



# **Benchtop PRO Assembly Instructions**

*v2024Q3.1*

# Getting Started

## READ THE FOLLOWING BEFORE ASSEMBLING YOUR BENCHTOP PRO CNC MACHINE KIT

1. The machine assembly is broken down into 8 main sections, visible in the PDF bookmarks tab.
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 while completing individual assembly steps.
5. Each section will identify the parts and tools needed for those assembly steps, as well as which box contains those parts. 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 three types of notes you will see throughout the assembly instructions:

### Section Note

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

### Assembly Note

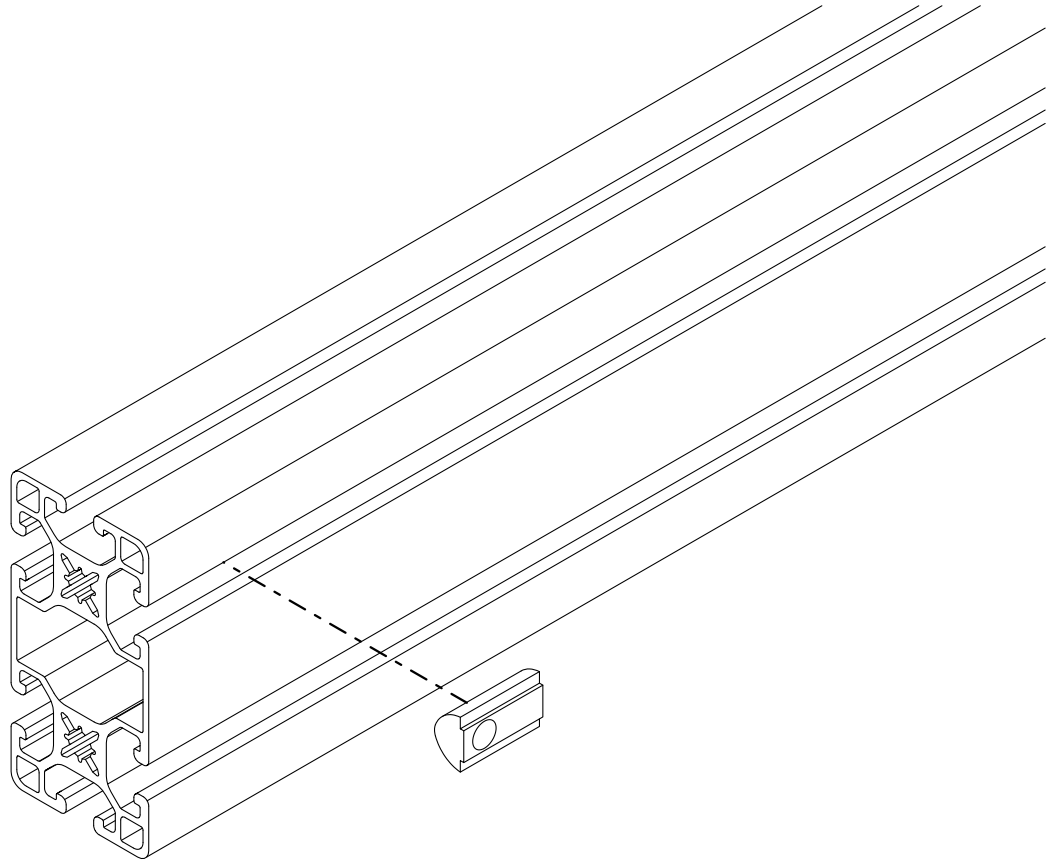
Assembly Notes are used to call attention to certain parts of the assembly step. Pay attention to these as they provide important information for a successful machine build.

### Machine Configuration Options

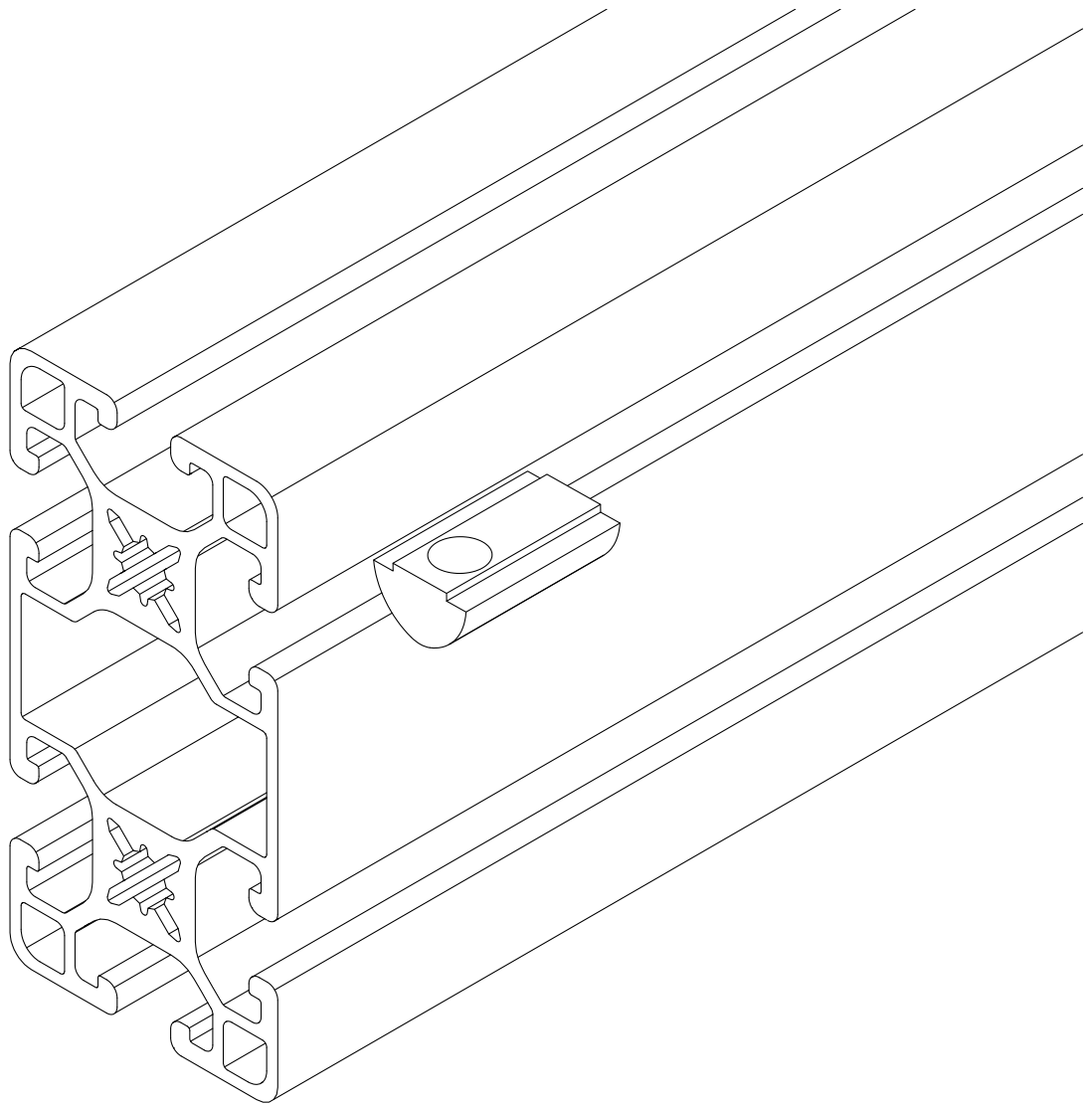
These will denote specific steps to follow if you purchased the different optional sizes of the machine.

8. Throughout the assembly of your machine, you will use Roll-in T-Nuts. Review the instructions on the following pages for proper use of this component.

## Roll-in T-Nuts

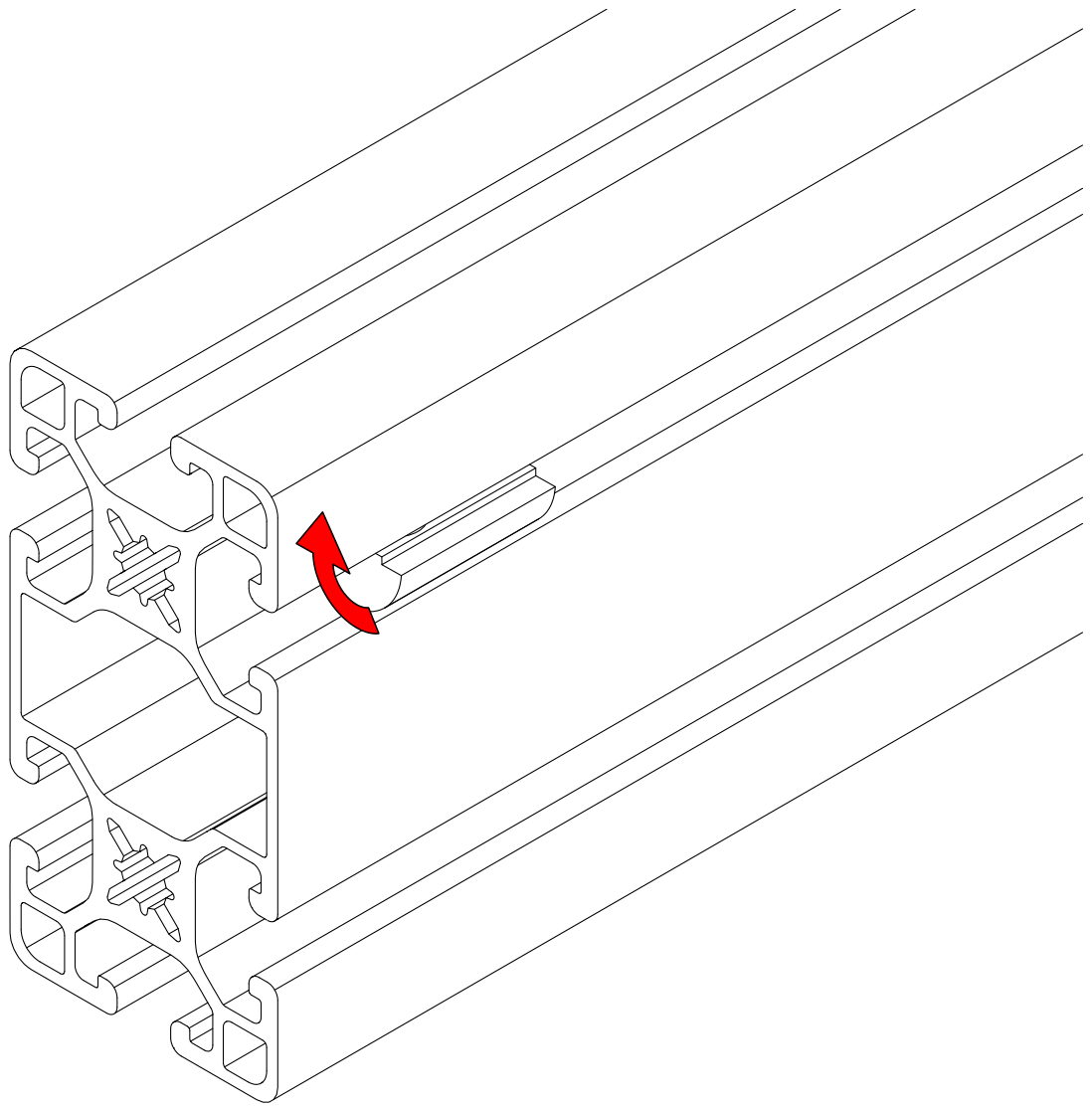


- Assembly steps will depict Roll-in T-Nut installation as shown above.

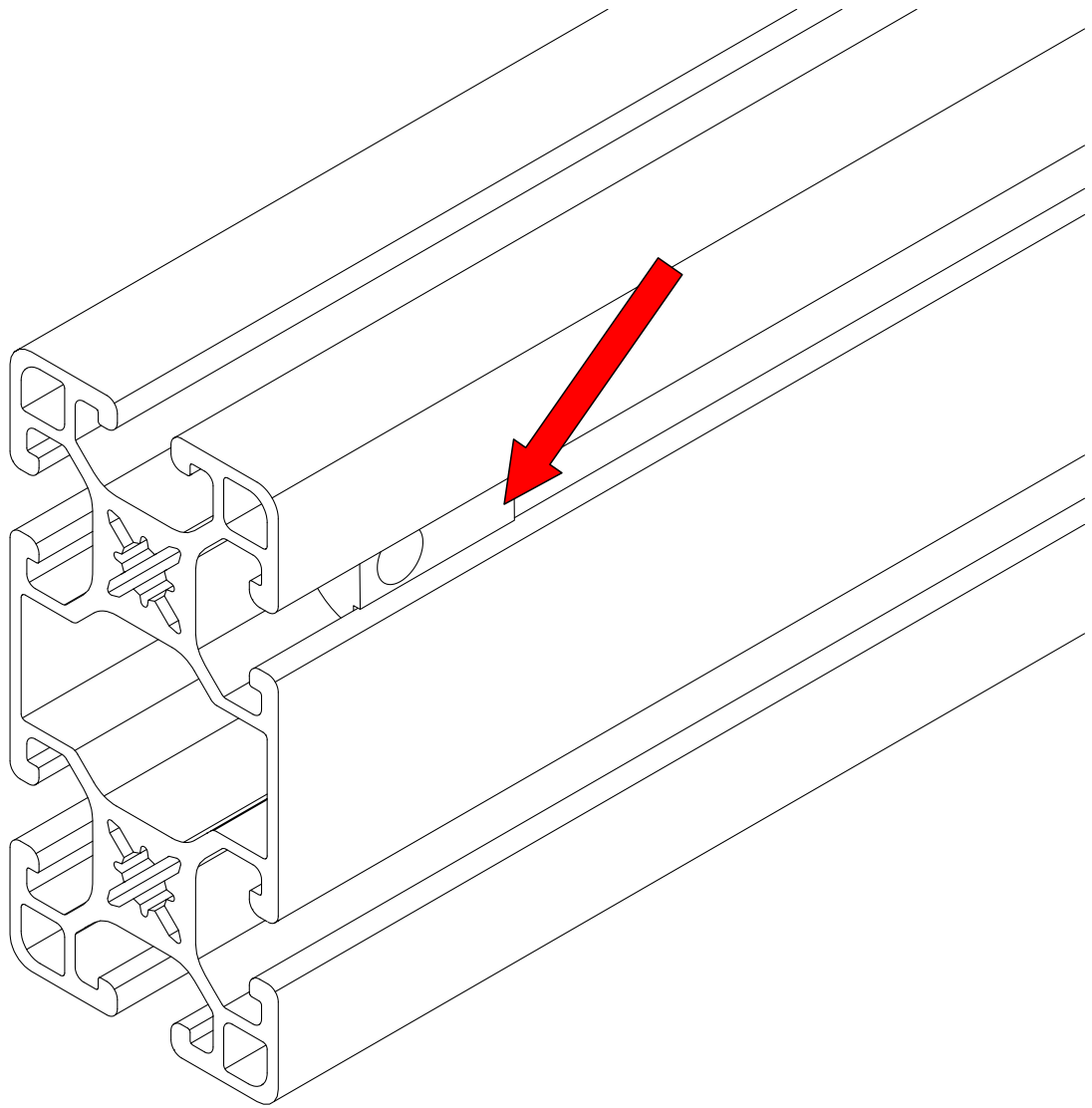


- To install in the appropriate extrusion slot, position the T-Nut as indicated.





- 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

## ***Required tools for assembly of your machine:***

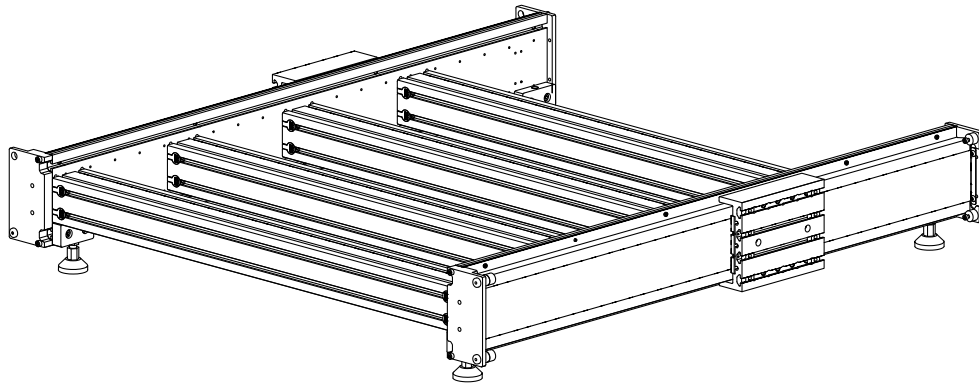
- Metric Ball-End Allen Wrenches:
  - 3mm, 4mm, 5mm, 6mm
- Adjustable Wrench
- Standard (Flat Tip) Screwdriver
- Tape Measure

## ***Additional recommended tools and supplies:***

- 6mm Hex Ball-end Power Bit and Drill/Impact Driver
- Metric Combination Wrenches:
  - 17mm
- Metric Tape Measure



## Section 1: Table Assembly



## Parts and Tools Required

*The following parts and tools will be used in Section 1*

### 2' x 2' Parts List

QTY	Part/Description	Packaged In
3	8080 Crossmember Extrusion, 641mm (25-1/4")	Linear Extrusion Bundle
1	CRP840-00-650 - PRO Linear Ballscrew Axis, Left	Table Axis Left
1	CRP840-00-650 - PRO Linear Ballscrew Axis, Right	Table Axis Right
1	CRP910-00-24-FAST: - (24) 40 Series Anchor Fastener - (24) M8 x 30mm Socket Head Cap Screw - (12) M8 Slide-in T-Nut	CRP900-00-2424-HW
4	CRP913-00: - (1) M12 Leveling Foot 50mm (Total QTY: 4) - (1) M12 BTP Leveling Foot End Plate (Total QTY: 4) - (2) M8 x 30mm Socket Head Cap Screw (Total QTY: 8) - (2) M8 Roll In T-Nut (Total QTY: 8)	CRP900-00-2424-HW

### 2' x 3' Parts List

QTY	Part/Description	Packaged In
4	8080 Crossmember Extrusion, 641mm (25-1/4")	Linear Extrusion Bundle
1	CRP840-00-950 - PRO Linear Ballscrew Axis, Left	Table Axis Left
1	CRP840-00-950 - PRO Linear Ballscrew Axis, Right	Table Axis Right
1	CRP910-00-36-FAST: - (32) 40 Series Anchor Fastener - (32) M8 x 30mm Socket Head Cap Screw - (16) M8 Slide-in T-Nut	CRP900-00-2436-HW
4	CRP913-00: - (1) M12 Leveling Foot 50mm (Total QTY: 4) - (1) M12 BTP Leveling Foot End Plate (Total QTY: 4) - (2) M8 x 30mm Socket Head Cap Screw (Total QTY: 8) - (2) M8 Roll In T-Nut (Total QTY: 8)	CRP900-00-2436-HW



### 3' x 2' Parts List

QTY	Part/Description	Packaged In
3	8080 Crossmember Extrusion, 961mm (37-7/8")	Linear Extrusion Bundle
1	CRP840-00-650 - PRO Linear Ballscrew Axis, Left	Table Axis Left
1	CRP840-00-650 - PRO Linear Ballscrew Axis, Right	Table Axis Right
1	CRP910-00-24-FAST: - (24) 40 Series Anchor Fastener - (24) M8 x 30mm Socket Head Cap Screw - (12) M8 Slide-in T-Nut	CRP900-00-3624-HW
4	CRP913-00: - (1) M12 Leveling Foot 50mm (Total QTY: 4) - (1) M12 BTP Leveling Foot End Plate (Total QTY: 4) - (2) M8 x 30mm Socket Head Cap Screw (Total QTY: 8) - (2) M8 Roll In T-Nut (Total QTY: 8)	CRP900-00-3624-HW

### 3' x 3' Parts List

QTY	Part/Description	Packaged In
4	8080 Crossmember Extrusion, 961mm (37-7/8")	Linear Extrusion Bundle
1	CRP840-00-950 - PRO Linear Ballscrew Axis, Left	Table Axis Left
1	CRP840-00-950 - PRO Linear Ballscrew Axis, Right	Table Axis Right
1	CRP910-00-36-FAST: - (32) 40 Series Anchor Fastener - (32) M8 x 30mm Socket Head Cap Screw - (16) M8 Slide-in T-Nut	CRP900-00-3636-HW
4	CRP913-00: - (1) M12 Leveling Foot 50mm (Total QTY: 4) - (1) M12 BTP Leveling Foot End Plate (Total QTY: 4) - (2) M8 x 30mm Socket Head Cap Screw (Total QTY: 8) - (2) M8 Roll In T-Nut (Total QTY: 8)	CRP900-00-3636-HW

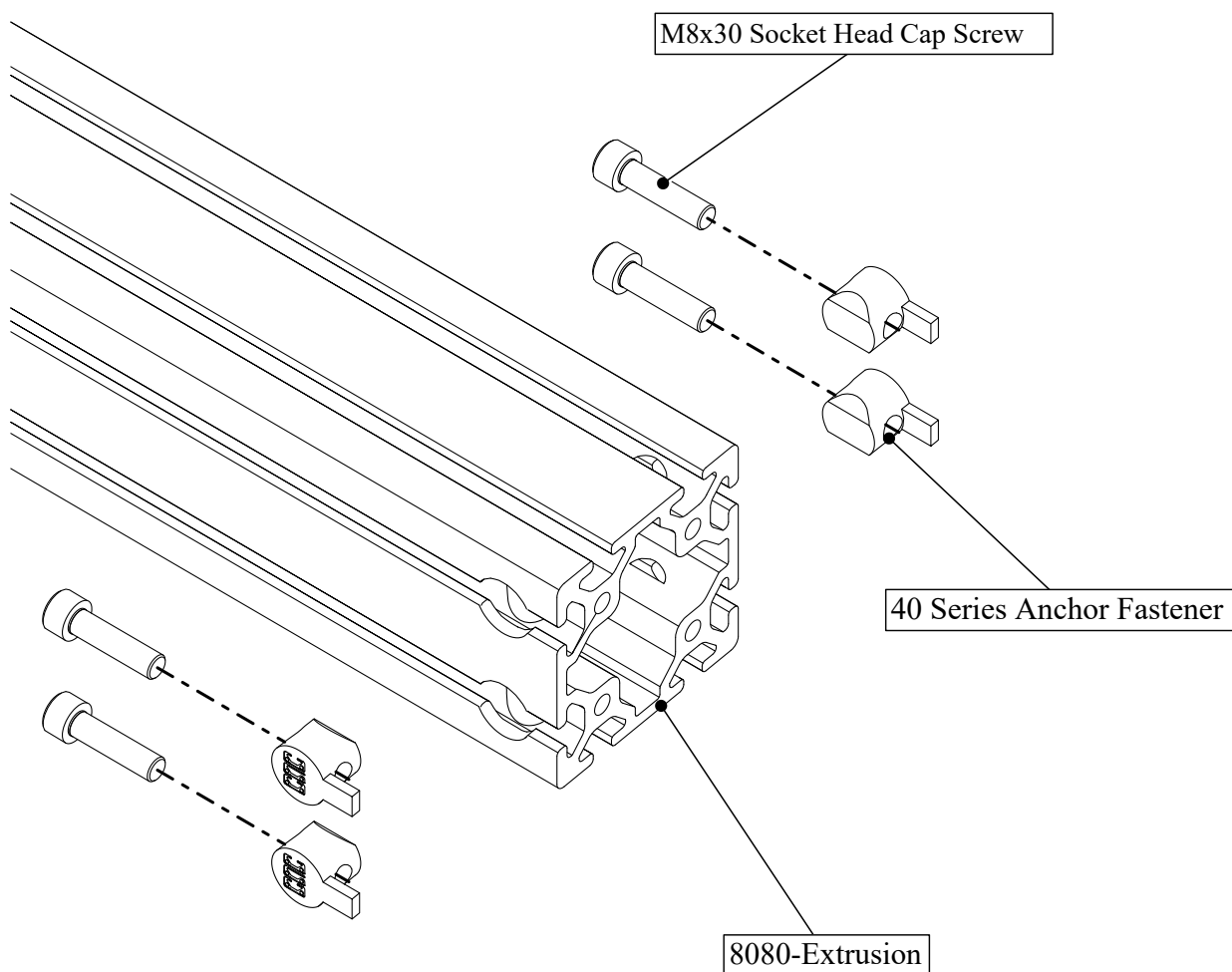
#### Required Tools:

- 6mm Ball-End Allen Wrench
- Adjustable Wrench



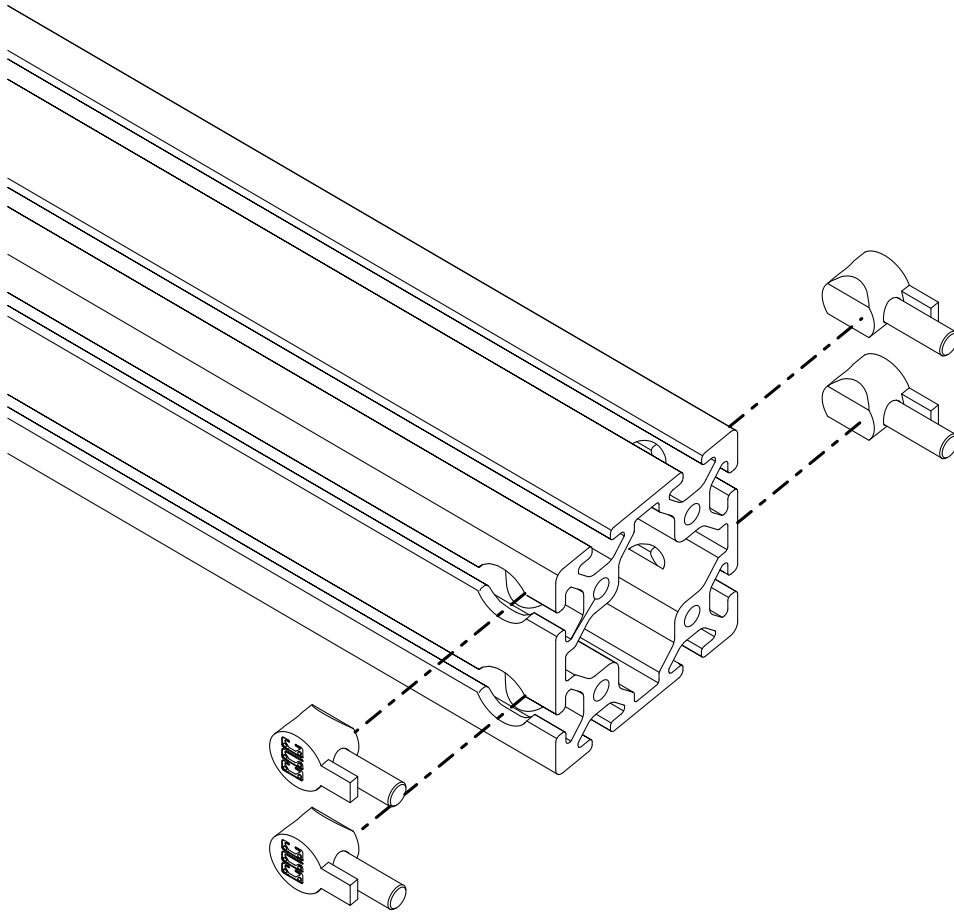
# 1.1 Table Base Assembly

## 1.1.1



- Insert socket head cap screws into anchor fasteners as indicated.

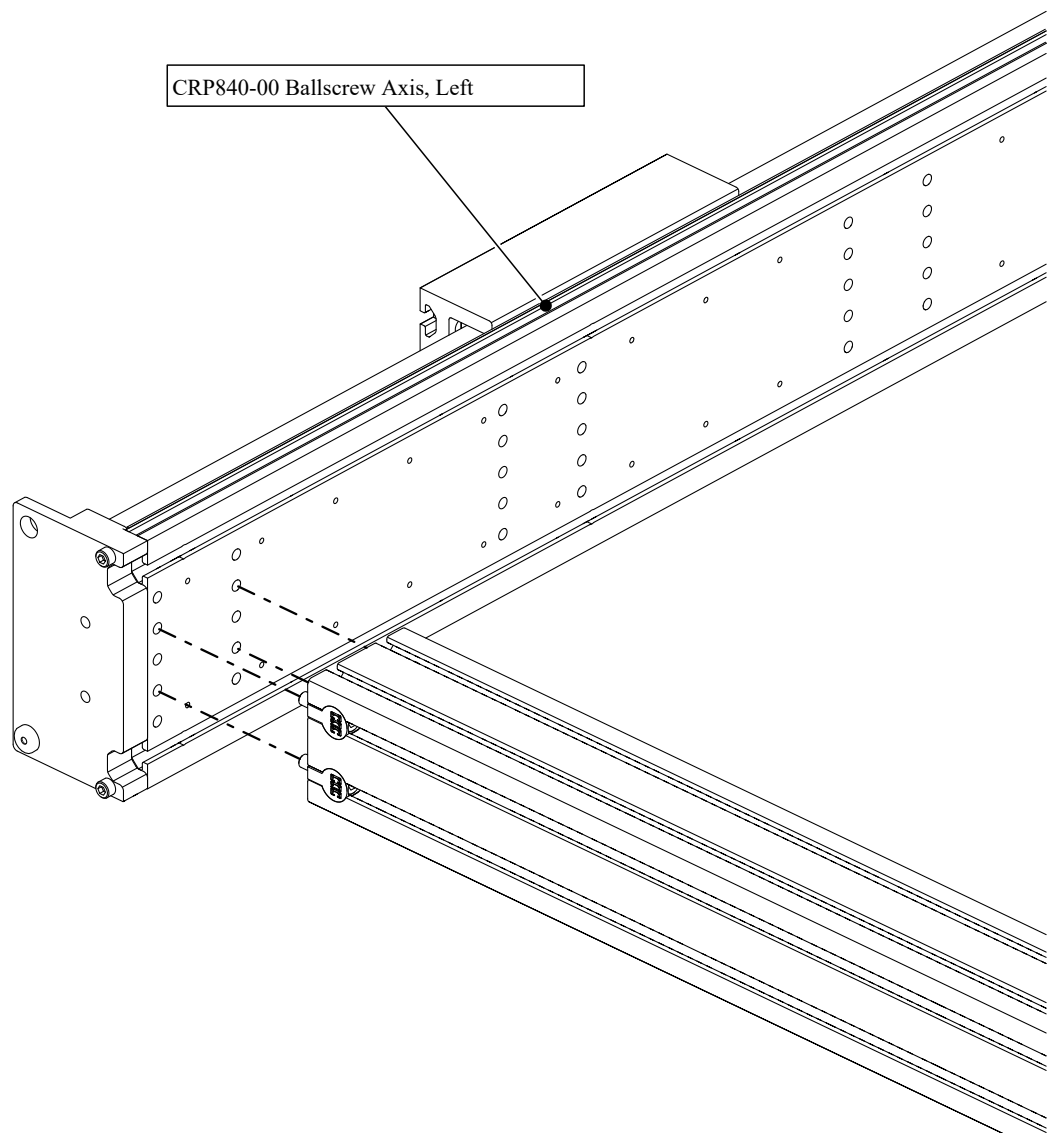
## 1.1.2



- Slide the anchor fasteners and screws into the extrusion counterbores.



### 1.1.3

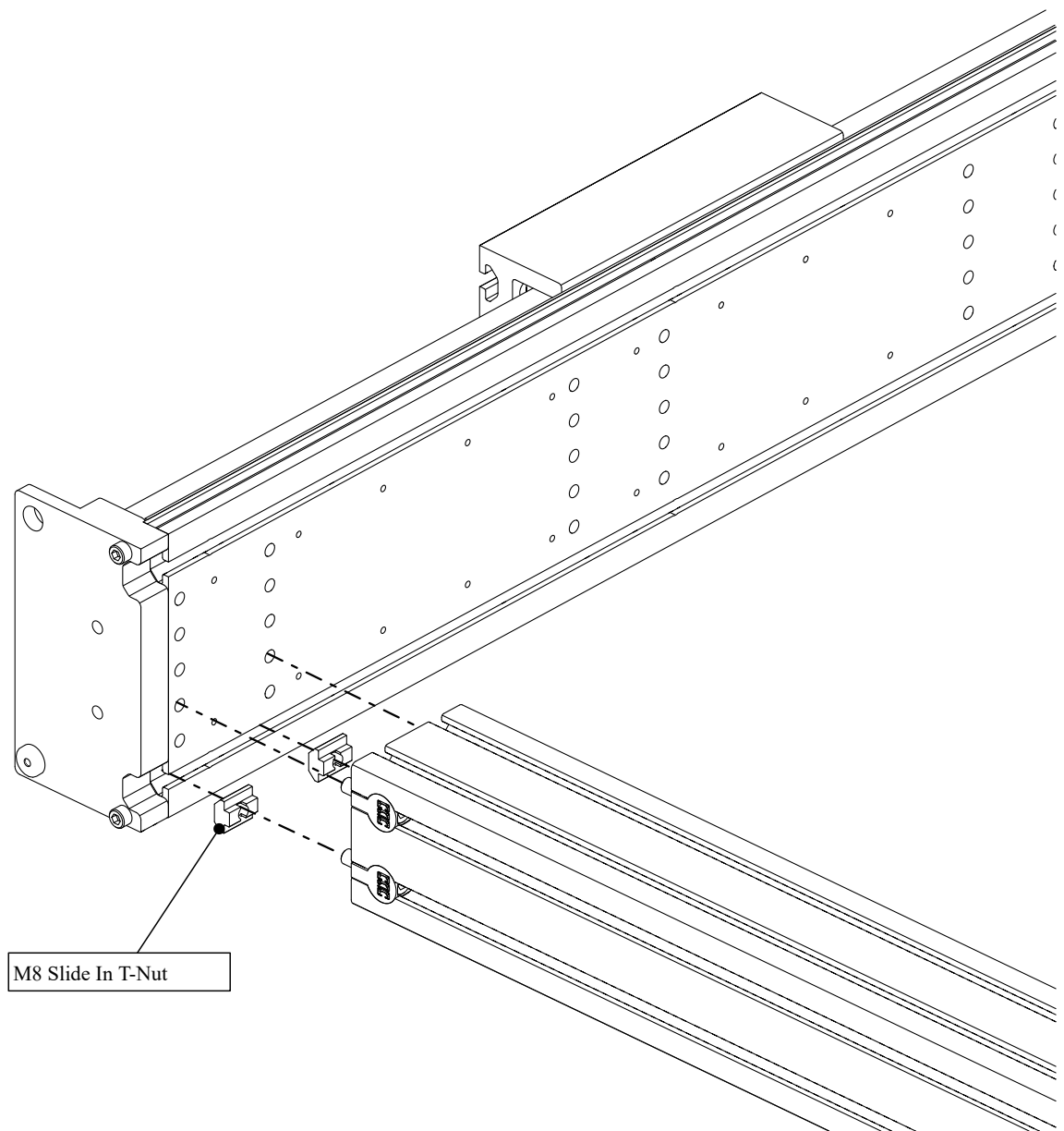


- Thread the screws into the left table ballscrew axis as indicated.

#### Assembly Note

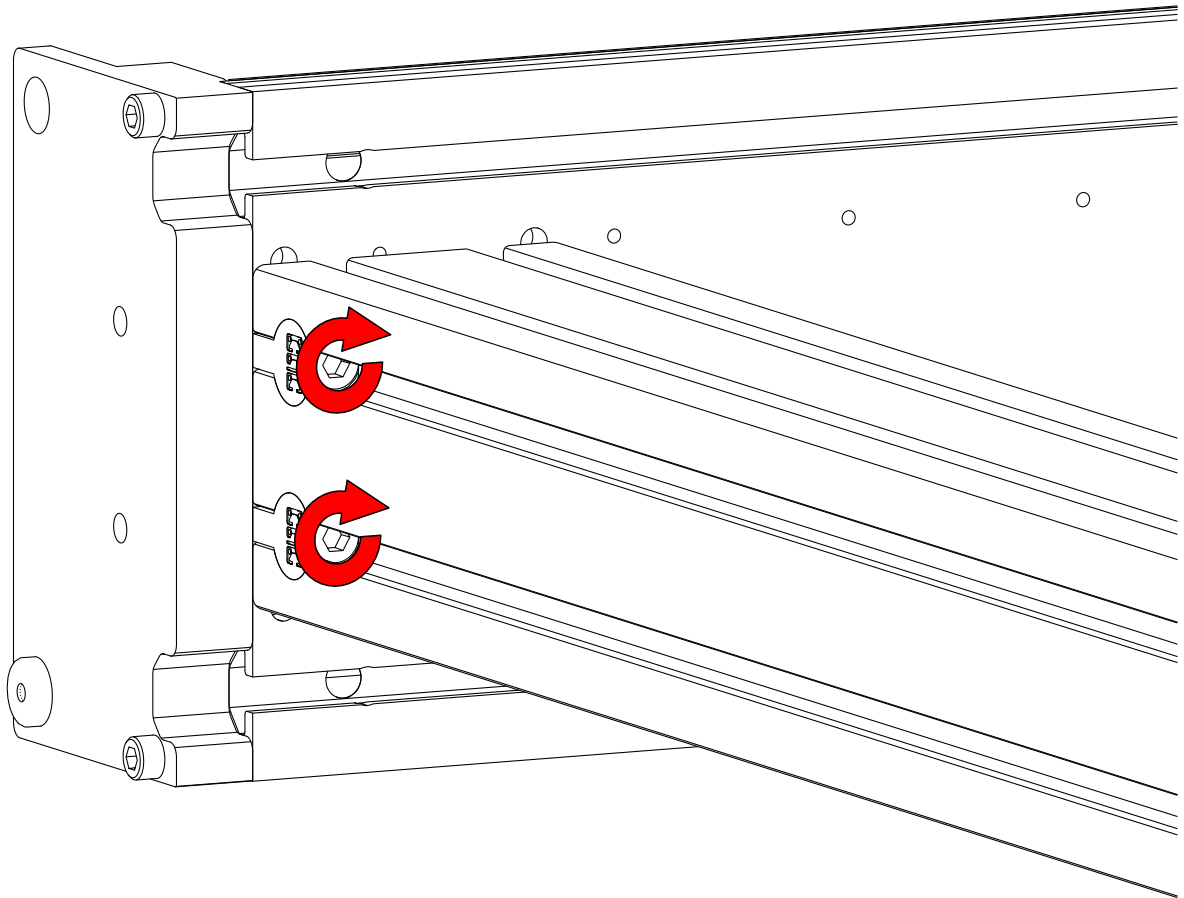
If crossmember extrusion has engraved arrows, orient arrows on all crossmembers pointing **up**.

## 1.1.4



- Alternately, you can use the provided slide-in t-nuts to lower the crossmember extrusion.

### 1.1.5



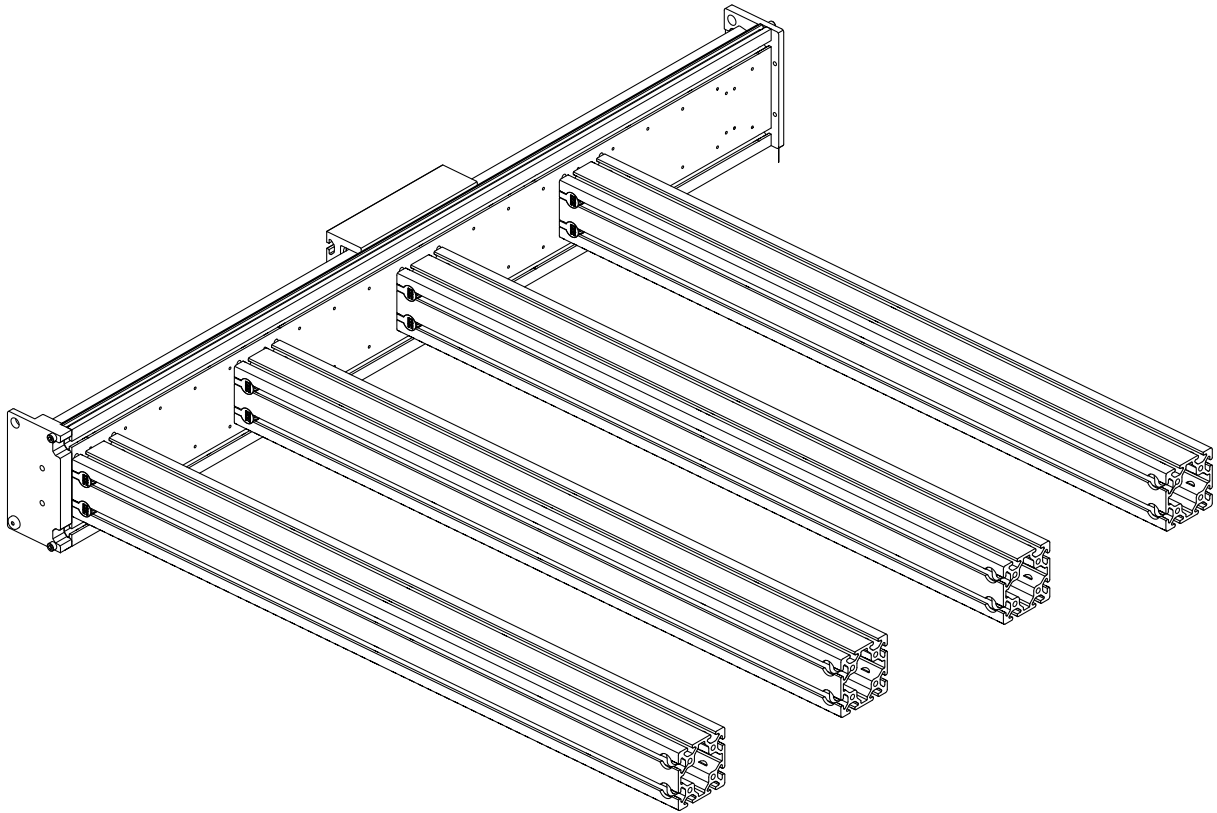
- Tighten the indicated fasteners



#### Assembly Note

Be sure to tighten all four crossmember fasteners.

### 1.1.6



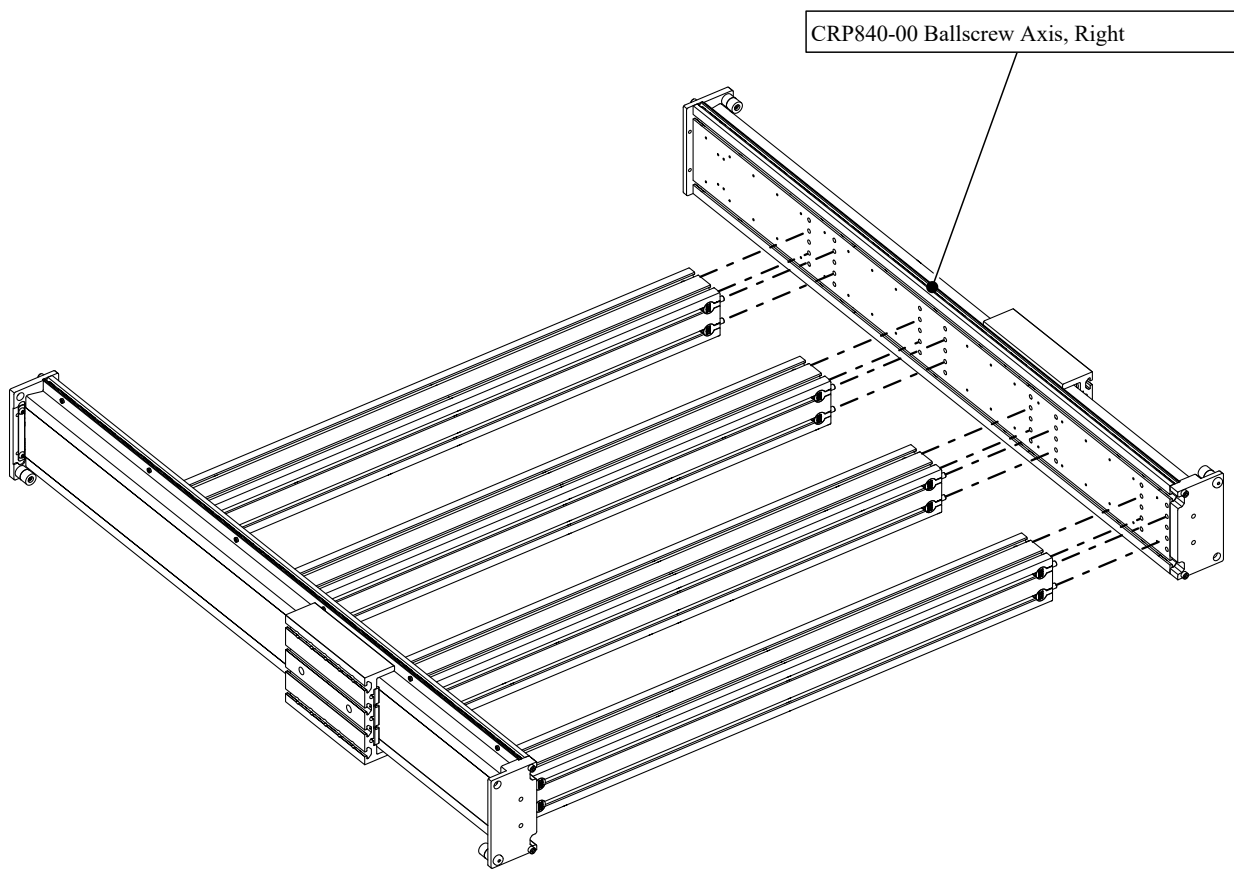
- Repeat the previous steps to install the remaining crossmembers.



#### Machine Configuration Options

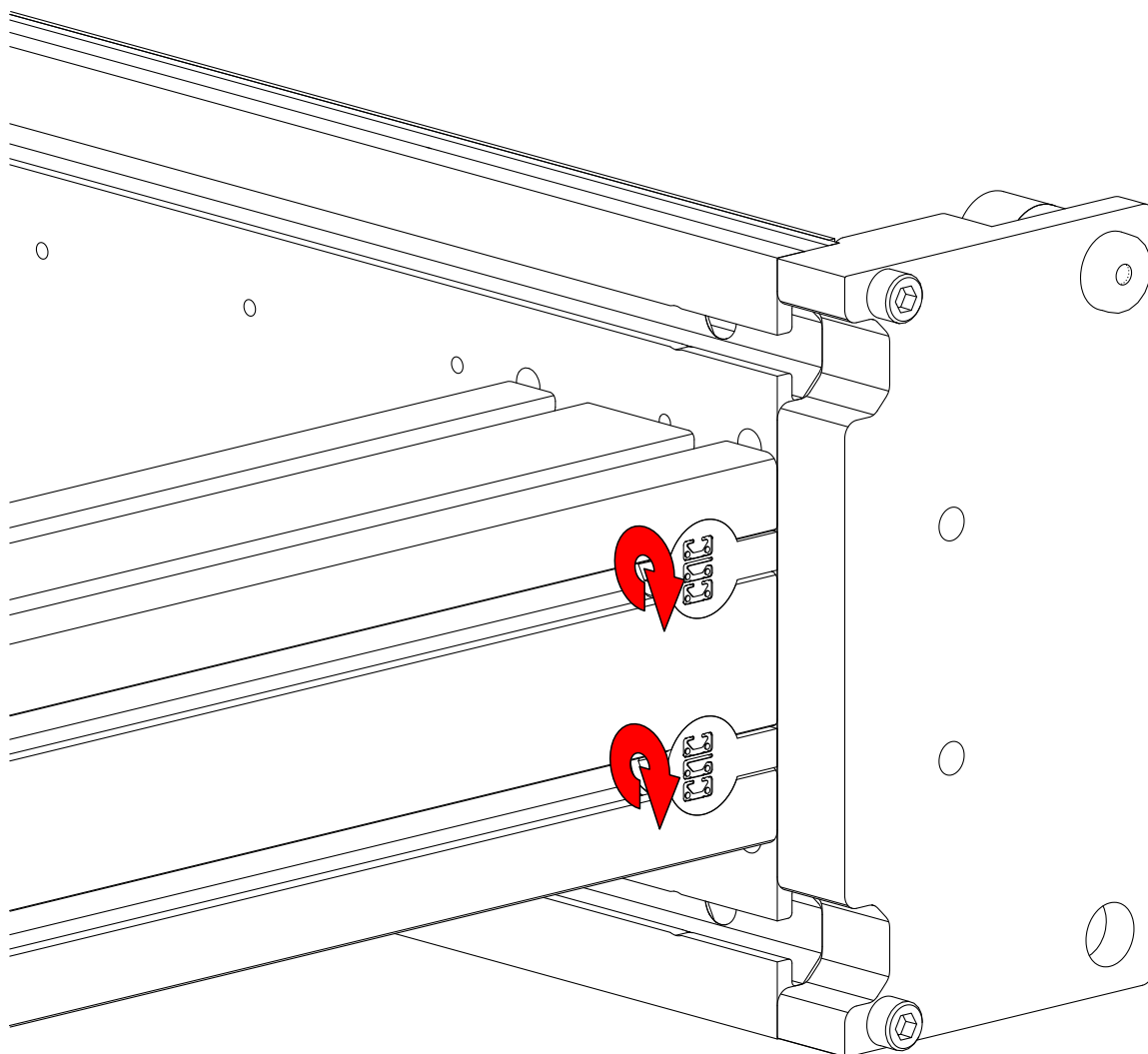
2' x 2' machines only require three crossmembers.

### 1.1.7



- Add anchor fasteners and screws to the other side of the extrusion and attach the right table ballscrew axis.

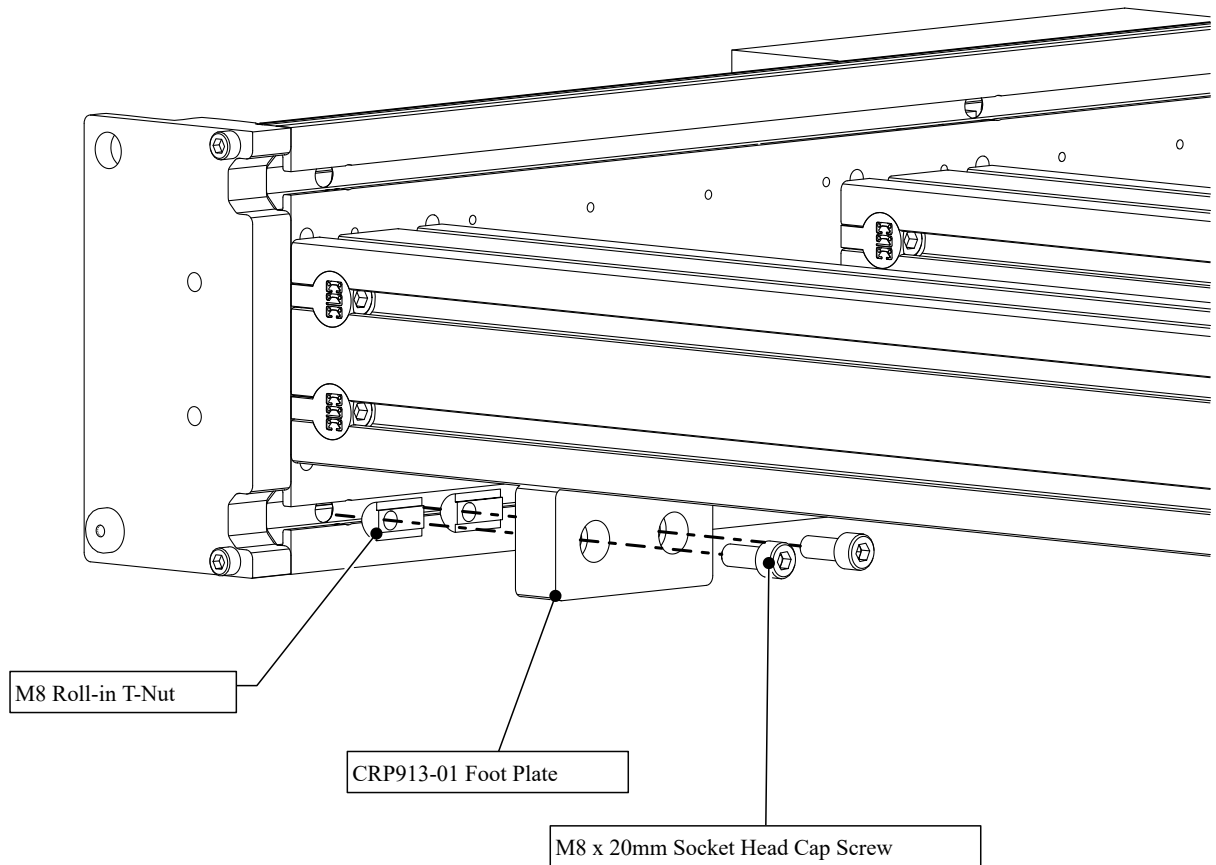
### 1.1.8



- Tighten all remaining crossmember anchor screws.

## 1.2 Leveling Feet Assembly

### 1.2.1



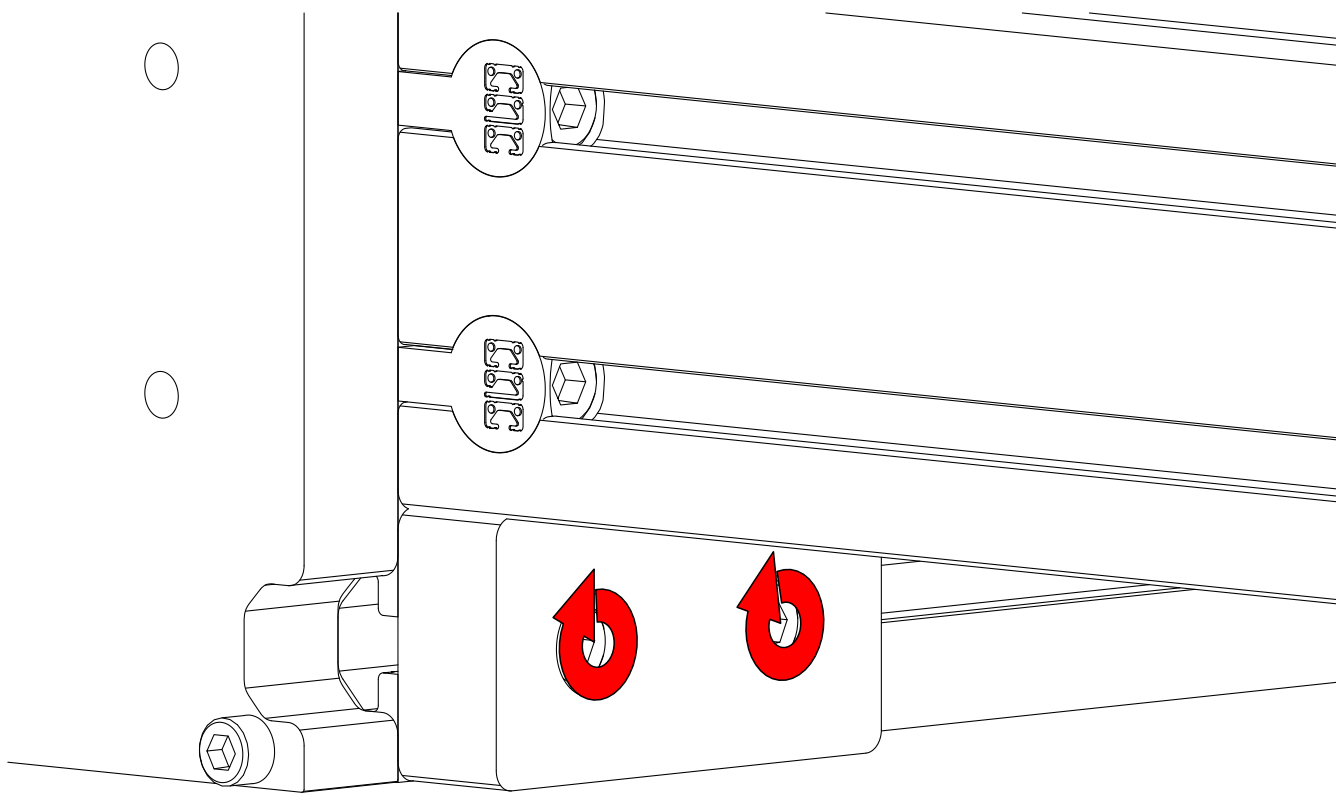
- Attach a foot plate to a ballscrew axis as indicated.



#### Assembly Note

If you assembled the crossmembers in the lowered configuration, locate the block to the side of the crossmember rather than under it.

### 1.2.2



- Bias the foot plate towards the crossmember, ensuring it is flush with the bottom of the extrusion.
- Tighten the indicated fasteners.

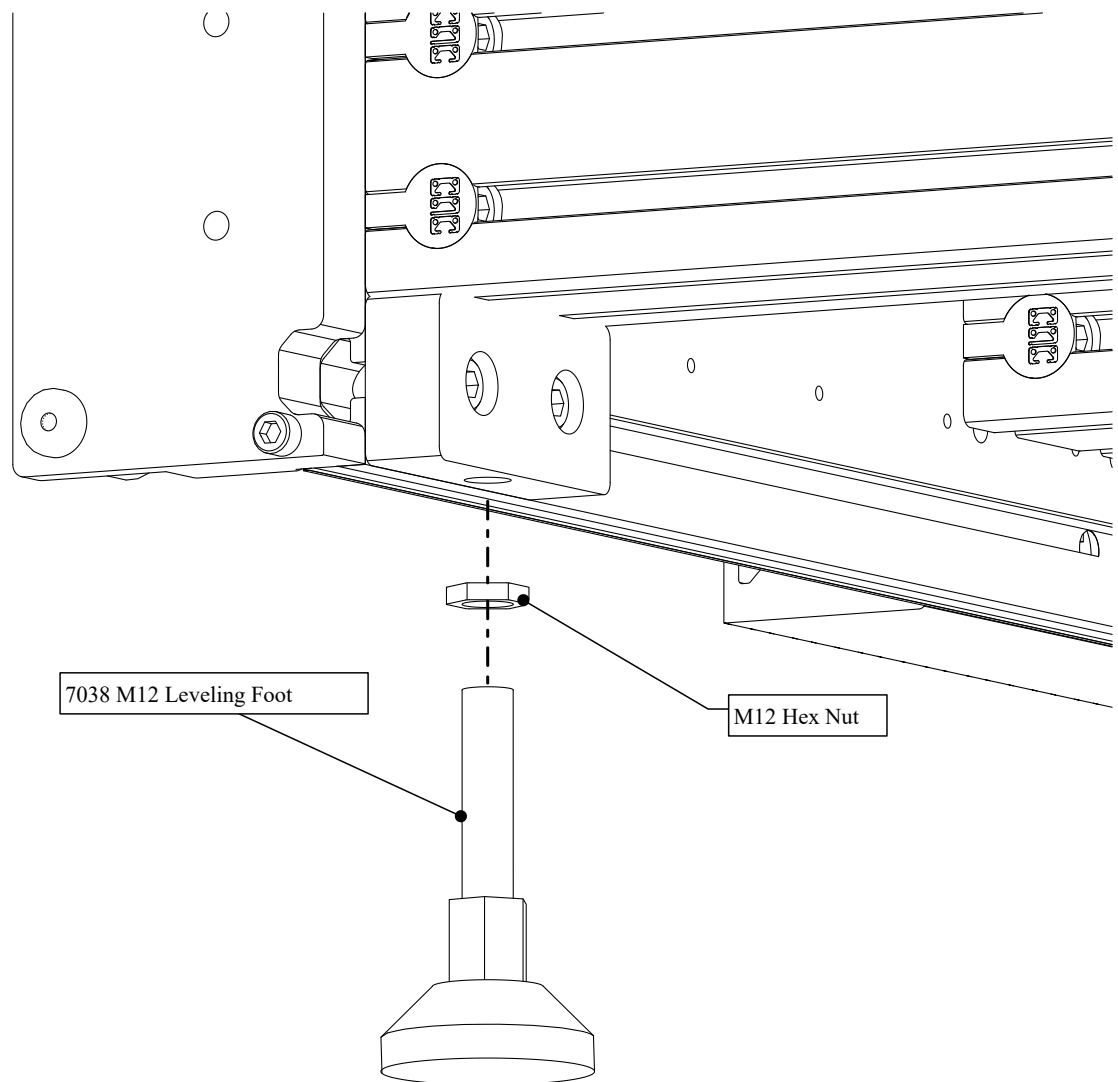


#### Assembly Note

If your crossmembers are not in the default configuration, do not attempt to bring the foot plate flush with the extrusion.

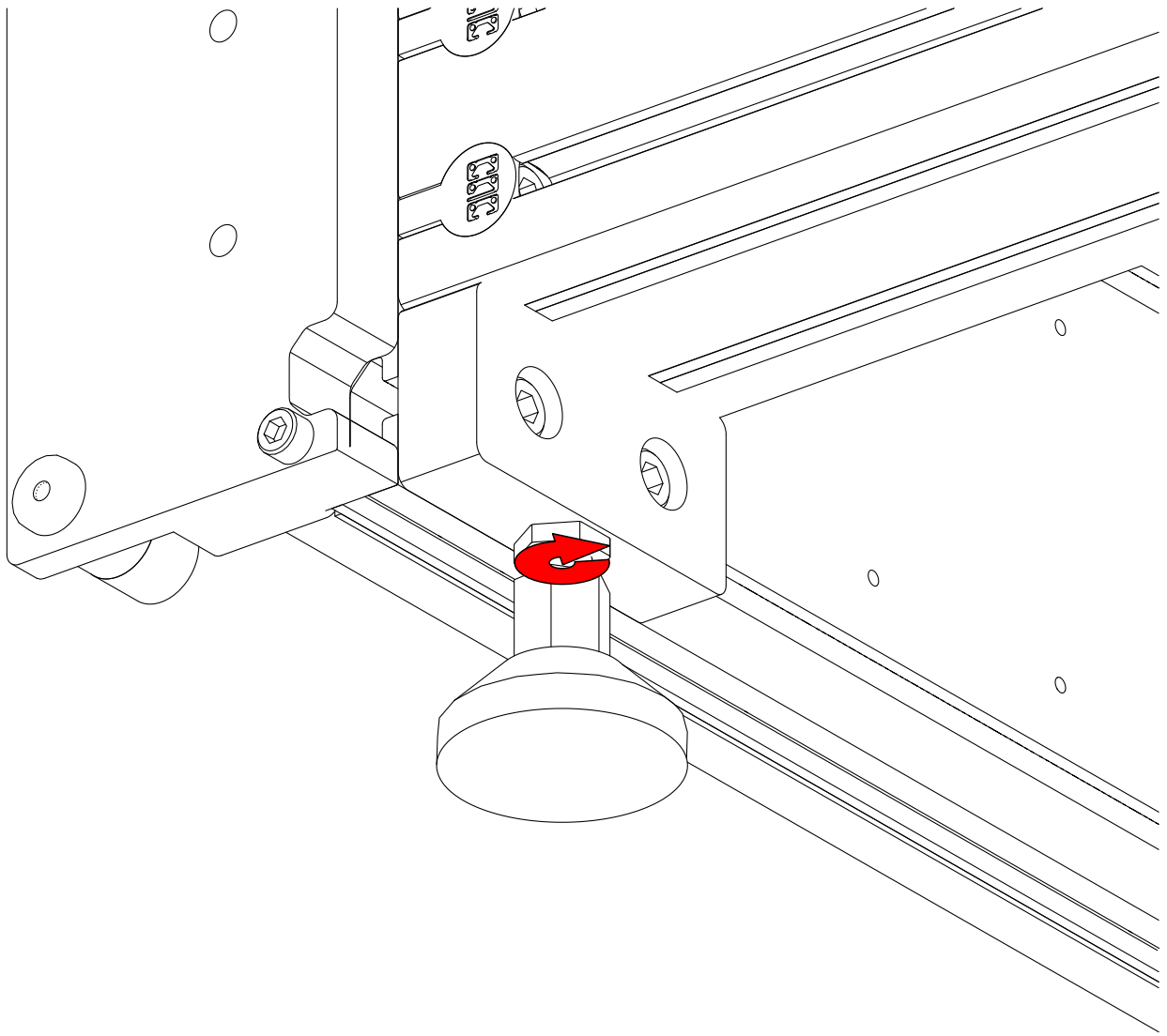


### 1.2.3



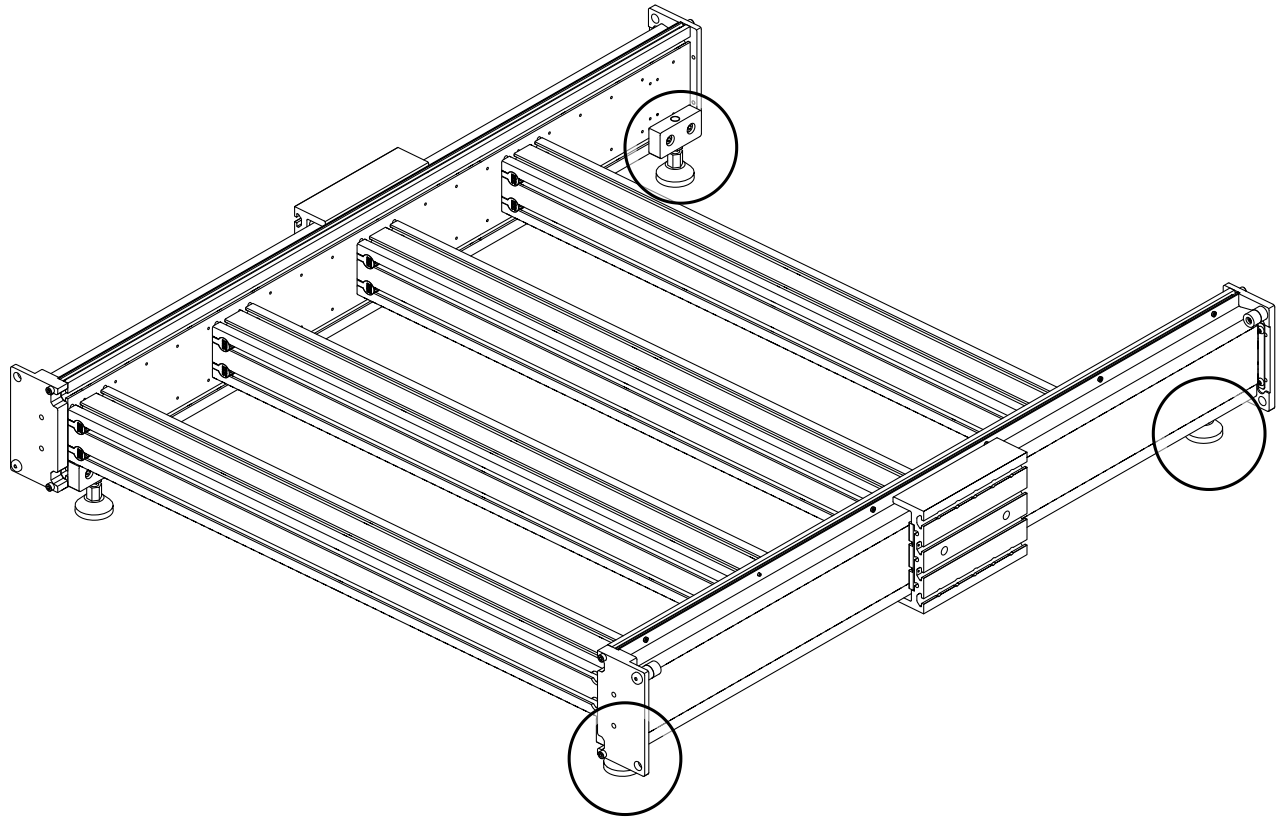
- Install the lock nut onto the leveling foot and thread the leveling foot into the foot plate.

## 1.2.4



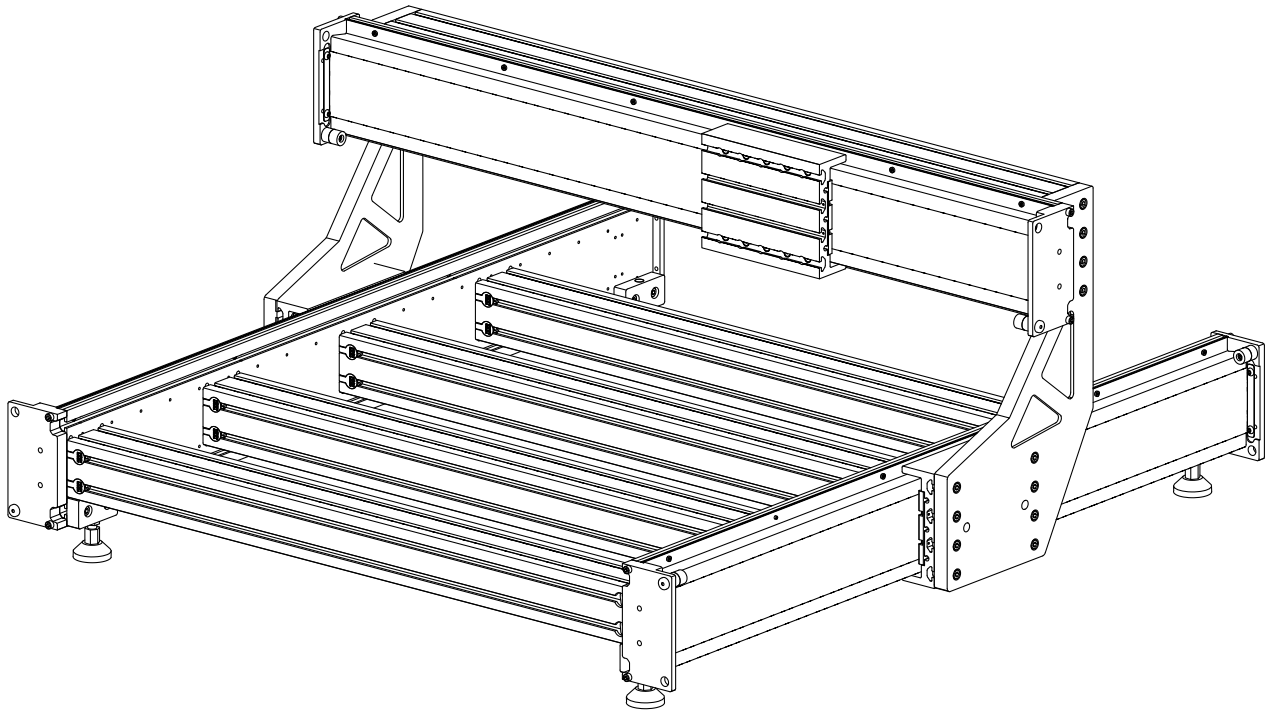
- Tighten the lock nut.

## 1.2.5



- Repeat this process to install the remaining leveling feet at the indicated locations.

## Section 2: Gantry Installation



## Parts and Tools Required

*The following parts and tools will be used in Section 2*

### Parts List - 2' Wide Machines

QTY	Part/Description	Packaged In
1	8016 Gantry Extrusion, 800mm (31-1/2)	Linear Extrusion Bundle
1	CRP840-00-650 - PRO Linear Ballscrew Axis, Gantry	Benchtop Gantry Axis
1	CRP920-01-L - Gantry Riser, Left	CRP900-00-XXXX-HW
1	CRP920-01-R - Gantry Riser, Right	CRP900-00-XXXX-HW
1	CRP920-00-FAST: - (16) M8 x 25mm Socket Head Cap Screw - (16) M8 Slide-in T-Nut	CRP900-00-XXXX-HW
1	CRP930-00-FAST: - (16) M8 x 25mm Flat Head Screw - (16) M8 x 25mm Socket Head Cap Screw - (16) M8 Slide-in T-Nut	CRP900-00-XXXX-HW

### Parts List - 3' Wide Machines

QTY	Part/Description	Packaged In
1	8016 Gantry Extrusion, 1120mm (44-1/16")	Linear Extrusion Bundle
1	CRP840-00-950 - PRO Linear Ballscrew Axis, Gantry	Benchtop Gantry Axis
1	CRP920-01-L - Gantry Riser, Left	CRP900-00-3636-HW
1	CRP920-01-R - Gantry Riser, Right	CRP900-00-3636-HW
1	CRP920-00-FAST: - (16) M8 x 25mm Socket Head Cap Screw - (16) M8 Slide-in T-Nut	CRP900-00-3636-HW
1	CRP930-00-36-FAST: - (22) M8 x 25mm Flat Head Screw - (16) M8 x 25mm Socket Head Cap Screw - (22) M8 Slide-in T-Nut	CRP900-00-3636-HW



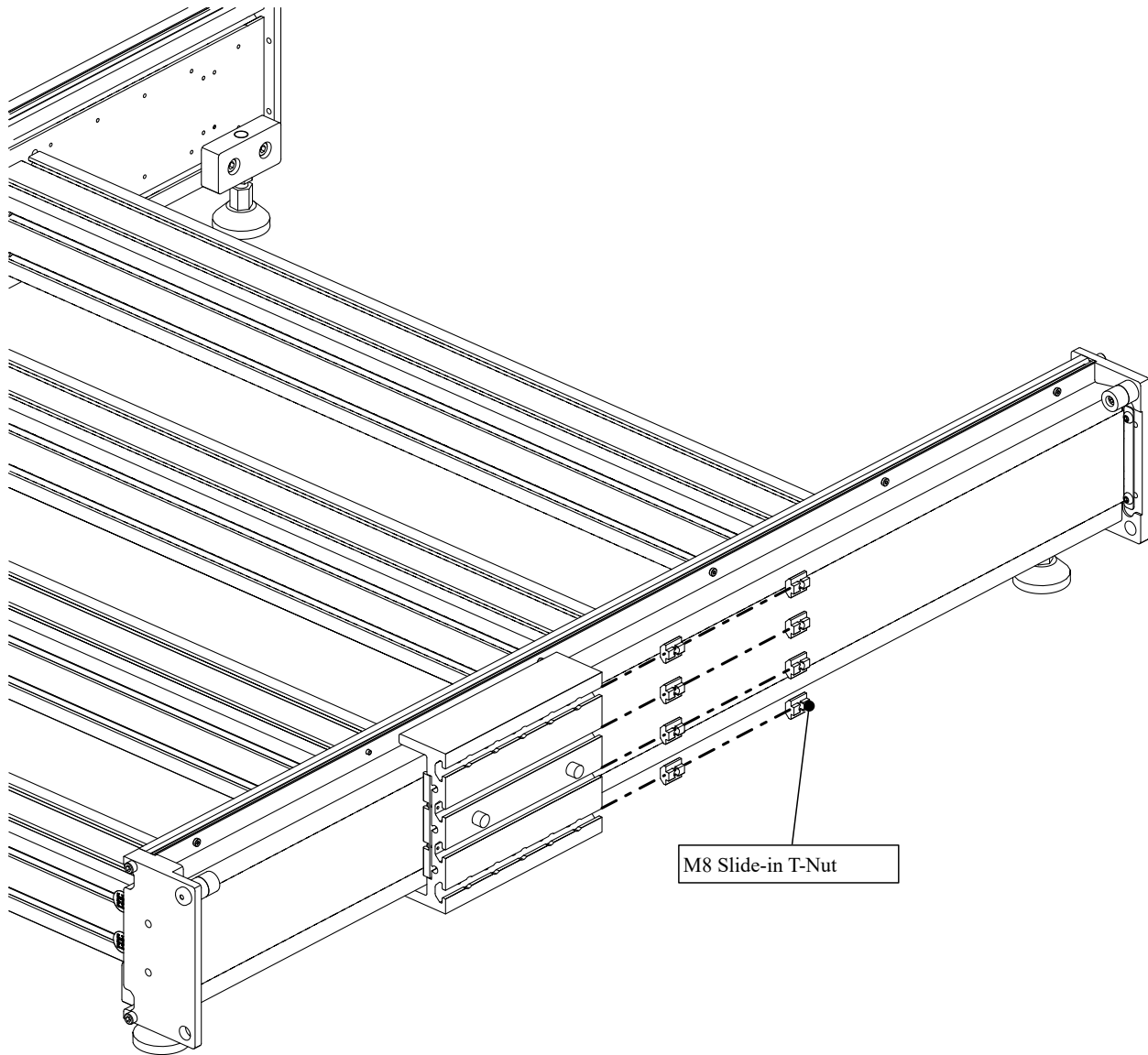
Required Tools:

- 3mm Allen Wrench
- 5mm Allen Wrench
- 6mm Allen Wrench
- Tape Measure



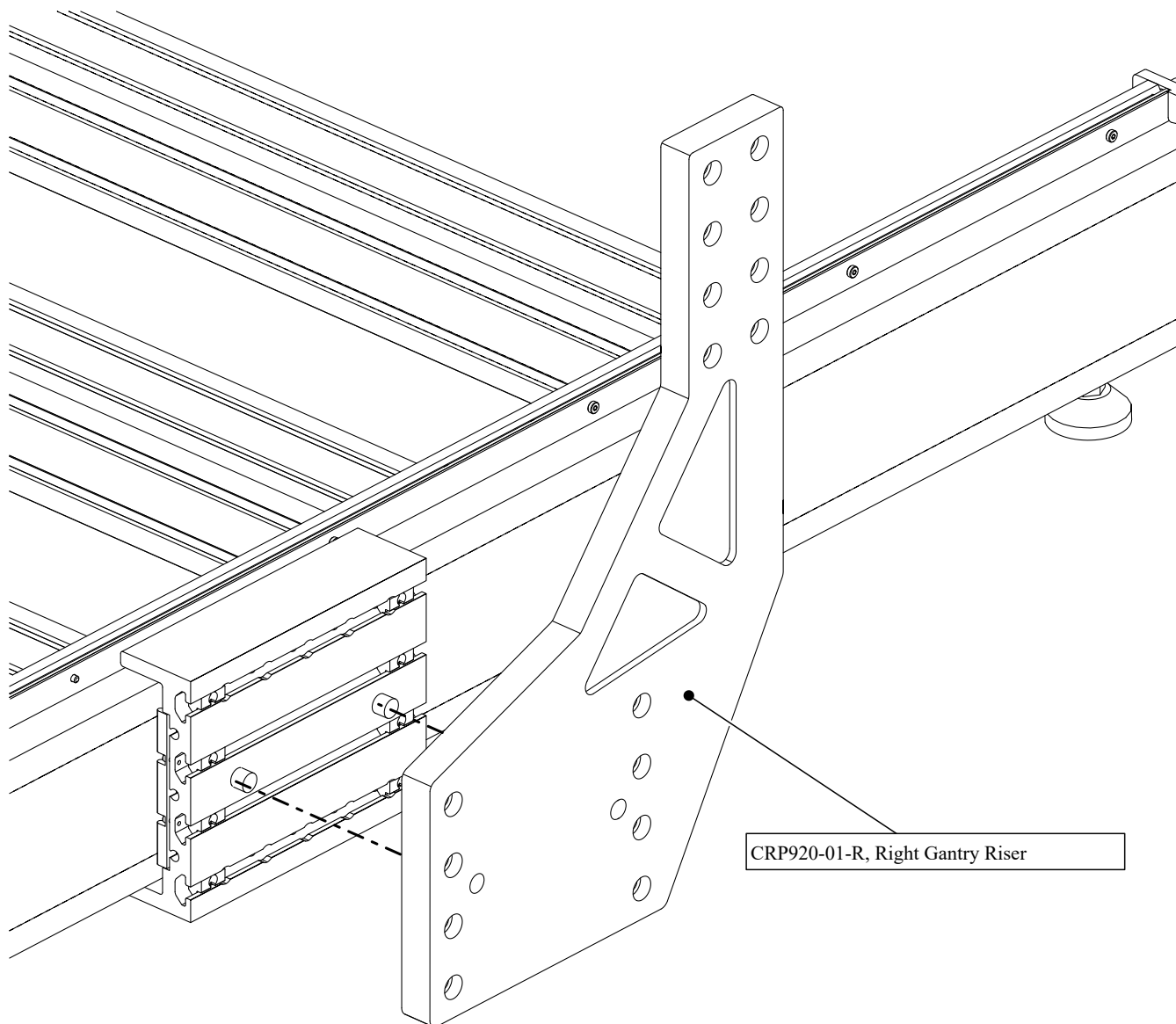
## 2.1 Gantry Riser Assembly

### 2.1.1



- Slide slide-in T-Nuts onto the right table axis as indicated.

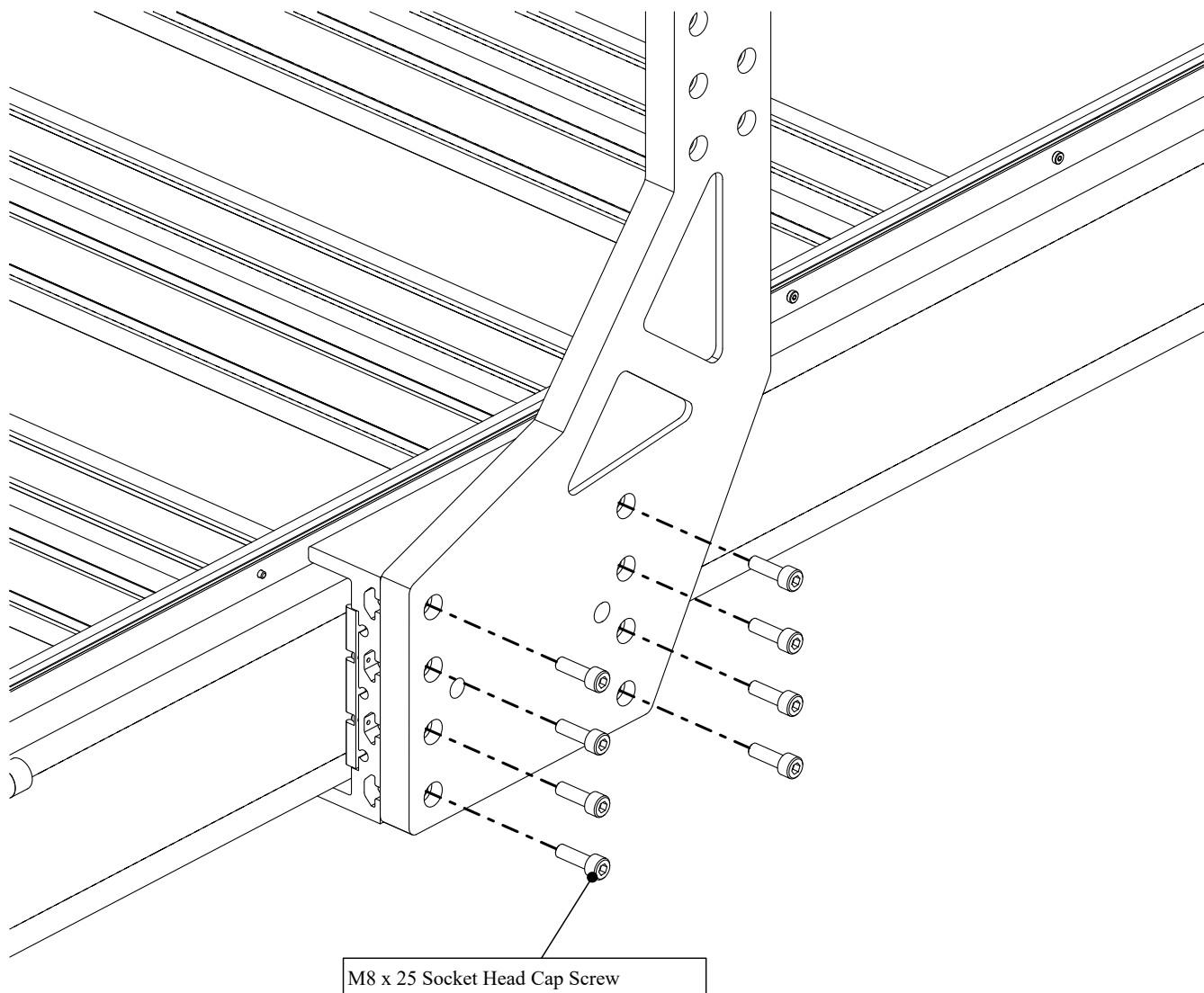
## 2.1.2



- Attach the right gantry riser to the extrusion.

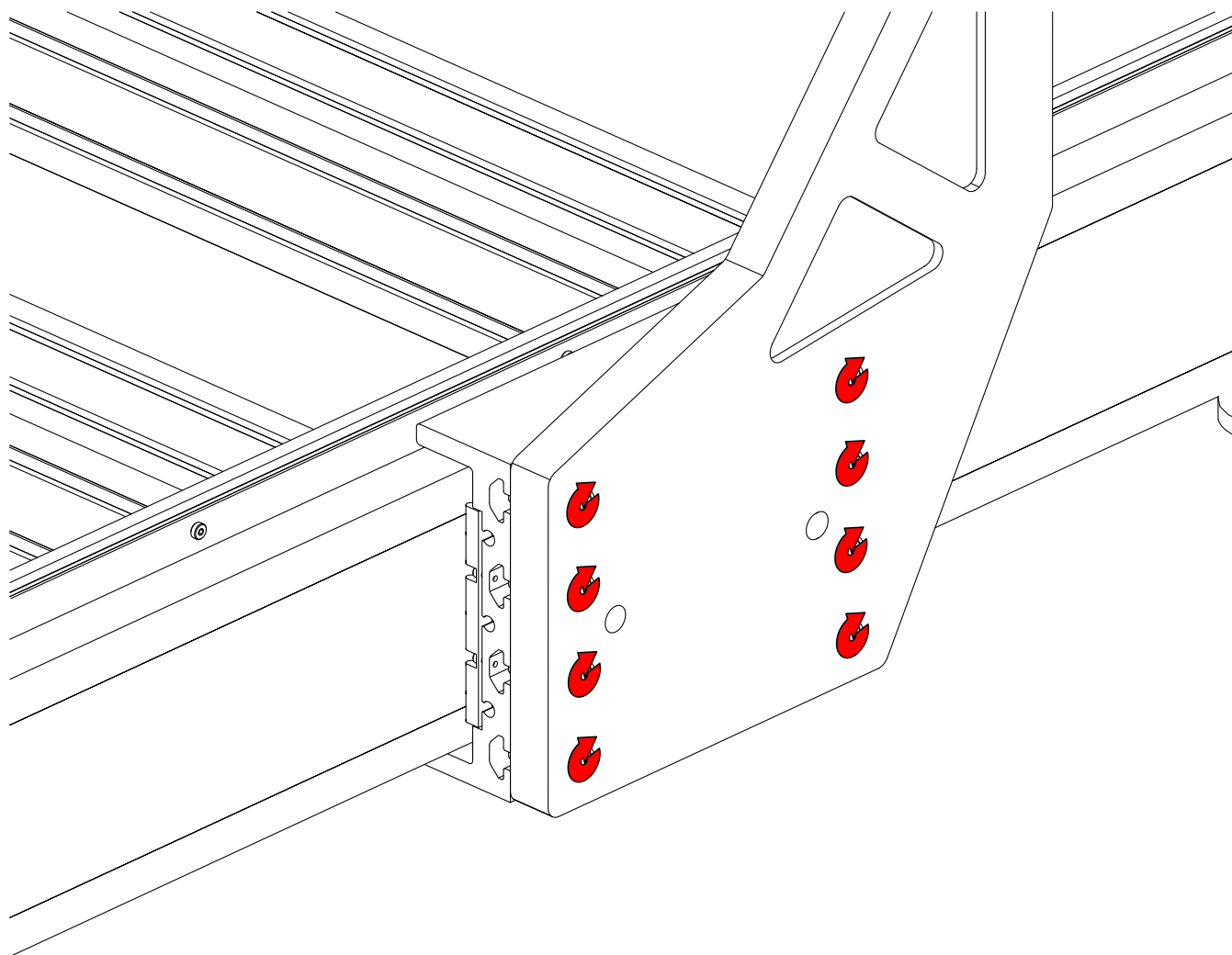


### 2.1.3



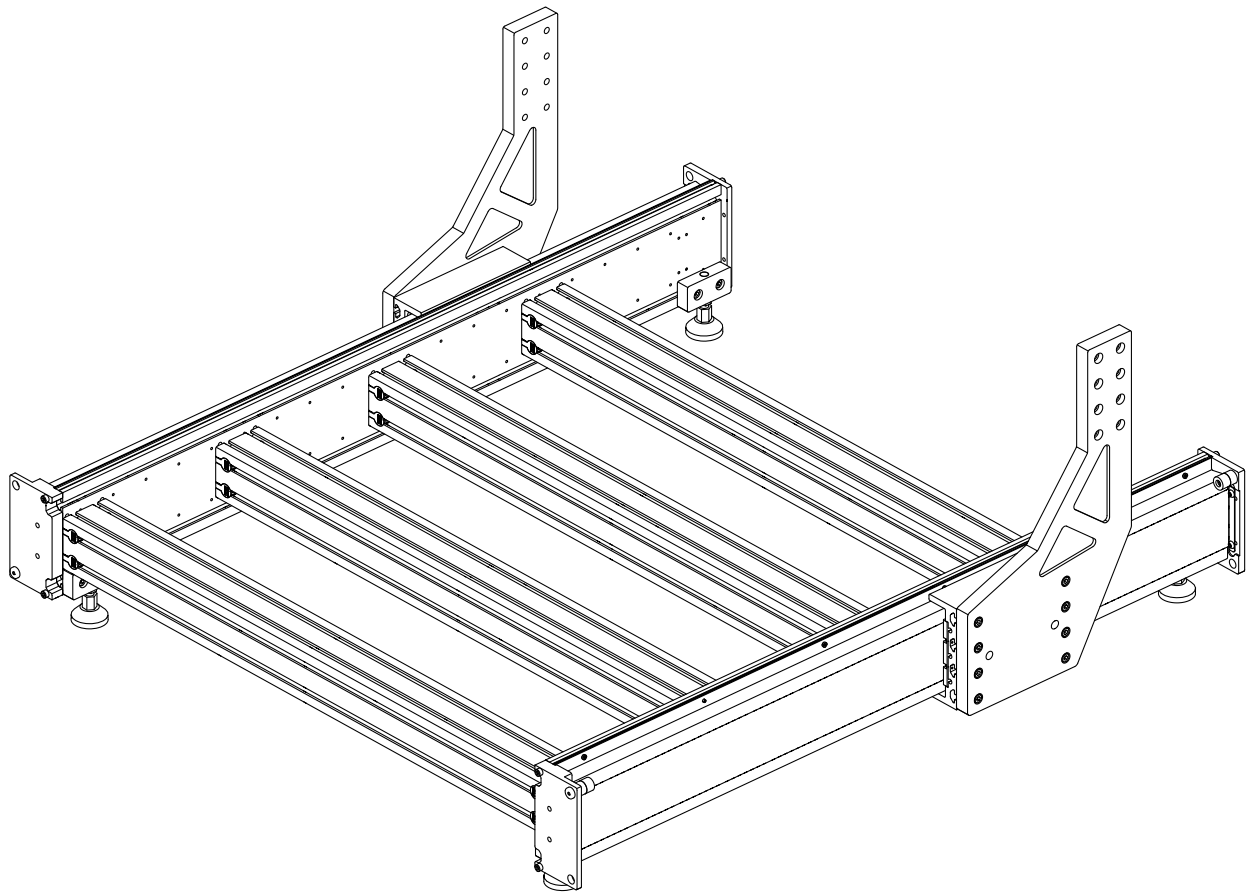
- Thread socket head cap screws into the T-Nuts.

## 2.1.4



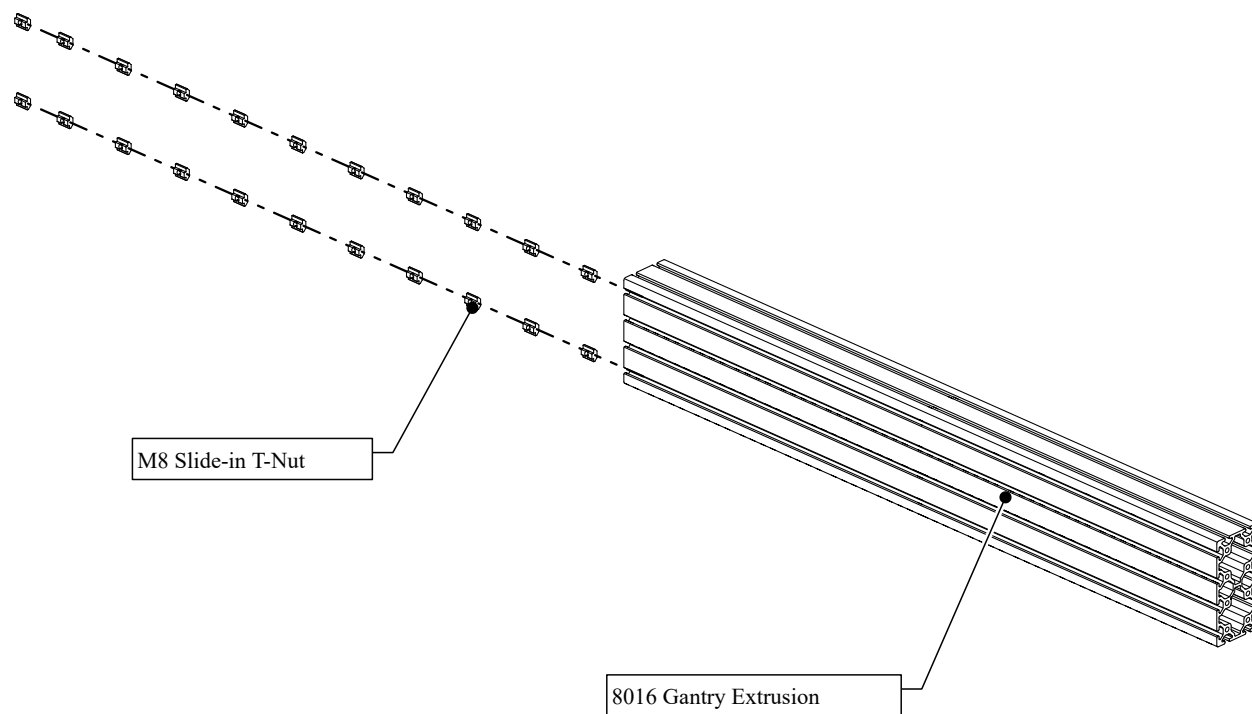
- Tighten the indicated bolts.

## 2.1.5



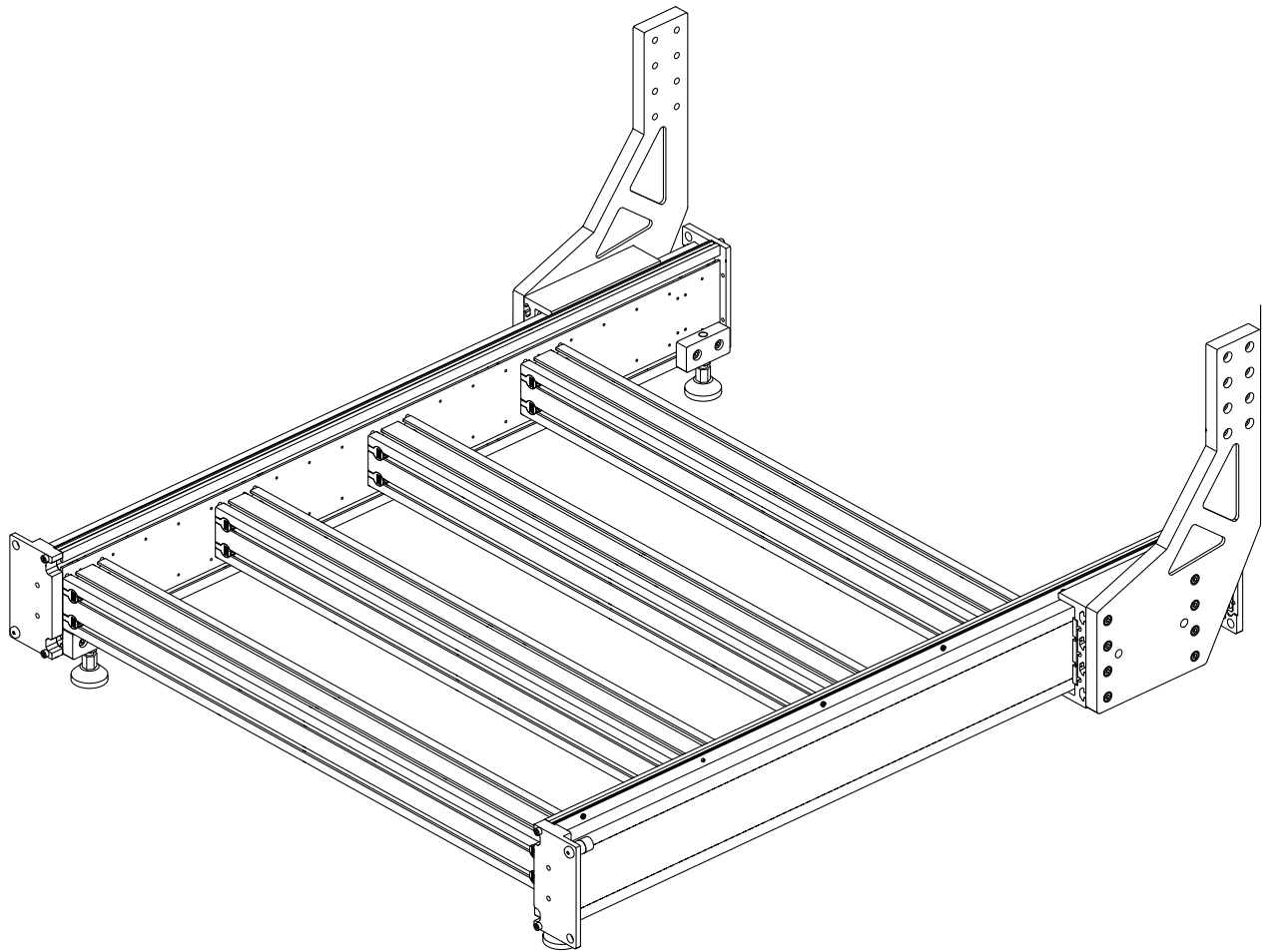
- Repeat the previous steps to attach the second gantry riser to the left table axis.

## 2.1.6



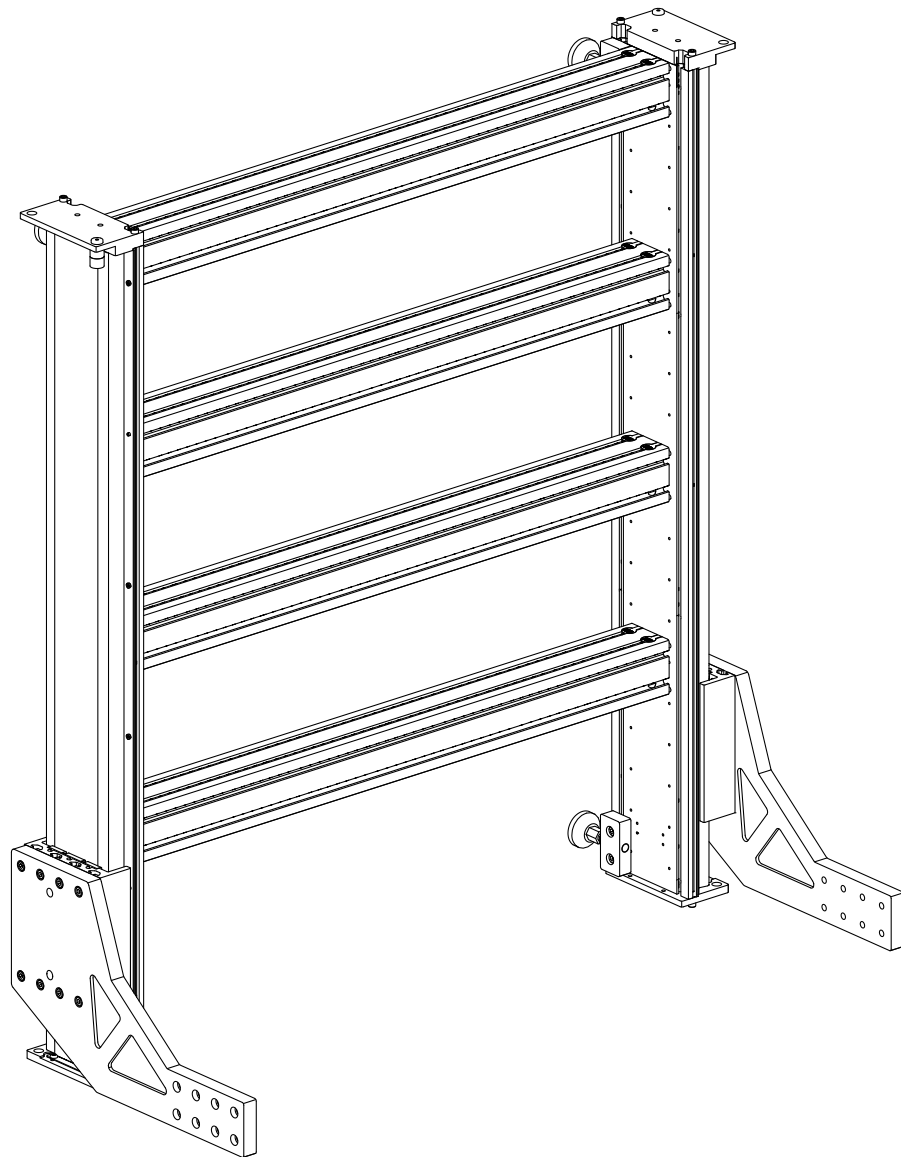
- Slide t-nuts into gantry extrusion.

## 2.1.7



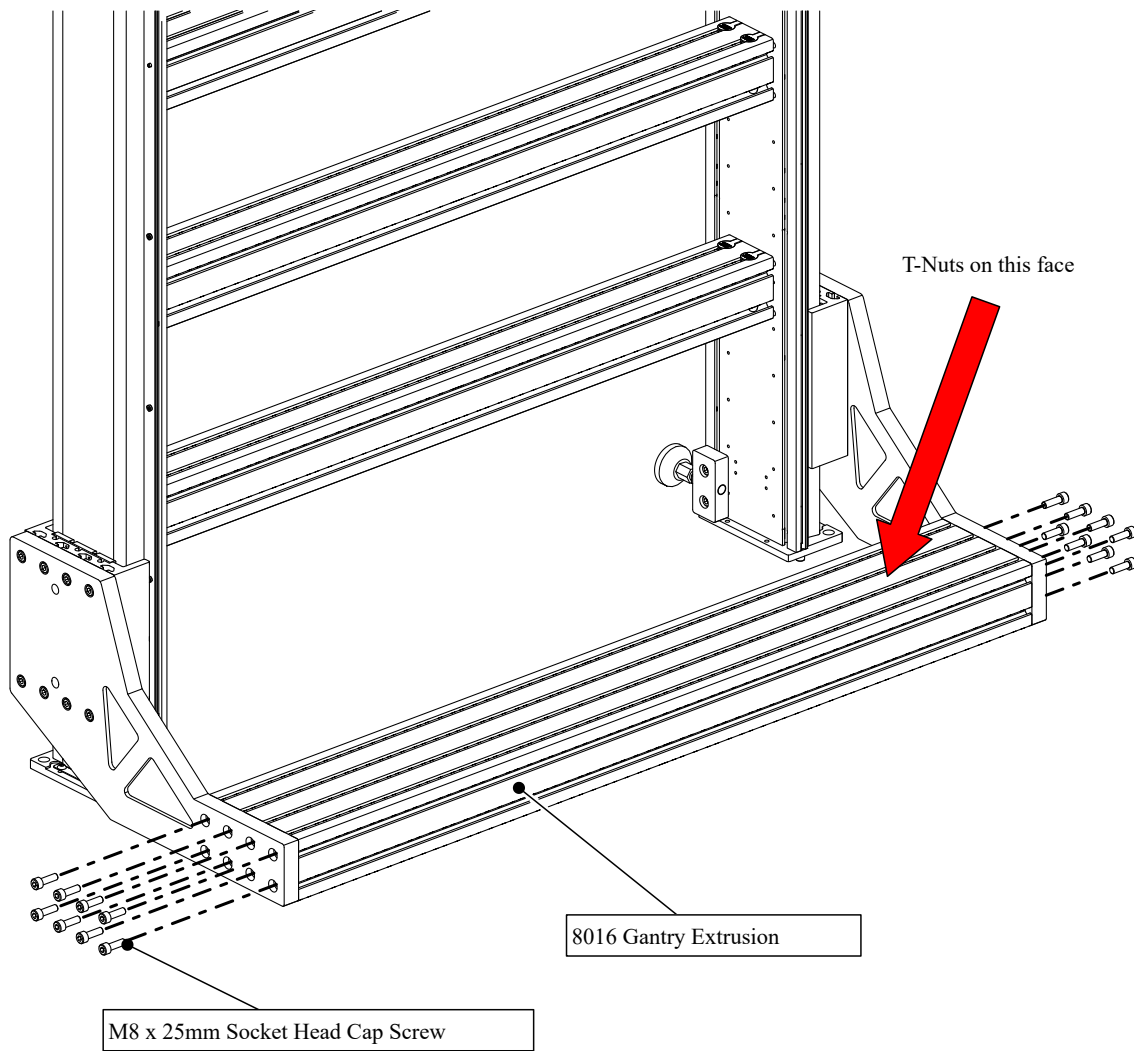
- Slide the risers to the back of the machine.

## 2.1.8



- Turn the machine onto its back.

## 2.1.9



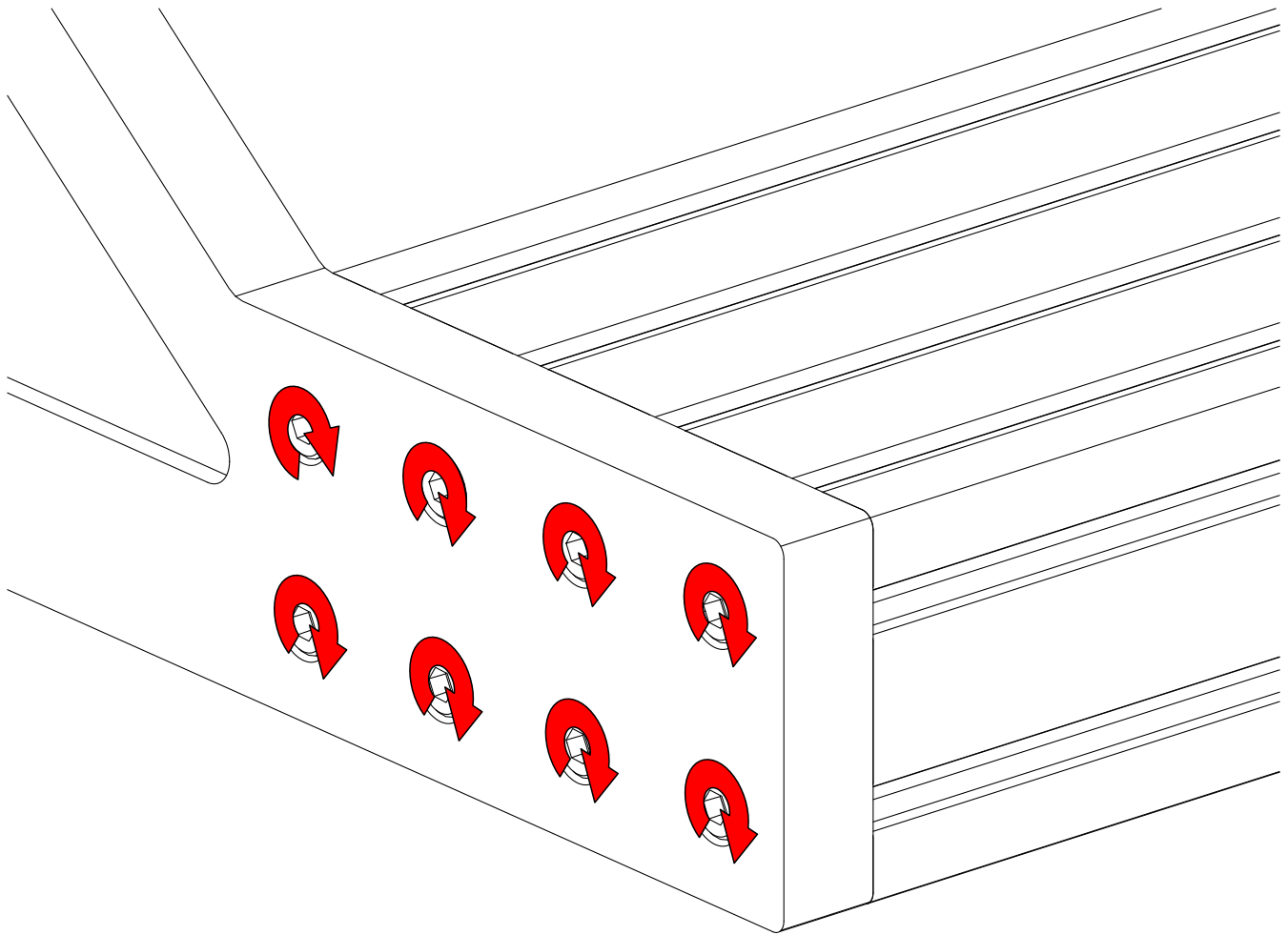
- Attach gantry extrusion to the risers with the M8 x 25mm fasteners.



### Assembly Note

Orient gantry extrusion with the previously installed t-nuts on the indicated face.

### 2.1.10

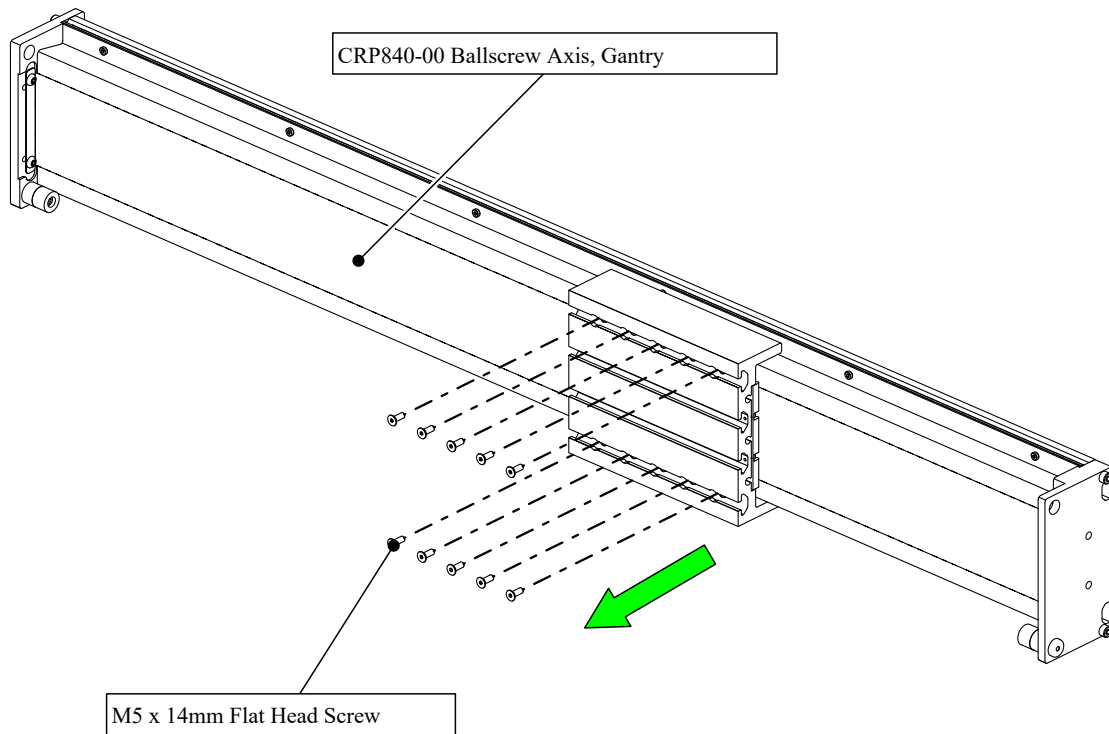


- Tighten the indicated bolts.



## 2.2 Gantry Axis Installation

### 2.2.1



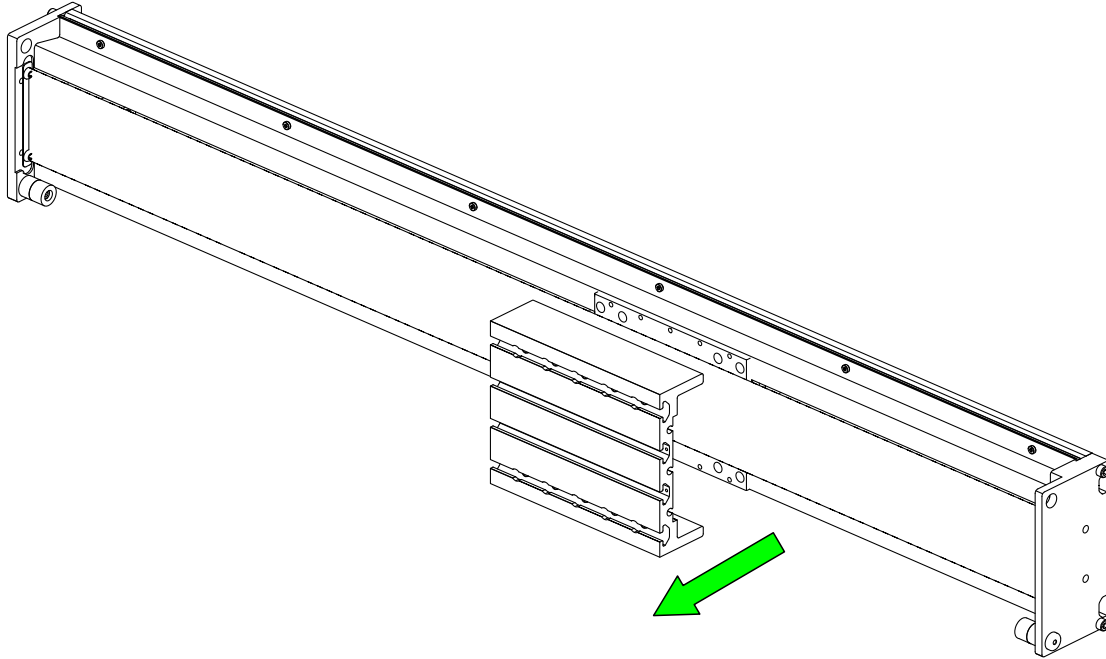
- Remove the indicated screws holding the moving plate to the gantry ballscrew axis.



#### Assembly Note

Place these screws aside, you will be reinstalling the moving plate in a future step.

## 2.2.2



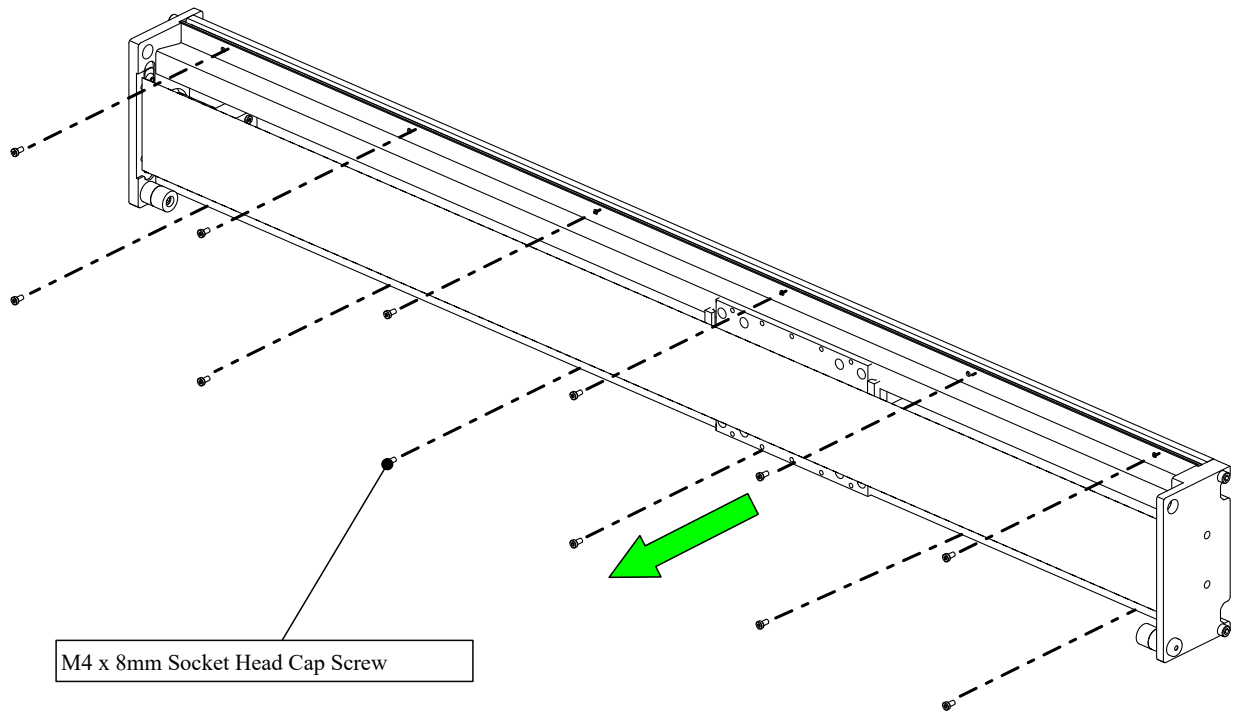
- Remove the moving plate and set aside.



### Assembly Note

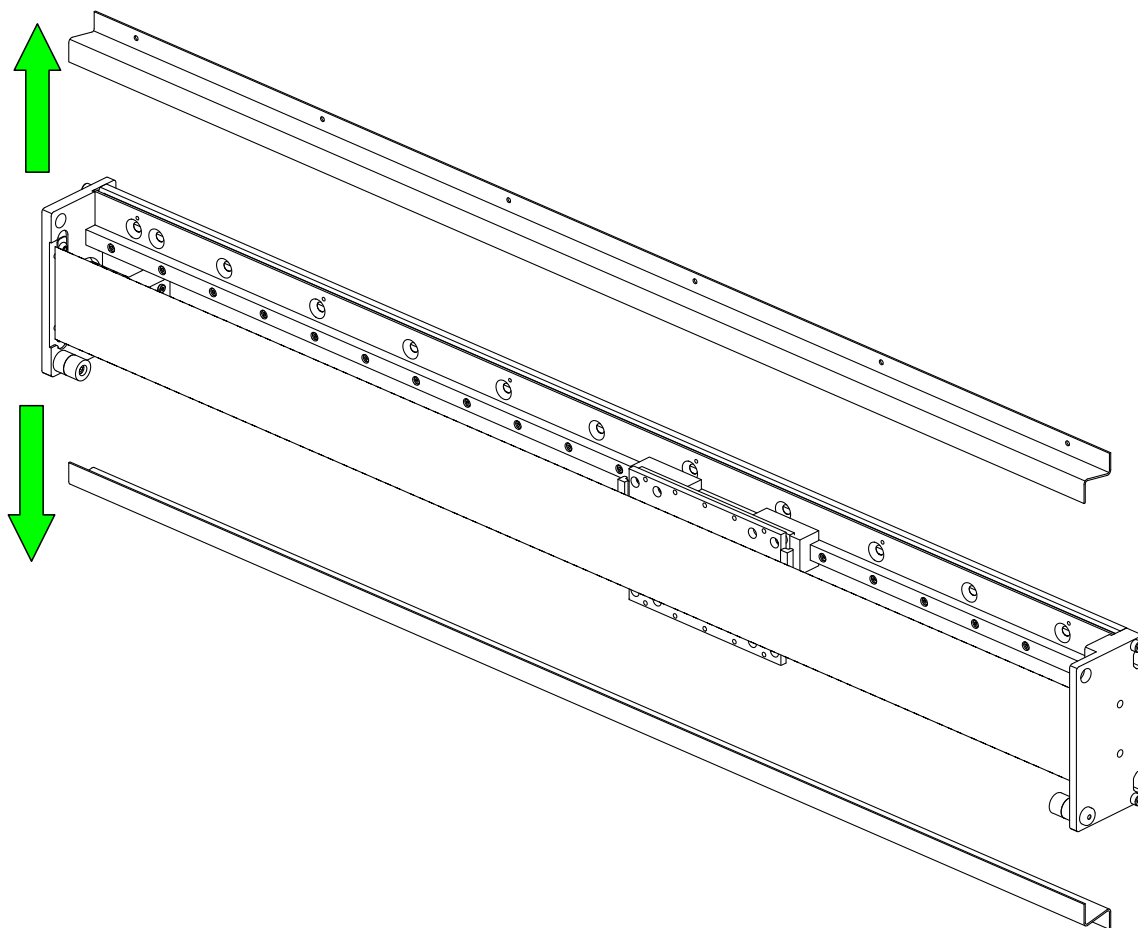
Some force may be required to remove the moving plate from the gantry ballscrew axis.

### 2.2.3



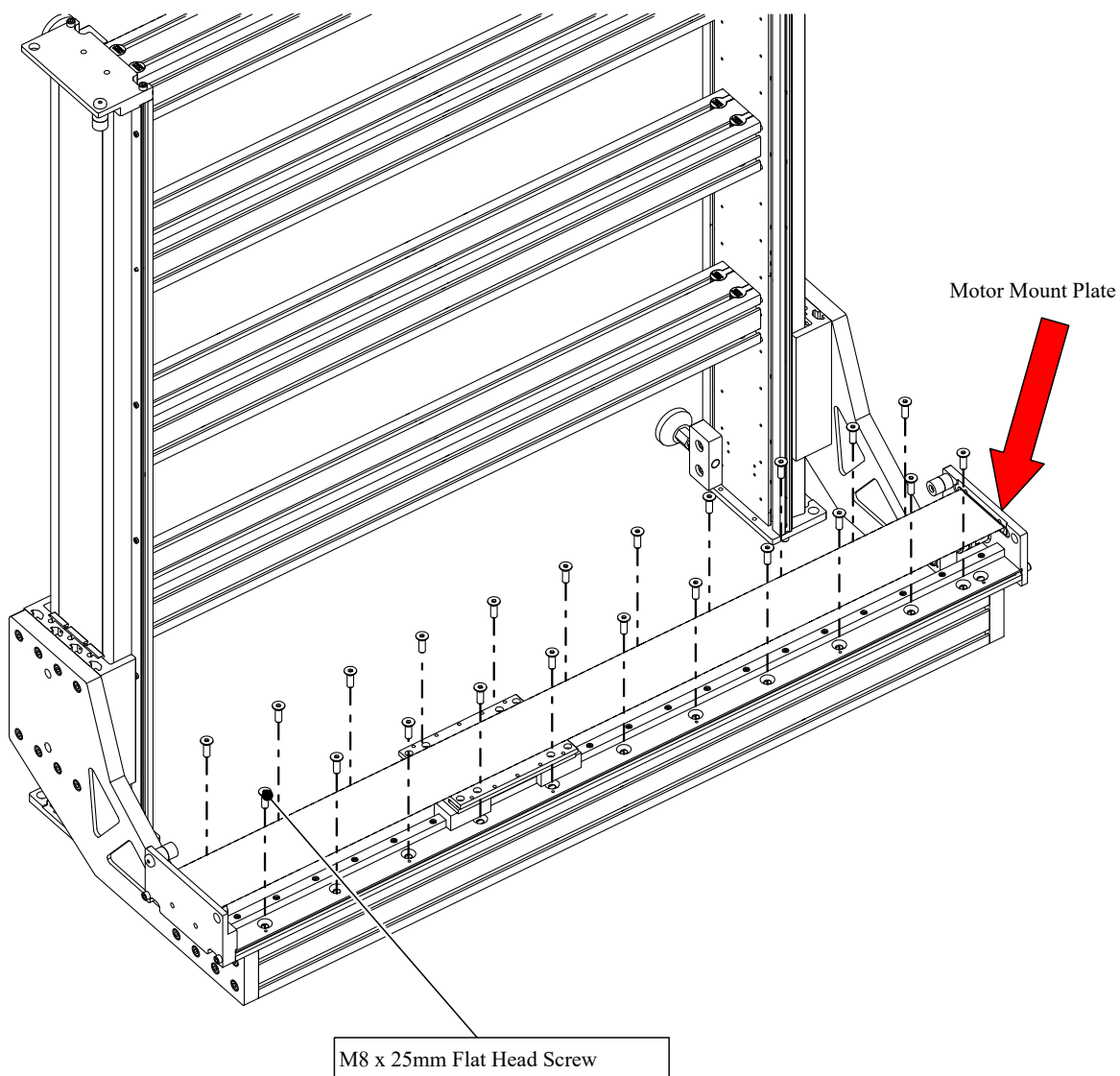
- Remove the metal dust cover screws from the gantry axis and set them aside.

## 2.2.4



- Remove the metal dust covers from the gantry axis.

## 2.2.5



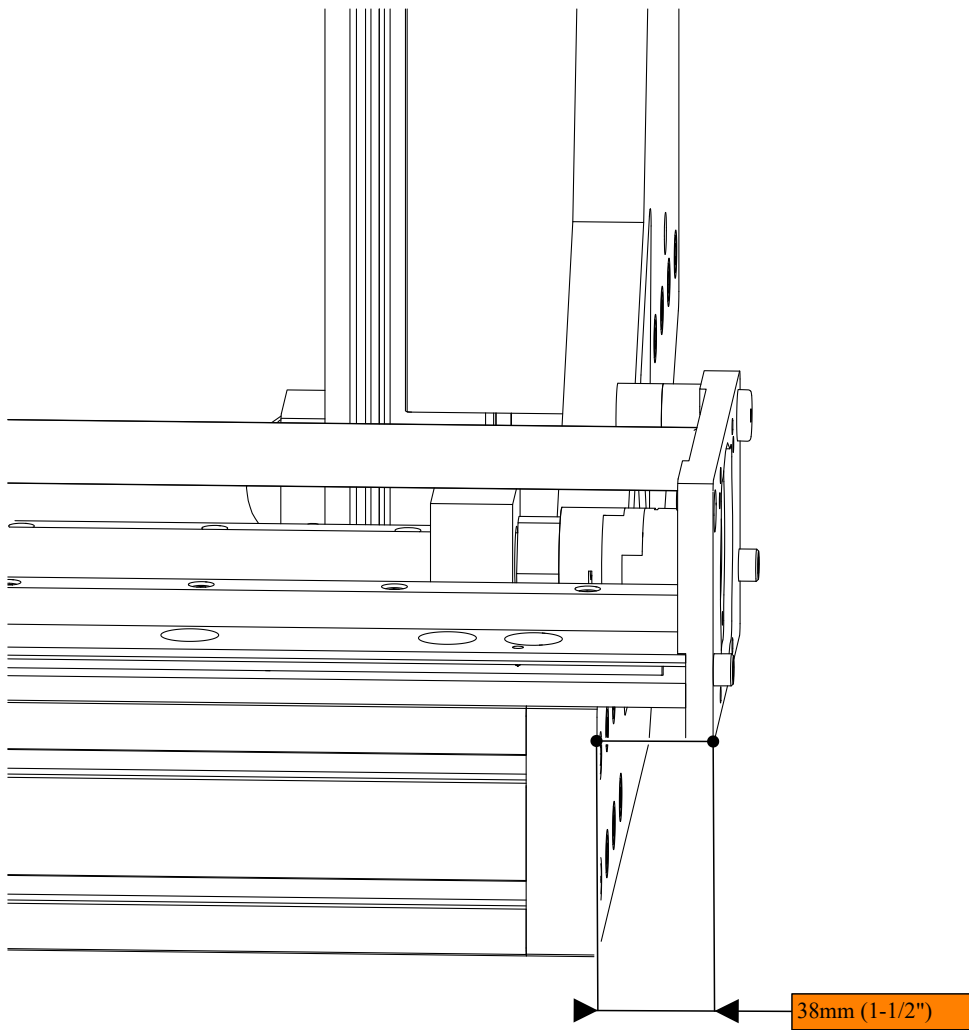
- Attach the gantry ballscrew axis to the gantry extrusion oriented with the motor mount plate on the indicated side.



### Assembly Note

For all gantry sizes, the two countersunk holes closest to the motor mount plate do not receive fasteners.

## 2.2.6

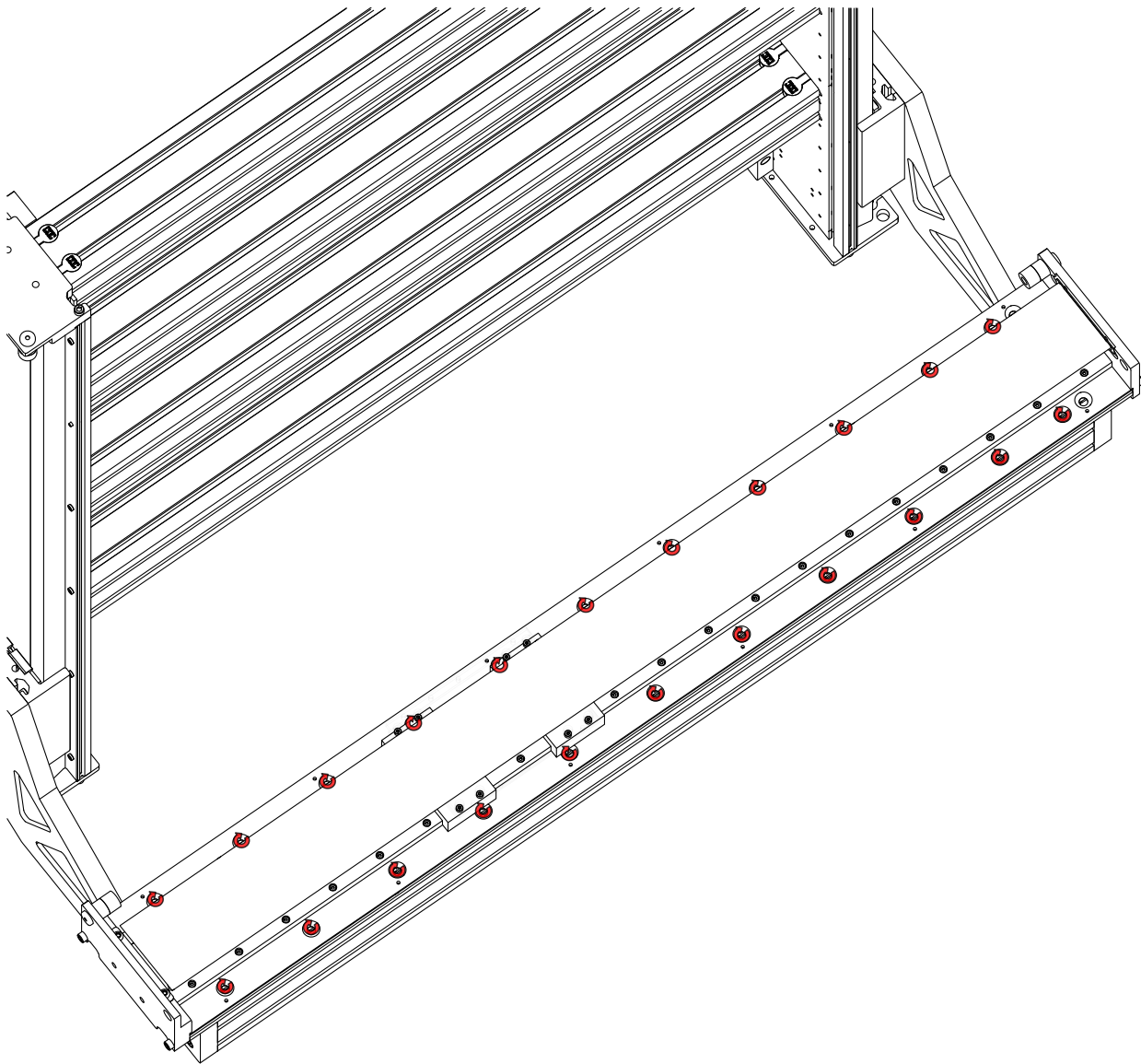


- Position the axis so the motor mount plate is 38mm (1-1/2") from the riser.

### Machine Configuration Options

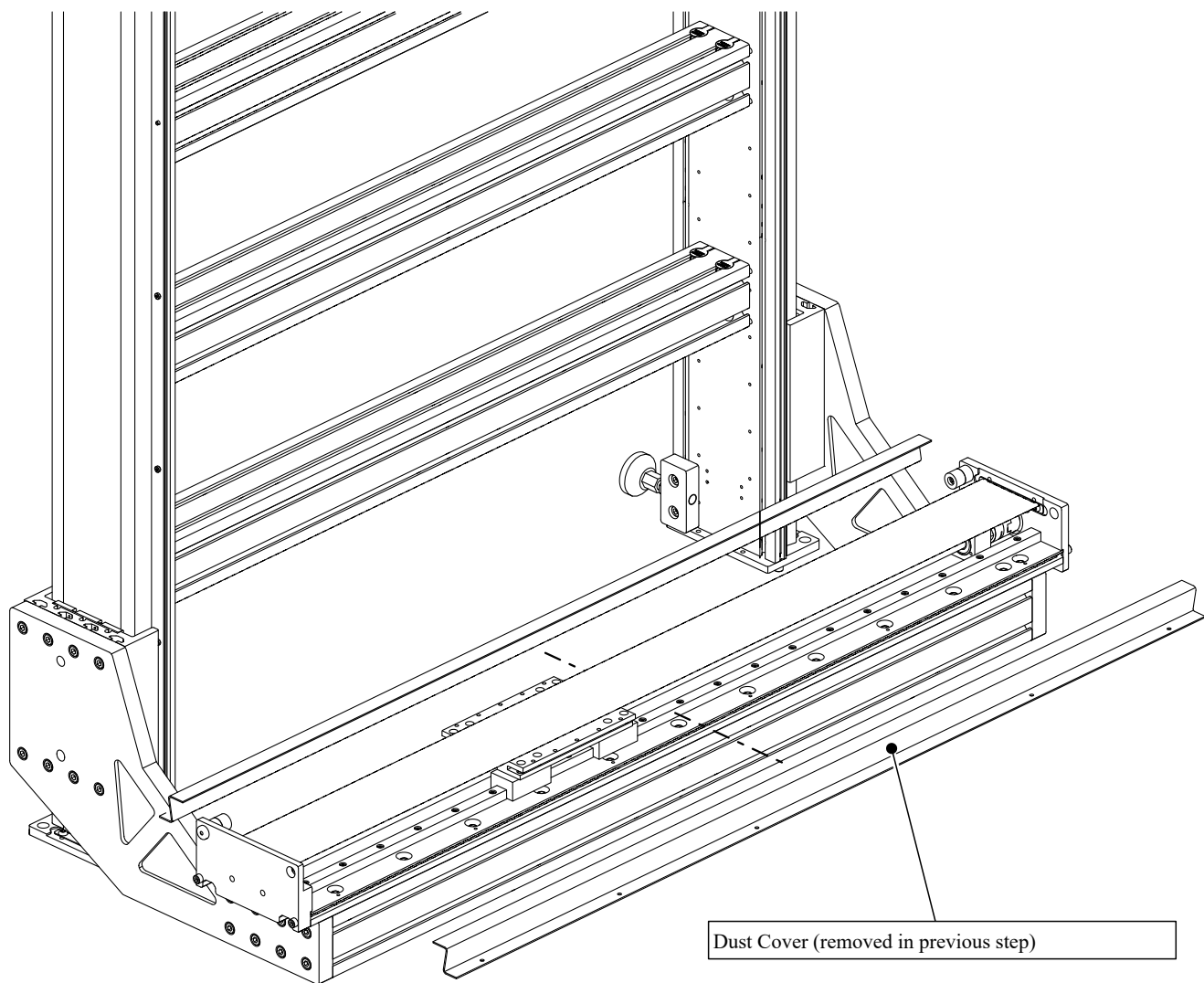
For 24" gantries, position the plate 46mm (1-13/16") from the riser

## 2.2.7



- Tighten the gantry axis bolts.

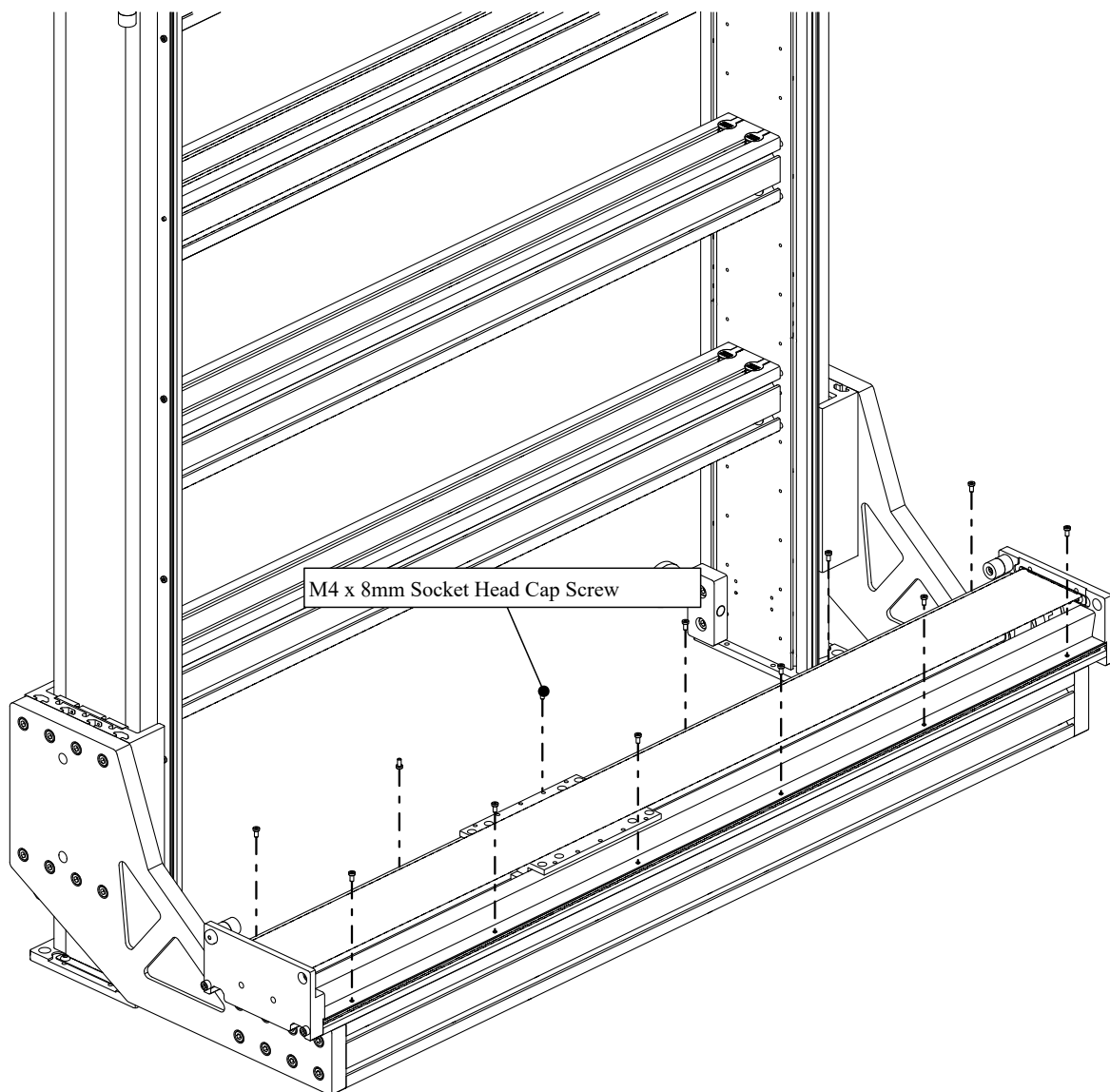
## 2.2.8



- Slide the metal dust covers back on the gantry axis as indicated.

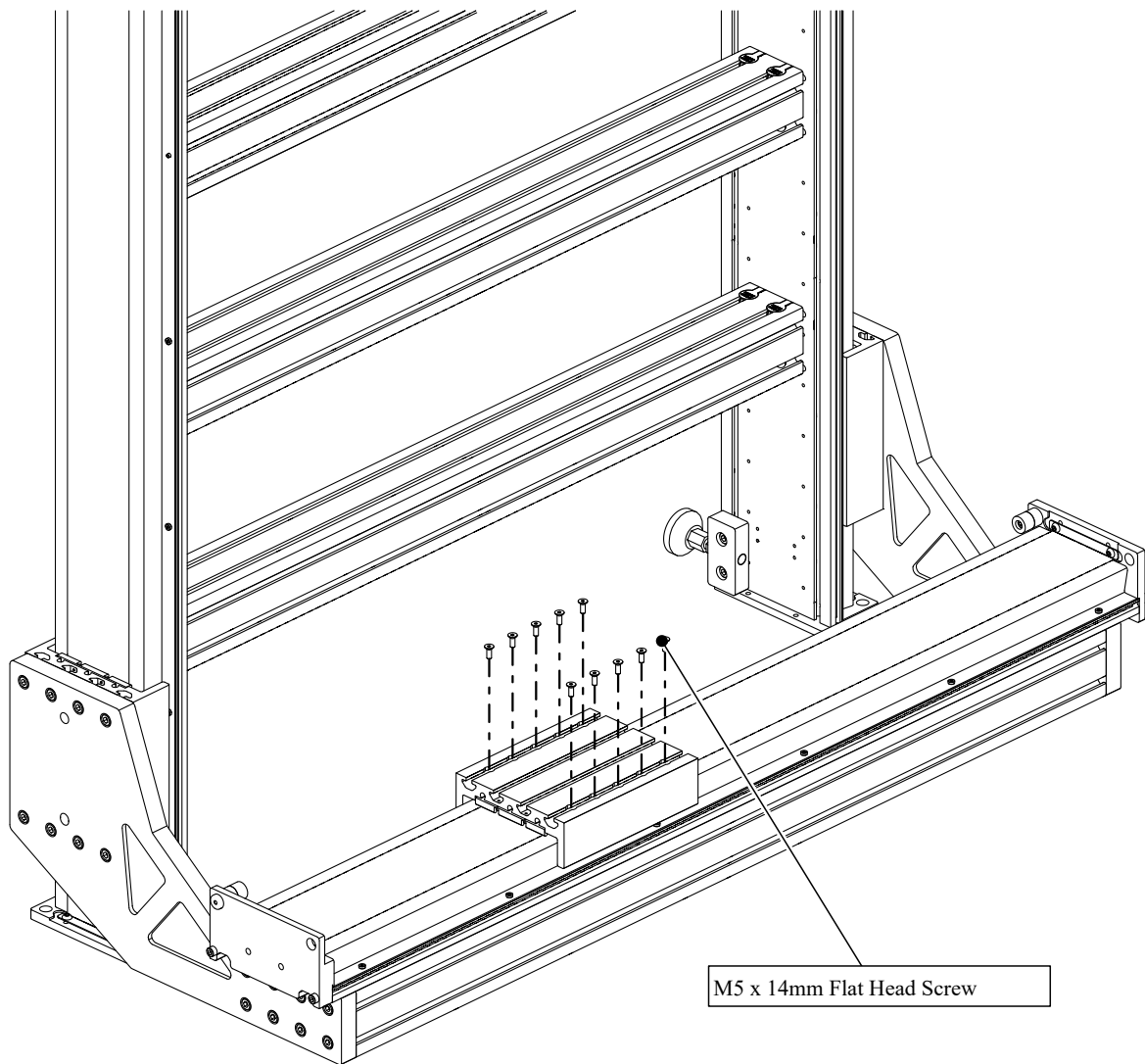


## 2.2.9



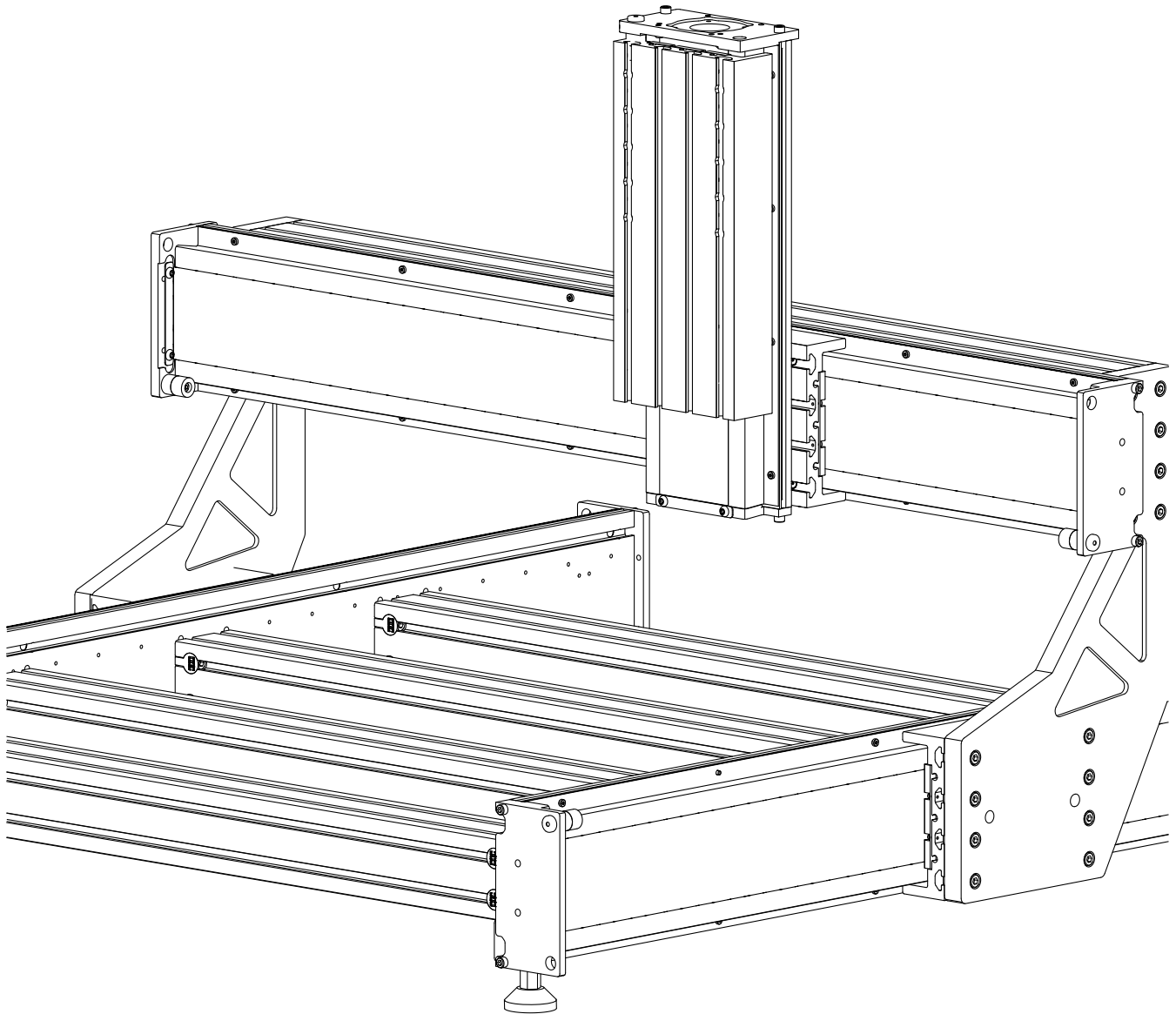
- Attach the metal dust covers using the screws removed in previous steps.

## 2.2.10



- Attach the moving plate to the gantry axis using the screws removed in previous steps.

## Section 3: Z-Axis Installation



## Parts and Tools Required

*The following parts and tools will be used in Section 3*

QTY	Part/Description	Packaged In
1	CRP840-00-200 - PRO Linear Ballscrew Axis	Z Axis
1	CRP940-00-FAST: - (8) M8 x 25mm Flat Head Screw - (8) M8 Slide-in T-Nut	CRP900-00-XXXX-HW

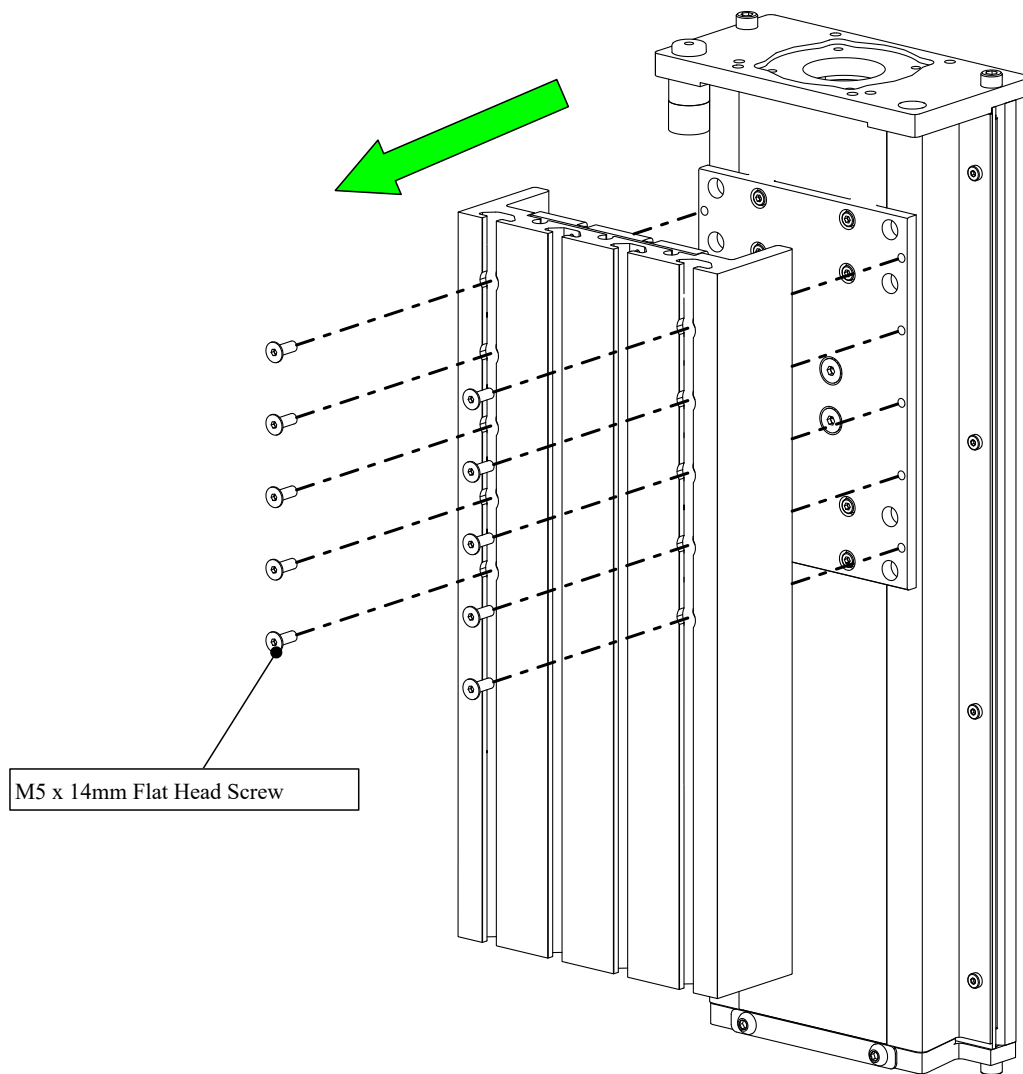
Required Tools:

- 3mm Allen Wrench
- 5mm Allen Wrench



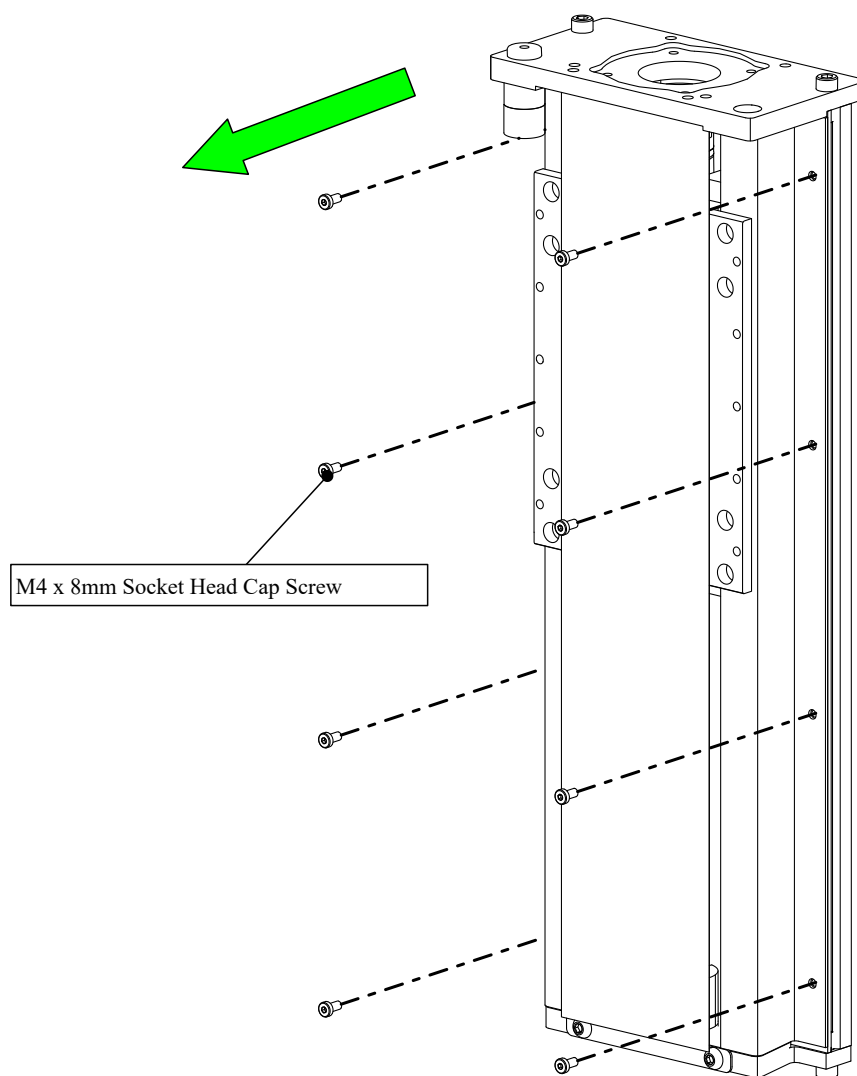
## 3.1 Z-Axis Installation

### 3.1.1



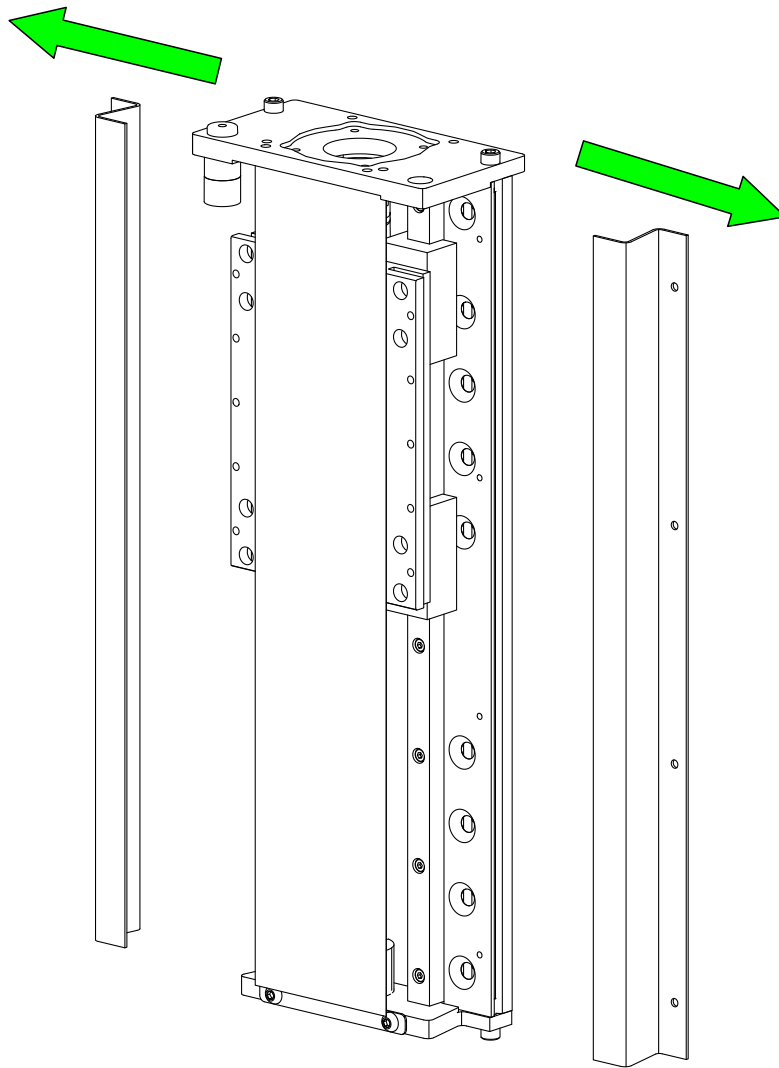
- Remove the moving plate from the Z axis.

### 3.1.2



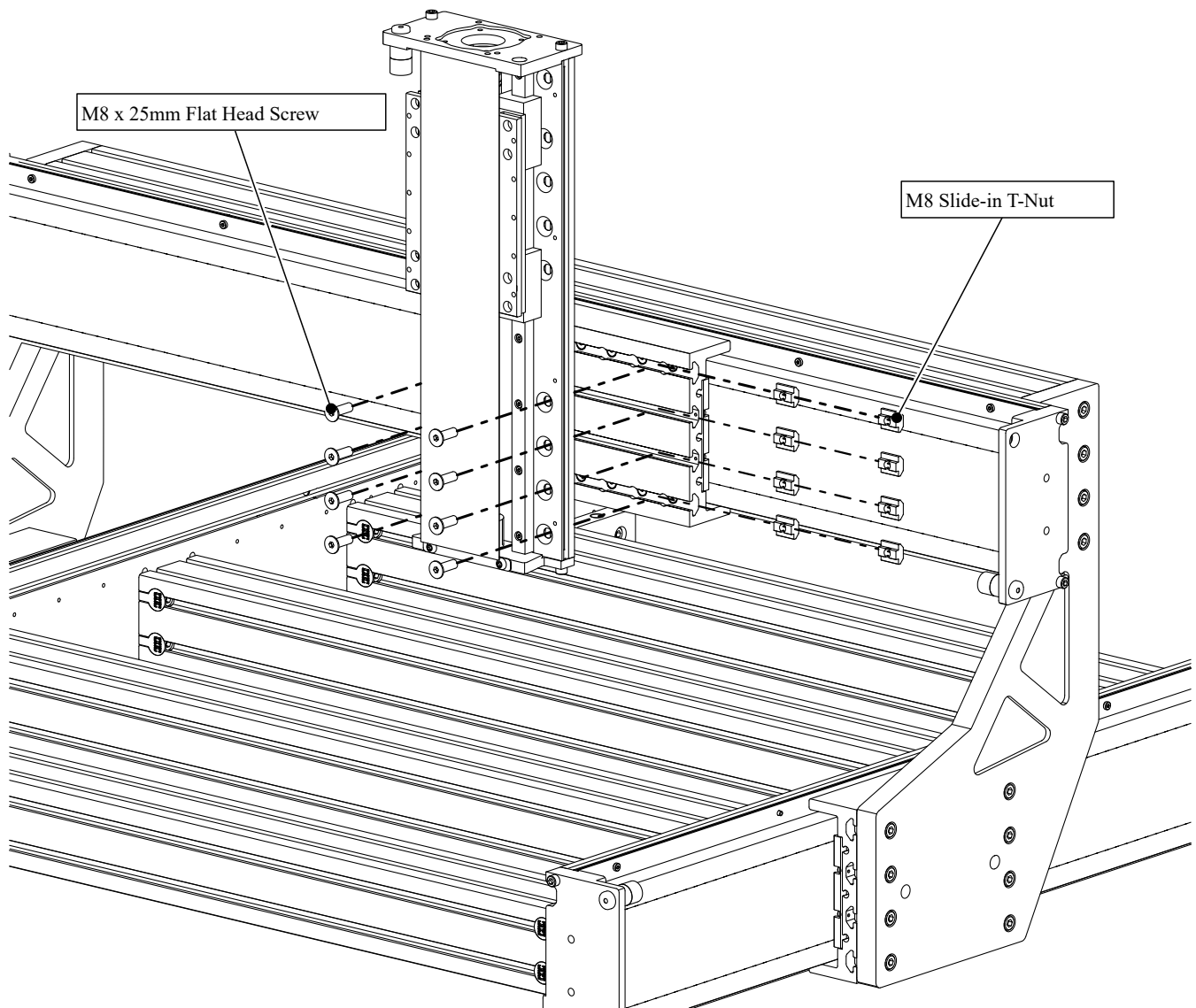
- Remove the metal dust cover screws from the Z axis and set them aside.

### 3.1.3



- Remove the metal dust covers from the Z-Axis.

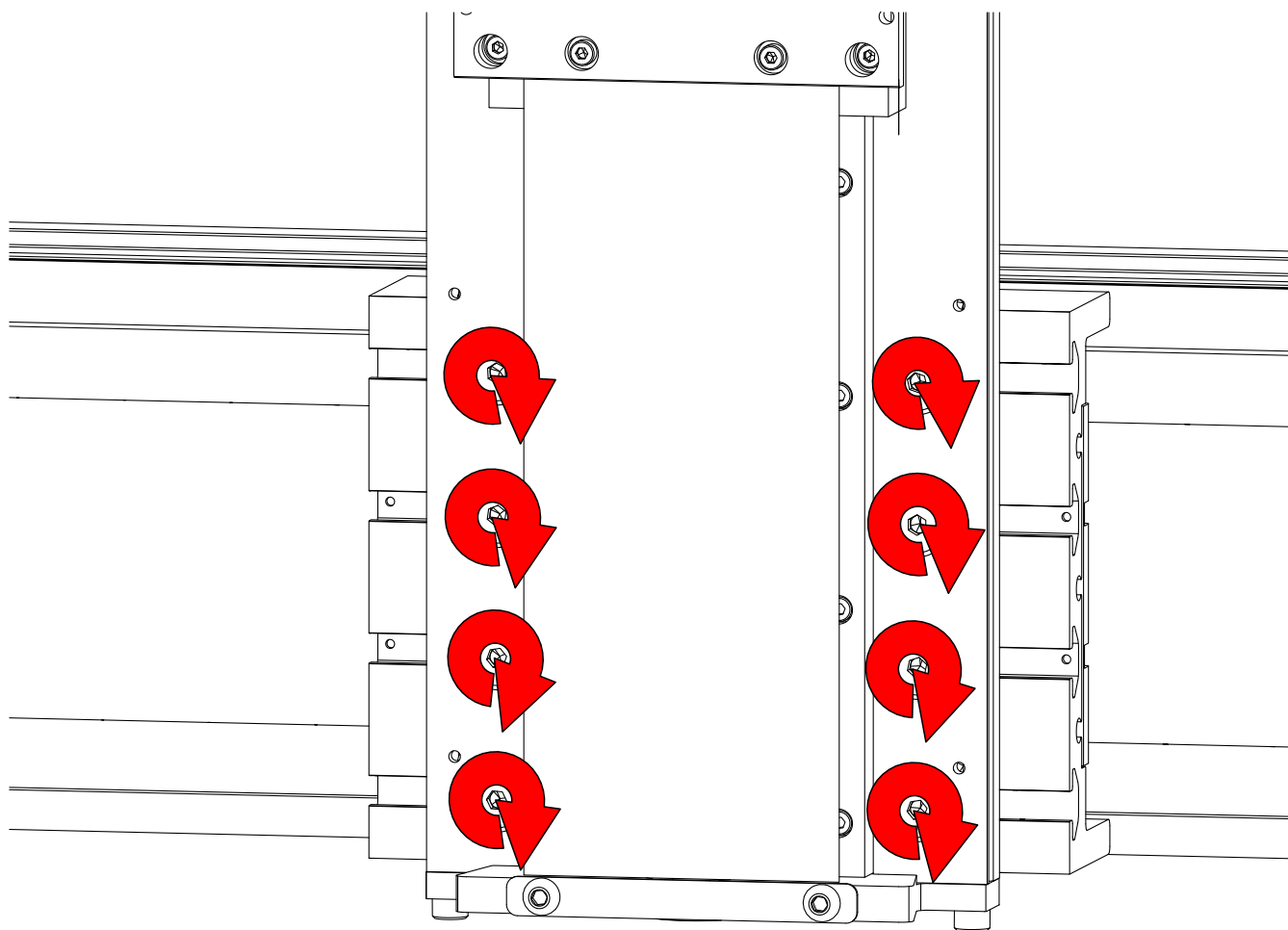
### 3.1.4



- Slide the M8 T-Nuts into the gantry plate and install the Z-axis to the gantry.

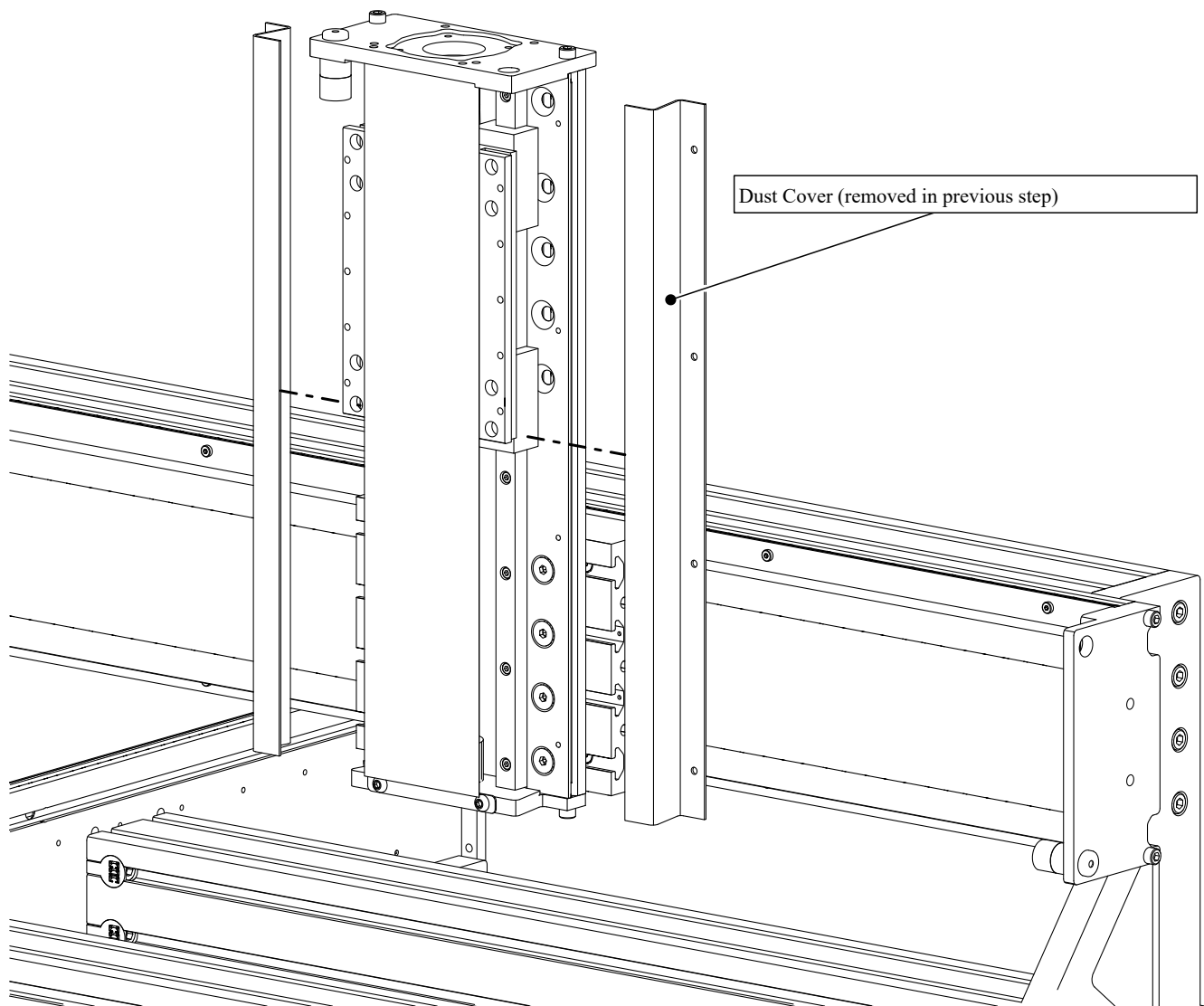


### 3.1.5



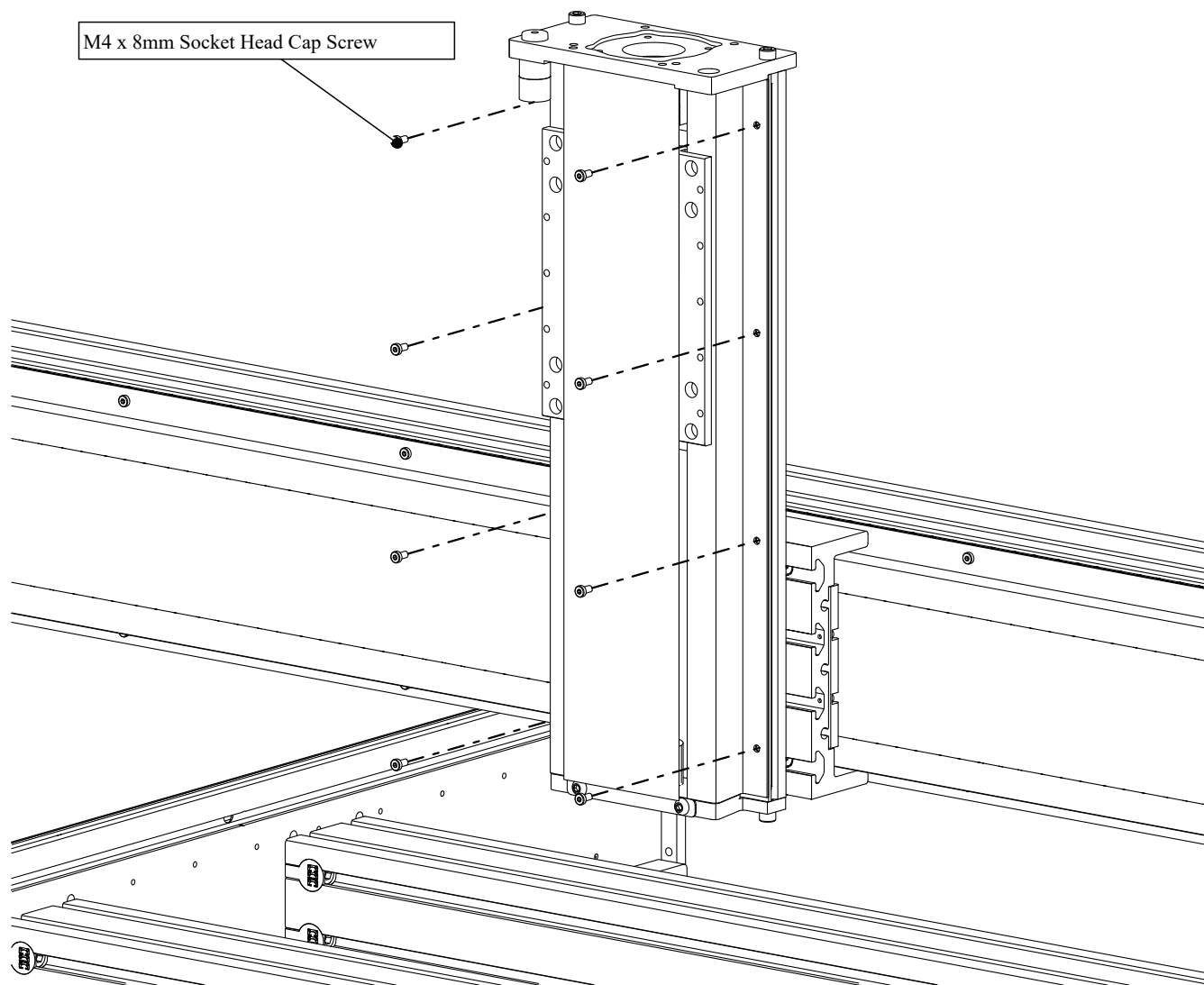
- Tighten the indicated bolts.

### 3.1.6



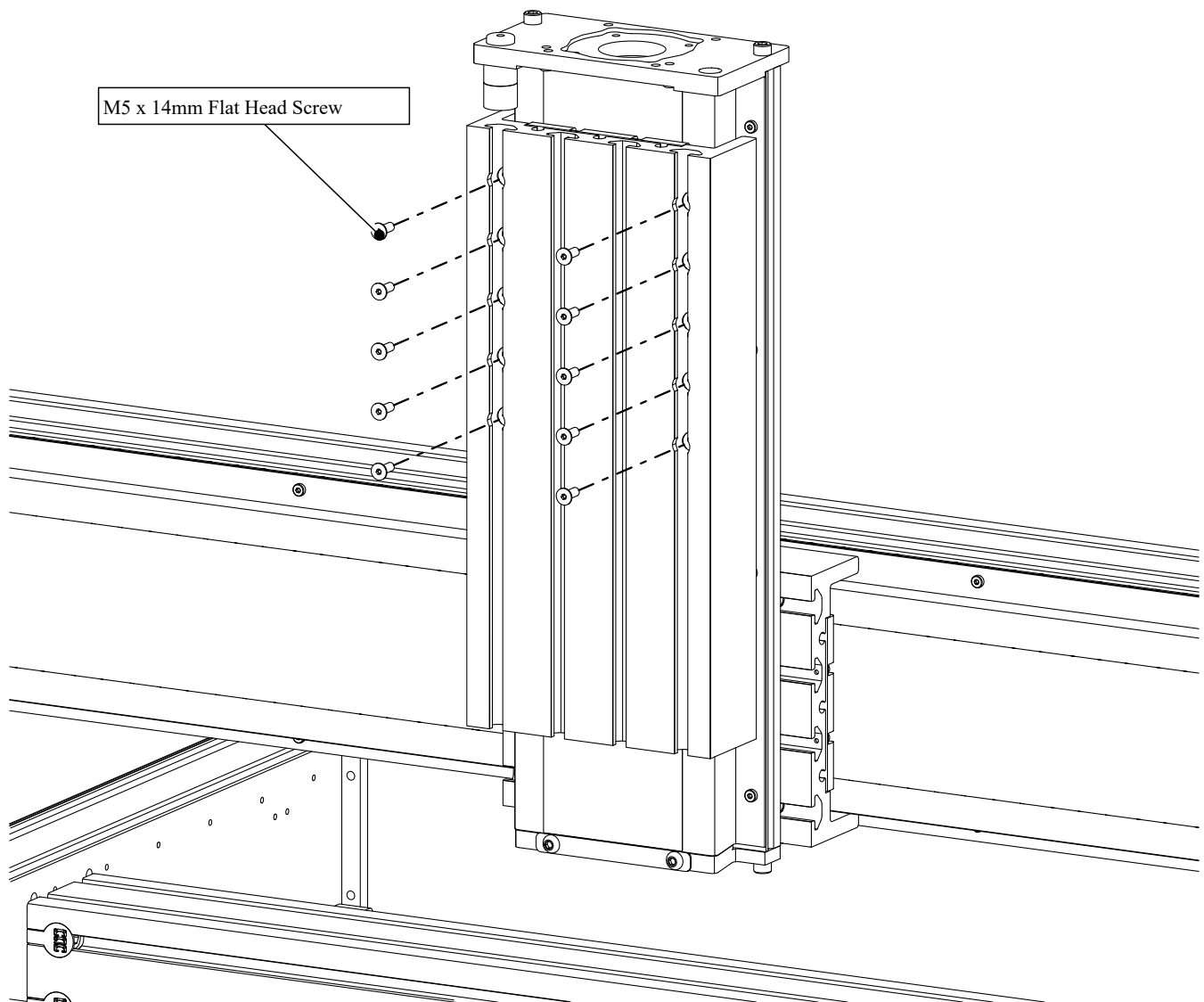
- Slide the metal dust covers back on the Z axis as indicated.

### 3.1.7



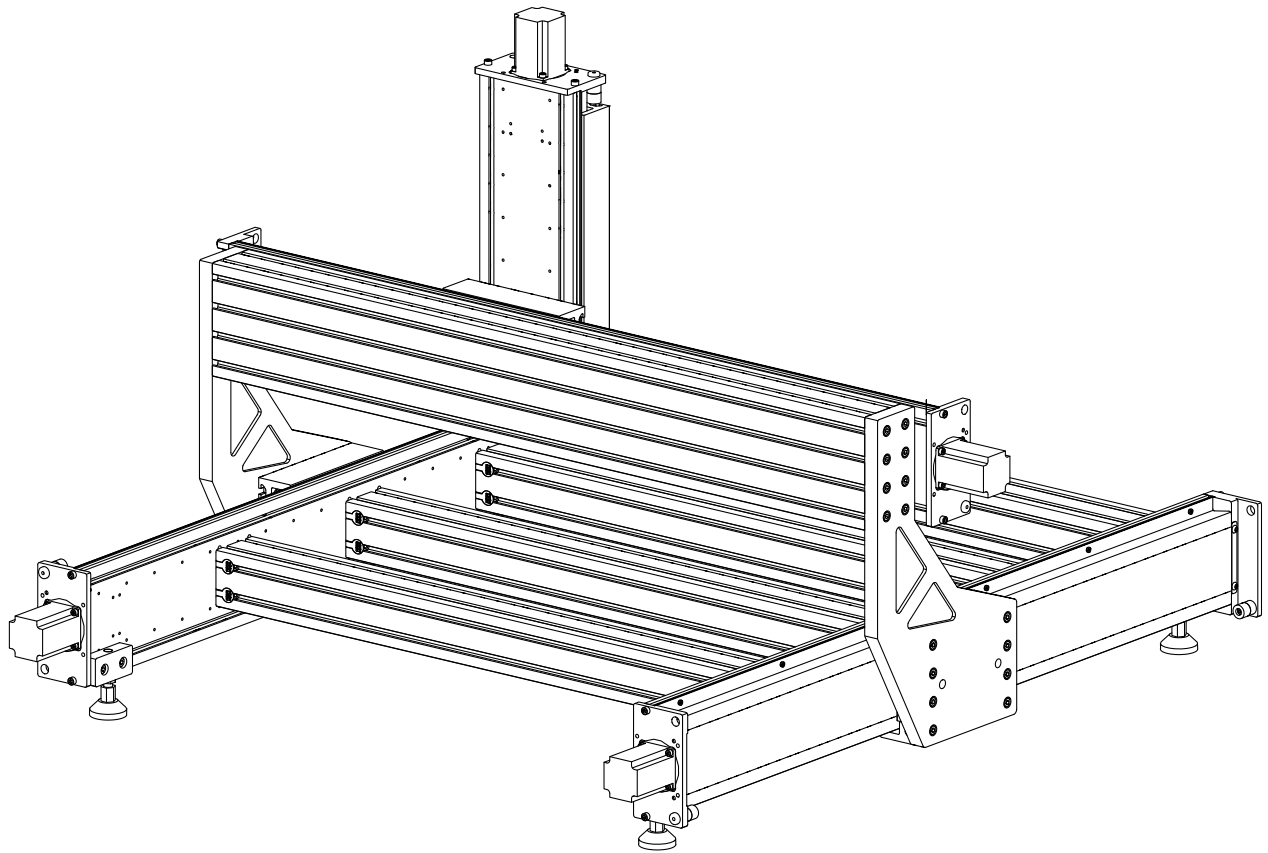
- Attach the metal dust covers using the screws removed in previous steps.

### 3.1.8



- Attach the moving plate to the Z axis using the screws removed in previous steps.

## Section 4: Motor Installation



## 4.1 NEMA 23 Electronics

### Section Note

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

## Parts and Tools Required

*The following parts and tools will be used in Section 4.1*

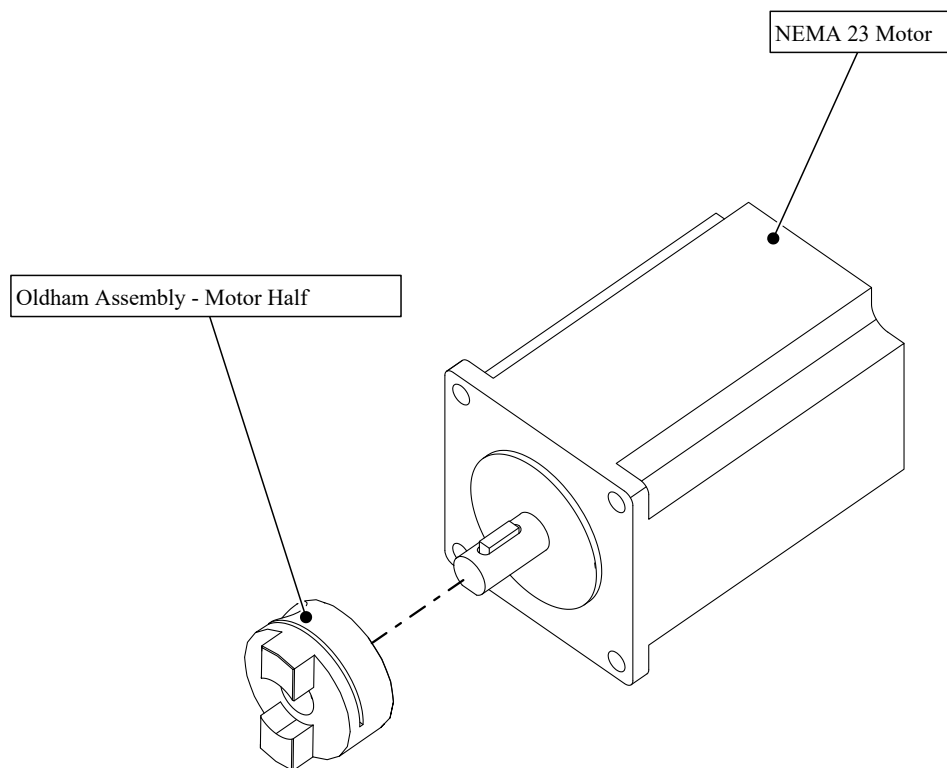
QTY	Part/Description	Packaged In
4	NEMA 23 Stepper Motor	Electronics
1	CRP900-00-MOTOR-HW-375: - (4) Oldham Assembly - Motor Side - (16) M5 x 12mm Socket Head Cap Screw	CRP900-00-XXXX-HW

### Required Tools:

- 4mm Allen Wrench
- 3mm Allen Wrench
- Tape Measure

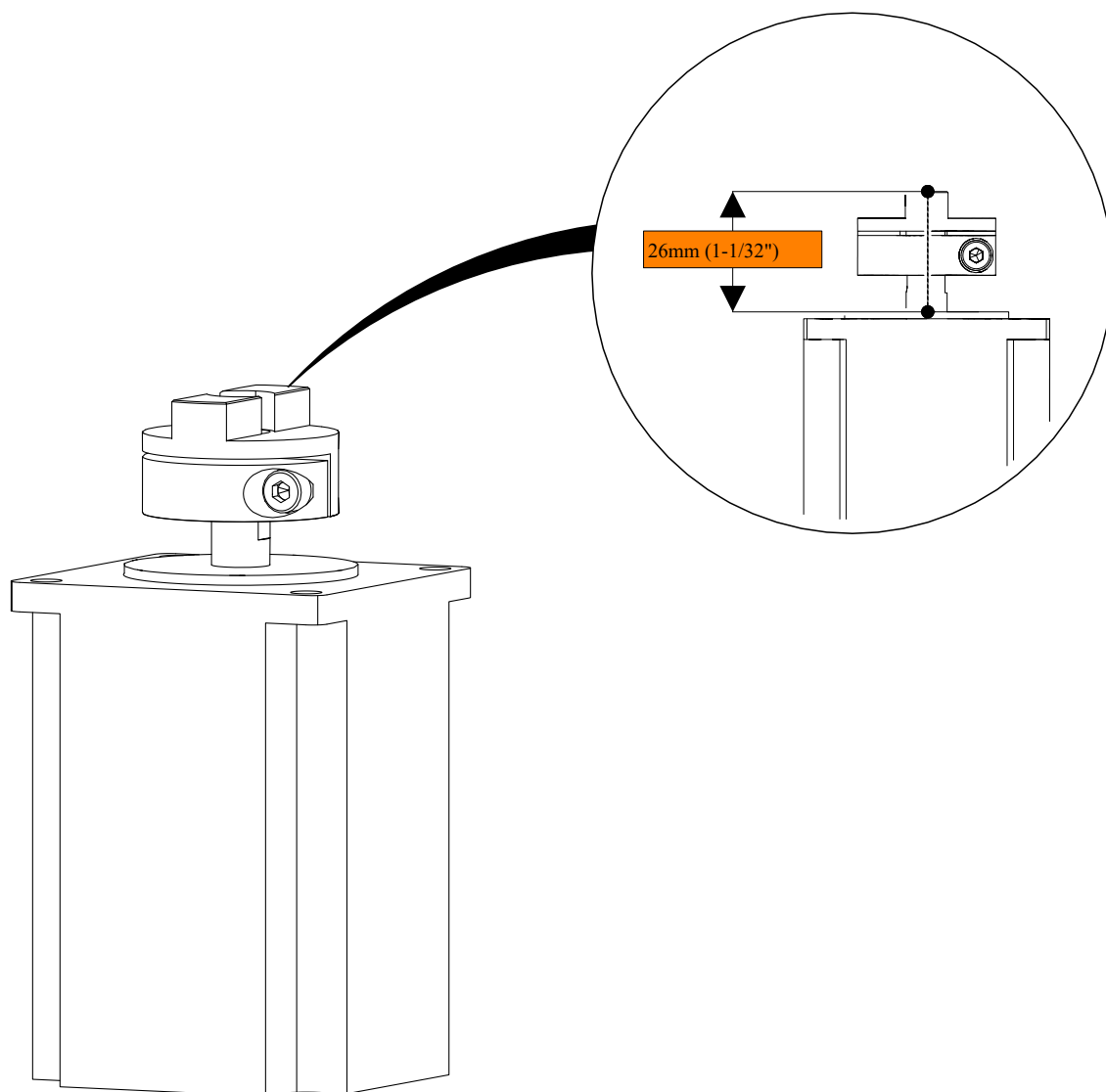
## N23 Motor Installation

### 4.1.1



- Slide the motor side of the oldham coupler onto the motor as indicated.

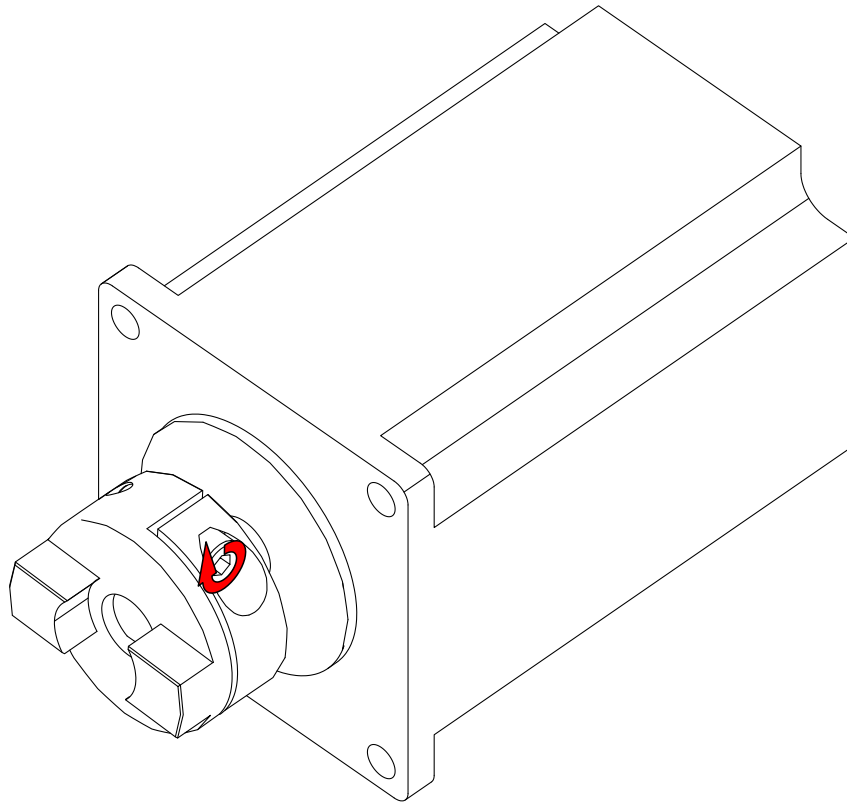
#### 4.1.2



- Position the end of the coupler 26mm (1-1/32") from the motor flat.

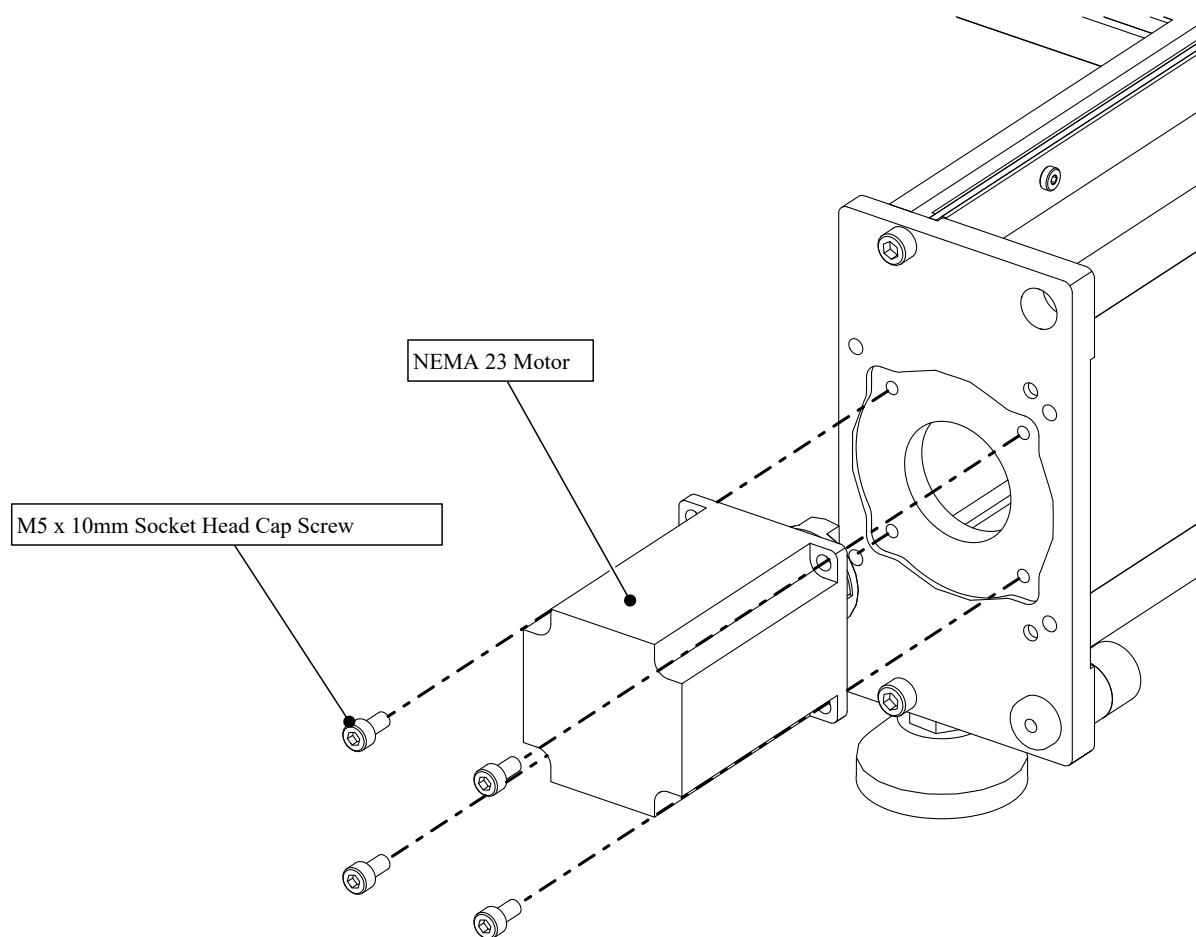


### 4.1.3



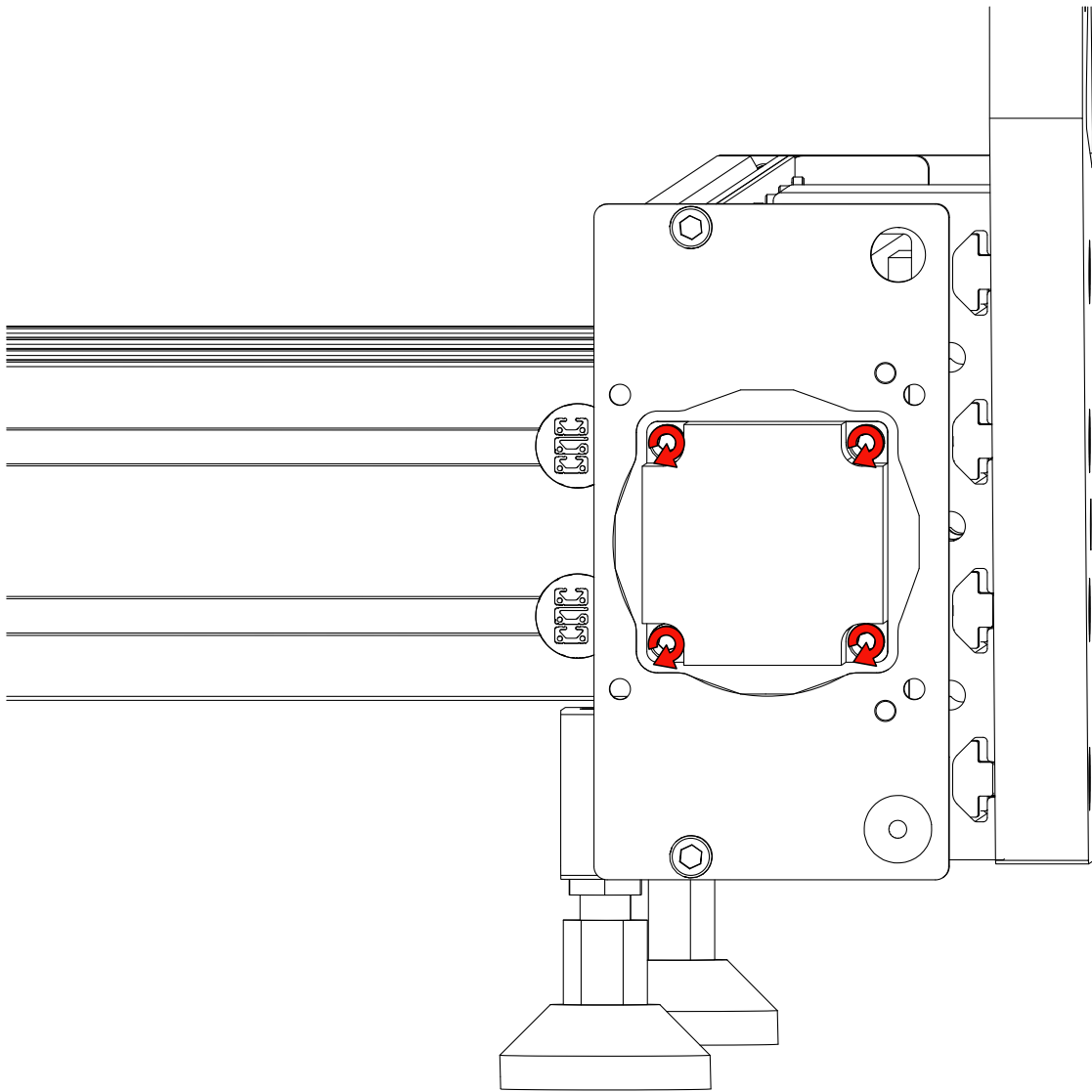
- Tighten the clamp bolt as indicated.

#### 4.1.4



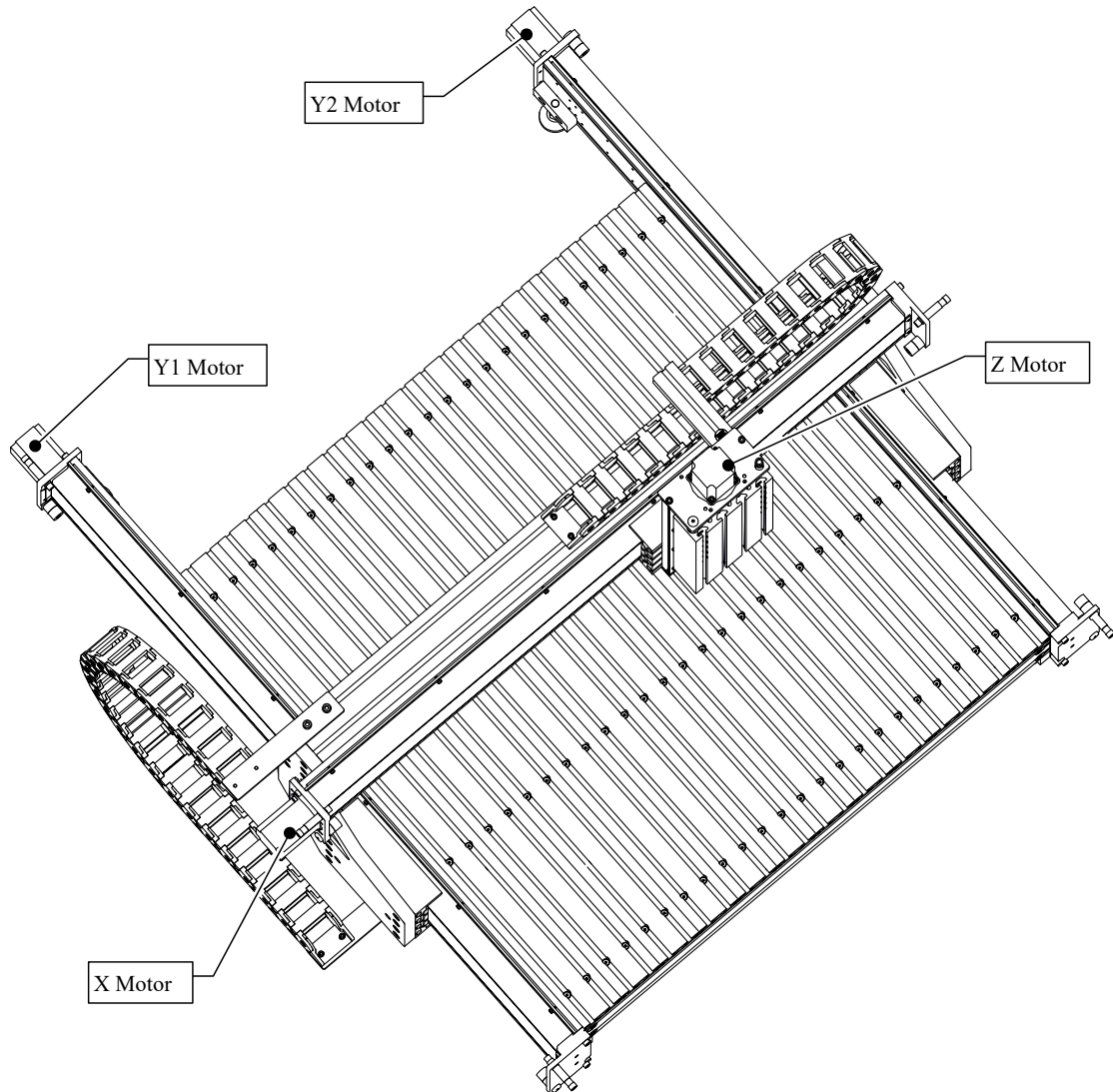
- Attach the motor to one of the table axes as indicated.

#### 4.1.5



- Tighten the indicated fasteners.

#### 4.1.6



- Install motors on the remaining axes.

## 4.2 NEMA 34 Electronics

### Section Note

Skip this section if you are using a NEMA 23 electronics package.

## Parts and Tools Required

*The following parts and tools will be used in Section 4.2*

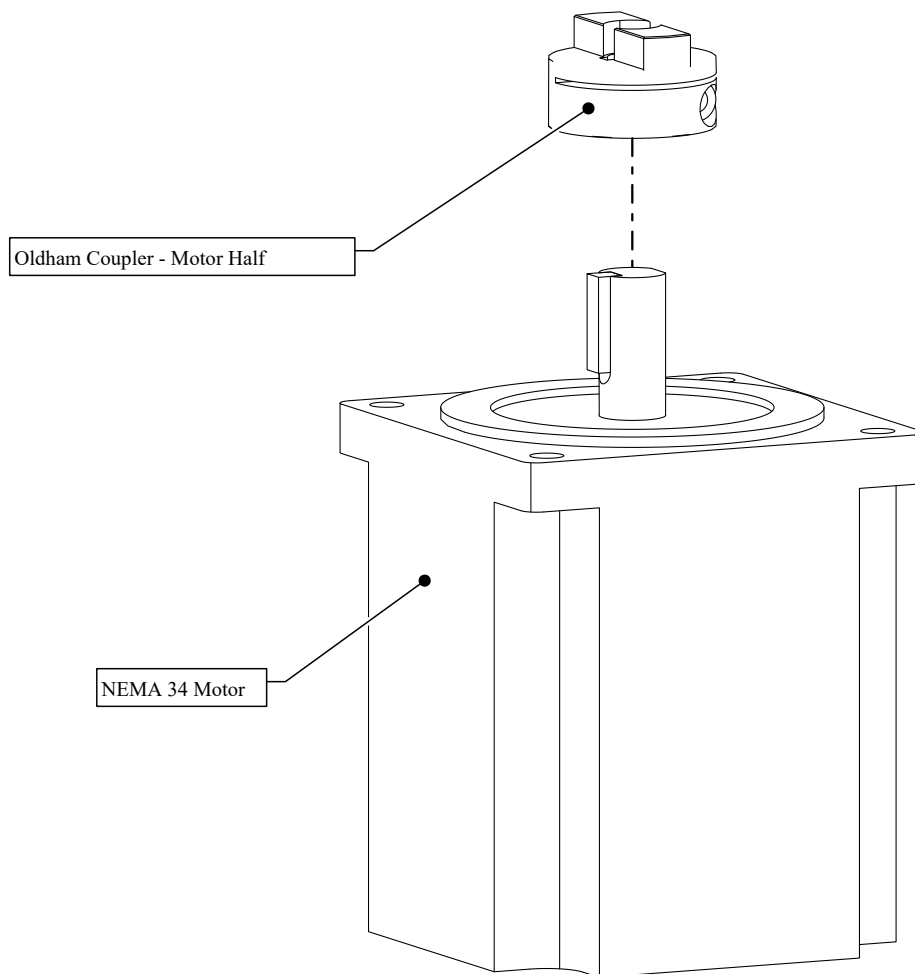
QTY	Part/Description	Packaged In
4	NEMA 34 Stepper Motor	Motors
1	CRP900-00-MOTOR-HW-500: - (4) Oldham Assembly - Motor Side - (16) M6 x 16mm Socket Head Cap Screw	CRP900-00-XXXX-HW

### Required Tools:

- 3mm Allen Wrench
- 5mm Allen Wrench
- Tape Measure

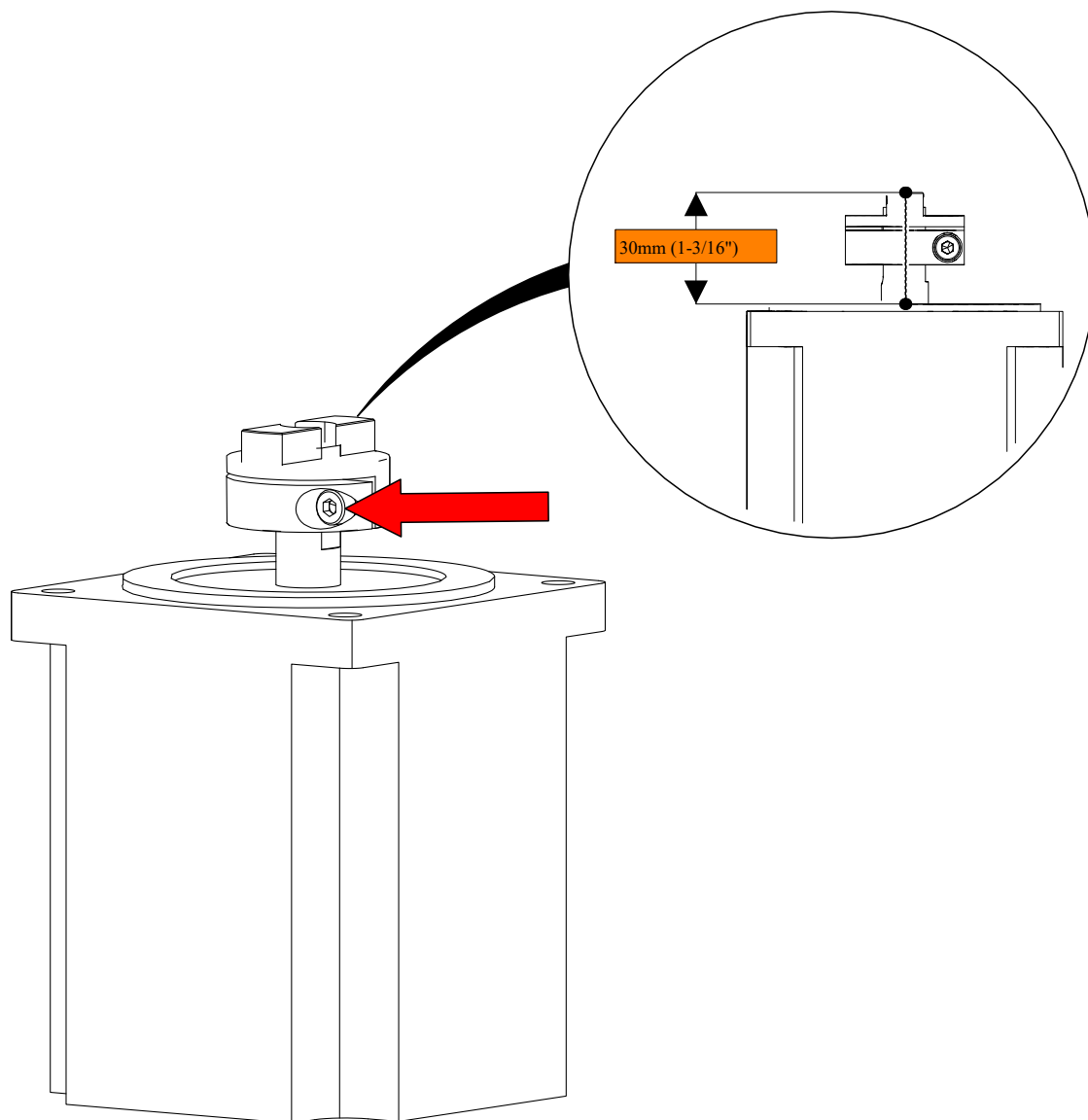
## N34 Motor Installation

### 4.2.1



- Slide the motor side of the oldham coupler onto the motor as indicated.

#### 4.2.2



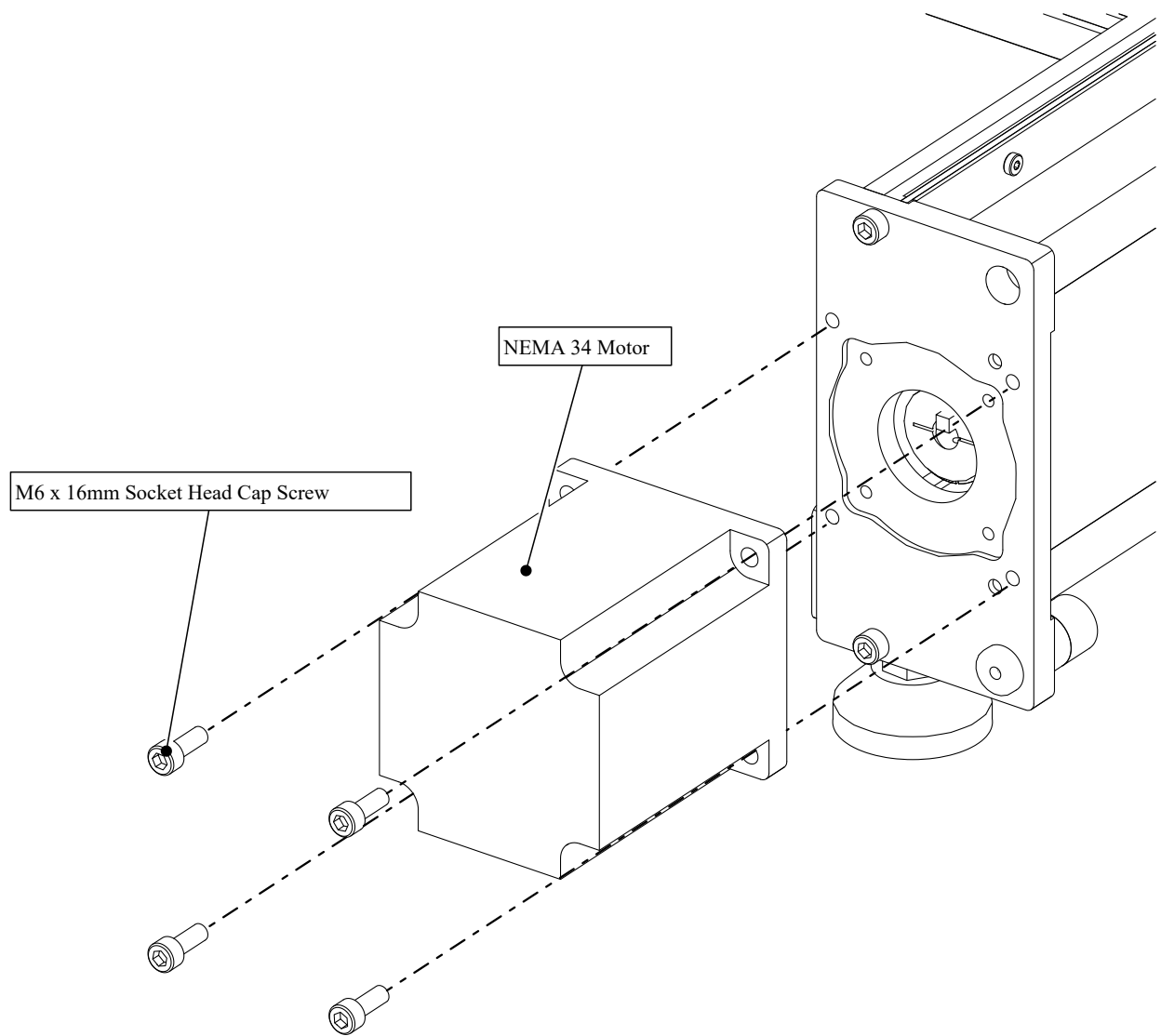
- Position the end of the coupler 30mm (1-3/16") from the motor flat.
- Then tighten the clamping screw on the oldham coupler.



#### Assembly Note

The dimension shown is measured from the boss on the motor to the top of the oldham coupler.

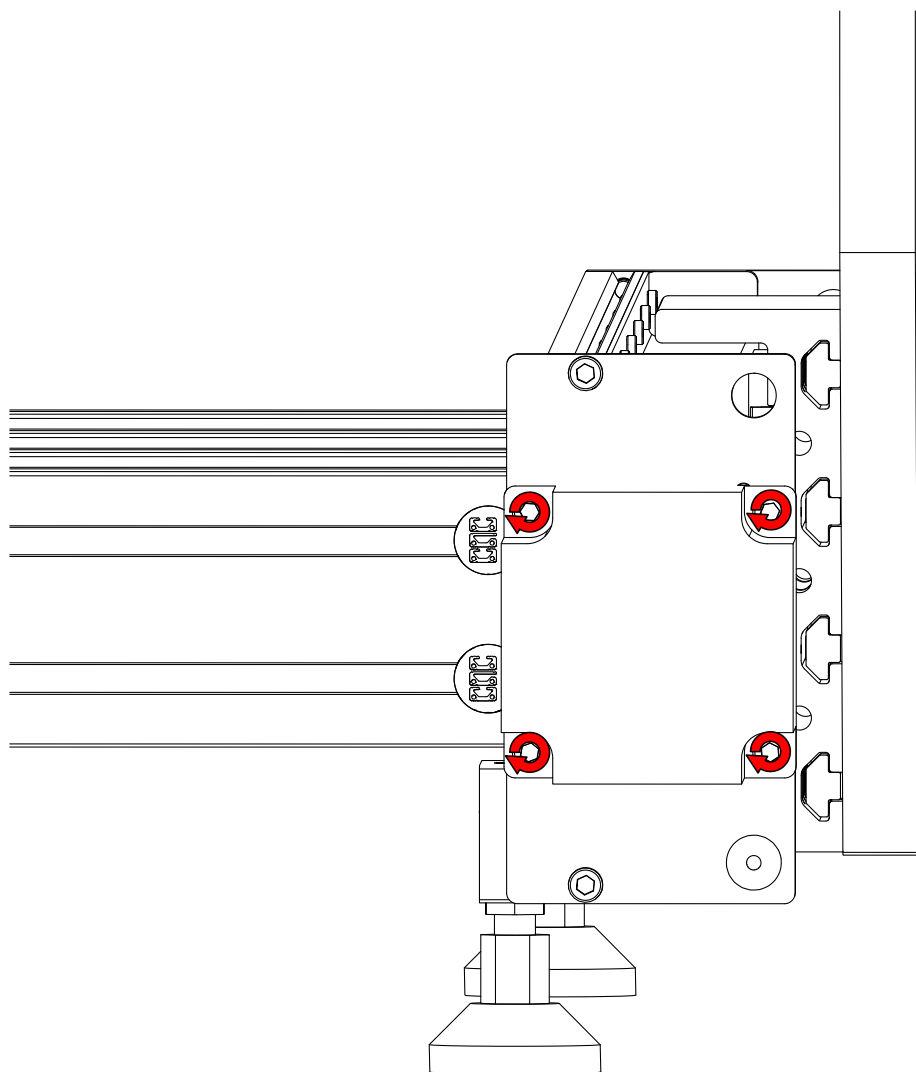
### 4.2.3



- Attach the motor to one of the table axes as indicated.

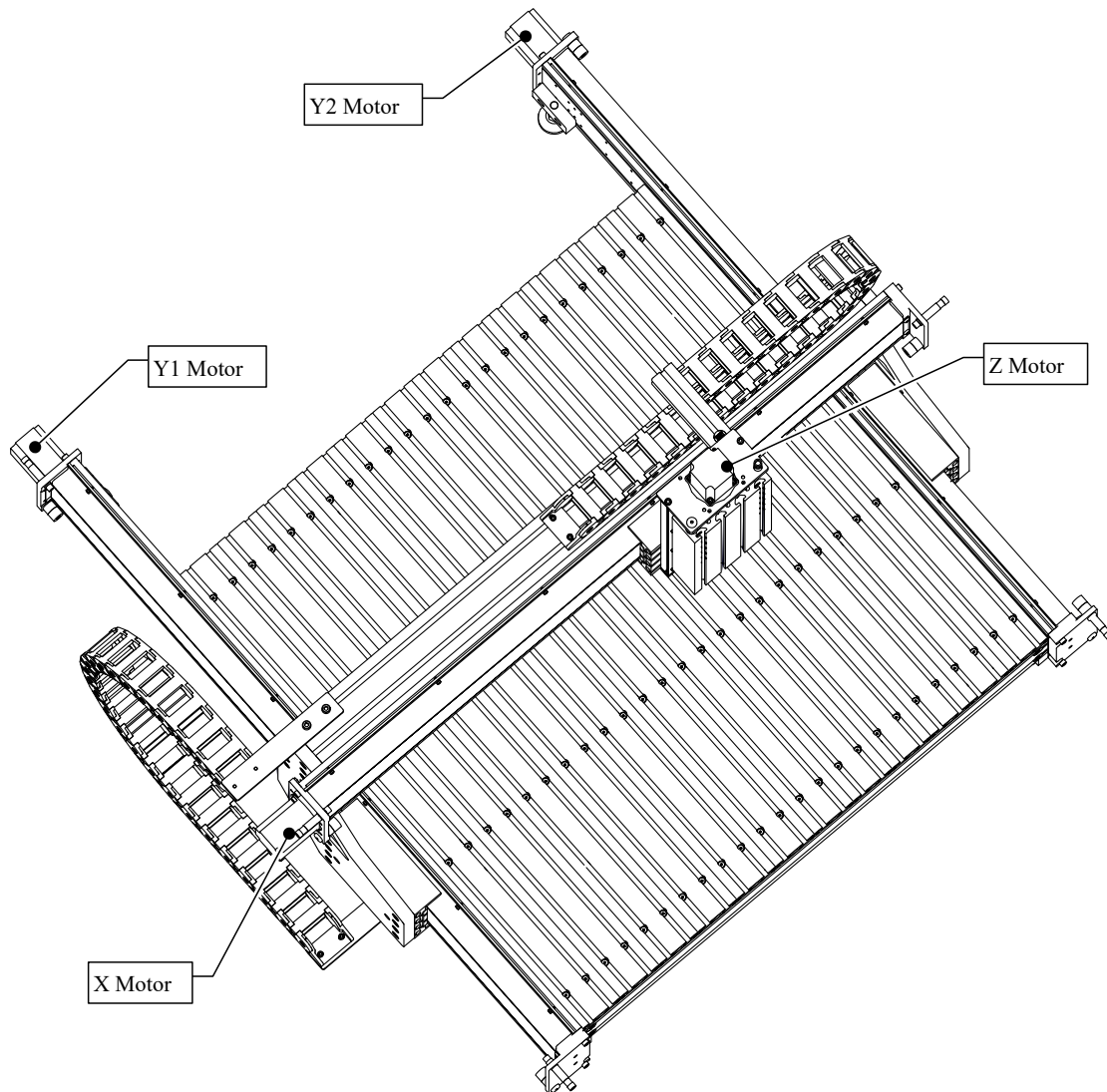


#### 4.2.4



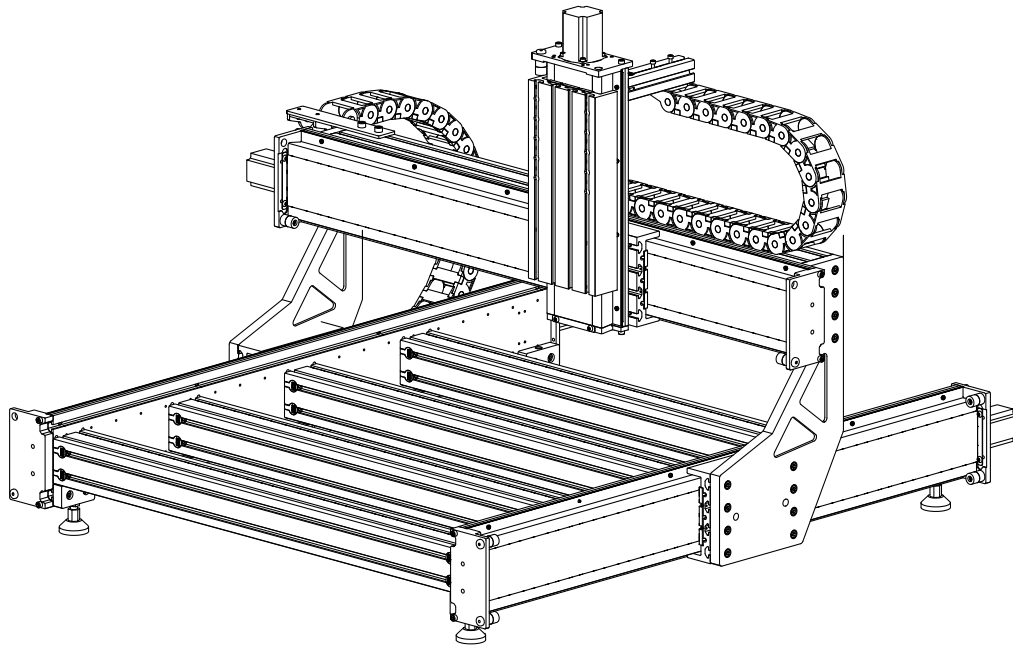
- Tighten the indicated fasteners.

#### 4.2.5



- Install motors on the remaining axes.

## Section 5: Cable Track Installation



## Parts and Tools Required

*The following parts and tools will be used in Section 5*

QTY	Part/Description	Packaged In
1	CRP950-01 Cable Track Bracket	CRP950-00-XX
1	CRP950-02 Cable Track Bracket	CRP950-00-XX
1	CRP950-03 4040 Cable Track Extrusion	CRP950-00-XX
2	50mm Cable Track Section	CRP950-00-XX
1	CRP950-00-FAST: - (6) M8 Roll-in T-Nut - (4) M8 x 16mm Socket Head Cap Screw - (4) M5 x 12mm Socket Head Cap Screw - (2) M8 x 30mm Socket Head Cap Screw - (2) 40 Series Anchor Fasteners - (4) M5 x 16mm Socket Head Cap Screw - (4) M5 Roll-in T-Nut	CRP950-00-XX

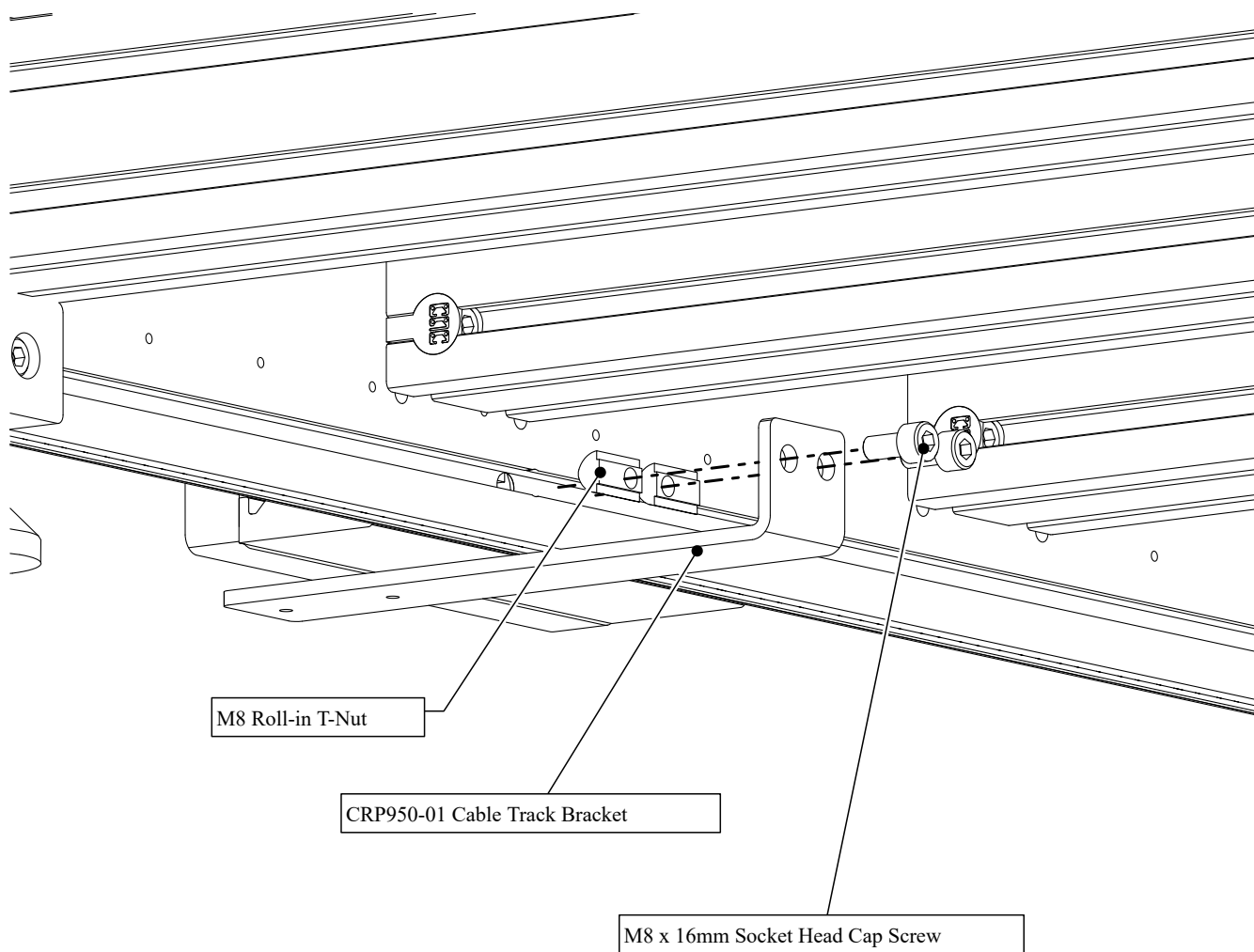
### Required Tools:

- 6mm Allen Wrench
- 4mm Allen Wrench
- Flat Head Screwdriver
- Tape Measure



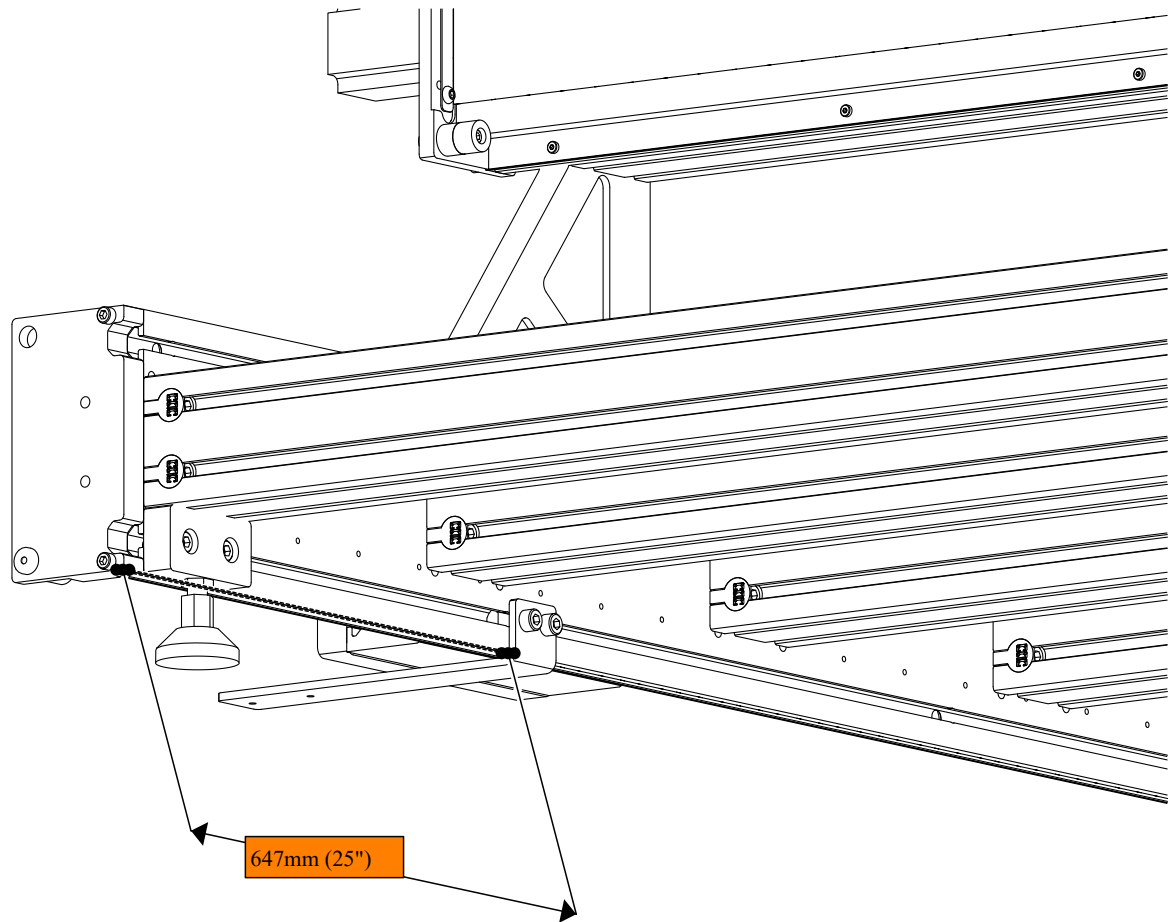
## 5.1 Table Cable Track Installation

### 5.1.1



- Install the lower cable track bracket onto the bottom of the base of the machine.

### 5.1.2

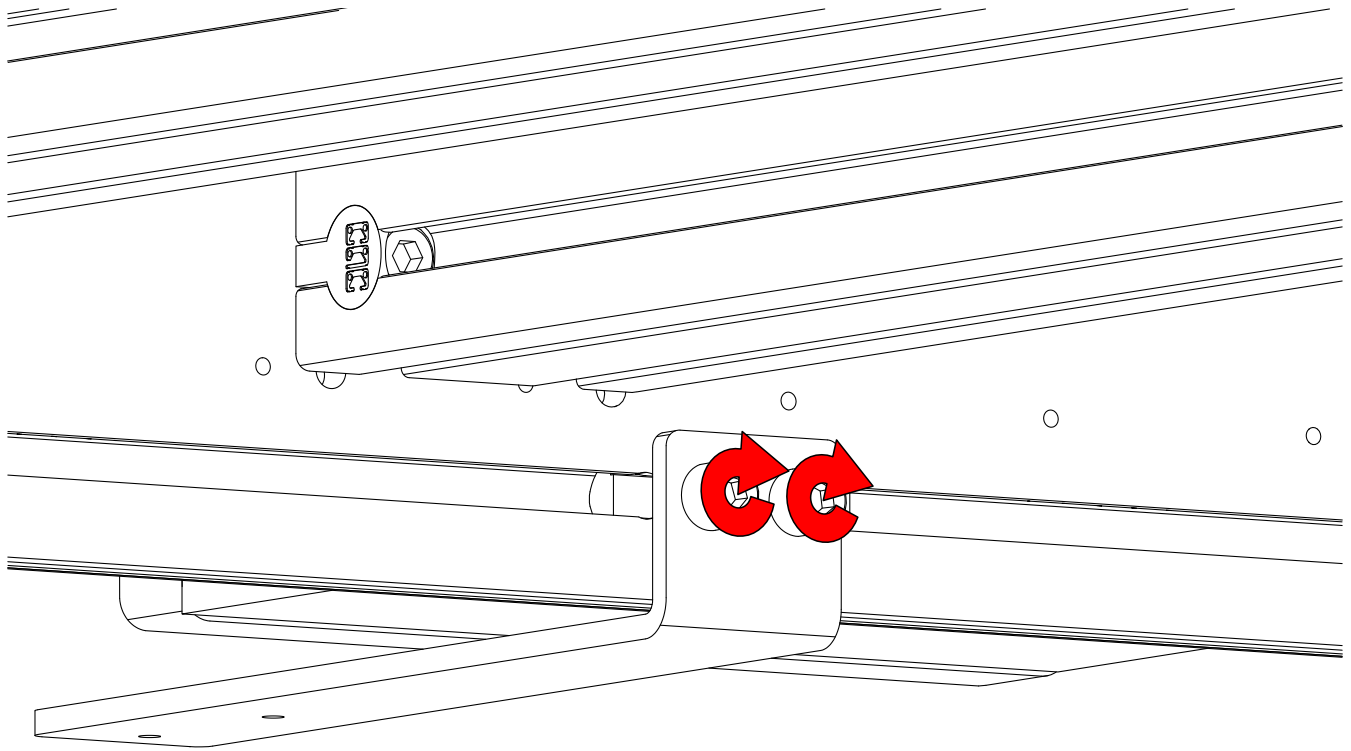


- Place the bracket 647mm (25") from the front of the machine.

#### Machine Configuration Option

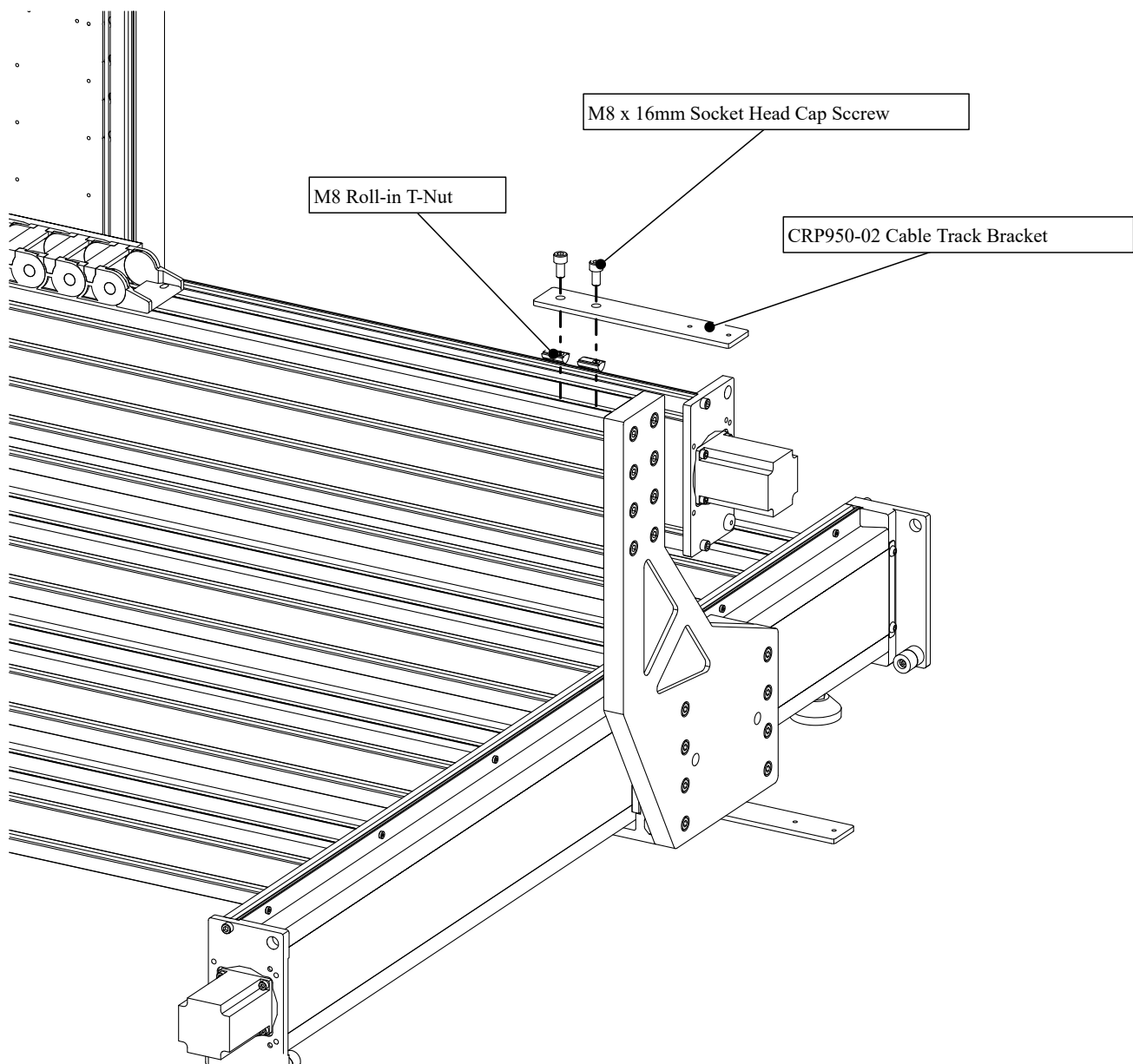
For 2' length machines, position the bracket 380mm (15") from the front of the machine.

### 5.1.3



- Tighten the indicated fasteners.

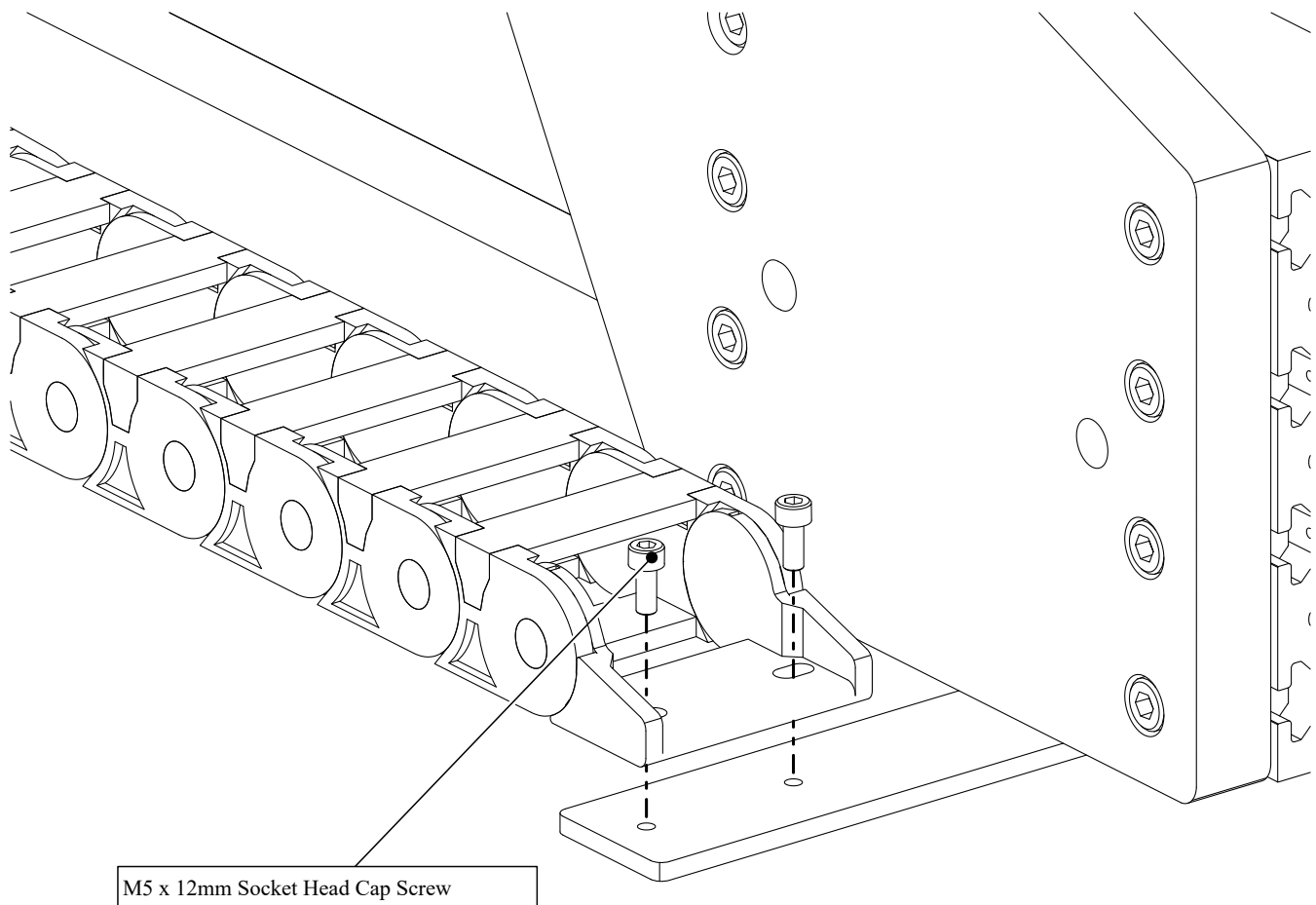
### 5.1.4



- Install the upper cable track bracket.



### 5.1.5



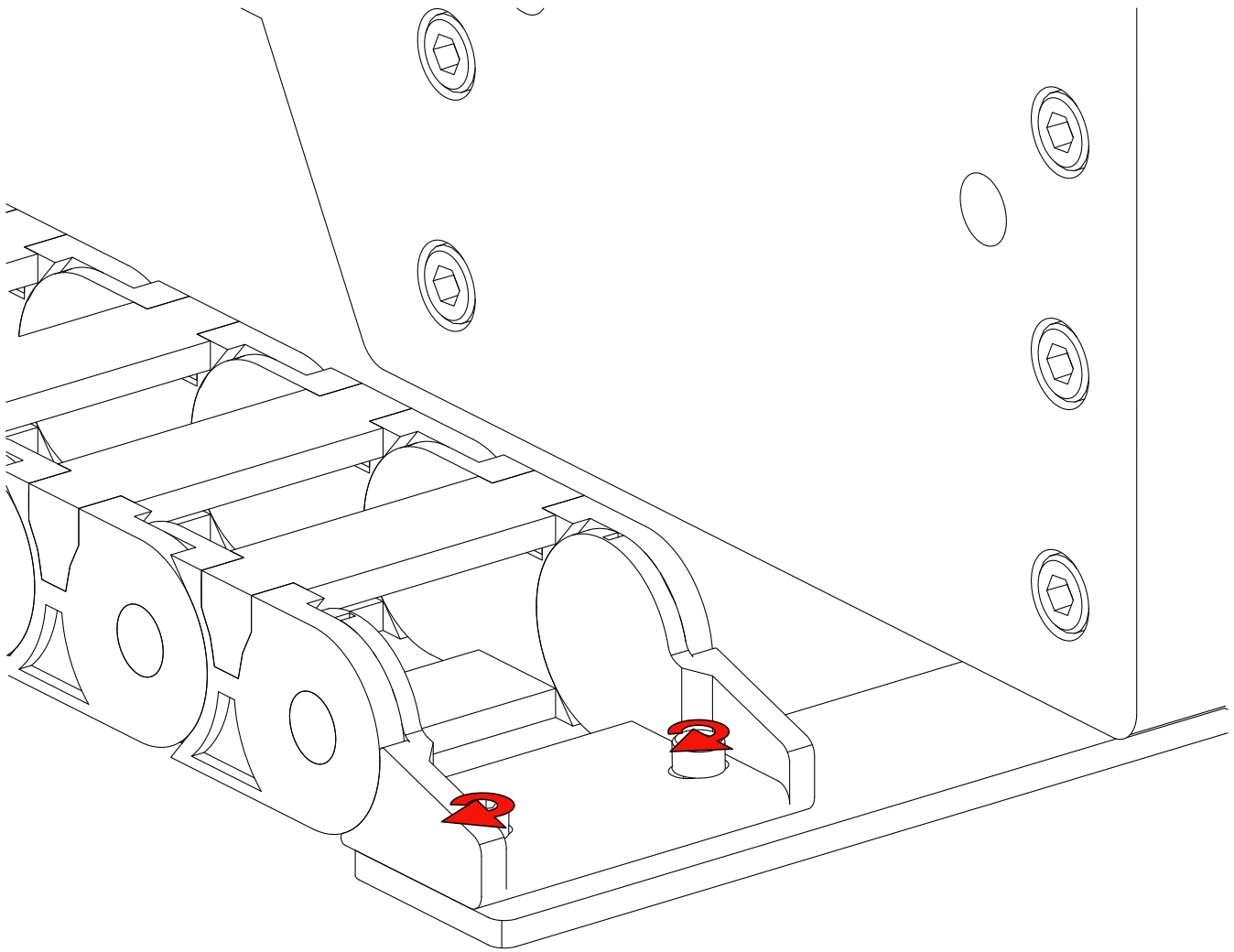
- Attach the fixed end of the cable track to the bracket as indicated.



#### Assembly Note

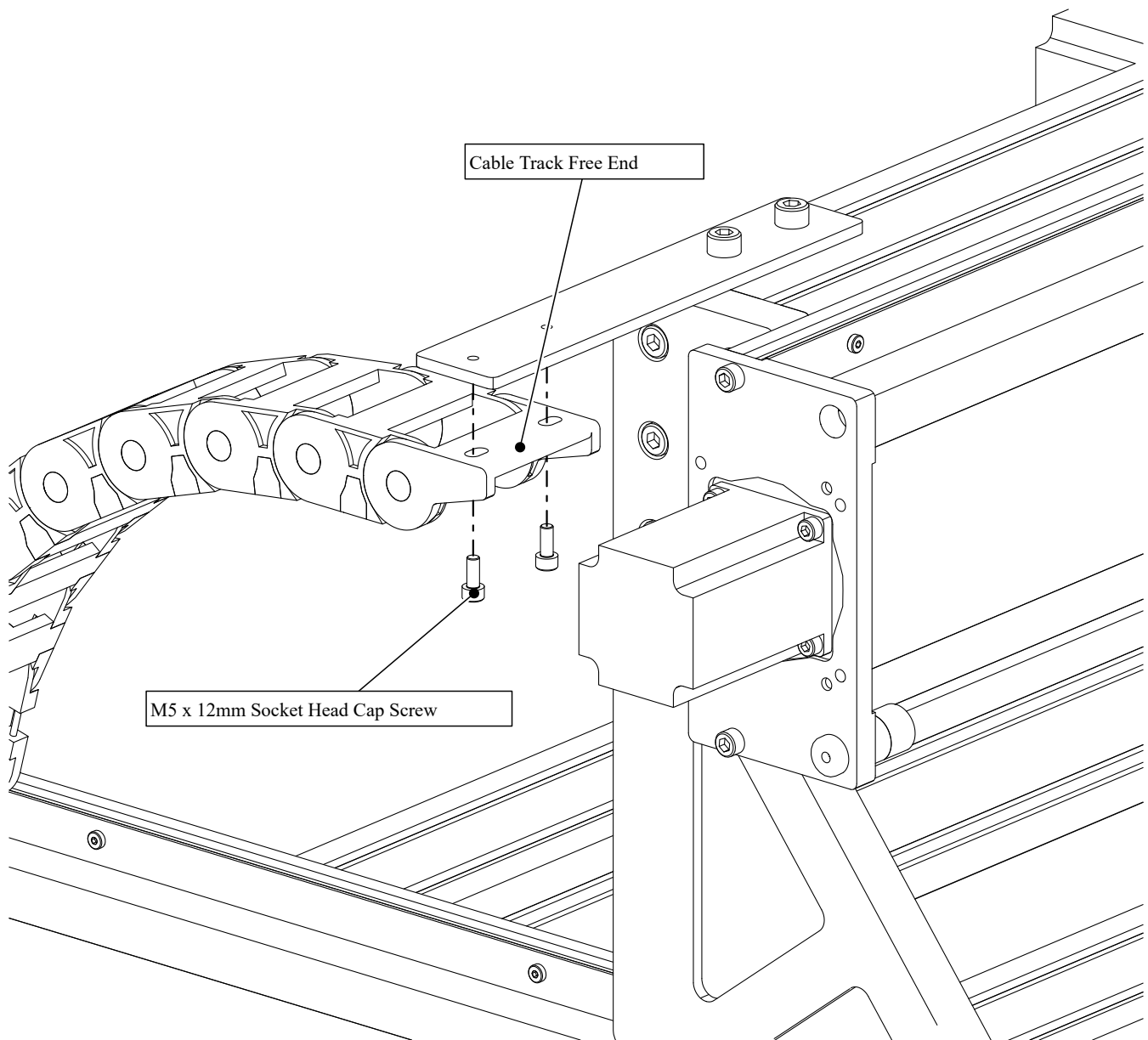
The fixed end of the cable track is the one which does not rotate independently.

### 5.1.6



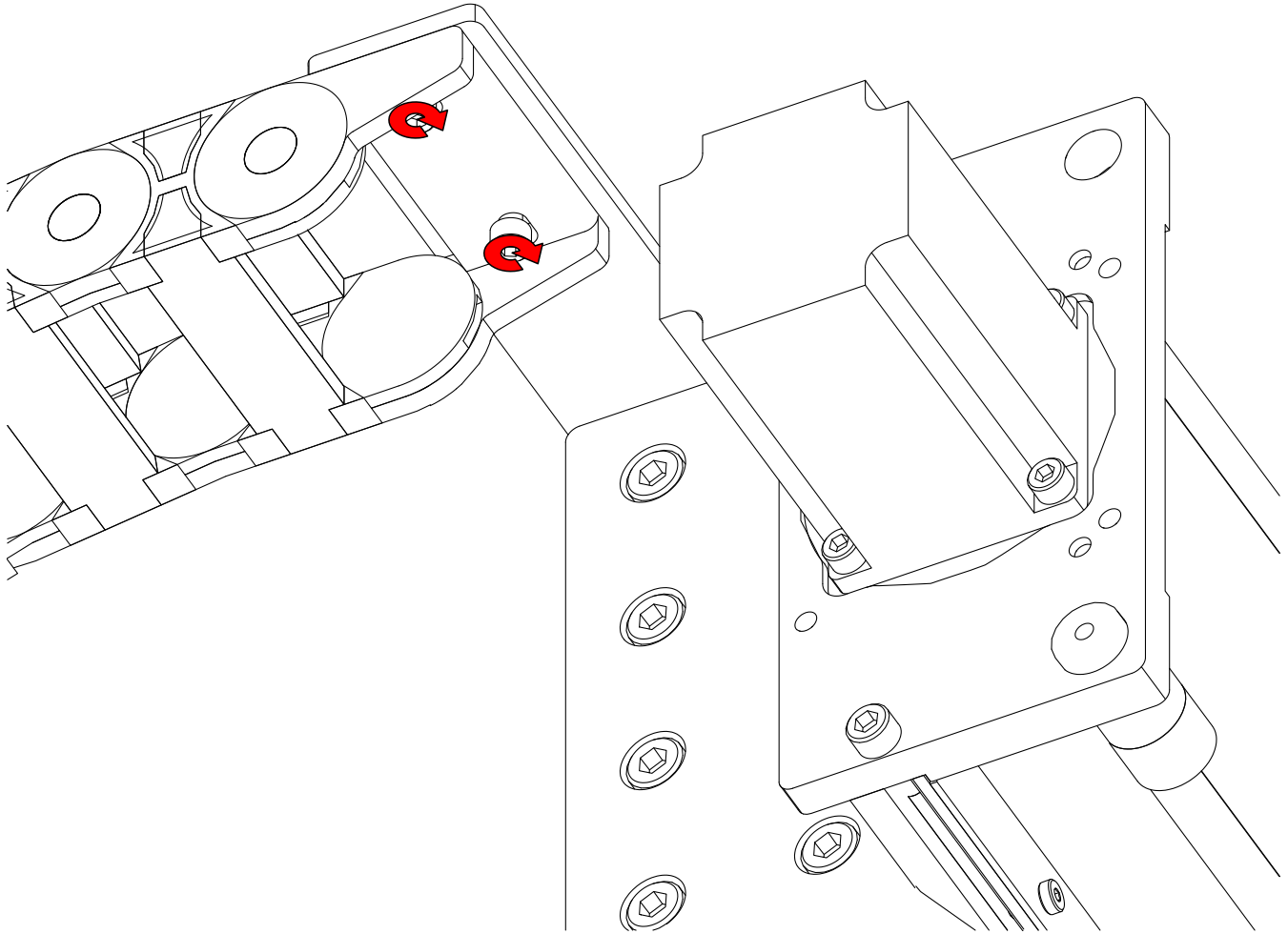
- Tighten the fixed end to the lower bracket.

### 5.1.6



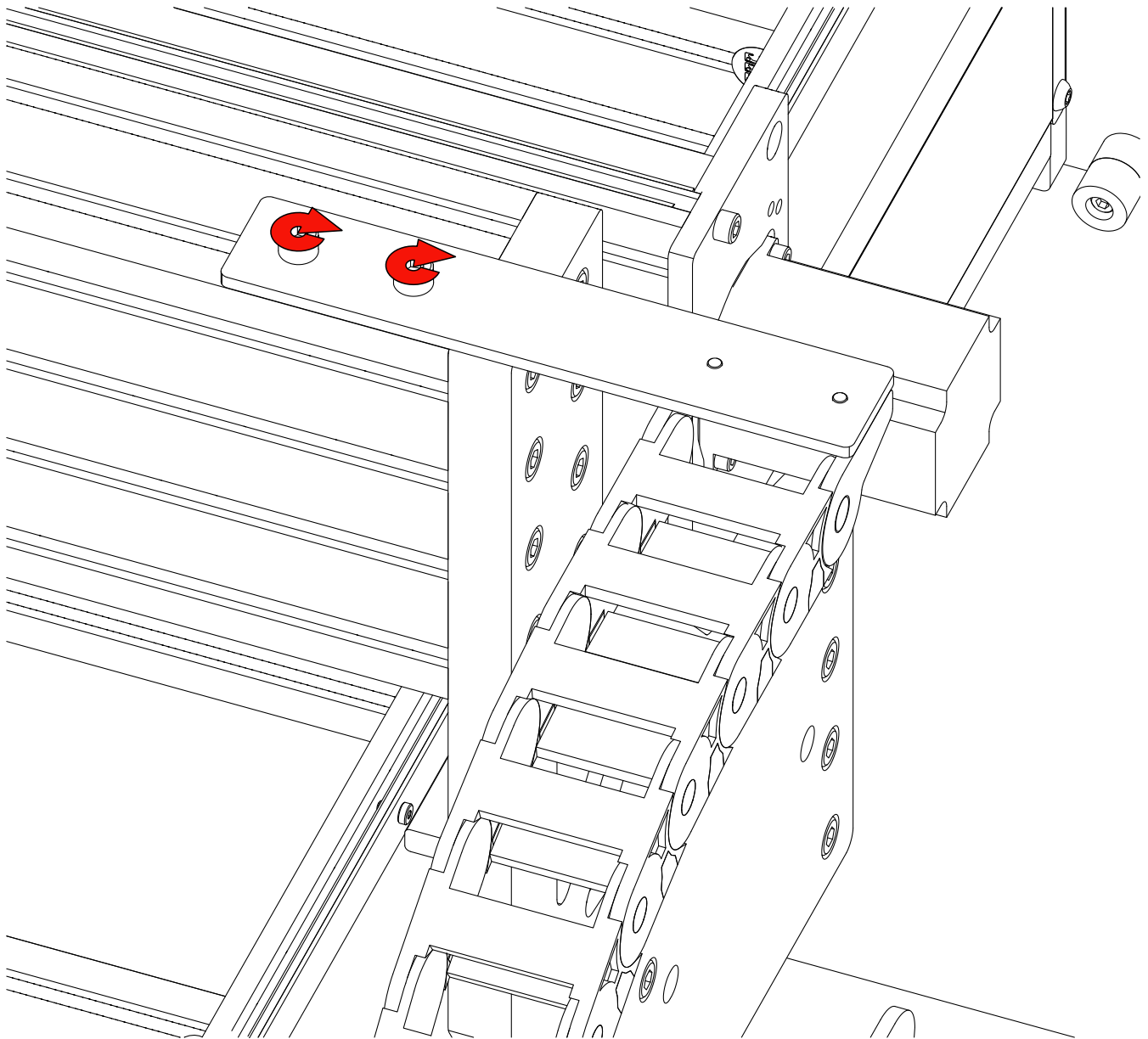
- Attach the other end to the upper bracket.

### 5.1.8



- Tighten the end to the upper bracket.

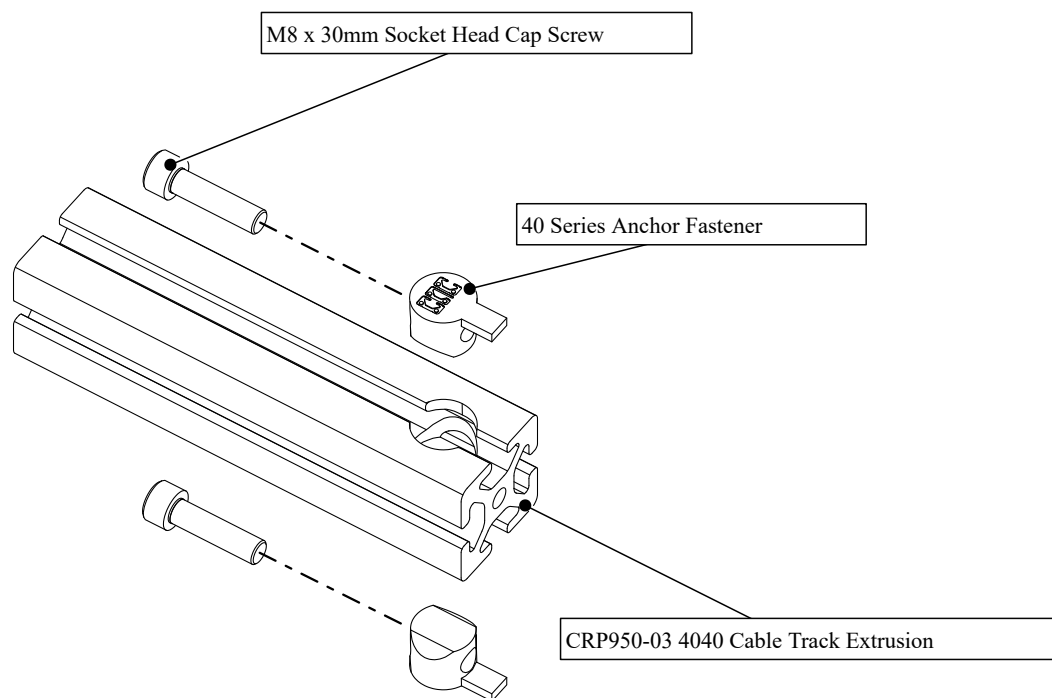
### 5.1.9



- Tighten upper bracket to the gantry extrusion.

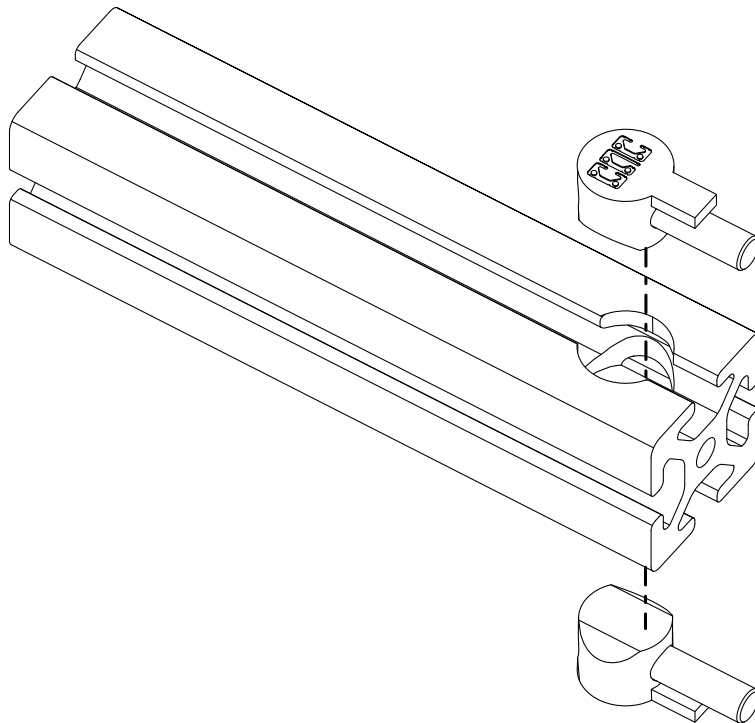
## 5.2 Gantry Cable Track Installation

### 5.2.1



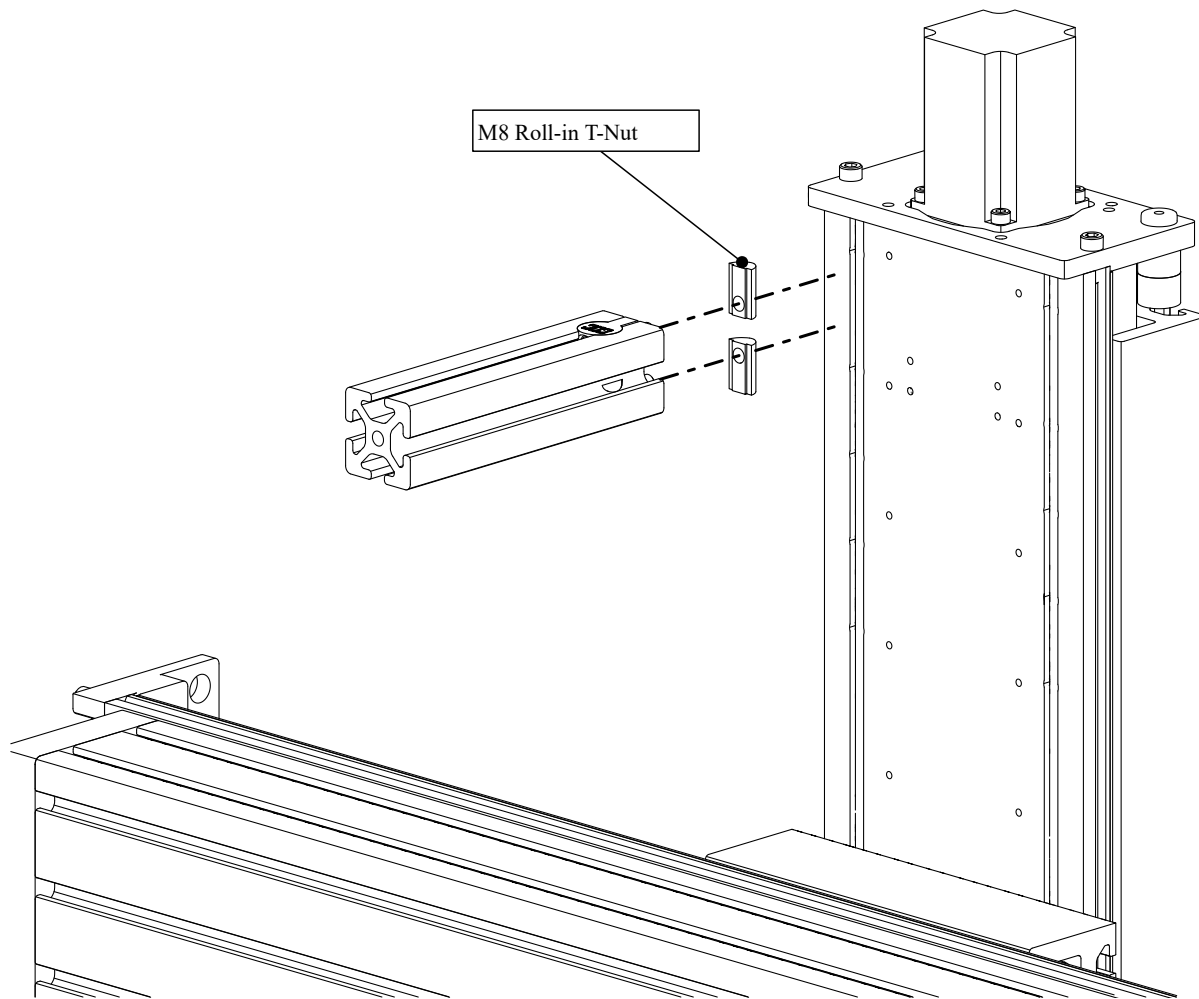
- Insert the M8 x 30mm bolts into the provided anchors and place the anchors in the bracket extrusion provided.

## 5.2.2



- Slide the anchors into the cable track extrusion as indicated.

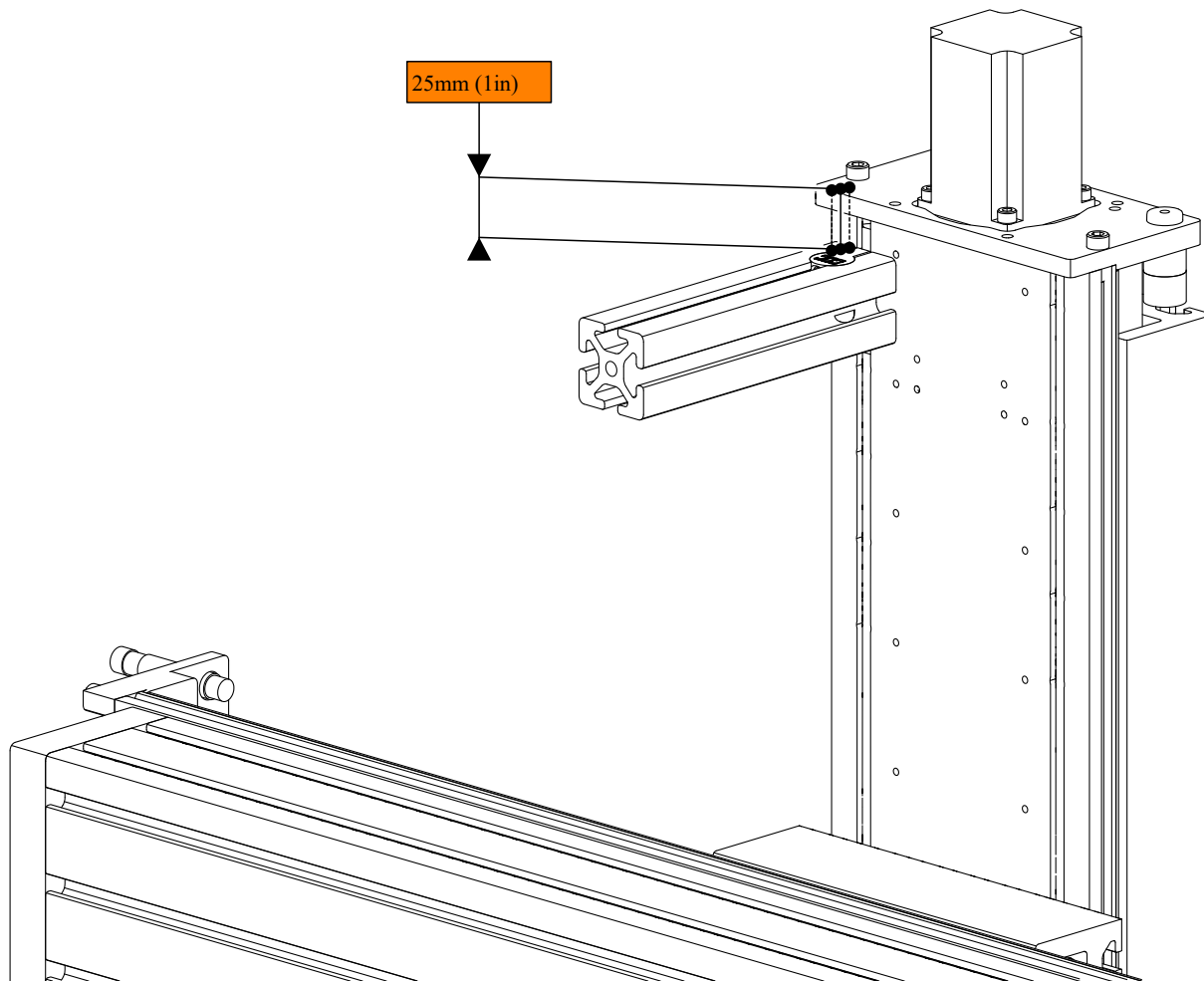
### 5.2.3



- Attach the cable track extrusion to the Z axis indicated.

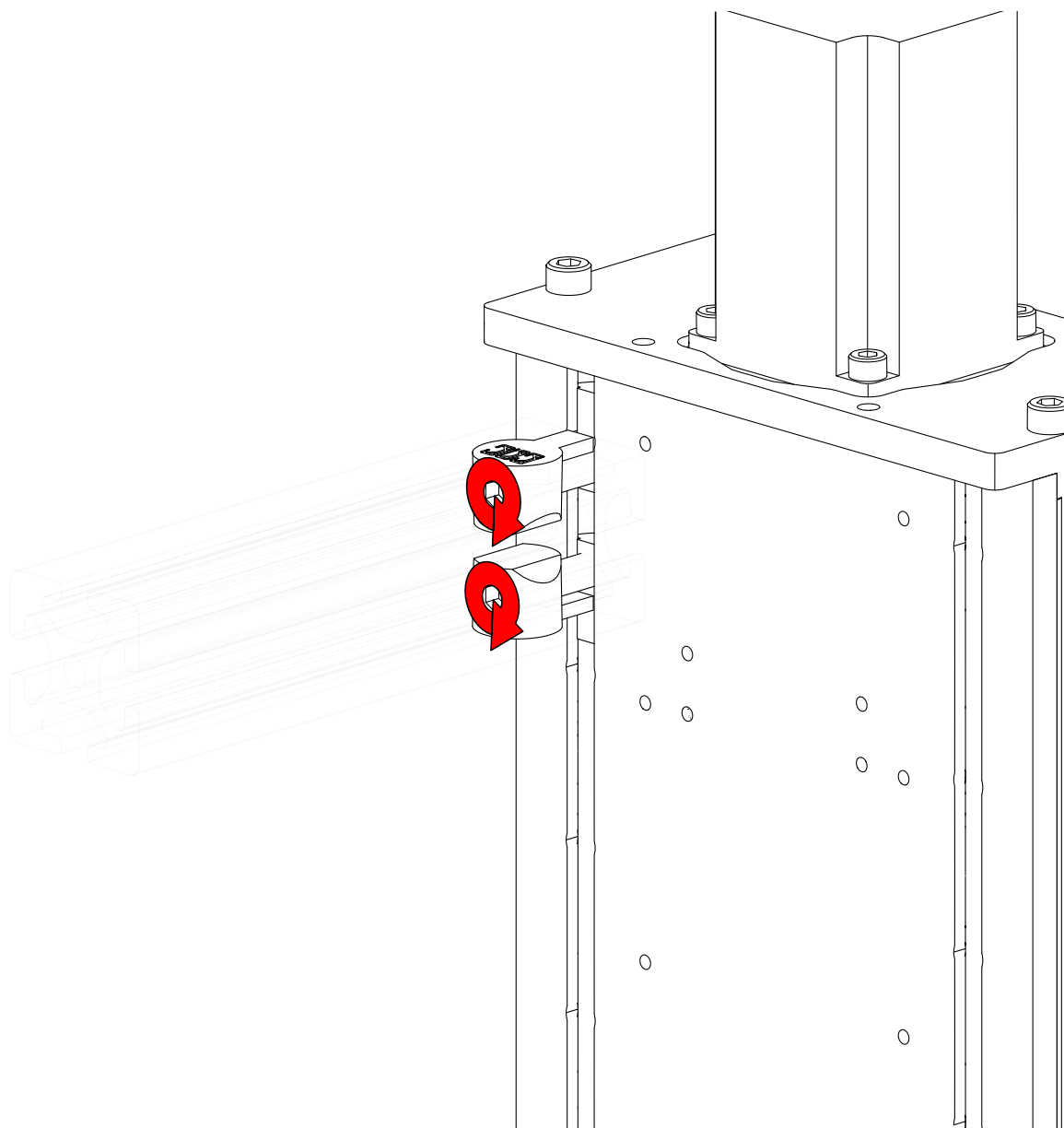


## 5.2.4



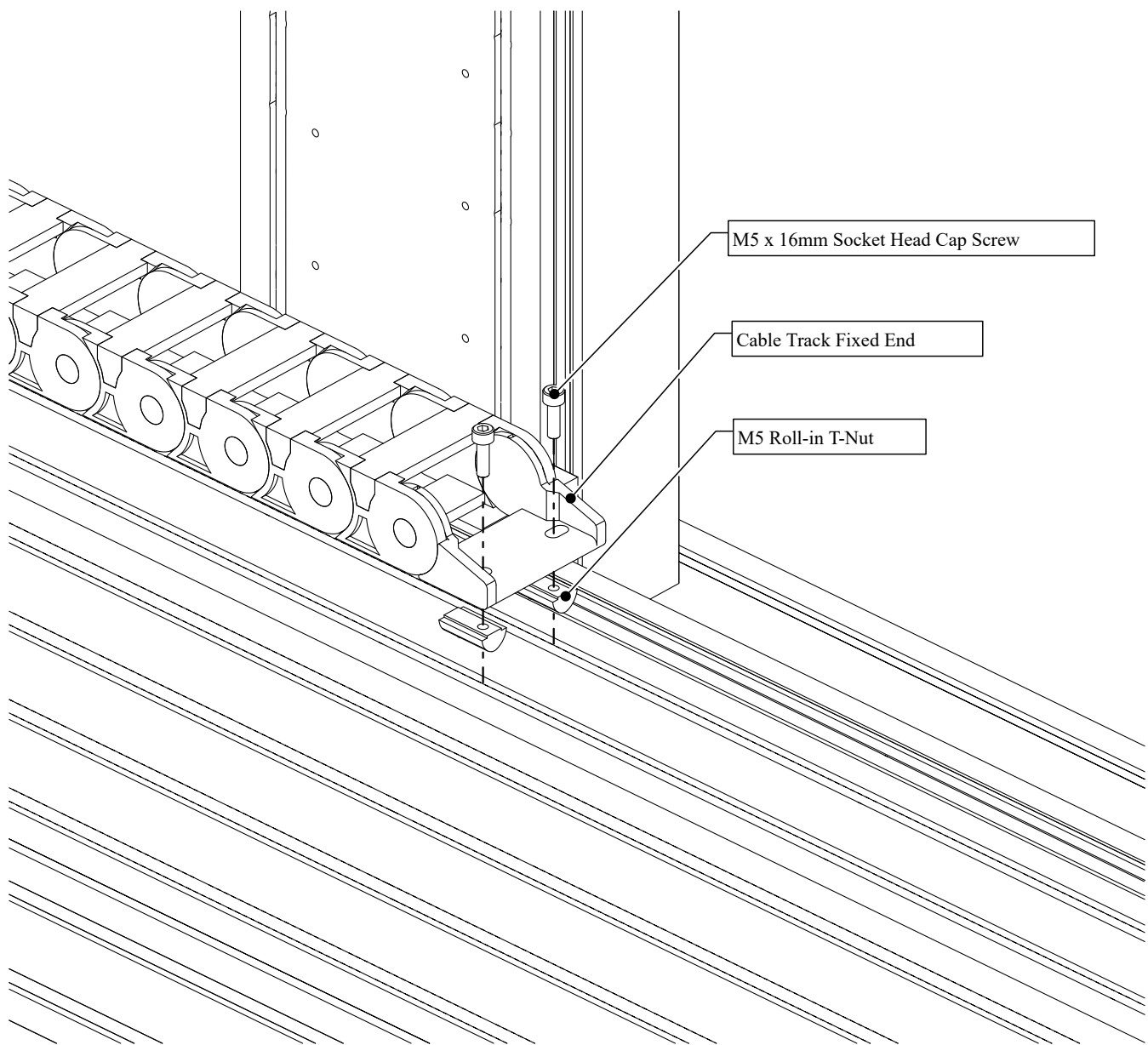
- Position the bracket extrusion approximately 25mm (1") from the top of the Z axis.

### 5.2.5



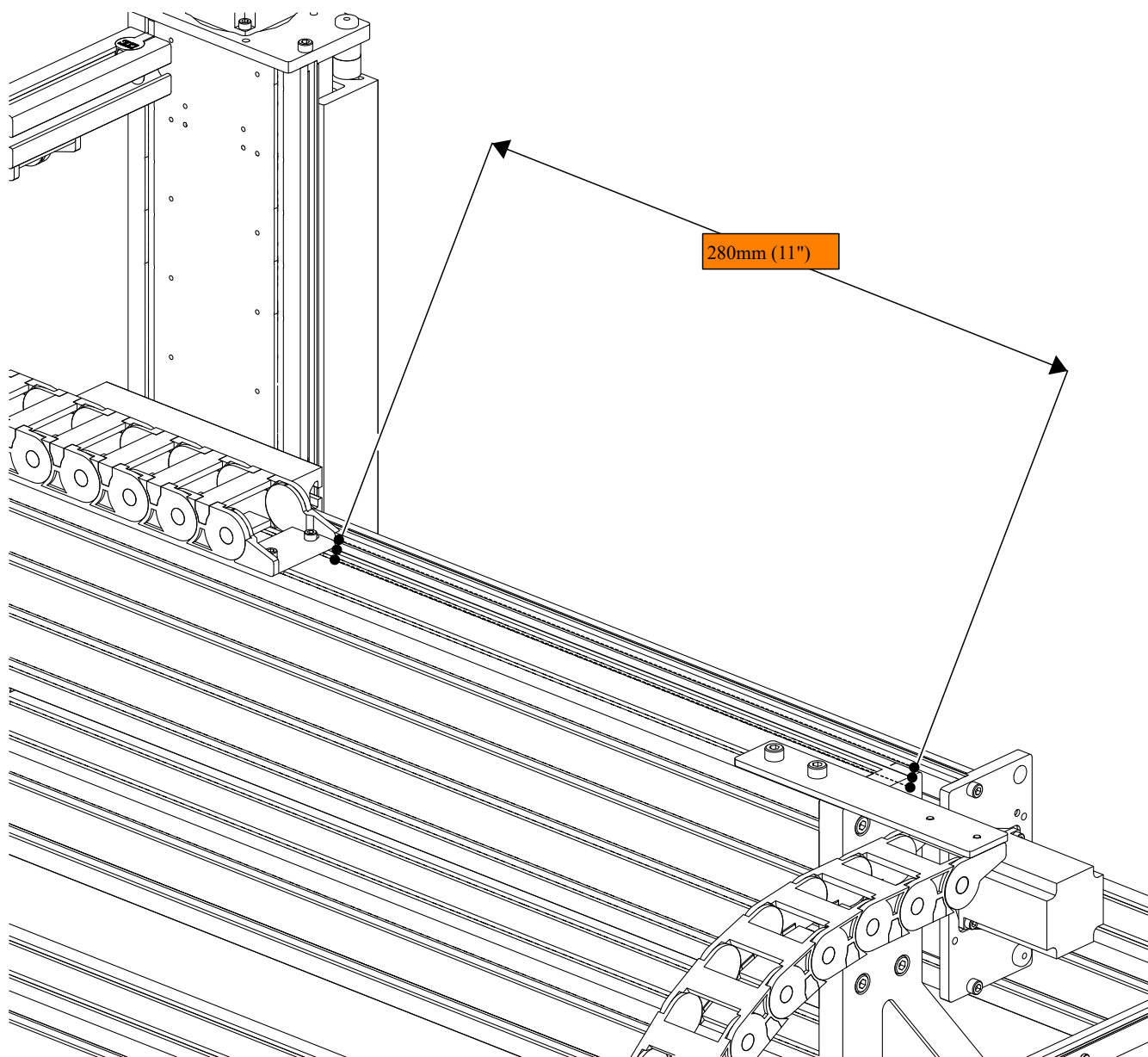
- Tighten the cable track extrusion fasteners as indicated.

## 5.2.6



- Install the fixed end of a length of cable track to the gantry extrusion.

## 5.2.7

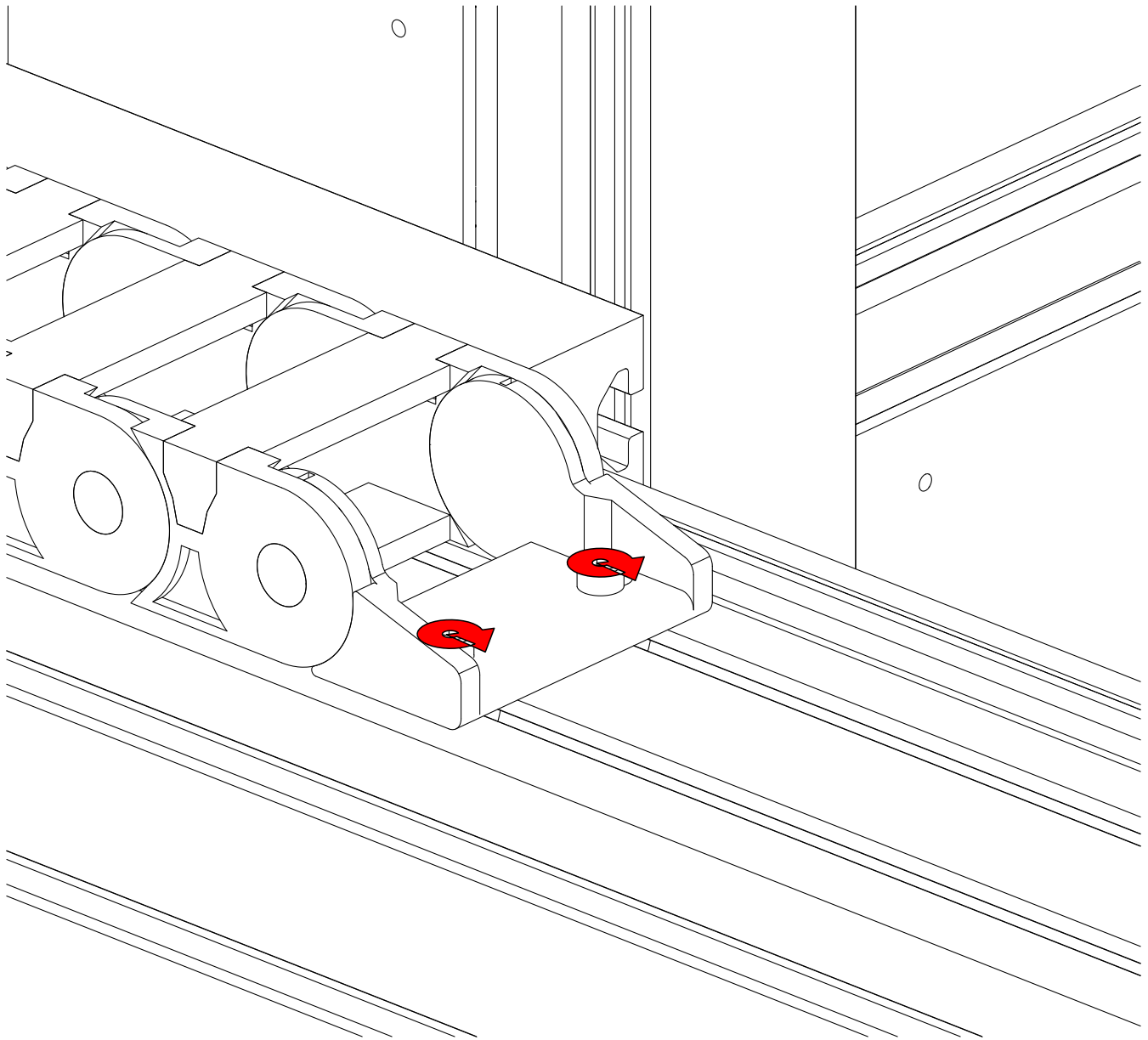


- Position the cable track approximately 280mm (11") from the riser plate.

### Machine Configuration Option

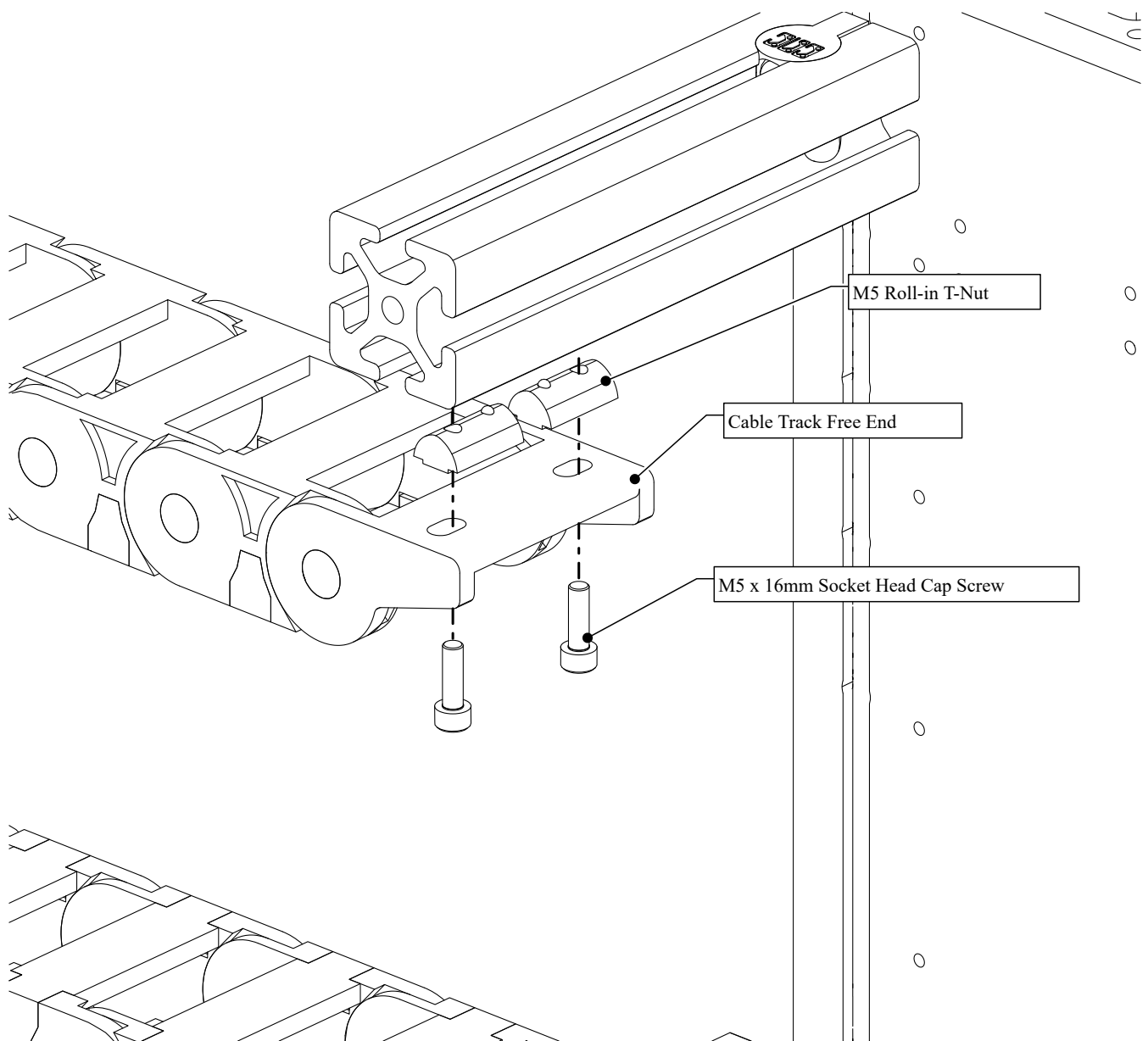
For the 3' width machines, position the cable track approximately 530mm (21") from the end of the riser plate.

## 5.2.8



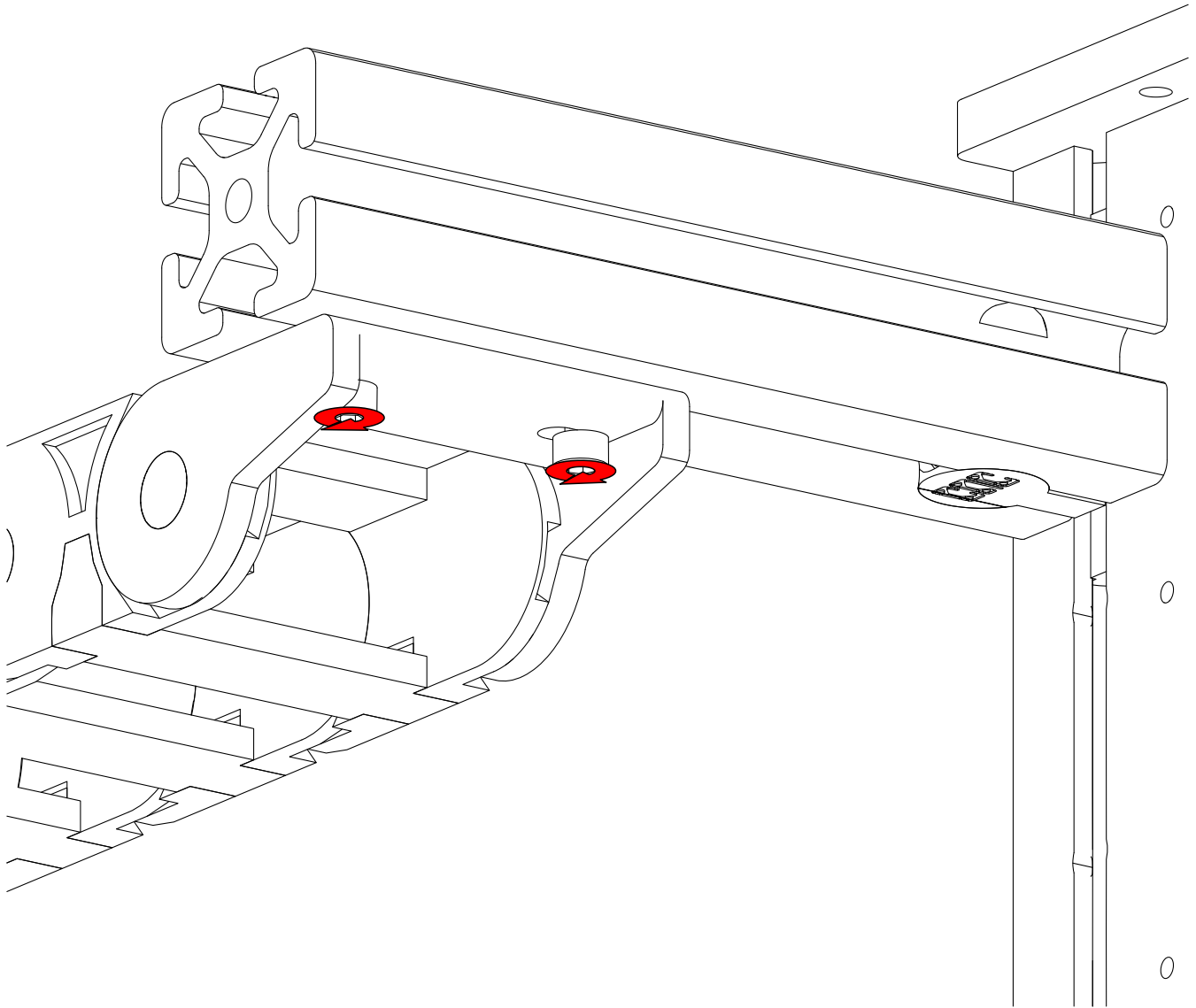
- Tighten the fixed end in place.

## 5.2.9



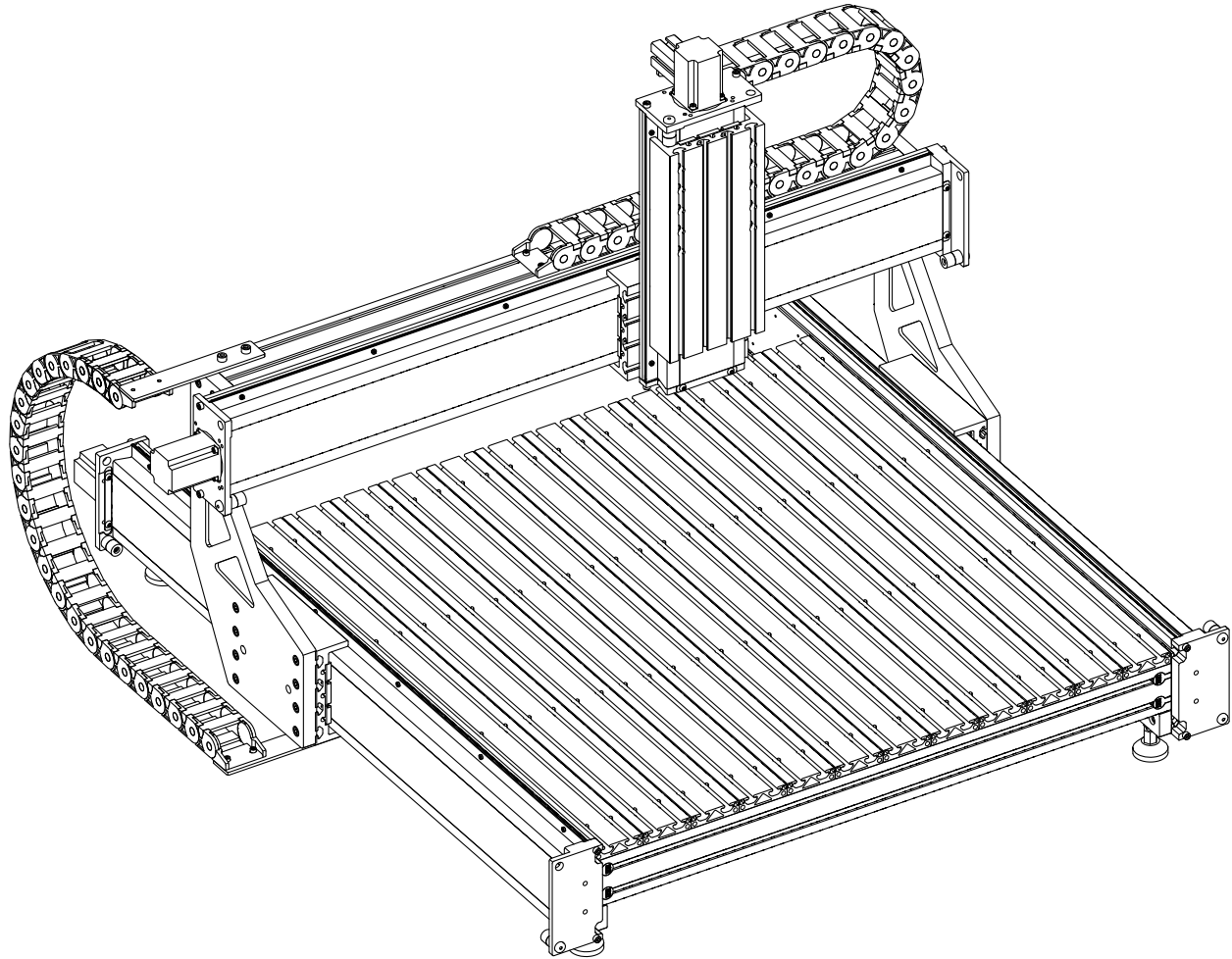
- Install the free end onto the extrusion bracket.

### 5.2.10



- Tighten the free end in place.

## Section 6: Tabletop Extrusion Installation





## Parts and Tools Required

*The following parts and tools will be used in Section 6*

### 2' x 2' Parts List

QTY	Part/Description	Packaged In
8	8020-720-CS6 T-Slot Machine Table Extrusion	CRP8020-720-CS6-BT-2424
1	CRP8020-720-CS6-BT-2424-FAST: - (48) M5 x 16mm Flat Head Screw - (48) M5 Roll-in T-Nut	CRP8020-720-CS6-BT-2424

### 2' x 3' Parts List

QTY	Part/Description	Packaged In
8	8020-960-CS8 T-Slot Machine Table Extrusion	CRP8020-960-CS8-BT-2436
1	CRP8020-960-CS8-BT-2436-FAST: - (64) M5 x 16mm Flat Head Screw - (64) M5 Roll-in T-Nut	CRP8020-960-CS8-BT-2436

### 3' x 2' Parts List

QTY	Part/Description	Packaged In
12	8020-720-CS8 T-Slot Machine Table Extrusion	CRP8020-720-CS6-BT-3624
1	CRP8020-720-CS6-BT-3624-FAST: - (72) M5 x 16mm Flat Head Screw - (72) M5 Roll-in T-Nut	CRP8020-720-CS6-BT-3624

### 3' x 3' Parts List

QTY	Part/Description	Packaged In
12	8020-960-CS8 T-Slot Machine Table Extrusion	CRP8020-960-CS8-BT-3636
1	CRP8020-960-CS8-BT-3636-FAST: - (96) M5 x 16mm Flat Head Screw - (96) M5 Roll-in T-Nut	CRP8020-960-CS8-BT-3636

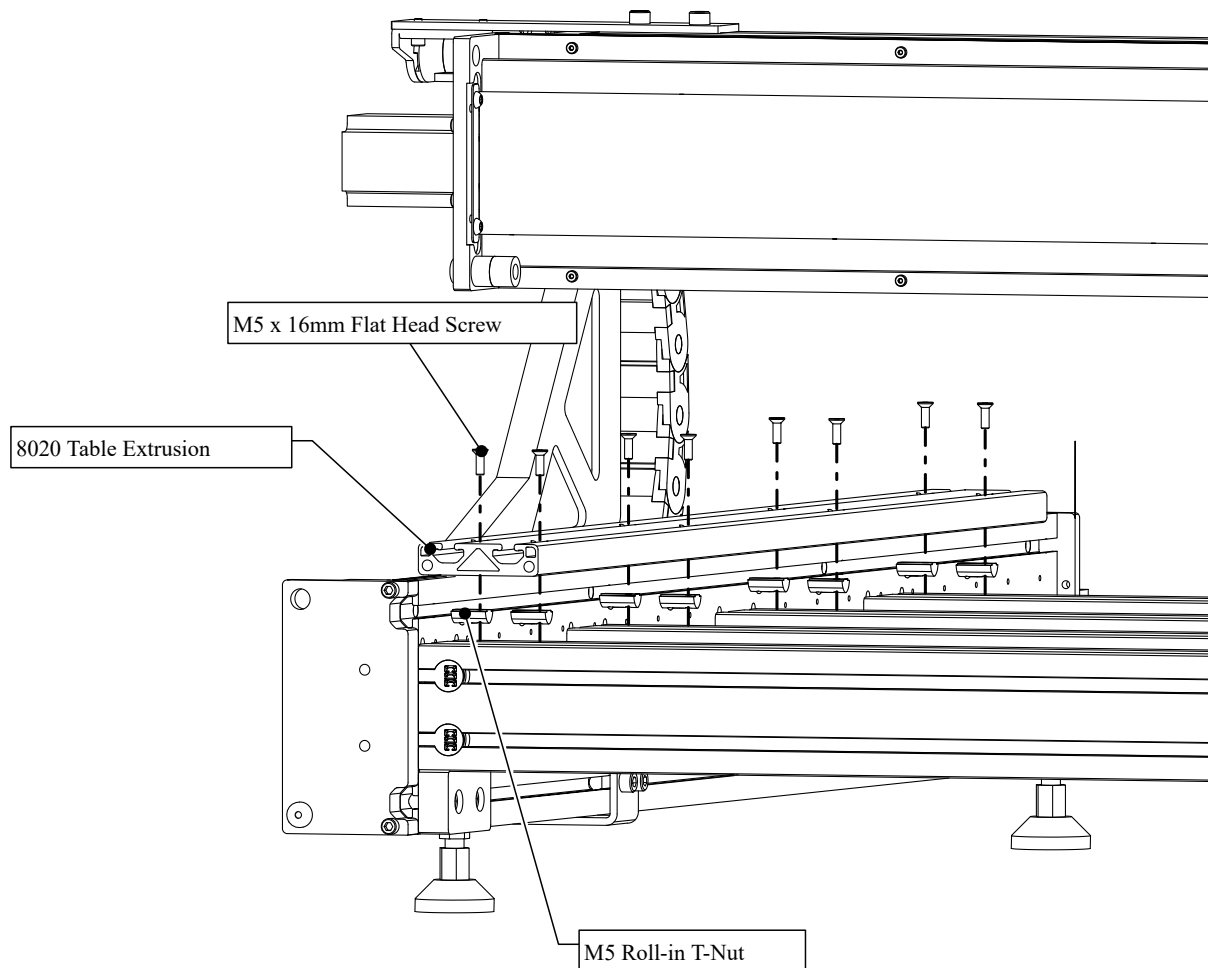
Required Tools:

- 3mm Allen Wrench



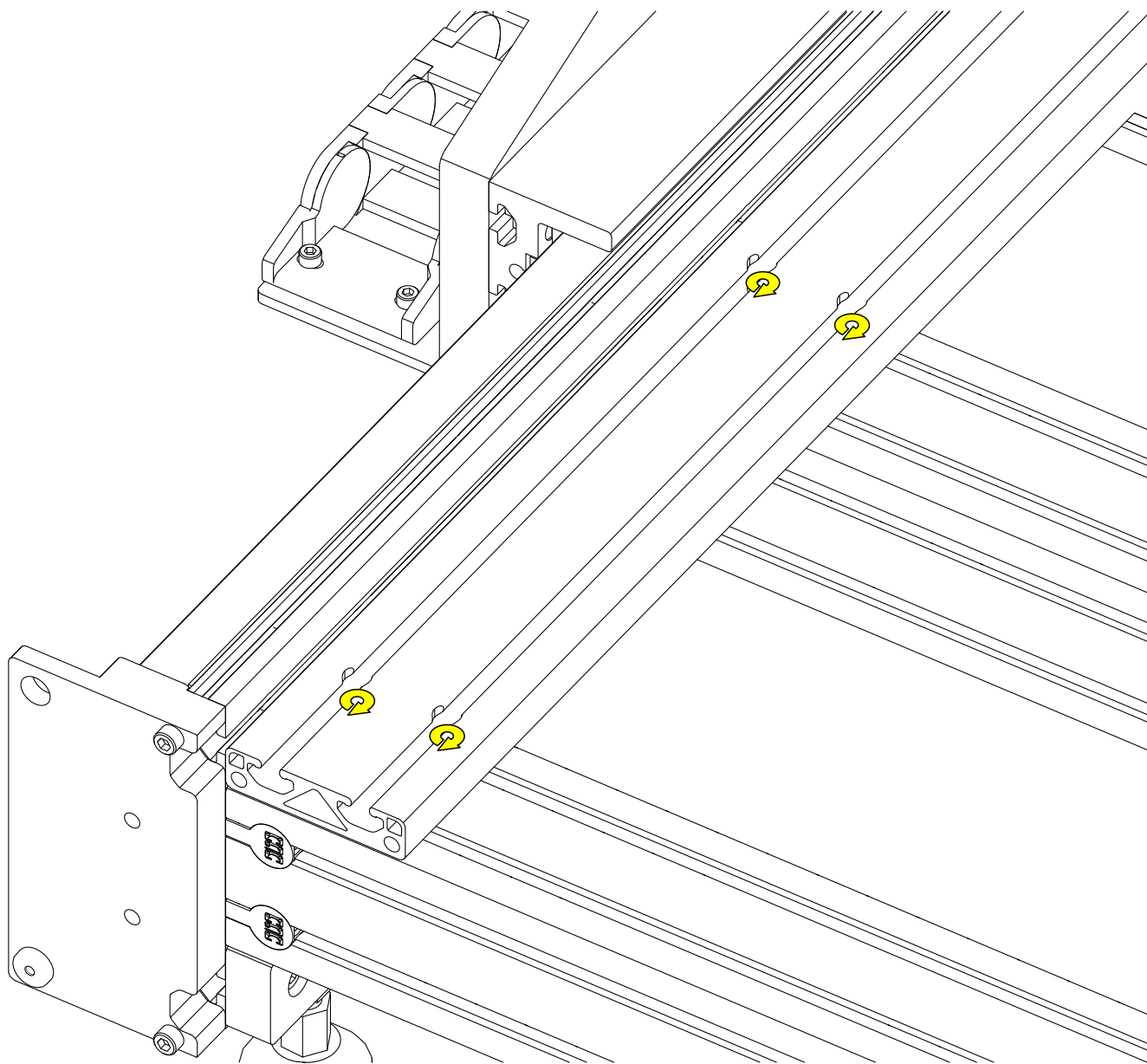
## 6.1 Tabletop Installation

### 6.1.1



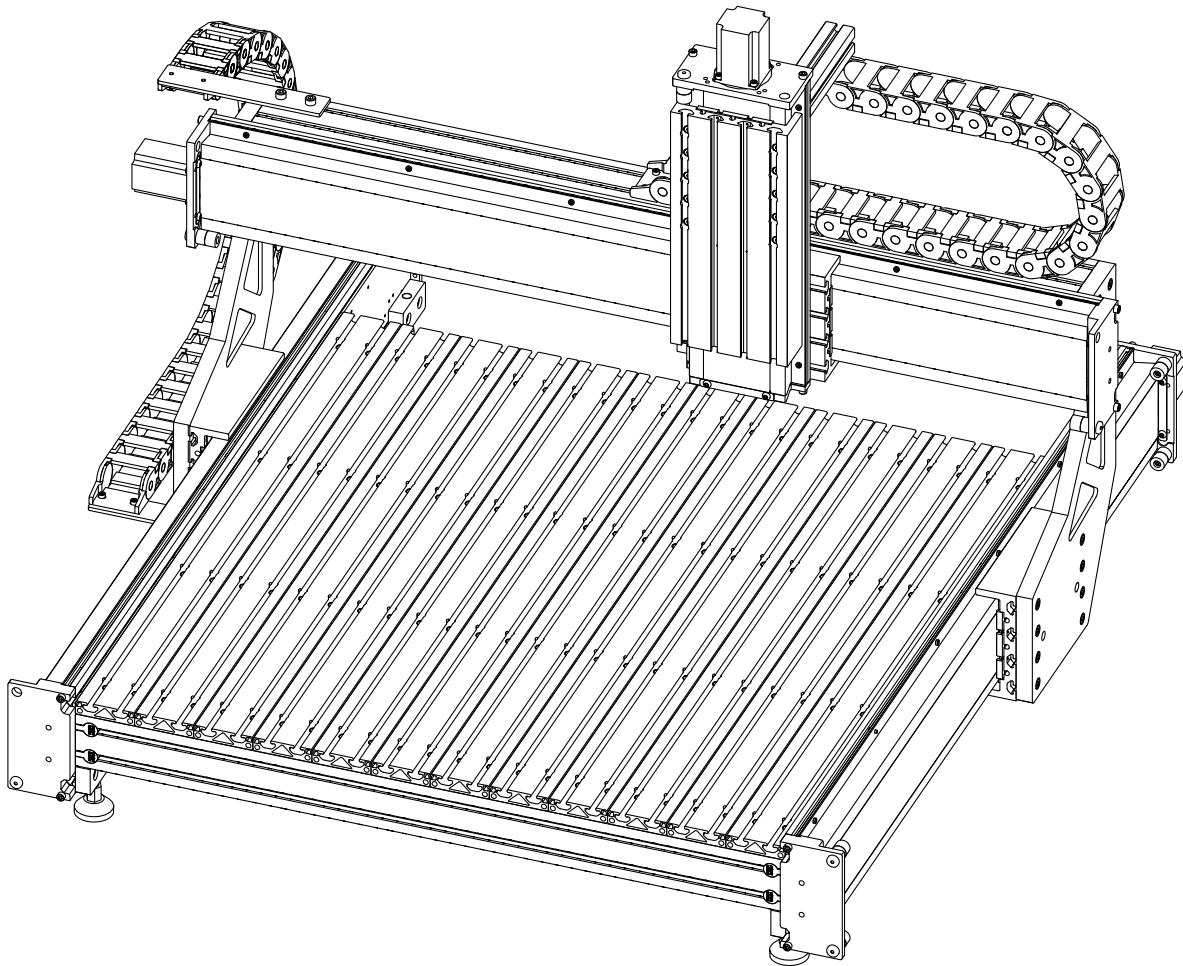
- Attach a piece of tabletop extrusion to the machine crossmembers as indicated.

## 6.1.2



- Partially tighten the tabletop extrusion fasteners.

### 6.1.3



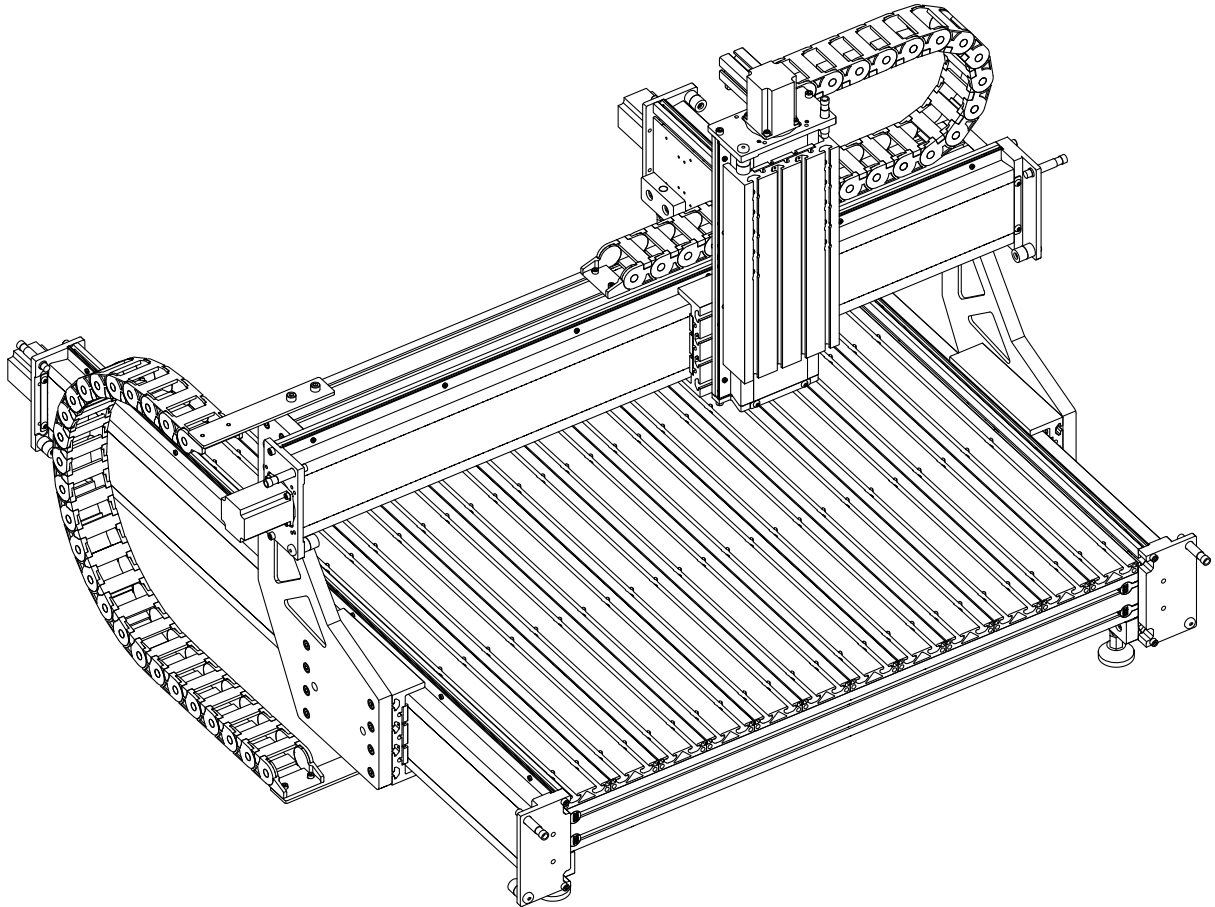
- Repeat the previous steps to install the remaining tabletop extrusion pieces.

#### 6.1.4



- Fully tighten the tabletop extrusion fasteners.

## Section 7: Motor and Sensor Connections

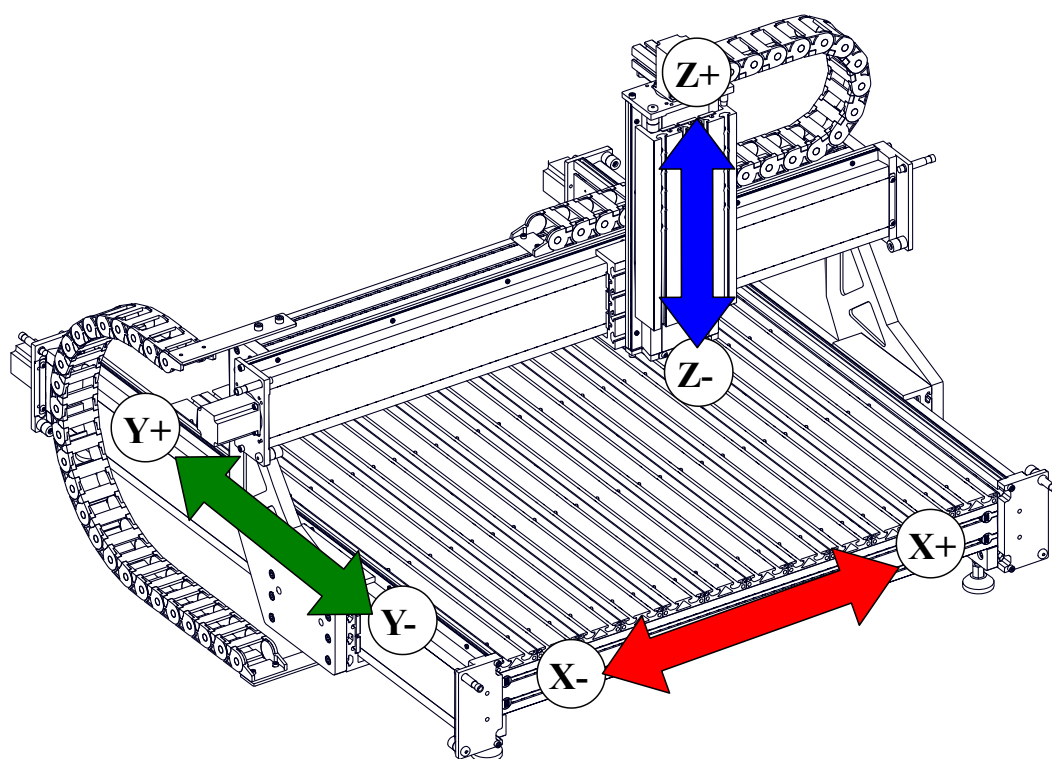


### Axis Nomenclature Update (April 2021)

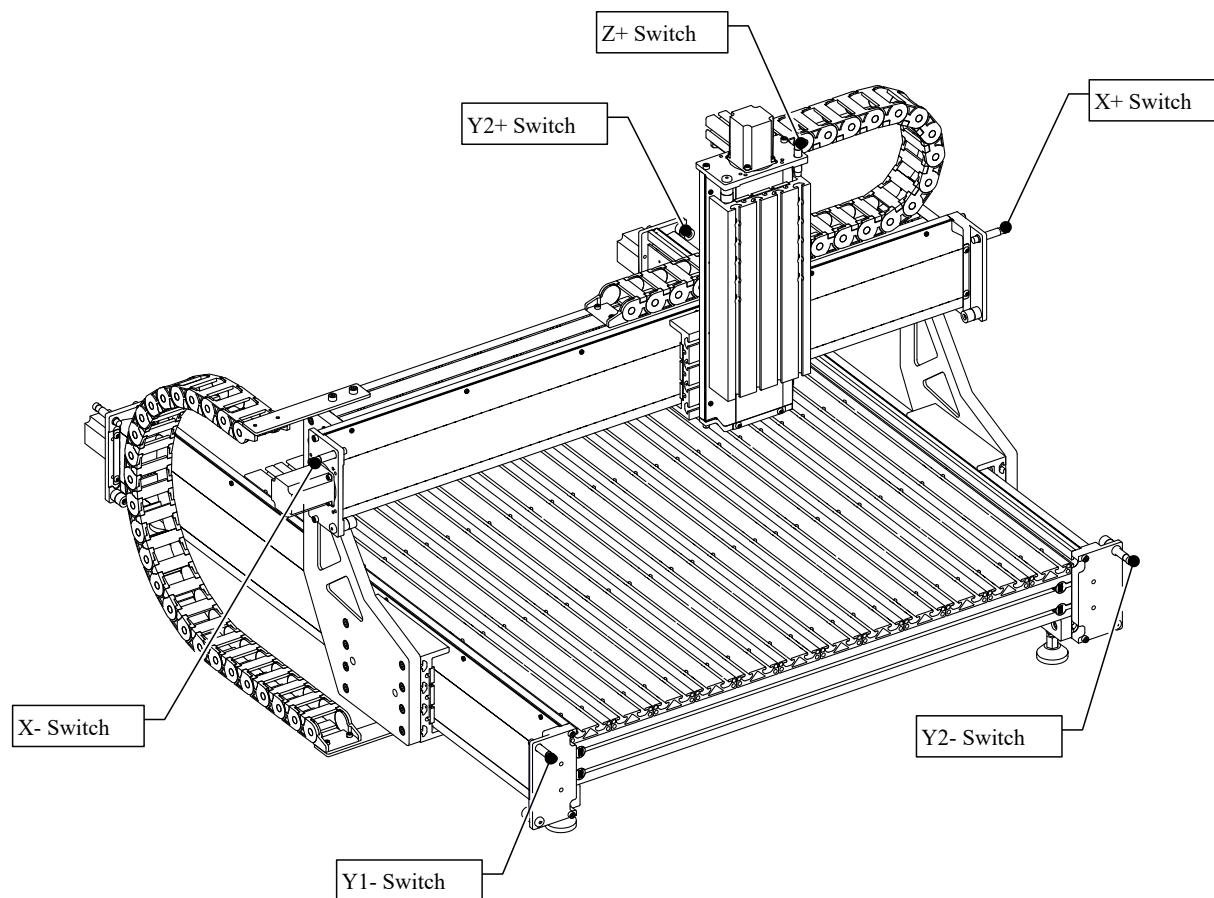
The nomenclature used to describe the dual-driven Y axis changed in April 2021 to "Y1" axis and "Y2" axis. If you purchased your Plug and Play CNC Control System prior to this, refer to the **Plug and Play CNC Control System Previous Revision** notes throughout this section. These will provide instructions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

## 7.1 Motor and Sensor Locations

### 7.1.1

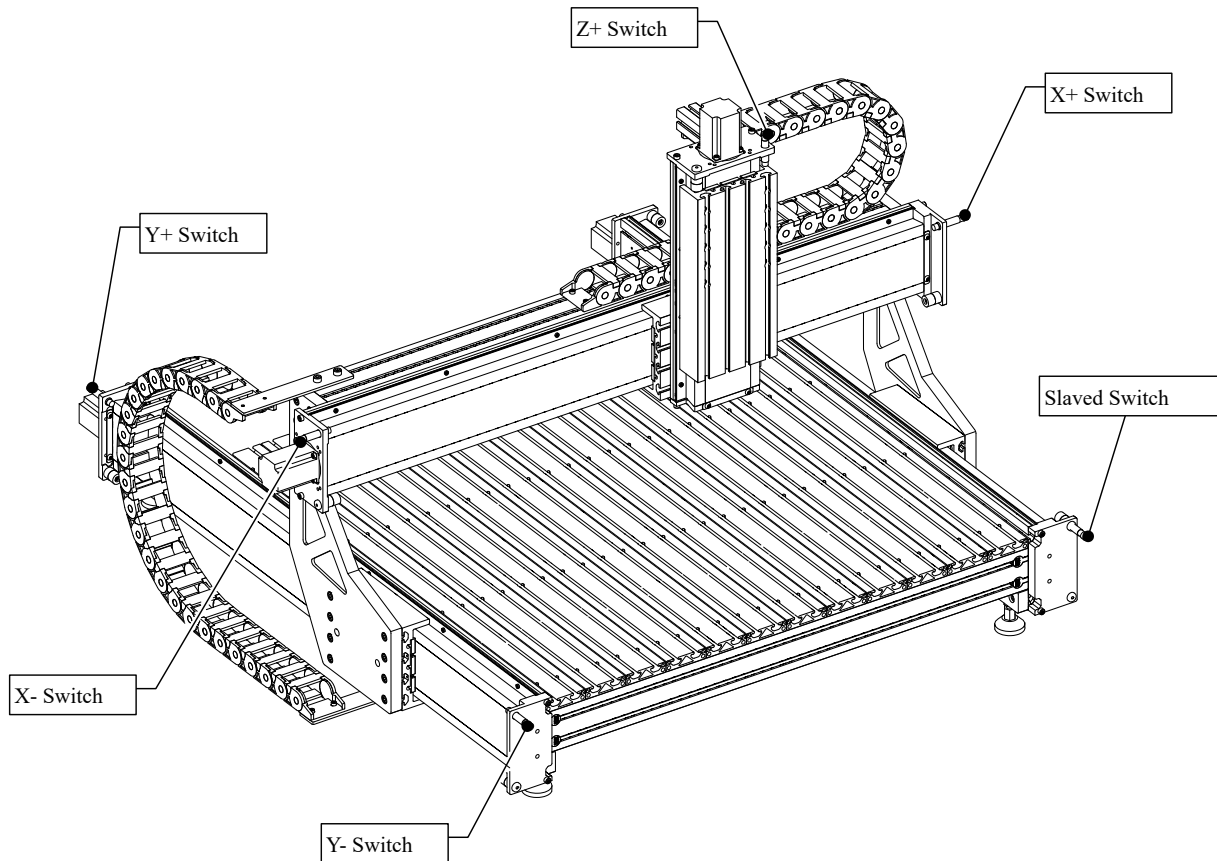


## 7.1.2

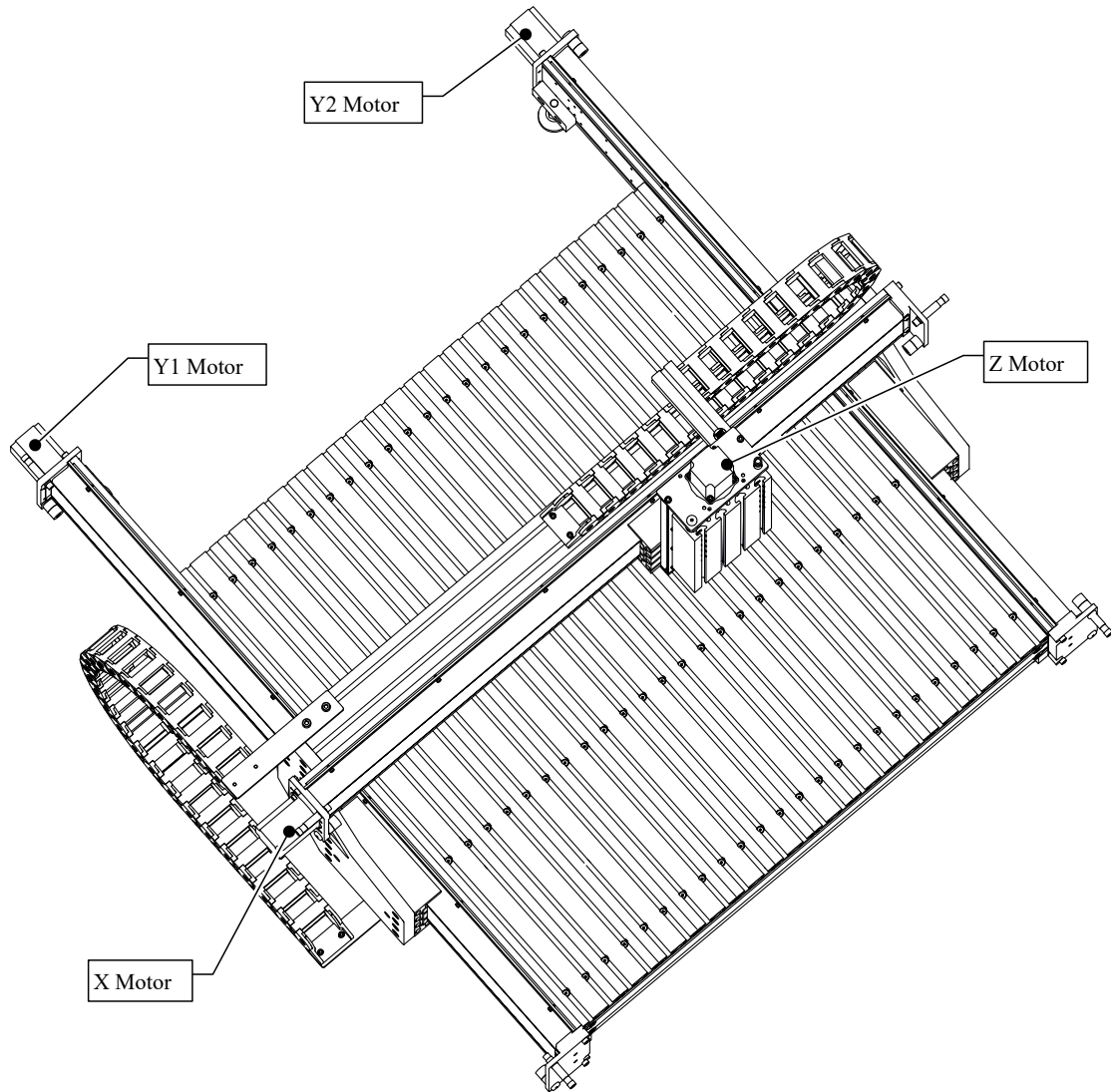




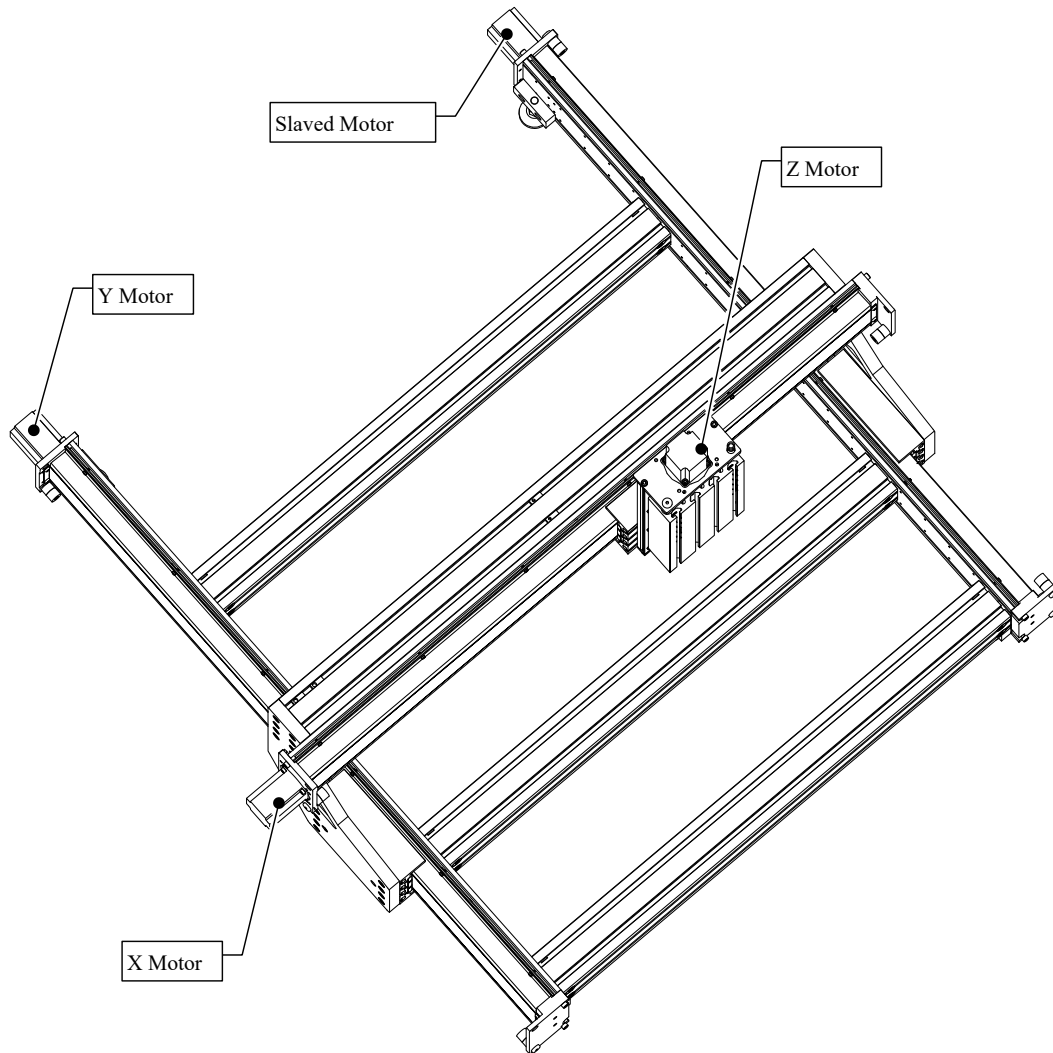
Plug and Play CNC Control Systems purchased prior to April 2021 use the nomenclature shown below for proximity limit switches.



### 7.1.3

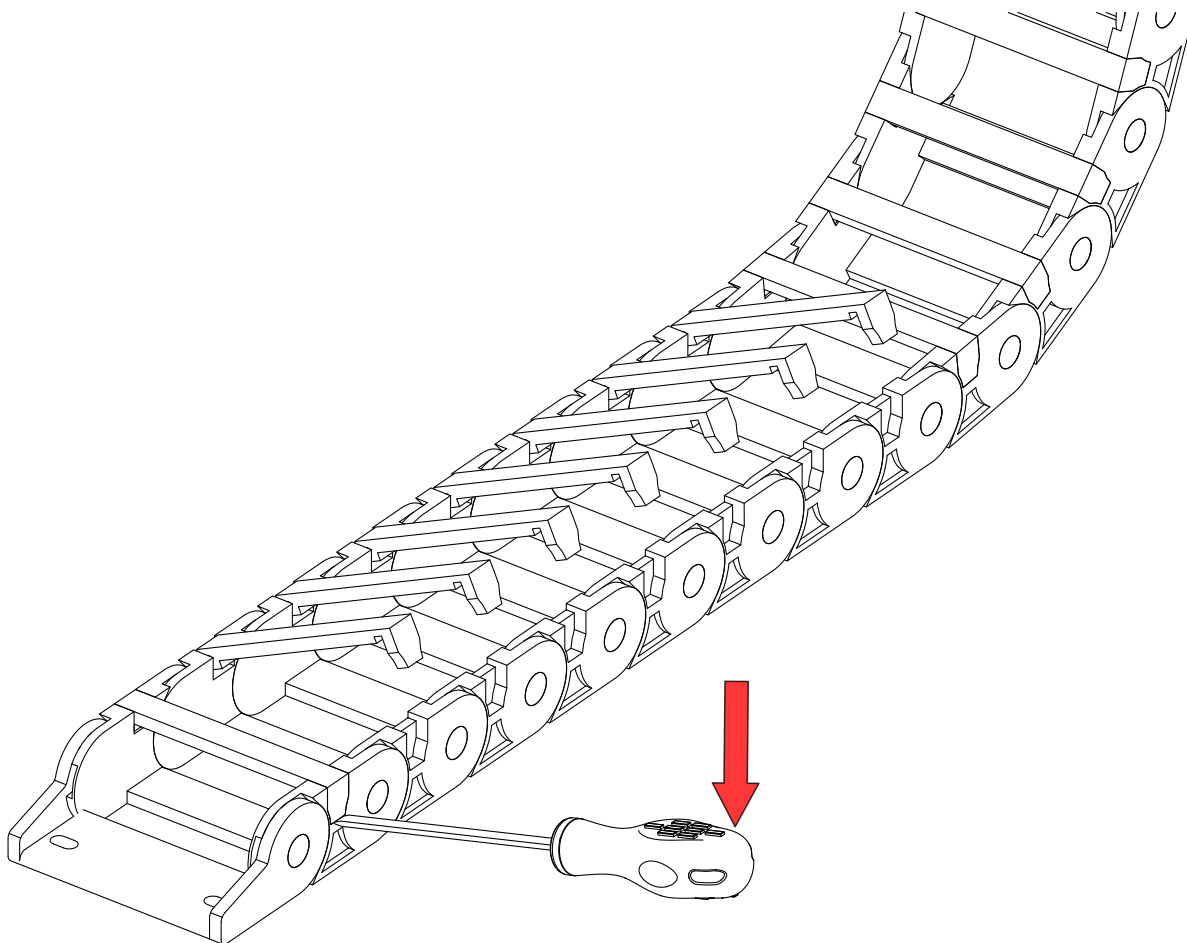


Plug and Play CNC Control Systems purchased prior to April 2021 use the nomenclature shown below for motors.



## 7.2 Cable Routing

### 7.2.1



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

## 7.2.2

### Cable Routing Paths

Motor/Sensor	Cable Routing Path
Y1- Switch	Directly to control box
Y2+ Switch	Directly to control box
Y2- Switch	Directly to control box
Y1 Motor	Directly to control box
X- Switch	Through table cable track
X+ Switch	Across gantry and through table cable track
X Motor	Through table cable track
Z Motor	Through table cable track and gantry cable track
Z+ Switch	Through table cable track and gantry cable track
Y2 Motor	Directly to control box

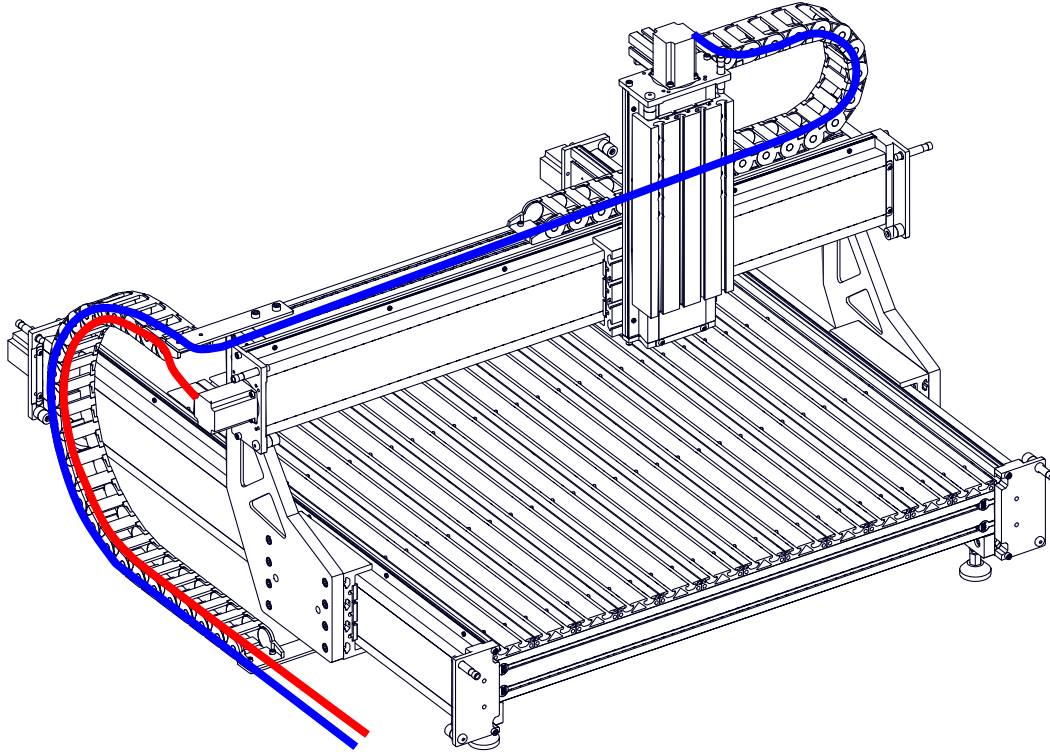


Plug and Play CNC Control Systems purchased prior to April 2021 use the following cable routing paths.

### Cable Routing Paths

Motor/Sensor	Cable Routing Path
Y- Switch	Directly to control box
Y+ Switch	Directly to control box
Slaved Switch	Directly to control box
Y Motor	Directly to control box
X- Switch	Through table cable track
X+ Switch	Across gantry and through table cable track
X Motor	Through table cable track
Z Motor	Through table cable track and gantry cable track
Z+ Switch	Through table cable track and gantry cable track
Slaved Motor	Directly to control box

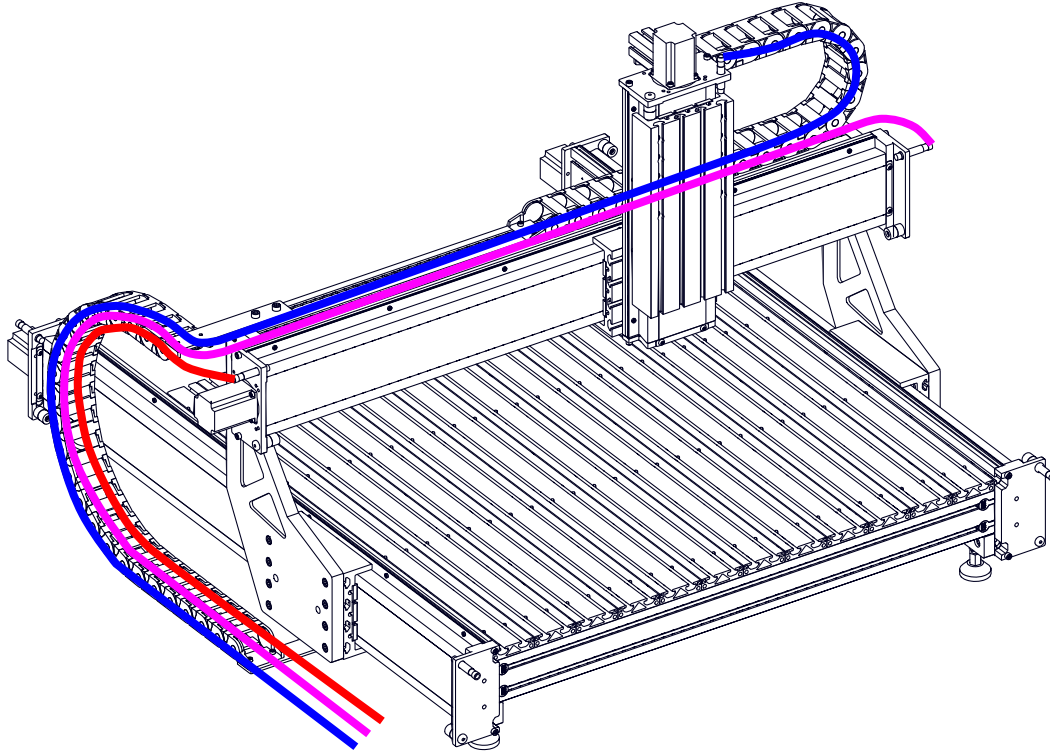
### 7.2.3



- Route the indicated motor cables as shown. The remaining two motor cables can be routed directly to your control box without going through cable track.

**Cables**

Axis	Color	Cable
X Motor	Red	12'
Z Motor	Blue	20'



- Route the indicated sensor cables as shown (see table on next page). The remaining three sensor cables can be routed directly to your control box without going through cable track.

#### Assembly Note

The X+ sensor cable is routed on top of the gantry, but not inside the gantry cable track.

#### Assembly Note

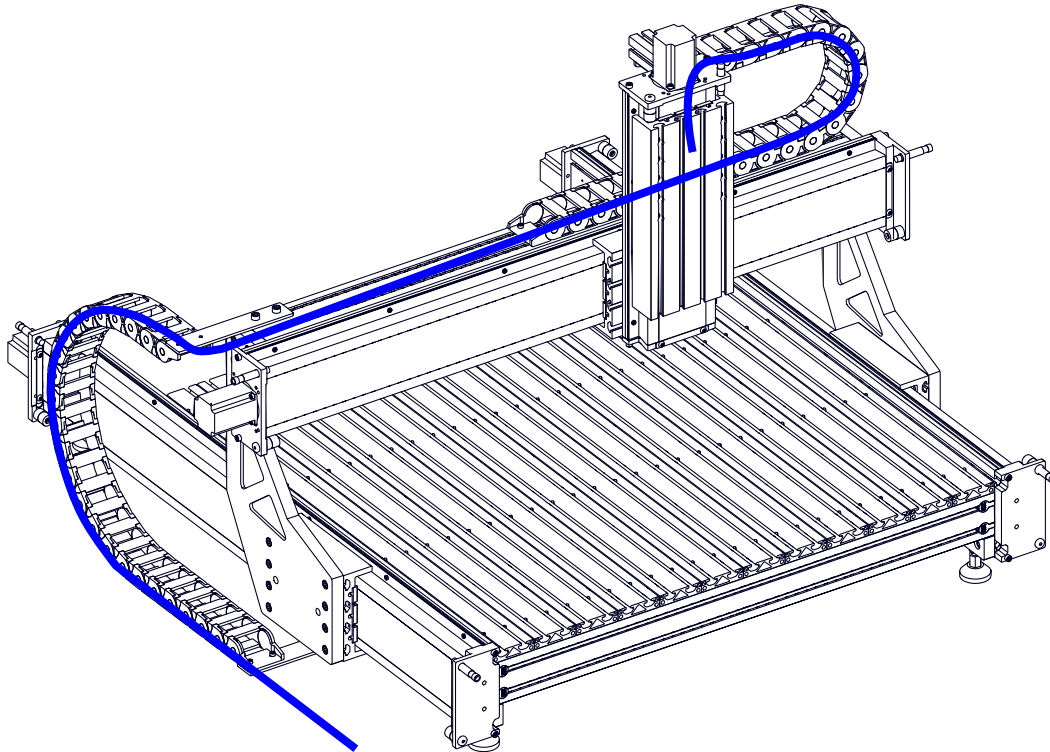
If using an Avid CNC Plug and Play CNC Control System purchased after October 2019, you will plug the X+ sensor cable into the "A" sensor port on the control box.



### Cables

Axis	Color	Cable
X- Sensor	Red	12'
X+ Sensor	Pink	20'
Z Sensor	Blue	20'





#### Accessory Routing

Connection	Color	Component	Routing Path
Spindle	Blue	M23 Spindle Cable	Through table cable track and gantry cable track
Router	Blue	Router Power Cable	Through table cable track and gantry cable track
Laser	Blue	See <b>Instructions</b>	Through table cable track and gantry cable track



#### Assembly Note

Ensure any components routed to the Z-axis moving plate have enough slack for the entire range of motion.



## 7.3 Sensor Installation

### Parts and Tools Required

*The following parts and tools will be used in Section 7.3*

QTY	Part/Description	Packaged In
1	Proximity Sensor Kit: <ul style="list-style-type: none"><li>- (6) Cylindrical Proximity Sensors</li><li>- Proximity Cables (See table in Step 7.2.2 for lengths)</li></ul>	Electronics

Required Tools:

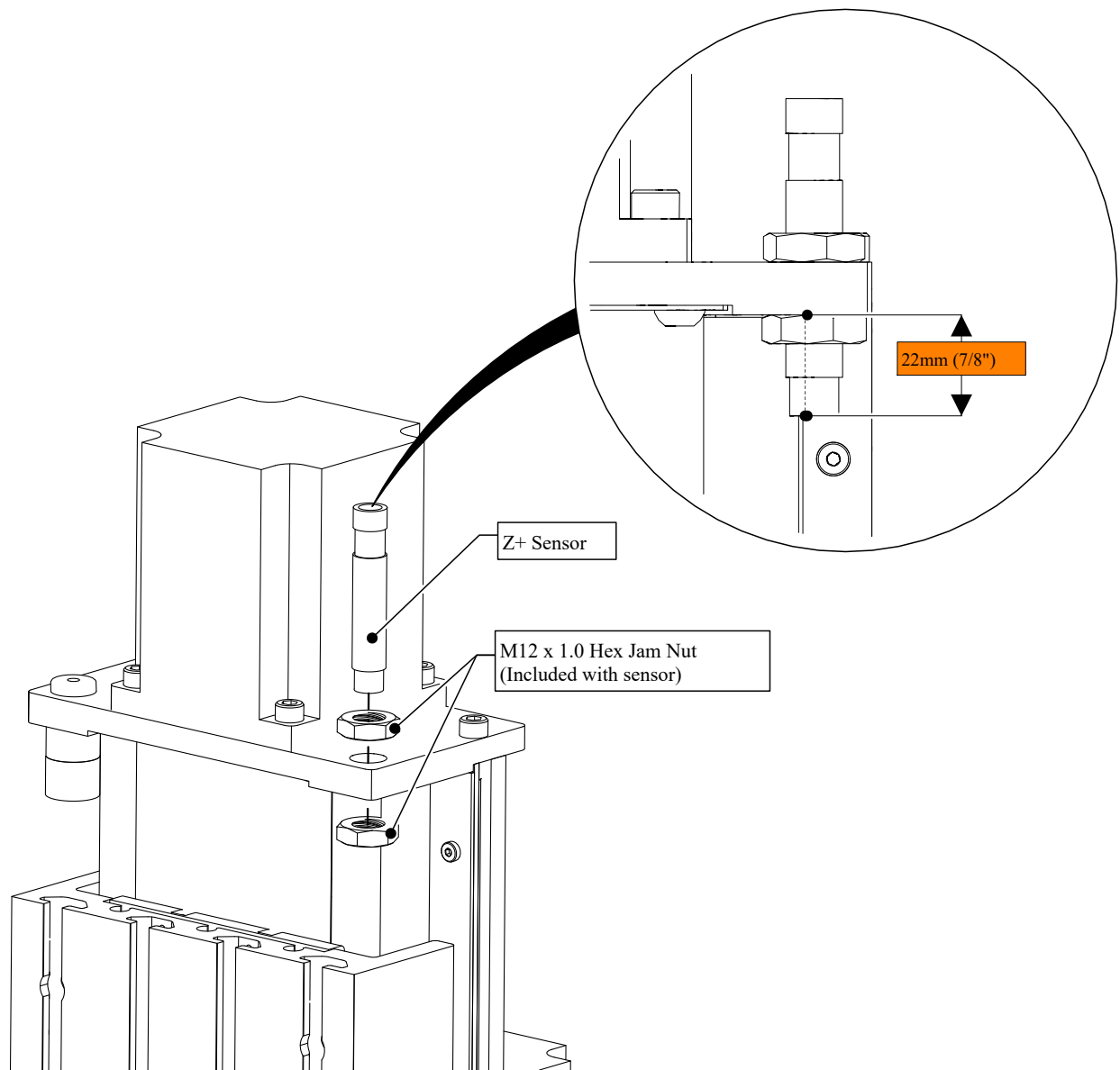
- Adjustable Wrench
- Tape Measure

Recommended Additional Tools:

- 17mm Combination Wrench



### 7.3.1



- Install sensors as indicated at each sensor location (see step 7.1.2).

#### Assembly Note

We recommend positioning the sensors 22mm (7/8") from the inside of the Motor Mount Plate as indicated.

# Section 8: Machine Setup

## 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.
- **Laser Kit** (<https://www.avidcnc.com/support/instructions/laser>)  
Assembly, installation, and calibration instructions for the Avid CNC laser kit.

