



DISTINCT FROM FORGE TO FINISH.

## **STRONGHOLD IRON®**

## **INSTALLATION GUIDE**



Revised 2/2015



***\*\*PLEASE NOTE – All installations have a varying degree of ‘uniqueness’ to them. The following instructions are meant to be general guidelines in a normal post-in-ground installation. If you are installing your fence in a different manner or have any questions that this guide does not answer, please contact us via phone or email. \*\****

<b>Before You Start .....</b>	<b>3</b>
<b>Mark Your Fence Layout.....</b>	<b>3</b>
<b>Obtain a Fence Permit (if Required).....</b>	<b>3</b>
<b>Have Your Utilities Marked.....</b>	<b>3</b>
<b>Gather the Required Tools.....</b>	<b>3</b>
<b>Purchase Concrete and Miscellaneous Supplies.....</b>	<b>4</b>
<b>Digging Your Post Holes .....</b>	<b>5</b>
<b>Run Your String Line.....</b>	<b>5</b>
<b>Determining Post Spacing for Panels and Gates.....</b>	<b>6</b>
Fence Panel Post Spacing.....	6
Walk and Driveway Gate Post Spacing .....	6
<b>Digging Your Post Holes.....</b>	<b>9</b>
<b>Setting Your Posts.....</b>	<b>11</b>
<b>Installing the Fence Panels.....</b>	<b>13</b>
<b>Trimming a Fence Panel .....</b>	<b>15</b>
<b>Installing Fence Panels in a Sloped Yard.....</b>	<b>15</b>
<b>Installing Walk Gates and Driveway Gates .....</b>	<b>17</b>
<b>Determine Your Gate Hardware .....</b>	<b>17</b>
<b>Install the Gate Hinges.....</b>	<b>18</b>
Safetech Self-Closing Hinges.....	18
J-Bolt Hinges (5.5" and 7") .....	18
<b>Install the Gate Latch .....</b>	<b>20</b>
Safetech Cobra Latches .....	20
Safetech Pool Latch.....	21
Locinox Latch .....	21
Gravity Latch .....	21
Drop Rod (Double Gates Only).....	21
<b>Project Completion and Maintenance on Your Fence and Gates.....</b>	<b>22</b>



## **Before You Start**

Before you get started with your installation, ensure you have done the following items first:

### **Mark Your Fence Layout**

In preparation for installation and for permit approval purposes (if required), you will want to mark the outline of where the fence will be installed. This can be done with a string line, marking spray paint or flags. If you are installing over or on concrete, you can mark the outline with chalk.

### **Obtain a Fence Permit (if Required)**

Call your local Building/ Engineering Department and ask if a permit needs to be obtained. Obtaining a fence permit typically requires filling out a form, paying a small fee and having a local inspector take a look at where your fence is going to be installed based on your marked layout.

### **Have Your Utilities Marked**

Even if you are not required to obtain a fence permit, call to have your utilities marked. It is important to know what's buried below before you begin digging post holes. Simply dial '811' and they will get you in contact with your local utility provider to come out and mark any buried lines at no charge. They will typically come out within 24-48 hours and will mark any buried utilities with flags or spray paint. You can visit [www.call811.com](http://www.call811.com) for more info on how the process works.

### **Gather the Required Tools**

To install your wrought iron fence, you will typically need the following tools:

- String Line
- Shovel and Post Hole Digger (manual or powered) for post holes
- Tub, wheelbarrow or powered mixer for cement
- Measuring Tape
- Level
- Rubber Mallet and Regular Hammer
- Hacksaw or Sawzall for trimming panels (if necessary)
- Drill or power driver
- Socket and/or wrench set for installing supplied gate hardware



## **Purchase Concrete and Miscellaneous Supplies**

The following building materials will need to be purchased from your local hardware store unless they are noted as optional:

### **Concrete Mix**

- Any standard concrete mix will work. You can utilize reinforced or fast setting concrete if you like, but it is not required.
- The number of concrete bags required will vary based on the size and length of post being buried. You can find concrete calculators online to help determine how many bags you will need. You will need to know the following to utilize the online calculators:
  - Size of your posts
  - Diameter of the hole (usually 3x the post size)
  - Depth of the hole
  - Number of posts

### **Large Size Gravel (optional)**

- While this is optional, adding gravel to the bottom of your post hole will allow for drainage of moisture and less chance of post heaving/ sinking due to freezing ground or excessive water. It is also beneficial to use if you accidentally over dig the depth of a post hole.

### **High Visibility Spray Paint (optional)**

- This can come in handy when marking where to dig your post holes as you determine their location in the layout.

### **3-4ft Steel Rebar Pieces**

- These will be tapped in ground and your string line wrapped around them when marking your layout for installation.



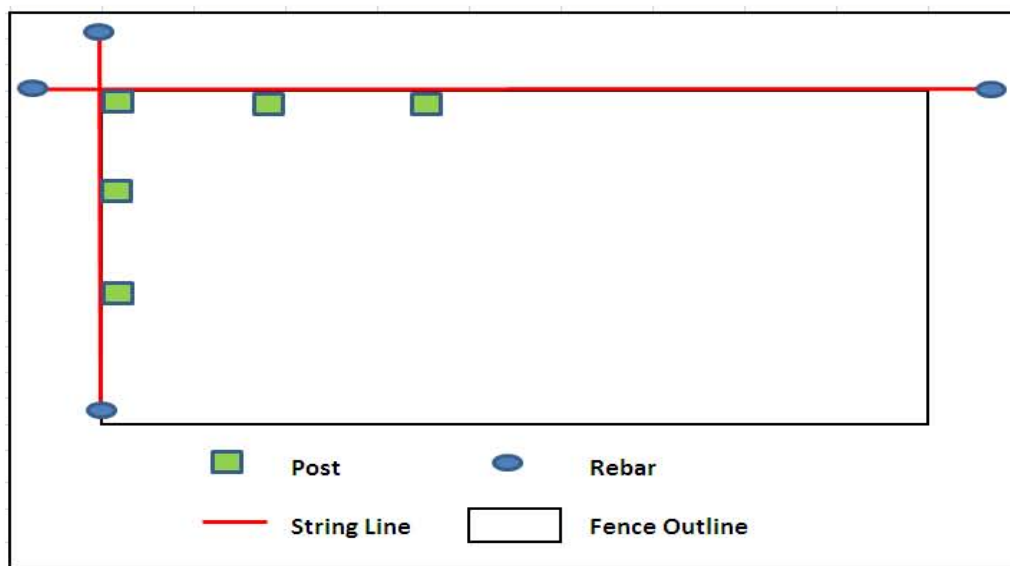
## Digging Your Post Holes

The following steps are to guide you through post placement, post hole digging and setting the posts in the ground in concrete. If you are not setting your posts in ground in concrete or are hanging your fence/ gates from different posts/ pillars, consult your Iron Fence Shop® salesperson for how the installation may differ.

## Run Your String Line

If you ran a string line when you marked the fence layout initially, you can skip this step. The purpose of the string line is to make sure all of your posts remain in a straight line as you install the fence.

- Purchase a string line that is bright and easily visible. This can commonly be found at any local hardware store, but any string that will be easily visible and able to be pulled taught will work.
- When tapping your rebar in ground and running your string line, keep in mind that the string line should be the outside edge of your post and **NOT** the center of the fence line. For corners and ends, have the rebar be a foot or more outside the fence layout. This will ensure that the string is your guide and the rebar is not in your way when you dig the post hole.



**Figure 1 –Example of a String Line Layout**



## Determining Post Spacing for Panels and Gates

Now that you have your string line run for guidance, you need to determine how far apart your posts will be spaced. This will vary based on whether a full fence panel, trimmed fence panel or gate is going in-between two posts.

### Fence Panel Post Spacing

- All of our standard wrought iron panels are 96 inches (8 feet) wide from end-of-rail to end-of-rail. You will want to aim for a 96-inch wide space between posts for mounting fence panels. The brackets do not add any additional width.
- The easiest way to determine where your post will go is to mark by the 'on center' measurement for your post. This measurement is basically the dead center of where the post will be installed.
- To calculate your 'on center' post measurement, add the width of your fence panel (96") plus the width of **ONE** fence post. (If you are unsure of what size fence post you have, you can refer to your itemized invoice or measure one face of the post) For example:

$$96'' \text{ Fence Panel} + 2'' \text{ Fence Post} = 98'' \text{ on center}$$

- This measurement holds true for full 96" fence panels and trimmed fence panels. If you had to trim a fence panel at the end of a run, you would simply substitute the 96" fence panel part of the equation with the width of your trimmed fence panel (ex: 57" Fence Panel + 2" Fence Post = 59" on center)
- Once you have your 'on center' post measurement, you can begin marking your post holes in the grass (spray paint works for well for this). Start in a corner or at the end of a run. Mark the end or corner, measure out your 'on center' post measurement and mark again in the grass. Continue doing this until you have marked where all your post holes will need to be dug up in the layout.

### Walk and Driveway Gate Post Spacing

Just as we did with our fence panels, we will want to determine the 'on-center' post measurement for our gates in a similar way. Post spacing for gate openings will vary based on gate width and the hinge/ latch hardware being installed. So before we can calculate our 'on-center' post measurement for the gate,



you will need to note the following items down:

- The width of the gate
  - The width needed for the hinges
  - The width needed for the latch
- First, let's determine which style of hinge was supplied in your order. If you are unsure which hinge you have, you can refer to your itemized invoice or refer to Figure 3 below. Once you know which hinge your gate is utilizing, note the single (one leaf) or double (two leaf) gate width measurement in the table below:

Hinge Name	Use	Adjustable	Single Gate Width	Double Gate Width
5.5" J-Bolt Hinge*	Walk Gates	Yes	3"	6"
7" J-Bolt Hinge*	Driveway Gates	Yes	3" to 4"	6" to 8"
Safetech Self-Close Hinge**	Walk Gates	No	3/4"	1.5"

**Figure 2 - Hinge Width Table**

*\* NOTE – revised parts with additional adjustability available late 2015.*

*\*\* NOTE – Covers all models of Safetech self-closing hinge*



**Figure 3 – 5.5" J-Bolt Hinge / 7" J-Bolt Hinge/ Safetech Self-Close Hinge**





- Next, let's determine which style of latch was supplied in your order. If you are unsure which latch you have, you can refer to your itemized invoice or look in Figure 5 below. Once you know which latch your gate is utilizing, note the width measurement in the table below:

Latch Name	Key Lockable?	Target Width Between Mounting Points
Gravity Latch	No	1"
Safetech Cobra Latch*	Yes	3/4"
Safetech Pool Latch	Yes	3/4"
Locinox w/ Ext Kit	Yes	1/2"

Figure 4 - Latch Width Table

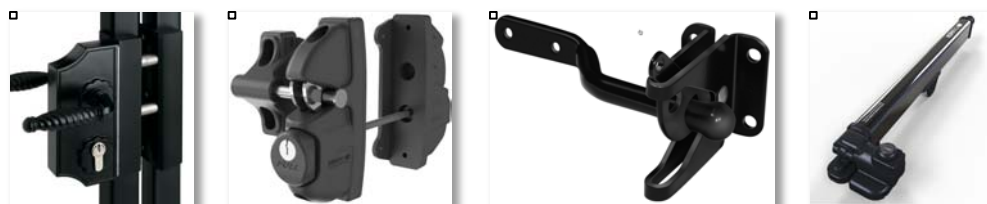


Figure 5 - Locinox / Safetech Cobra / Gravity Latch / Safetech Pool Latch

- Now that you have all of your width measurements (gate, hinges, latch), we are going to add all of those together plus the width of **ONE** post to get the 'on-center' post measurement:

$$\text{Gate Width} + \text{Hinge Width} + \text{Latch Width} + 1 \text{ Post Width} = \text{Gate On-Center}$$

- Using that equation, let's calculate the gate post 'on-center' measurement for the following situation:
  - 48" Wide Single Gate (one leaf)
  - 3" for 5.5" J-Bolt Hinge
  - 1" for Gravity Latch
  - 2" Posts Being Used

$$48" \text{ Gate} + 3" \text{ Hinge} + 1" \text{ Latch} + 2" \text{ Post} = 54" \text{ On-Center for Gate Posts}$$





- If you were installing a double walk gate or double driveway gate (two leafs make up the total width) then you would need to use the double gate hinge measurement in the table since you will have two sets of hinges instead of one. Let's look at that same equation with a double gate:
  - 10ft (120") Arched Double Driveway Gate (two 5' leafs)
  - 8" for 7" J-Bolt Hinges (4" each side of the gate)
  - 1" for Gravity Latch
  - 4" Posts Being Used

***120" Gate + 8" Hinges + 1" Latch + 4" Post = 11'1" (133") On-Center for Gate Posts***

- If the hinges or latch you are utilizing can work at multiple widths (adjustable), you want to utilize the middle number of the adjustment range so that you have left/ right adjustment available to you.

### Digging Your Post Holes

- Once you have determined the 'on-center' post spacing for your posts and marked all the locations around your layout, its time to start digging post holes. These instructions apply to either manually digging your post holes or using powered equipment.
- Begin with an end or corner post in your layout. The 'on-center' location you marked should be the center of your hole. Dig outwards from there. Your posthole should be situated so that when you place the post in the center, its outer edge is touching against the string line.



**Figure 6 - Post Hole Should be Positioned so That The Centered Post Will Contact Your String Line**



- Be sure to dig your post hole as straight down as possible. If you live in an area that freezes heavily in the winter, digging a post hole that is wider at the top than the bottom will allow the frost to push on the concrete footing and ‘heave’ your post.
- The rule of thumb is that a post hole should be roughly three times the diameter of the post you are setting. So if you were setting a 2x2 post, the hole should be at least 6” across ( $2 \times 3 = 6$ ). A wider hole will not hurt anything, but it will require more concrete.
- The depth to dig your post hole varies by region. Rule of thumb is that in dry areas with no winter freeze, you should set the post 18” to 24” in ground. In areas with heavy winter and persistent freeze, you should set them 24” to 36” in ground.
- Before digging your post hole, be sure to account for the height of the post that needs to remain above ground. To determine how much post you need above ground vs buried in ground, take the following into consideration:
  - The height of your fence panels
  - How much of a gap you want under each panel for grass trimming/ landscaping (ideally 2-3”)
  - Where you want your post caps in relation to the top of the fence panels
- **NOTE** - If you have a fence panel style with finial tips sticking through the top, we recommend installing the fence so that the tips of the fence panel line up with the top of the post WITHOUT the post cap on.
- **NOTE** - If you have a flat top style fence panel, we recommend setting the top rail at least an inch below the top of the post so you have room for your brackets and post cap.
- **EXAMPLE** - Let’s say we have a 4’ tall fence panel style with finial tips on top, 7’ long posts and we want a 2” gap at the bottom of the fence. You would set your post so that 4’2” was sticking up above ground and your post hole was 2’10” deep ( $4’2”$  above ground +  $2’10”$  buried = 7’ post length).
- **EXAMPLE** - Let’s say we have a 4’ tall fence with a flat top style, 7’ long posts and we want a 2” gap at the bottom. You would set your post so that 4’3” was sticking up above ground and your post hole was 2’9” deep ( $4’3”$  above ground +  $2’9”$  buried = 7’ post length). That way we can have the 2” gap at the bottom of the panel and the 1” gap from the top of the post.
- You can choose to have the posts stick up higher or inline with the fence tips matching the height with the post cap attached. Simply adjust the example calculations above to match up with your desired look.



- Once you have determined the depth of your post holes, it's time to start digging. Be sure to check your post hole depth and width as you go. Keep loose dirt away from the top of your hole. You can utilize a flat object at the top of your post hole and a tape measurer to monitor the depth as you proceed.
- If you accidentally dig too deep, add gravel (not loose dirt) to the bottom of the hole. It can actually be beneficial to over dig your post hole by 2-3 inches and add gravel at the bottom, but it is not required. The gravel will allow for water to drain away and unlike loose dirt it will not compact over time. It also makes fine tuning your above ground post height much easier.



**Figure 7 - Adding Gravel to the Bottom of the Hole is Not Required, but Can Be Beneficial**

### Setting Your Posts

- Once all of your fence post holes are dug, you can begin placing the posts in concrete. Start by mixing your concrete up. We recommend following the manufacturer's mixing guidelines and NOT using the 'dry bag' method of placing dry concrete mix in the ground and pouring water on top.
- You want to mix your concrete on the dry side. The concrete should roughly have the consistency of chunky peanut butter so that it will hold the post upright in the hole without additional support.
- Once mixed, start on a corner or end in your layout and scoop a couple shovels' worth into the post hole filling it between 1/4 to 1/2 way up. Take one of your posts and push it into the concrete at the center of the post hole. Make sure the post is touching your string line.



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- Once you feel good about the post positioning, pour or shovel more concrete into the hole. Leave roughly to 2-4 inches from the top of the hole to the concrete. This will allow you to later cover the concrete footing with dirt and allow grass to grow around the post.
- Using your level, ensure the post is still plumb on both faces and contacting your string line. The post should be able to stand on its own in the concrete if it was mixed to the correct consistency
- As you move through your layout, be sure to measure between the posts to double-check your spacing. Unlike before with the 'on-center' measurement for posts, we now want the **ACTUAL** fence panel or gate spacing between posts.
- Those measurements should be 96" for un-cut fence panel, the width of any trimmed fence panels and the width of your gate(s) including their hinge and latch hardware.
- If you find any posts have shifted or need adjustment for the space between posts, use a rubber mallet to tap them into place while the concrete is still wet.
- Allow the concrete to dry to the point you can no longer move the post in the hole. Once it has reached that point, you can shovel dirt over the concrete in the last 2-4".
- It's often a good idea to mound the dirt above the yard line to allow for the soil to settle without leaving a depression. Ideally, this will be done the day you set the posts so that if it rains or snows, water does not begin pooling and saturating the still curing concrete.



Figure 8 - Keep Everything Level as You Proceed



## Installing the Fence Panels

- **IMPORTANT** – Due to the weight of iron fence panels, make sure you have followed your concrete's instructions on how soon it is strong enough to use after being poured. This can vary greatly depending on the type of concrete used and the ambient outside temperature.
- There are only four components required when hanging your iron fence panels:
  - Fence Post
  - Fence Panel
  - Iron Brackets
  - Self-Tapping Screws



**Figure 9 - Main Fence Components: Fence Post, Bracket, Screw, and Fence Panel**





- The number of iron brackets and self-tapping screws used per panel will be based on the number of horizontal rails on your fence panel. Each rail requires 2 brackets (one on each side). So if you had a fence panel with 3 horizontal rails, you would need 6 brackets and 6 self-tapping screws (2 per rail x 3 rails = 6).
- Slide your brackets on the end of the rails and line your fence panel up between the posts. The tab with the screw hole should go up against the post and is typically installed pointing down. However, you can utilize the bracket with the tab pointing up if you choose to.
- When positioning your panel, be sure to leave your gap under the panel so that if you need to trim grass you can do so without taking the powder coat finish off the pickets. Standard bottom gap spacing is 1-3 inches off the ground. Use a piece of wood that is roughly the height you want the panel gapped off the ground to place under the panel when positioning and installing them.
- Make sure your fence panel is level top to bottom and located at the center of the post. Once you have the fence panel positioned, grab your self-tapping screws and a power screwdriver or drill.
- Slide your brackets up against the post. Place the self-tapping screw through the tab hole of the bracket. Slowly begin running the drill until it gets a bite into the metal then speed up the drill to drive the screw in. Be careful to not over tighten the screw and strip out the threads in the hole.
- If you are having difficulty getting the self-tapping screw to drill into the post, a small center punch tool can help. Put it in the screw hole and give it a solid tap with a hammer. The indentation it leaves will help the self-tapping screw to bite into the post metal and begin drilling in.



**Figure 10 – Example of an Installed Iron Fence Bracket with Self-Tapping Screw**



## Trimming a Fence Panel

- Its fairly typical that at least one fence panel will need to be trimmed for width in your layout. This could be due to gate placement or coming to the end of a run.
- Trimming fence panels for width is an easy process. We recommend using a simple hacksaw since it has the most control. You can also use power tools to cut the panel to width, but be sure to have another person hold both sides of your cut as violent shaking of the panel by power tools like reciprocating saws (sawzalls) could break a weld.
- Determine the panel width you need. Measure along the horizontal rails and mark where the cut needs to be made. If your measurement lands on a picket, you may need to trim from both sides of the panel to line everything up.
- An optimal cut will be one that you can make up against a picket. This preserves the 3.875" spacing between the pickets and gives a cleaner look to the installation. If your cut needs to be tighter, make sure you at least have 1.5" of rail sticking out from a picket so you can get your bracket on.
- After marking the cut, use your selected tool and cut through the horizontal rail. Be sure to file or grind down any burrs and apply touch-up paint to the bare metal. Installation of the cut panel will be the same as a regular full size panel with the bracket and self-tapping screw.

## Installing Fence Panels in a Sloped Yard

- There is usually some slope to a yard that may need to be compensated for during installation. While there is no reason that the yard needs to be totally level underneath the fence, you may want to adjust the fence installation so that its aesthetically pleasing to you or tight enough at the bottom to keep animals in or out of your yard. There are two methods to addressing yard slopes that leave too large of a gap between the bottom of the fence and the ground:
  - Level the area or back fill with landscaping (See Figure 11)
  - Stair-step the fence panels to follow the grade (See Figure 12)
- The easiest is to level or back fill the area the fence is passing through so that the panels can be mounted level across. This works for slight dips and grades where the drainage is not an issue.
- If the grade is too steep or leveling would create drainage issues, you will need to 'step' the fence panels. 'Stepping' panels is adjusting the panel height on the posts to compensate for grade. So one panel may be higher or lower from the prior one to maintain a uniform height off the ground.





- If the slope is too severe, you may need to cut your panels into smaller widths and do incremental steps with additional posts. Post hole depths and above ground measurements will also need to be adjusted so there is enough post sticking up to intercept the fence on the higher ground end of the panel.



**Figure 11 - Backfilled with Stones**



**Figure 12 - Stair Stepped Fence Panels**



## Installing Walk Gates and Driveway Gates

- **IMPORTANT** – Gates can exert a lot of leverage force on concrete post footings. Make sure your post have fully dried and cured before hanging your gates. Consult the concrete manufacturer for drying/ curing time required before use.
- **NOTE** - The following steps cover installing a walk or driveway gate utilizing our gate hardware and installing the gate on our steel posts. If you are utilizing other gate hardware or mounting the gate to a surface other than a steel post (such as a wood post or masonry pillar), please consult your Iron Fence Shop® salesperson for assistance on installation.

### Determine Your Gate Hardware

We offer several options in hinges and latches for our walk and driveway gates. Consult figures 13 and 14 below to determine which hinges and latches you are utilizing:

#### Gate Hinges



Figure 13 – 5.5" J-Bolt Hinge / 7" J-Bolt Hinge / Safetech Self-Close Hinge

#### Gate Latches

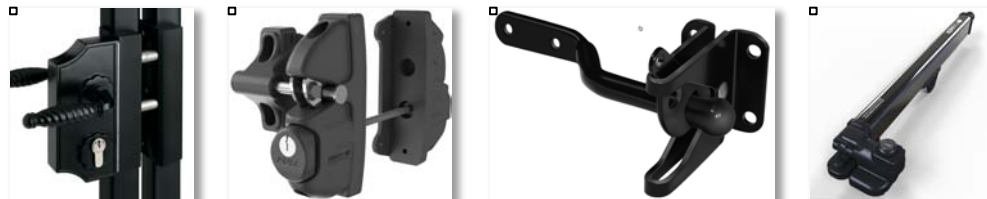


Figure 14 - Locinox / Safetech Cobra / Gravity Latch / Safetech Pool Latch



## Install the Gate Hinges

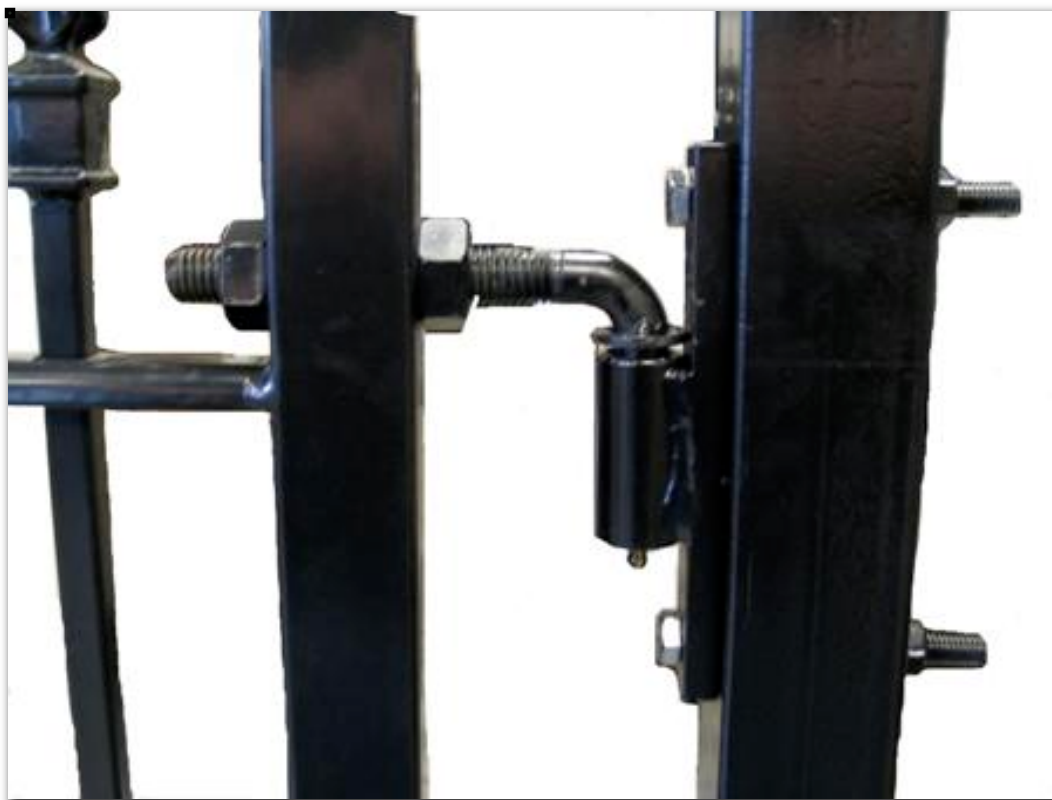
- There is no standard spacing for where the hinges need to be mounted vertically on the gate frame and post. You generally want to install them a third of the way down the gate frame top and bottom so that they are not too far inward or outward.
- When determining hinge placement on the gate frame and post, be sure to account for the gap at the bottom of the gate. There is no standard bottom gap height, but you want to ensure the gate can freely swing all the way open and shut without contacting the ground.
- So long as the area around the gate is flat, most installations will match the bottom gate gap with the bottom gap of the fence panels. So if your fence panels are mounted 2" off the ground, you can mount your gates with the same bottom gap.
- Make sure that your chosen hinge mounting location will not interfere or come in contact with any horizontal rails or decorative features of the gate.

## Safetech Self-Closing Hinges

- If you are utilizing Safetech self-closing hinges, consult the installation instructions included in their package.

## J-Bolt Hinges (5.5" and 7")

- Installation of the j-bolt hinges is the same whether you are using the 5.5" for a walk gate or the larger 7" version for a driveway gate.
- The flat plate part mounts against the post and the threaded J-portion with the two adjusting nuts will be mounted through a hole you drill in the gate frame (see Figure 15)



**Figure 15 – An Installed J-Bolt Hinge. The Gate is on the Left and the Post is on the Right Side**

- Determine the mounting location of your J-bolt hinge in relation to both the post and gate frame. Mark your post and gate frame for drilling. Be sure to measure and line up your drilling points as both the gate frame and post will be drilled on two sides of the post and the holes need to be level.
- Use the supplied drill bit (or a quality cobalt tip) to drill your holes in the post first. Clean any burrs in the hole and apply a small amount of touch-up paint to the hole.
- Mount the flat portion of the j-bolt against the post using the supplied hinge hardware kit bolts. These will be the silver bolts of varying length in the clear bag. (**NOTE** – You will not use all of the bolts in the bag. There are enough bolts for a set [two] of j-bolt hinges and in every length to accommodate post sizes from 2” up to 6”).
- When installing the bolt and washer from the hinge hardware kit, a small smear of grease on the bottom of the bolt head and the washer for the nut will make sure that the contact points on the hinge and post do not have their finish marred or stripped when the hardware is tightened down.



- With the j-bolt hinge mounted on the post, lift your gate up to ensure your marked location on the gate frame still lines up with the bottom gap and top of gate as you planned. If everything looks good, drill the gate frame. Clean up any burrs and put a shot of touch-up paint in the hole.
- Take the outer (at the end of the threads) adjusting nut off the threaded portion of the j-bolt. Feed the thread through the hole you just drilled in the gate frame and then re-thread the nut on the outside to secure the threaded portion to the gate frame. Use the two adjusting nuts to move the gate frame left/ right if adjustments are necessary.
- **NOTE** – If you are installing a larger gate, the threaded portion of the j-bolt and the backing plate will separate so that you can install them separate and then lift the gate up dropping arm back in the plate portion. Just be careful not to lose the ball bearing that is down in the grease of the mounting point.



**Figure 16 - The J-Bolts Will Separate at the Swivel Point**

### Install the Gate Latch

- There is no specific place you need to mount the latch on your gate. Most latches are normally mounted in the 40-42" height range.

### Safetech Cobra Latches

- See the installation instructions included with the latch



### Safetech Pool Latch

- See the installation instructions included with the latch

### Locinox Latch

- See the installation instructions included with the latch

### Gravity Latch

- The clasp portion will go on the post (in a double gate setup it will go on the adjoining gate half in the center) with the larger padlock hole facing the bottom. Use the smaller supplied self-tapping screws to mount the clasp portion to the post.
- The arm portion will go on the gate frame. Line it up to intercept the clasp and affix to the gate frame using the smaller self-tapping screws provided.

### Drop Rod (Double Gates Only)

- If you have a double gate to be manually opened, you will need to install a drop rod on one or both leafs to keep it the gate stationary in the center. Do not rely on a latch alone to hold a double gate shut.
- Mount the drop rod brackets on the inside (property side) of the gate frame using the supplied hardware. Install the brackets so that the curved part of the drop rod can rest on the top bracket with the rod also in full contact with the ground.
- If you are mounting over grass drive a small piece of pipe one size larger than the drop rod into the ground as a more solid stop for the rod.
- If the drop rod is being installed over concrete, you will need to drill out a small hole in the concrete with a masonry bit to give the drop rod a place to catch. You can also epoxy a small piece of pipe in the hole that the rod will fit into to prevent the concrete chipping around the hole from use.



## Project Completion and Maintenance on Your Fence and Gates

- Be sure to fill out your warranty sheet and email or mail it in to us.
- After installation, go back and touch up any scuffs or scratches that occurred in shipping or installation using the supplied touch-up paint.
- Keep an eye on the fence for the first couple weeks for any missed scuffs or scratches to bare metal and touch them up.
- Inspect your fence yearly for any damage that went to bare metal and may have caused rust to start. If surface rust has formed due to damage, there is no need to be concerned. The thickness of the steel would require many years of being left unattended to structurally weaken the piece. Simply use a wire brush to take the rust off, clean the area of dust/ dirt and then use satin black paint with rust-inhibitor to touch the area up.
- If you have gates, grease or oil the hinges as needed. Key lockable latches may require a shot of graphite every couple of years to ensure continued smooth operation.