Field align the interlock keeper latch to properly engage the internal interlock contacts and latch. Each panel requires an interlock keeper assembly.
17. With the lift carriage present at the gate check that the interlock keeper assembly magnet holds the panel closed until the operator pulls open the panel. The magnet will require field adjustment to fine tune the panel "held closed" force. Adjust the panel position by backing off the magnet locking nut. Rotate the magnet hex head bolt to position the panel. Secure the magnet position by turning down and locking the magnet locking nut. **See Figure 7.**
18. Verify gate interlock operation with the lift carriage present and with the lift carriage not present.



## ***Swing Gate Installation Instructions***

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



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**SINGLE & BI-PANEL VA GATE INSTALLATION INSTRUCTIONS****IDENTIFY COMPONENTS**

Gate components (posts, panels, header assembly, interlocks) will have color coded tags for the appropriate level.

Level	Tag Color
1 <sup>st</sup> (Bottom)	Green
2 <sup>nd</sup>	Yellow
3 <sup>rd</sup>	Red
4 <sup>th</sup>	Blue
5 <sup>th</sup>	Orange
6 <sup>th</sup> and higher	White

Each gate tag is a different color. Hardware will be in boxes marked for each level gate. Before beginning installation of the gate, match up all gate components with their floor placement as determined by the general arrangement (GA) drawing. Assembly is easiest if there is room to lay the components out. As this is not always possible, please see *Helpful Hints for Upright Assembly*.

**NOTICE**

**The use of a forklift or come-along may be required to place heavier gate assemblies into position.**

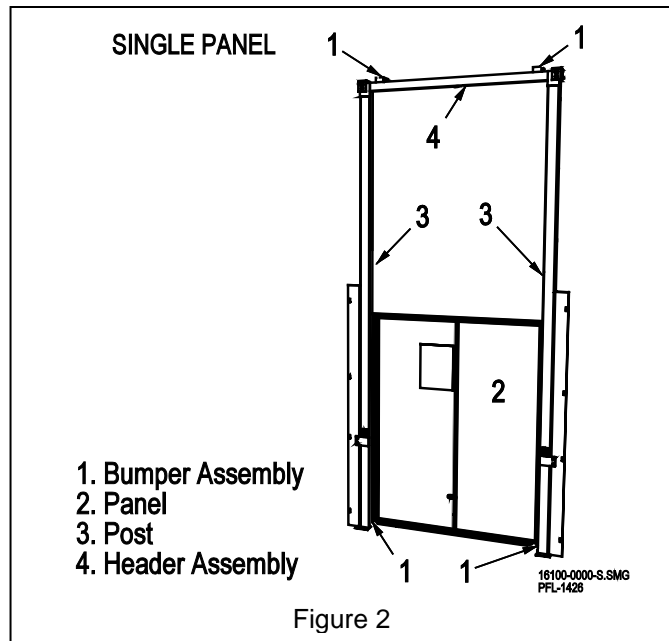
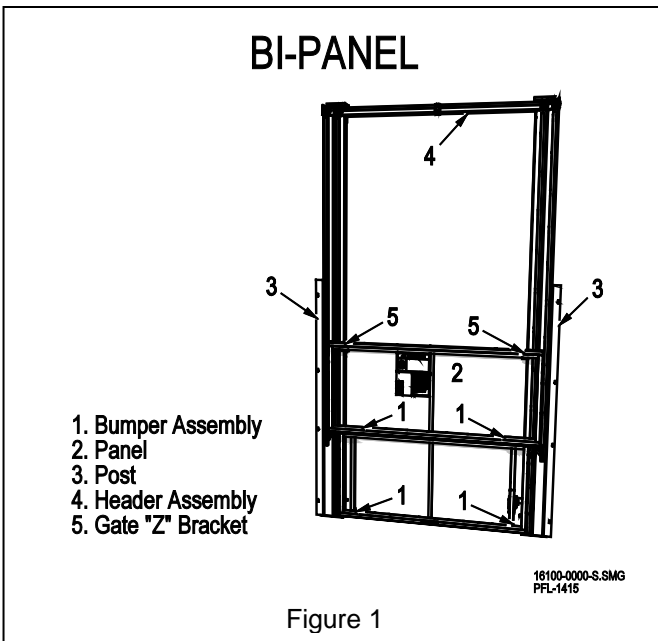
**NOTICE**

**With standard bi-panel gates the smaller panel is the lower panel and will be closer to the carriage. For reverse gates (interlock on operating side) check the panel orientation with gate assembly drawing.**

## Single & Bi-Panel VA Gate Installation Instructions

### HELPFUL HINTS FOR UPRIGHT ASSEMBLY

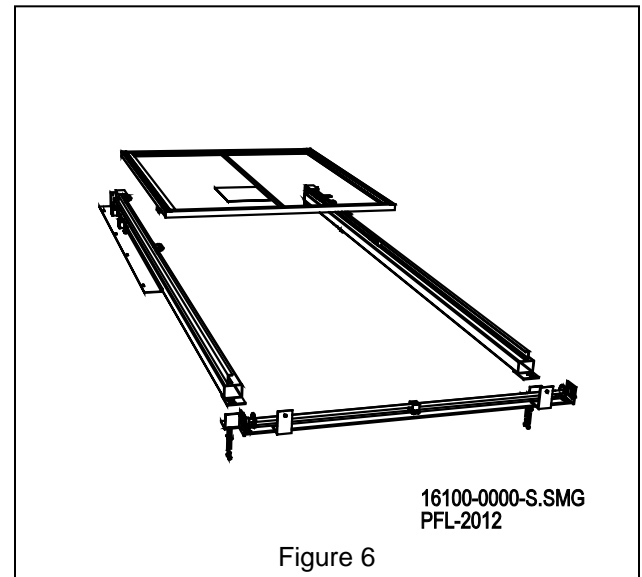
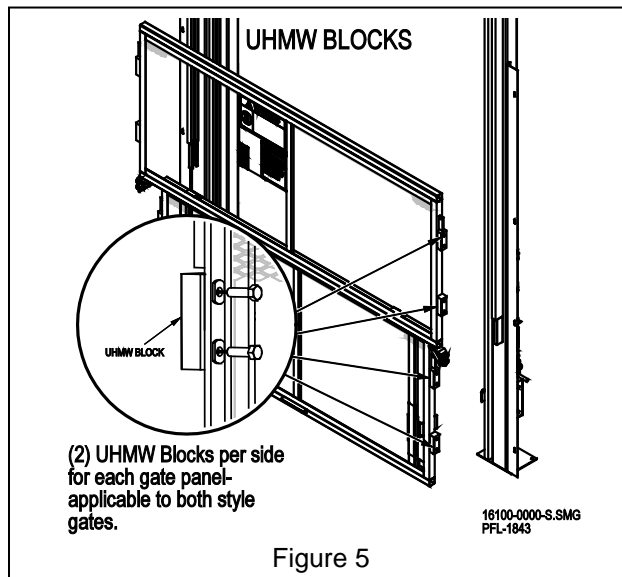
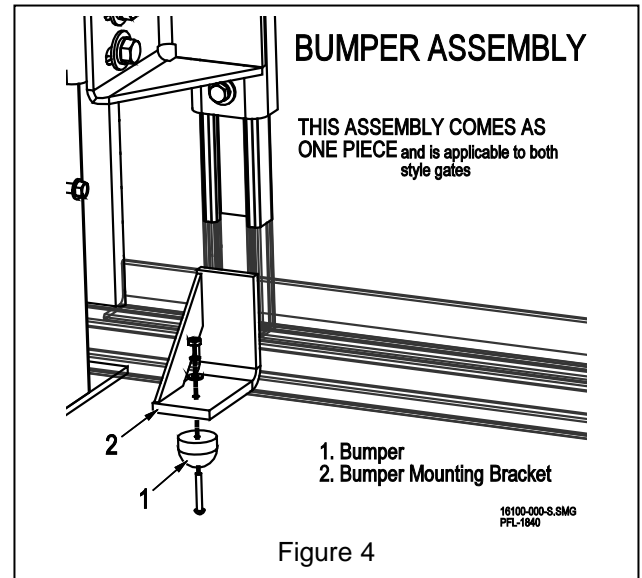
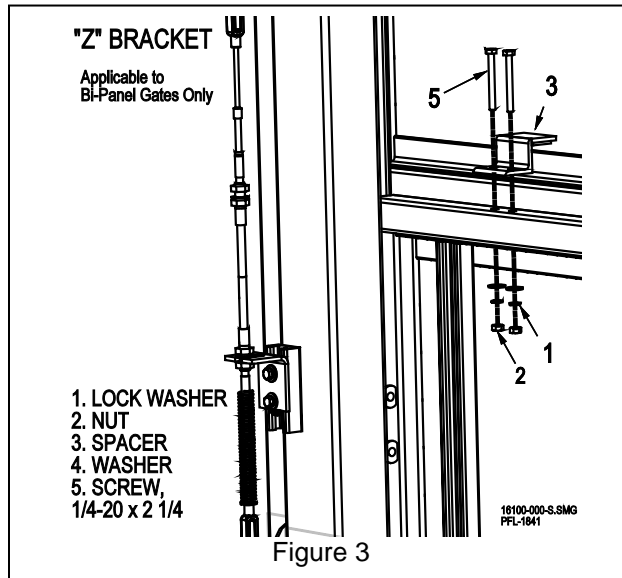
1. Set up one post at a time. (Tie a long length of string to the last few links of chain. This will help retrieve the chain if it accidentally falls down the tube during installation.)
2. Take out the counterweight shipping bolt. Slide weight above bolt and reinstall bolt.
3. Make sure each post is plumb.
4. With header on and chain weaved through the sprockets, you should have one to two feet of chain hanging over the sprockets. Lift panel up to meet this chain. Heavier panels may require the use of a forklift or come along around the header.



### NOTICE

**On some applications, the panel may be in two or more pieces (knock-down).  
This requires panel assembly in the field.**

5. Attach gate panel components. See Figures 3, 4, and 5.



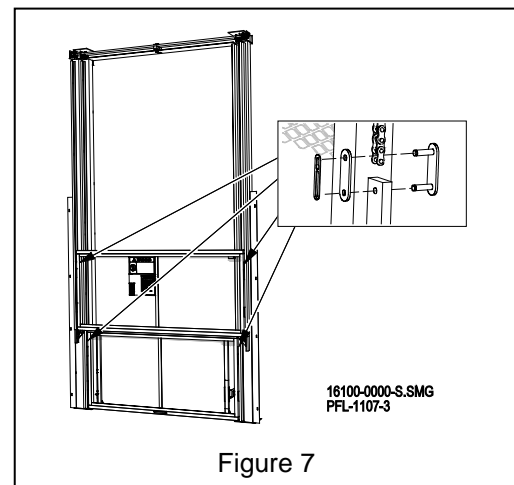
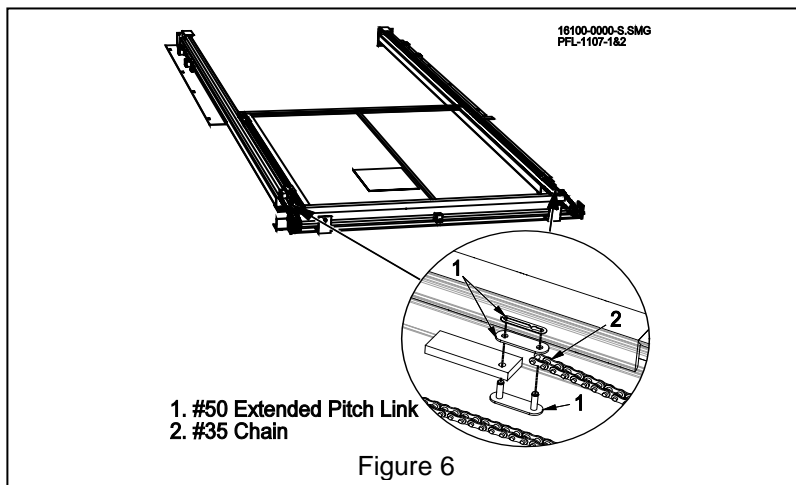
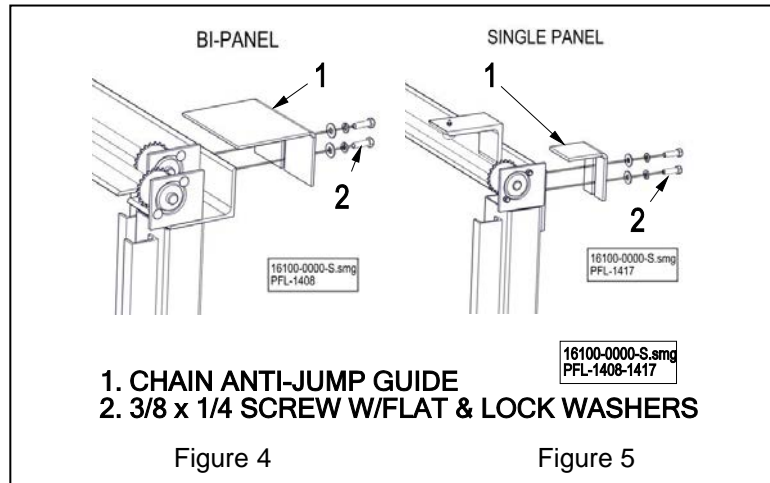
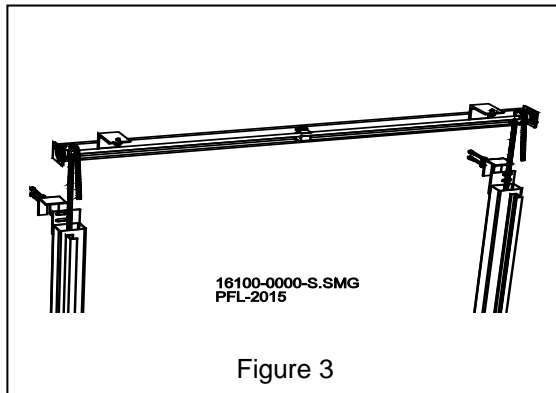
## NOTICE

**Panel plastic UHMW slide blocks fit over the bolt threads. See Figure 5**

# Single & Bi-Panel VA Gate Installation Instructions

## GATE ASSEMBLY LAYED DOWN ON THE FLOOR

1. Lay out the framework in the proper arrangement. **See Figure 6.**
2. Position the header with the sprockets facing up. Bolt into place using four (4) 3/8-16 x 1 1/4" long bolts with lock washers and nuts. **See Figures 7, 8, and 9.**
3. Remove the #50 master links from the #35 chain sticking out of each gate post and thread the chain over the sprockets on the header. **See Figure 10.**
4. Place the panel(s), with all components installed, into the track of the gate posts. **See Figures 3, 4 and 5.**
5. Slide the panel up to the header and re-connect the master links removed in Step #4 (Figure 10). Make sure that the length of chain on each side is equal. **See Figure 11.**



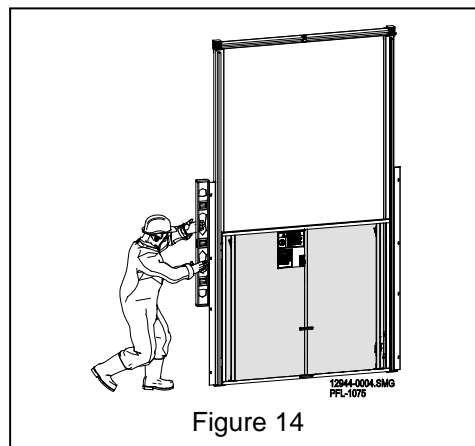
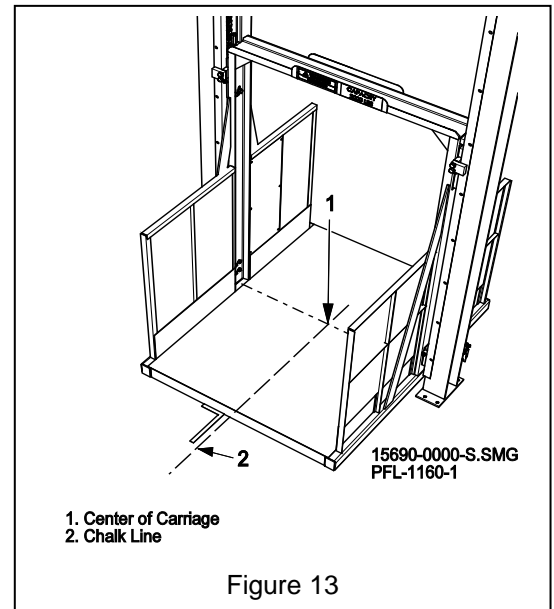
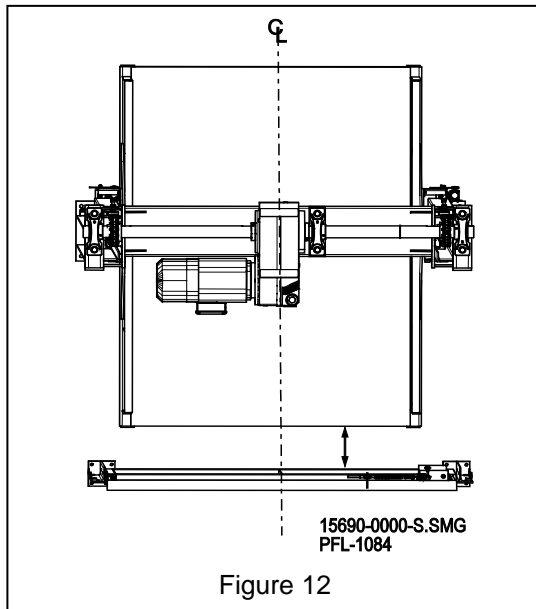
## NOTICE

Remove the counterweight shipping bolt, slide the counterweight above the bolt, position, and re-install the bolt. Tie a length of string to the end of the #35 chain to assist in pulling the chain out of the tube if it should fall down into the tube.

## NOTICE

**When raising the panels, have one to two feet of chain hang over the sprockets.**

6. Stand gate assembly upright and place in position. Place the back face of the gate post on the chalk line 6" from the face of the carriage. **See Figures 12 and 13.** Some states require the gate closer to the carriage. Where necessary, adjust accordingly.
7. Make sure the posts are plumb in both directions. **See Figure 14.**
8. Temporarily brace the posts to the enclosure panels, building, or lift, as required.



## NOTICE

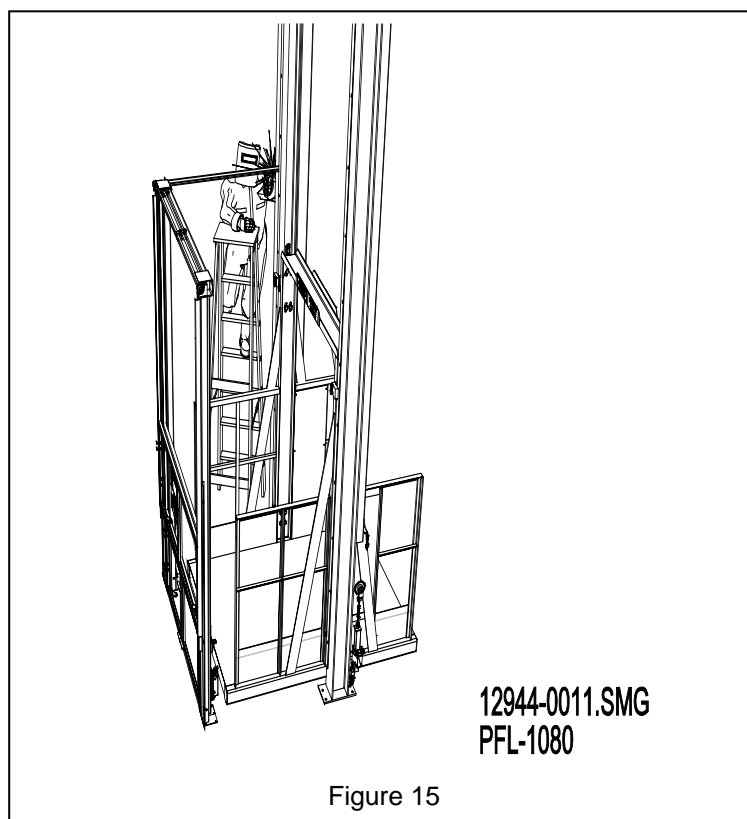
**Anchor hole should always be deeper than the length of the anchor bolt.  
Recommended wedge anchor size: 3/8" dia. x 3 1/2 long.**

## Single & Bi-Panel VA Gate Installation Instructions

9. Move the gate panels up and down and check that the panels move freely during travel from top to bottom of the posts. Lift the gate panel approximately two feet to check the counterbalancing. The gate should remain in that position.
  - a. If the gate continues to rise, add steel bar stock to the bottom center of the panel inside the frame. Recheck and repeat as needed.
  - b. If the gate drops, contact PFlow Industries for instructions.
10. If everything runs smoothly, brace the gate posts and anchor the gate base plates securely to the floor. **See Figure 15.**

### NOTICE

**Carriage gates must also be tested during operation. Routine vibration during travel may affect the weight required and necessitate adjustments.**



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## SLIDING GATE INSTALLATION INSTRUCTIONS

### IDENTIFY COMPONENTS

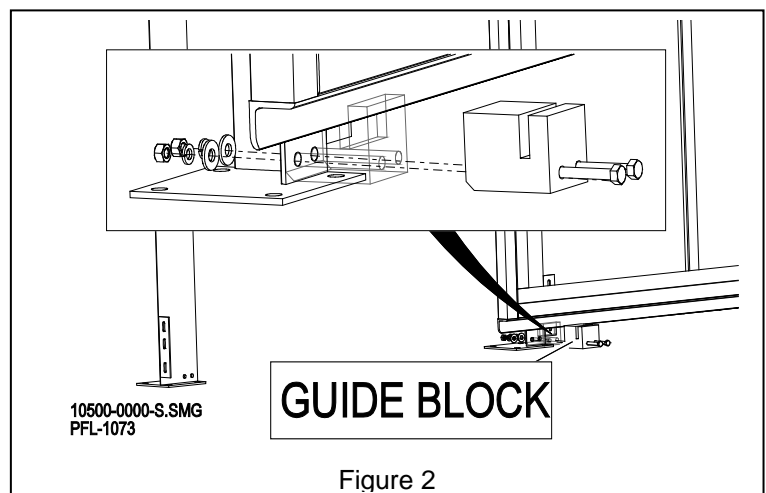
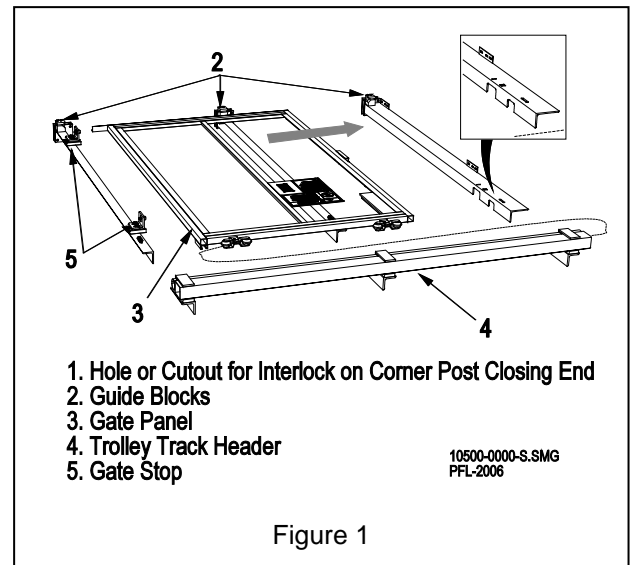
Gate components, posts, panels, header assembly, interlocks, will have color coded tags. Each gate tag will be a different color.

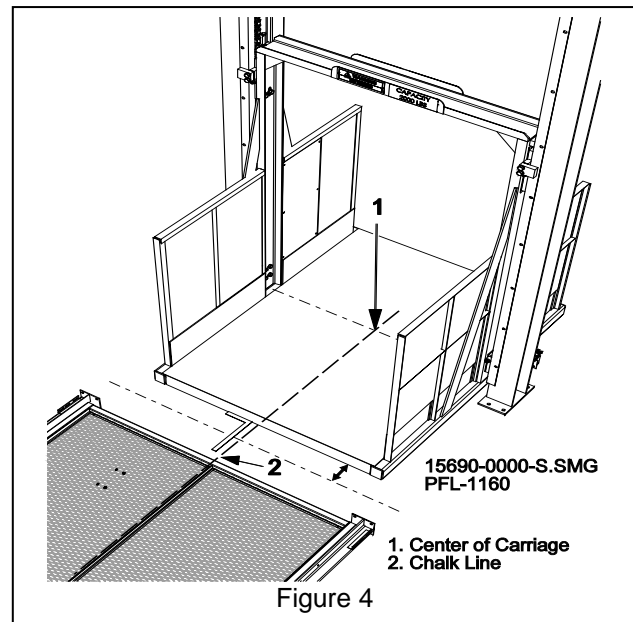
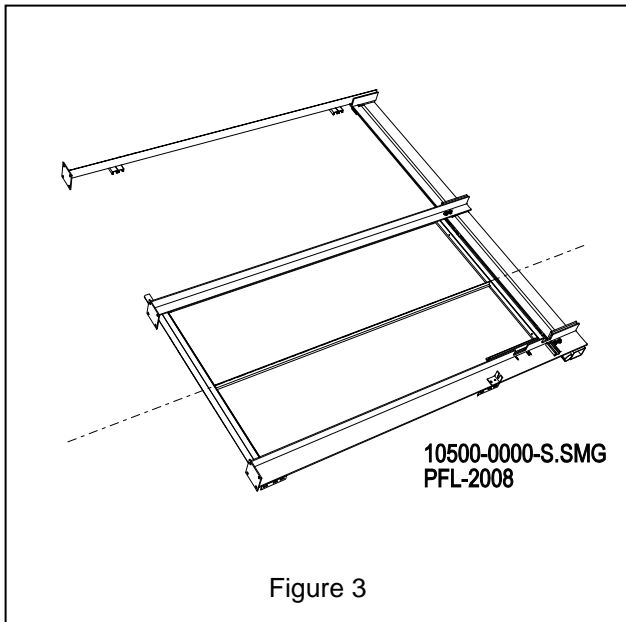
Level	Tag Color
1 <sup>st</sup> (Bottom)	Green
2 <sup>nd</sup>	Yellow
3 <sup>rd</sup>	Red
4 <sup>th</sup>	Blue
5 <sup>th</sup>	Orange
6 <sup>th</sup> and higher	White

### INSTALLATION

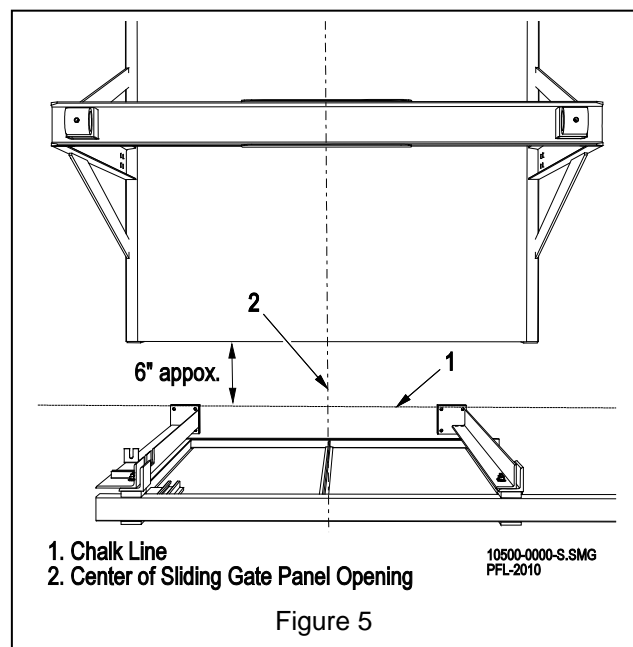
The preferred method of installing a sliding gate is to pre-assemble the gate on the floor and then stand it up. The following instructions are for pre-assembly of the gates. If for some reason pre-assembly is not possible, use these instructions as a general guide for the assembly, positioning, and securing of the gates.

1. Lay the gate posts on the floor parallel to each other with the gate post that has the hole or cutout for the interlock on the closing end. The middle post should have two holes near the base plate for mounting the guide block. **See Figure 1.**
2. Bolt the trolley track header to the gate posts, and slide the gate panel into the trolley track header.
3. Bolt guide block to middle post. **See Figure 2.**



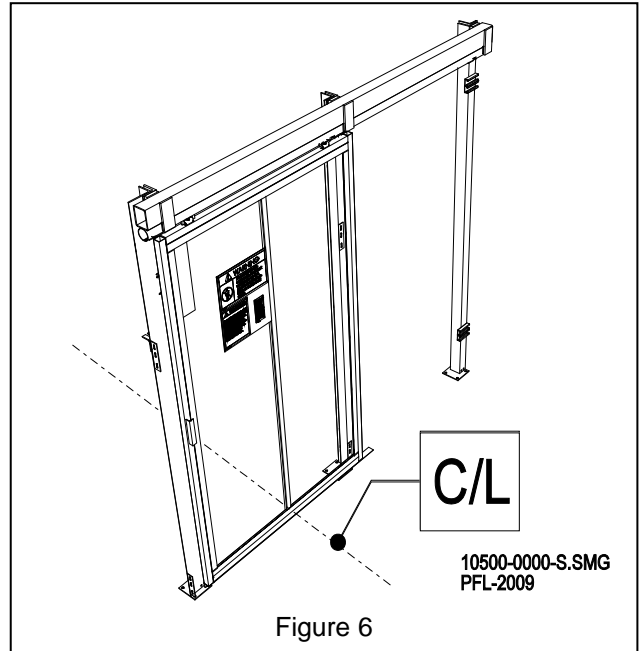


4. Slide gate to its closed position. Add remaining guide blocks. Locate and mark center of the gate panel. **See Figure 3.**
5. Locate and mark center of carriage. Using a carpenter square held on the front edge of the carriage, mark a chalk line on the floor to ensure center of the gate is on the center line of the carriage. **See Figure 4.**
6. The ideal position of the gate is 6" from inside of gate to carriage. However, the gate can be located anywhere within a range of 4" minimum from the inside of the gate post to carriage and a maximum of 6" from inside of gate post to carriage. Verify if the local code requires a panel distance from carriage. When the gate post to carriage measurement has been determined, snap a chalk line to identify the gate position parallel to the carriage. **See Figure 5.**





7. Raise the gate assembly. The track and gate are to be on the outside. Position the gate assembly so the center of the closed gate is located on the center of the carriage parallel to the carriage and the inside of the gate posts' base plates are on the chalk line. **See Figure 6.**
8. Using 3/8" anchors 3 1/2" long, drill and anchor gate post gate plates to the floor.



## NOTICE

**Length of enclosures may be a determining factor in gate location. Check GA drawing for enclosure placement.**

## Sliding Gate Installation Instructions

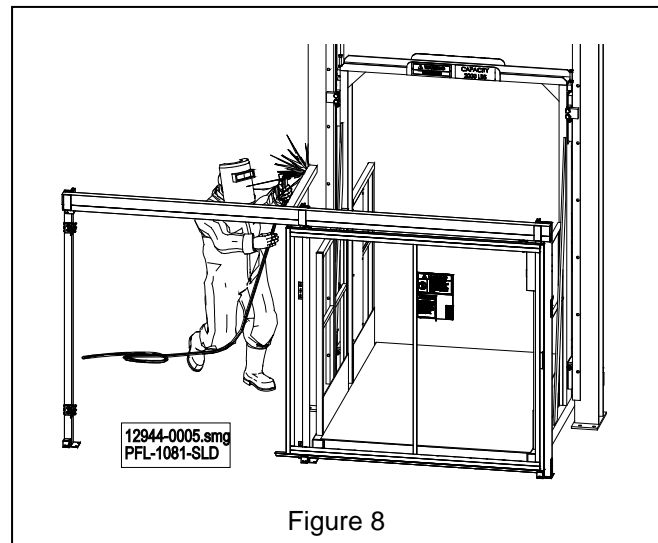
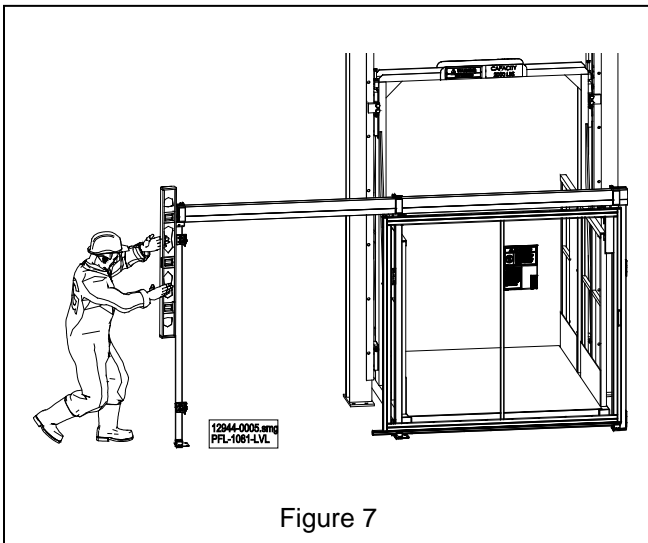
9. Plumb and square the gate using a plumb bob or a four foot or longer. **See Figure 7.**

### NOTICE

**Anchor hole depth should always be deeper than the length of the anchor bolt.**

**Recommended wedge anchor size: 3/8" dia. x 3 1/2 long.**

10. With the gate posts plumb, measure from gate post to VRC column. Cut two support braces and install as illustrated (1 1/2" x 1 1/2" steel angle or similar). **See Figure 8.**
11. Tighten all bolts.
12. Verify the gate operation.
13. Weld the steel angle header to gate posts.
14. Check the gate. Adjust the gate panel as necessary. Additional bracing may be necessary.
15. Install and wire the gate interlock.
16. Verify the proper gate panel and interlock operation.
17. Verify the safe gate operation with the carriage present and not present at the gate location.



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



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**Gate Interlock Information**

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## GATE CABLE INTERLOCK INSTALLATION

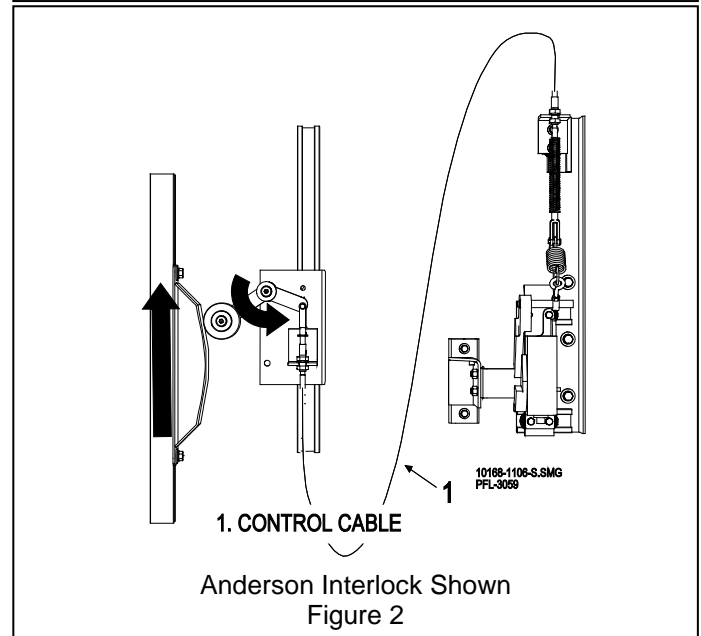
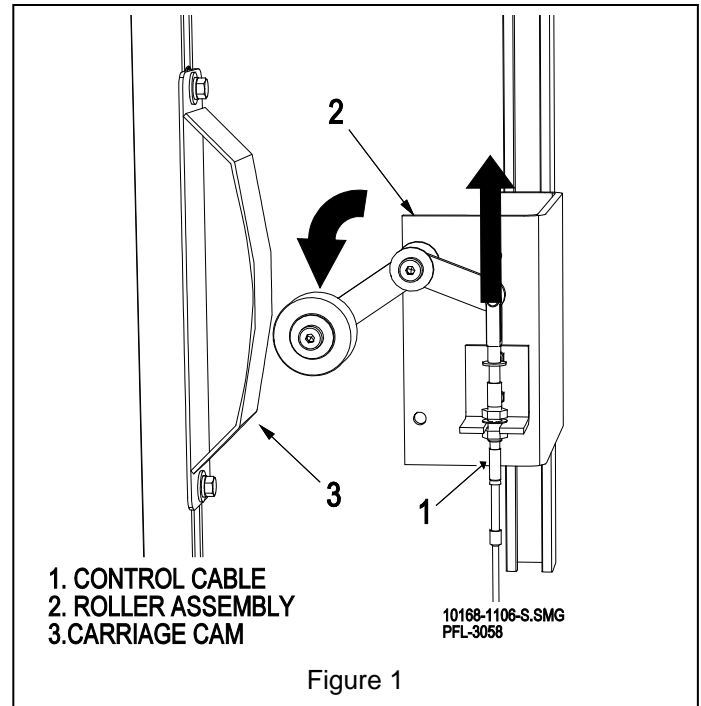
### NOTICE

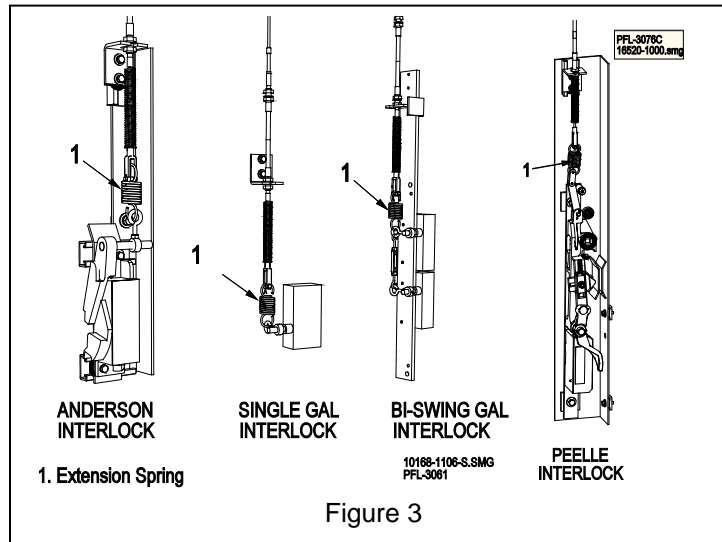
**Read this bulletin in its entirety before starting the installation.**

### GENERAL DESCRIPTION

The cable interlock consists of four main items:

1. Carriage Cam - The cam is mounted on the carriage to activate the roller assembly. It must be positioned to allow the roller to move freely on the inclined cam face and to allow the control cable to activate the interlock. **See Figure 1.**
2. Column Mounted Roller Assembly - The roller assembly is mounted on the lift column. It must be positioned to limit the control cable travel. **See Figure 1. Note:** Do not allow the clevis to bottom out or overextend. The required travel is approximately  $\pm \frac{3}{4}$ ". The maximum cable travel is 2".
3. Control Cable - The control cable is a utility cable with threaded stainless steel end rods. The cable has a maximum 2" stroke. **See Figures 1 and 2.**
4. Gate Cable Interlock Assembly - The gate cable interlock is attached to the gate post. The stroke of the cable is adjusted to permit the interlock to release the gate latch. **See Figure 3.**





### WARNING

- If travel is extended beyond 2", cable damage will occur.
- A gradual or sudden increase in the no-load friction (cable disconnected at both ends) of a cable is an indication of a pending or present performance problem. The cable should be replaced.
- A gradual or sudden decrease in the usable stroke of a cable is an indication of a pending or present performance problem. The cable should be replaced.
- Cables which have moisture inside of them and/or have become frozen should be replaced. Do not apply heat to thaw or dry cables.
- Cables are lubricated for the life of the cable. Do not remove the seals or lubricate the cable.
- Cables are designed to be non-repairable. Do not attempt to repair the cable.

### CAUTION

- Cables are designed to be contaminant resistant, not contaminant proof. Protect cables from contaminants such as gas, oil, diesel fuel, water, dirt, and chemicals.
- Protect the cable from physical damage by paint, kinking, vibration, etc., which may damage cable.
- The swivel angle must be centered within the available swivel angle.
- The usable travel must be centered within the available stroke.
- Do not bend cable sharply. Cable has a minimum bend radius for 4". If the cable is too tight it may not operate properly.

## INTERLOCK ASSEMBLY ADJUSTMENT

The tension on the extension spring should be adjusted by positioning the cable on the angle bracket. The activation of the interlock is also adjusted by the position on the set collar. **See Figure 4.**

## CABLE ADJUSTMENT WITH ROLLER ARM

1. Adjust the carriage cam to allow  $\pm \frac{3}{4}$ " cable travel (2" maximum cable travel). Make sure the roller wheel clears the edge of the cam. Center the cable travel at the center of the full cable stroke by positioning the cable in the bracket angle. **See Figure 5.**
2. Edge of cam must not be past the center of the wheel toward the bracket. This could catch the wheel at the cam edge and break the cable clevis. **See Figure 6.**

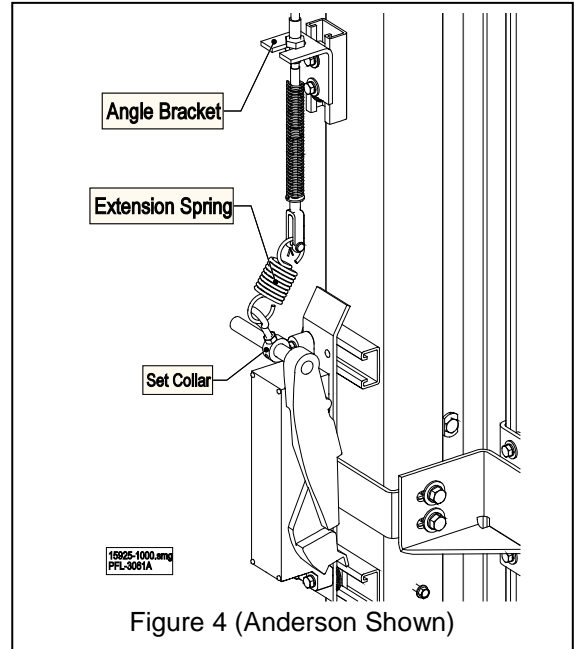


Figure 4 (Anderson Shown)

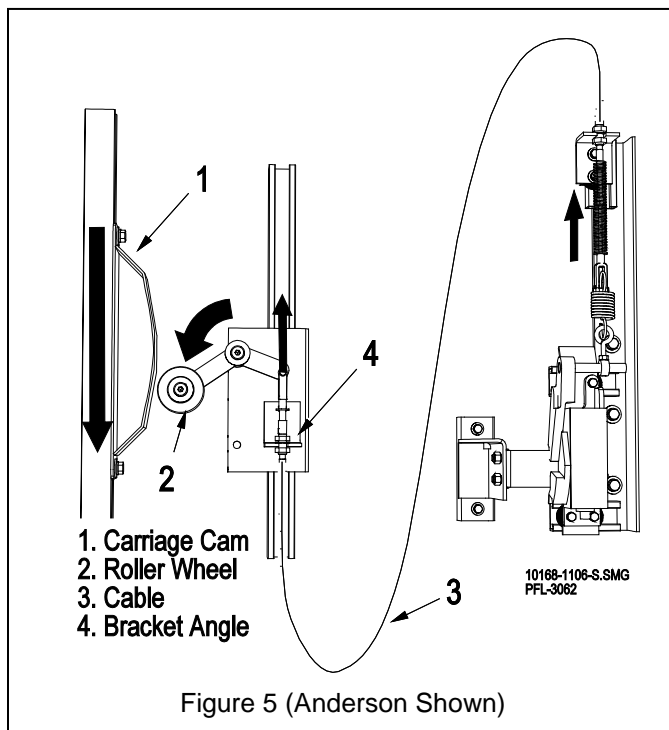


Figure 5 (Anderson Shown)

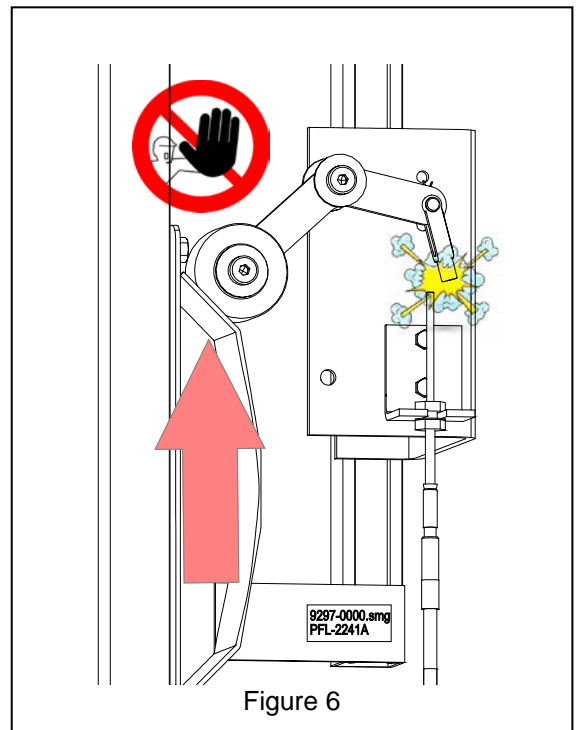


Figure 6

## WARNING

**Proper engagement of the roller and cam is critical. The roller arm should control the cable out of the sleeve. Improper alignment could cause the roller arm to push the cable into the sleeve causing it to bend and break.**

### POSITION ON THE ROLLER ARM ON THE LIFT COLUMN

1. The position of the roller on the cam is very important. The roller must roll freely on the cam incline. See **Figure 7**.

#### CAUTION

Do not allow the roller to hang up on the top/bottom horizontal surface of the cam.

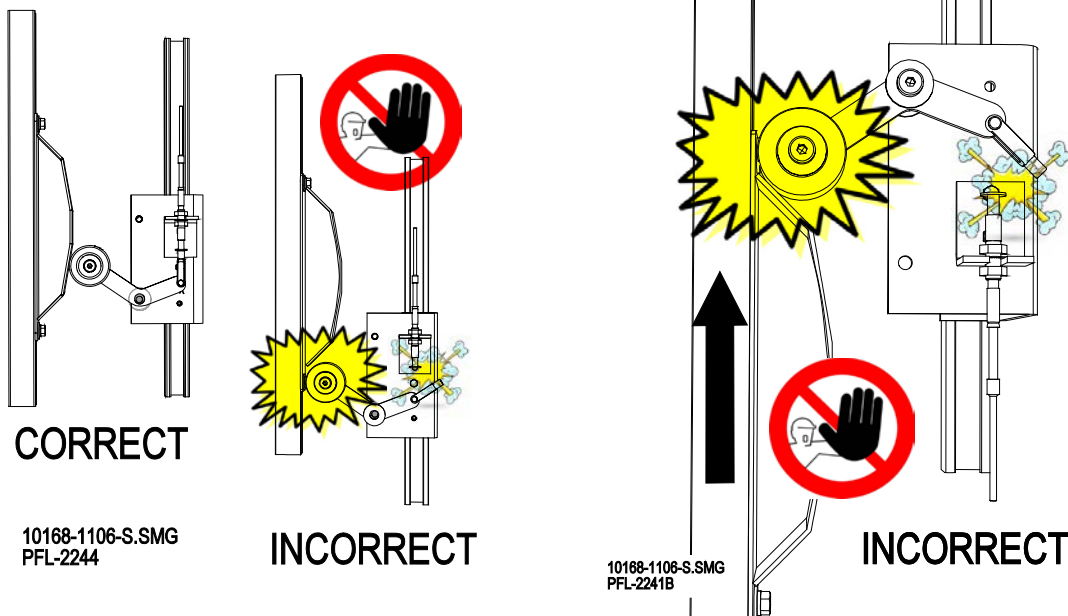


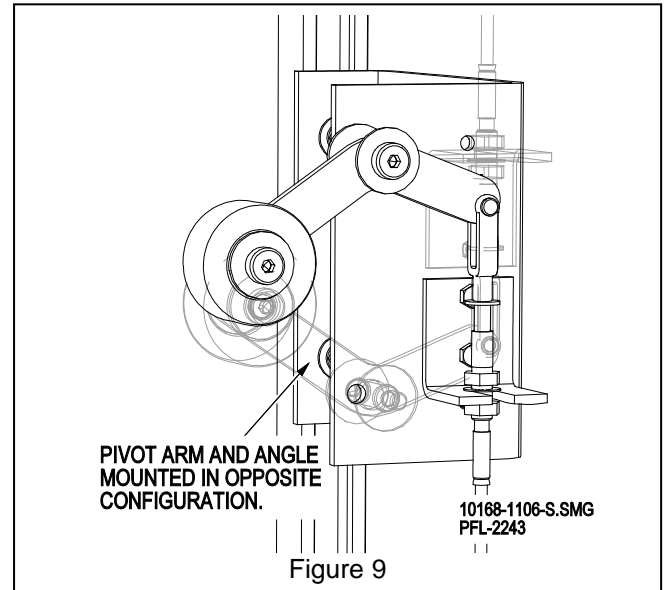
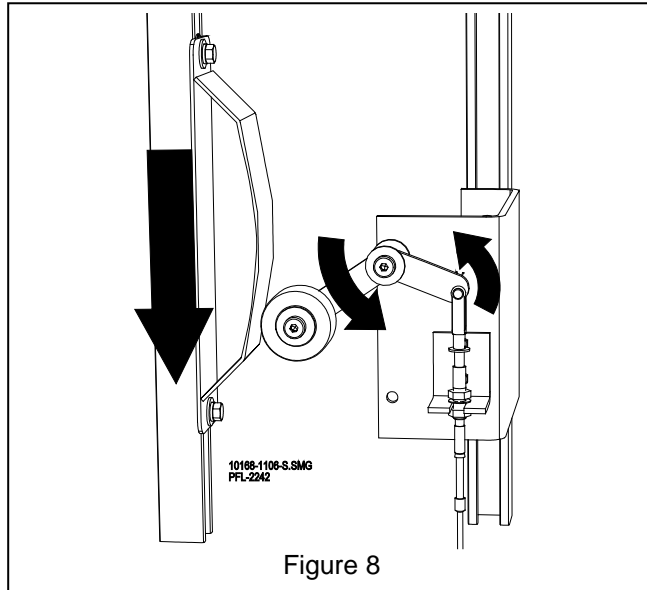
Figure 7

#### WARNING

Proper engagement of the roller and cam is critical. The roller arm should control the cable out of the sleeve. Improper alignment could cause the roller arm to push the cable into the sleeve causing it to bend and break.

2. At the top and bottom levels, the roller arm assembly should be orientated so the cam hits the roller wheel arm in the pivot direction. See **Figure 8**.
3. If you need to change the roller assembly to an opposite hand, unbolt the angle and pivot arm and reassemble in new location. See **Figure 9**.

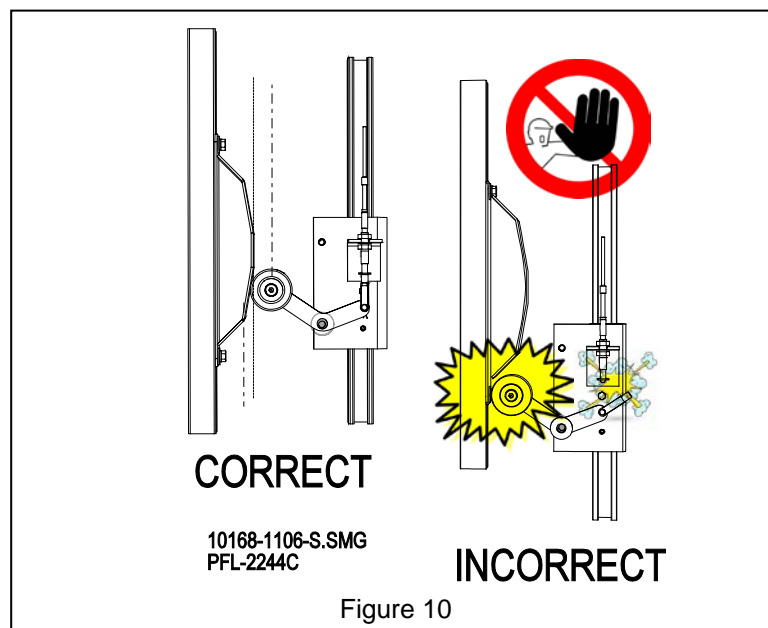




## NOTICE

**Only on the intermediate levels, the cam will hit the roller arm in both directions, so alignment is important. See Figure 7.**

4. The edge of the cam must past center of the wheel (away from bracket) to allow pivot arm to rotate. **See Figure 10.**
5. If cam hits under the wheel not allowing the arm to pivot, the cable will break. **See Figure 6.**



## ***Gate Cable Interlock Installation***

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



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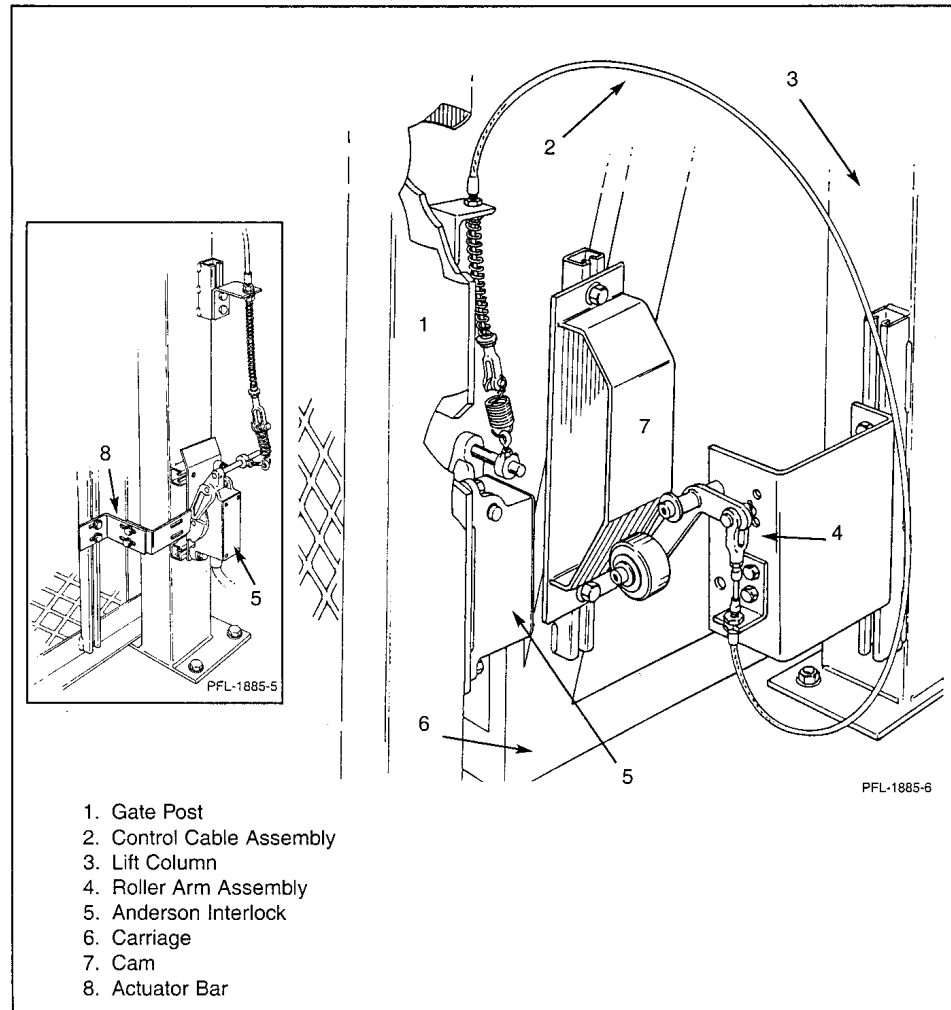
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ANDERSON CABLE INTERLOCK

FOR USE ON VERTICAL ACTING & BI-PANEL VERTICAL ACTING GATES

NOTICE

Read PFlow Service Bulletin 15709-0029-B284  
"Gate Cable Interlock Installation" before starting installation.



If you have any questions or require assistance, please contact the Product Support Department.



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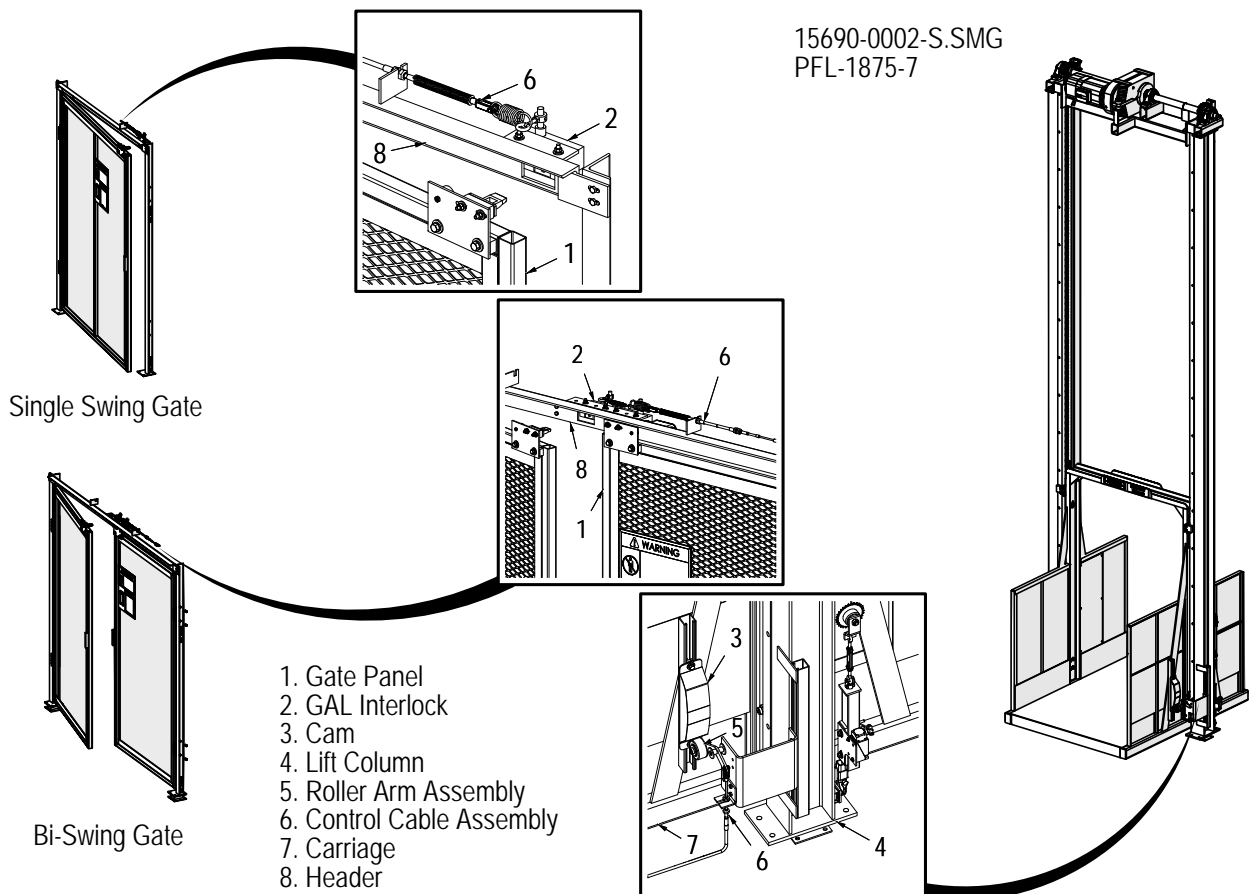
Notes

**GAL CABLE INTERLOCK**

**FOR USE ON SINGLE & BI-SWING GATES**

**NOTICE**

**Read PFlow Service Bulletin 15709-0029  
"Gate Cable Interlock Installation" before starting installation.**



If you have any questions or require assistance, please contact the Product Support Department.

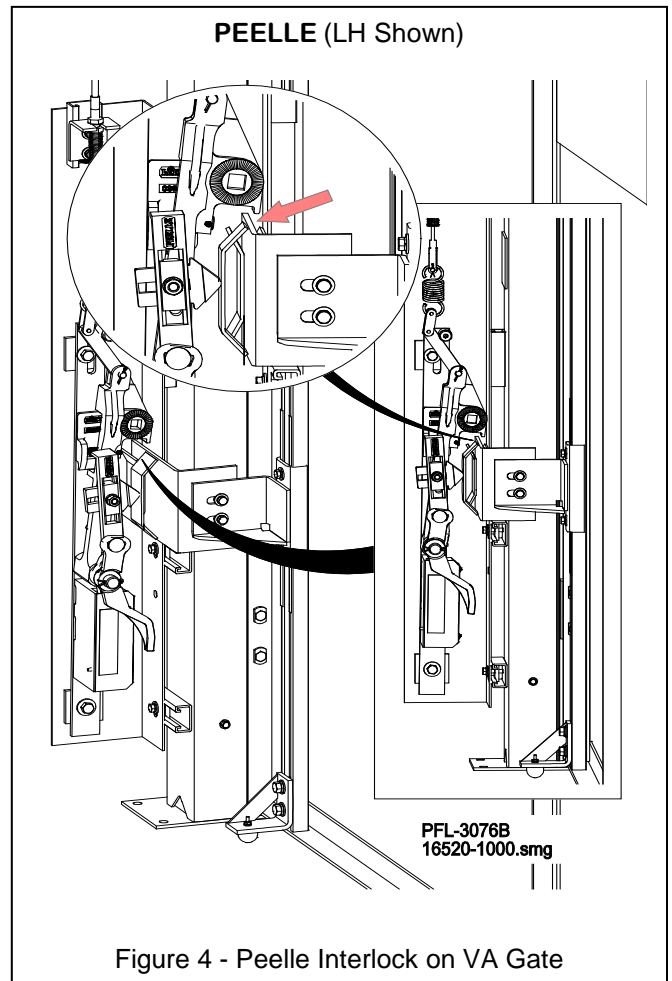
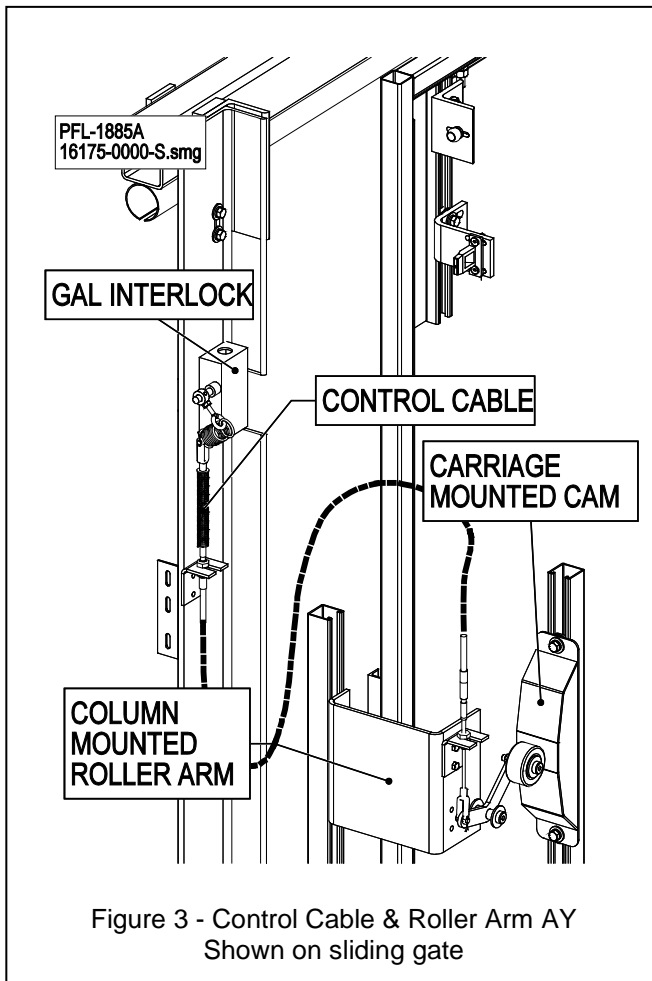
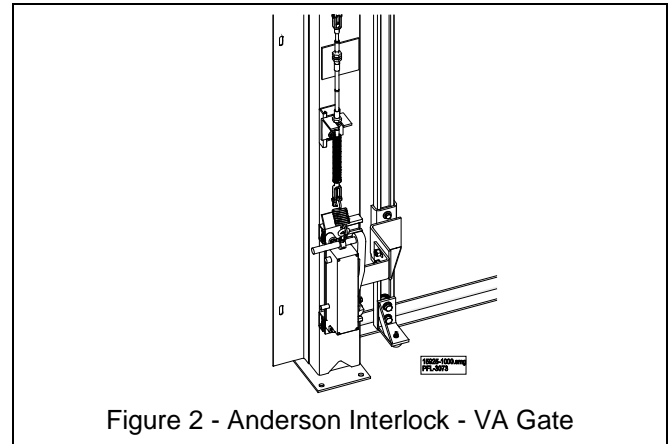
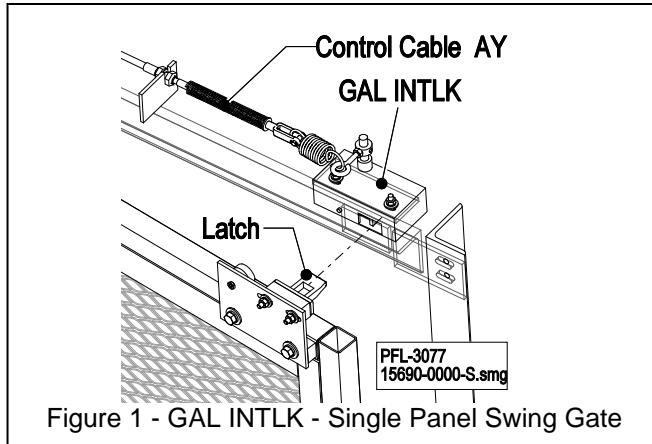


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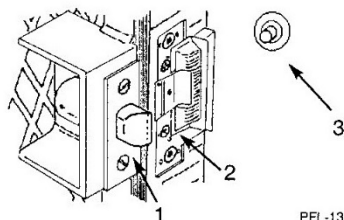
Notes

## 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

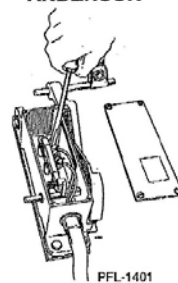


PFL-1389

1. Spring Latch
2. Strike
3. Button

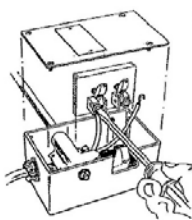
Figure 5 - Electric Strike - Swing Gate

## ANDERSON



PFL-1401

## GAL

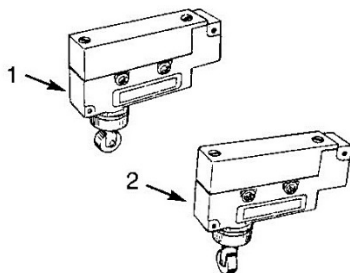


PFL-1250

See schematic for proper wiring instructions.

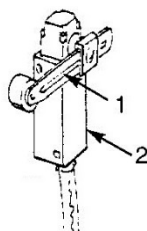
Figure 6 - Interlock internal electrical contacts

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.



PFL-1293

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



PFL-1205

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](mailto:psd@pflow.com)

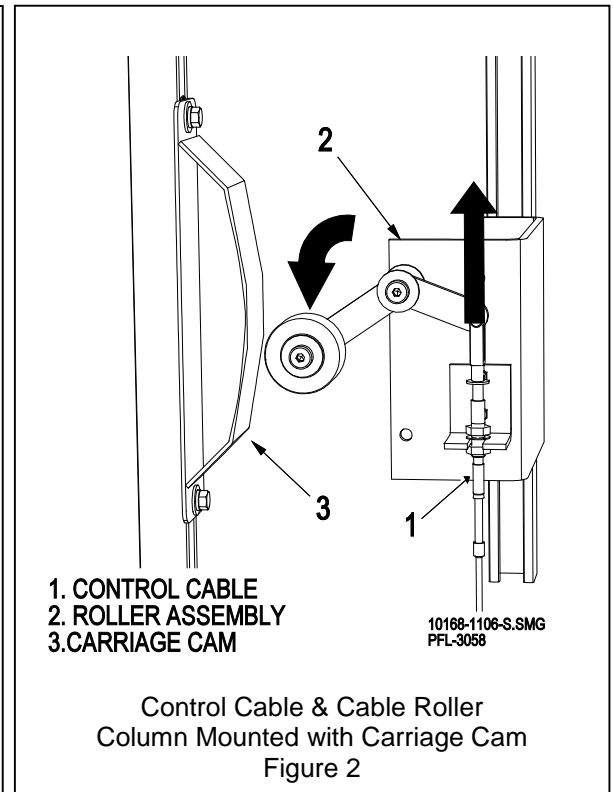
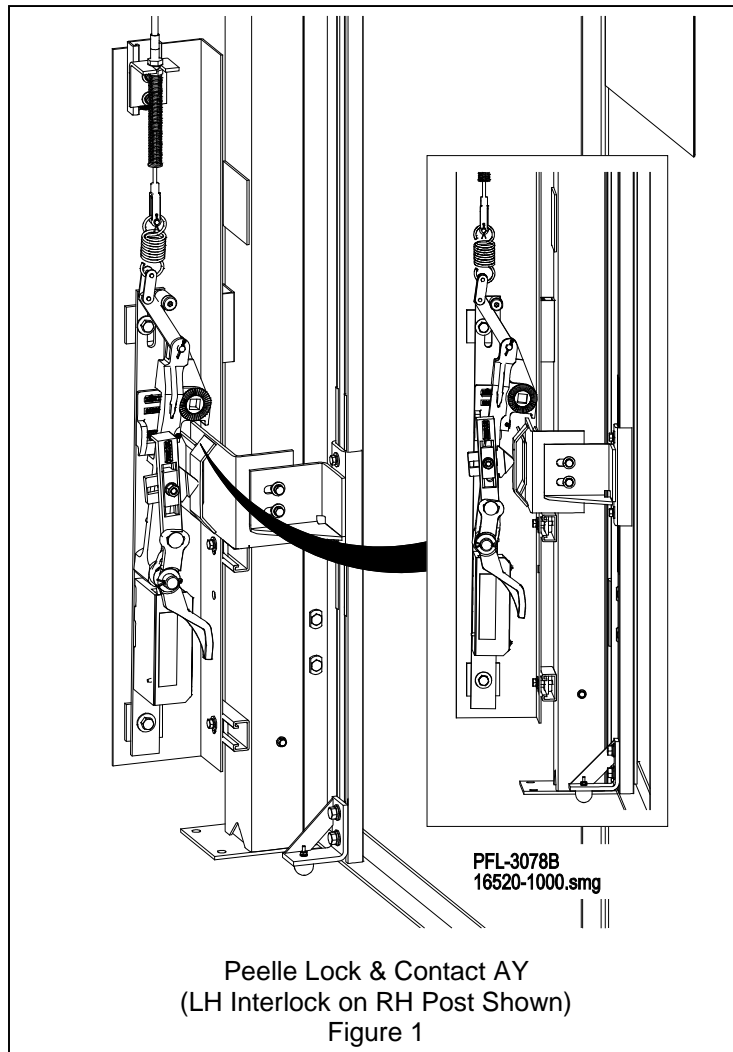


## PEELE CABLE INTERLOCK

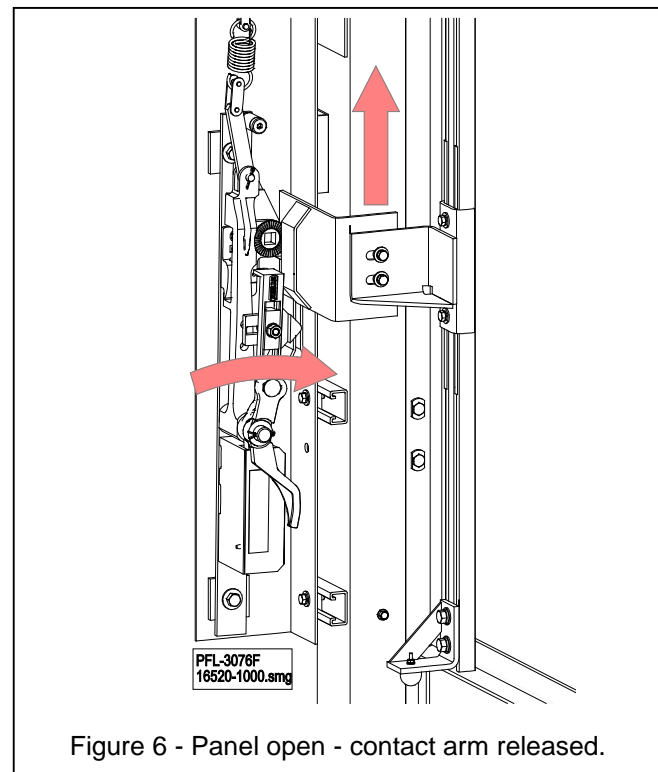
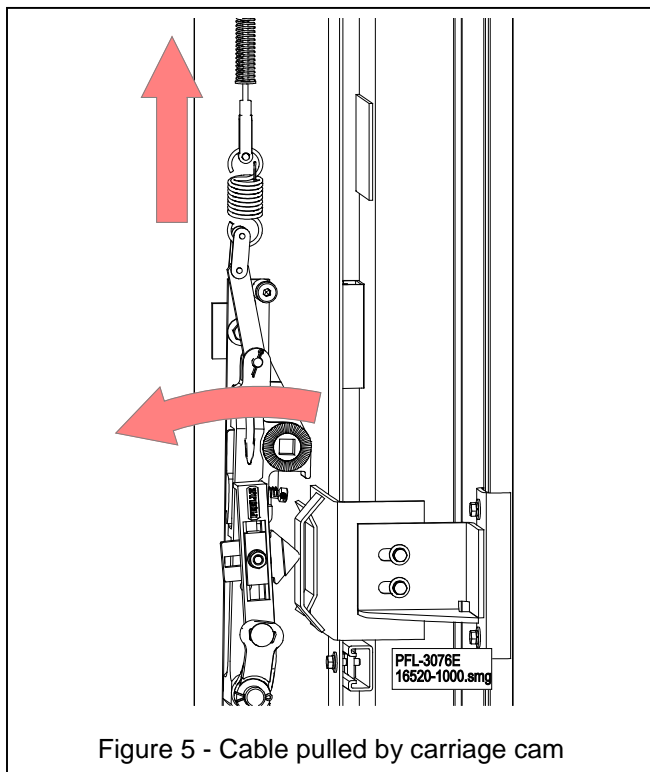
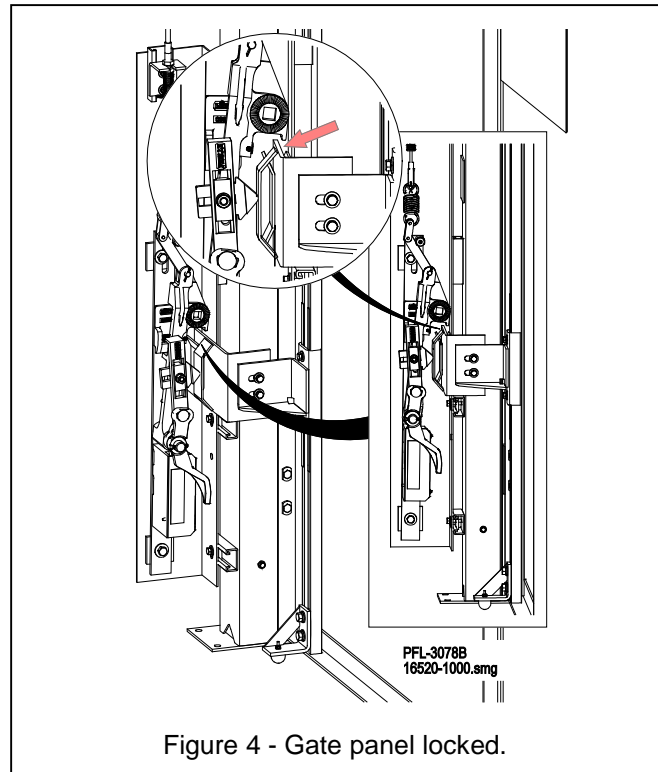
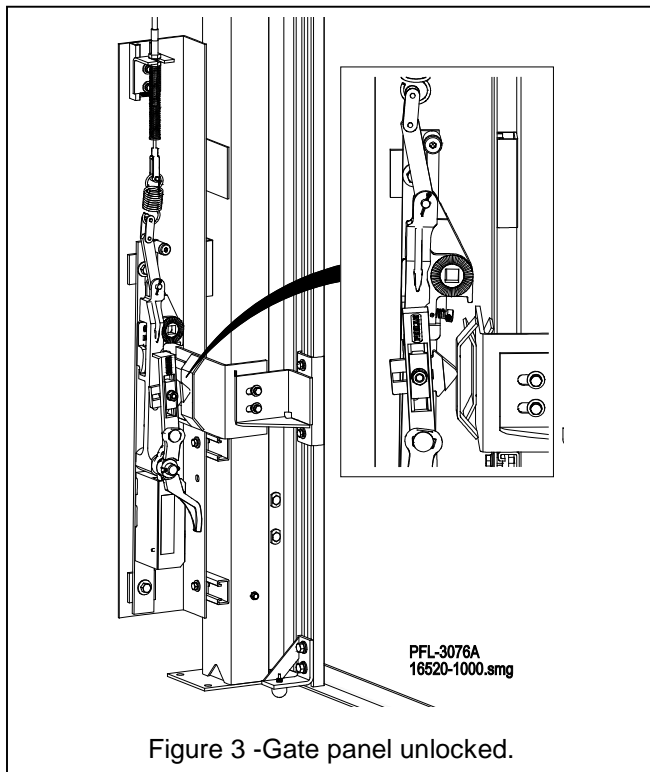
FOR USE ON VERTICAL ACTING & BI-PANEL VERTICAL ACTING GATES

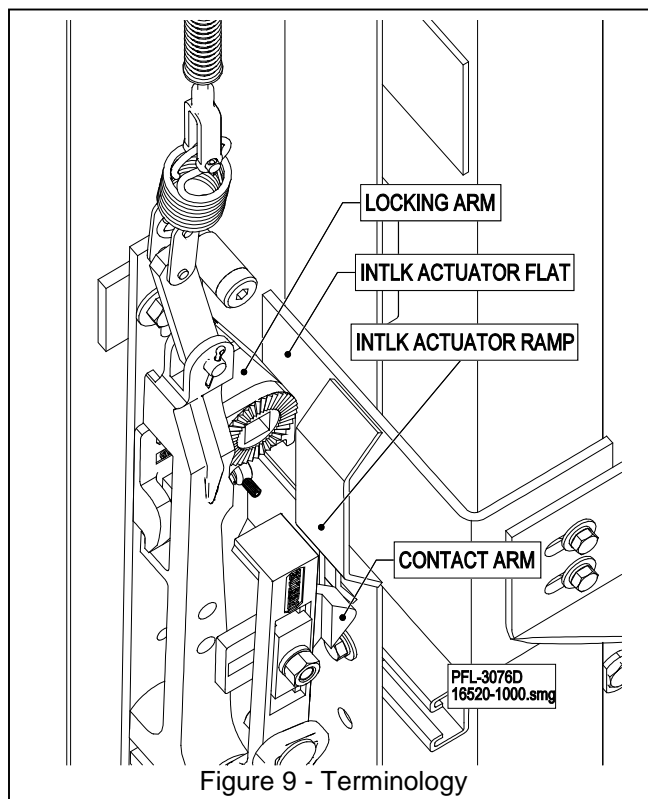
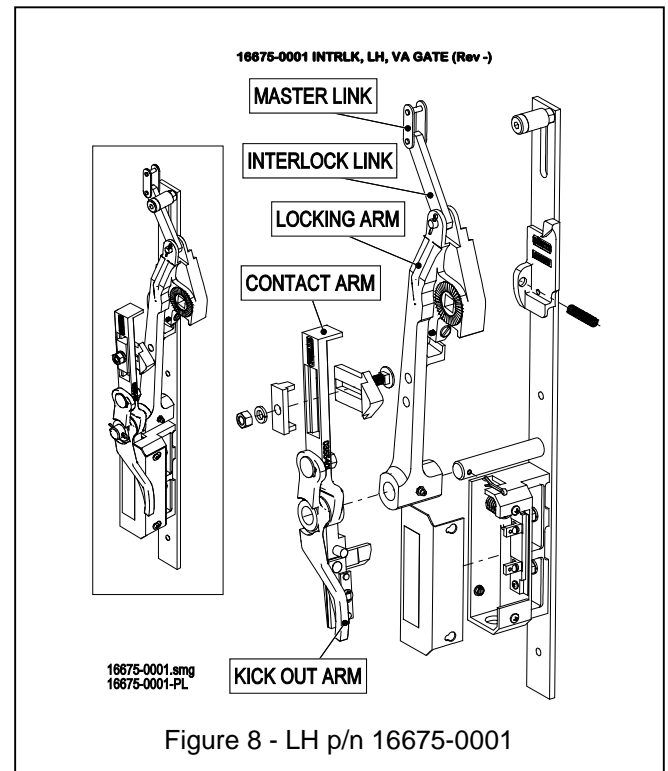
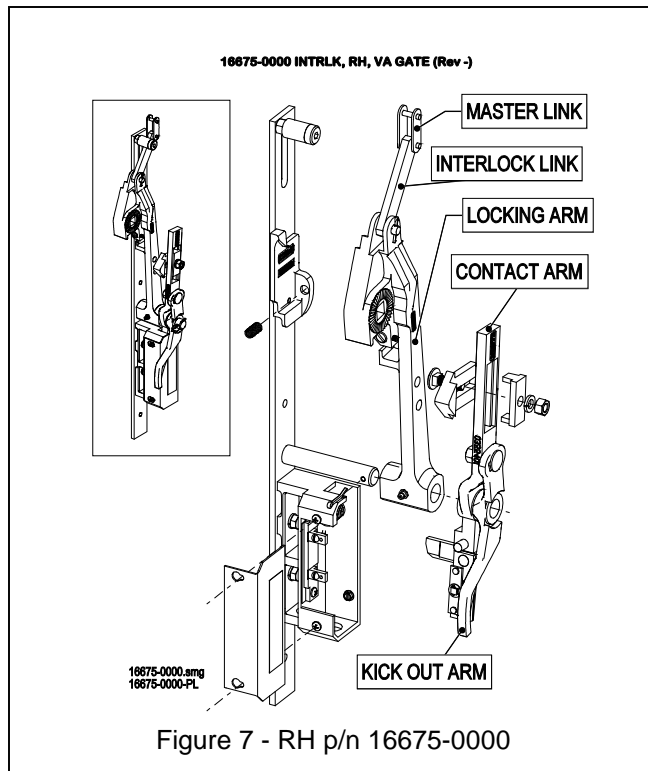
### NOTICE

Read PFlow Service Bulletin 15709-0029  
"Gate Cable Interlock Installation" before starting installation.



The orientation of the interlock is described in the interlock part description as the "hand". The hand of the interlock does not necessary align itself with the hand of the top level assembly. As is with a standard "vertical acting (VA)" gate a left hand (LH) interlock is used on a right hand (RH) post assembly.





If you have any questions or require assistance, please contact the 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

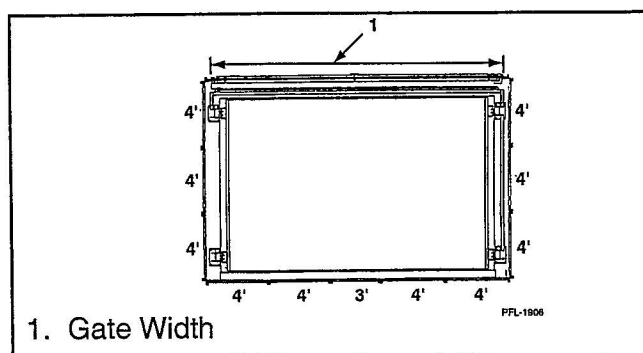
email: [psd@pflow.com](mailto:psd@pflow.com)

Notes

## Enclosure Panels

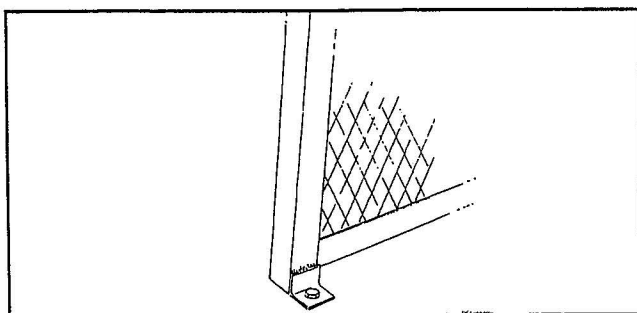
In accordance with ANSI B20.1, Pflow Industries supplies standard enclosure panels to be installed around the unit as required by site conditions. Our panels are manufactured of 1-1/2" angle iron frame and 15 gauge flattened expanded metal which will reject a ball 2" in diameter.

The general arrangement drawing provides a "Plan View" for each level. This will show the proper placement and appropriate size for layout and installation purposes. Applications that require full height enclosures will have an additional drawing in the shipping packet. Modifications for site obstructions are best done in the field by the installer. See Figure 1.



**Figure 1**

Standard panels are 8' high in compliance with OSHA requirements. Total height includes 1-1/2" legs. These panels are to be mounted to the floor. See Figure 2.

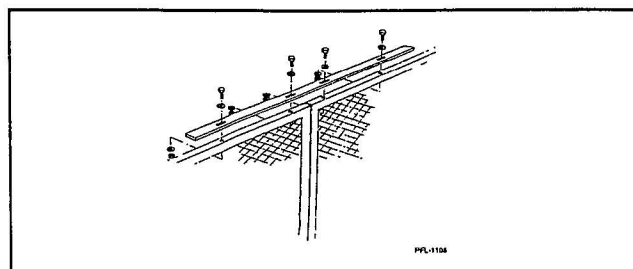


**Figure 2**

When stacking panels, as in full height applications or a transom above a gate, panels without legs are used on top of our regular panels.

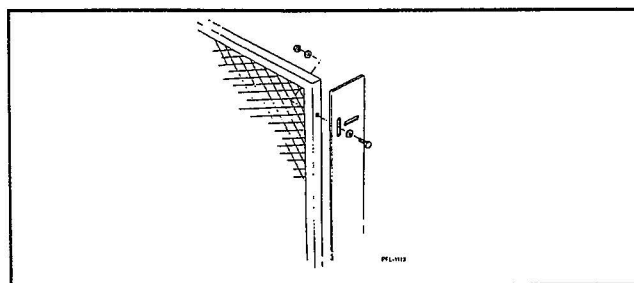
Enclosures must be braced to the VRC or building structure by the mechanical installer. Use of structural angle is suggested.

Stiffeners are provided whenever two panels in excess of 6" meet. See Figure 3.



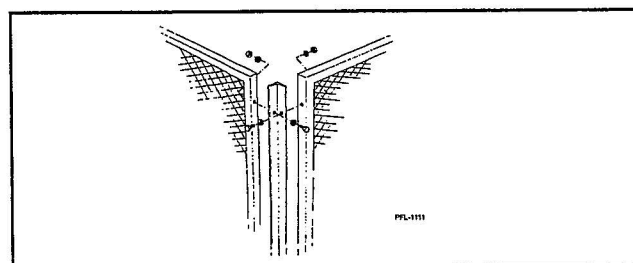
**Figure 3**

Filler panels are used to fill a gap of less than 6". See Figure 4.



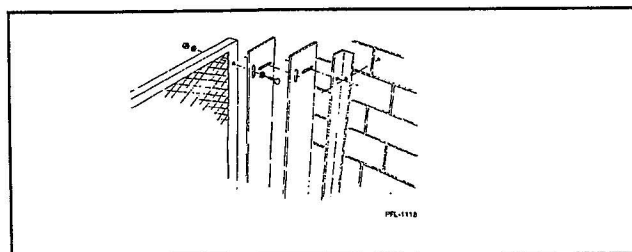
**Figure 4**

Corner angles are required for 90 degree attachment of panels. See Figure 5.



**Figure 5**

Wall attachment kits are provided when a gate or panel meets an existing wall. See Figure 6.



**Figure 6**

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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

<b>Regulatory Information</b>	(216) 566-2902
<b>Medical Emergency</b>	(216) 566-2917
<b>Transportation Emergency*</b>	(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	<b>V. M. &amp; P. Naphtha</b> ACGIH TLV OSHA PEL OSHA PEL	300 PPM 300 PPM 400 PPM STEL	12 mm
9	108-88-3	<b>Toluene</b> ACGIH TLV OSHA PEL OSHA PEL	20 PPM 100 ppm (Skin) 150 ppm (Skin) STEL	22 mm
4	100-41-4	<b>Ethylbenzene</b> ACGIH TLV OSHA PEL OSHA PEL	20 PPM 100 PPM 125 PPM STEL	7.1 mm
22	1330-20-7	<b>Xylene</b> ACGIH TLV ACGIH TLV OSHA PEL OSHA PEL	100 PPM 150 PPM STEL 100 PPM 150 PPM STEL	5.9 mm
24	67-64-1	<b>Acetone</b> ACGIH TLV ACGIH TLV OSHA PEL	500 PPM 750 PPM STEL 1000 PPM	180 mm
4	110-19-0	<b>Isobutyl Acetate</b> ACGIH TLV OSHA PEL	150 PPM 150 PPM	12.5 mm
1	108-65-6	<b>1-Methoxy-2-Propanol Acetate</b> ACGIH TLV OSHA PEL	Not Available Not Available	1.8 mm
3	112926-00-8	<b>Amorphous Precipitated Silica</b> ACGIH TLV OSHA PEL	10 mg/m3 as Dust 6 mg/m3 as Dust	
2	14807-96-6	<b>Talc</b> ACGIH TLV OSHA PEL	2 mg/m3 as Resp. Dust 2 mg/m3 as Resp. Dust	
4	13463-67-7	<b>Titanium Dioxide</b> ACGIH TLV OSHA PEL OSHA PEL	10 mg/m3 as Dust 10 mg/m3 Total Dust 5 mg/m3 Respirable Fraction	
0.3	1333-86-4	<b>Carbon Black</b> ACGIH TLV OSHA PEL	3.5 MG/M3 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

<b>Health</b>	2*
<b>Flammability</b>	3
<b>Reactivity</b>	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

<b>FLASH POINT</b> 1 °F TCC	<b>LEL</b> 0.9	<b>UEL</b> 13.1	<b>FLAMMABILITY CLASSIFICATION</b> RED LABEL -- Extremely Flammable, Flash below 21 °F (-6 °C)
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### 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

<b>PRODUCT WEIGHT</b>	7.84 lb/gal	939 g/l
<b>SPECIFIC GRAVITY</b>	0.94	
<b>BOILING POINT</b>	132 - 325 °F	55 - 162 °C
<b>MELTING POINT</b>	Not Available	
<b>VOLATILE VOLUME</b>	77%	
<b>EVAPORATION RATE</b>	Slower than ether	
<b>VAPOR DENSITY</b>	Heavier than air	
<b>SOLUBILITY IN WATER</b>	Not Available	
<b>VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)</b>		
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**

<b>CAS No.</b>	<b>Ingredient Name</b>			
<b>64742-89-8</b>	<b>V. M. &amp; P. Naphtha</b>	LC50 RAT LD50 RAT	4HR	Not Available Not Available
<b>108-88-3</b>	<b>Toluene</b>	LC50 RAT LD50 RAT	4HR	4000 ppm 5000 mg/kg
<b>100-41-4</b>	<b>Ethylbenzene</b>	LC50 RAT LD50 RAT	4HR	Not Available 3500 mg/kg
<b>1330-20-7</b>	<b>Xylene</b>	LC50 RAT LD50 RAT	4HR	5000 ppm 4300 mg/kg
<b>67-64-1</b>	<b>Acetone</b>	LC50 RAT LD50 RAT	4HR	Not Available 5800 mg/kg
<b>110-19-0</b>	<b>Isobutyl Acetate</b>	LC50 RAT LD50 RAT	4HR	Not Available 13400 mg/kg
<b>108-65-6</b>	<b>1-Methoxy-2-Propanol Acetate</b>	LC50 RAT LD50 RAT	4HR	Not Available 8500 mg/kg
<b>112926-00-8</b>	<b>Amorphous Precipitated Silica</b>	LC50 RAT LD50 RAT	4HR	Not Available 4500 mg/kg
<b>14807-96-6</b>	<b>Talc</b>	LC50 RAT LD50 RAT	4HR	Not Available Not Available
<b>13463-67-7</b>	<b>Titanium Dioxide</b>	LC50 RAT LD50 RAT	4HR	Not Available Not Available
<b>1333-86-4</b>	<b>Carbon Black</b>	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/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	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
*for Chemical Emergency ONLY (spill, leak, fire, exposure, or accident)	

## 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		7.1 mm
		ACGIH TLV	20 PPM	
		OSHA PEL	100 PPM	
		OSHA PEL	125 PPM STEL	
7	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	
2	64742-95-6	Light Aromatic Hydrocarbons		3.8 mm
		ACGIH TLV	Not Available	
		OSHA PEL	Not Available	
2	95-63-6	1,2,4-Trimethylbenzene		2.03 mm
		ACGIH TLV	25 PPM	
		OSHA PEL	25 PPM	
35	67-64-1	Acetone		180 mm
		ACGIH TLV	500 PPM	
		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**

<b>Health</b>	<b>2*</b>
<b>Flammability</b>	<b>3</b>
<b>Reactivity</b>	<b>0</b>

**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/m<sup>3</sup> (total dust), 3 mg/m<sup>3</sup> (respirable fraction), OSHA PEL 15 mg/m<sup>3</sup> (total dust), 5 mg/m<sup>3</sup> (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

<b>PRODUCT WEIGHT</b>	9.62 lb/gal	1153 g/l
<b>SPECIFIC GRAVITY</b>	1.16	
<b>BOILING POINT</b>	132 - 360 °F	55 - 182 °C
<b>MELTING POINT</b>	Not Available	
<b>VOLATILE VOLUME</b>	73%	
<b>EVAPORATION RATE</b>	Slower than ether	
<b>VAPOR DENSITY</b>	Heavier than air	
<b>SOLUBILITY IN WATER</b>	Not Available	
<b>VOLATILE ORGANIC COMPOUNDS (VOC Theoretical - As Packaged)</b>		
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**

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

### 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

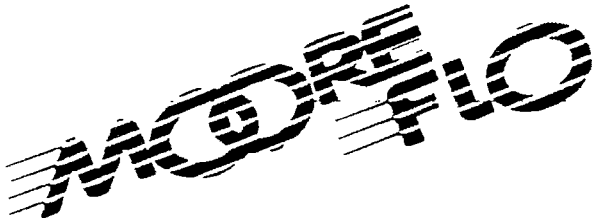
Proper Shipping name: Aerosols, Flammable

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 <sup>3</sup> @ 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

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### 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**

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**SECTION I**

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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

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**SECTION II-HAZARDOUS INGREDIENTS/IDENTITY INFORMATION**

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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.

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**SECTION 111-PHYSICAUCHEMICAL CHARACTERISTICS**

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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

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#### SECTION IV-FIRE AND EXPLOSION HAZARD DATA

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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.

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#### SECTION V-REACTIVITY DATA

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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:

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#### SECTION VI-HEALTH HAZARD DATA

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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

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**SECTION VII-PRECAUTIONS FOR SAFE HANDLING AND USE**

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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/m<sup>3</sup> or less is recommended.

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**SECTION VIII-CONTROL MEASURES**

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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.