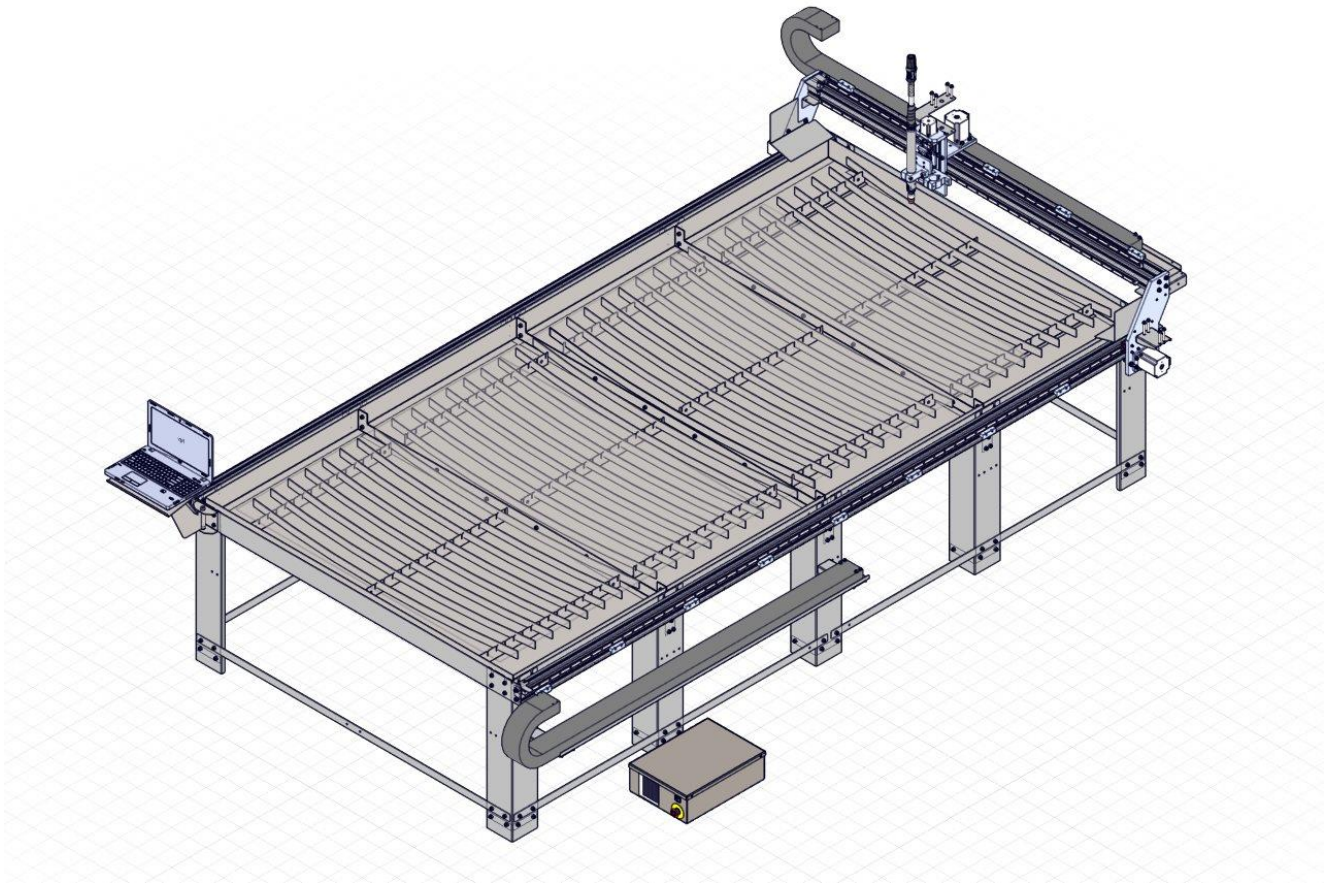


A-Series Plasma Table 5x10/5x5 Assembly Manual

Original Instruction: English

Version 1.1.1

Revision and Validity

231114 Revised 1/30/2024

Valid for A-series Air Plasma Table with 5x5ft and 5x10ft table

Copyright

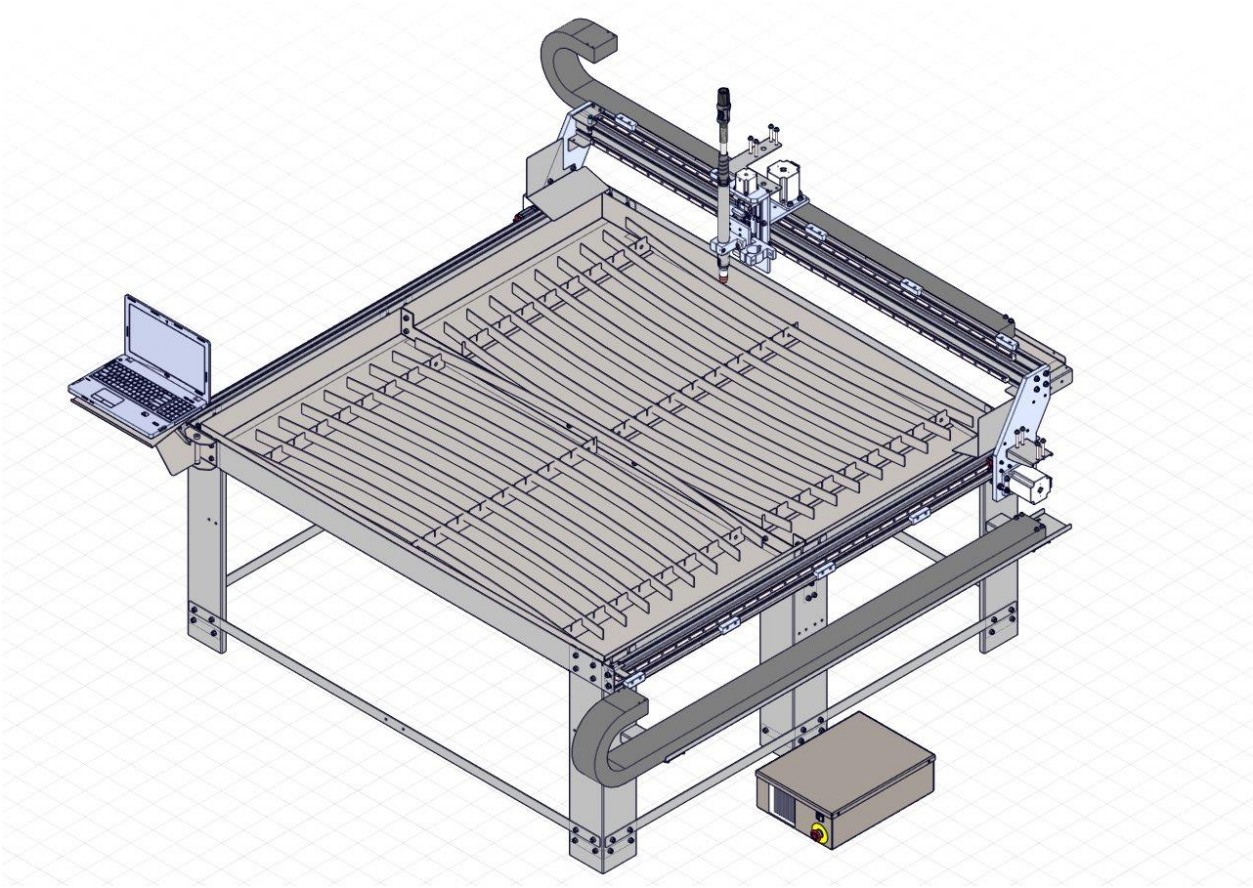


Table of Contents

Chapter 1: General Information

As exciting as it is to start assembling your plasma table, please read Chapter 2 first. We strive to make this manual easy to use, with detailed step-by-step instructions to make the experience as smooth and quick as possible.

Safety and operation information can be found in the A-Series Plasma Table Operation Manual. Check our website for updates: www.piranhafab.com.

If there are questions, comments, or concerns, regarding the machine or assembly and installation instructions, please use the following information.

1.1 Contact Information

For technical support:
Via Phone: +1.815.490.0473
Via Email: service@piranhafab.com

For ordering parts and consumables:
Via Phone: +1.815.490.0472
Via Email: tooling@piranhafab.com

All other inquires:
+1.815.964.6771 or
Toll-free within the US 800.338.5471

Primary address:
Piranha
650 Race St.
Rockford, Illinois 61101, USA

Mailing address:
Piranha
P. O. Box 1206
Rockford, Illinois 61105, USA

Chapter 2: Preparation

2.1 Tools List

- Masking tape or painter's tape
- Tape Measure
- Socket wrench with ½" socket
- Battery powered impact driver with ½" socket
  - A socket extension is also useful
- ½" and 7/16" combination wrenches
- Flathead screwdriver
- Allen wrench sets – both inch and metric
- Adjustable wrench with minimum ¾" opening
- Bubble/Spirit level or similar
- Pliers
- Work gloves
- Box cutter
- Zip ties

2.2 Supplies

- Caulk Permatex Ultra Black RTV Silicone Gasket Maker – 85080 https://www.oreillyauto.com/detail/c/ultra-black/permatex-ultra-black-rtv-silicone-gasket-maker/perd/85080
- Rust inhibitor/biocide for a plasma table, if not purchased as an option, part number 230812
- 4" Square Shims, if leveling feet were not purchased as an option
- Computer or laptop, if not purchased as an option, specs below

2.3 Computer Requirements

Minimum Requirement	
Operating System	Windows 7 or newer
RAM	4 GB
Ports	(1) USB 2.0 Type-A

Recommended	
Operating System	Windows 10 or higher, Pro or Home
Processor Family	AMD 3000 Series or Intel Core i3-6100 or later
RAM	8 GB or larger
Internal Storage	128 GB SSD or larger
Ports	(1) USB 3.0 Type-A

2.4 Electrical Requirements

The machine needs 110V and 15A to run.

2.5 Plasma Unit Requirements

Air and electrical requirements for the plasma unit can be found in the plasma unit manual. If the plasma unit was not purchased with the A-series plasma table from Piranha, it will need to include the following:

- Mechanized torch lead that is at least 25ft.
- Remote start signal
- Arc voltage feedback signal

2.6 Location and Floor Level

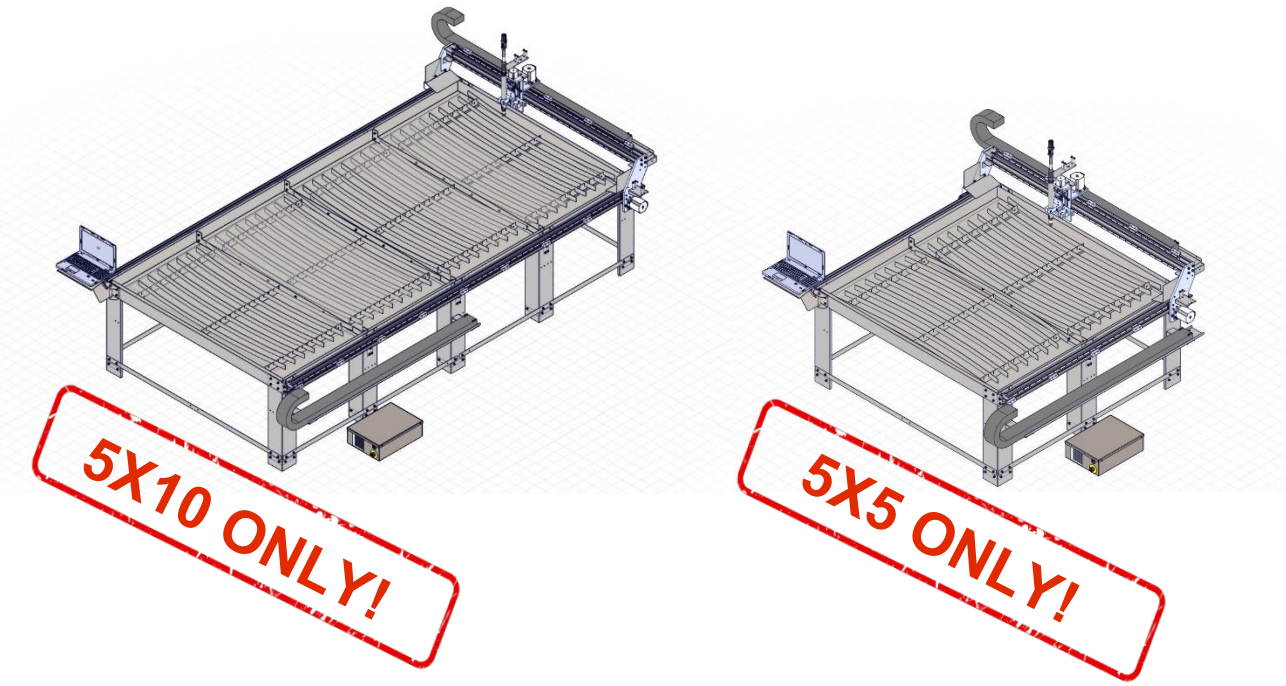
See section 3.1.2 Floor Layout for floor layout drawing to help you determine the orientation and placement of the machine. Make sure to have enough room around the machine to load material.

The location of the machine should have no more than a 1% slope. In other words, the slope should not change more than 0.6 inches over 5ft. Shims can be used under the feet to help create a more level surface.

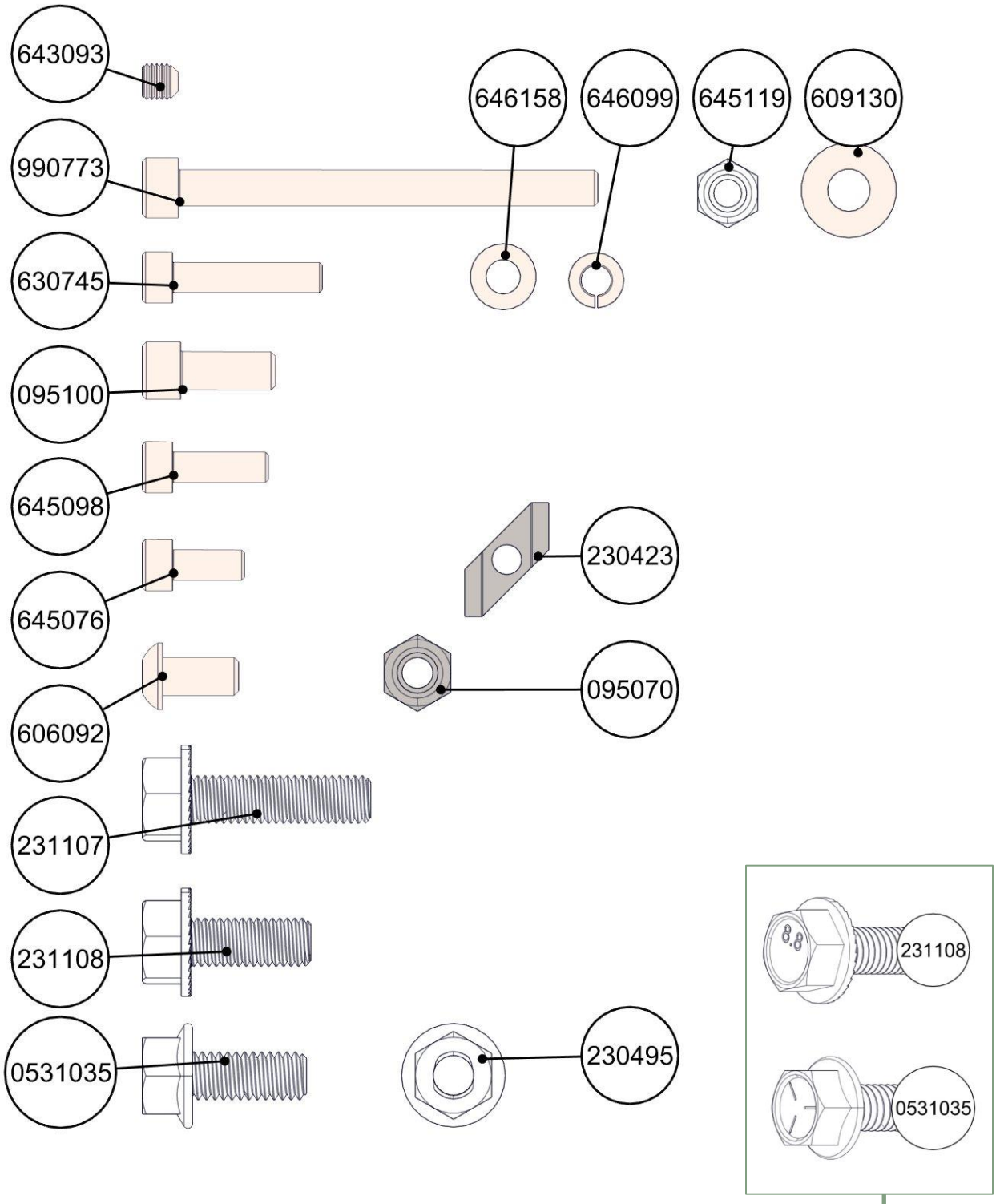
Some simple ways to check if the floor is level can be found here: https://www.wikihow.com/Check-if-a-Floor-Is-Level.

2.7 Model Size

While the model shown in the illustrations and photos are primarily of the 5' x 10', the instructions are mostly identical for both sizes. Please be aware of the following stamps when the information differs. If part number or quantity varies, it will be noted in the Parts list table.



2.8 Fastener List with Actual Sizes



To differentiate between **231108** and **0531035**, check the top of the fastener.

Chapter 3: Assembly Instructions

When tightening fasteners, tighten by hand until it contacts the surface. Then use a wrench to make a consistent number of turns to ensure that all the bolts have the same torque.

Symbols used:

Hand-tighten only at this point. Do not tighten all the way.

Use the tool specified and tighten until snug.

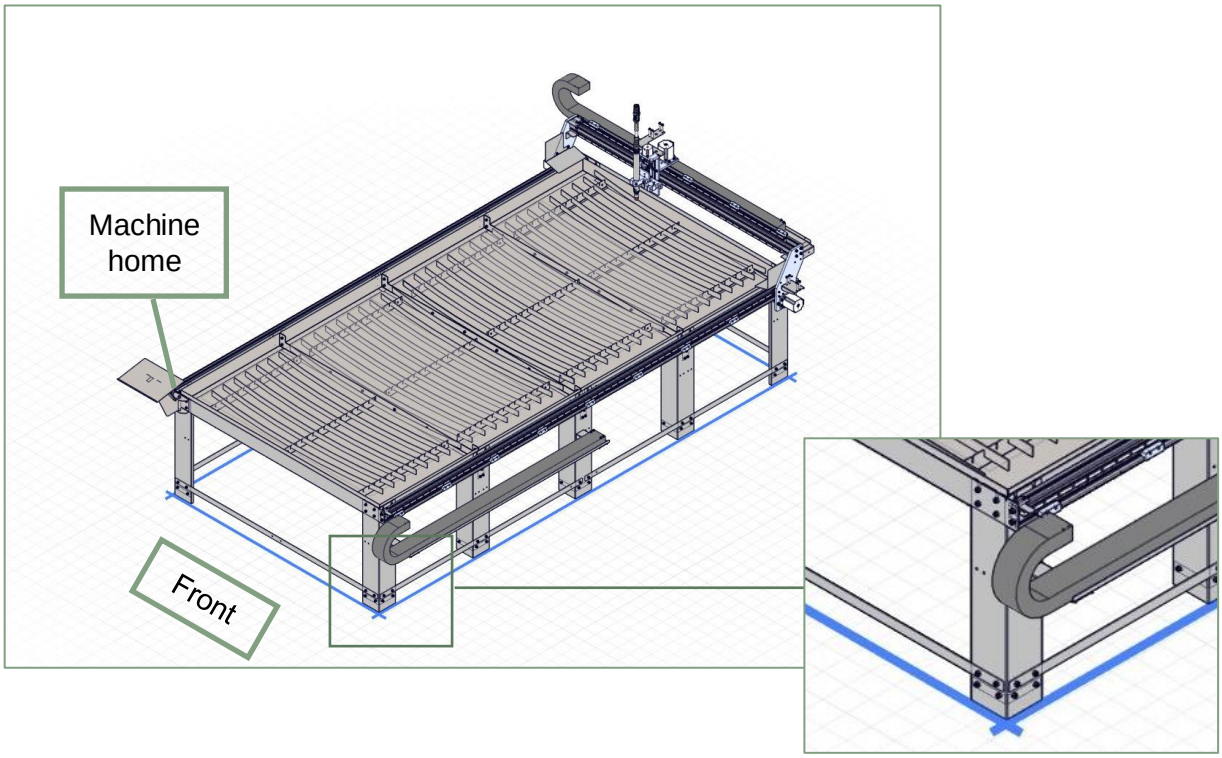
Use impact driver or wrenches to tighten until snug.

A second person will make this step easier and safer.

Heavy component; Use caution.

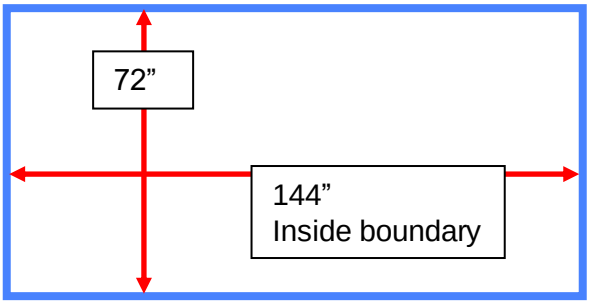
3.1 Preparation for Placement of Machine

1. Use painter's tape or masking tape to layout the area in which the machine's legs will be built as a reference. The inside of the **tape will be the outside boundary of the legs as seen below**. See the dimensions below.

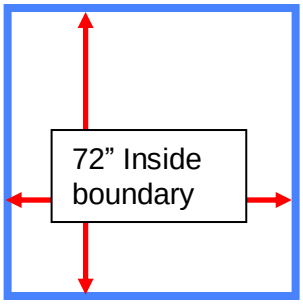


The inside boundary of the width is 72"/1829mm and the length of the inside boundary is 144"/3660mm.

5X10

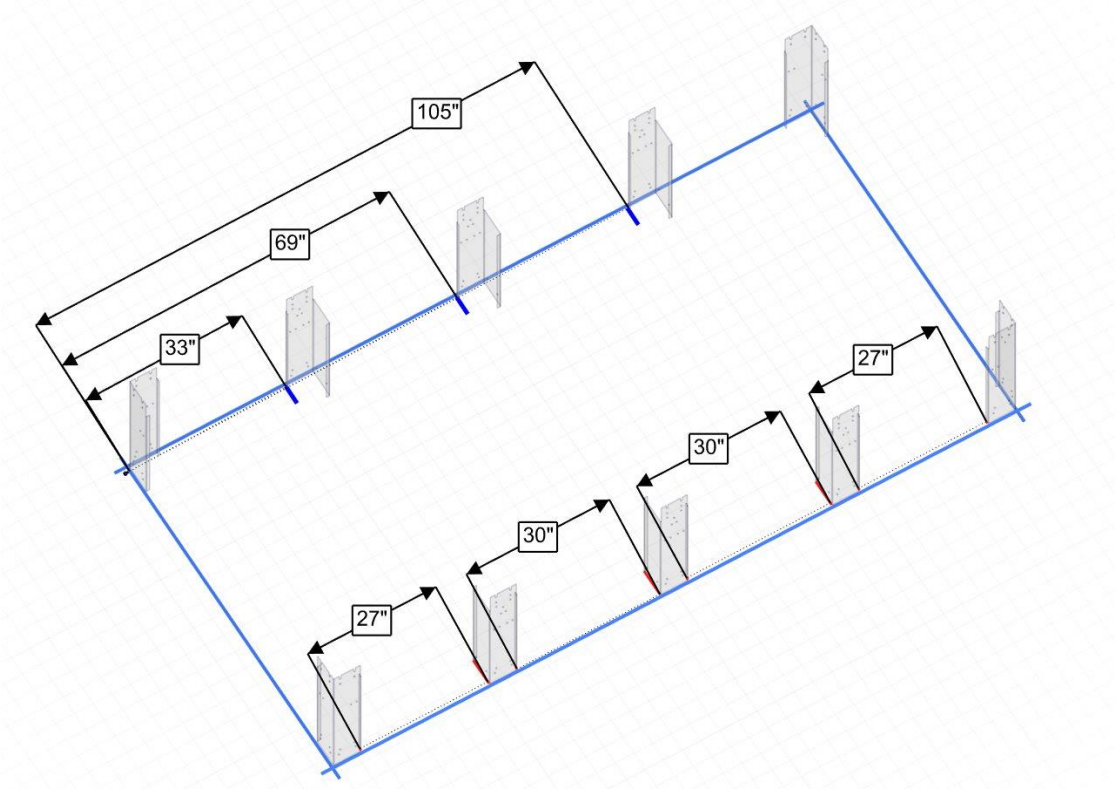


5X5

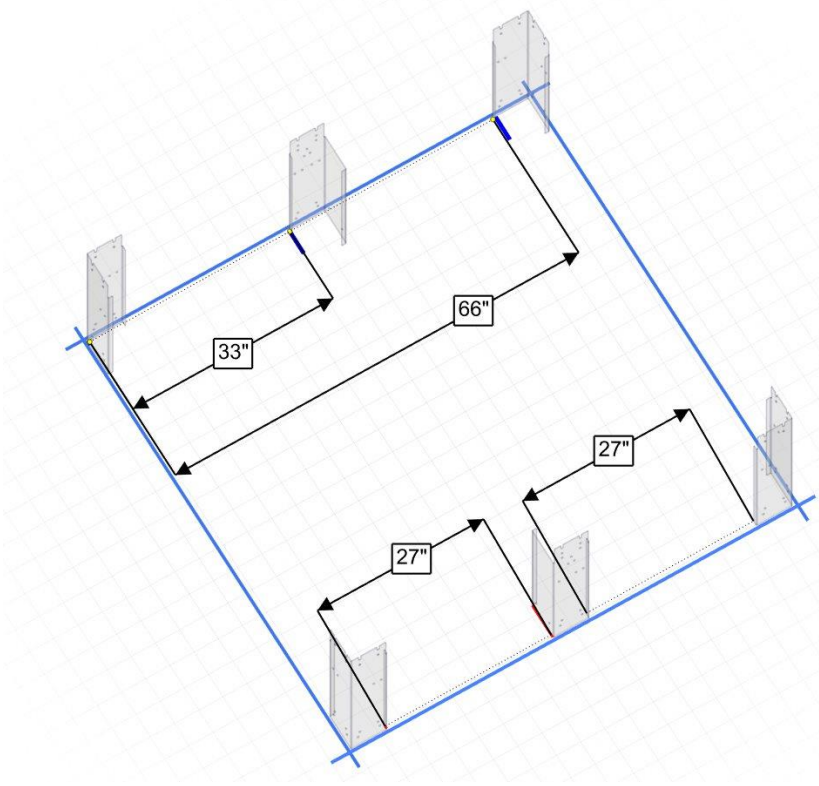


Optionally you can also mark where the legs will be placed.

5X10



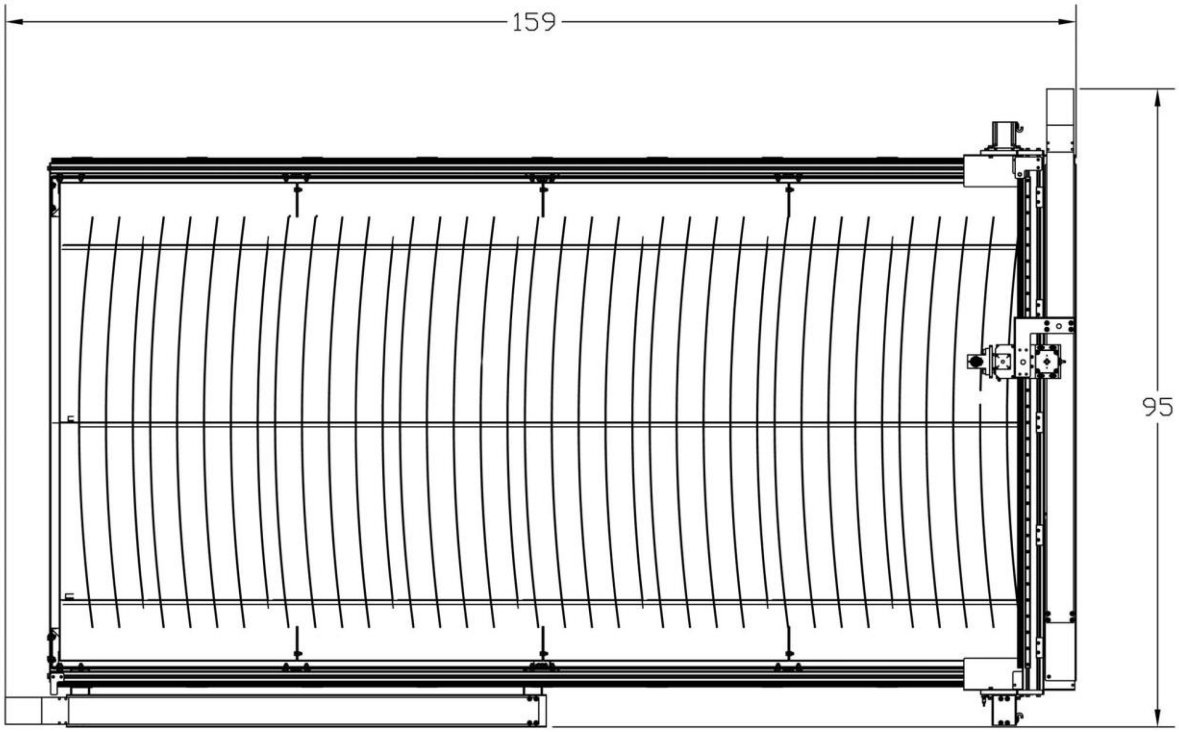
5X5



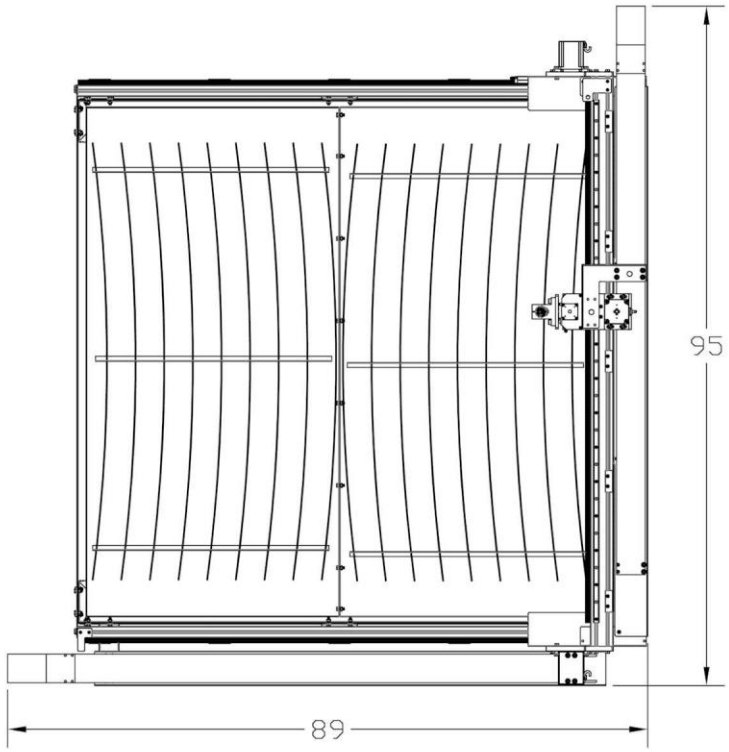
3.1.2. Floor Layout

Here is a machine layout showing overall dimensions with overhead view for reference.

5X10



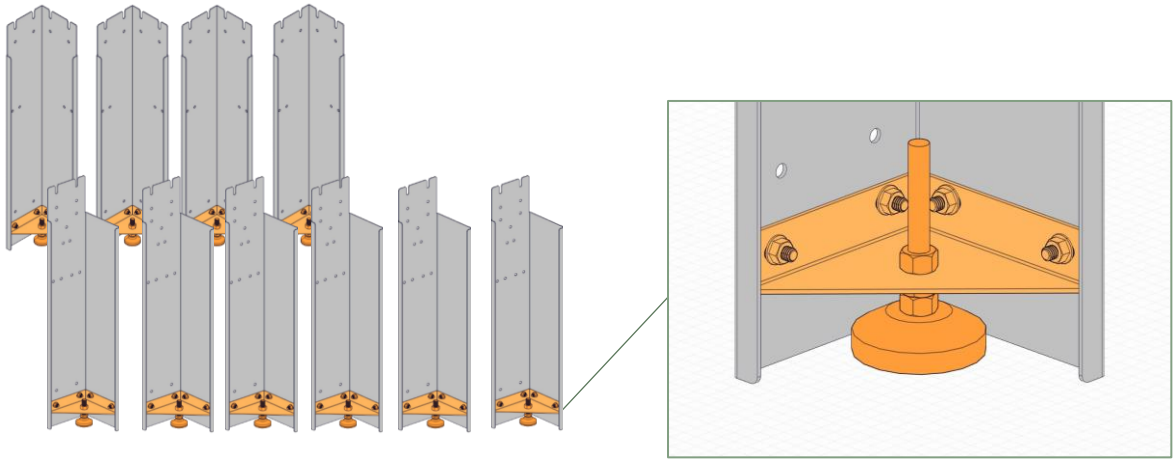
5X5



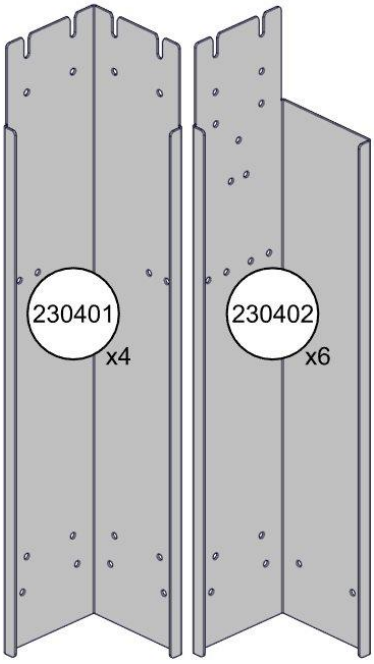
3.2 Attach Leveling Feet (Option) to the Table Legs

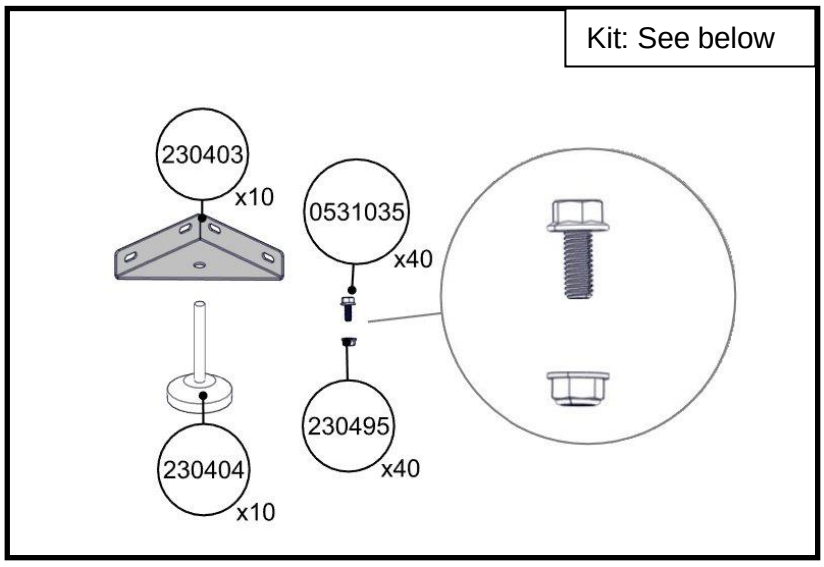
The leveling feet are an option. **Skip to the next section** if these were not purchased.

3.2.1. Goal of this Section



3.2.2. Parts List

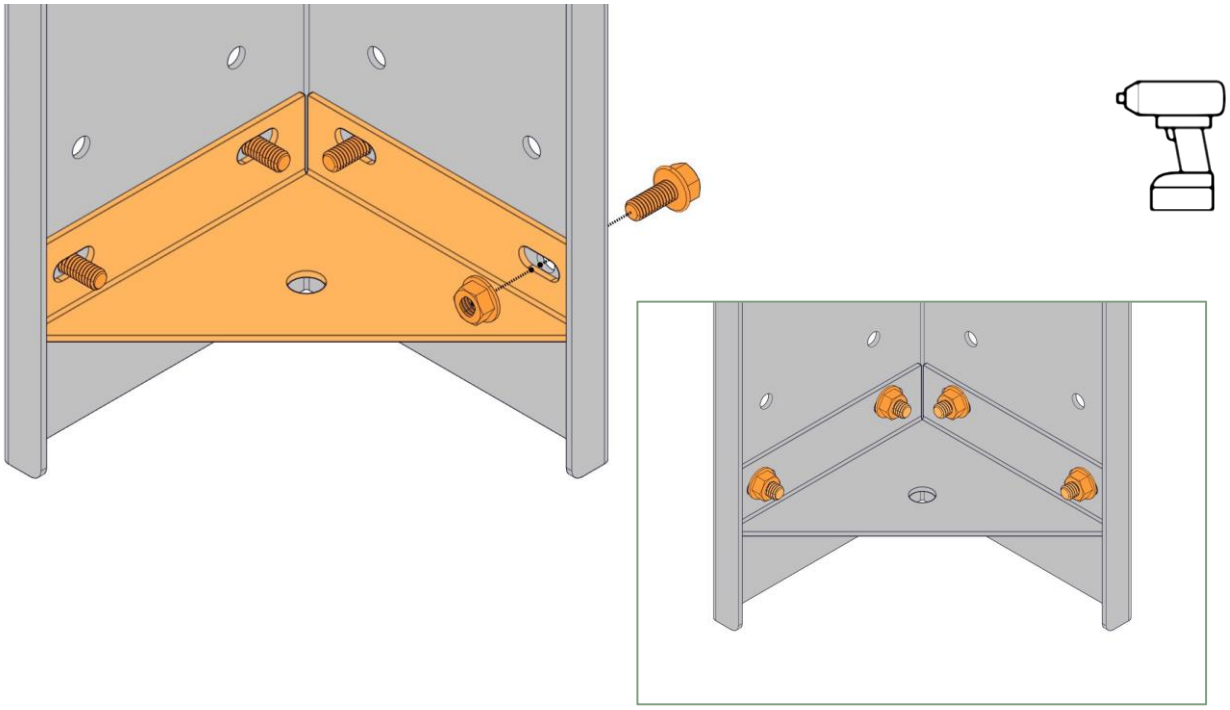




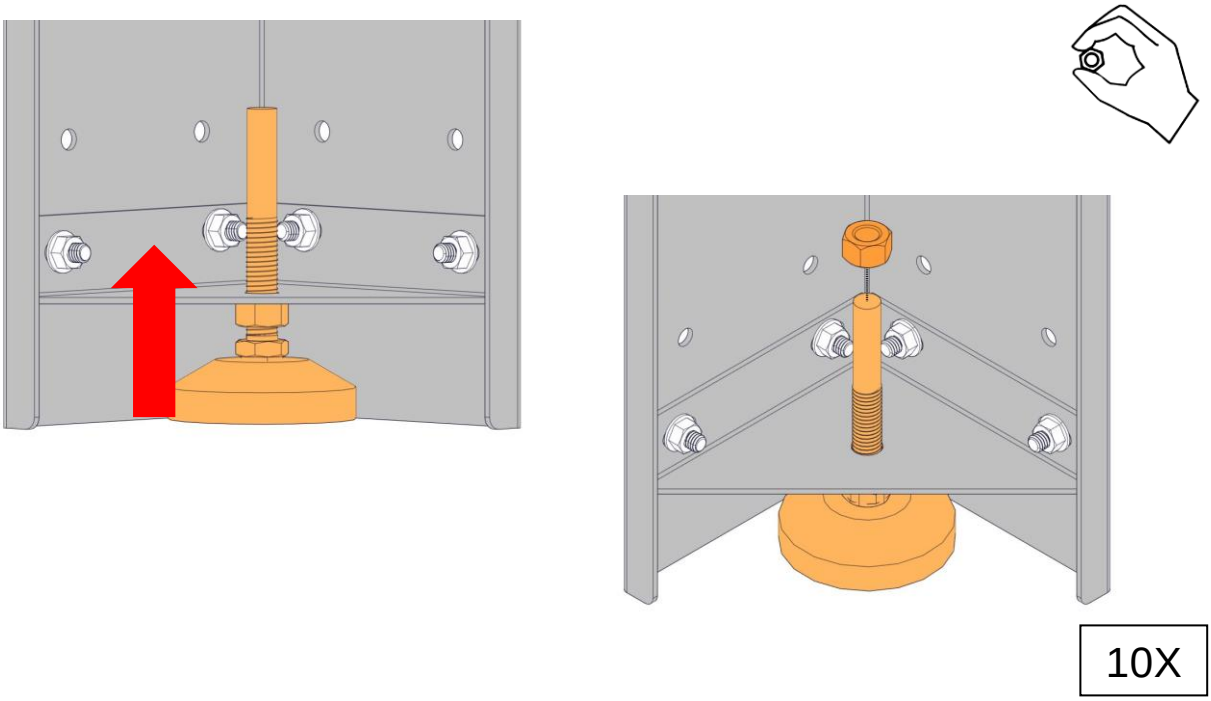
Number	Qty	5X5Q	Part Description
230401	4	4	Corner leg
230402	6	2	Side leg: Notice that one side of the leg is longer than the other
230499 for 5x10 or 230999 5x5	1	1	Kit that includes the following:
230403	10	6	Leg bracket
230404	10	6	Leveling foot
0531035	40	24	Screw Hex Head Flanged 5/16-18 X 3/4
230945	40	24	Nut Flanged 5/16-18 W/Nylon Insert

3.2.4. Steps

2. Locate a leg and align the corner bracket on the inside bottom of the leg. Insert 4 bolts and 4 nuts into both the leg and the corner bracket. Then tighten the bolts.

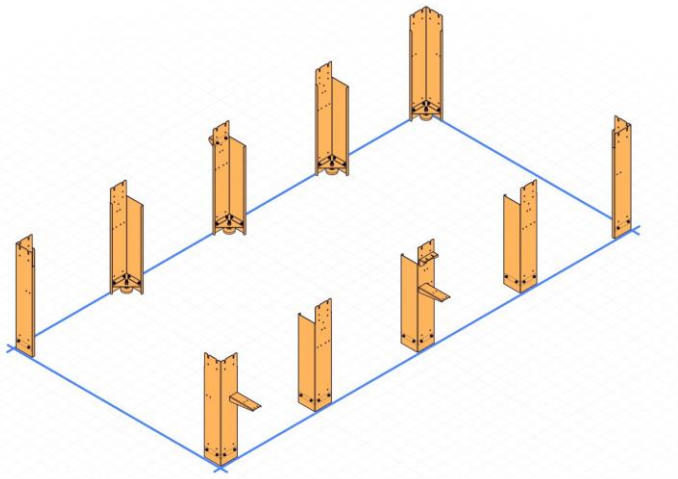


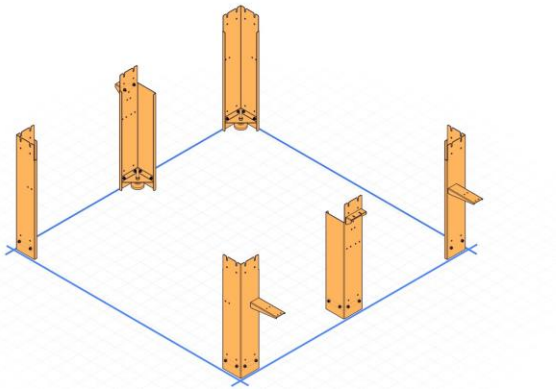
3. Insert the leveling foot through the hole of the bottom of the corner bracket. To make the leveling easier, **the foot should as high as it can be**. Snug the leveling foot locknut onto to leveling foot. Leave finger tight as this will be adjusted later. Repeat with the other 9 legs, or 5 legs on the 5x5.



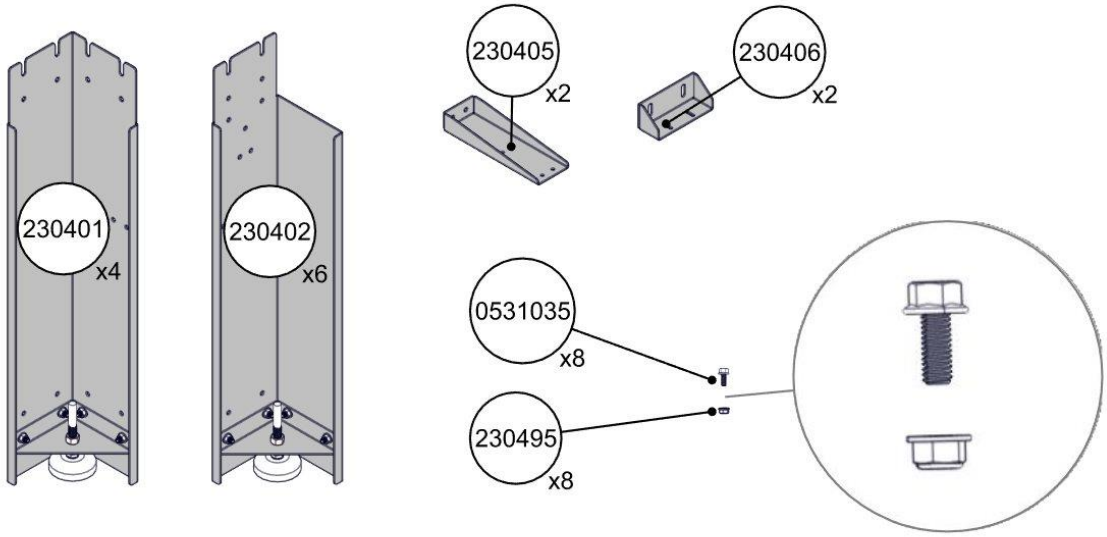
3.3 Attach Brackets to Legs and Placement of Legs

3.3.1. Goal of this Section





3.3.2. Parts List

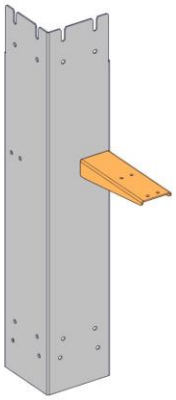


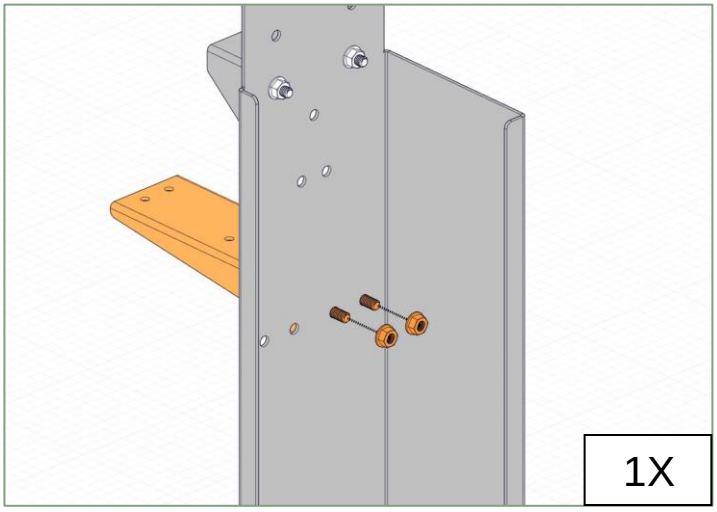
Number	Qty	5x5Q	Part Description
230401	4	4	Corner leg (shown above with the optional leveling feet kit)
230402	6	2	Side legs (shown above with the optional leveling feet kit)
230405	2	2	Y-Axis cable track long bracket/ Bracket carrier tray Y-Axis
230406	2	2	Short bracket supports/ Bracket Extrusion Support
0531035	8	8	Screw Hex Head Flanged 5/16-18 X ¾
230945	8	8	Nut Flanged 5/16-18 W/Nylon Insert

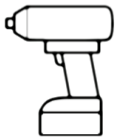
TIP: Pay attention to the difference between corner legs and side legs.

3.3.3. Steps

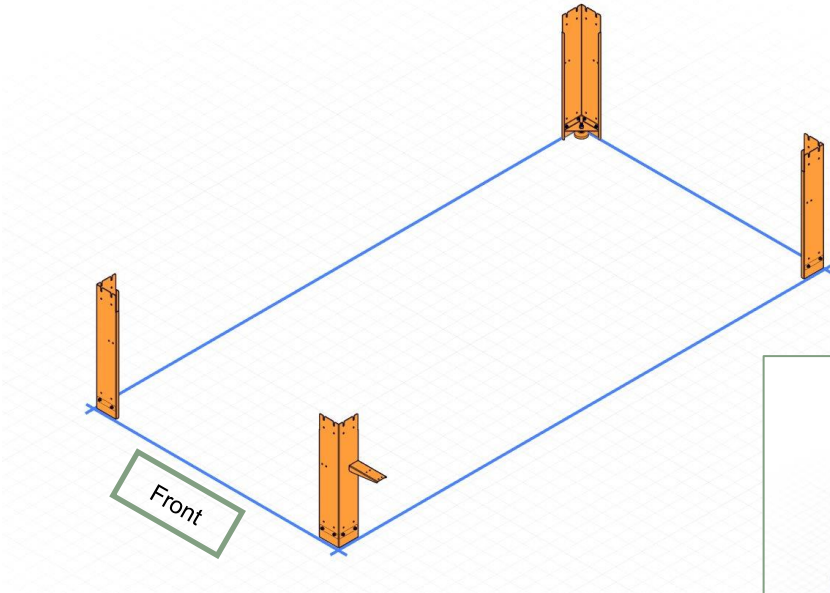
4. Line up the Y-axis cable track bracket to the outside of one corner leg. Insert the bolts into the Y-axis cable track bracket and the corner leg. Tighten the bolts until snug keeping the bracket level.

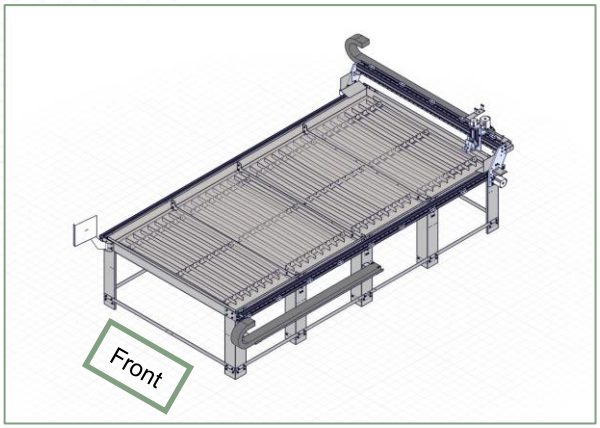




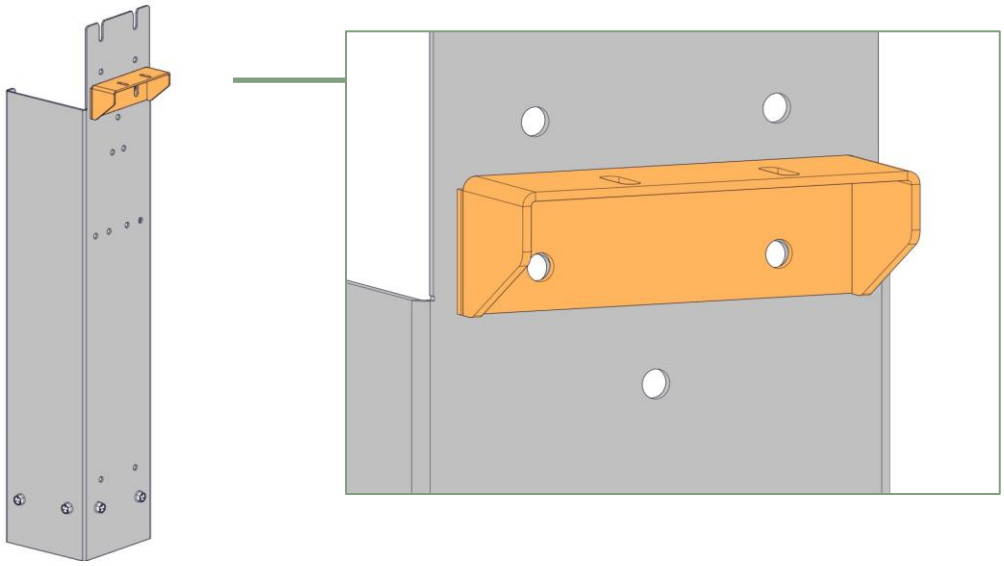


5. Place this leg in the front, righthand corner with the bracket facing outward and towards the right. Place the other three corner legs on the corners of the masking tape. The legs can be laid on their sides for now.

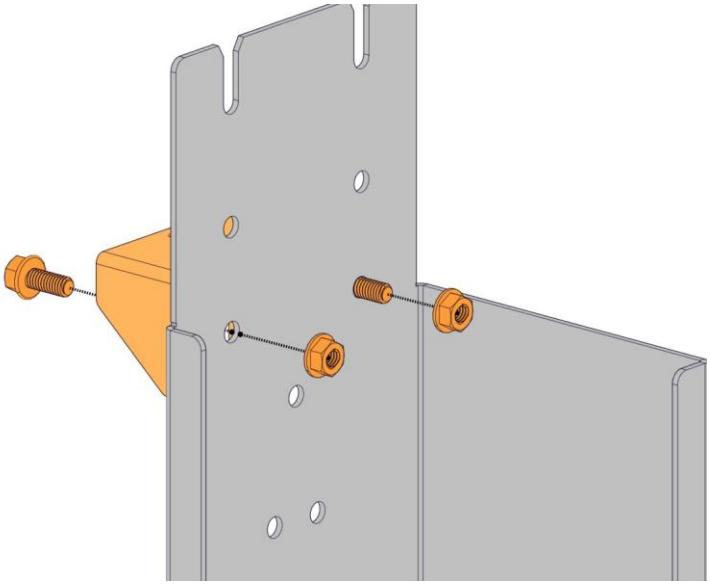




6. Line up one short bracket support to the outside of one side leg. This uses the second set of holes from the top on the side leg.

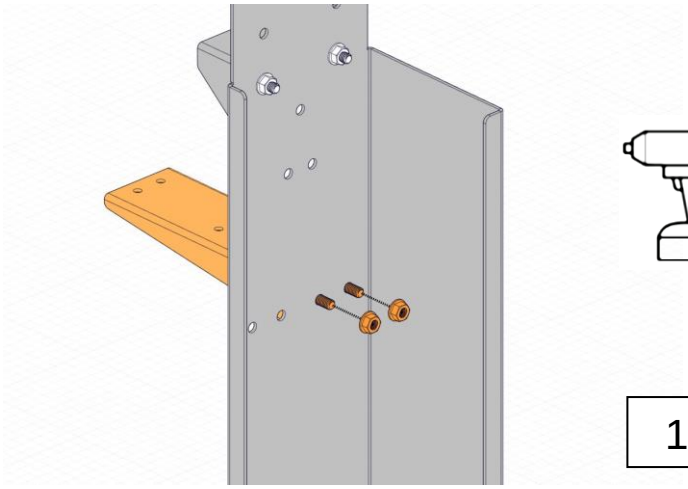


7. Insert the bolts into the short bracket support and the side leg. Tighten the bolts until snug keeping the bracket level. Repeat the process with the second side leg.



2X

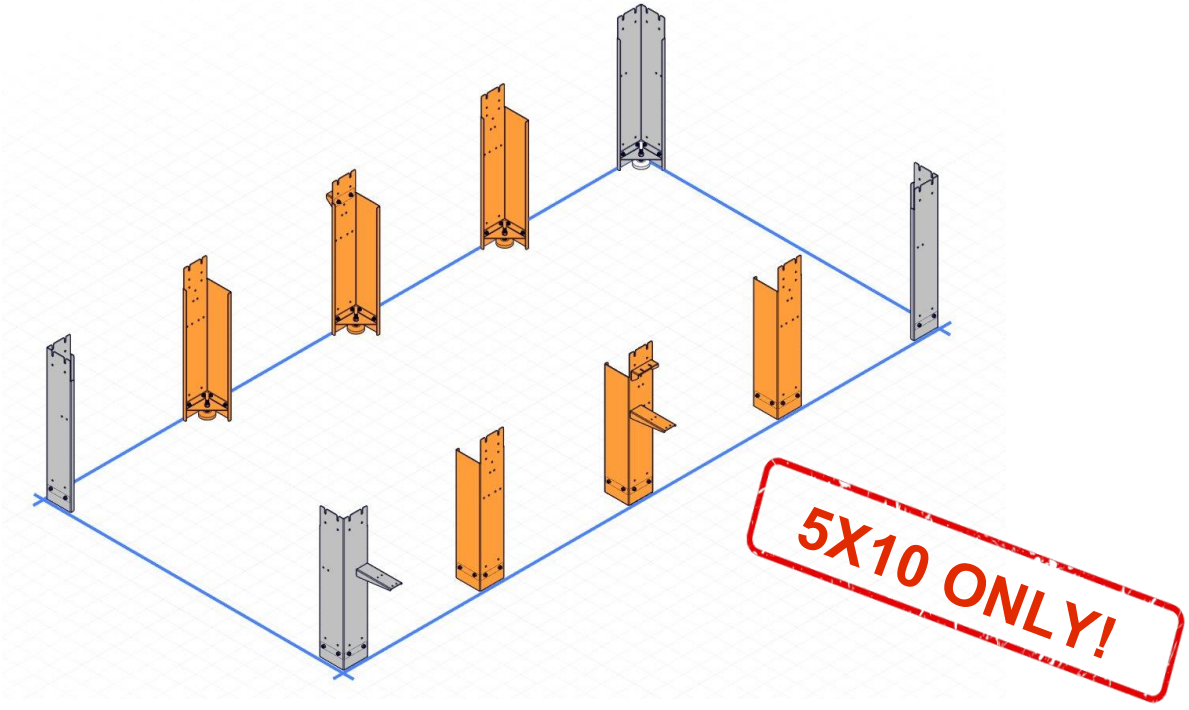
8. **5x10 only. Skip to the next page for 5x5 instructions**. Align the Y-axis cable track long bracket to **one** of the legs used above. This bracket will line up to the two left holes in a series of four holes on the leg. Insert the bolts and nuts and tighten the bolts until snug keeping the bracket level. This leg is now complete.



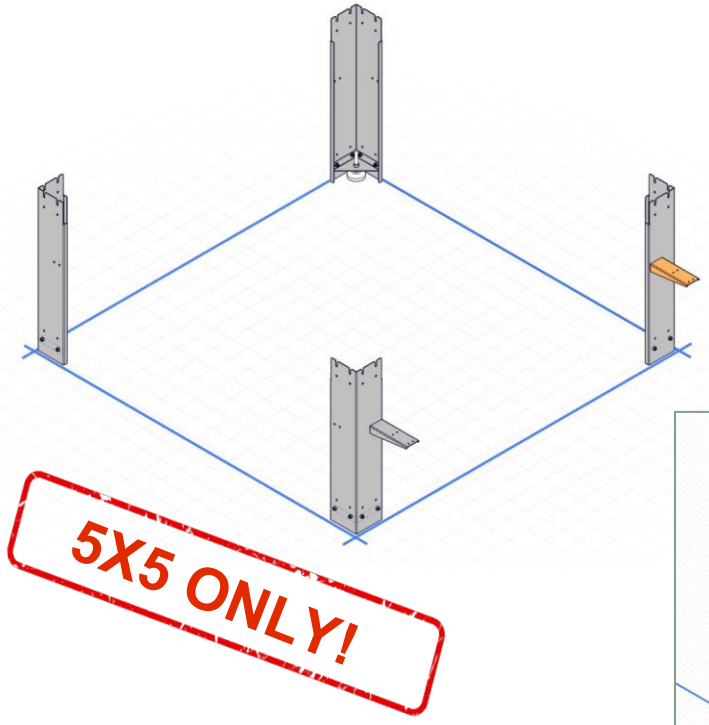
1X

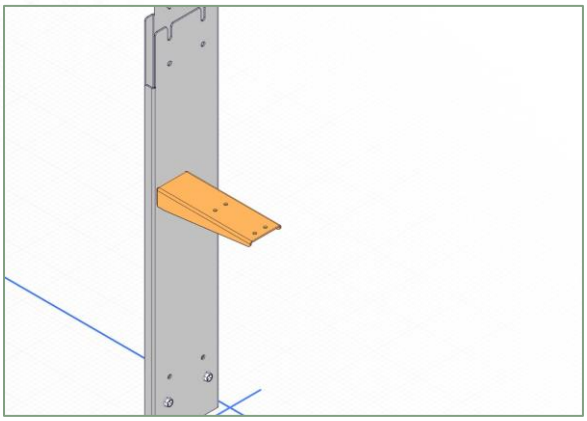
9. Place the side leg that was just assembled on the same side as the corner leg with the bracket. The side leg with the short bracket will be on the opposite side. The taller side of each leg will be the side facing outward and sitting on the masking tape.

   The other four side legs will go in between the corner legs and side legs. Exact measurements are not yet needed but can be seen in 3.1 Preparation for Placement of Machine.

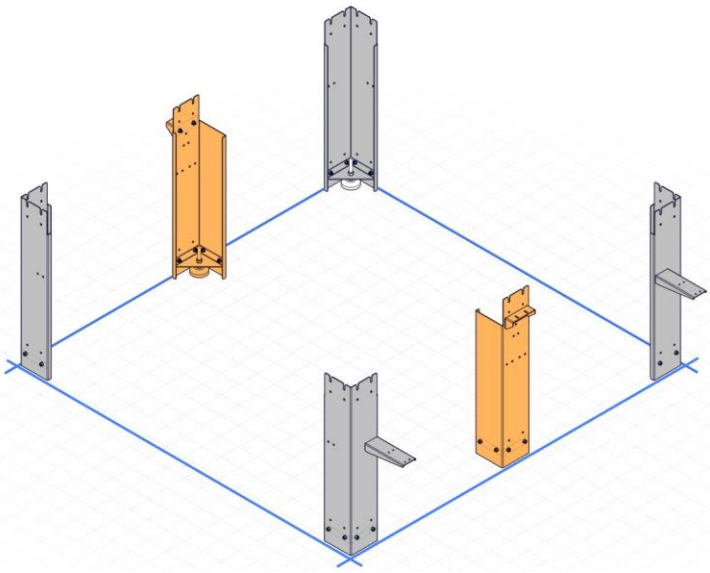


8. **5x5 only. Skip to next page for the 5x10**. Line up the Y-axis cable track bracket to the outside of the back right corner leg, facing to the right. Insert the bolts into the Y-axis cable track bracket and the corner leg. Tighten the bolts until snug keeping the bracket level.



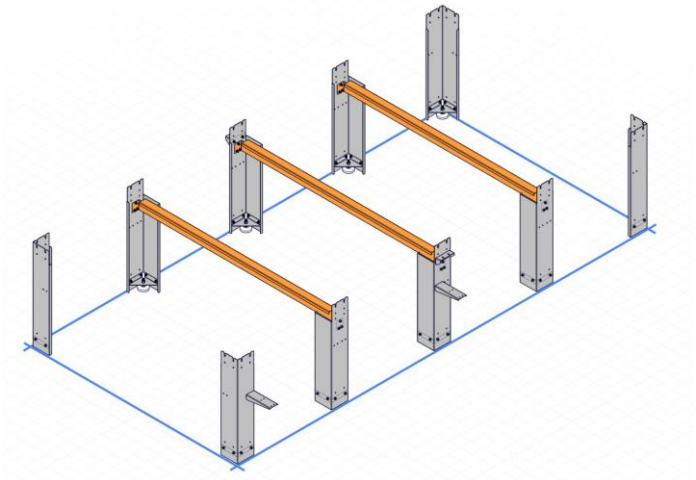


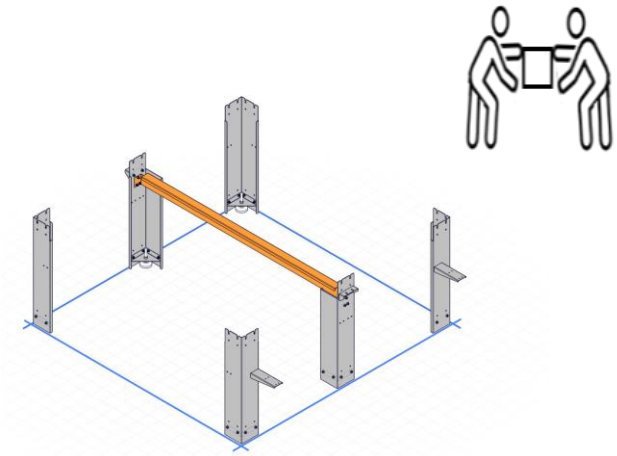
9. The other 2 side legs will go in between the corner legs. Exact measurements are not yet needed but can be seen in 3.1 Preparation for Placement of Machine.



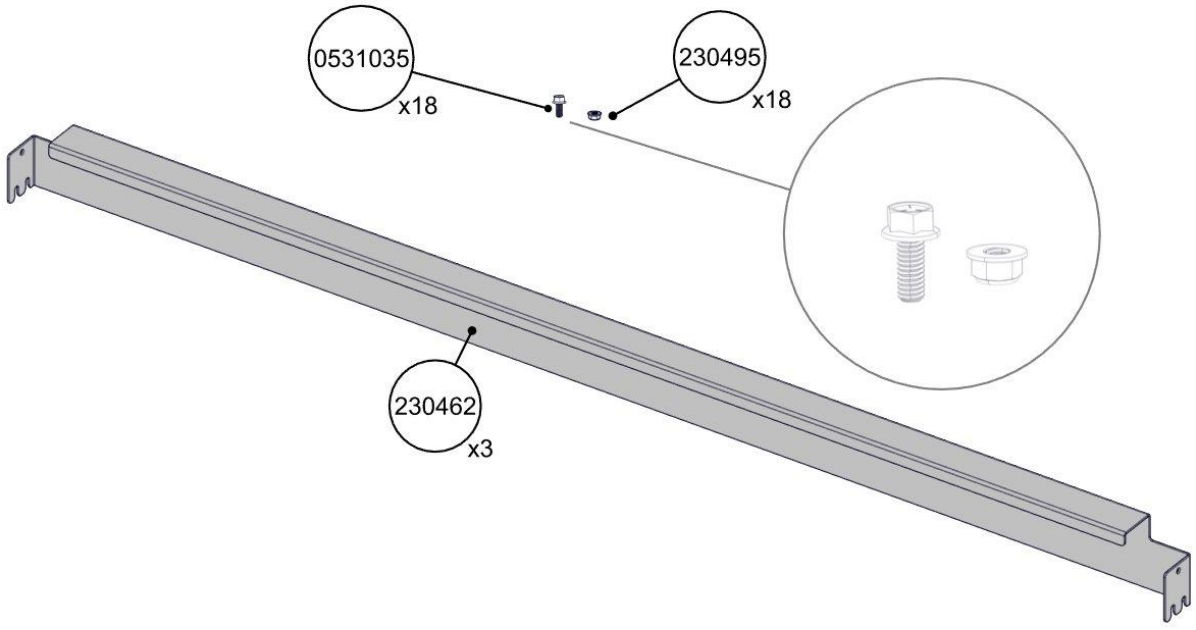
3.4 Attach the Cross Braces to the Side Legs

3.4.1. Goal of this Section





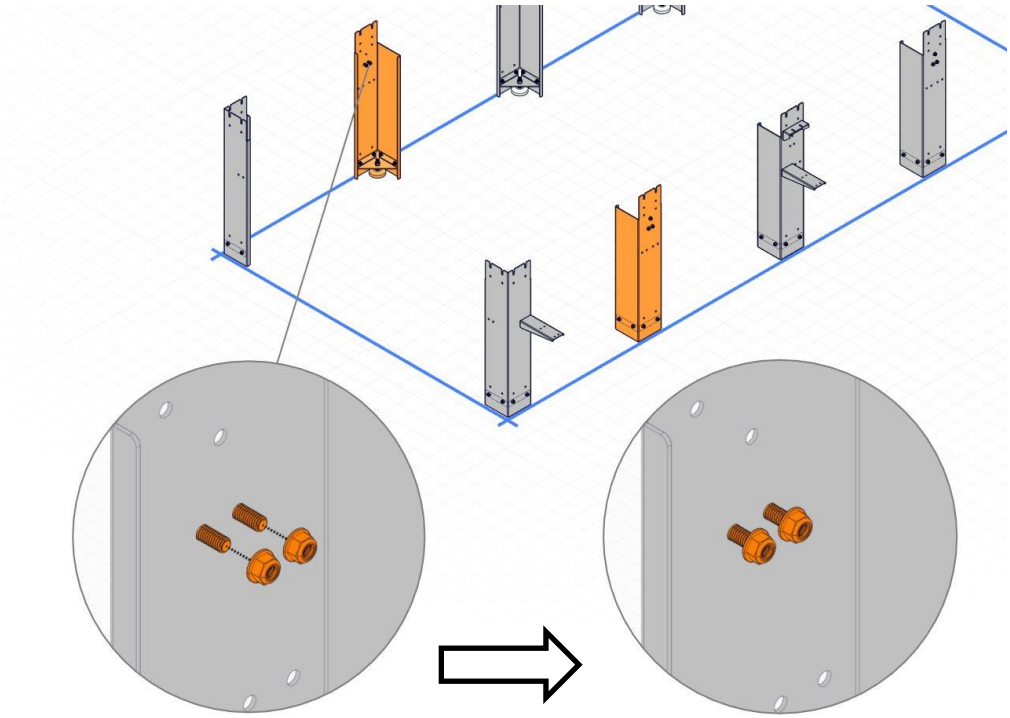
3.4.2. Parts List



Number	Qty	5x5Q	Part Description
230462	3	1	Cross Brace
0531035	18	6	Screw Hex Head Flanged 5/16-18 X ¾
230945	18	6	Nut Flanged 5/16-18 W/Nylon Insert

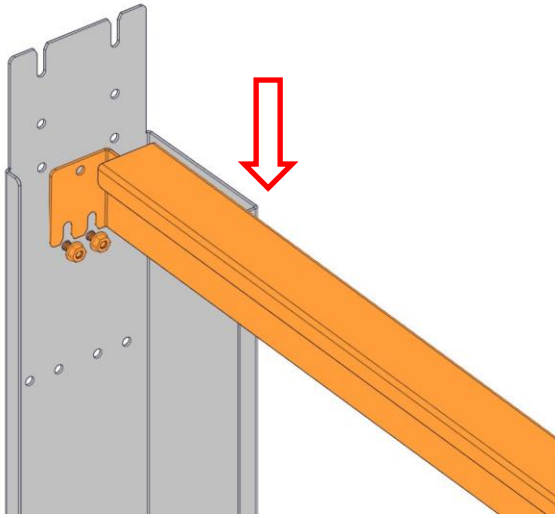
3.4.3. Steps

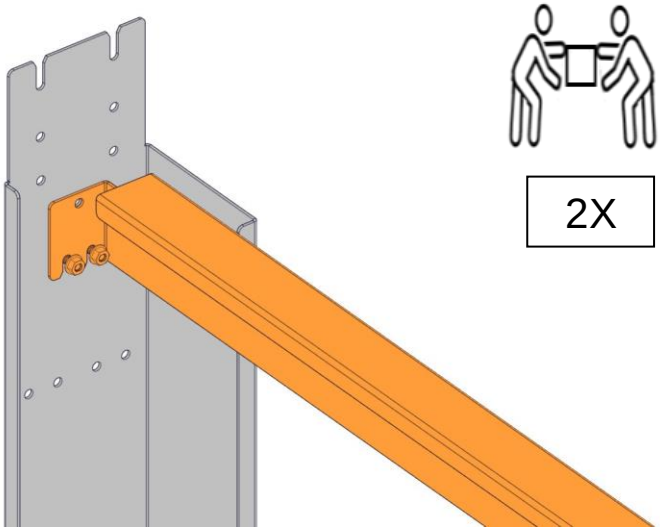
10. On any one of the side legs already in position, locate a set of two bolt holes about a quarter of the way down from the top of the leg. Insert the bolts and screw on the nuts **very loosely,** with the nuts on the inside of the leg. This will provide room to slide the cross brace onto the bolt. Do the same on the leg on the opposite side.



2X

11. Align the notches at each end of the cross brace above the bolts and slide the cross brace down completely. It is best to do one side at a time. A second person will be useful to hold the cross brace.

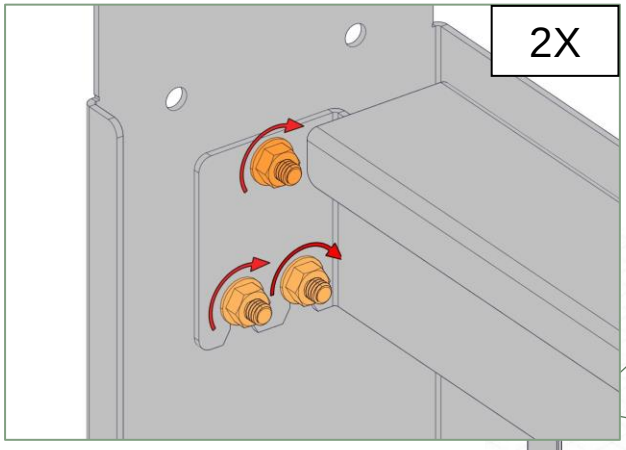


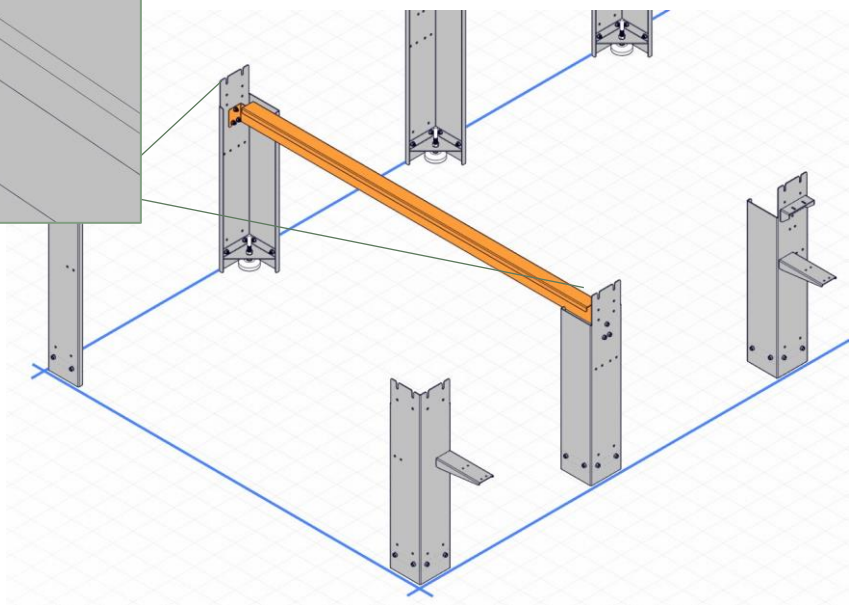


2X

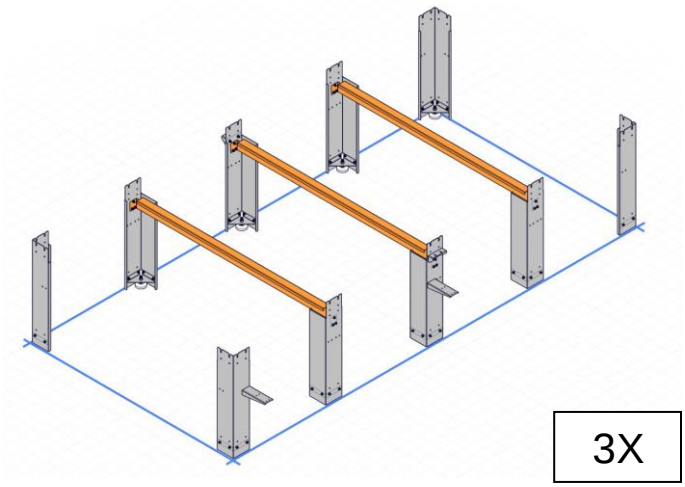
12. Insert the third bolt above the other two. Repeat on the other side of the cross brace.

13. Tighten all 6 bolts, leaving them a bit loose.





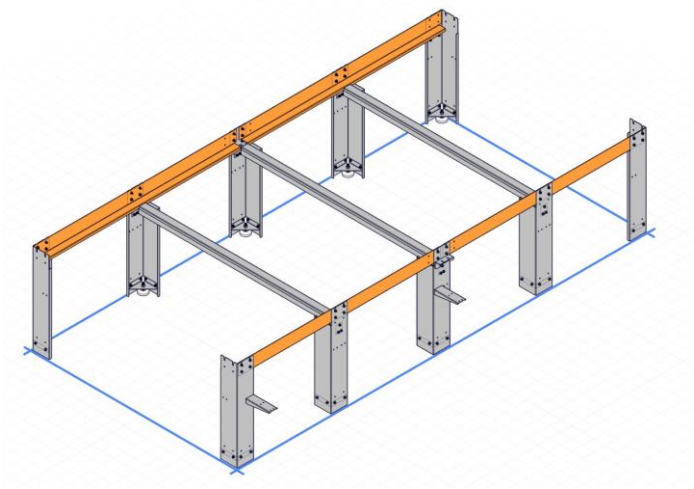
14. **5x10 only**: Repeat the above steps with the other two cross braces on the other side legs.

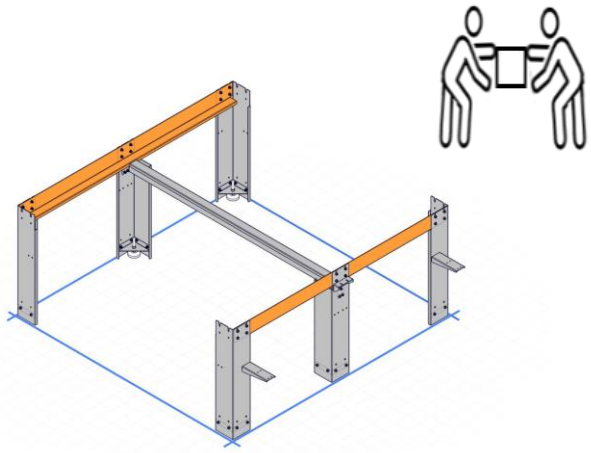


TIP: If the assemblies are a bit wobbly, the bolts can be tightened a bit more. Leave them loose enough to be able to adjust them later.

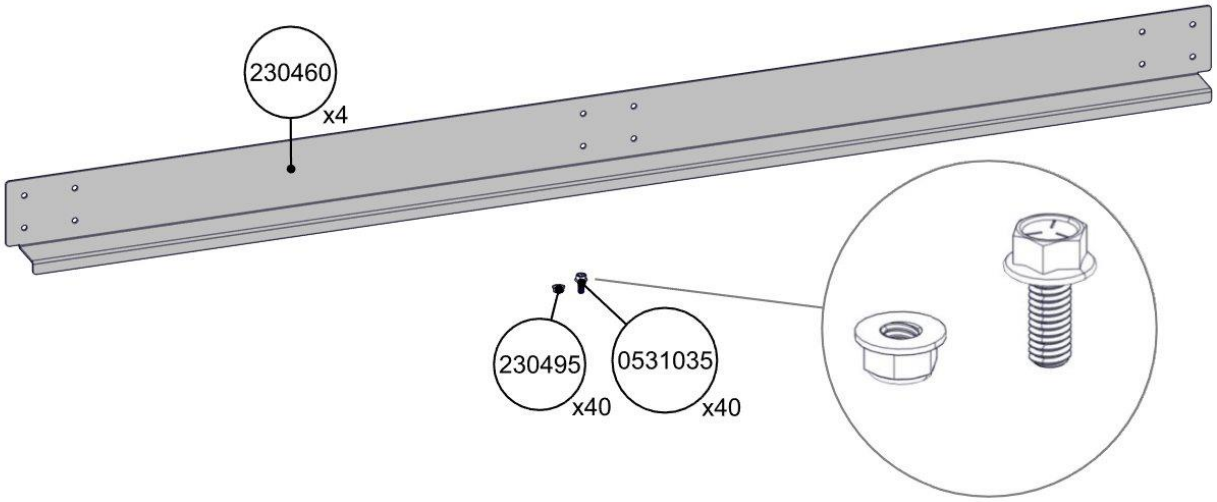
3.5 Attach Side Rail Supports to the Legs

3.5.1. Goal of this Section





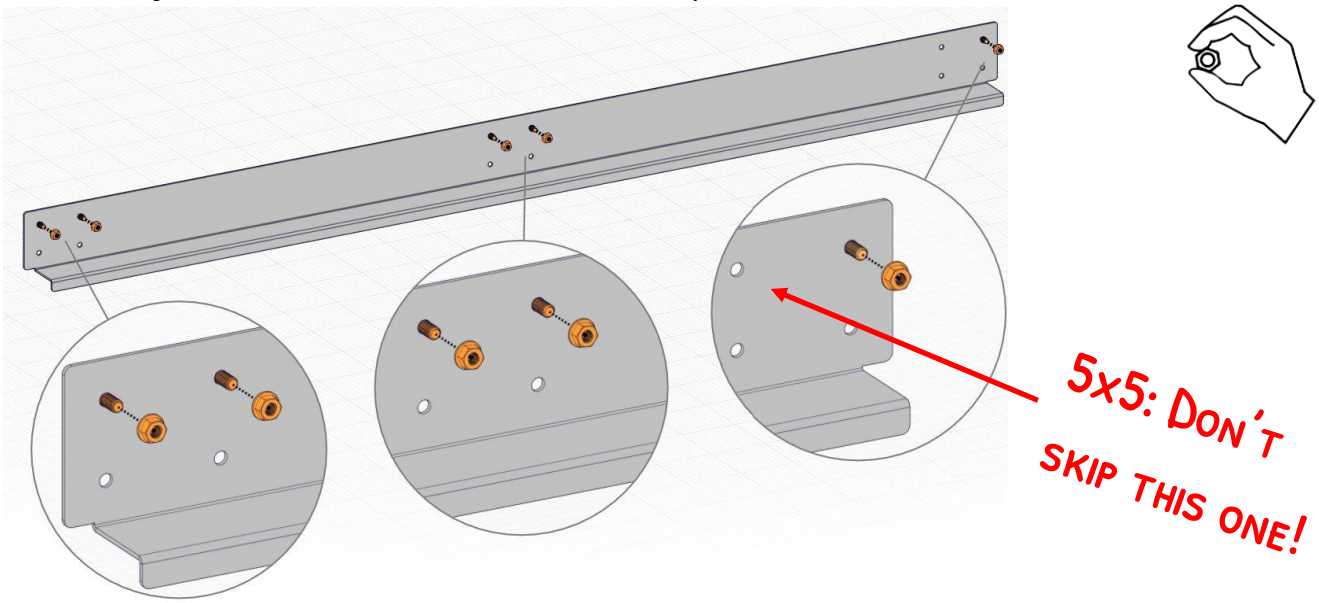
3.5.2. Parts List



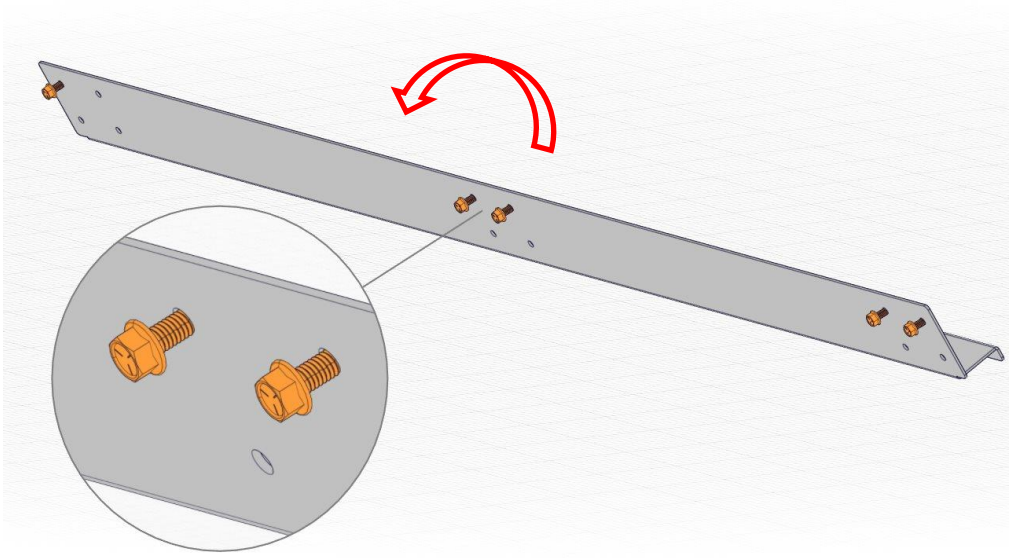
Number	Qty	5x5Q	Part Description
230460	4	2	Rail Support Side
0531035	40	24	Screw Hex Head Flanged 5/16-18 X ¾
230945	40	24	Nut Flanged 5/16-18 W/Nylon Insert

3.5.3. Steps

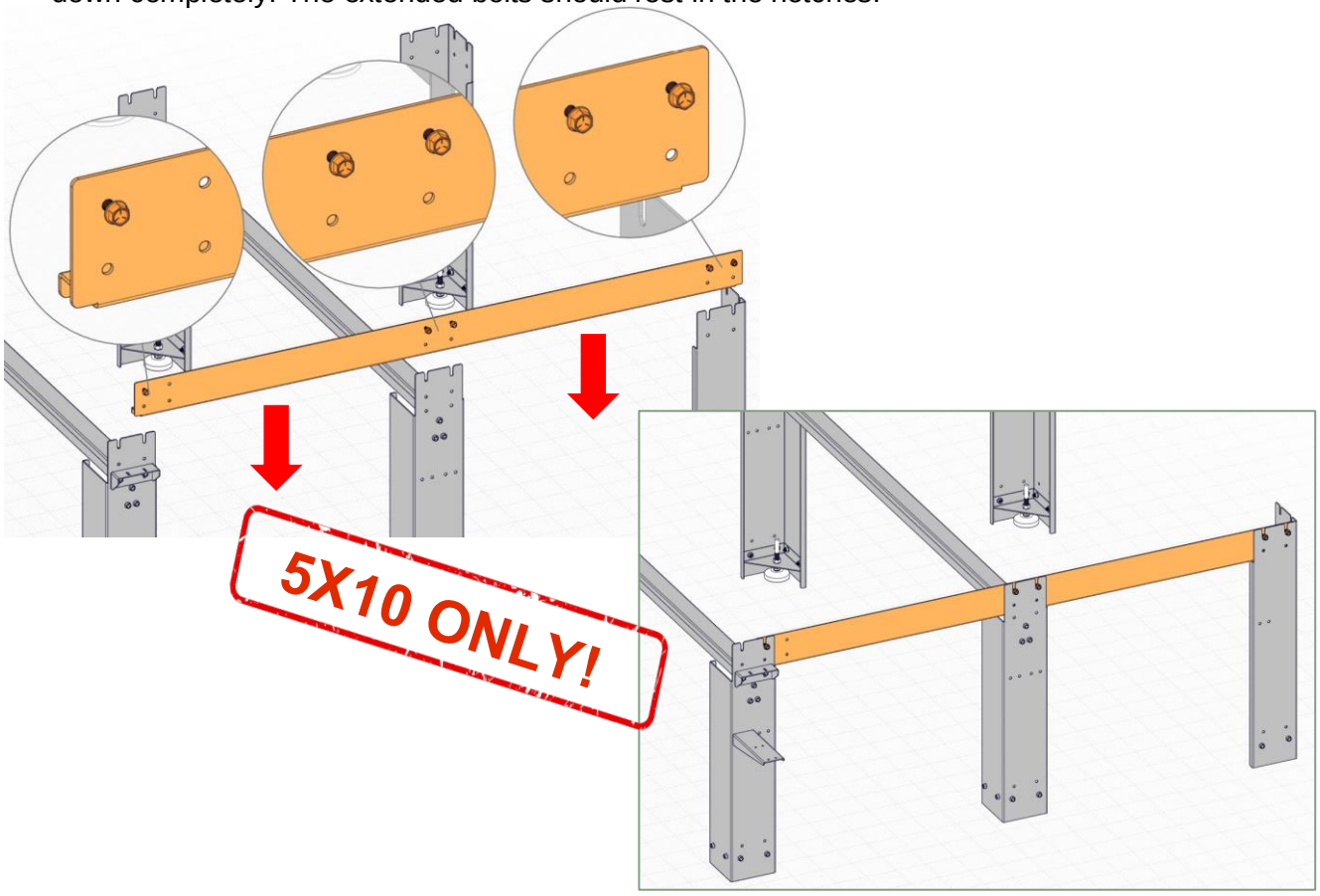
15. Set the side rail support lengthwise on the ground laying on the shorter side of the rail, the side with no holes. Insert the bolts in the top left holes going across the rail. Screw the nuts on **very loosely.** The nut should be on the same side as the shorter side of the rail. **5x10 only: Skip the fifth hole. 5x5 only:** Insert **all 6** bolts and nuts across the top of the rail.

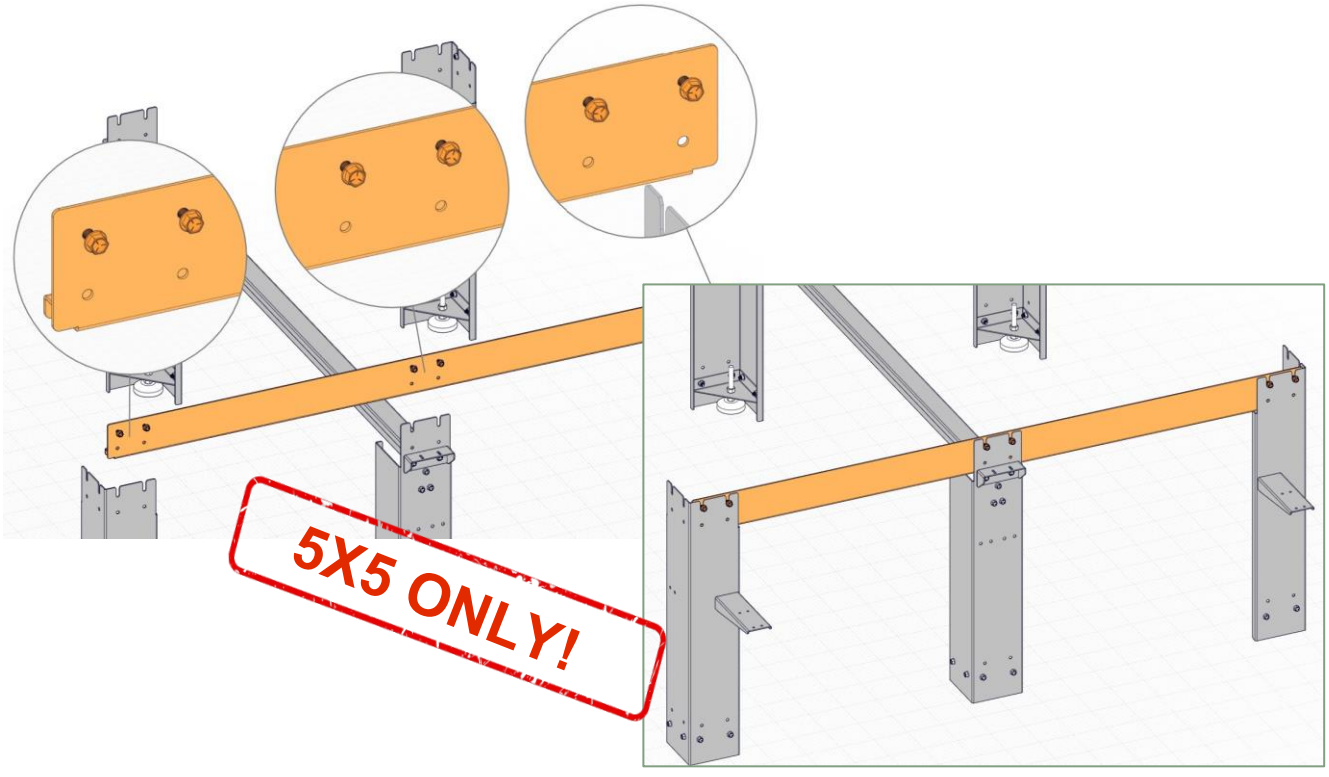


16. Tilt the side rail support backwards and down so that the bolts slide and extend out on the backside of the rail.



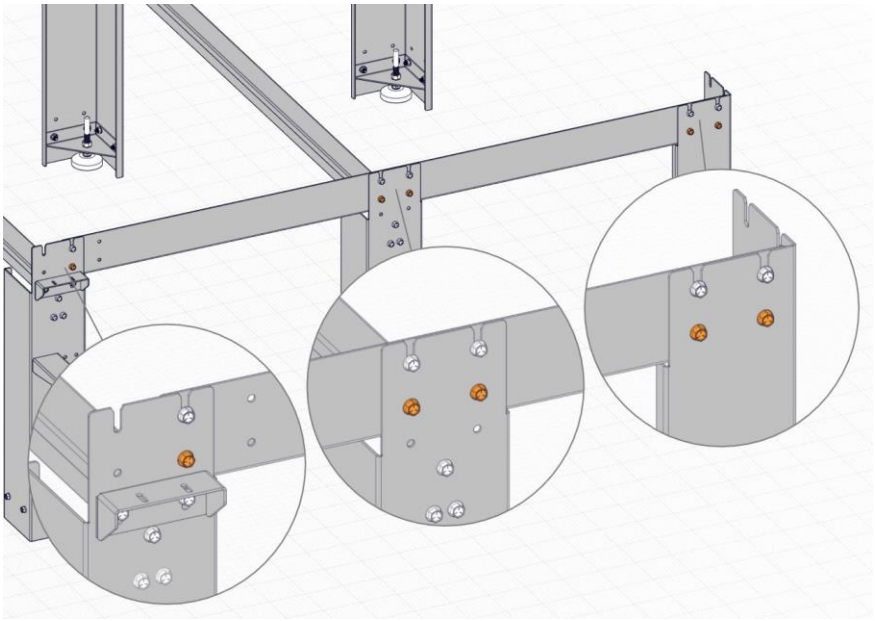
17. Align the bolts on the side rail support above the notches in the right back legs and slide the rail end down completely. The extended bolts should rest in the notches.





18. **5x10**: Insert the five bolts and nuts in the bottom row going across the side rail support.

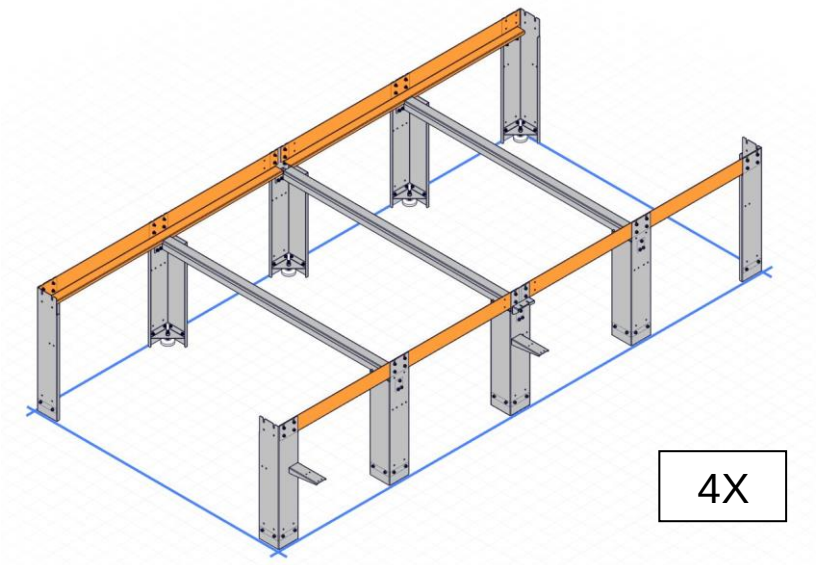
    5x5: Insert all six bolts and nuts in the bottom row going across the side rail support. See next page.



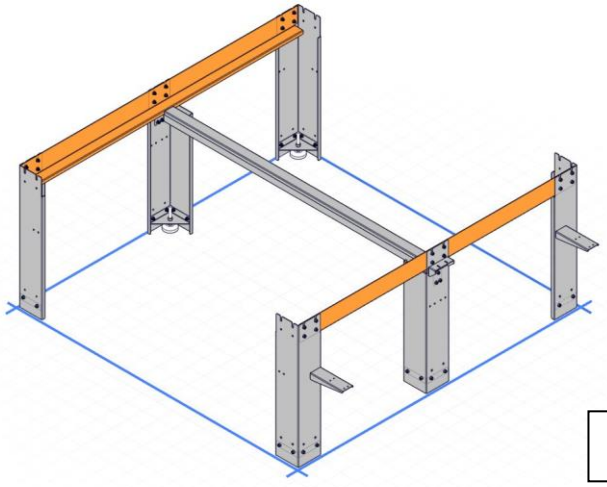
19. Finger-tighten **both the top and bottom row of bolts and nuts**, leaving them a bit loose.

20. **5x10 only**: The next side rail support will be done in a similar manner, but it will be the **second** set of bolt holes that will be skipped. Repeat the steps on the opposite side with the side rail supports.

    5x5 only: Repeat the steps above on the other side. See next page.



TIP: If the assemblies are a bit wobbly, the bolts can be tightened a bit more. Leave them loose enough to be able to adjust them later.

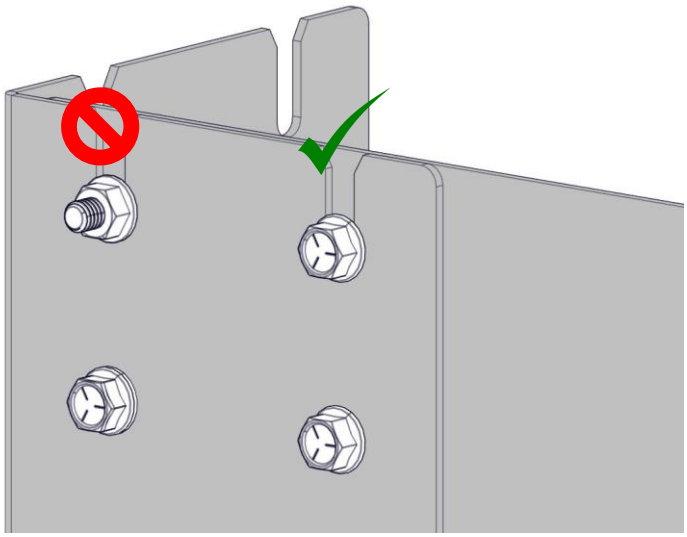


5X5 ONLY!

2X

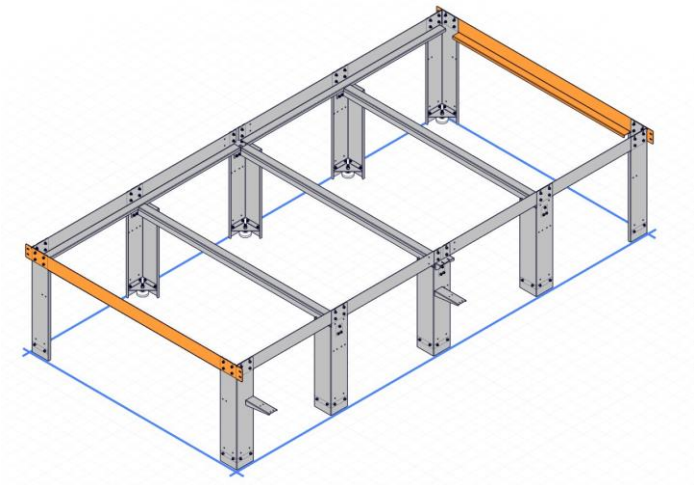
TIP: If the assemblies are a bit wobbly, the bolts can be tightened a bit more. Leave them loose enough to be able to adjust them later.

TIP: Double-check all the bolts are on the outside of the table and the nuts are on the inside as they can interfere with a future step if done incorrectly.

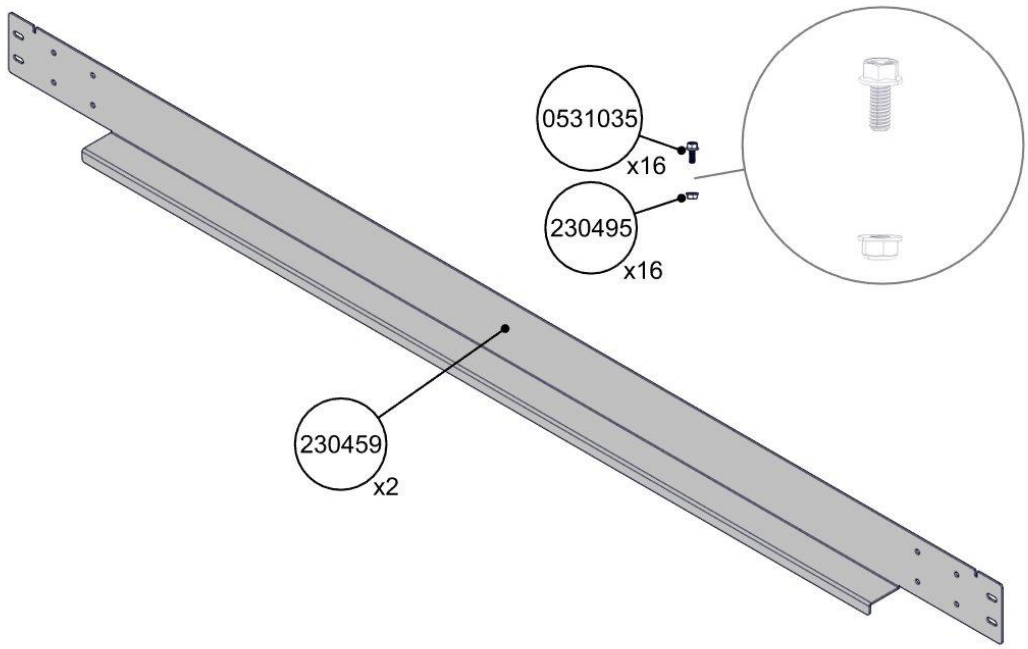


3.6 Attach Rail Support Ends to the Corner Legs

3.6.1. Goal of this Section



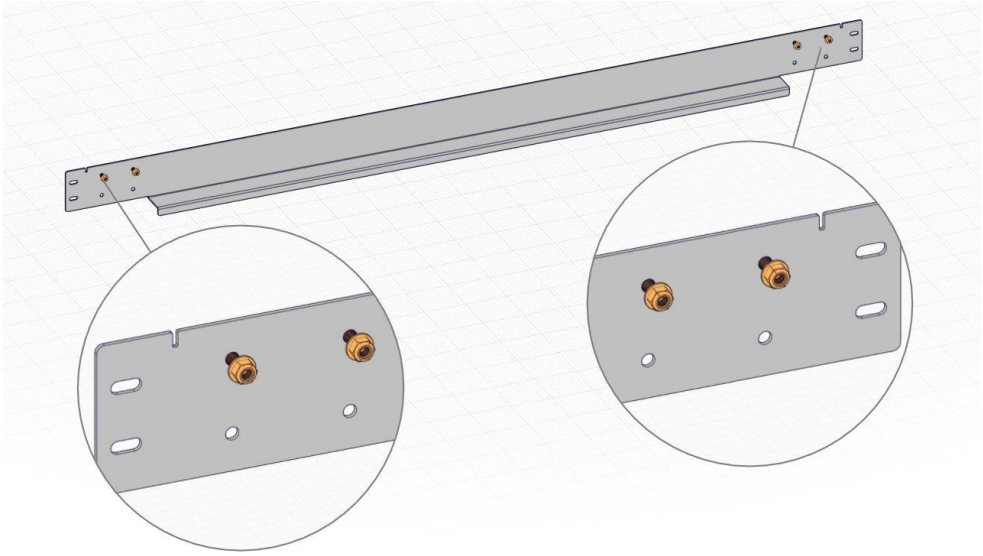
3.6.2. Parts List



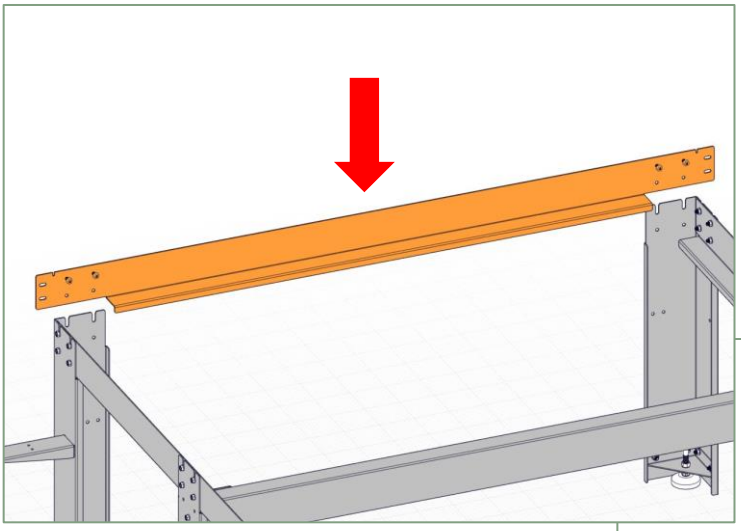
Number	Qty	Part Description
230459	2	Rail Support End
0531035	16	Screw Hex Head Flanged 5/16-18 X ¾
230945	16	Nut Flanged 5/16-18 W/Nylon Insert

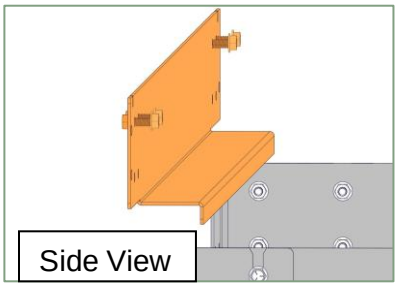
3.6.3. Steps

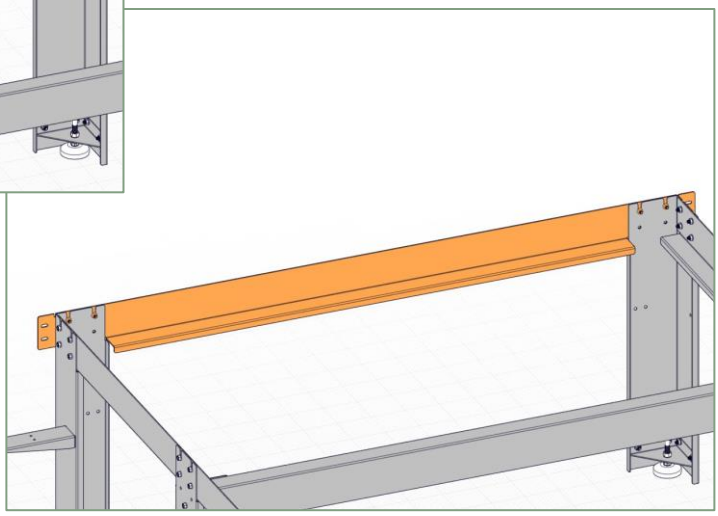
21. Set the rail support end on the ground lengthwise laying on the shorter side of the rail, the side with no holes. Insert the bolts in the top four **round** holes going across the rail. Screw the nuts on **very loosely.** The nut should be on the same side as the shorter side of the rail.



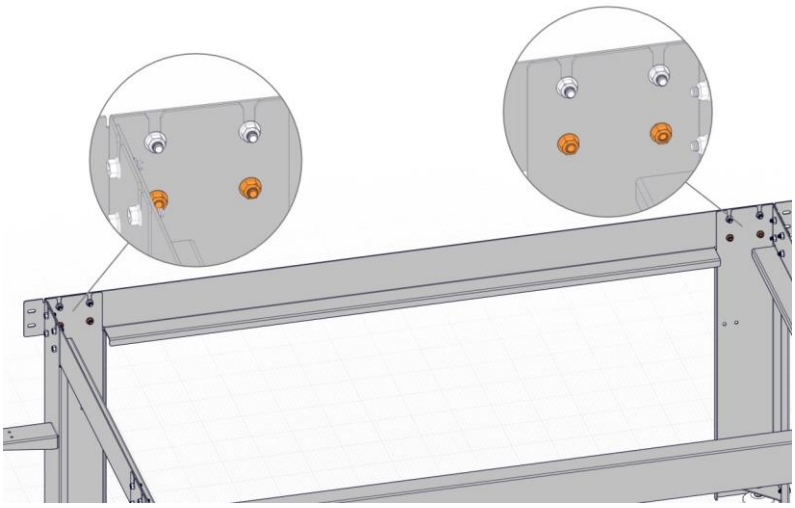
22. Align the bolts at each end of the rail above the notches in the corner legs and slide the rail end down completely. It is best to do one side at a time.

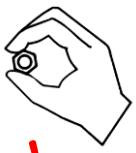






23. Insert the bolts in the bottom four **round** holes going across the rail and into the corner legs.



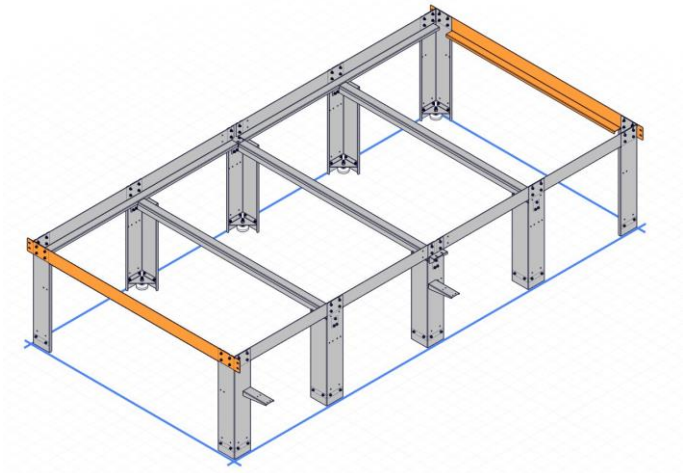


HAND TIGHT ONLY!

24. Finger-tighten **all eight nuts** on the end rail.

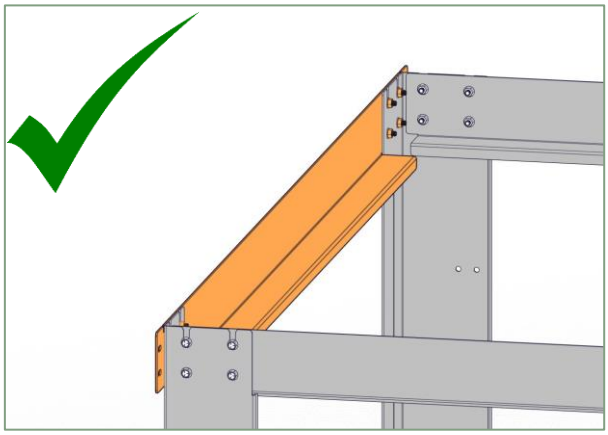
25. Repeat the steps with the other end rail.

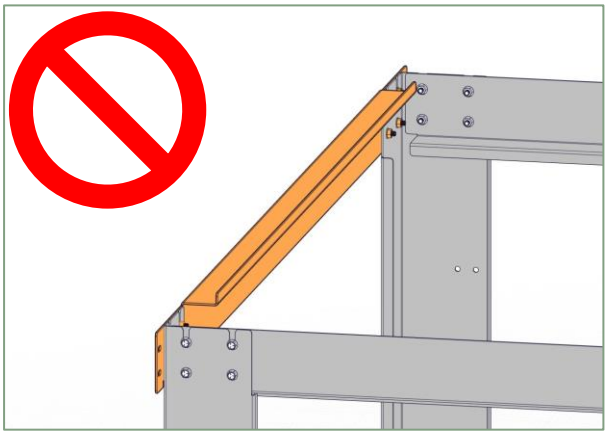
2X



TIP: If the assemblies are a bit wobbly, the bolts can be tightened a bit more. Leave them loose enough to be able to adjust them later.

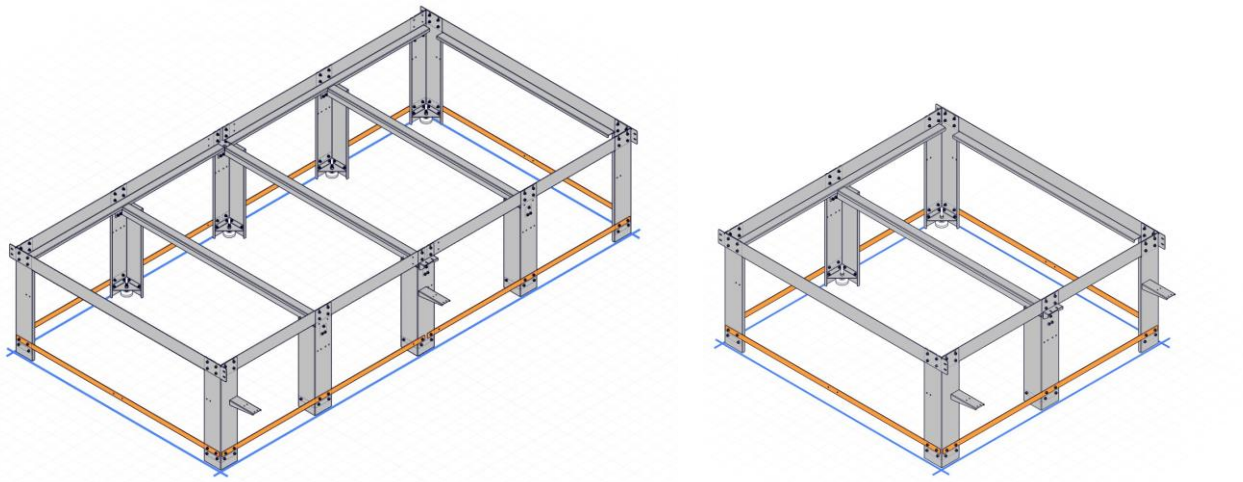
26. Stop! Verify that the rail support end is inserted correctly.



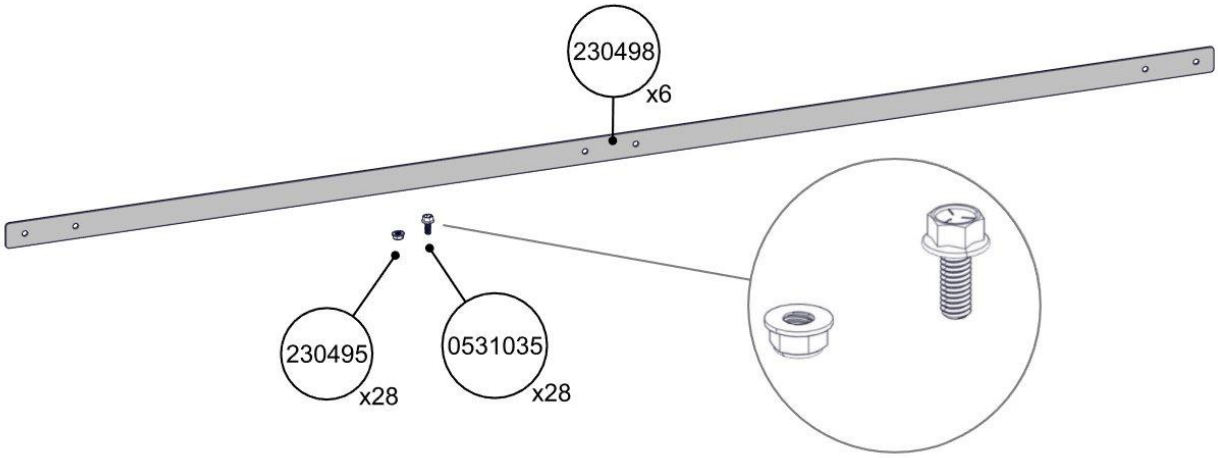


3.7 Attach Leg Braces

3.7.1. Goal of this Section



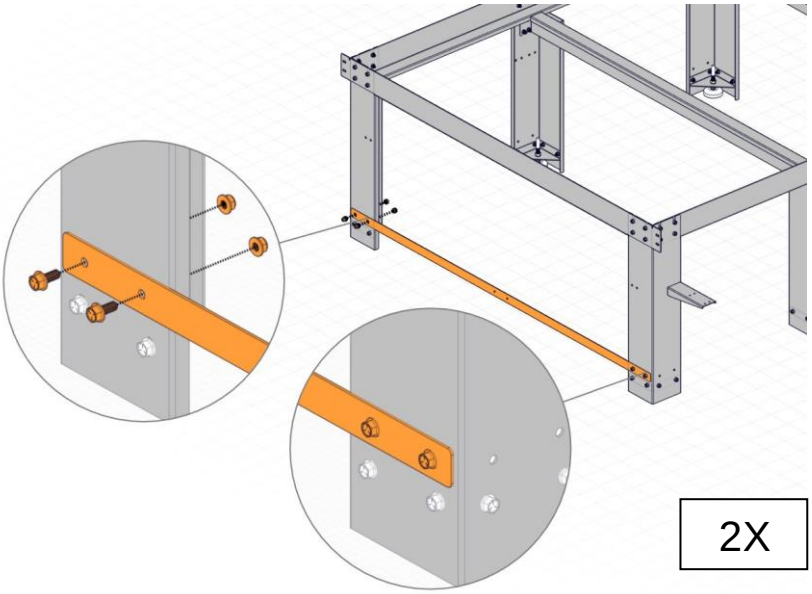
3.7.2. Parts List



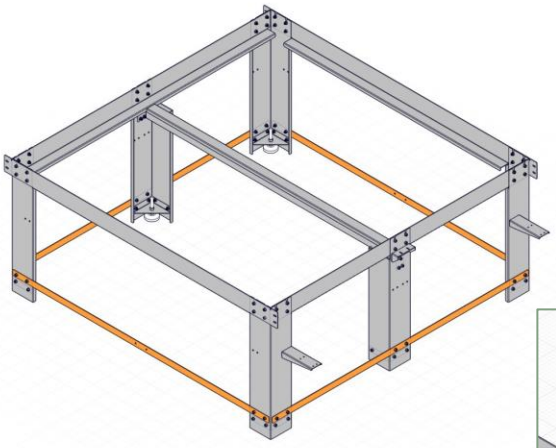
Number	Qty	5x5Q	Part Description
230498	6	4	Brace Leg
230945	28	20	Nut Flanged 5/16-18 W/Nylon Insert
0531035	28	20	Screw Hex Head Flanged 5/16-18 X 3/4

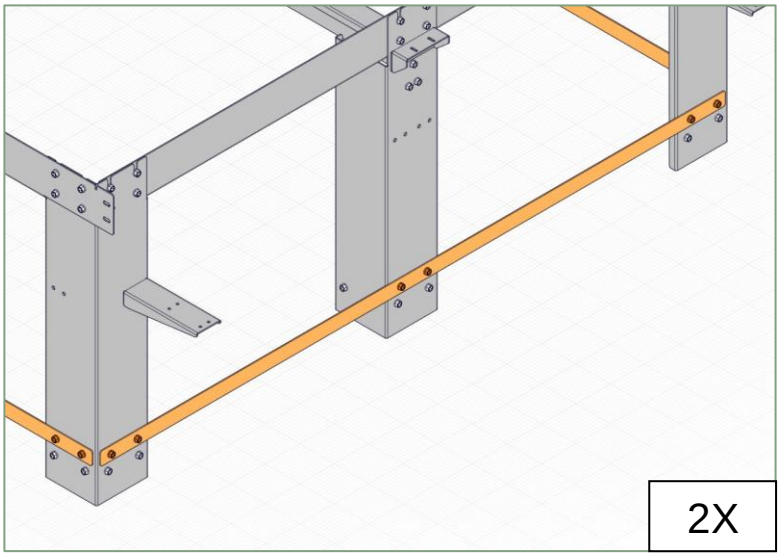
3.7.3. Steps

27. Align one leg brace with the 4 bolt holes on the front of the machine. The middle bolt holes on the brace will not be used. Insert 4 bolts and screw the nuts on loosely. Repeat the process on the other end of the machine.

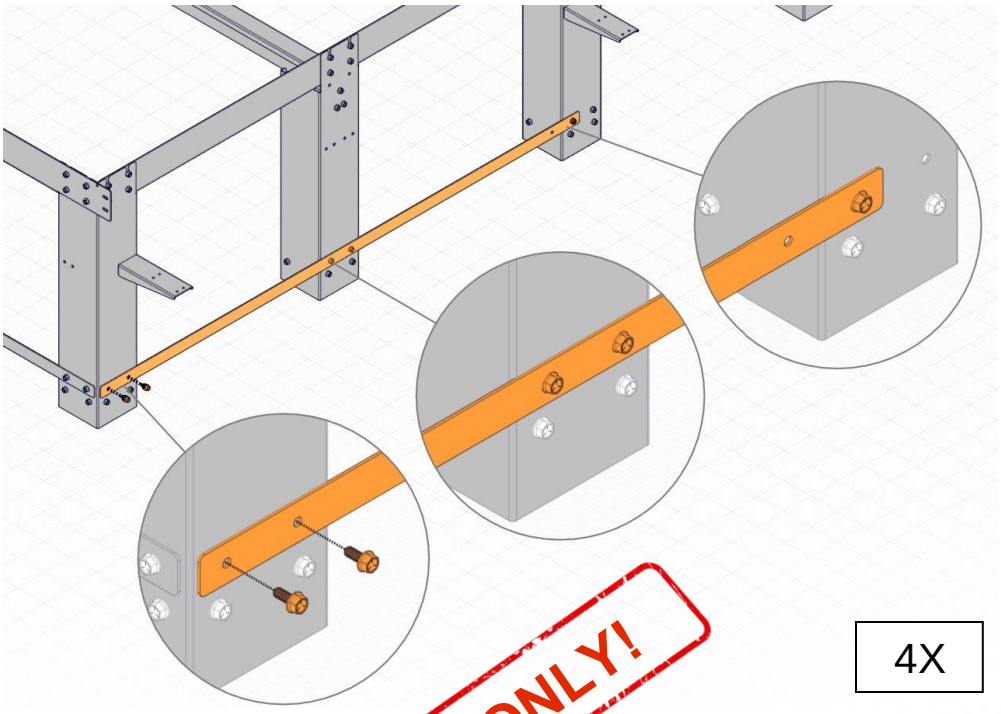


28. **5x5 only**: Repeat with other 2 braces as above **including attaching to the center leg**.

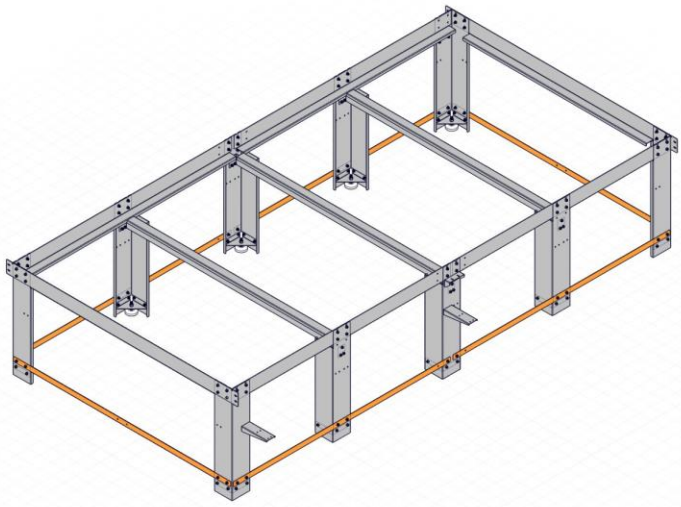




5x10 only: Align another leg brace with the 5 bolt holes on the front-right of the machine. Insert 5 bolts and screw the nuts on loosely, **skipping the fifth bolt hole**. Repeat the process with the other leg braces.



4X



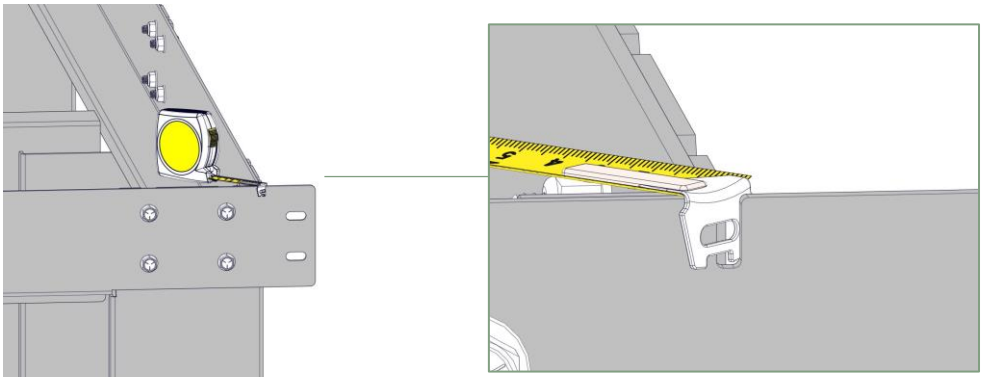
3.8 Square, Tighten and Level

3.8.1. Goal of this Section

Make sure the machine is square and level before tightening it down.

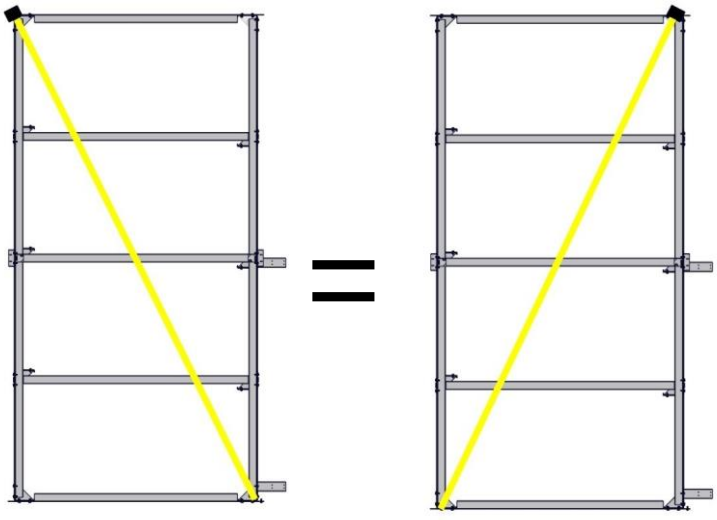
3.8.2. Steps

29. Clip the tape measure at one end of the machine.

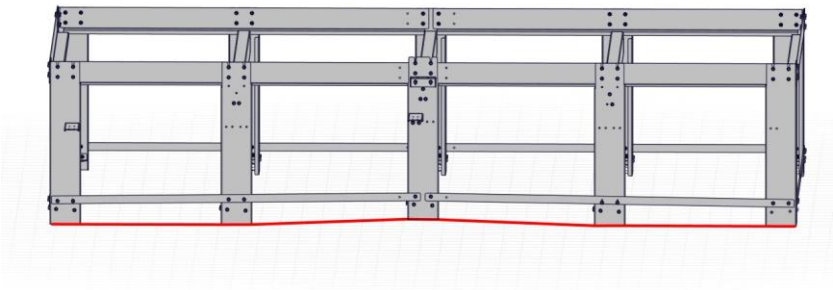


30. Measure diagonally across the table from the left and right side. The value should be the same. Square the machine so both sides are within 1/8”.

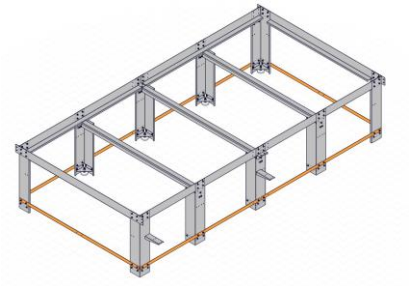
Top View

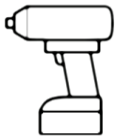


31. Do a rough level check first: Check that all legs are touching the ground. In this example the middle leg is higher than the rest. The leveling feet, if available, can be adjusted. If leveling feet are not available, place shims under the other legs to match the high spot. The location of the machine may need to be reconsidered if the floor is very unlevel. More information on leveling will be on the next page.

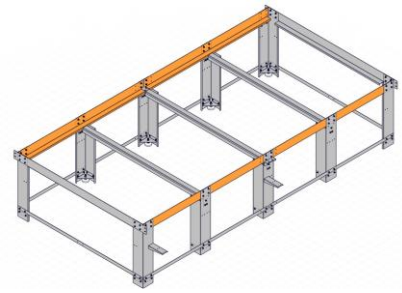


32. Tighten all bolts on the leg braces until snug. TIP: Use a spiral or star pattern tightening sequence.

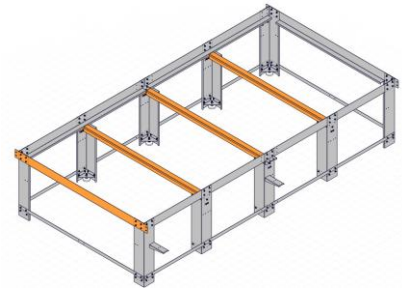


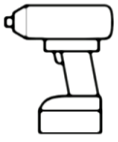


33. Tighten side rail supports.



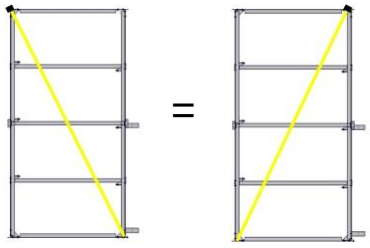
34. Tighten the cross braces and the front-end support rail.





TIP: Double-check all fasteners are tight. The only loose fasteners should be the back-end support rail.

35. Check the squareness again and adjust if needed.



3.8.3. Leveling

Failure to properly level the machine can result in accuracy issues, drive faults, and even premature wear of components. Leveling is a time-consuming process. Plan to spend a bit of time to make sure that the machine is level. The main idea of leveling is to find the high spot of the machine and have everything else match.

TIP: Check level then rotate the level 180° at the same spot and check again.

TIP: Wipe the level surface before and during the leveling process.

If you are unfamiliar with using a level, this website explains the process:
https://www.wikihow.com/Use-a-Level.

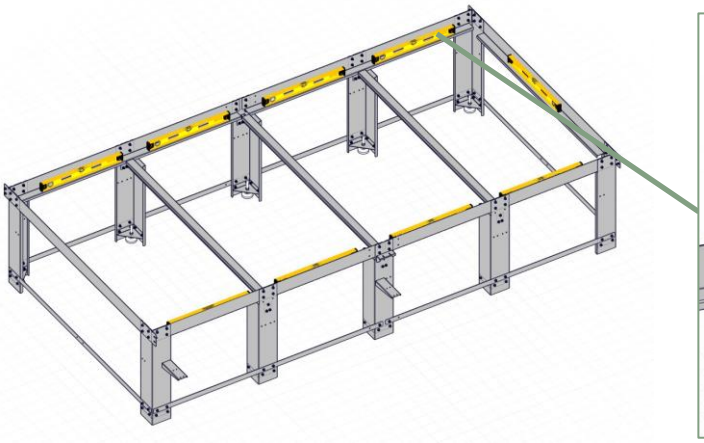
3.8.3.1 Checking the Level

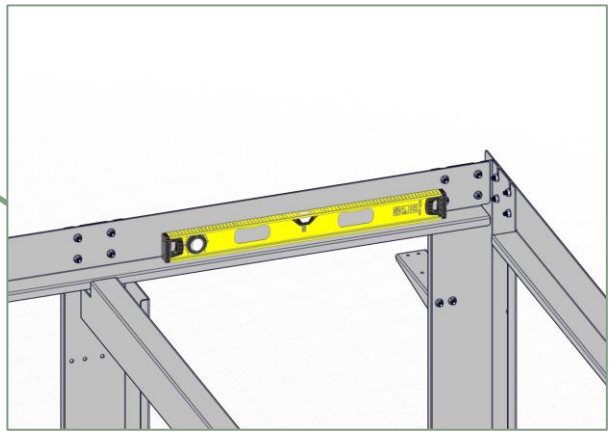
A. Again, check that all the legs are touching the floor. A leg that does not touch indicates a low spot on the floor. Adjust the leveling foot (next page) or place shim under this leg.

B. Place a level at various points of the ledge of the side rail supports to find where the highest spot is. The bubble in the level will indicate the direction of the high spot. There may be more than one high spot. Remember the bubble always goes to the high side.

   I. Check across 8 spots between the legs along the long axis as seen in the left image below.

   II. Check across both ends of the short axis as well.





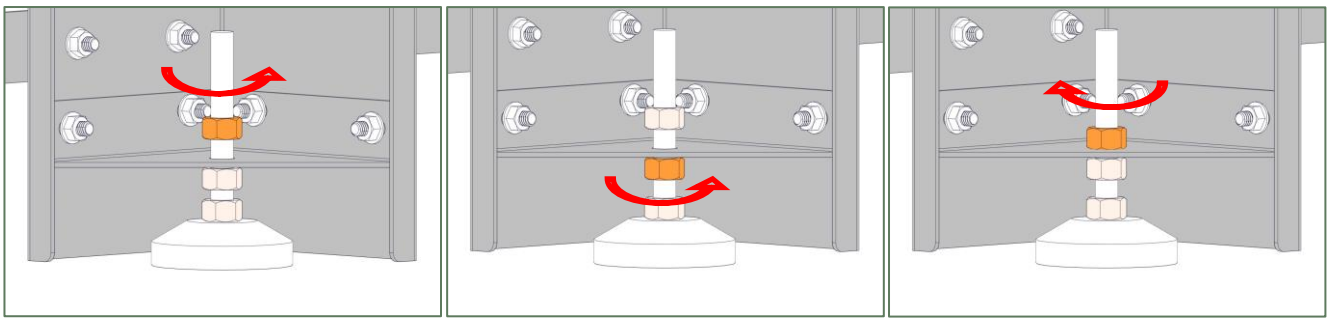
3.8.3.2 Leveling the Machine

C. Find the high spot(s) on the machine as described above. Raise the leveling feet on the legs that are low as described below. If the leveling feet were not purchased, carefully place a shim underneath those legs.
D. Check level again as described in the section above.
E. Repeat the process until the machine is level. This may need to be repeated many times.

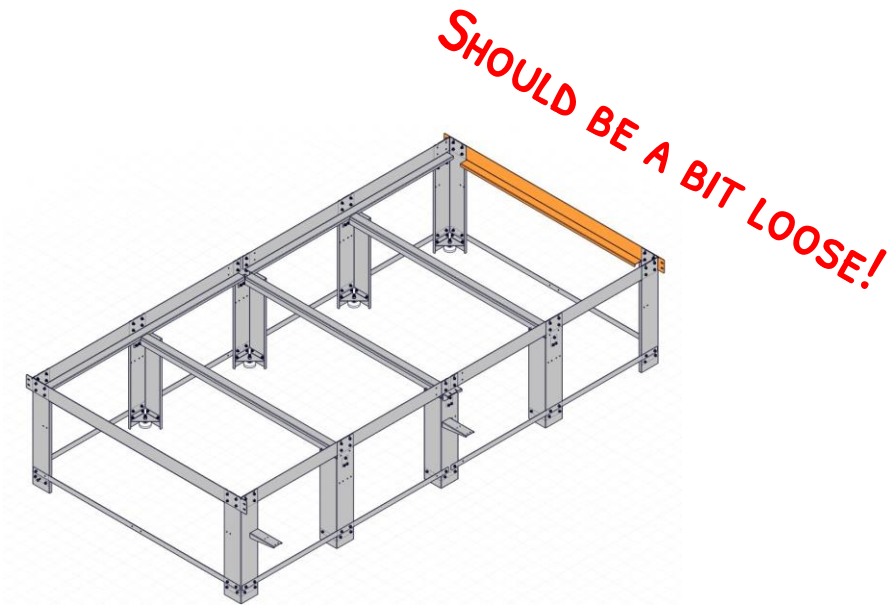
3.8.3.3 How to Adjust Leveling Feet (Machine Option)

If you did not purchase leveling feet with the machine, please use shims instead to raise the legs.

F. Loosen the jam nut, the top nut, on the leg you want to raise.
G. Turn the adjustment nut/middle nut up to bring the foot down, which will raise the leg up.
H. Once all leveling pads are set, tighten the jam nut at the top of each leveling pad to make sure it does not loosen. Keep a wrench on the adjustment nut to keep it from moving as you are tightening the jam nut.

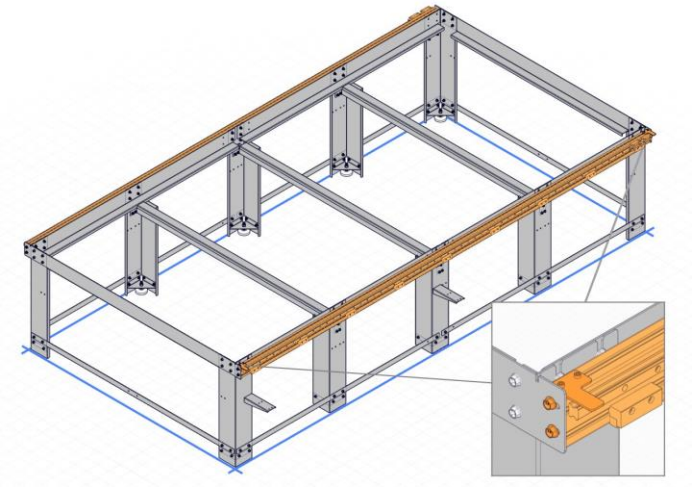


36. Stop! Did you leave back rail support end a little loose?

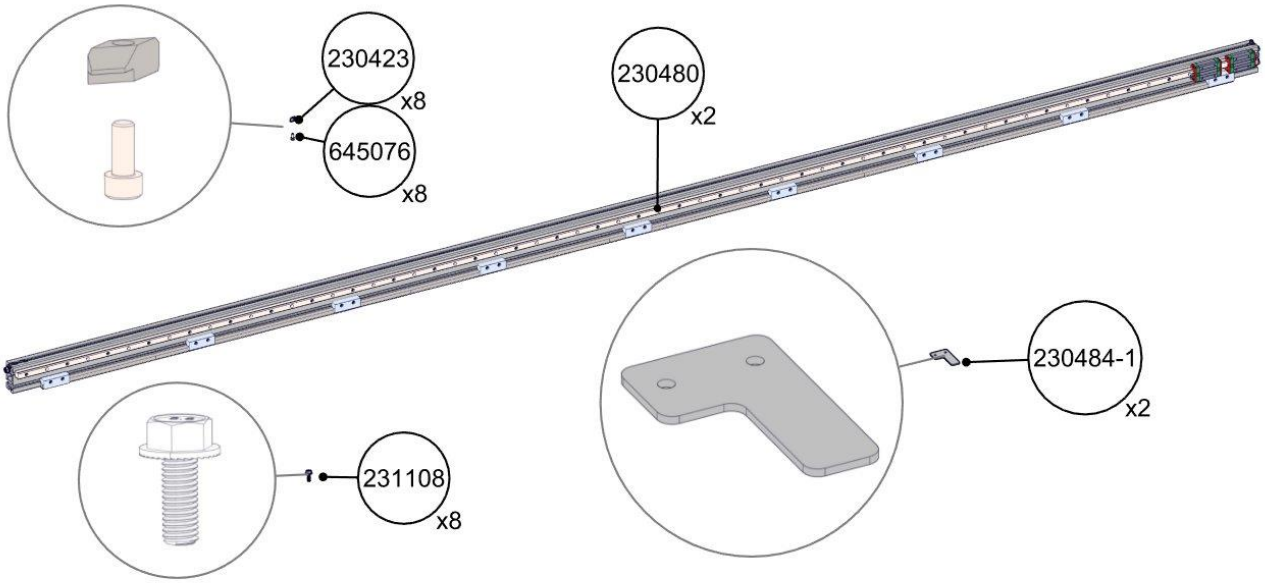


3.9 Attach Rail Mount Assemblies & Hard-Stops

3.9.1. Goal of this Section



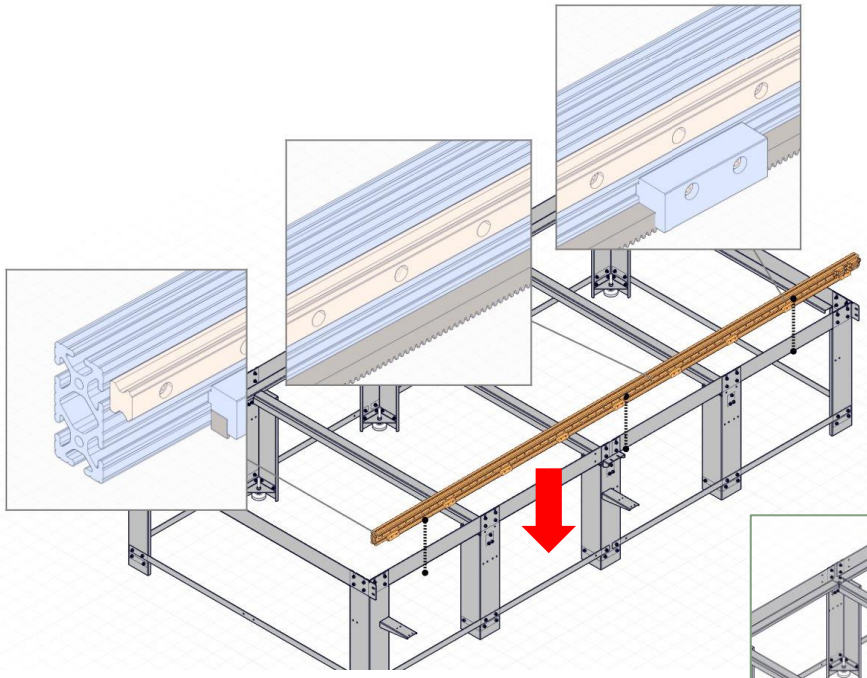
3.9.2. Parts List



Number	Qty	Part Description
230423	8	Nut T-Slot Drop-In M5
645076	4	Hex Socket Cap Screw M5 X 0.8 Pitch X 12
231108	8	Bolt Hex Washer Head M8-1.25 X 20
230480	2	Rail Mount Linear Guide Assembly for **5x10**
Or 230465	2	Rail Mount Linear Guide Assembly for **5x5**
230484-1	2	Bracket Hardstop

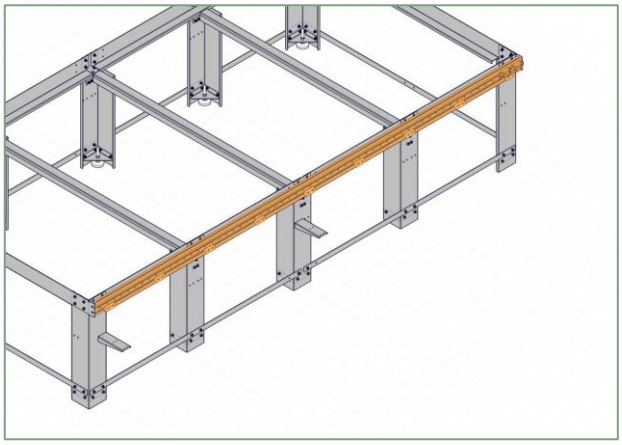
3.9.3. Steps

37. Position the rail mount assembly lengthwise on the right side of the machine. It will rest on the short bracket on the middle leg. The teeth of the rack should face down as shown in the middle close-up. Other components such as bearing blocks will face outward.

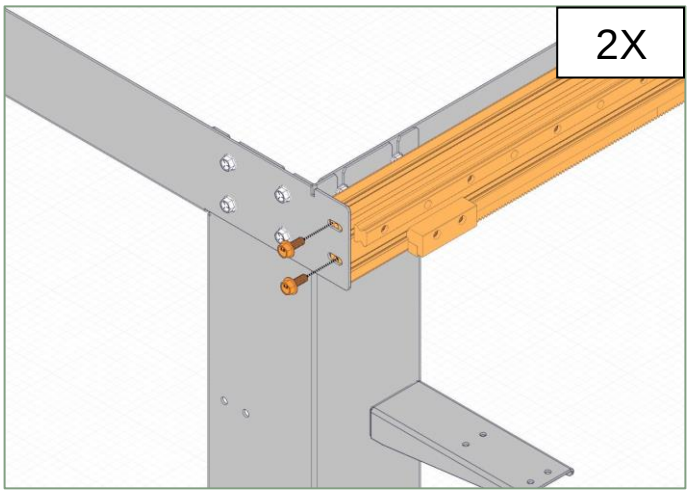


RAILS CAN BE SHARP!

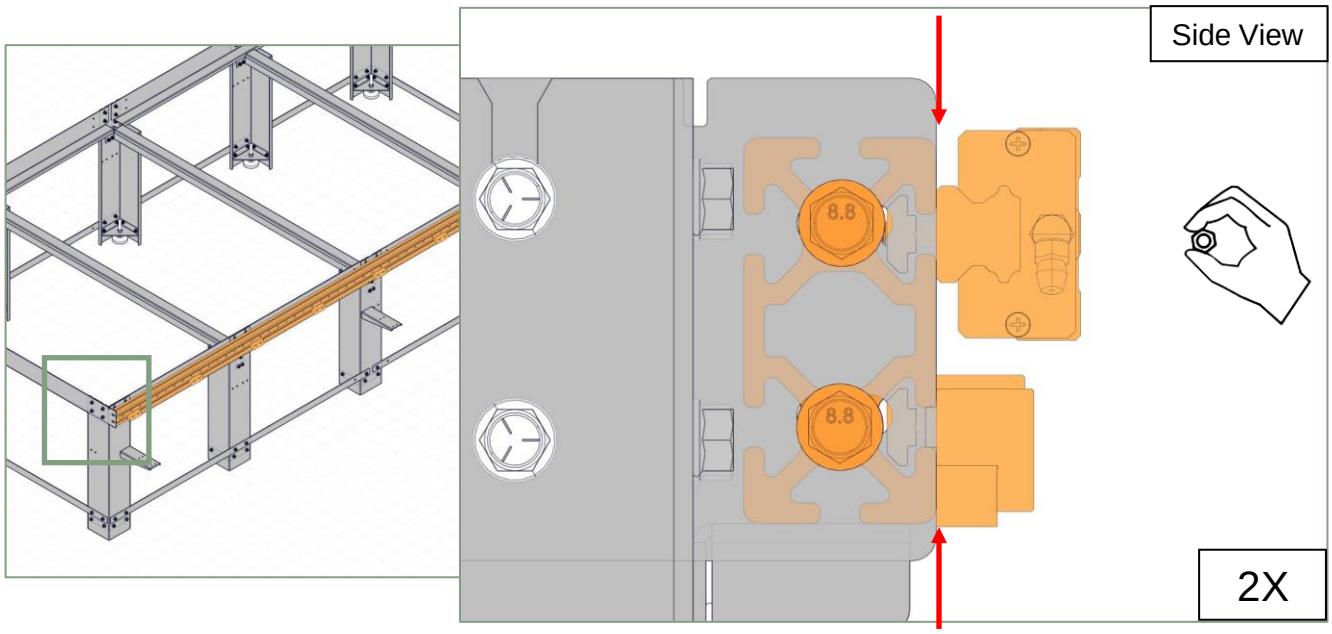
WEAR GLOVES!



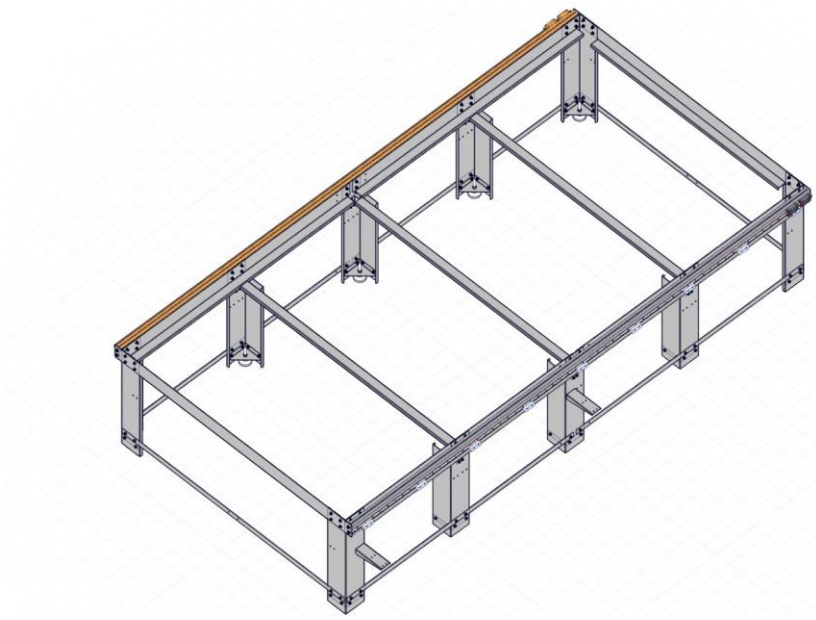
38. Align the two bolts to the oval bolt holes on the end support ends to the rail mount assembly. Screw in but leave **loose**. Repeat on the other end.



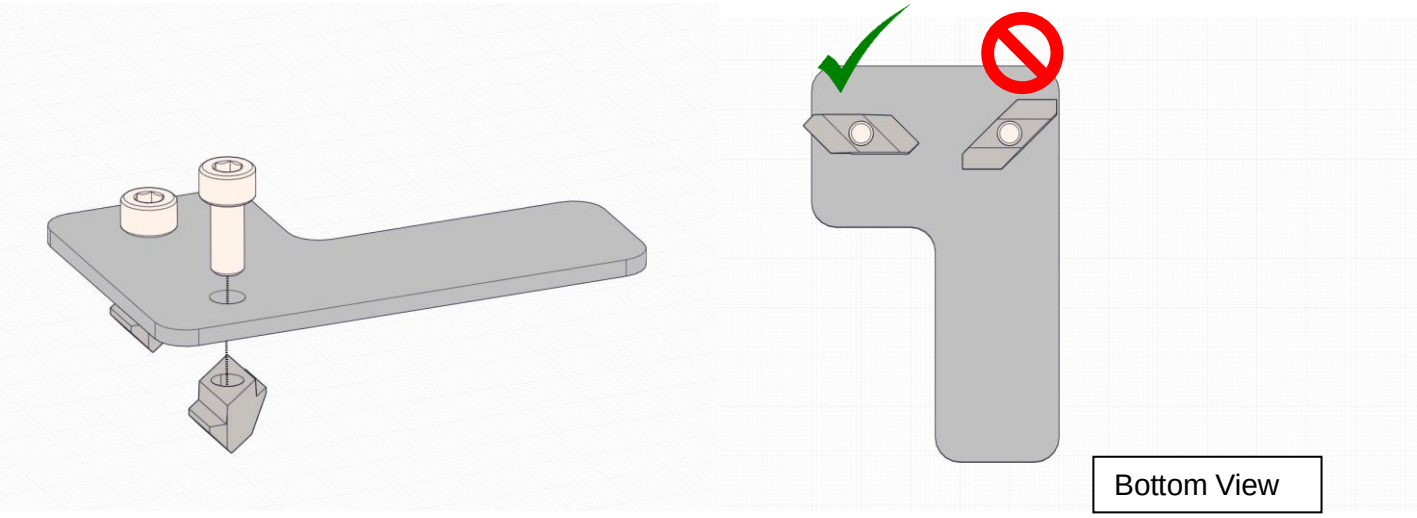
39. Align the edge of the aluminum extrusion of the rail mount assembly to the edge of the rail support end. **Tighten the 4 bolts a bit more so they hold the position and stay aligned**. These will stay slightly loose until the bridge is placed.



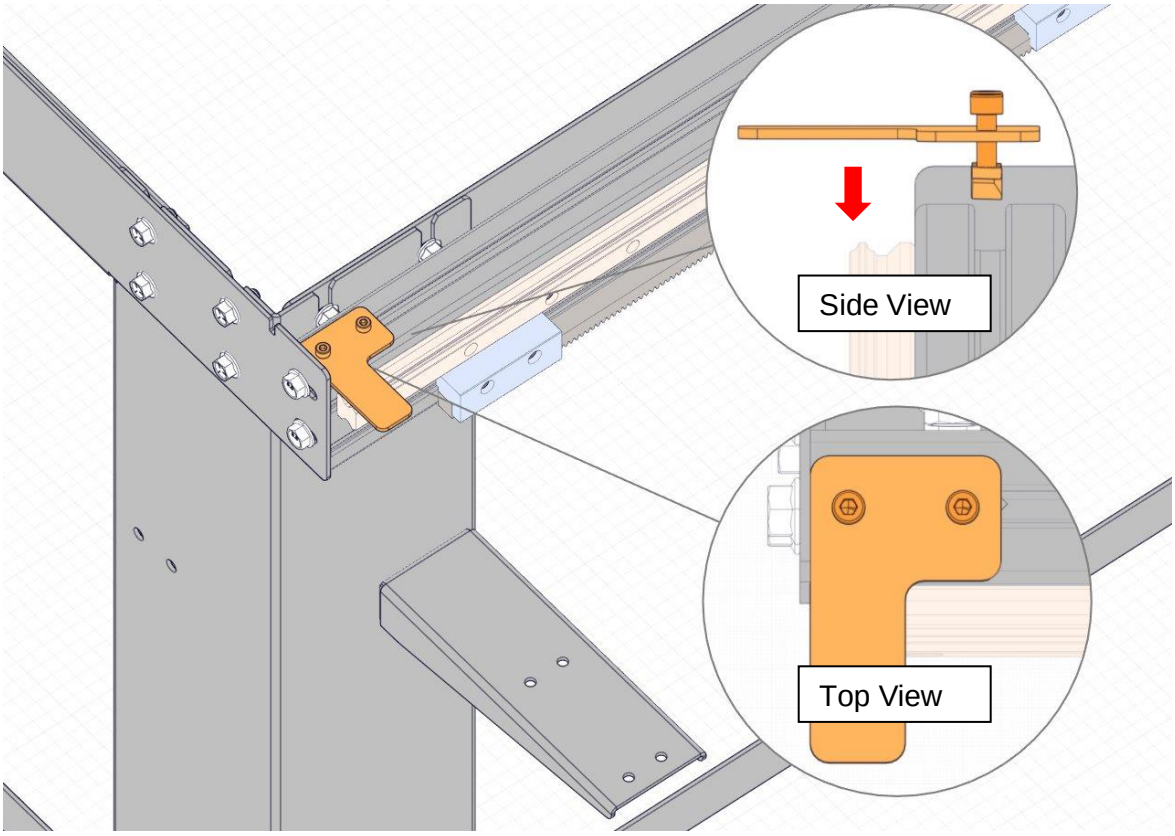
40. Repeat the process with the rail mount on the left side.



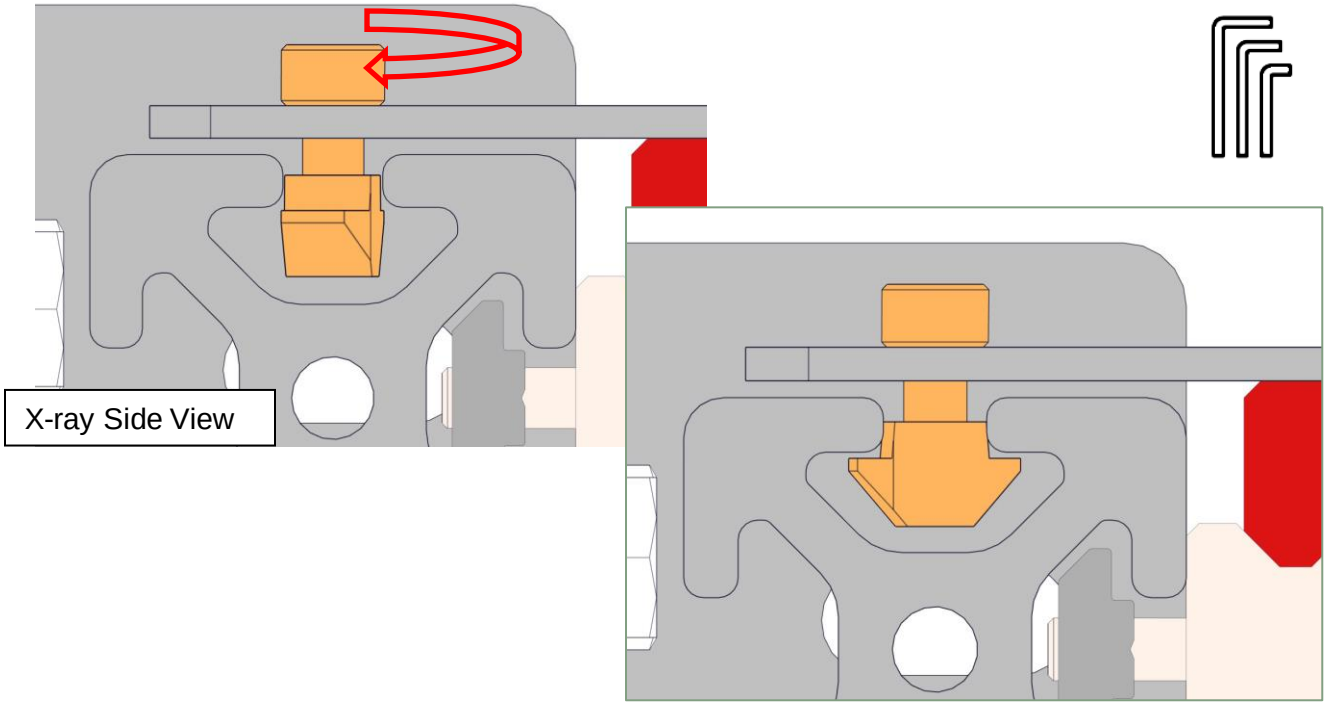
41. Insert 2 socket head cap screws into the 2 bolt holes. Hand-tighten the T-slot nuts on the backside, leaving the T-slot nuts **parallel** to the short side of the bracket as seen below.



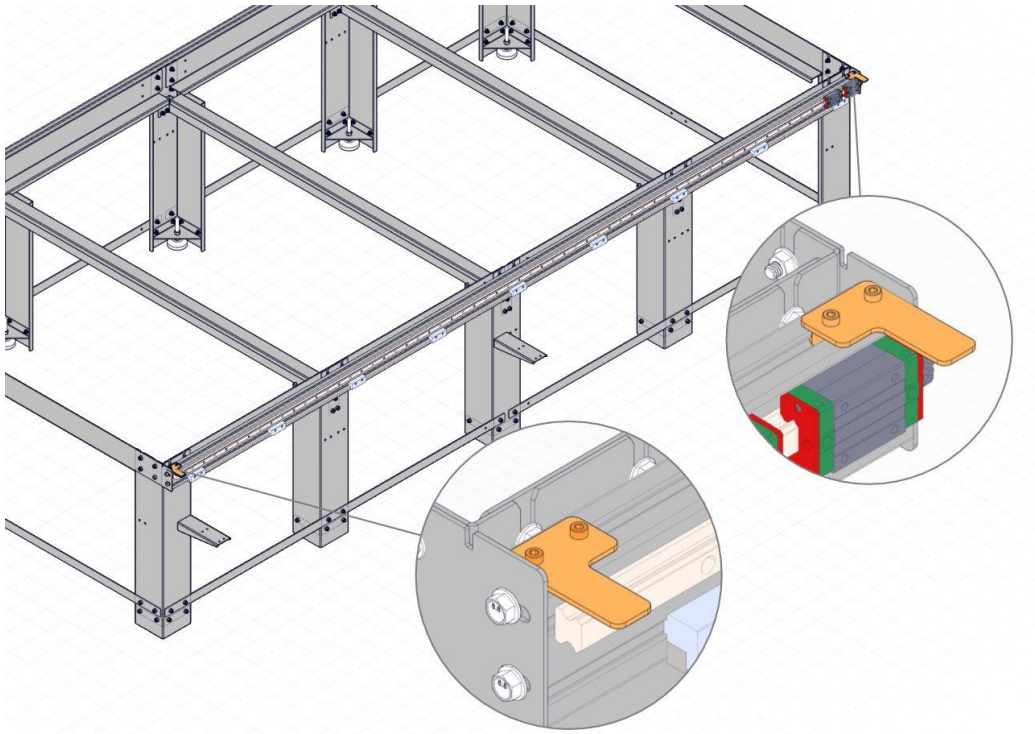
42. The first hard-stop assembly will be installed in the front right corner. Insert the T-slot nuts into the rail and push the hard-stop assembly as far left as it will go.



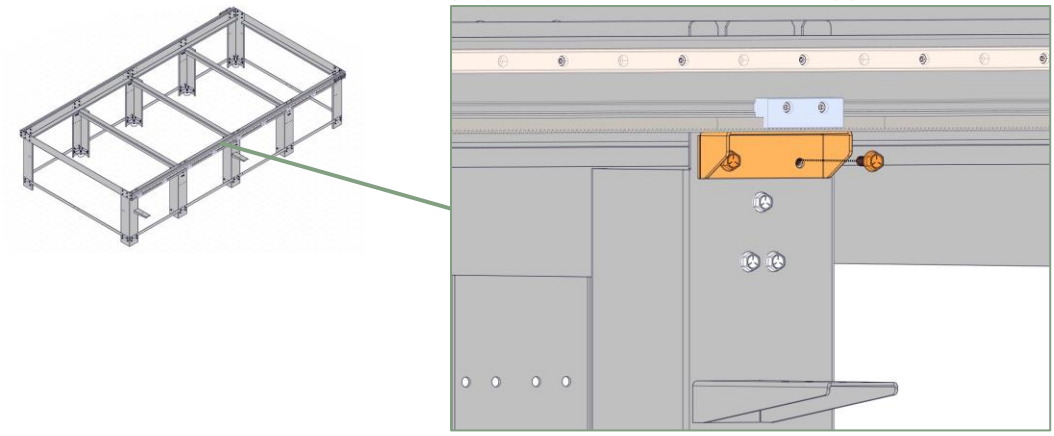
43. Using an Allen/hex key, tighten both fasteners. You will not be able to access the nut. The T-slot nut will rotate and stay wedged to keep the piece in place.



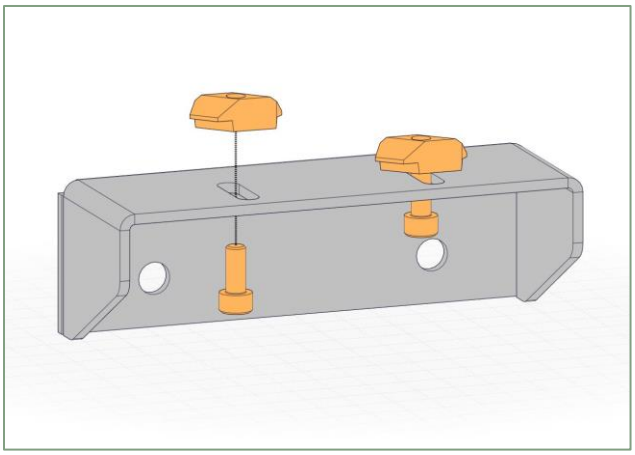
44. Repeat the process with the second hard-stop assembly at the other end of the same rail.

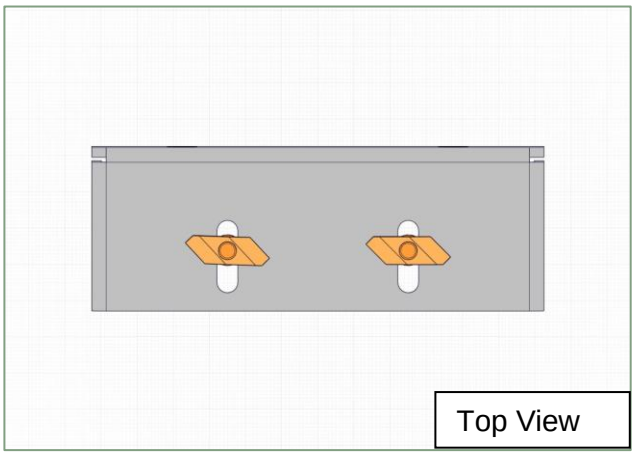


45. Remove both bolts and nuts that hold up the short bracket support on the center leg. It is normal for the aluminum rail to shift/move/pop when you remove this support.

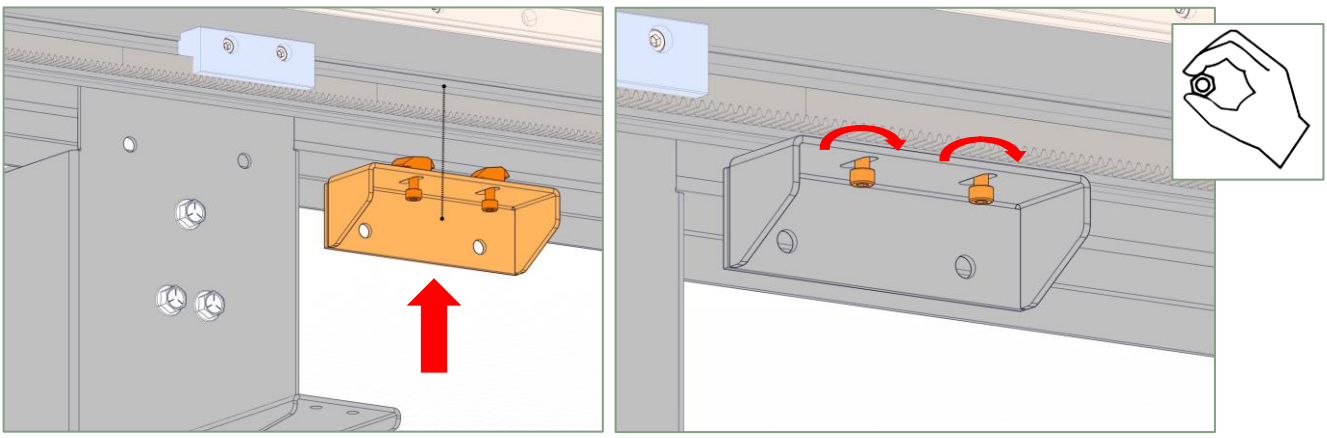


46. Insert 2 socket head cap screws into the 2 bolt holes. Hand-tighten the T-slot nuts on the backside, leaving the T-slot nuts barely threaded**.** Adjust the T-slot nuts so that they are **parallel to the long side of the bracket** and will be parallel to the rail**.**

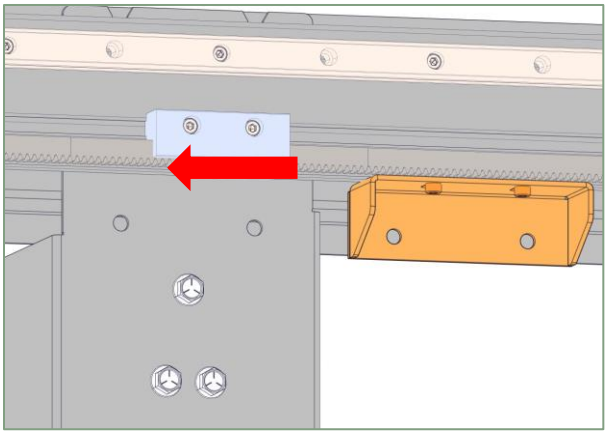


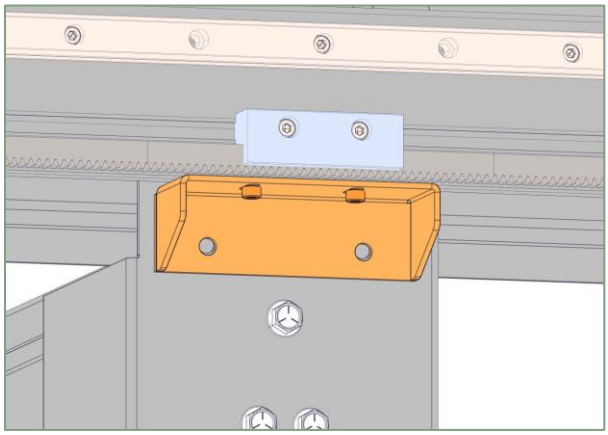


47. Insert the T-slot nuts into the rail, just to the right of where the bracket was originally. Using an Allen/hex key, tighten both T-slot fasteners **slightly,** enough to keep the bracket from falling out. You will not be able to access the nut. If done correctly, the nut should rotate and wedge itself in the rail. Applying some downward pressure as you are tightening helps wedge the nut.

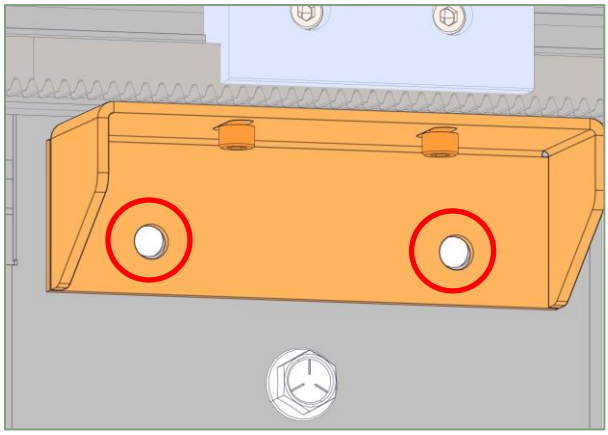


48. Slide the bracket with the fasteners to the left and align the holes on the bracket to the leg.

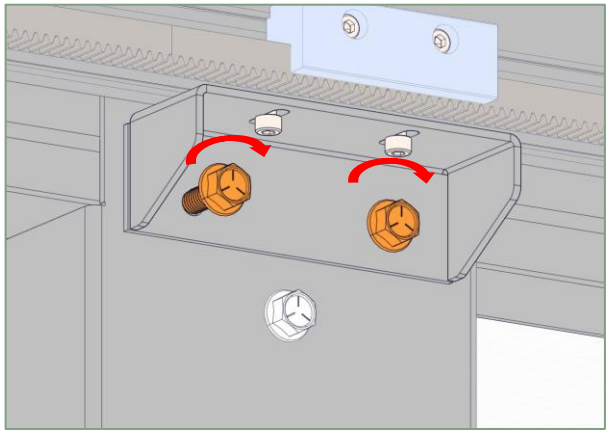




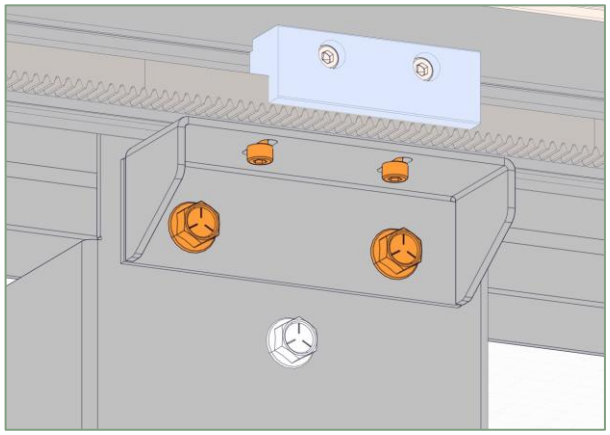
TIP: If the holes do not align, the machine or rail may need to be leveled. Usually, the center leg may need to be adjusted up or down.



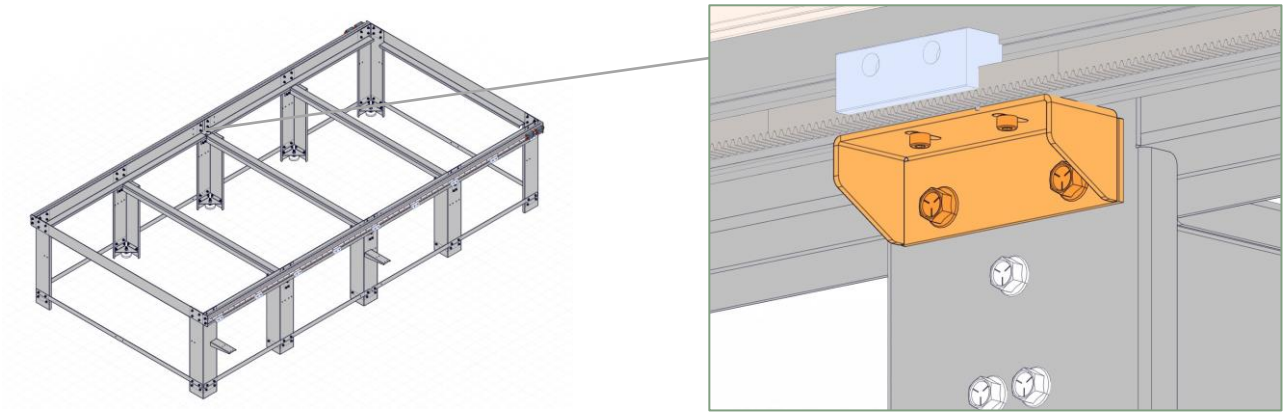
49. Insert the bolts and nuts that hold the bracket to the leg.



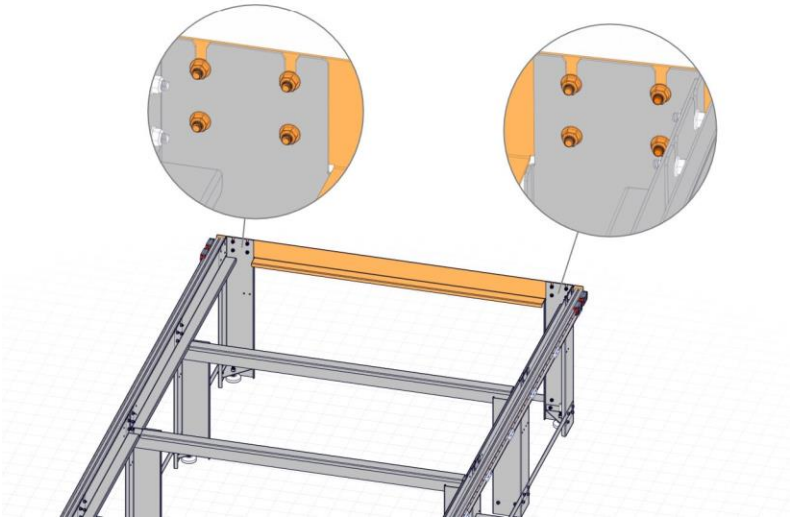
50. Tighten both the bolts and nuts and the T-slot fasteners.



51. Repeat on the other side.

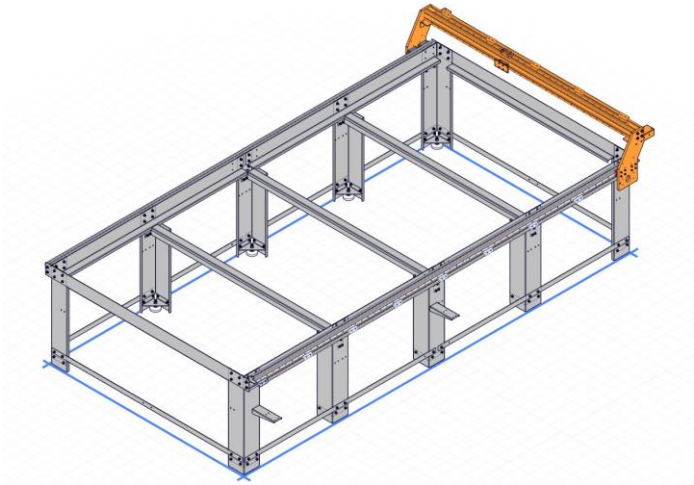


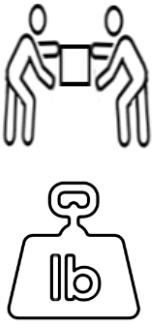
52. Tighten the 8 bolts on the back rail support ends until snug. Notice these are **not** the bolts that were just inserted.



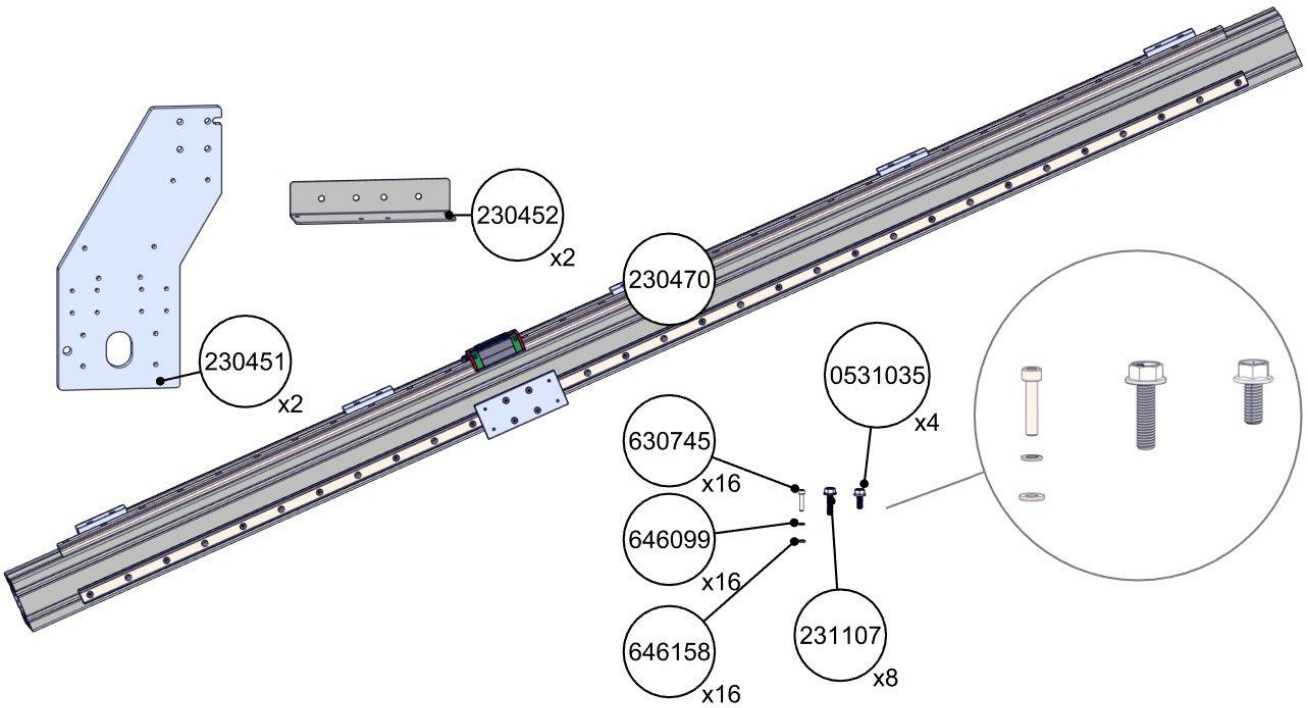
3.10 Attach Bridge Support Plates and Bridge

3.10.1. Goal of this Section





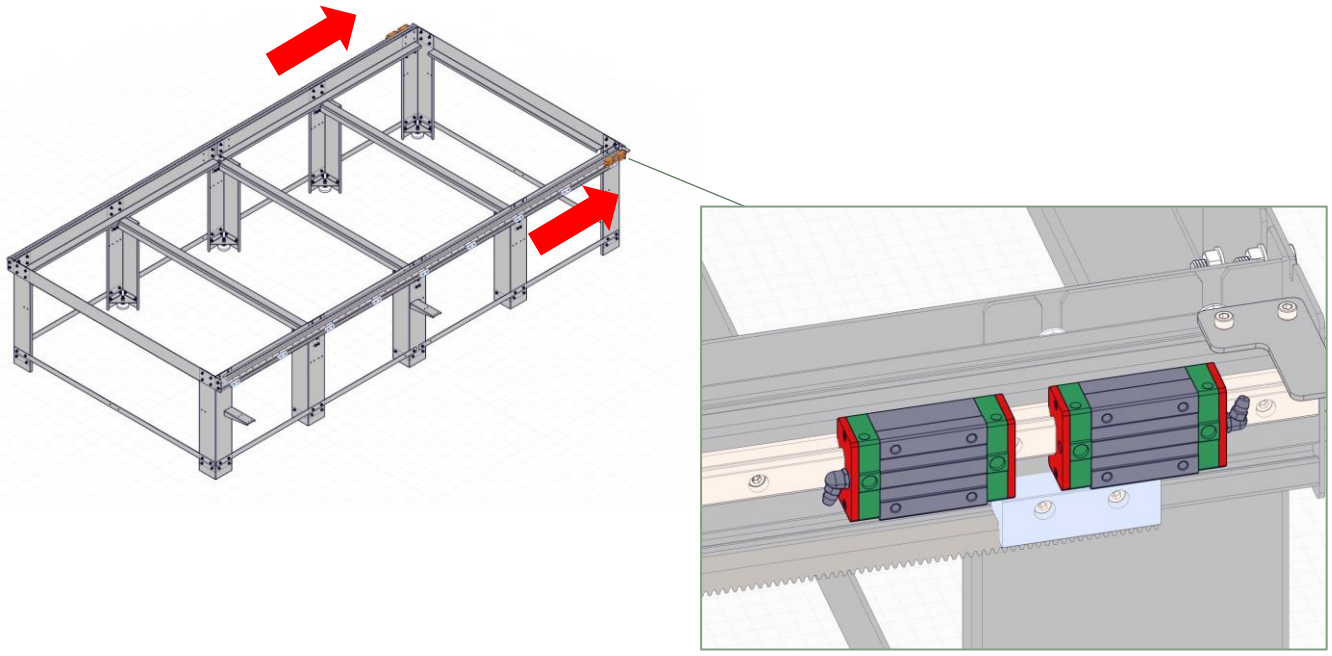
3.10.2. Parts List



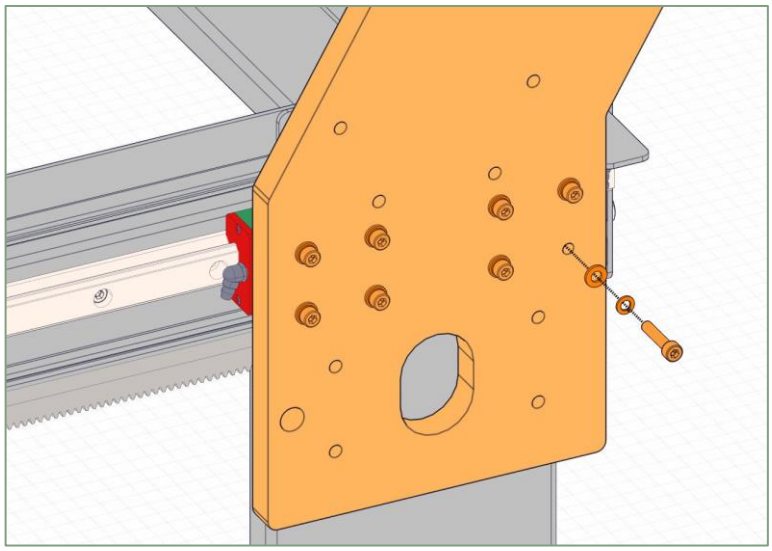
Number	Qty	Part Description
230451	2	Side Plate- Support Y-Axis
230452	2	Bridge Support Bracket
230470	1	Y-Axis Bridge Assembly
630745	16	Screw Socket Head Cap M5x0.8x25
646099	16	Spring washer DIN 128 - A5
646158	16	B18.22M - Plain washer, 5 mm, narrow
231107	8	Bolt Hex Washer Head M8-1.25 X 30
0531035	4	Screw Hex Head Flanged 5/16-18 X ¾

3.10.3. Steps

53. Locate the bearing blocks on the rail. Slide them down to the right to the back end of the machine. Set the two bearing blocks a little less than 1 inch apart from each other.



54. Line up the side plate to the bearing blocks. Insert 8 cap head screws into the 8 holes, 4 per bearing block, and screw in snugly with an Allen/hex key. Each cap head screw will have two washers. The larger flat washer will be against the side plate.

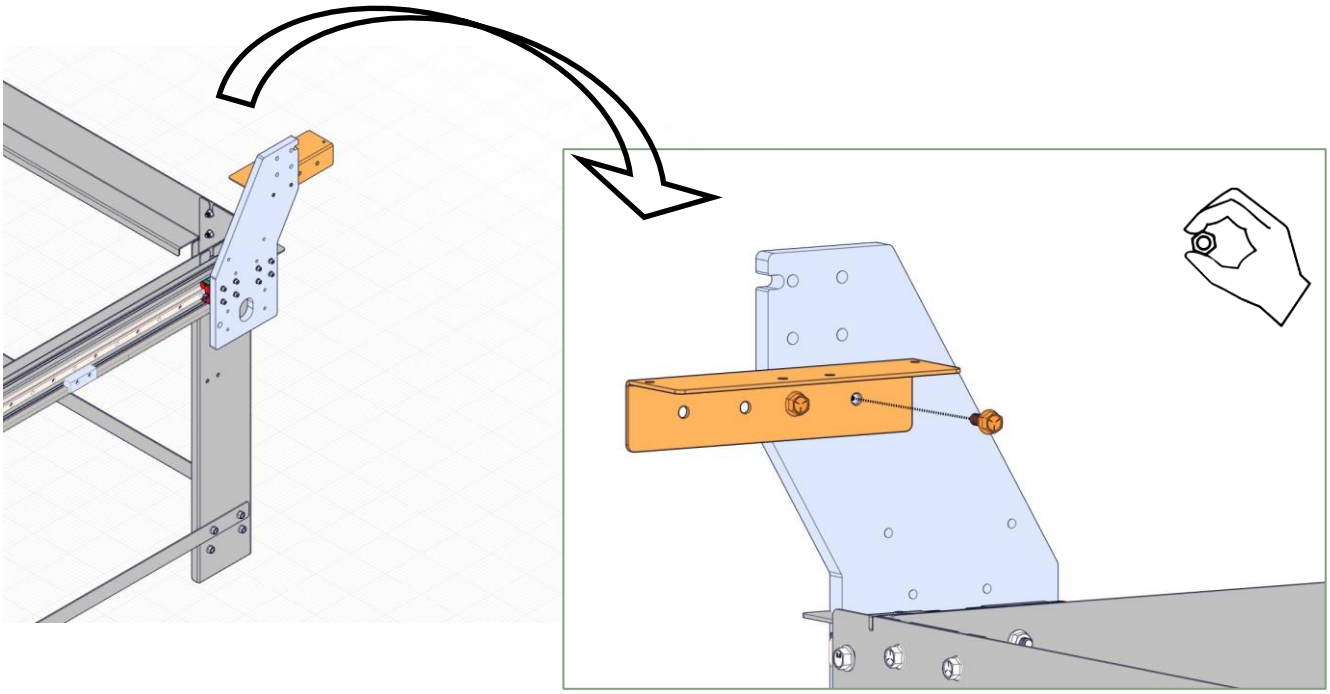


2X

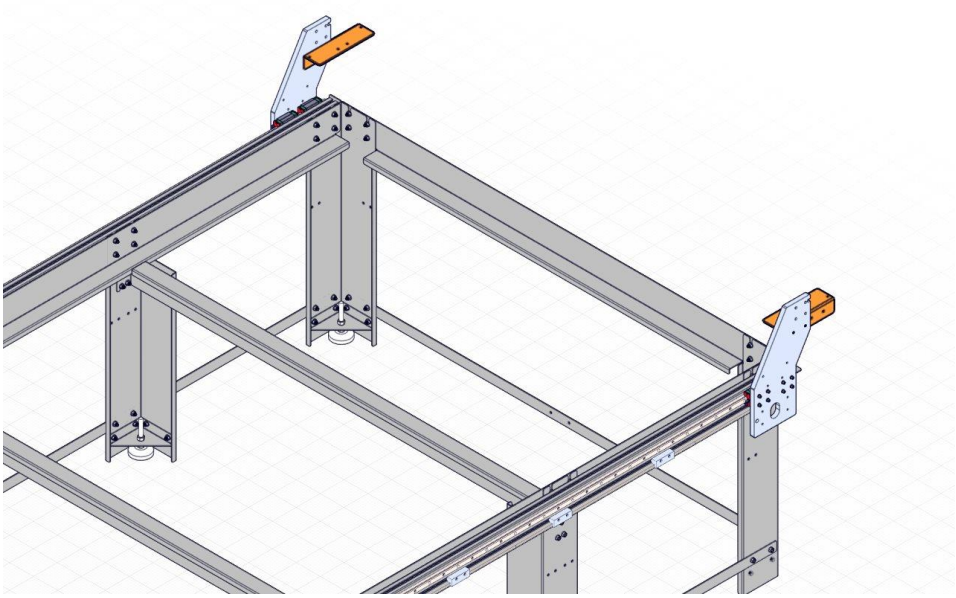
TIP: Use a spiral or star pattern tightening sequence.

55. Align the bridge support bracket to the **inside** of the side plate. The right 2 holes on the bridge support bracket will line up with the third set of holes on the side plate.

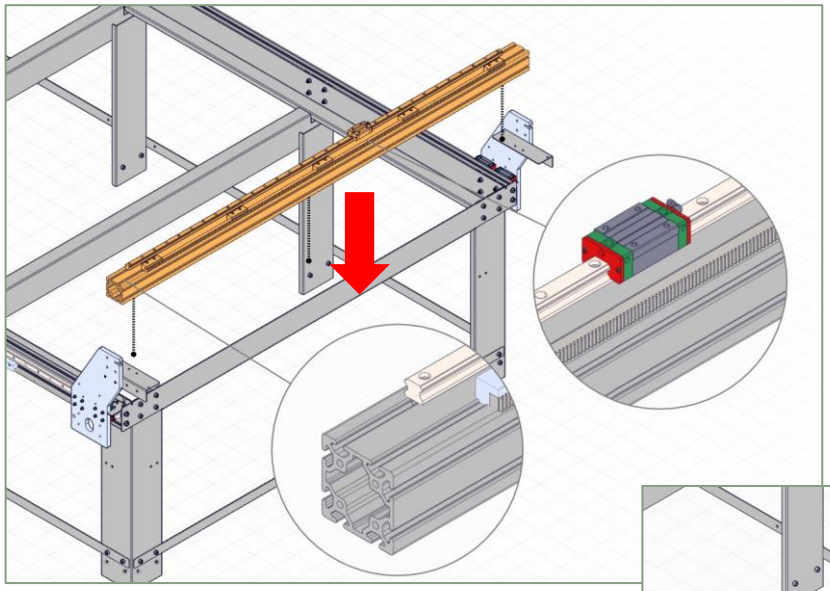
56. Insert 2 bolts **0531035** and tighten halfway, keeping them slightly loose.

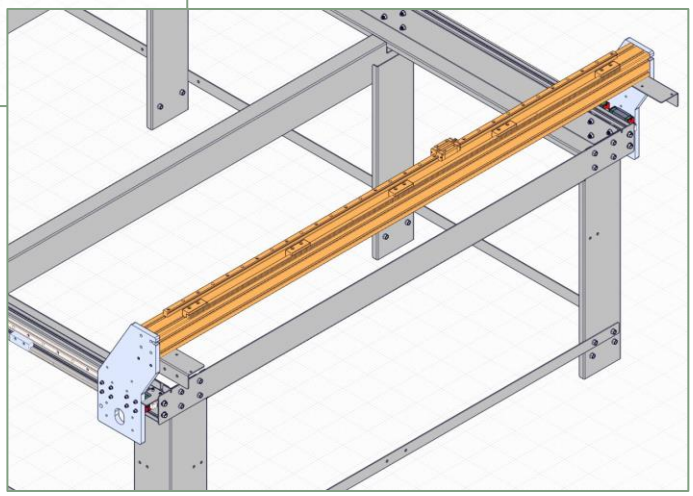


57. Repeat the process on the other side.

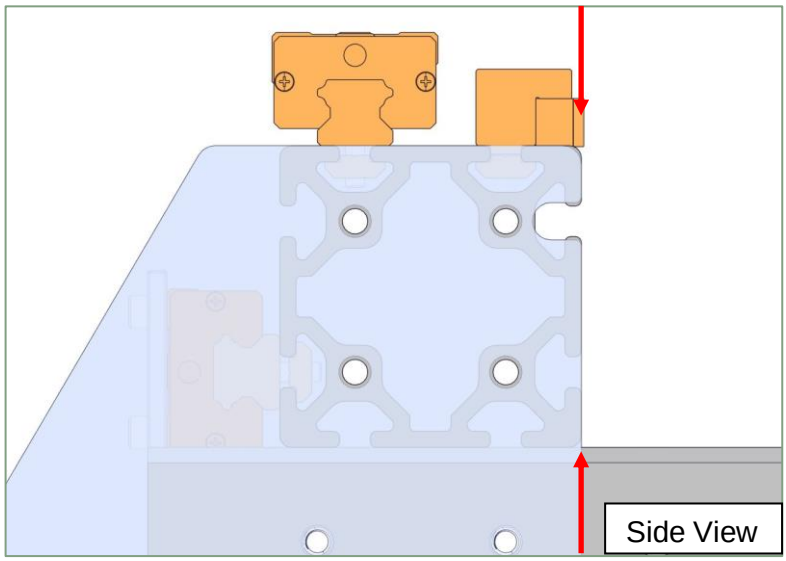


58. With the help of another person, position the bridge assembly on the backside of the machine. The bridge will rest on the bridge support plates. The teeth of the rack face out, towards you. The bearing blocks will face up.

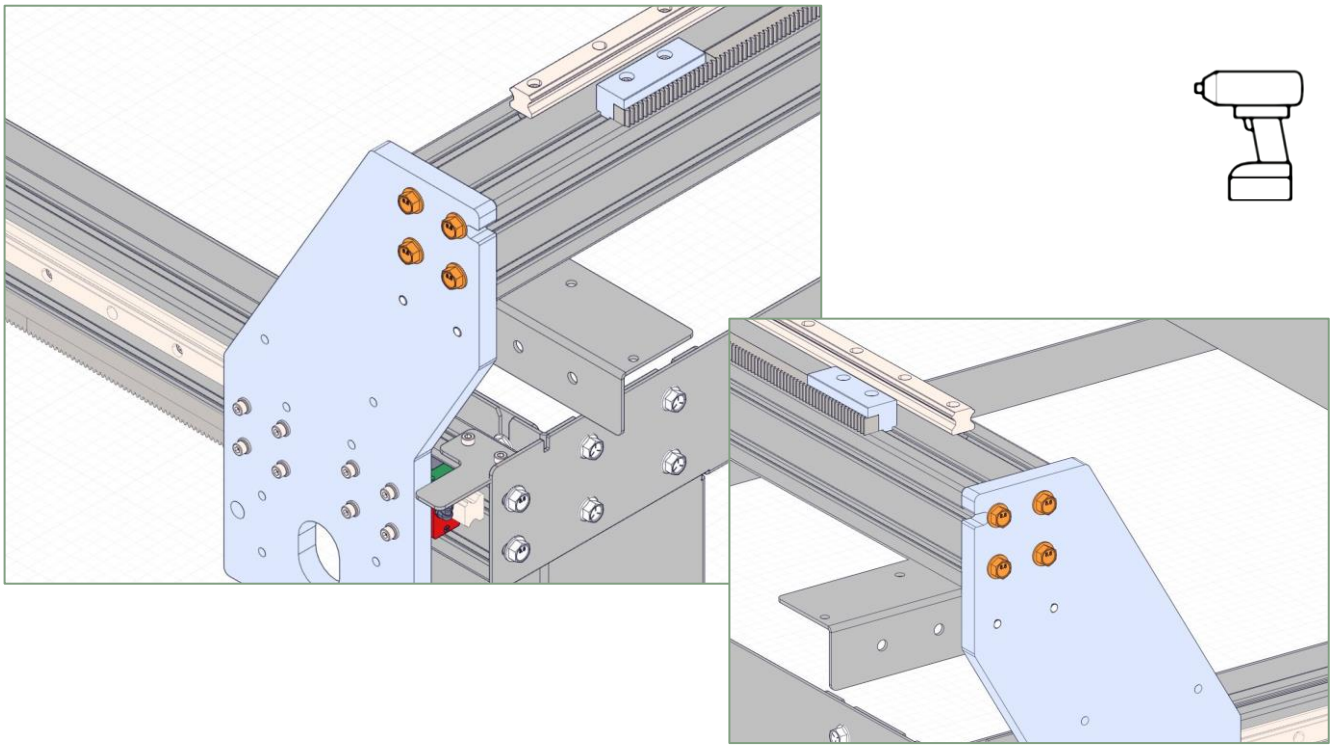




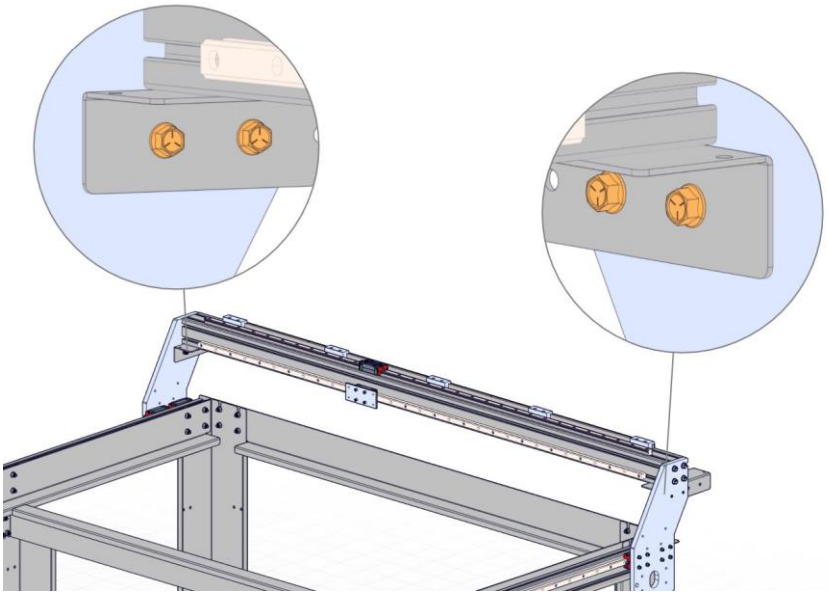
TIP: Align the edge of the aluminum extrusion of the rail mount assembly to the edge of the side plate.



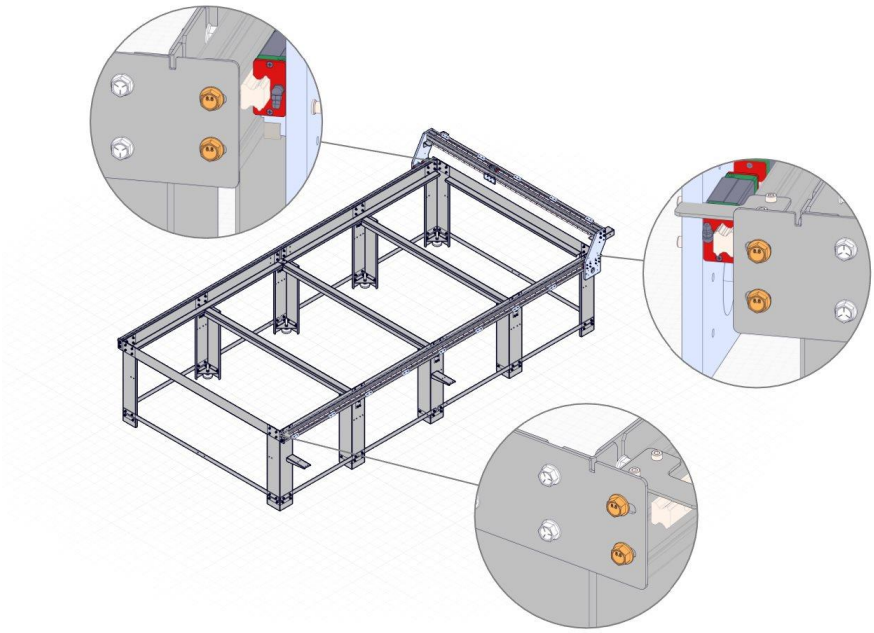
59. Align the 4 bolts **231107** to the top 4 holes in the side plate and into the side of the bridge assembly. Drive the bolts in until tight. Repeat with the 4 bolts on the other side of the bridge.

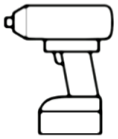


60. With the bridge firmly attached, go back to the 4 bolts on the bridge support bracket and tighten those.

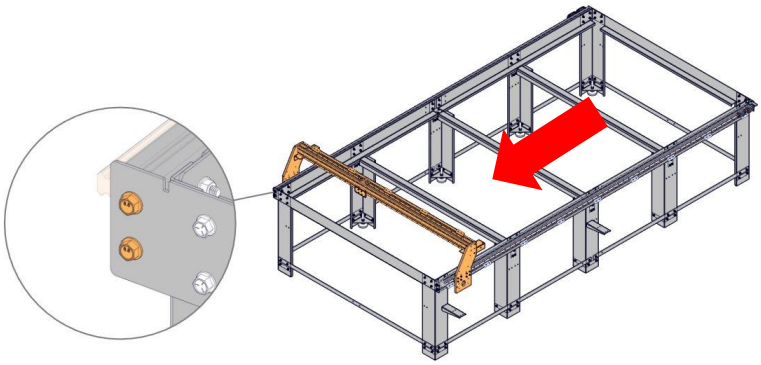


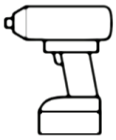
61. Go back and tighten the 4 bolts on the end rails connected to the rail mount assemblies. Start with bottom right, then top right, then top left.





62. Move the bridge to the front of the machine. Tighten the other 2 bolts on the end rails. All fasteners on the machine should be snug at this point.

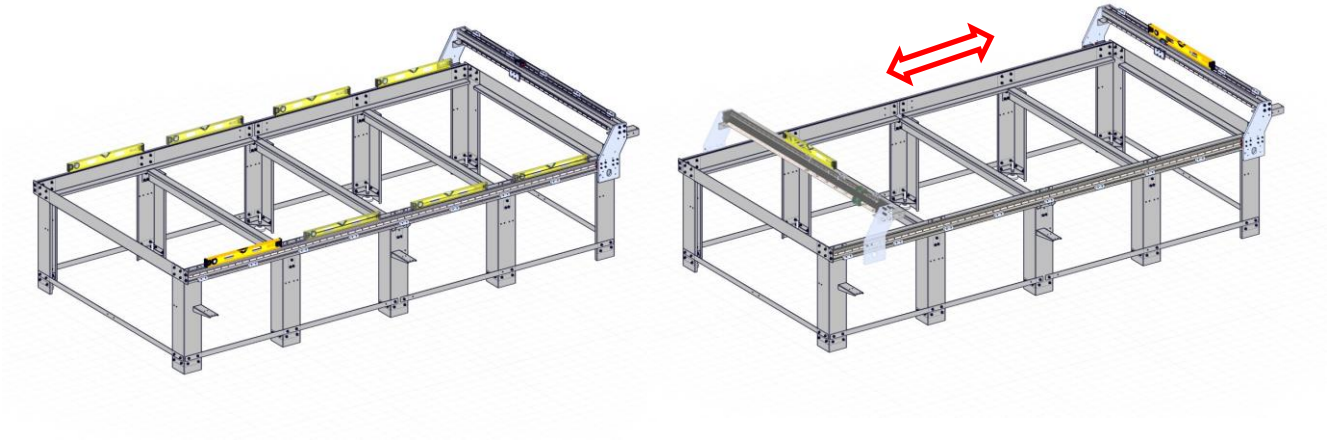




63. Stop! Verify that the bridge moves freely on the rail before moving on.

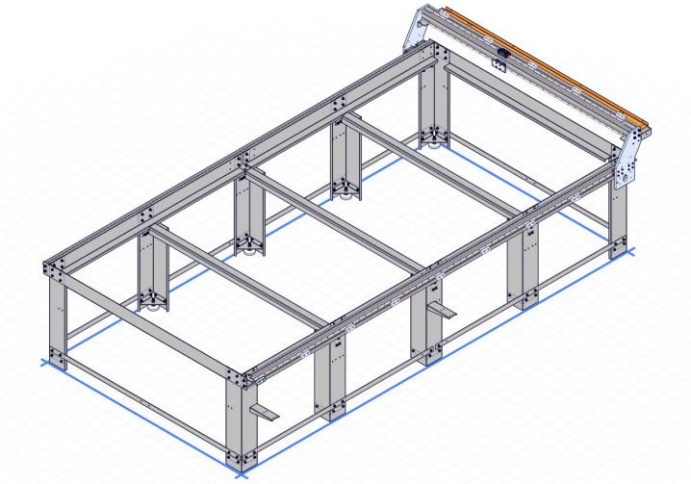
3.11 Re-Check the Level

1. Check that all the legs are touching the floor. A leg that does not touch indicates a low spot on the floor. Adjust the leveling foot or place shim under this leg.
2. Place a level at various parts of the linear guides to find where the highest spot is. The bubble in the level will indicate the direction of the high spot. There may be more than one high spot. Make sure the level is on the linear way on the aluminum extrusion as you are checking the machine.
    a. Check across 8 spots between the legs along the long axis as seen in the left image below.
    b. Place the level on the rail and check. Push the rail towards the front and check again.
    c. Remember the bubble always goes to the high side.

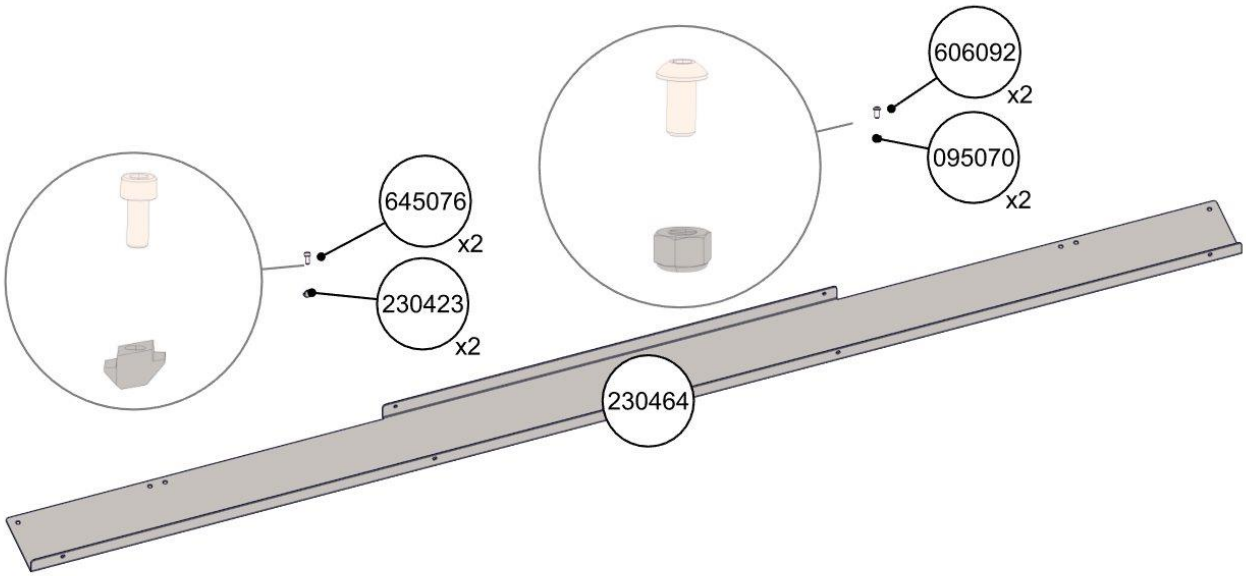


3.12 Attach X-Axis Cable Track Tray

3.12.1. Goal of this Section



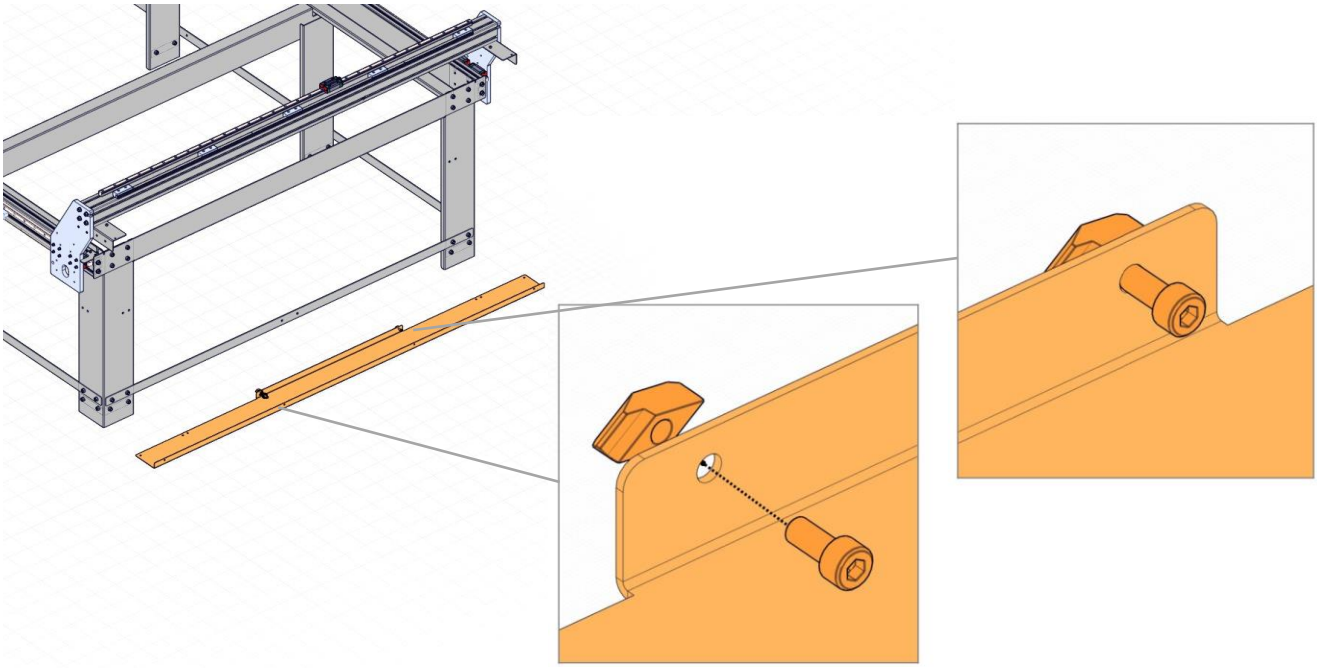
3.12.2. Parts List



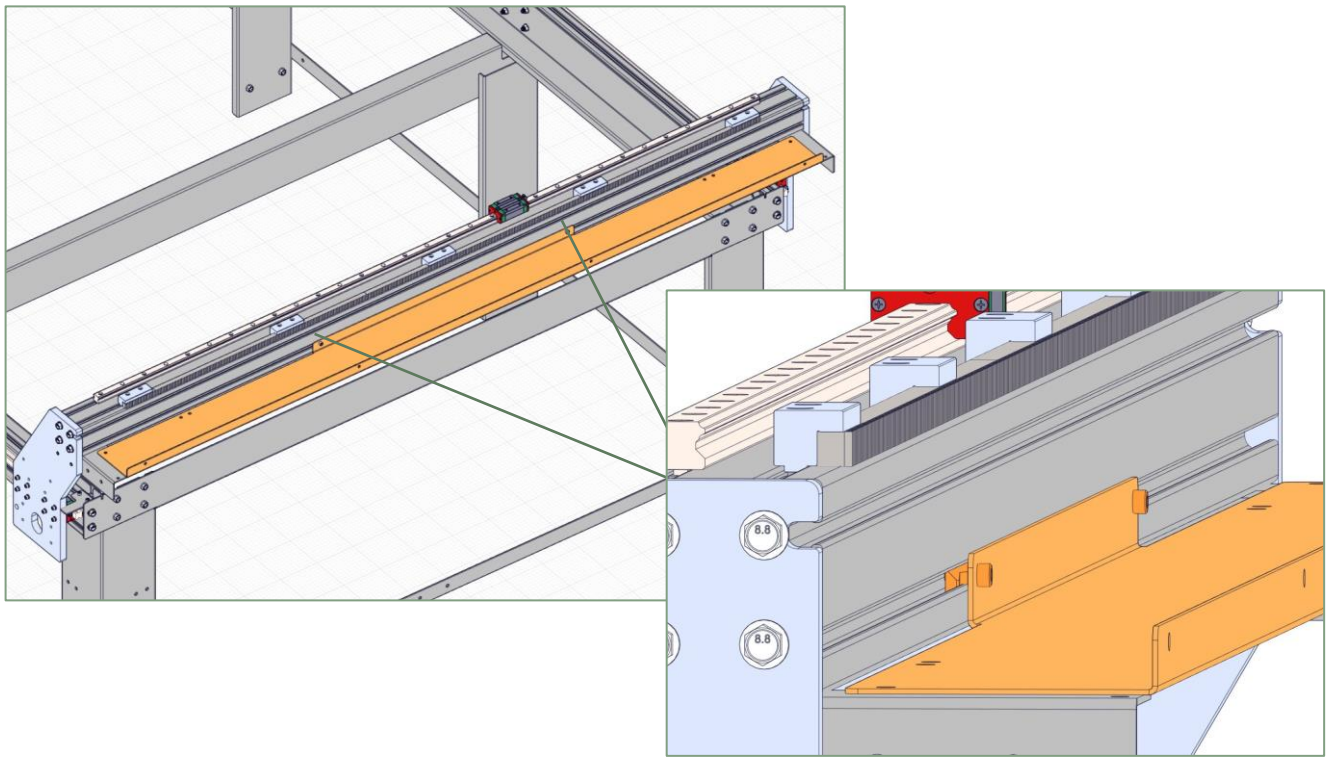
Number	Qty	Part Description
645076	2	Socket head cap screw B18.3.1M - 5 x 0.8 x 12
230423	2	Nut T-Slot Drop-In M5
606092	2	Socket button head cap screw 0.25-20x0.5-HX-N
095070	2	Nut Hex Lock Nylon 1/4-20
230464	1	Tray Carrier X-Axis

3.12.3. Steps

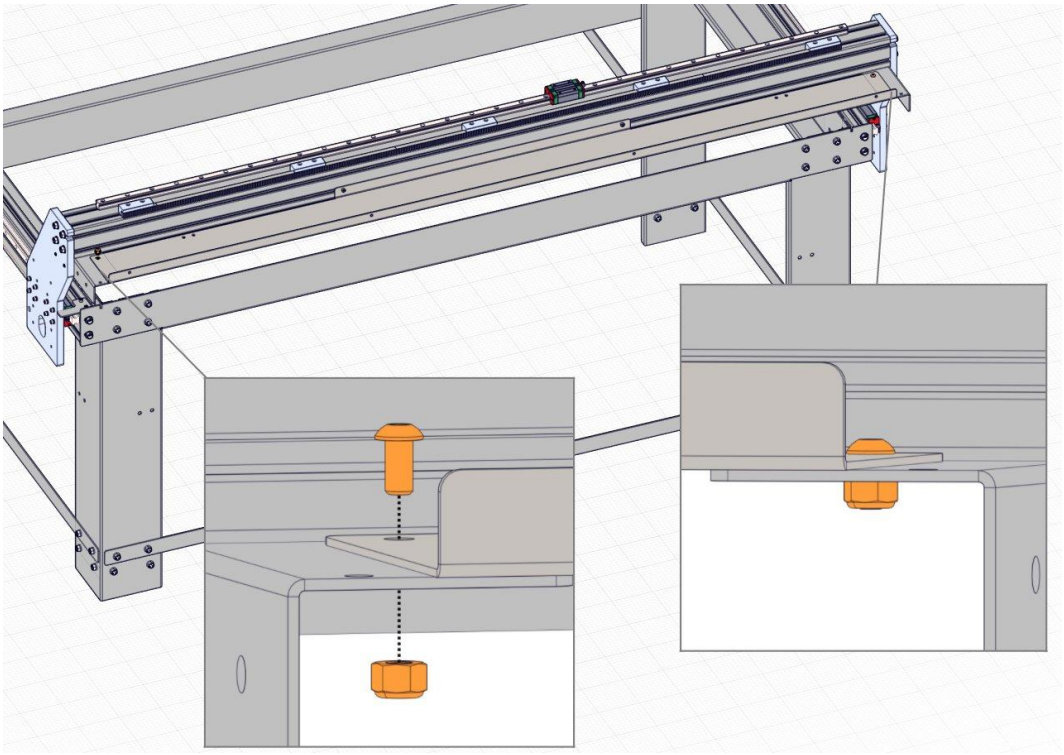
64. Place the tray carrier on the floor behind the back of the machine with the thin, long folded side facing outward. Insert 2 socket head cap screws **645076** into the 2 bolt holes of the smaller fold. Hand-tighten the T-slot nuts on the backside, leaving the **T-slot nuts horizontal**.



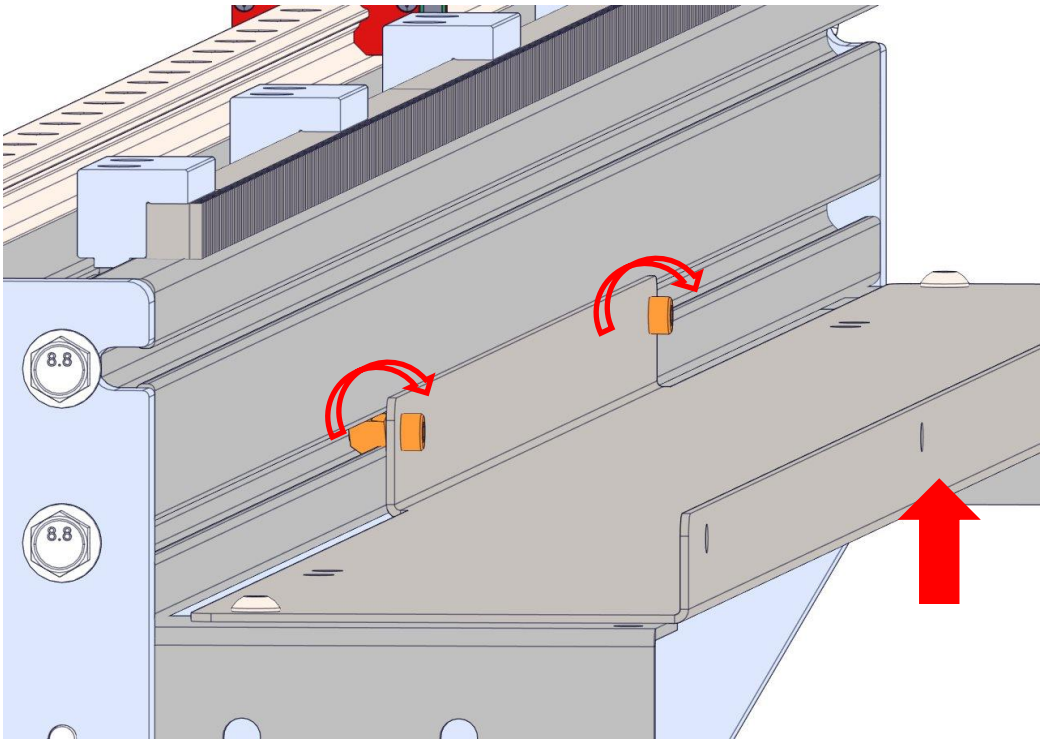
65. Lift the tray carrier behind the back of the table and position it so that the left and right sides rest on the bridge support brackets, roughly centered. Insert the T-slot nuts into the rail. Don't tighten yet.



66. Insert the other two fasteners **606092** and nuts at either end of the cable track tray, which will attach to the bridge support plate.

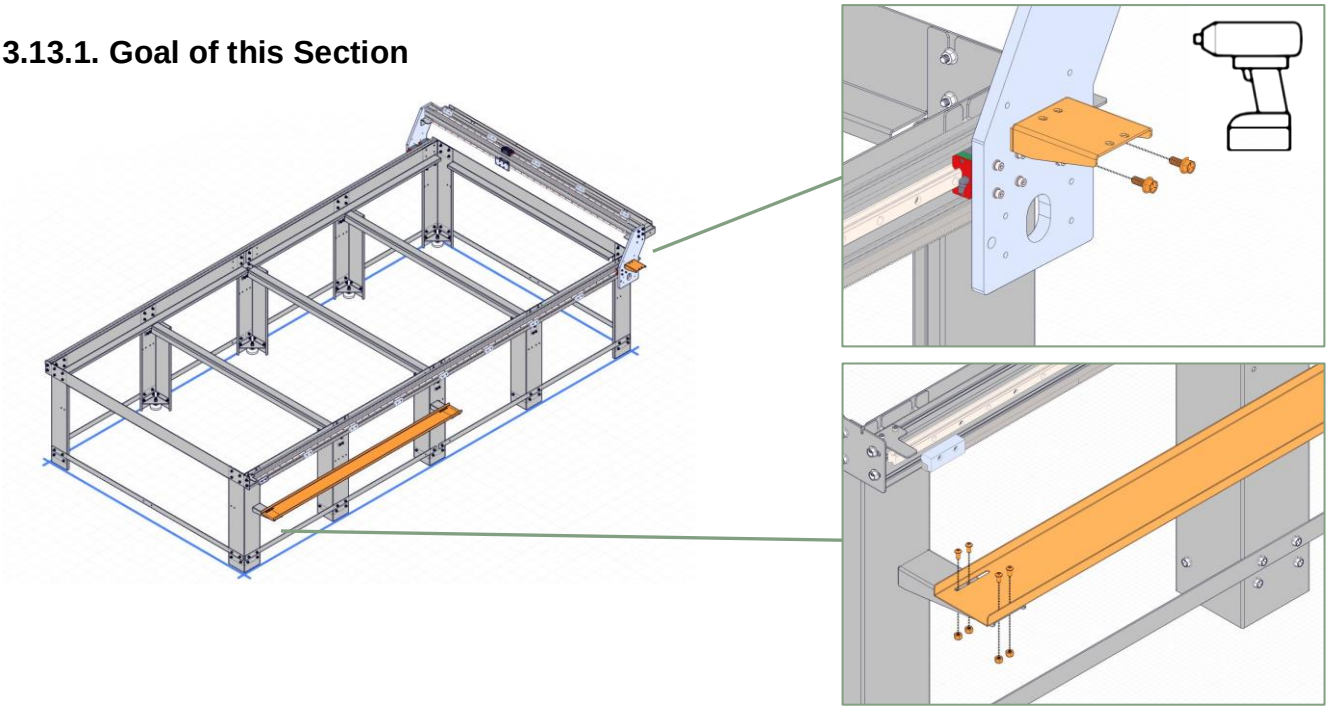


67. Using an Allen/hex key, tighten both T-slot fasteners. You will not be able to access the nut. While tightening, push up slightly on the middle of the tray to keep it from sagging. If done correctly, the nut should rotate and wedge itself in the rail.

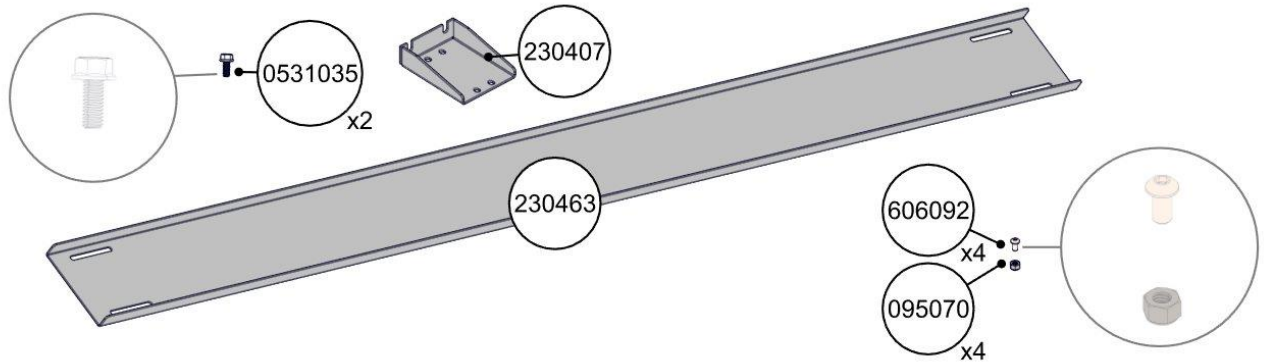


3.13 Y-Axis Cable Track Tray and Carrier Support

3.13.1. Goal of this Section



3.13.2. Parts List



Number	Qty	Part Description
0531035	2	Screw Hex Head Flanged 5/16-18 X 3/4
230407	1	Y-Axis carrier bracket
230463	1	Tray Cable Carrier Y-Axis
606092	4	Socket Button Head Cap Screw 0.25-20x0.5-HX-N
095070	4	Nut Hex Lock Nylon 1/4-20

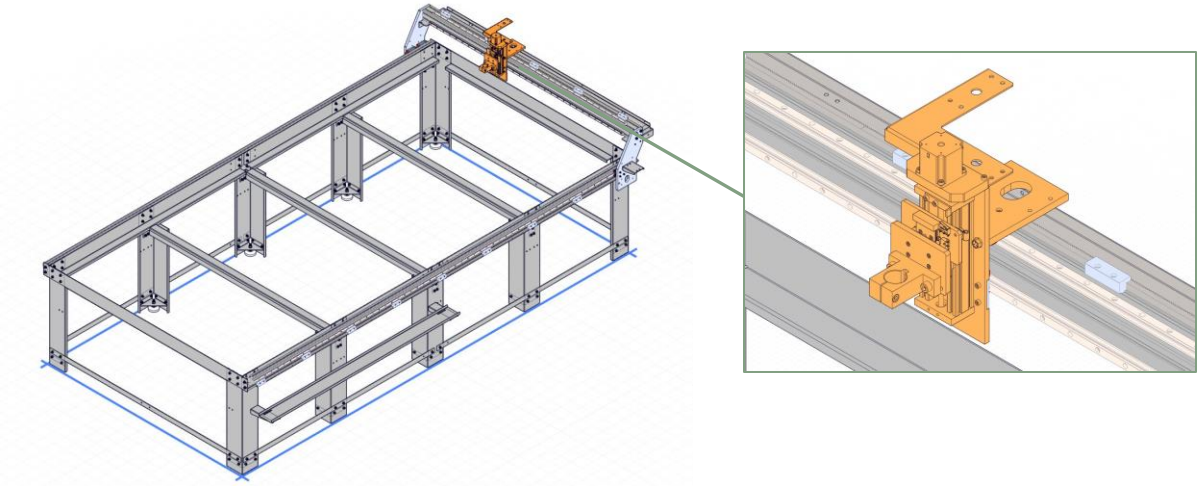
3.13.3. Steps

68. See illustrations above. Align the slots on Y-axis carrier bracket to the holes on the side plate on the right side of the machine. Align and tighten the 2 fasteners. An extension for the driver will be useful.

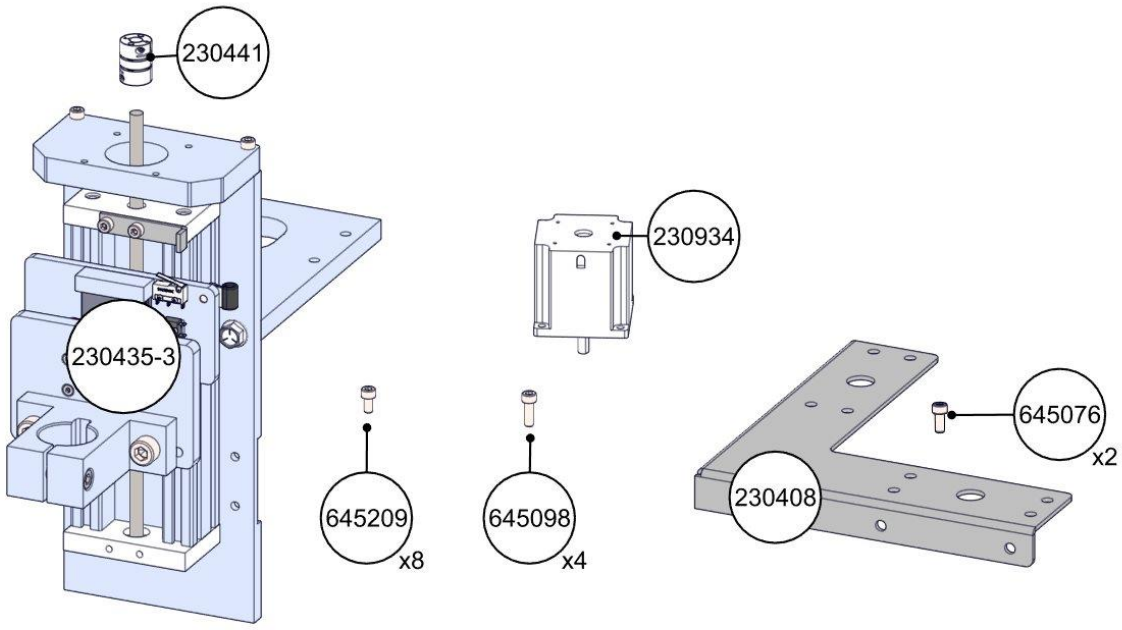
69. Place the Y-axis cable carrier tray onto the support brackets on the right side of the machine and align the holes of the support bracket to the tray on the left side. Align the 4 button head cap screws to the top and the nuts on the bottom and then tighten. Only **one side** is attached for now.

3.14 Z-Axis Assembly and Bracket

3.14.1. Goal of this Section



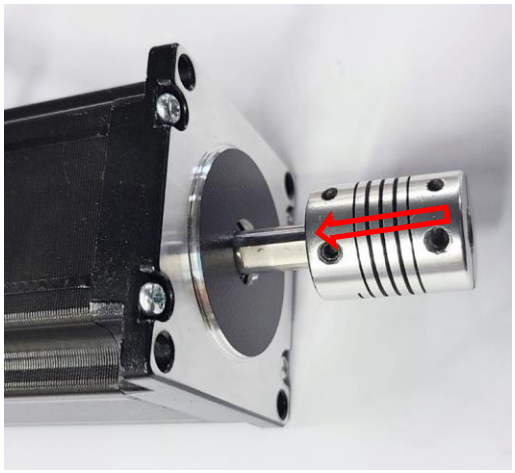
3.14.2. Parts List



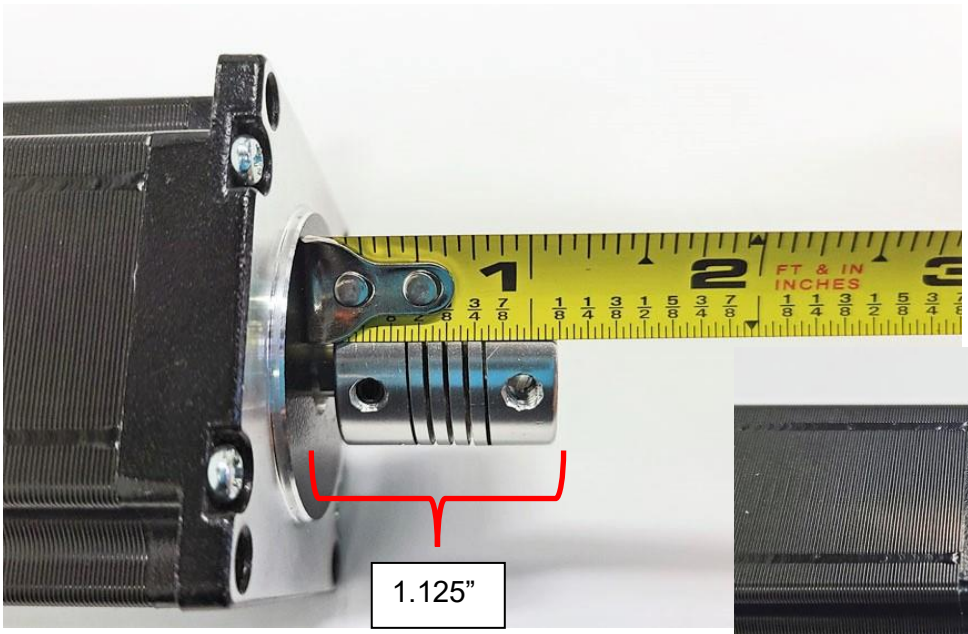
Number	Qty	Part Description
230441	1	Coupler (may come atop the Z-Axis Assembly)
230435-3	1	Z-Axis Assembly/Torch holder
645209	8	Screw Socket Head Cap M5x0.8x10
645098	4	Screw Socket Head Cap M5x0.8x16
230934	1	Stepper Motor Z-Axis
230408	1	Bracket Cable Carrier
645076	2	Screw Socket Head Cap M5x0.8x12

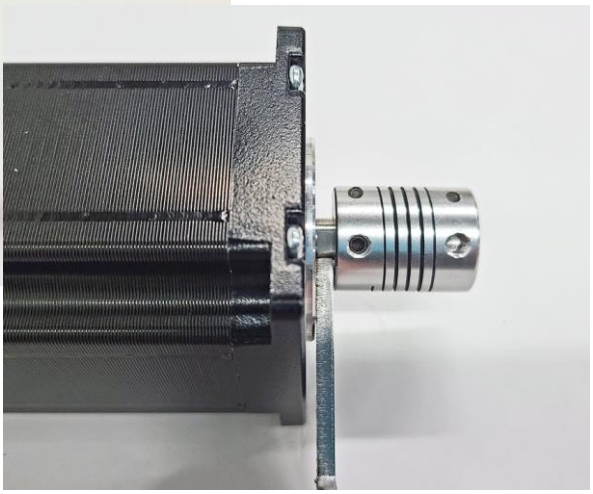
3.14.3. Steps

70. Locate the set screw on the coupler. Locate the flat portion of the shaft on the Z-axis motor. Line up the set screw with the flat portion and slide the coupler onto the shaft keeping the set screw over the flat portion.

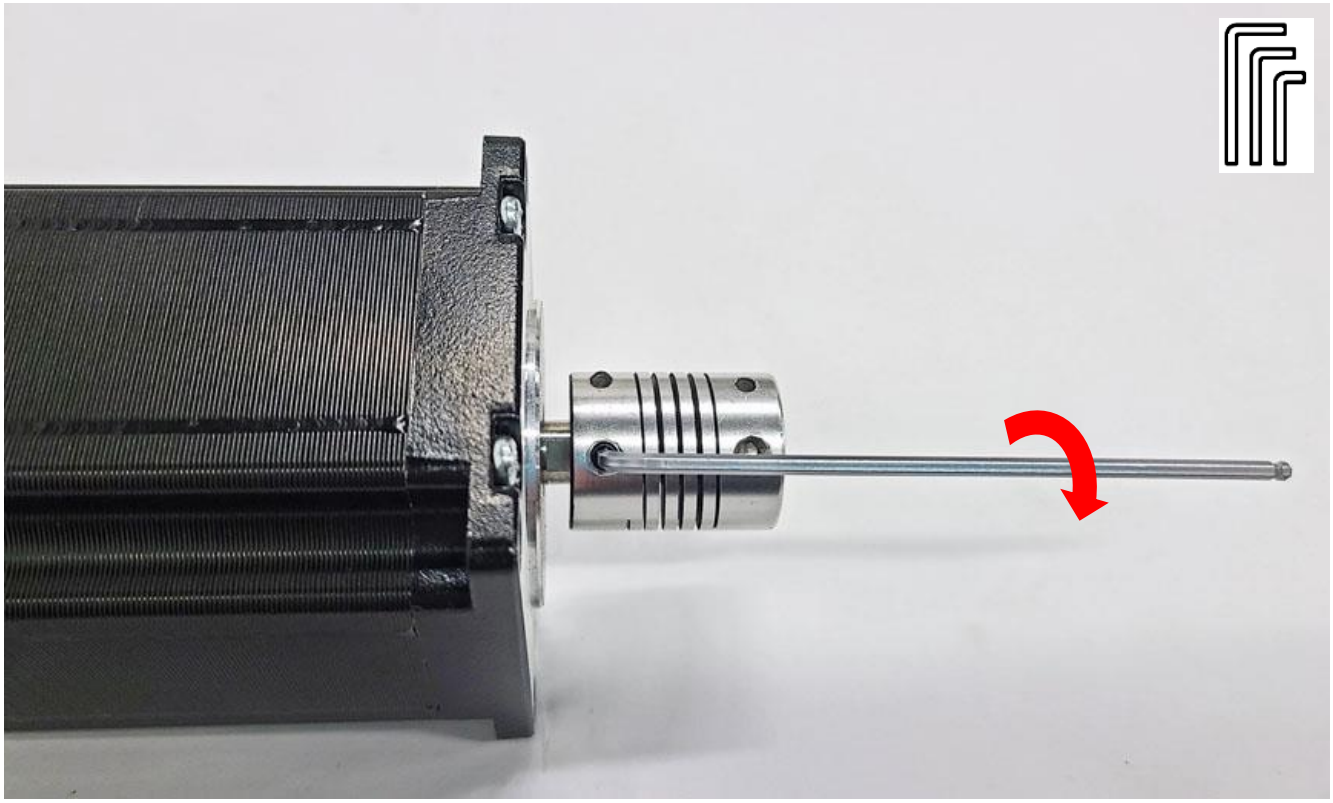


71. The coupler should be an ⅛" from the face of the motor. It is easiest to measure the distance from the end of the coupler to face of the shaft as shown on the left. The total distance from the face of the motor to the end of coupler is 1-⅛" (1.125"). An ⅛" object, such as 11ga steel or two pennies, can be used as a spacer, as shown on the right.

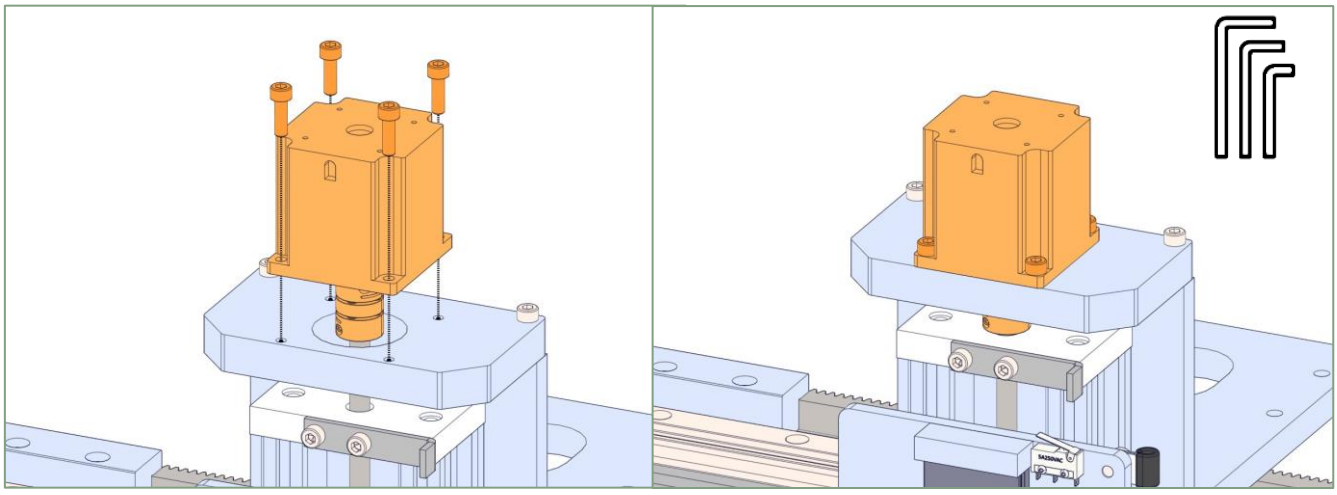




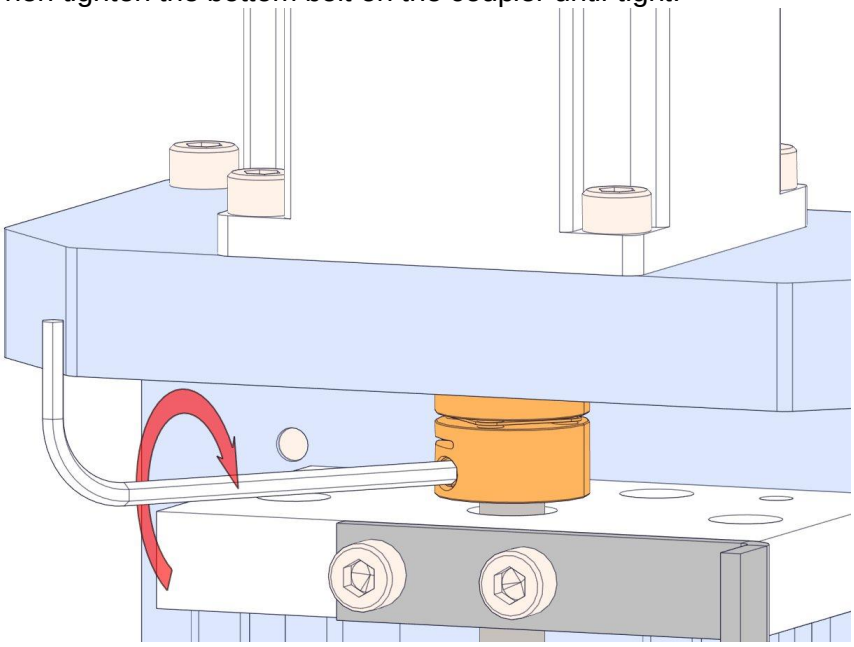
72. Tighten the set screw.



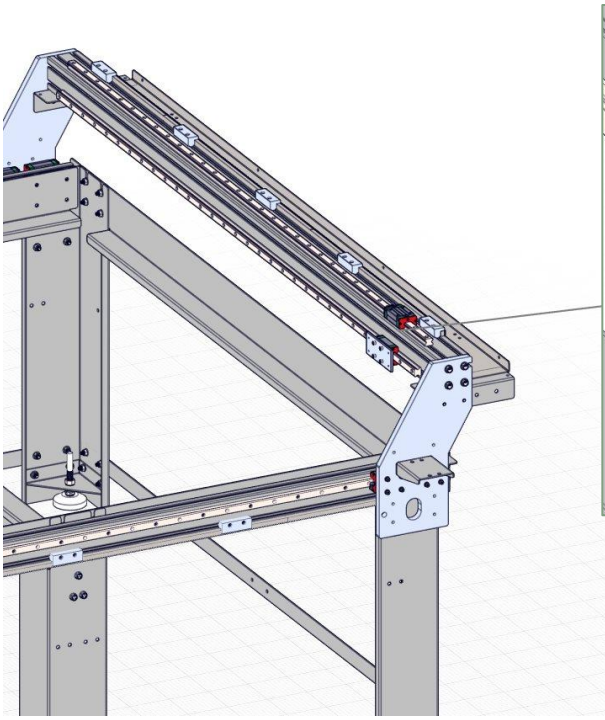
73. Place the Z-axis motor on top of the Z-axis assembly, sliding the coupler onto the threaded rod. The cable will face the back of the machine. Position and tighten the 4 bolts **645098** into the motor housing and the top of the Z-axis assembly.

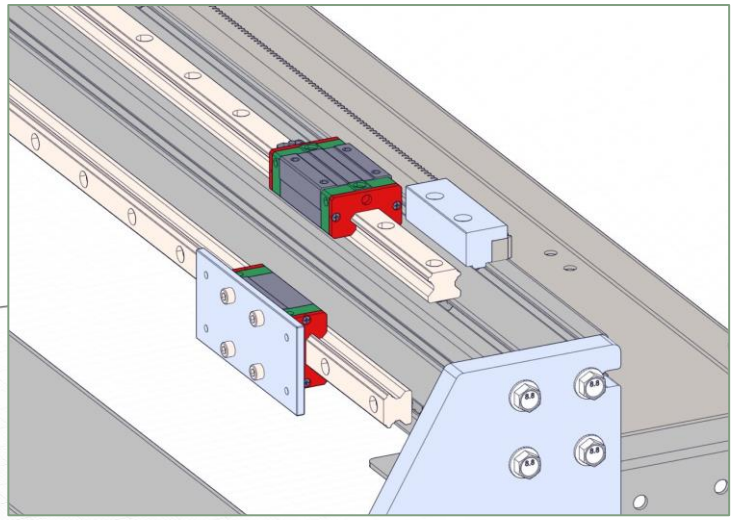


74. Then tighten the bottom bolt on the coupler until tight.



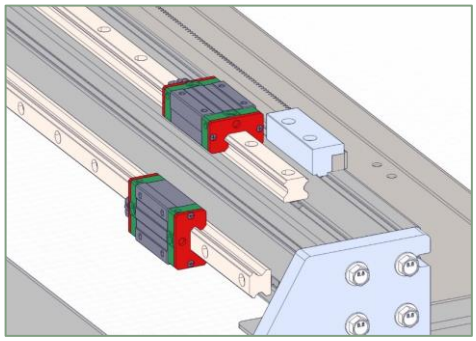
75. Locate the bearing blocks on the rail. Slide both down to either side of the machine.



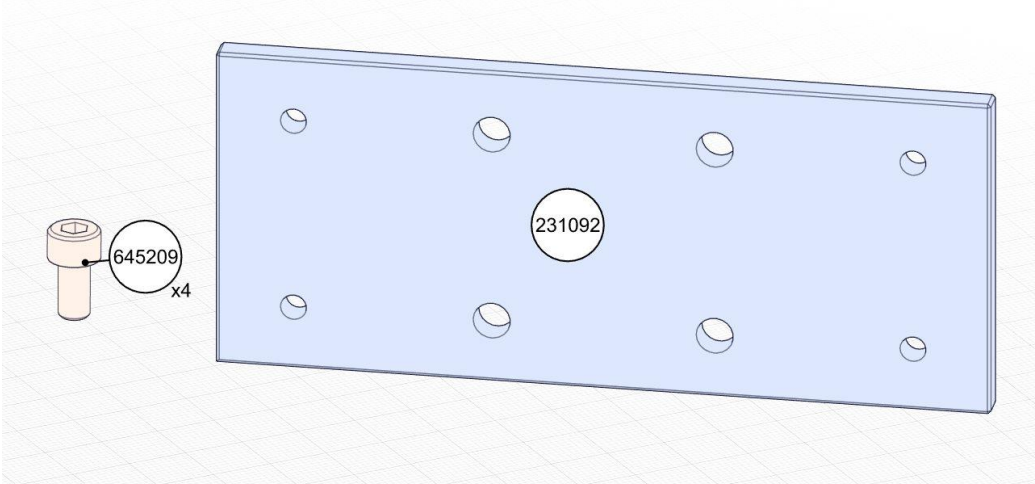


Addendum to Z-Axis Assembly

If the bearing blocks do not have the plate attached as shown above and instead look like these, please do the following.

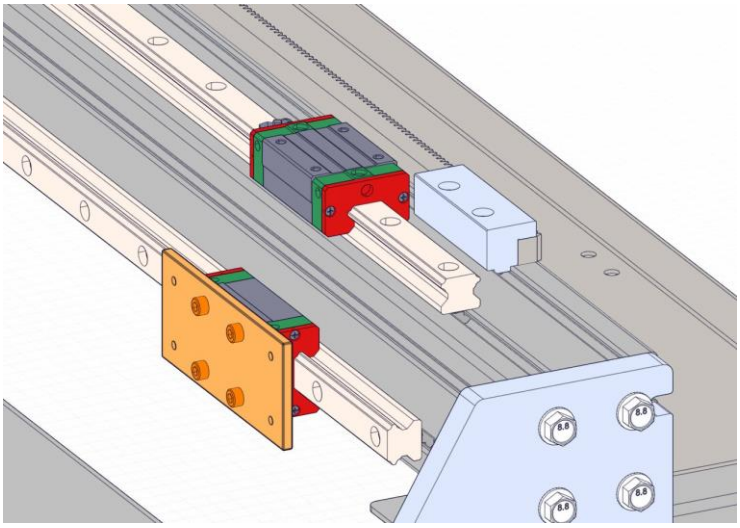


a. Locate these parts.

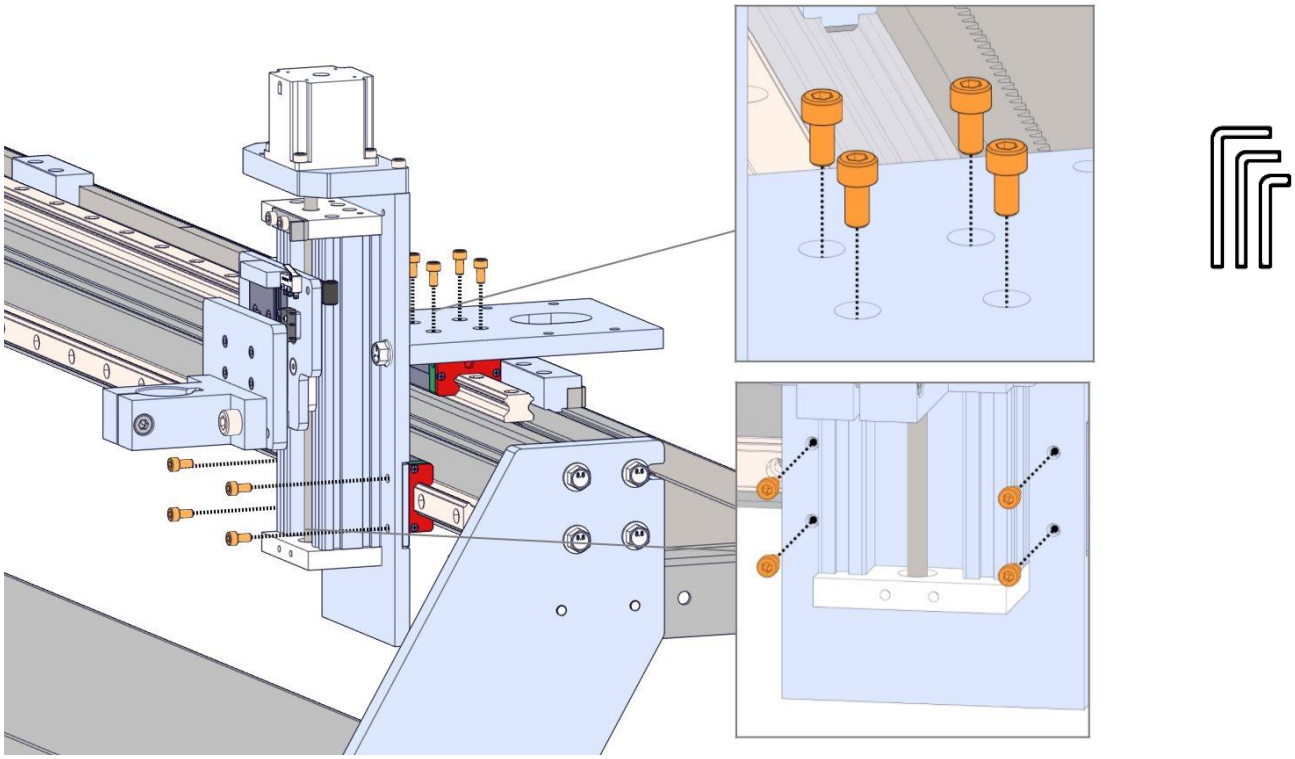


Number	Qty	Part Description
645209	4	Screw Socket Head Cap M5x0.8x10
231092	1	Z-Axis Carriage Plate

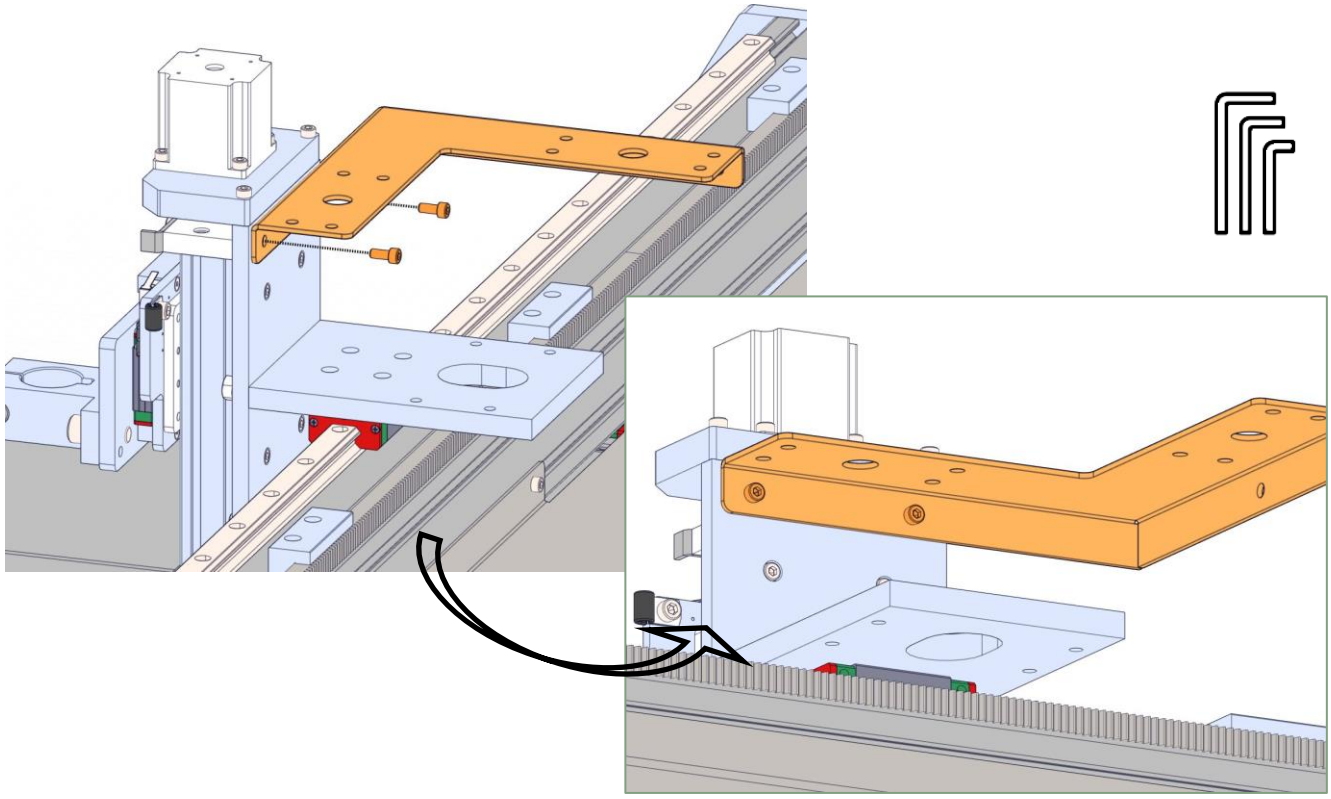
b. Line up the 4 center holes of the plate to the bearing block. Insert the 4 bolts **645209** and tighten.



76. Line up the Z-axis assembly to the plate and bearing block. Insert the 4 bolts **645209** at the front of the assembly and 4 bolts at the top and tighten.

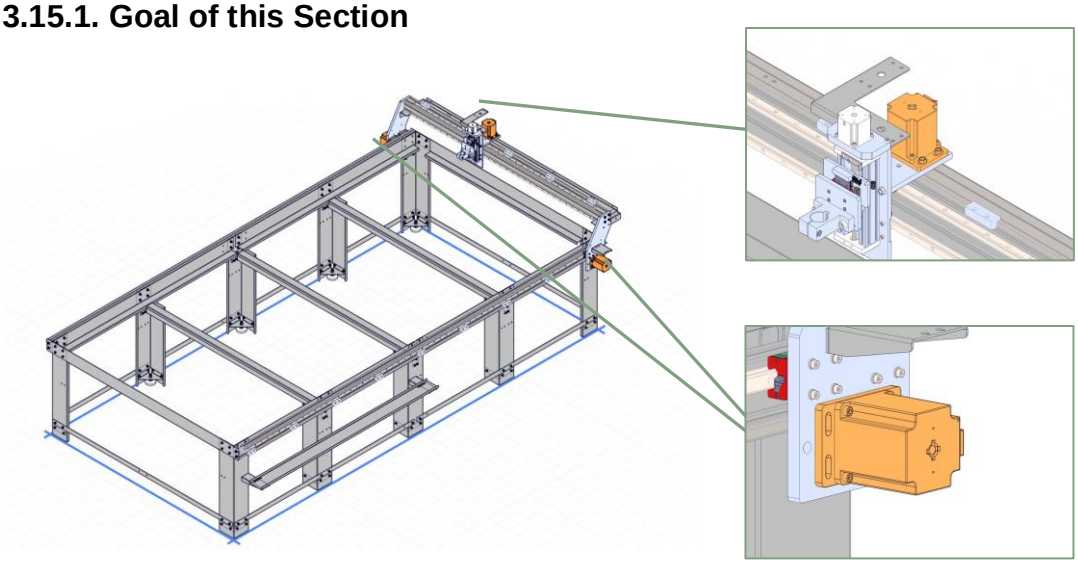


77. On the back of the Z-axis assembly, line up the bracket to the back top portion of the assembly and tighten the 2 bolts **645076** until snug.

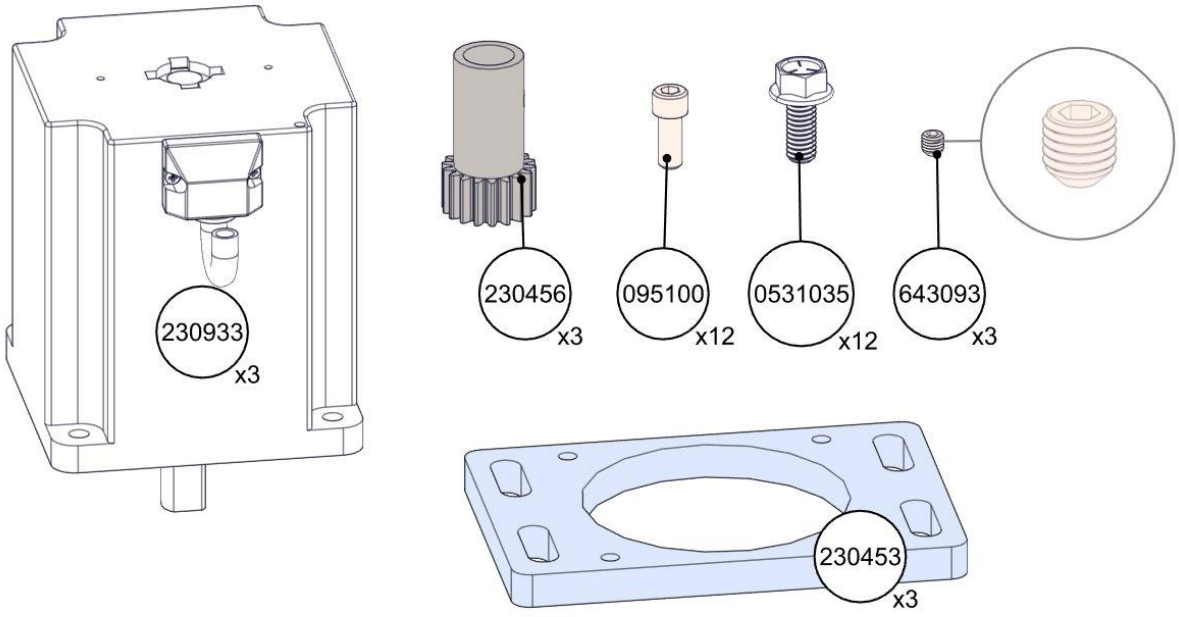


3.15 X-Axis and Y-Axis Motors

3.15.1. Goal of this Section



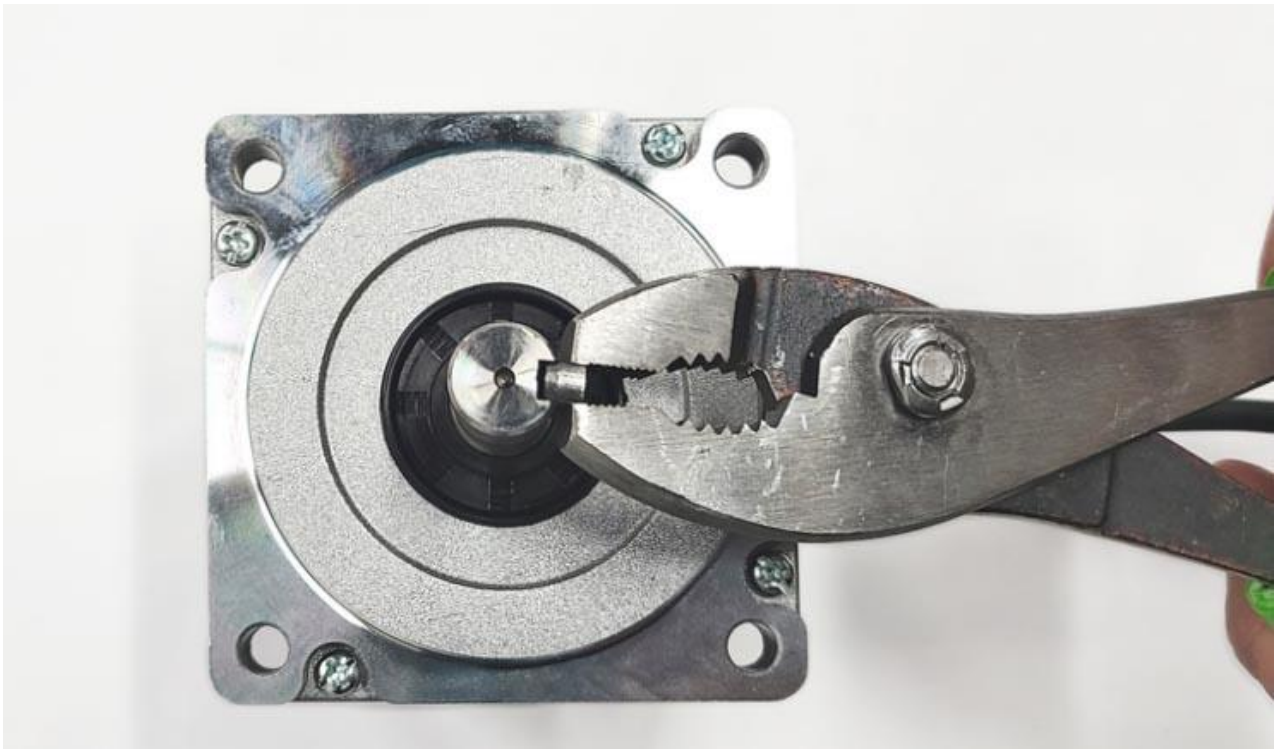
3.15.2. Parts List



Number	Qty	Part Description
230933	3	Stepper Motor Assembly for X or Y Axis (labeled X, Y, Y1)
230456	3	Pinion
095100	12	Screw Socket Head Cap 1/4-20 X 5/8"
0531035	12	Screw Hex Head Flanged 5/16-18 X ¾
643093	6	Set screws for pinion
230453	3	Motor adjustment plate

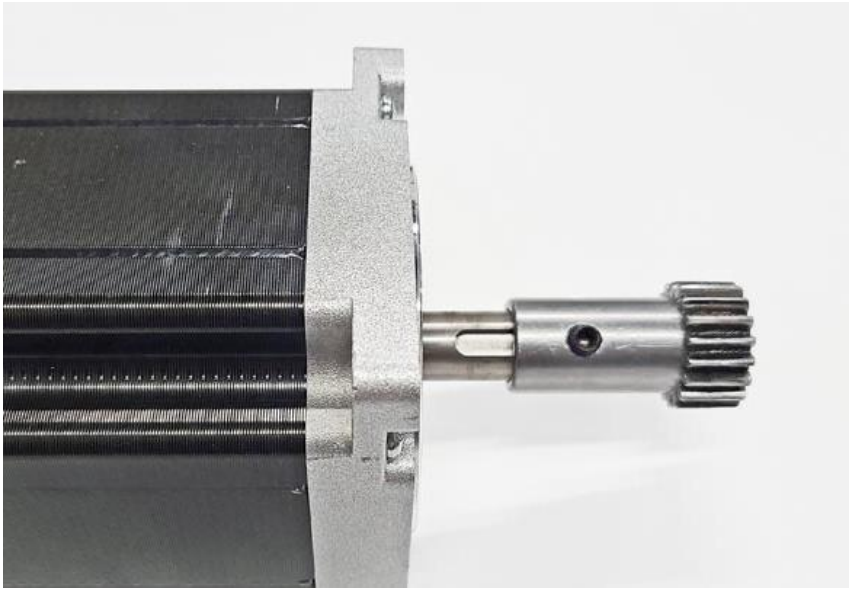
3.15.3. Steps

78. Start with any motor. Flip the motor upside down. Using pliers, remove the keyway insert from the motor shaft.

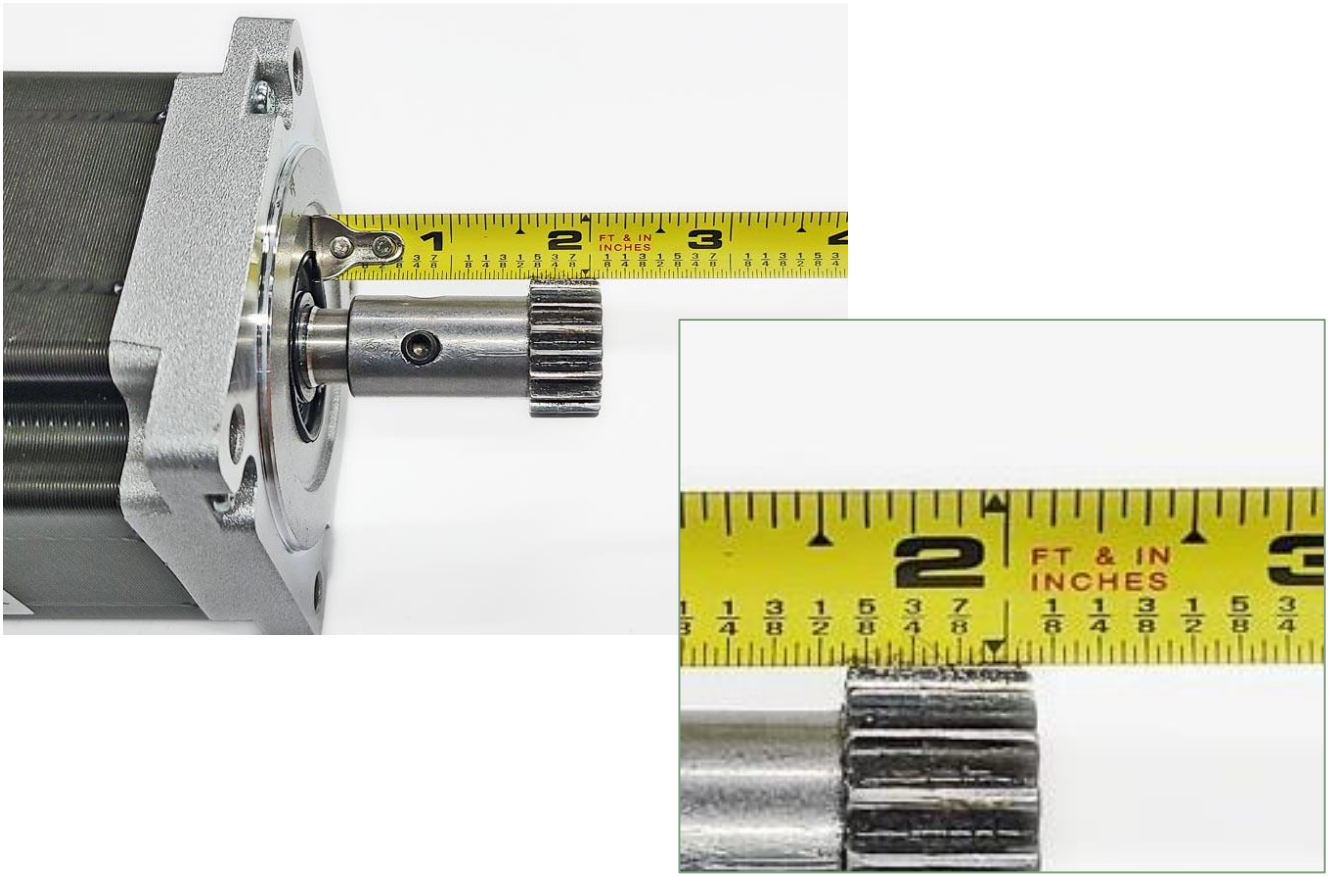


79. Insert one set screw into the pinion.

80. Line up the set screw on the pinion with the keyway on the motor shaft and then slide the pinion onto the motor shaft.

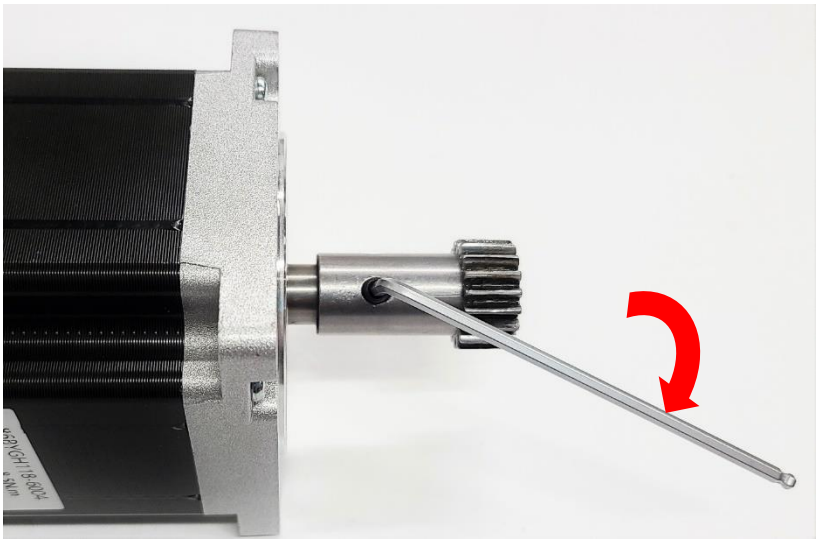


81. Set the **starting** distance for the pinion. This will need to be adjusted once the motor is in place. The total distance from the bottom face of the motor to the end of coupler is 2-$\frac{1}{16}$" (2.0625").



82. Tighten the set screw until snug.

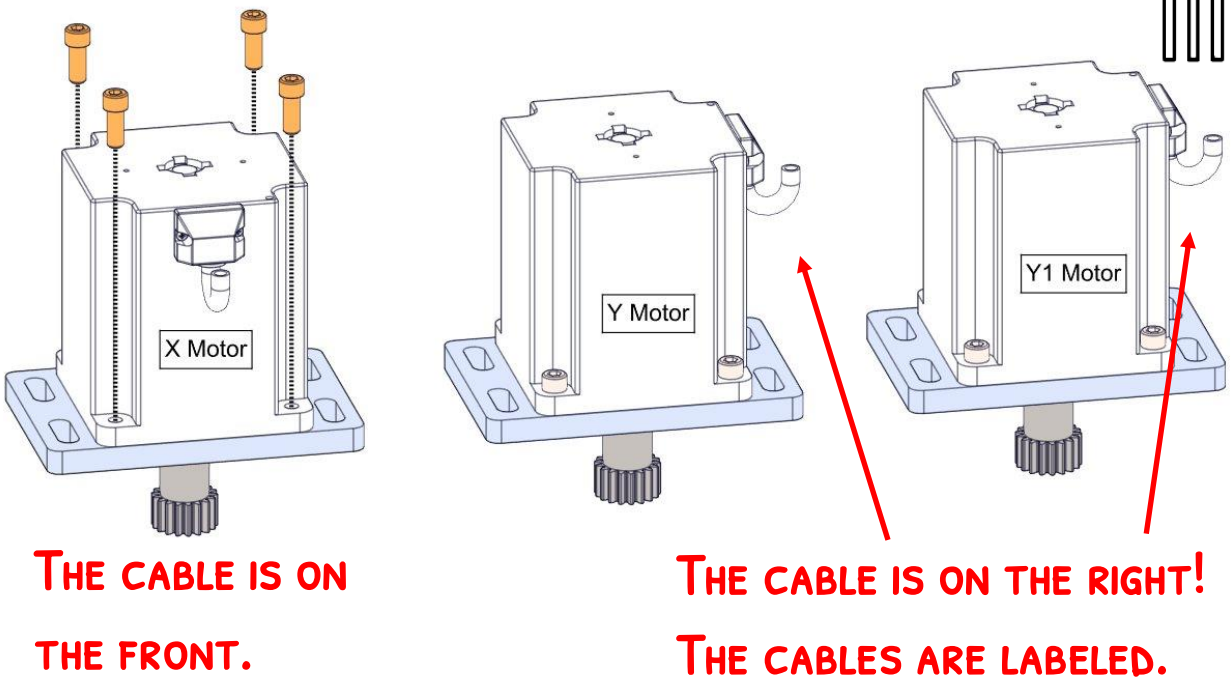
83. Repeat the above steps with the other 2 motors.



3X

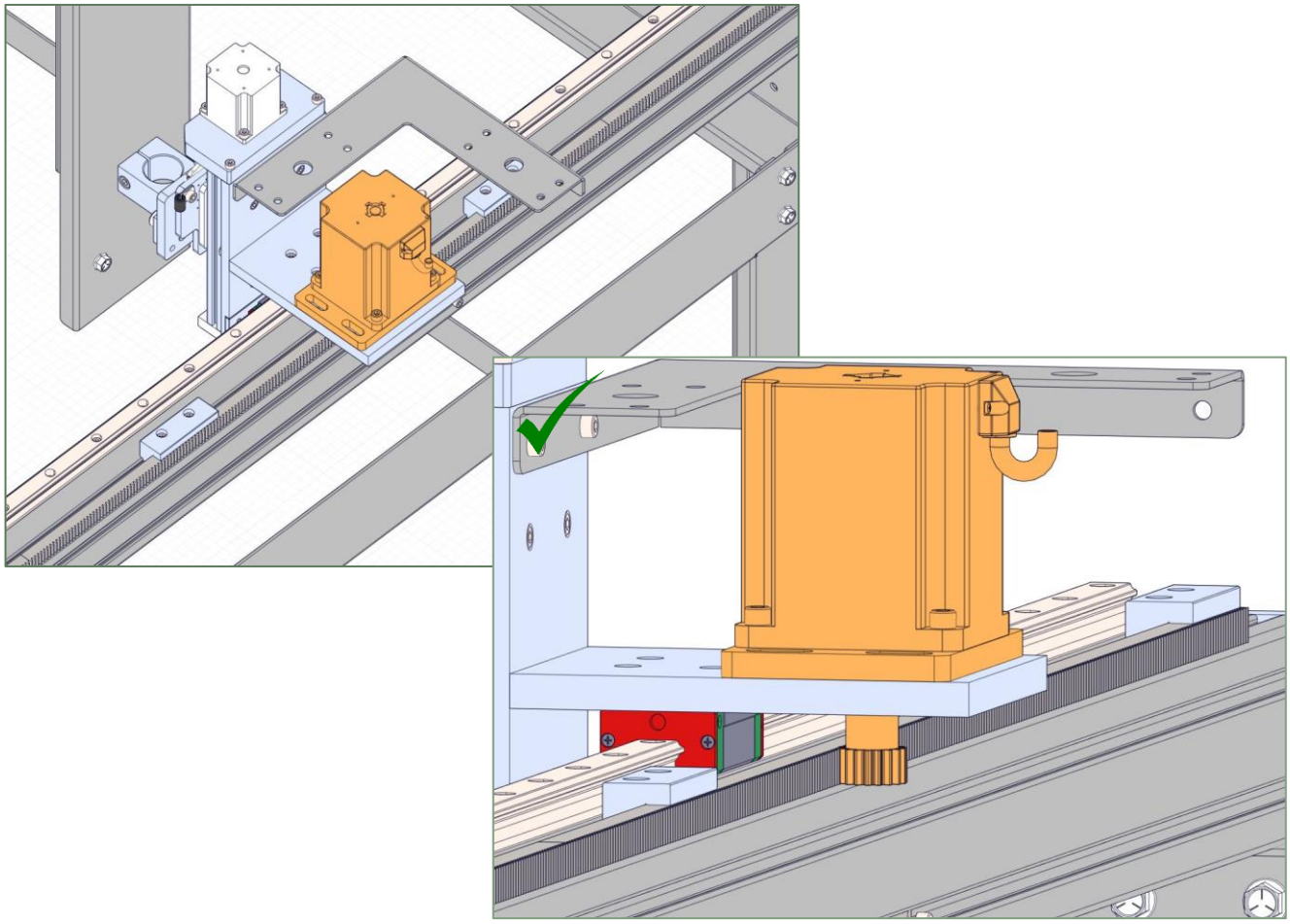
84. Line up one motor onto the motor adjustment plate. Insert the 4 socket head cap bolts and tighten. Notice the cable is on the front of the motor. This will be the X Motor.

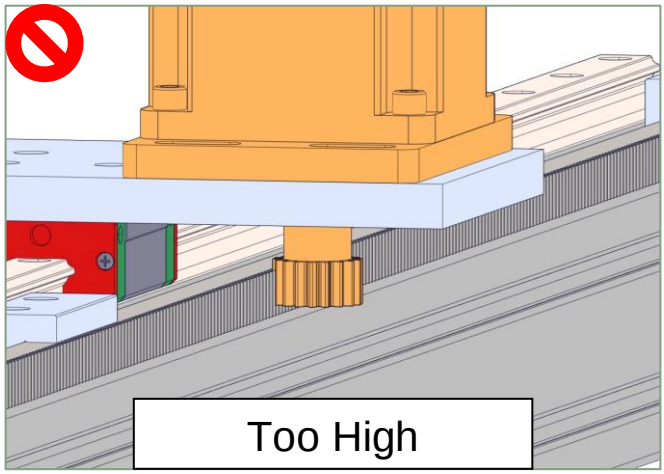
85. The other two motors will be done in the same way but **rotated 90°** on the motor mounts. Notice the cable is on the right side. These will be the Y and Y1 Motor.

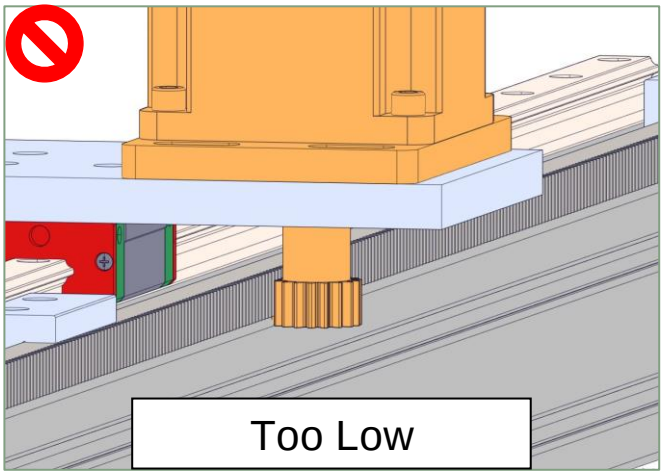


TIP: The motors are identical. The cables that will attach to the motors are not. Be mindful of the label on the motor cable so that you connect the correct cable to the right motor.

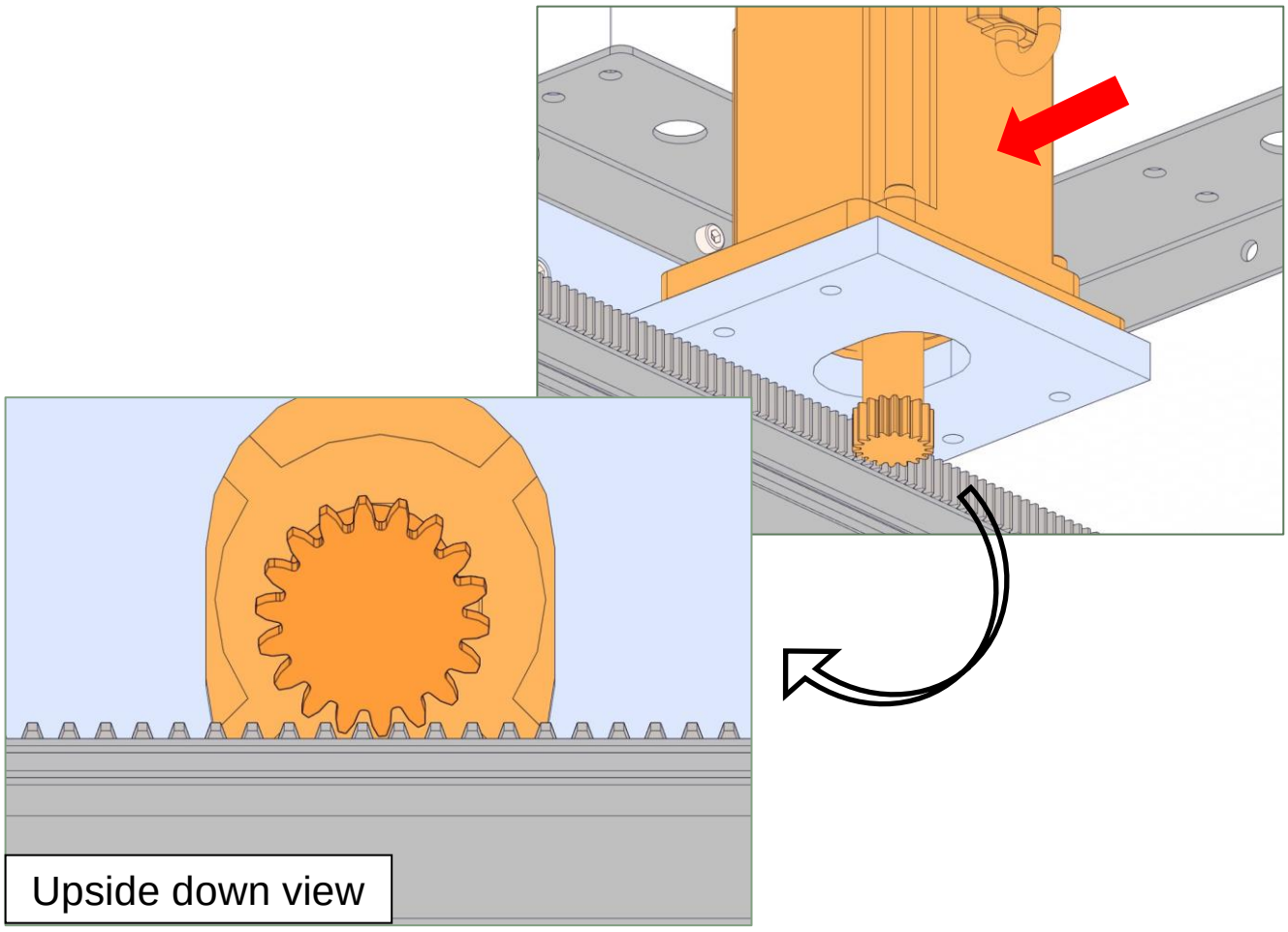
86. Place the X motor onto the back of the Z-axis assembly. Rotate it so that the cable faces outward, towards the back. **Check the pinion height first**. Take the motor off and adjust the pinion as described before if needed.



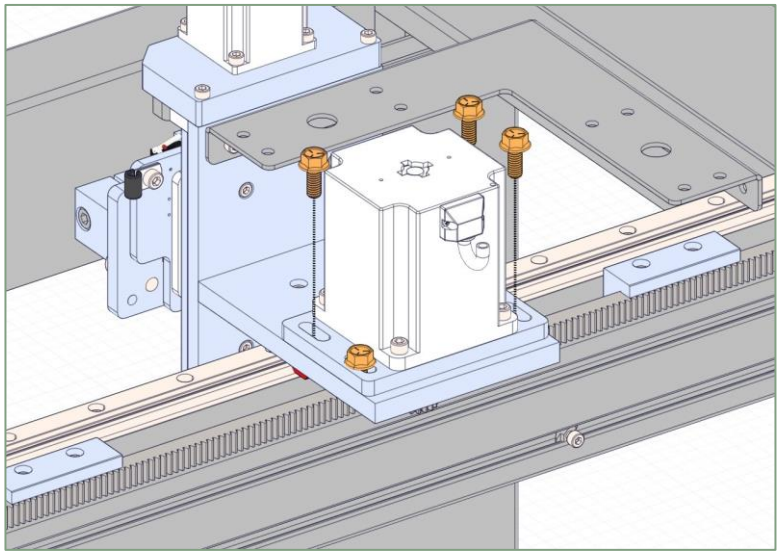


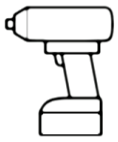


87. Now position the motor as far as it will go so that the pinion lines up and **fully engages with the teeth** of the rail.

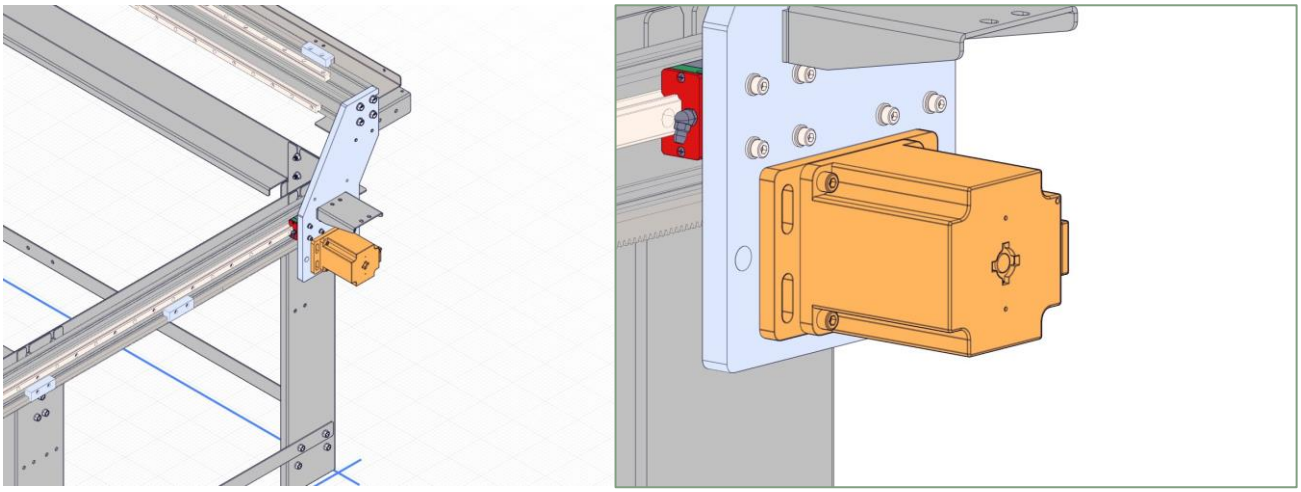


88. Align the 4 larger bolts to the holes of the motor adjustment plate and tighten.

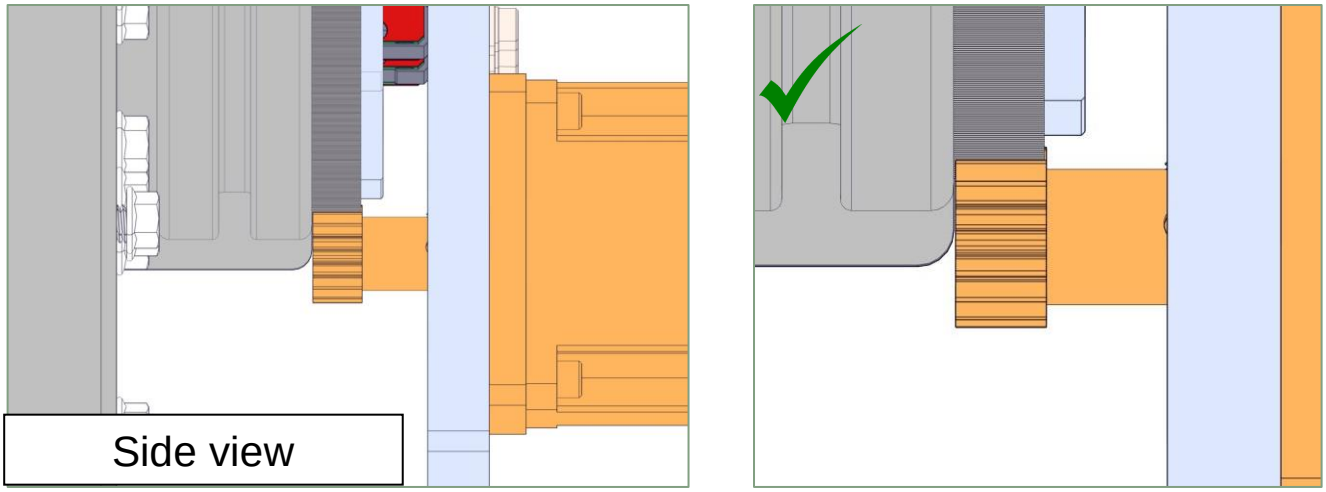




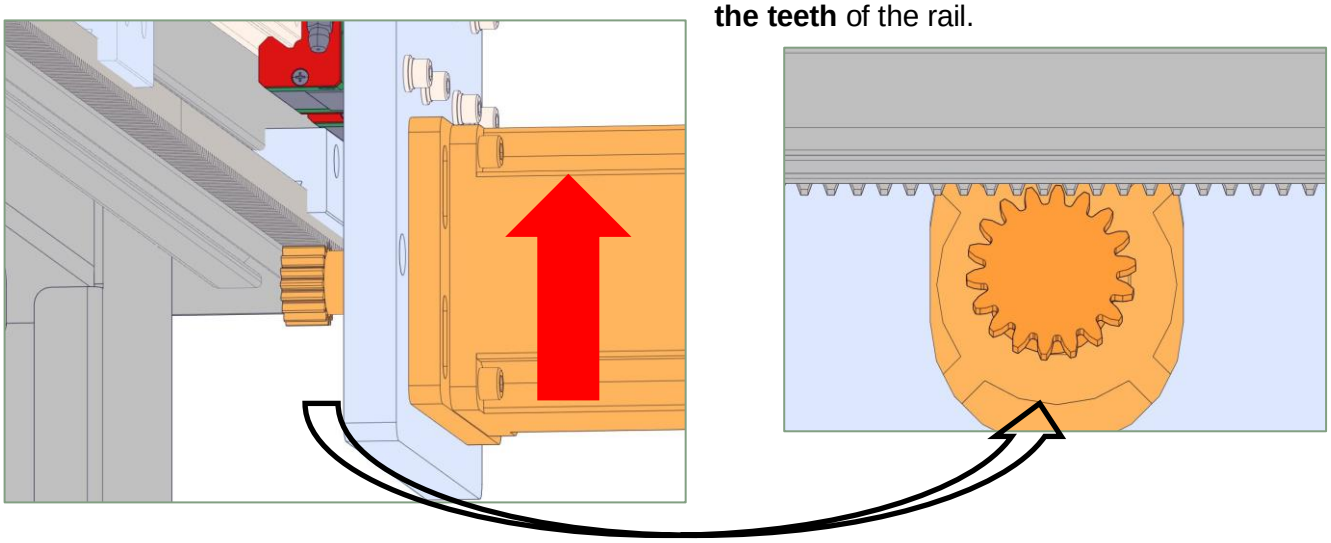
89. Repeat the process with the other two motors. The **Y1 motor** will go on the right side of the machine. Align the Y1 motor to the holes on the bottom of the right side plate.



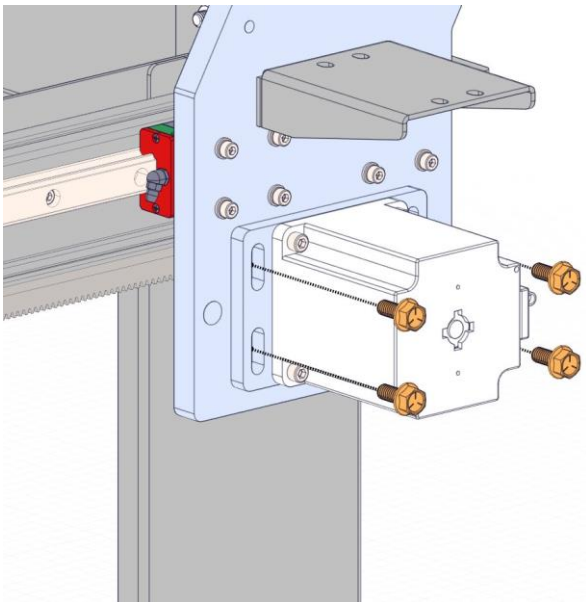
a. Like before, check and adjust the pinion depth first.



b. Then position the motor as high as it will go so that the pinion lines up and **fully engages with the teeth** of the rail.



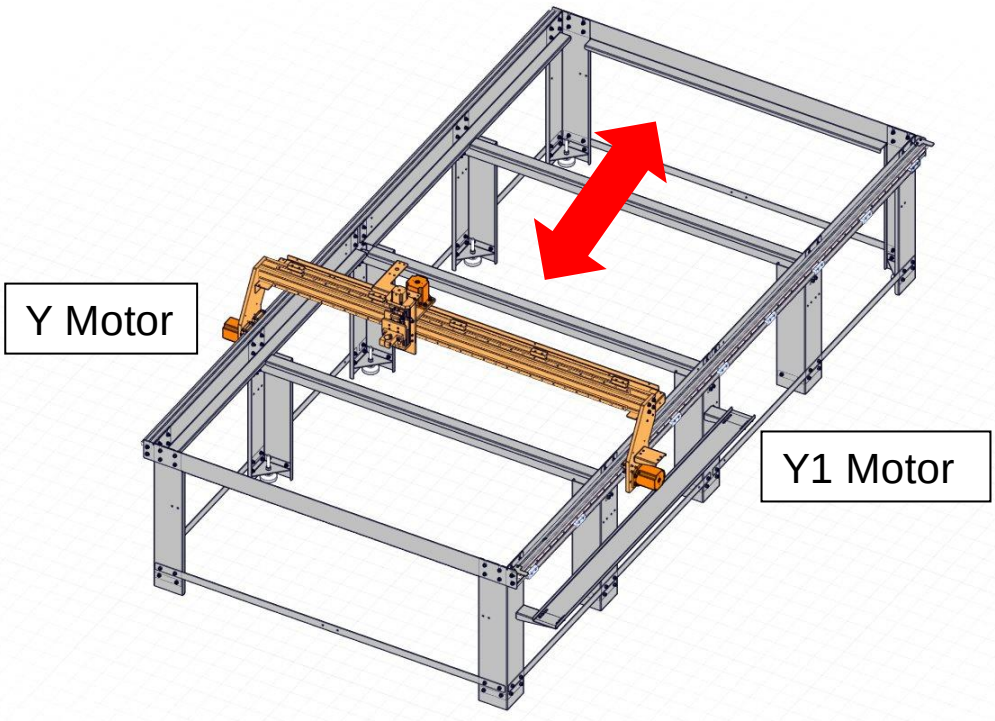
90. Align the 4 larger bolts to the holes of the motor adjustment plate and side plate and tighten.



2X

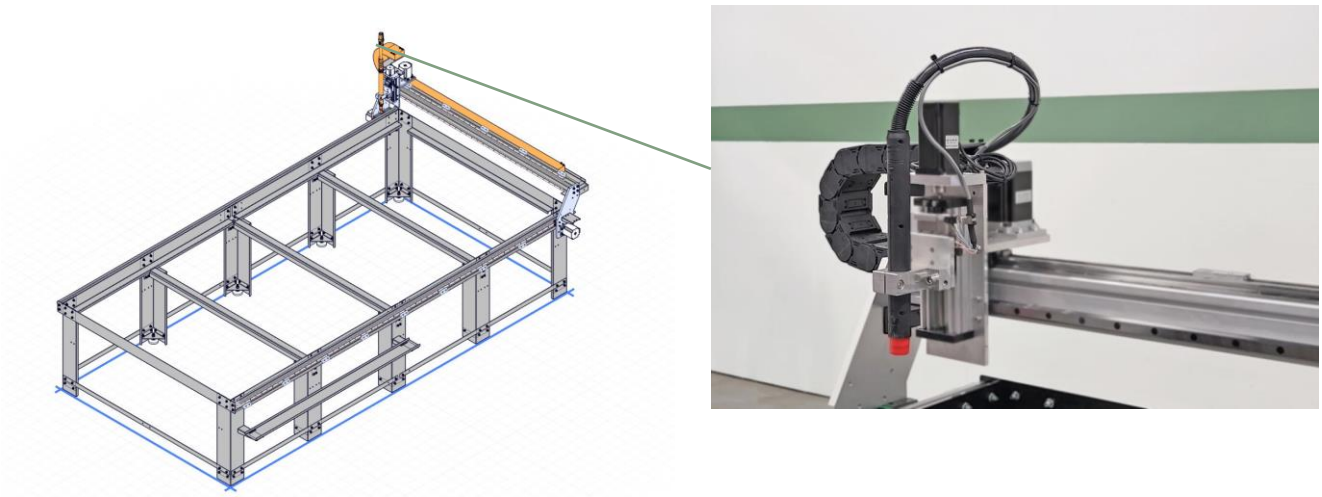
91. Repeat the process on the left side of the machine with the **Y motor**.

92. Move the gantry up and down the length of the machine to make sure it moves easily. Adjust motors as needed.

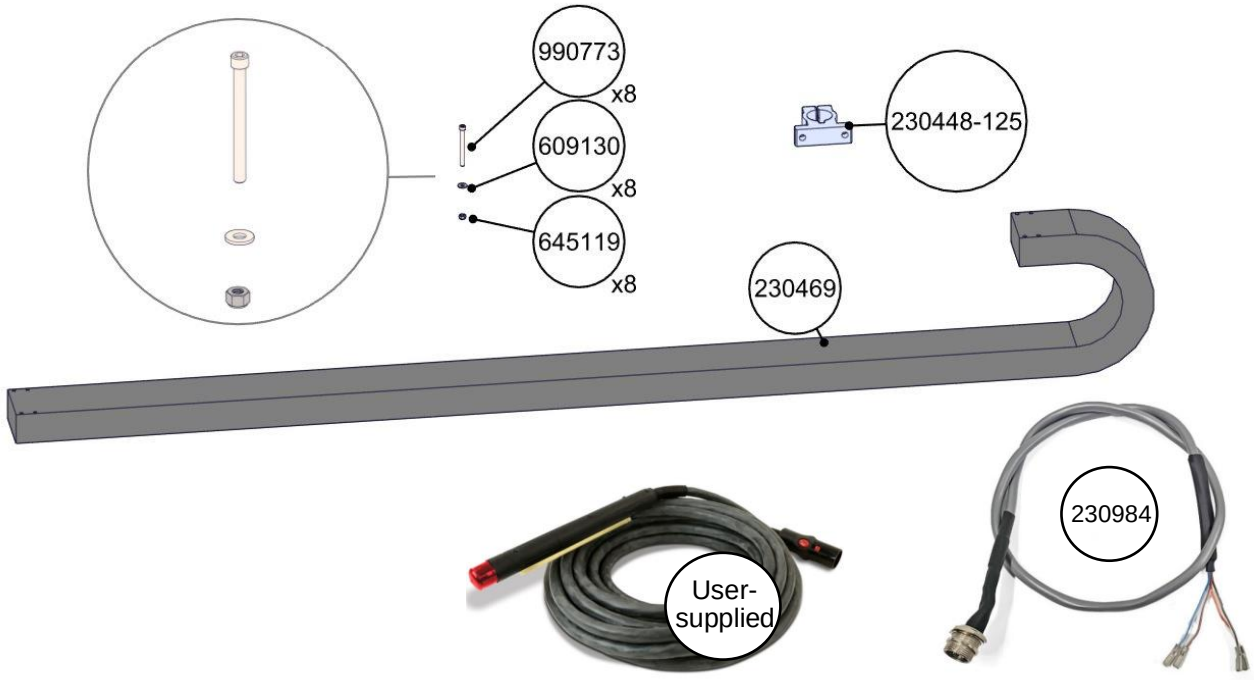


3.16 X-Axis Cable Carrier & Connections

3.16.1. Goal of this Section

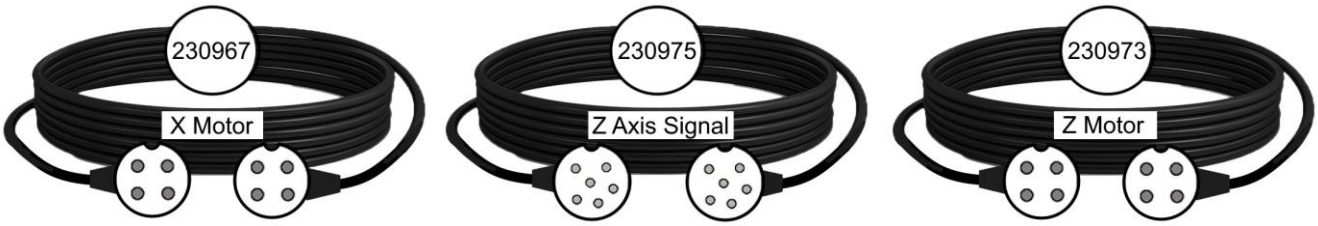


3.16.2. Parts List



Number	Qty	Part Description
990773	8	Screw Socket Head Cap M6x1.0x70
609130	8	Washer Plain 1/4" Light
645119	8	Nut, Nylon Insert, M6-1
230469	1	X-Axis Cable Carrier
230448-125	1	125amp torch holder- only need if 125amp plasma is being used
User supplied	1	Torch lead from the plasma source
230984	1	Sensor Pigtail Z-Axis Cable

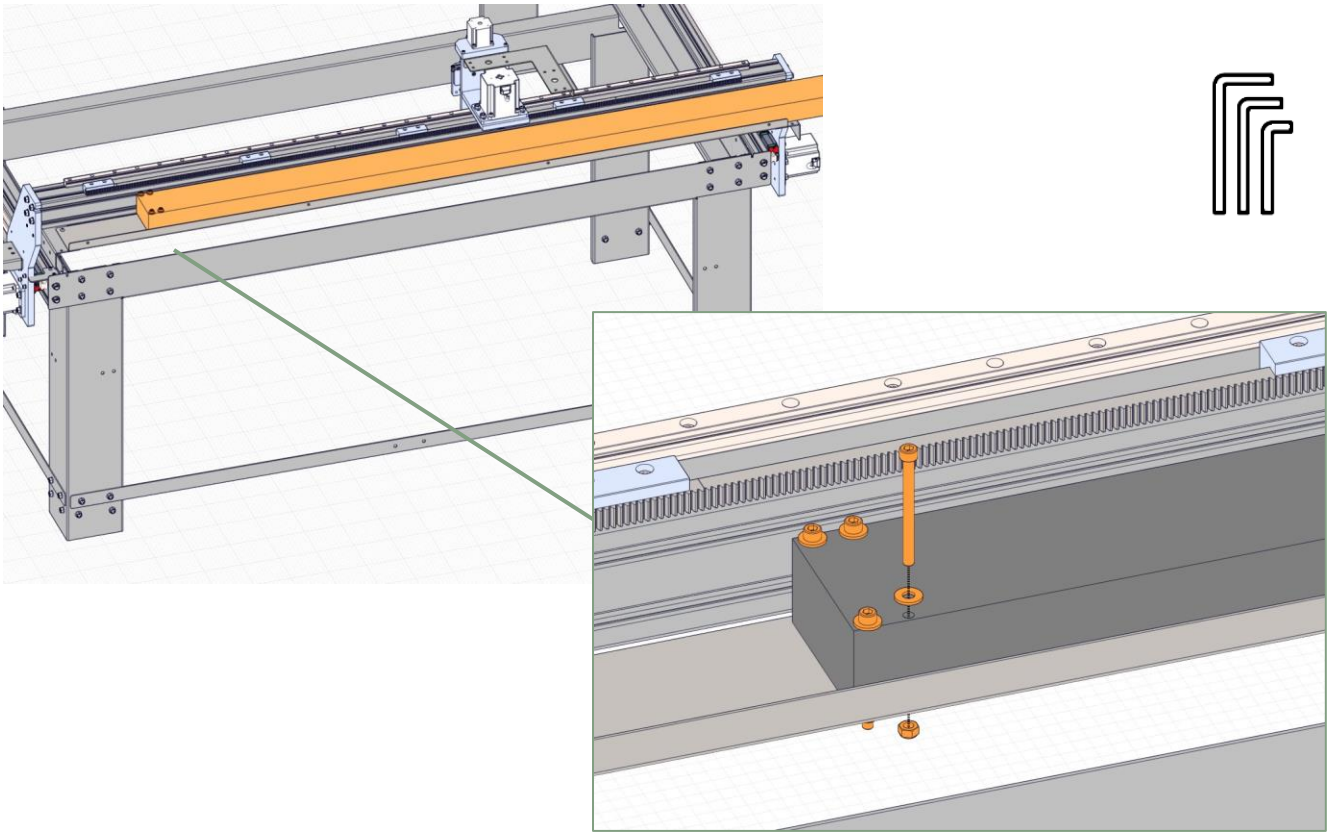
Parts list continued next page.



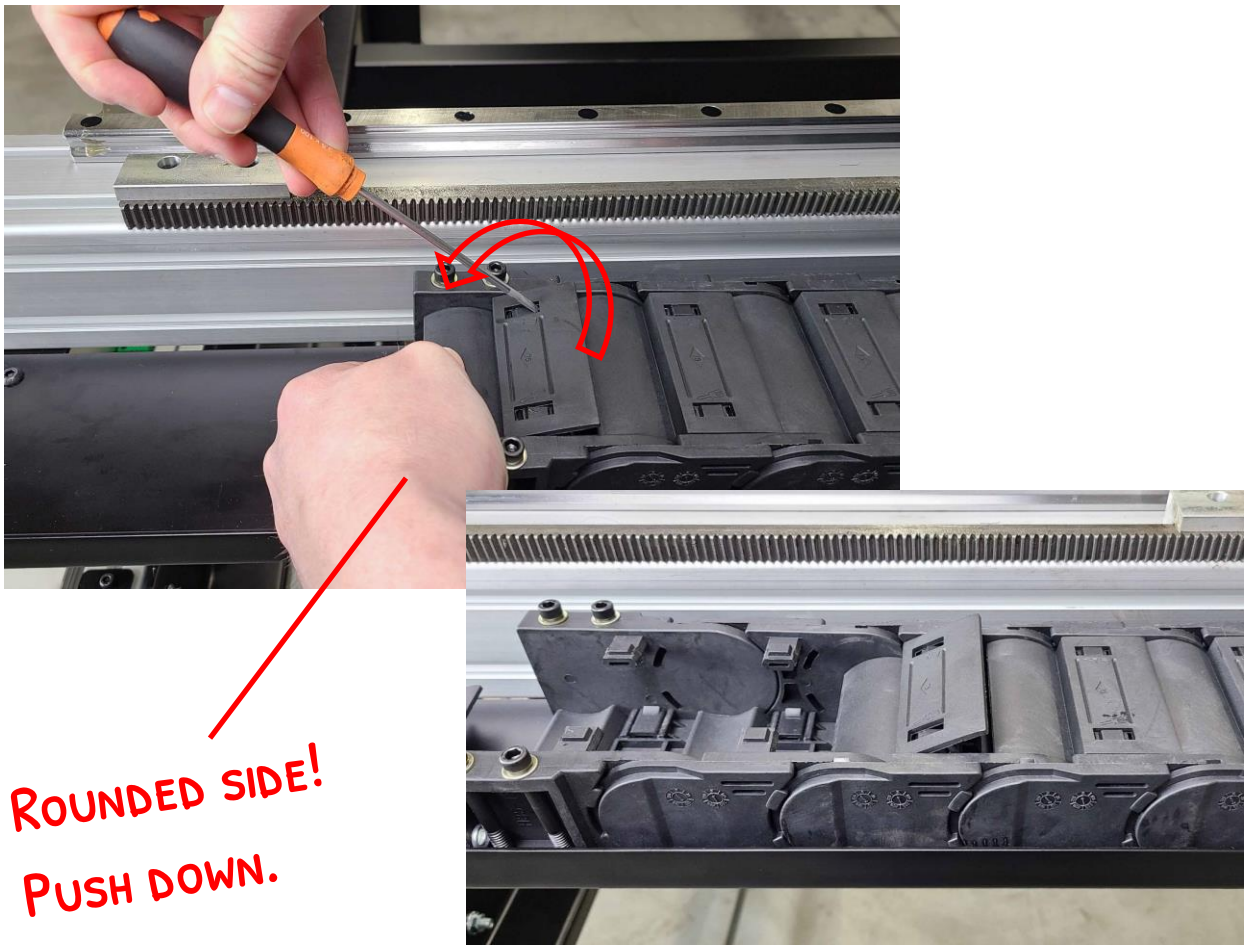
Number	Qty	Part Description
230967	1	X Motor cable
230975	1	Z-Axis sensor signal cable
230973	1	Z motor cable

3.16.3. Steps

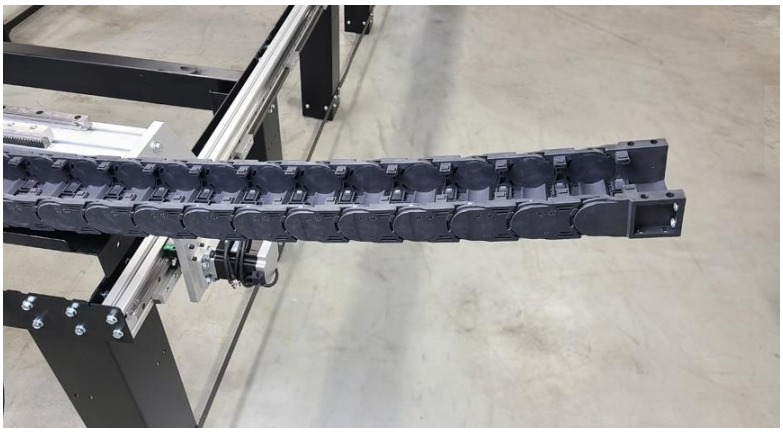
93. On the back of the machine, place the X-axis cable carrier onto the X-axis tray. Align the four bolt holes of the carrier with the holes on the tray, closest to the Y1 motor. Insert the four bolts, with washers, into the cable carrier and tray. Place the nuts on the bottom and tighten.



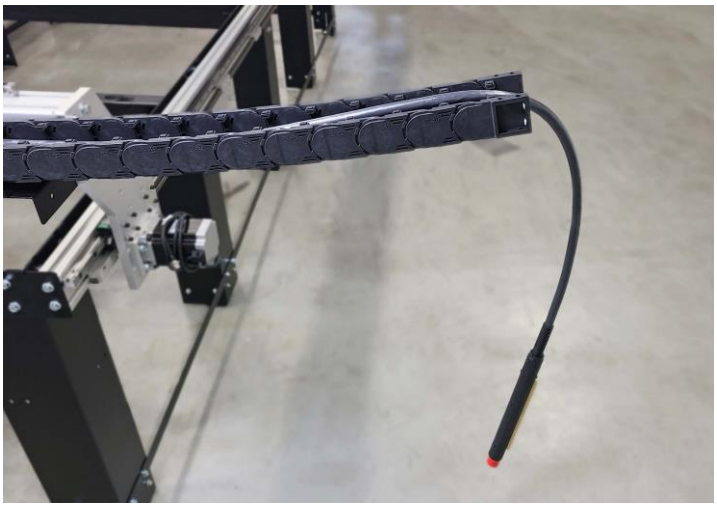
94. On the cable carrier, start removing links in the cable carrier with whichever end has the **rounded side of the link** exposed. To remove a link, insert the flathead screwdriver into one of the slots closer to the square end. Push down just a bit, gently. With your other hand, push down on the rounded end. Switch the screwdriver to the other slot to unsnap and release the link. If a link is very difficult to take out, you can wedge a second flathead between the links on the square side to pivot that side up.



95. Remove all the link covers on the top of the cable carrier.



96. Lay the torch lead into the cable carrier. When facing the back of the machine, the end with torch should be on your right. Let it overhang by about 3 feet.



97. Insert the following cables into the cable carrier. Both ends are identical, so orientation does not matter. These can stick out of the cable carrier a couple of inches.

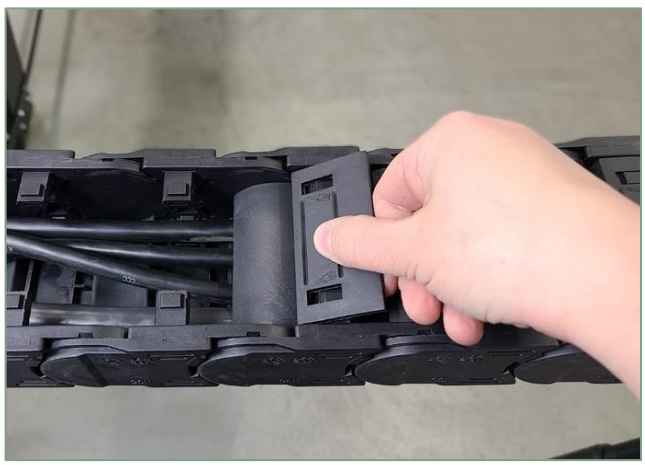
a. **X motor cable**

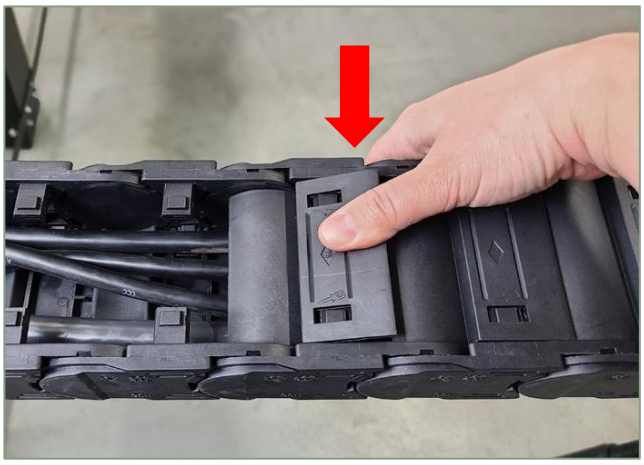
b. **Z-axis signal cable**

c. **Z motor cable**

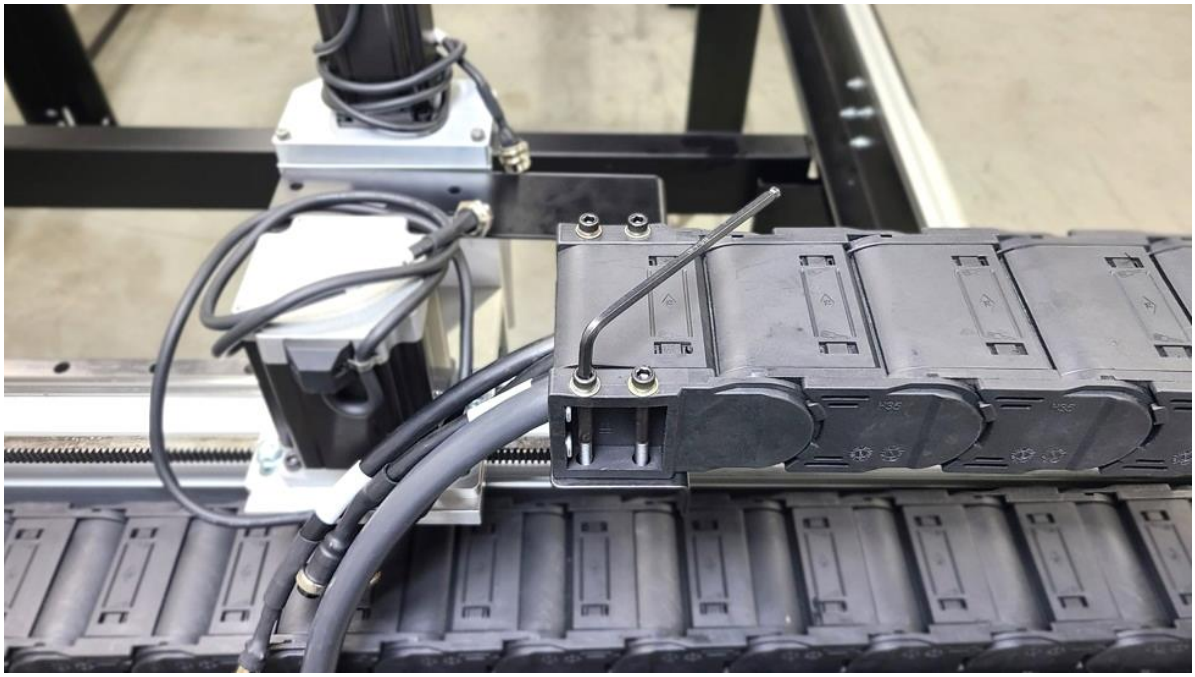
TIP: Make sure there aren't any kinks or knots in the cables.

98. Replace the link covers in the cable carrier. With the rounded side going in first, angle the link cover, align the rectangular holes, and then snap the link cover into place.



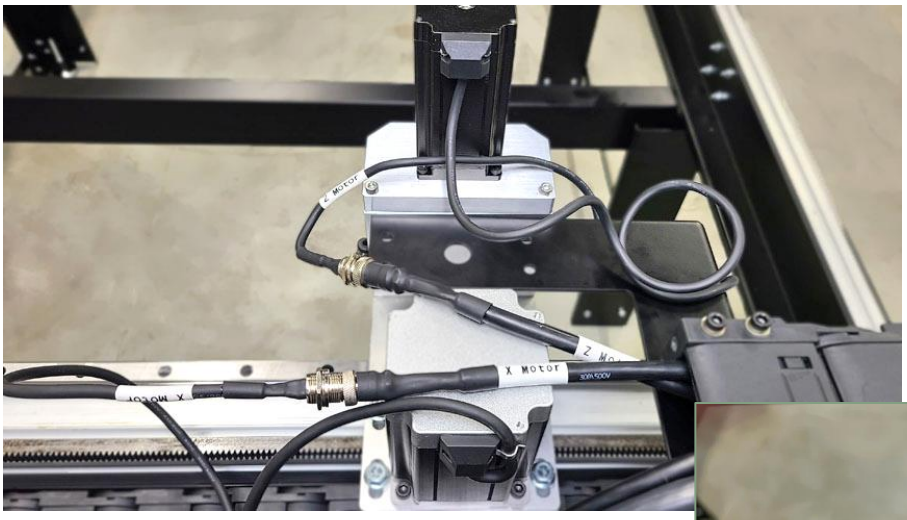


99. While facing the back of the machine, take the right end of the cable carrier and turn it up and then back to the machine. Align the holes on the end of the carrier to the X-axis bracket on the bridge. Insert the four bolts with washers into the other end of the cable carrier and tray. Place the nuts on the bottom and tighten.



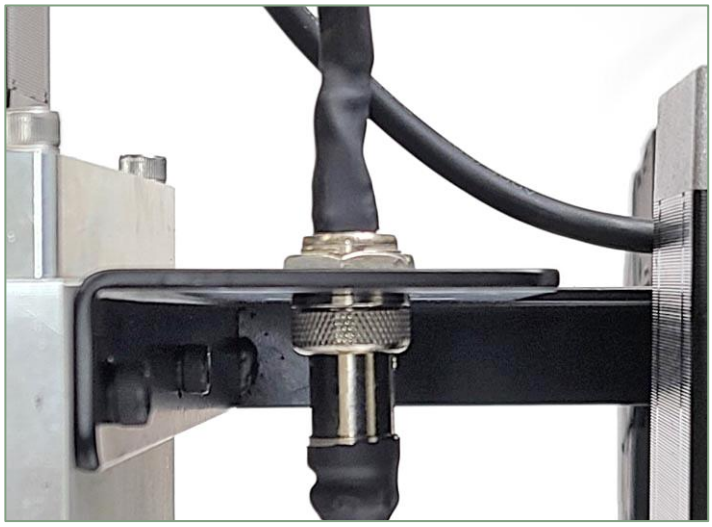
100. Connect the **Z motor cable** to the **Z motor**. Turn the locking ring to lock the connection.

101. Connect the **X motor cable** to the **X motor** in the same way. The z motor and x motor have the same connections so double-check the labels.

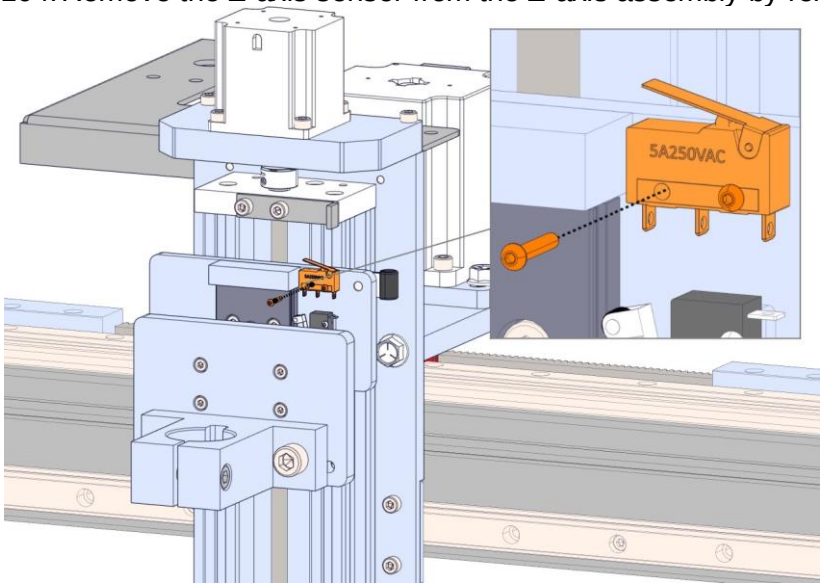


102. Unscrew and remove the lock nut and washer from the **sensor pigtail cable**. Run the cable into the hole on the Z-axis bracket on the back of the Z-axis assembly.

103. Connect the **Z-axis signal cable** to the sensor pigtail cable and tighten the nut until snug. Then tighten the nut and washer to hold it in place. You can use pliers and a wrench for better grip but **do not overtighten**.

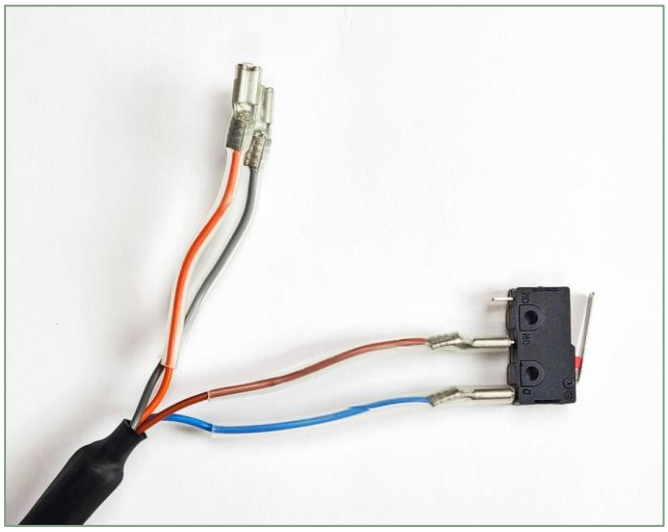


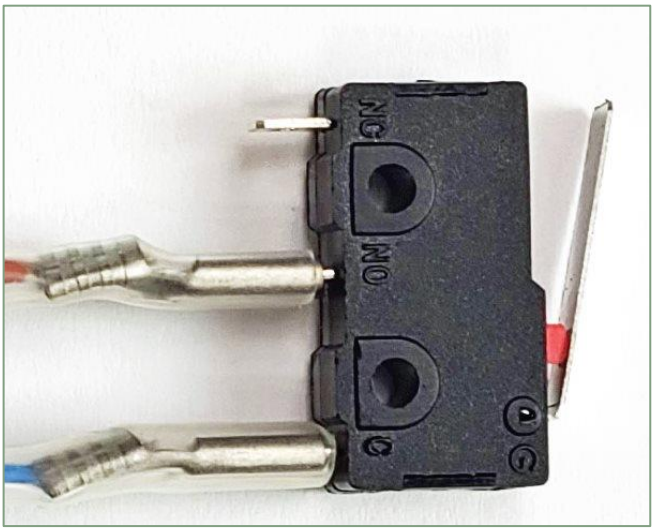
104. Remove the Z-axis sensor from the Z-axis assembly by removing the two fasteners.



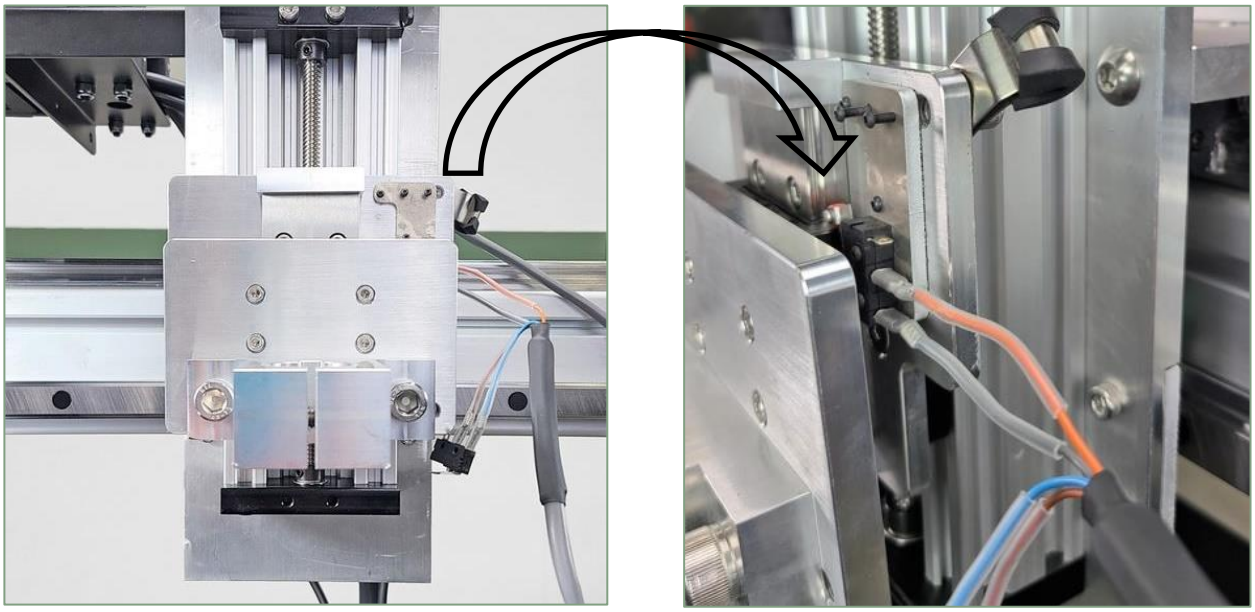
105. Connect the Z-home sensor to the leads of the pigtail cable.

Blue lead → C. (bottom) Brown → NO. (middle)

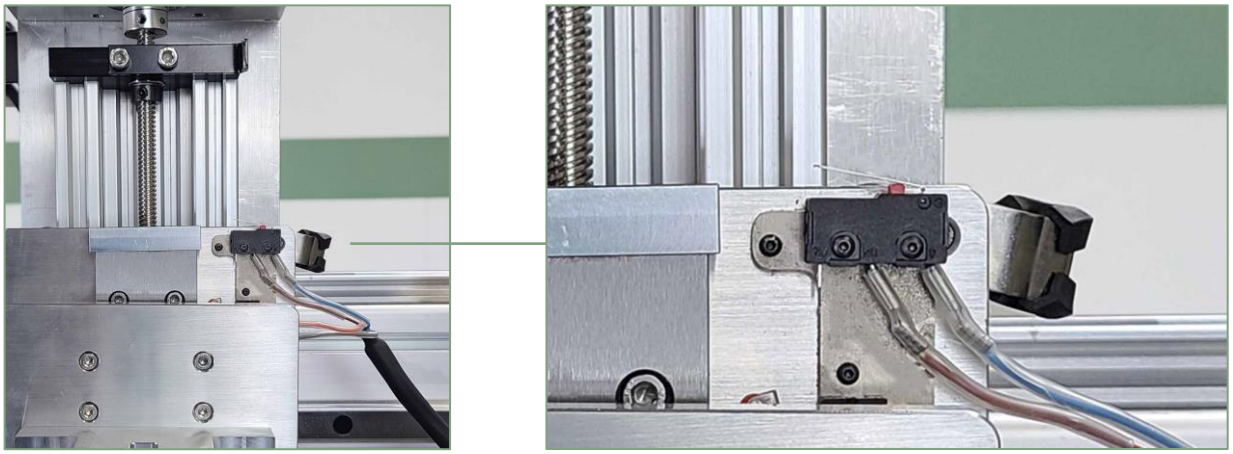




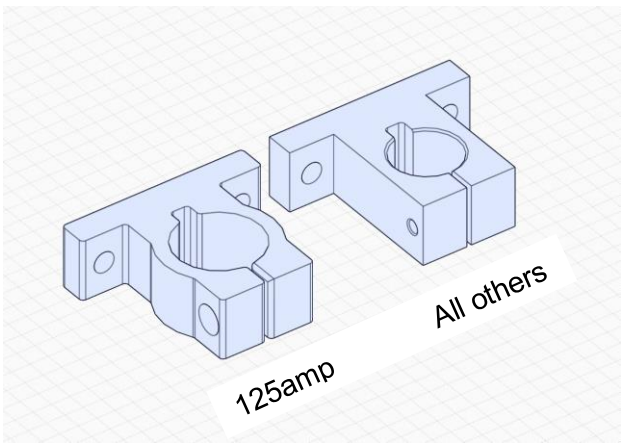
106. On the front of the Z-axis assembly, connect the other two leads to the material detect switch.
5Gray → C. (bottom) Orange → NO (middle)

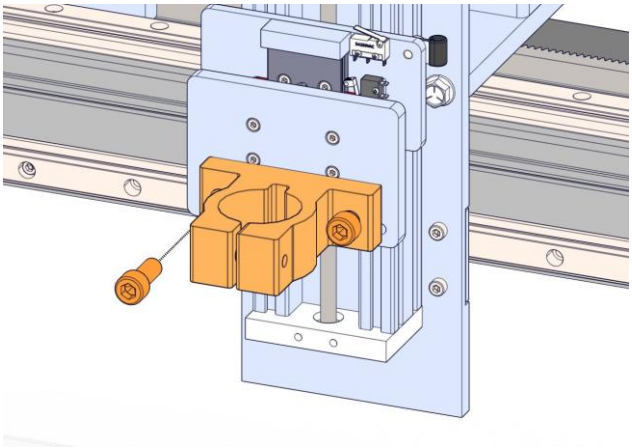


107. Mount the Z-home sensor using the two screws and bolt holes just above the material detect switch. It is okay to bend the leads a little.

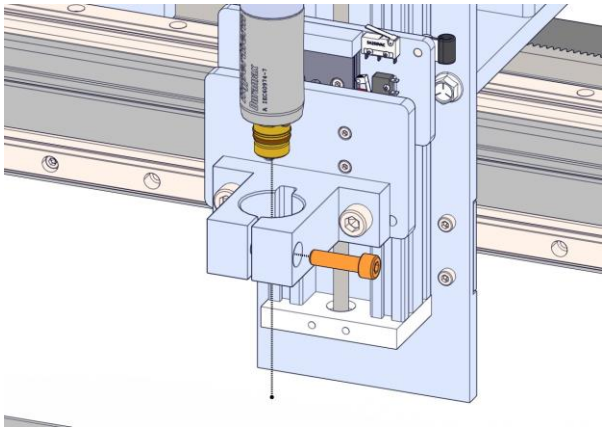


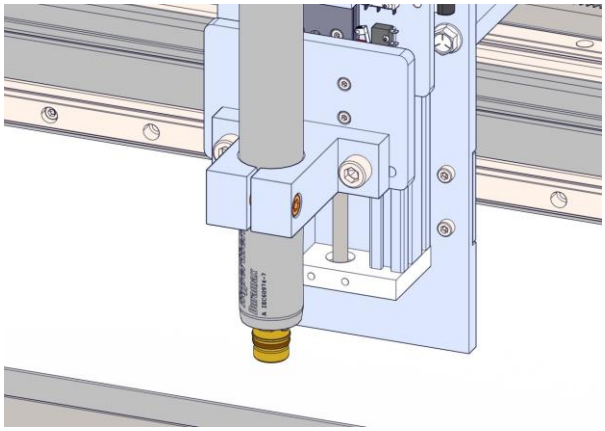
108. If the 125-amp plasma was purchased, the torch is larger, and the holder used will need to be swapped to part 230448-125. Use the bolts on the front of the holder to swap them.





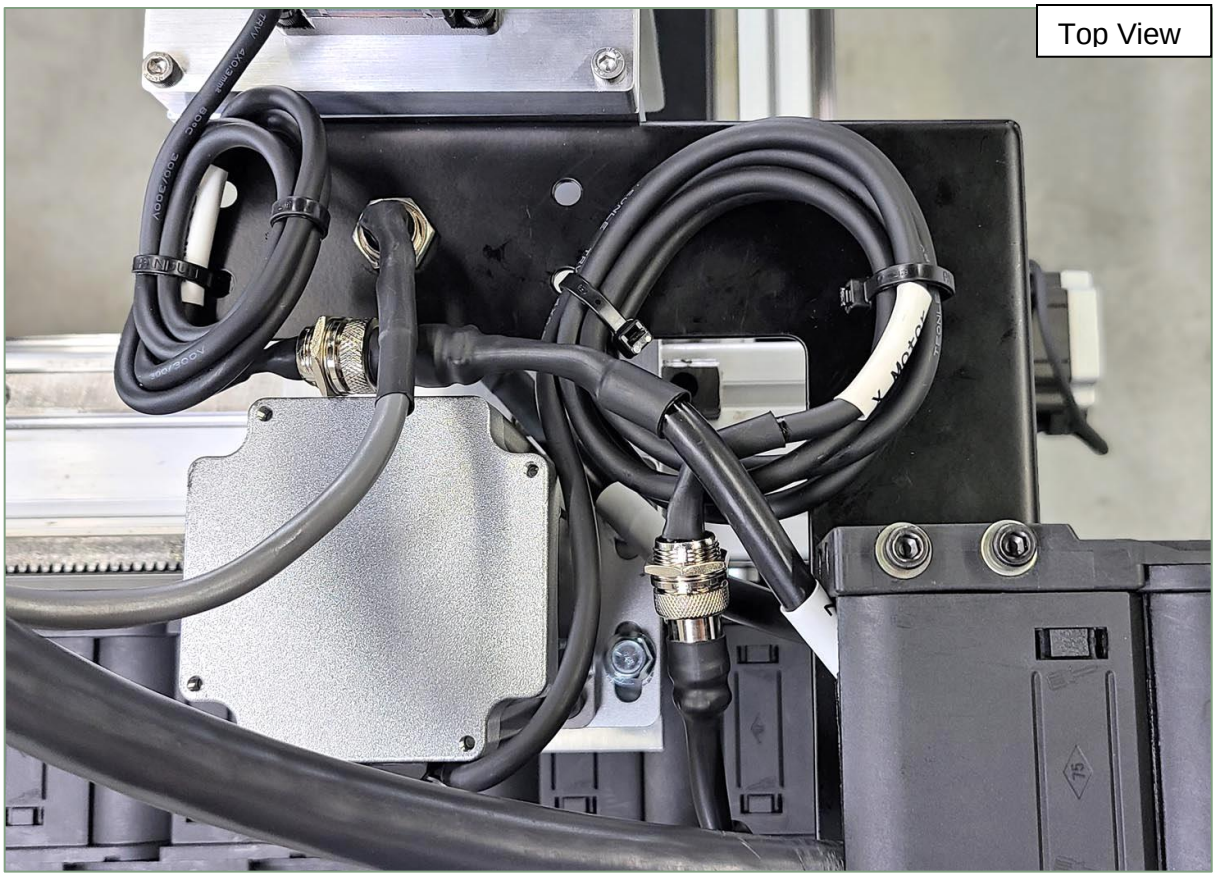
109. Loosen the bolt on the side of the torch holder. Slide the torch in and tighten the bolt. The height will be adjusted later.



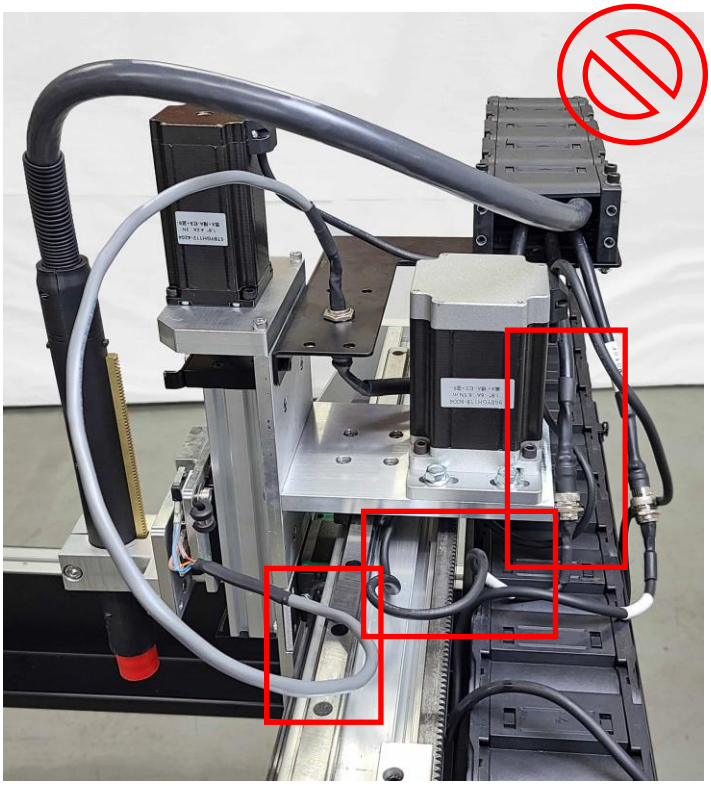


110. Use the clip on the front of the front of the machine for the sensor pigtail cable. Use zip ties to anchor the sensor pigtail cable to the torch lead.

111. Organize and zip tie the rest of the cables. See more examples on the next page.

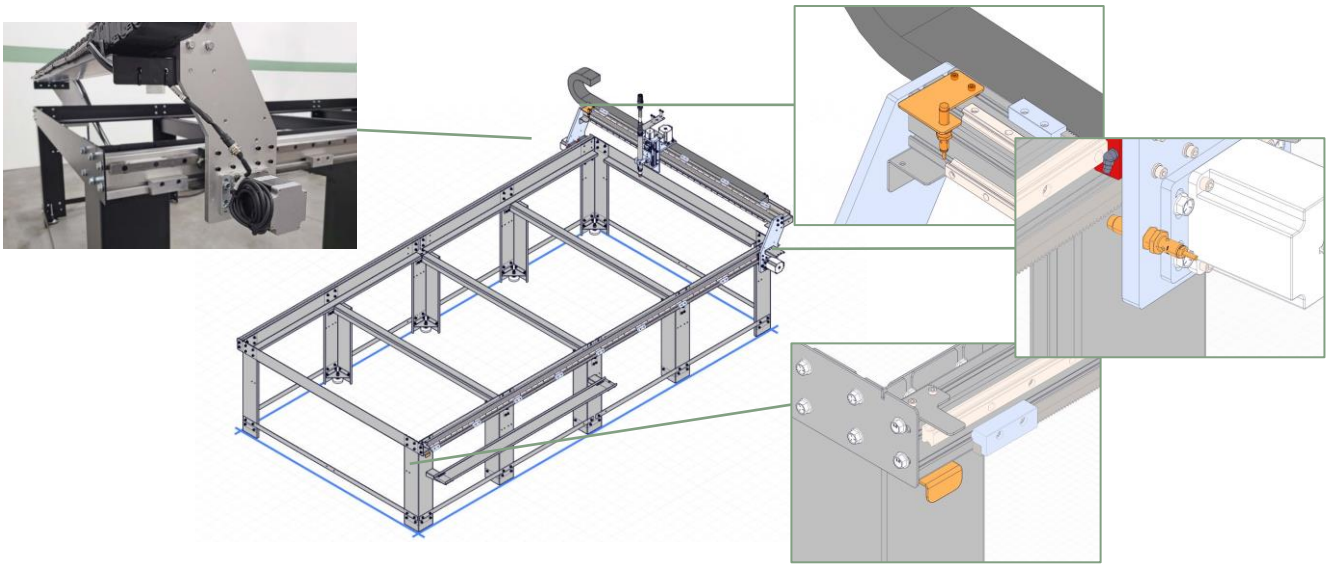


TIP: The cables do not need to be exactly as shown above. However, organize the cables so they will not get pinched, rub against other parts, or fall between any moving parts.

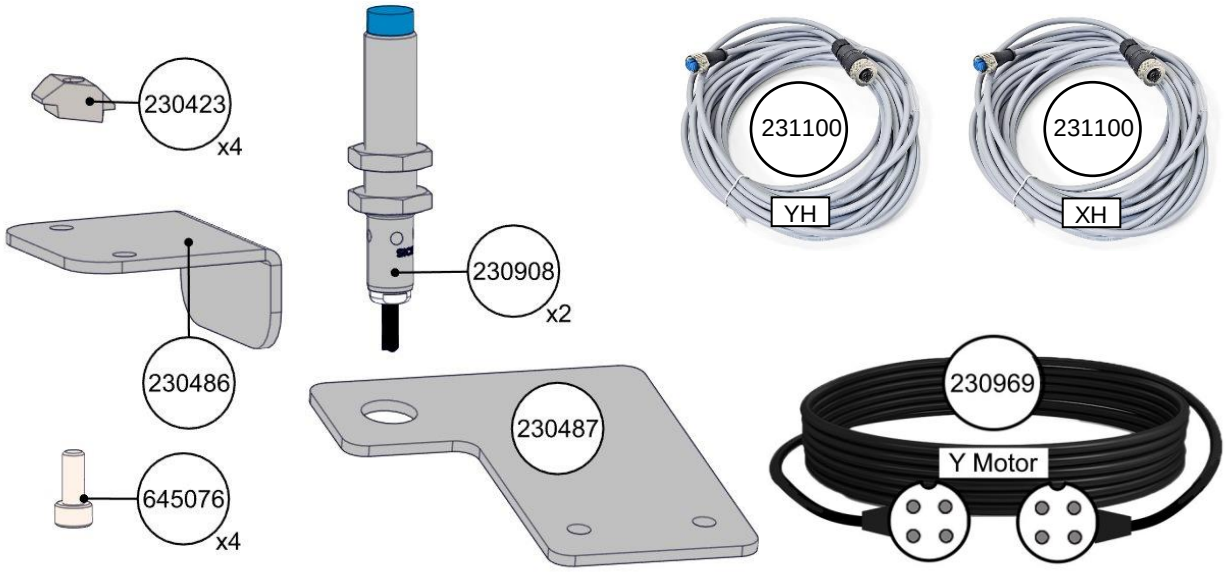


3.17 Homing Brackets & Y Motor Cable

3.17.1. Goal of this Section



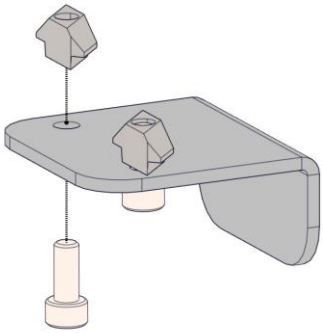
3.17.2. Parts List



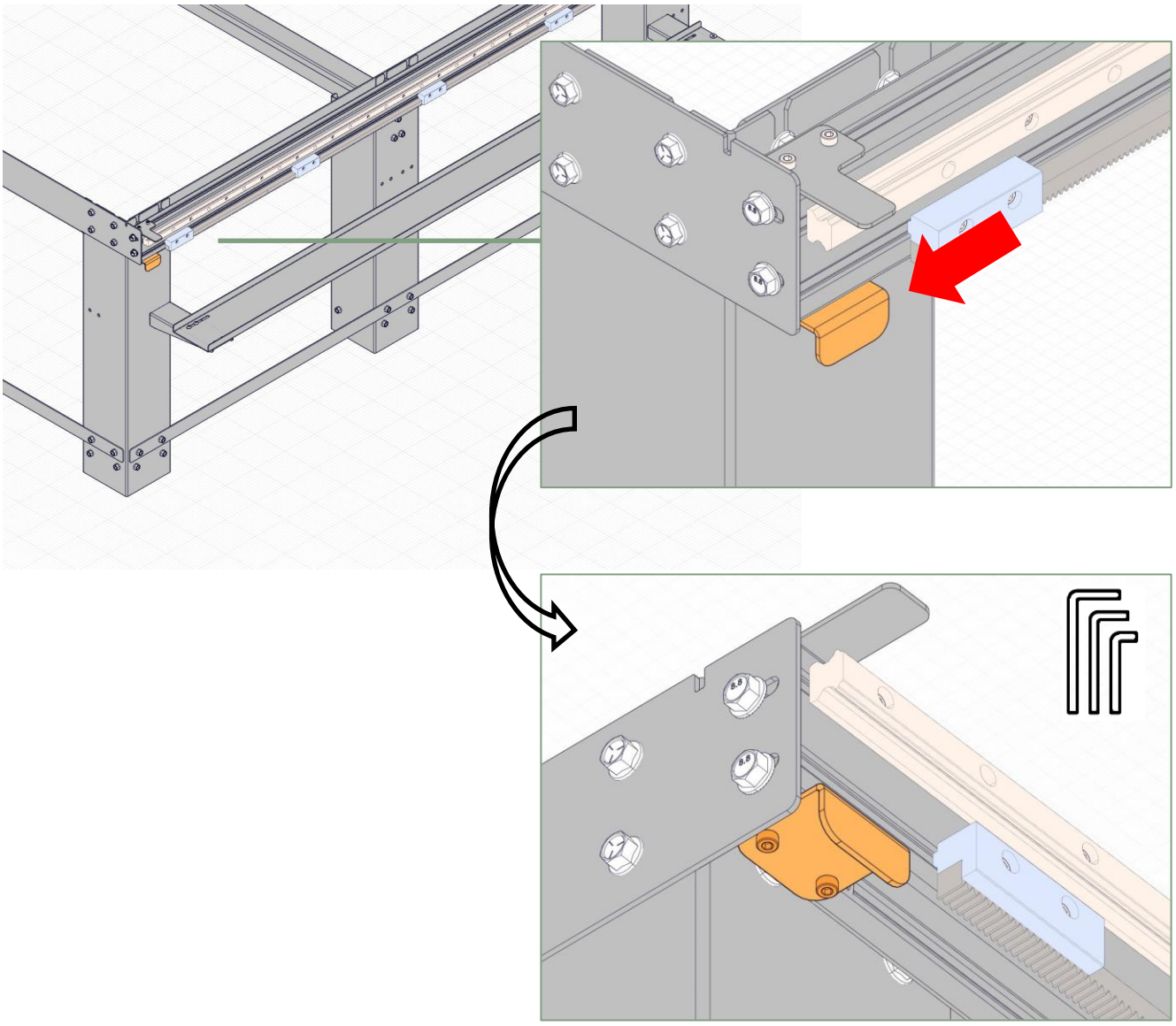
Number	Qty	Part Description
230423	4	Nut T-Slot Drop-In M5
230486	1	Homing Dog Bracket
645076	2	Hex Socket Cap Screw M5 X 0.8 Pitch X 12
230908	2	Switch Prox NPN IME12
230487	1	Homing Switch Bracket
231100	1	Y Homing cable (YH)
231100	1	X Homing cable (XH)
230969	1	Y Motor cable

3.17.3. Steps

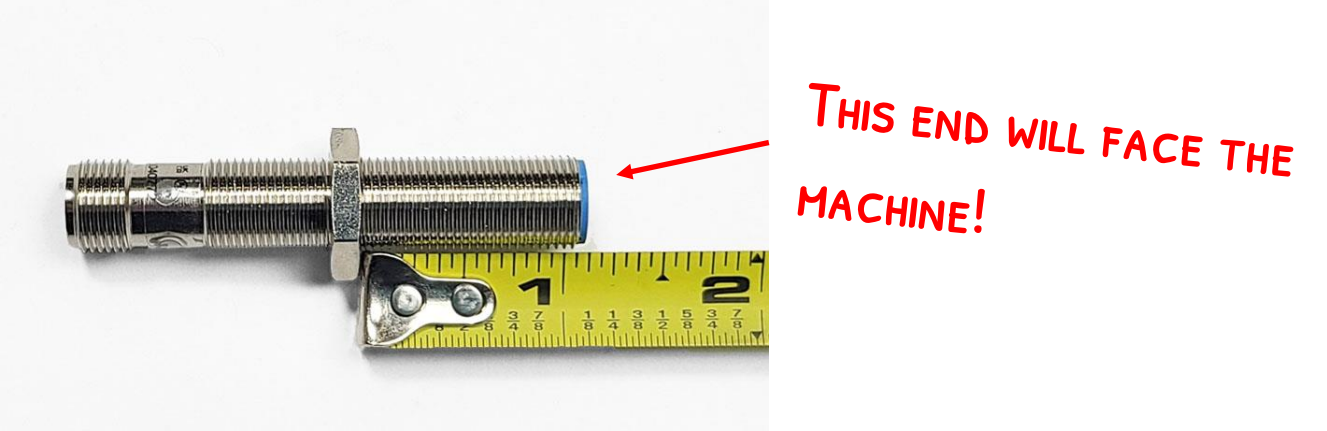
112. Prepare the homing dog bracket with head cap screws and T-slot nuts as before. This one will be inserted upside down.



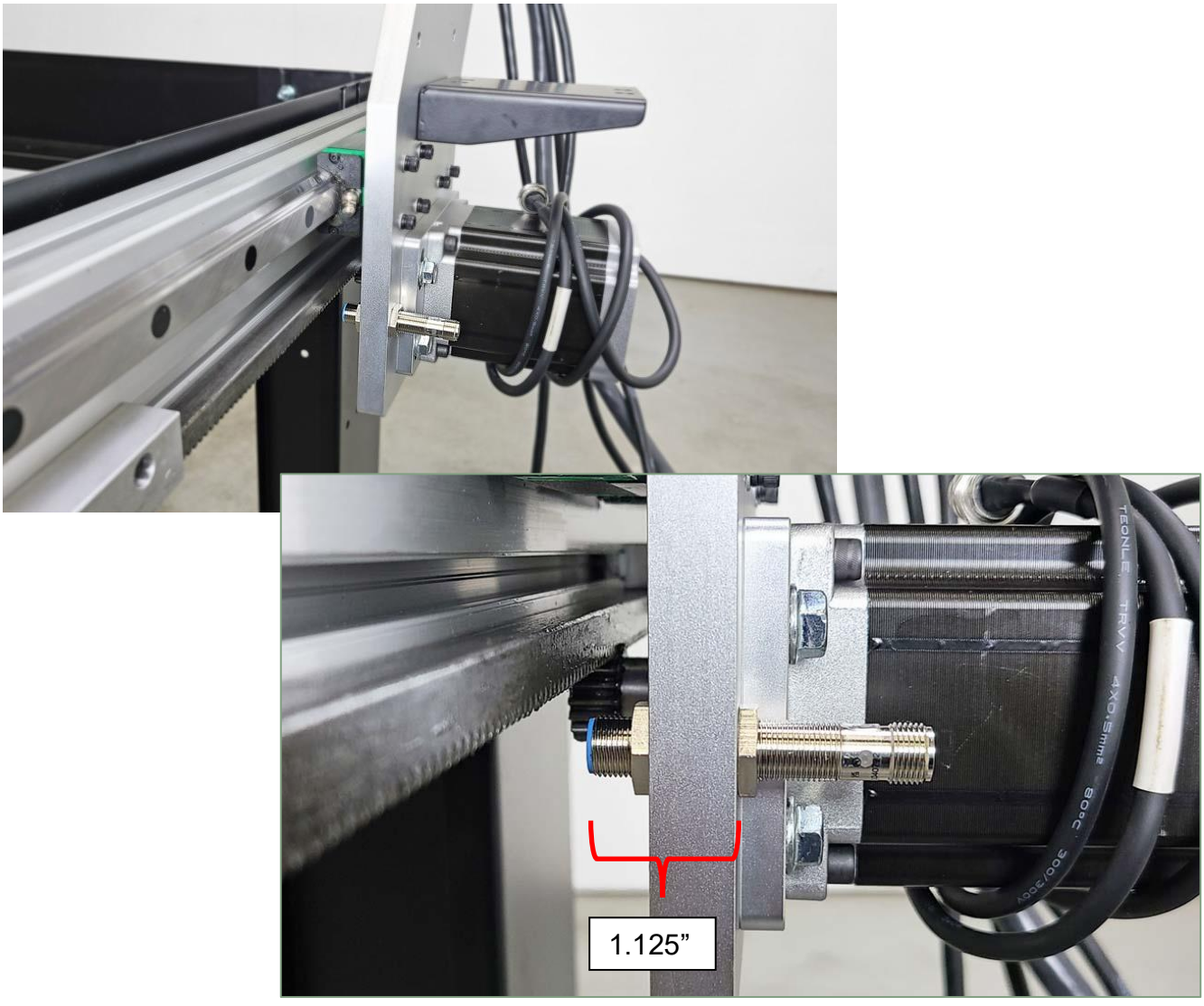
113. Insert it into the rail upside down and slide it down towards the front of the machine as far as it will go. Using an Allen/hex key, tighten both T-slot fasteners. You will not be able to access the nut. If done correctly, the nut should rotate and wedge itself in the rail.



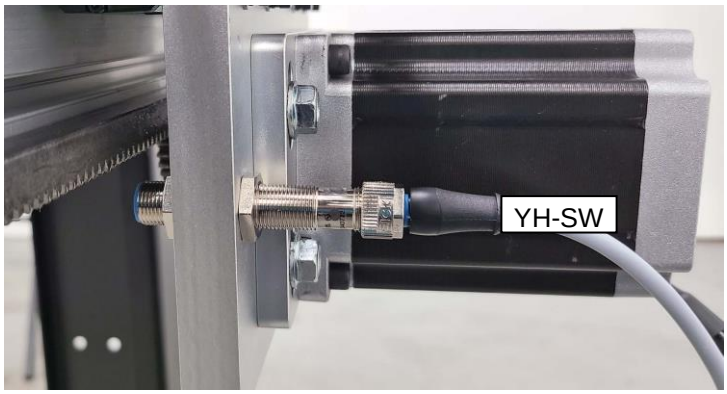
114. Remove one lock ring from the proximity switch. Adjust the second lock ring so that it is 1-⅛” (1.125”) from the plastic end.



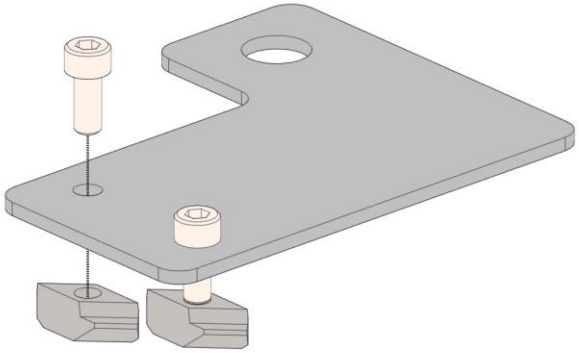
115. Mount the proximity switch on the right-side bridge support plate in front of the Y1 motor. The plastic end will face the machine. Put the second lock ring back on and tighten.



116. Connect the y-homing cable with the side labeled **YH-SW** to this proximity sensor.

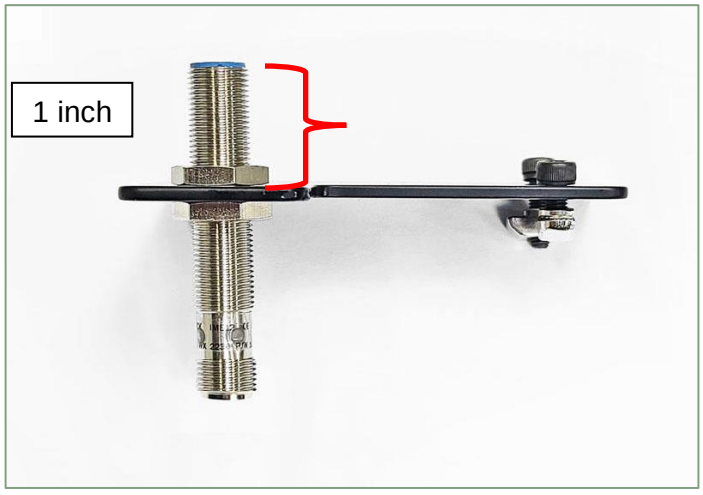


117. Insert 2 socket head cap screws into the 2 bolt holes of the second bracket. Hand-tighten the T-slot nuts on the backside.

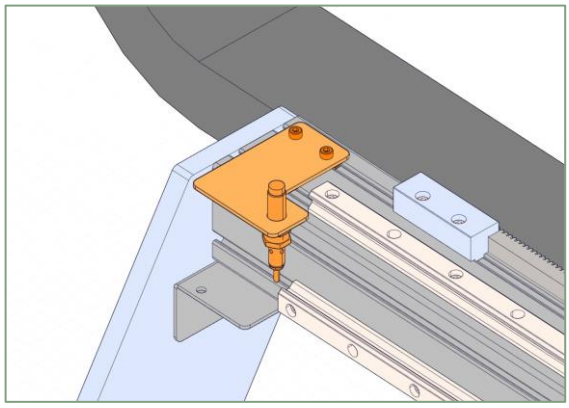


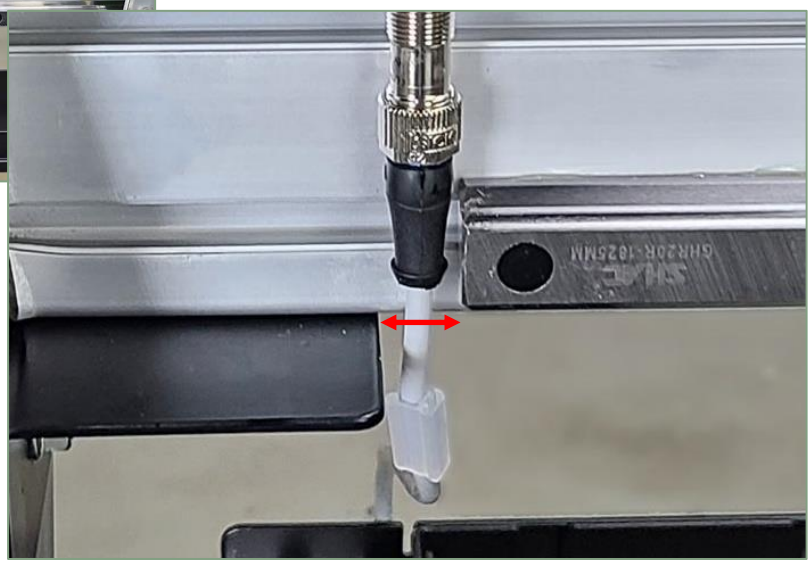
118. Remove the locking nut and insert the proximity switch into the bracket hole. Then put the locking nut back and tighten. Position the bracket 1” from the top.

119. Connect the proximity switch to the end of the X homing cable labeled **XH-SW**.



120. This assembly will be mounted on the left side of the bridge, left of the torch assembly. Insert the T-slot nuts into the rail and position so that the proximity switch sits halfway between the edge of the bridge support bracket and the linear way. Using an Allen/hex key, tighten both fasteners.



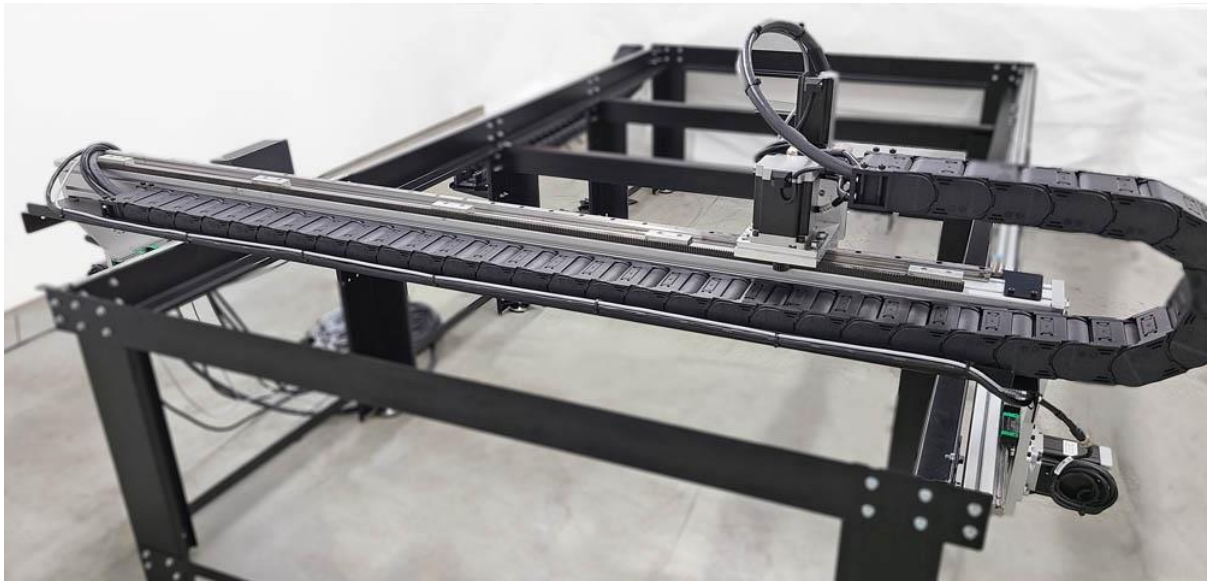


HALFWAY

121. Connect the **Y motor cable** to the Y motor, on the left side of the machine, by inserting the ends and turning to lock together. DO NOT use the Y1 cable which is shorter.

122. Tie up the excess Y motor cabling using zip ties.

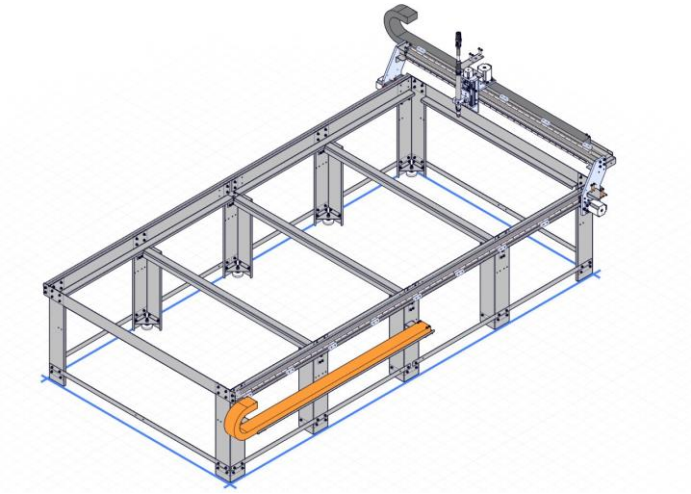
123. Run the Y motor cable and the X Homing Cable to the backside of the bridge support bracket. These will run along the back side X-axis tray. The tray will either have holes for the zip ties or clips will be provided. Use the holes on the tray to anchor the zip ties or slide the provided clips on the backside of the X-axis tray and run zip ties thru them.



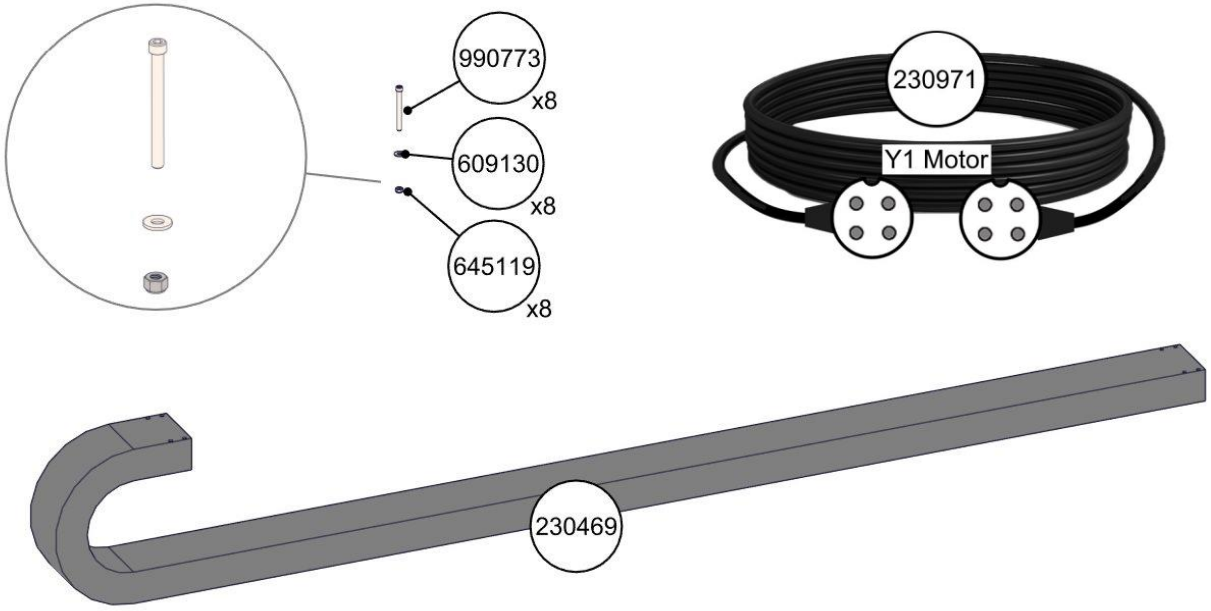
There are four clips with zip ties in the above photo and a couple spots the cables are just zip tied to themselves to keep from sagging.

3.18 Y-Axis Cable Carrier and Cable Connections

3.18.1. Goal of this Section



3.18.2. Parts List

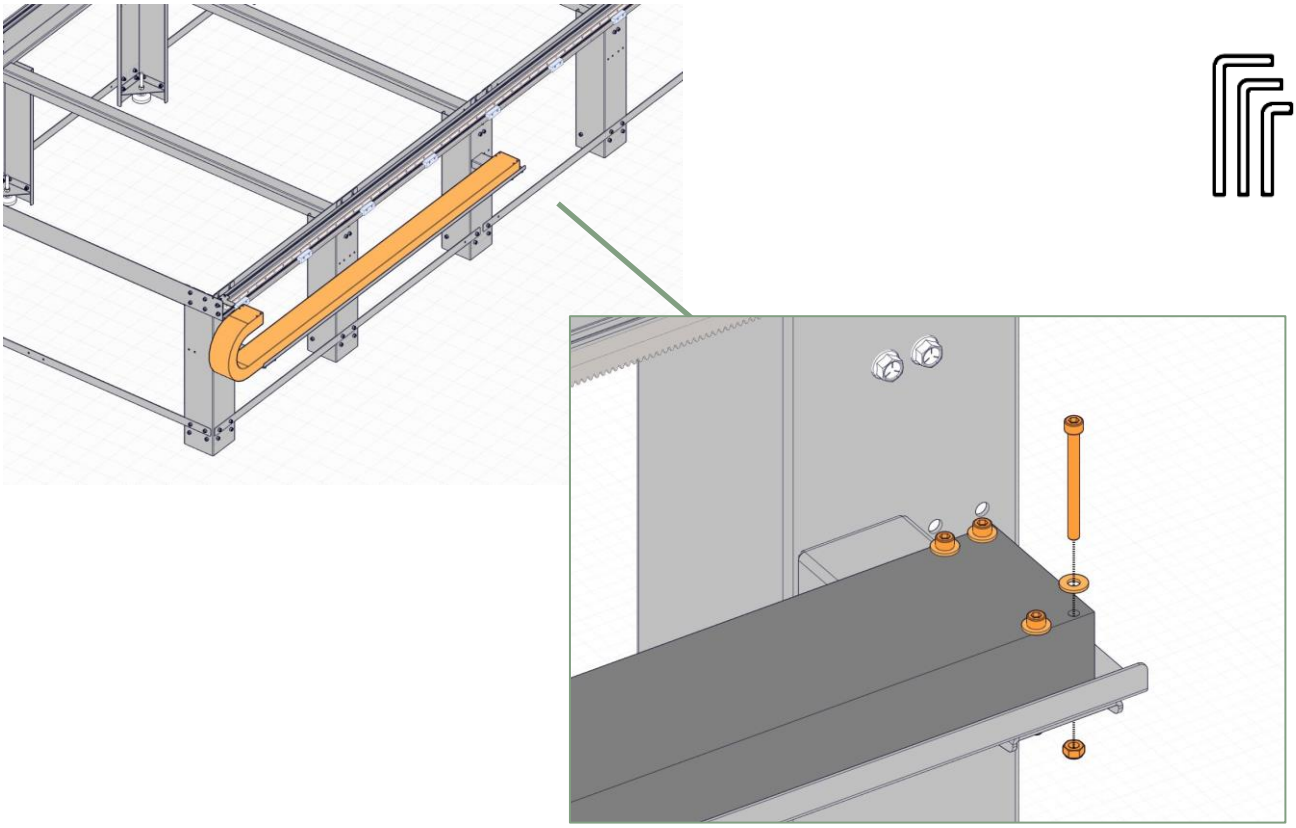


Number	Qty	Part Description
990773	8	Screw Socket Head Cap M6x1.0x70
609130	8	Washer Plain 1/4" Light
645119	8	Nut, Nylon Insert, M6-1
230469	1	Cable Carrier
230971	1	Y1 Motor Cable

3.18.3. Steps

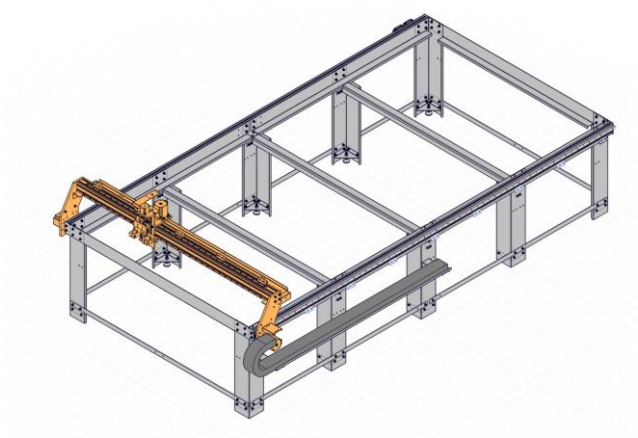
124. Connect the **Y1 cable** to the Y1 motor. Tie the excess cable.

125. On the front right of the machine, place the Y-axis cable carrier onto the carrier tray. Insert the four long bolts into the cable carrier and into the cable track tray holes. Position the nuts on the bottom and tighten until snug.

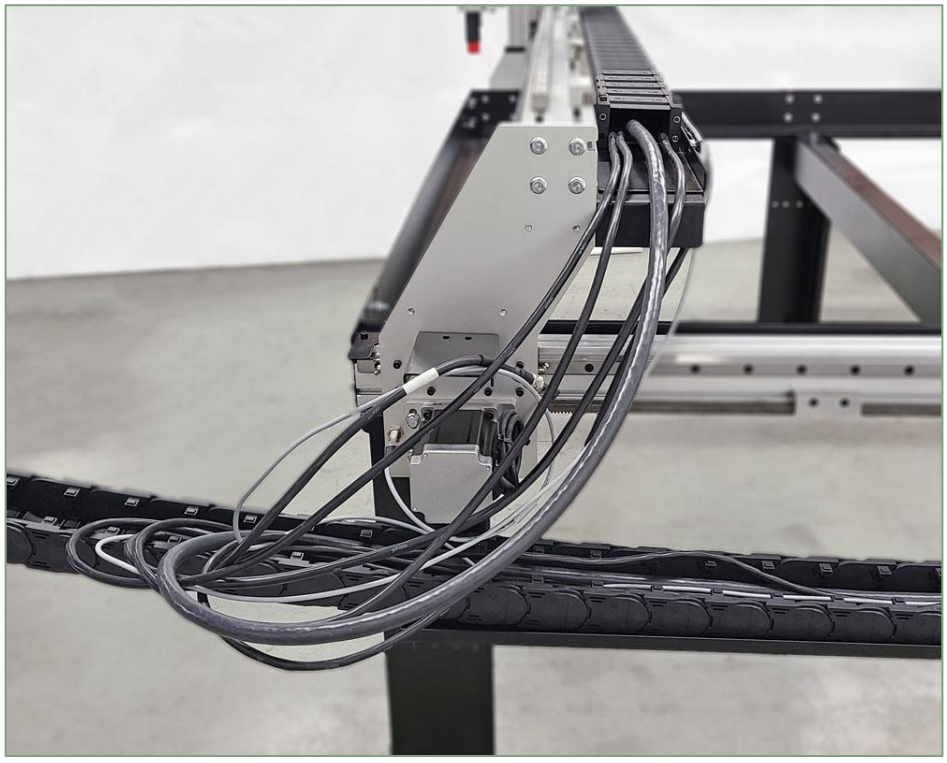


126. Remove all the link covers from the top of cable carrier.

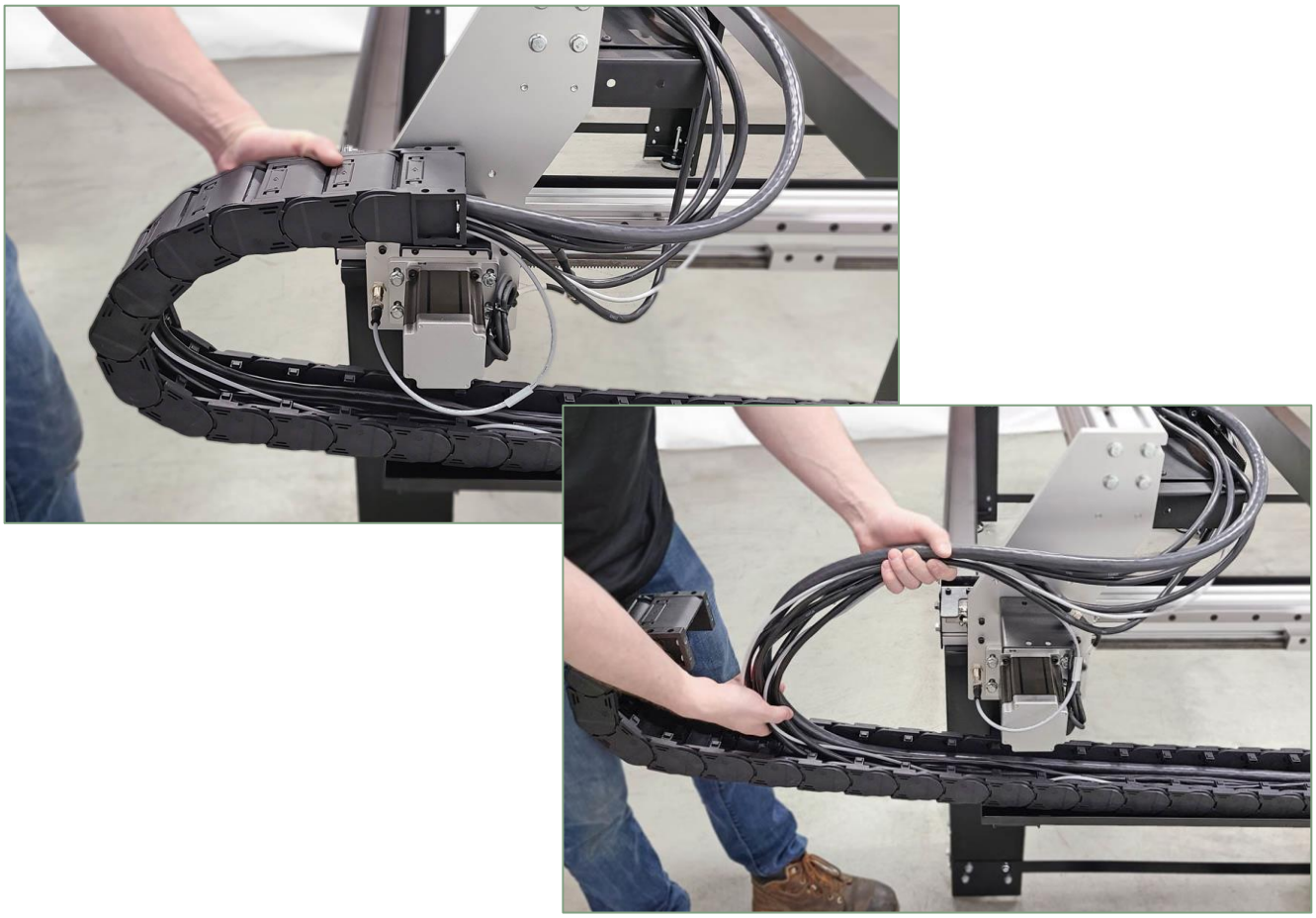
127. **Carefully** move the bridge to the front of the machine.



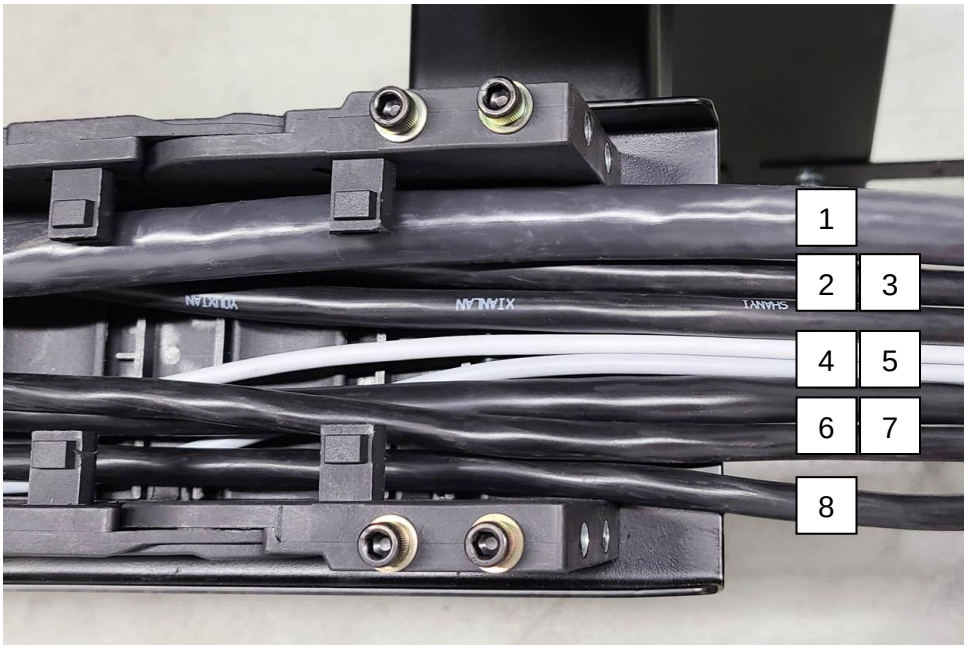
128. Run all the cables from the X-axis cable carrier, the Y1 motor cable, and X homing cable into the second cable carrier, running them from left to right.



129. Loop the left end of the cable carrier around to the mounting bracket. Adjust how much slack the cables have.



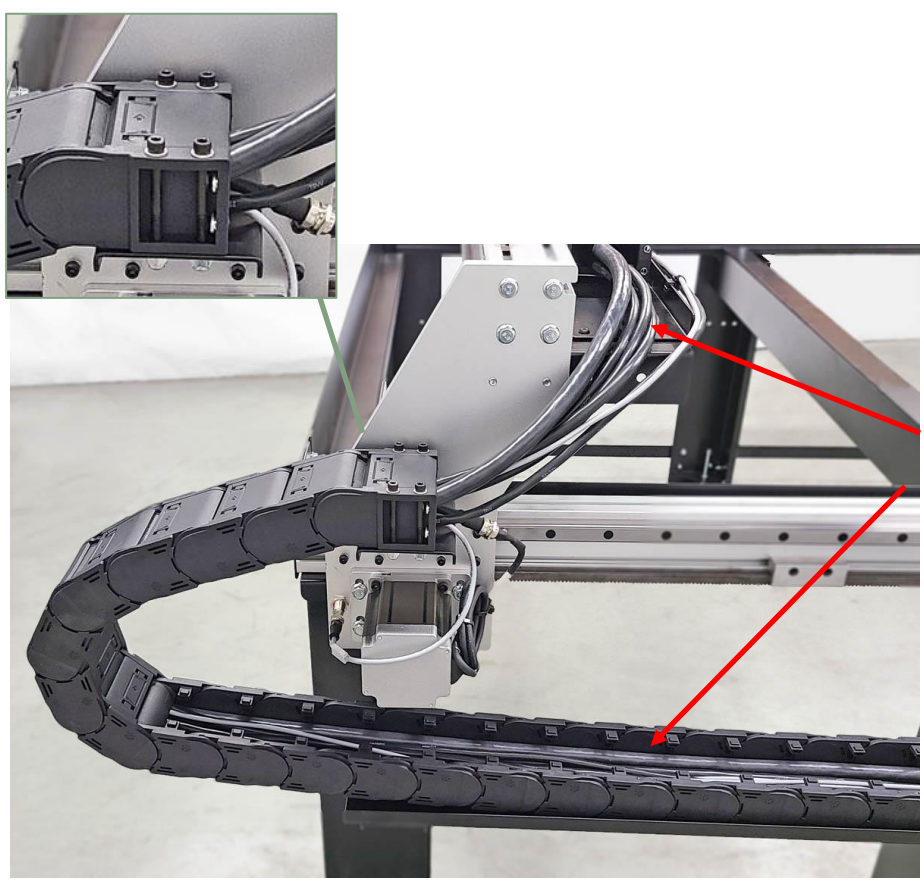
130. Double-check for the correct number of cables.



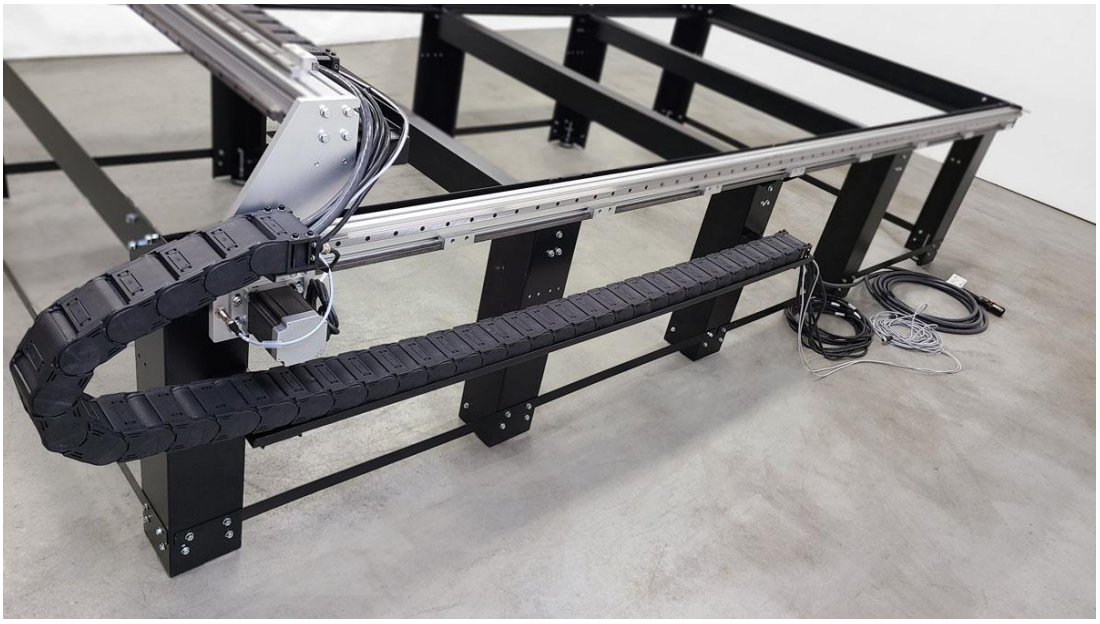
1. Torch Lead
2. Y Motor
3. Y1 Motor
4. X Homing
5. Y Homing
6. X Motor
7. Z Signal
8. Z Motor

131. Replace just the first one or two link covers to keep the cables from falling out and readjust the cable slack again.

132. Align the holes on the left end of the carrier to the Y-axis bracket on the corner leg. Insert the four bolts with washers into the cable carrier and tray. Place the nuts on the bottom and tighten until snug.



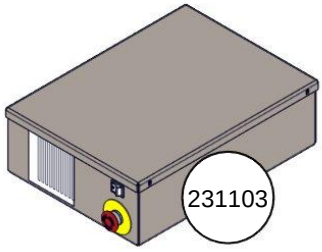
133. Replace the links and adjust the slack as you go.

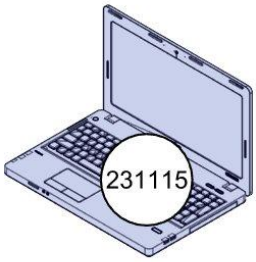


3.19 Laptop, Controller, and Plasma Connections

3.19.1. Goal of this Section

3.19.2. Parts List





TIP: If the laptop holder was purchased, jump to section 3.22 Laptop Holder (Option) install it before starting this section.

Number	Qty	Part Description
231103	1	MyPlasm CNC Controller
231115	1	Laptop/PC: Purchased as option or user supplied
230917	1	Cord AC Power
230921	1	USB Cable
User supplied	1	Plasma unit
230977 OR		Hypertherm Interface Cable OR
231104		Torch Interface Cable Universal, for customers not using Hypertherm as the plasma source (not pictured)

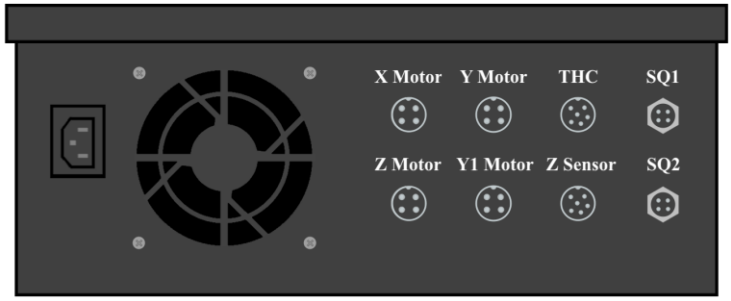
3.19.3. Steps

134. **Controller**

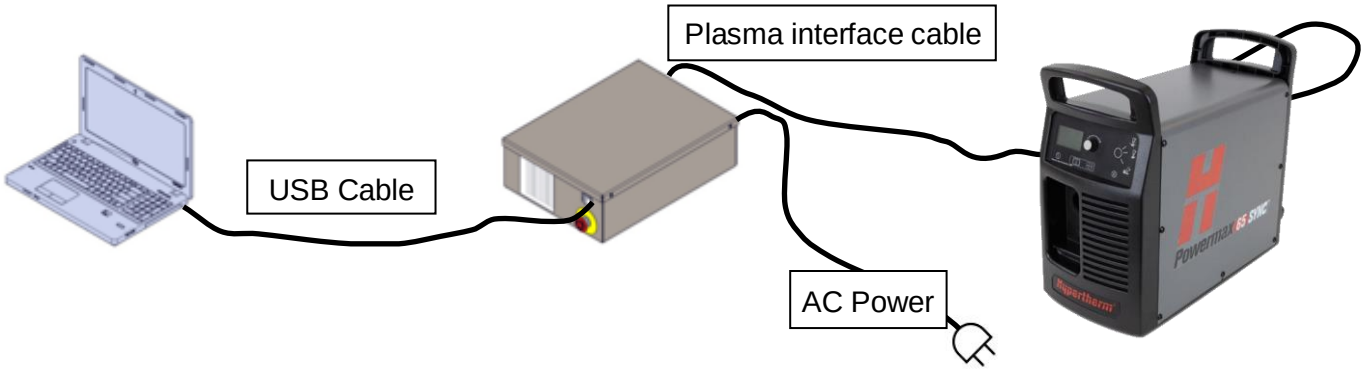
a. Follow the table below for connections between cables from cable carrier to controller.

b. Plug the plasma interface cable to the connection labeled THC.

c. Plug the AC power to the back of the controller.



Cable Label	Label on Controller
X Motor Cable	**X Motor**
Z Motor Cable	**Z Motor**
Y Motor Cable	**Y Motor**
Y1 Motor Cable	**Y1 Motor**
Z-Axis Signal Cable	**Z Sensor**
X Homing Cable (XH)	**SQ1**
Y Homing Cable (YH)	**SQ2**



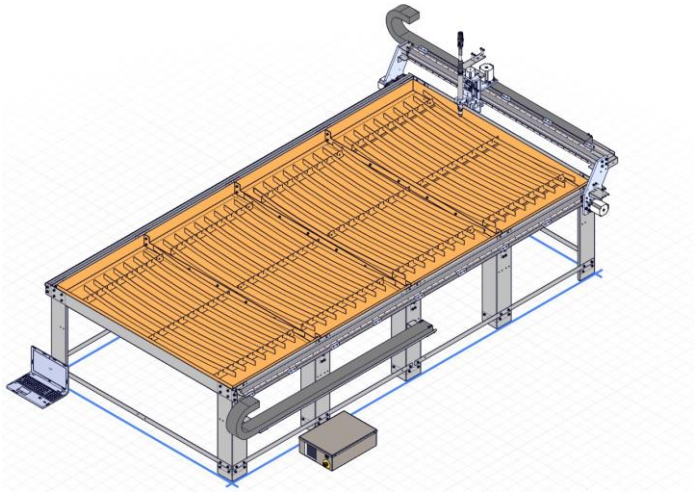
135. **Laptop** Connect USB cable to the front of the controller and the other end to the laptop.

136. **Plasma** Connect the torch lead and the plasma interface cable to the plasma unit. Refer to plasma manual for other plasma connections.

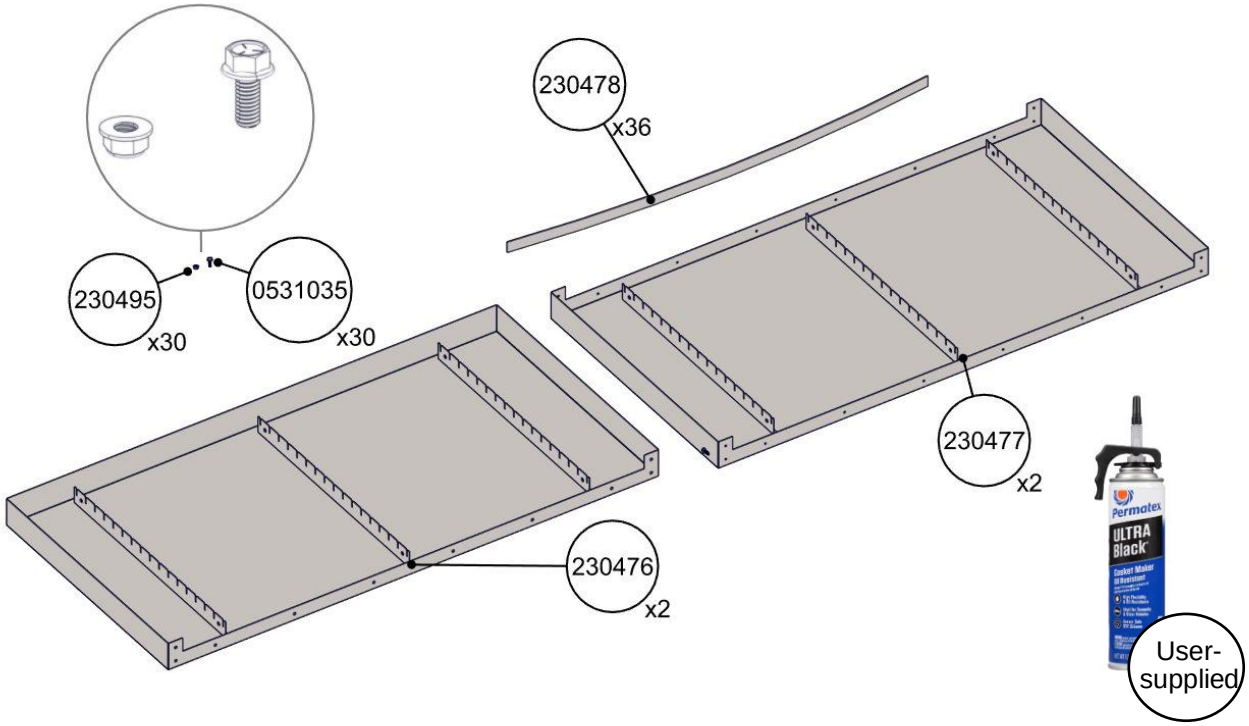
Cable	Connection Location(s)
Torch lead from machine (not shown above)	**Plasma Unit**
Cord AC Power	**Controller to AC Power**
USB Cable	**Laptop/PC to Front of Controller**
Plasma Interface Cable	**THC on Controller to plasma**

3.20 Table Trays and Slats

3.20.1. Goal of this Section



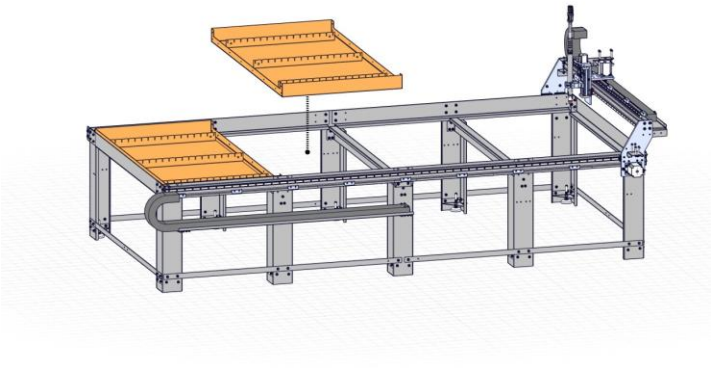
3.20.2. Parts List



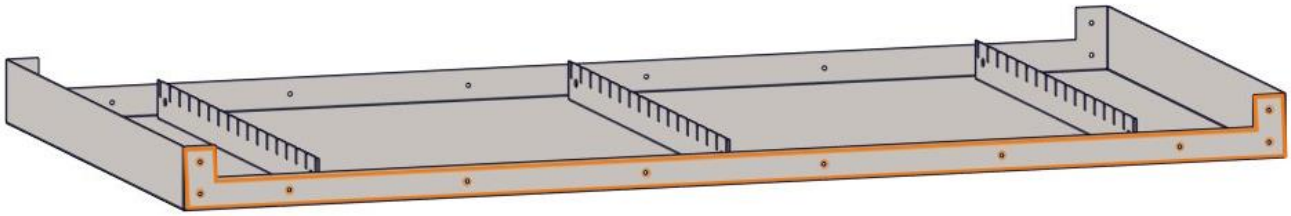
Number	Qty	5x5Q	Part Description
230495	30	20	Nut Flanged 5/16-18
0531035	30	20	Screw Hex Head Flanged 5/16-18 X 3/4
230478	36	18	Slat (5x)
230476	2	2	Water Pan End Assembly
230477	2	0	Water Pan Center Assembly
User supplied	1	1	Caulk - see Supplies list

3.20.3. Steps

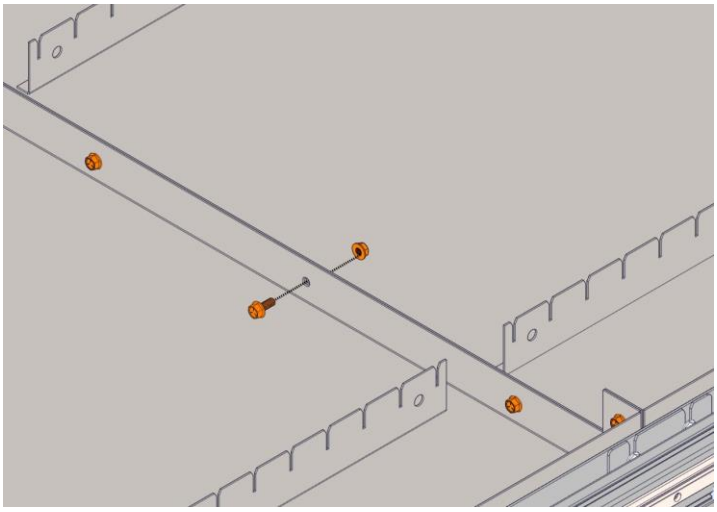
137. Start at one end of the machine and insert a water pan end tray and then a center tray. Notice the trays that go at the ends are different than the ones that go in the middle.



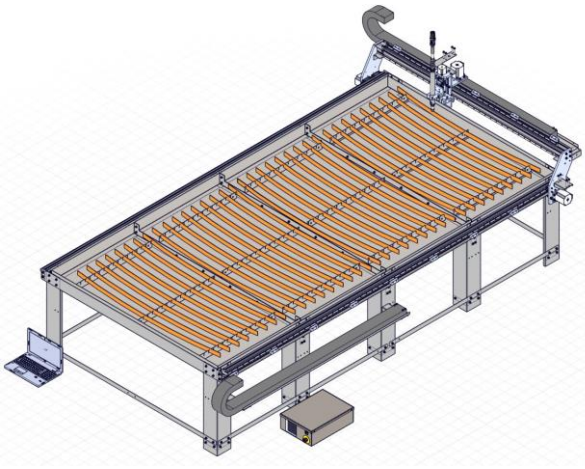
138. Using the recommended caulk, apply a smooth line of caulk on the outline of the center tray, including the bolt holes, on the side facing the end tray.

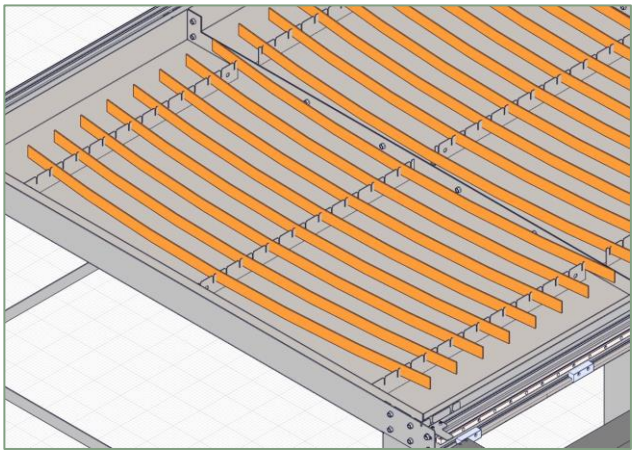


139. Bolt the trays together. Repeat with the other trays.



140. Insert slats into every other slot. It is recommended to bend the slats slightly when inserting them.





3.21 Finishing Up

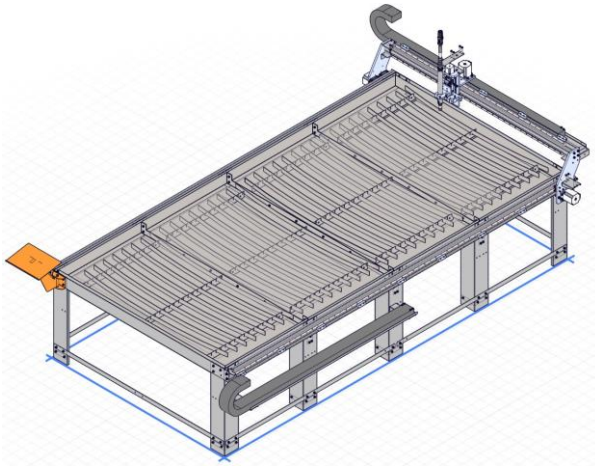
As the finishing touch, add the decal to the front of the machine.

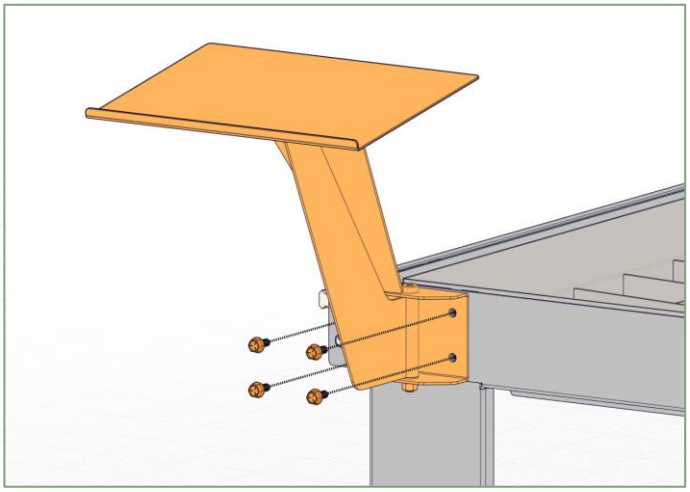
If the laptop holder or splash shield was purchased, continue to those sections. Otherwise, continue to the A-Series Safety and Operation manual for power up instructions.

3.22 Laptop Holder (Option)

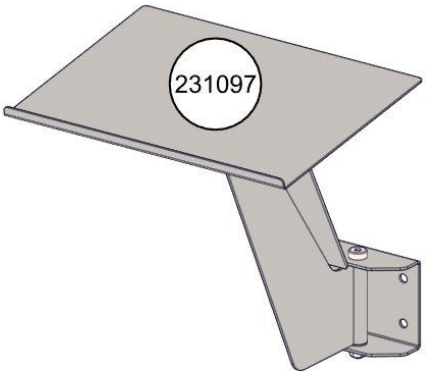
3.22.1. Goal of this Section

Skip this section if the laptop holder was not purchased.





3.22.2. Parts List



Number	Qty	Part Description
231097	1	Laptop Support Kit

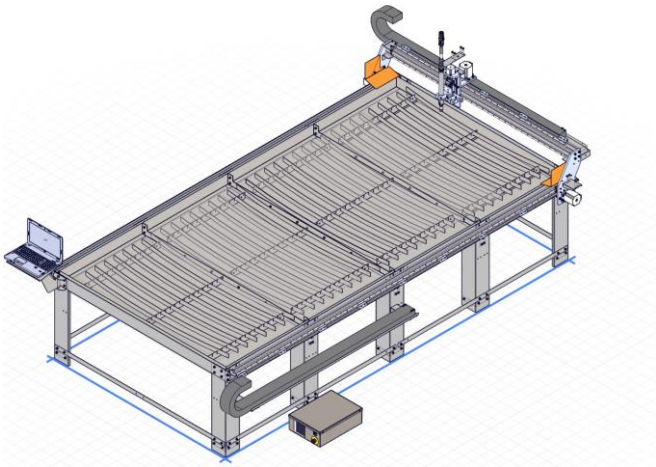
3.22.3. Steps

141. Use the existing bolts on the frame of the machine in the front left corner of the machine to attach the laptop holder. See illustration above.

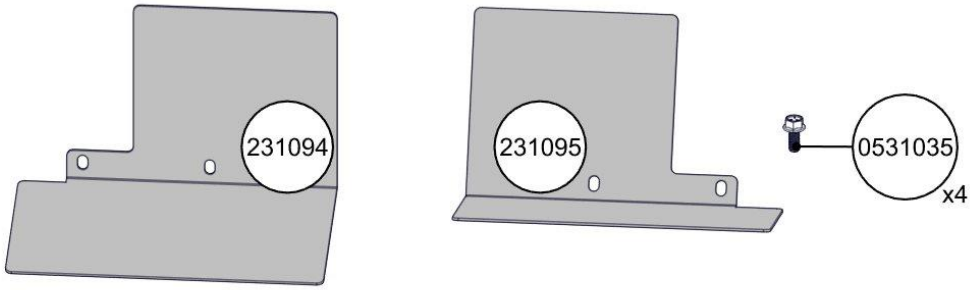
3.23 Splash Shield (Option)

3.23.1. Goal of this Section

Skip this section if the splash shield was not purchased.



3.23.2. Parts List



Number	Qty	Part Description
231112	1	Splash Shield Kit that includes
231094	1	Shield Splash RH
231095	1	Shield Splash
0531035	4	Screw Hex Head Flanged 5/16-18 X 3/4

3.23.3. Steps

142. Bolt the splash shields into position. The larger shield will go on the right-hand side of the machine.