

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate



MATERIAL HANDLING SOLUTIONS

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### Before You Begin

*Read this entire manual.*

***Before starting the installation, verify the job site dimensions and the dimensions of the delivered materials against the PFlow Industries, Inc. General Arrangement (GA) drawing. Review and verify the enclosure positions and attachment fit-up to the gate post enclosure angle. If the site conditions do not match the GA drawing, please consult the PFlow Industries, Inc. Customer Support Department.***



## **DANGER**

Falling gate hazard! The installation of this equipment requires a qualified installer with extensive knowledge and experience on how to rig and erect structural steel. Make sure to properly support, tie off, or temporarily brace the gate posts, gate panels, and gate assembly during installation. Do not depend on the gate post feet to support the gate posts while the gate is being positioned or assembled. Final bracing of the gate assembly must be to the Vertical Reciprocating Conveyor (VRC) or building structure. The use of structural angle is recommended.



Falling Hazard! The gate panel safety latch may not be operational while the gate is being installed. If you must leave a gate or gate panel unattended, put up barriers and signs warning personnel to stay clear.

## **CAUTION**



Lifting hazard! Components and accessories are heavy. To prevent serious personal injury, use the appropriate lifting apparatus, tie offs, or help when moving, lifting or assembling the components or accessories.

### **NOTICE**

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

### Identify Components

Gate components, posts, panels, and header assembly have color coded tags. Each gate tag is a different color.

Level	Tag Color
1st (bottom)	Green
2nd	Yellow
3rd	Red
4th	Blue
Other	Cream

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

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly



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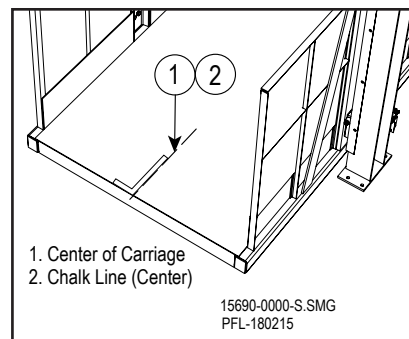
### Establish Placement

**NOTE** *It is often possible to assemble the gate on the ground. However, it may not be possible to erect the fully assembled gate.*

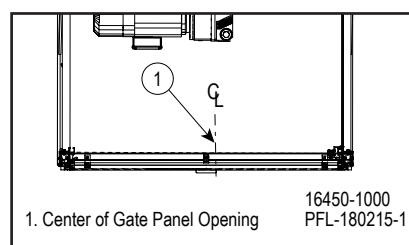
*Horizontal assembly and vertical assembly methods are included in this manual. Both methods require additional support and temporary bracing during assembly.*

1. Measure the outside edge to the outside edge of the carriage to locate the center line. Mark the center line with a pencil on the top of the carriage deck. See Figure 1 and Figure 2.
2. Position a carpenter square on the edge of the carriage to extend the center line onto the carriage deck.

**NOTE** *The ideal position of the outside edge of the gate post is at the front edge of the carriage.*



Establish Center Line  
Figure 1



Alignment  
Figure 2

## Gate Installation

### Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly



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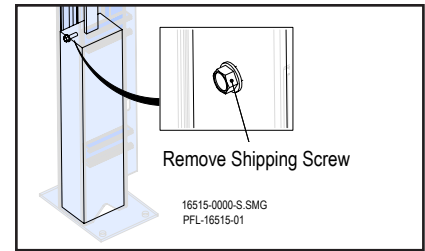
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#### Prepare the Chains in the Gate Posts

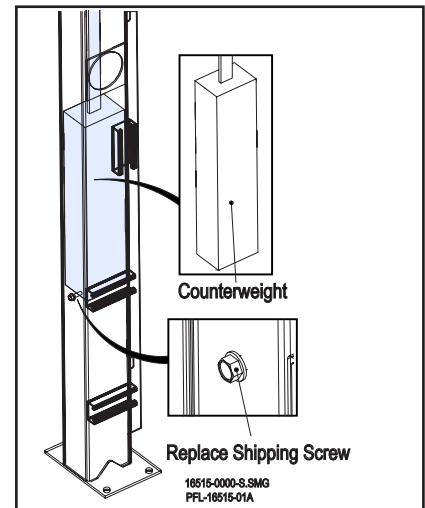
For shipping purposes, the single vertical acting gate panel counterweight is secured with a shipping screw located toward the bottom of the gate post assembly.

To prevent the chain from falling down into the gate post:

1. Remove shipping screw located toward the bottom of the gate post assembly. See Figure 3.
2. Pull the counterweight chain forward until the counterweight is moved forward about 2' (610mm).
3. Make sure the counterweight is above the shipping screw and replace the shipping screw. See Figure 4.
4. Tie one end of a string to the counterweight chain about 3 links back.
5. Tie the other end of the string to the base plate of the gate post assembly.
6. Carefully handle the gate post assembly to keep the counterweight inside the gate post tube. Keep the counterweight above the shipping screw until the gate post is stood upright.



Post Assembly Counterweight  
Figure 3



Post Assembly Counterweight  
Figure 4

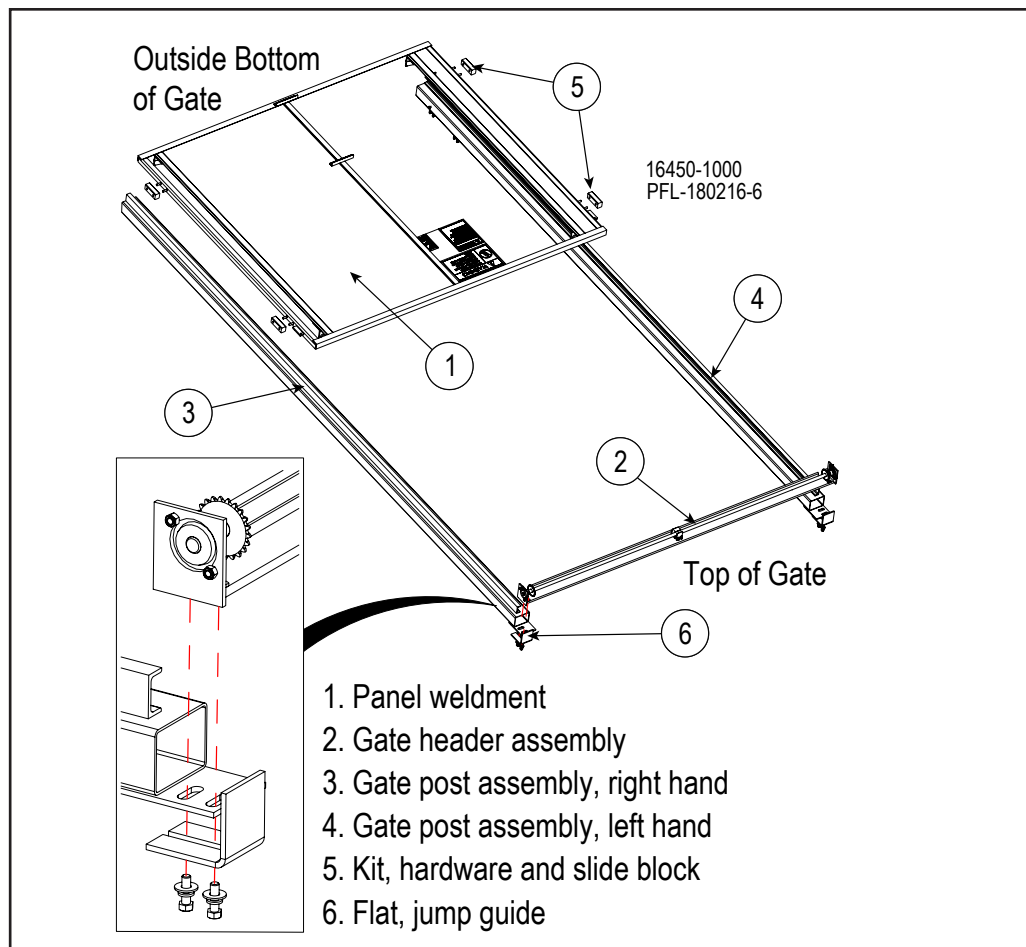
# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly



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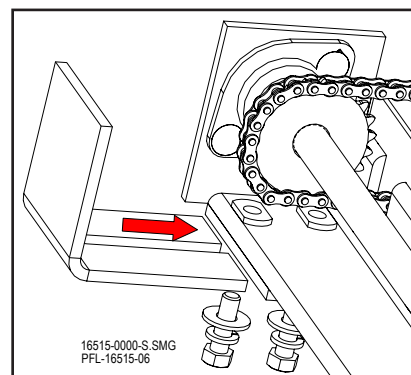
Single VA Gate Layout  
Figure 5

### Begin Horizontal Assembly

1. Lay the gate in the proper position to allow for safe handling and efficient fit-up to the VRC. See Figure 5.
2. Lay each gate post (left side and right side) with the panel guide channel facing up, and the channel open towards the middle.

### Install the Header

1. Position the gate header with the sprockets facing up and ends flush.
2. Position the chain jump guides to leave space for the chain. See Figure 6.
3. Bolt the chain jump guides and header to the post using four (4) 3/8-16 x 1-1/4" long bolts with lock and flat washers (weld-nut on header angle).
4. Align the gate header, making sure the posts are square, and snug the attachment hardware.



Position Chain Jump Guides  
Figure 6

# Gate Installation

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### **WARNING**



Entanglement hazard! Remove gloves, secure long hair, wear snug-fitting clothing, and avoid wearing jewelry while working with chains.



Crush hazard! Keep hands outside and above the chain. If the lift chain does not reach the wheelblock, carefully work the lift chain around the sprocket until it does reach the wheelblock. Lift the chain from the sides. If the chain drops unaided, the weight of the chain will crush fingers. Do not allow the chain to come off the sprocket.

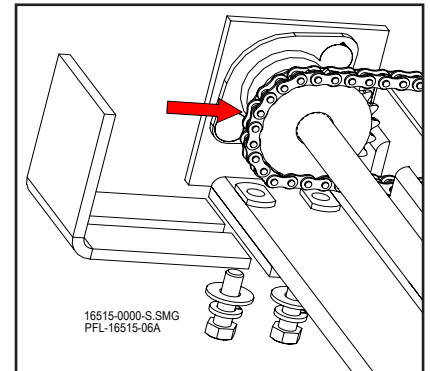
Header falling hazard! Loosen but do not remove the bolts when adjusting the chain jump guide or the headers. Once assembled, the header can fall if the bolts are completely removed.

### Install the Chains

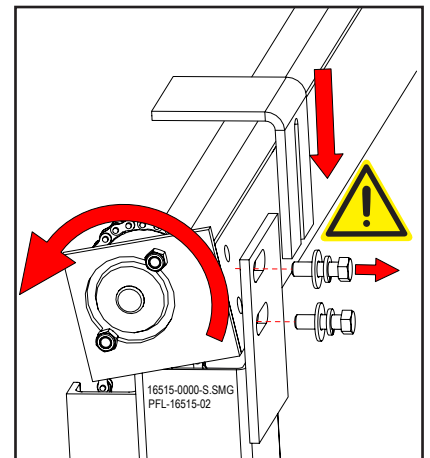
#### NOTE

*The chains must be equal in length on both sides of the sprocket to align the position of the counterweight. If the chains are not equal, work the chain on the front side of the sprockets.*

1. Make sure to eliminate any chain twist. The chain should be straight between the counterweight tab and the sprocket.
2. Remove the #2050 master links from the end of the #35 chain on each post.
3. Place the center link on top of the sprocket. See Figure 7.
4. Thread the chain over the sprockets on the header.
5. Pull the chain tight over the sprocket to remove the slack in the chain without moving the counterweight.
6. Re-attach the #2050 master links to the #35 chain and remove the strings.
7. Verify that the chains on each end of the gate are equal in length from the sprocket to the panel.
8. Loosen the header/post hardware to allow the chain jump guide to slide down into position. Do not loosen the hardware to the point that the header falls off. See Figure 8.
9. Set the space between the chain jump guides approximately  $\pm 1/8"$  (3mm) from the top of the chain.
10. Securely attach the chain jump guides.



Position Center of Chain  
Figure 7



Attach Chain Jump Guides  
Figure 8

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly



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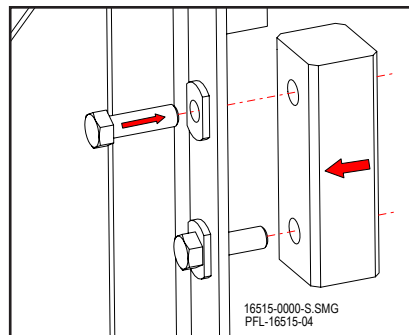
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### Assemble the Gate Panel

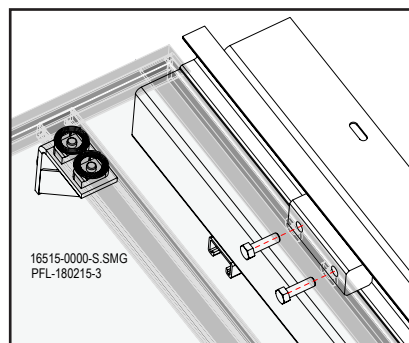
1. Place the gate panel face up between the guide tracks on the gate posts.
2. Insert the guide blocks and attach to the gate panel and guide track. See Figure 9 and Figure 10.

### Attach the Gate Panel to the Gate Chains

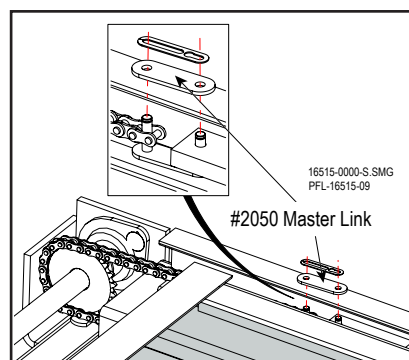
1. Slide the gate panel toward the header. It should move without binding on the guide tracks.
2. Connect the #2050 master link to the gate panel. See Figure 11 and Figure 12.
3. Verify that the chain length is equal on each side.
4. Slide the gate panel to the bottom of the gate posts.



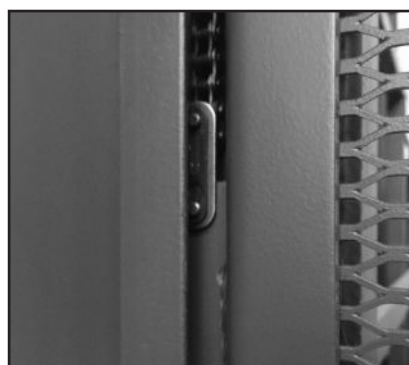
Attach Guide Blocks to the Gate Panel  
Figure 9



Attach Guide Blocks to the Guide Track  
Figure 10



Connect Master Link  
Figure 11



Connect Master Link  
Figure 12

# Gate Installation

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### Raise and Secure the Gate



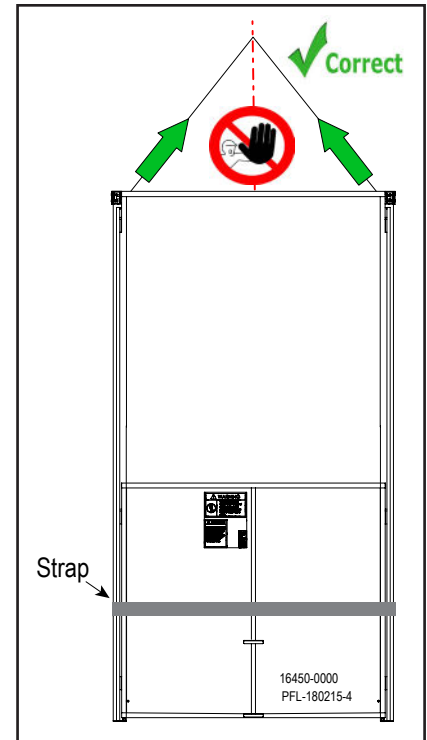
### **DANGER**

Falling gate hazard! Do not lift the VA gate assembly by the header shaft or by a single strap at the center of the header.

1. Place a strap around the gate posts to secure and maintain the assembly in place. See Figure 13.
2. Place two (2) straps around the header, one near each gate post. Avoid the brackets at the top of each gate post. See Figure 13.
3. To avoid sudden panel and counterweight movement, slowly raise and secure the gate assembly into place.
4. Tie off or continue to support the gate assembly to prevent tipping or accidental movement.

### Align the Gate Assembly

1. Align the center of the gate to the center of the carriage with the front side of the gate panel facing out.
2. Position the gate posts at the front of the carriage.



Secure and Lift Gate Assembly  
Figure 13



# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly

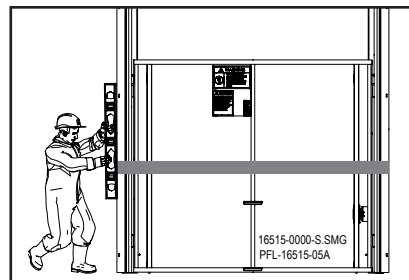


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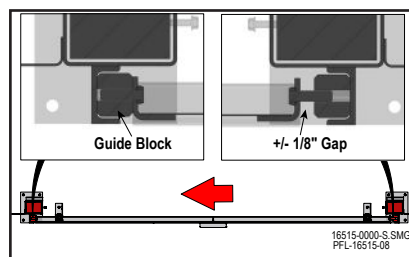
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### Plumb and Square the Gate

1. Plumb and square the gate posts using a plumb bob or a level that is 4' (1,22 m) or longer. See Figure 14.
2. Snug the gate panel and slide the blocks on one side of the channel guides.
3. Set a  $\pm 1/8"$  (3mm) gap between the opposite side guide block and the gate panel. Align the gate post or trim the guide blocks if necessary. The guide block must stay trapped in the guide track. See Figure 15.
4. Make sure the gate header is level horizontally and that the gate posts are plumb and square in both directions. Shim and / or adjust as necessary.
5. Verify that the panel travels up and down evenly and is not binding on the guide tracks.



Plumb the Gate  
Figure 14



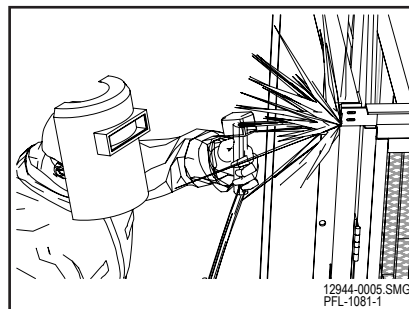
Guide Block Gap  
Figure 15

### Weld the Gate Posts

1. Weld the bottom of the gate posts to the carriage deck.
2. Weld the ends of the carriage panel or rails to the gate posts.

### Install Support Braces

1. Measure from the gate post to the carriage upright.
2. Cut two (2) 1-1/2" x 1-1/2" (38mm x 38mm) steel angle support braces and weld to each gate post and to the carriage upright.
3. Tighten all bolts.
4. Confirm that the gate is plumb and square.
5. Weld the gate header to the gate posts. See Figure 16.
6. Remove all straps on the gate.
7. Slowly slide the panel down until the chains are tight and the counterweights are off the shipping screws.
8. Remove the counterweight shipping screw.



Weld Gate Header to Gate Posts  
Figure 16



# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly

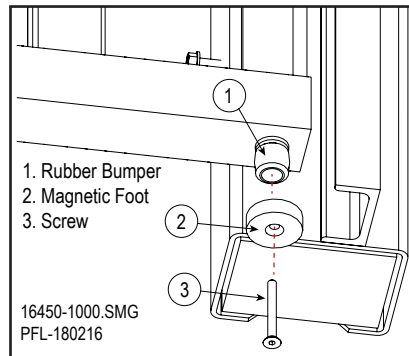


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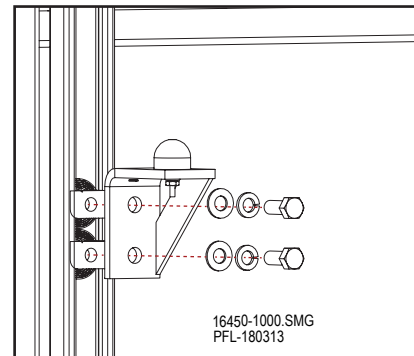
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### Attach the Bumpers

1. Attach the panel magnetic foot to the bottom of the panel. See Figure 17.
2. Attach the panel bumper brackets to the top of the gate panel. See Figure 18.



Attach Panel Magnetic Foot  
Figure 17



Attach Top Bumper Brackets  
Figure 18



### Adjust the Gate Panel

## WARNING

The gate panel must float freely within the guide track or the panel interlock will not operate safely. Make sure the gate is fit properly.

Guide block fit up is important for the gate panel to operate properly and safely. This over-rides any other horizontal alignment dimensions.

1. Verify that the gate panel travels up and down evenly from the top to the bottom of the posts and is not binding on the guide tracks.
2. Adjust the bumpers as necessary.
3. Verify that the gate panel clears the fully open height. If the counterweight bottoms out in the gate post before the gate panel is fully open, remove chain links to shorten the chain length.
4. Lift the gate panel approximately 2' (610mm) off the floor to verify that the gate panel is properly counterbalanced with panel accessories (e.g., cams, interlock flats) on the panel. The gate panel should remain in this position.
  - If the gate continues to rise, add steel bar stock to the inside bottom center of the panel frame.
  - If the gate drops, contact PFlow Industries, Inc. Customer Support Department for instructions.
5. Verify that the counterweight is not hitting the post base plate.

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Horizontal Assembly



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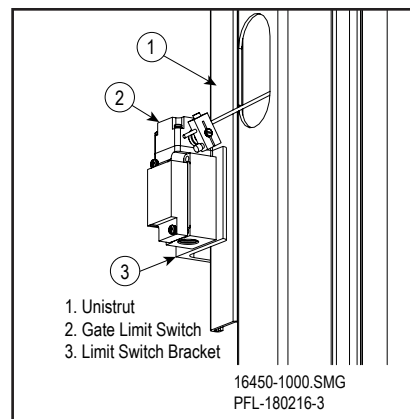
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### NOTE

*The drop cord is supplied by PFlow Industries, Inc. The wires from the junction box on the carriage to the switch on the gate post is not supplied by PFlow Industries, Inc.*

### Install the Gate Limit Switch and Stationary Junction Boxes

1. Attach the gate limit switch and bracket to the unistrut mounted on the gate post. See Figure 19.
2. Mount the **carriage mounted junction box** on the outside of the carriage making sure there are no obstructions above the junction box.
3. On a two-level VRC, mount the **stationary junction box** on the same side of the VRC as the carriage mounted junction box. Mount the stationary junction box on the outside of the floor to beam bracing.
4. On a multiple level VRC, mount the **stationary junction box** on the same side of the VRC as the carriage mounted junction box. Mount the stationary junction box approximately 8' (2,44 m) above the halfway point of the vertical travel of the VRC.



Attach Gate Limit Switch  
Figure 19

### Verify the Gate Operation

1. Verify that the gate panel opens when the carriage is present and does not open when the carriage is not present.
2. Verify that the gate panel remains locked when the carriage leaves the floor level.

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Vertical Assembly



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### Establish Placement

Make sure the placement of the gate has been established. Follow instructions beginning on page 2.

### Prepare the Chains in the Gate Posts

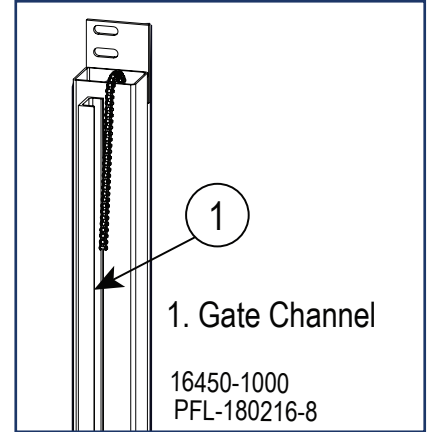
Make sure the chains and counterweights are prepared before raising the gate posts. Follow instructions beginning on page 3.



### CAUTION



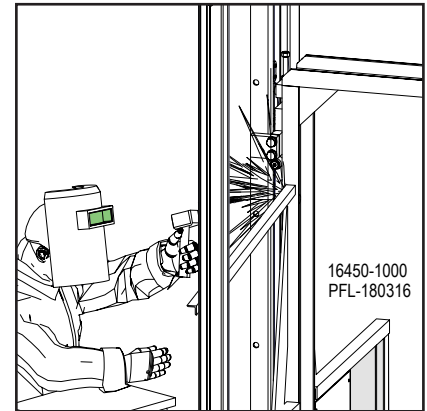
Lifting hazard! Components and accessories are heavy. To prevent serious personal injury, use the appropriate lifting apparatus, tie offs, or help when moving, lifting or assembling the components or accessories.



Channel Position  
Figure 20

### Raise and Secure the Gate Posts

1. Raise, position, and secure one gate post on the carriage deck edge. Make sure the channel on the gate post is facing out and the opening of the channel is facing in. See Figure 20.
2. Temporarily brace the gate post to the Vertical Reciprocating Conveyor (VRC) carriage or the carriage column. See Figure 21.
3. Raise, position, and secure the other gate post on the carriage deck edge. Make sure the channel on the gate post is facing out and the opening of the channel is facing in.
4. Temporarily brace the second gate post to the VRC carriage or the carriage column.



Temporarily Brace Gate Post  
Figure 21

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Vertical Assembly



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### **WARNING**



Entanglement hazard! Remove gloves, secure long hair, wear snug-fitting clothing, and avoid wearing jewelry while working with chains.



Crush hazard! Keep hands outside and above the chain. If the lift chain does not reach the wheelblock, carefully work the lift chain around the sprocket until it does reach the wheelblock. Lift the chain from the sides. If the chain drops unaided, the weight of the chain will crush fingers. Do not allow the chain to come off the sprocket.

Header falling hazard! Loosen but do not remove the bolts when adjusting the chain jump guide or the headers. Once assembled, the header can fall if the bolts are completely removed.

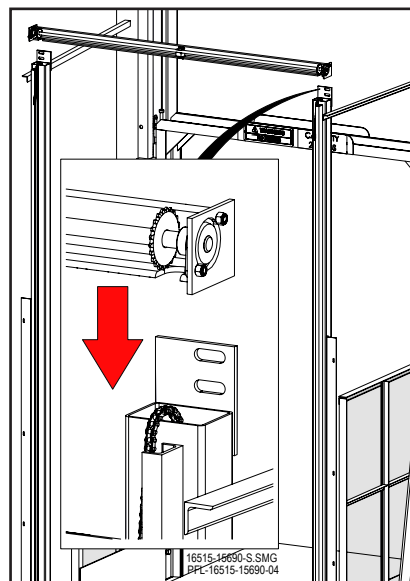
### Install the Header

1. Position the gate header with the sprockets facing out and with the ends flush. See Figure 22.
2. Position the chain jump guides to leave space for the chain. See Figure 23.
3. Bolt the chain jump guides and gate header to the gate post using four (4) 3/8-16 x 1-1/4" long bolts with lock and flat washers (weld-nut on header angle).
4. Align the gate header, making sure the gate posts are square, and snug the attachment hardware.

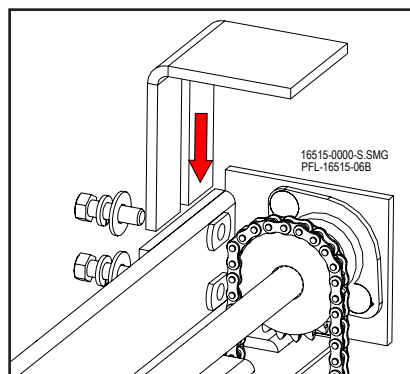
### Install the Chains

**NOTE** *The chains must be equal in length on both sides of the sprocket to align the position of the counterweight. If the chains are not equal, work the chain on the front side of the sprockets.*

1. Make sure to eliminate any chain twist. The chain should be straight between the counterweight tab and the sprocket.
2. Remove the #2050 master links from the end of the #35 chain on each post.
3. Place the center link on top of the sprocket.



Position Chain Jump Guides  
Figure 22



Position Chain Jump Guides  
Figure 23

## Gate Installation

### Carriage Mounted Single Vertical Acting (SVA) Gate - Vertical Assembly

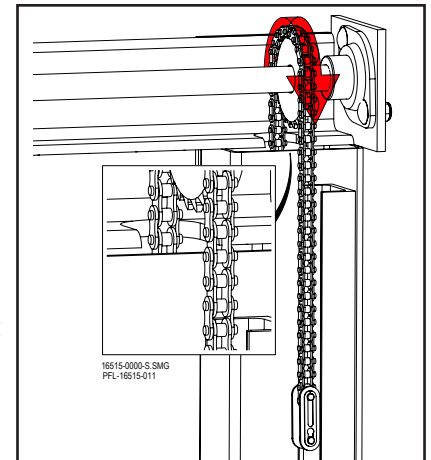


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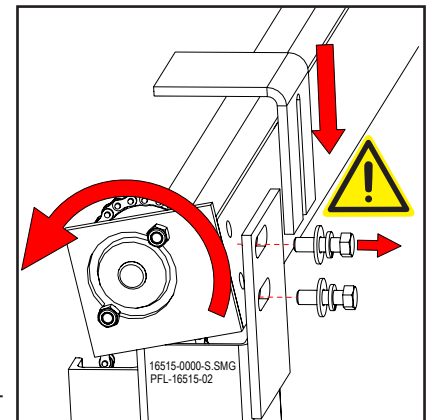
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#### Install the Chains (continued)

4. Thread the chain over the sprockets on the header. See Figure 24.
5. Pull the chain tight over the sprocket to remove the slack in the chain without moving the counterweight.
6. Re-attach the #2050 master links to the #35 chain and remove the strings.
7. Verify that the chains on each end of the gate are equal in length from the sprocket to the gate panel.
8. Loosen the header/post hardware to allow the chain jump guide to slide down into position. Do not loosen the hardware to the point that the header falls off. See Figure 25.
9. Set the space between the chain jump guides approximately  $\pm 1/8"$  (3mm) from the top of the chain.
10. Securely attach the chain jump guide.
11. Remove the counterweight shipping screw.
12. Carefully pull the chain up to move the counterweight above the shipping screw.
13. Replace the shipping screw.



Thread Chain Over the Sprockets  
Figure 24



Attach Chain Jump Guides  
Figure 25

# Gate Installation

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### Assemble the Gate Panel

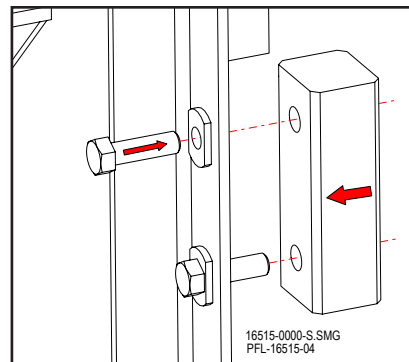
1. Place the gate panel face up between the guide tracks on the gate posts.
2. Insert the guide blocks and attach to the gate panel and guide track. See Figure 26 and Figure 27.

### Attach the Gate Panel to the Gate Chains

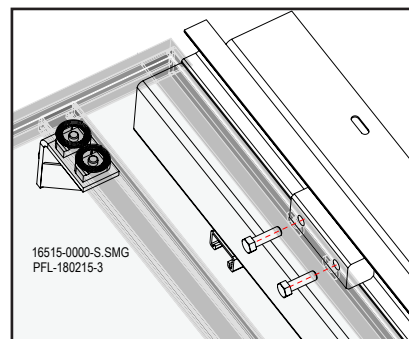
1. Use an appropriate lifting device to carefully slide the gate panel up towards the gate header. See Figure 28.

**NOTE** The gate panel should move up without binding on the guide tracks.

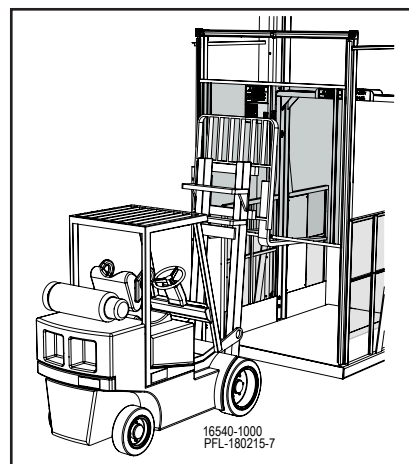
2. Continue to support the gate panel and attach the gate panel to the chains.
3. Connect the #2050 master links to the gate panel and remove the string.
4. Verify the chain length is equal on each side.



Attach Guide Blocks to Gate Panel  
Figure 26



Attach Guide Blocks to Guide Track  
Figure 27



Lift Gate Panel  
Figure 28

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Vertical Assembly

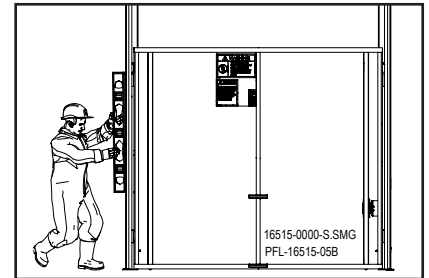


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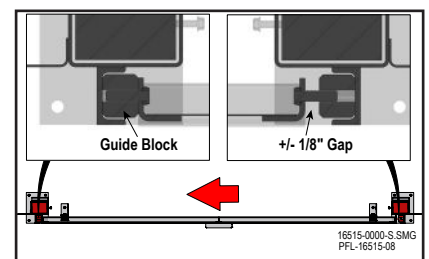
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### Plumb and Square the Gate

1. Plumb and square the gate posts using a plumb bob or a level that is 4' (1,22 m) or longer. See Figure 29.
2. Snug the gate panel and slide the blocks on one side of the channel guides.
3. Set a  $\pm 1/8"$  (3mm) gap between the opposite side guide block and the gate panel. Align the gate post or trim the guide blocks if necessary. The guide block must stay trapped in the guide track. See Figure 30.
4. Make sure the gate header is level horizontally and that the gate posts are plumb and square in both directions. Shim and / or adjust as necessary.
5. Verify that the panel travels up and down evenly and is not binding on the guide tracks.



Plumb the Gate  
Figure 29



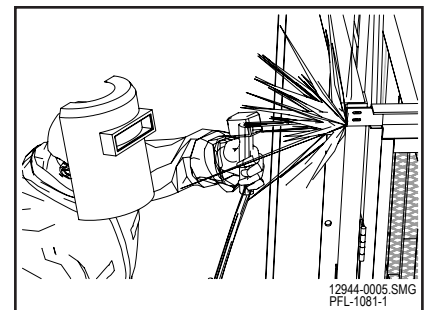
Guide Block Gap  
Figure 30

### Weld the Gate Posts

1. Weld the bottom of the gate posts to the carriage deck.
2. Weld the ends of the carriage panel or rails to the gate posts.

### Install Support Braces

1. Measure from the gate post to the carriage upright.
2. Cut two (2) 1-1/2" x 1-1/2" (38mm x 38mm) steel angle support braces and weld to each gate post and to the carriage uprights.
3. Remove the temporary bracing.
4. Tighten all bolts.
5. Confirm that the gate is plumb and square.
6. Weld the gate header to the gate posts. See Figure 31.
7. Slowly slide the panel down until the chains are tight and the counterweights are off the shipping screws.
8. Remove the counterweight shipping screw.



Weld Gate Header to Gate Posts  
Figure 31



# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Vertical Assembly

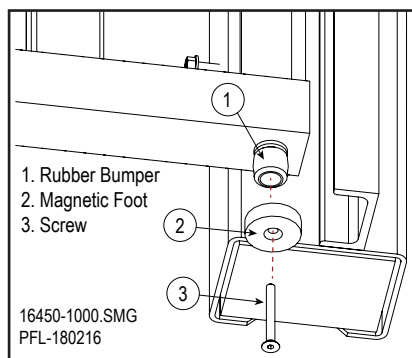


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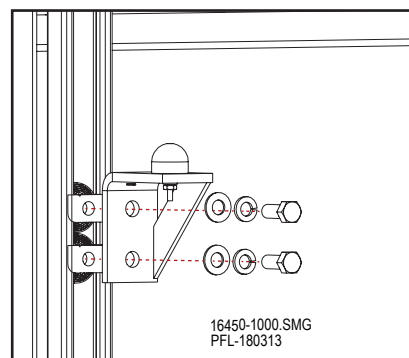
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Milwaukee, WI 53209

### Attach the Bumpers

1. Attach the panel magnetic foot to the bottom of the panel. See Figure 32.
2. Attach the panel bumper brackets to the top of the gate panel. See Figure 33.



Attach Panel Magnetic Foot  
Figure 32



Attach Top Bumper Brackets  
Figure 33



### Adjust the Gate Panel

## WARNING

The gate panel must float freely within the guide track or the panel interlock will not operate safely. Make sure the gate is fit properly.

Guide block fit up is important for the gate panel to operate properly and safely. This over-rides any other horizontal alignment dimensions.

1. Verify that the gate panel travels up and down evenly from the top to the bottom of the posts and is not binding on the guide tracks.
2. Adjust the bumpers as necessary.
3. Verify that the gate panel clears the fully open height. If the counterweight bottoms out in the gate post before the gate panel is fully open, remove chain links to shorten the chain length.
4. Lift the gate panel approximately 2' (610mm) off the carriage deck to verify that the gate panel is properly counterbalanced with panel accessories (e.g., cams, interlock flats) on the panel. The gate panel should remain in this position.
  - If the gate continues to rise, add steel bar stock to the inside bottom center of the gate panel frame.
  - If the gate drops, contact PFlow Industries, Inc. Customer Support Department for instructions.
5. Verify that the counterweight is not hitting the post base plate.

# Gate Installation

## Carriage Mounted Single Vertical Acting (SVA) Gate - Vertical Assembly



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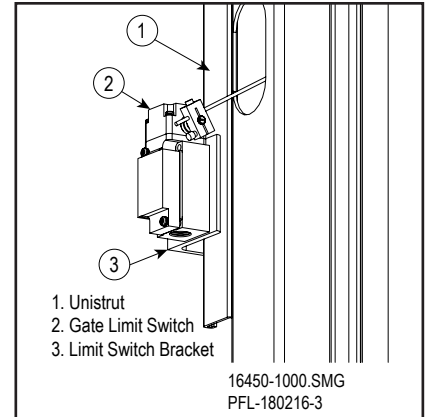
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### NOTE

*The drop cord is supplied by PFlow Industries, Inc. The wires from the junction box on the carriage to the switch on the gate post is not supplied by PFlow Industries, Inc.*

### Install the Gate Limit Switch and Stationary Junction Boxes

1. Attach the gate limit switch and bracket to the unistrut mounted on the gate post. See Figure 34.
2. Mount the **carriage mounted junction box** on the outside of the carriage making sure there are no obstructions above the junction box.
3. On a two-level VRC, mount the **stationary junction box** on the same side of the VRC as the carriage mounted junction box. Mount the stationary junction box on the outside of the floor to beam bracing.
4. On a multiple level VRC, mount the **stationary junction box** on the same side of the VRC as the carriage mounted junction box. Mount the stationary junction box approximately 8' (2,44 m) above the halfway point of the vertical travel of the VRC.



Attach Gate Limit Switch  
Figure 34

### Verify the Gate Operation

1. Verify that the gate panel opens when the carriage is present and does not open when the carriage is not present.
2. Verify that the gate panel remains locked when the carriage leaves the floor level.

## Gate Installation

### Carriage Mounted Single Vertical Acting (SVA) Gate

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