

# Bear Bones Systems Minimalift User's Manual

Bear-Bones.com



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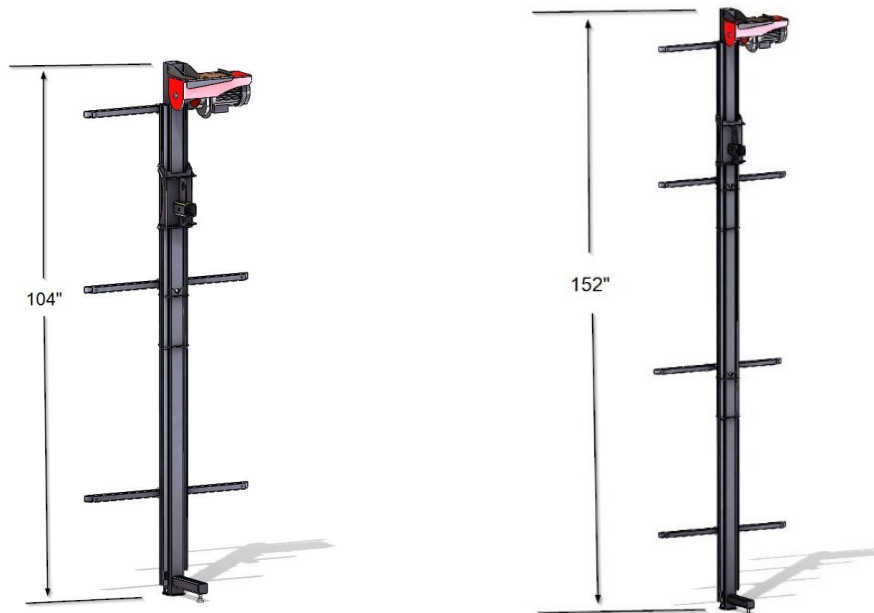
Please read and understand the information in this User's Manual to help avoid possible damage, injury or death that could result from failure to follow these instructions and heed these warning.

### 1. MINIMALIFT INTRODUCTION

Bear Bones Systems is proud to present the Minimalift which is part of the Bear Bones System's family of products. The Minimalift system is a minimalist approach to a lift that provides lifting capabilities for stowing, storing or comfortably positioning your stuff. The Minimalift has the unique capability of being configured for different applications using the receiver carriages that can accept various accessory platforms. Also multiple carriages can be used to lift multiple cargo loads in a stacked or over/under arrangement.

#### 1.1. CONFIGURATIONS

The Minimalift is a modular design that allows for various configurations to accommodate different mounting requirements and user needs. The base model assembly has an overall height of 104" (8'8") to fit under a typical 9' garage ceiling but by adding available column extensions (sold separately) the overall height can be increased by the length of the extension.



Also, various accessory platforms can be used to configure the Minimalift for specific applications. The example to the right shows a dirt bike platform and a cargo carrier.



## 2. SAFETY

- 2.1. Never place your body beneath a suspended load.
- 2.2. Never exceed the weight capacity of the lift or the torque load capacity of the carriages as explained in Section 3.
- 2.3. Ensure that assembly and installation are done properly as explained in Section 4.
- 2.4. Be aware of the general envelope of the load being lifted to avoid collisions with surrounding items or ceilings.
- 2.5. Inspect cable regularly and replace if showing any signs of wear or damage.

## 3. WEIGHT CAPACITY, LOADING AND TORQUE.

### 3.1. WEIGHT CAPACITY

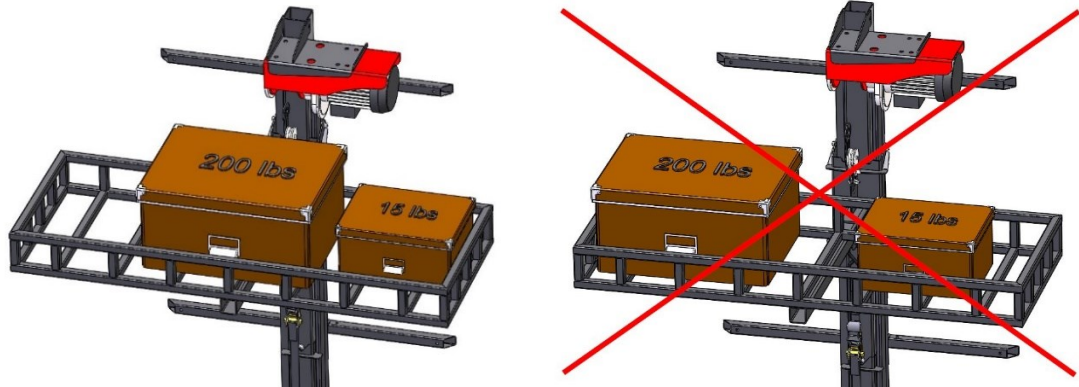
The Minimalift has a lifting capacity of 880 lbs. that should never be exceeded. The weight of the carriages, any accessory platform or bike rack etc. must be included in the total weight.

### 3.2. CENTER OF MASS aka CENTER OF GRAVITY

Center of mass is defined as a single point at which the whole mass of the body or system is imagined to be concentrated and all the applied forces act at that point. In other words, the center of mass is the 3 dimensional balance point of the item. When only gravity is acting on the system such as is the case with the Minimalift, this is basically the balance point.

When loading cargo to be lifted it is important to position the combined balance point close to the center of the main vertical column to avoid excessive side loading of the track rollers. This applies to all types of cargo. When loading multiple items such as in the cargo carrier examples below,

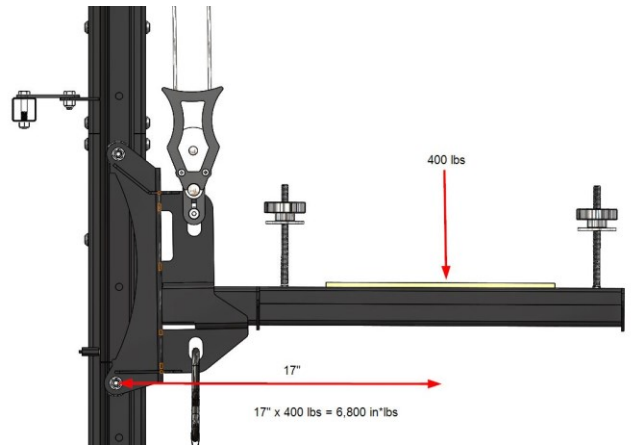
position the loads so that their combined weights are balanced near the main vertical column.



### 3.3. TORQUE

The standard Minimalift carriages are rated for 6,800 in\*lbs of torque loading resulting from mass supported in front of the main vertical column. Heavy Lift Carriages are rated for 13,600 in\*lbs of torque.

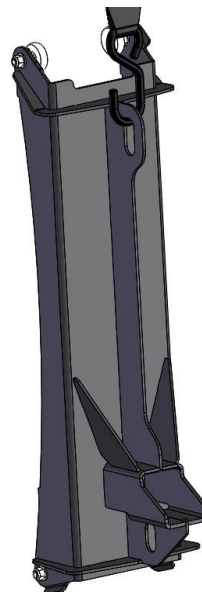
The torque is determined by multiplying the weight of the cargo by the distance from the center of the track rollers to the Center of Mass or balance point of the cargo as shown below.



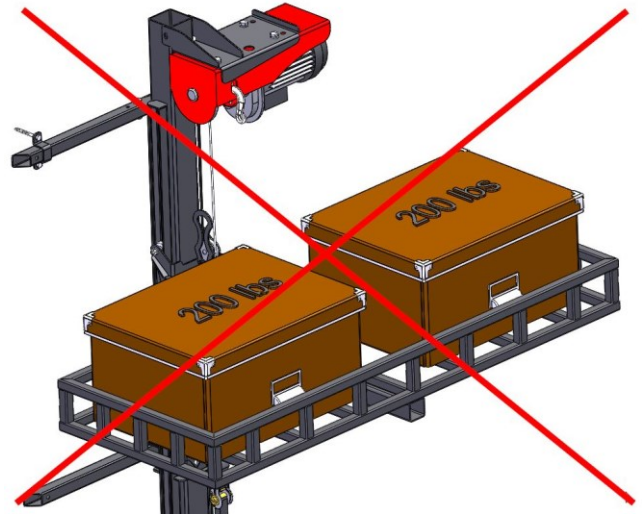
Standard Carriage



Heavy Lift Carriage



**Accessories** Various accessories or cargo specific attachments can be used with the Minimalift and it is important to remember that they may have their own capacity rating that is higher than the capacity rating of the Minimalift or can cause a torque that exceeds the capacity of the Minimalift carriage. For example, the image to the right shows a cargo carrier loaded with 400lbs which is well within the cargo carrier's capacity but with a center of mass 20.6" from the rollers it generates a torque of 8266in\*lbs which exceeds the capacity of the carriage.



**Note:** Always go with the lowest capacity rating whether it be the Minimalift or the accessory being used with it.

A properly installed and loaded Minimalift will exert a total force of less than 100lbs pulling on the wall and a force on each stud less than 33lbs.

#### 4. ASSEMBLY AND INSTALLATION

### WARNING

**WARNING:** Due to the potential hazards of improper installation, Bear Bones Systems recommends that the installation of the Minimalift be performed by a trained professional only. Bear Bones Systems will not be responsible for damage or injury resulting from improper installation.

##### 4.1. RECOMMENDED ASSEMBLY AND INSTALLATION TOOLS

- 1- 1/8" hex wrench
- 2- 7/32 hex wrench
- 3- Measuring tape
- 4- Level
- 5- Stud Finder
- 6- 9/16" and 5/8" open end wrenches or adjustable wrenches.
- 7- Step ladder or man lift

- 8- Phillips Screw driver or ½" socket, depending on anchor type.
- 9- WD-40 or other light lubricant.
- 10- Plumb bob or vertical layout laser.
- 11- Appropriate drill bit depending on wall type. ½" for concrete block or metal stud, and 3/16 for wood stud.
- 12- Drill motor
- 13- Plastic or rubber mallet
- 14- Pencil

#### 4.2. FASTENERS AND HARDWARE KIT

- (1) Swivel Foot      (6) 5/16 x 1-3/4" Hex bolt      (7) 5/16 lock nuts



- (16) 3/8-16 x 3/4" Button socket head screws.



- (2) 1/4 x 1/2 set screws



- (1) 3/8 Shoulder bolt



- (1) 5/16 Flat washer



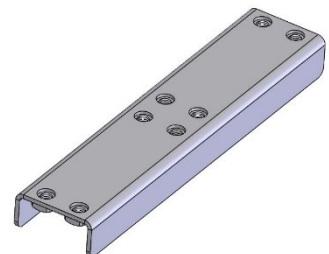
- (1) Limit Switch Tripper



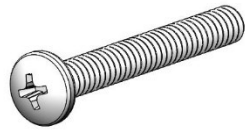
- (2) Pulley link



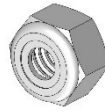
- (2) Splice Channel



(2) Screw 10-24 x 1-1/2



(2) 10-24 Locknut



(1) Cotter Pin



(1) Hoist mount pack containing 4 hex bolts M10 x 25mm, 4 flat washers and 4 split washers.

(1) Pulley assembly.

(1) Extension cord.

#### **Recommended anchors purchased separately**

(6) 5/16 x 3" lag bolts for wood stud walls



(6) 1/4-20 Snaptoggle® Item #50425 by Toggler® Anchors for concrete/cinder block walls.



Note: Additional accessories may include and/or require additional fasteners and hardware.

#### **4.3. Assembly and installation**

Assembly of the Minimalift can be done using one of two basic approaches. It can be assembled on the floor and raised into position against the wall or assembled or mounted to the wall in steps starting with the lower column assembly and adding column pieces on top. The first approach may be done manually with a column containing no extensions but is not recommended for an extended column unless a man lift is available. Either way the hoist should be installed after the column is attached to the wall.

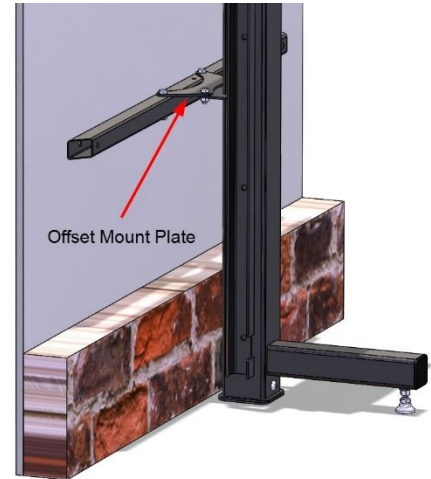


## Selecting an installation location

The Minimalift can be mounted to different wall construction types such as wood stud, hollow concrete block, brick and concrete. Others types of wall construction may also be possible but are not addressed in this guide.

**Note: The wall to which the Minimalift is to be mounted must be structurally sound. It is the responsibility of the installer to ensure that the wall is adequate for mounting.**

Walls may have foundations or other structure protruding at their base. An available Offset Mount Kit (sold separately) can be used to offset the Minimalift an additional 2-3/8" from the wall. See example.

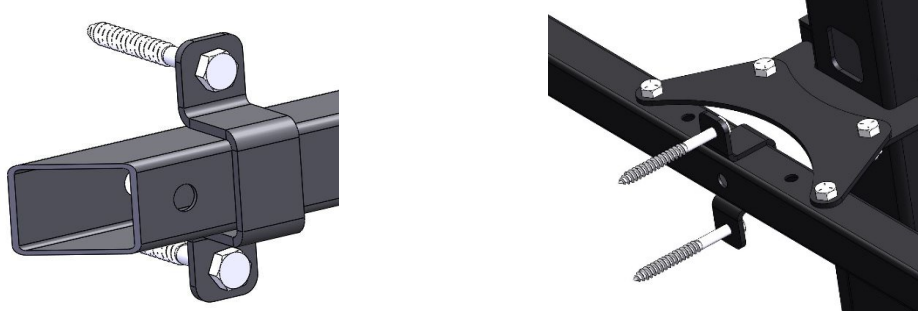


The Minimalift must be secured to the structural members of a wall. Each horizontal mounting bar has 5 holes spaced for 2x4 on 16" centers or 2x6 on 24" wall construction. An Alternate Mounting Bracket is available for purchased from Bear Bones that can accommodate non-typical stud spacing or out of position studs.

For typical 2x4 construction, select your preferred installation location and ensure that a stud aligns with the center of the column. Use the stud finder and plumb bob to verify that the stud runs straight and vertical from the bottom to the height of the top mounting bar. If it does not, I suggest you find another stud that does to use as the center stud. With a center stud selected, use the measuring tape to measure 16" from center of the center stud to either side then use the stud finder and plumb bob to determine if the studs on either side run parallel to the center stud. If they do not, the Alternative Mounting Brackets mentioned above can be used to accommodate the misalignment. See examples below. The alternate mounting bracket can be used at the center position if necessary but requires the use of the offset mount plates mentioned above.

For typical 2x6 construction find two studs in your chosen installation location and use the stud finder and plumb bob to verify that they run

parallel and vertical and plan to position the column centered between the two studs.



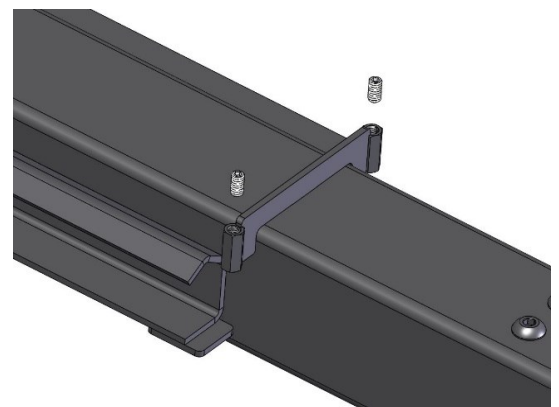
Alternate Mtg. Bkt.

Warning: Use a voltage sensor or a stud finder with metal and ac power sensing capabilities to ensure that you don't drill into electrical wires.

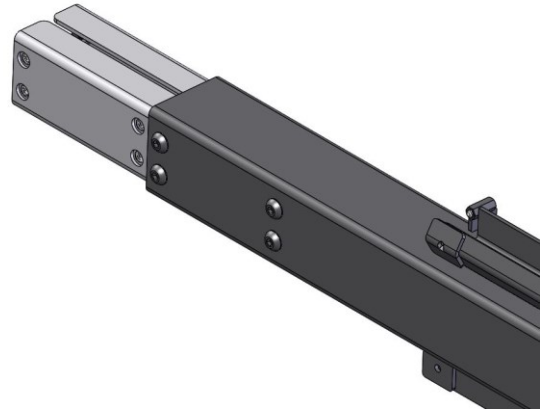
### Lower Column Prep



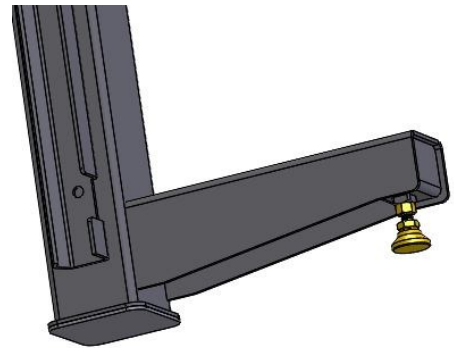
1. Begin by locating the  $\frac{1}{4}$ " x  $\frac{1}{2}$ " set screws and screw them into the track support brackets from the rear until they are buried in the nut but not protruding out the front side of the nut.



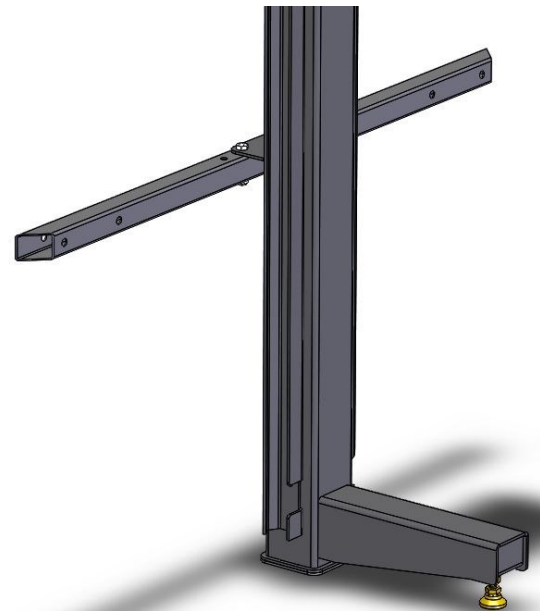
2. Locate two Splice Channels and 8 of the 3/8-16 x 3/4 Button socket head screws and loosely assemble them as shown.



3. Now install the swivel foot into the weld nut on the underside of the column leg. Screw it all the way in for now but don't tighten it.



4. Attach the wall mount bar to the lower column using two of the 5/16 x 1-3/4 bolts and two 5/16 lock nuts with the bar positioned below the bracket on the column. Position the lower column assembly with the mounting bar against the wall at the installation location, check plum and level and mark the outer anchor hole locations for 2x4 studs spaced 16" apart or the second hole from the end on each side for 2x6 studs spaced 24" apart. Remove the assembly and verify that the marks align with the center of the studs. Detach the mounting bar from the column. If mounting to 2x4 studs spaced 16" apart position the bar



against the wall with the marks aligned with the holes and mark the center hole location then drill the mounting holes and and anchor the mounting bar to the wall using the appropriate anchor type as noted in Sec. 4.2

### Column Sections Joining

Now you must decide if you will join the column sections on the ground and raise them into position against the wall which should be done as a two person operation or join the two column sections by stacking one onto the other in the vertical which requires 14" of additional ceiling clearance.

#### **To join on the ground**

1. Lay both column sections on a piece of cardboard or other protective surface that will not damage the powder coat finish but will allow the columns to slide. Position both on their sides and lined up end to end as shown.



2. Apply WD-40 or other light lubricant to the inside surfaces of the rails where they will overlap the lower column. This should be a tight fit and the powder coat does not slide well on its self.
3. Slide the two column sections together while carefully guiding the rails between the brackets of the lower column. A plastic or rubber mallet may be needed to encourage the union. With the two sections fully engaged, use 8 more of the 3/8-16x3/4 button head screws to secure fasten the splice channels to the upper section and then tighten all 16 screws.

4. With the assistance of a second person, position the foot of the column at the wall in front of the installation location and raise it up and maneuver it so that it can be bolted to the already mounted wall mount tube.

**To join vertically,**

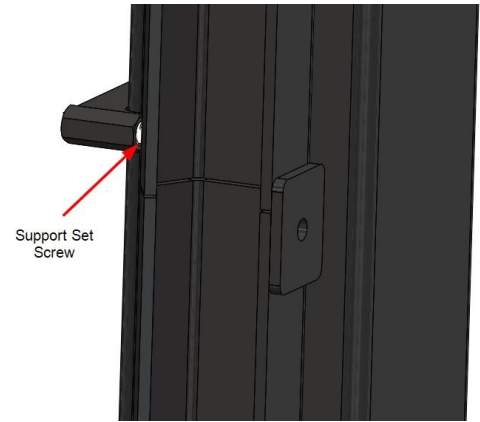
1. Bolt the lower column to the wall mount tube. Apply WD-40 to the inside of the rails as described above and using a ladder, lift the upper column above the lower column then guide the rails down between the brackets of the lower column. Again a plastic or rubber mallet may be required to encourage the union. Bolt together as described above.

Note: If extensions are being added, the process is the same but with the extension or extensions inserted between the upper and lower column sections.

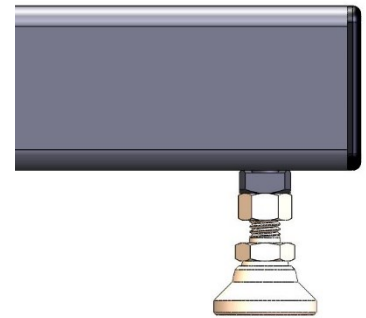
**Upper wall mount bars.**

1. With the lower column section attached to the wall via the lower wall mounting bar and the bolts loosened, you should be able to pull the top of the upper column away from the wall to give some working room. Using 5/16 x 1-3/4 bolts and 5/16 lock nuts, attach the upper wall mount bars to the brackets on the back side of the upper column with the bars below the brackets as before. Push the column against the wall and check plum and level of the column and bars, verify that the center of the wall mount tubes align with the center of the center stud for 2x4 stud walls or that the second hole from the end on each side aligns with the studs for 2x6 stud walls. Mark the anchor holes. Then pull the column away and off to a side and drill the anchor holes.
2. This is a good time to fish the extension cord down the inside of the column and through the cord hole in the back of the column from top to bottom. Leave a foot or so of the female end dangling out of the top so you can plug the hoist in later.
3. Anchor the wall mount bars in place and bolt the column to the wall mount bars.

4. With the column mounted securely to the wall, use the hex wrench to advance the rail support set screws forward until they contact the rails. Use the set screws to align the upper and lower rails. Blue thread locker can be applied to the set screws to keep them set.



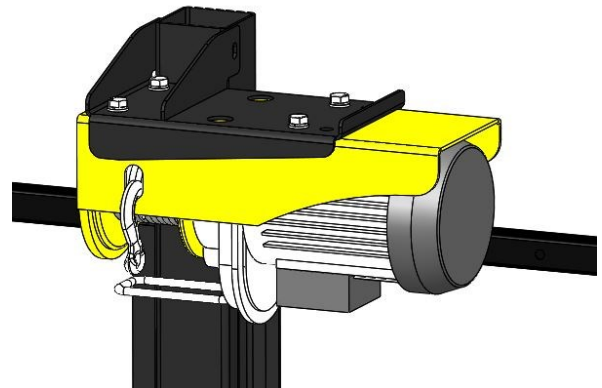
5. Next screw the swivel foot out until it is tight against the floor and taking some load but not quite lifting the column off the floor. Use wrenches to lock it in place with the lock nut.



### Installing the hoist.

**Warning: The hoist is heavy and awkward and should be installed as a two person operation.**

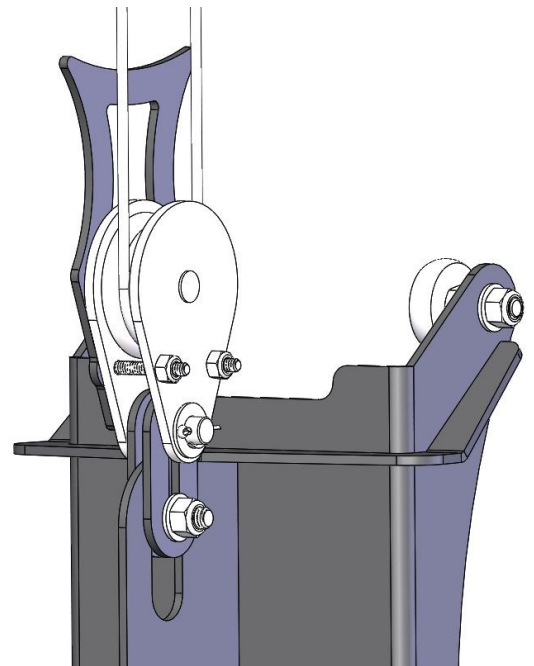
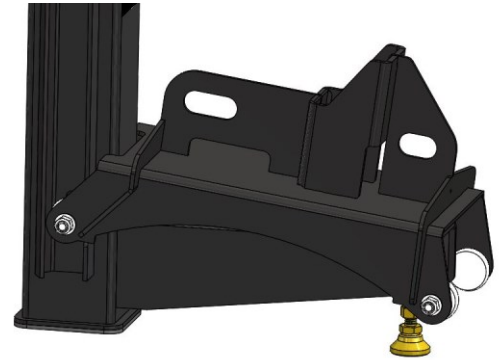
1. Using a ladder and a second person on a separate ladder, hold and align the hoist with the bolt patten in the hoist bracket while a second person inserts and tightens the M10 bolts with washers as shown.



2. Plug the hoist power cord into the extension cord and slip the connection into the column. It may be necessary to remove the bolts in the upper wall mount brackets so that you can pull the column away from the wall enough to get the connection into the hole. Alternately you can pull the female end of the extension cord up through the top of the column, plug in the hoist cord and then push the two back down into the column.
3. Using the remote switch, unspool a few feet of cable while maintaining tension on the line with a gloved hand. Hook the hook into the cutout in the front of the hoist. Continue to maintain tension

on the cable and unspool enough cable so that it can nearly reach the ground.

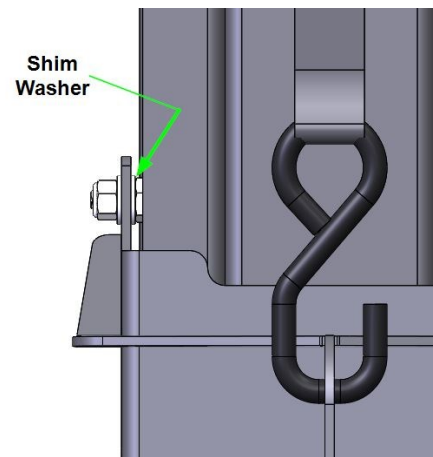
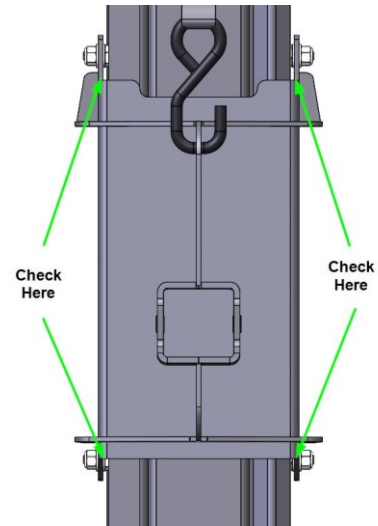
4. Install a carriage assembly onto the rails by orienting it horizontally while passing the upper rollers through the rail cutouts located near the bottom. Then raise it up and pass the lower rails through the cutouts.
5. Assemble the pulley as shown using the (2) 10-24 x 1-1/2 screws and lockjuts, the Switch Tripper, the two pulley links, the 3/8" socket head shoulder bolt, a 5/16" locknut, the 5/16" washer, the cotter pin and the carriage assembly. Tighten the two smaller nuts until they almost pinch the pulley. The screws should be loose enough to rotate with your fingers. Use pliers to bend the legs of the cotter pin back around the pin.



Note: Do not overtighten the two fasteners that pass through the pulley. Overtightening will pinch the pulley wheel and restrict its movement. Ensure that the pulley wheel rotates freely before continuing.

Note: During the assembly process the cable on the hoist spool may have become loose or unevenly wound. If so, use the pendent to unwind the cable and with a gloved hand around the cable to give tension rewind it making sure that the wraps are tight with no gaps. An unevenly wound cable will cause a rough and jerky lift.

6. Next check the clearance between the carriage/s and the guide rails. Install the carriage/s on the column and insert an attachment into the receiver to cause the rollers to seat securely in the guide rails. Check the clearance between the carriage and the guide rails at the top and bottom as shown. If the carriage is touching or very close to touching the rail at any position along the column the Shim Washers on the carriage rollers can be transferred from roller to roller to compensate. Note that the upper carriage rollers are guided by the right rail and the lower carriage rollers are guided by the left rail so if the upper end of the carriage needs to be shifted to the left then both Shim Washers should be placed on the left roller and if the bottom end of the carriage needs to be shifted to the right then both Shim Washers should be placed on the right roller and vice versa.

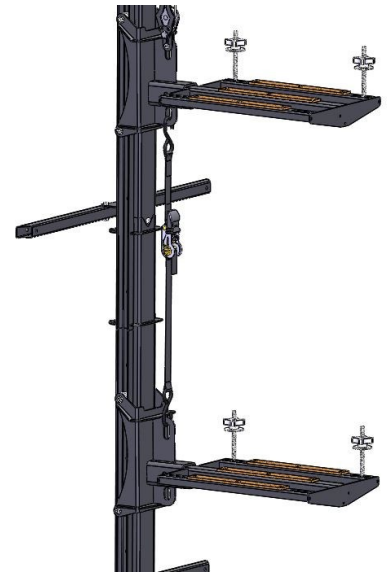


After completion of the installation, perform a load test to verify the adequacy of the installation using a low value load.



## 5. MULTIPLE CARRIAGES AND ACCESSORY PLATFORMS

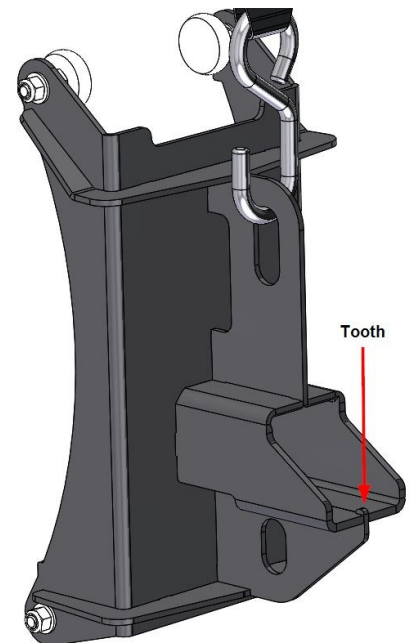
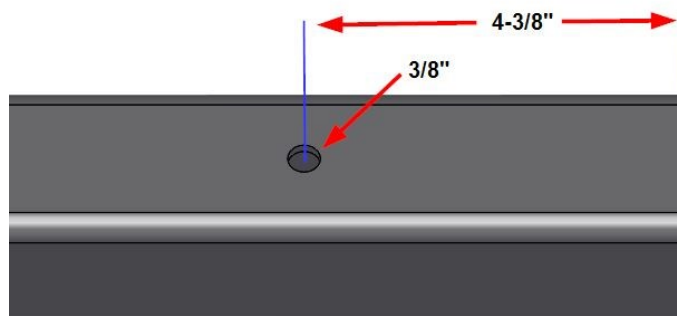
5.1. Multiple carriages can be installed on the Minimalift at a time for lifting multiple loads. They are connected with a strap and travel up and down the column together. In some cases, such as with the dirt bike platforms, it is necessary to remove a carriage completely from the column in order to lower the carriage above it enough that it can be unloaded. An organized person might have a hook mounted to the wall nearby for hanging carriages as they are removed.



5.2. Various different accessories can be used with the Minimalift by simply inserting the tube into the receiver of the Minimalift carriages.

One of two modifications will be necessary to use accessories intended for vehicle hitch receivers.

- 1- File/grind down the tooth at the front edge of the carriage receiver.
- 2- Drill a 3/8" diameter hole through the underside wall of the hitch tube of the accessory at the location shown below.



**Note:** Do not apply a lateral torqueing force to the carriages.

The Minimalift is a great way to position an item like a motorcycle or lawn mower etc. at a comfortable level for doing maintenance or making repairs but it is important that you don't pull against the column or torque the carriage by applying a lateral or side to side force to a platform.

## 6. SPECIFICATIONS

- 1- Height Min = 104-1/4" + XX" for each additional extension.
- 2- Weight Capacity Max = 880lbs
- 3- Max Torque for Standard Carriage = 6,800 in\*lb/carriage =(weight \* distance from CG to roller)
- 4- Max Torque for Heavy Lift Carriage = 13,600 in\*lb/ carriage
- 5- Wall Load- Vertical load 0. Overall load perpendicular to wall < 100lbs. Local perpendicular load from column flex < 250lbs distributed over 2 studs 2x6 or 3 studs 2x4.