CRP4848 4' x 4' Standard CNC Machine Assembly Instructions

v2023Q3.1

Getting Started

READ THE FOLLOWING PRIOR TO BEGINNING THE ASSEMBLY OF YOUR MACHINE

1. The machine assembly is broken down into different sections, visible in the navigation pane on the left. The Table of Contents on the right will show the steps within each section.
2. Section 8 includes links for install & setup of spindles, software, VFDs, and other accessories.
3. It is helpful to look through each section prior to beginning its assembly.
4. Each section begins with an image of the fully assembled component. If needed, refer to this as a reference frame while completing individual assembly steps.
5. Each section will identify the parts and tools needed for those assembly steps. Identification of fasteners is easier if they are kept in their respective fastener bags.
6. Assembling the larger components, such as the base and optional leg kit, is made easier with two people. Though not required, this can make the process more efficient.
7. Listed below are two types of Notes you will see through the assembly instructions:

Section Note

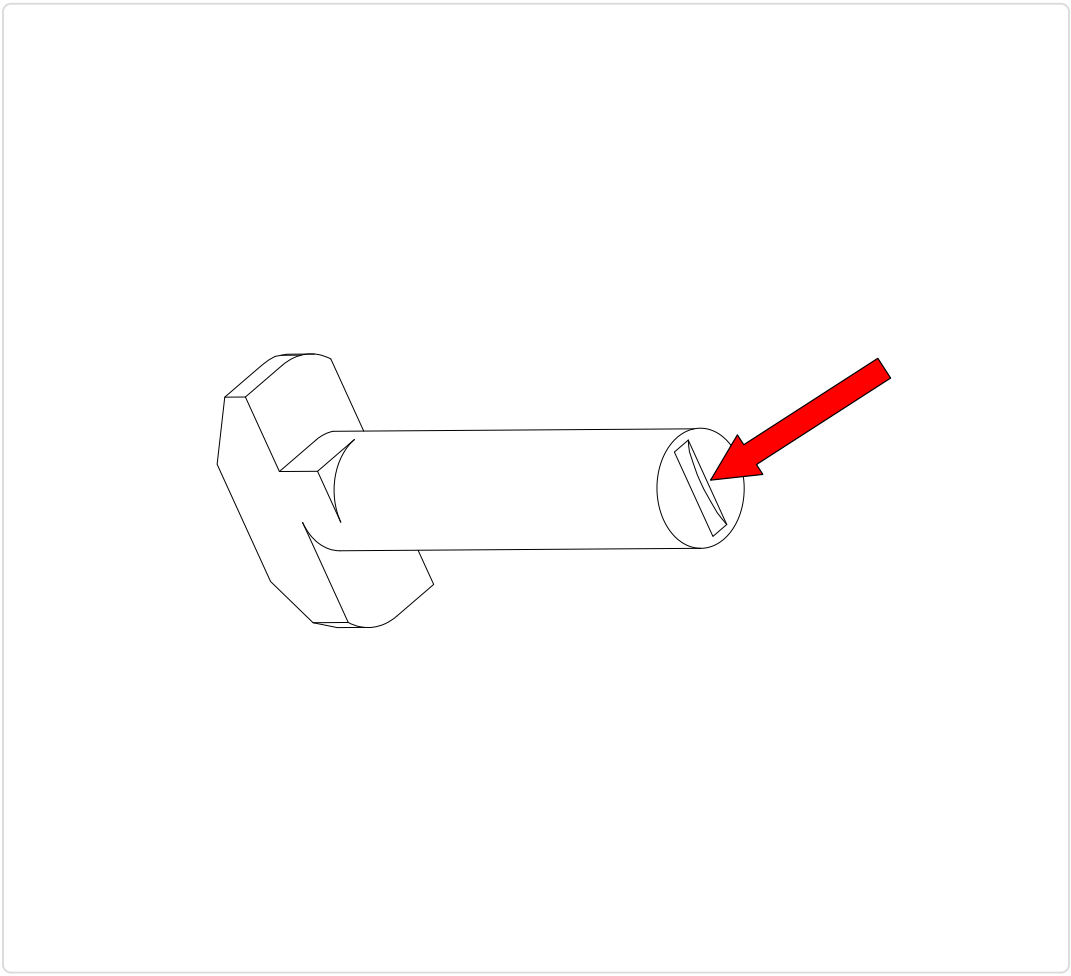
Section Notes are used to denote when the section is configuration specific (ex: NEMA 23 vs NEMA 34 electronics).

Assembly Note

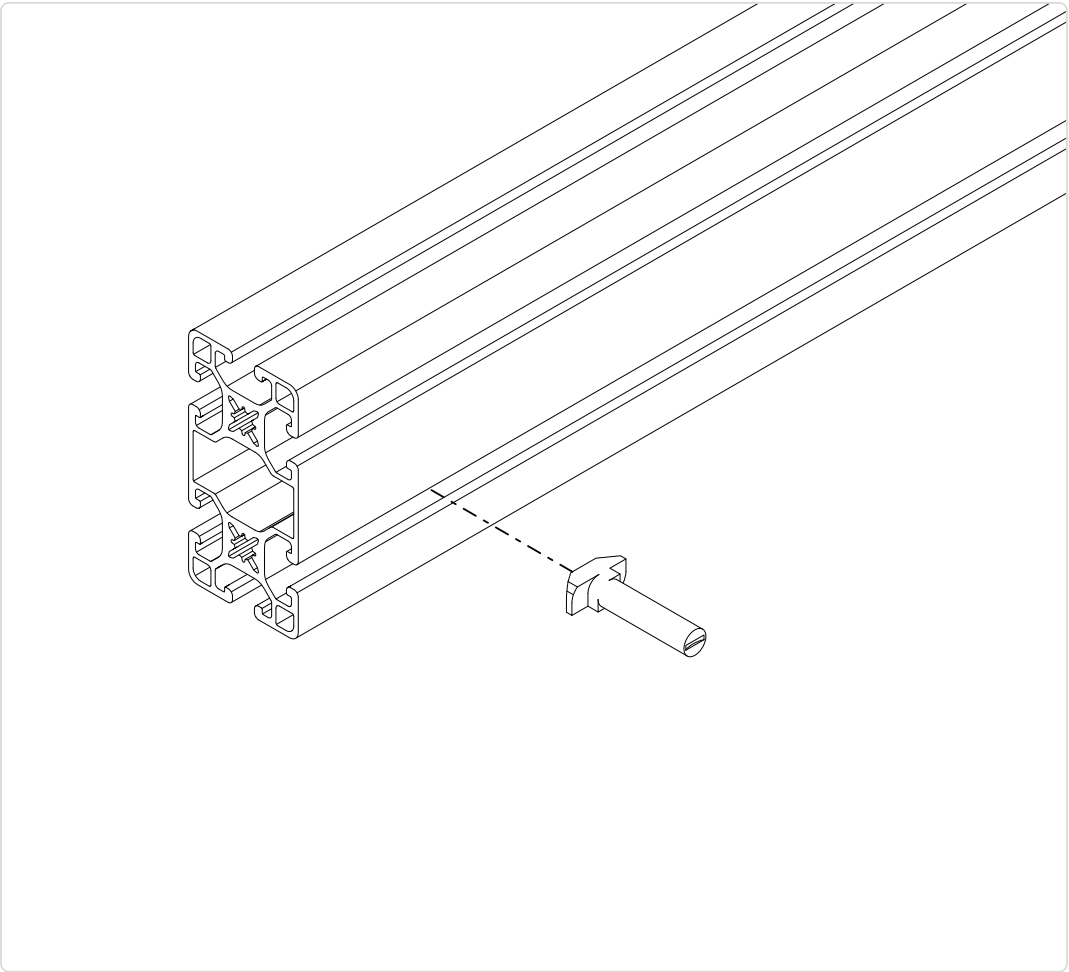
Assembly Notes are used to call attention to certain parts of the assembly step. Pay attention to these as they provide important information for a successful machine build.

Throughout the assembly of your machine, you will use both T-Studs and Roll-in T-Nuts. Review the following instructions for proper use of these components.

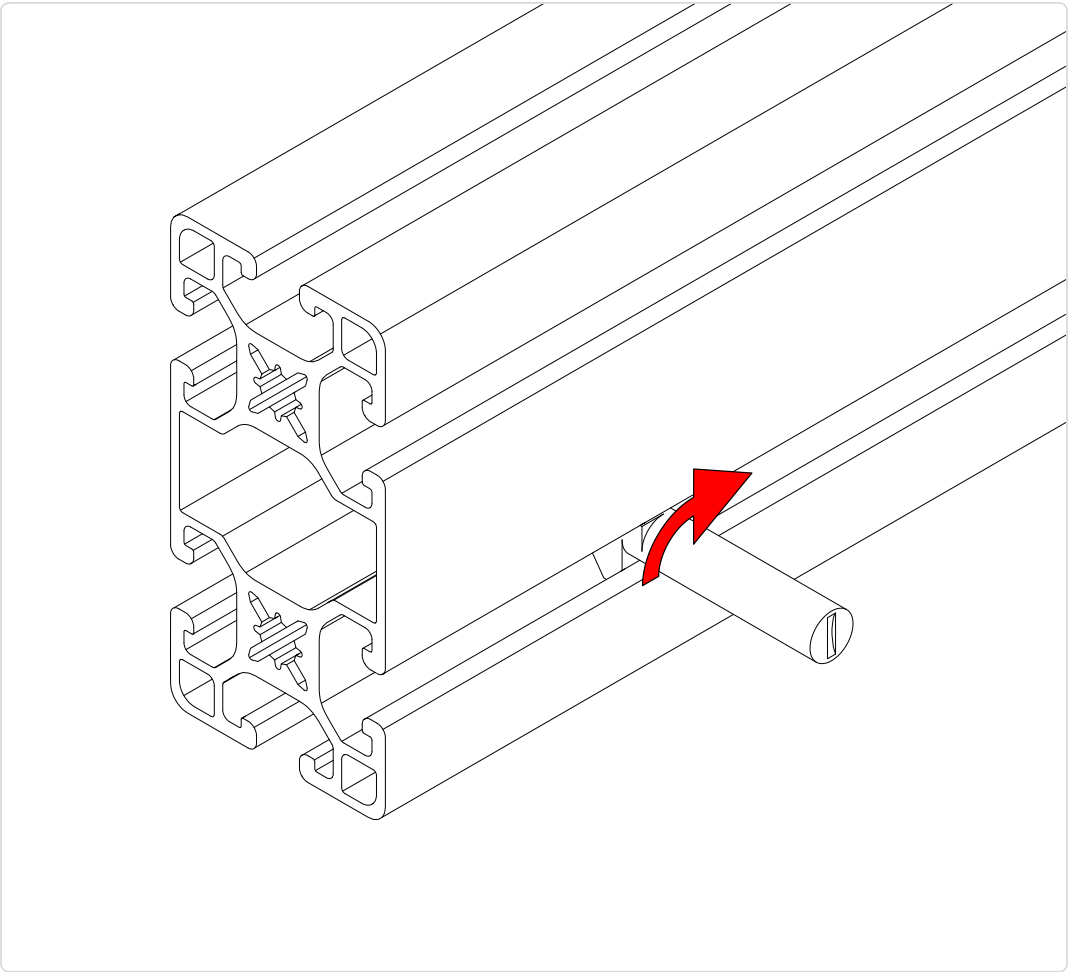
T-Studs



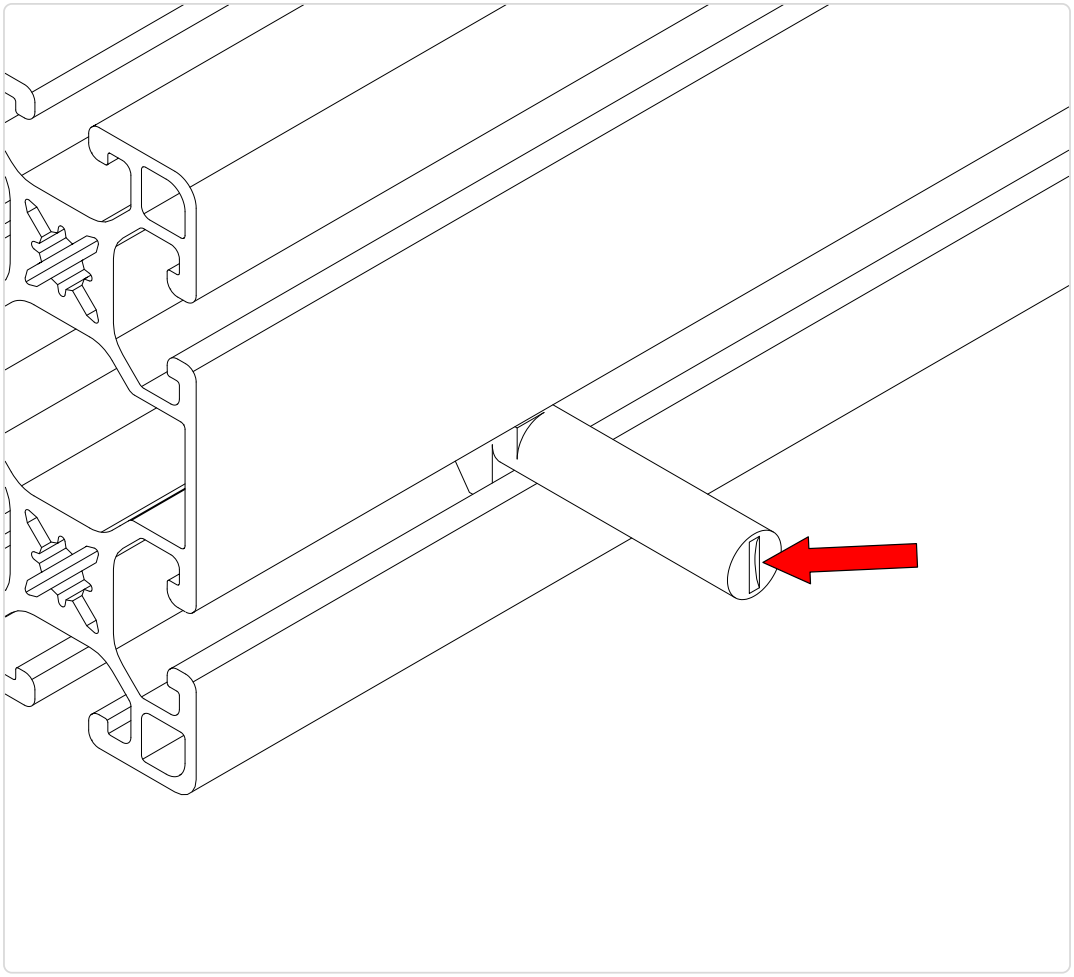
- The indicated slot is parallel with the head of the T-Studs.



- Insert the T-Stud into the extrusion with the slot parallel to the extrusion.



- Rotate the T-Stud 90° in the clockwise direction.

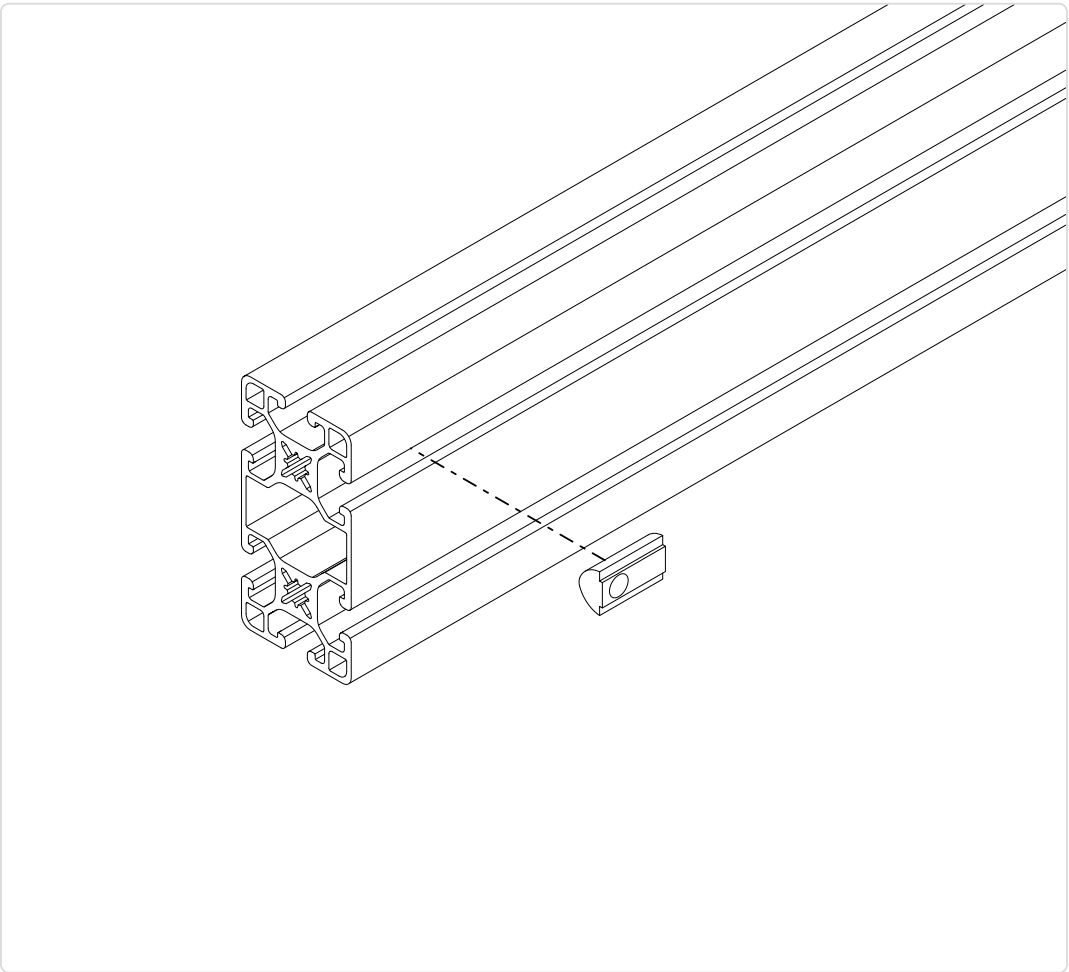


- The slot on the end of the T-Nut will now be perpendicular to the extrusion.

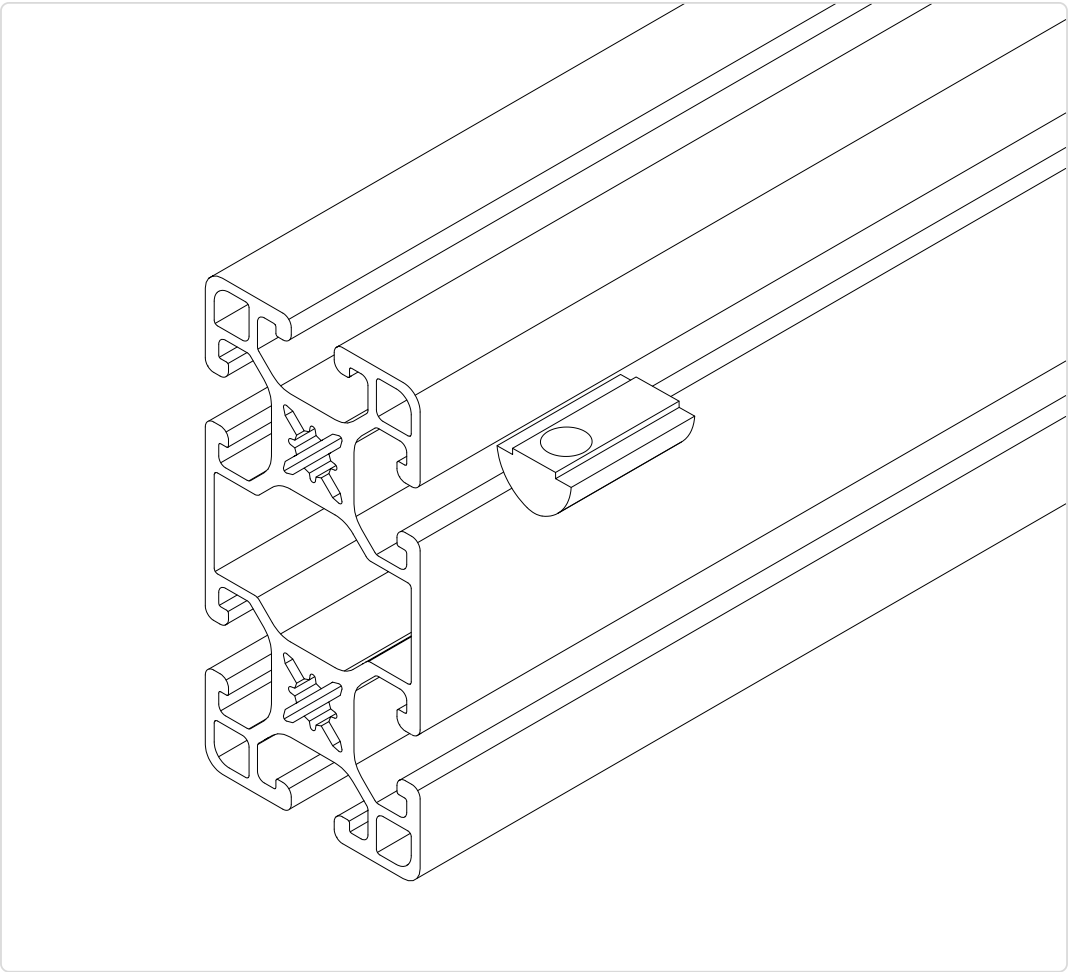
Assembly Note

When fastening components using T-Studs, use this feature to ensure the T-Studs are positioned correctly within the extrusion. The slots will not be depicted in the assembly instruction figures.

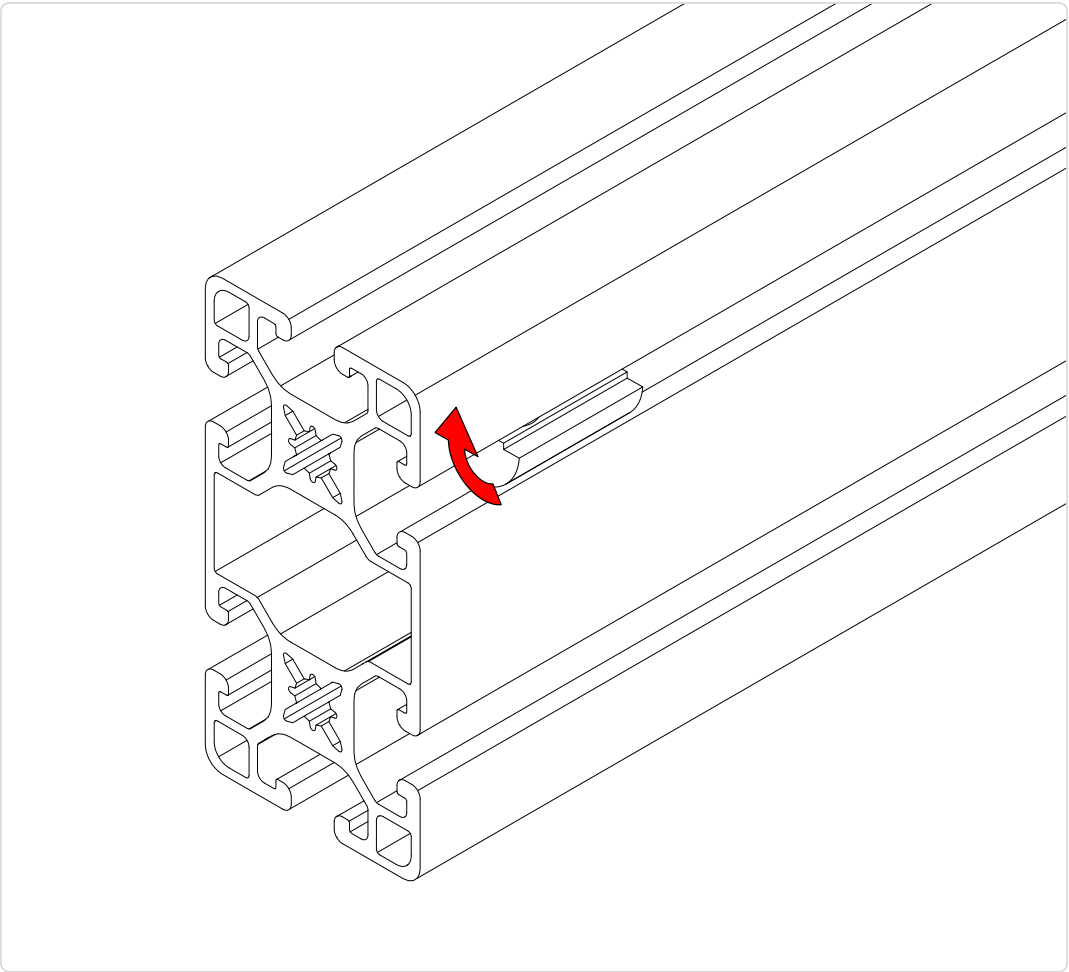
Roll-in T-Nuts



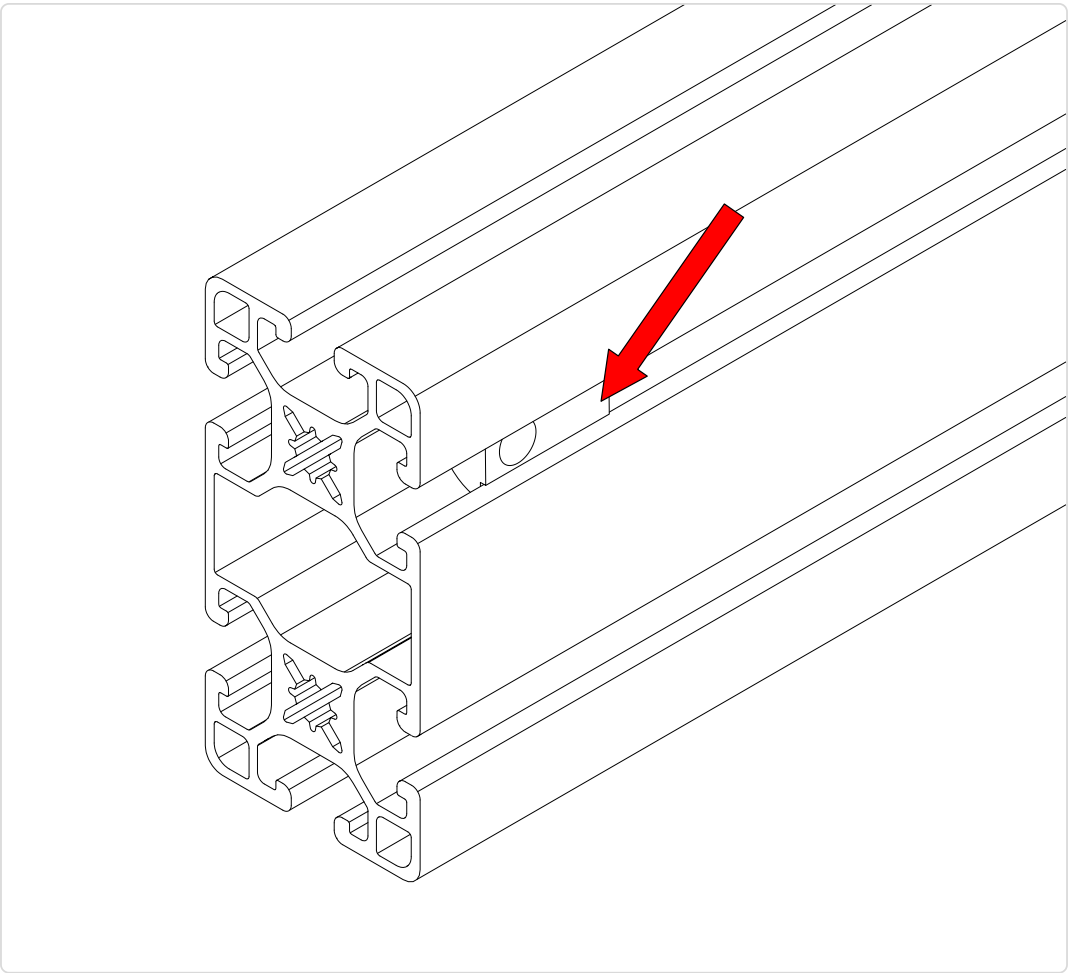
- Assembly steps will depict Roll-in T-Nut installation as shown above.



- To install in the appropriate extrusion slot, position the T-Nut as indicated.



- Insert the T-Nut into the extrusion slot and rotate 90°.



- When properly installed, the indicated face of the T-Nut will be parallel with the face of the extrusion.

Assembly Note

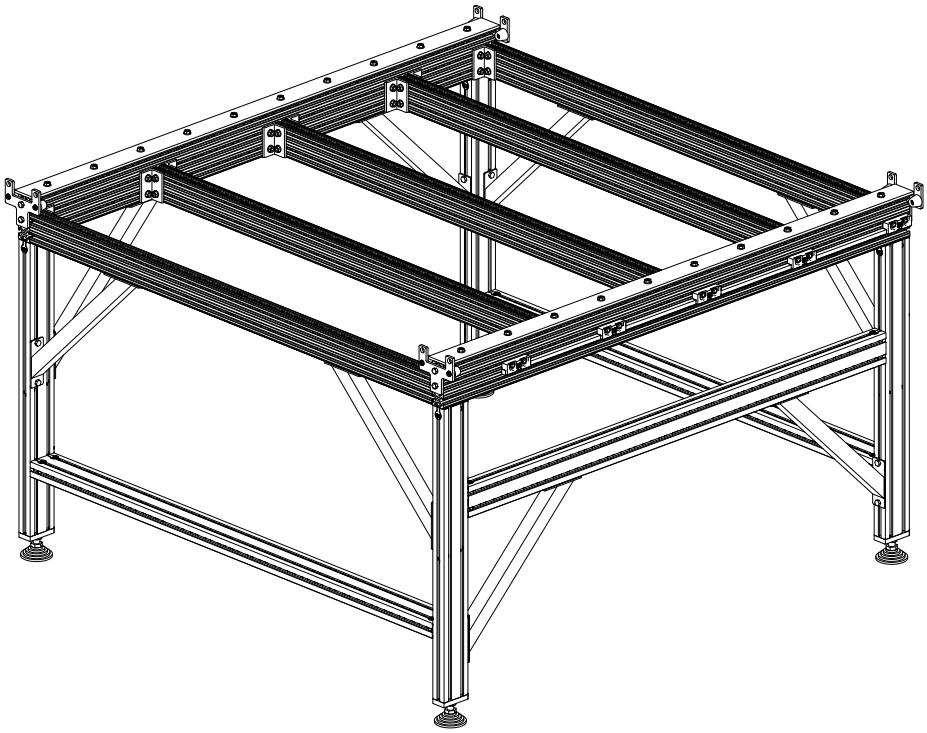
A small allen wrench can be inserted into the hole of the T-Nut and subsequently used to rotate it the full 90°.

Tools List

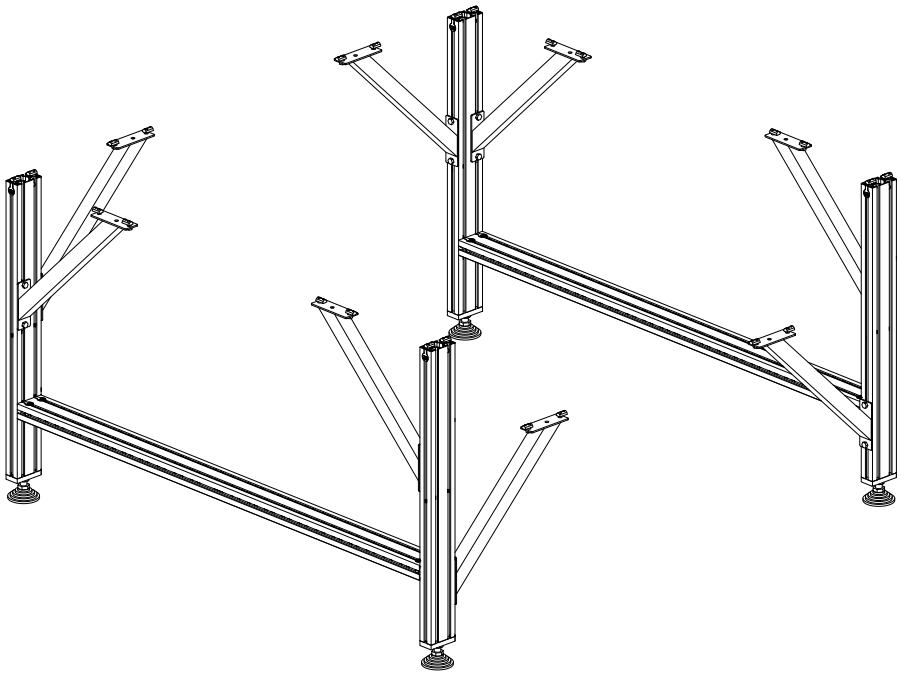
The following tools will be used during assembly of your machine:

- Imperial Allen Wrench Set
    - 3/32", 1/8", 5/32", 3/16", 1/4"
- Metric Allen Wrench Set
    - 3mm, 4mm, 5mm, 6mm
- 6mm Ball-End Allen Wrench
- 6mm Ball-End Hex Driver Attachment for Drill/Impact Driver (recommended)
- 3/8" Combination Wrench
- 7/16" Combination Wrench
- 1/2" Combination Wrench
- 9/16" Combination Wrench
- 13mm Combination Wrench
- 13mm Socket and Ratchet
- Adjustable Wrench
- Standard (Flat Head) Screwdriver
- Tape Measure
- (2) Clamp
    - Bar clamp or quick trigger clamp recommended
    - Minimum opening distance of 8"

Section 1: Base Assembly



1.1 Table Legs



Section Note

Skip this section if you are not using a Avid CNC leg kit

Parts and Tools Required

The following bags and parts will be used in this section:

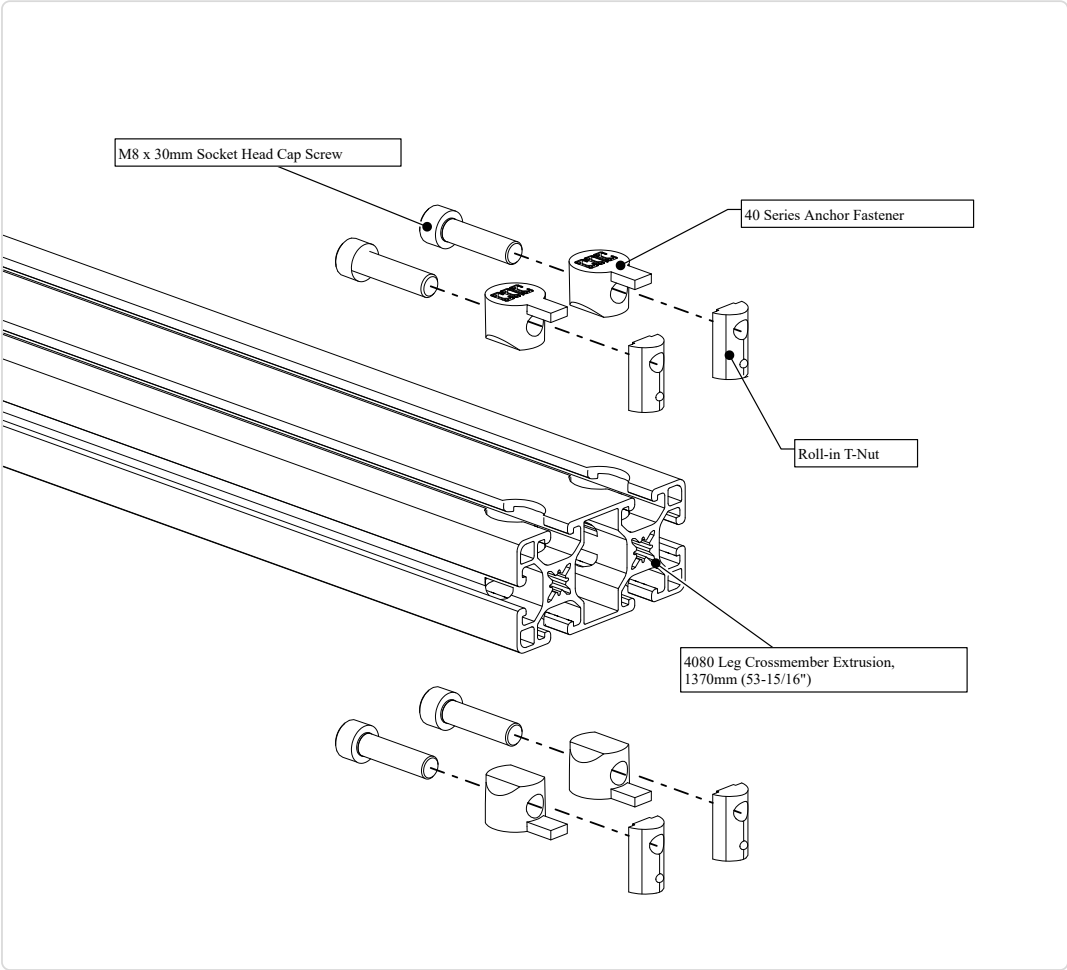
- (4) 4080 Leg Extrusion, 750mm (29-1/2")
- (2) 4080 Leg Crossmember Extrusion, 1370mm (53-15/16")
- (1) 4080 Electronics Bar Extrusion, 1364mm (53-11/16")
- (8) Leg Kit Gusset
- (1) CRP813-00-LEGSET-HW-BAG
    - (32) M8 x 30mm Socket Head Cap Screw
    - (24) 40 Series Anchor Fastener
    - (48) M8 Roll-in T-Nut
    - (4) 7111 Foot Plate
    - (4) H172 Leveling Foot
    - (4) M16 Hex Nut
    - (24) M8 x 14mm Hex Cap Bolt
- (1) CRP813-00-ELCBAR-HW-BAG
    - (4) M8 x 30mm Socket Head Cap Screw
    - (4) 40 Series Anchor fastener
    - (4) M8 Roll-in T-Nut

The following tools will be used in this section:

- 6mm Ball-End Allen Wrench
- 6mm Ball-End Driver Attachment for Drill/Impact Driver (recommended)
- 13mm Combination Wrench
- Adjustable Wrench
- Tape Measure

1.1.1 Anchor Fastener Assembly

1.1.1.1

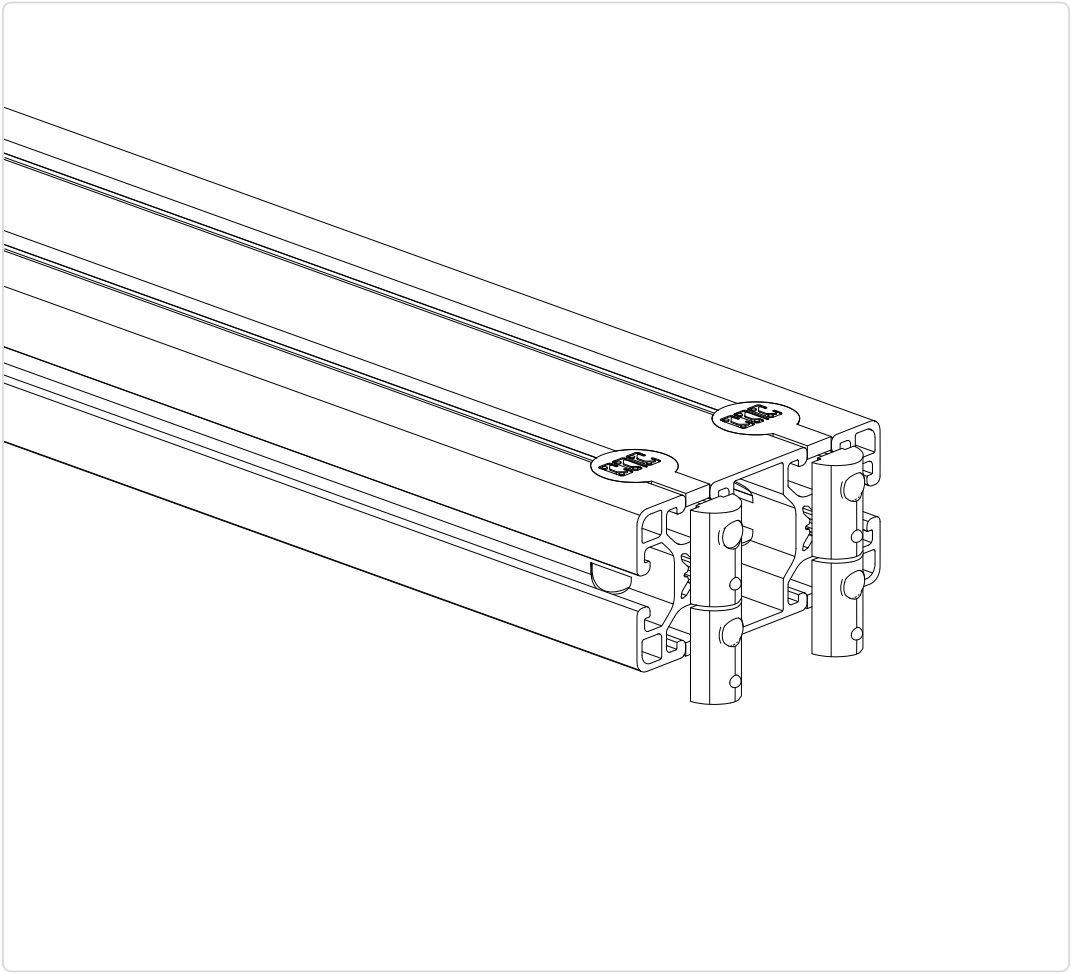


- Thread the socket head cap screws into the T-Nuts through the anchor fasteners as indicated.

Assembly Note

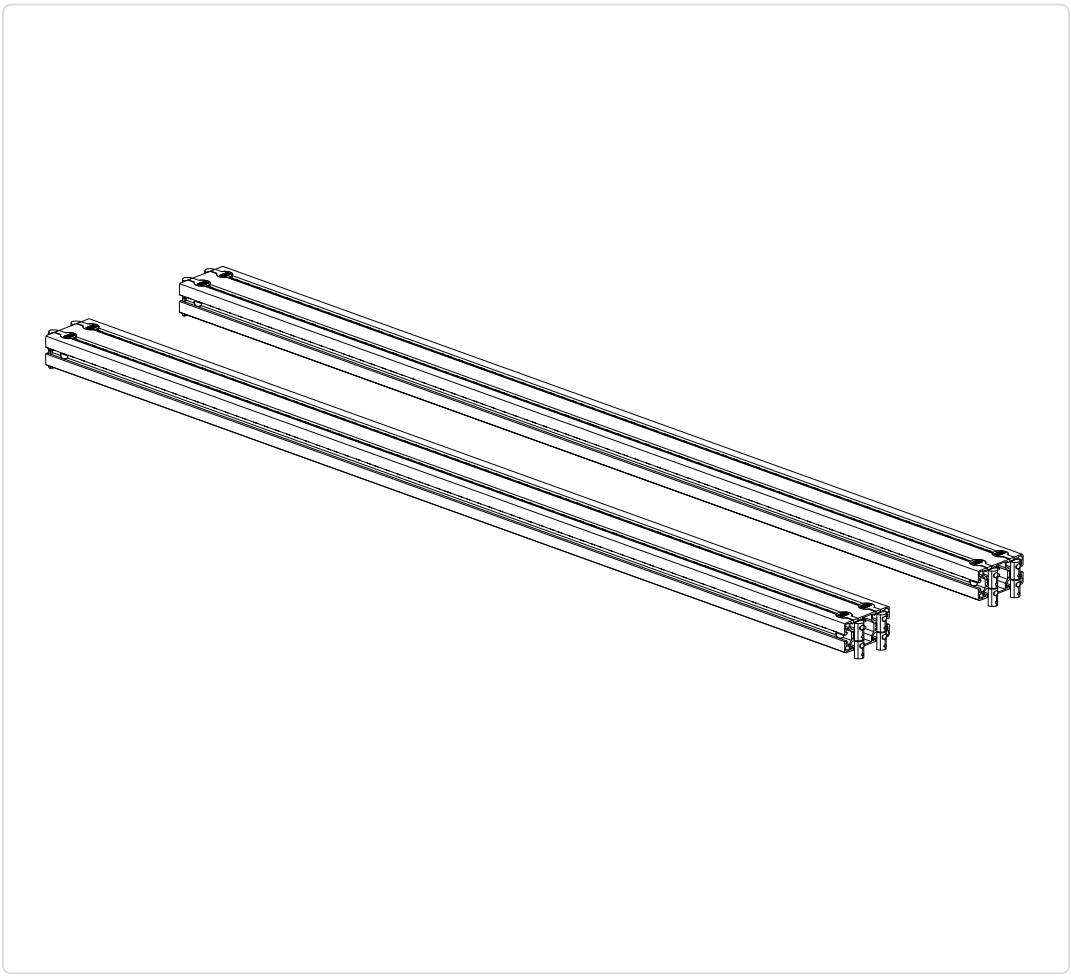
Be sure to select the correct length of extrusion. There will be (2) 4080 Leg Crossmember Extrusions that are 6mm (1/4") SHORTER than the (1) 4080 Electronics Bar Extrusion.

1.1.1.2



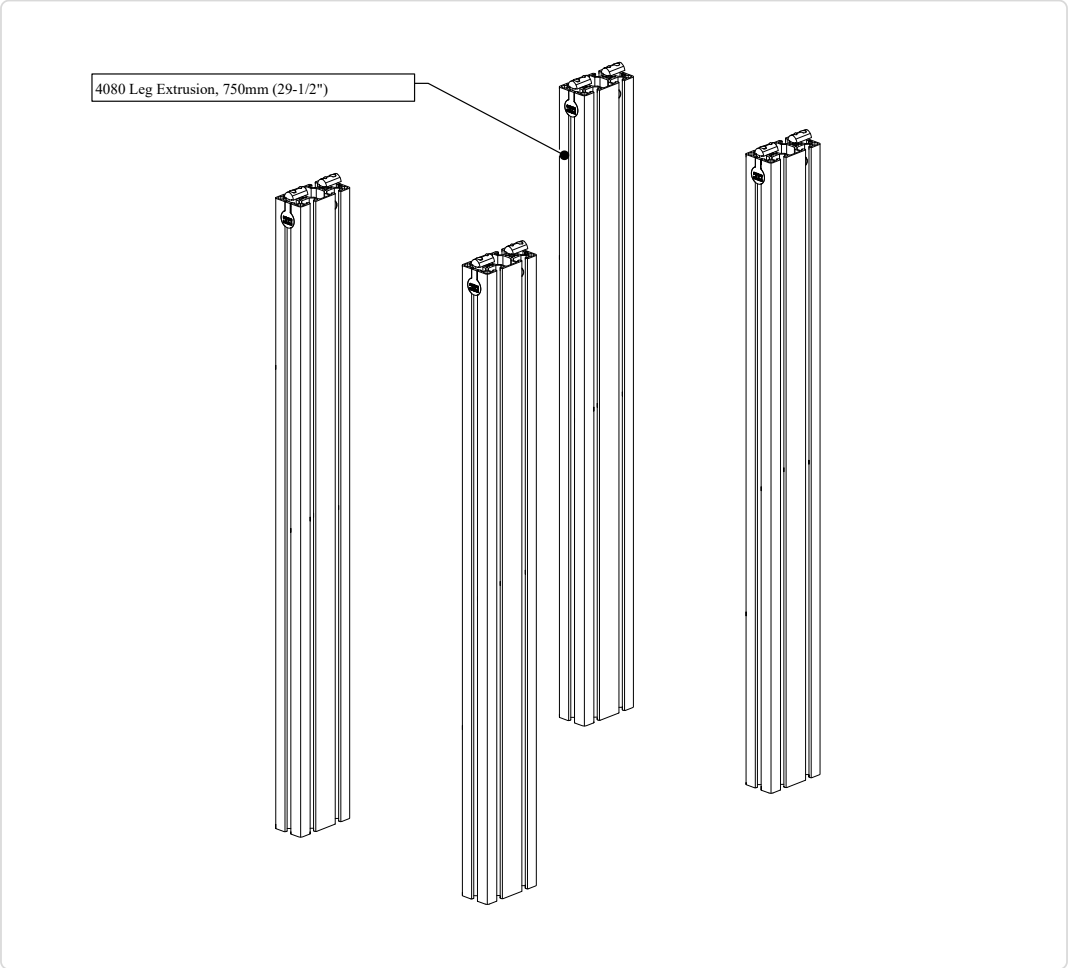
- Slide the anchor assemblies into the 1370mm (53-15/16") 4080 Leg Crossmember Extrusion.

1.1.1.3



- Repeat the previous steps to install anchor fasteners on both sides of the 1370mm (53-15/16") Leg Crossmember Extrusions.

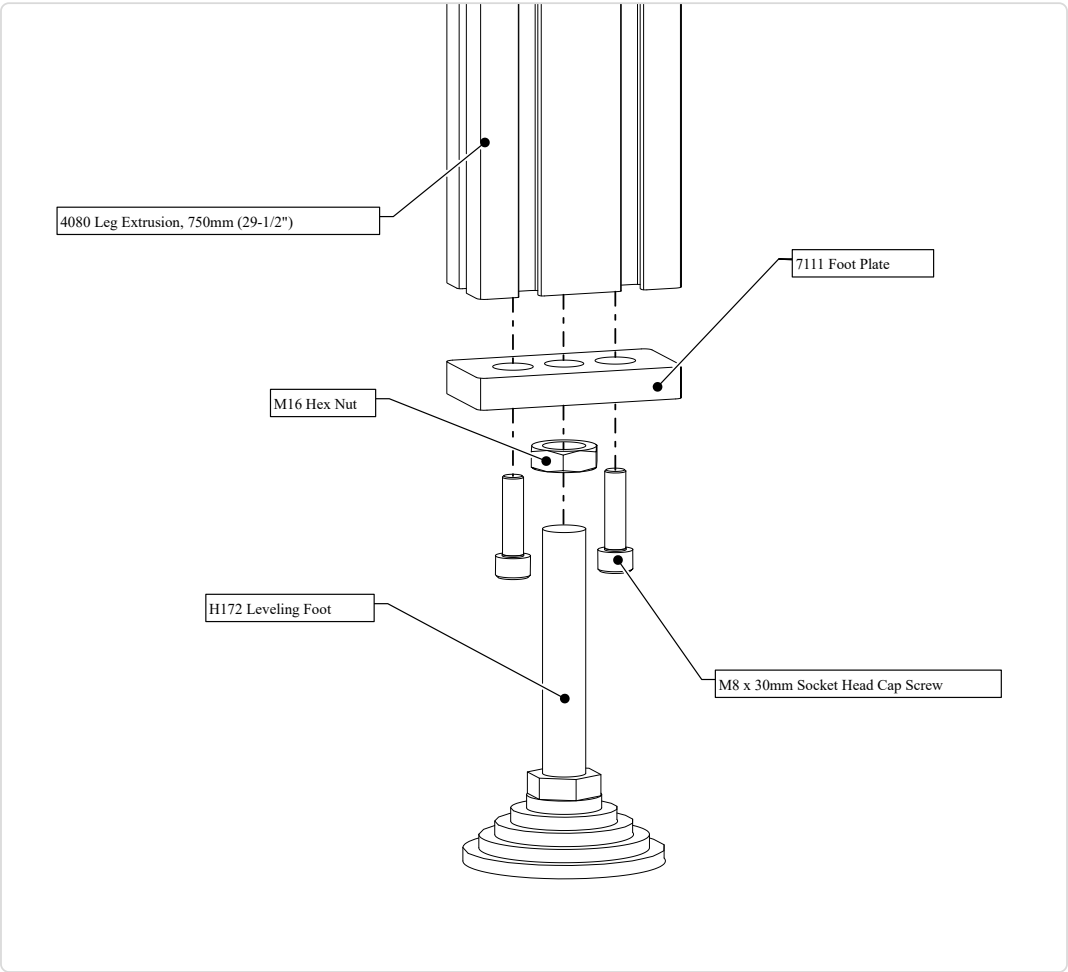
1.1.1.4



- Repeat the previous steps to install anchor fasteners on one side of each 750mm (29-1/2") Leg Extrusion.

1.1.2 Leveling Feet Installation

1.1.2.1



- Install a foot assembly onto each 750mm (29-1/2") Leg Extrusion as indicated.

1.1.2.2

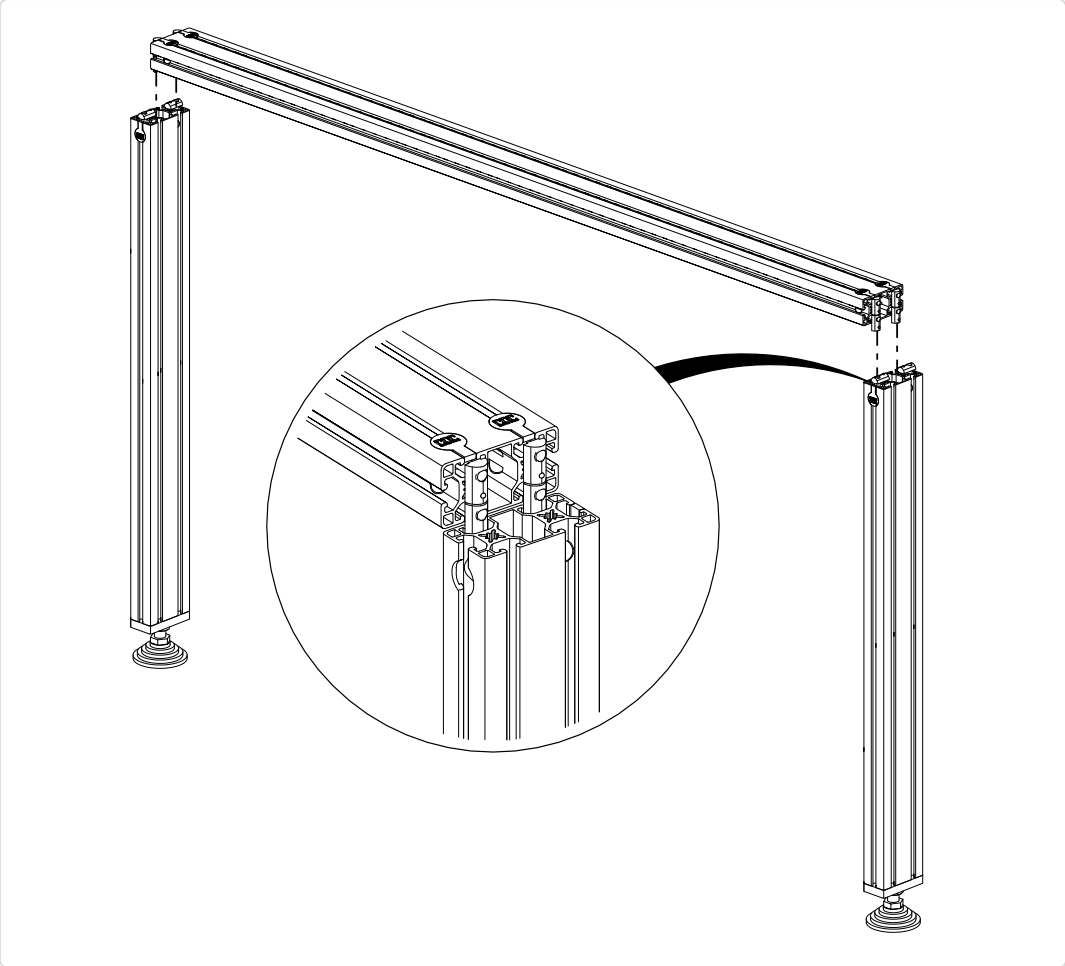
- Repeat the previous steps for each of the 750mm (29-1/2") Leg Extrusions as indicated.

Assembly Note

Adjust the leveling feet to approximately the same heights during this step. After machine assembly, final adjustments will be made in the table leveling procedure.
(https://www.avidcnc.com/support/instructions/machineSetup/levelingSquaringAndTramming)

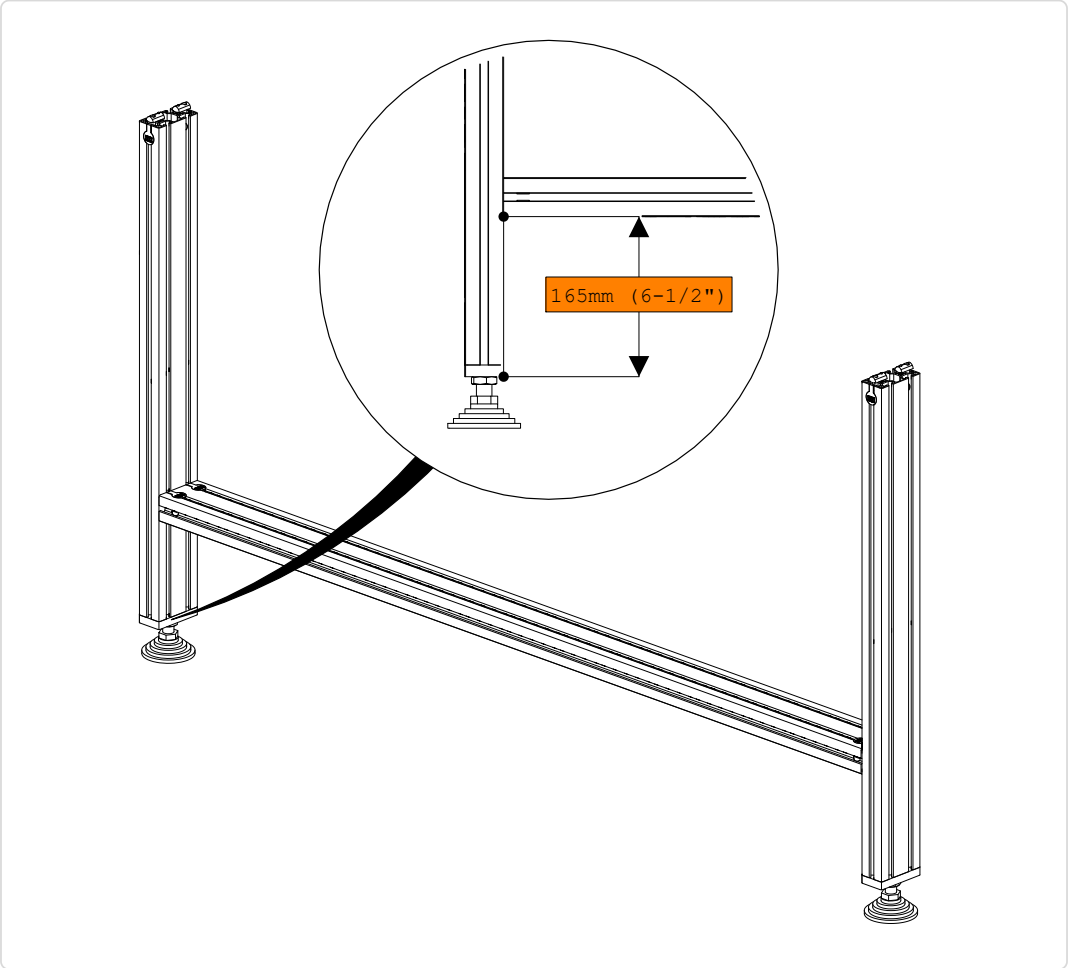
1.1.3 Leg Crossmember Assembly

1.1.3.1



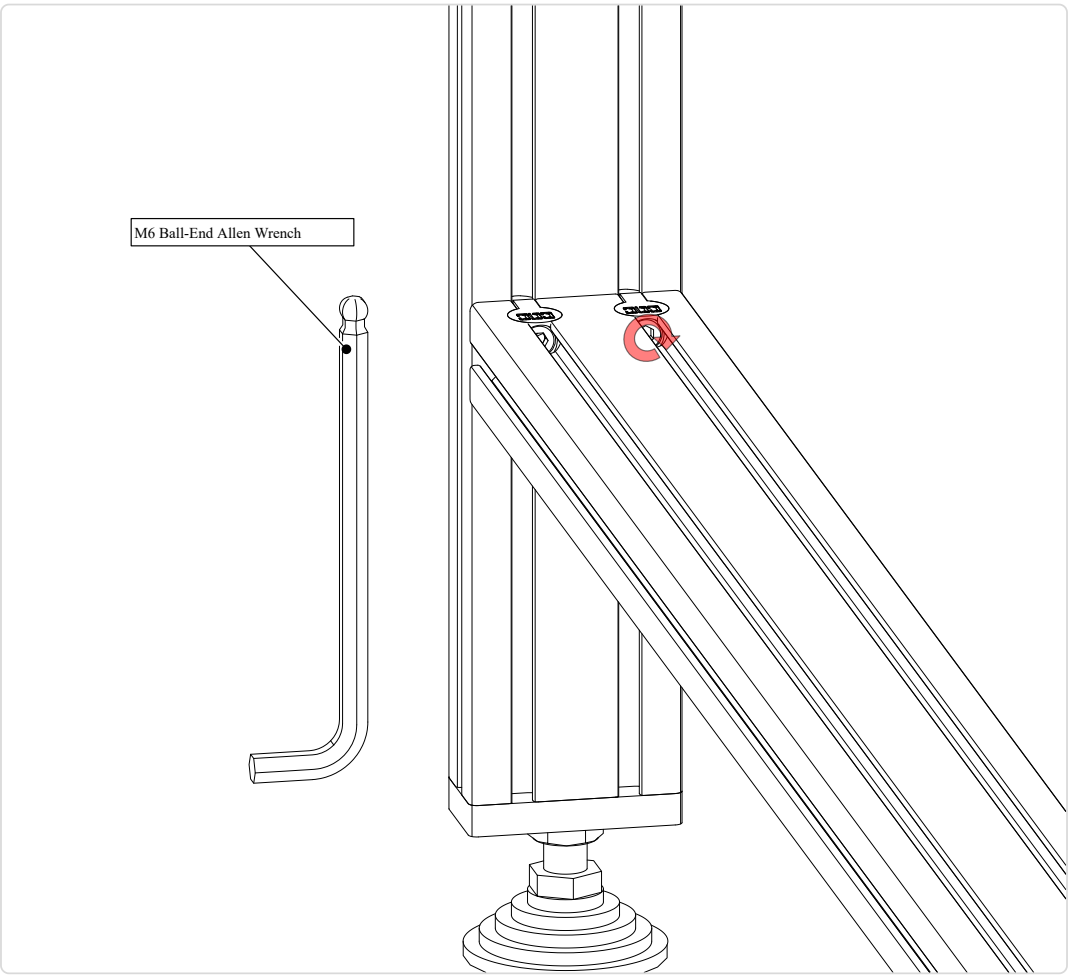
- Use a section of 1370mm (53-15/16") Leg Crossmember Extrusion to join two of the 750mm (29-1/2") Leg Extrusion sections.

1.1.3.2



- Position the leg crossmember 165mm (6-1/2") from the bottom of the leg as indicated.

1.1.3.3



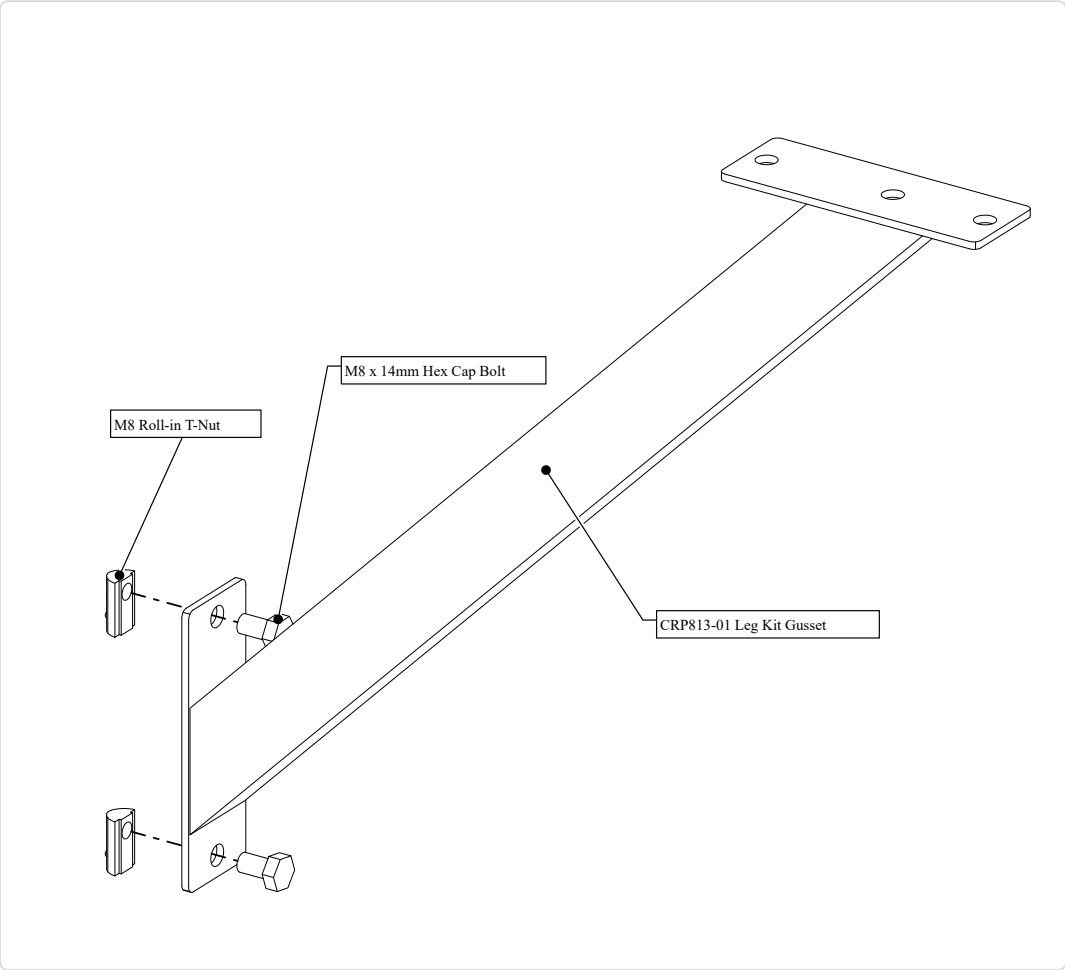
- On each side of the leg crossmember tighten the anchor fasteners incrementally, alternating between fasteners.

Assembly Note

For tightening the anchor fasteners, an M6 ball-end allen wrench is required. An M6 ball-end driver attachment for a drill or impact driver can make assembly more efficient.

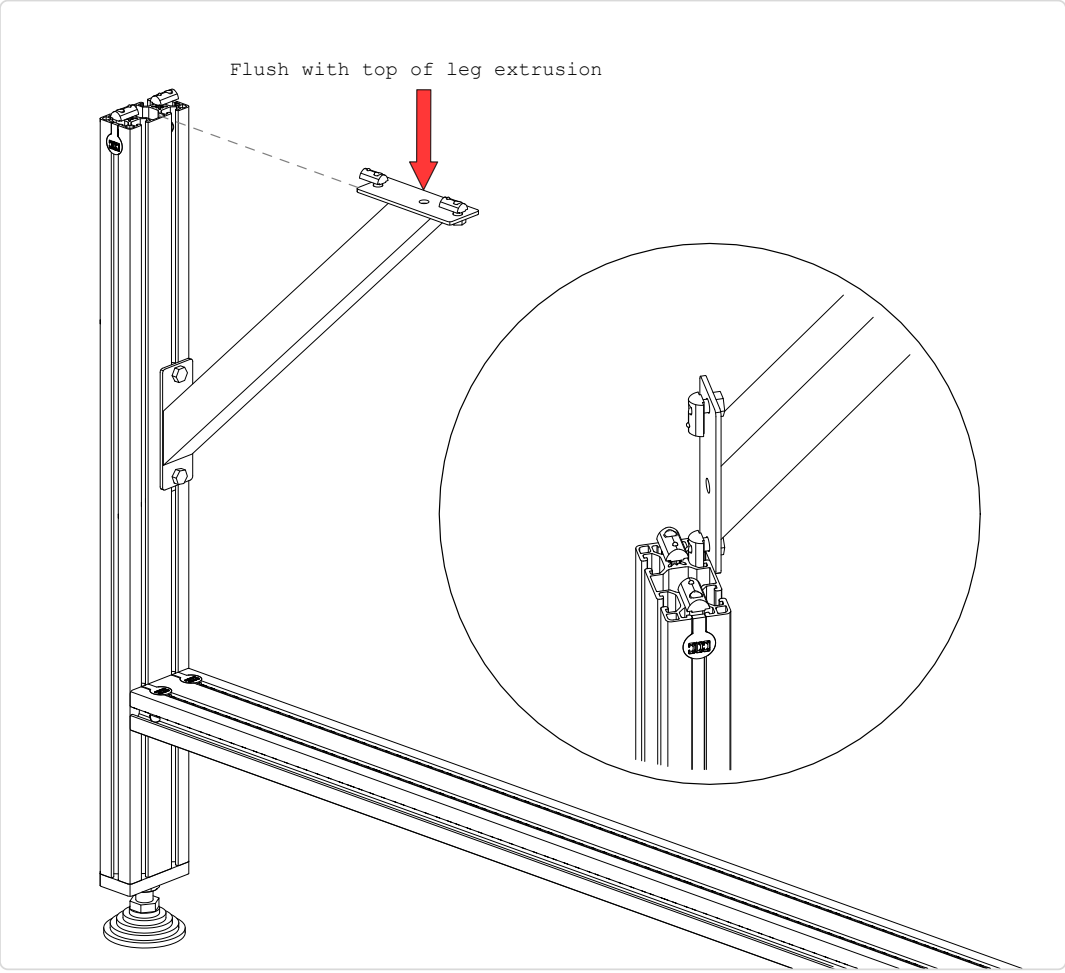
1.1.4 Leg Gussets Installation

1.1.4.1



- Install M8 bolts through the gusset as indicated, partially threading on the T-Nuts.

1.1.4.2

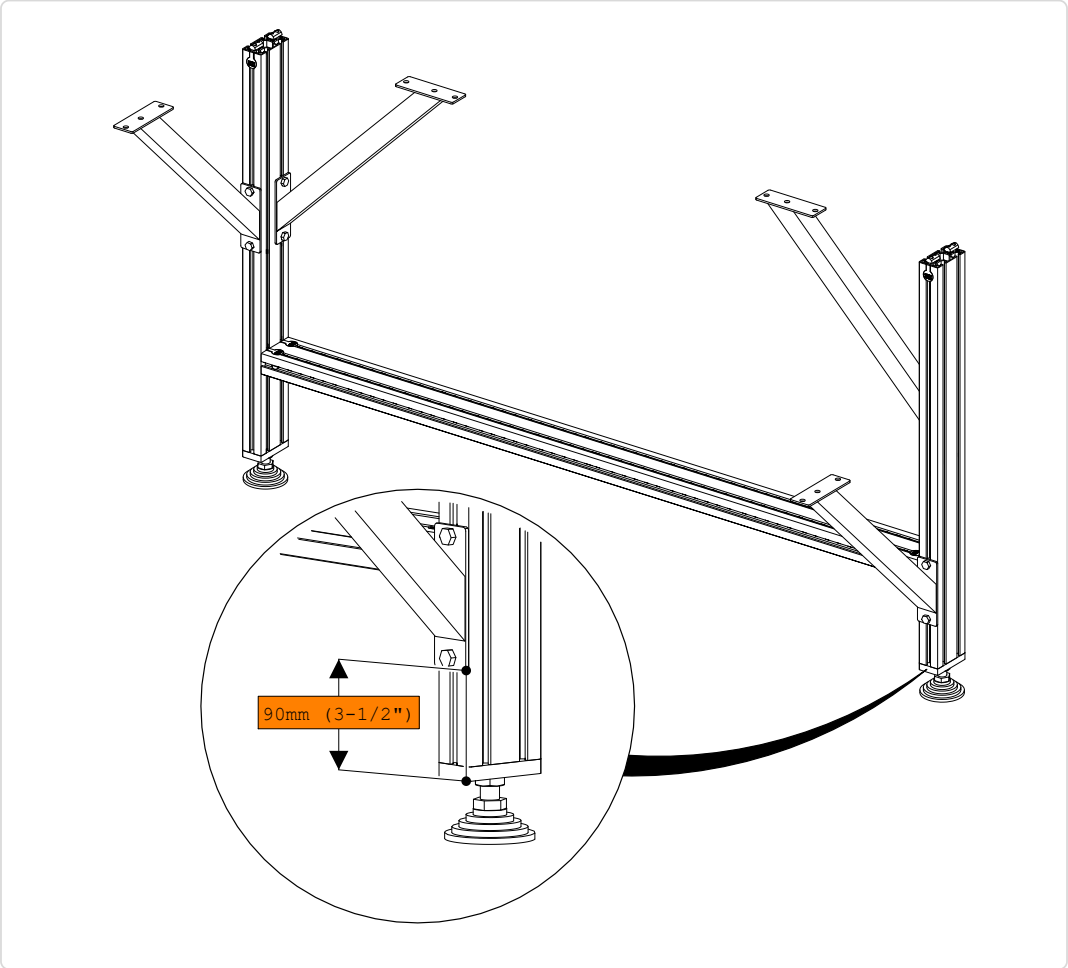


- Slide the gusset into the extrusion as indicated and partially tighten the M8 bolts.

Assembly Note

The top of the gusset should be roughly flush with the top of the extrusion.

1.1.4.3

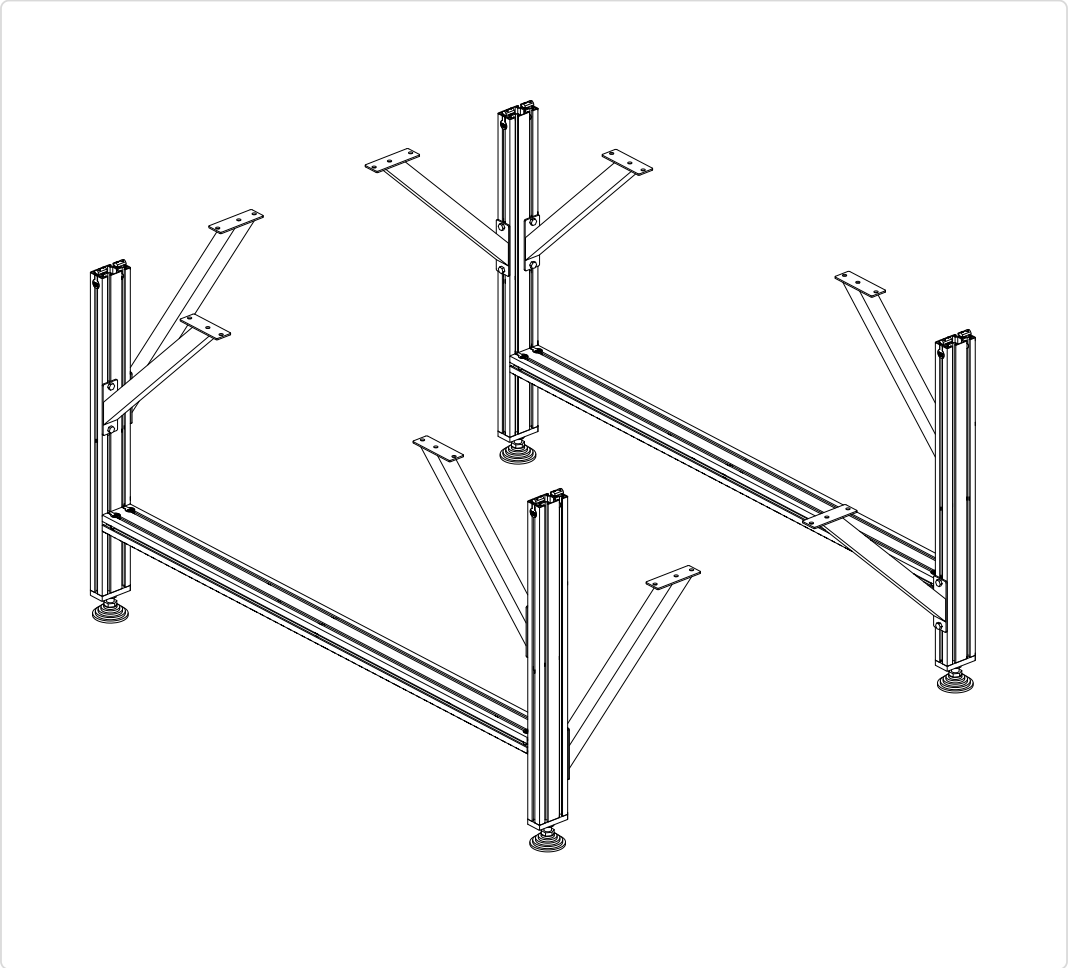


- Install 3 additional gussets to the leg assembly as indicated.

Assembly Note

One gusset should be lowered to the dimension shown to accommodate the electronics mounting bar.

1.1.4.4



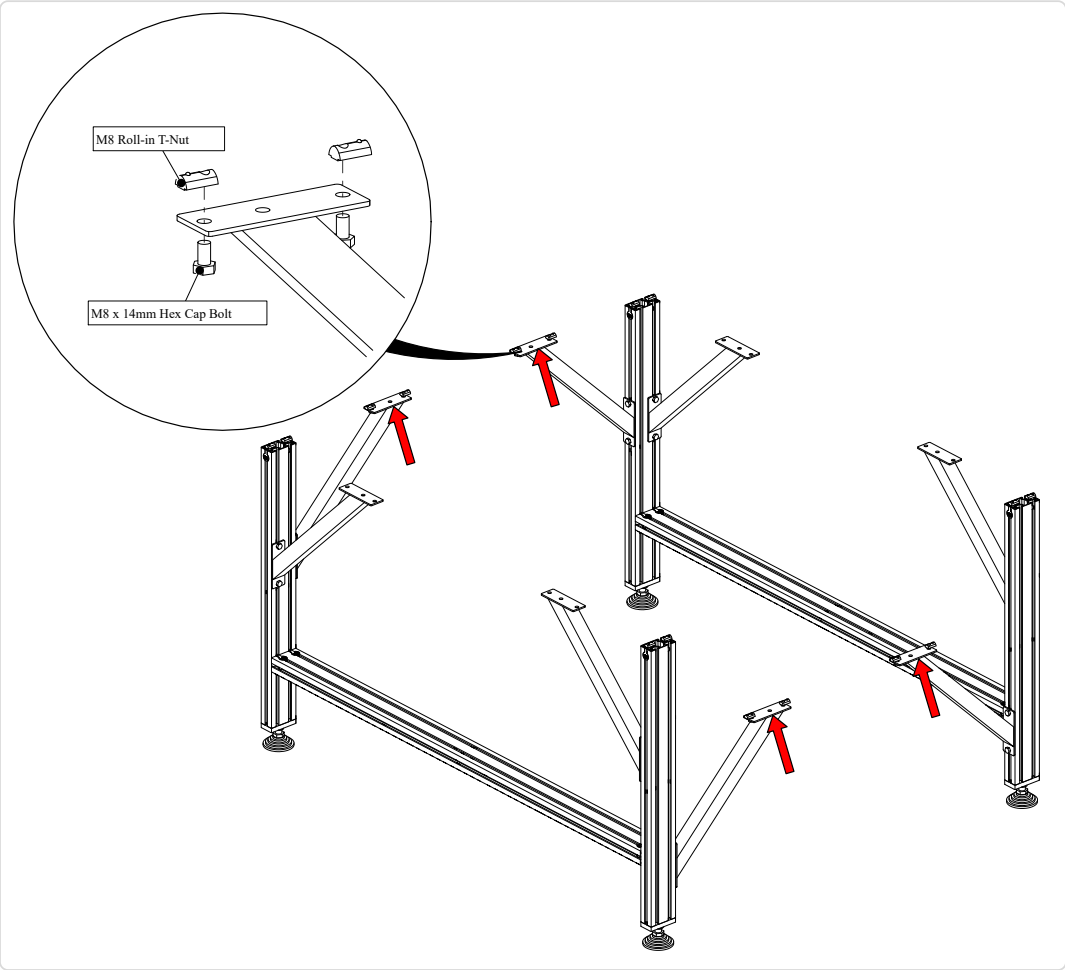
- Repeat the previous steps to assemble the remaining gussets and extrusion sections in the indicated configuration.

Assembly Note

The lowered gussets should be on the same side as indicated.

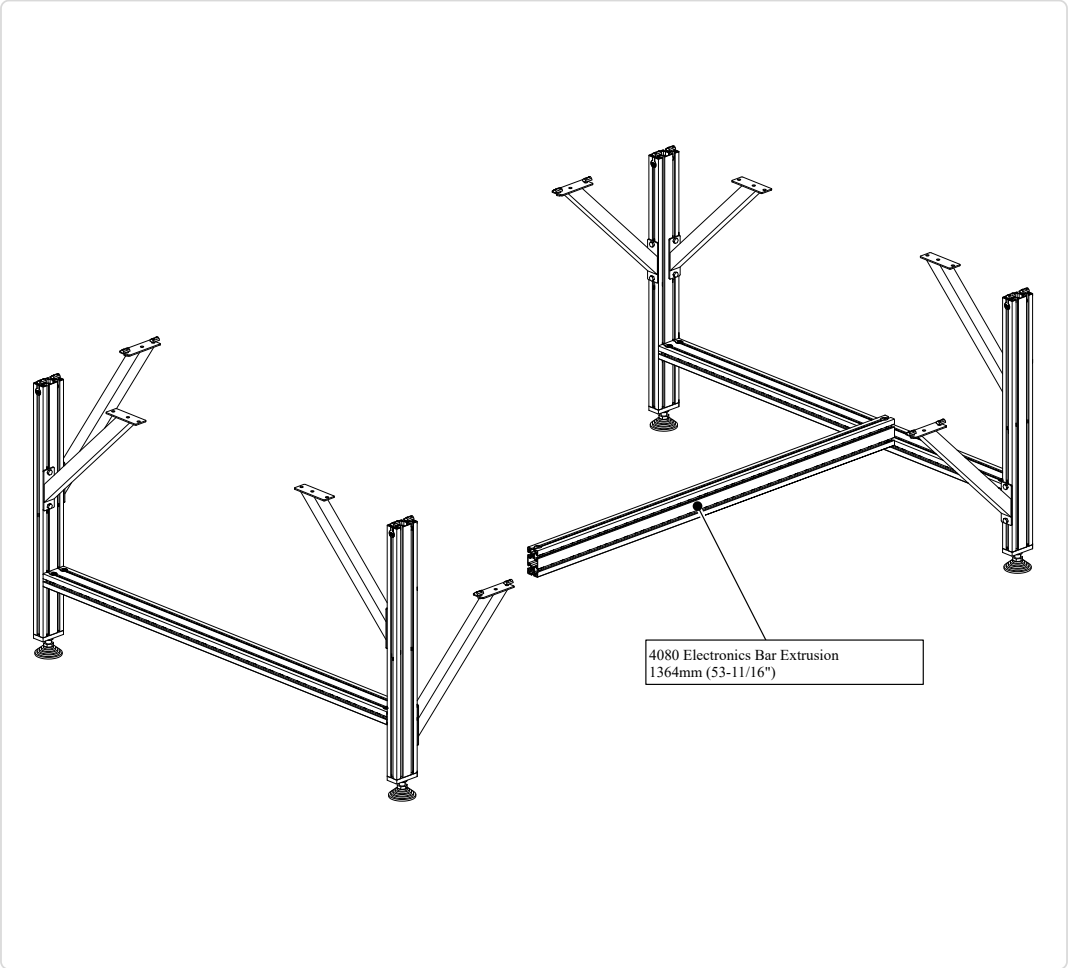
1.1.5 Electronics Mounting Bar Installation

1.1.5.1



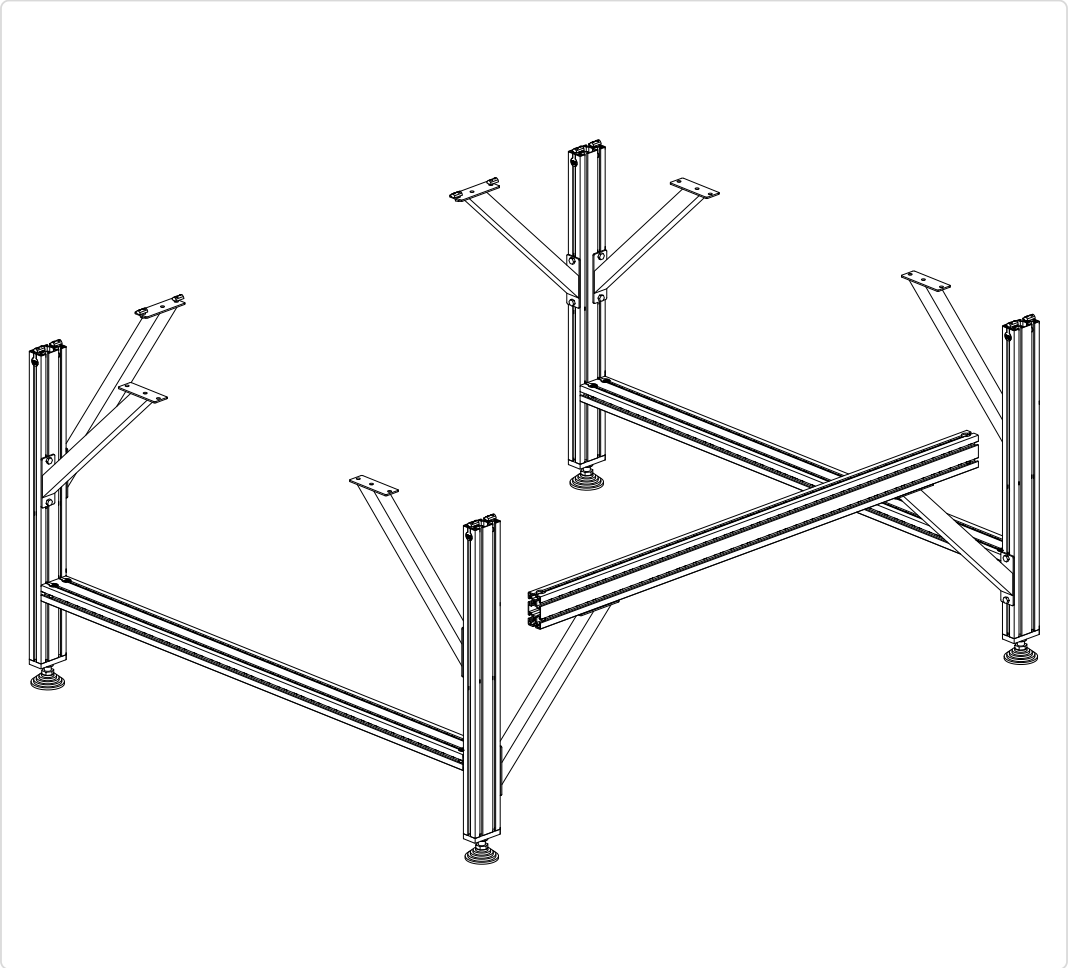
- On the indicated gussets, install M8 bolts and partially thread on the T-Nuts.

1.1.5.2



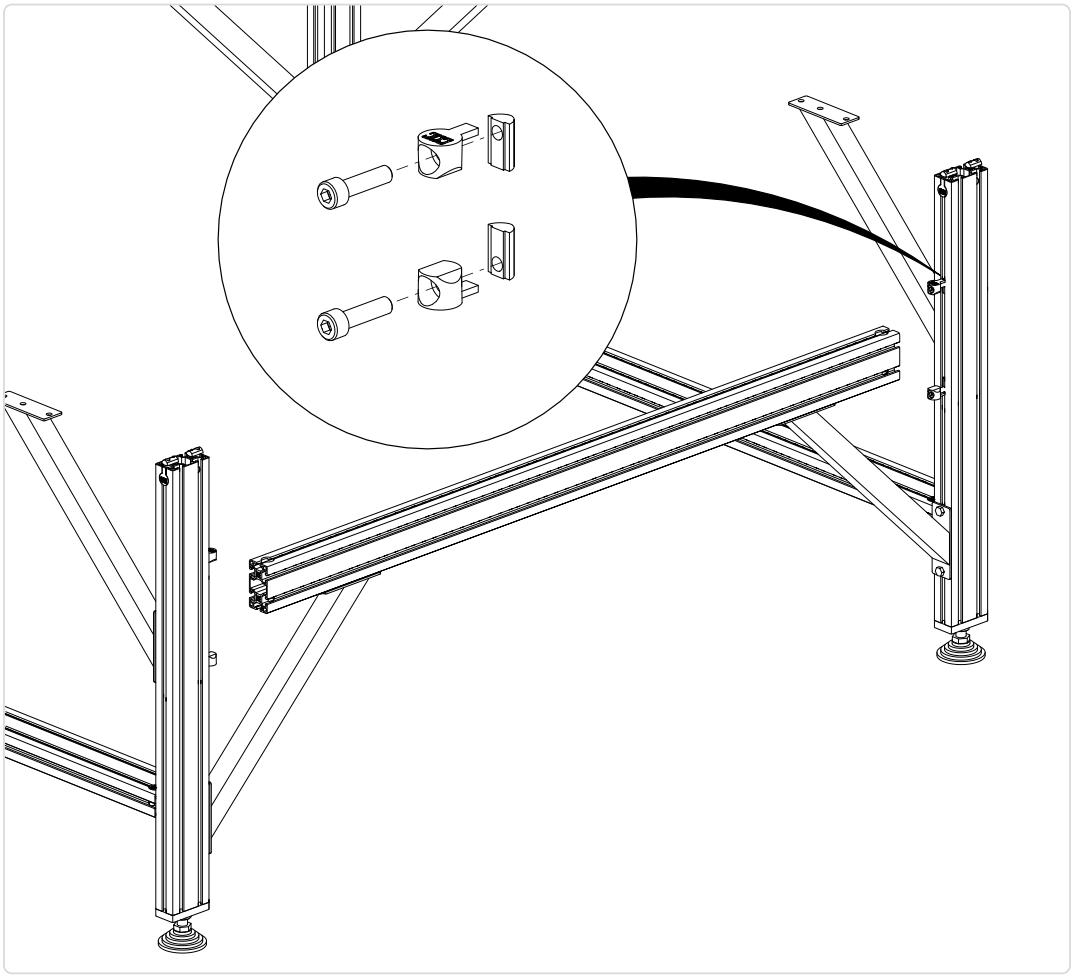
- Separate the leg assemblies to allow room for the 1364mm (53-11/16") Electronics Bar Extrusion to slide on the lower gussets.

1.1.5.3



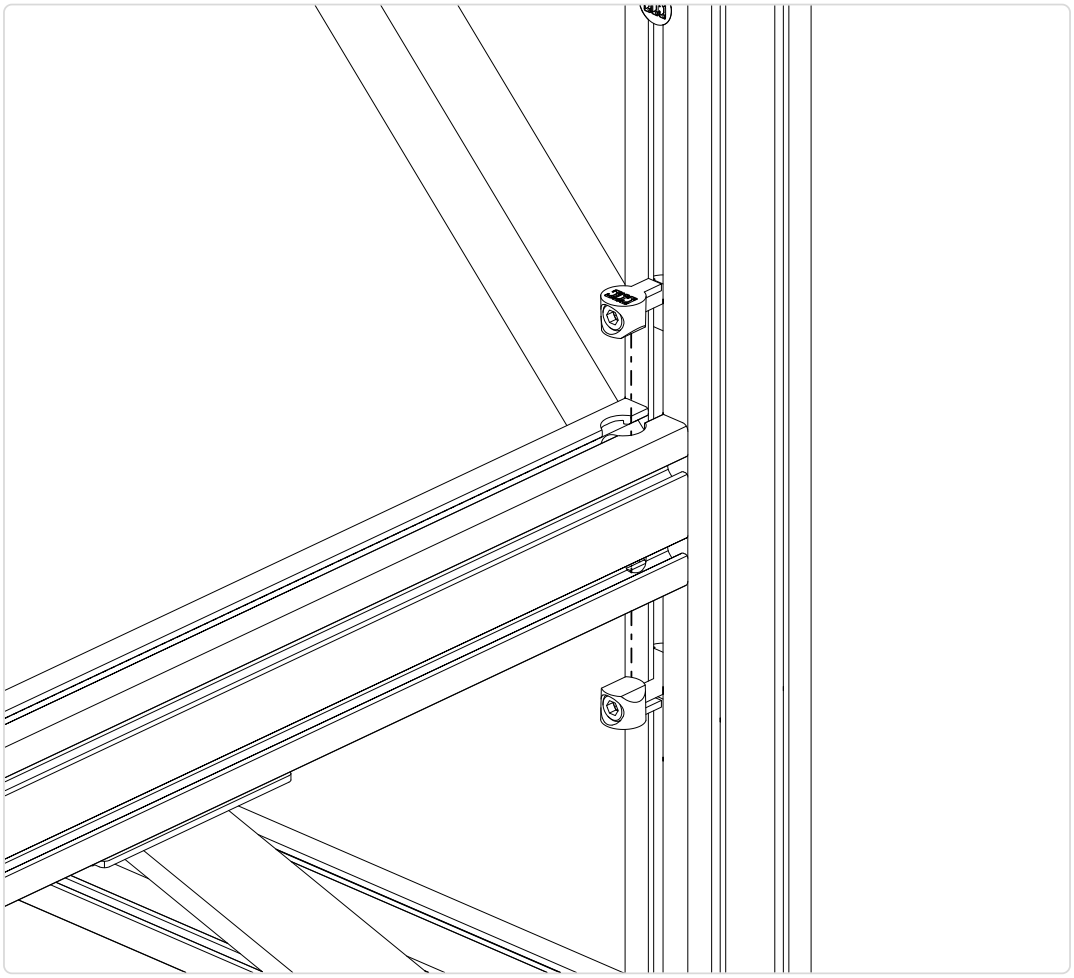
- Slide the electronics bar onto the gussets, leaving space between it and the leg extrusions as indicated.

1.1.5.4



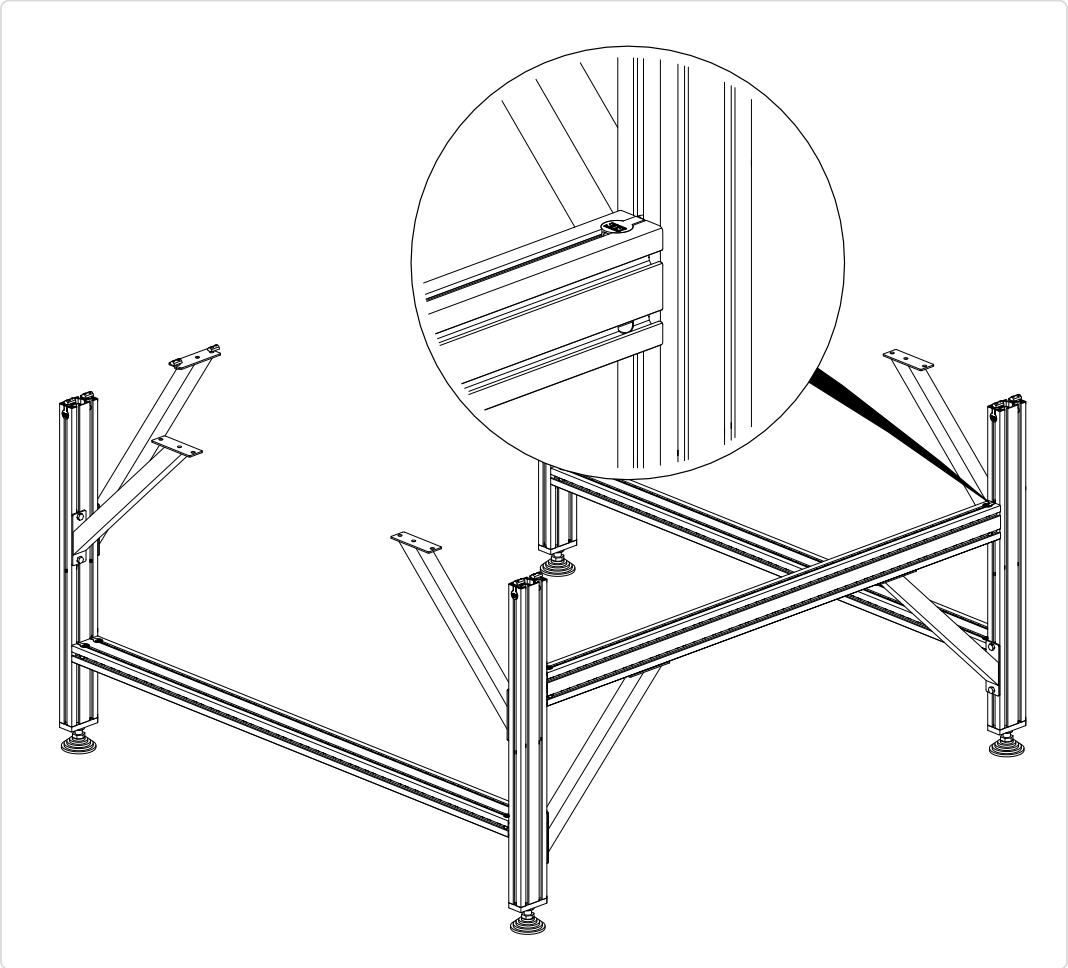
- Slide assembled anchor fasteners into the leg extrusions, positioning them above and below the electronics bar as indicated.

1.1.5.5



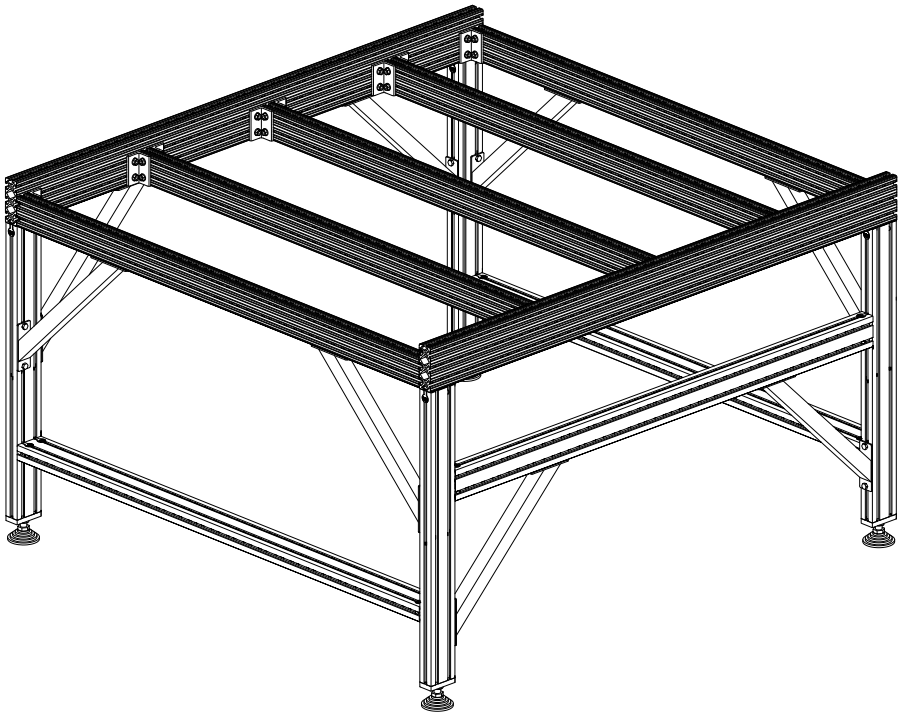
- With the electronics bar flush against the leg extrusion, insert the anchor fasteners.

1.1.5.6



- Complete this process on both sides of the electronics bar.
- Tighten all electronics bar anchor fasteners.

1.2 Table Frame Assembly (with Leg Kit)



Section Note

Skip this section if you are not using a Avid CNC leg kit

Parts and Tools Required

The following parts and bags will be used in this section:

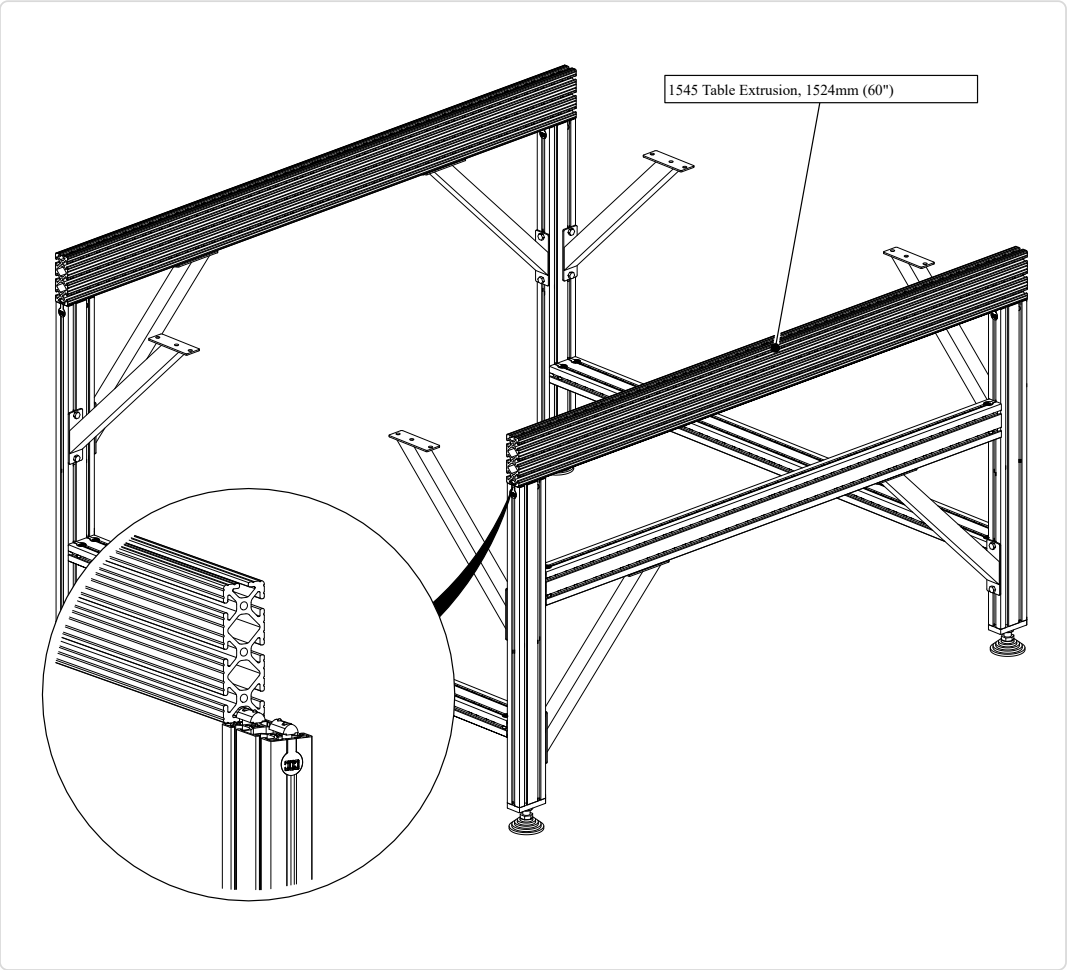
- (2) 1545 Table Extrusion, 1524mm (60")
- (5) 1530 Table Crossmember Extrusion, 1372mm (54")
- (16) Inside Corner Bracket
- (1) CRP813-00-LEGSET-HW-BAG
    - (8) M8 x 14mm Hex Cap Screw
    - (8) M8 Roll-in T-Nuts
- (1) TS-M8-16K-FN
    - (64) M8 x 16mm T-Stud
    - (64) M8 Hex Flange Nut

The following tools will be used in this section:

- 6mm Ball-End Allen Wrench
- 6mm Ball-End Driver Attachment for Drill/Impact Driver
- 13mm Combination Wrench
- Tape Measure

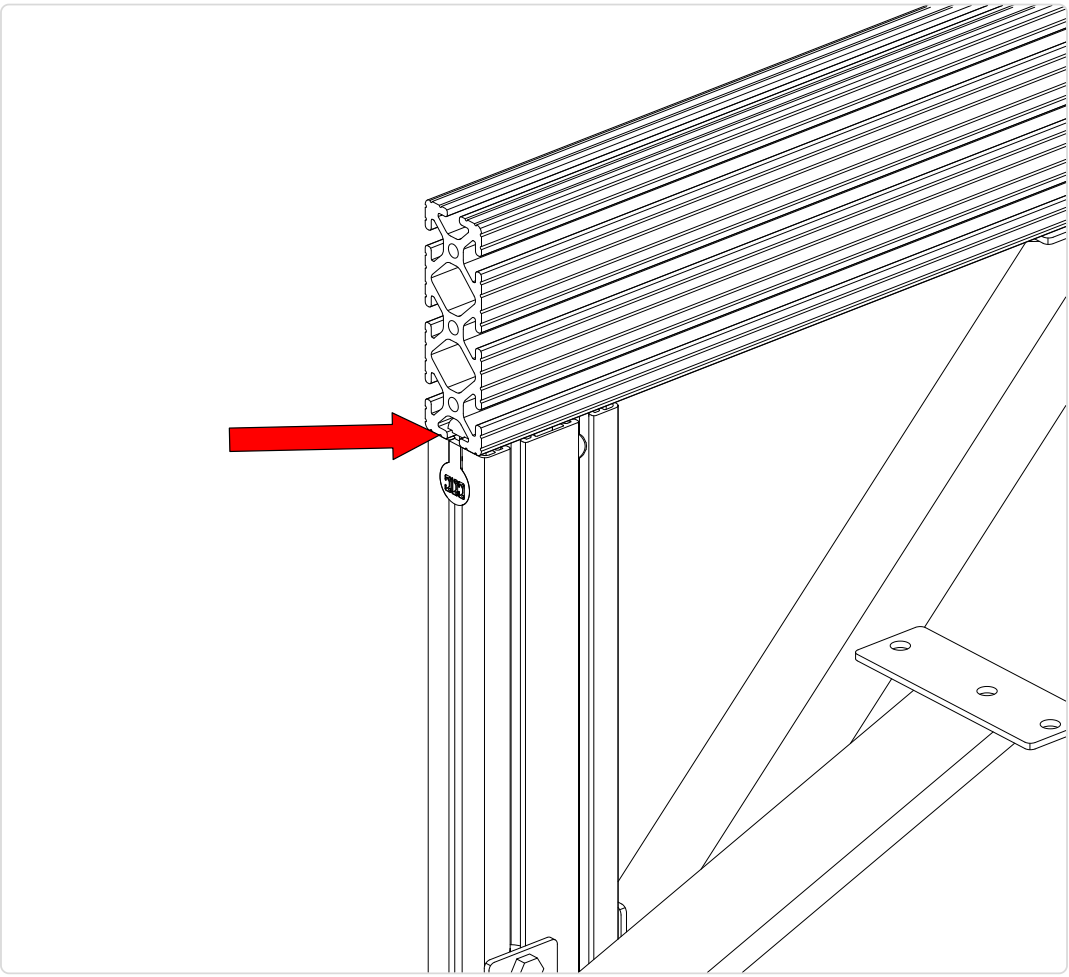
1.2.1 Frame Extrusions Installation

1.2.1.1



- Slide the two 1524mm (60") 1545 Table Extrusions on to the leg assemblies as indicated.

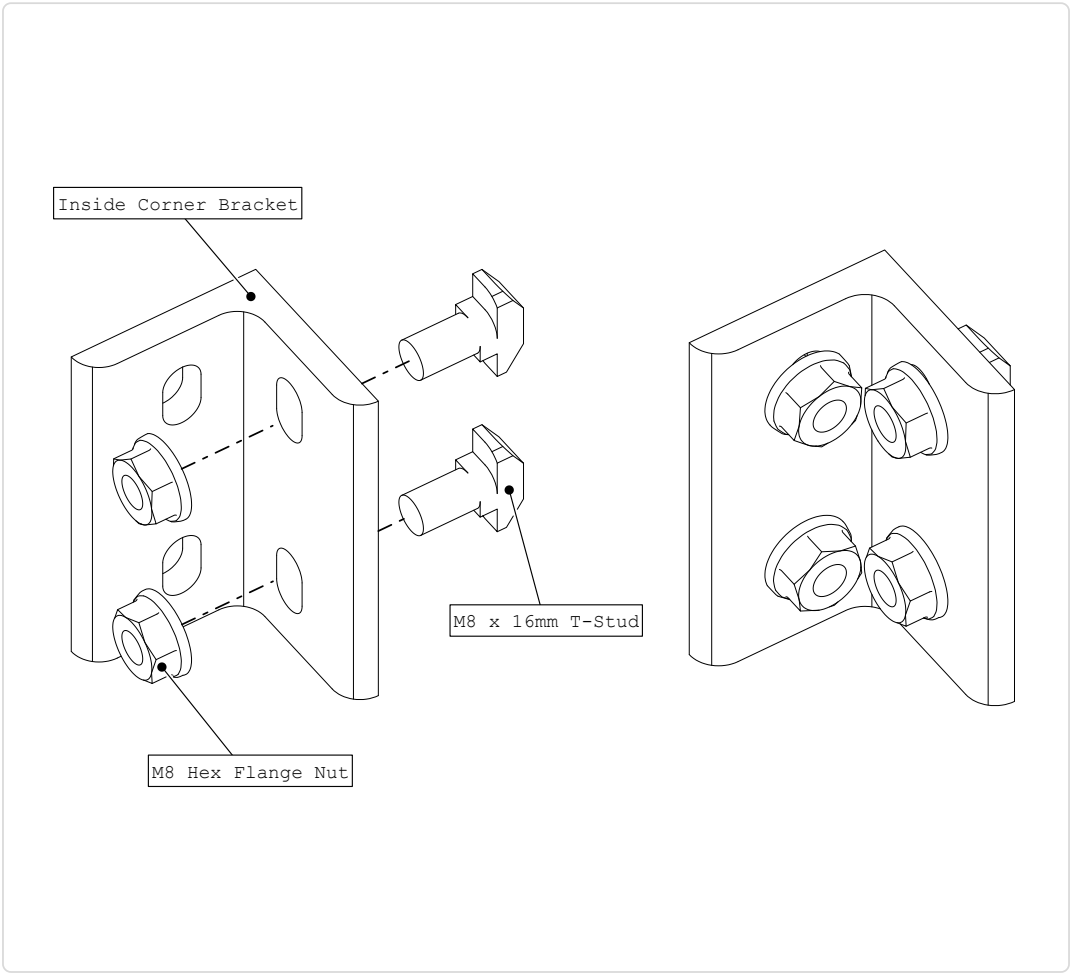
1.2.1.2



- Bring the ends of the frame extrusion flush with the legs as indicated.
- Fully tighten the anchor fasteners attaching the frame extrusions to the legs.

1.2.2 Corner Brackets Assembly

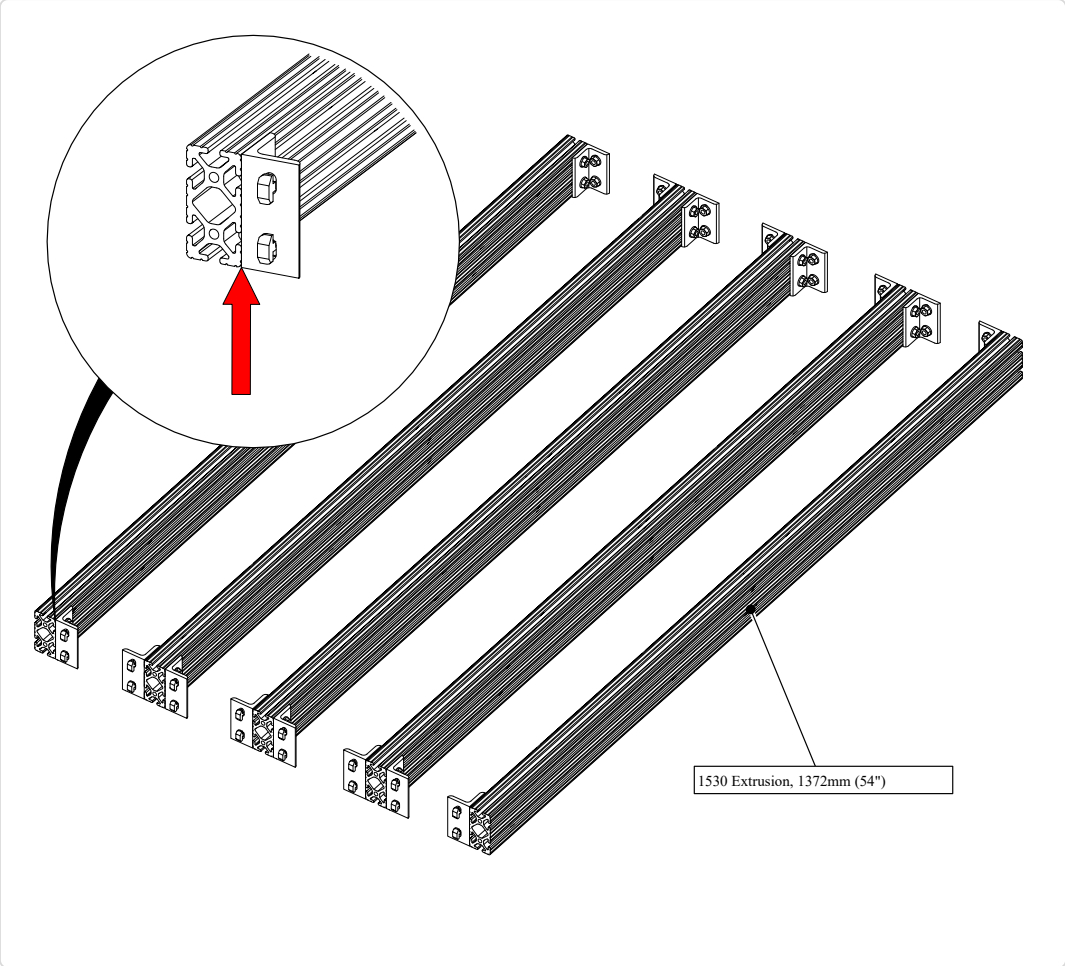
1.2.2.1



- Partially thread M8 flange nuts on to M8 T-Studs through each slot in the corner bracket.
- Repeat this procedure to assemble (16) corner brackets.

1.2.3 Table Crossmembers Installation

1.2.3.1

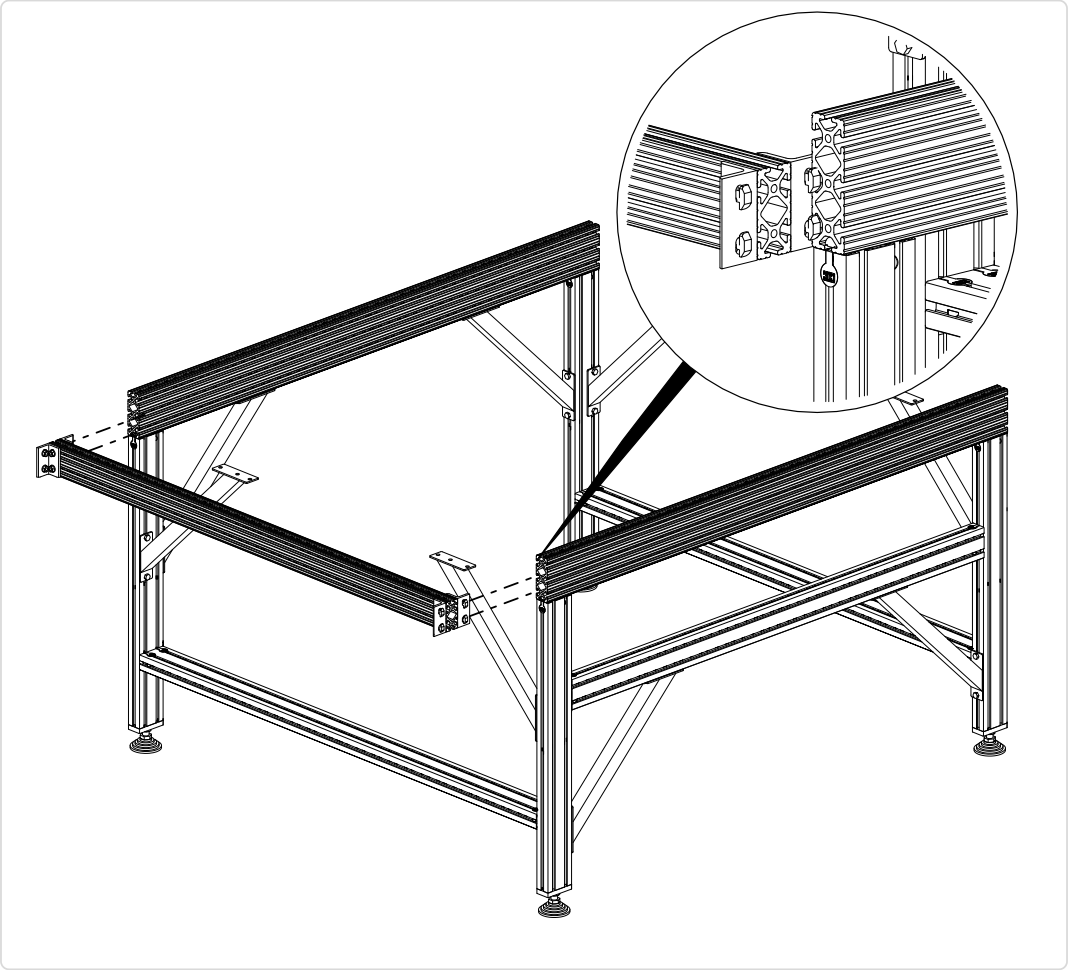


- Attach corner brackets to the 1372mm (54") 1530 Table Crossmember Extrusions in the positions indicated.

Assembly Note

Ensure the corner brackets are flush with the ends of the extrusion before tightening the M8 flange nuts.

1.2.3.2



- Slide a crossmember with four corner brackets onto the table extrusion.

Assembly Note

Use the lower two slots on the table extrusion as indicated.

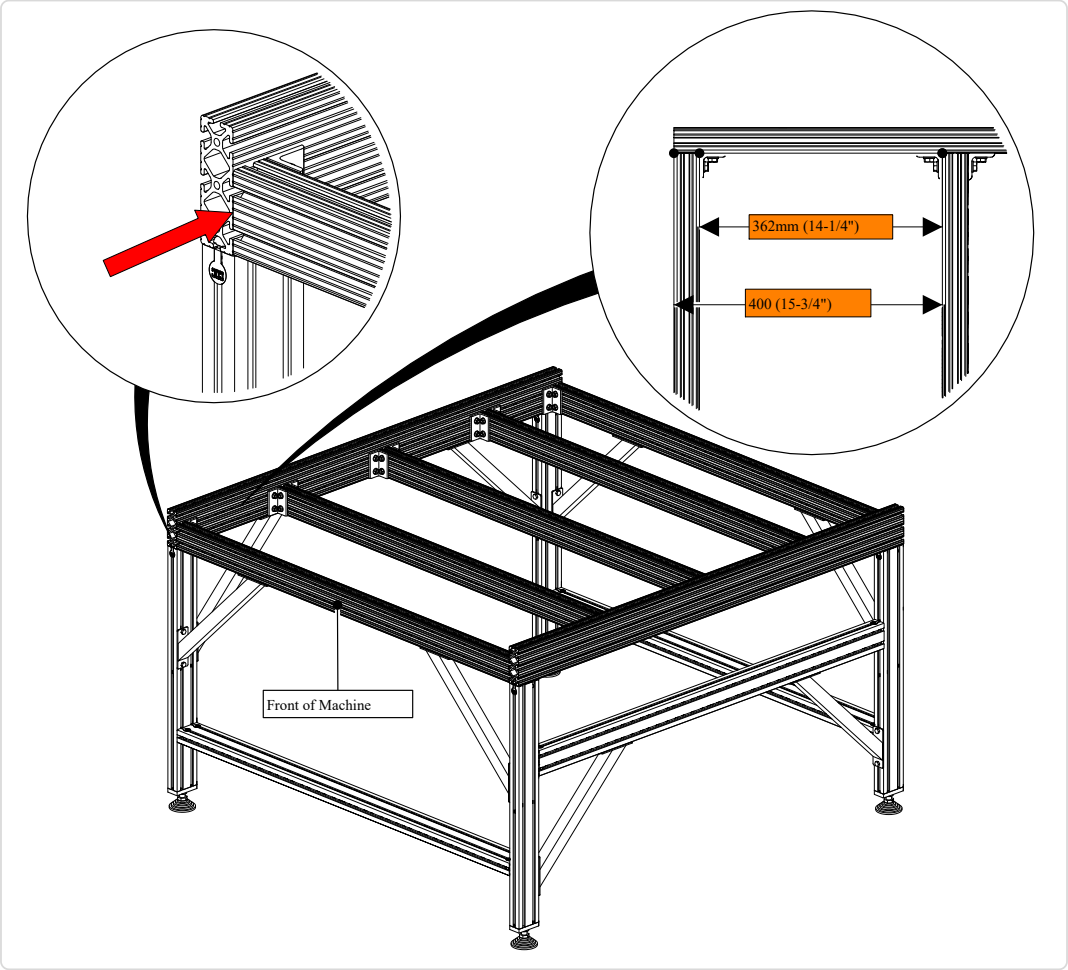
1.2.3.3

- Repeat this process with the remaining crossmembers.

Assembly Note

Install the crossmembers with the corner brackets in the correct positions as indicated.

1.2.3.4

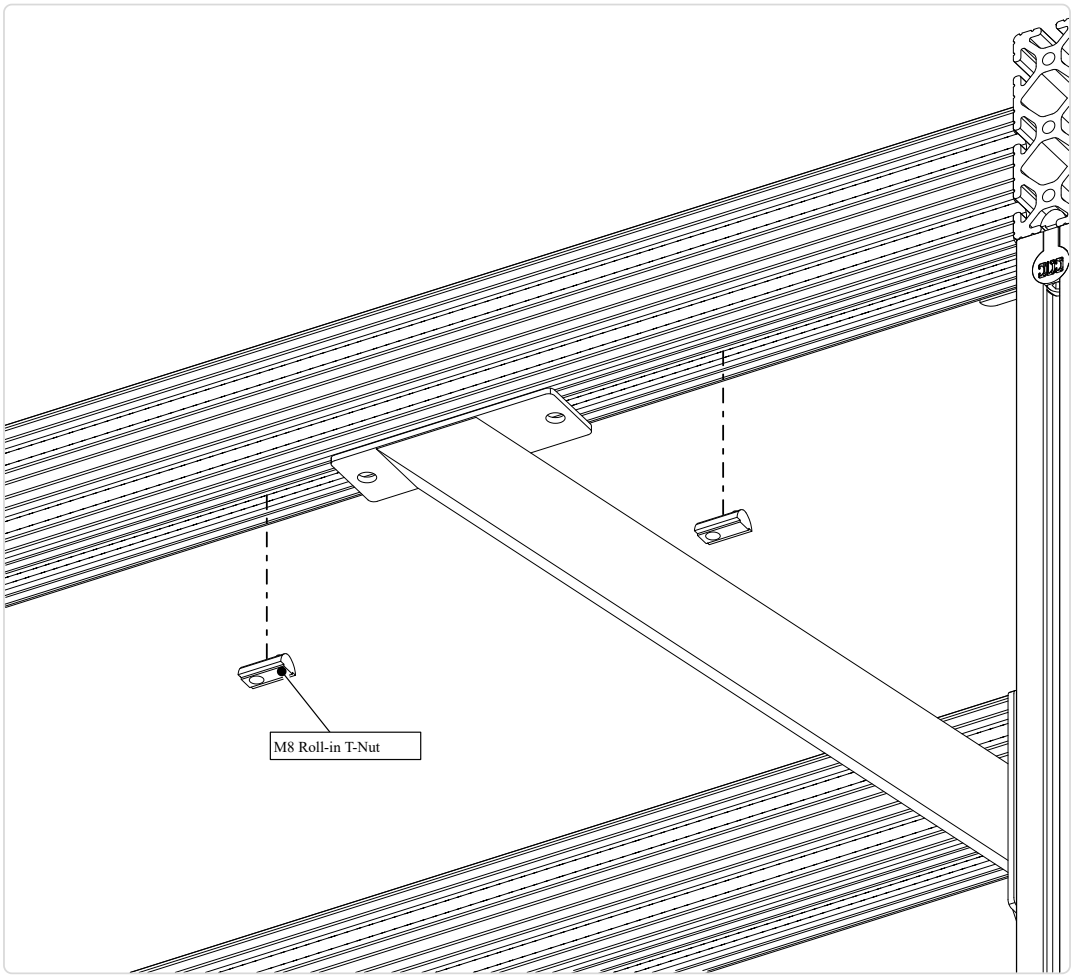


- Position the the outer crossmembers flush with the ends of the table extrusion.
- Position the next crossmember 362mm (14-1/4") from the front crossmember (or 400mm (15-3/4") center to center).
- Repeat this process to position the remaining crossmembers.

Assembly Note

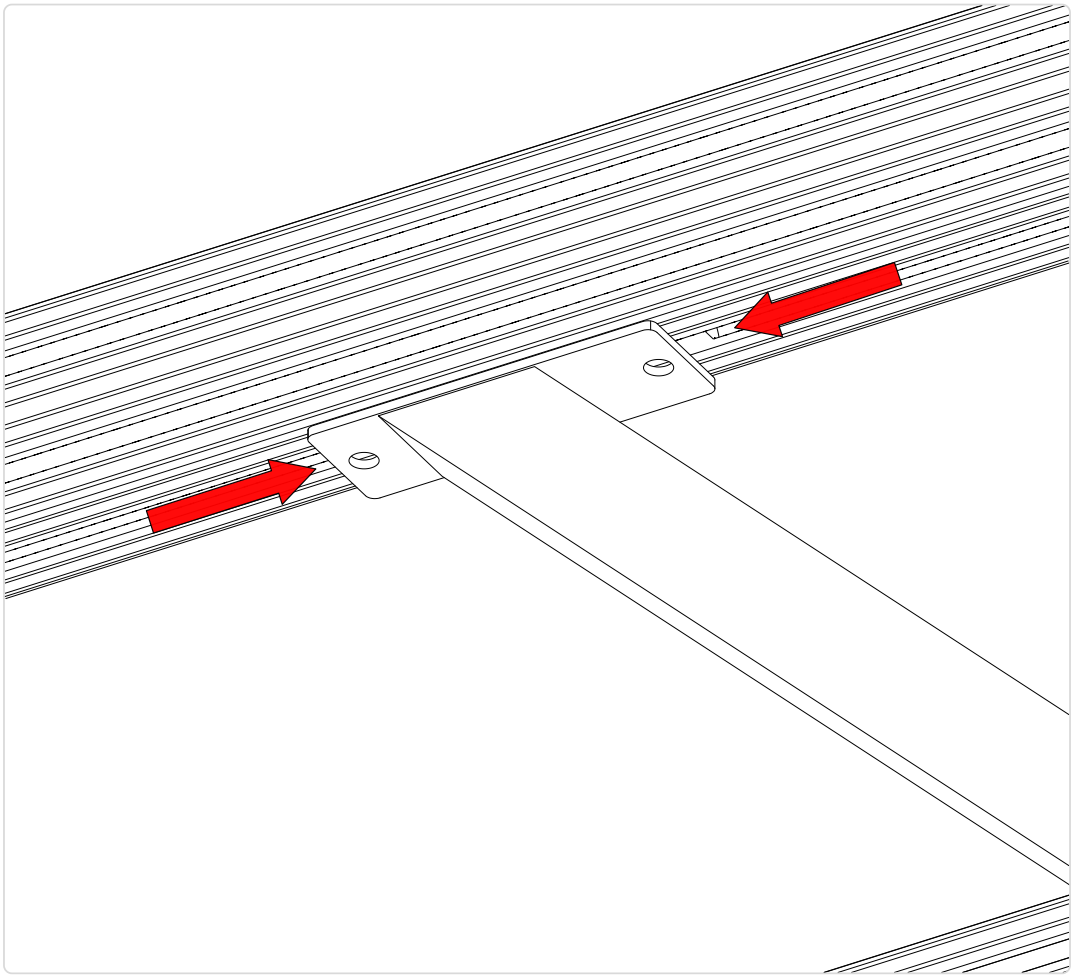
Measure at both ends of the crossmember to ensure they are parallel. The last two crossmembers at the back of the machine will end up being spaced closer together.

1.2.3.5



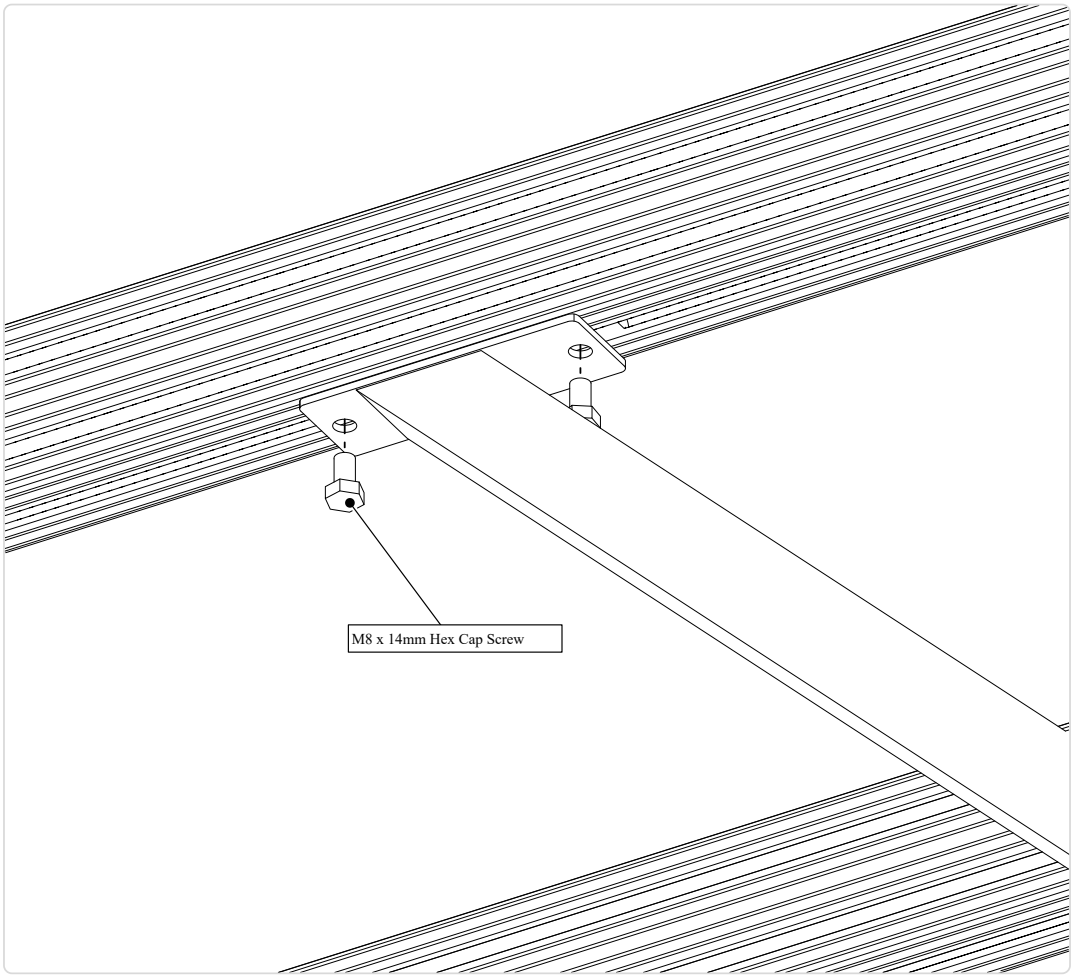
- For each of the four gussets that attach to the outer crossmembers, install two Roll-in T-Nuts to the bottom of the crossmember extrusion as indicated.

1.2.3.6



- Slide the T-Nuts in the extrusion to align them with the gusset holes.

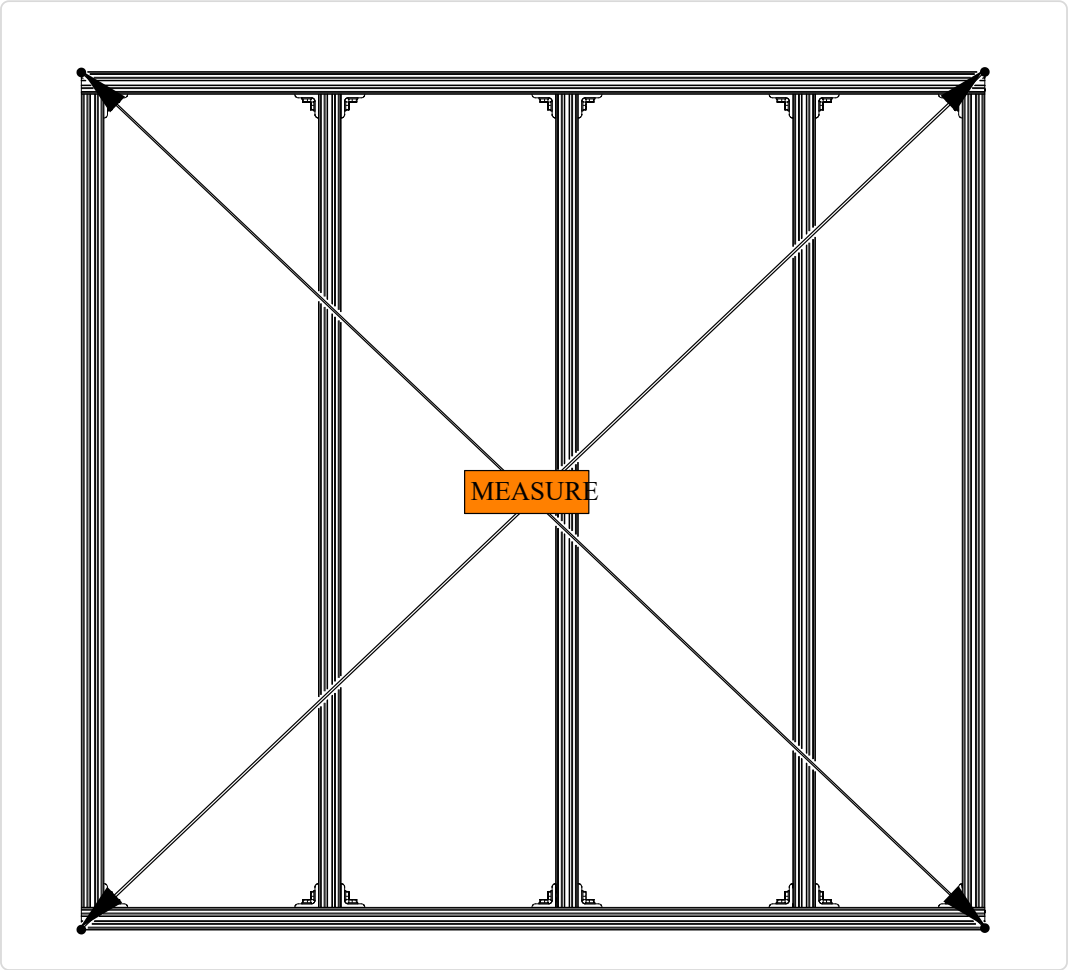
1.2.3.7



- Insert the fasteners as indicated and partially tighten.

1.2.4 Table Squaring

1.2.4.1

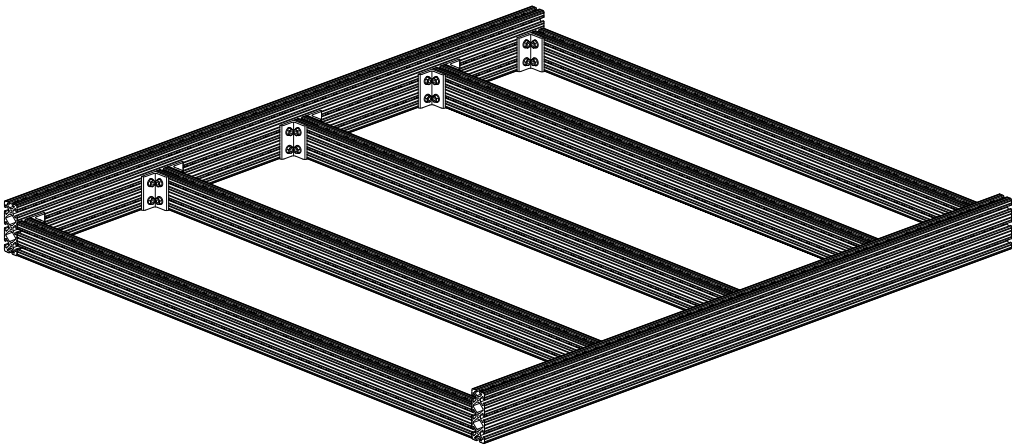


- Measure diagonal across the table in each direction as indicated.
- Make adjustments until the two measurements are within 1/8" or less of each other.
- After squaring the table, tighten all corner bracket and leg gusset fasteners.

Assembly Note

Position of the corner brackets and leg gussets may need to be adjusted in the table squaring process.

1.3 Table Frame Assembly (without Leg Kit)



Section Note

Skip this section if you are using a Avid CNC leg kit

Parts and Tools Required

The following parts and bags will be used in this section:

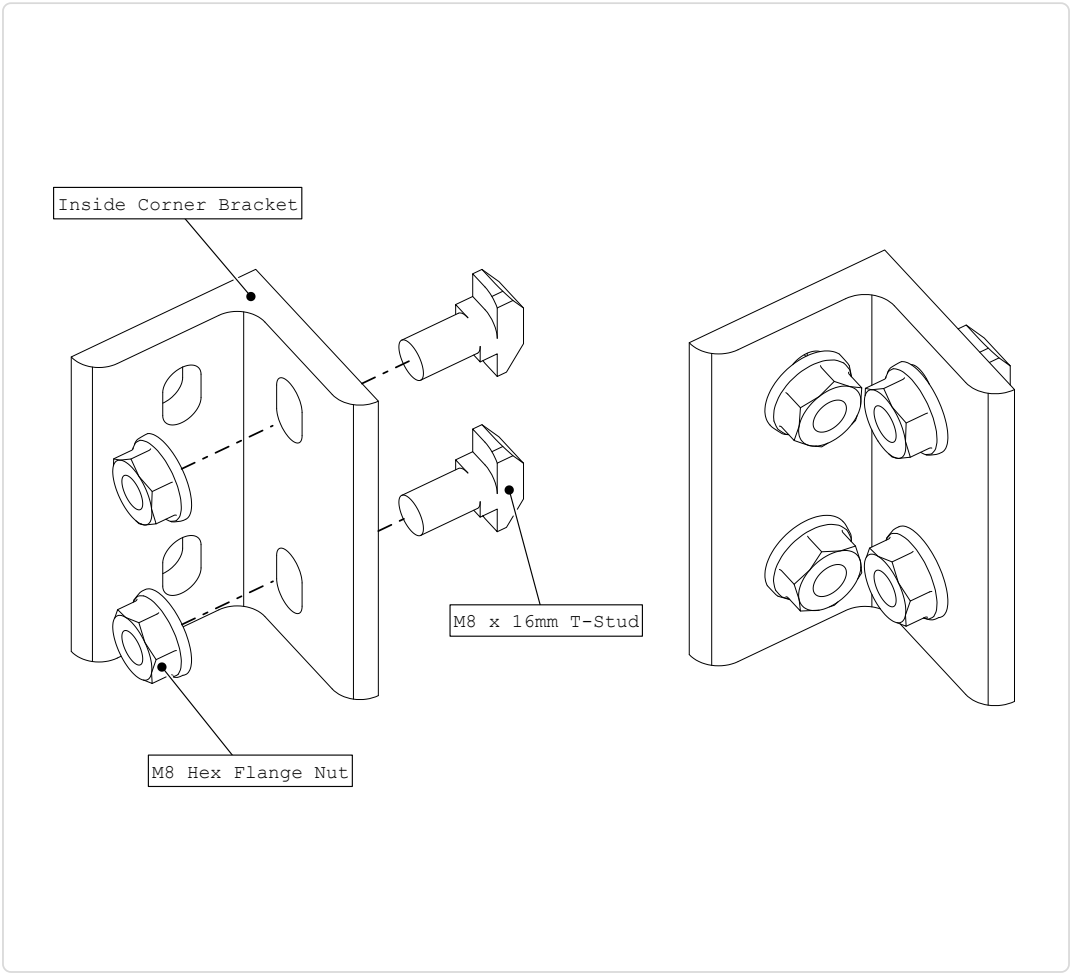
- (2) 1545 Table Extrusion, 1524mm (60")
- (5) 1530 Table Crossmember Extrusion, 1372mm (54")
- (16) Inside Corner Bracket
- (1) TS-M8-16K-FN
    - (64) M8 x 16mm T-Stud
    - (64) M8 Hex Flange Nut

The following tools will be used in this section:

- 13mm Combination Wrench
- Tape Measure

1.3.1 Corner Brackets Assembly

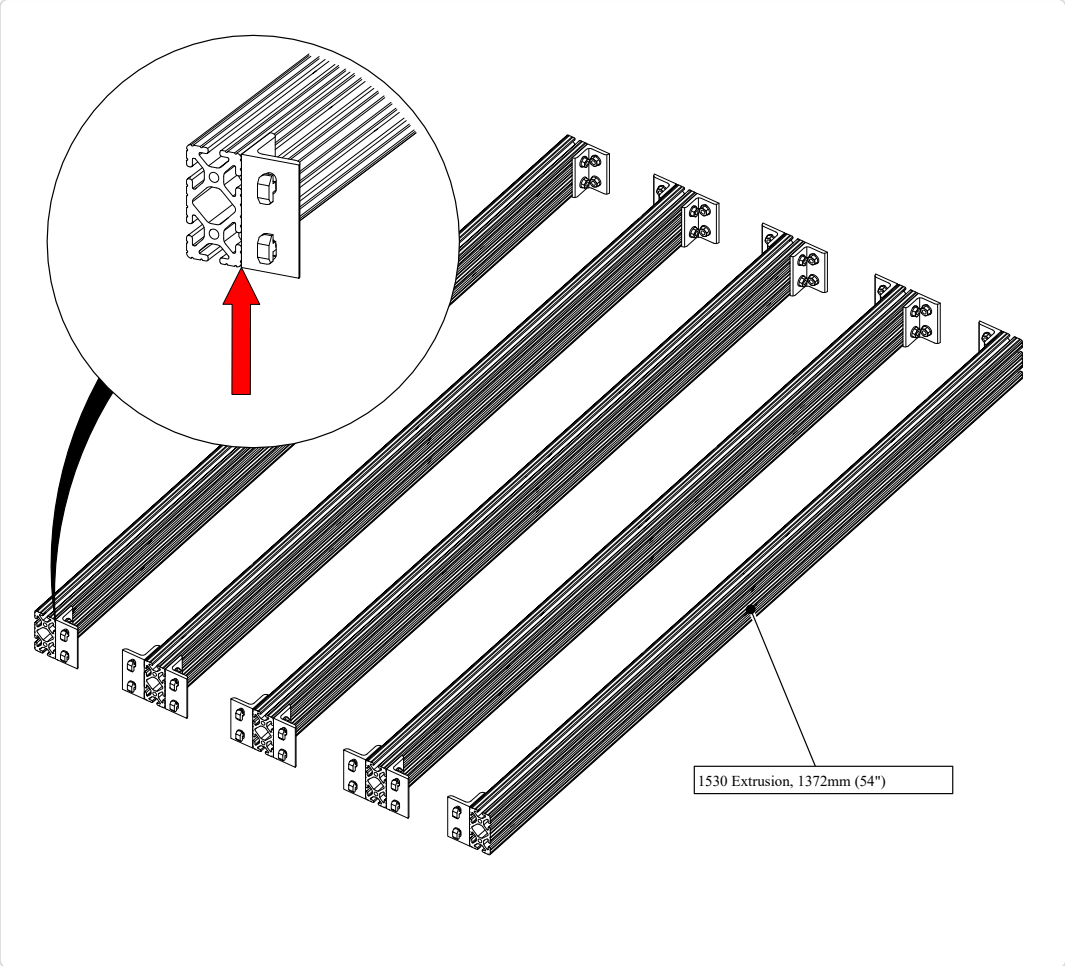
1.3.1.1



- Partially thread M8 flange nuts on to M8 T-Studs through each slot in the corner bracket.
- Repeat this procedure to assemble (16) corner brackets.

1.3.2 Table Crossmembers Installation

1.3.2.1

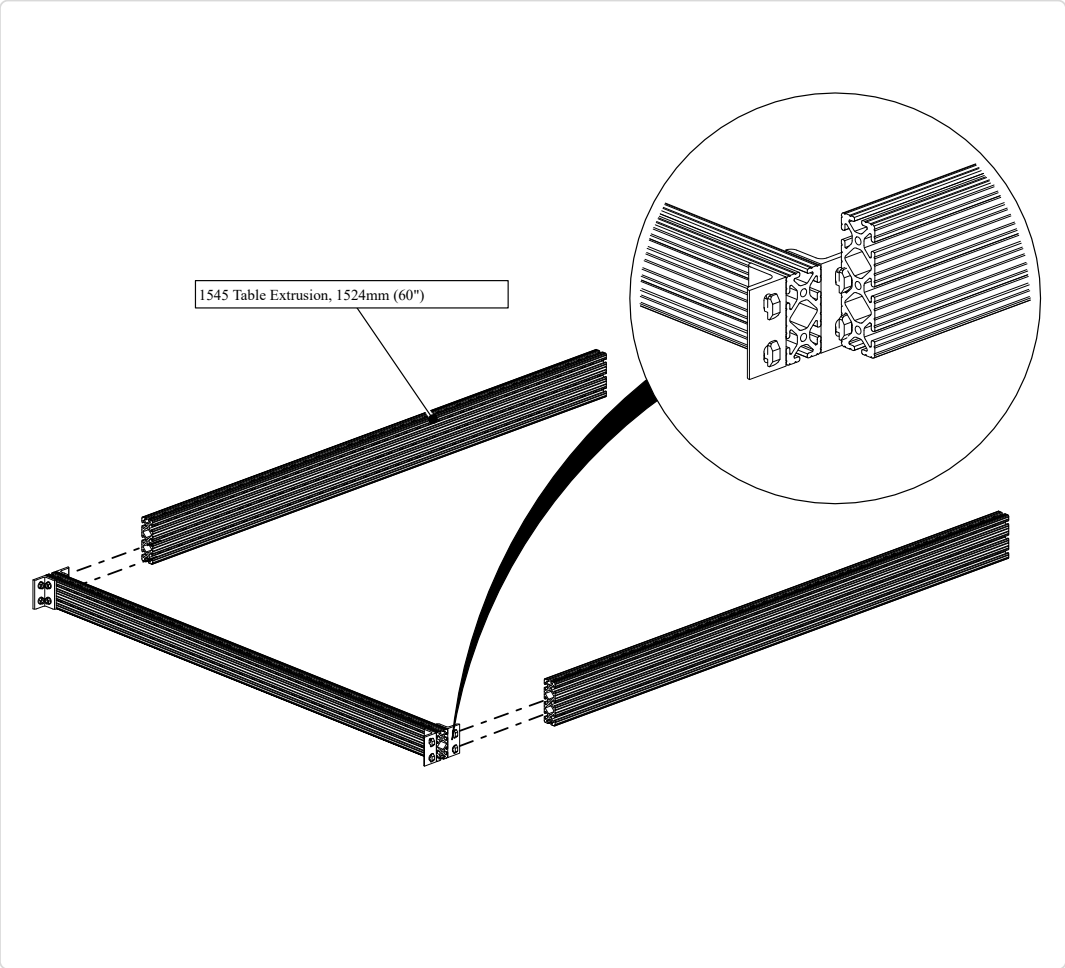


- Attach corner brackets to the 1372mm (54") 1530 Table Crossmember Extrusions in the positions indicated.

Assembly Note

Ensure the corner brackets are flush with the ends of the extrusion before tightening the M8 flange nuts.

1.3.2.2

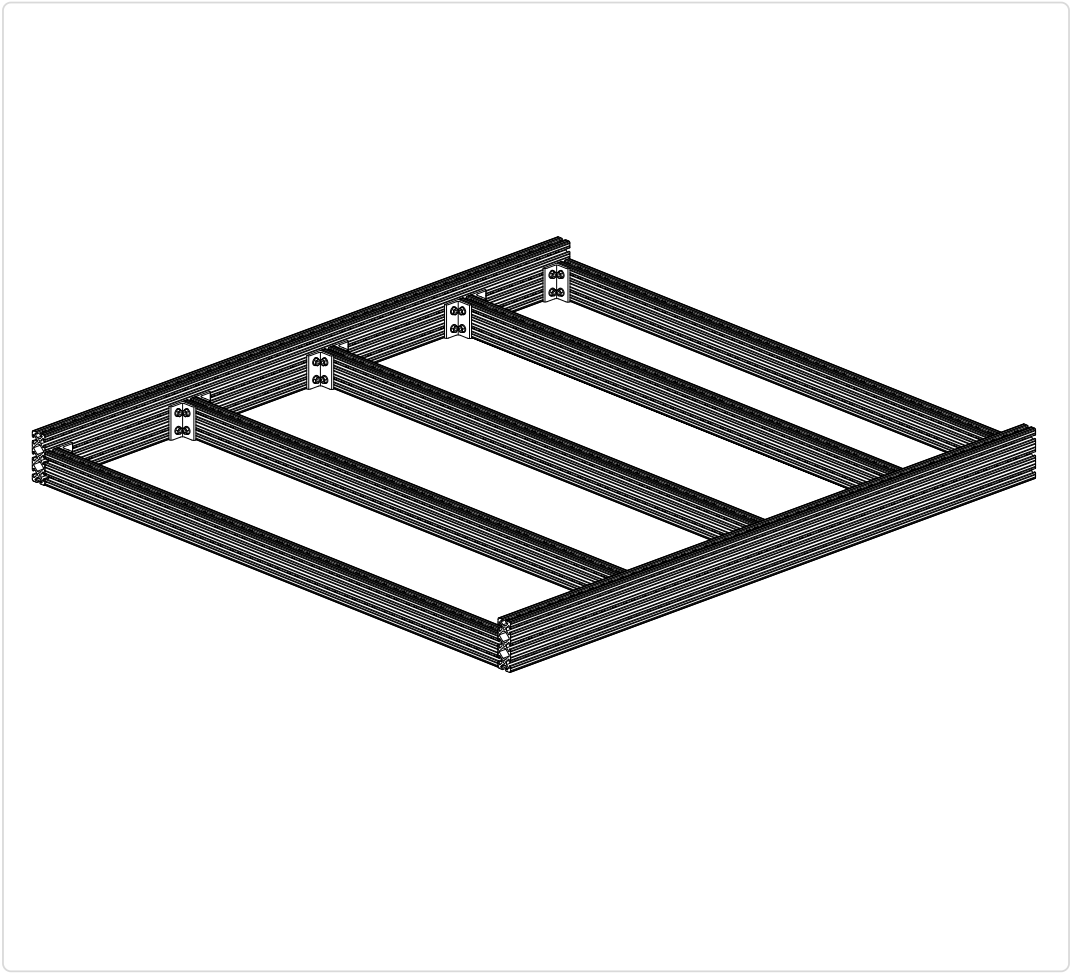


- Slide a crossmember with four corner brackets on to the 1524mm (60") 1545 Table Extrusions as indicated.

Assembly Note

Use the lower two slots on the table extrusion as indicated.

1.3.2.3

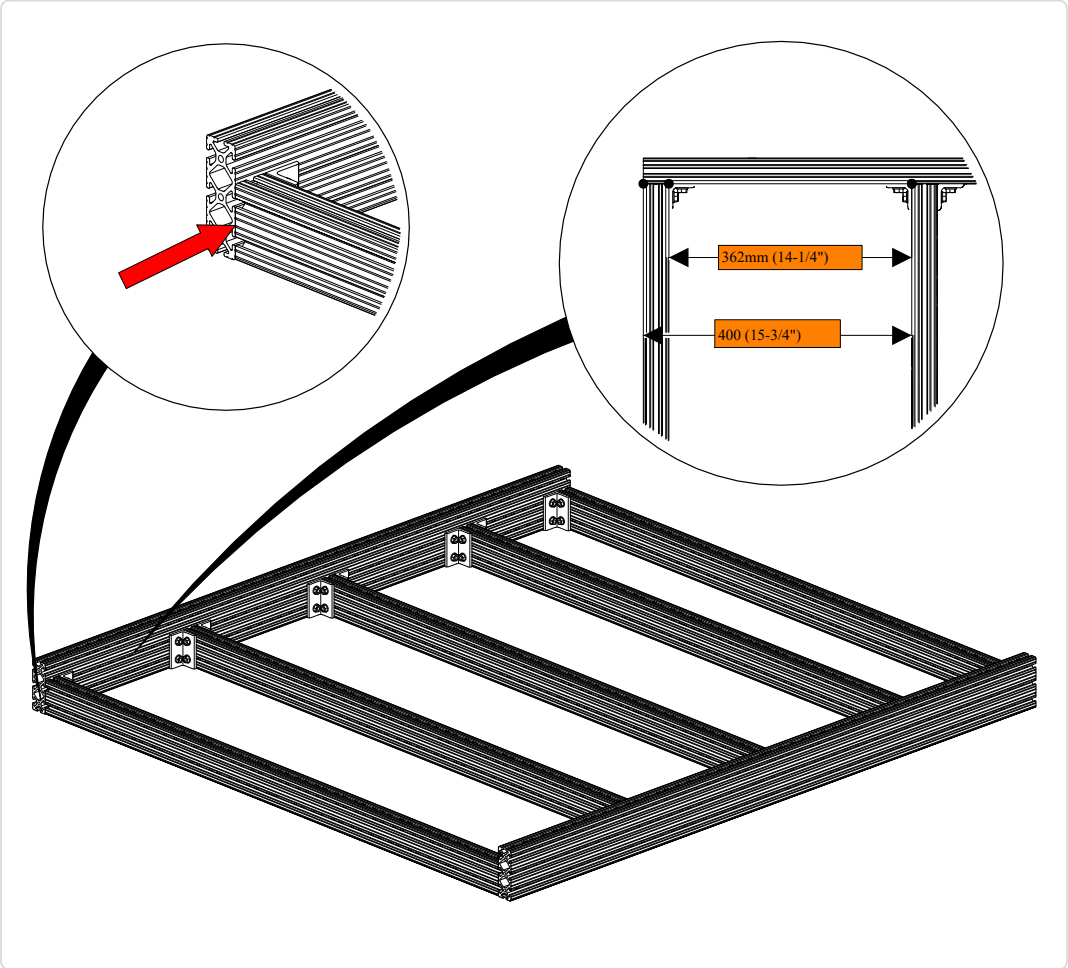


- Repeat this process with the remaining crossmembers.

Assembly Note

Install the crossmembers with the corner brackets in the correct positions as indicated.

1.3.2.4



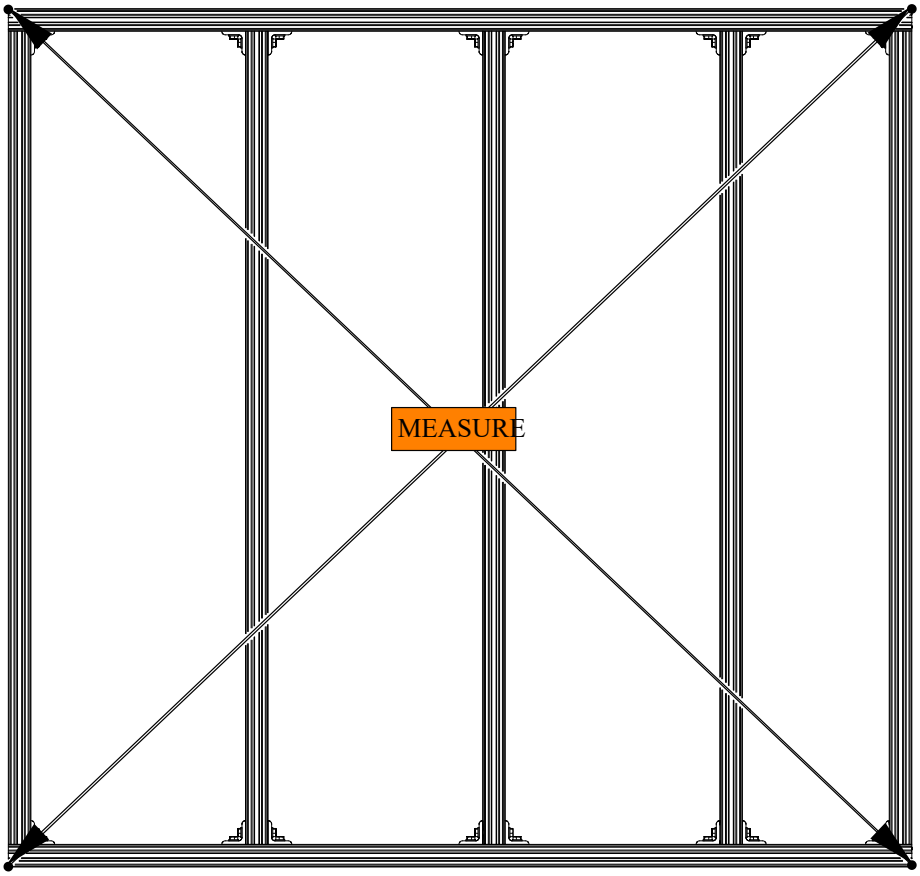
- Position the the outer crossmembers flush with the ends of the table extrusion.
- Position the next crossmember 362mm (14-1/4") from the front crossmember (or 400mm (15-3/4") center to center).
- Repeat this process to position the remaining two crossmembers.

Assembly Note

Measure at both ends of the crossmember to ensure they are parallel. The last two crossmembers at the back of the machine will end up being spaced closer together.

1.3.3 Table Squaring

1.3.3.1

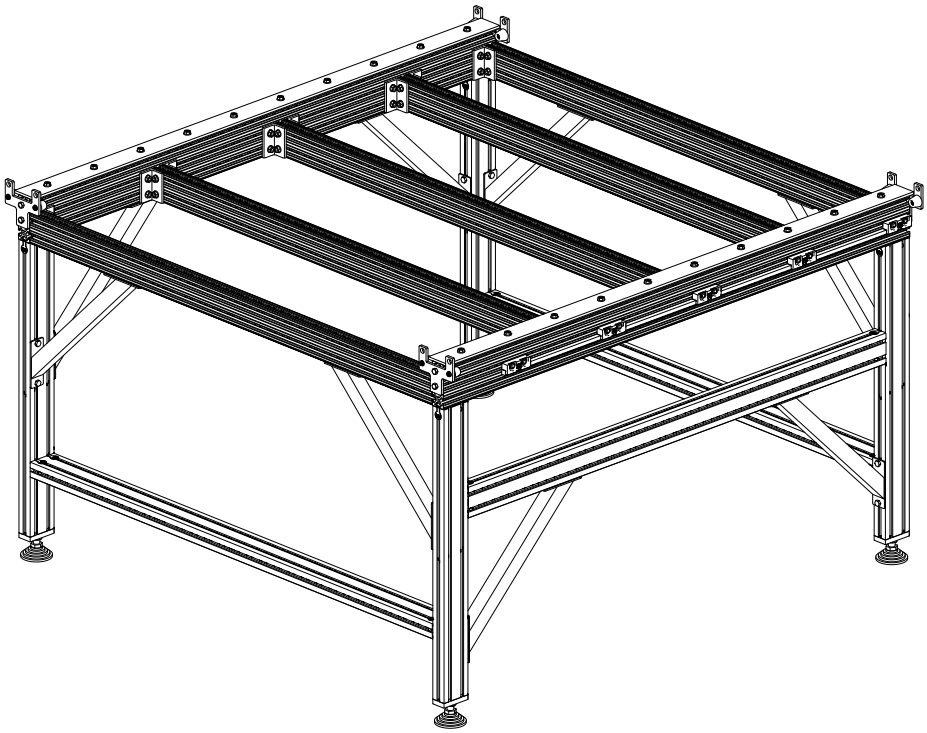


- Measure diagonal across the table in each direction as indicated.
- Make adjustments until the two measurements are within 1/8" or less of each other.
- After squaring the table, tighten all corner bracket fasteners.

Assembly Note

Adjustment in the position of the corner brackets will assist in the table squaring process.

1.4 Steel Rails and Gear Rack



Section Note

The remaining sections are applicable both with or without a Avid CNC leg kit.

Parts and Tools Required

The following parts and bags will be used in this section:

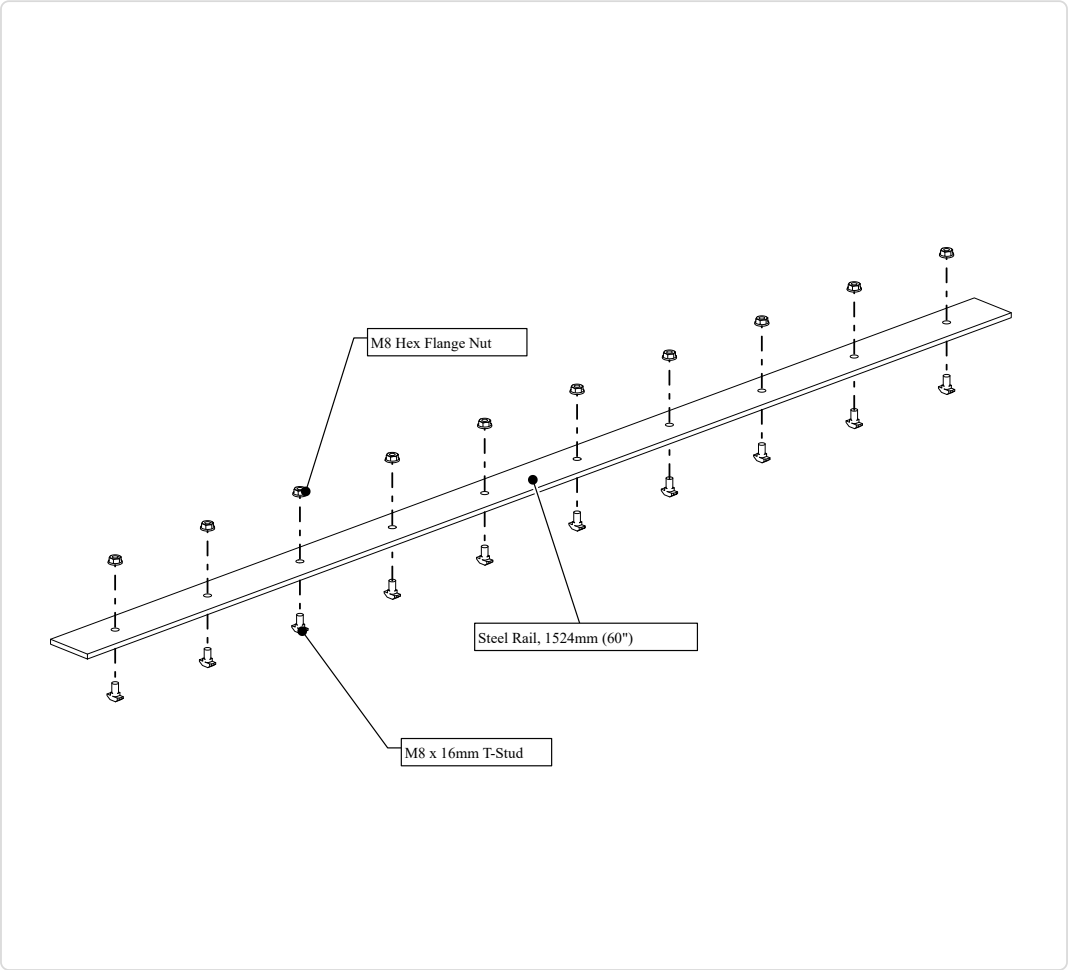
- (2) Steel Rail, 1524mm (60")
- (2) Gear Rack, 1320mm (52")
- (4) CRP112-00-01, Table Bumper Kit
    - (4) Bumper Plate
    - (8) Bumper
    - (8) 10-32 Flat Washer
    - (8) 10-32 Hex Nut
    - (8) 10-32 x 1" Socket Head Cap Screw
    - (8) 5/16-18 x 1" Hex Cap Screw
- (1) TS-M8-16K-FN
    - (20) M8 x 16mm T-Stud
    - (20) M8 Hex Flange Nut
- (1) CRP202-00C-LF
    - (10) Rack Clamp
    - (20) M8 Hex Jam Nut
    - (20) M8 x 23mm T-Stud

The following tools will be used in this section:

- 13mm Combination Wrench
- 13mm Socket and Ratchet
- 5/32" Allen Wrench
- 3/8" Combination Wrench
- 1/2" Combination Wrench
- (2) Clamp
- Tape Measure

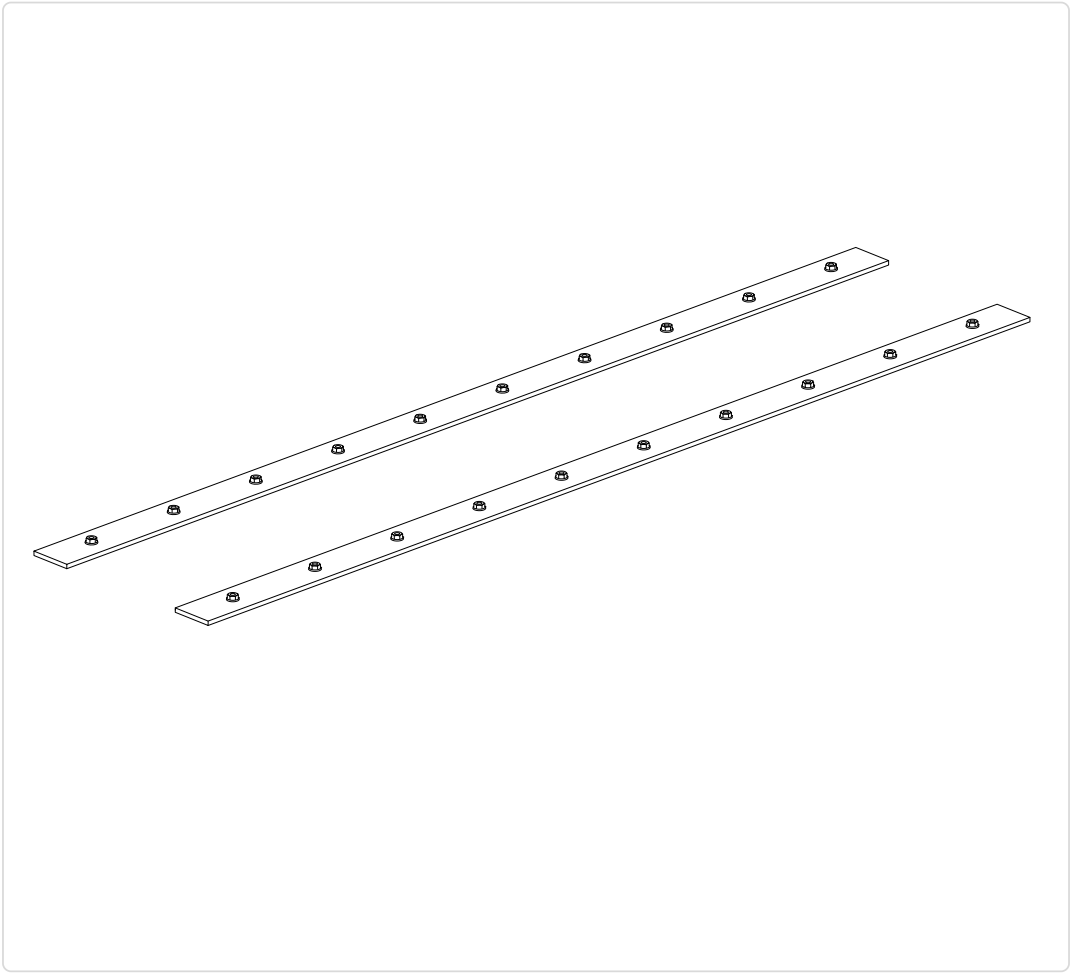
1.4.1 Steel Rail Installation

1.4.1.1



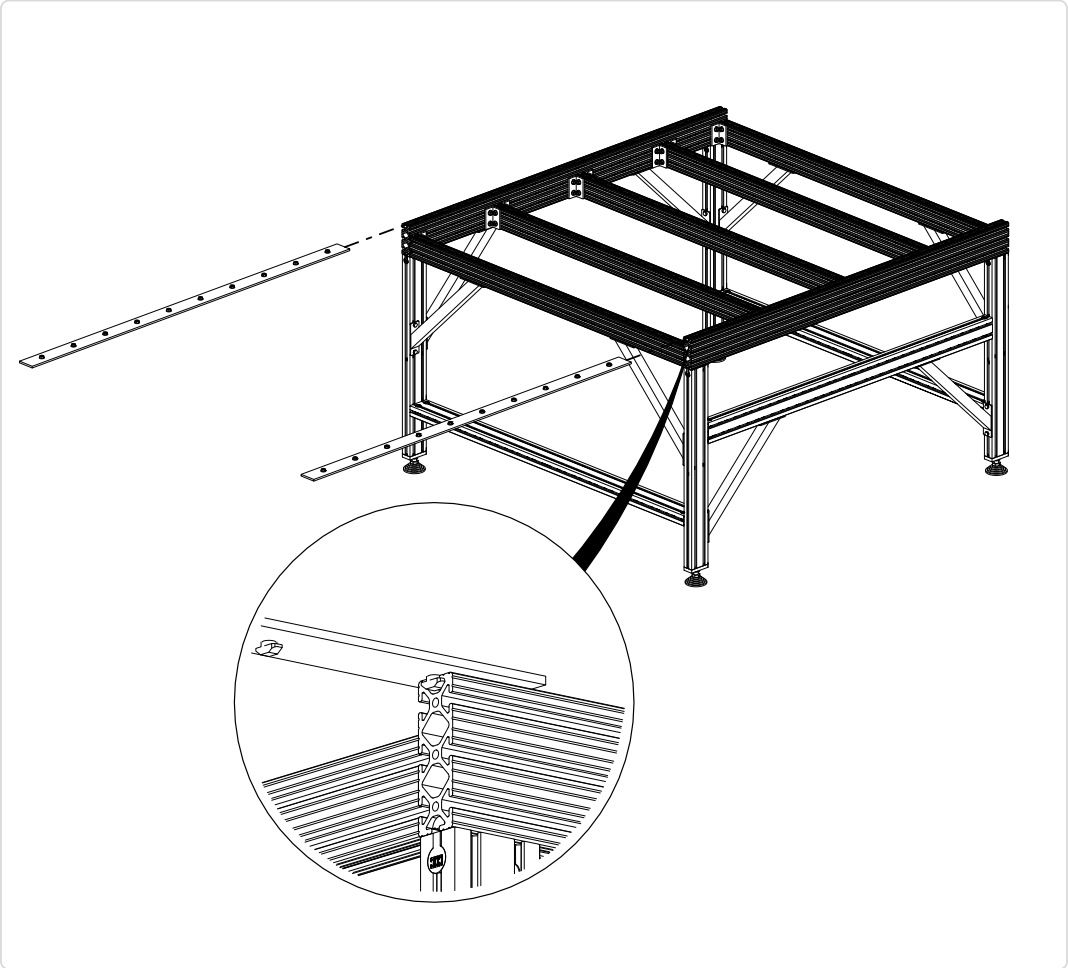
- Install fasteners into a 1524mm (60") Steel Rail as indicated, partially threading on the M8 nuts.

1.4.1.2



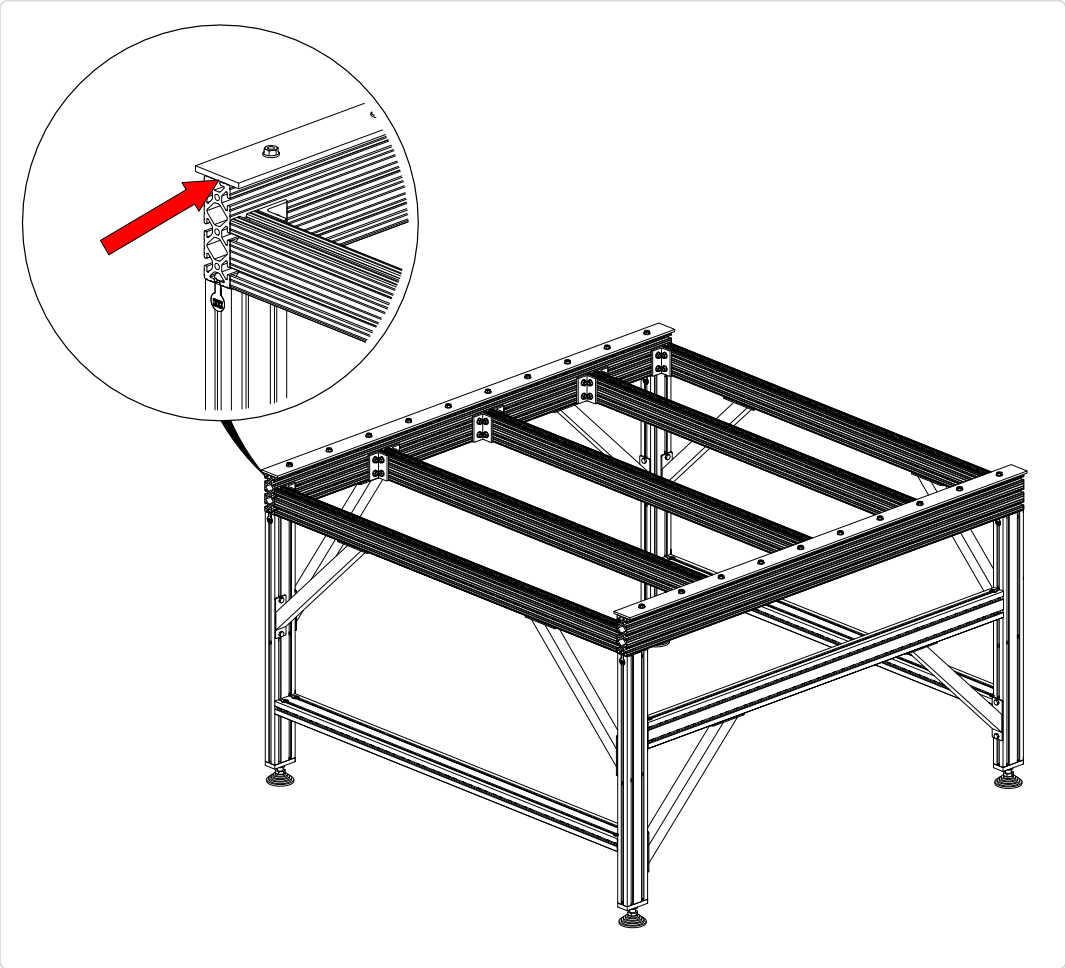
- Repeat this process for both 1524mm (60") Steel Rails.

1.4.1.3



- Slide the steel rails into the table extrusions as indicated.

1.4.1.4



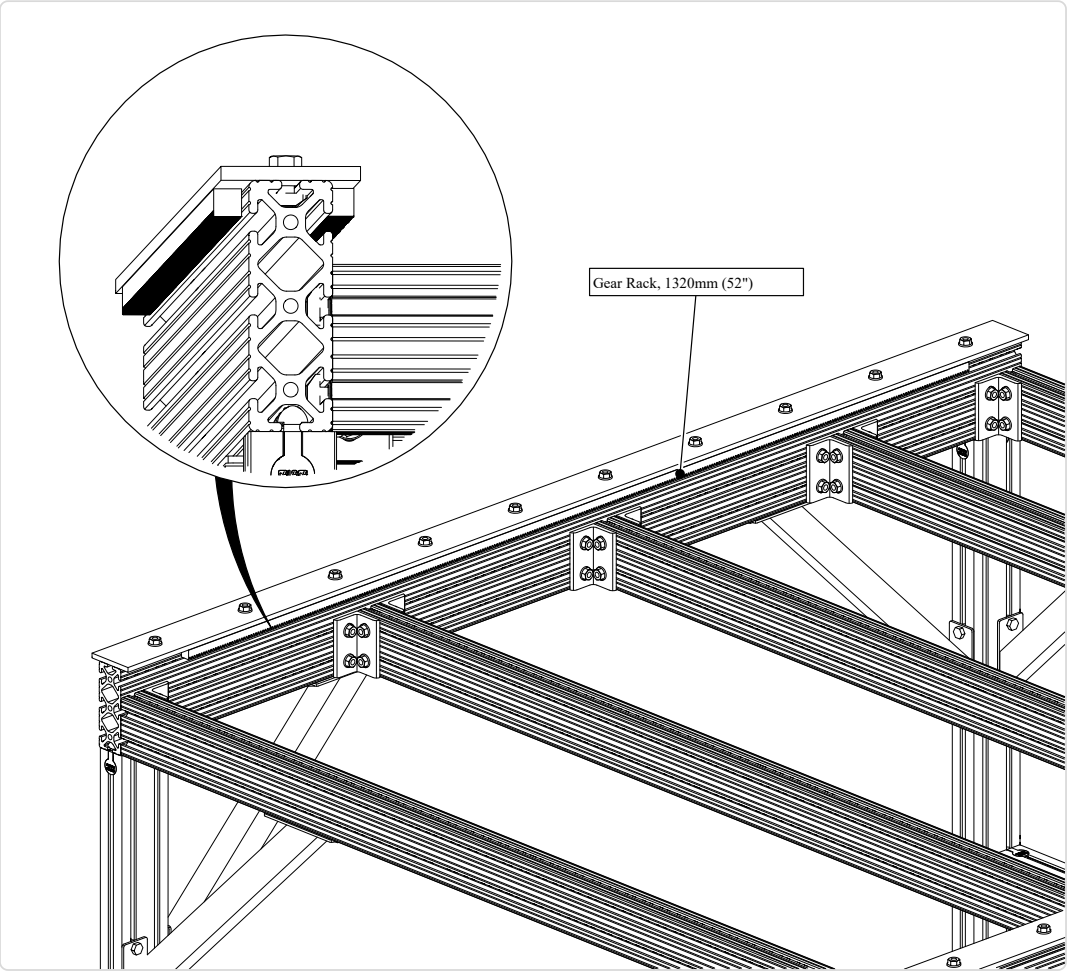
- Partially tighten the M8 nuts on each steel rail.

Assembly Note

Position the steel rails so the ends are flush with the table extrusion as indicated.

1.4.2 Steel Rail Alignment

1.4.2.1

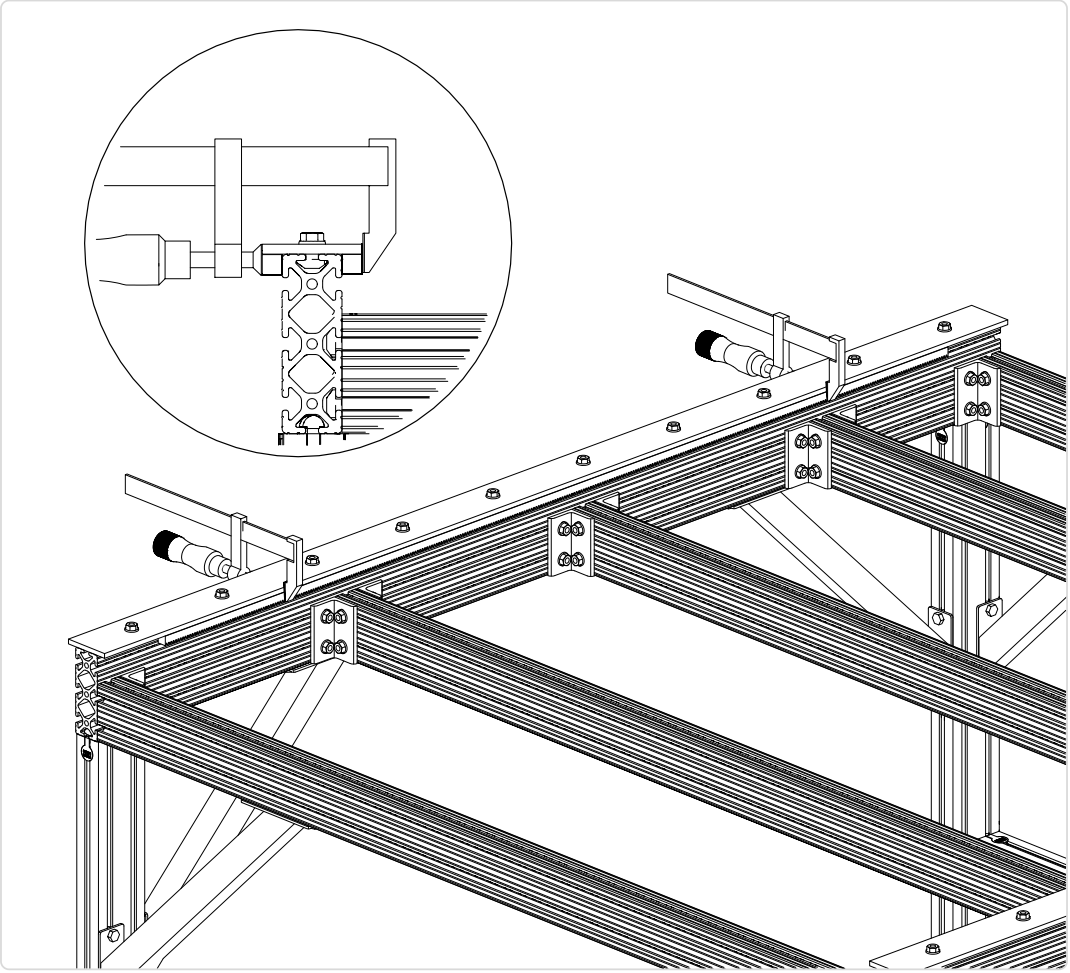


- Position two pieces of 1320mm (52") Gear Rack under one of the steel rails as indicated.
- Clamp the gear racks against the table extrusion

Assembly Note

See the next step for positioning of the clamps.

1.4.2.2

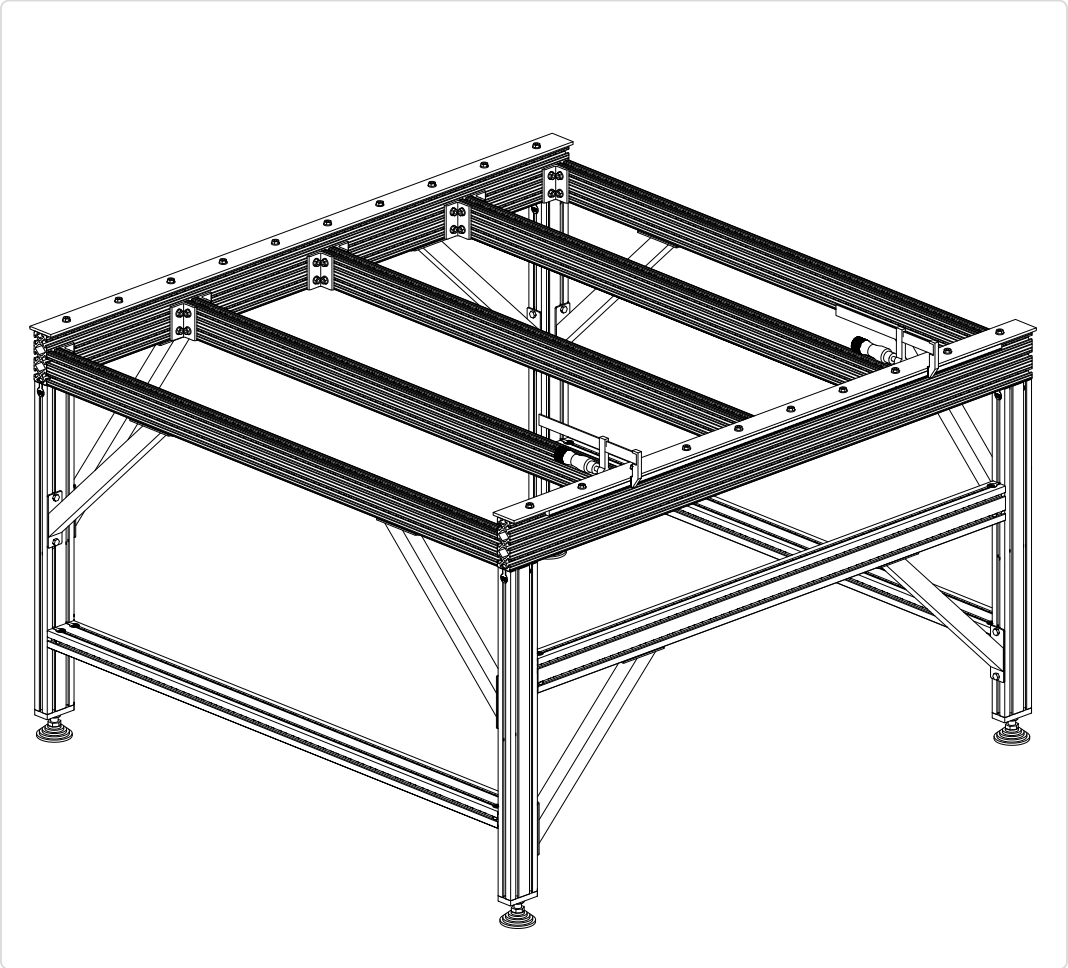


- Position the clamps as indicated to align the steel rail with the table extrusion.
- Tighten the M8 nuts fastening this steel rail to the table extrusion

Assembly Note

Ensure the clamping surface is in contact with both the gear rack and steel rails.

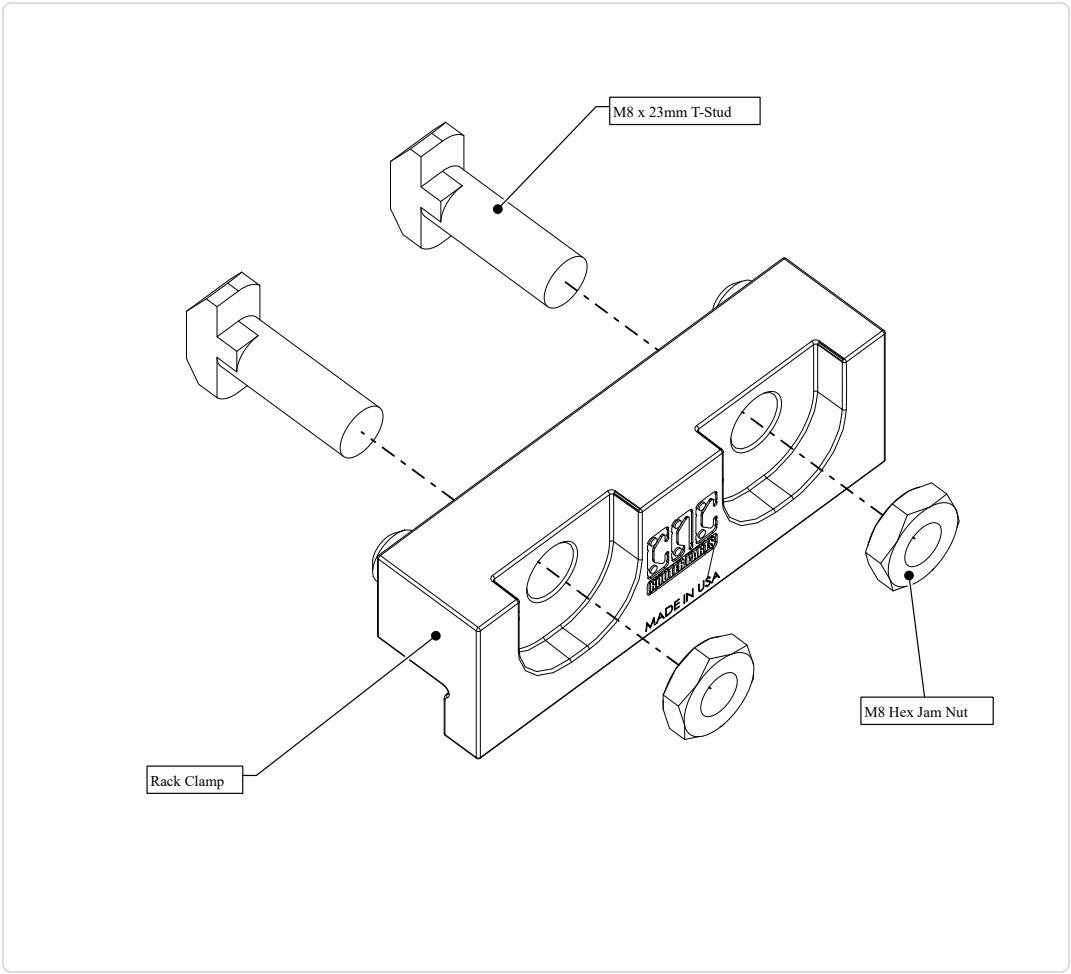
1.4.2.3



- Repeat this process to align the second steel rail.
- Tighten the M8 nuts fastening this steel rail to the table extrusion.

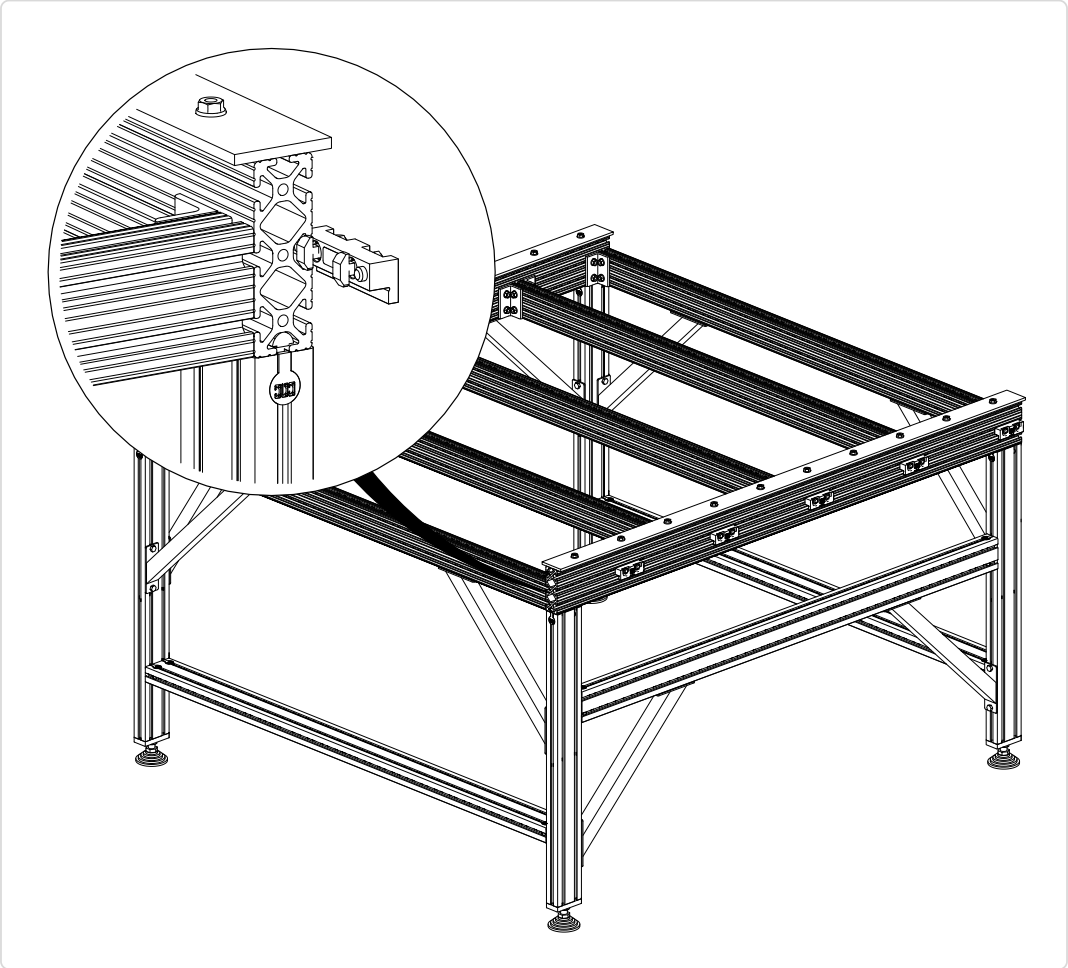
1.4.3 Gear Rack Installation

1.4.3.1



- Assemble (10) rack clamps as indicated.
- Partially thread on the jam nuts to allow installation on the table extrusion.

1.4.3.2

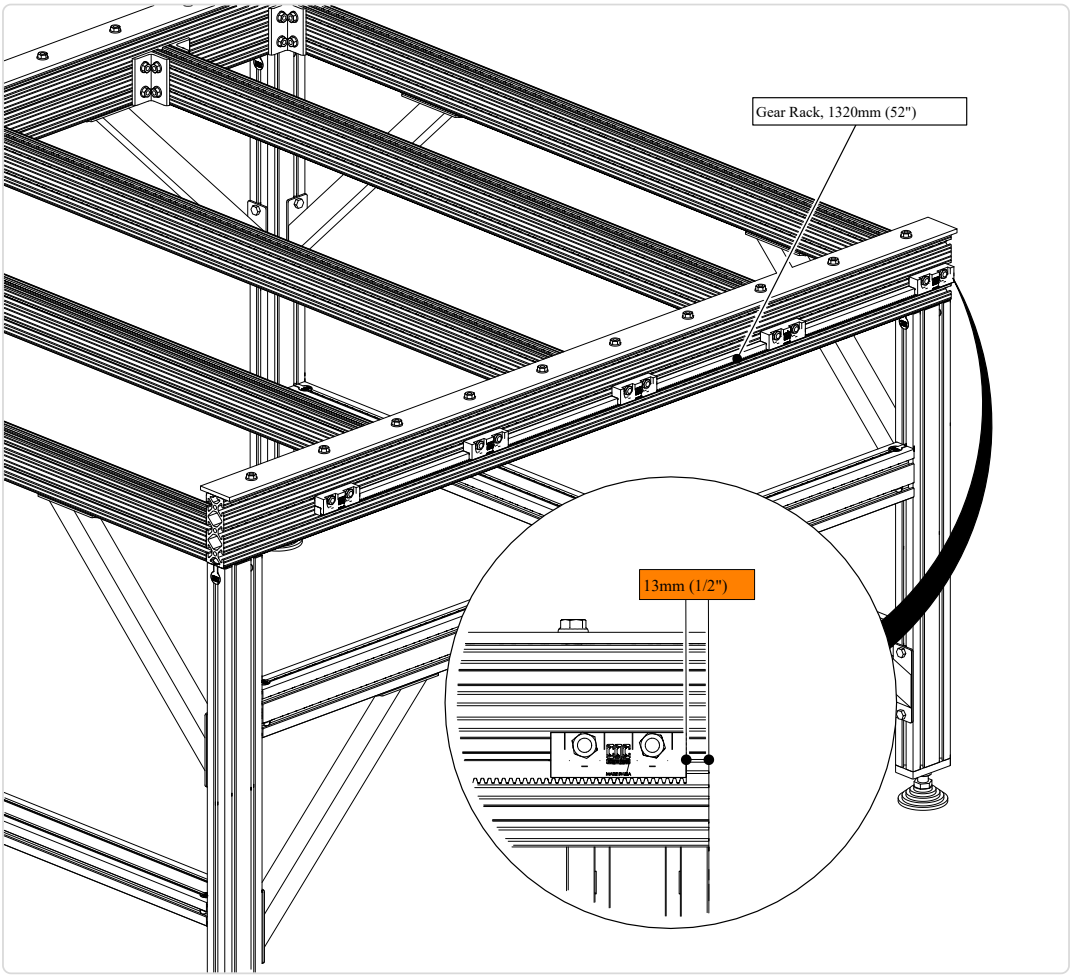


- Install rack clamps into table extrusion as indicated
- Repeat this process on both sides.

Assembly Note

Install the rack clamps in the middle slot of the table extrusion.

1.4.3.3

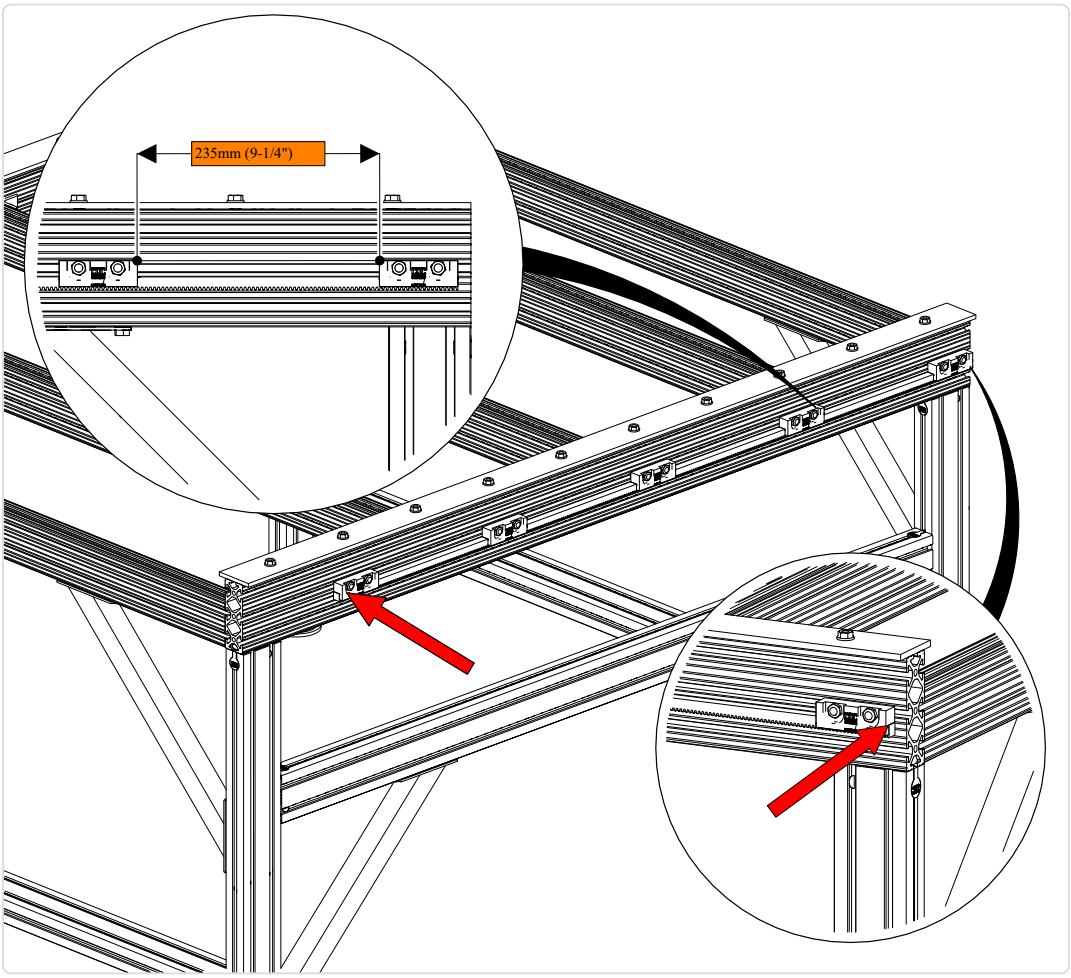


- Install a piece of 1320mm (52") Gear Rack as indicated.
- Position the gear rack 13mm (1/2") from the back edge of the table extrusion.

Assembly Note

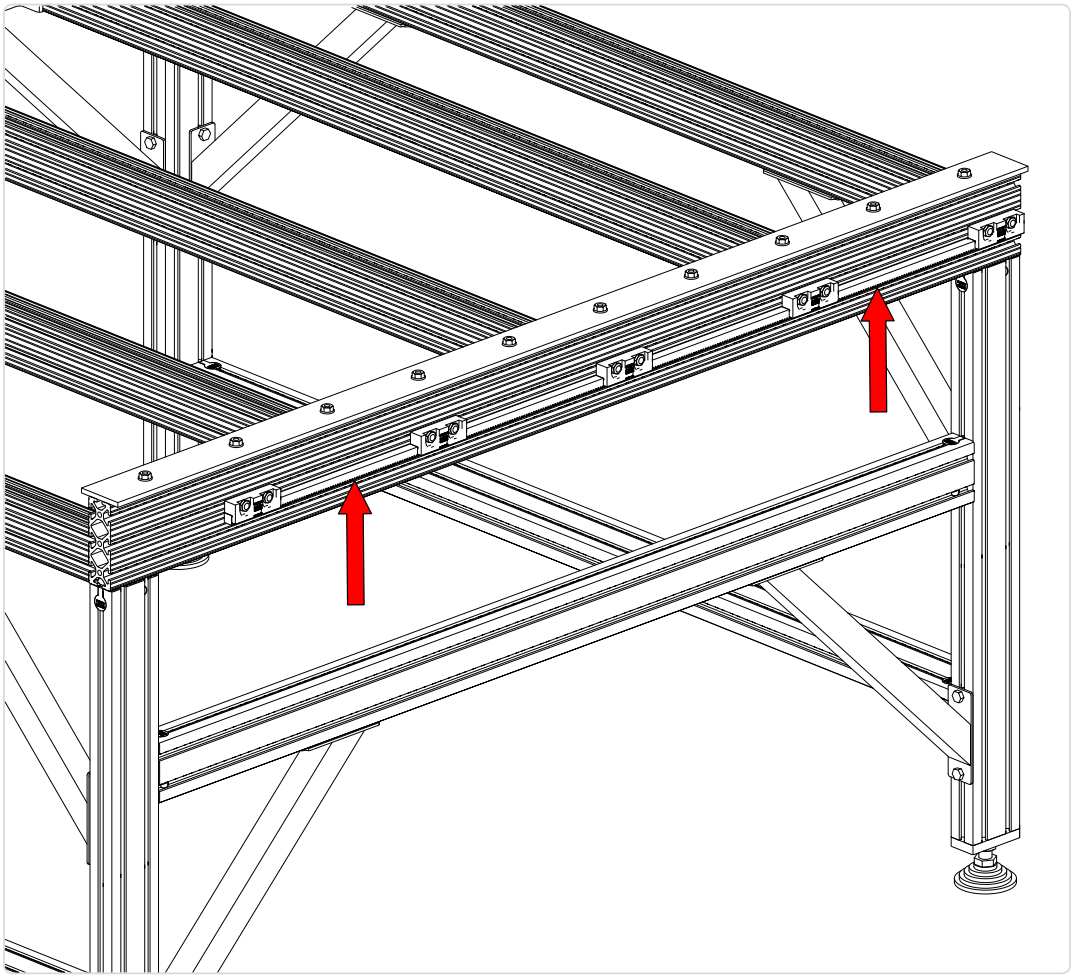
Ensure the teeth of the gear rack are facing downwards.

1.4.3.4



- Position the outer rack clamps flush with the gear rack as indicated. *Red Arrows*
- Space the remaining rack clamps 235mm (9-1/4") apart as indicated.

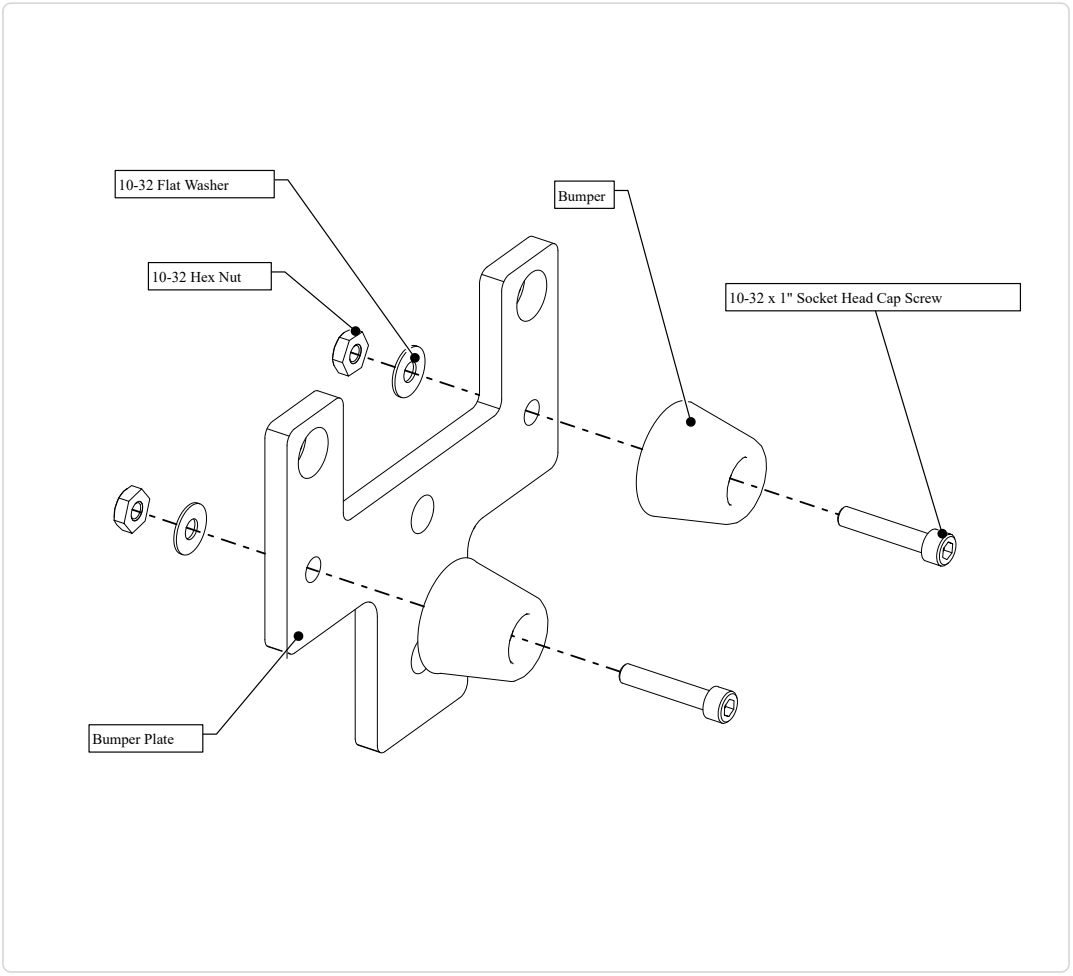
1.4.3.5



- Tighten the rack clamp M8 jam nuts while applying pressure to the gear rack as indicated.
- Repeat this process to install the gear rack on the other side of the table.

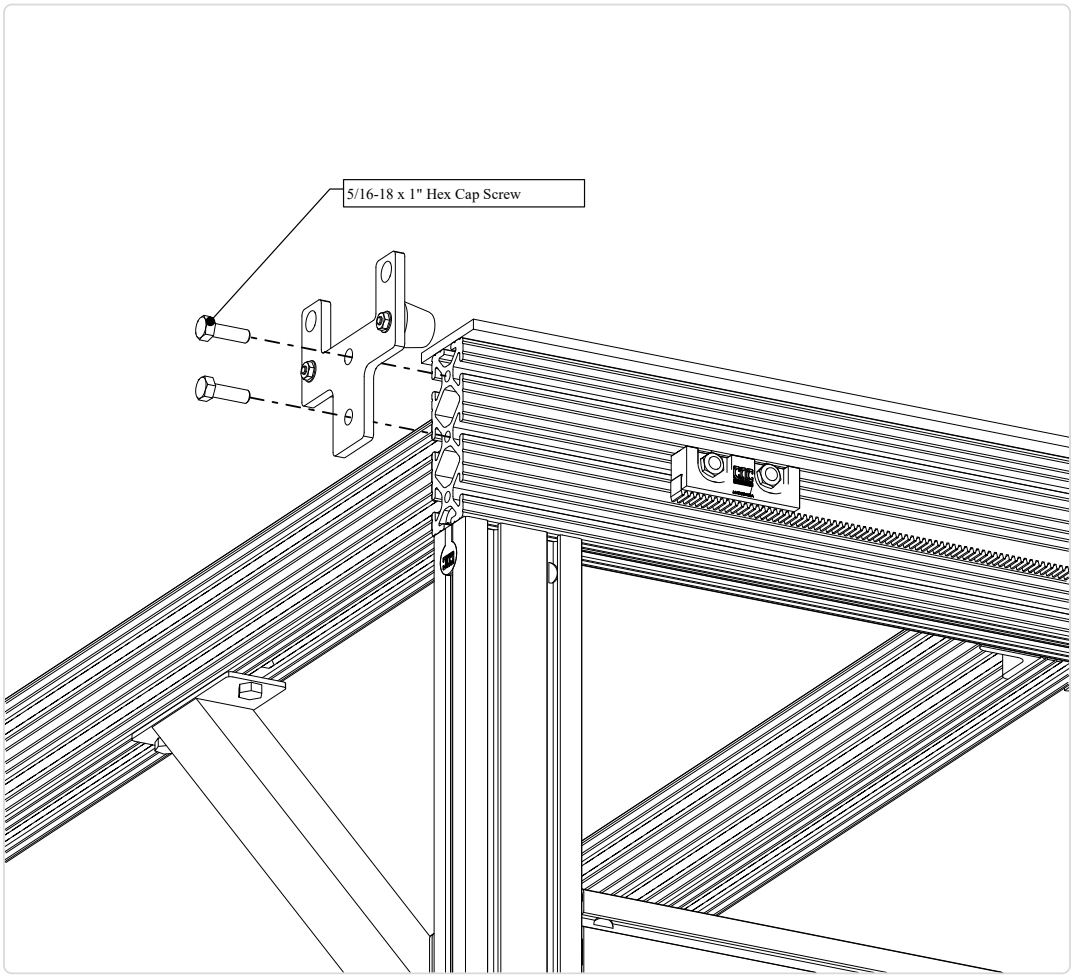
1.4.4 Table Bumper Installation

1.4.4.1



- Assemble four table bumpers as indicated.

1.4.4.2

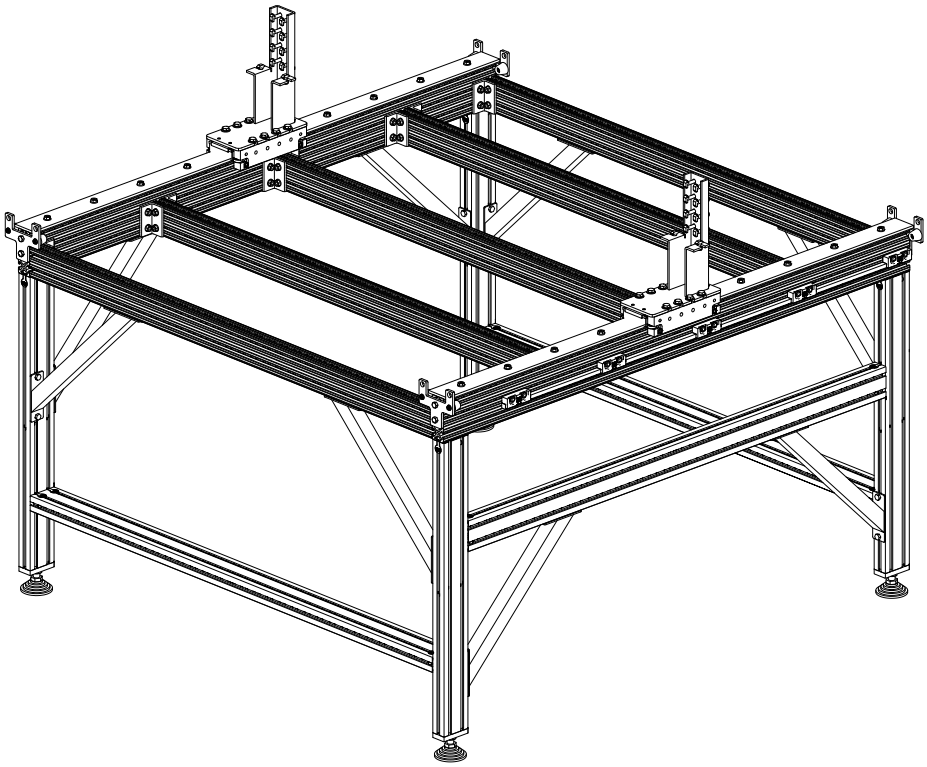


- Fasten an assembled table bumper to end of table extrusion as indicated.

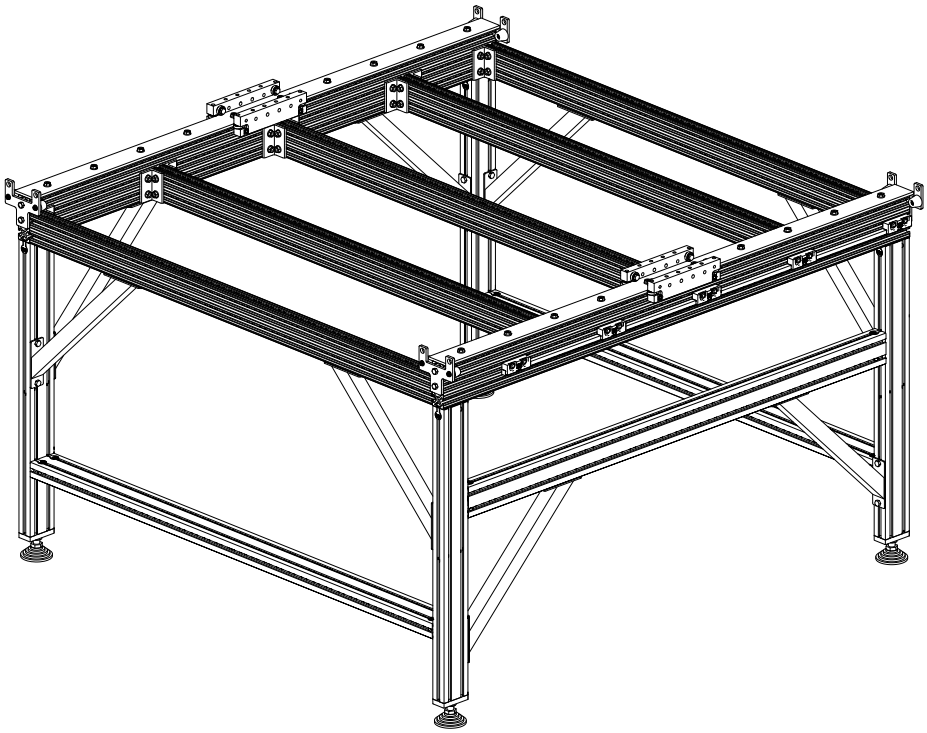
1.4.4.3

- Repeat this process to install the remaining table bumpers.

Section 2: Riser Assembly



2.1 Linear Carriages



Parts and Tools Required

The following bags and parts will be used in this section:

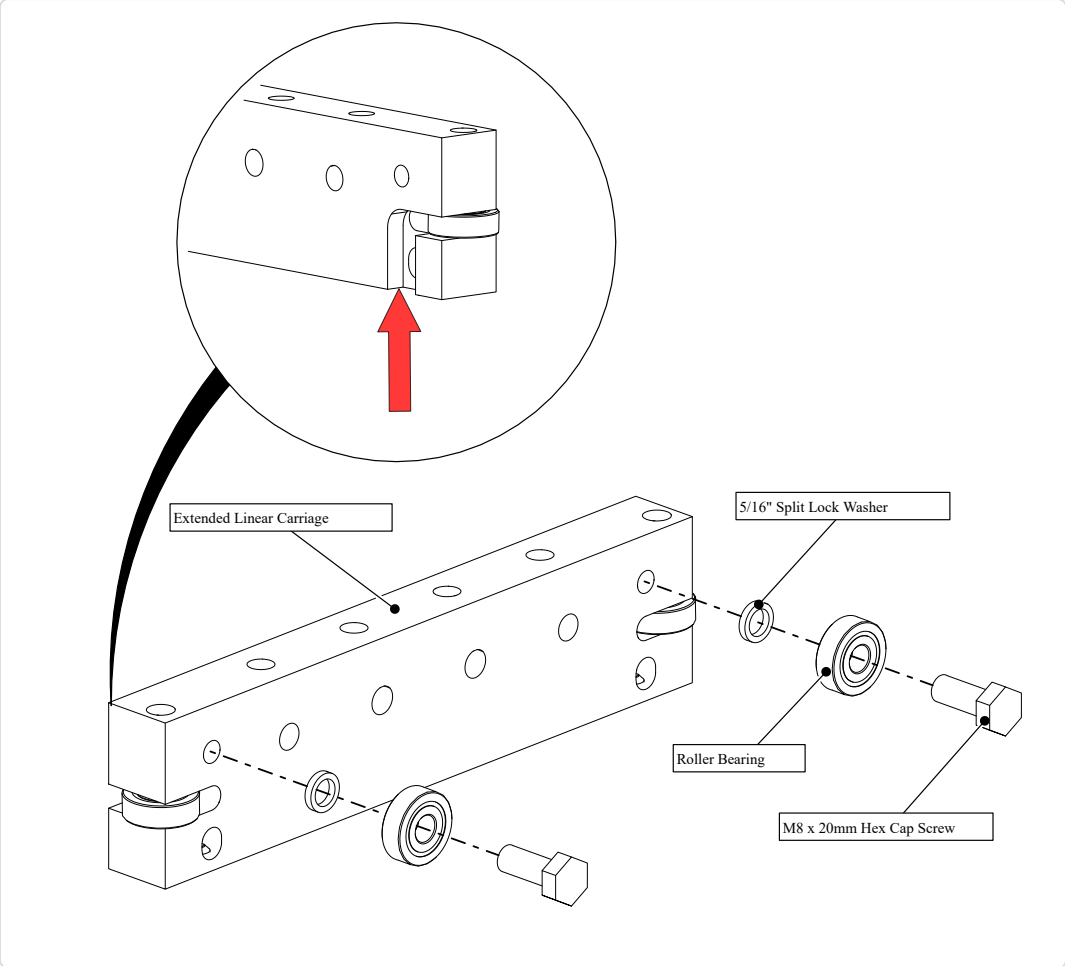
- (4) CRP102-00-01 Extended Linear Carriage
- (4) CRP101-00-FAST-17.2
    - (16) 5/16" Split Lock Washer
    - (16) Roller Bearing
    - (8) M8 x 20mm Hex Cap Screw
    - (8) M8 x 30mm Hex Cap Screw
    - (8) M8 Hex Nut
    - (8) 1/4-20 Set Screw

The following tools will be used in this section:

- 13mm Combination Wrench
- 1/8" Allen Wrench

2.1.1 Linear Carriage Assembly

2.1.1.1

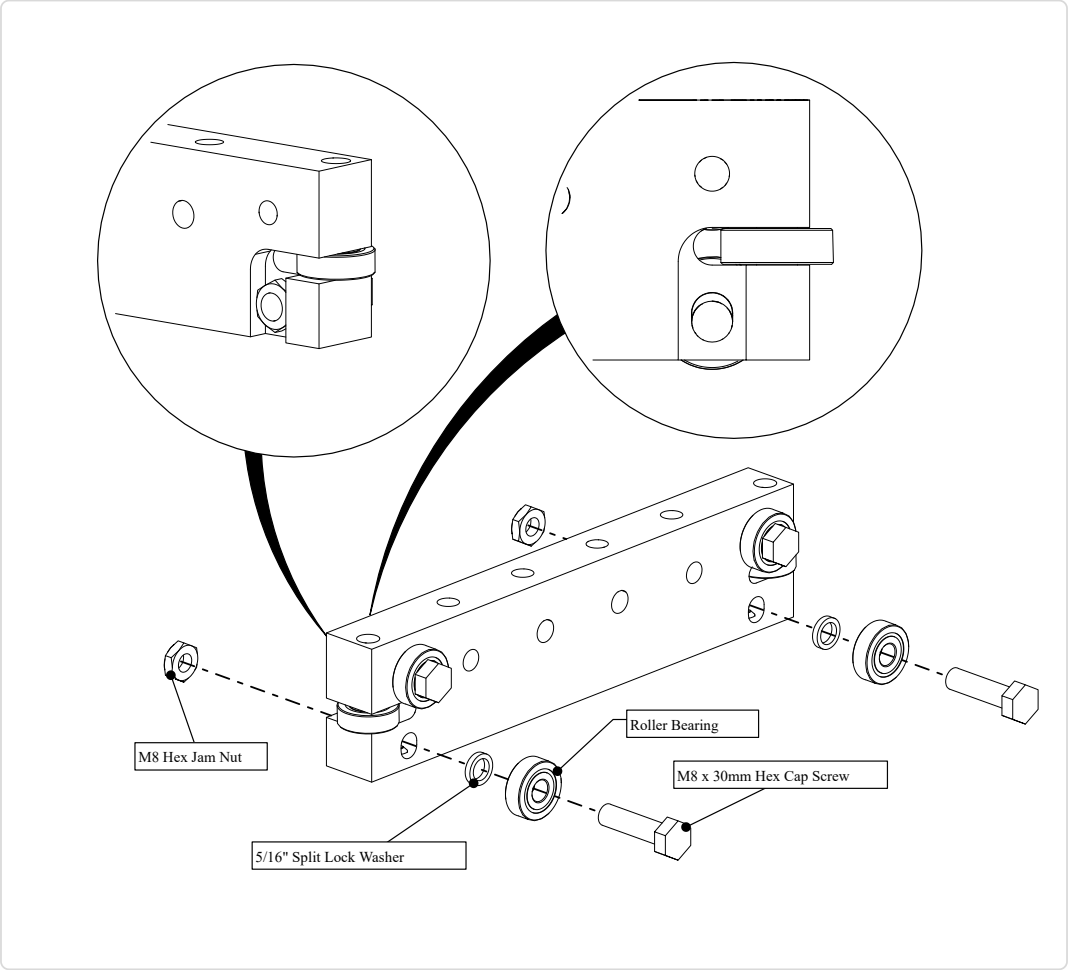


- Orient the Extended Linear Carriage body as shown.
- Install upper bearings as indicated and tighten fasteners.

Assembly Note

In the correct orientation, the nut slots will be located on the back side of the extended linear carriage.

2.1.1.2

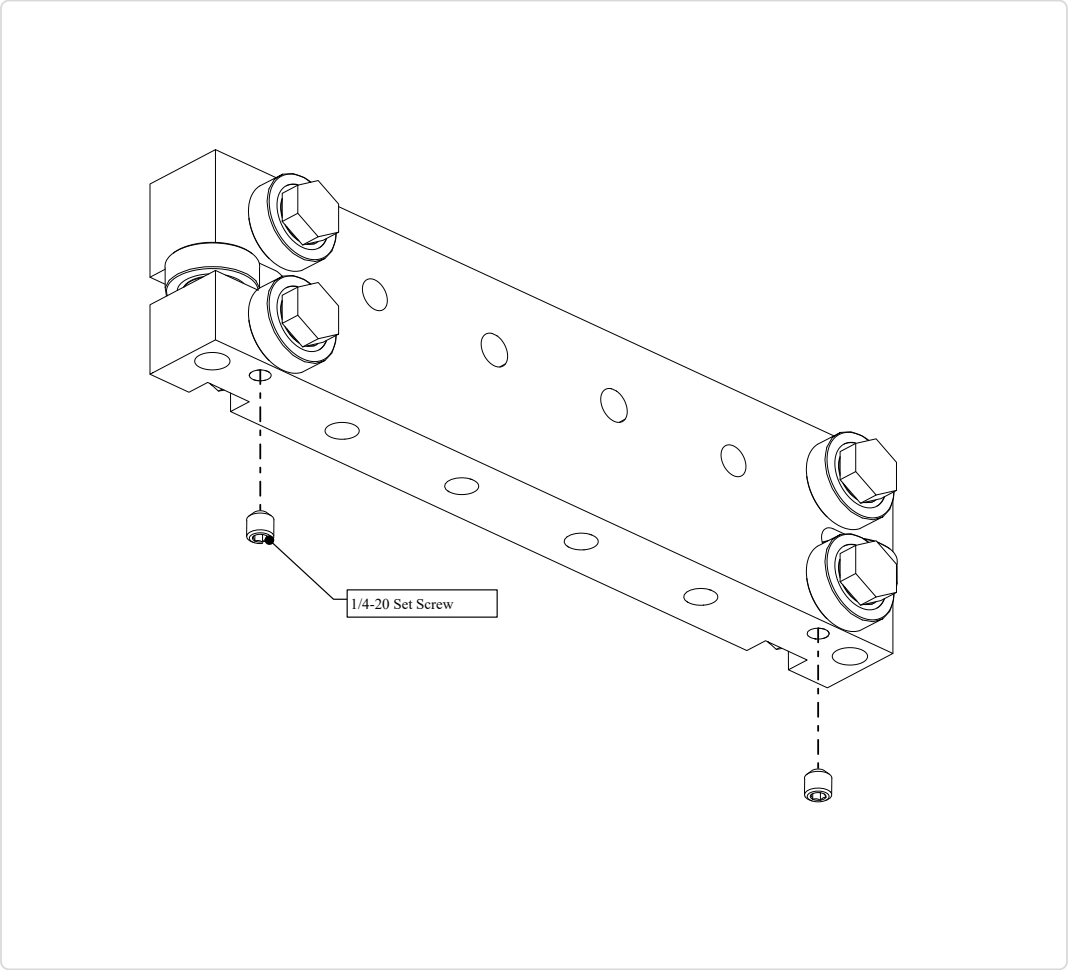


- Install bearings into the lower slots on the extended linear carriage as indicated.
- The M8 jam nuts will reside within the nuts slots as shown.

Assembly Note

Position the M8 x 30mm Hex Cap Bolts in the lowest possible position within the slots before fully tightening fasteners.

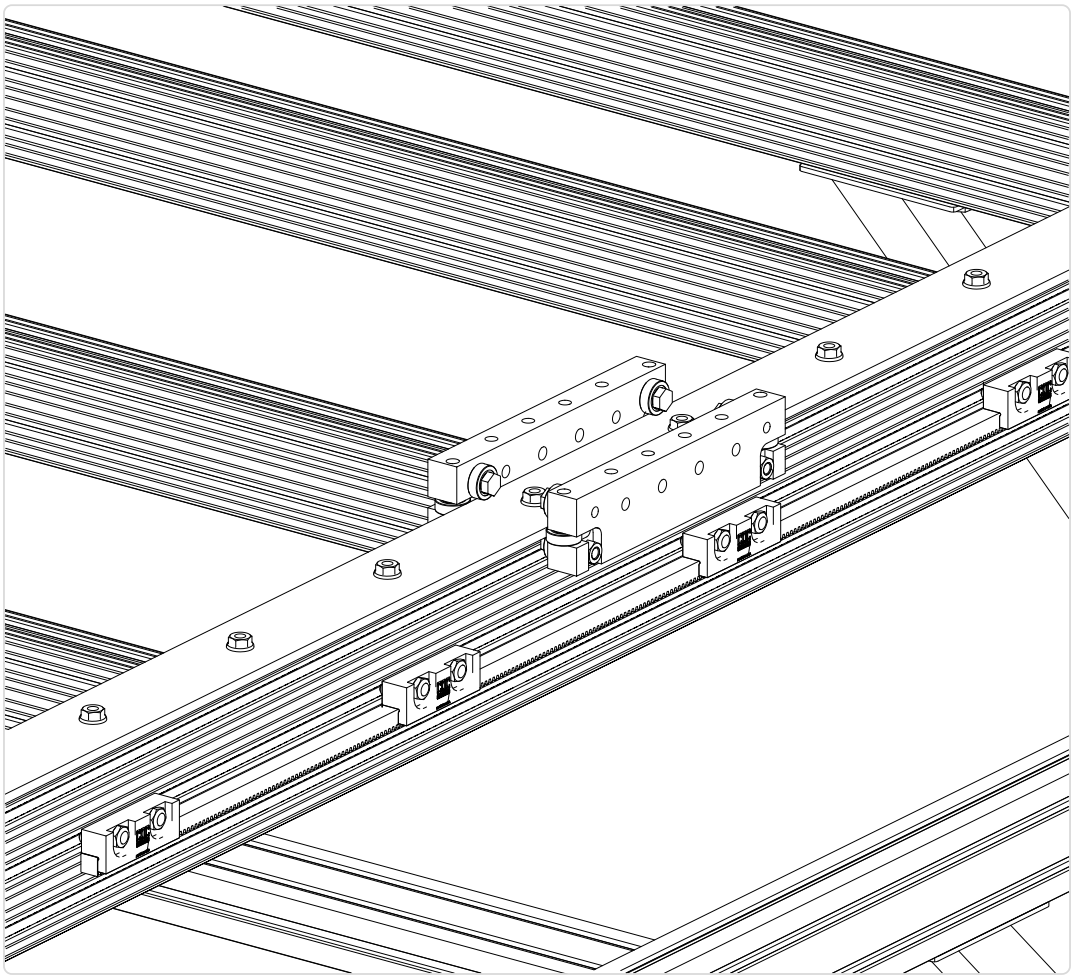
2.1.1.3



- Partially thread in 1/4-20 set screws as indicated.
- Repeat this process to assemble four extended linear carriages.

2.1.2 Linear Carriage Installation

2.1.2.1

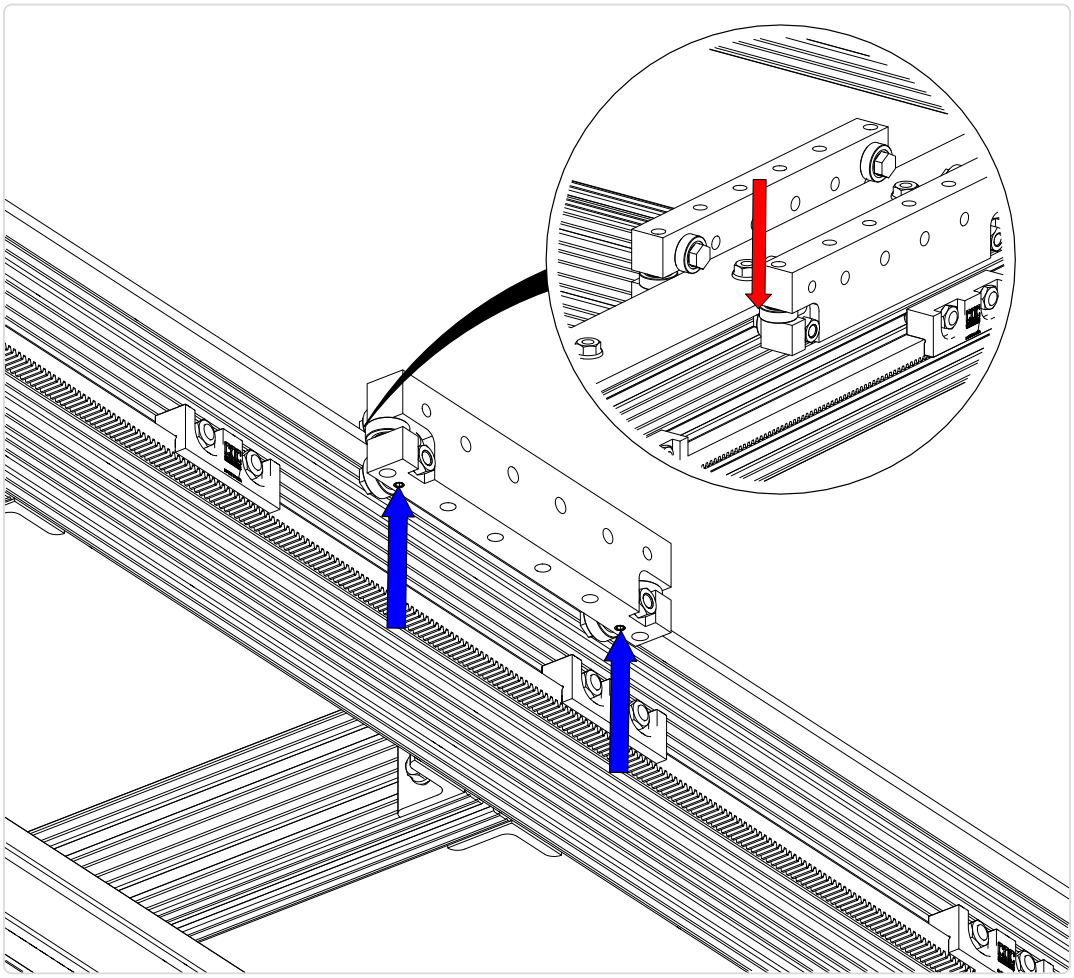


- Position the two assembled linear carriages on one of the steel rails as indicated.

Assembly Note

Position the linear carriages with the set screws facing down.

2.1.2.2

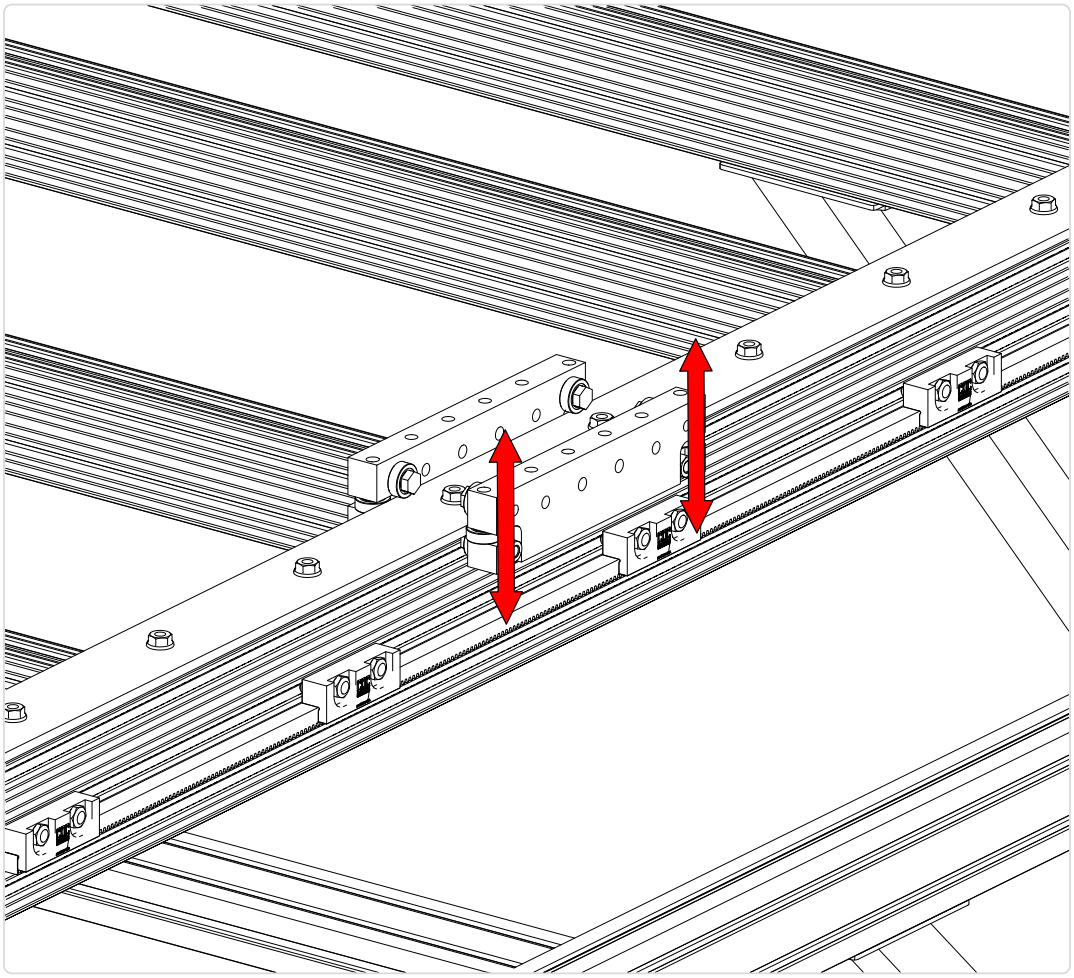


- Partially tighten the set screws (*blue arrows*) to bring the lower roller bearings in contact with the steel rail.

Assembly Note

Ensure the horizontal roller bearings are in contact with the edges of the steel rails.

2.1.2.3



- Continue tightening each set screw until no vertical movement is possible at either end of the linear carriage.
- Ensure the linear carriage is still able to freely move along the steel rail.

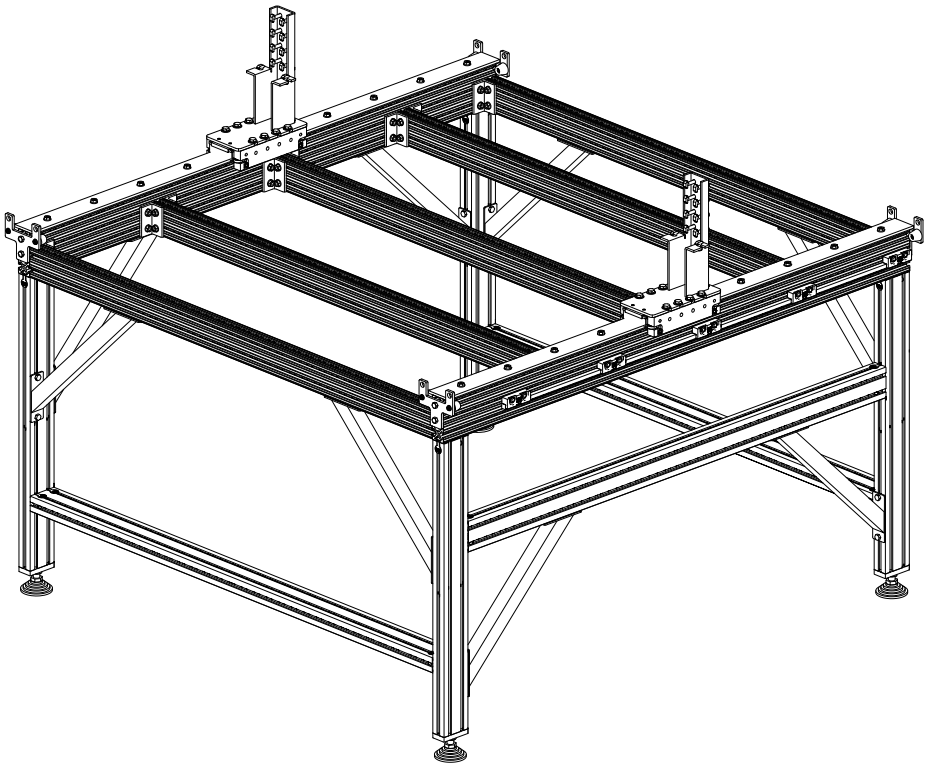
Assembly Note

If the linear carriage does not move freely on the steel rail, adjust the set screw. When properly adjusted, the linear carriages will have no vertical movement and freely slide along the steel rail. While adjusting the set screws, ensure the horizontal roller bearings remain in contact with the edge of the steel rail.

2.1.2.4

- Repeat the previous steps to install and adjust the linear carriages on the other steel rail.

2.2 Gantry Risers



Parts and Tools Required

The following bags and parts will be used in this section:

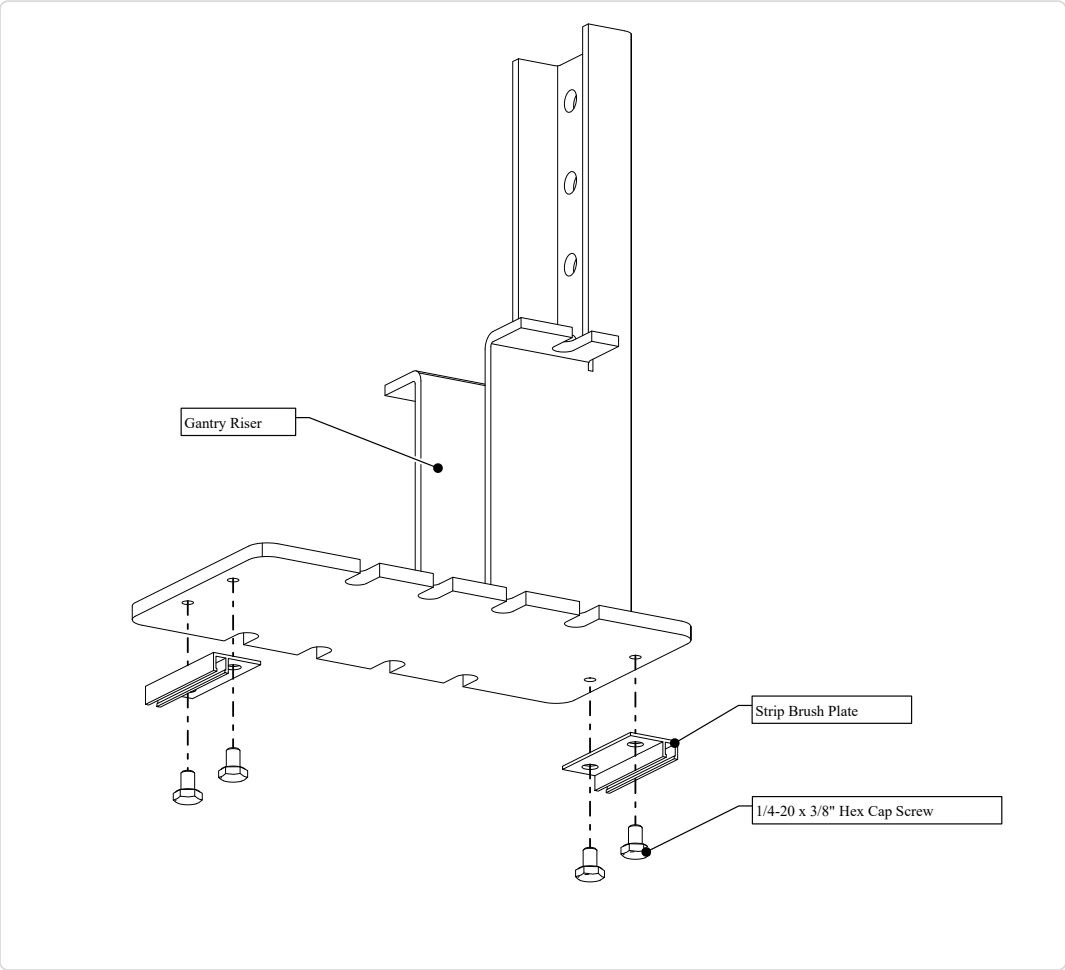
- (2) Gantry Riser
- (4) CRP122-00 Strip Brush Kit
- (8) 1/4-20 x 3/8" Hex Cap Screw
- (1) CRP120-00-FAST-17.2
    - (16) 3/8-16 x 3/4" Hex Cap Screw
    - (16) 3/8" Flat Washer
    - (16) M8 x 35mm T-Stud
    - (16) M8 Hex Nut

The following tools will be used in this section:

- 7/16" Combination Wrench
- 9/16" Combination Wrench
- (2) Clamp

2.2.1 Gantry Riser Assembly

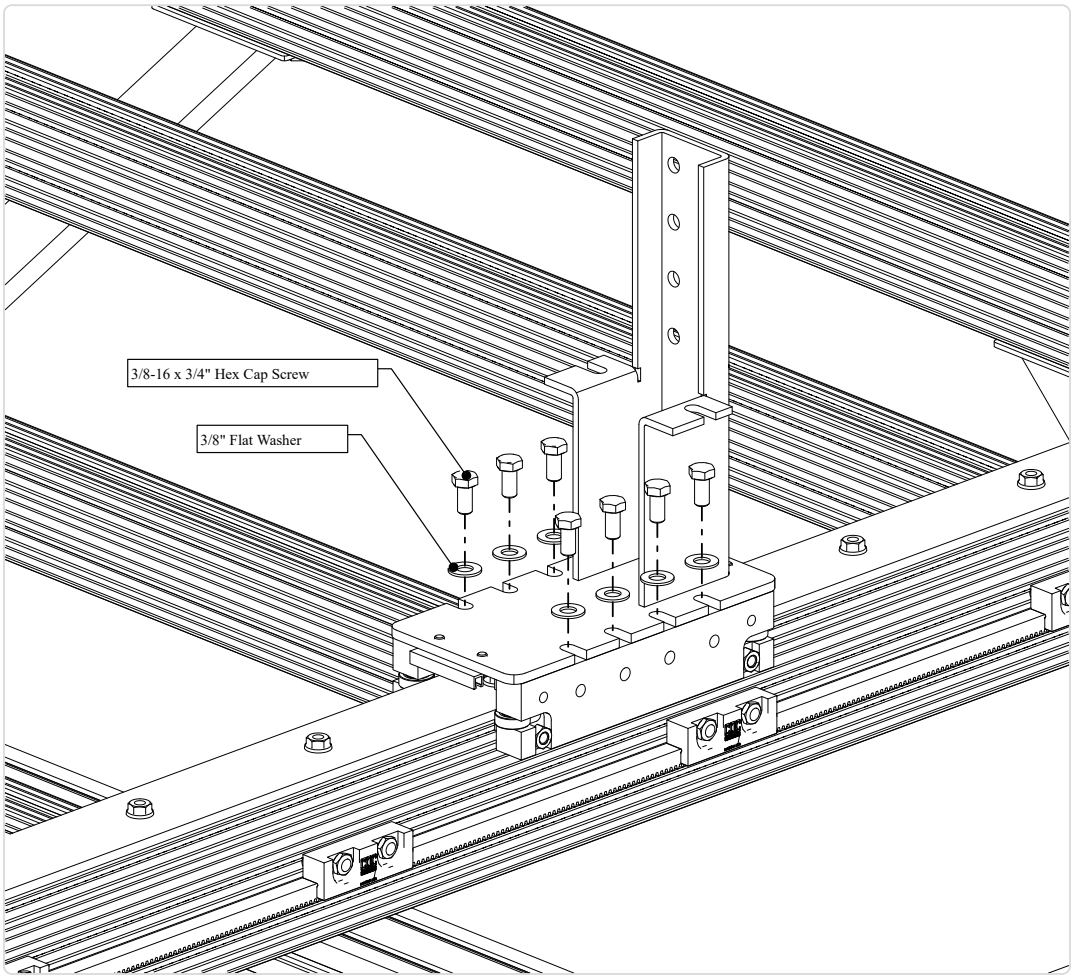
2.2.1.1



- Install strip brush plates as indicated.
- Repeat this step for both gantry risers.

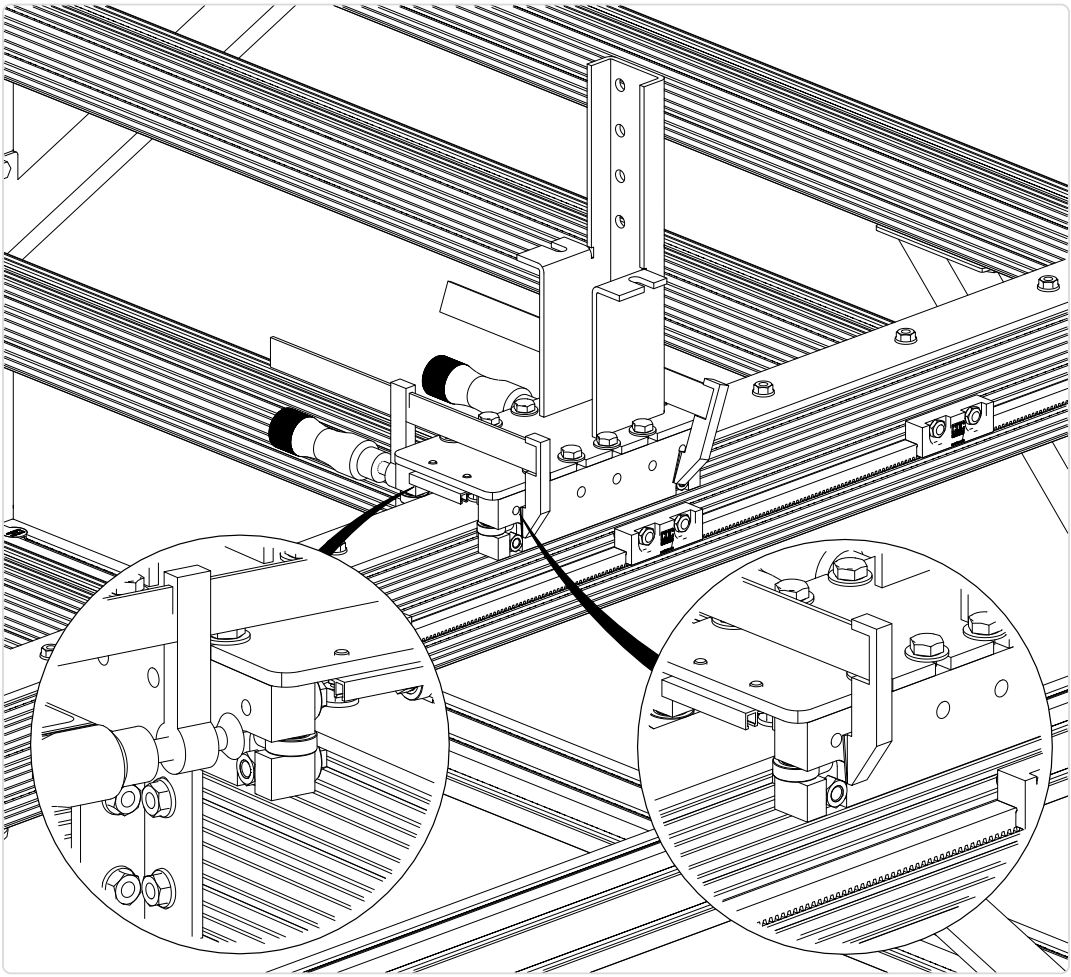
2.2.2 Gantry Riser Installation

2.2.2.1



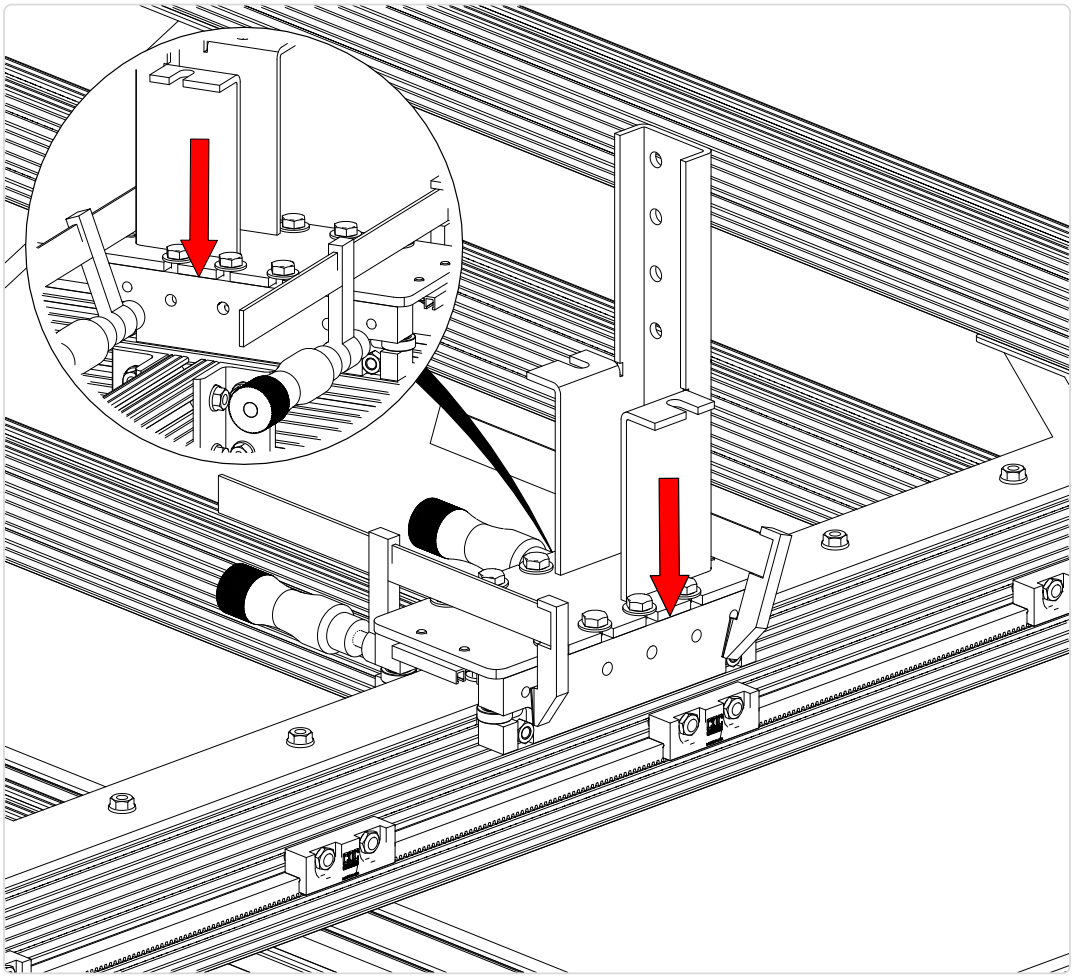
- Position gantry riser on linear carriages as indicated.
- Insert and partially tighten fasteners.

2.2.2.2



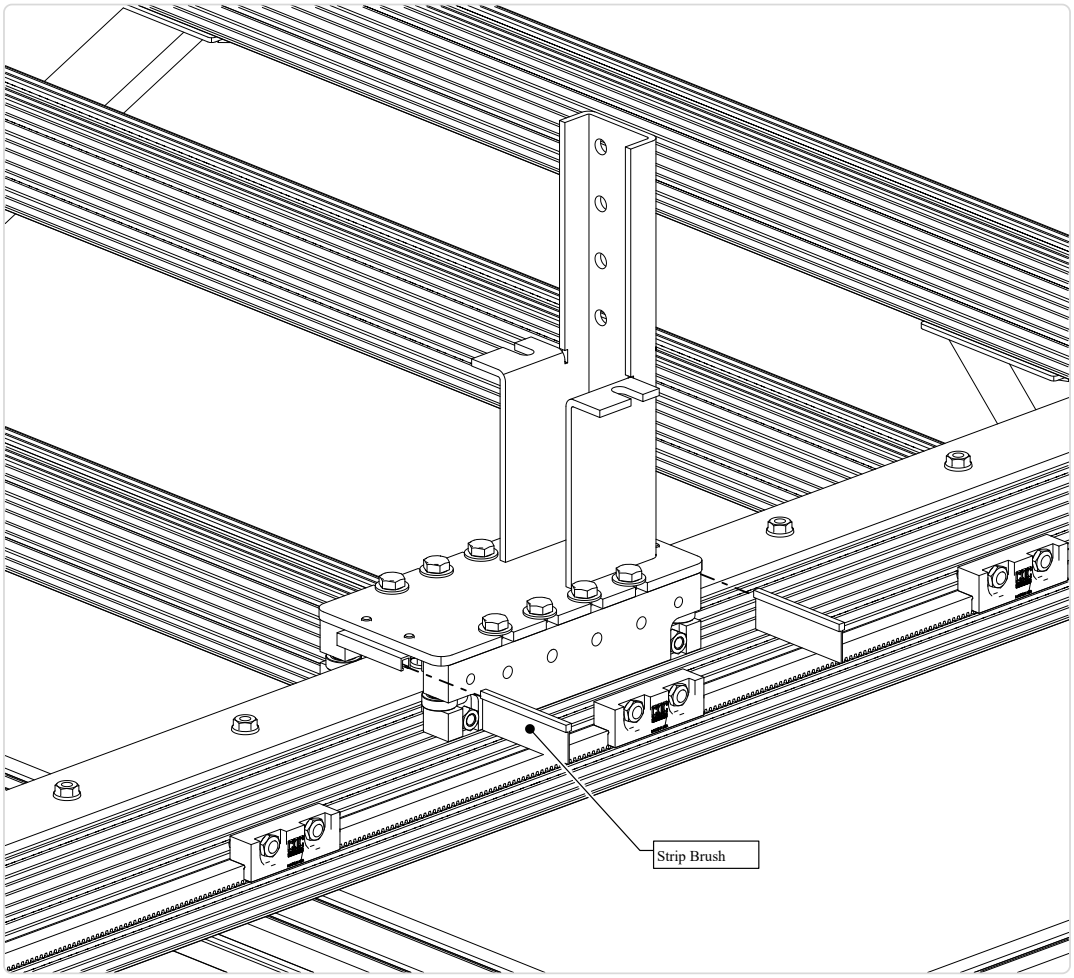
- Clamp linear carriages to the steel rail as indicated.
- Position the clamps with the clamping surface centered vertically on the linear carriages.

2.2.2.3



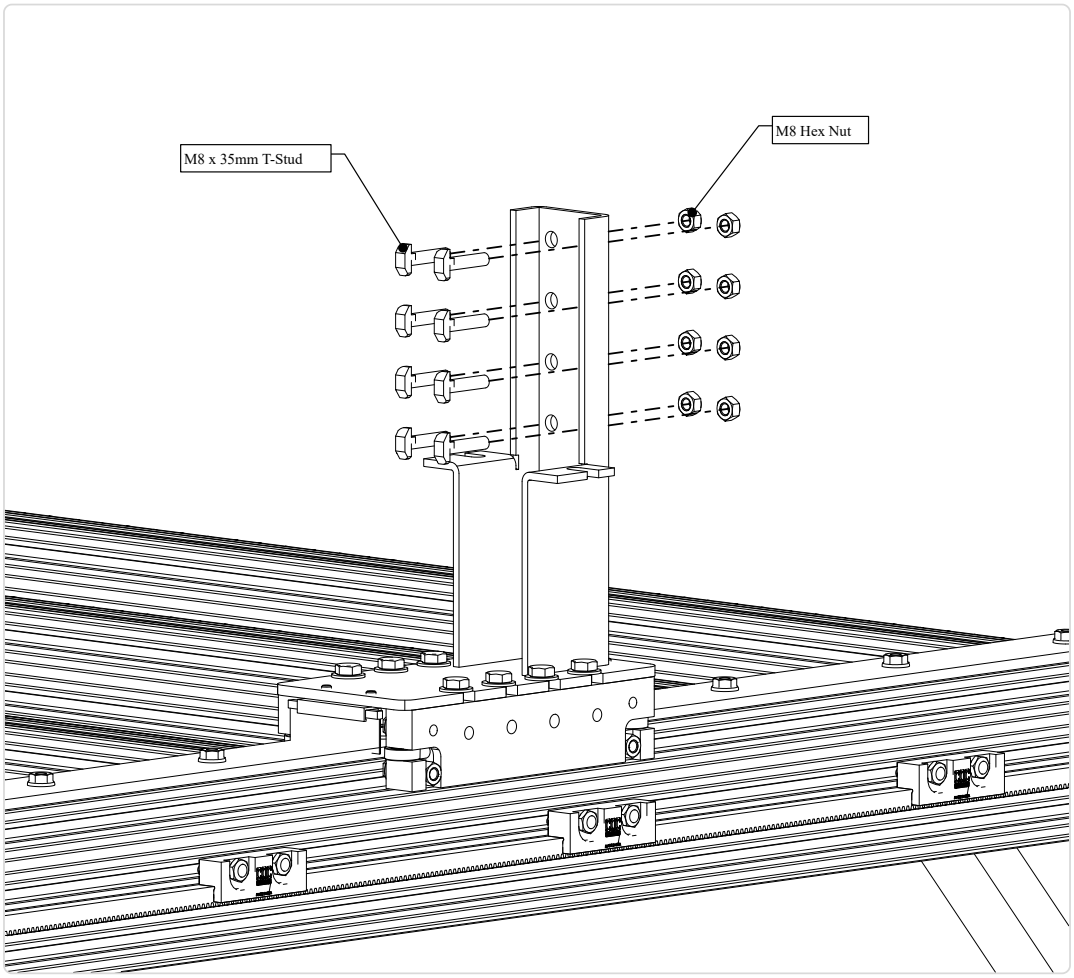
- Adjust the gantry riser to make the edges flush with the linear carriages as indicated.
- Progressively tighten the 3/8-16 fasteners, alternating sides, to secure the gantry riser to the linear carriages.
- Remove clamps.

2.2.2.4



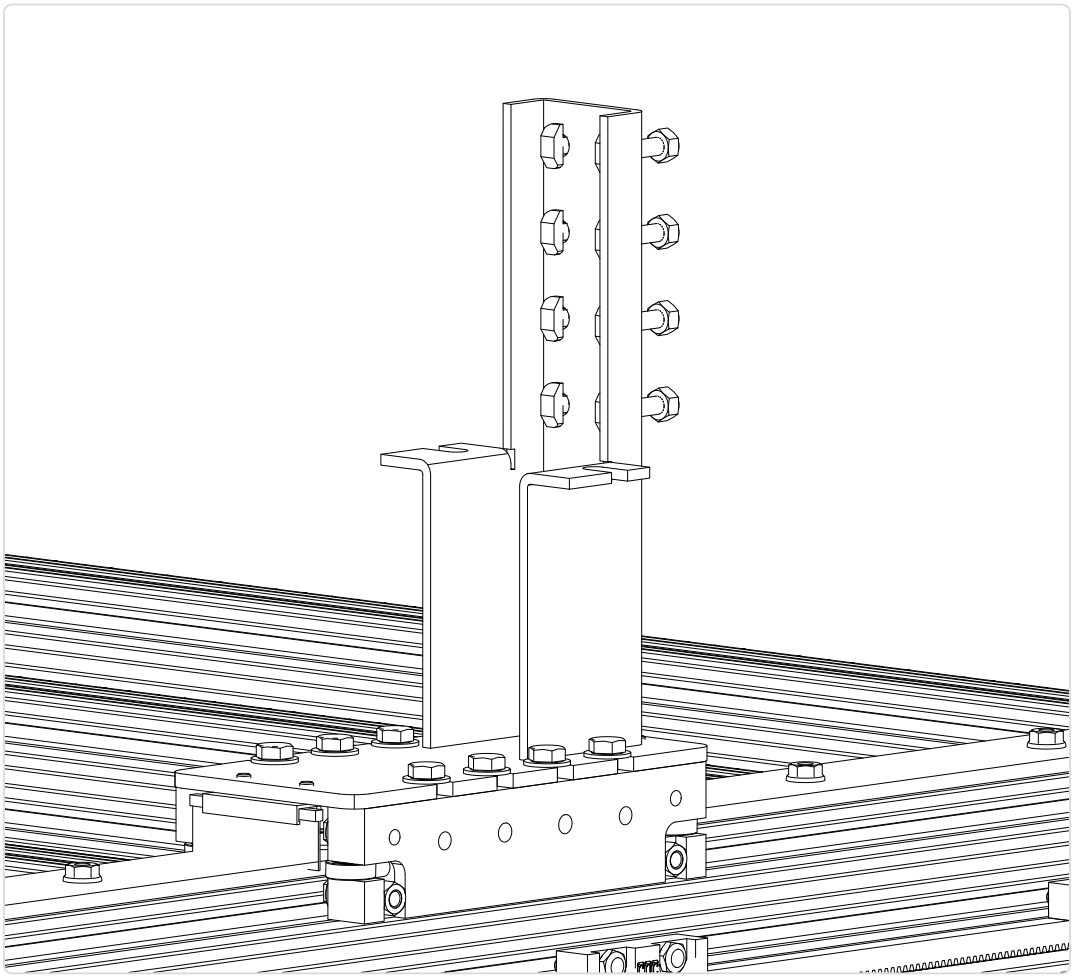
- Install strip brushes as indicated.

2.2.2.5



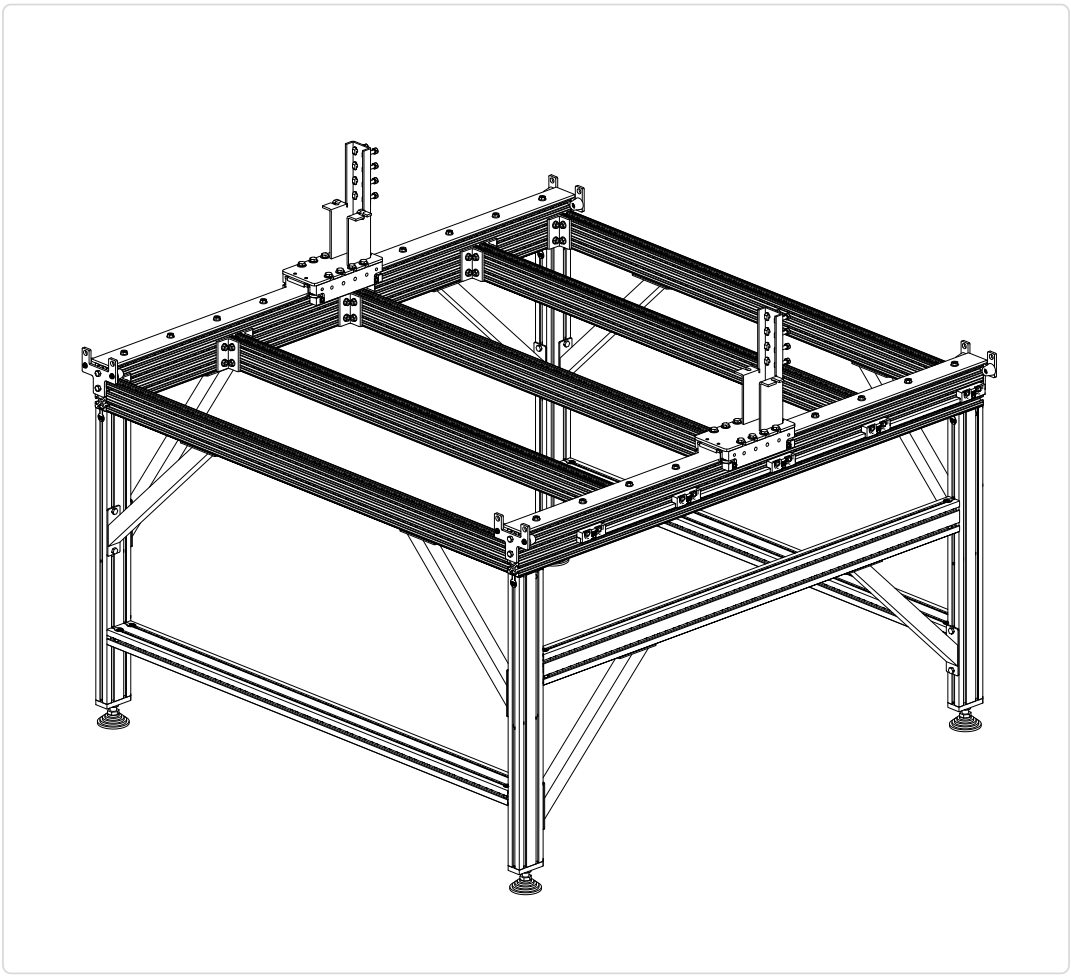
- Install fasteners on gantry riser as indicated, partially threading on M8 hex nuts.

2.2.2.6



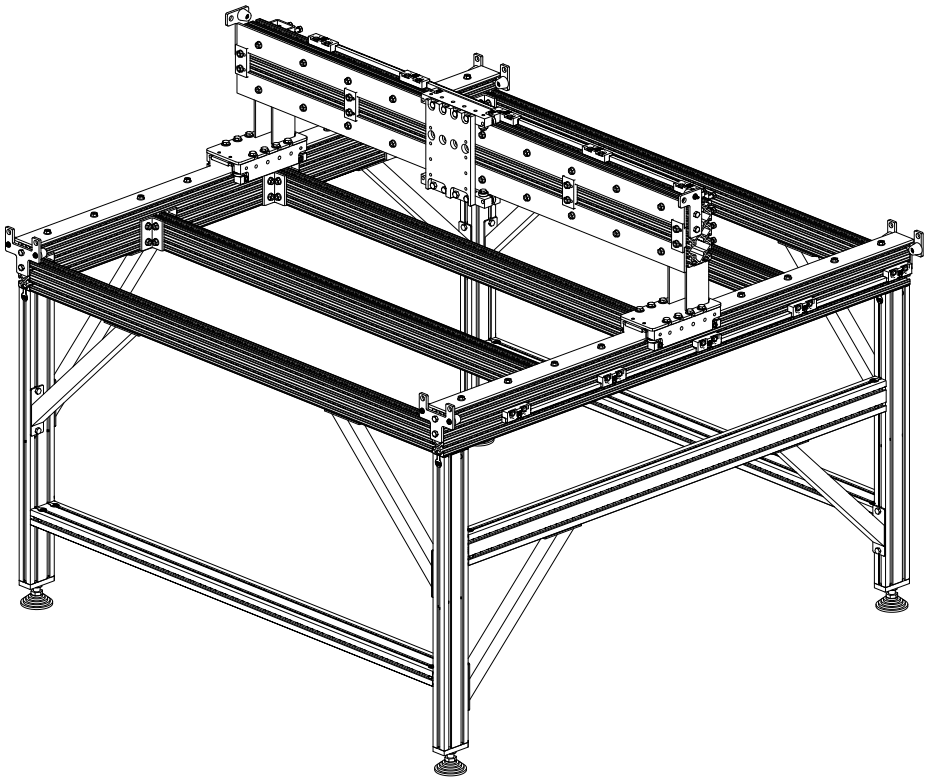
- Position T-Studs to rear of the gantry riser as indicated.

2.2.2.7

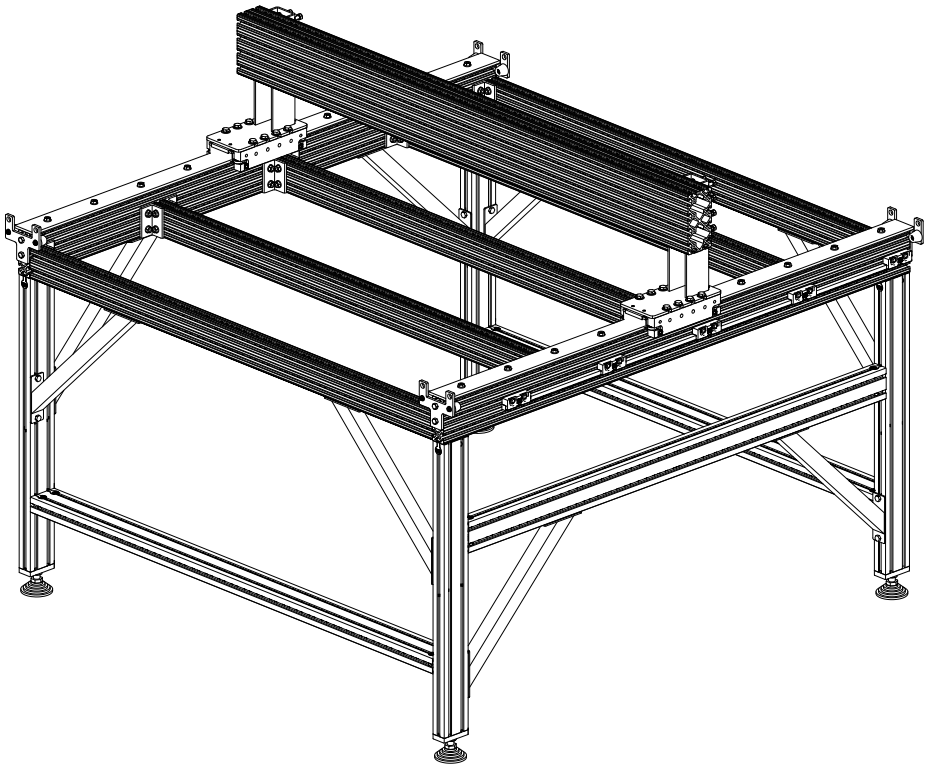


- Repeat the previous steps for the second gantry riser.

Section 3: Gantry Assembly



3.1 Gantry Extrusion



Parts and Tools Required

The following bags and parts will be used in this section:

- (1) 3060 Gantry Extrusion, 1537mm (60-1/2")
- (1) CRP120-00-FAST-17.2
    - (4) M8 x 16mm T-Stud
    - (4) M8 Hex Nut

The following tools will be used in this section:

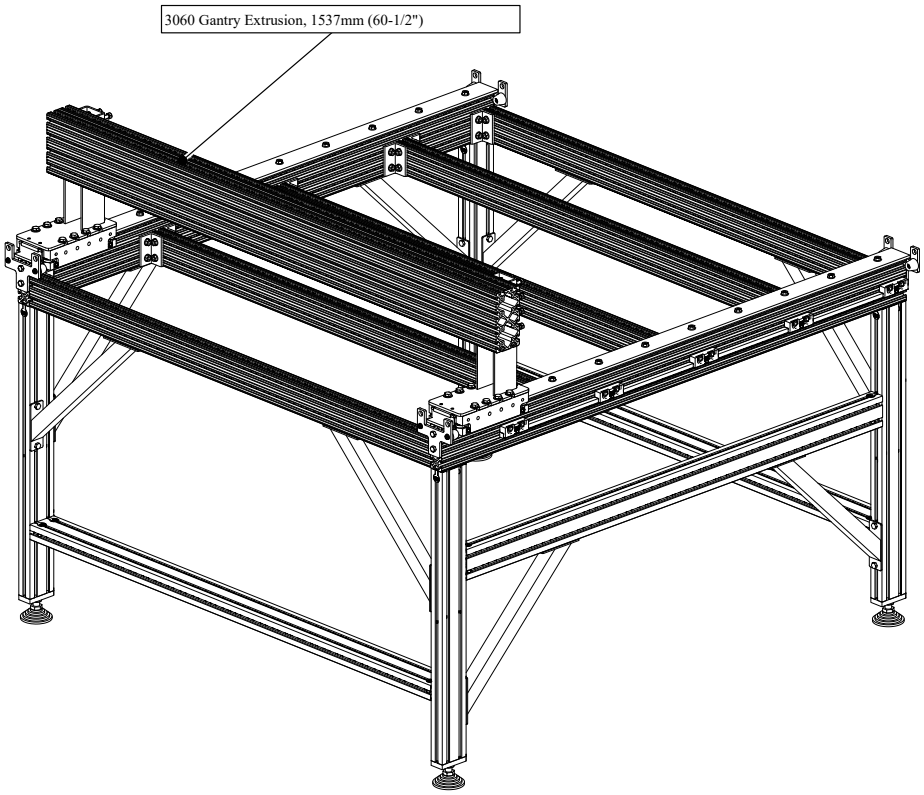
- 13mm Combination Wrench
- (2) Clamp
- Tape Measure

3.1.1 Extrusion Installation

3.1.1.1

- Position the gantry risers at front of machine as indicated.

3.1.1.2

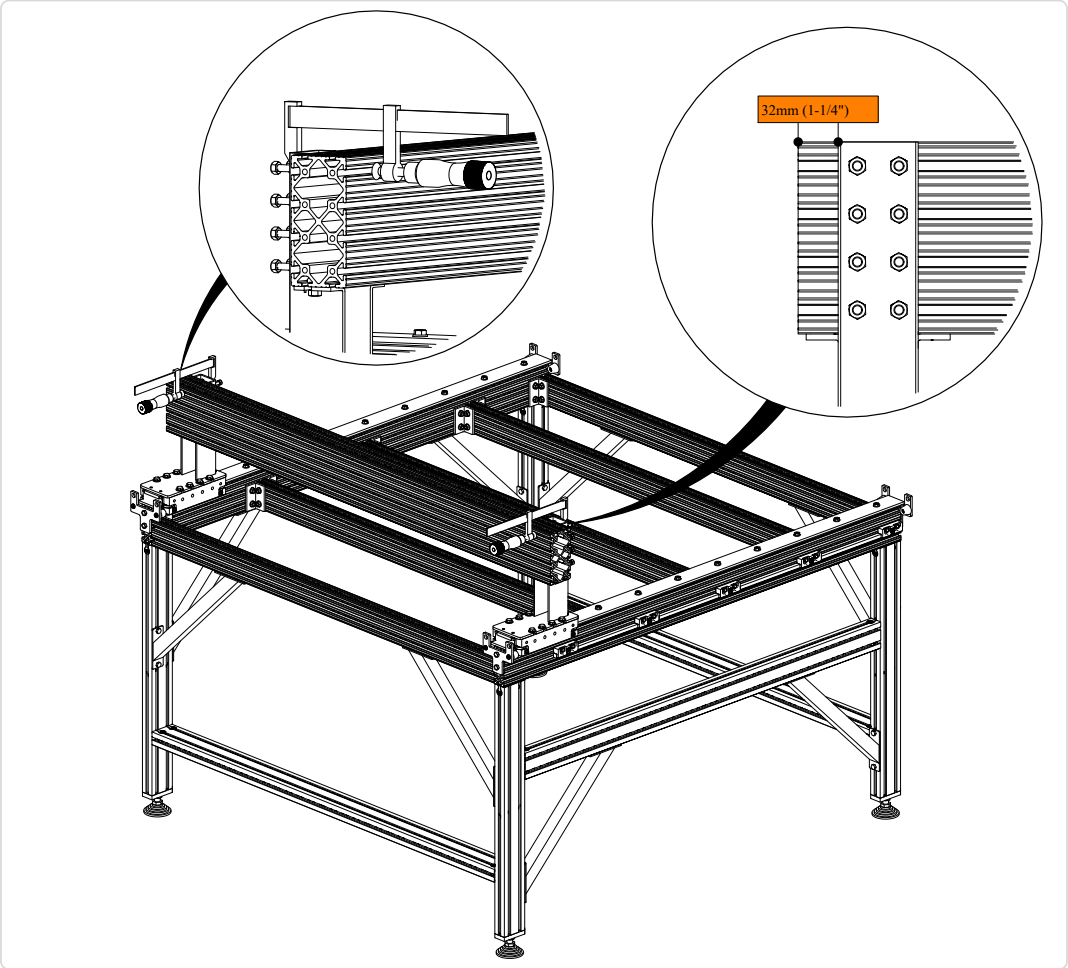


- Place the 1537mm (60-1/2") 3060 Gantry Extrusion on the gantry risers as indicated.
- Use clamps to temporarily secure the gantry extrusion to the gantry risers.

Assembly Note

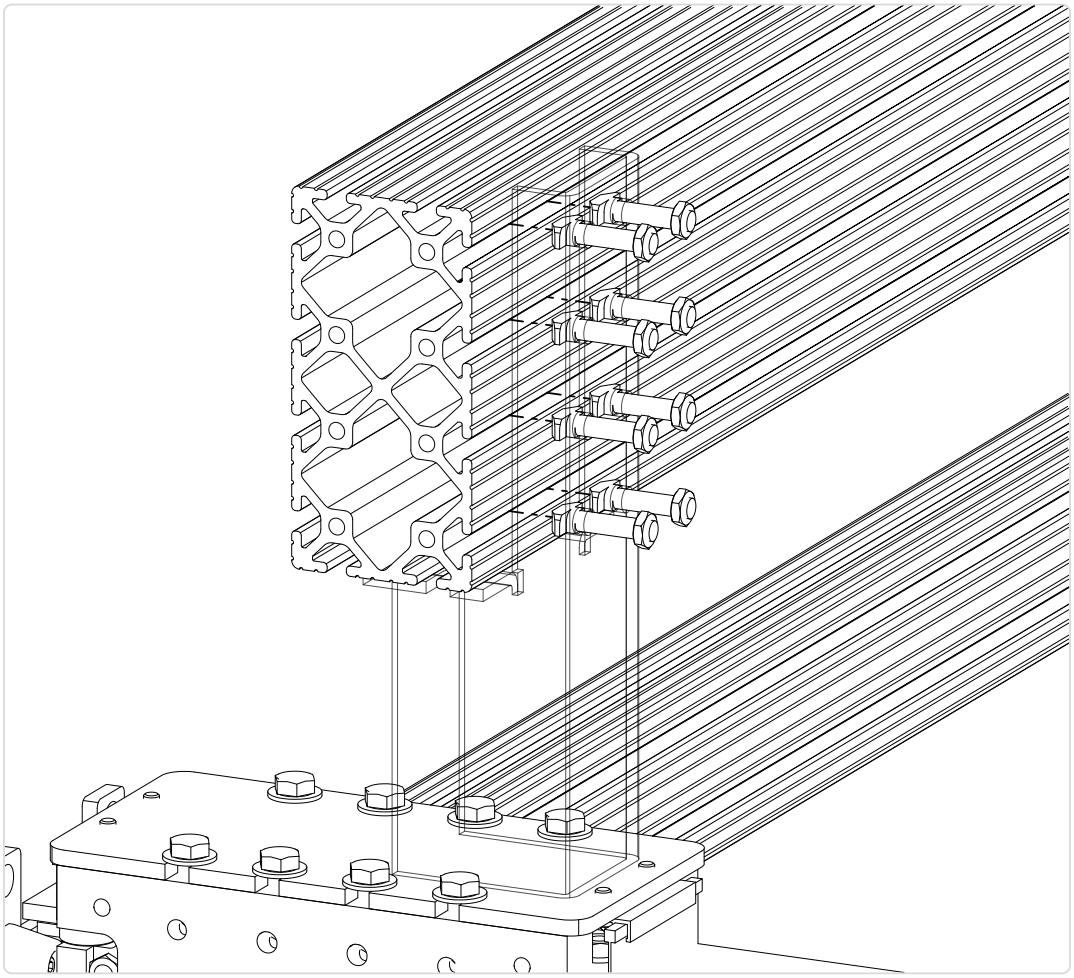
See the next step for positioning of the gantry extrusion and clamps.

3.1.1.3



- Clamp gantry extrusion to gantry risers as indicated.
- Center the gantry extrusion, positioning the end of the extrusion approximately 32mm (1-1/4") from the gantry riser.

3.1.1.4

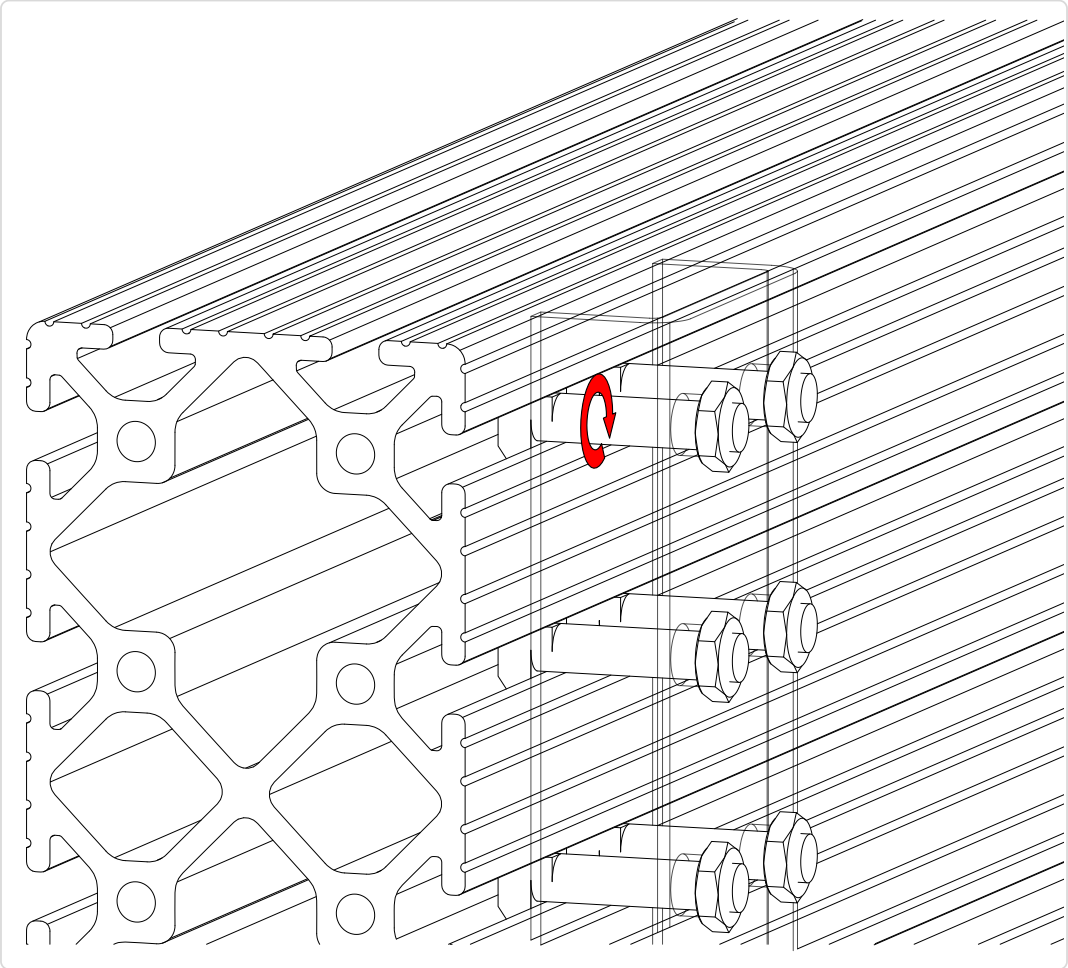


- Insert the T-Studs into gantry extrusion

Assembly Note

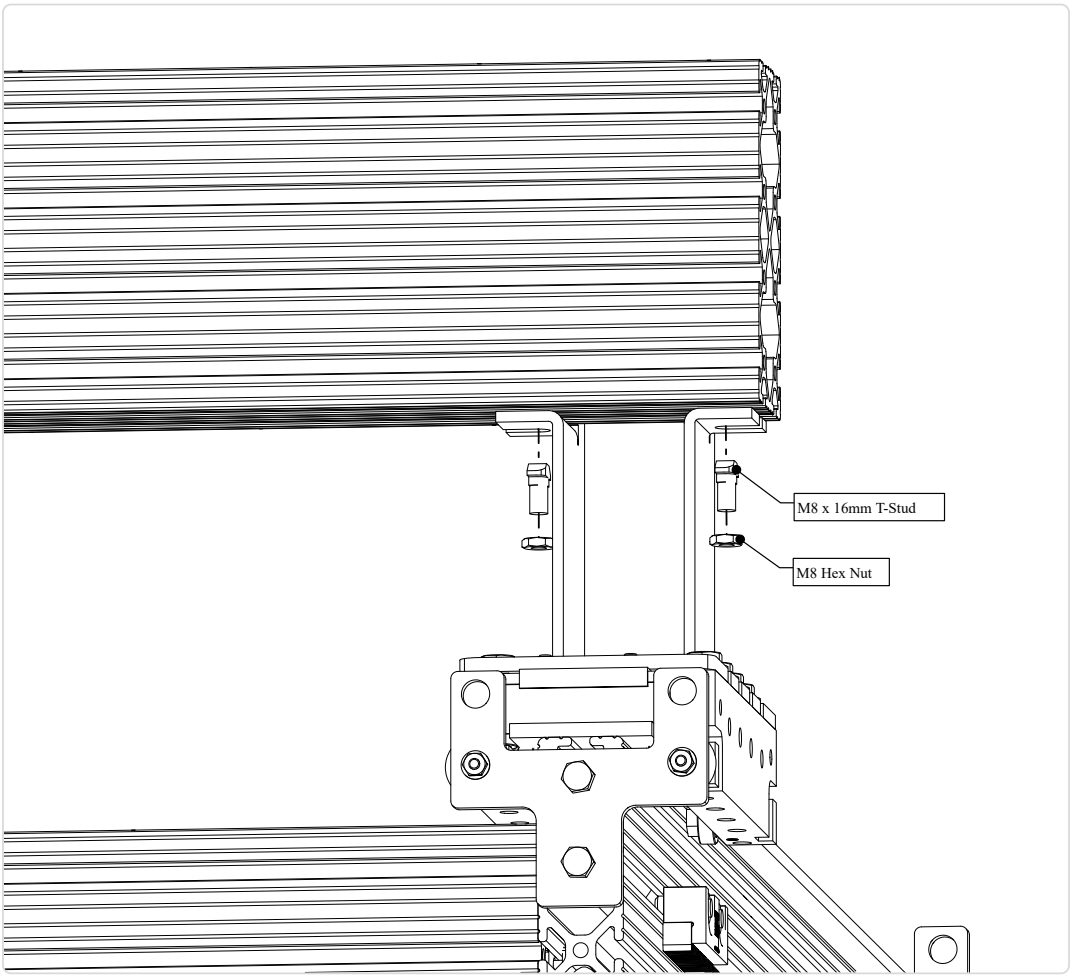
The gantry riser and clamps are hidden for illustrative purposes.

3.1.1.5



- Rotate all T-Studs 90° to hold gantry extrusion.
- Partially tighten the M8 nuts and then remove the clamps.

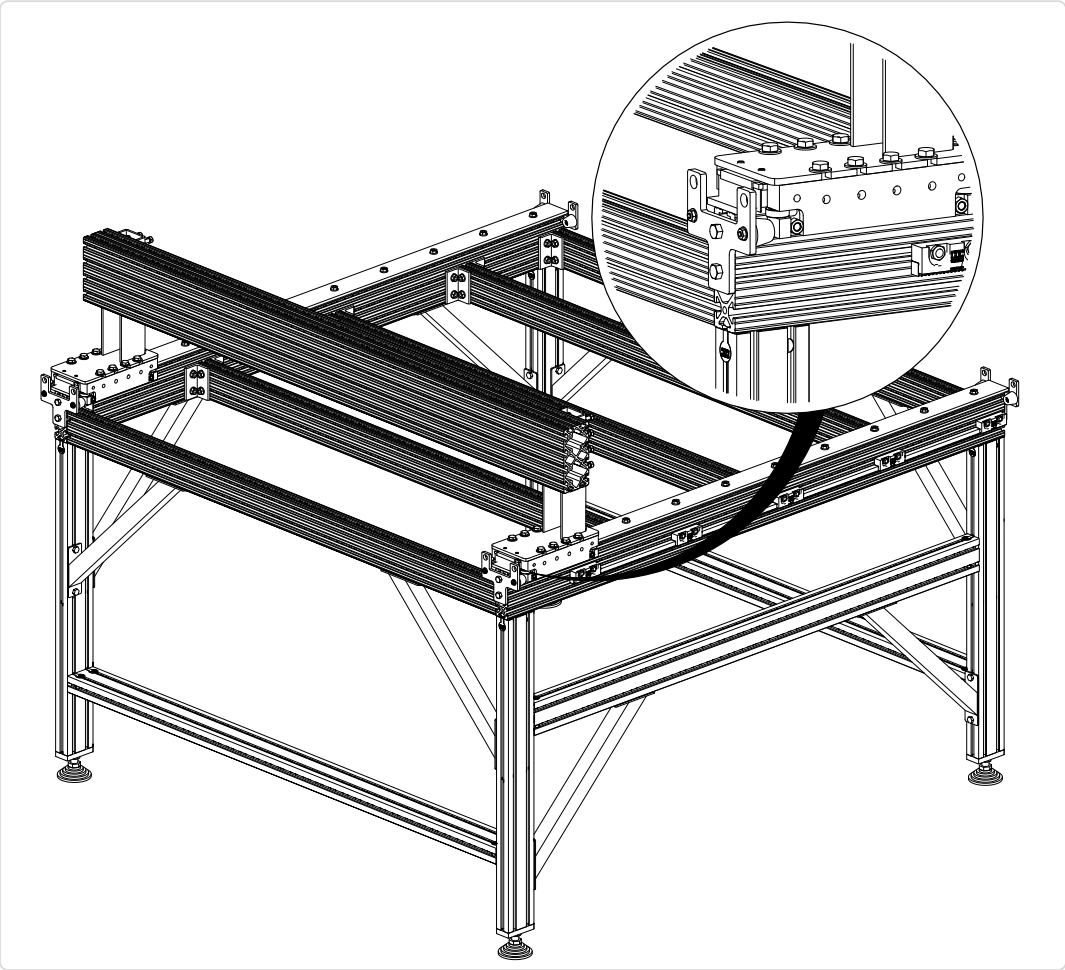
3.1.1.6



- Install T-Studs and nuts on underside of gantry riser as indicated.
- Tighten all fasteners attaching gantry extrusion to gantry riser.
- Utilize this process for both gantry risers.

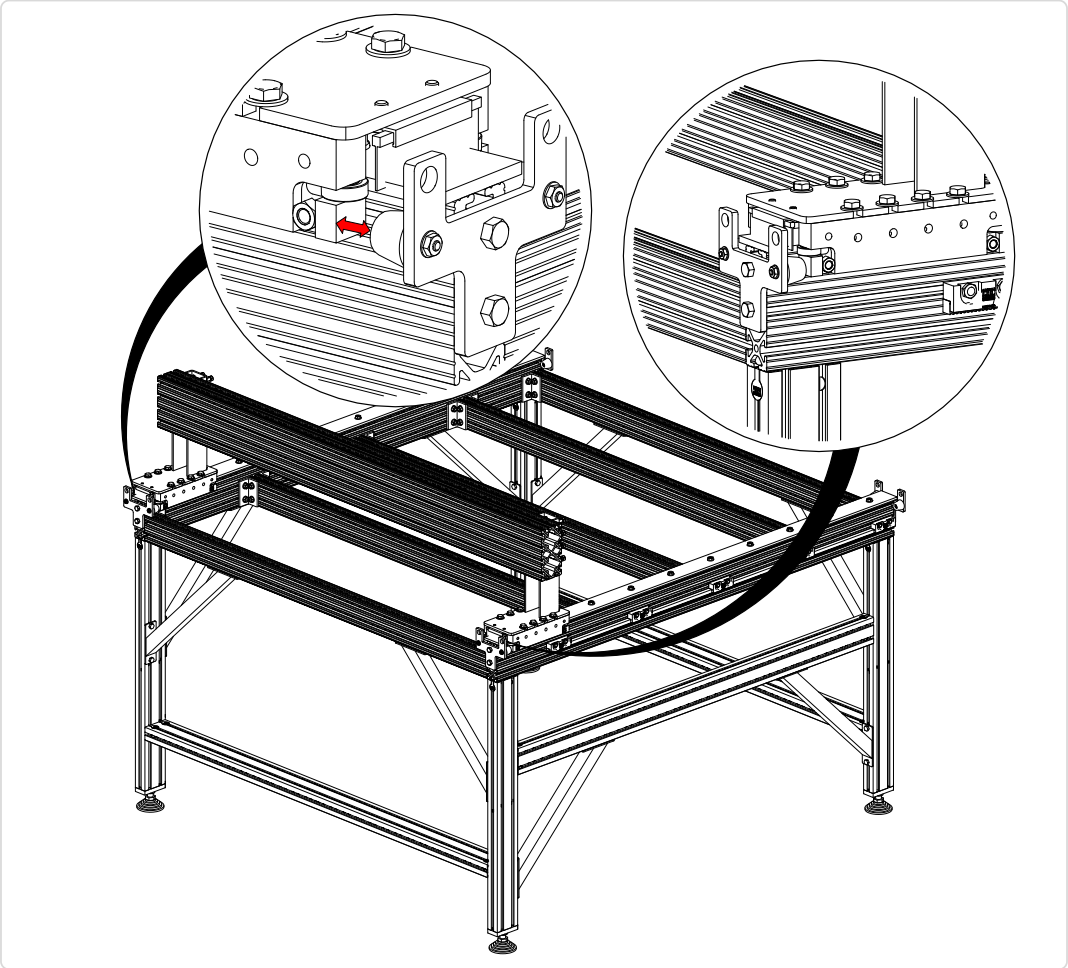
3.1.2 Gantry Alignment

3.1.2.1



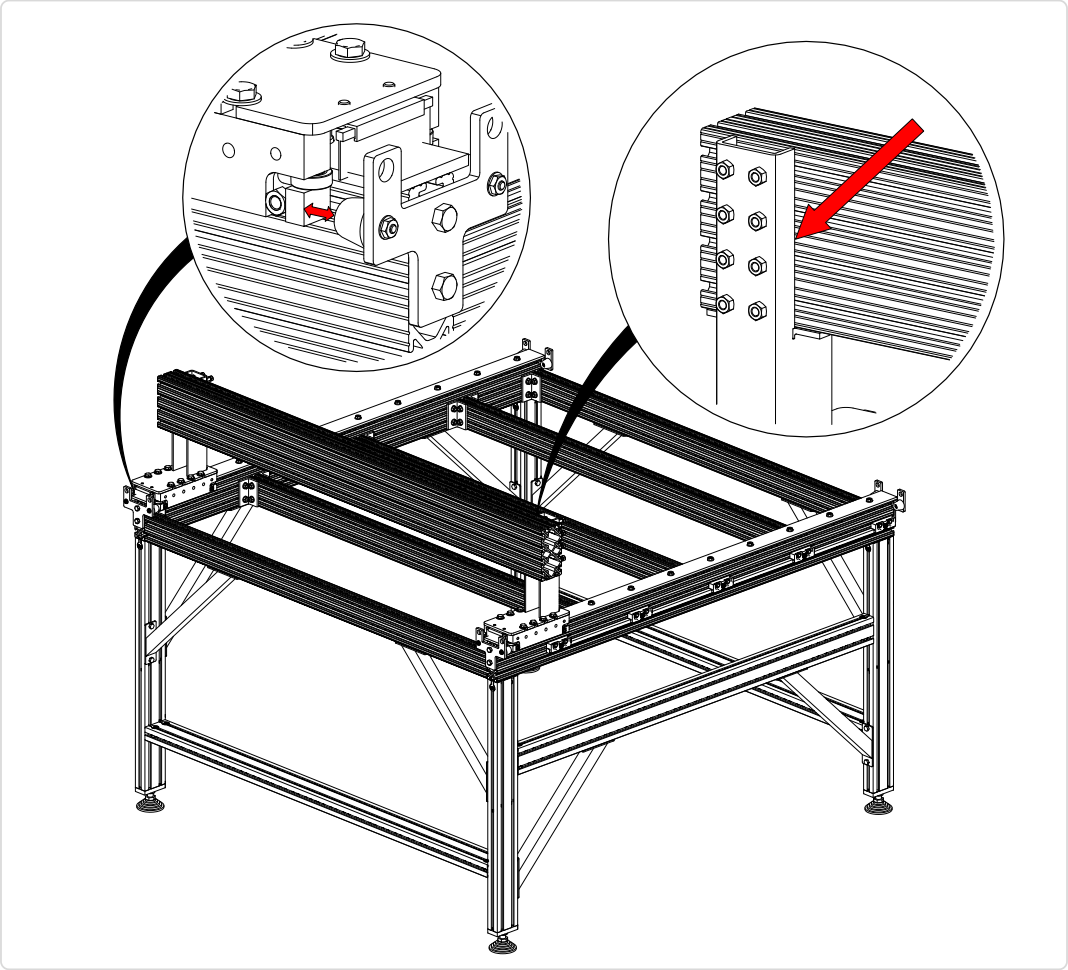
- Move the gantry forward until the linear carriages are touching the bumpers as indicated.

3.1.2.2



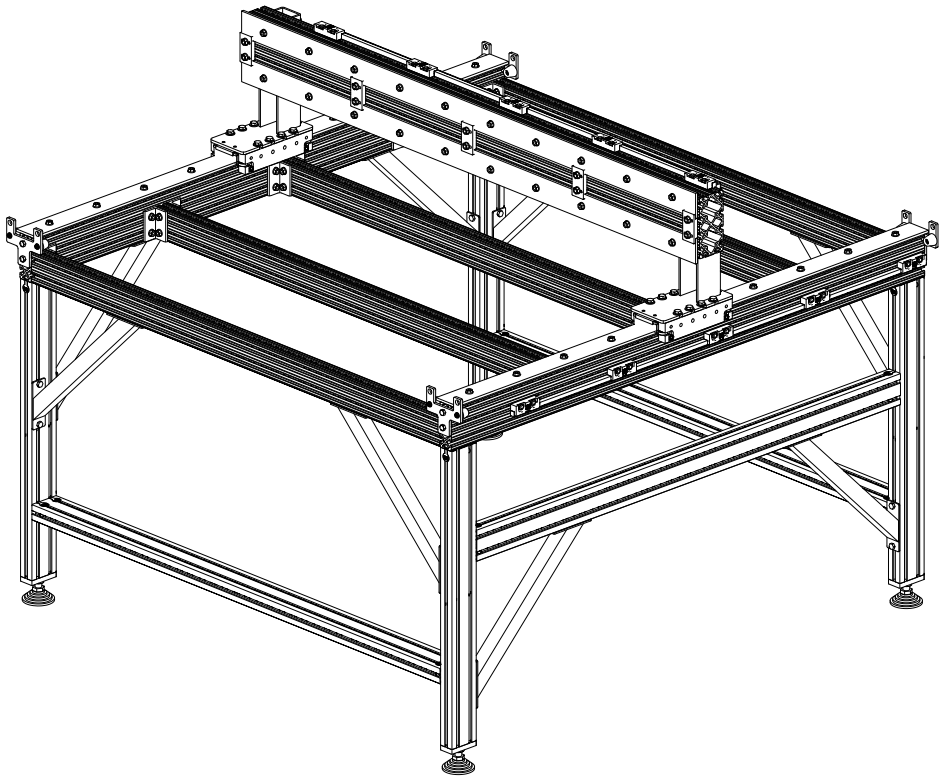
- If the linear carriages do not touch the bumpers on one side, measure the distance between the linear carriage and bumper as indicated.
- If this measurement is roughly 3mm (1/8") or less, skip to section 3.2.

3.1.2.3



If the measurement in the previous step is greater than 3mm (1/8"), the best place to address this is at the vertical interface between the gantry risers and gantry extrusion. A thin shim can be placed at the inside interface of the gantry riser as indicated in the above figure. A piece of aluminum foil is recommended if shim stock is not available. (The aluminum foil can be folded to achieve different thicknesses) Shimming in this manner produces approximately a 20:1 lever arm, so a 0.005" shim will move the opposite riser approximately 0.100" after re-tightening the gantry bolts.

3.2 Steel Rails and Gear Rack



Parts and Tools Required

The following bags and parts will be used in this section:

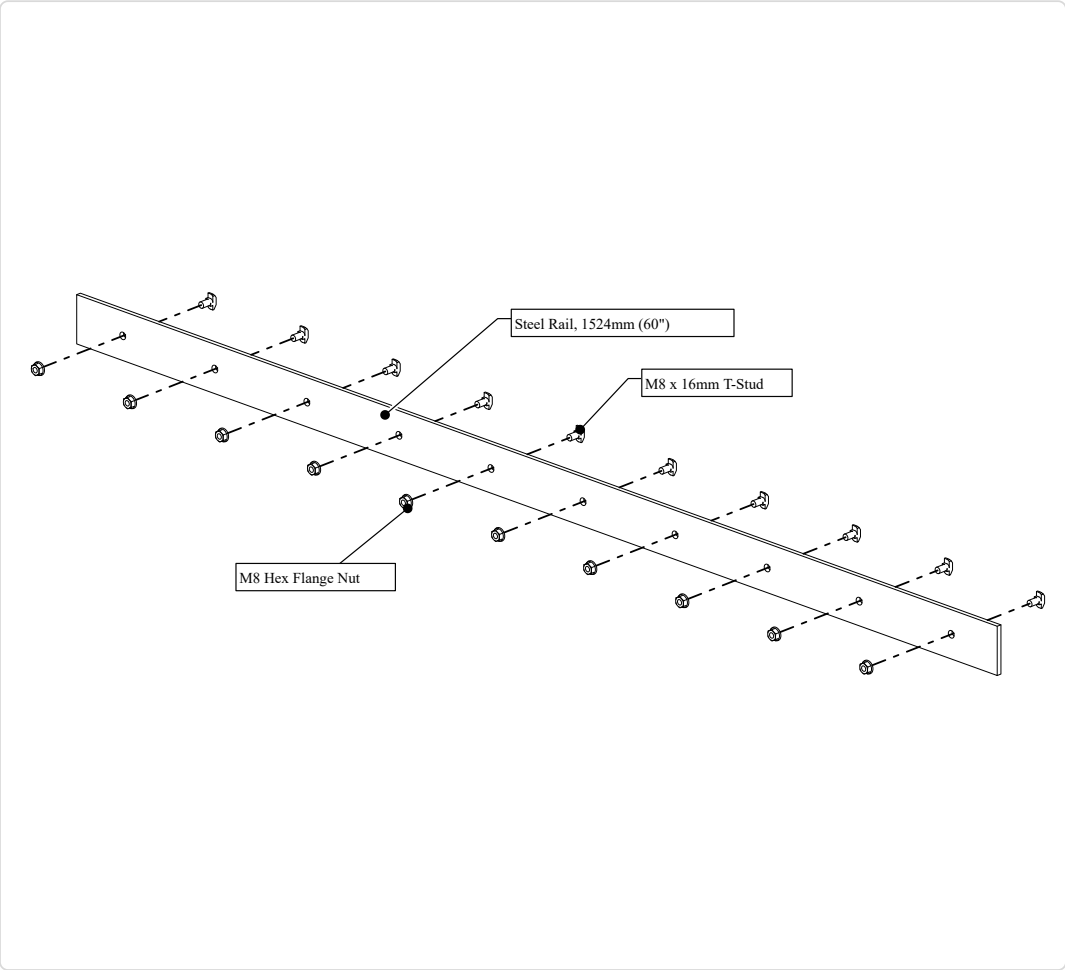
- (2) Steel Rail, 1524mm (60")
- (1) Gear Rack, 1320mm (52")
- (1) TS-M8-16K-FN
    - (20) M8 x 16mm T-Stud
    - (20) M8 Hex Flange Nut
- (1) CRP130-05-00
    - (5) Rail Clamp
    - (10) M8 x 23mm T-Stud
    - (10) M8 Hex Flange Nut
- (1) CRP202-00C-LF
    - (5) Rack Clamp
    - (10) M8 Hex Jam Nut
    - (10) M8 x 23mm T-Stud

The following tools will be used in this section:

- 13mm Combination Wrench
- 13mm Socket and Ratchet
- (2) Clamp
- Tape Measure

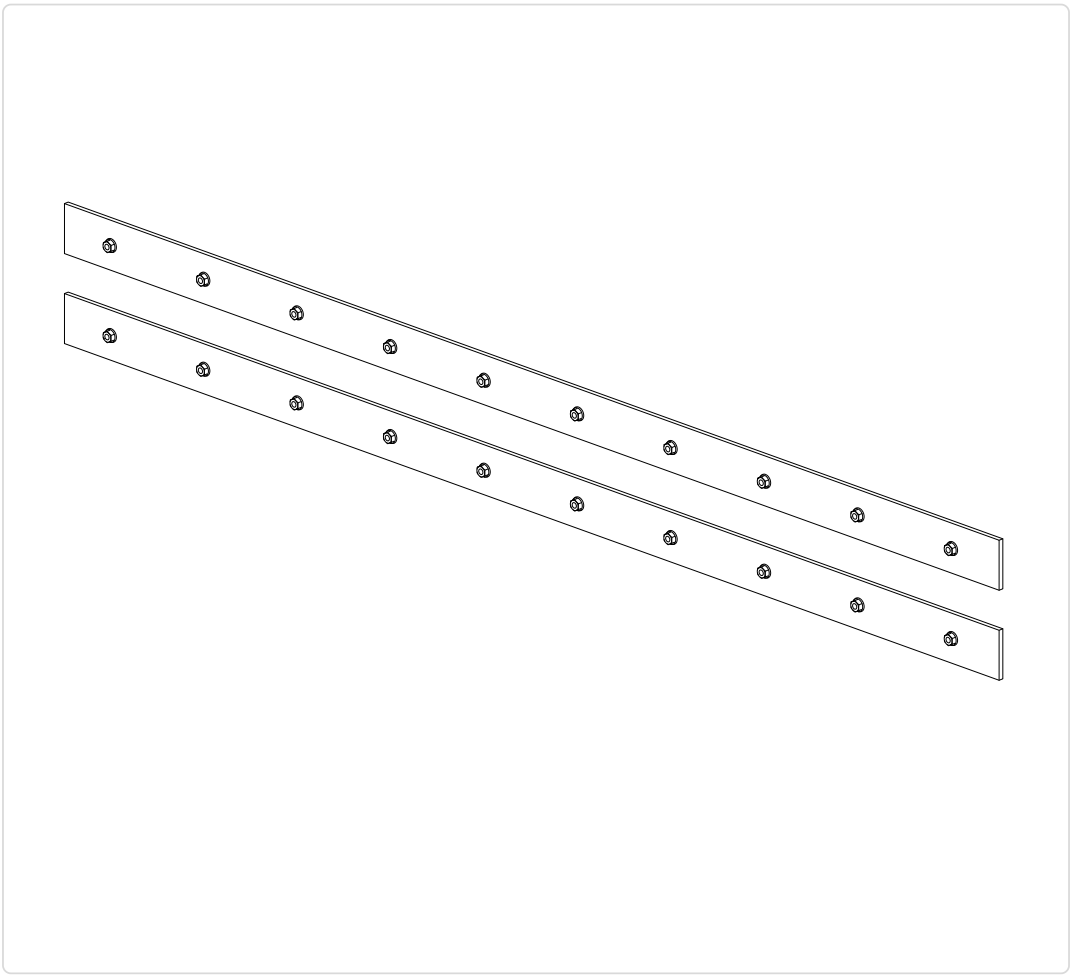
3.2.1 Steel Rail Assembly

3.2.1.1



- Install fasteners into a 1524mm (60") Steel Rail as indicated, partially threading on the M8 nuts.

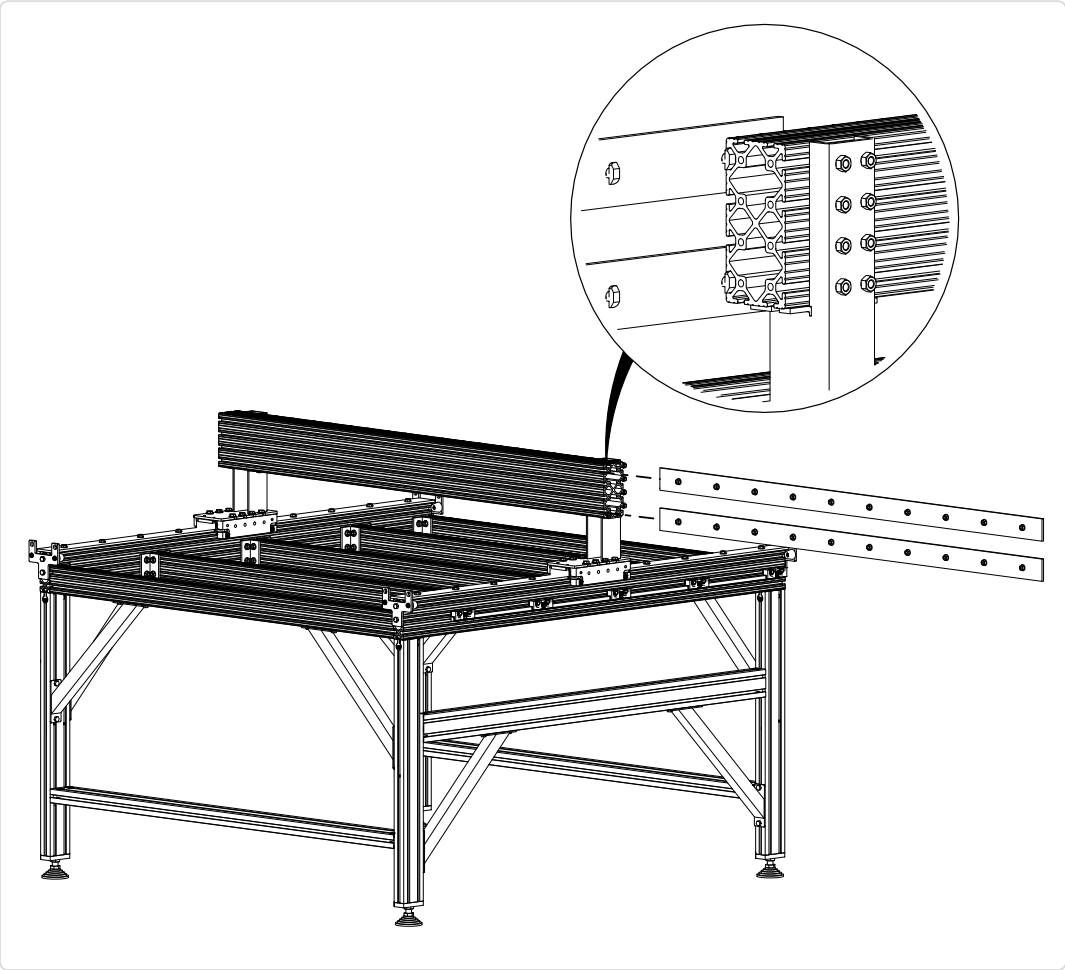
3.2.1.2



- Repeat this process for both 1524mm (60") Steel Rails.

3.2.2 Steel Rail Installation

3.2.2.1

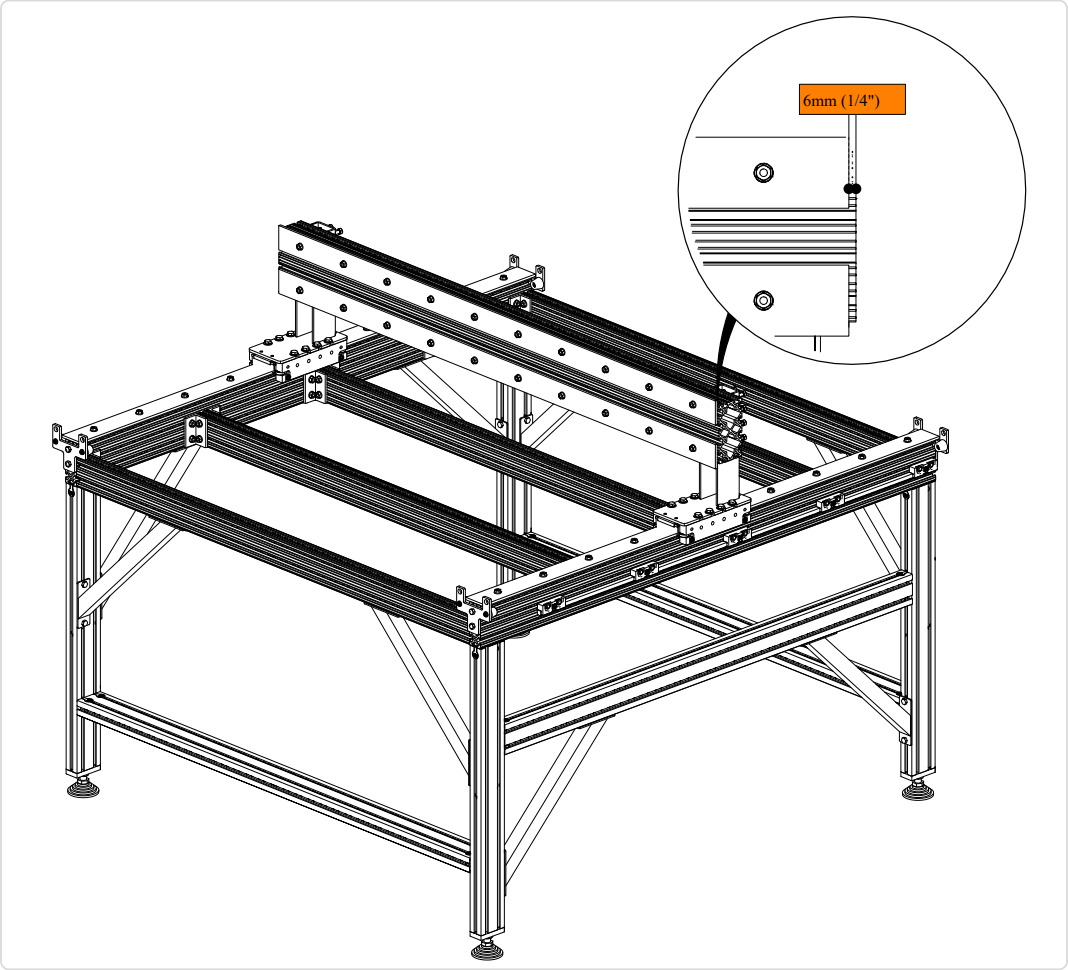


- Slide the steel rails into the gantry extrusion as indicated.

Assembly Note

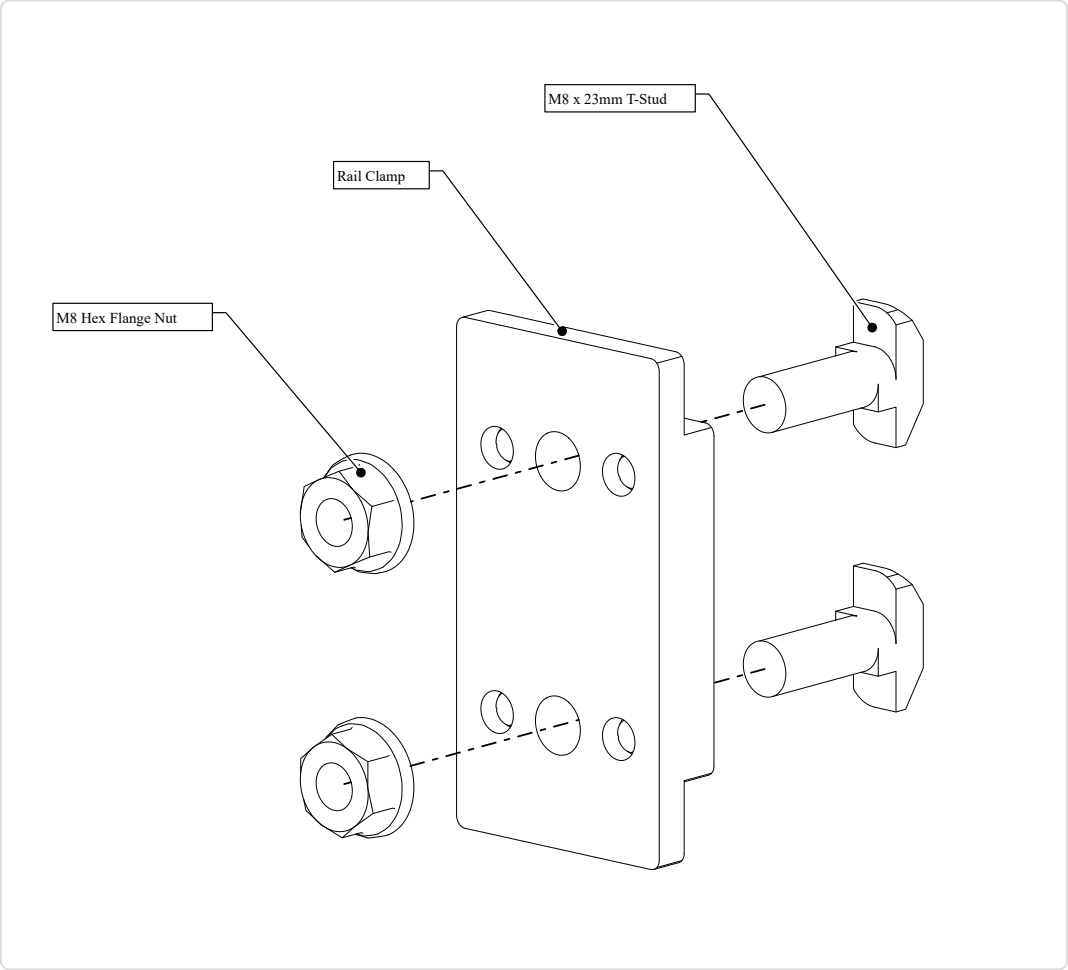
The steel rails will be installed in the upper and lower slots on the front of the gantry extrusion.

3.2.2.2



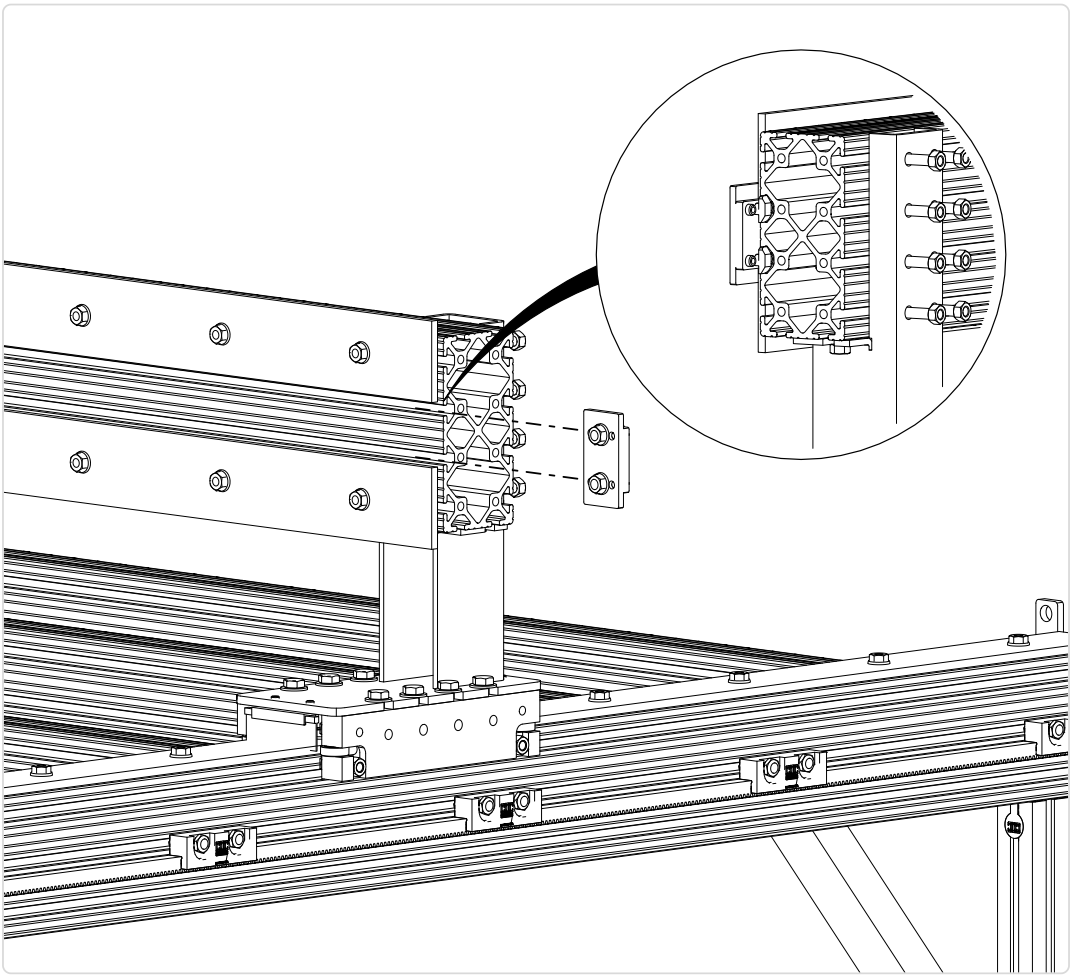
- Position the steel rails approximately 6mm (1/4") from end of the gantry extrusion as indicated.

3.2.2.3



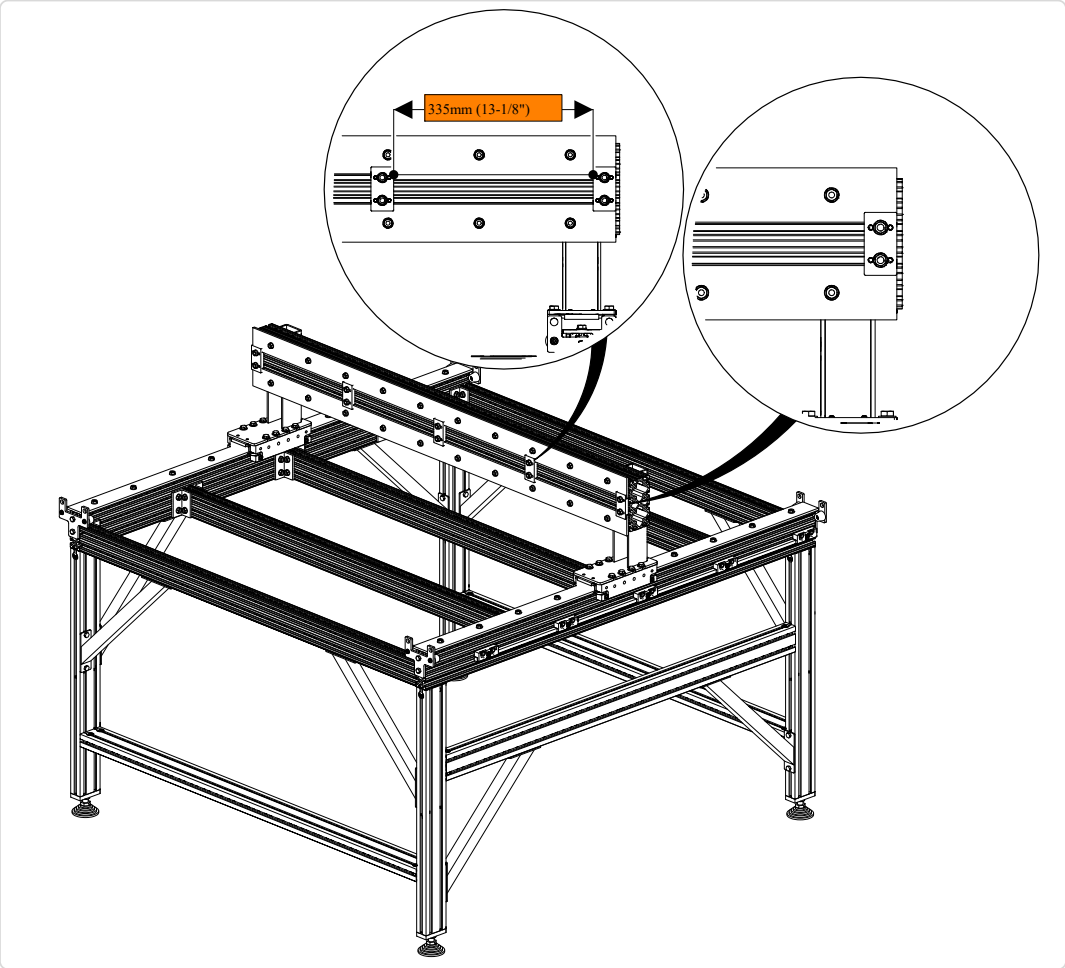
- Assemble five rail clamps as indicated, partially threading on the hex nuts.

3.2.2.4



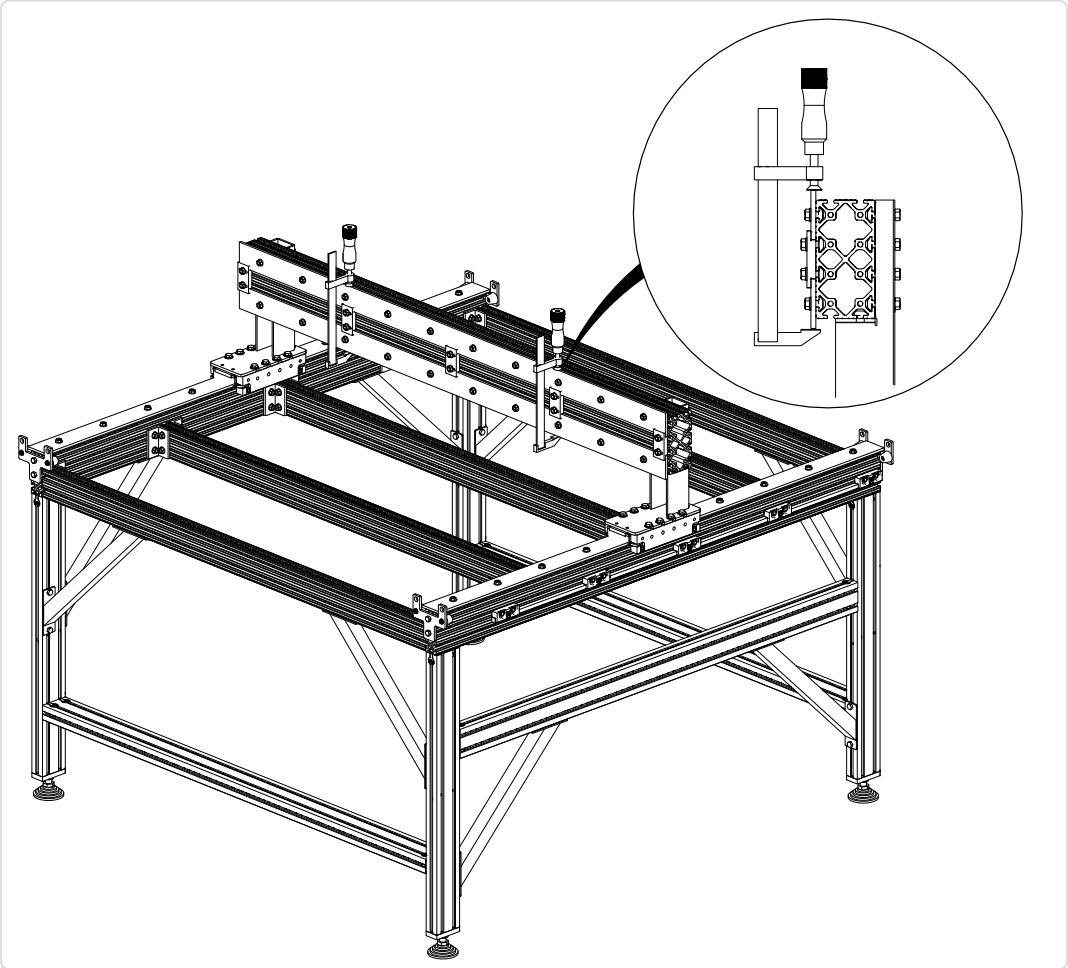
- Slide assembled rail clamps on to gantry extrusion as indicated.

3.2.2.5



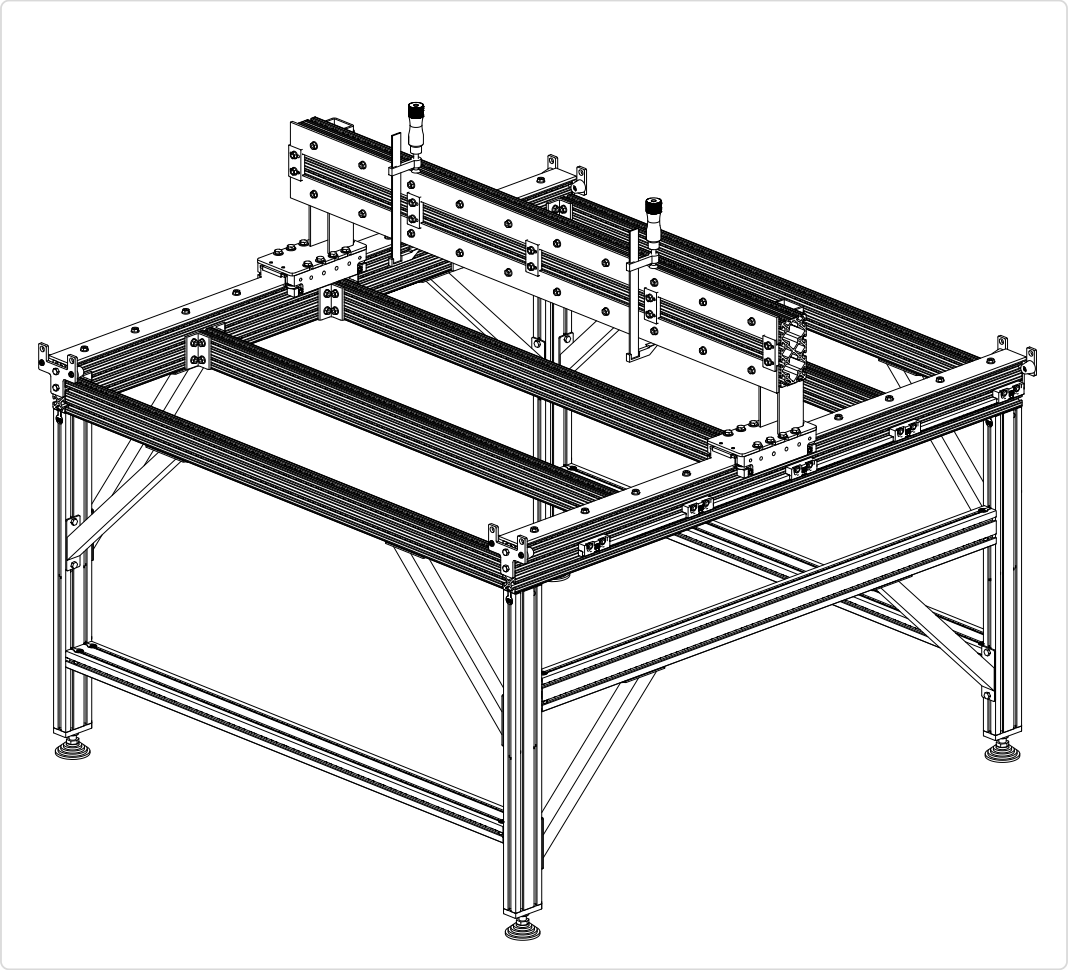
- Position the outer rail clamps flush with the steel rails as indicated.
- Space the remaining rail clamps 335mm (13-1/8") apart as indicated.
- Partially tighten the rail clamp fasteners.

3.2.2.6



- Position clamps as indicated to align the steel rails.

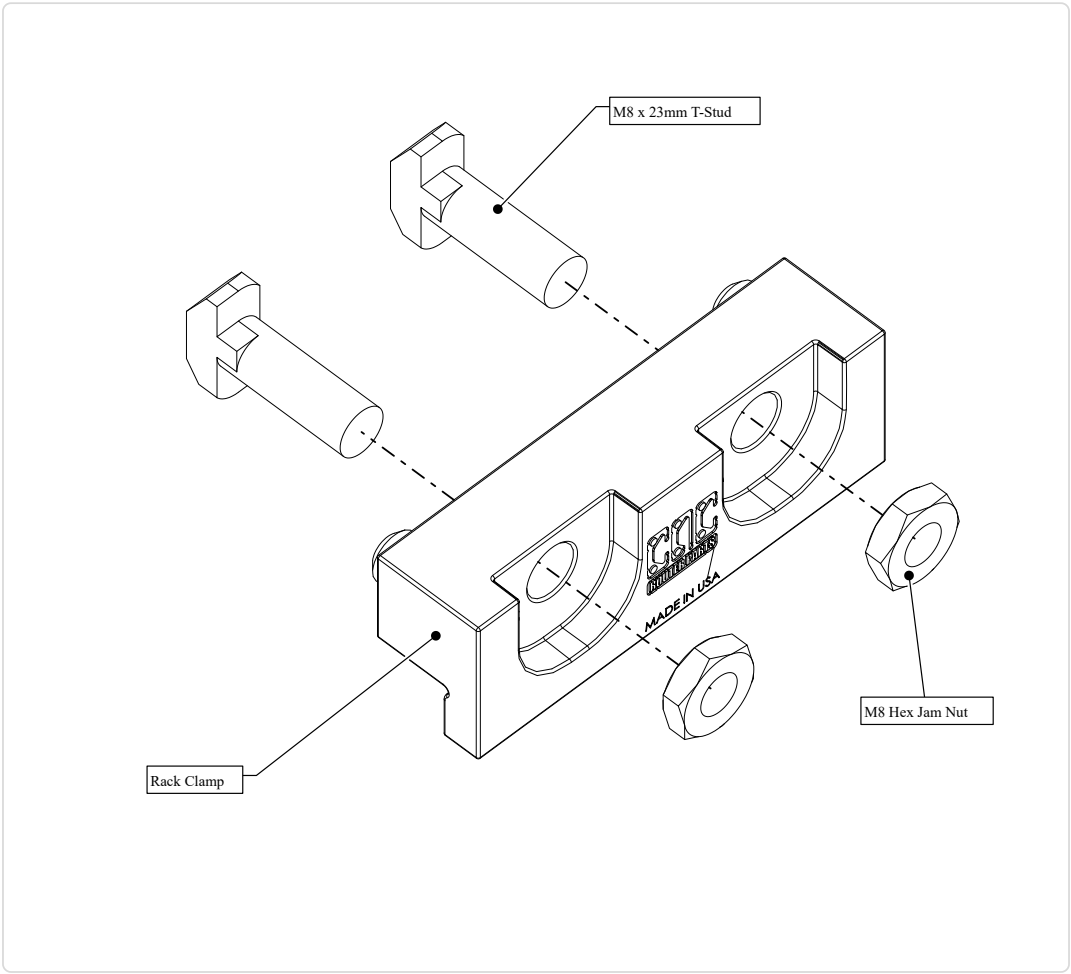
3.2.2.7



- While clamped, tighten all fasteners securing the steel rails and rail clamps to the gantry extrusion.
- Remove clamps.

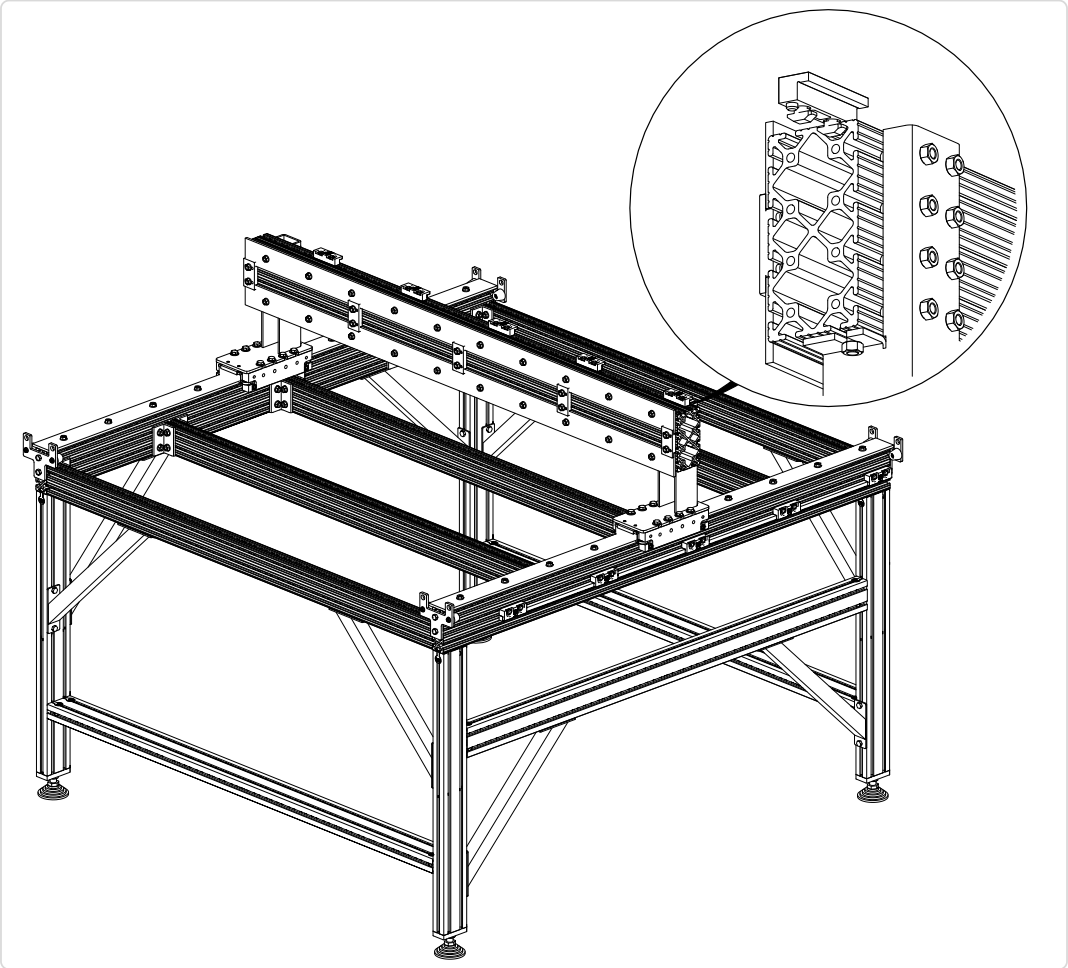
3.2.3 Gear Rack Installation

3.2.3.1



- Assemble five rack clamps as indicated.
- Partially thread the jam nuts to allow installation on the gantry extrusion.

3.2.3.2

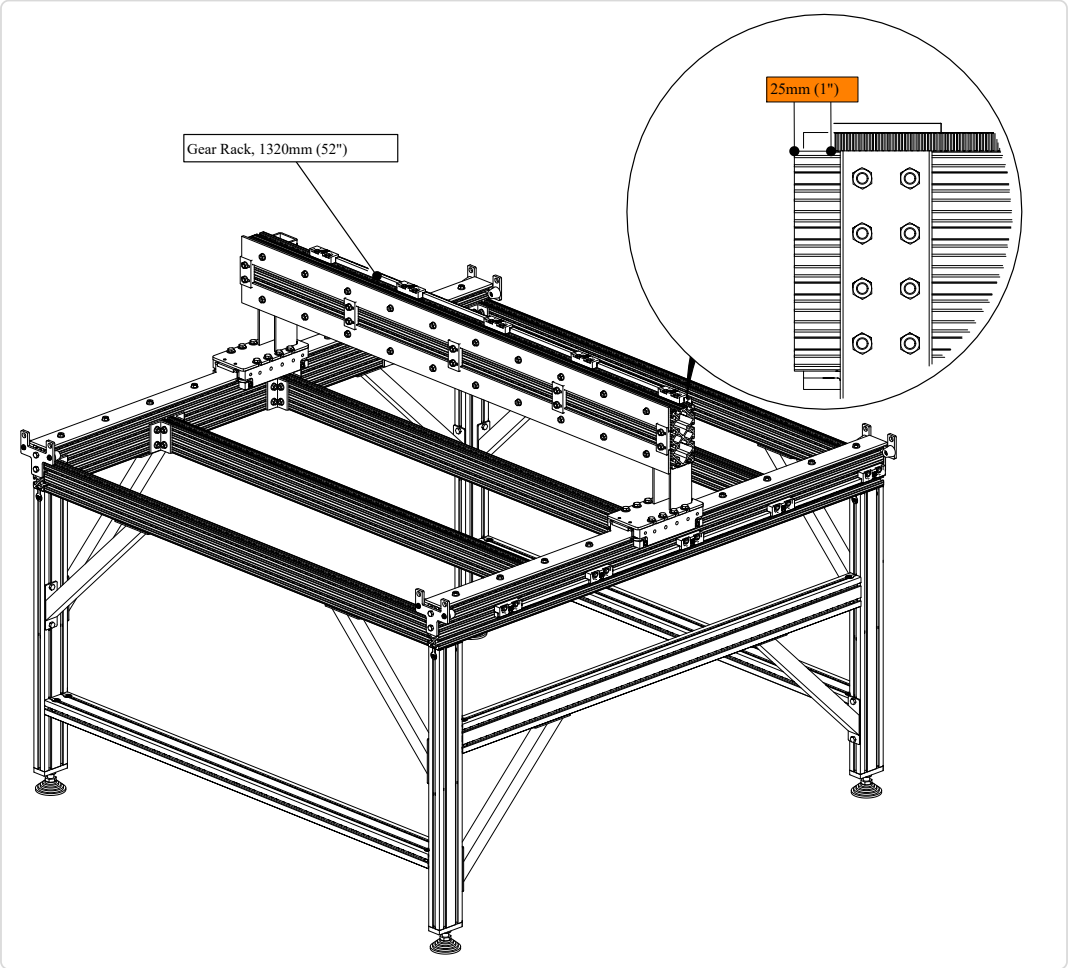


- Install rack clamps into gantry extrusion as indicated.

Assembly Note

Ensure the rack clamps are oriented as shown and installed in the rear slot on the top of the gantry extrusion.

3.2.3.3

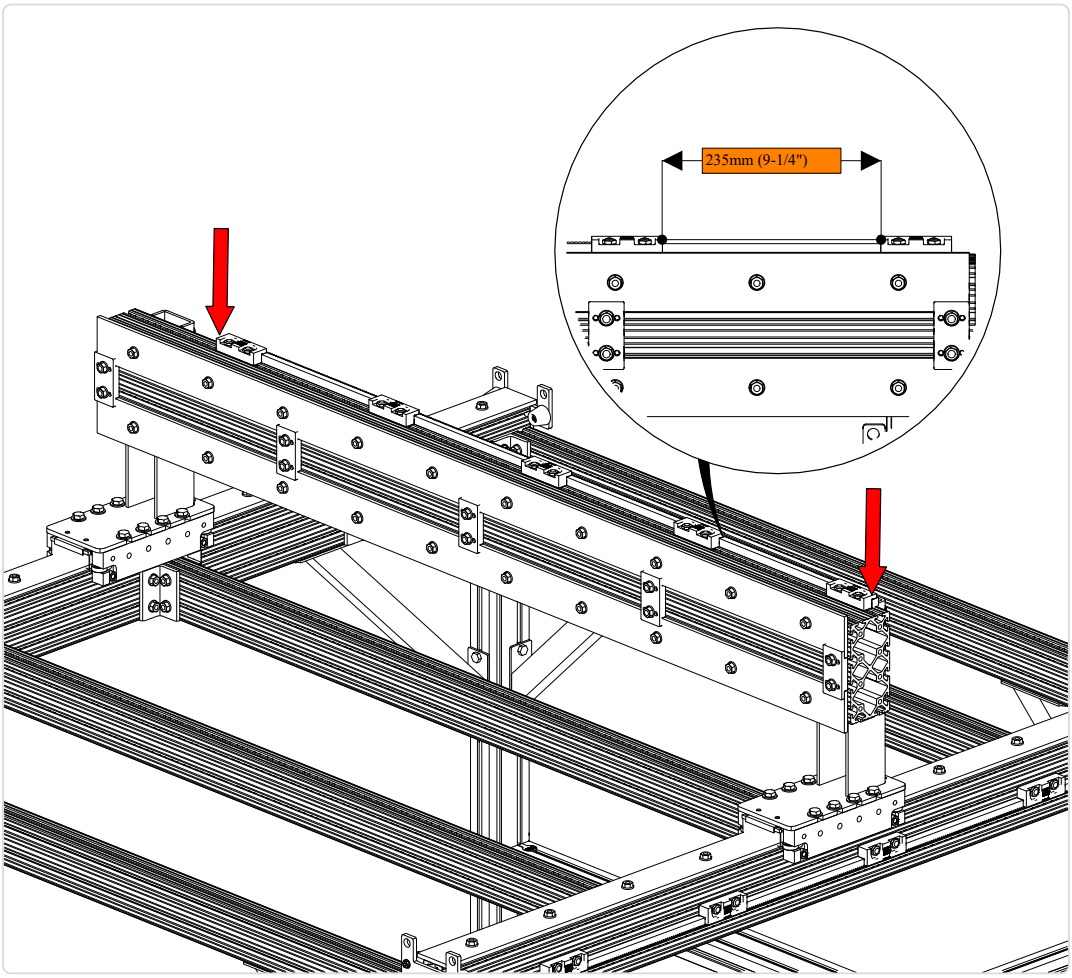


- Install a piece of 1320mm (52") Gear Rack as indicated.
- Position the gear rack 25mm (1") from the right edge of the gantry extrusion.

Assembly Note

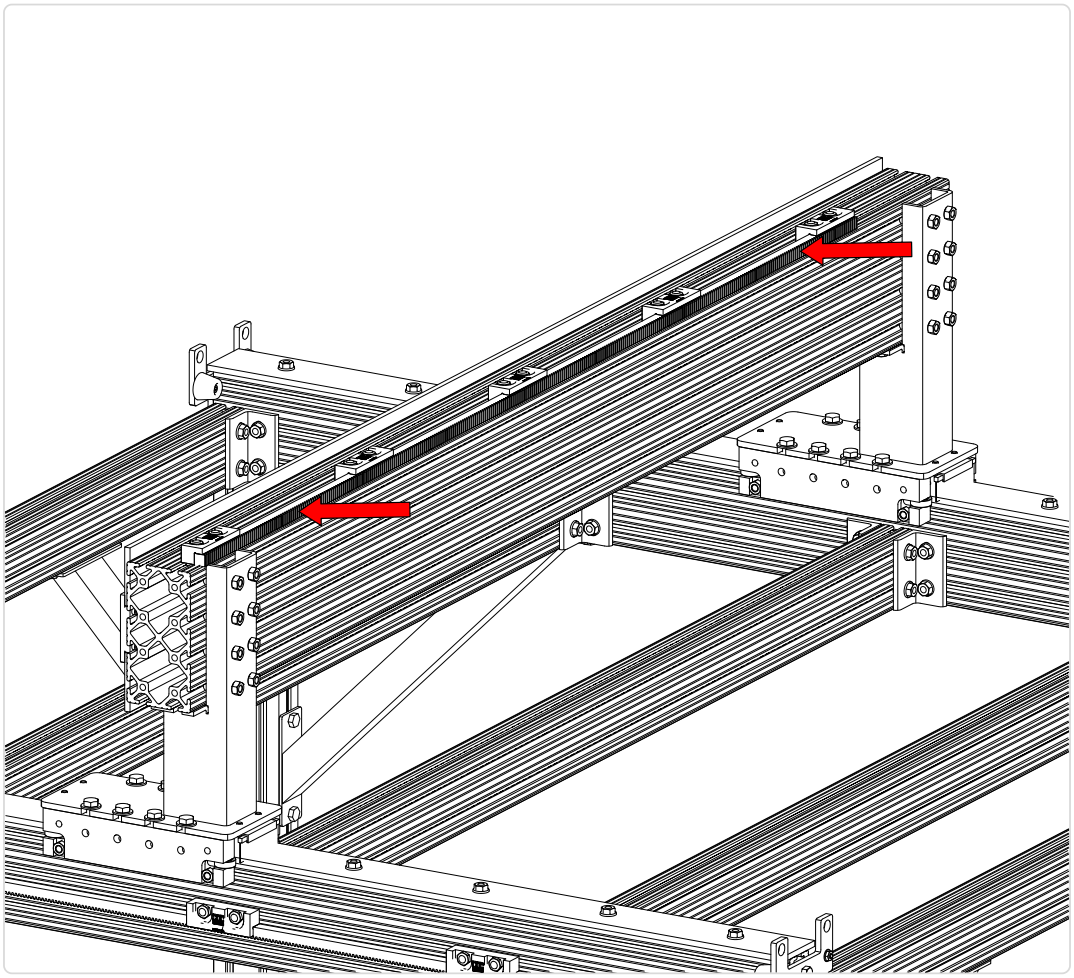
Ensure the teeth of the gear rack are facing towards the rear of the machine.

3.2.3.4



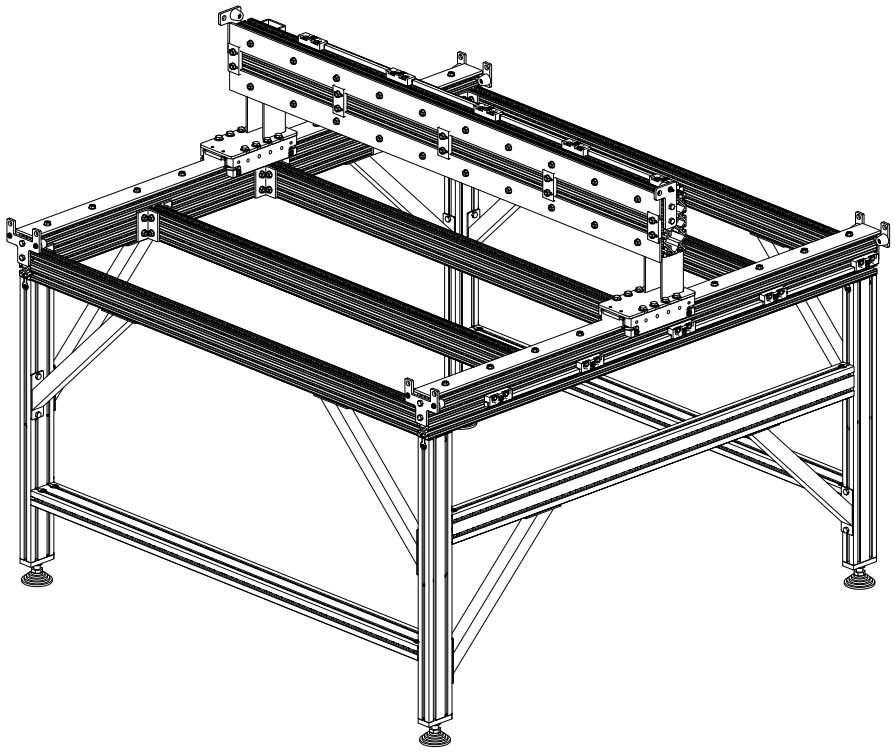
- Position the outer rack clamps flush with the ends of the gear rack as indicated. *Red Arrows*
- Space the remaining rack clamps 235mm (9-1/4") apart as indicated.

3.2.3.5



- Tighten the rack clamp fasteners while applying pressure on the gear rack in the indicated direction.

3.3 Gantry Bumpers



Parts and Tools Required

The following bags and parts will be used in this section:

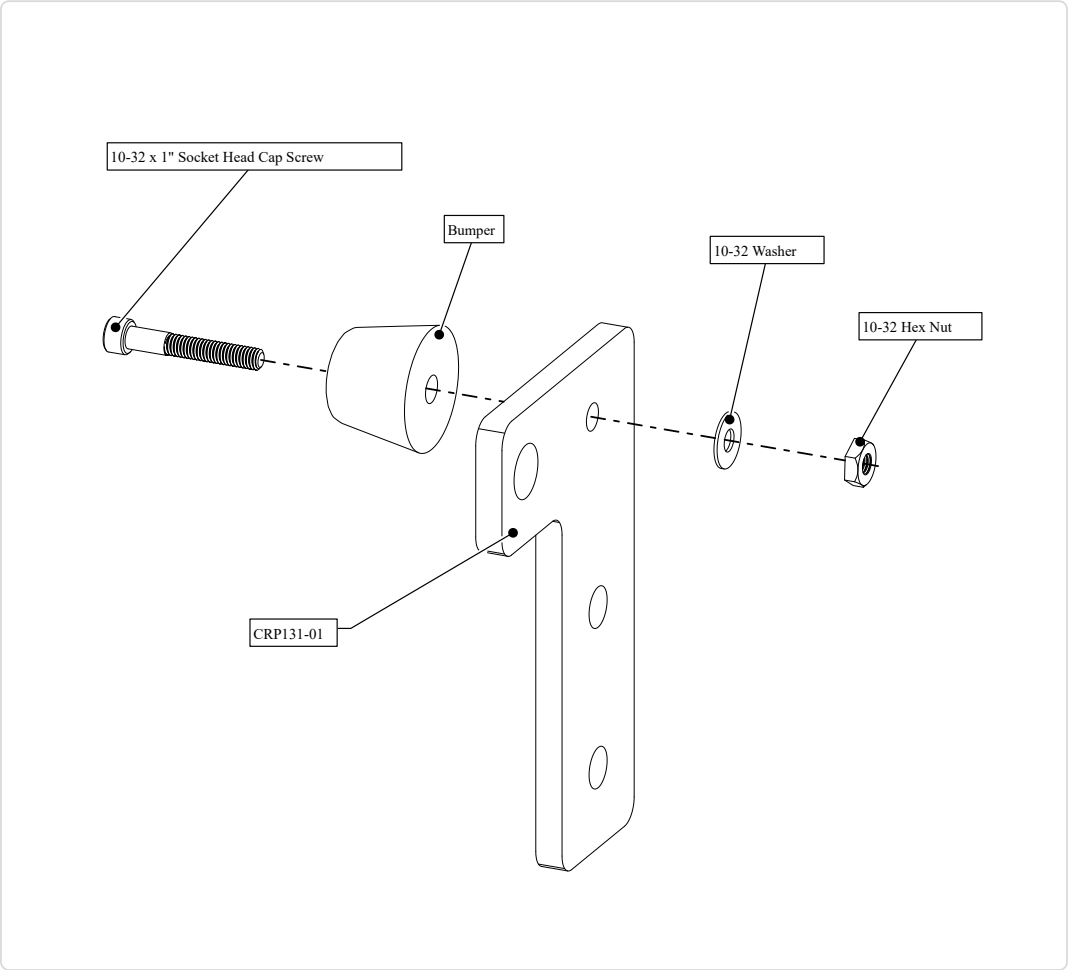
- (2) CRP131-00
    - (2) Bumper
    - (2) Bumper Plate
    - (2) 10-32 Flat Washer
    - (4) 5/16-18 x 1" Hex Cap Screw
    - (2) 10-32 Hex Nut
    - (2) 10-32 x 1" Socket Head Cap Screw

The following tools will be used in this section:

- 5/32" Allen Wrench
- 1/2" Combination Wrench
- 3/8" Combination Wrench

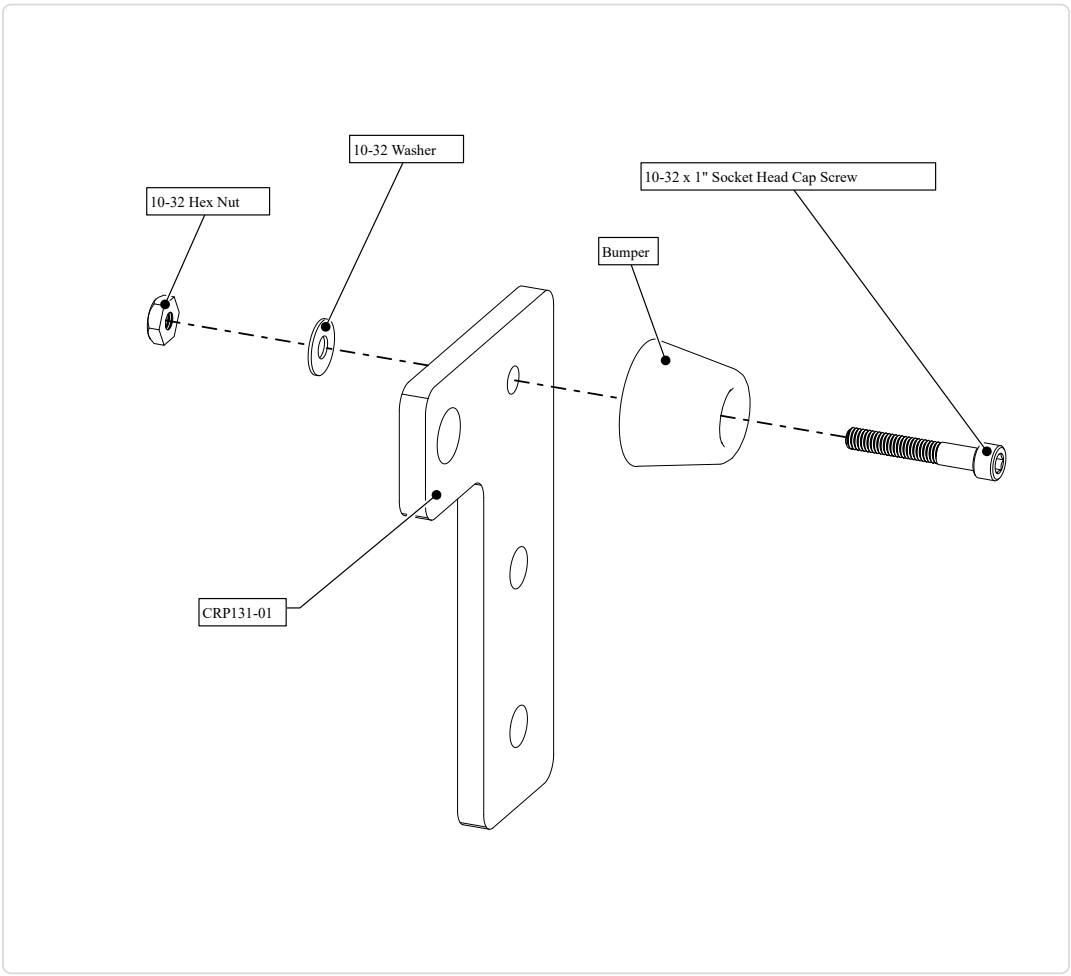
3.3.1 Bumper Assembly

3.3.1.1



- Assemble one gantry bumper as indicated.

3.3.1.2



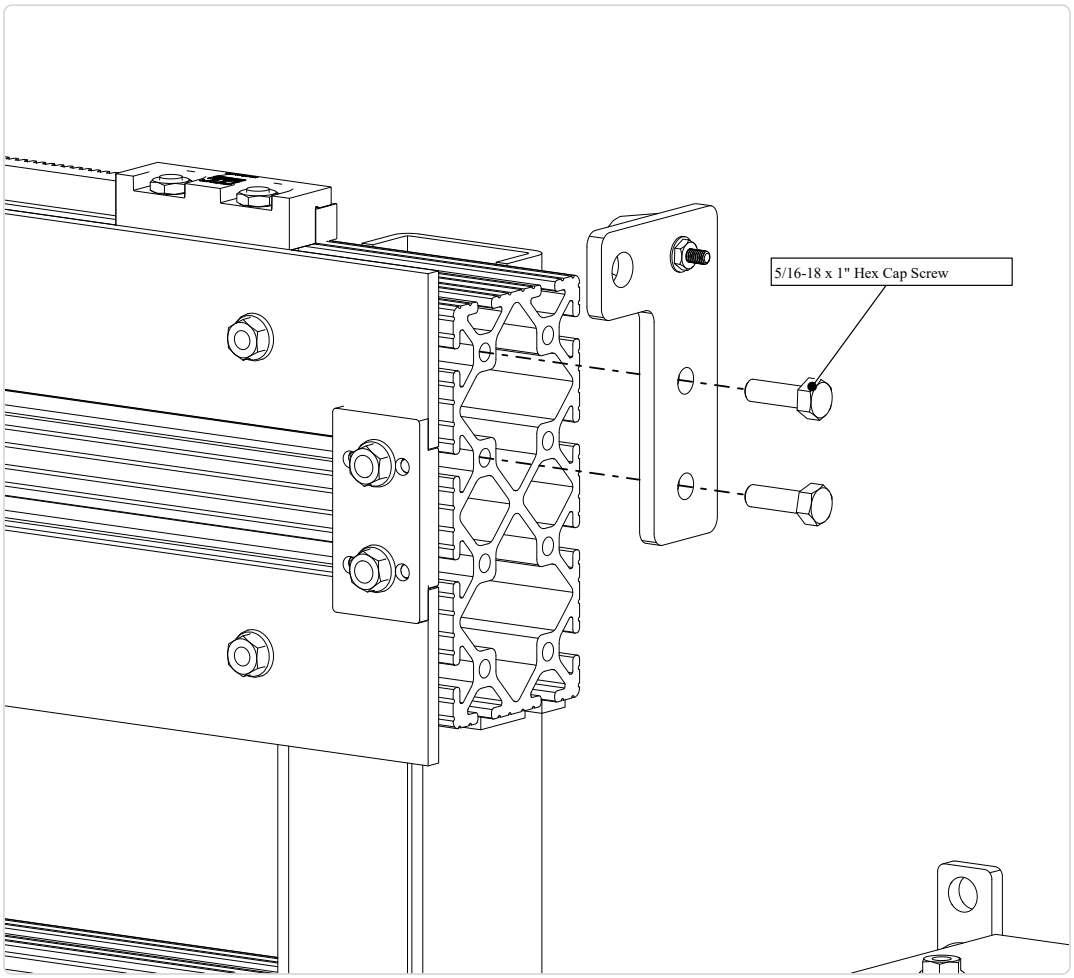
- Assemble a second gantry bumper as indicated.

Assembly Note

Ensure the two gantry bumpers are assembled in mirrored configurations.

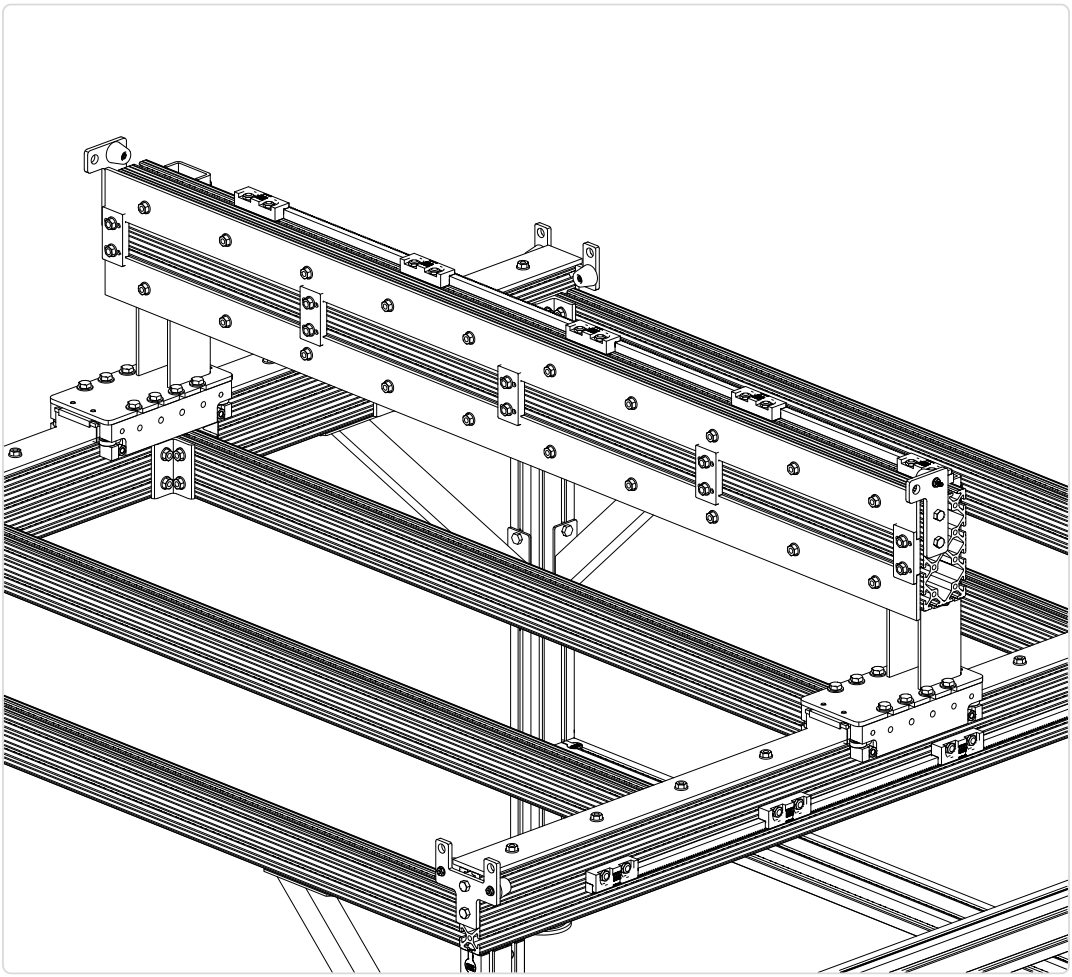
3.3.2 Bumper Installation

3.3.2.1



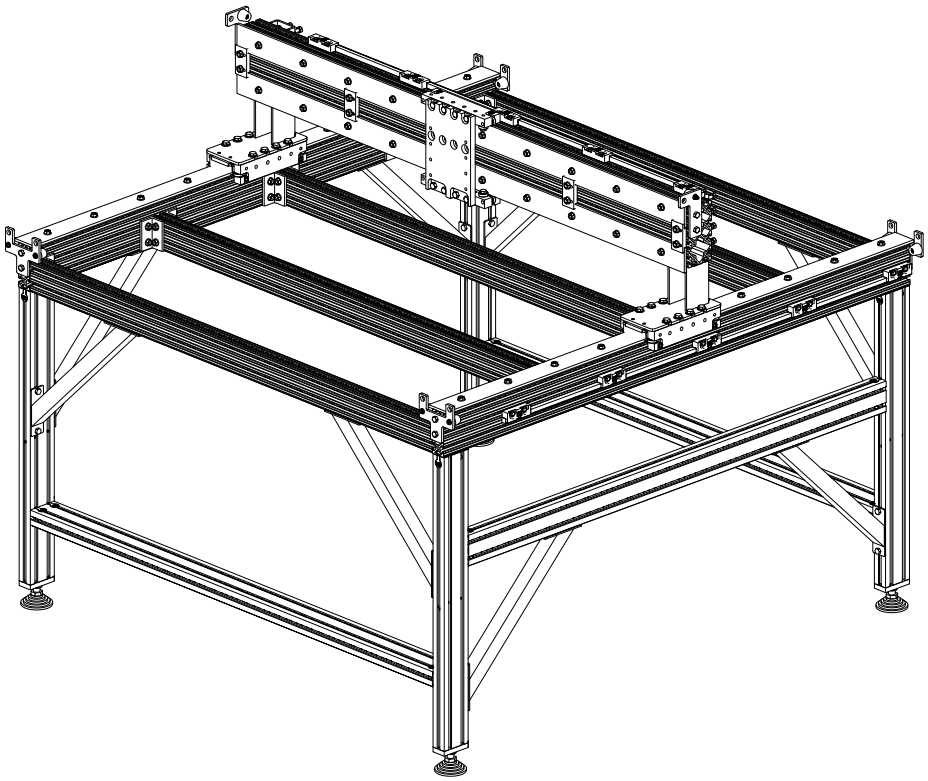
- Install the first assembled bumper on the gantry extrusion as indicated.

3.3.2.2



- Repeat process with the other assembled bumper on the opposite side of the gantry.

3.4 Linear Carriages



Parts and Tools Required

The following bags and parts will be used in this section:

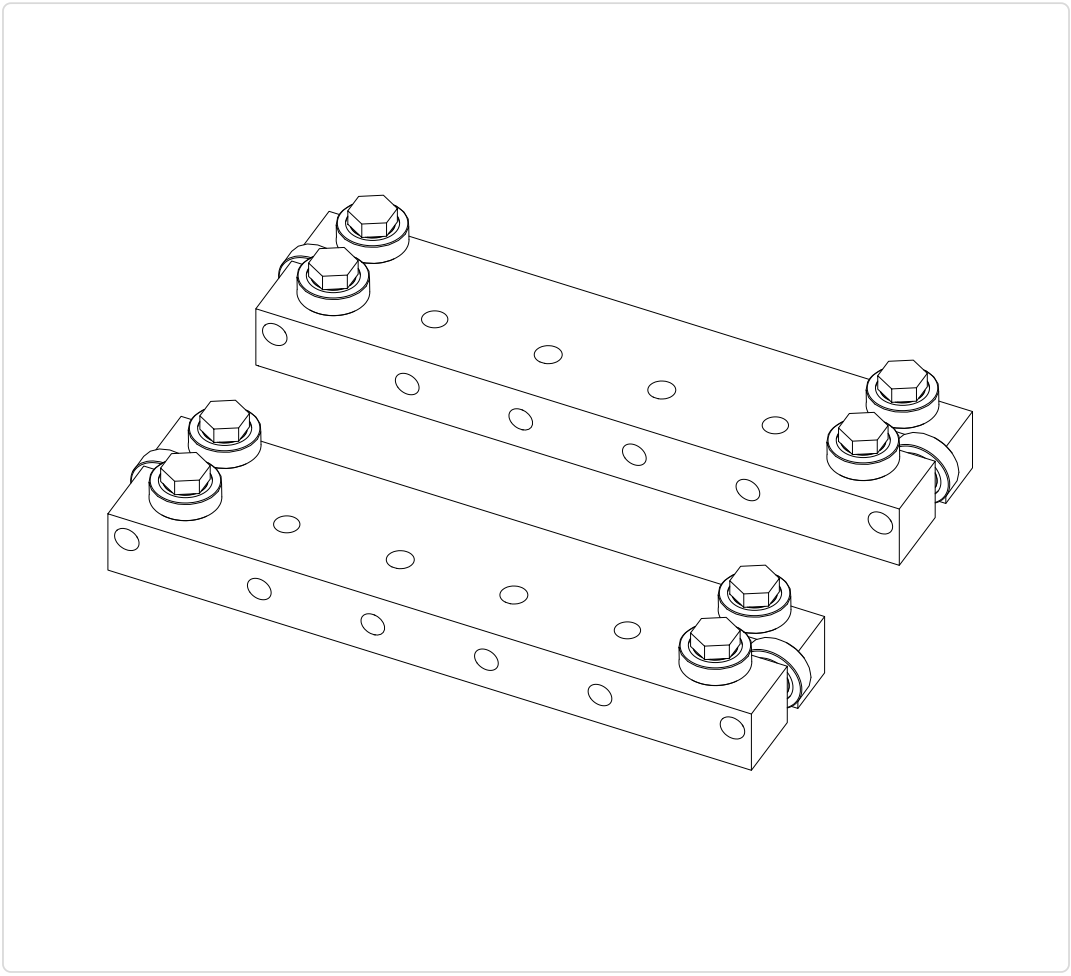
- (2) CRP102-00-01 Extended Linear Carriage
- (1) CRP130-07 Gantry-to-Z Adapter Plate
- (8) 3/8-16 x 3/4" Hex Cap Screw
- (2) CRP101-00-FAST-17.2
    - (8) 5/16" Split Lock Washer
    - (8) Roller Bearing
    - (4) M8 x 20mm Hex Cap Screw
    - (4) M8 x 30mm Hex Cap Screw
    - (4) M8 Hex Nut
    - (4) 1/4-20 Set Screw

The following tools will be used in this section:

- 13mm Combination Wrench
- 1/8" Allen Wrench
- 9/16" Combination Wrench
- (2) Clamp

3.4.1 Linear Carriage Assembly

3.4.1.1



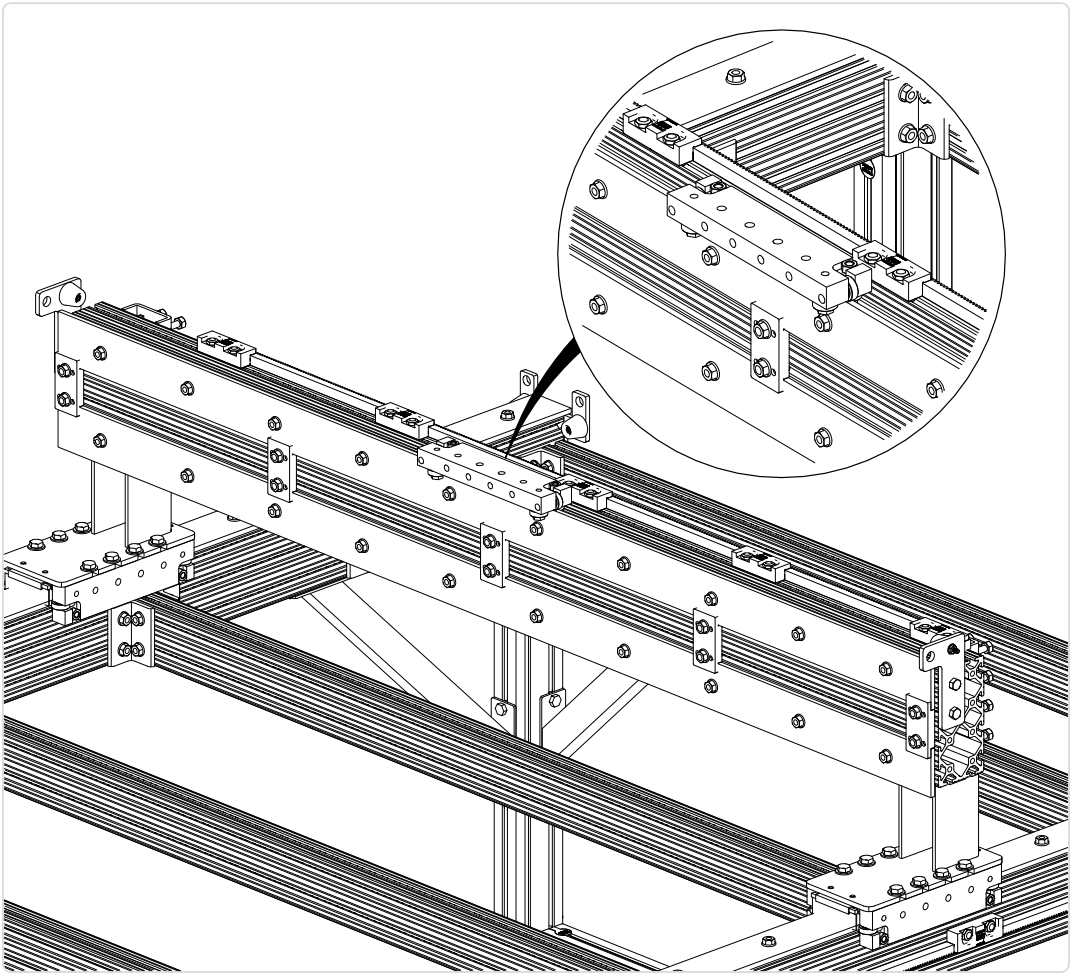
- Assemble two linear carriages.

Assembly Note

Refer to Section 2.1.1 for linear carriage assembly instructions.

3.4.2 Linear Carriage Installation

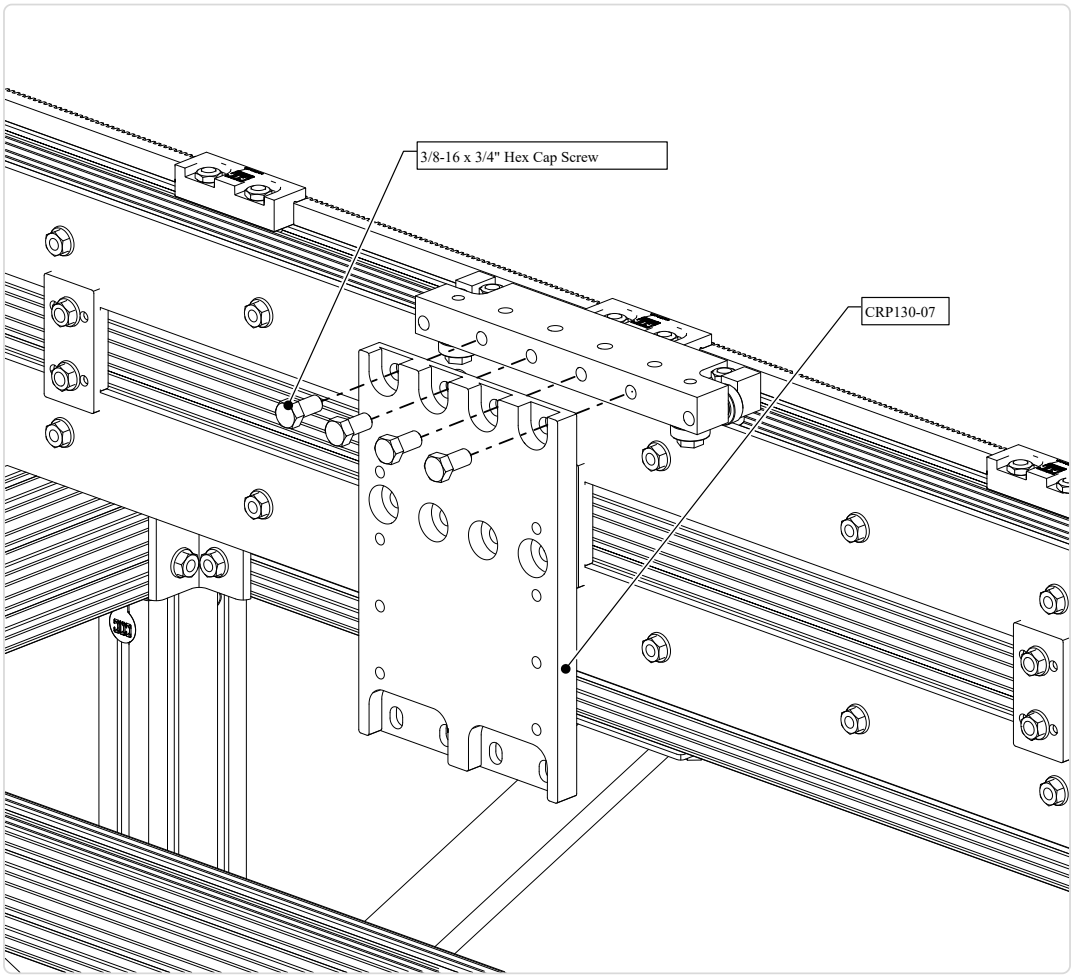
3.4.2.1



- Install one linear carriage on the upper steel rail as indicated.
- Ensure the linear carriage is in the correct orientation, with the set screws facing towards the back of the gantry.

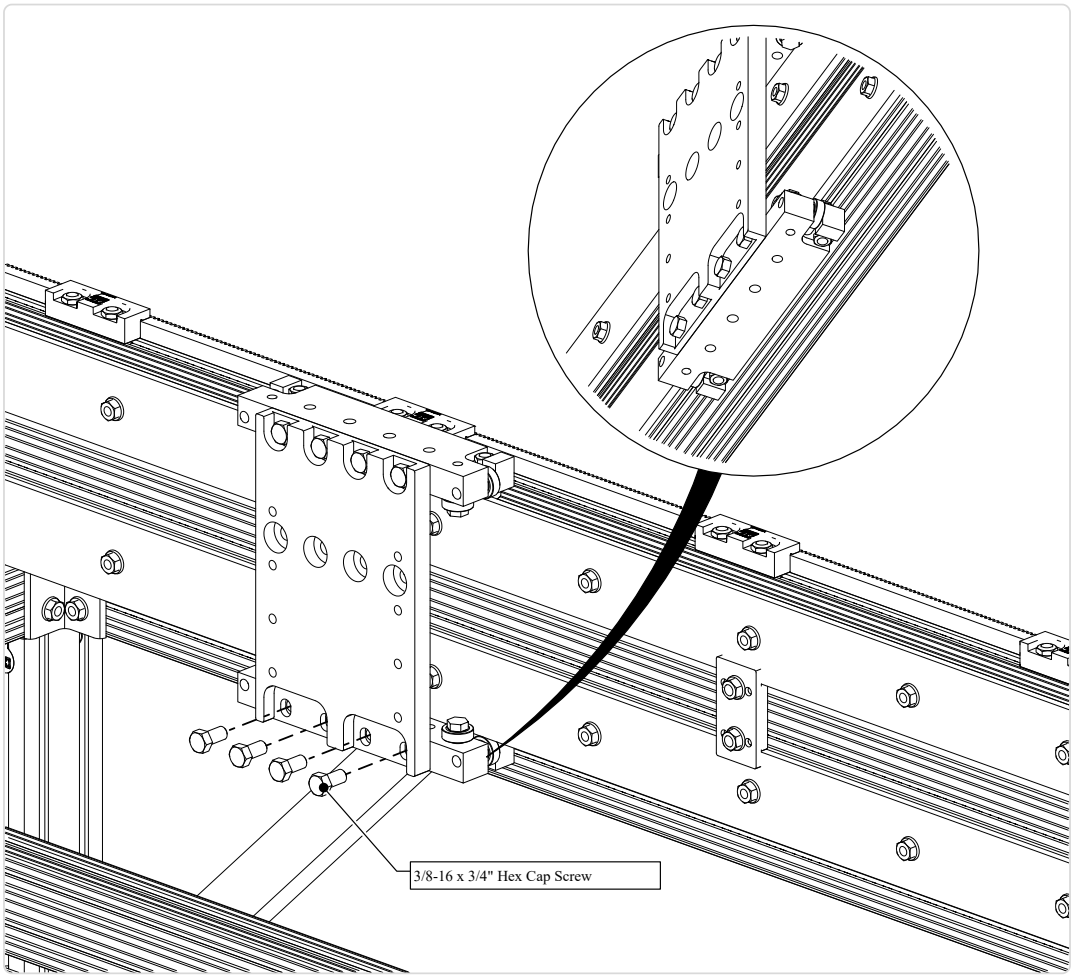
> **Assembly Note**
>
> Refer to the procedure in Section 2.1.2 for installing the linear carriage.

3.4.2.2



- Attach the Gantry-to-Z Adapter Plate to the upper linear carriage as indicated.
- Partially tighten the 3/8-16 fasteners.

3.4.2.3

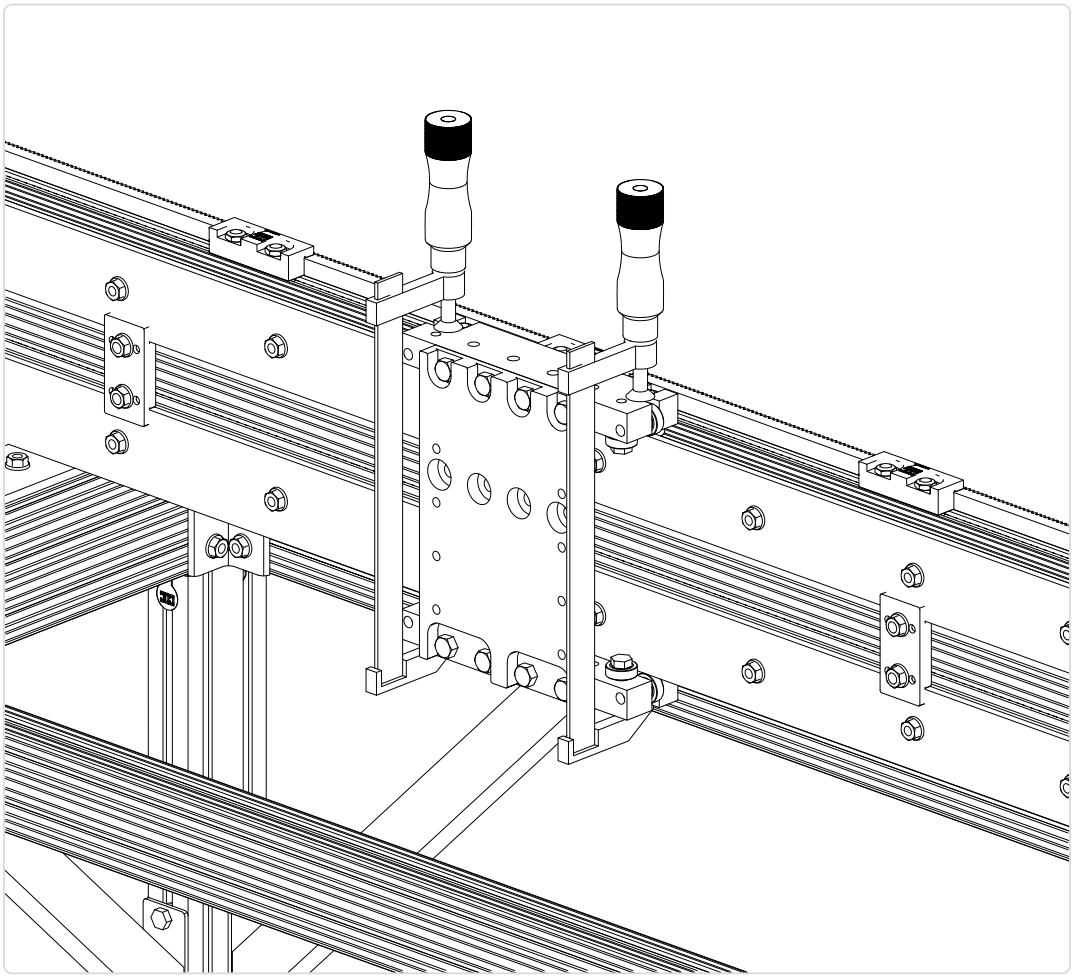


- Install the second linear carriage on the lower steel rail as indicated.
- Thread in 3/8-16 fasteners to hold the linear carriage in position.

Assembly Note

Refer to the procedure in Section 2.1.2 for installing the linear carriage.

3.4.2.4

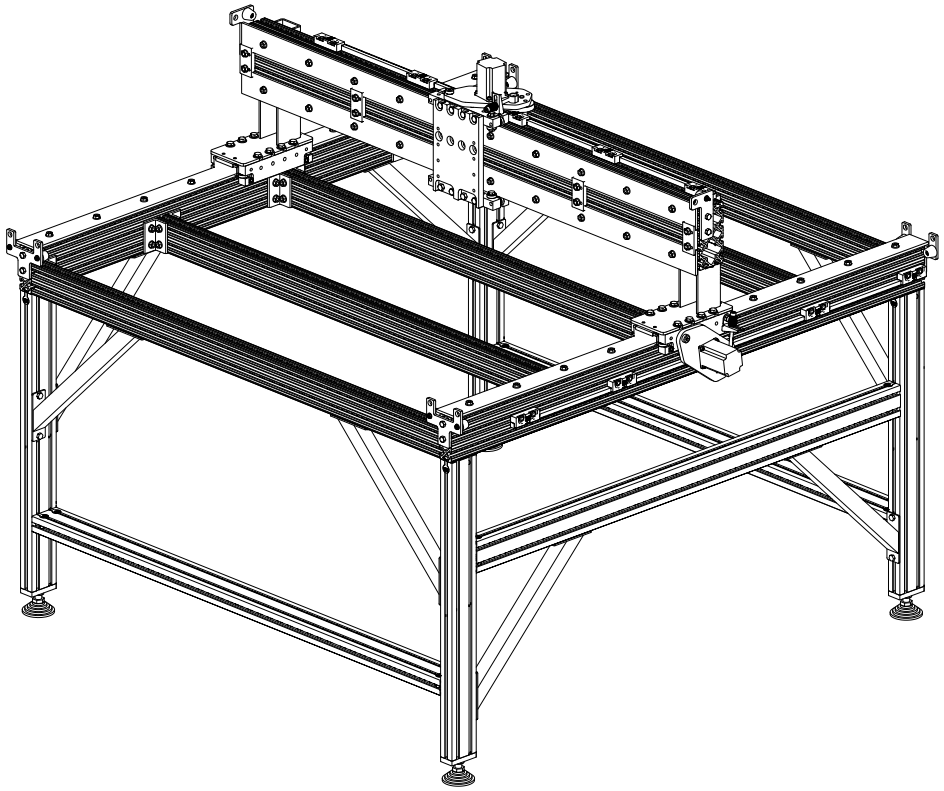


- Clamp the upper and lower linear carriages as indicated.
- Tighten all fasteners to secure the Gantry-to-Z Adapter Plate to the lower linear carriage.
- Remove clamps

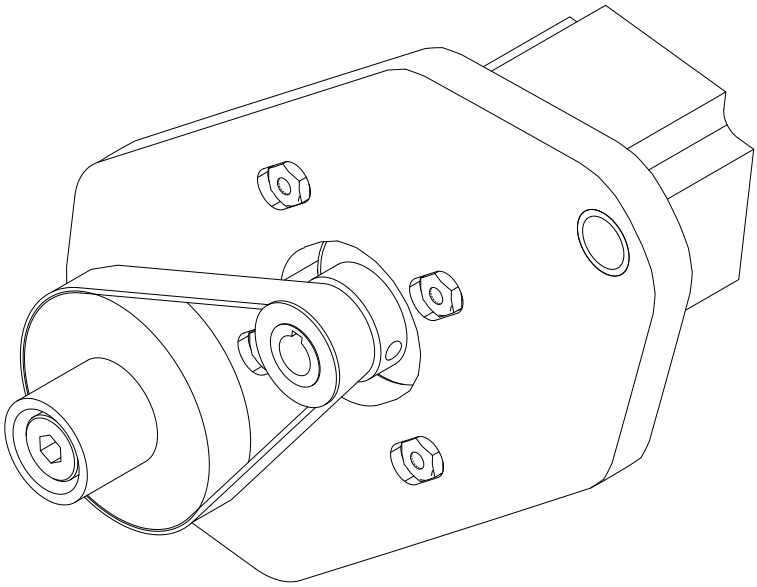
Assembly Note

Ensure top of Gantry-to-Z Adapter Plate is flush with the top of the upper linear carriage.

Section 4: Rack and Pinion Drive



4.1 Rack and Pinion Assembly (NEMA 23)



Section Note

Skip to Section 4.2 if you are using a NEMA 34 electronics package.

Parts and Tools Required

The following bags and parts will be used in this section:

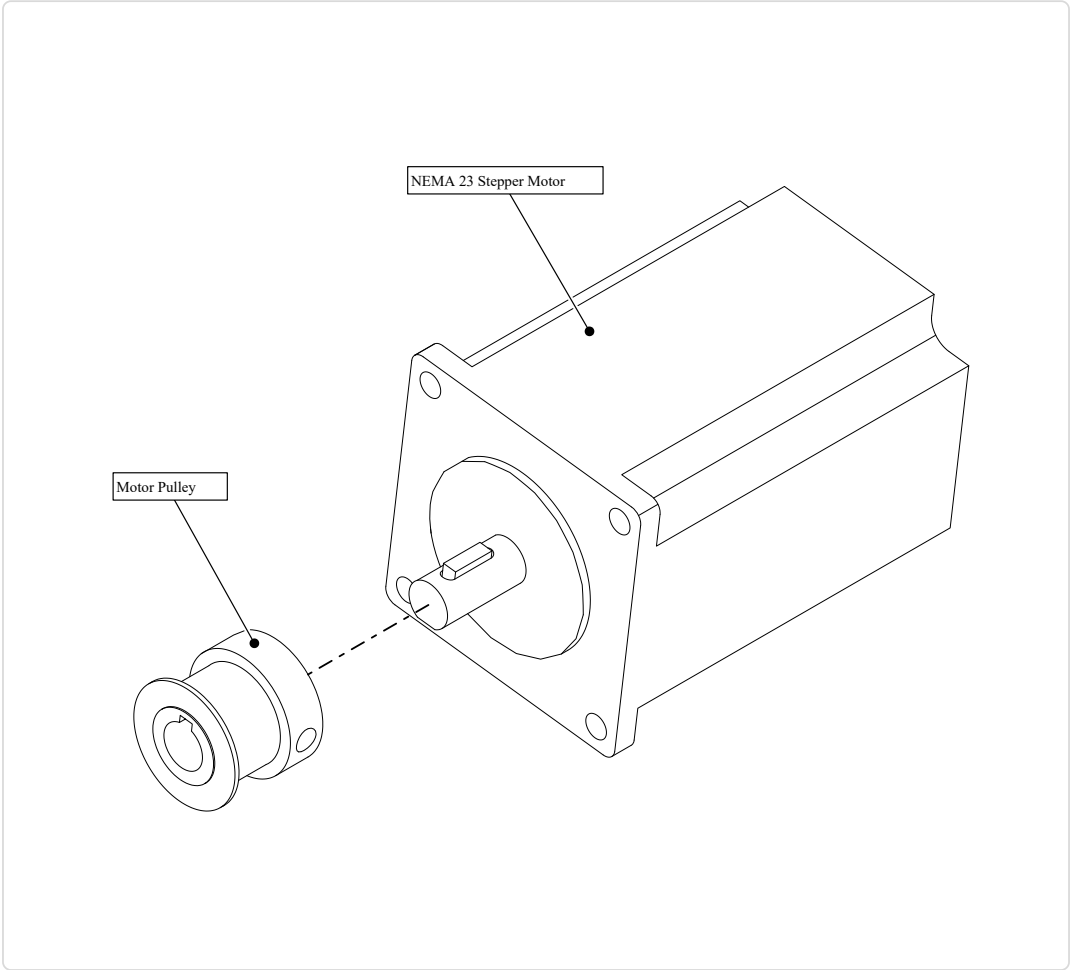
- (3) NEMA 23 Stepper Motor
- (3) CRP201-09 NEMA 23 R&P Motor Pulley
- (3) NEMA 23 R&P Drive Plate
- (3) CRP203-00 NEMA 23 Standard Drive Spindle
- (3) CRP201-00-FAST-02-17.2
    - (3) 3/8" Washer
    - (3) 1" x 0.5" Shoulder Bolt
    - (3) NEMA 23 R&P Drive Belt
    - (12) 10-32 x 5/8" Socket Head Cap Screw
    - (12) 10-32 Hex Nut

The following tools will be used in this section:

- 3/32" Allen Wrench
- 5/32" Allen Wrench
- 1/4" Allen Wrench
- Tape Measure

4.1.1 Motor Assembly

4.1.1.1

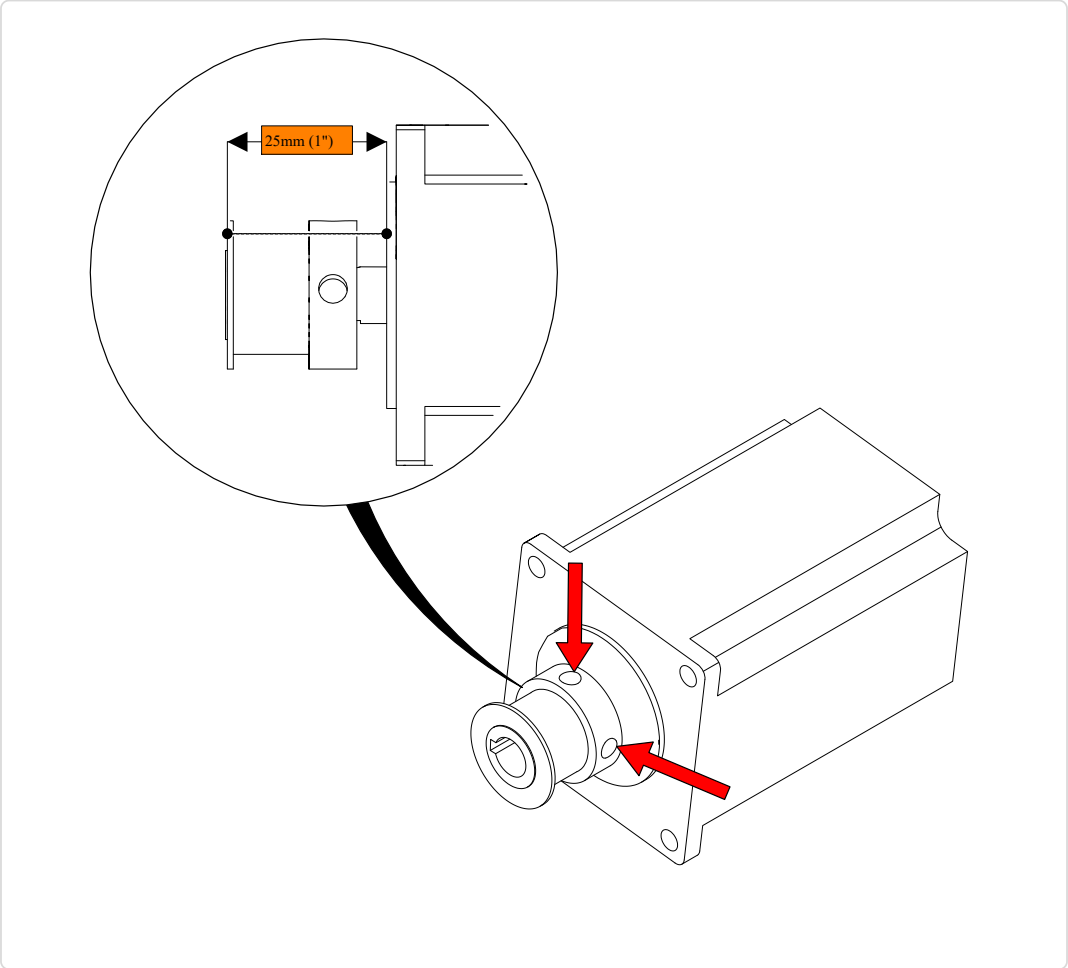


- Remove tape on motor shaft.
- Loosen motor pulley set screws.
- Install motor pulley on motor shaft as indicated.

Assembly Note

Ensure keyway is fully seated in slot on motor shaft to allow easy installation of the motor pulley.

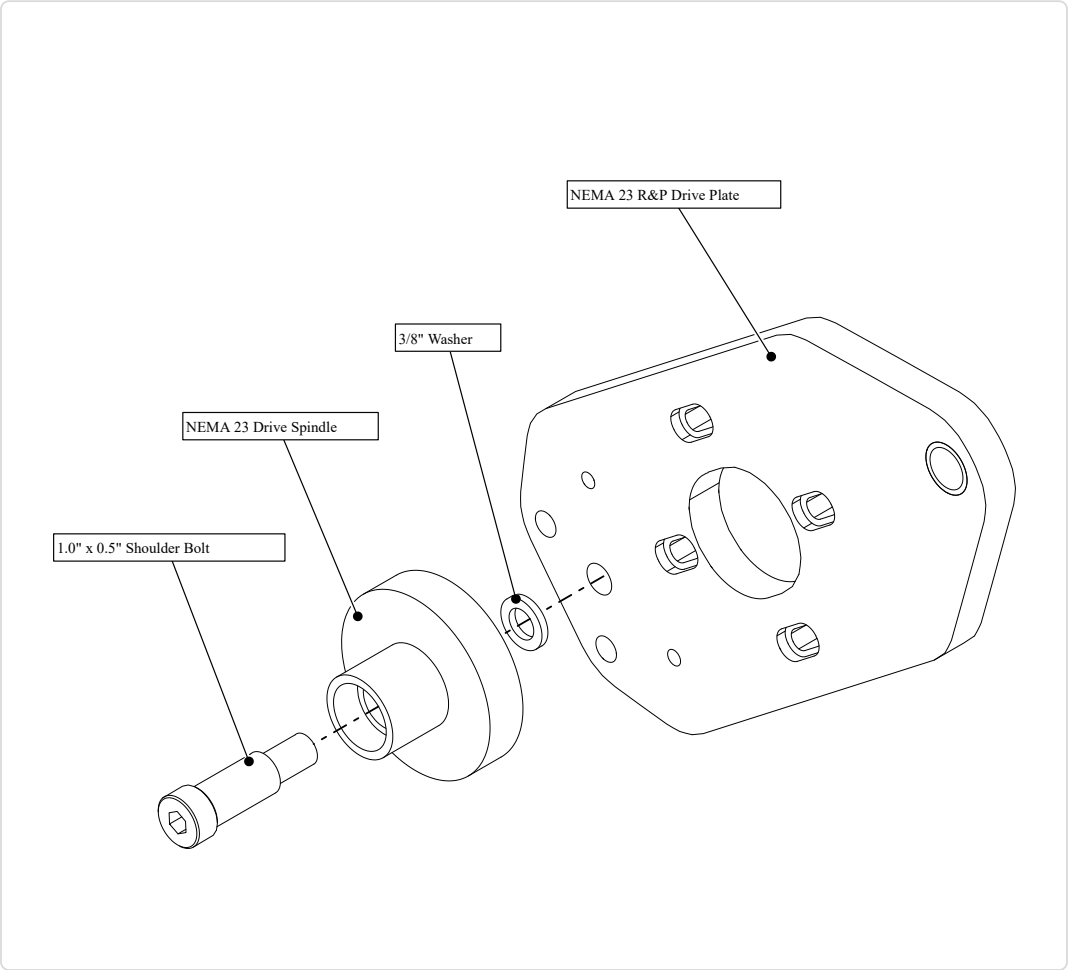
4.1.1.2



- Position motor pulley to dimension shown.
- Tighten indicated set screws. *Red Arrows*

4.1.2 Drive Plate Assembly

4.1.2.1

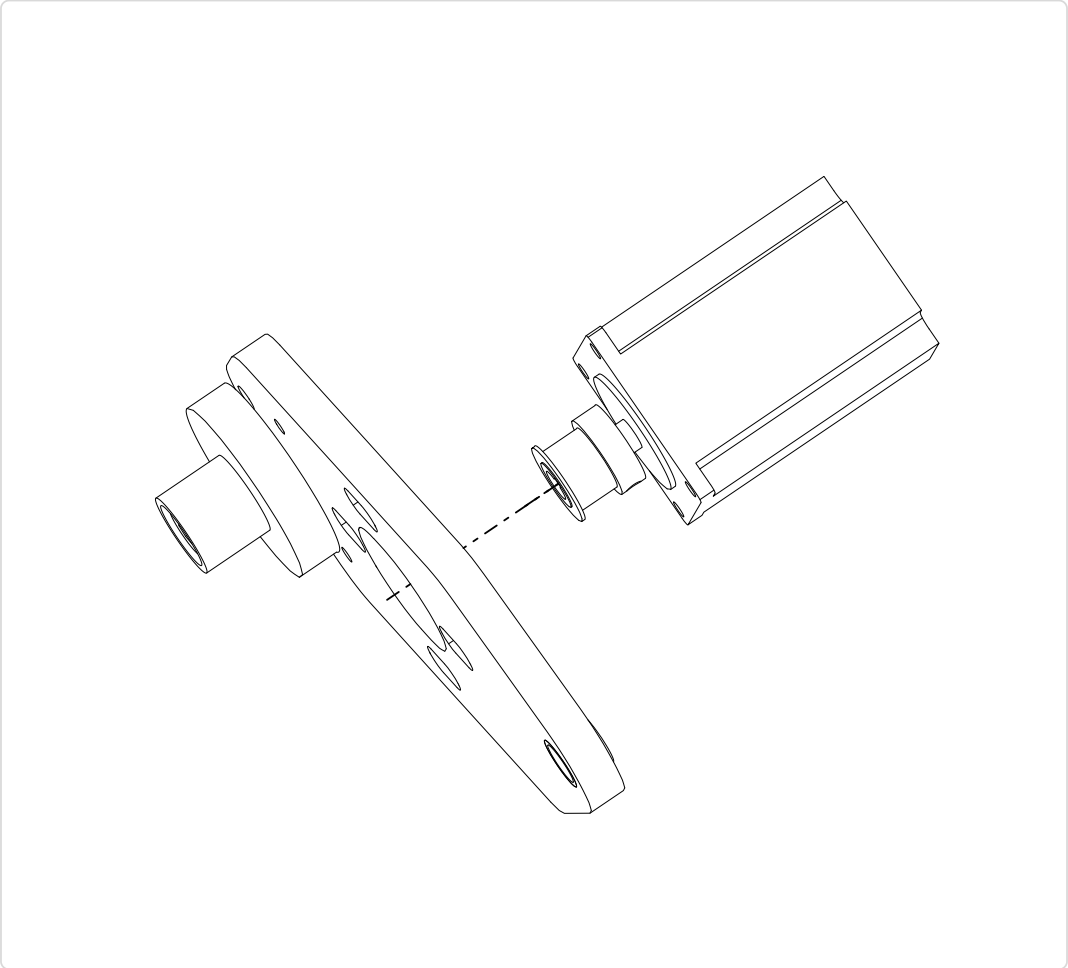


- Install spindle on drive plate as indicated.
- Fully tighten shoulder bolt.

Assembly Note

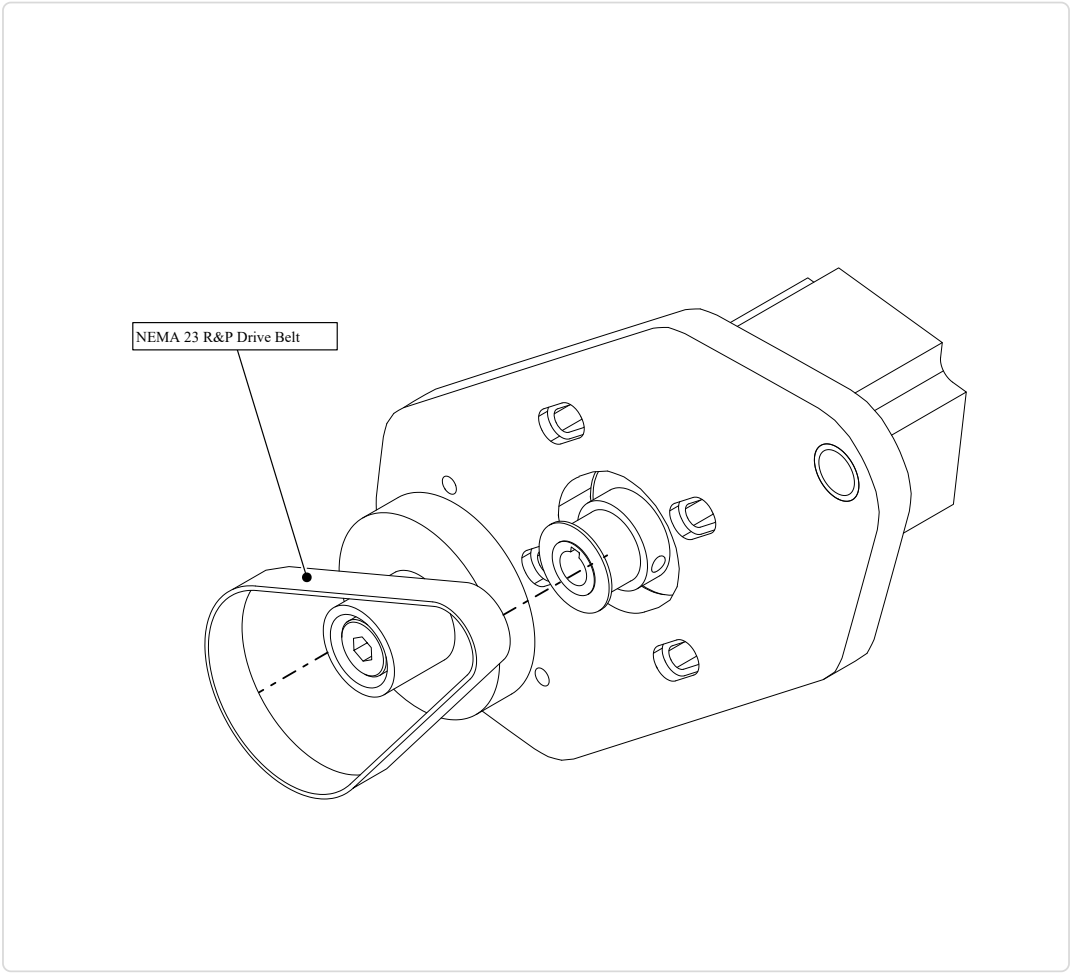
Ensure the drive spindle is installed on the correct side of the drive plate. The spindle will be on the same side as the recessed nut slots, as shown in the above figure.

4.1.2.2



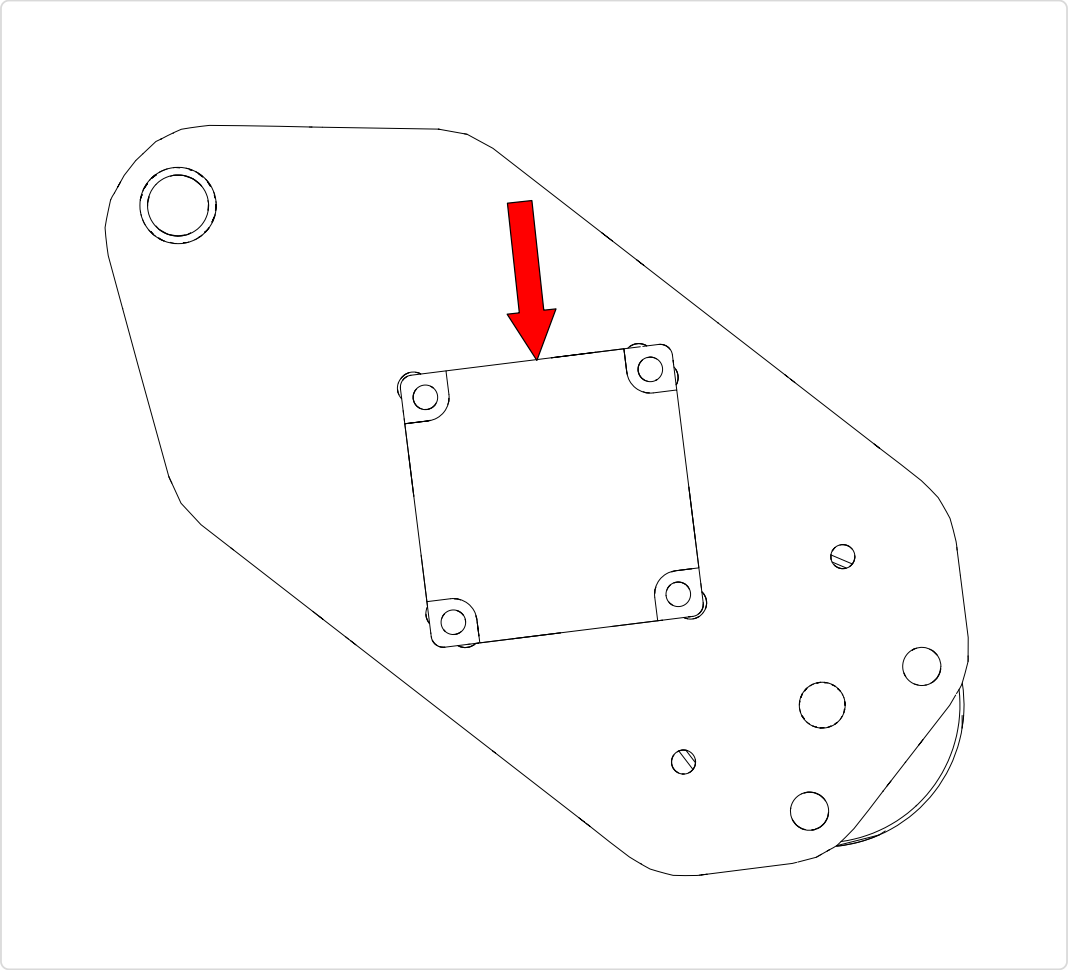
- Place the motor on the drive plate as indicated.

4.1.2.3



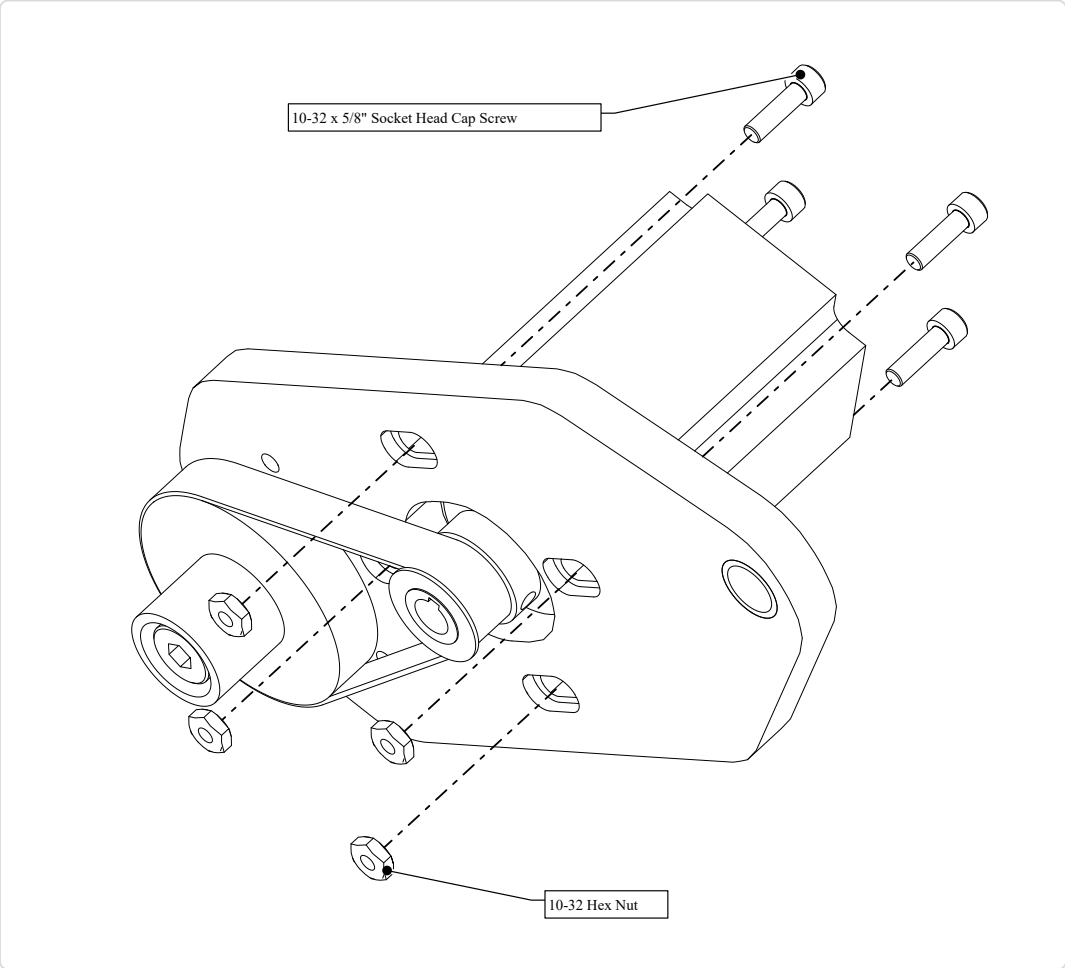
- Install drive belt on motor pulley and drive spindle as indicated.

4.1.2.4



- Orient motor with the cable in the position indicated by the red arrow.

4.1.2.5

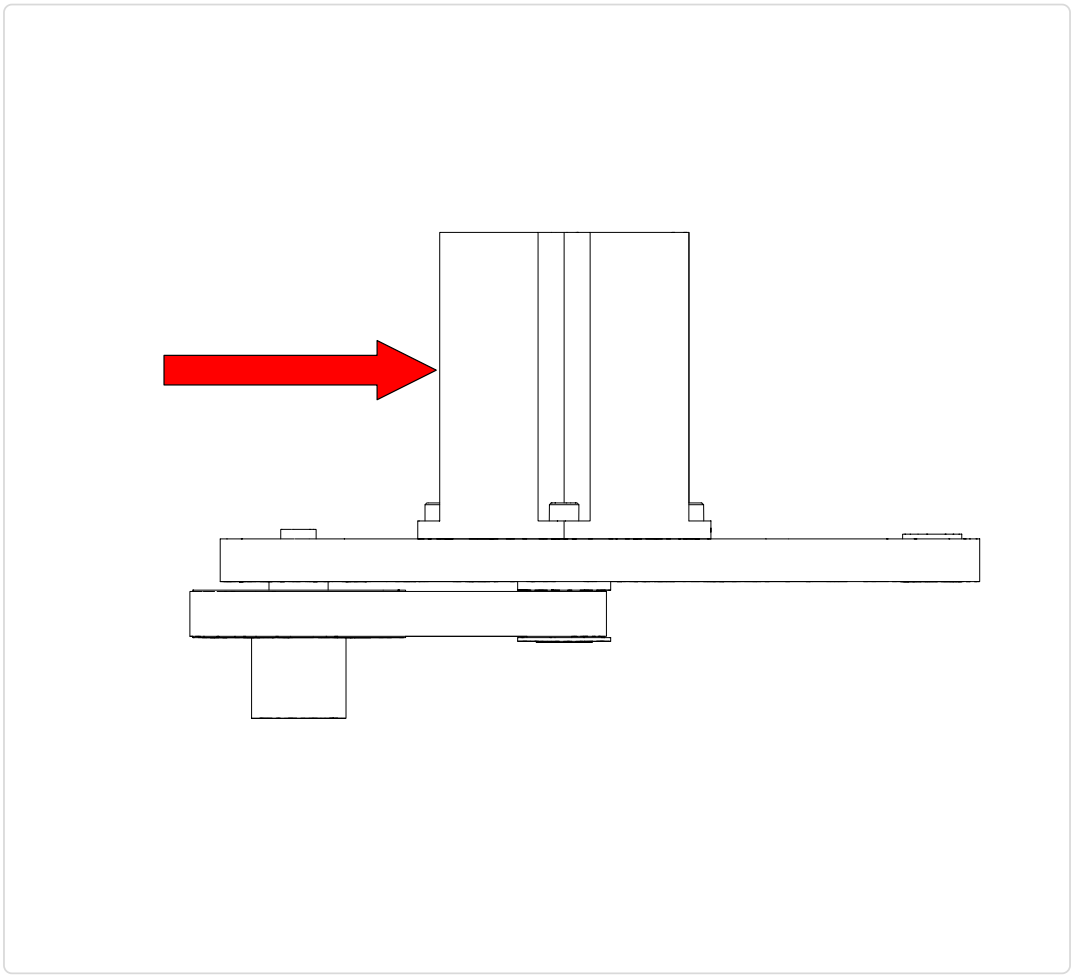


- Insert motor fasteners as indicated.

Assembly Note

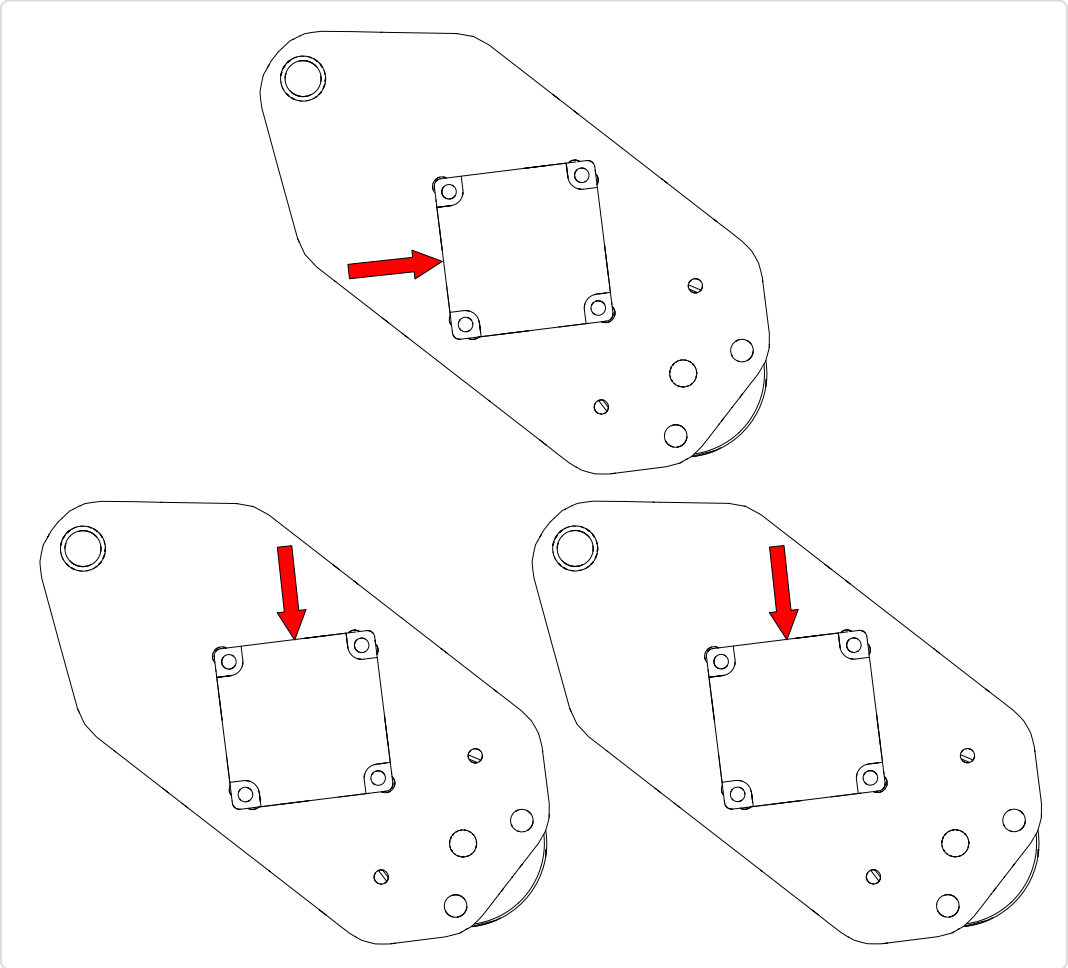
Do not tighten these fasteners prior to adjusting the belt tension in the following step.

4.1.2.6



- Tension belt by applying pressure to motor in the indicated direction.
- Keep this pressure on the motor and tighten the 10-32 x 5/8" motor screws.

4.1.2.7

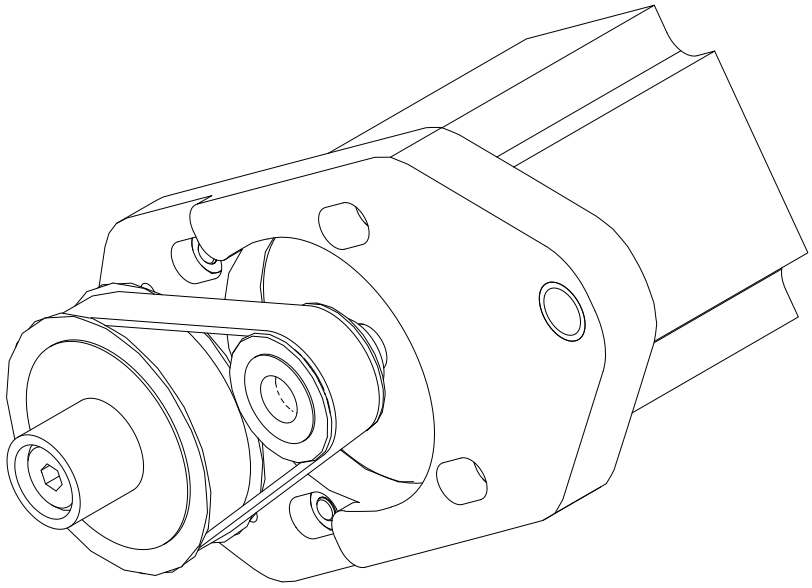


- Use this process to assemble three R&P Assemblies.

Assembly Note

Orient each motor with the cables in the position indicated by the red arrows.

4.2 Rack and Pinion Assembly (NEMA 34)



Assembly Note

Skip to Section 4.3 if you are using a NEMA 23 electronics package.

Parts and Tools Required

The following bags and parts will be used in this section:

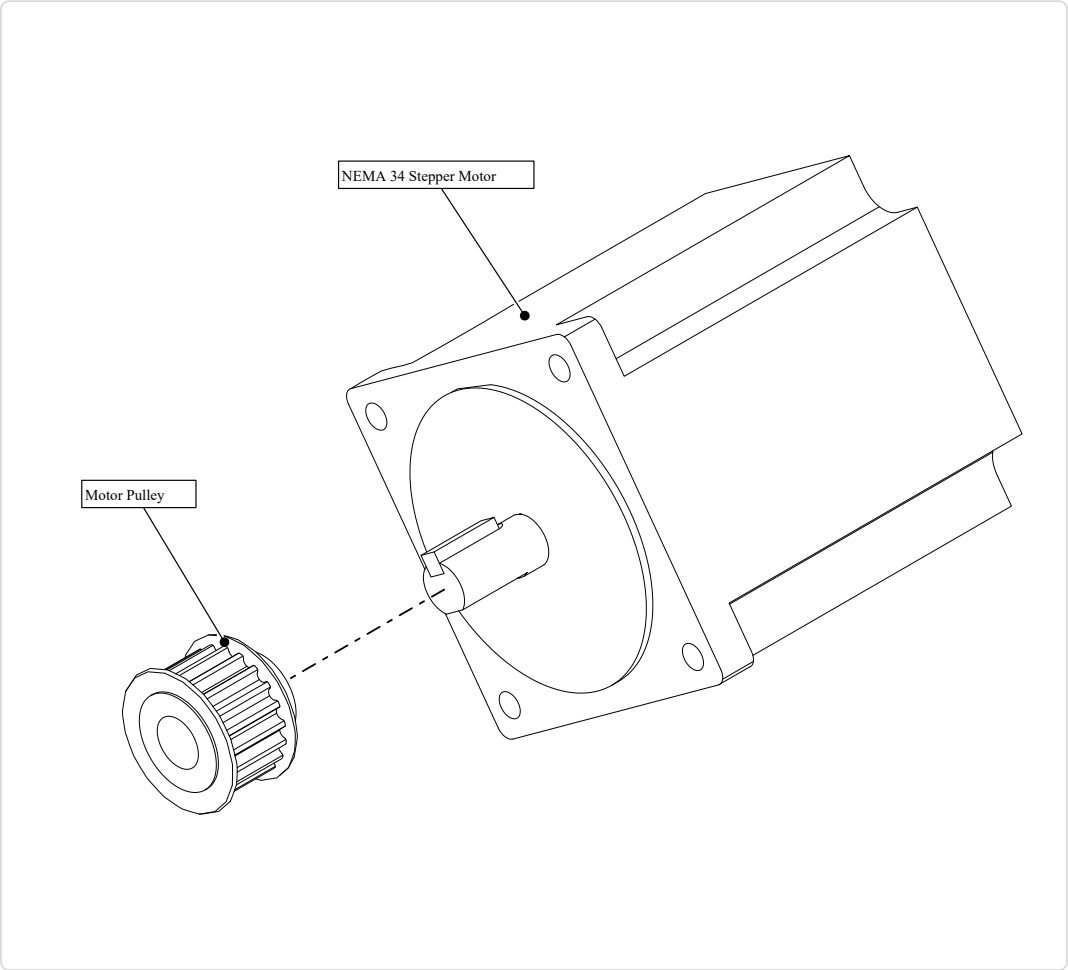
- (3) NEMA 34 Stepper Motor
- (3) CRP301-03 NEMA 34 Motor Pulley
- (3) NEMA 34 R&P Drive Plate
- (3) CRP303-00 NEMA 34 Standard Drive Spindle
- (3) CRP301-00-FAST-17.2
    - (3) 0.020" Shim
    - (3) 1.25" x 0.5" Shoulder Bolt
    - (3) NEMA 34 R&P Drive Belt
    - (12) 1/4-20 x 3/4" Socket Head Cap Screw
    - (12) 1/4-20 Hex Nut

The following tools will be used in this section:

- 3/32" Allen Wrench
- 3/16" Allen Wrench
- 1/4" Allen Wrench
- Tape Measure

4.2.1 Motor Assembly

4.2.1.1

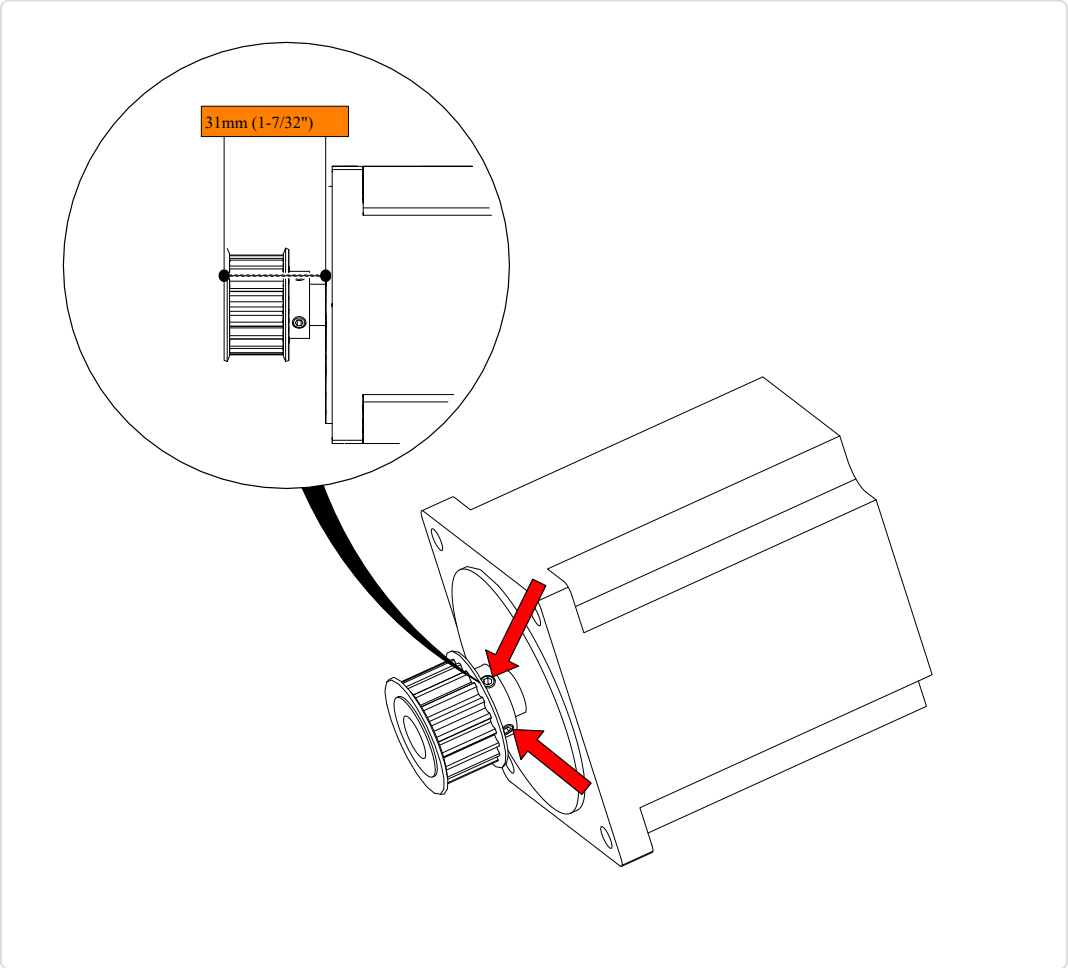


- Remove tape on motor shaft.
- Loosen motor pulley set screws.
- Install motor pulley on motor shaft as indicated.

Assembly Note

Ensure keyway is fully seated in slot on motor shaft to allow easy installation of motor pulley.

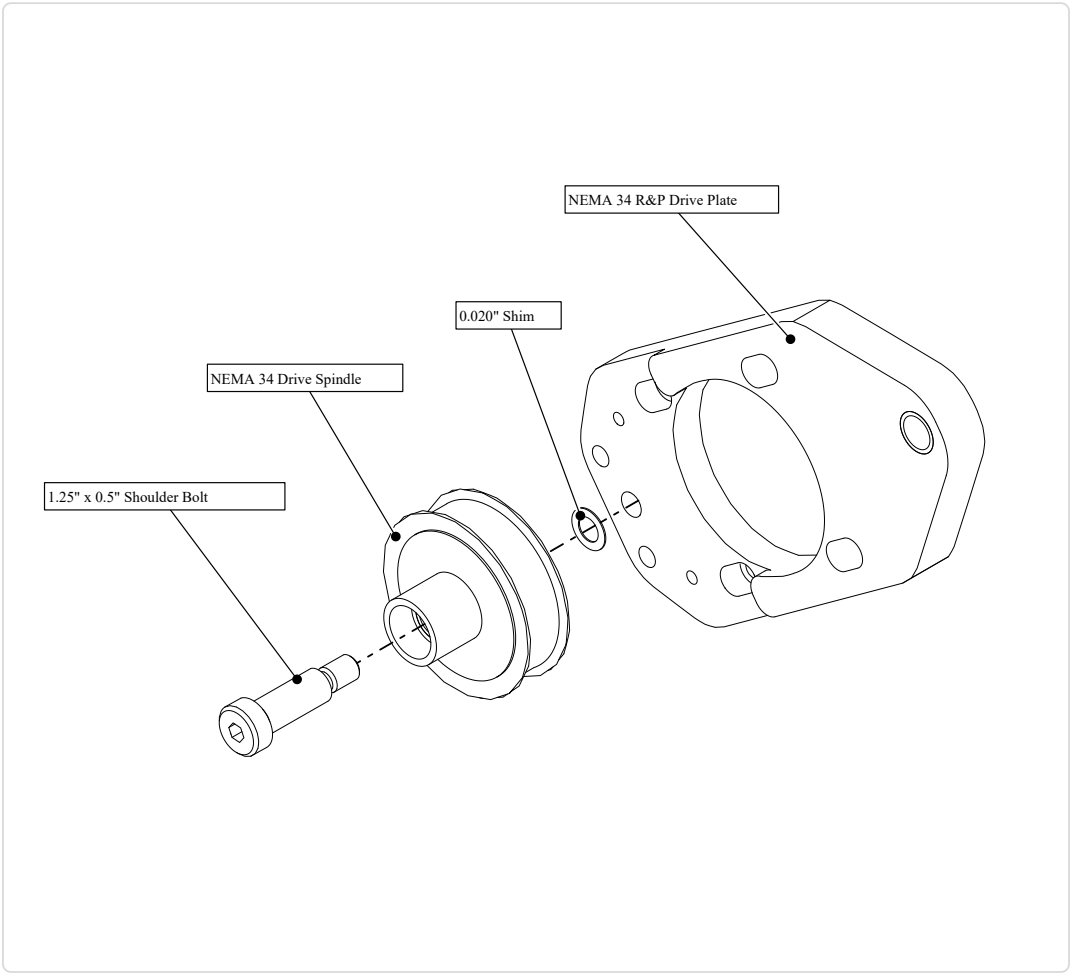
4.2.1.2



- Position motor pulley to dimension shown.
- Tighten set screws as indicated. *Red Arrows*

4.2.2 Drive Plate Assembly

4.2.2.1

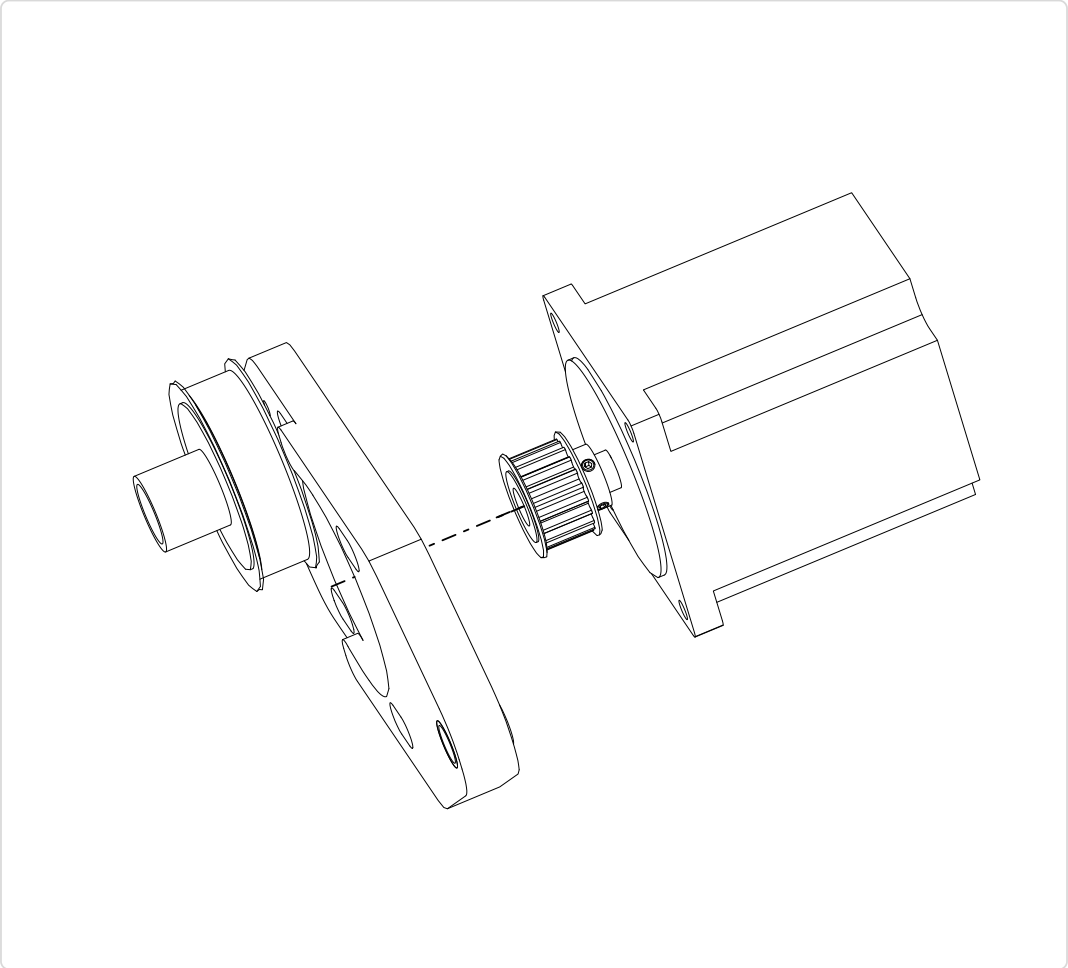


- Install spindle on drive plate as indicated.
- Fully tighten shoulder bolt.

Assembly Note

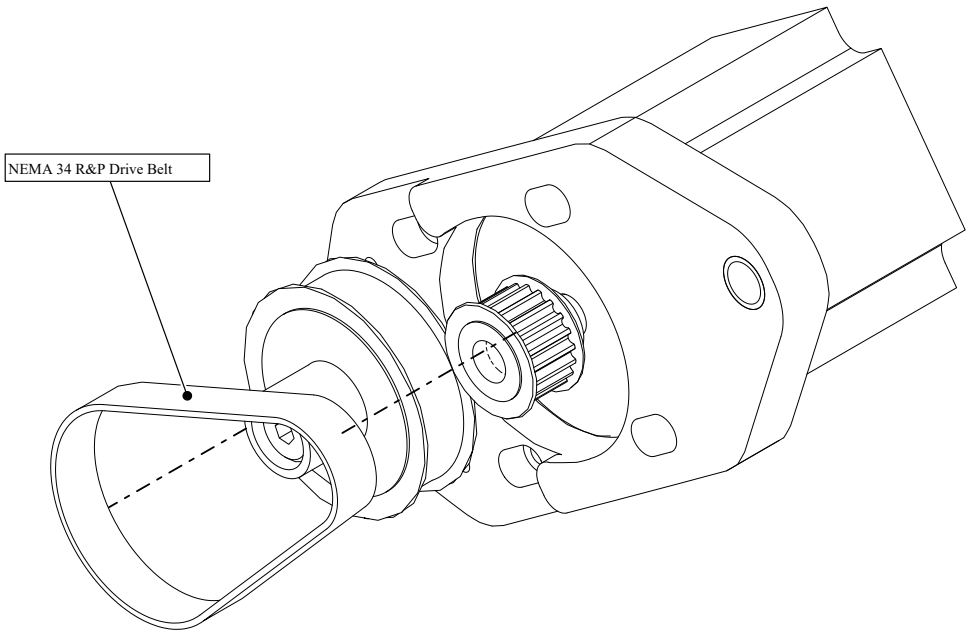
Ensure the drive spindle is installed on the correct side of the drive plate. The spindle will be installed on the recessed portion, as shown in the above figure.

4.2.2.2



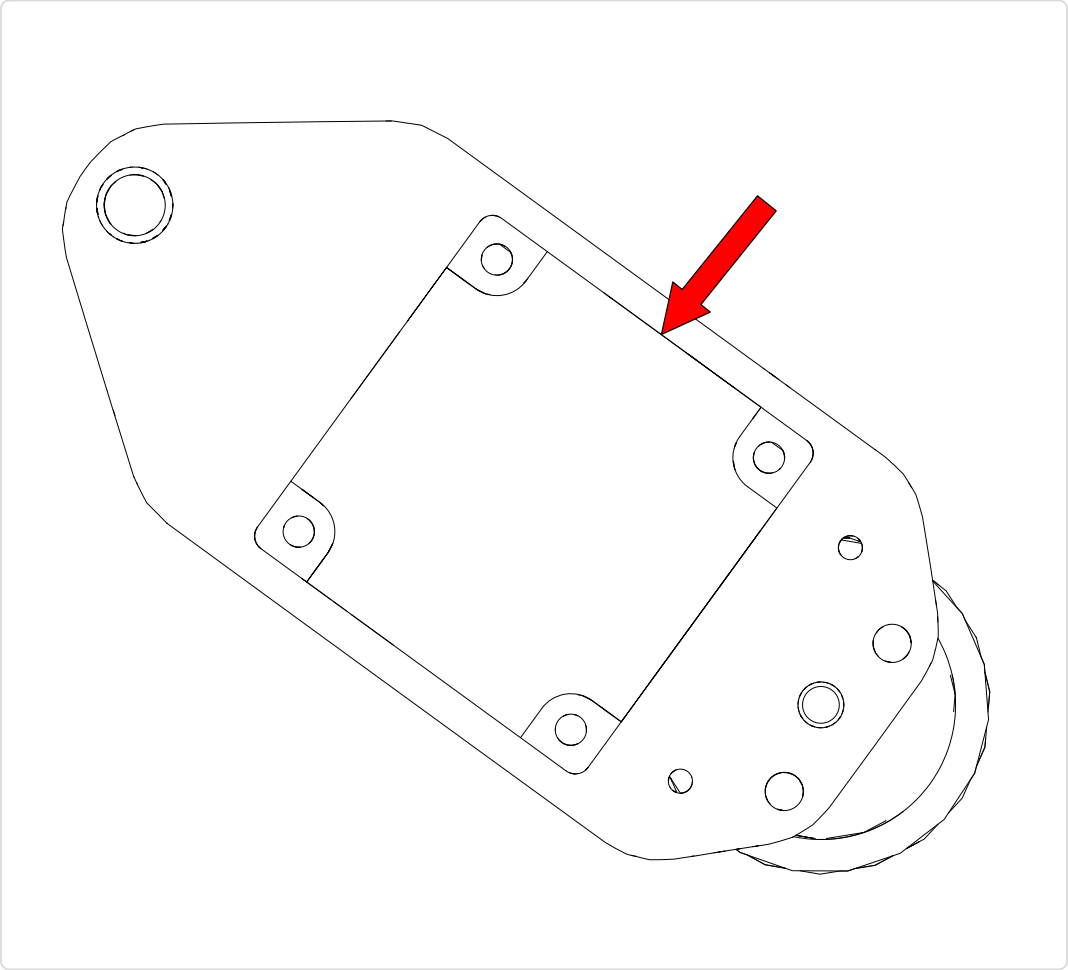
- Place the motor on the drive plate as indicated.

4.2.2.3



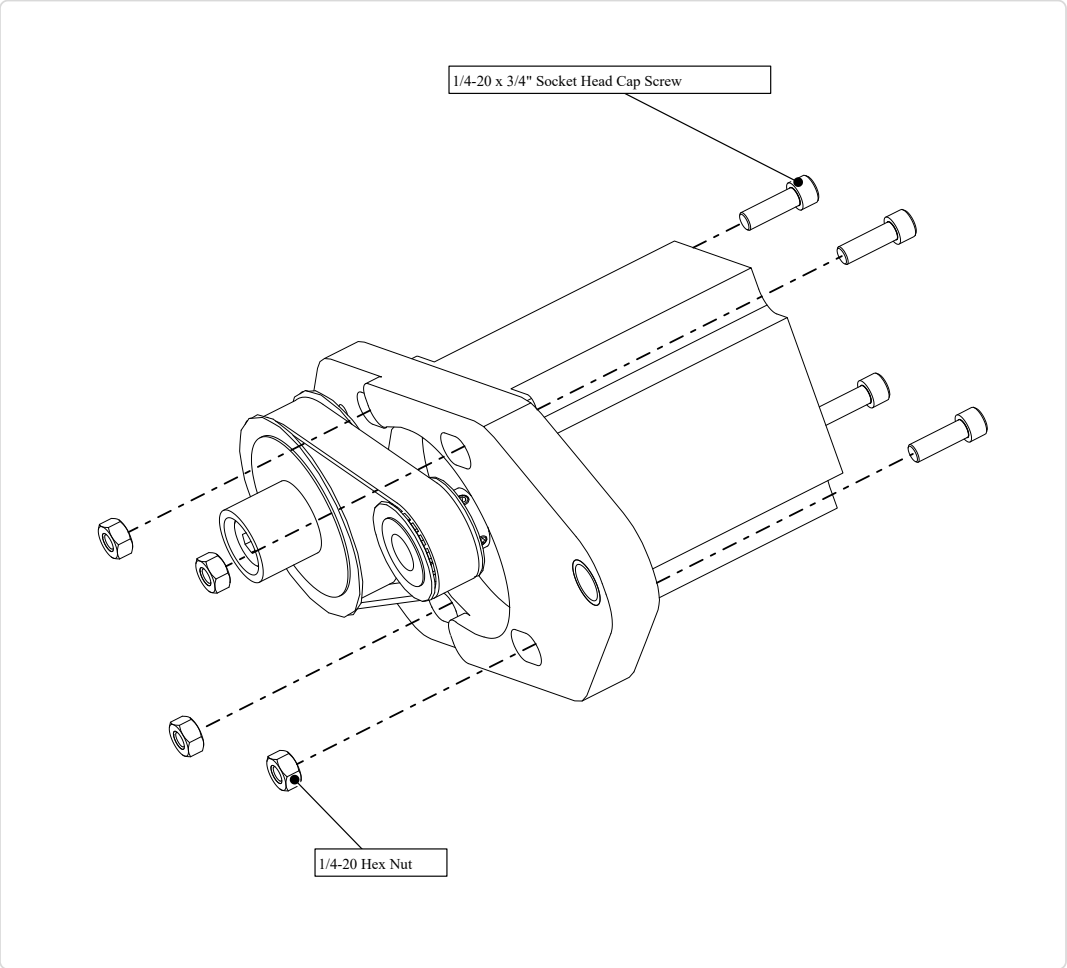
- Install drive belt on motor pulley and drive spindle as indicated.

4.2.2.4



- Orient motor with the cable in position indicated by the red arrow.

4.2.2.5

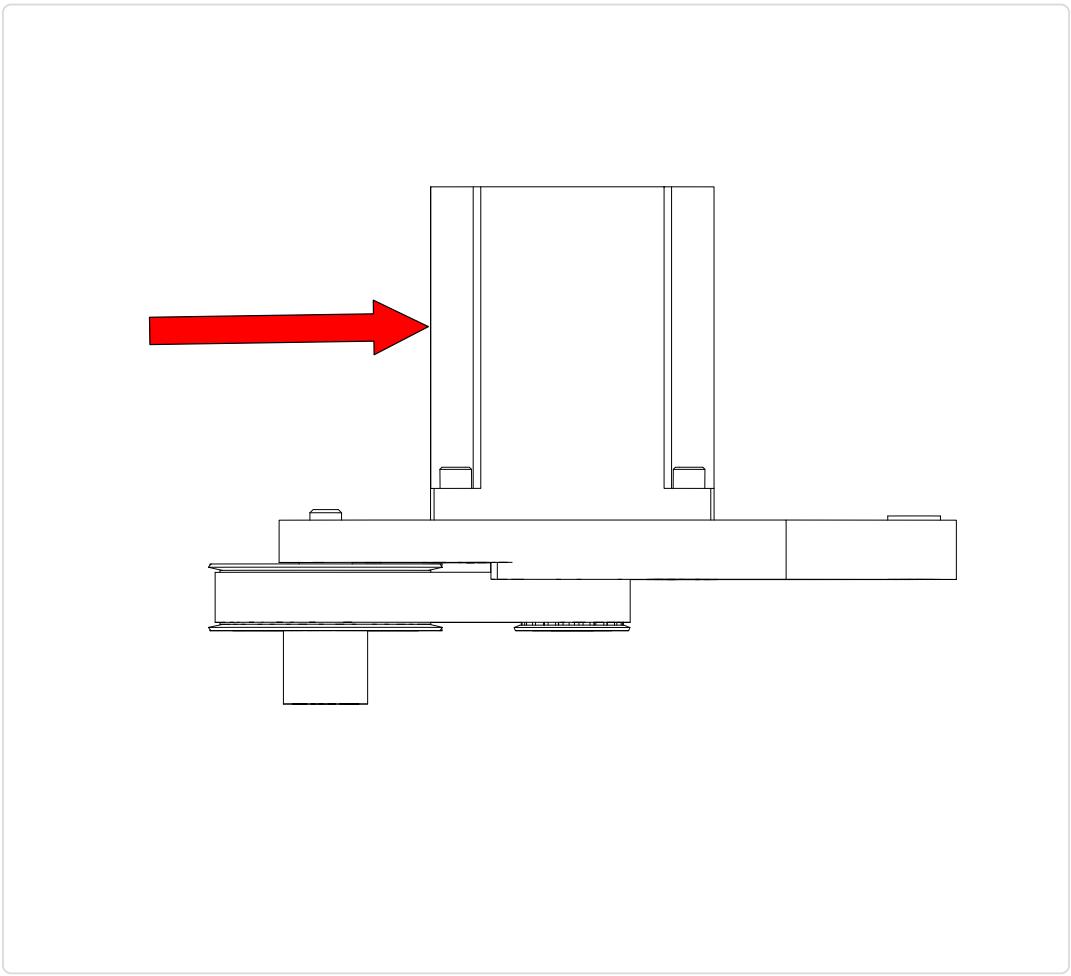


- Insert motor fasteners as indicated.

Assembly Note

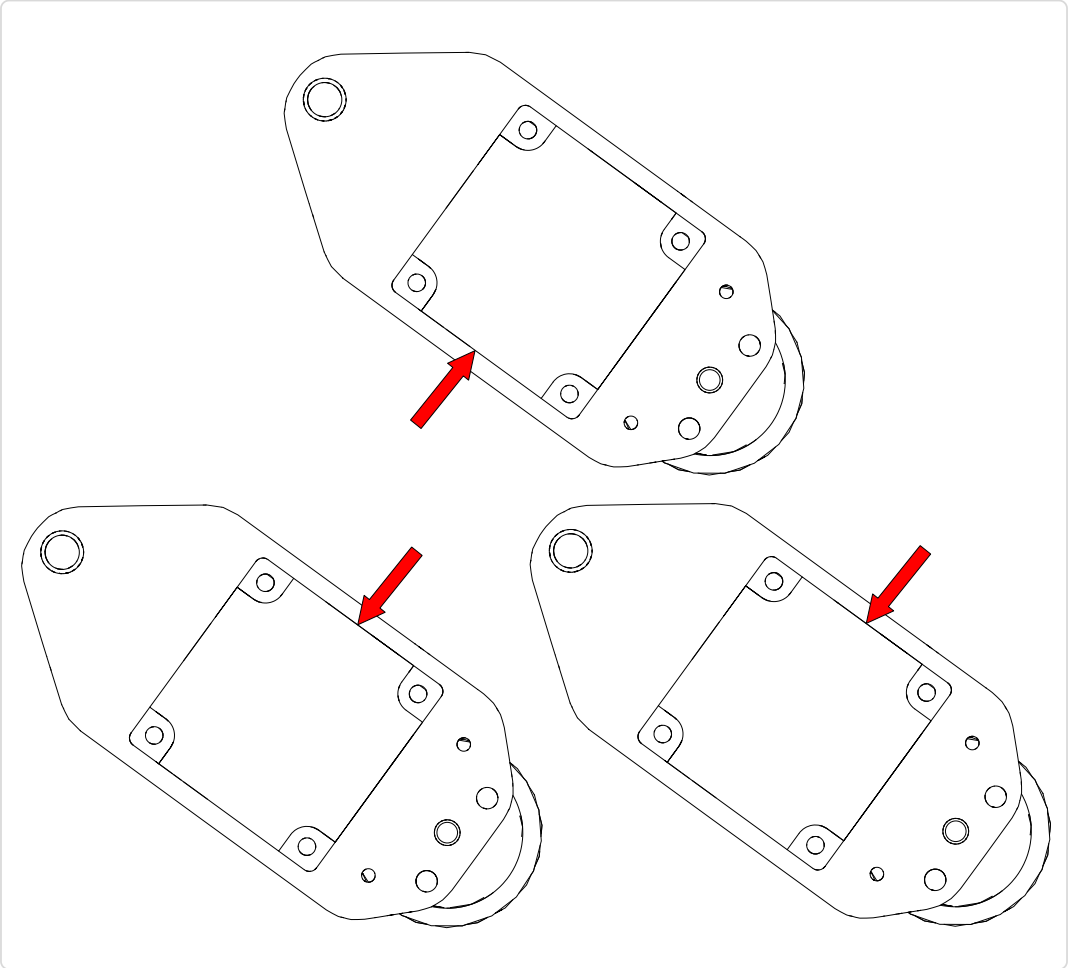
Do not tighten these fasteners prior to adjusting the belt tension in the following step.

4.2.2.6



- Tension belt by applying pressure to motor in the indicated direction.
- Keep this pressure on the motor and tighten the 10-32 x 5/8" motor screws.

4.2.2.7

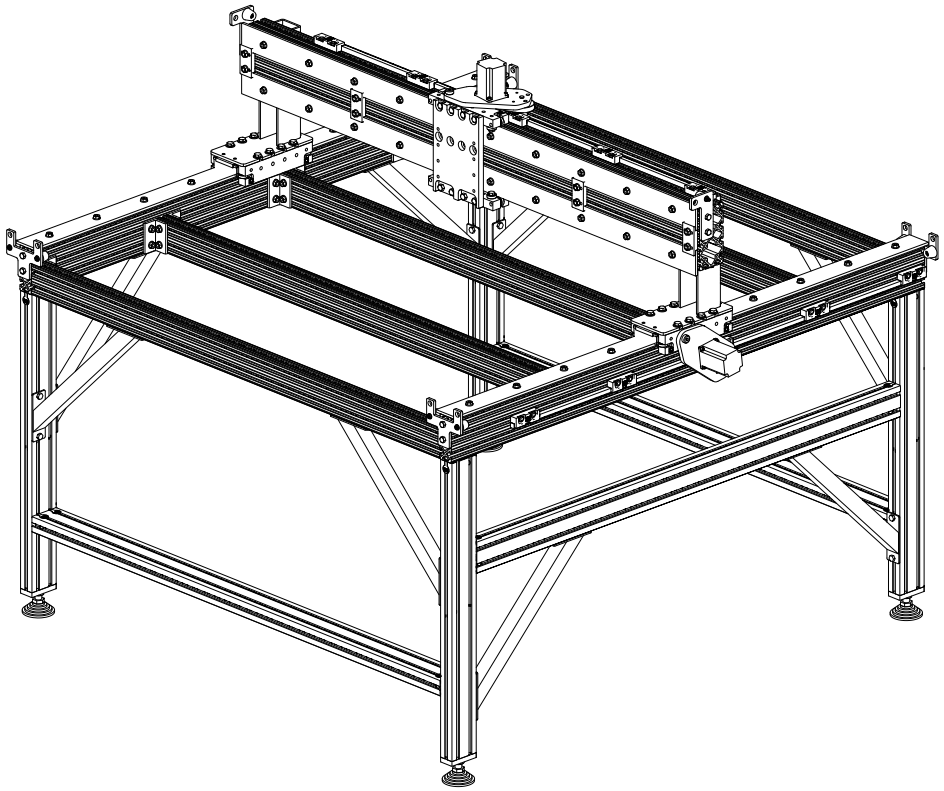


- Use this process to assemble three R&P Assemblies.

Assembly Note

Orient each motor with the cables in the position indicated by the red arrows.

4.3 Rack and Pinion Installation



Parts and Tools Required

The following bags and parts will be used in this section:

- (3) CRP201-00-FAST-02-17.2 (NEMA 23 Applications)
    - (3) 0.005" Shoulder Bolt Shim
    - (3) 1/2" x 1/2" Shoulder Bolt
- (3) CRP301-00-FAST-17.2 (NEMA 34 Applications)
    - (3) 0.005" Shoulder Bolt Shim
    - (3) 3/4" x 1/2" Shoulder Bolt
- (3) CRP201-00-TEN-17.2
    - (3) M8 x 10mm Hex Cap Screw
    - (3) M6 x 12mm Flat Head Screw
    - (3) R&P Tensioner Bracket
    - (3) R&P Tension Post
    - (3) M8 x 100mm Socket Head Cap Screw
    - (6) M8 Flat Washer
    - (3) Die Spring

The following tools will be used in this section:

- 1/4" Allen Wrench
- 4mm Allen Wrench
- 6mm Allen Wrench
- 13mm Combination Wrench

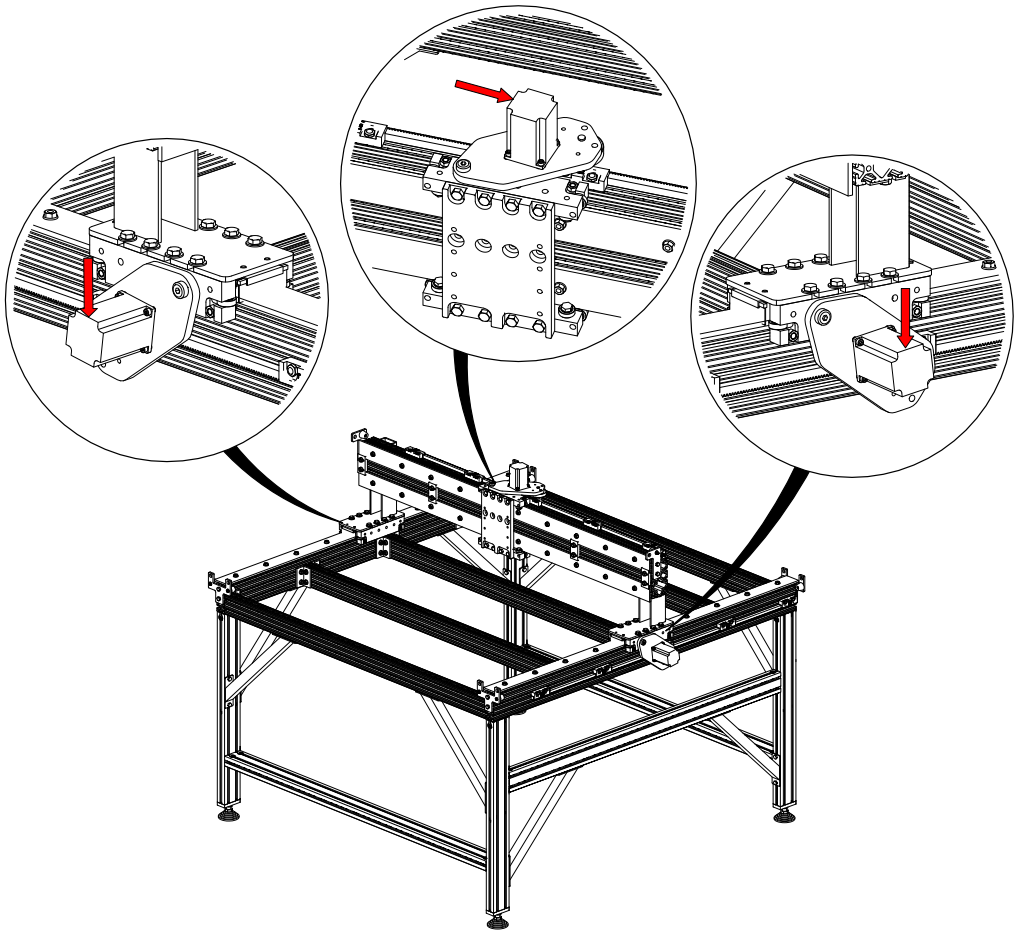
Section Note

For NEMA 23 applications, continue to Section 4.3.1

Section Note

For NEMA 34 applications, skip to Section 4.3.2

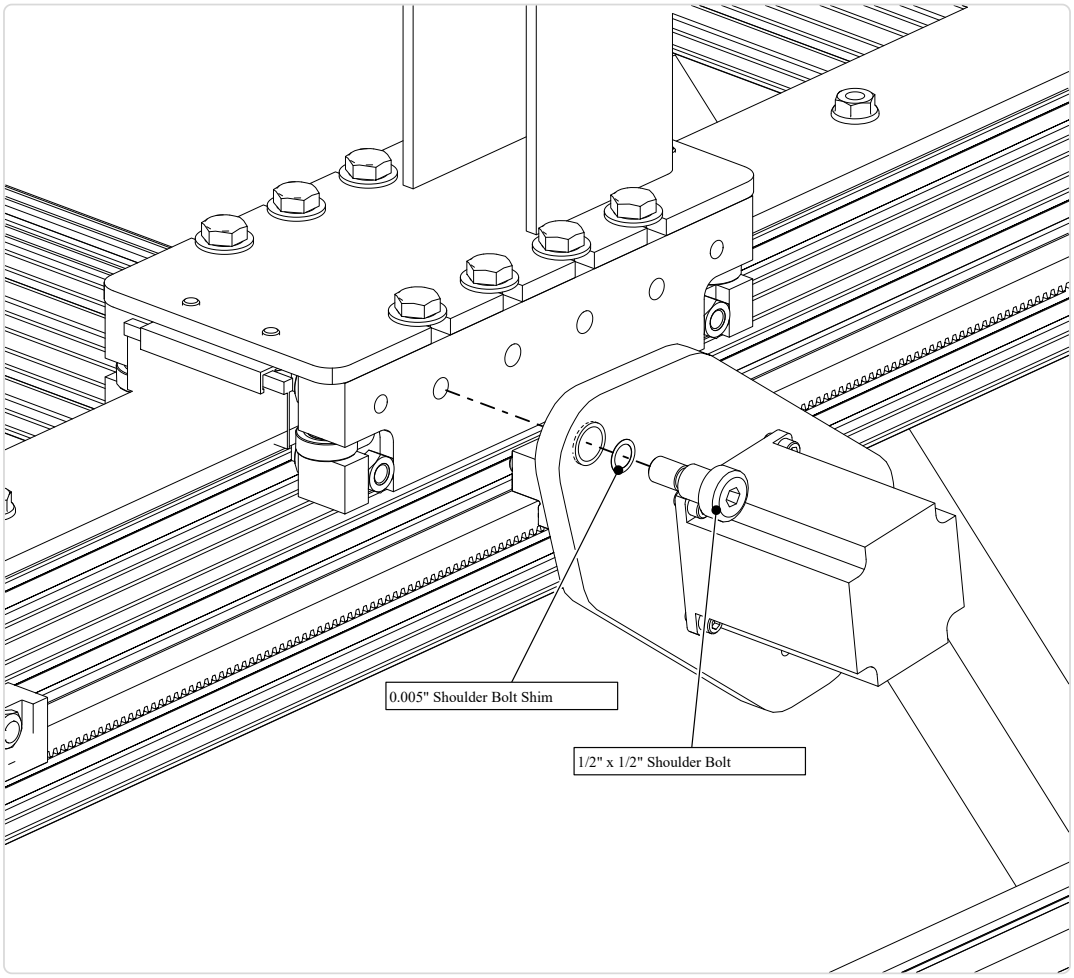
4.3.1 R&P Assembly Installation (NEMA 23)



Assembly Note

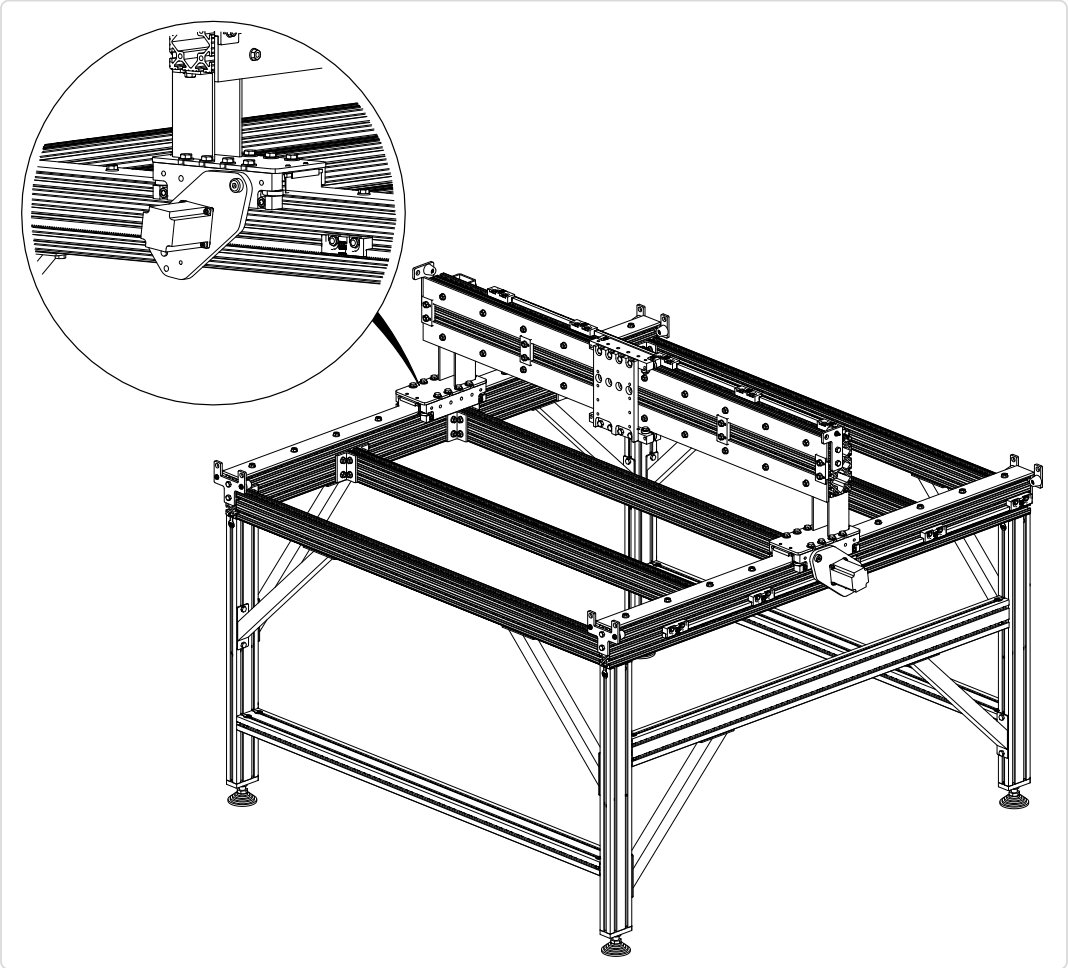
In the following steps, use the appropriate R&P Assembly to position the motor cables as indicated by the red arrows.

4.3.1.1



- Attach an R&P Assembly to the linear carriage as indicated.

4.3.1.2

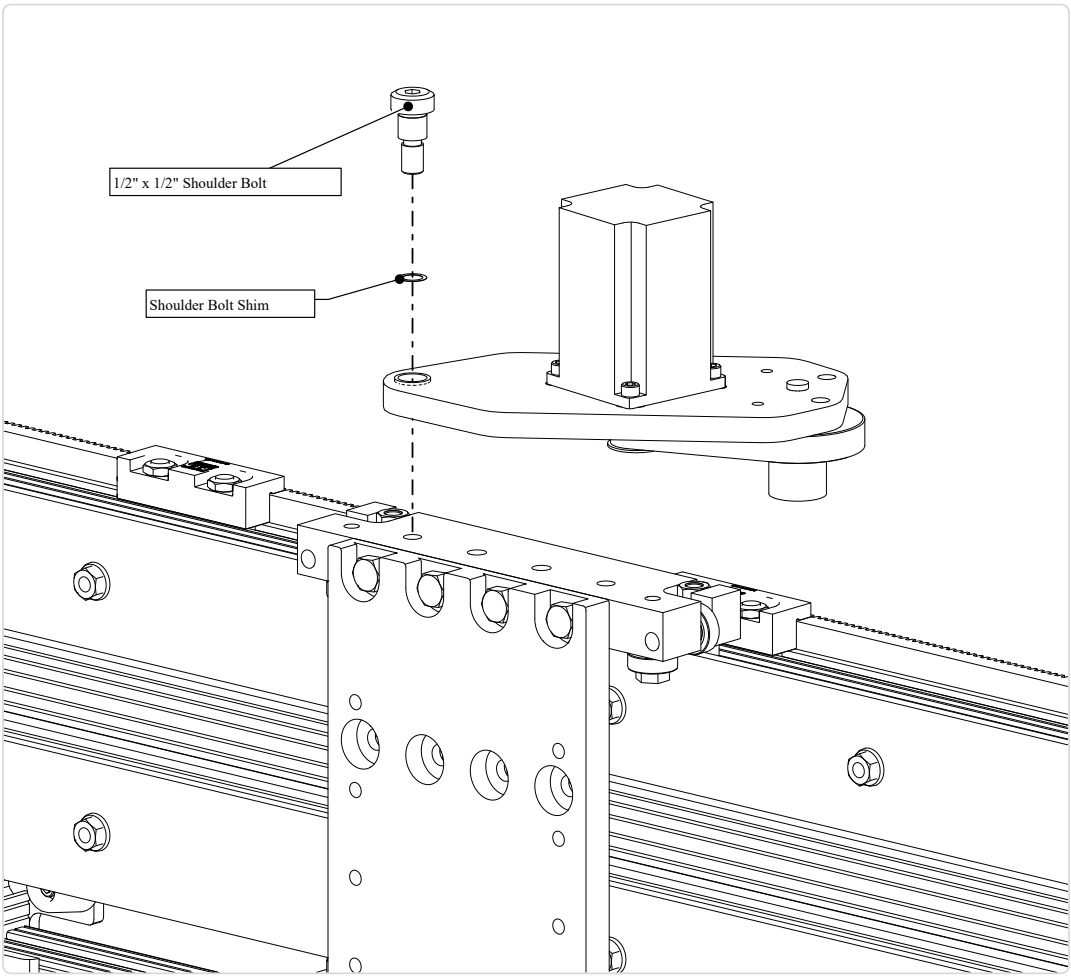


- Repeat the process on the opposite side of the machine.

Assembly Note

When installing R&P Assemblies, ensure correct orientation with the drive spindles towards the rear of the machine.

4.3.1.3

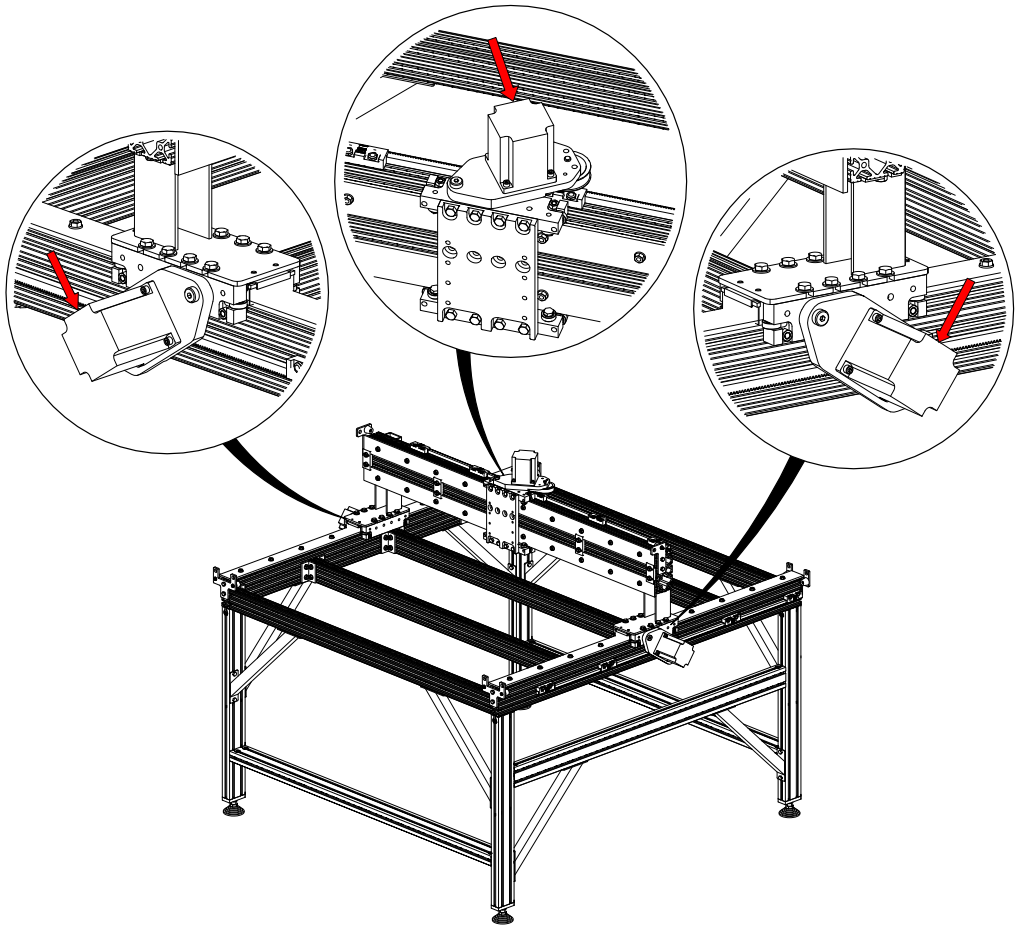


- Attach the third R&P Assembly to the gantry's top linear carriage as indicated.

Section Note

Now skip to Section 4.3.3 to install the R&P Tensioners

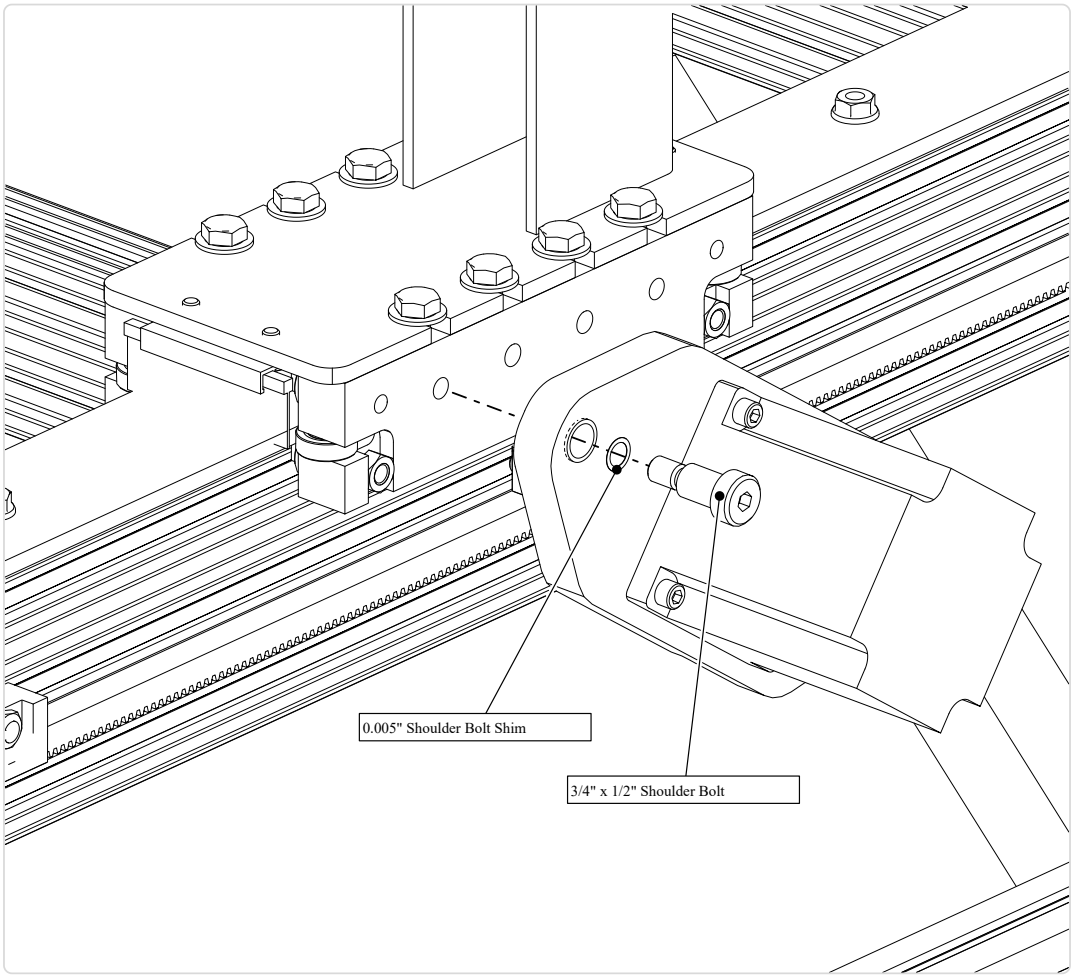
4.3.2 R&P Assembly Installation (NEMA 34)



Assembly Note

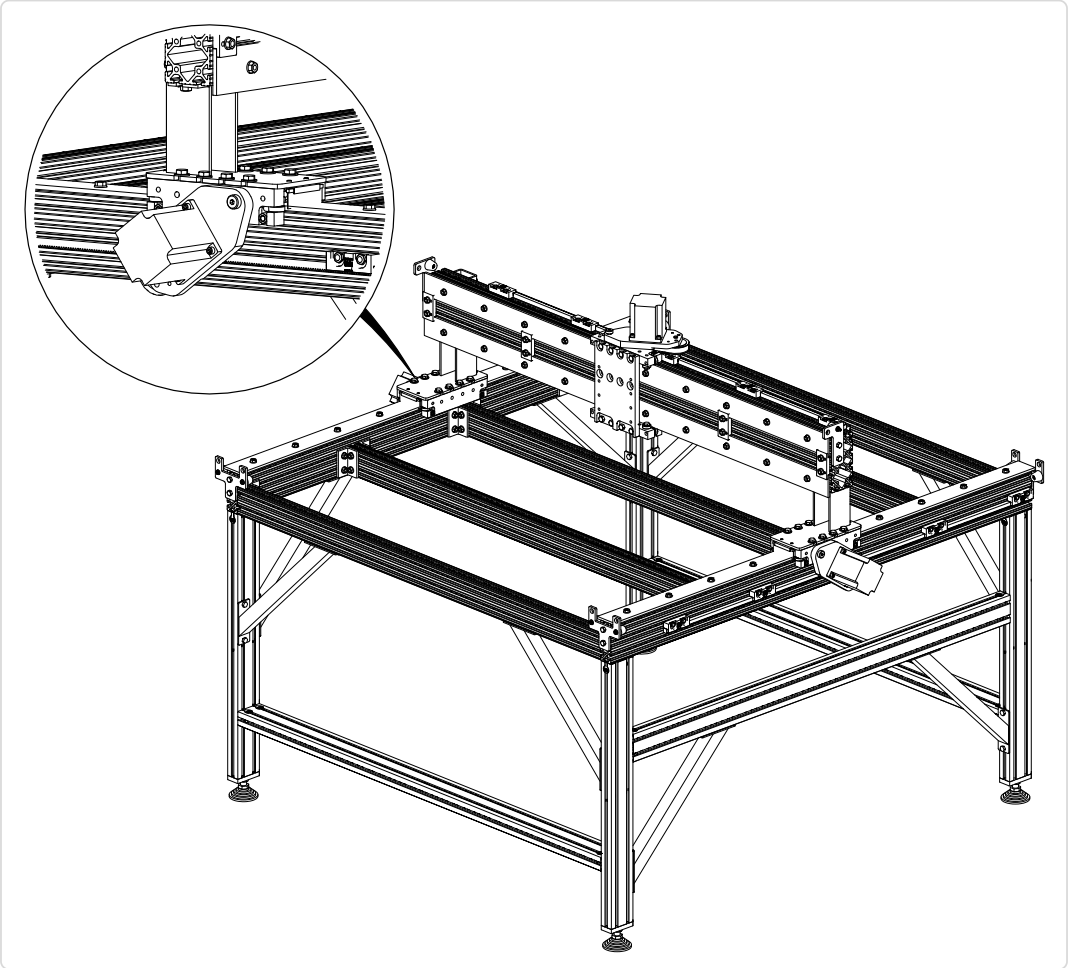
In the following steps, use the appropriate R&P Assembly to position the motor cables as indicated by the red arrows.

4.3.2.1



- Attach an R&P Assembly to the linear carriage as indicated.

4.3.2.2

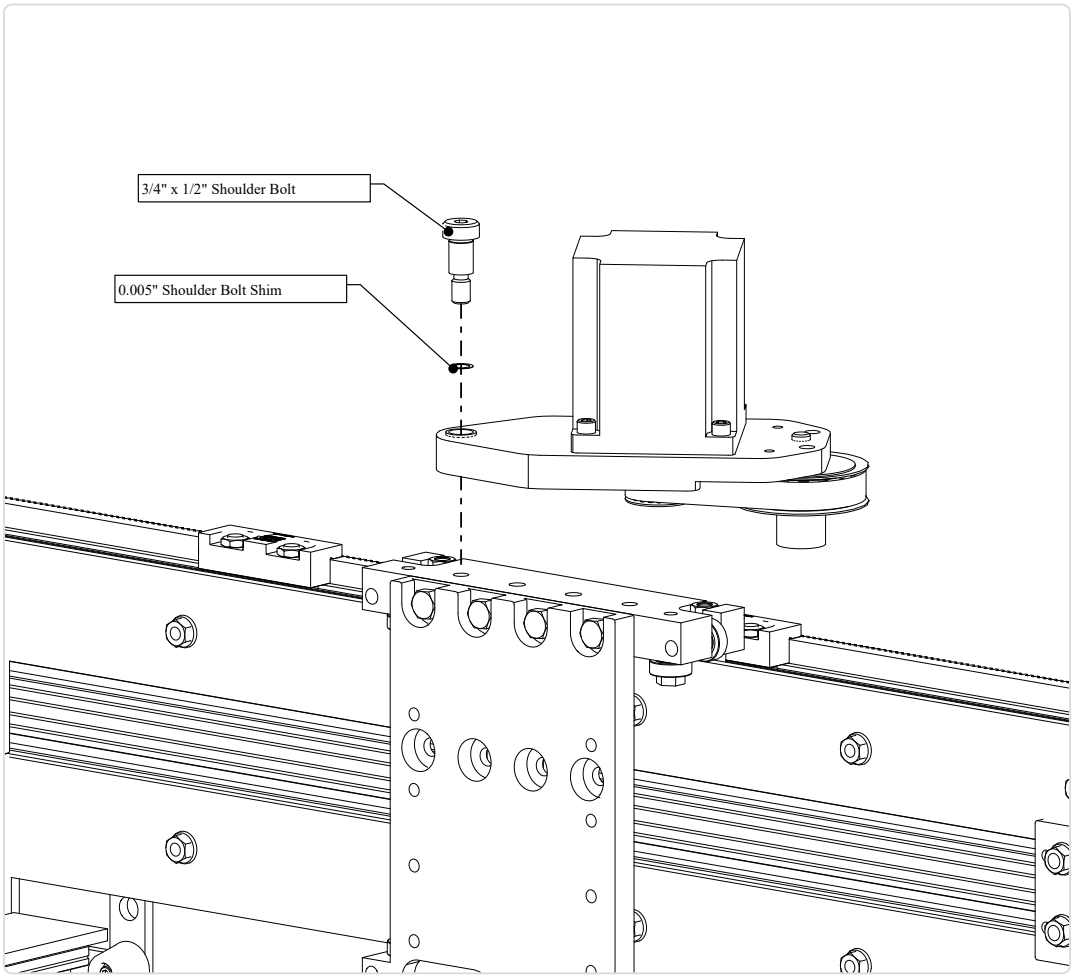


- Repeat the process on the opposite side of the machine.

Assembly Note

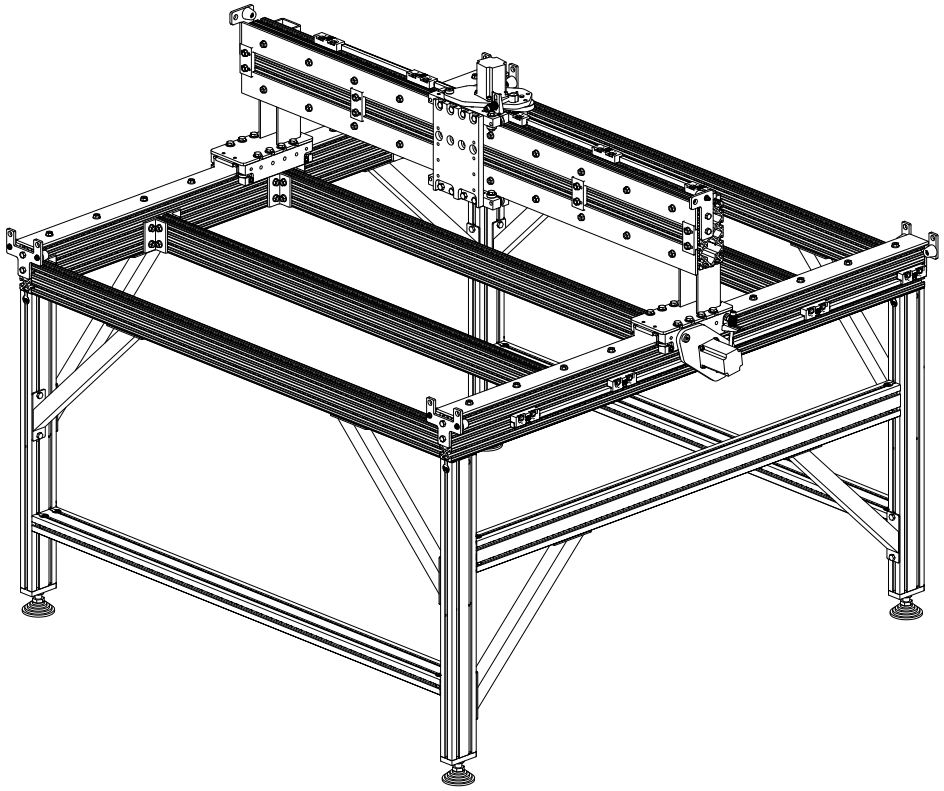
When installing R&P Assemblies, ensure correct orientation with the drive spindles towards the rear of the machine.

4.3.2.3



- Attach the third R&P Assembly to the gantry's top linear carriage as indicated.

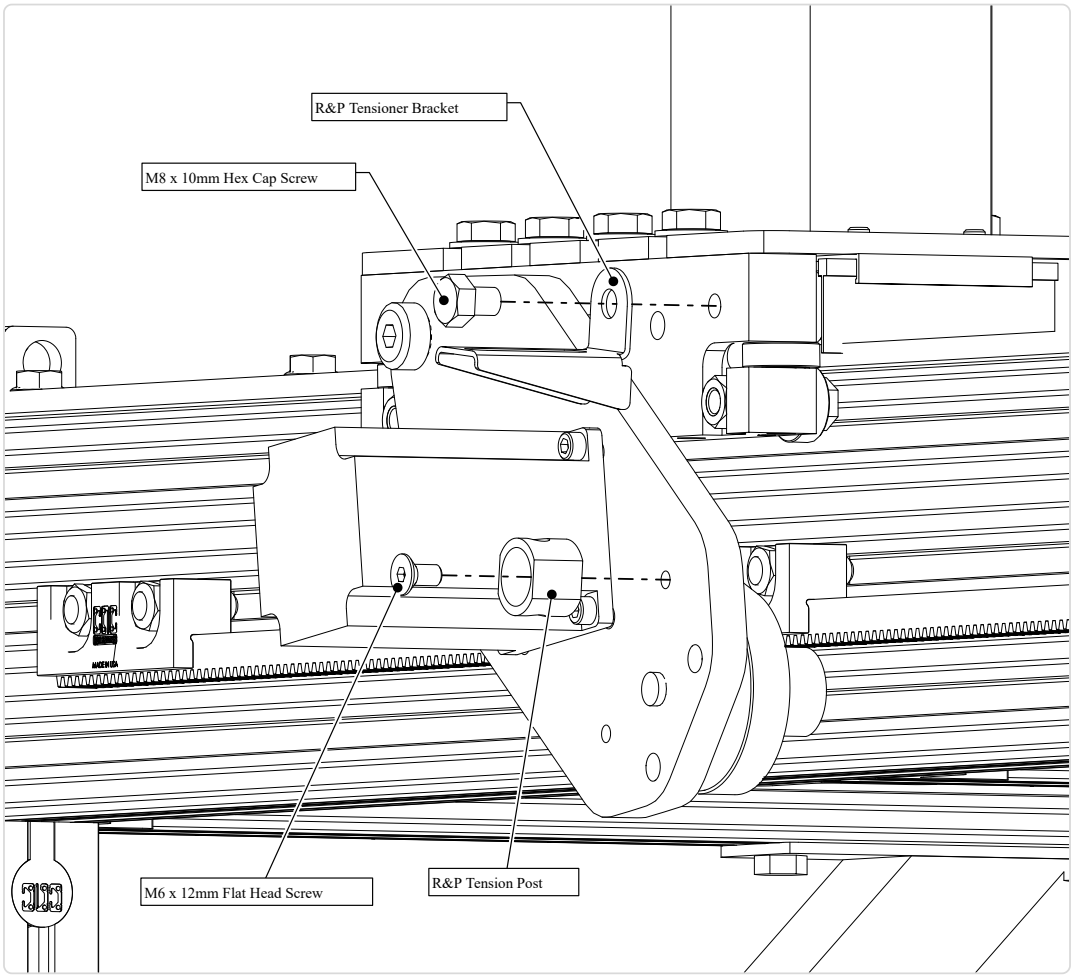
4.3.3 R&P Tensioner Installation



Section Note

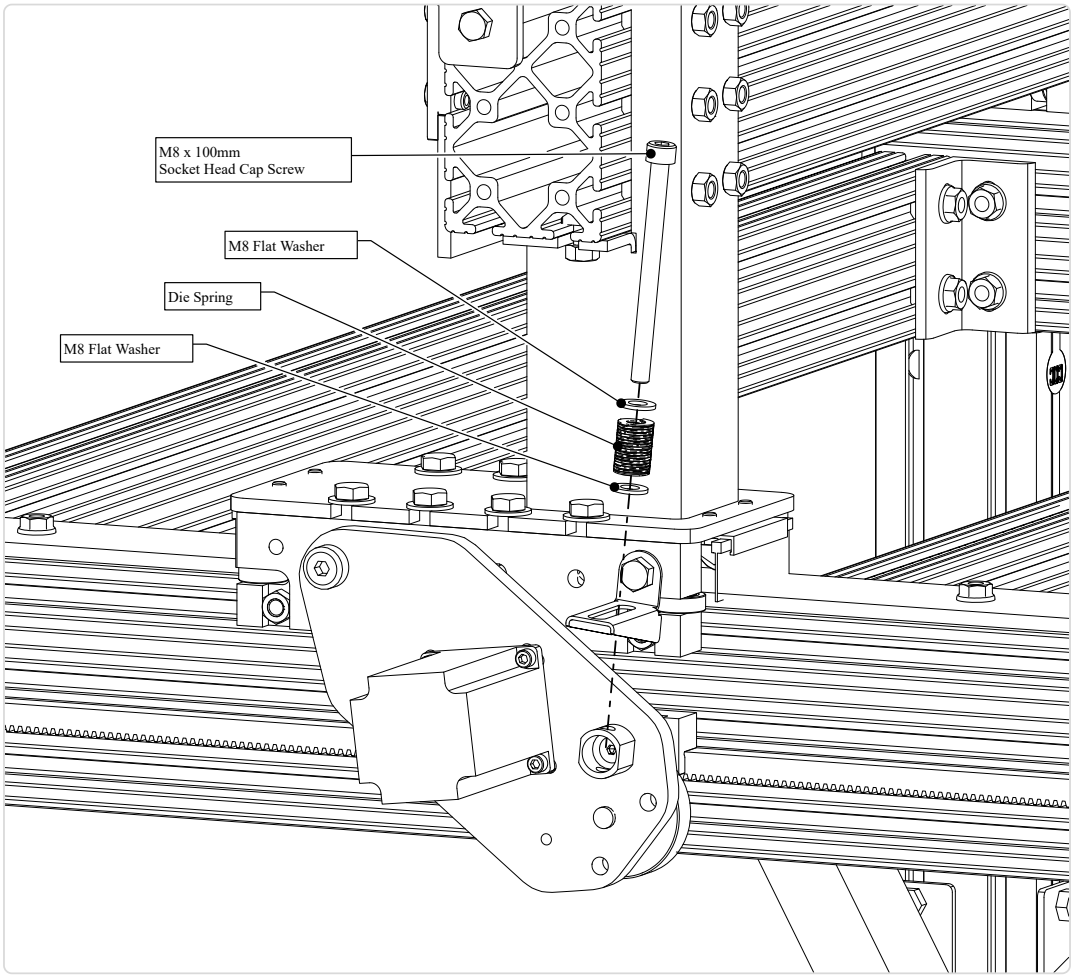
This section is applicable to both NEMA 23 and NEMA 34 applications

4.3.3.1



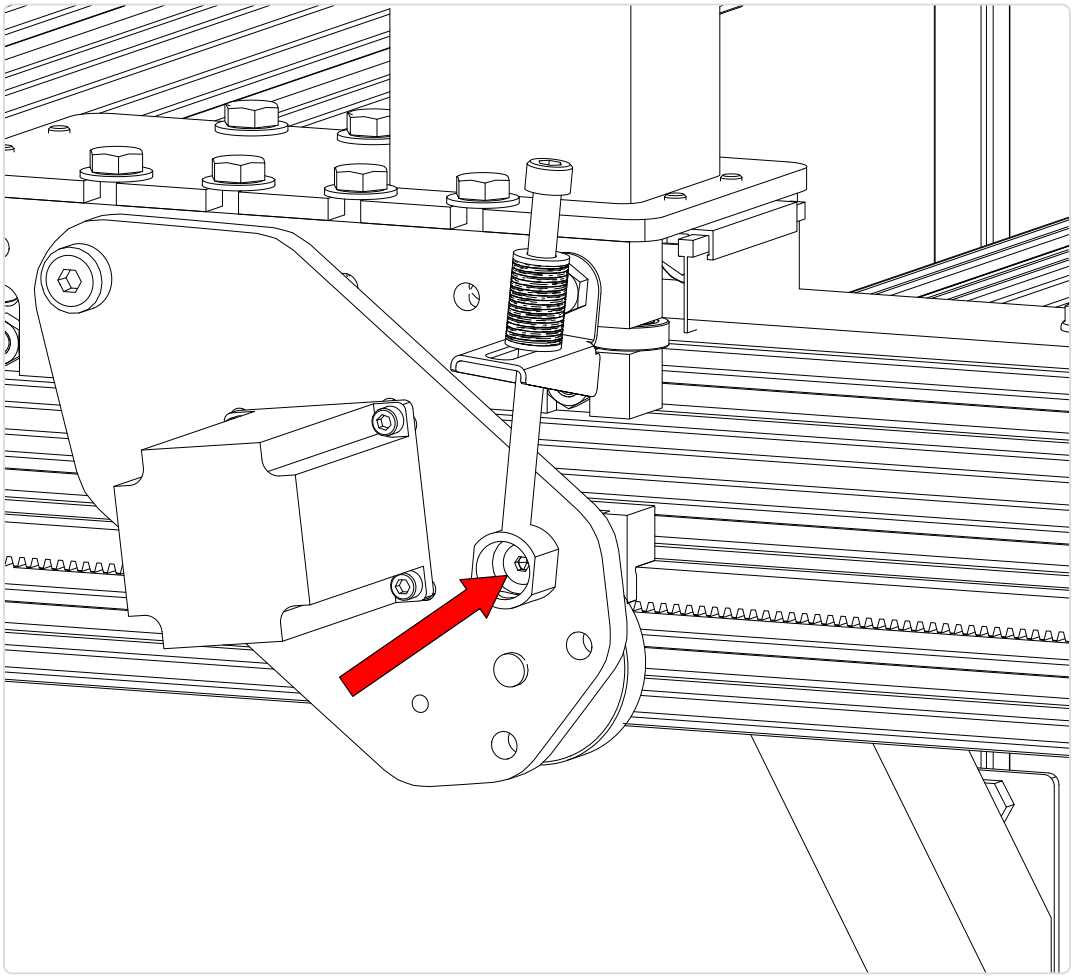
- Install R&P Tensioner Bracket and Tension Post as indicated.
- Partially tighten fasteners.

4.3.3.2



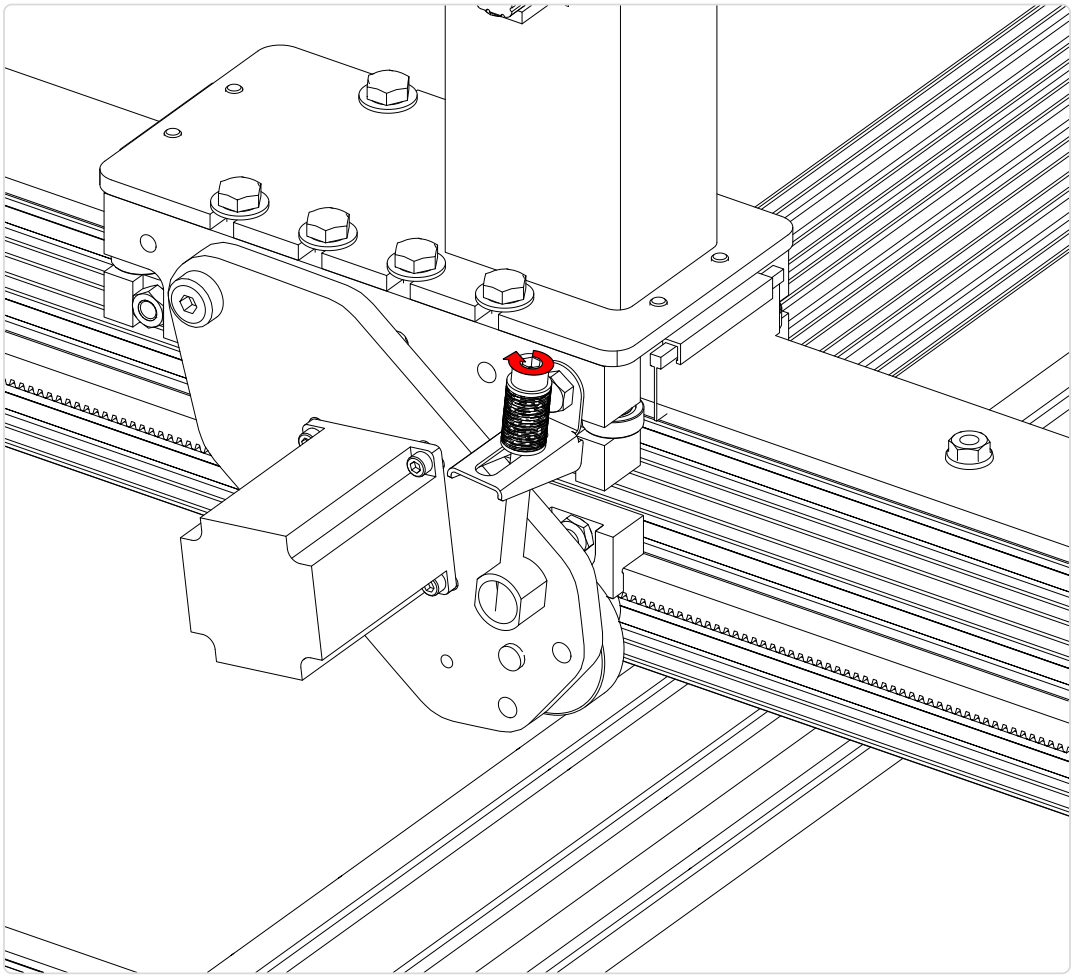
- Install tensioner screw as indicated and hand tighten.
- Tighten R&P Tension Bracket M8 x 10mm fastener.

4.3.3.3



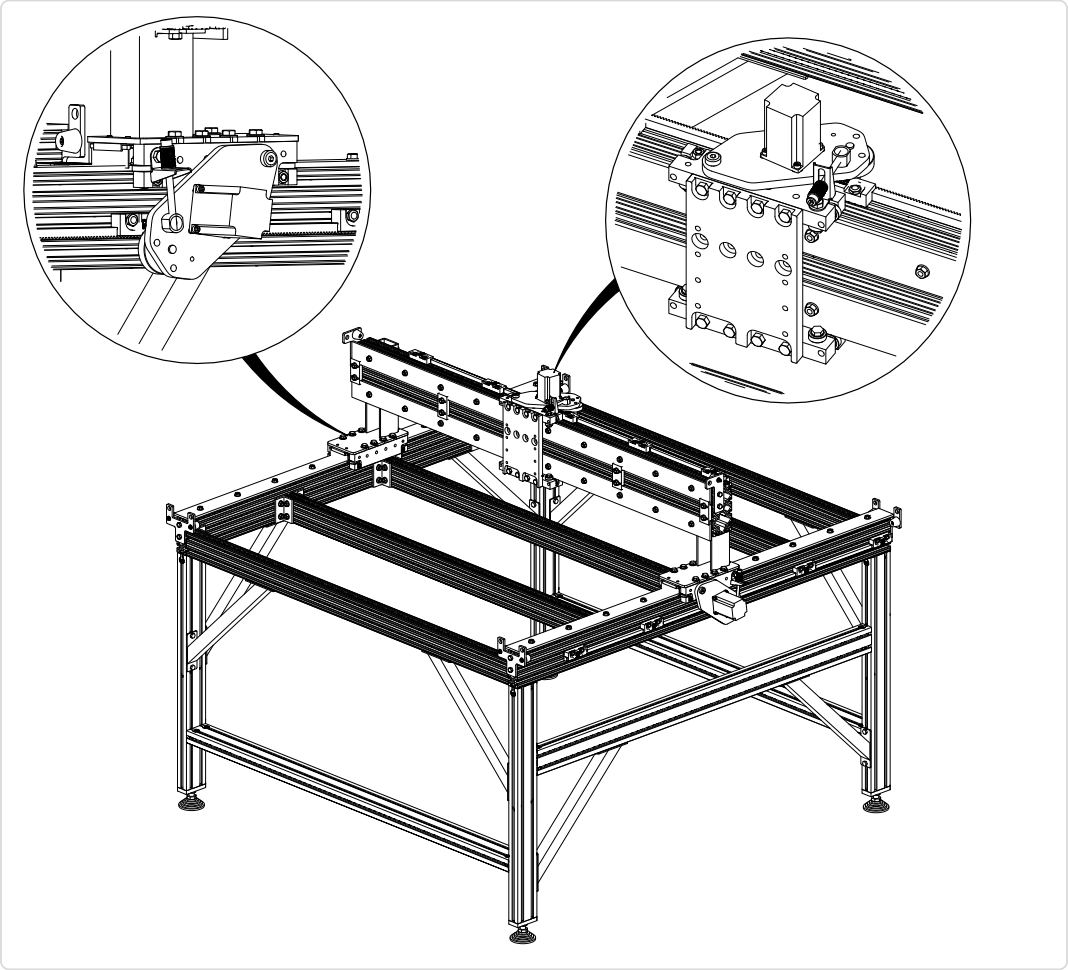
- Partially remove the tension screw as indicated.
- Tighten R&P Tension Post fastener indicated by the red arrow.

4.3.3.4



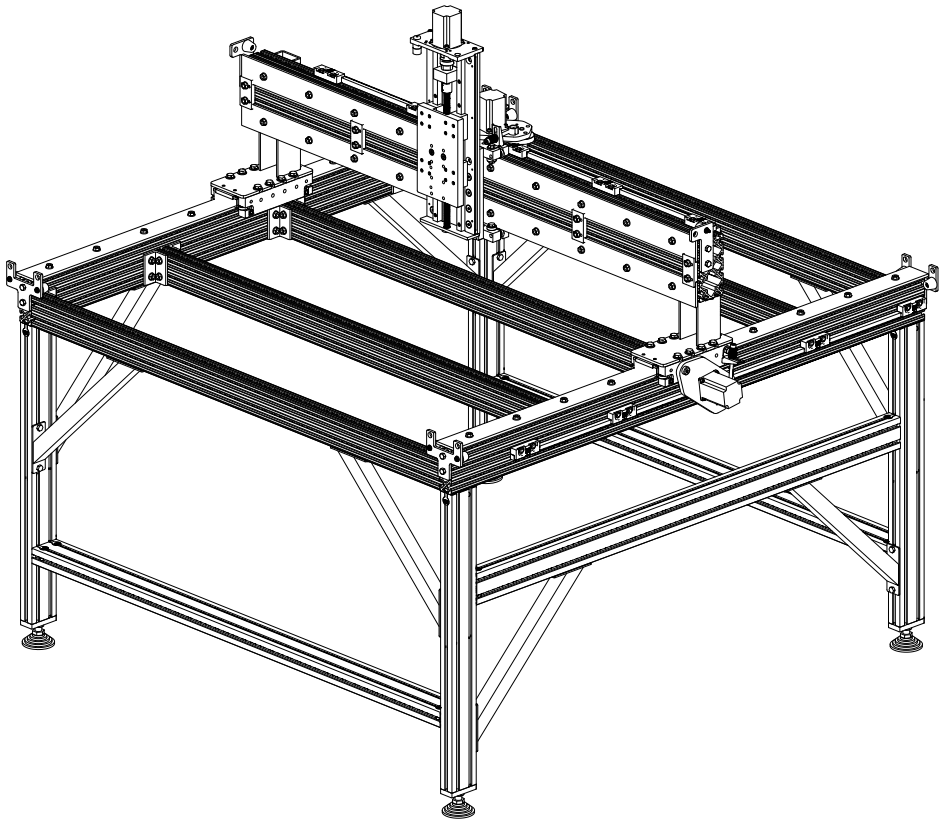
- Hand tighten tension screw until finger tight.
- Set initial R&P tension by tightening tension bolt three additional turns.

4.3.3.5



- Repeat the process to install tensioners on the remaining two R&P Assemblies.

Section 5: Z-Axis Installation



Parts and Tools Required

The following bags and parts will be used in this section:

- (1) CRP1040-00 Linear Acme Axis
- (1) CRP840-00-FAST-18.3
    - (8) M8 x 25mm Flat Head Socket Screw
- (1) Oldham Coupler

NEMA 23 applications:

- (1) NEMA 23 Stepper Motor (NEMA 23 Applications)
- (1) CRP840-00-FAST
    - (4) M5 x 10mm Socket Head Cap Screw

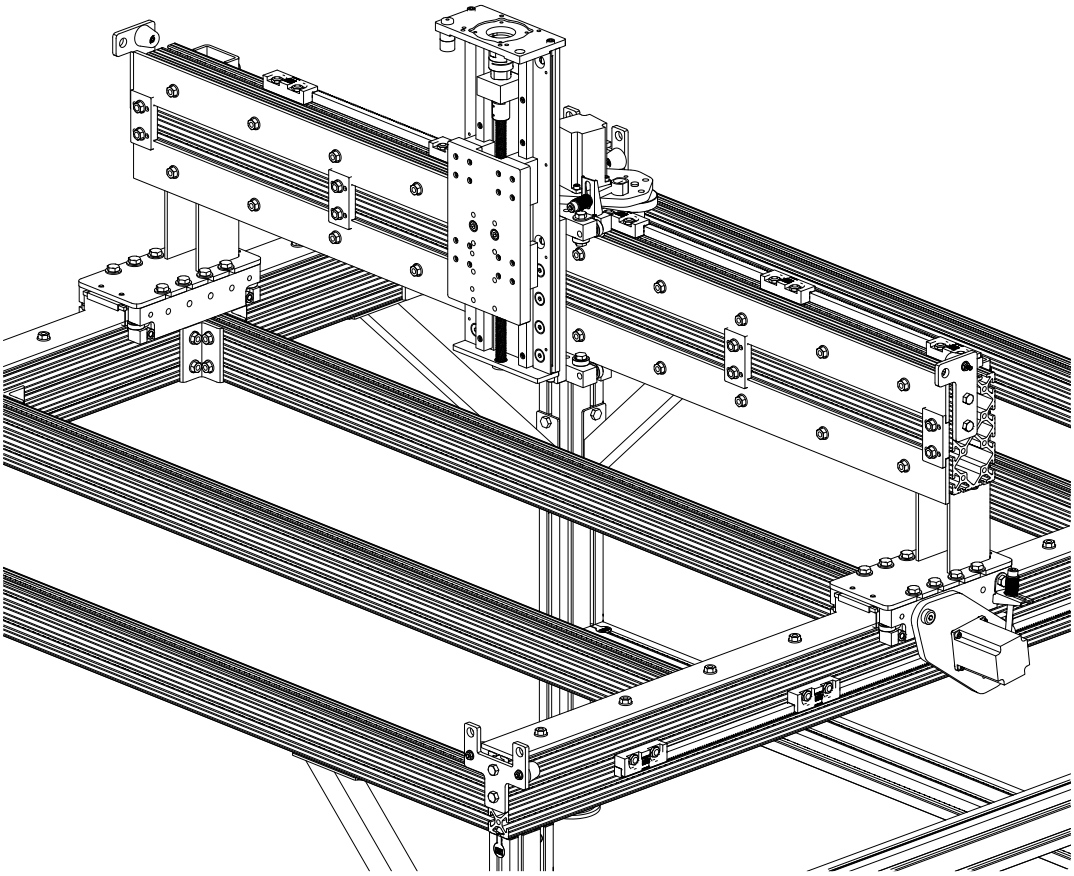
NEMA 34 applications:

- (1) NEMA 34 Stepper Motor (NEMA 34 Applications)
- (1) CRP840-00-FAST
    - (4) M6 x 16mm Socket Head Cap Screw

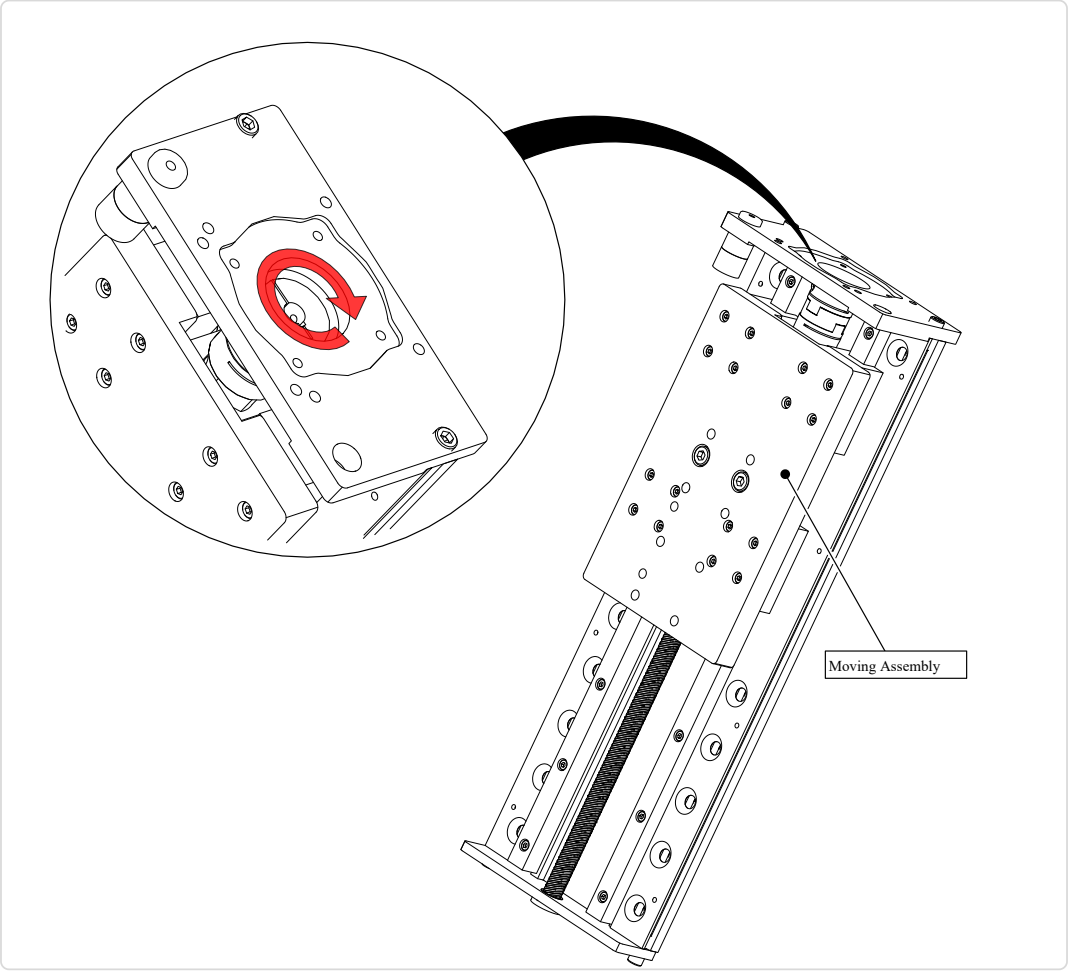
The following tools will be used in this section:

- 3mm Allen Wrench
- 4mm Allen Wrench
- 5mm Allen Wrench

5.1 Z-Axis Installation

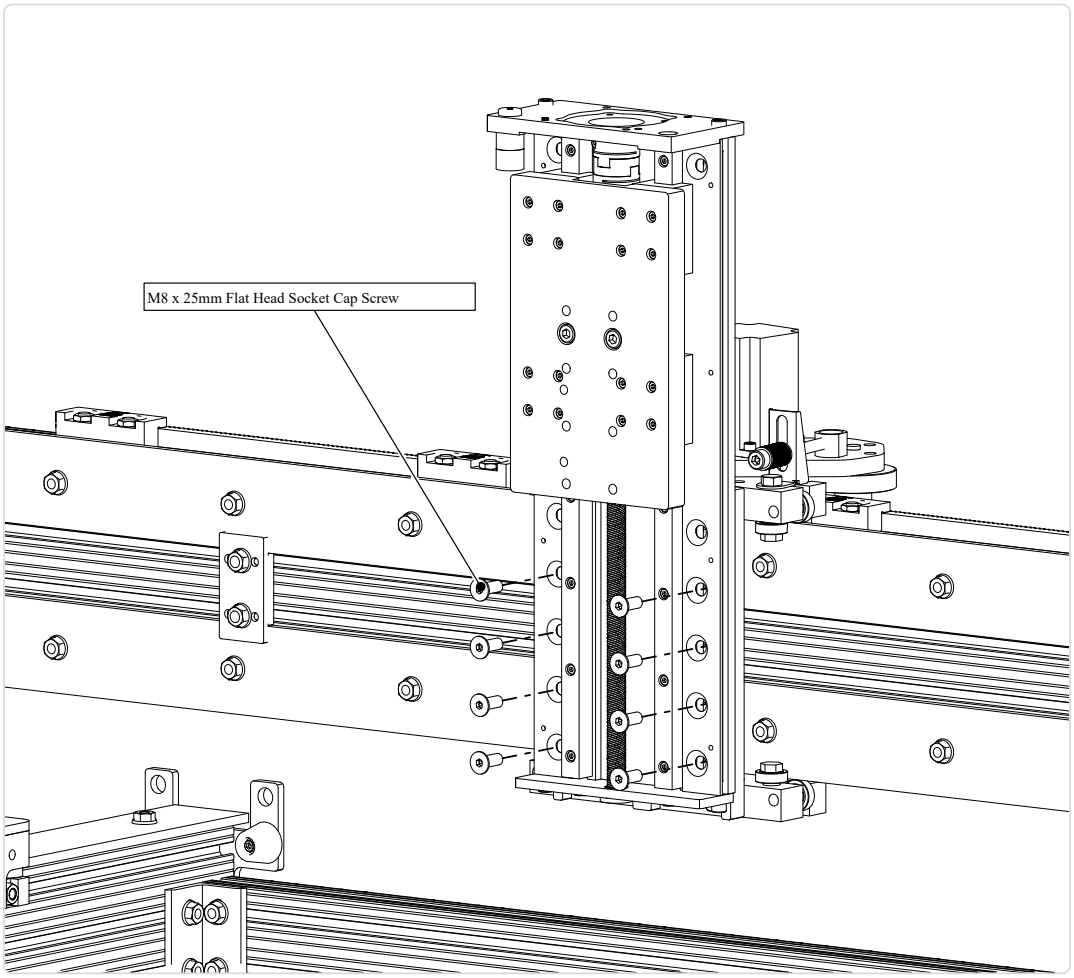


5.1.1.1



- Rotate Oldham coupler clockwise to position moving assembly at top of Z-Axis as indicated.

5.1.1.2



- Install Z-Axis on Gantry-to-Z adapter plate as indicated.

5.2 Motor Installation

Section Note

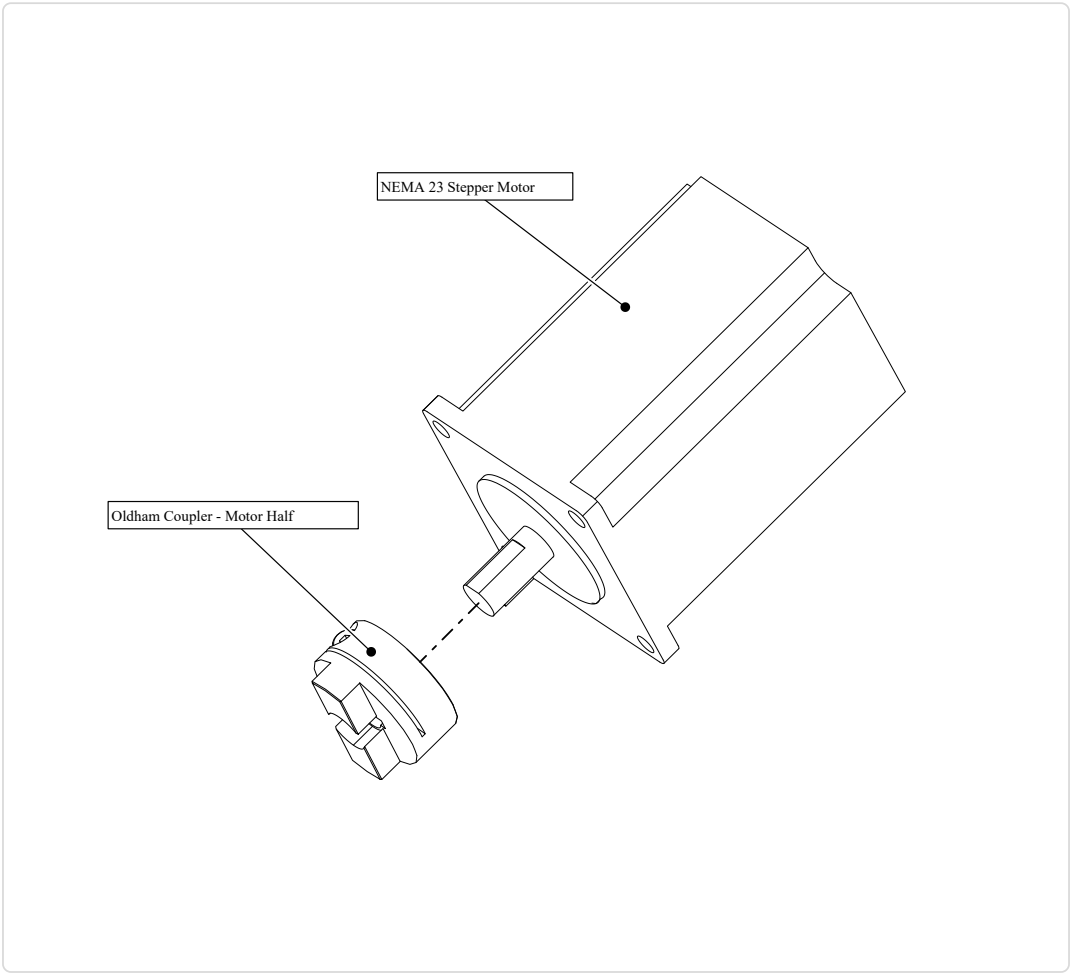
Continue to Section 5.2.1 if you are using a NEMA 23 electronics package.

Section Note

Skip to Section 5.2.2 if you are using a NEMA 34 electronics package.

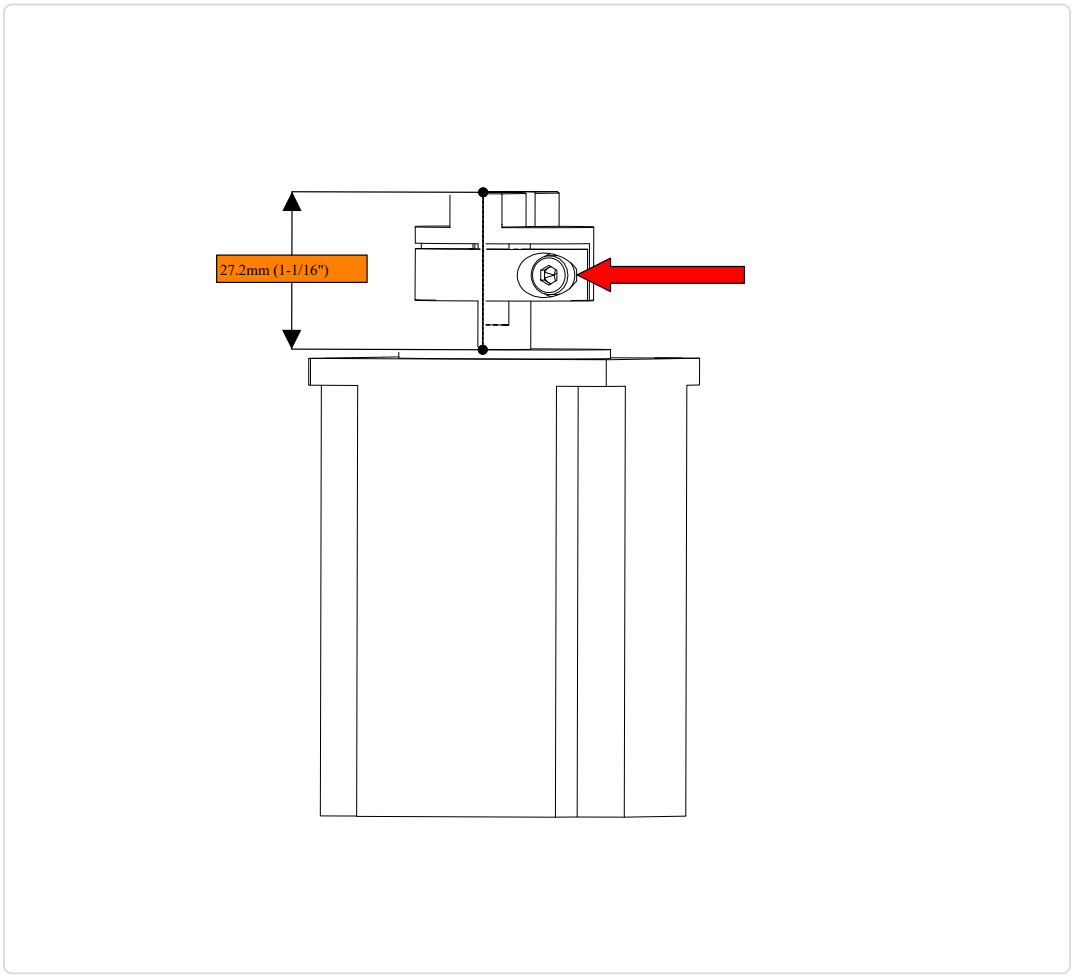
5.2.1 NEMA 23

5.2.1.1



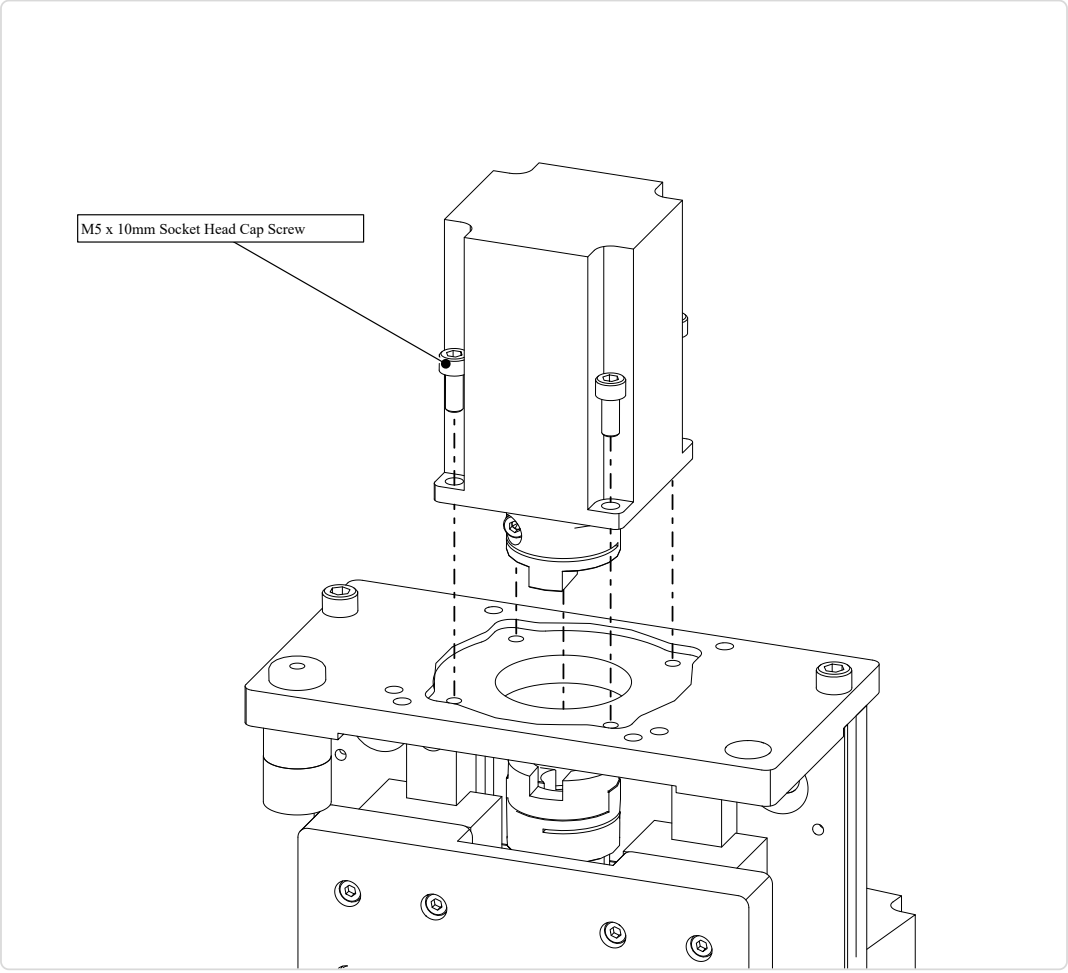
- Install motor half of Oldham coupler on motor shaft as indicated.

5.2.1.2



- Position Oldham coupler to dimension shown.
- Tighten clamping screw.

5.2.1.3



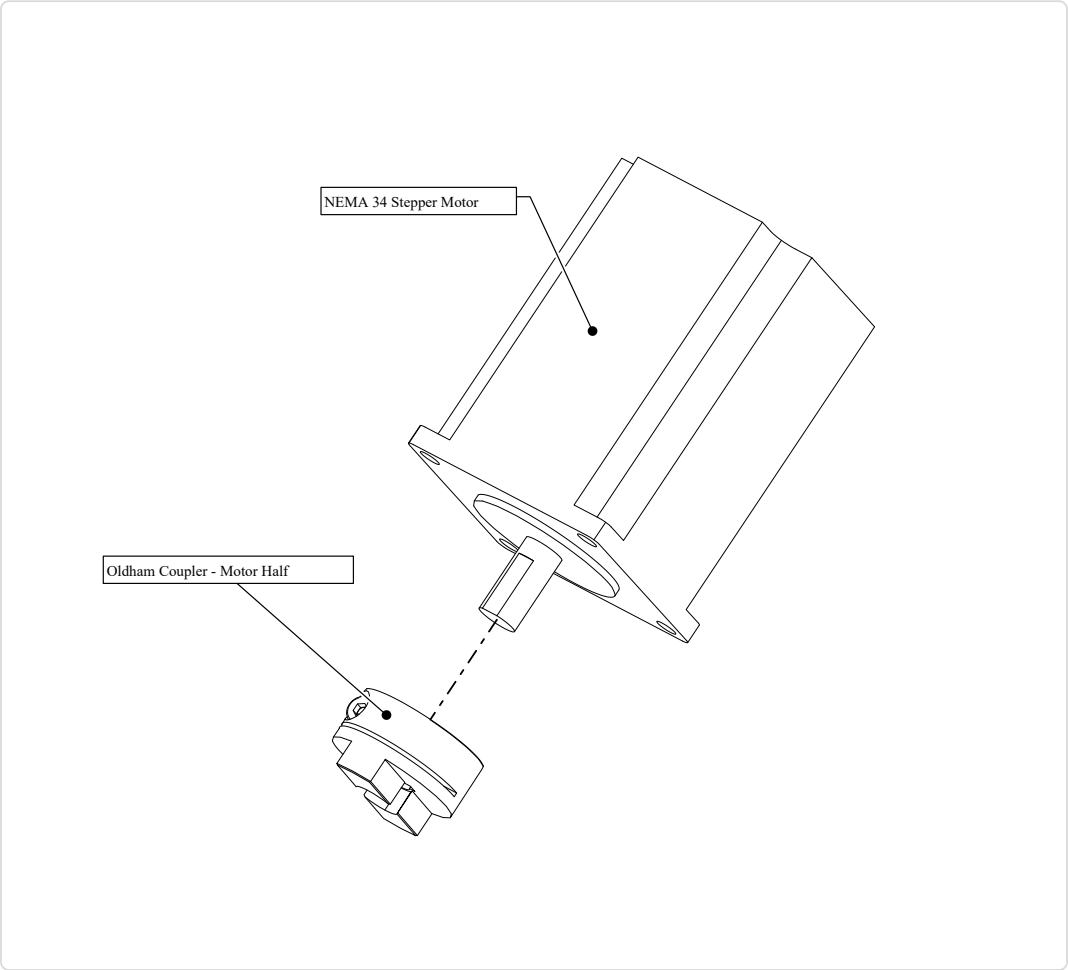
- Install motor on Z-Axis as indicated.

Assembly Note

Align motor half of Oldham coupler with Oldham coupler on Z-Axis ACME screw.

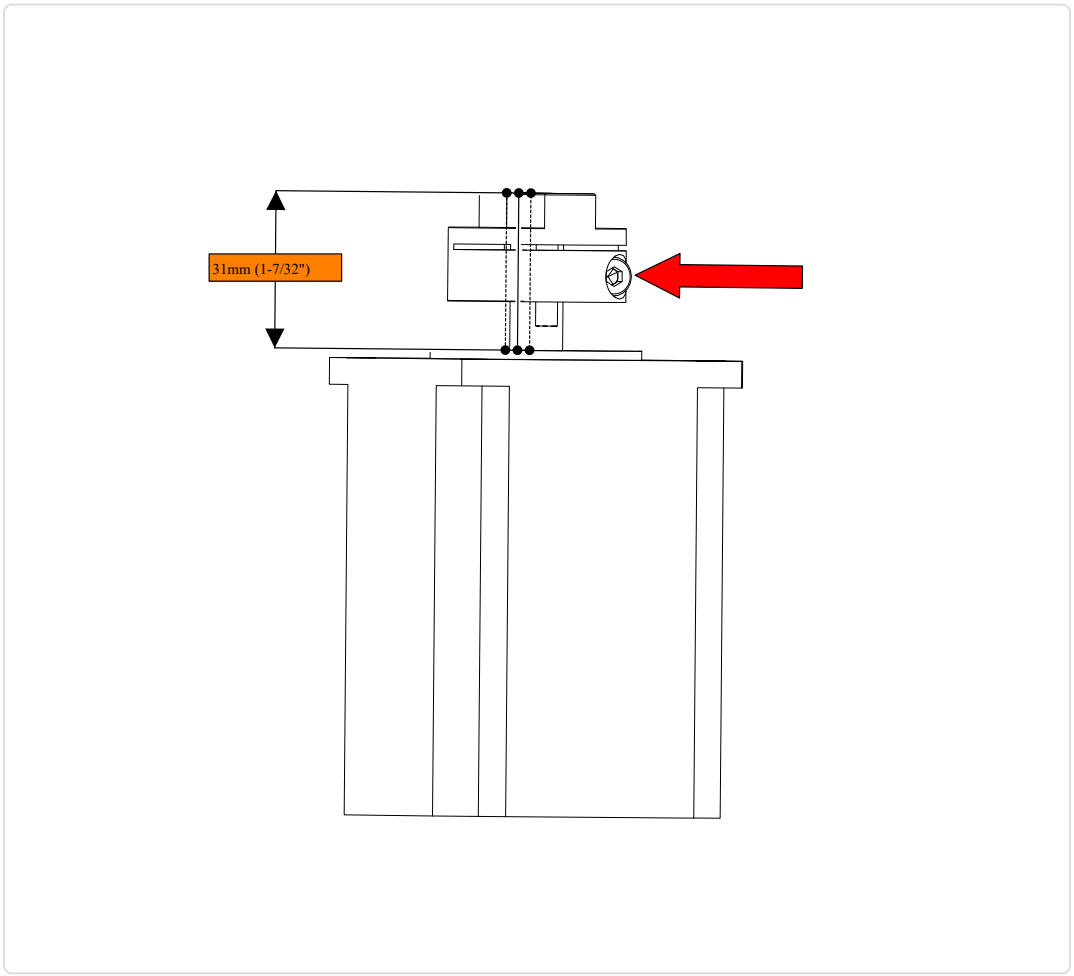
5.2.2 NEMA 34

5.2.2.1



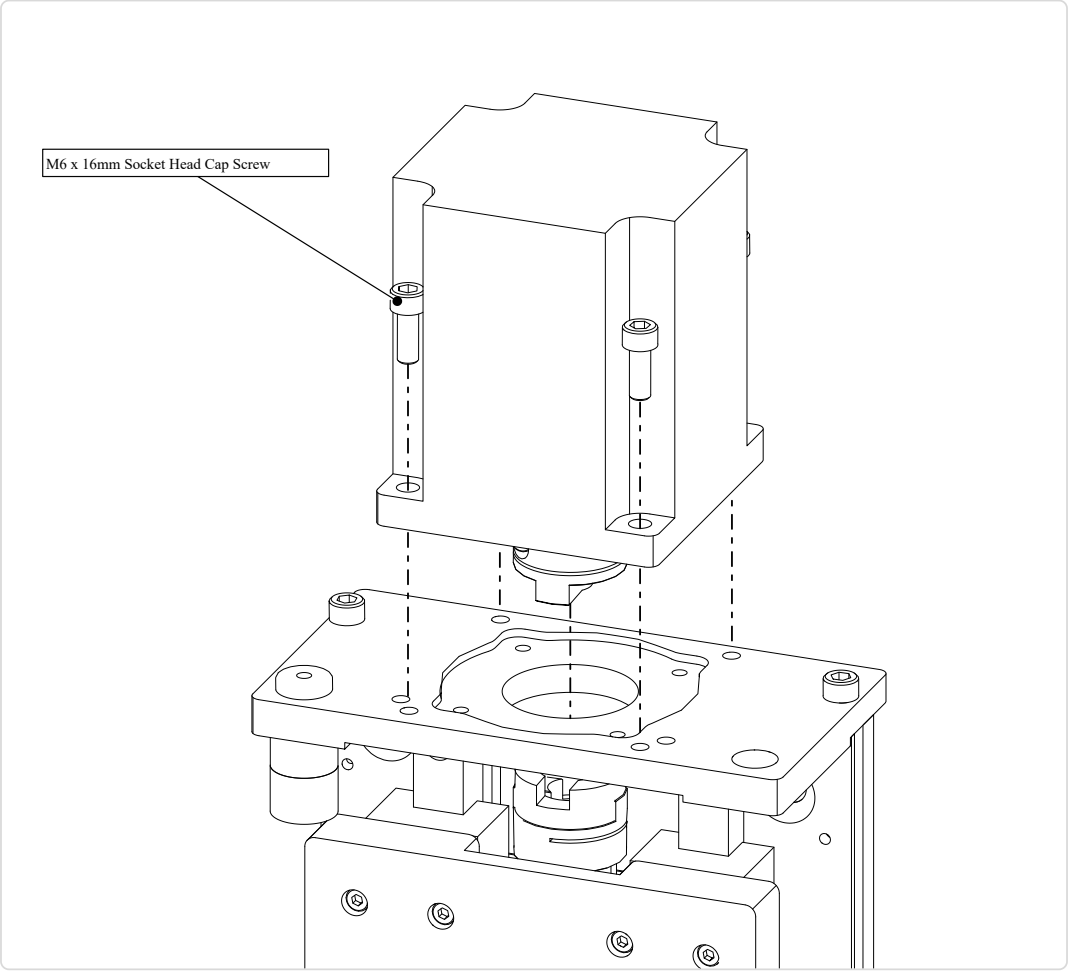
- Remove key from motor shaft.
- Install motor half of Oldham coupler on motor shaft as indicated.

5.2.2.2



- Position Oldham coupler to dimension shown.
- Tighten clamping screw.

5.2.2.3

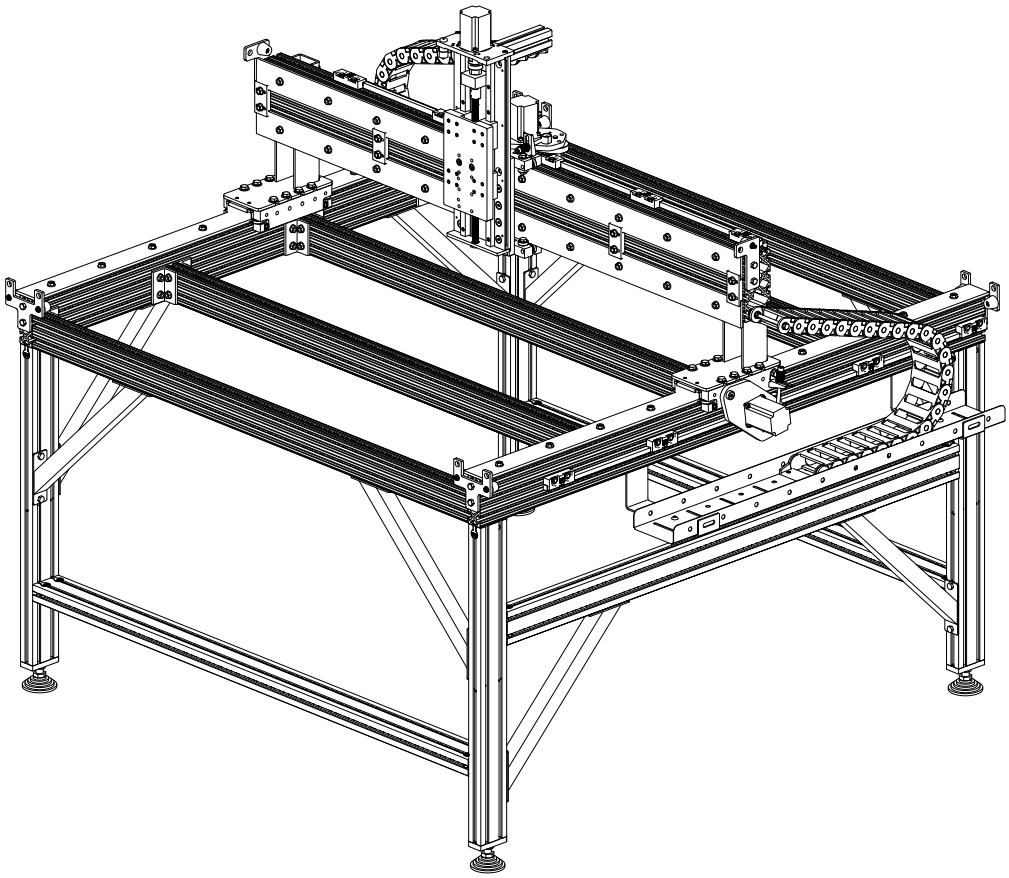


- Install motor on Z-Axis as indicated.

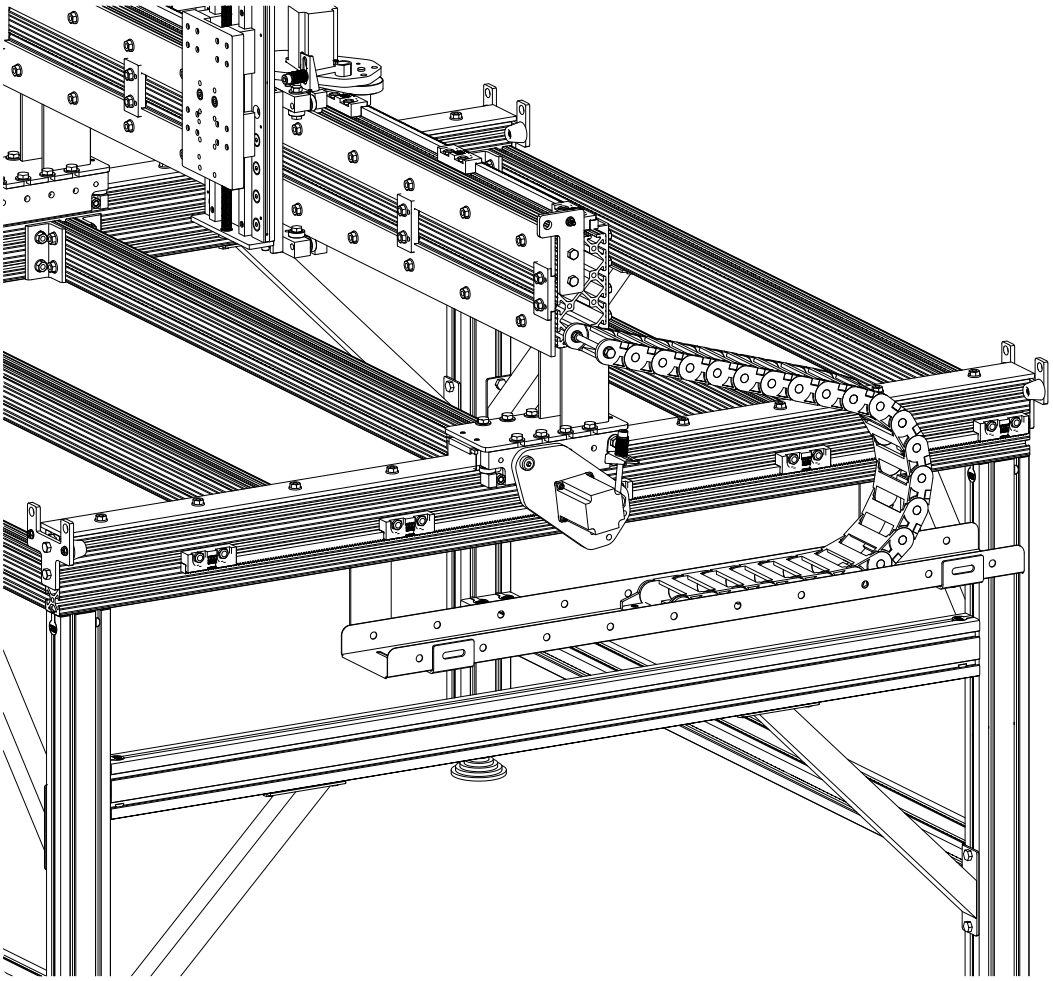
Assembly Note

Align motor half of Oldham coupler with Oldham coupler on Z-Axis ACME screw.

Section 6: Cable Track Assembly



6.1 Table Cable Track



Section Note

The leg kit is not shown in some figures for illustrative purposes.

Parts and Tools Required

The following bags and parts will be used in this section:

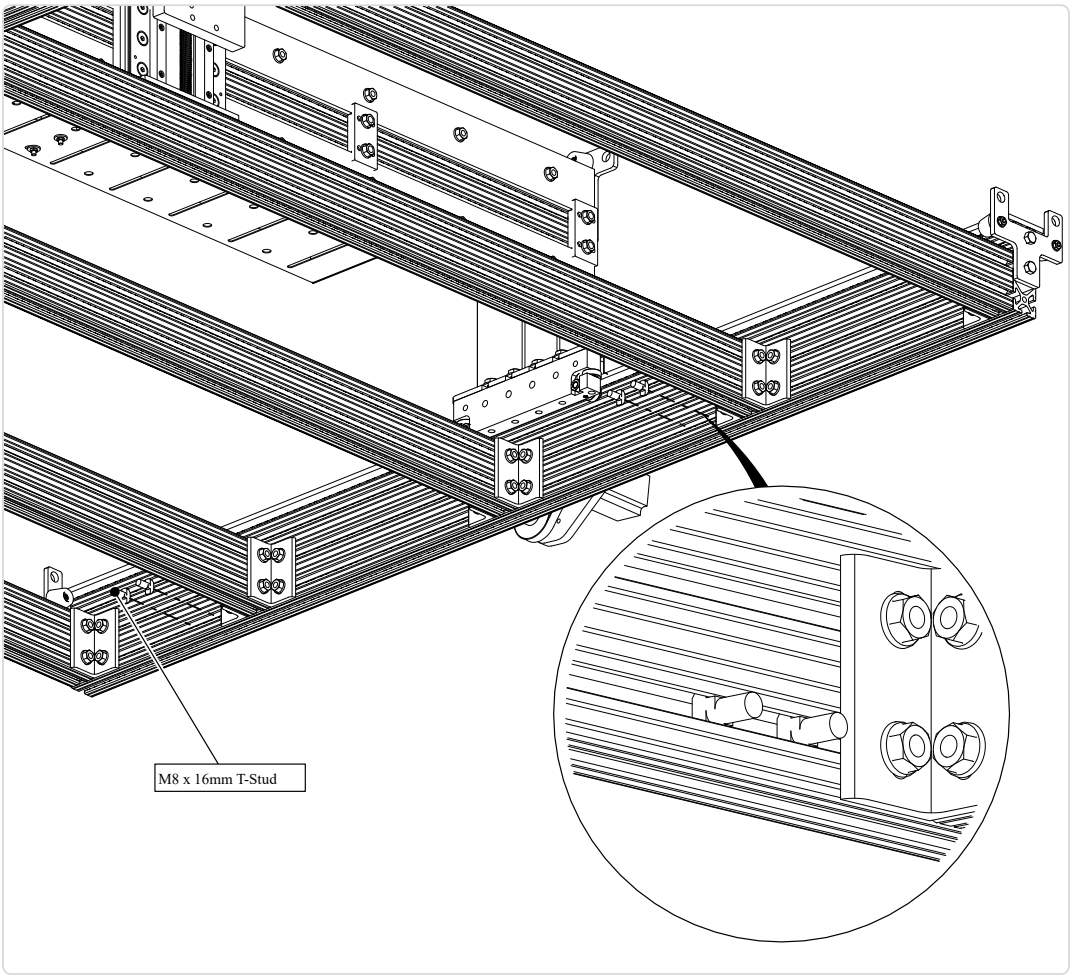
- (2) CRP150-07 Cable Tray Bracket
- (1) QT40x125B Cable Track Tray
- (1) 75mm Cable Track Section
- (1) CT-TRAY-TABLE-17.2
    - (4) M8 x 16mm T-Stud
    - (4) M8 x 16mm Button Head Cap Screw
    - (8) M8 Hex Flange Nut
- (1) CT-FAST-17.2
    - (1) 5/16-18 x 5" Hex Cap Screw
    - (5) M8 Washer
    - (4) 5/16-18 Hex Jam Nut
    - (2) M5 x 16mm Flat Head Cap Screw
    - (2) M5 Hex Nut
    - (2) M5 Flat Washer

The following tools will be used in this section:

- 3mm Allen Wrench
- 5mm Allen Wrench
- 13mm Combination Wrench
- 1/2" Combination Wrench
- Tape Measure

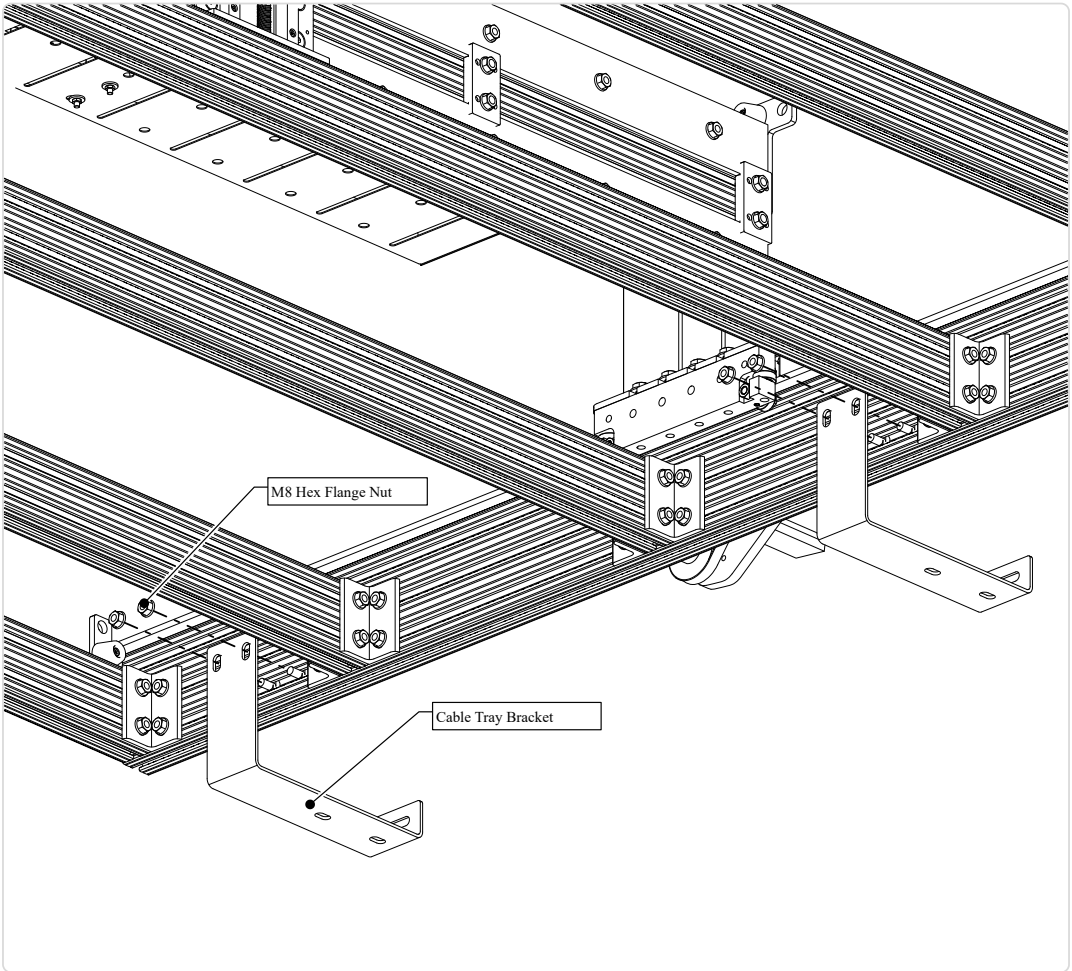
6.1.1 Cable Track Tray Installation

6.1.1.1



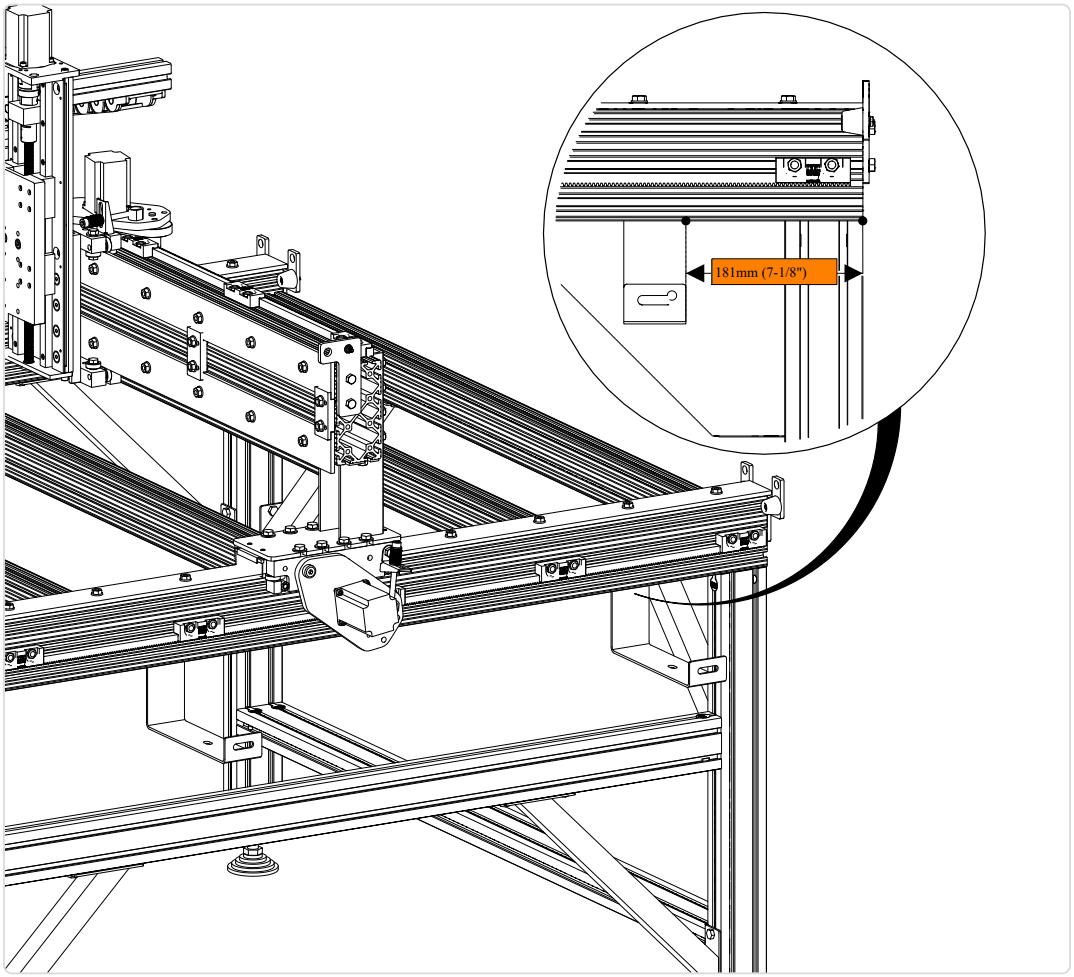
- Insert (4) T-Studs into the lower slot of table extrusion as indicated.

6.1.1.2



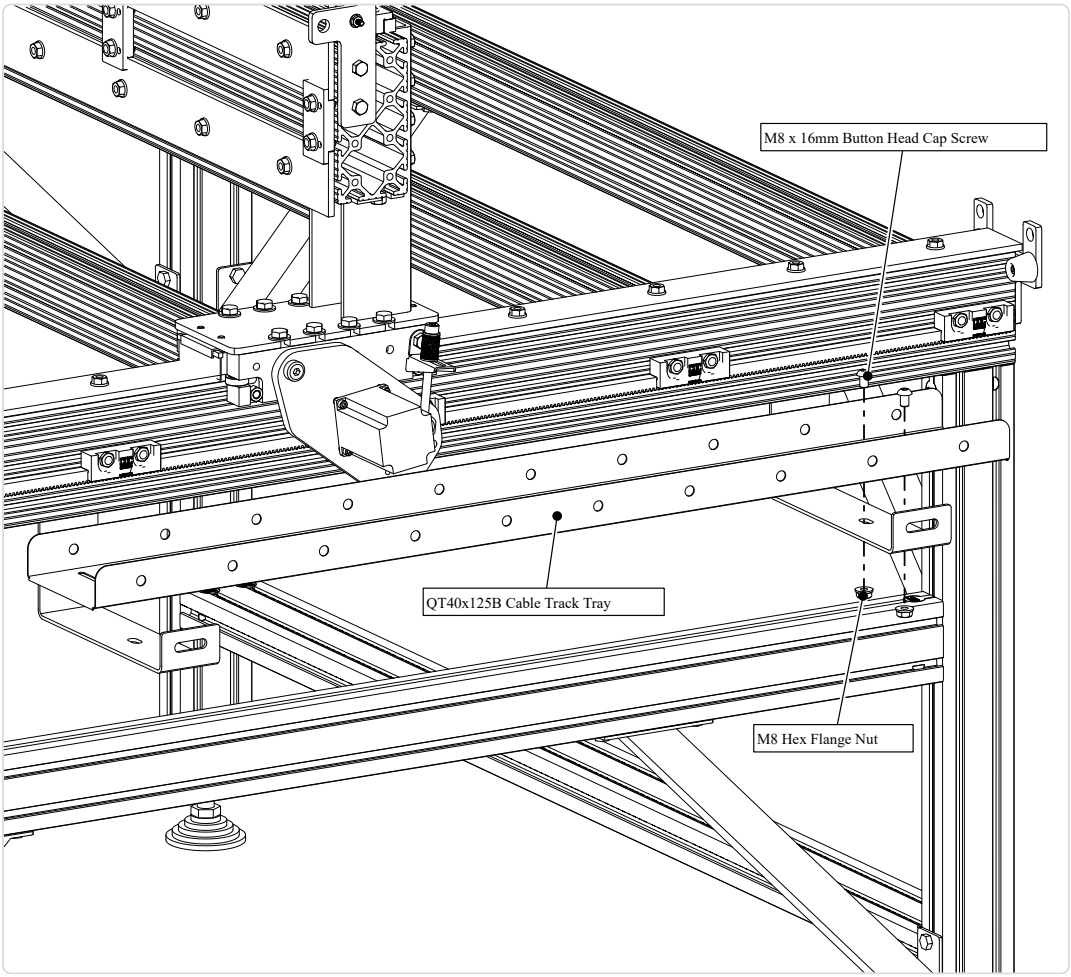
- Attach Cable Tray Brackets as indicated.
- Partially tighten fasteners.

6.1.1.3



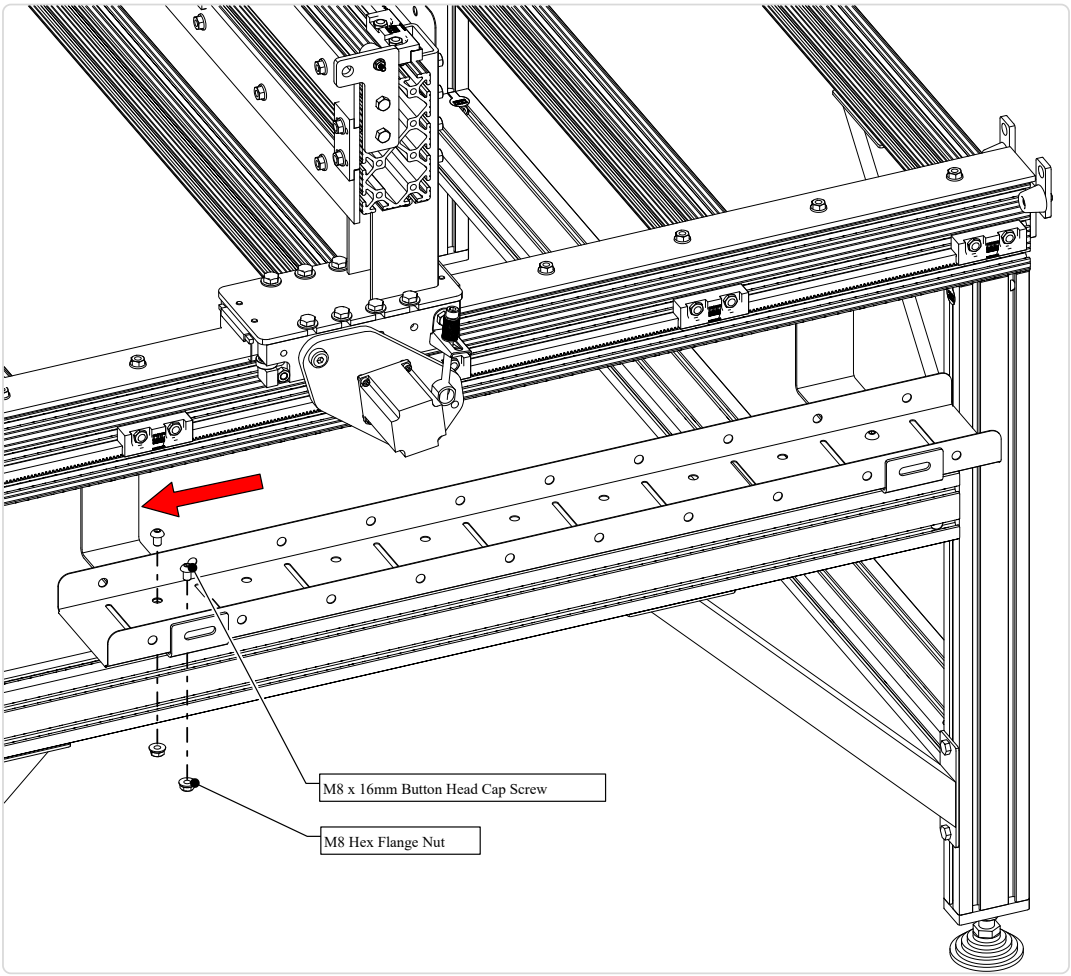
- Position the rear bracket 181mm (7-1/8"") from the back of the table as indicated.

6.1.1.4



- Fasten cable track tray to the rear bracket as indicated.

6.1.1.5

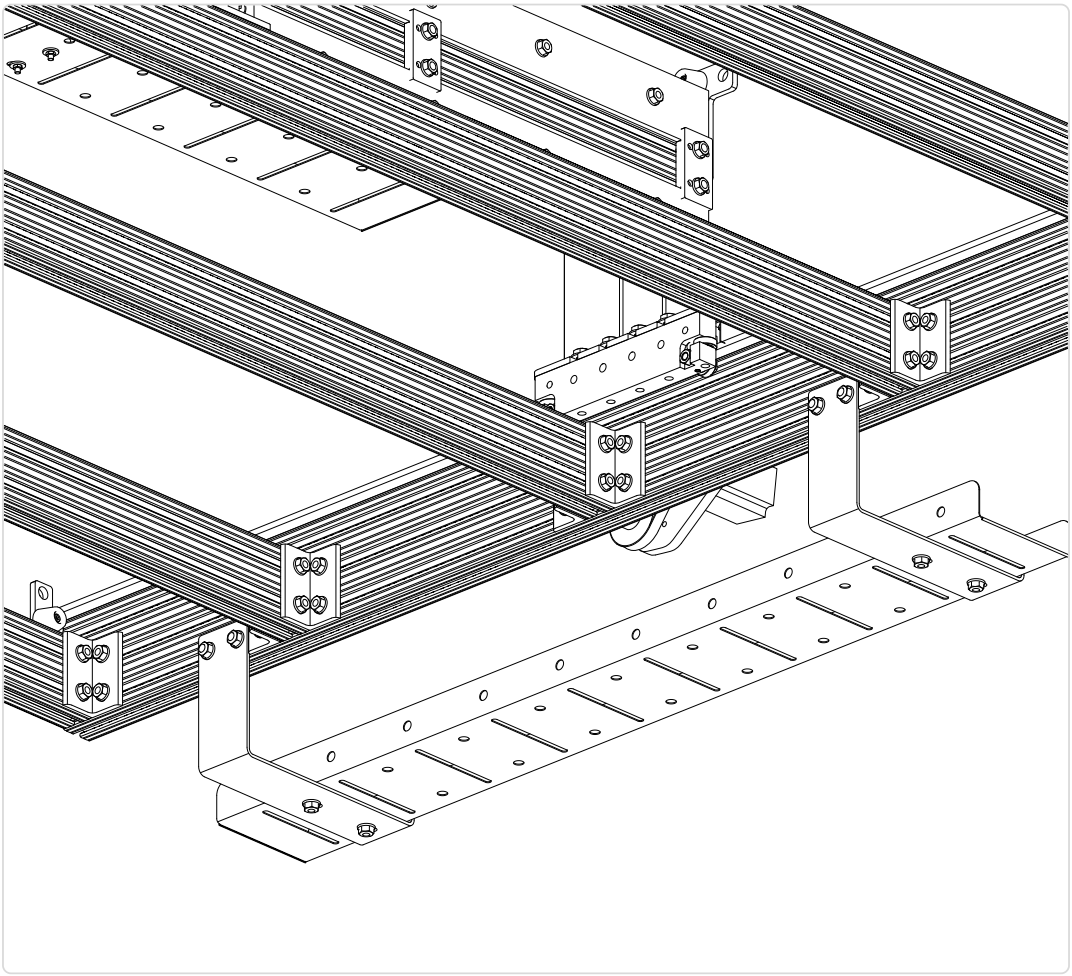


- Attach cable track tray to front bracket as indicated.

Assembly Note

Adjust position of front cable tray bracket to align with mounting holes of cable tray bracket as indicated.

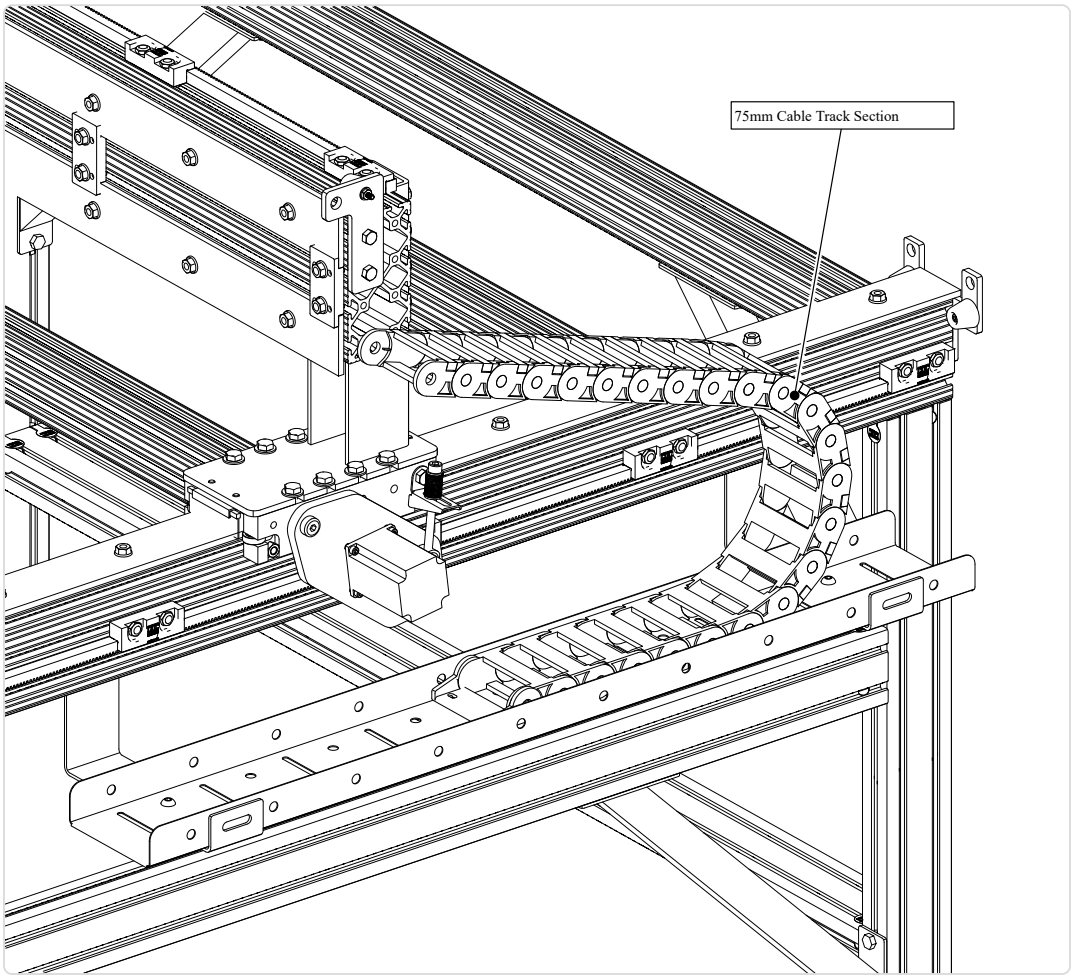
6.1.1.6



- Tighten fasteners attaching cable tray brackets to table extrusion.

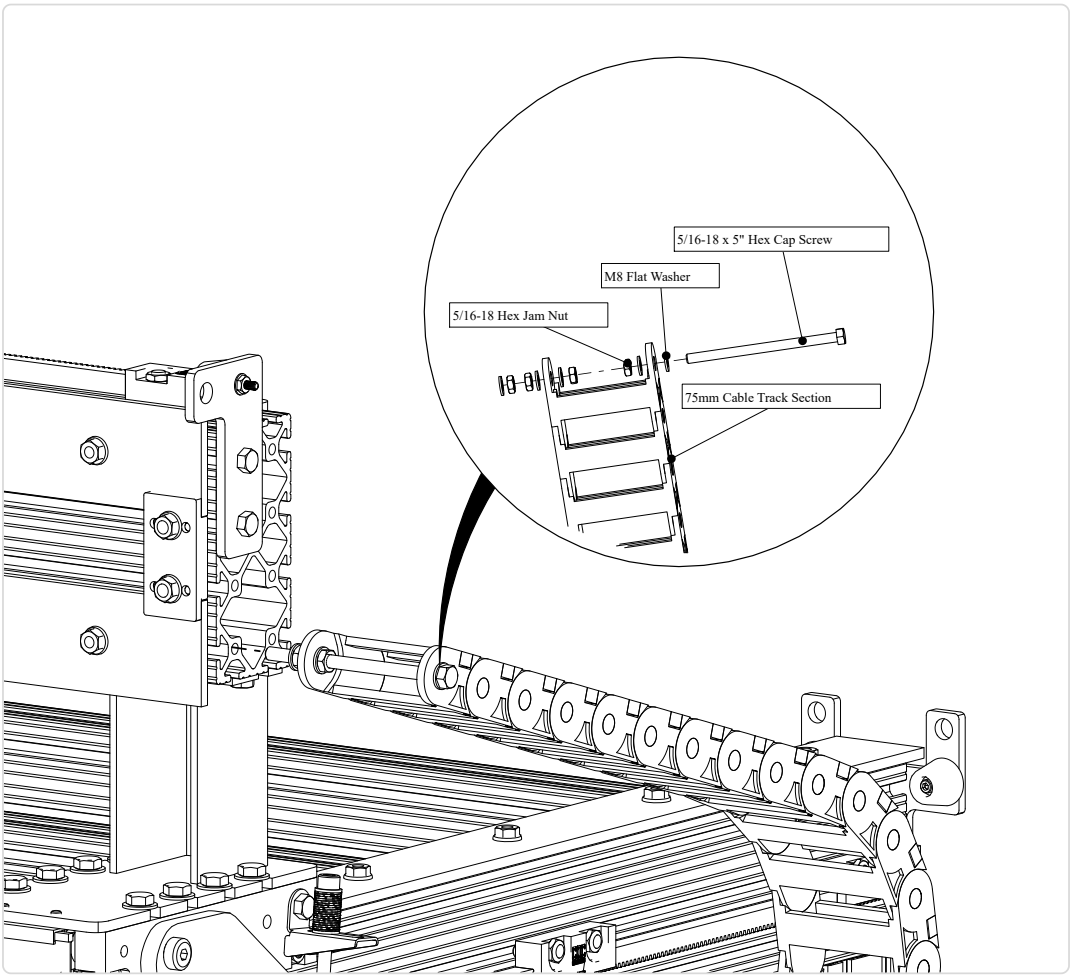
6.1.2 Cable Track Installation

6.1.2.1



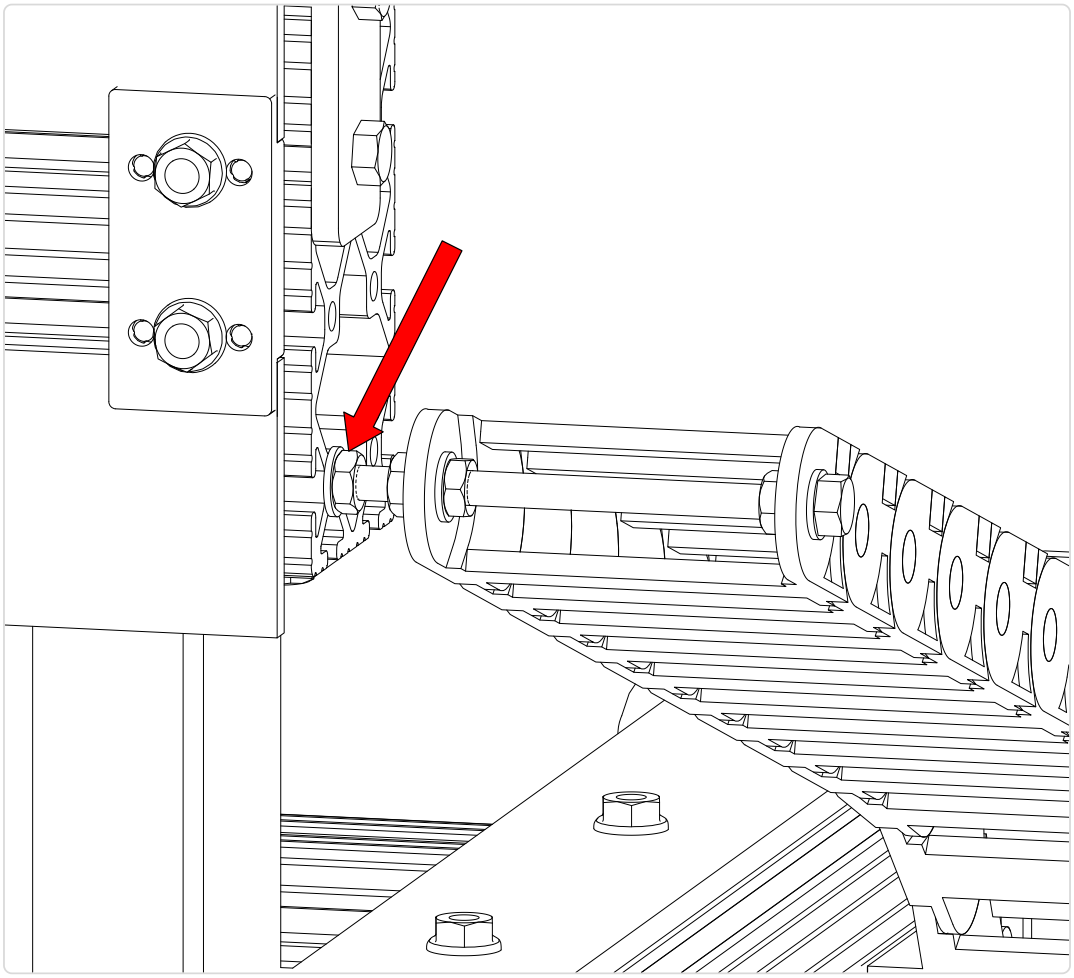
- Position 75mm Cable Track Section as indicated.

6.1.2.2



- Attach cable track to gantry extrusion as indicated.

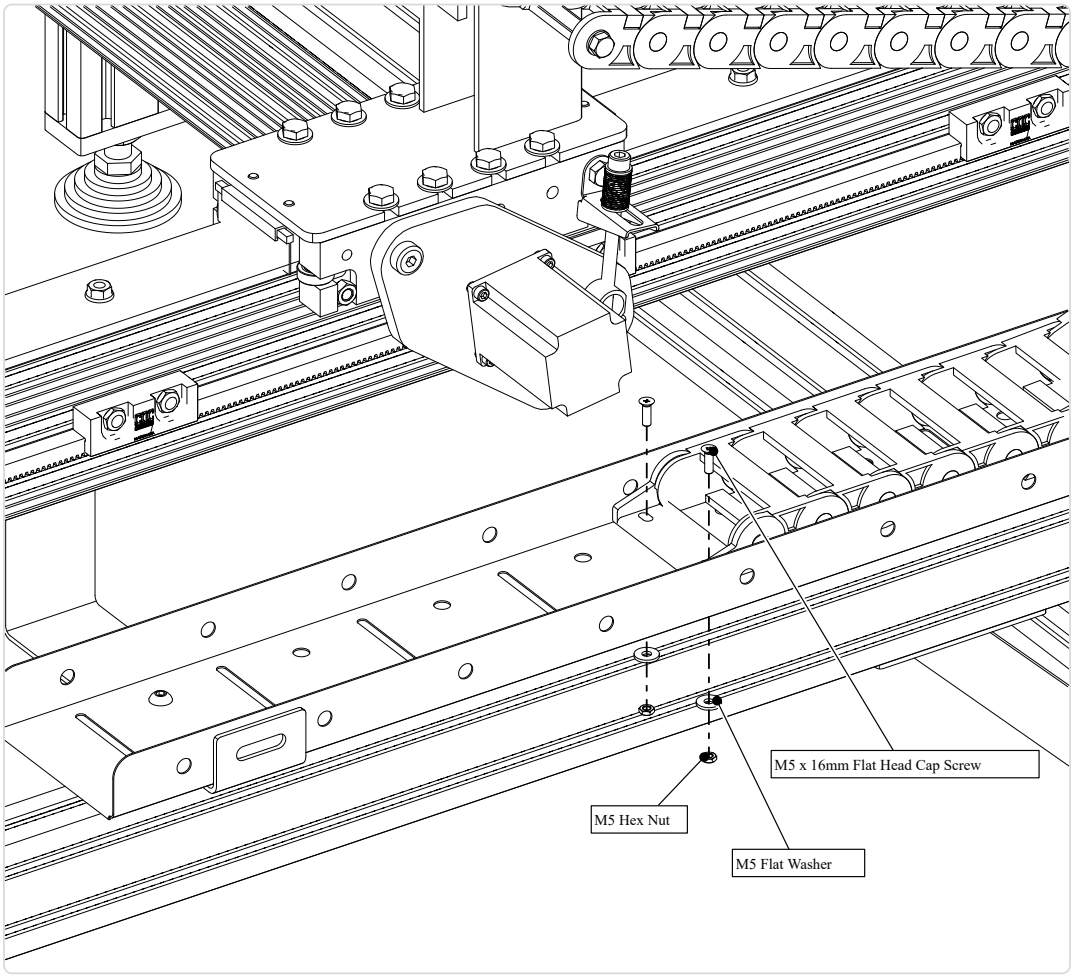
6.1.2.3



Assembly Note

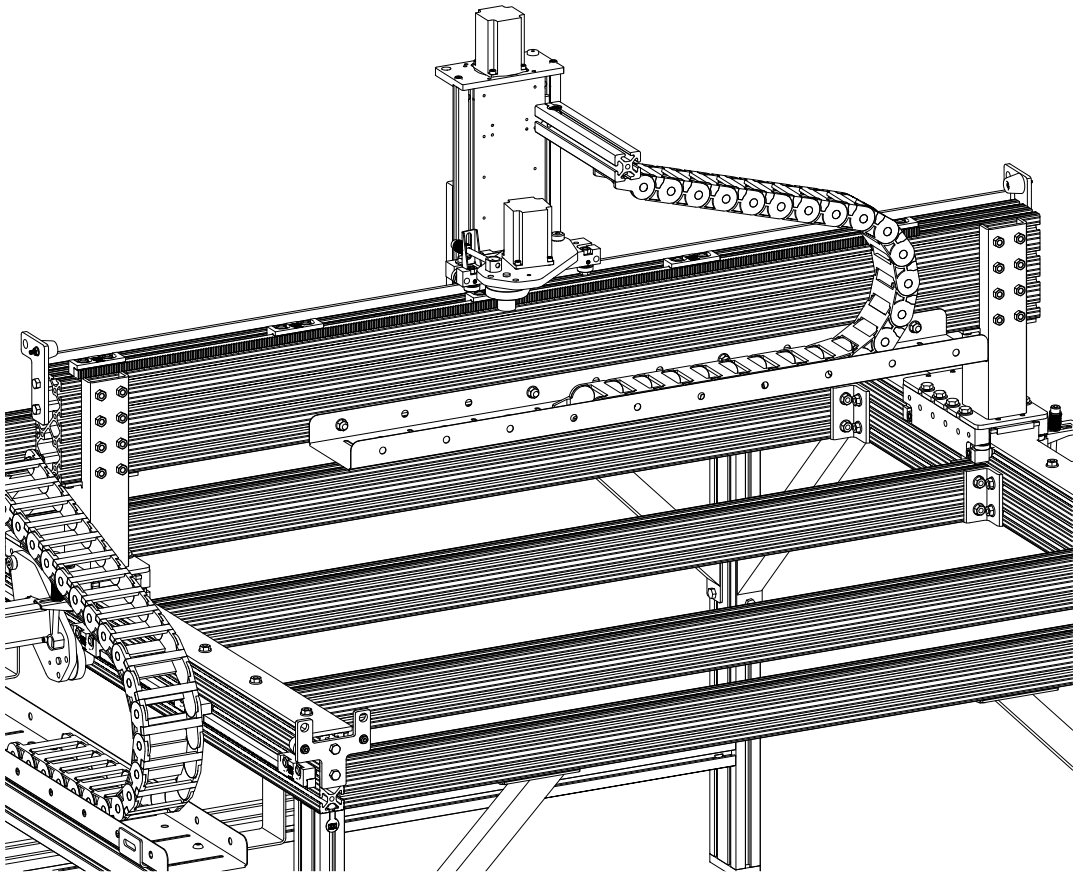
The cable track's horizontal offset can be adjusted with the 5/16-18 x 5" hex cap screw. Tighten the indicated jam nut following adjustment.

6.1.2.4



- Attach cable track to the cable track tray in the position indicated.

6.2 Gantry Cable Track



Parts and Tools Required

The following bags and parts will be used in this section:

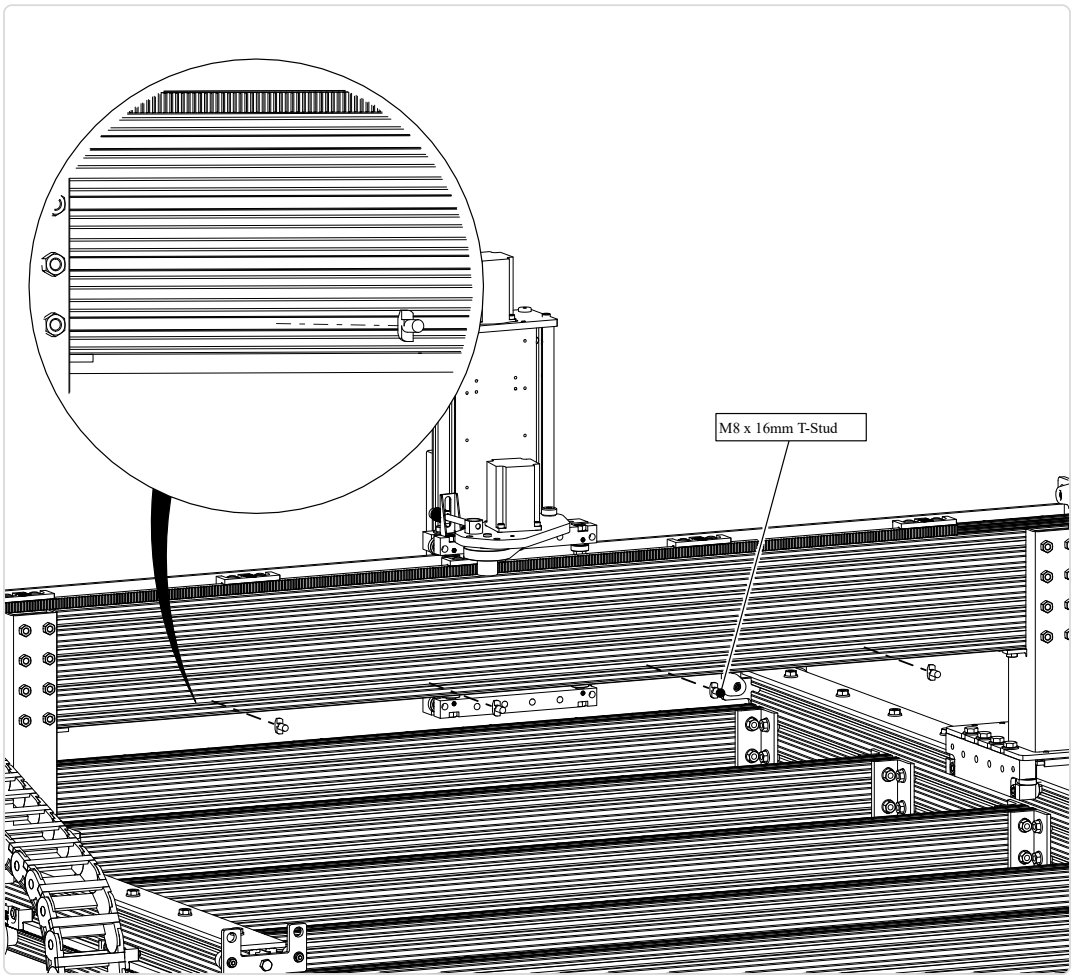
- (1) QT40x125B Cable Track Tray
- (1) 4040 CT Extrusion, 240mm (9-7/16")
- (1) 50mm Cable Track Section
- (1) CT-TRAY-GANTRY_FAST
    - (4) M8 x 16mm T-Stud
    - (4) M8 Hex Flange Nut
- (1) CT-FAST-17.2
    - (2) M8 Roll In T-Nut
    - (2) 40 Series Anchor Fastener
    - (2) M8 x 30mm Socket Head Cap Screw
    - (2) M5 Roll In T-Nut
    - (4) M5 x 16mm Flat Head Cap Screw
    - (2) M5 Hex Nut
    - (2) M5 Flat Washer

The following tools will be used in this section:

- 3mm Allen Wrench
- 6mm Allen Wrench
- 13mm Combination Wrench
- Tape Measure

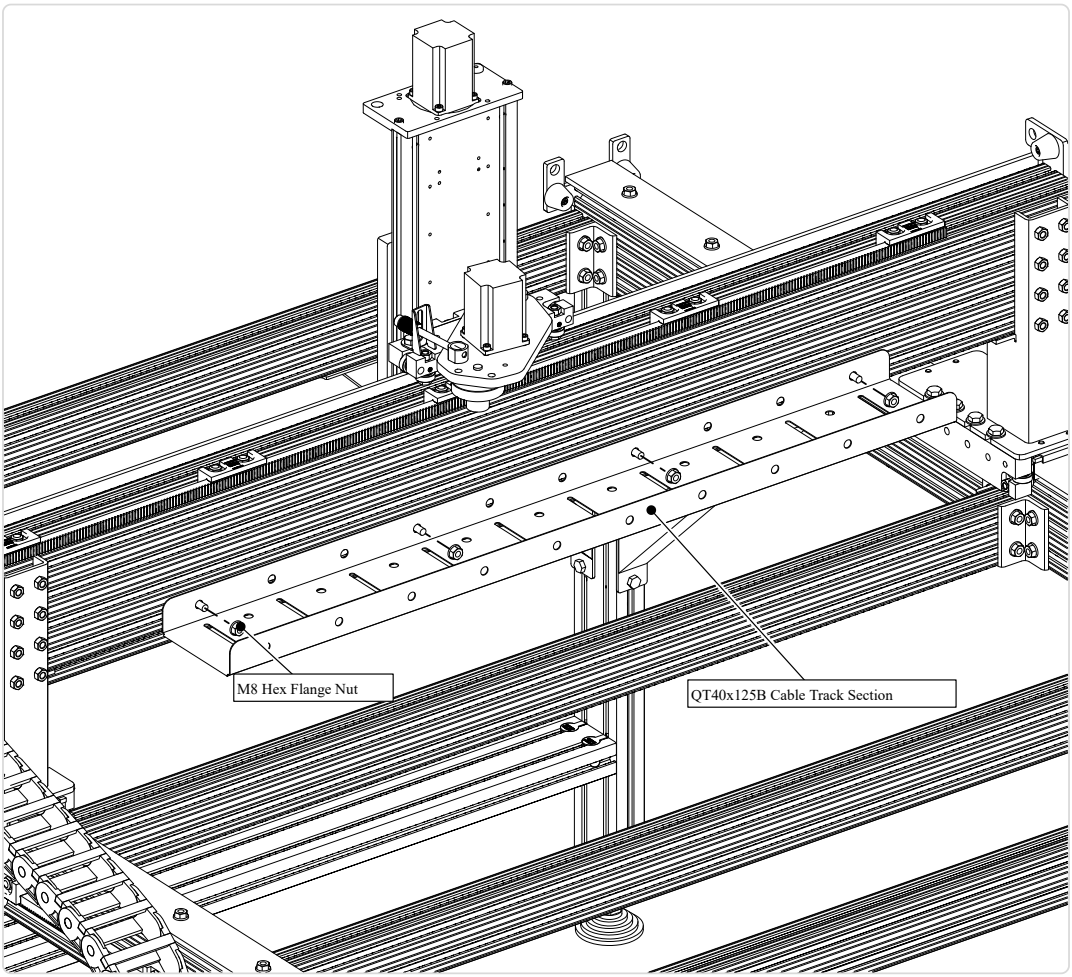
6.2.1 Cable Track Tray Installation

6.2.1.1



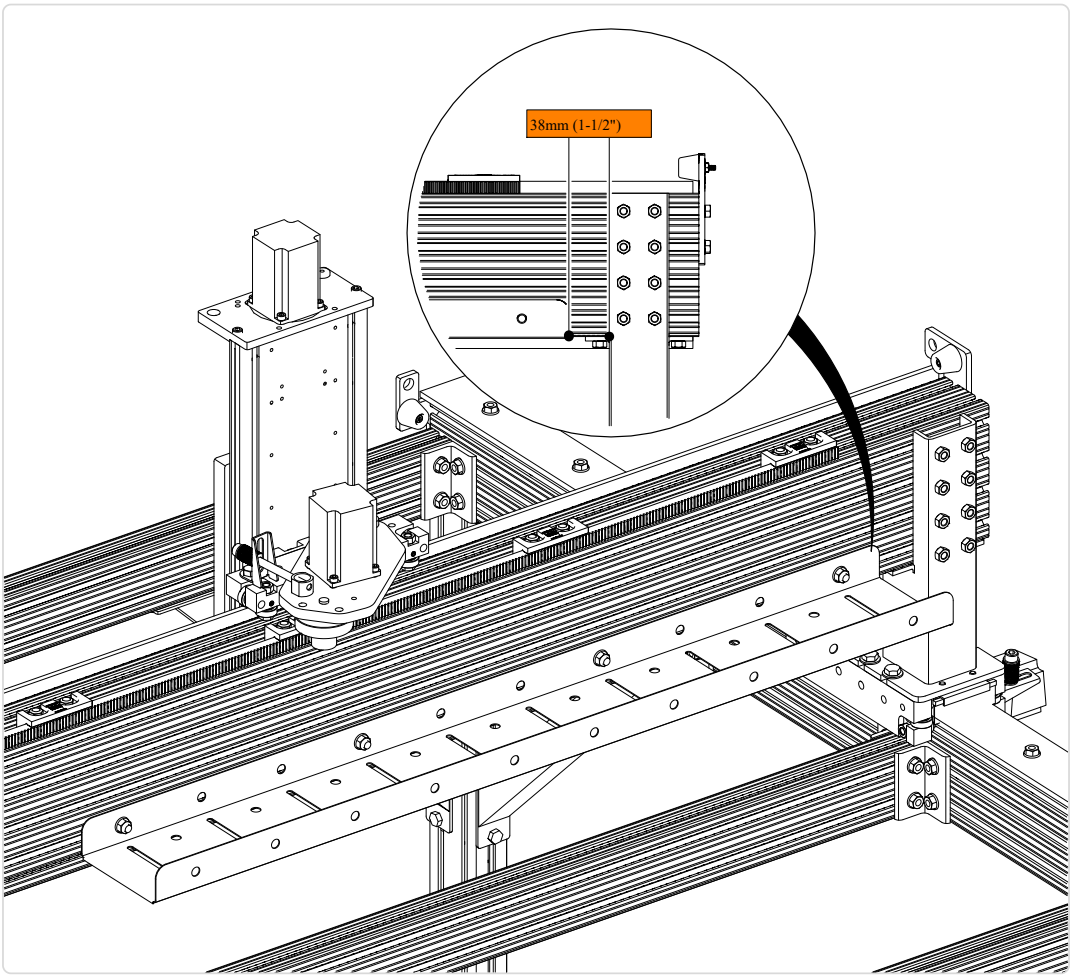
- Insert four T-Studs into the bottom slot on the gantry extrusion as indicated.

6.2.1.2



- Attach the gantry Cable Track Tray as indicated.
- Partially tighten fasteners.

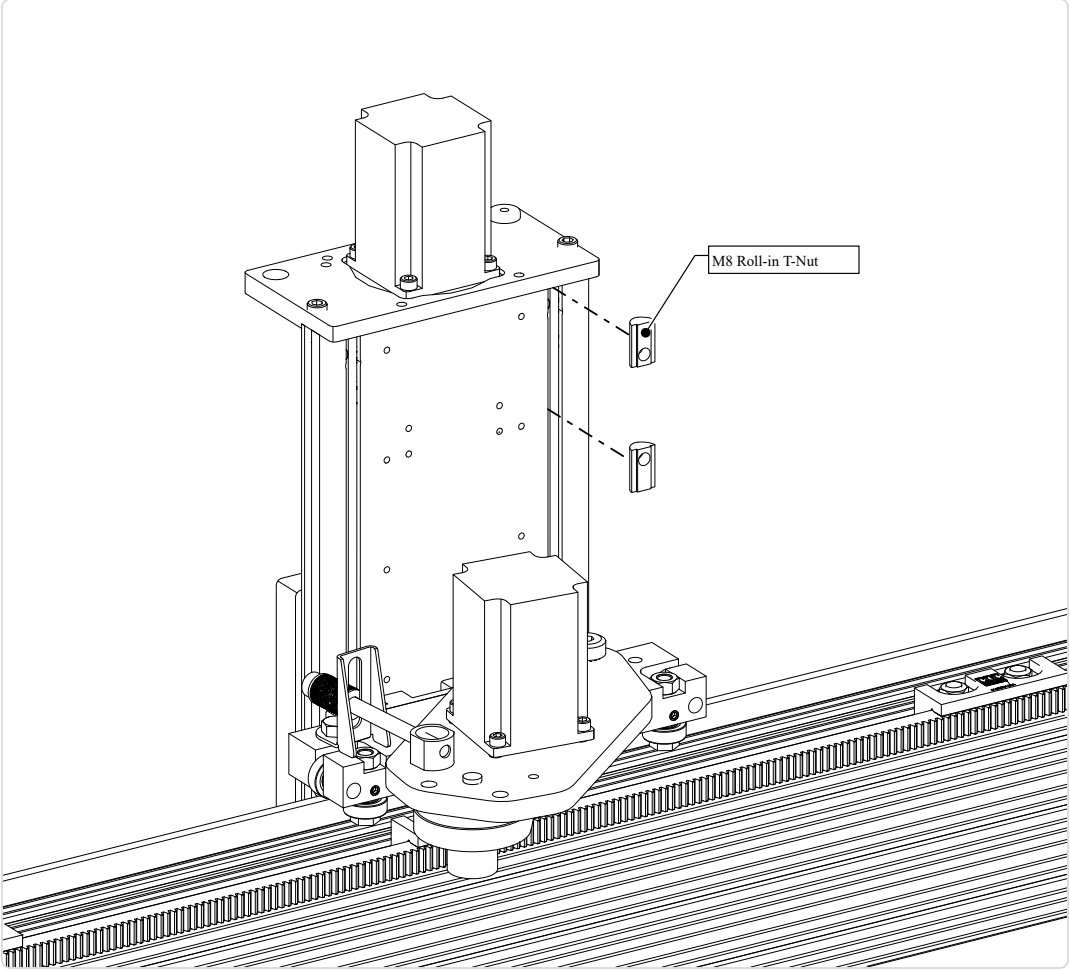
6.2.1.3



- Position cable track tray to dimension shown and tighten cable track tray fasteners.

6.2.2 Cable Track Extrusion Installation

6.2.2.1

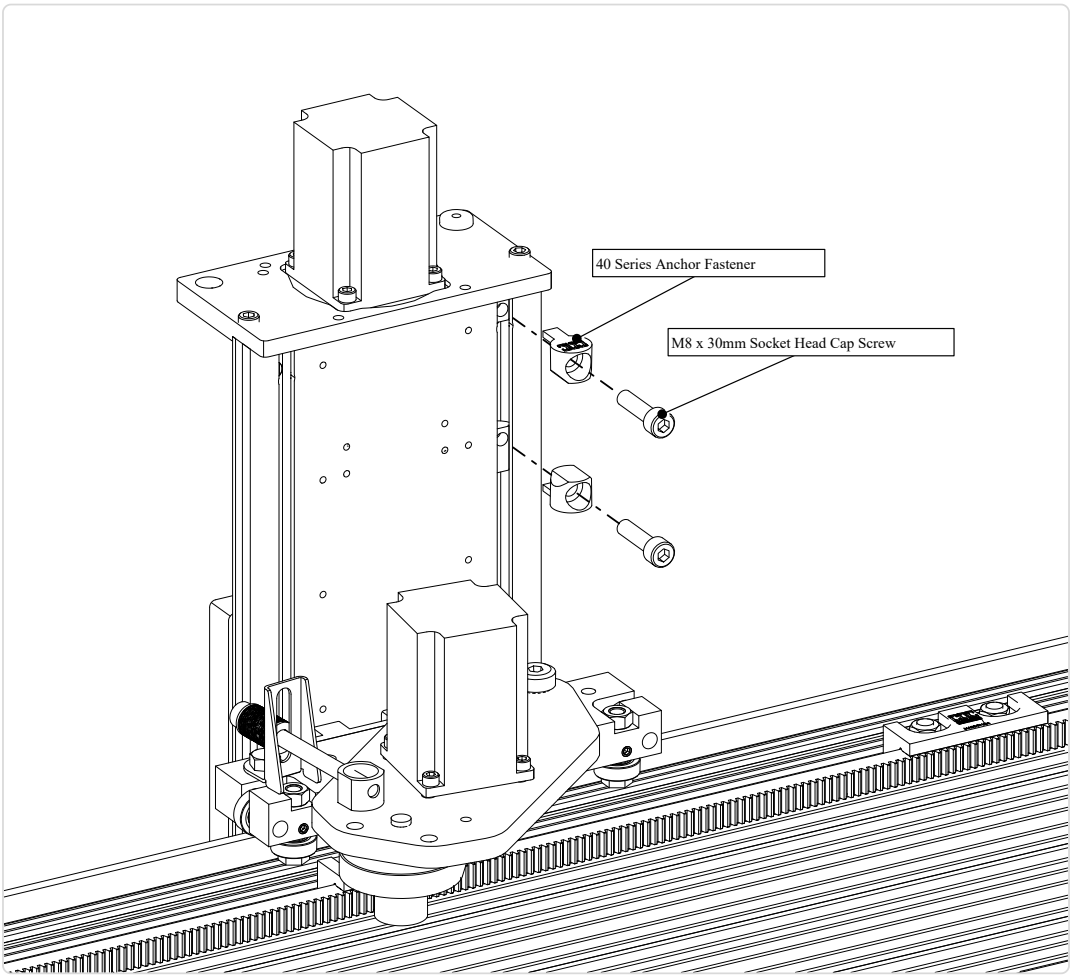


- Insert Roll-in T-Nuts into the back of Z-Axis as indicated.

Assembly Note

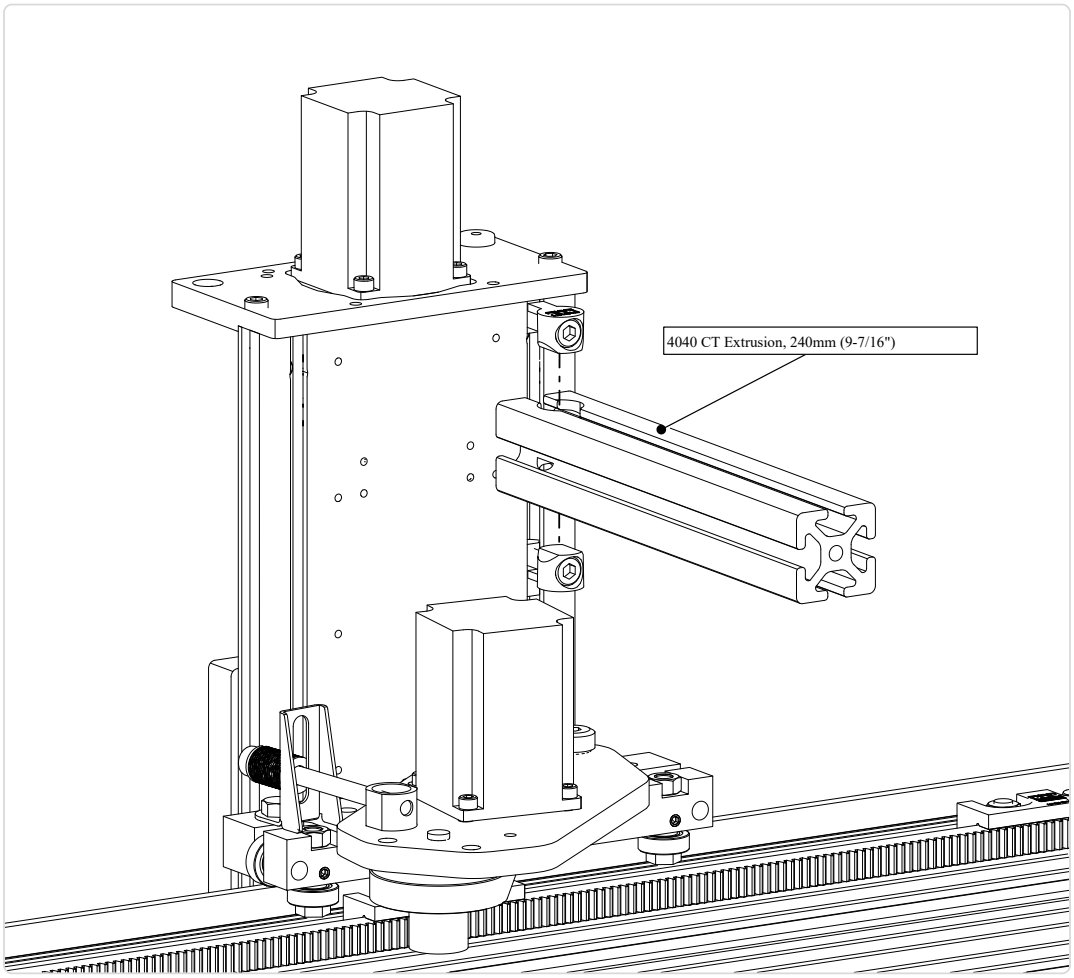
Take care when installing Roll-in T-Nuts to prevent them from sliding down the extrusion slot.

6.2.2.2



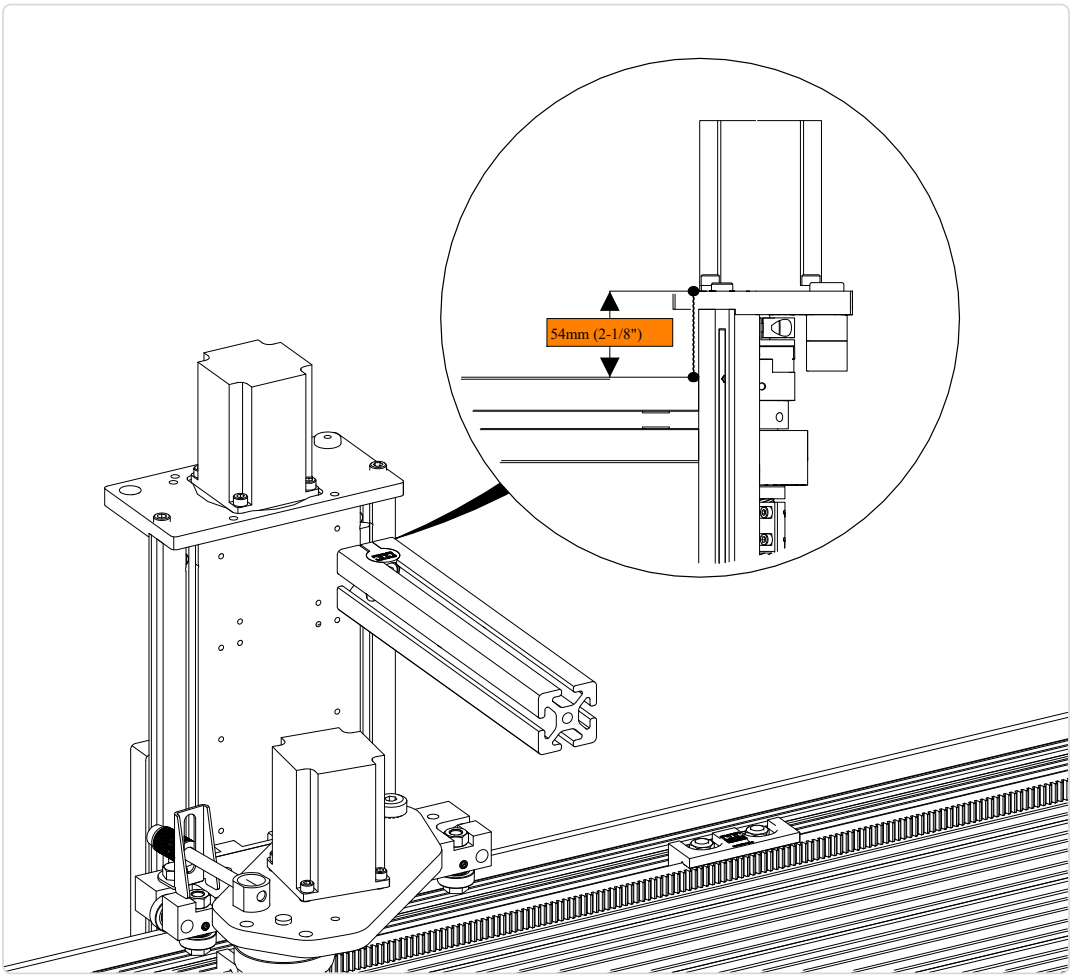
- Assemble anchor fasteners as indicated.

6.2.2.3



- Slide anchor fasteners into the 240mm (9-7/16") 4040 CT Extrusion as indicated.

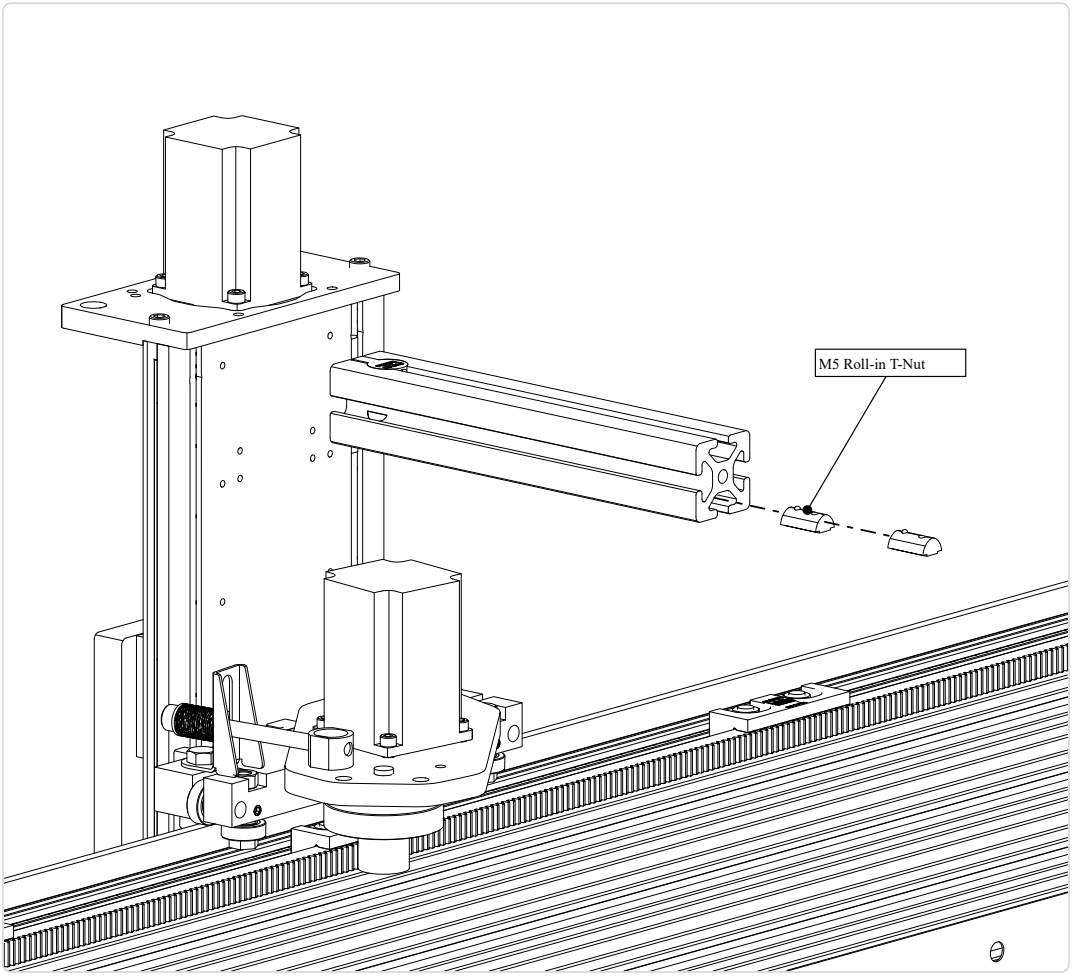
6.2.2.4



- Position the CT extrusion 54mm (2-1/8") from the top of the Z-Axis as indicated.
- Tighten the anchor fasteners.

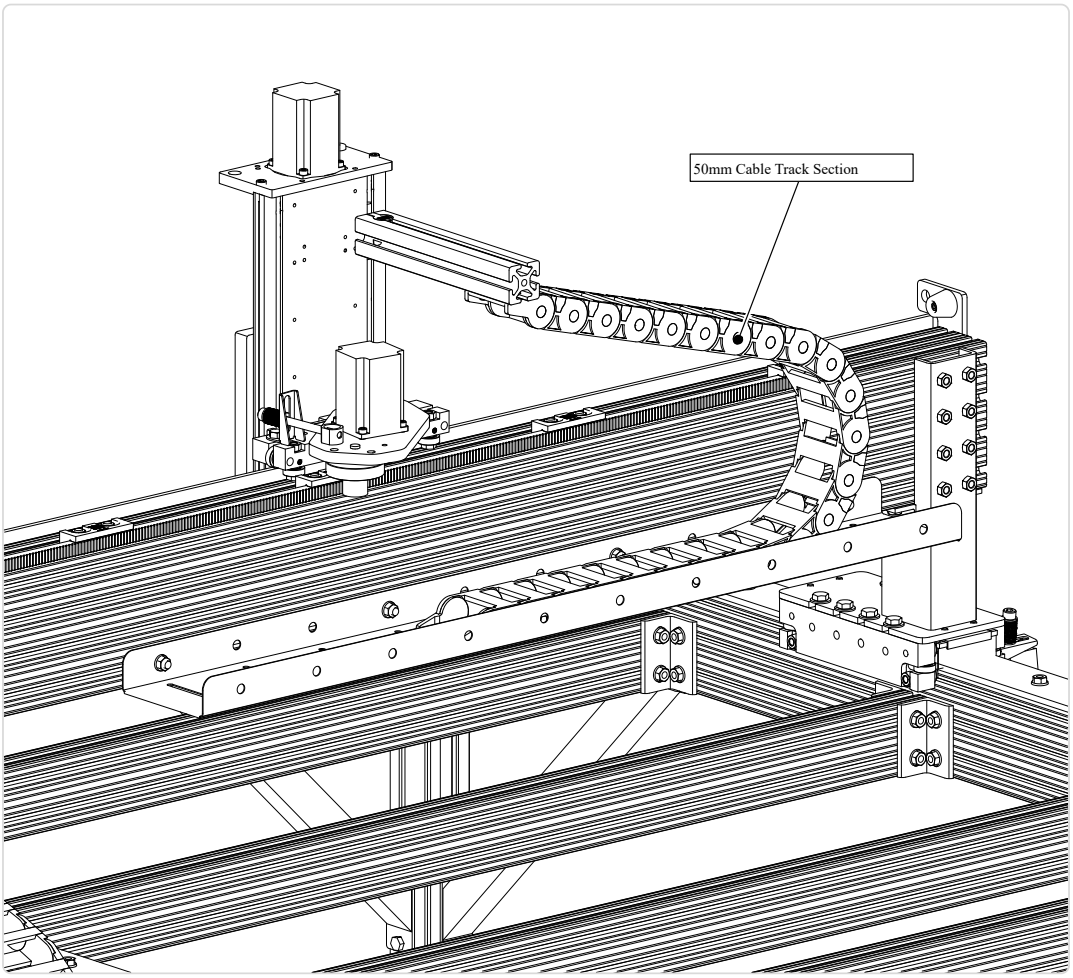
6.2.3 Cable Track Installation

6.2.3.1



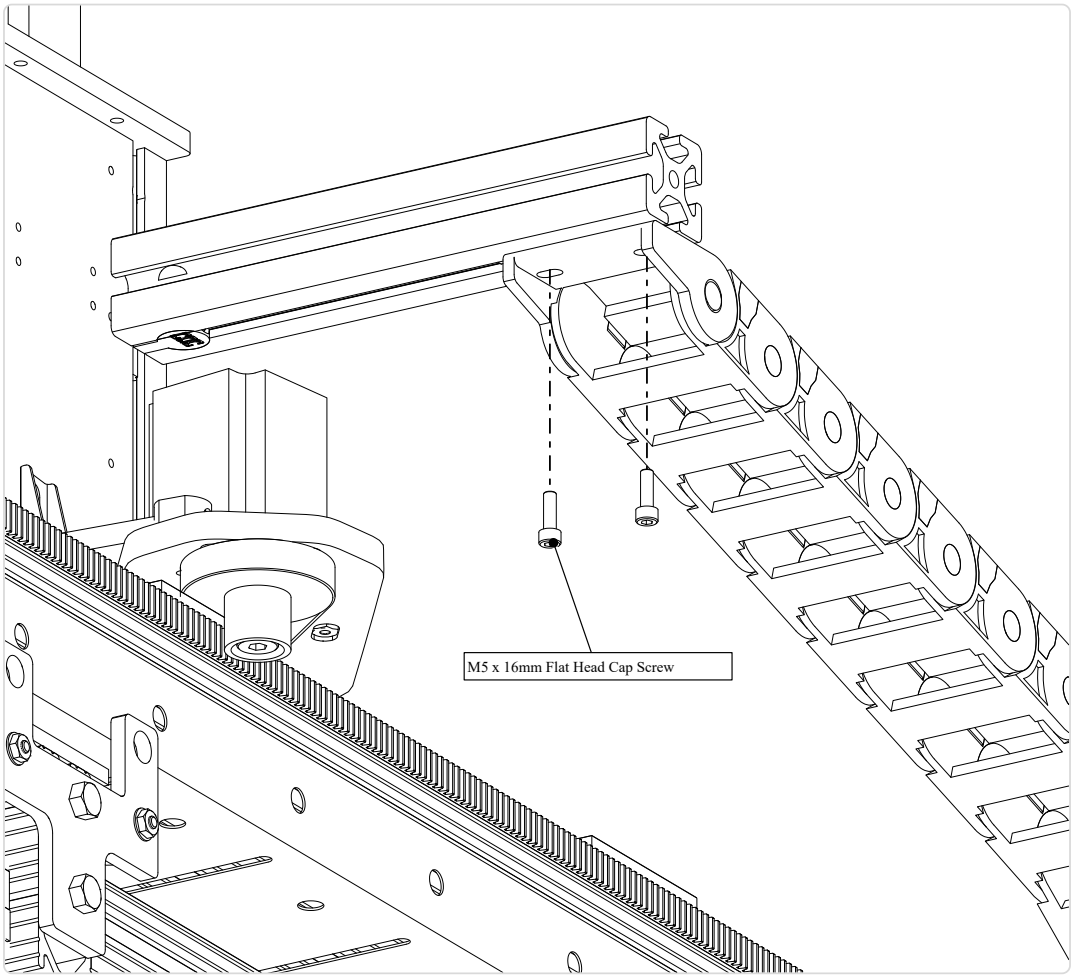
- Slide two M5 Roll-in T-Nuts into the CT extrusion as indicated.

6.2.3.2



- Position the 50mm Cable Track Section as indicated.

6.2.3.3

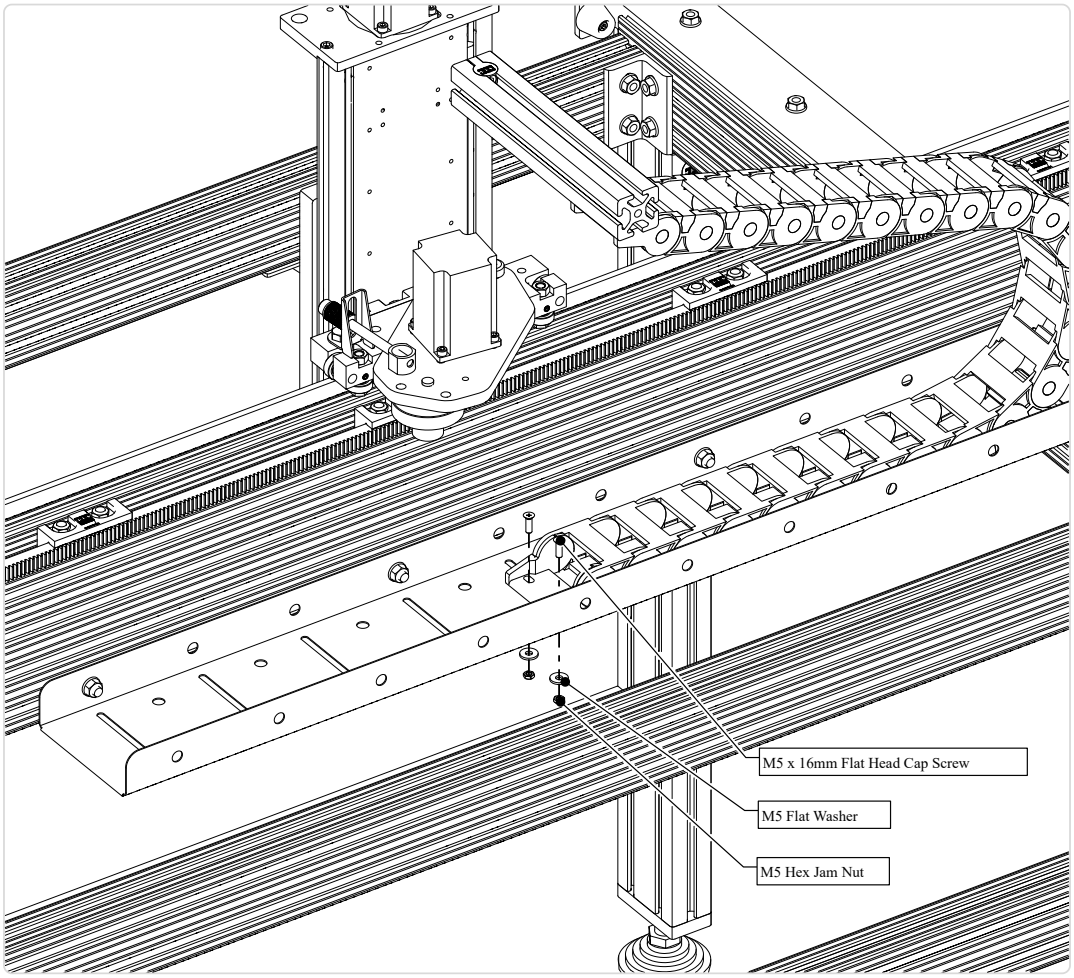


- Fasten cable track to the CT extrusion as indicated.

Assembly Note

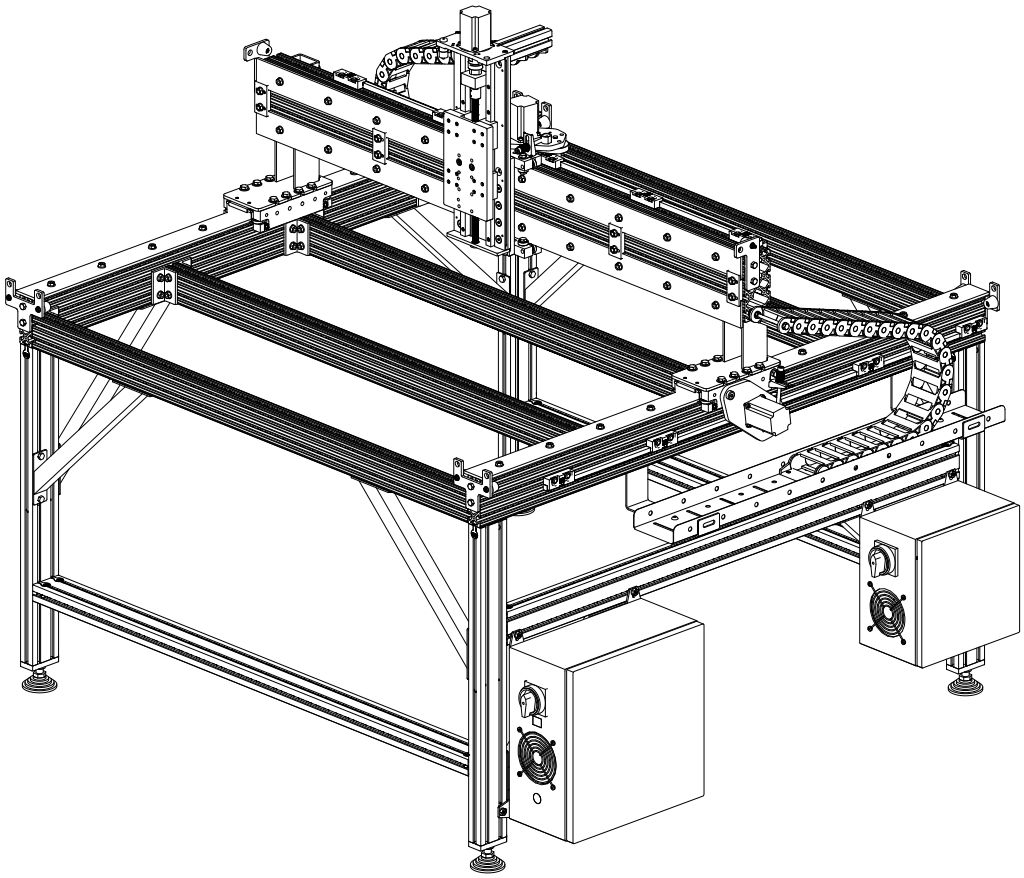
Begin with the Cable Track flush with the end of the CT extrusion as shown. This position can be adjusted to provide adequate clearance during machine operation.

6.2.3.4



- Fasten cable track to the cable track tray in the indicated position.

Section 7: Motor and Sensor Connections

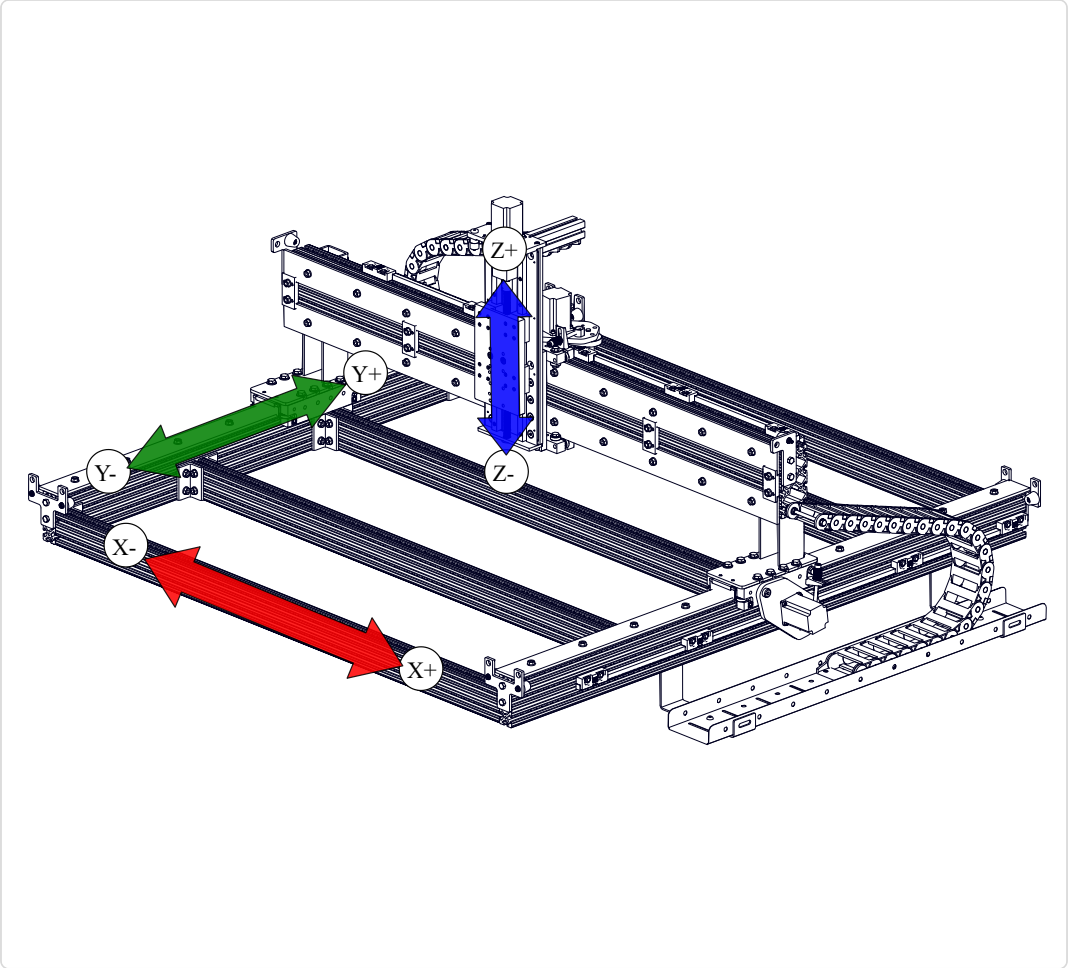


Axis Nomenclature Update (April 2021)

The nomenclature used to describe the dual-driven Y axis changed in April 2021 to "Y1" axis and "Y2" axis. If you purchased your Plug and Play CNC Control System prior to this, refer to the **Plug and Play CNC Control System Previous Revision** notes throughout this section. These will provide instructions that match the motor and sensor labels on your control box.

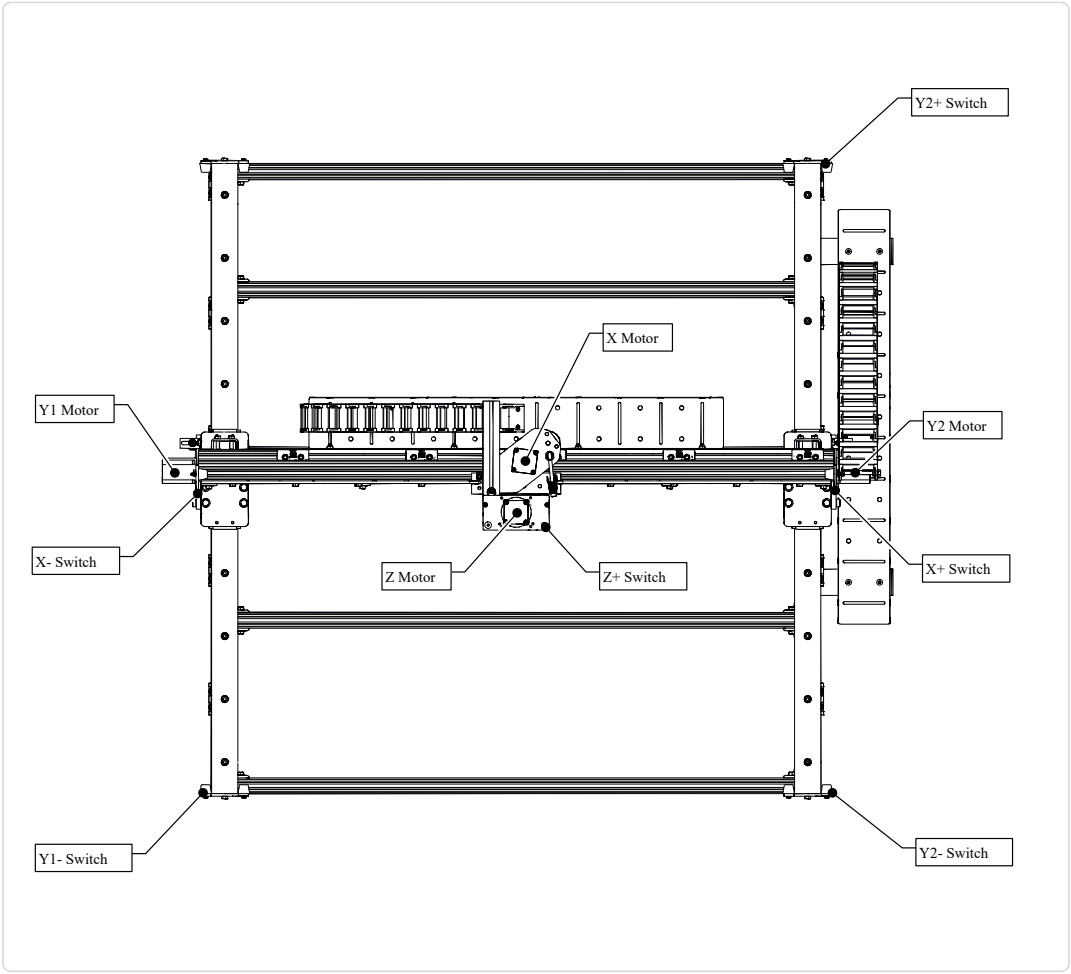
7.1 Wiring Diagrams

7.1.1.1



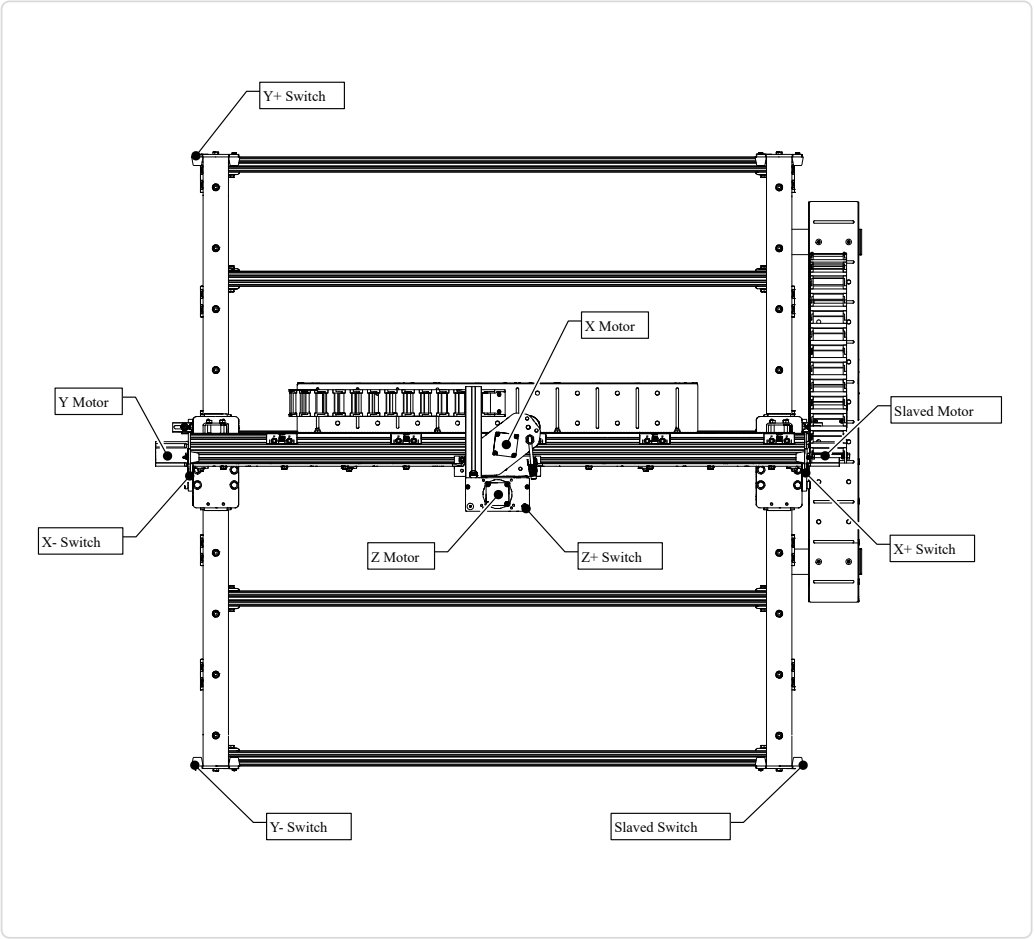
- This figure depicts the appropriate axes and sign convention to correspond with Avid CNC's version of Mach4 CNC control software.

7.1.1.2



Plug and Play CNC Control System Previous Revision

Plug and Play CNC Control Systems purchased prior to April 2021 use the nomenclature shown below for motors and proximity limit switches.



7.2 Cable Routing

7.2.1.1

Cable Routing Paths

Motor/Sensor Cable	Routing Path
Y1- Switch	Directly to Electrical Box
Y2+ Switch	Directly to Electrical Box
Y2- Switch	Directly to Electrical Box
Y1 Motor	Through Gantry Extrusion and Table Cable Track
X- Switch	Through Gantry Extrusion and Table Cable Track
X Motor	Through Gantry Cable Track and Table Cable Track
Z Motor	Through Gantry Cable Track and Table Cable Track
Z+ Switch	Through Gantry Cable Track and Table Cable Track
Y2 Motor	Through Table Cable Track
X+ Switch	Through Table Cable Track

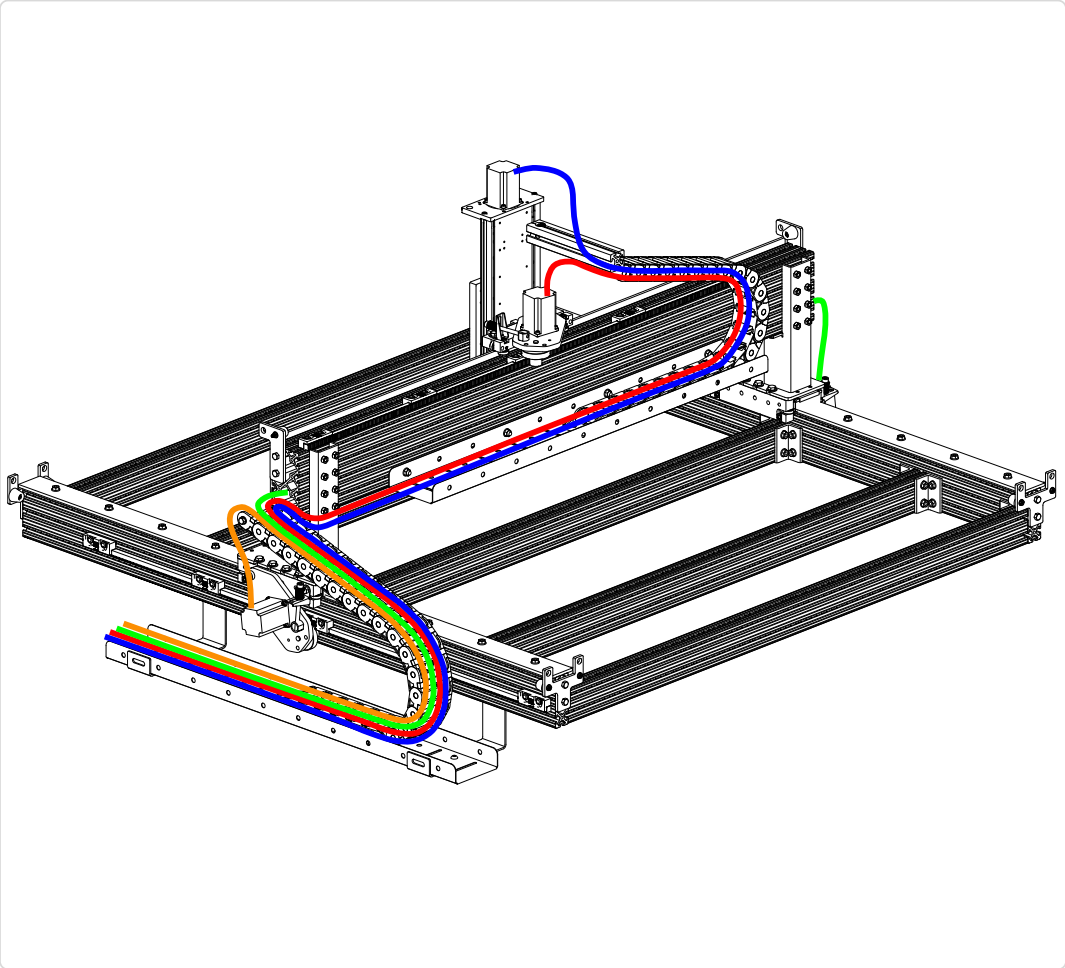
Plug and Play CNC Control System Previous Revision

Plug and Play CNC Control Systems purchased prior to April 2021 use the nomenclature shown below for cable routing paths.

Cable Routing Paths

Motor/Sensor Cable	Routing Path
Y- Switch	Directly to Electrical Box
Y+ Switch	Directly to Electrical Box
Slaved Switch	Directly to Electrical Box
Y Motor	Through Gantry Extrusion and Table Cable Track
X- Switch	Through Gantry Extrusion and Table Cable Track
X Motor	Through Gantry Cable Track and Table Cable Track
Z Motor	Through Gantry Cable Track and Table Cable Track
Z+ Switch	Through Gantry Cable Track and Table Cable Track
Slaved Motor	Through Table Cable Track
X+ Switch	Through Table Cable Track

7.2.1.2



Motor Cables

Axis	Color	Length
X	Red	20'
Y1	Green	20'
Z	Blue	20'
Y2	Orange	12'

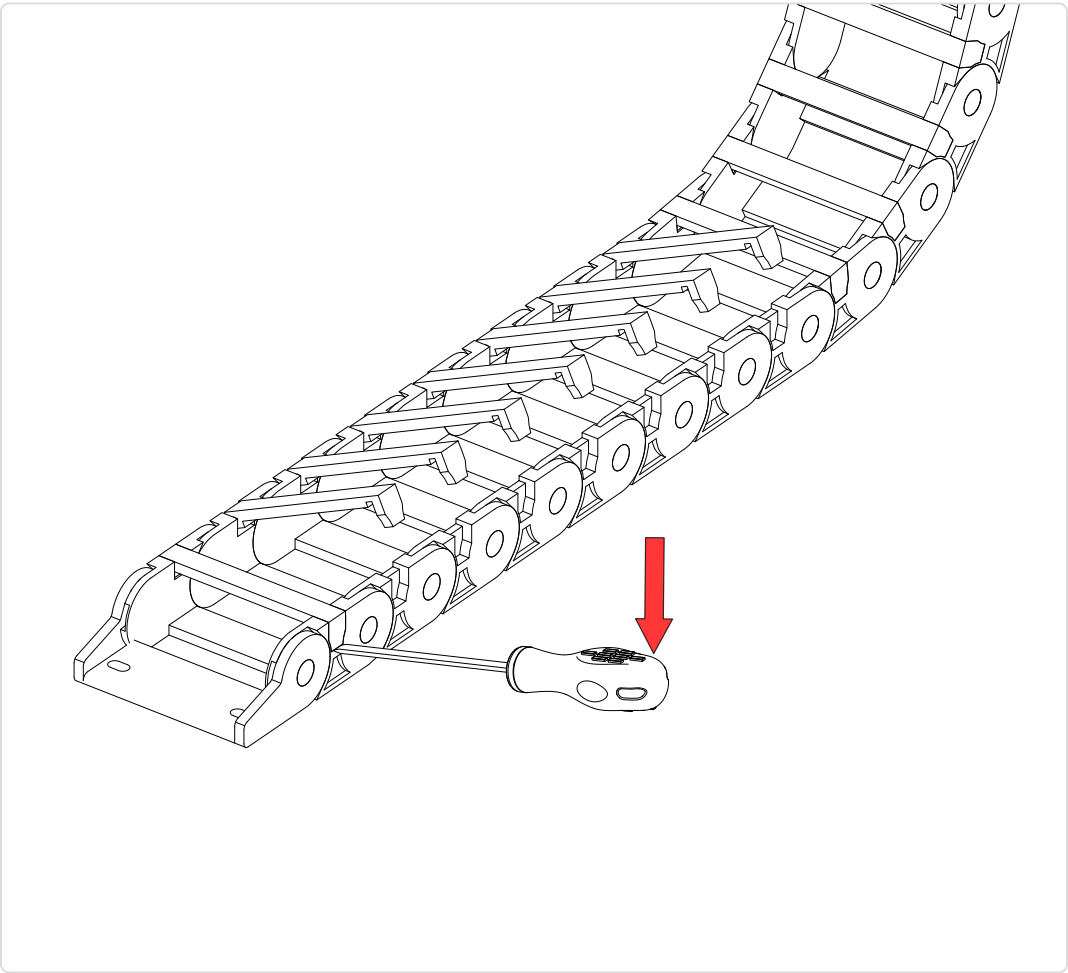
Plug and Play CNC Control System Previous Revision

Plug and Play CNC Control Systems purchased prior to April 2021 use the nomenclature shown below for motor cables.

Motor Cables

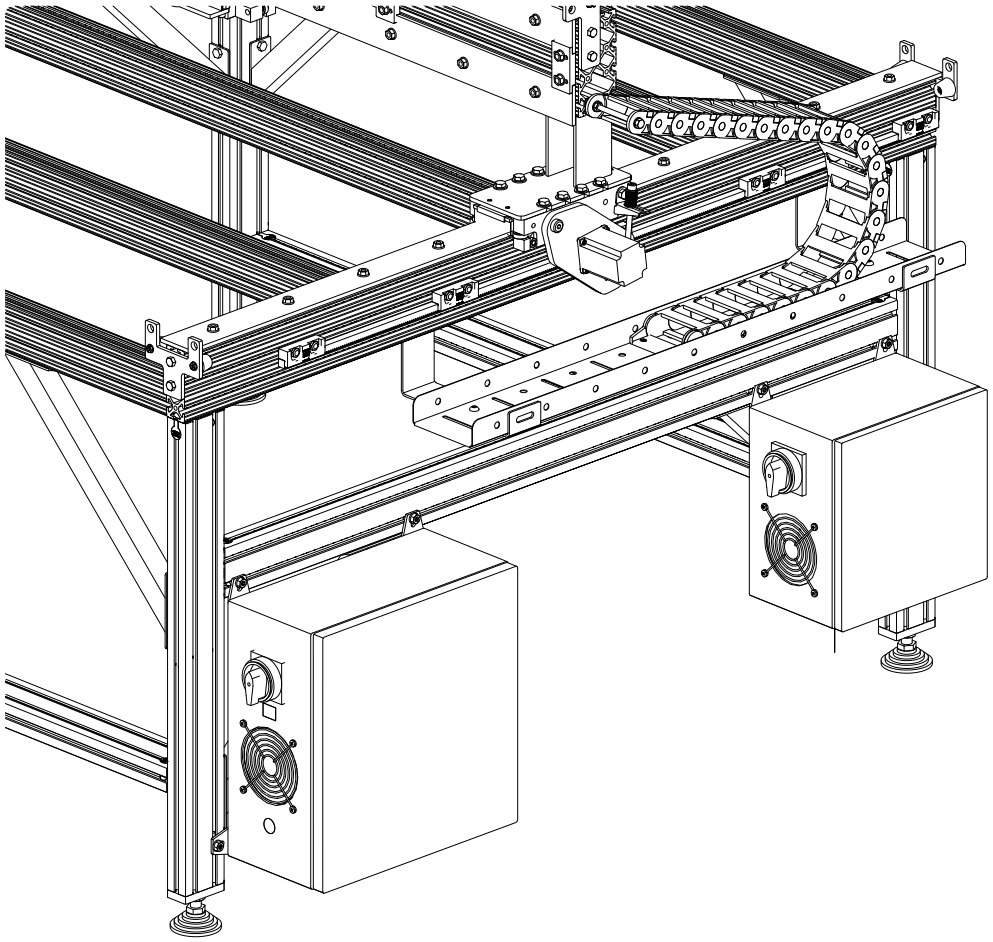
Axis	Color	Length
X	Red	20'
Y	Green	20'
Z	Blue	20'
Slaved	Orange	12'

7.2.1.3



- To route cables through the cable track, use a screwdriver to lift open the individual cable track sections as indicated.

7.3 Electronics Enclosure Installation



Section Note

Continue with this section if you purchased a Plug-and-Play Electronics Kit and/or a VFD.

Parts and Tools Required

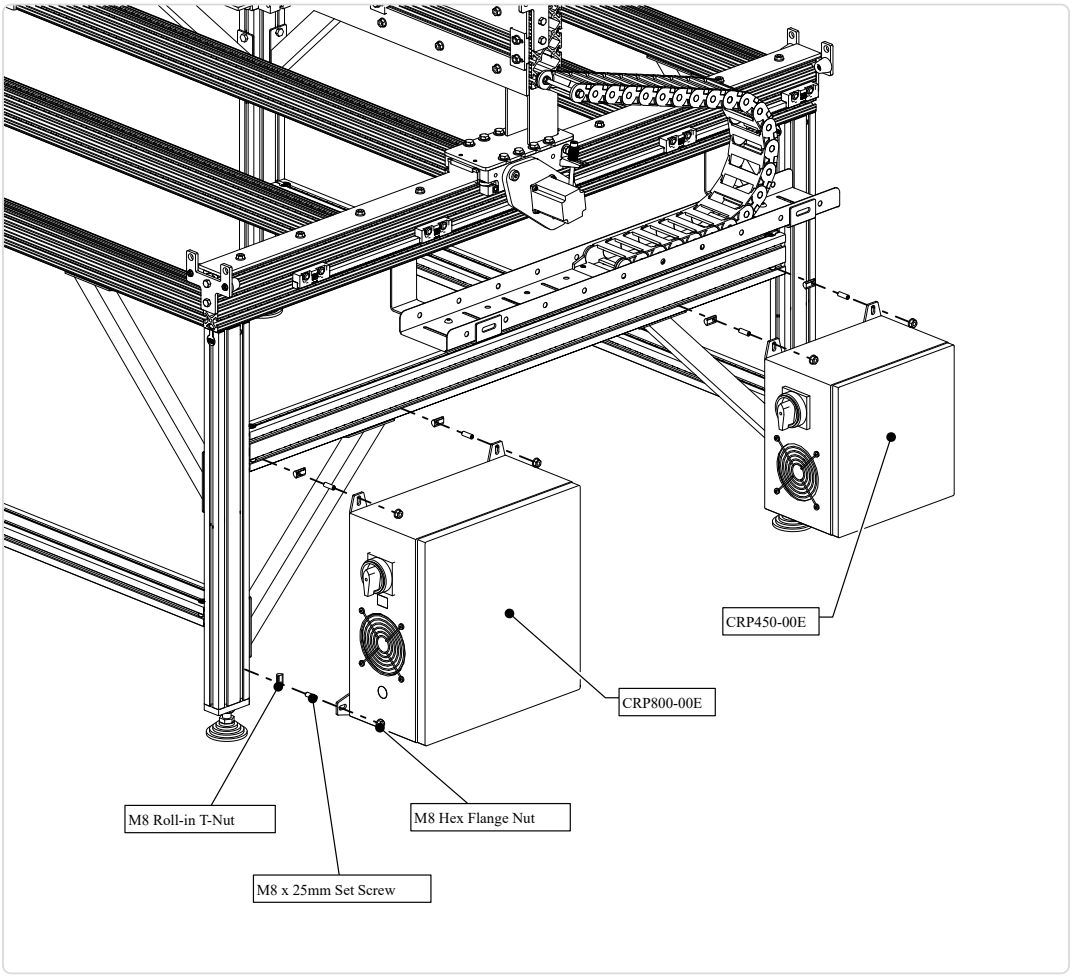
The following bags and parts will be used in this section:

- (1) CRP800-00E Plug-and-Play Control System
- (1) CRP450-00E Plug-and-Play Spindle/VFD System
- (1) CRP913-00-ELCBAR-HW-BAG
    - (6) M8 Roll In T-Nut
    - (6) M8 x 25mm Set Screw
    - (6) M8 Hex Flange Nut

The following tools will be used in this section:

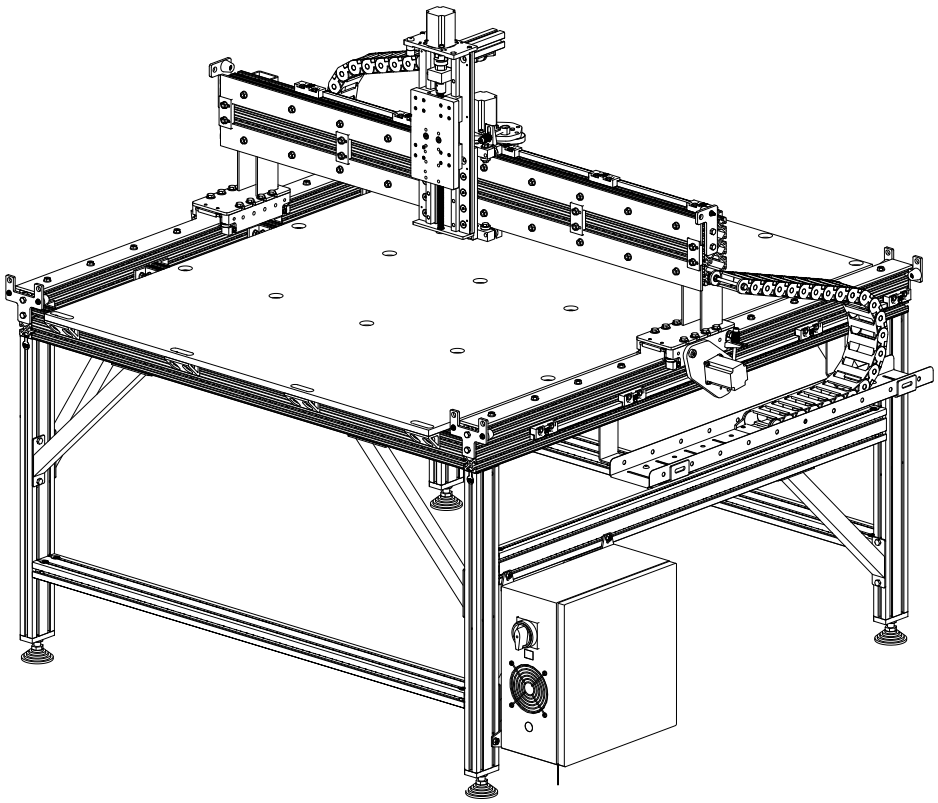
- 4mm Allen Wrench
- 13mm Combination Wrench

7.3.1.1



- Attach electronics enclosures to leg kit as indicated.

Section 8: Machine Setup



8.1 Post-Assembly Machine Setup Instructions

- **Spindle & Router Mount Installation**
  (https://www.avidcnc.com/support/instructions/accessories/spindles/mountInstallation)
  Installation instructions for spindle and router mounts (including tramming adapter).
- **Plug & Play Spindle / VFD Setup** (https://www.avidcnc.com/support/instructions/accessories/spindles/setup)
  Setup guides for spindle / VFD systems. This includes our Plug & Play systems and DIY installations.
- **Mach4 Software Setup & Usage Guide** (https://www.avidcnc.com/support/instructions/software/mach4)
  Guides for installation, setup, and usage of Mach4 CNC controller software. Use of the software is required in the remaining machine setup items below.
- **Machine Leveling, Squaring, & Tramming**
  (https://www.avidcnc.com/support/instructions/machineSetup/levelingSquaringAndTramming)
  Instructions to help calibrate your machine for optimal performance and precision.
- **Spoilboard** (https://www.avidcnc.com/support/instructions/machineSetup/spoilboard)
  Design & Make project to guide you through creating the spoilboard for your machine.
- **Dust Collection** (https://www.avidcnc.com/support/instructions/machineSetup/dustCollection)
  Information about dust collection solutions for your machine.
- **Auto Z & Corner Finding Touch Plate** (https://www.avidcnc.com/support/instructions/accessories/touchplate)
  Instructions for using our touch plate with Mach4 and your machine.
- **Rotary Axis** (https://www.avidcnc.com/support/instructions/rotary)
  Assembly, installation, and calibration instructions for the Avid CNC rotary axis.

8.2 Spoilboard Installation

Parts and Tools Required

The following bags and parts will be used in this section:

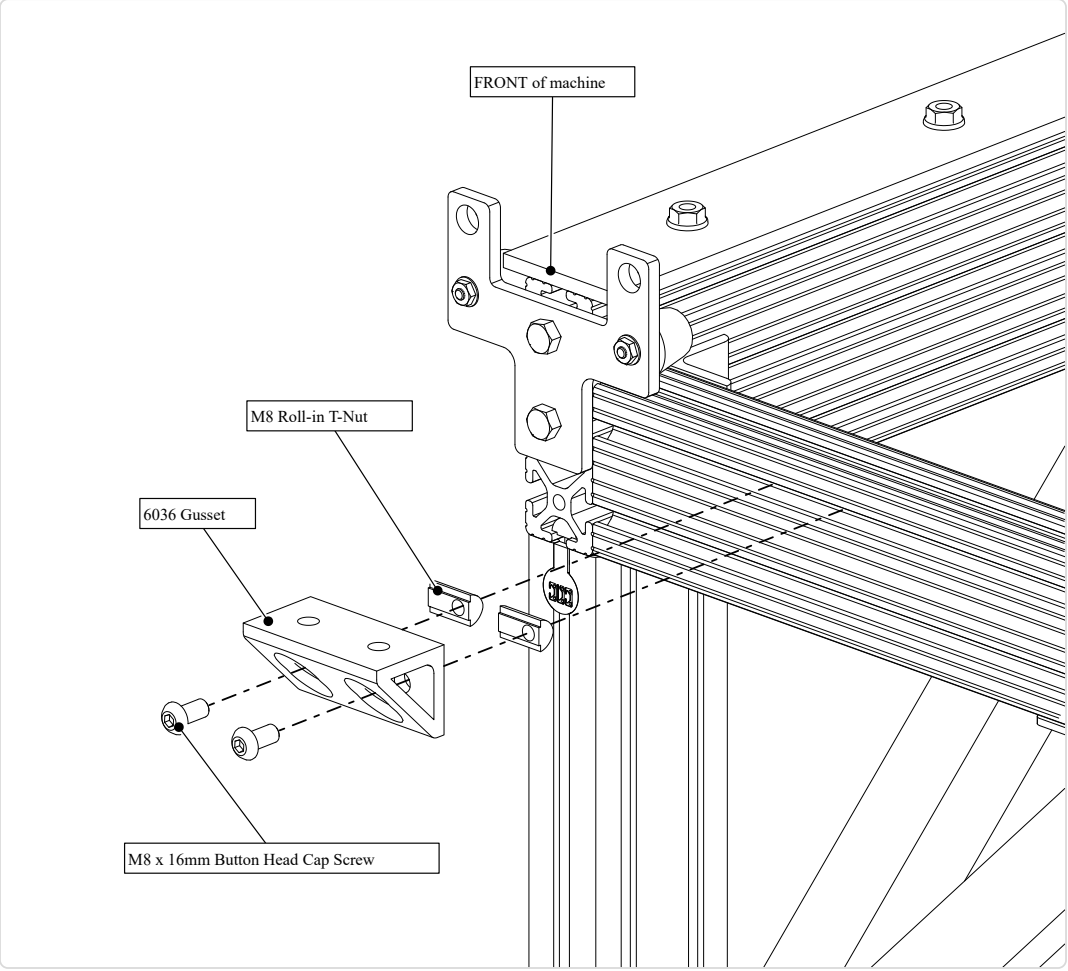
- (1) CRP116-00-48 - Standard Spoil Board Hardware
    - (4) 6036 - Gusset
    - (8) M8 x 16mm Button Head Cap Screw
    - (8) M8 Roll-in T-Nut
    - (8) M8 x 20mm Button Head Cap Screw
    - (8) M8 Hex Nut
- (1) CRP816-00-4848 - Spoil Board Fastener Kit
    - (20) M8 x 16mm Button Head Cap Screw
    - (20) M8 Roll-in T-Nut

The following tools will be used in this section:

- 5mm Allen Wrench
- 13mm Socket with Ratchet
- Tape Measure

8.2.1 Spoil Board Brackets

8.2.1.1

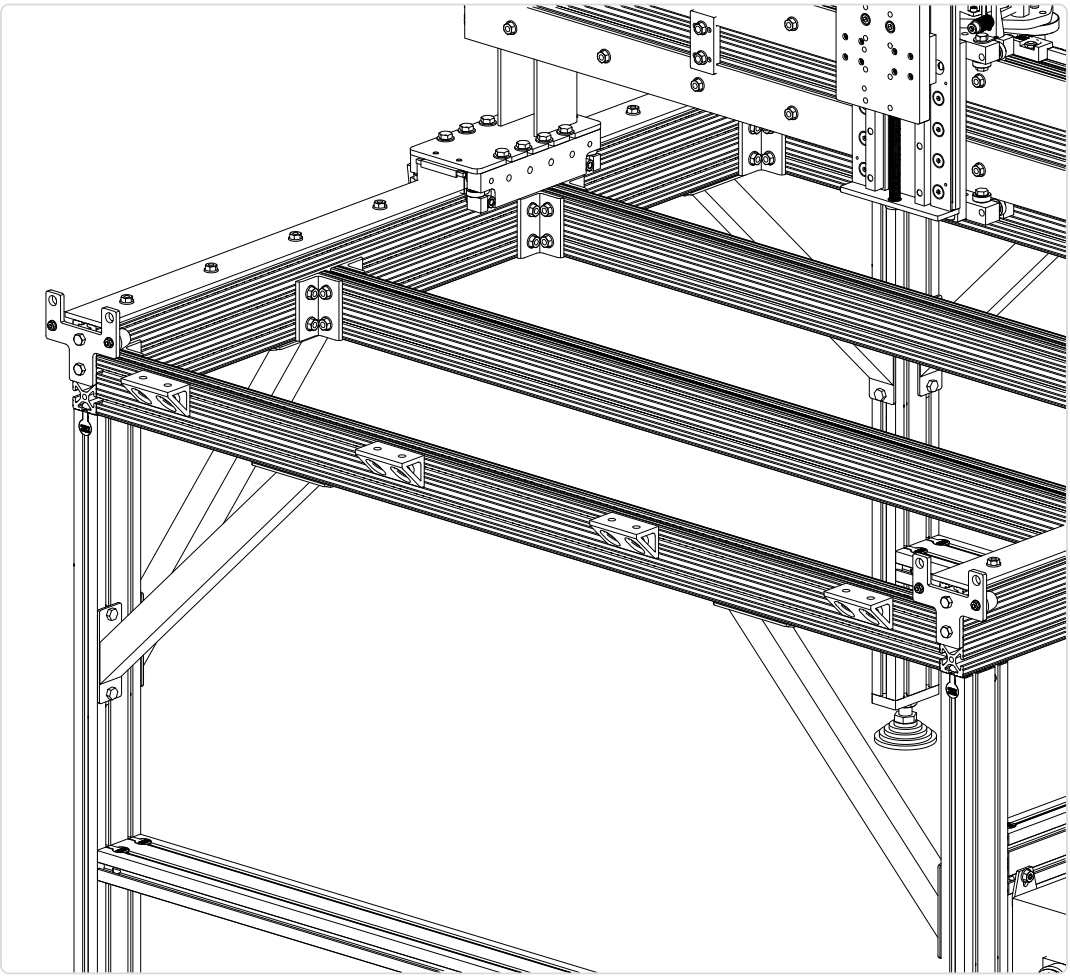


- Attach a gusset to the front of the table as indicated.
- Partially tighten the fasteners.

Assembly Note

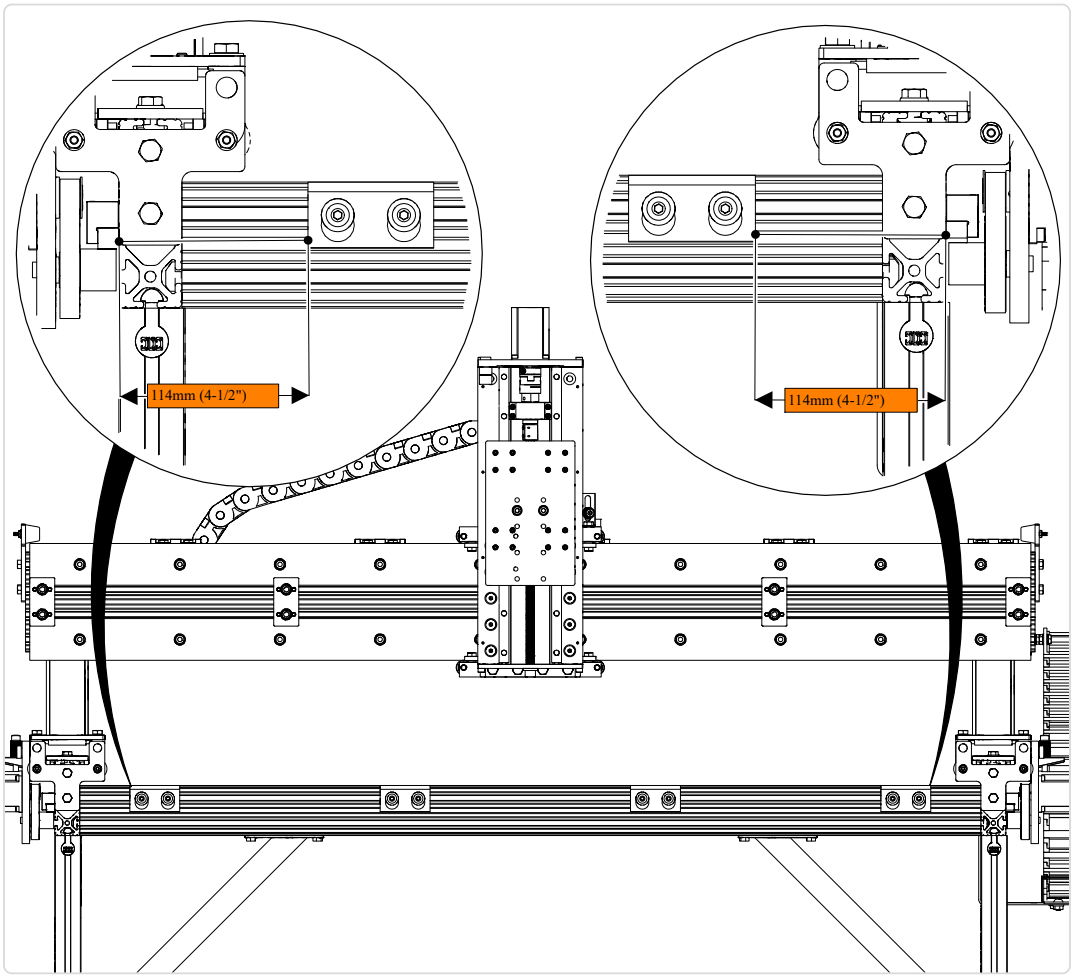
Use the upper t-slot on the front of the extrusion.

8.2.1.2



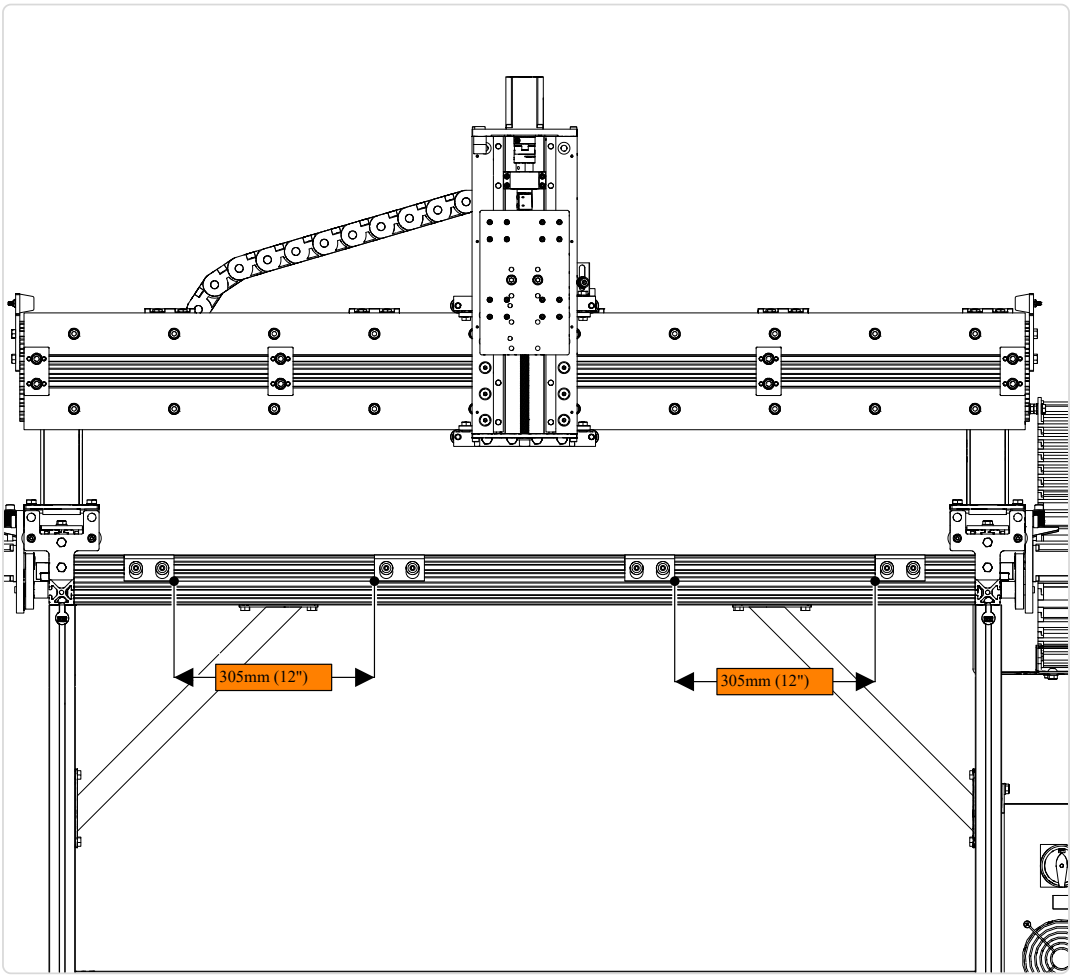
- Repeat this process to attach the remaining three gussets.

8.2.1.3



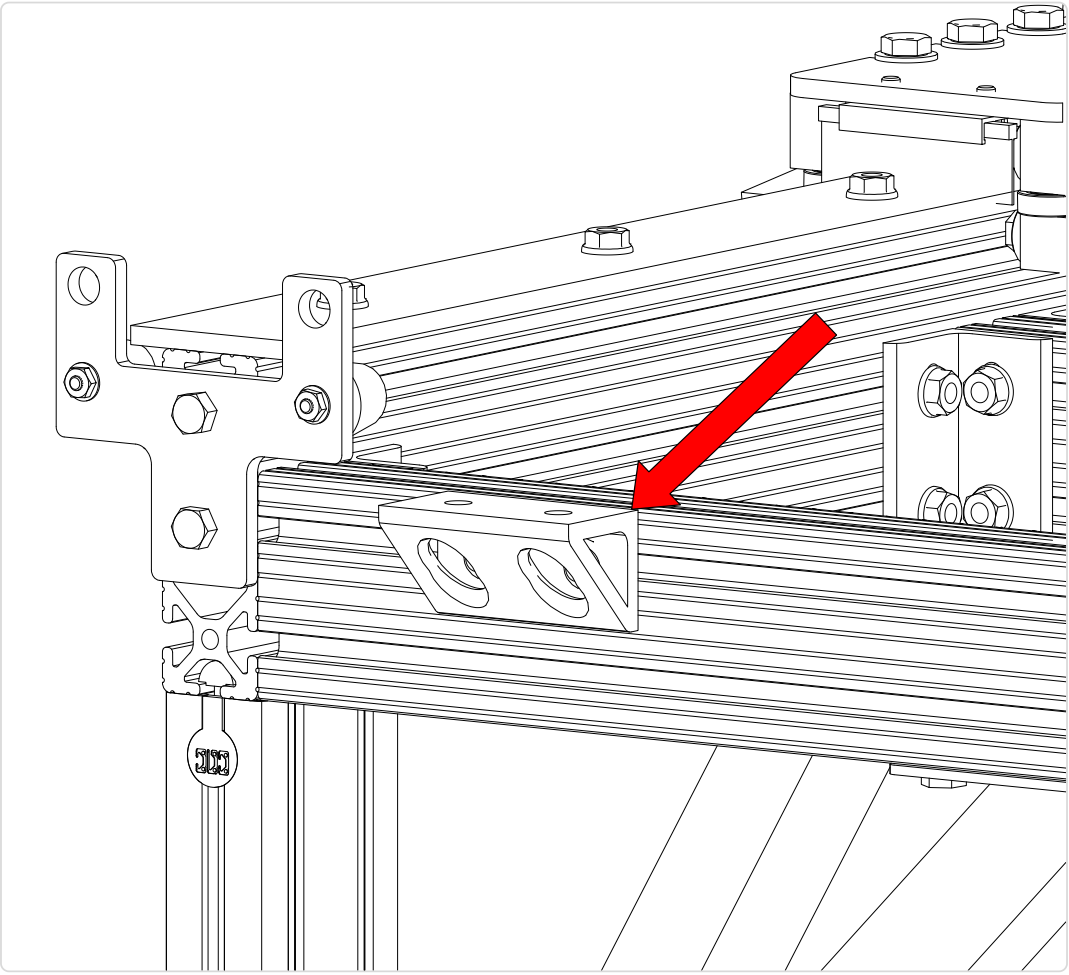
- Position the outer gussets 114mm (4-1/2") from the outside edge of the table extrusion as indicated.

8.2.1.4



- Position the center two gussets to the dimensions shown.

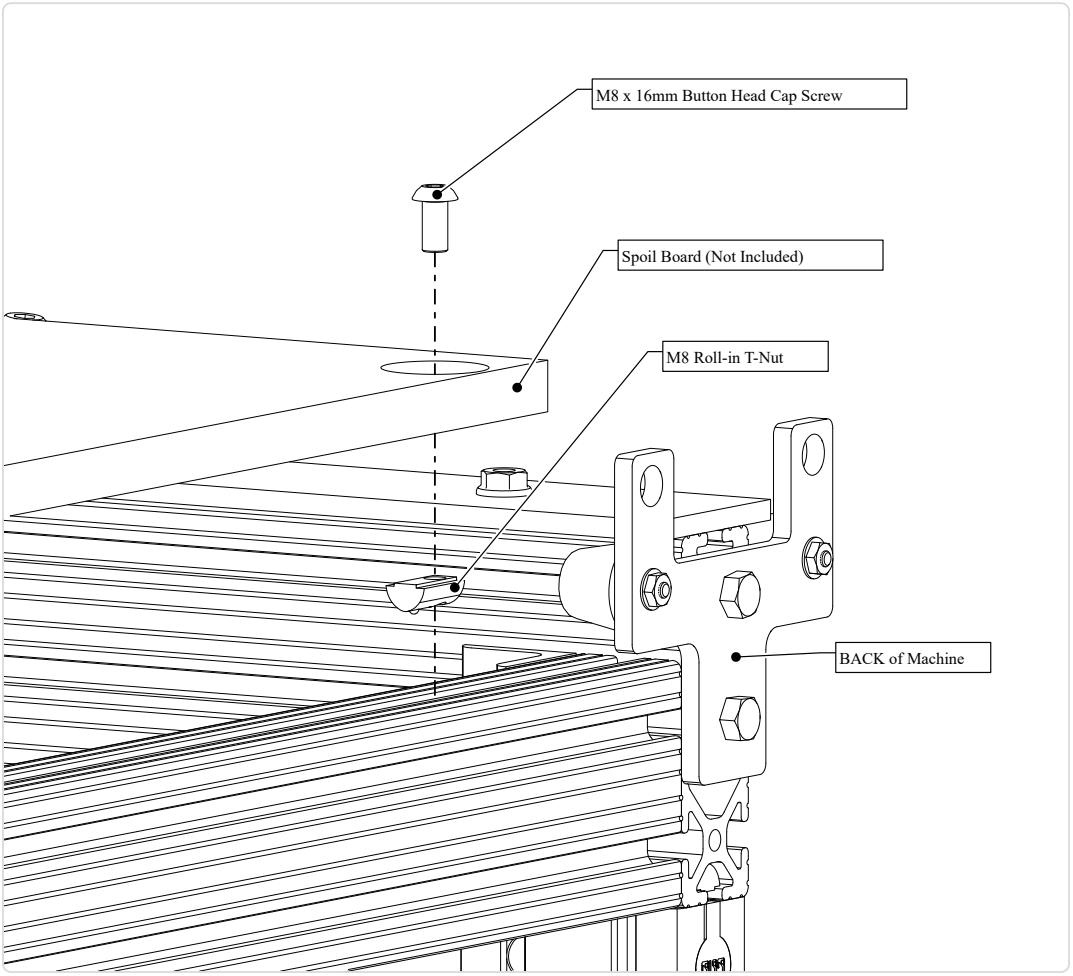
8.2.1.5



- Ensure the top of the gussets are flush with the top of the extrusion.
- Fully tighten the gusset fasteners.

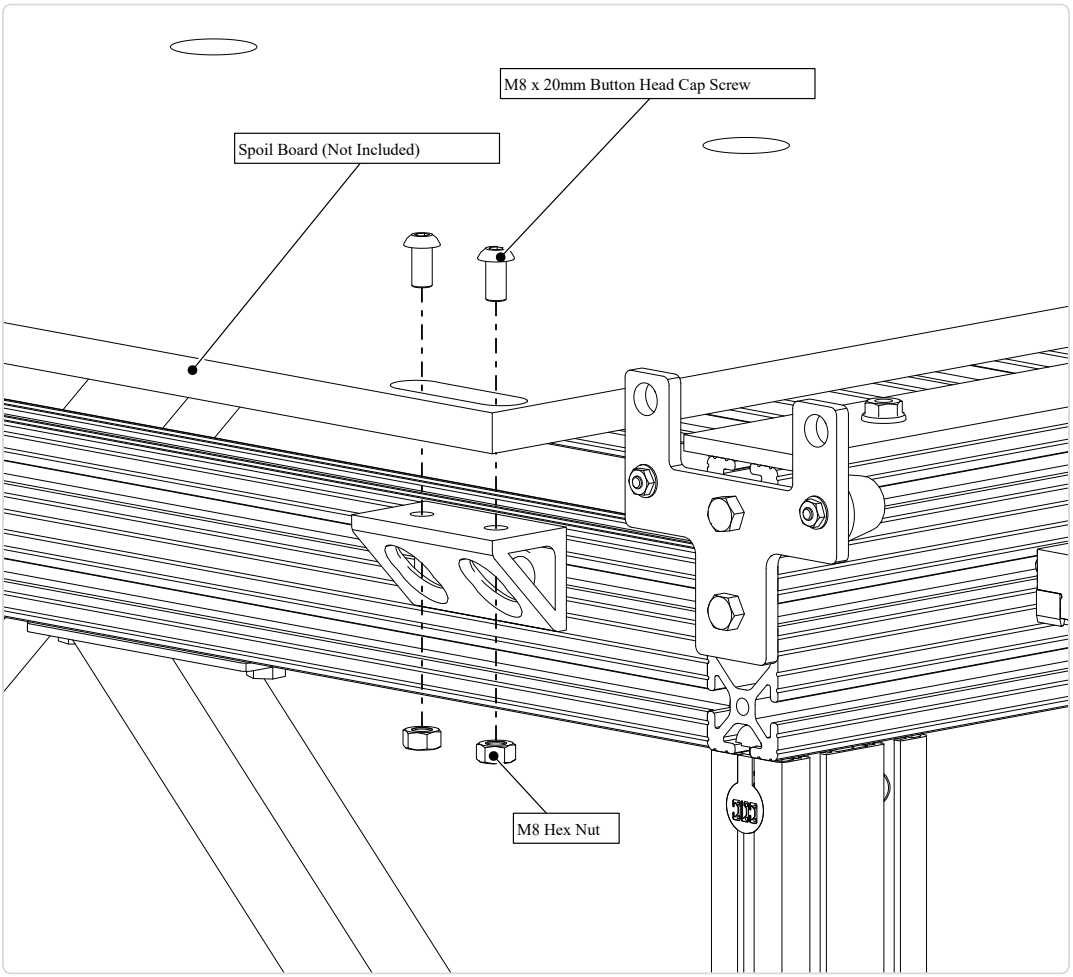
8.2.2 Spoil Board Installation

8.2.2.1



- For locations where you want to attach your spoil board to the table crossmembers, use the M8 x 16mm Button Head Cap Screws and M8 Roll-in T-Nuts.

8.2.2.2



- To attach the spoil board to the gussets on the front of the machine, use the M8 x 20mm Button Head Cap Screws and M8 Hex Nuts.