



PRO60120 CNC Machine Assembly Instructions

v2024Q2.1

Assembly Instructions Configuration

Model Revision	21.1
Machine Width	60"
Machine Length	120"
Gantry Width	Standard
Gantry Height	Standard
Leg Kit	Avid CNC
Motors	NEMA 34 (1/2" shaft)
Cutting Tool	Routing
Dual-Use Cutting Tool	N/A
Routing Tool	Spindle
Spindle Type	4 HP Avid CNC Spindle

Getting Started

An important first step in the assembly of your PRO CNC machine is to read through this Getting Started section. It will explain how the assembly instructions are laid out and helpful tips before beginning assembly.

Instructions Layout

1. The machine assembly instructions are broken down into different sections (base assembly, riser assembly, etc.) that correspond with how the machine components are packaged. Complete each section in order.
2. Each section begins with an image of the fully assembled component. If needed, refer to this as a reference while completing individual assembly steps.
3. 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.
4. 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.
5. Throughout the instructions, you will see notes like the ones shown below.



Assembly Note

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



Section Note

Section notes contain information that is specific to an entire section of instructions.

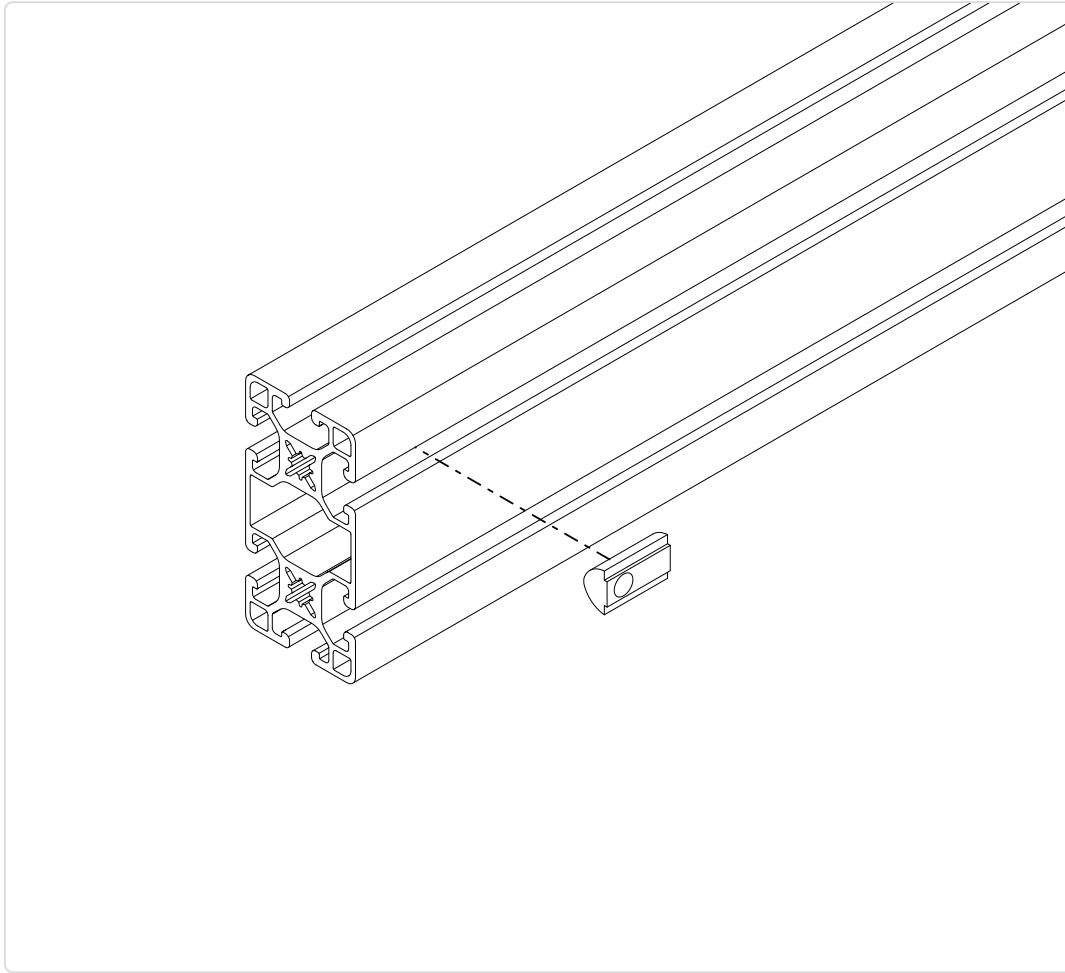


Alternate Cable Track Location

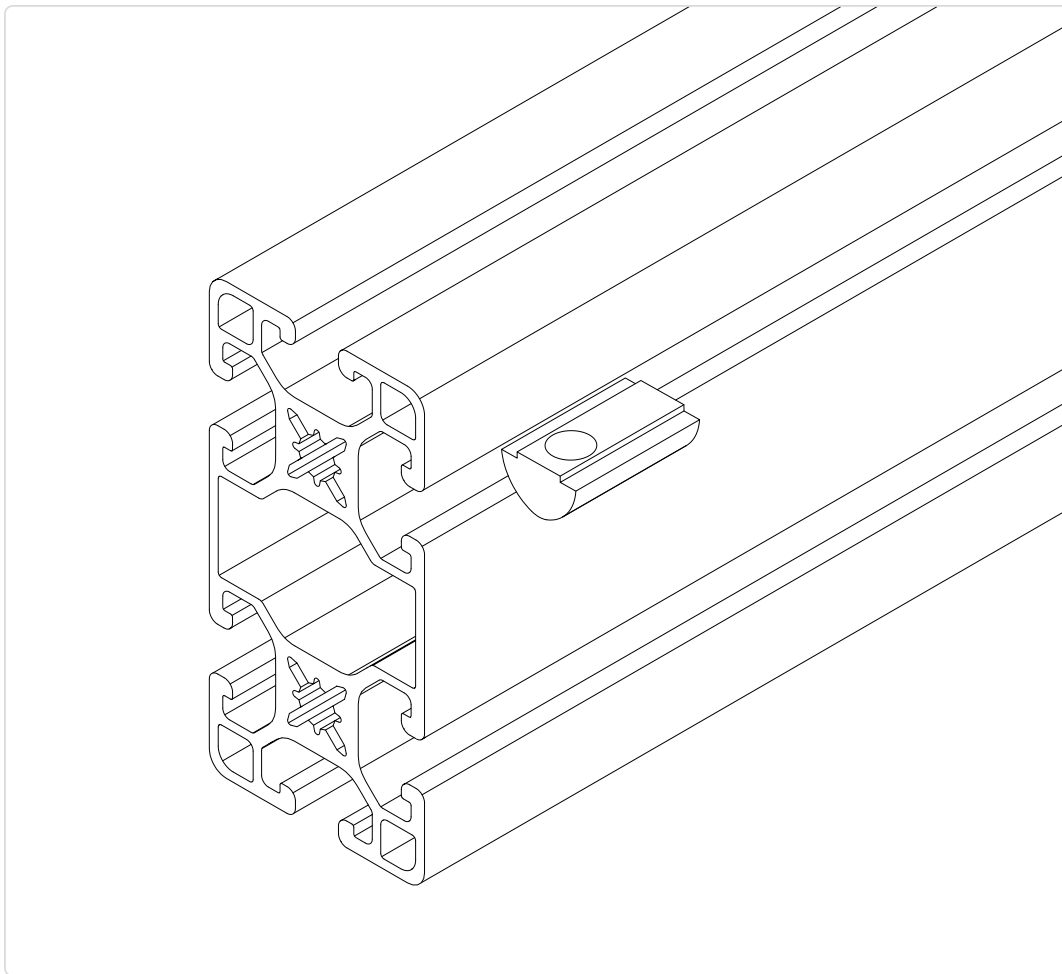
These notes provide additional instructions if you want the table cable track and electronics enclosures located on the machine's left side.

Roll-in T-Nut Assembly

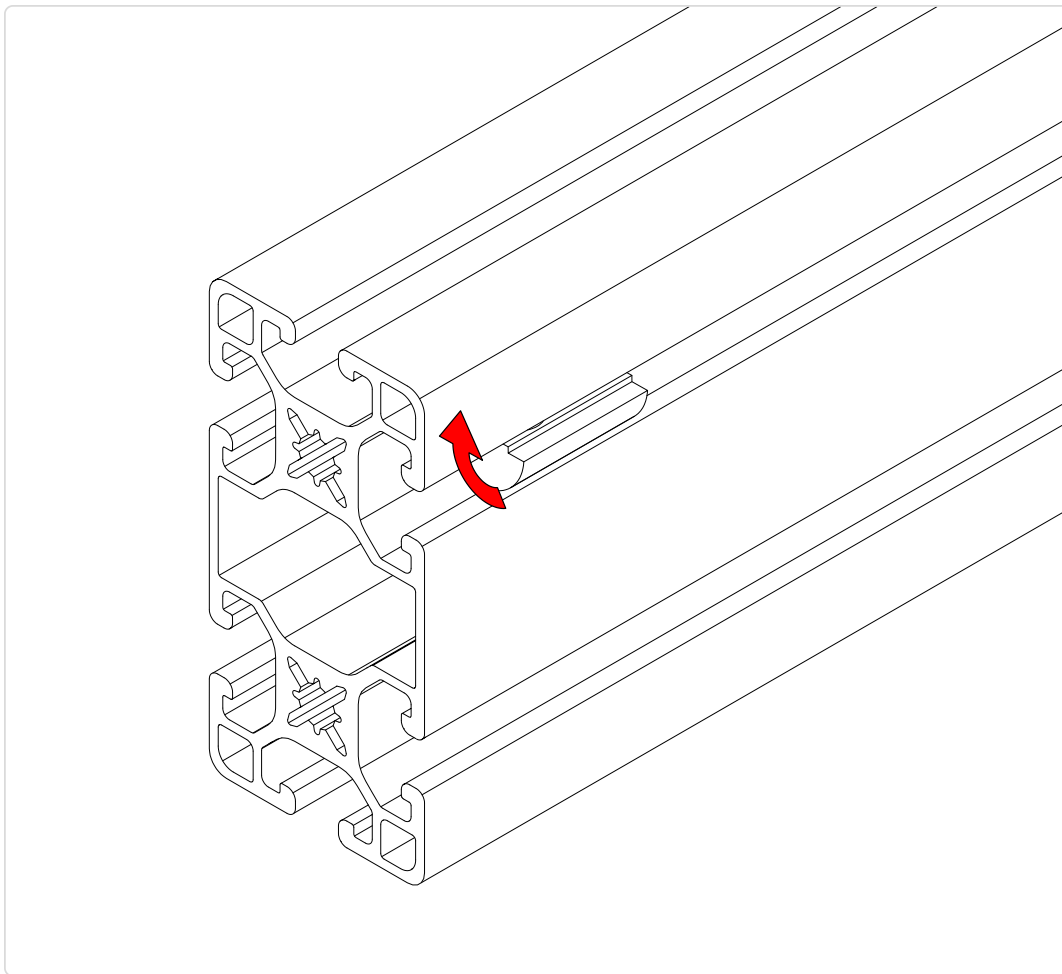
Throughout the assembly of your machine, you will use Roll-in T-Nuts. Review these assembly steps for proper use of this component.



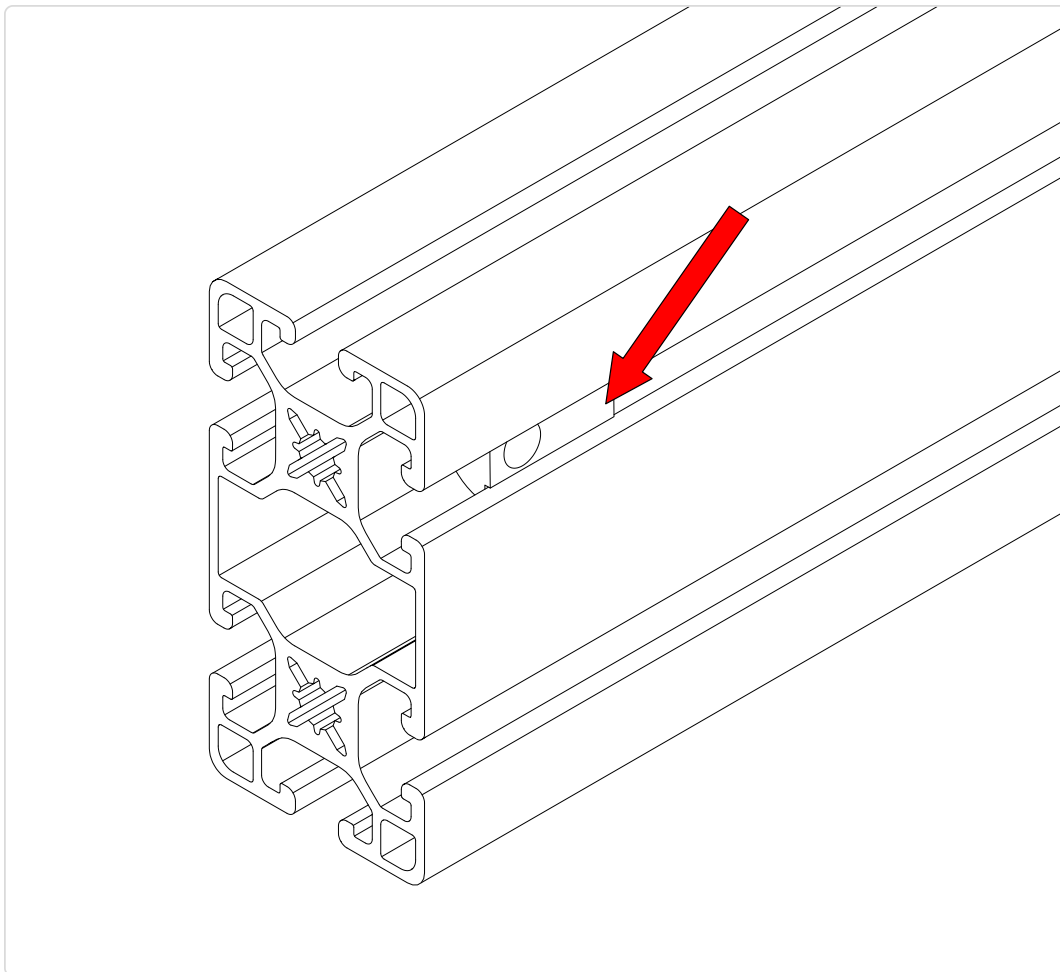
- Assembly steps will depict Roll-in T-Nut installation as shown above.



- 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.

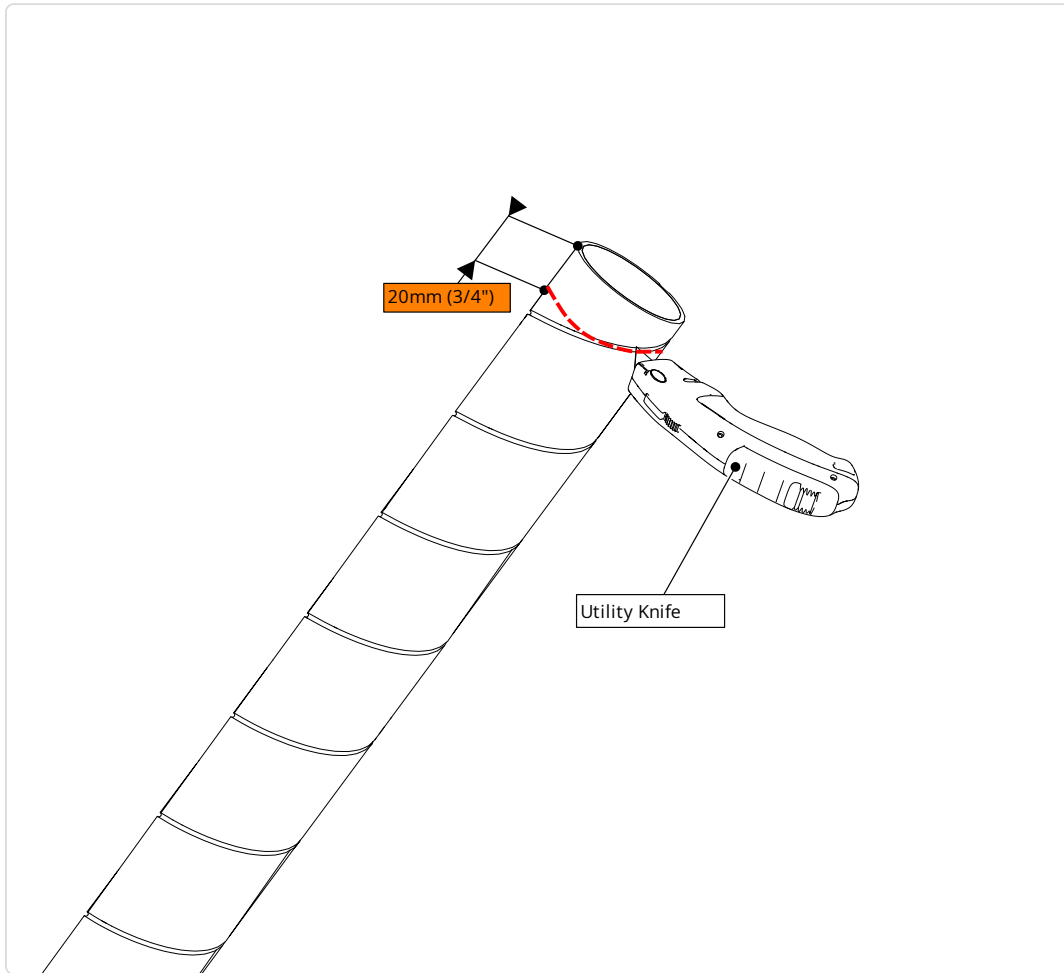


Assembly Note

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

Unpacking Cardboard Tubes

The profile linear rails and gear rack for your machine are packaged in cardboard tubes. Take care when opening to prevent damage to these components.



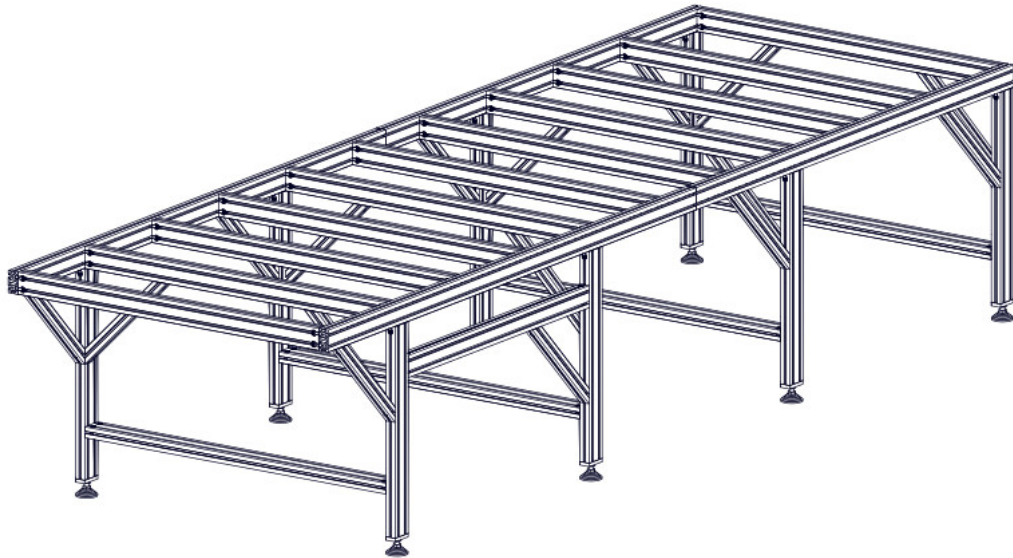
- Use a utility knife (or similar tool) to cut the cardboard 20mm (3/4") from either end of the tube.

Tools List

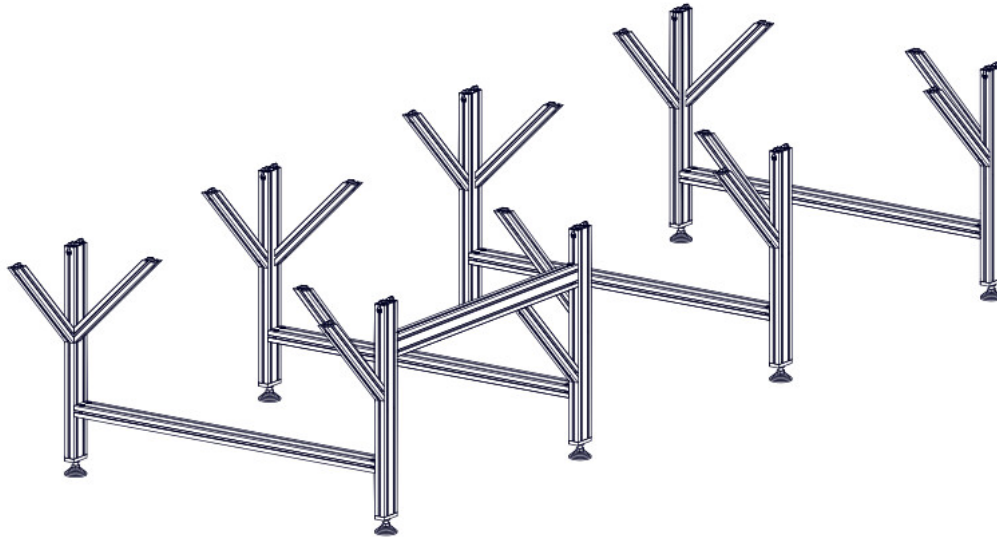
Requirement	Tool
Required	Metric Ball-End Allen Wrenches <i>2.5mm, 3mm, 4mm, 5mm, 6mm</i>
Required	Imperial Allen Wrenches <i>3/32", 1/4"</i>
Required	Adjustable Wrench
Required	Standard (Flat Tip) Screwdriver
Required	(2) Clamps <i>6" C-Clamps recommended</i>
Required	Tape Measure
Required	Utility Knife
Recommended	6mm Hex Ball-end Power Bit and Drill/Impact Driver
Recommended	Metric Combination Wrenches <i>8mm, 10mm, 13mm, 16mm, 17mm</i>
Recommended	Metric Tape Measure
Recommended	Threadlocker <i>(Loctite Blue 242)</i>
Recommended	Dimensional Lumber <i>2x4 recommended of min length 30"</i>
Recommended	(2) 24" Hand Trigger Clamps
Recommended	Cable Ties
Recommended	Level (minimum 48")



1. Base Frame



1.1 - Table Leg Assembly



Section Note

It is important to keep the leg kit extrusion separated from the table frame extrusion during unboxing. Only leg kit extrusion is used in this section.

Parts List

ID	QTY	Part/Description	Package Label
(A)	4	4080 Leg Crossmember Extrusion, 1550mm (61")	Leg Extrusion
(B)	8	4080 Leg Extrusion, 750mm (29-1/2")	Leg Extrusion
(C)	1	4080 Electronics Bar Extrusion, 1080mm (42-1/2")	Leg Extrusion
	4	CRP813-00-LEGSET-HW-BAG-21.1	Base Table Kit
(D)	48	40 Series Anchor Fastener <i>(12 per bag)</i>	CRP813-00-LEGSET-HW-BAG-21.1 >
(E)	48	M8 x 30mm Socket Head Cap Screw <i>(12 per bag)</i>	CRP813-00-LEGSET-HW-BAG-21.1 >
(F)	16	M8 x 16mm Socket Head Cap Screw <i>(4 per bag)</i>	CRP813-00-LEGSET-HW-BAG-21.1 >
(G)	48	M8 Roll-in T-Nut <i>(12 per bag)</i>	CRP813-00-LEGSET-HW-BAG-21.1 >
(H)	8	7111 Foot Plate <i>(2 per bag)</i>	CRP813-00-LEGSET-HW-BAG-21.1 >
(I)	8	H172 Leveling Foot <i>(2 per bag)</i>	CRP813-00-LEGSET-HW-BAG-21.1 >
	1	CRP813-00-ELCBAR-HW-BAG	Base Table Kit
(J)	4	40 Series Anchor Fastener	CRP813-00-ELCBAR-HW-BAG >
(K)	4	M8 x 30mm Socket Head Cap Screw	CRP813-00-ELCBAR-HW-BAG >
(L)	4	M8 Roll-in T-Nut	CRP813-00-ELCBAR-HW-BAG >
<i>Remaining parts from CRP813-00-LEGSET-HW-BAG-21.1 used in future section</i>			
<i>Remaining parts from CRP813-00-ELCBAR-HW-BAG used in future section</i>			



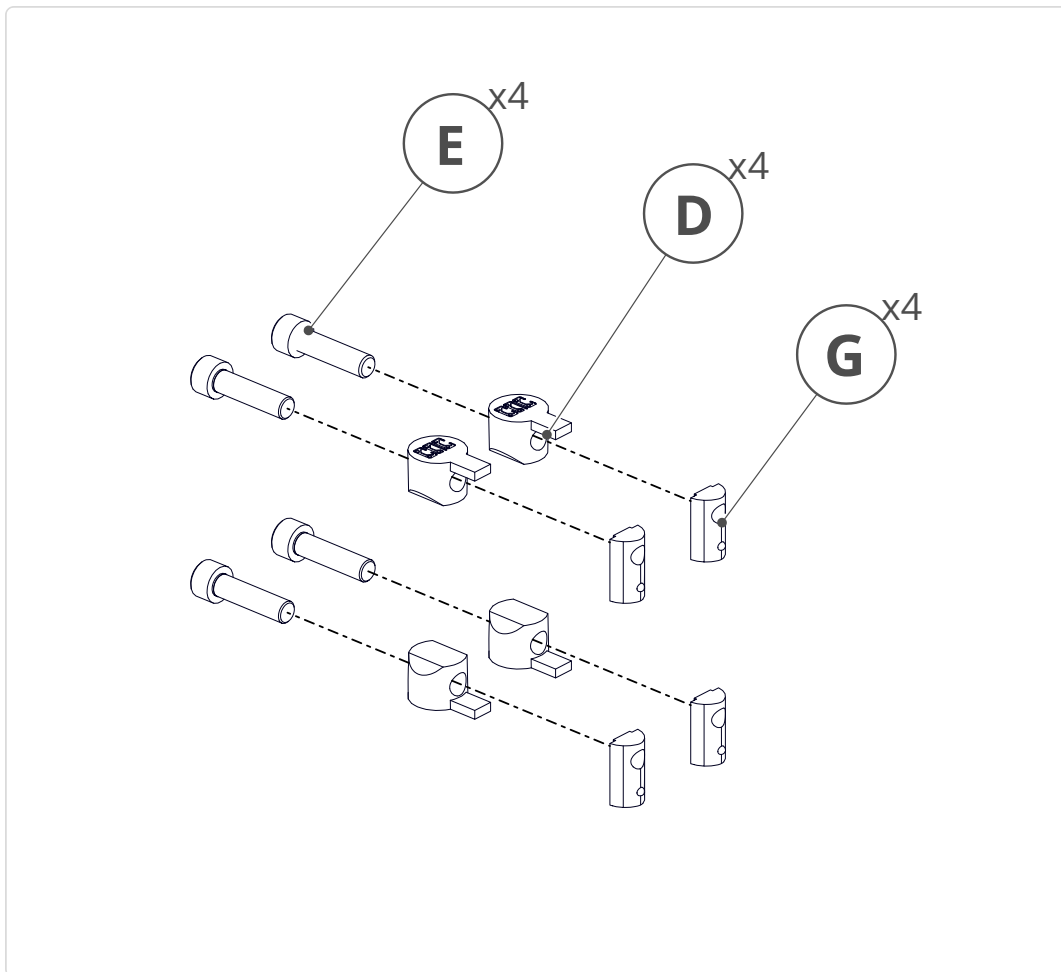
Tools List

Requirement	Tool
Required	6mm Ball-End Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure
Recommended	6mm Hex Ball-End Power Bit



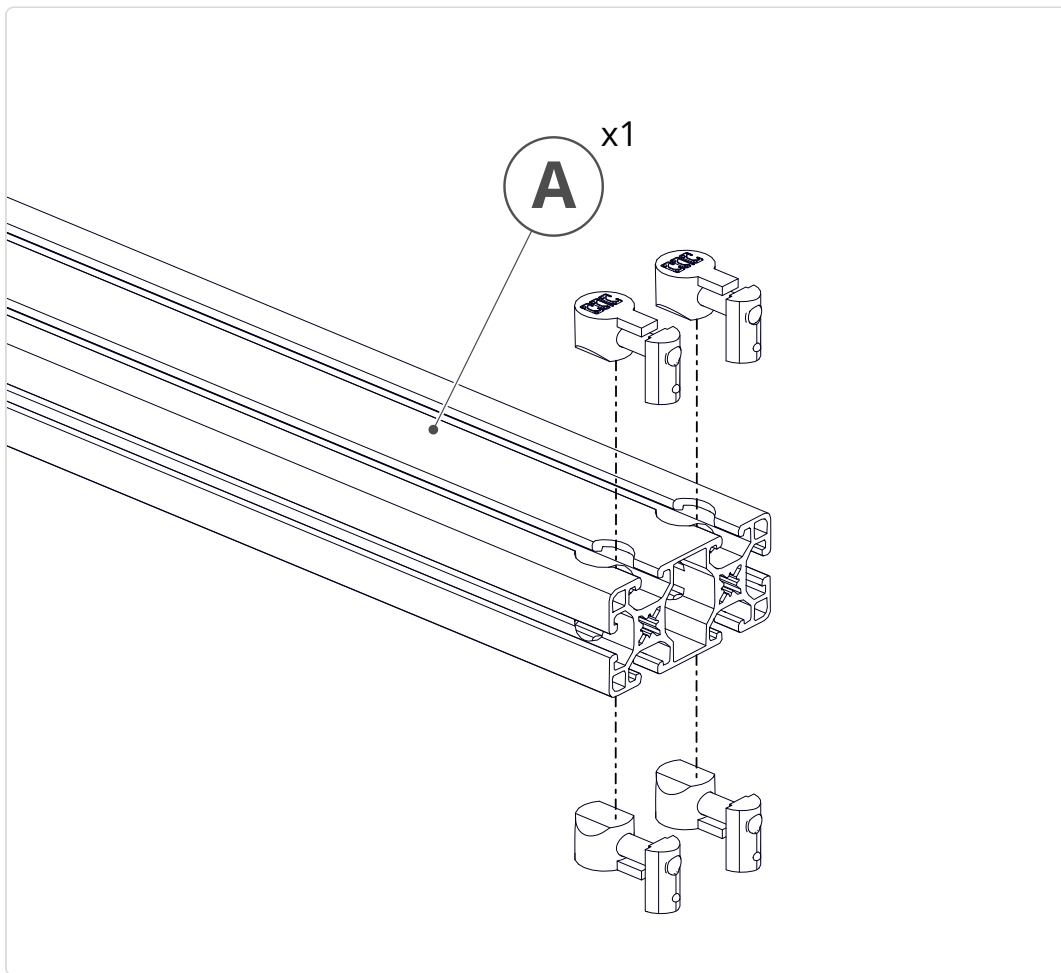
1.1.1 - Anchor Fastener Installation

1.1.1.1



1. Thread **M8 x 30mm Socket Head Cap Screws (E)** into the **M8 Roll-in T-Nuts (G)** through **40 Series Anchor Fasteners (D)**.

1.1.1.2



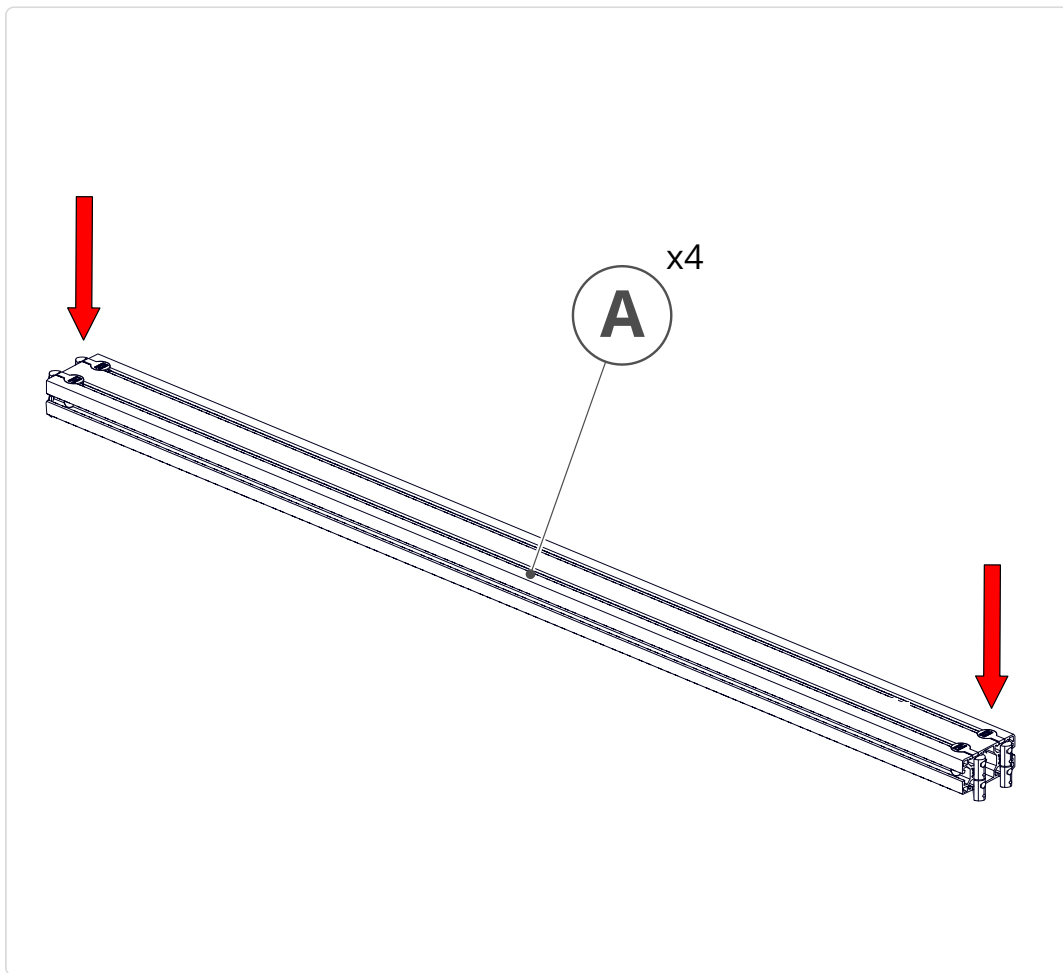
1. Slide the anchor assemblies into a piece of **4080 Leg Crossmember Extrusion, 1550mm (61")** (A).



Assembly Note

It can be helpful to use a small piece of masking tape to hold the anchor assemblies in the extrusion during leg assembly.

1.1.1.3



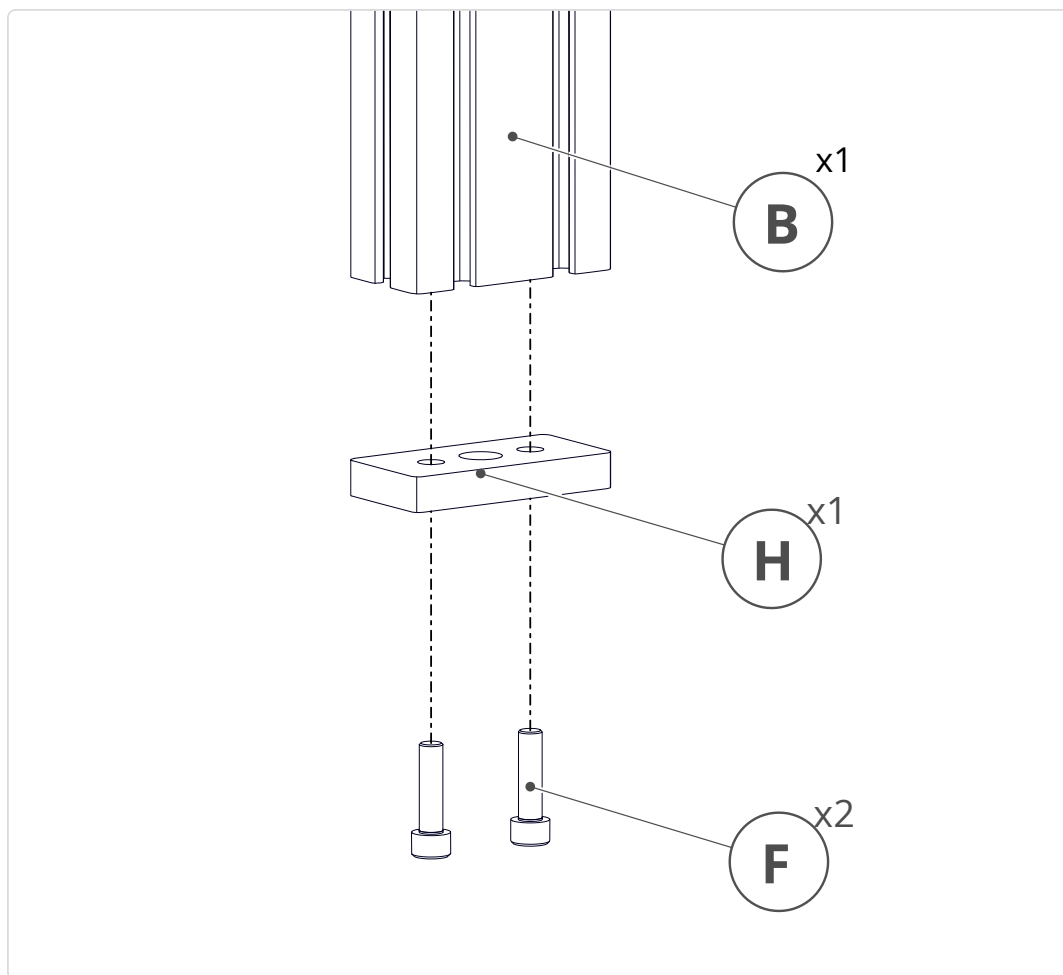
1. Repeat the previous steps to install anchor fasteners on both sides of all **4080 Leg Crossmember Extrusion, 1550mm (61")** (A).

Assembly Note

It can be helpful to use a small piece of masking tape to hold the anchor assemblies in the extrusion during leg assembly.

1.1.2 - Leveling Feet Installation

1.1.2.1



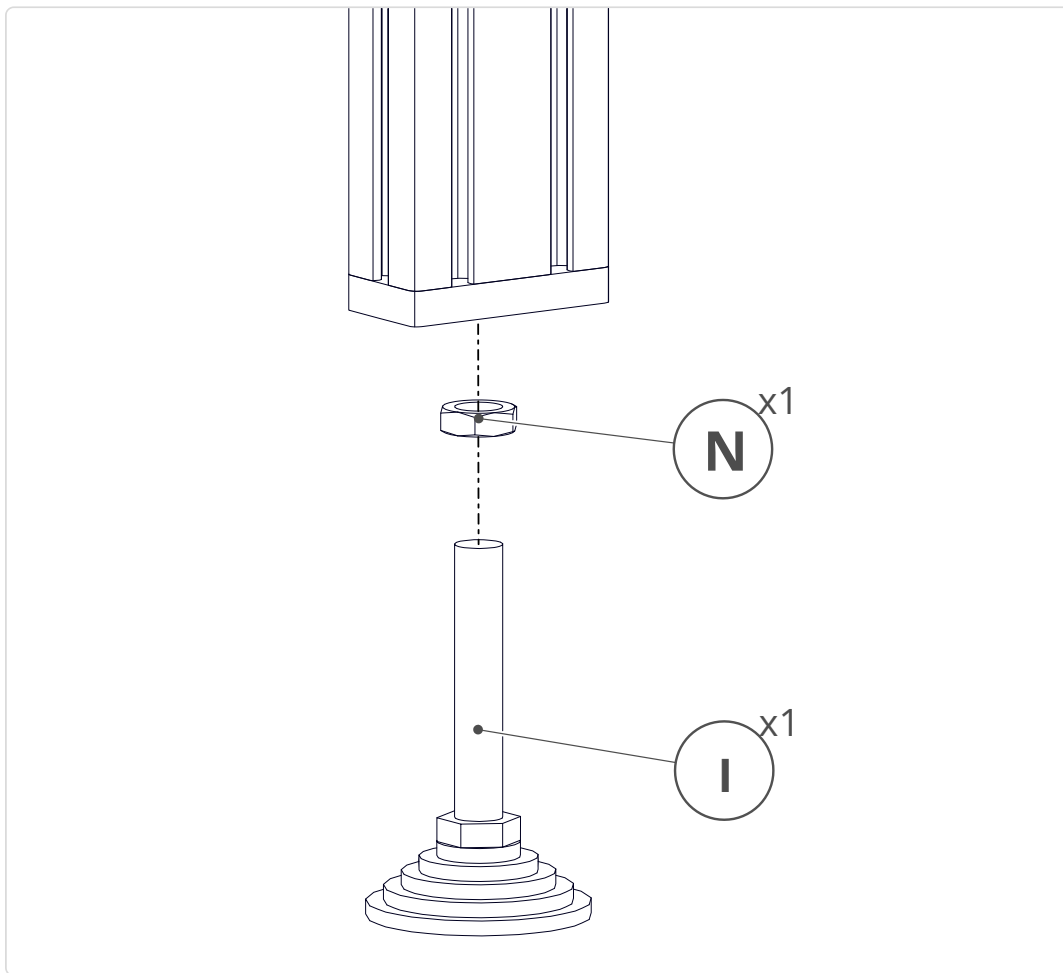
1. Attach the 7111 Foot Plate (H) to a piece of 4080 Leg Extrusion, 750mm (29-1/2") (B) using M8 x 16mm Socket Head Cap Screws (F).



Assembly Note

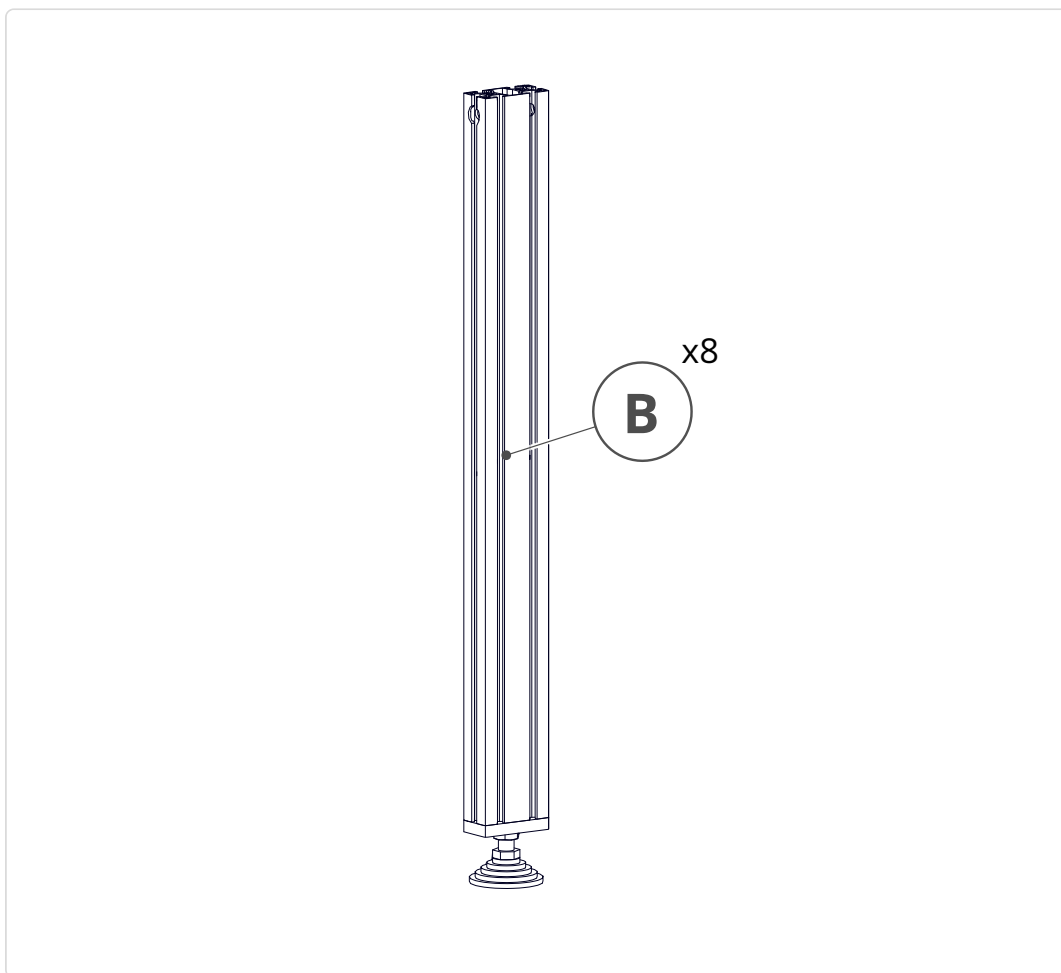
Attach the foot plate to the end of the extrusion that has tapped holes.

1.1.2.2



1. Thread the **M16 Hex Nut (N)** onto the **H172 Leveling Foot (I)** and attach to the foot plate installed in the previous step.

1.1.2.3



1. Repeat **this process** for each of the 4080 Leg Extrusion, 750mm (29-1/2") (B) pieces.

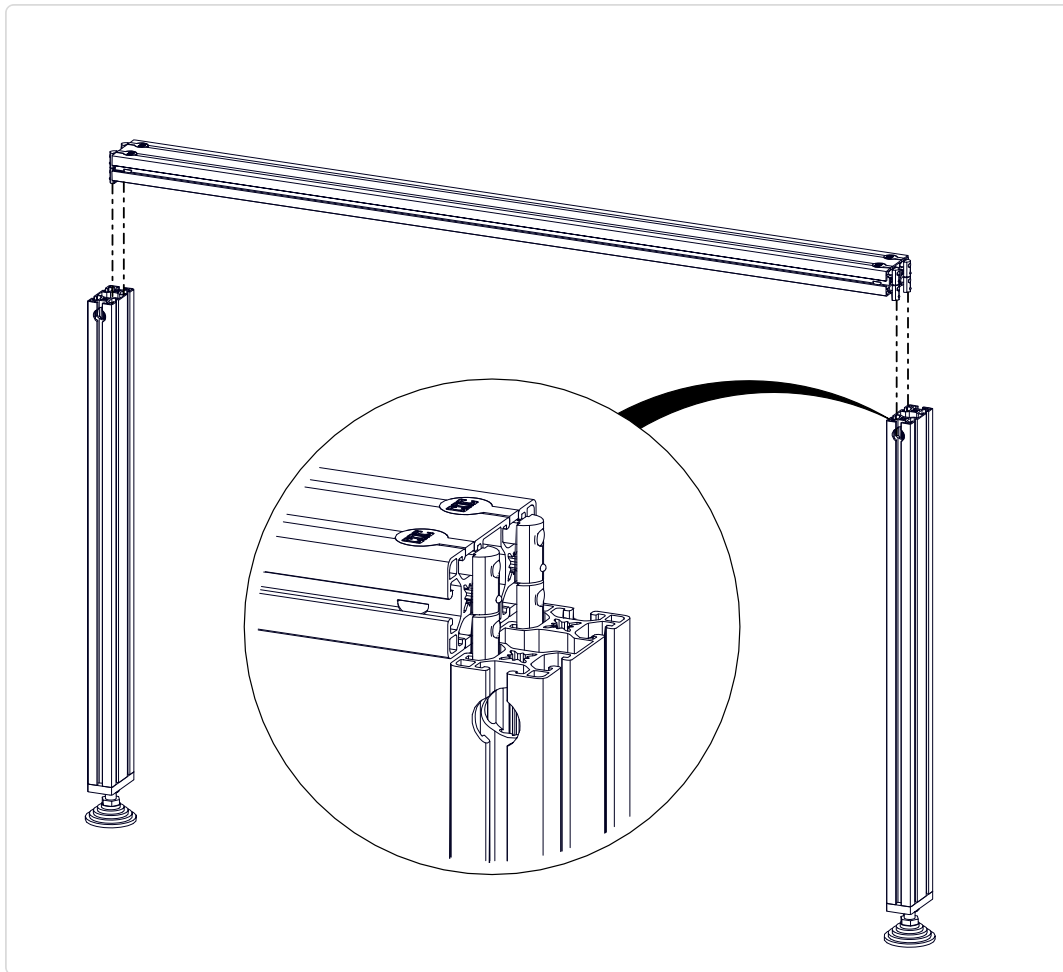


Assembly Note

Initially thread the leveling feet all of the way into the foot plate. After machine assembly, final adjustments will be made in the **table leveling procedure**.

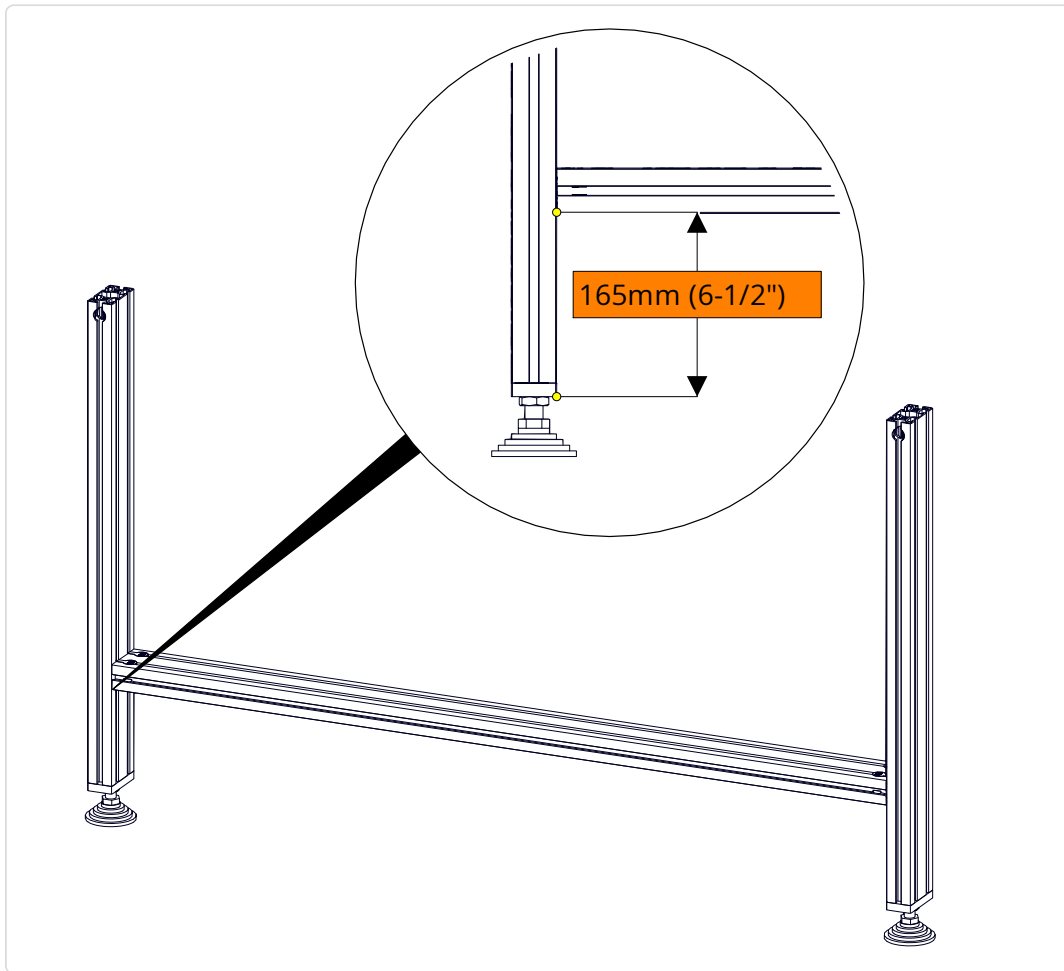
1.1.3 - Leg Crossmember Installation

1.1.3.1



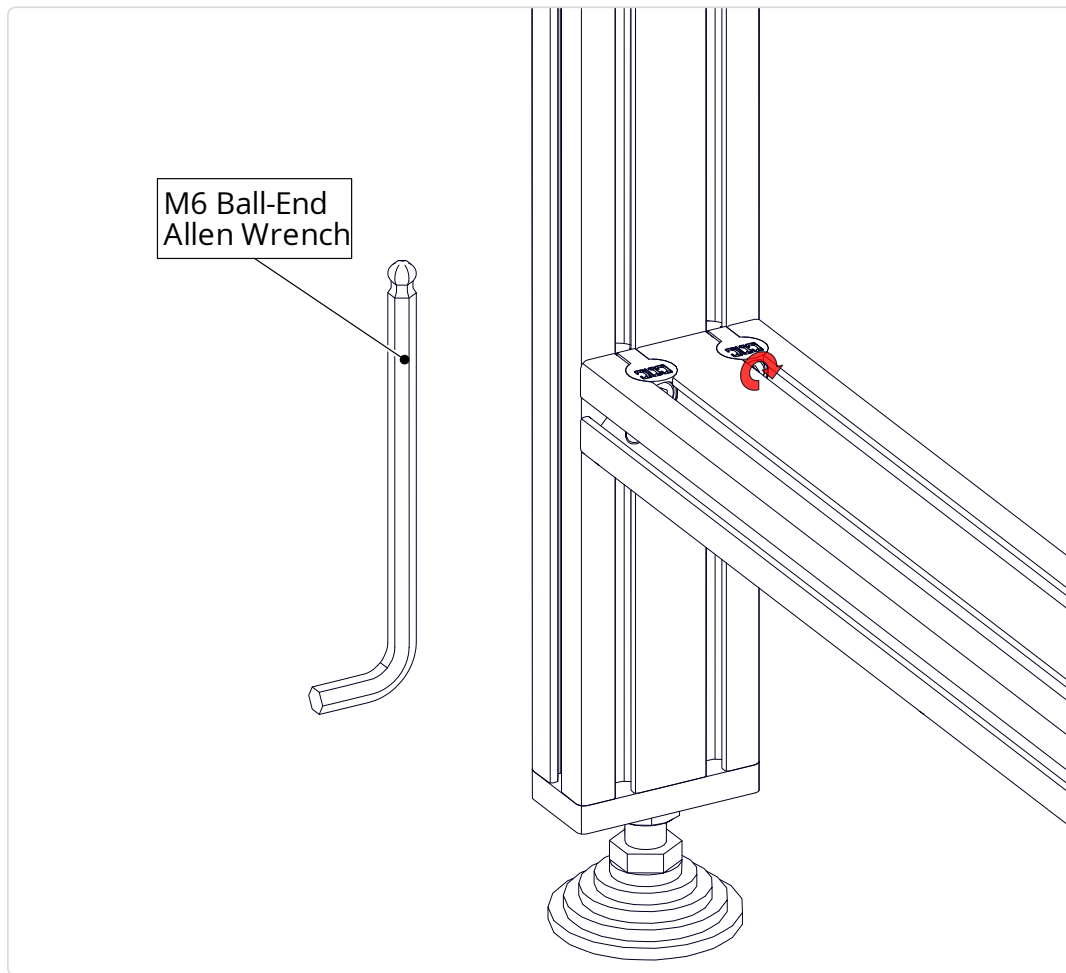
1. Use one of the previously assembled leg crossmembers to join two of the legs.

1.1.3.2



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

1.1.3.3



1. On each side of the leg crossmember tighten the anchor fasteners, 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.

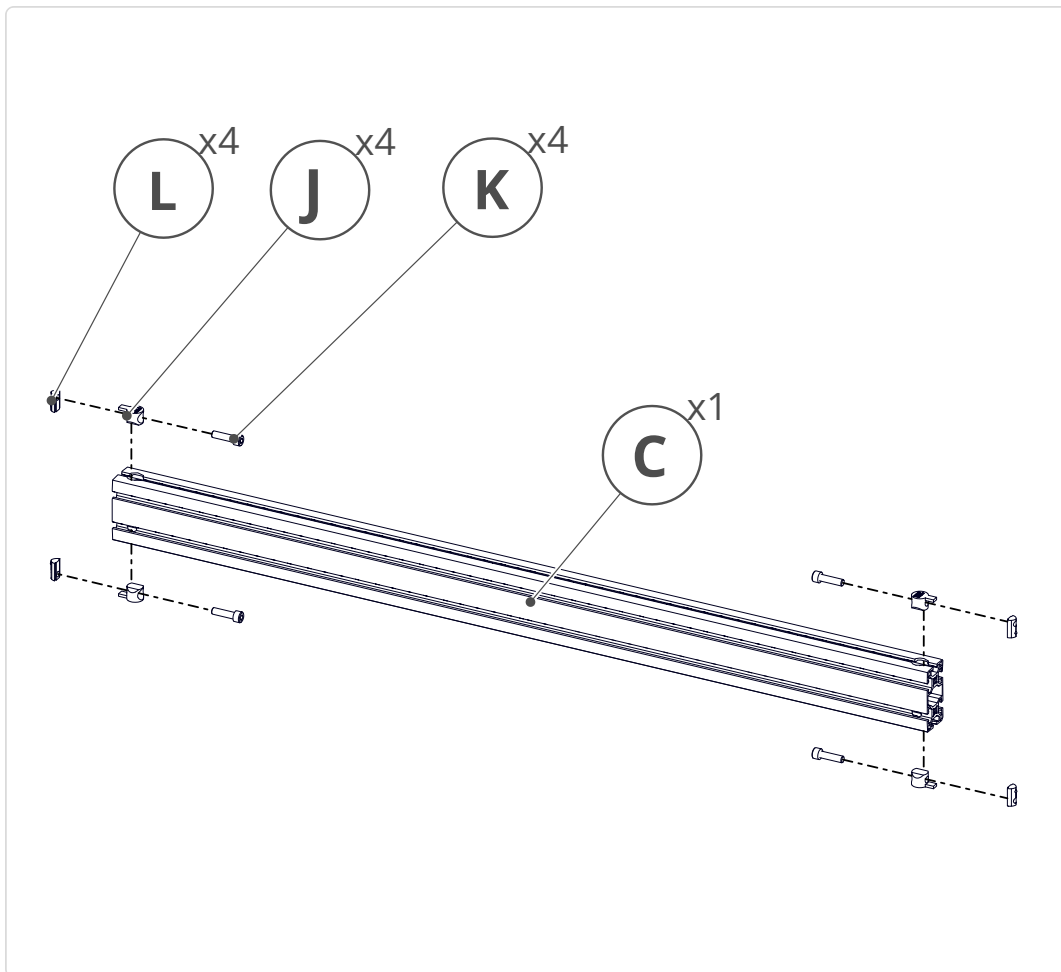
1.1.3.4



1. Repeat this process to assemble four sets of legs.

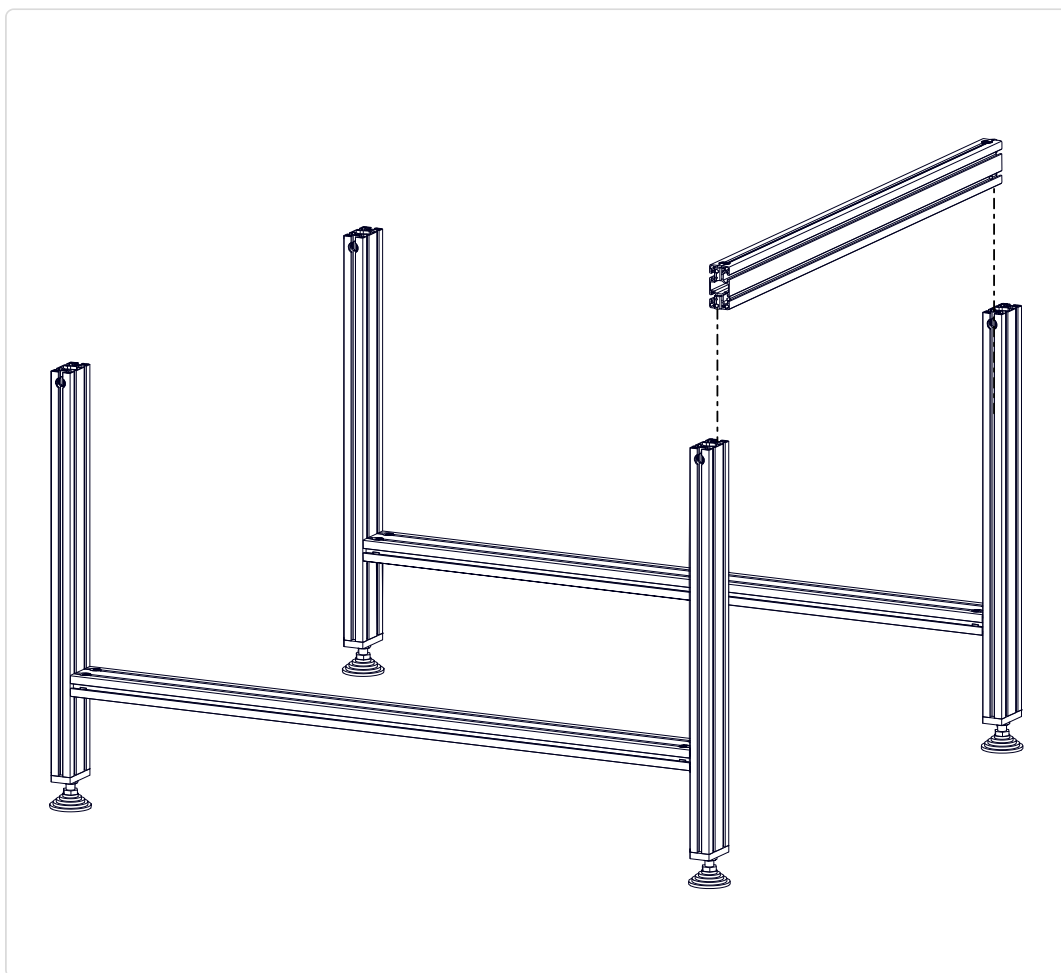
1.1.4 - Electronics Bar Installation

1.1.4.1



1. Assemble four anchor fasteners (**M8 x 30mm Socket Head Cap Screws (K)**), **40 Series Anchor Fasteners (J)**, and **M8 Roll-in T-Nuts (L)** and install in the **4080 Electronics Bar Extrusion, 1080mm (42-1/2") (C)**.

1.1.4.2

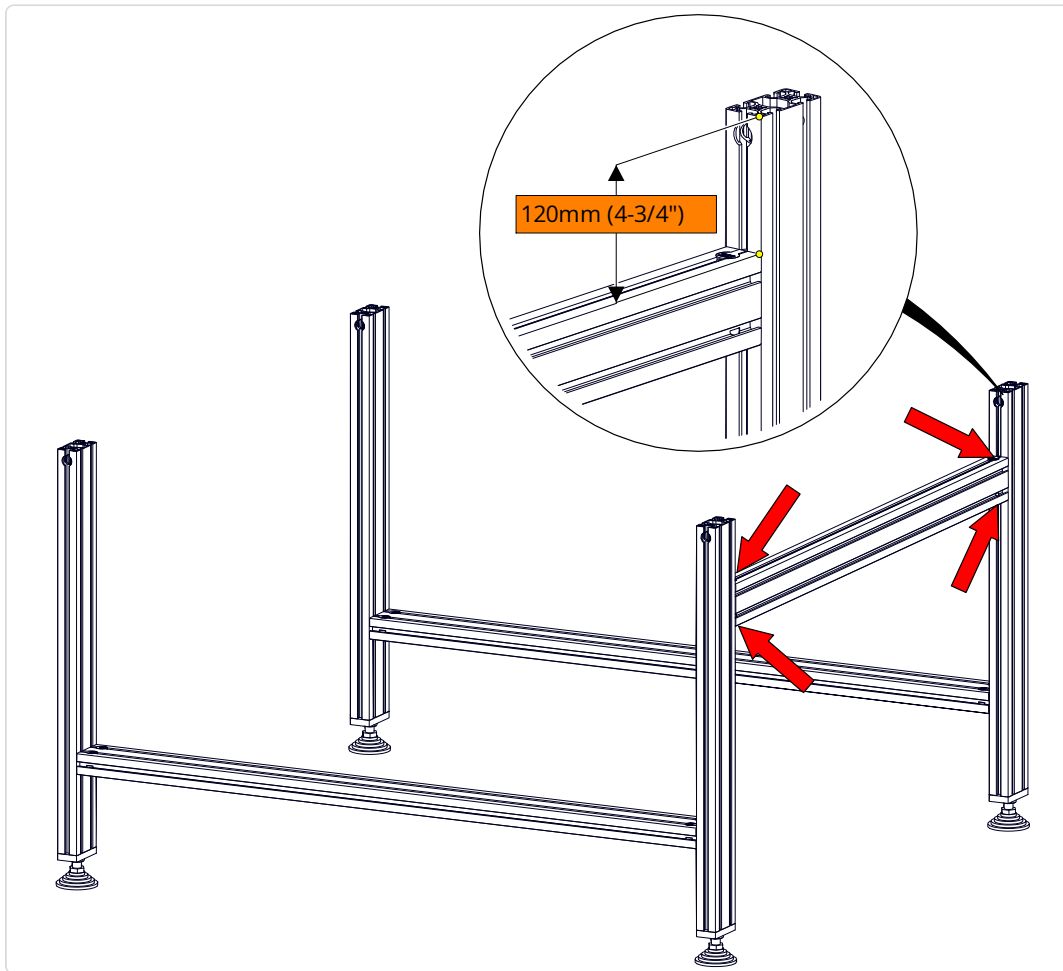


1. Slide the electronics bar onto two of the leg assemblies.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, install the electronics bar on the opposite end of the two leg assemblies.

1.1.4.3

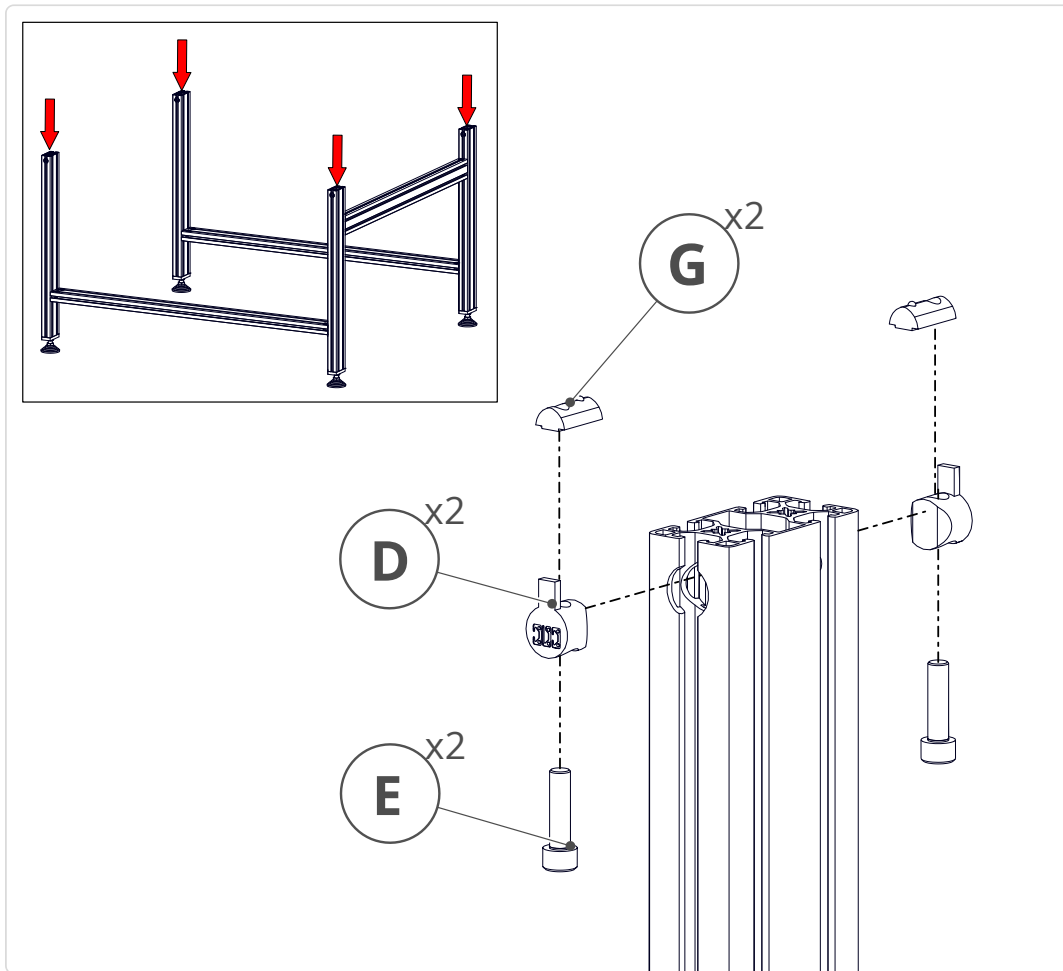


1. Position the electronics bar 120mm (4-3/4") from the top of the leg extrusion.
2. Fully tighten the indicated fasteners.

Assembly Note

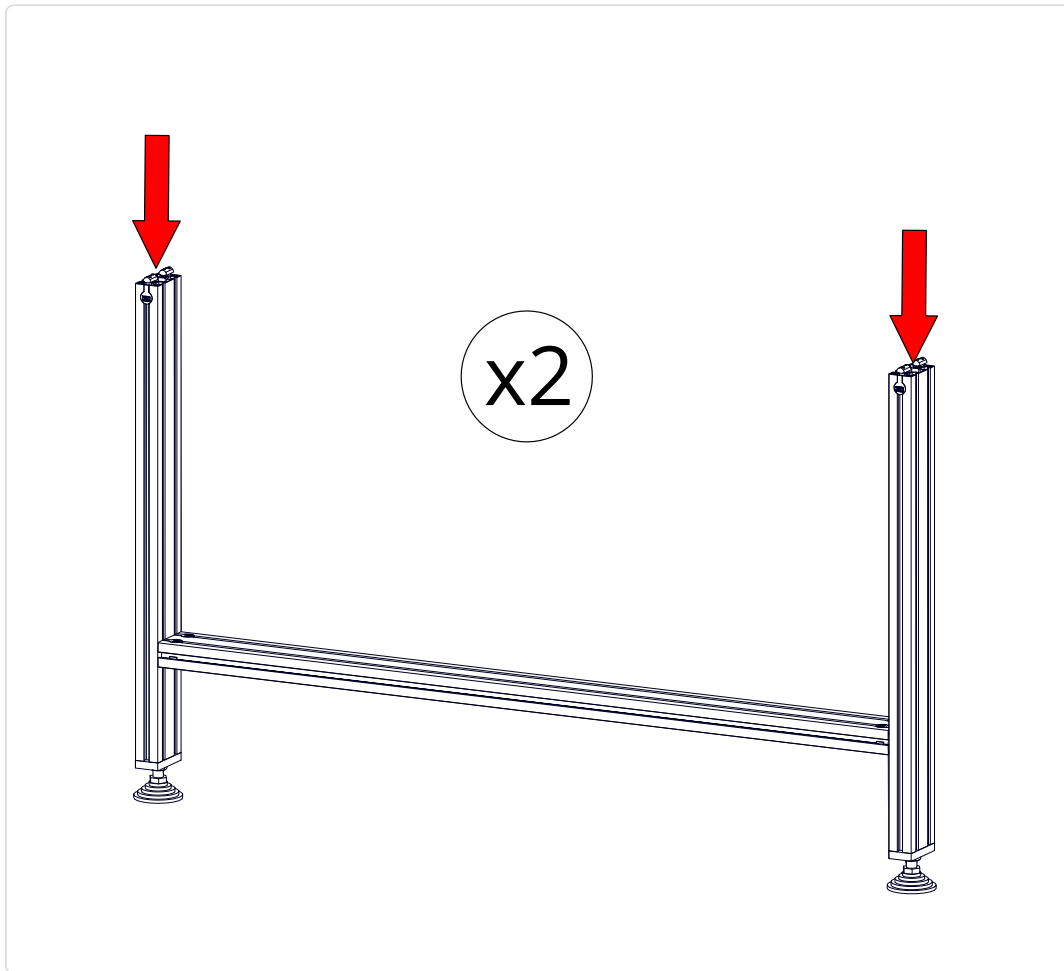
Measure from the top of the leg extrusion at each end of the electronics bar.

1.1.4.4



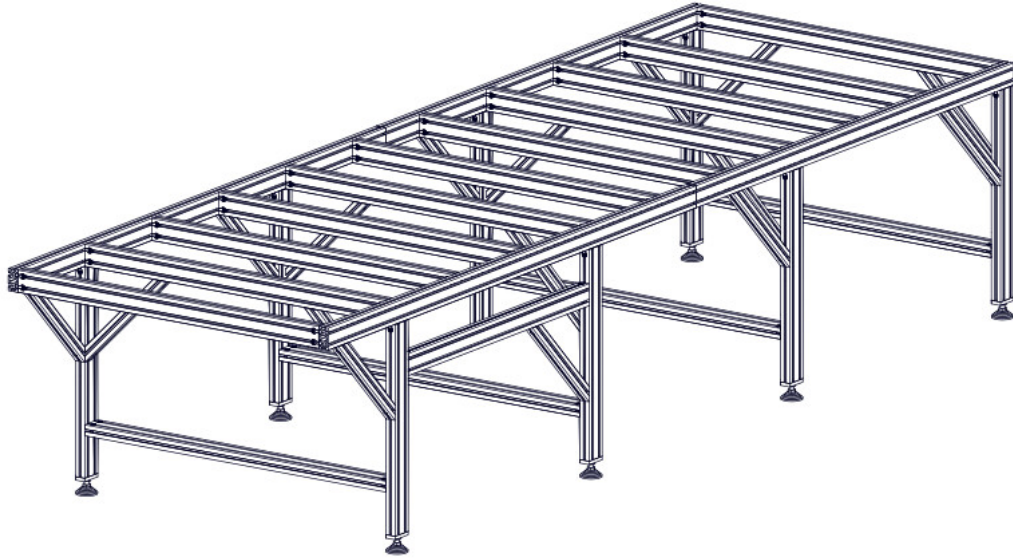
1. At the top of the indicated legs, partially thread **M8 x 30mm Socket Head Cap Screws (E)** into **M8 Roll-in T-Nuts (G)** through **40 Series Anchor Fasteners (D)**.

1.1.4.5



1. Repeat the previous step to install anchor fasteners on the remaining leg assemblies.

1.2 - Table Frame Assembly



Parts List

ID	QTY	Part/Description	Package Label
(A)	2	4080 Frame Extrusion, 1900mm (74-13/16")	Machine Kit Extrusion
(B)	2	4080 Frame Extrusion, 1600mm (63")	Machine Kit Extrusion
(E)	10	4080 Table Crossmember Extrusion, 1550mm (61")	Machine Kit Extrusion
	1	40-3100-00 - 40 Series Short Double Anchor Assembly - 120	Base Table Kit
(F)	80	40 Series Anchor Fastener	40-3100-00 >
(G)	80	M8 x 30mm Socket Head Cap Screw	40-3100-00 >
(H)	40	CRP810-01 M8 Double Anchor Slide-in T-Nut	40-3100-00 >
	4	CRP813-00-LEGSET-HW-BAG-21.1	Base Table Kit
(I)	32	M8 x 16mm Socket Head Cap Screw (4 per bag)	CRP813-00-LEGSET-HW-BAG-21.1 >
(J)	32	M8 Roll-in T-Nut (12 per bag)	CRP813-00-LEGSET-HW-BAG-21.1 >
(K)	16	CRP813-02 Leg Gusset	Leg Extrusion
	1	CRP810-00-SP-21.1 - PRO Splice Kit	Base Table Kit
(L)	4	CRP810-02 Splice Bar	CRP810-00-SP-21.1 >
(M)	16	M8 x 8mm Set Screw	CRP810-00-SP-21.1 >



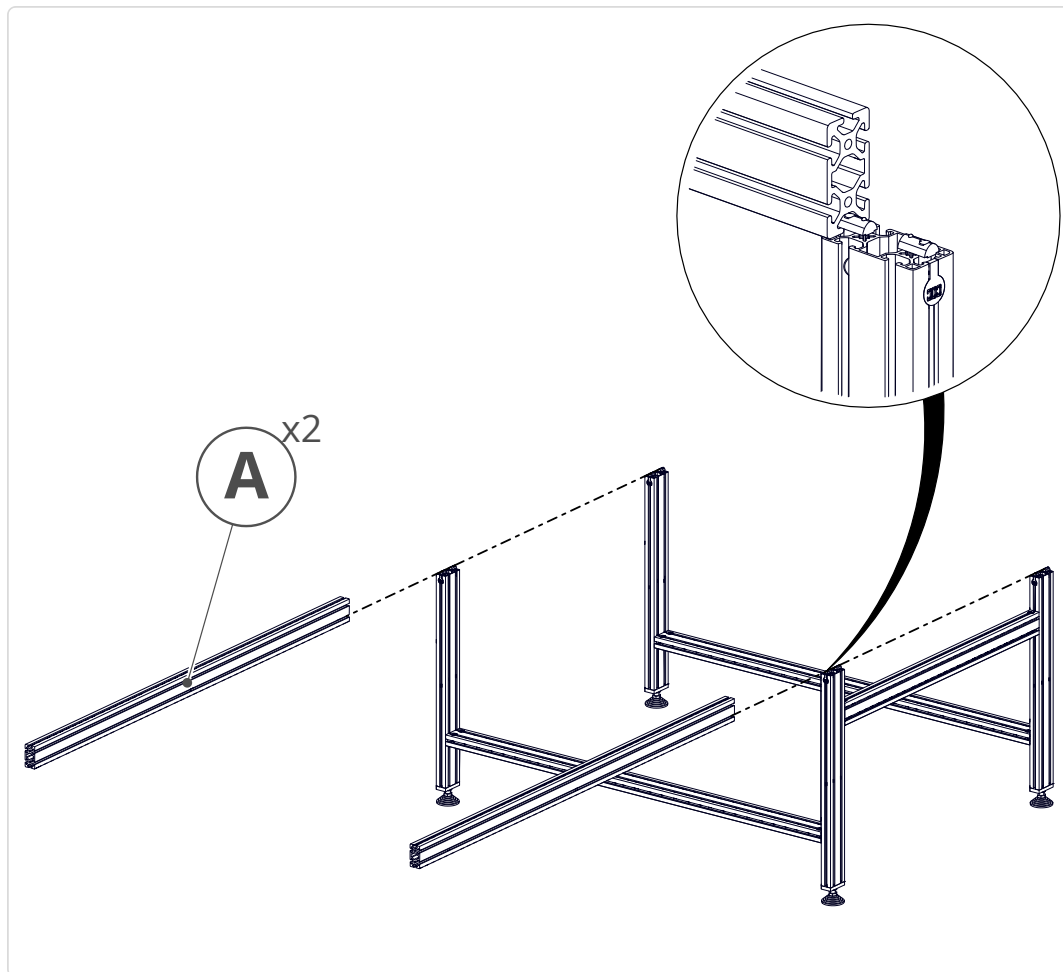
Tools List

Requirement	Tool
Required	4mm Ball-End Allen Wrench
Required	6mm Ball-End Allen Wrench
Required	Tape Measure
Recommended	6mm Hex Ball-End Power Bit
Recommended	Dimensional Lumber
Recommended	(2) 24" Hand Trigger Clamp



1.2.1 - Frame Extrusion Installation

1.2.1.1



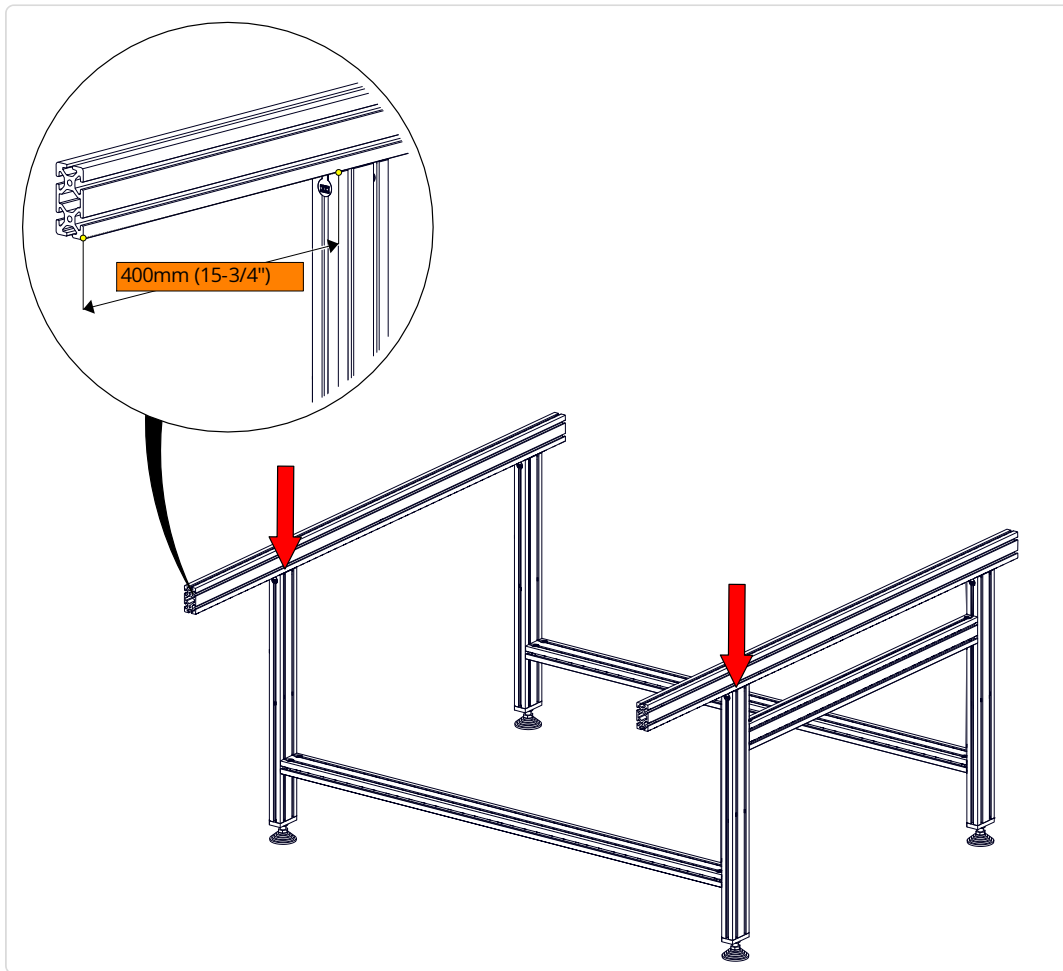
1. Slide two **4080 Frame Extrusion, 1900mm (74-13/16")** (A) onto the leg assemblies as indicated.



Assembly Note

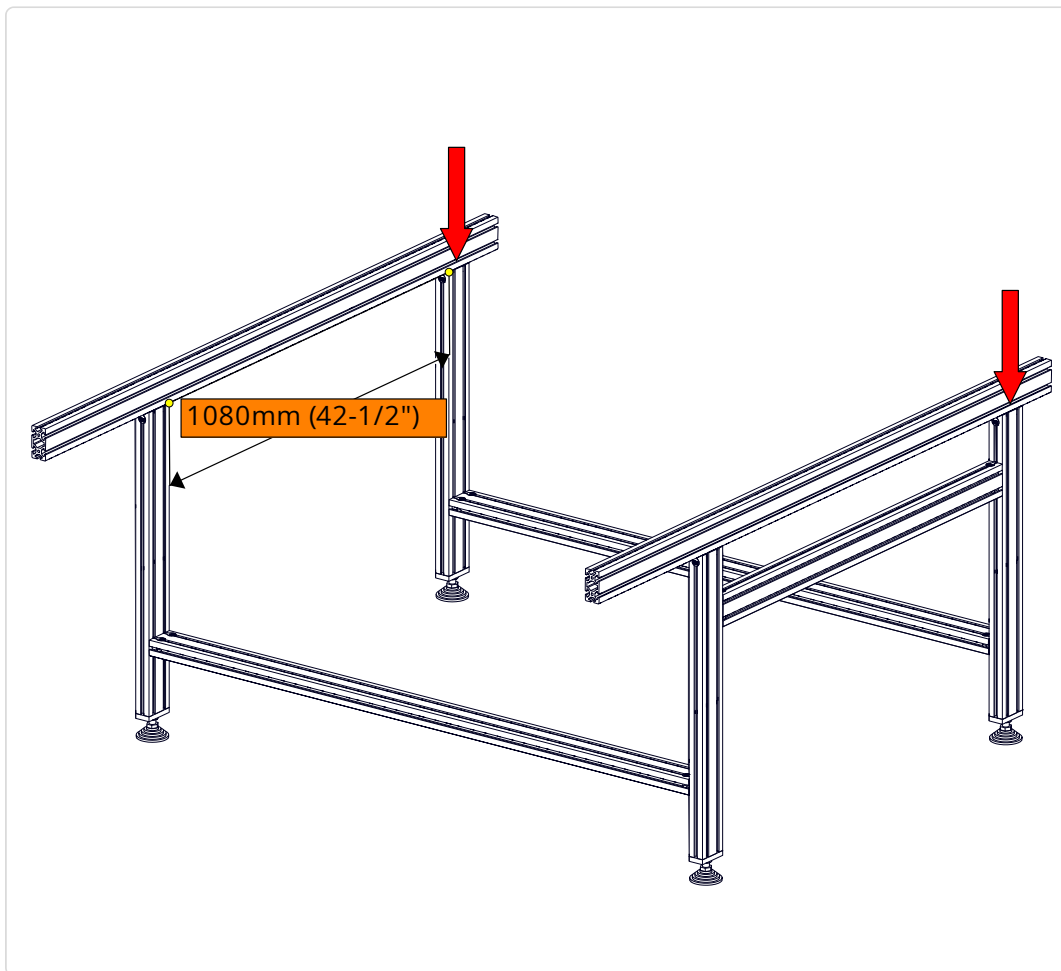
If you received a frame extrusion with 4x 4080 Frame Extrusion, 1750mm (68-7/8") the following instructions still apply.

1.2.1.2



1. Position the frame extrusion 400mm (157-1/2") from the front legs.
2. Partially tighten the anchor fasteners on the indicated legs.

1.2.1.3

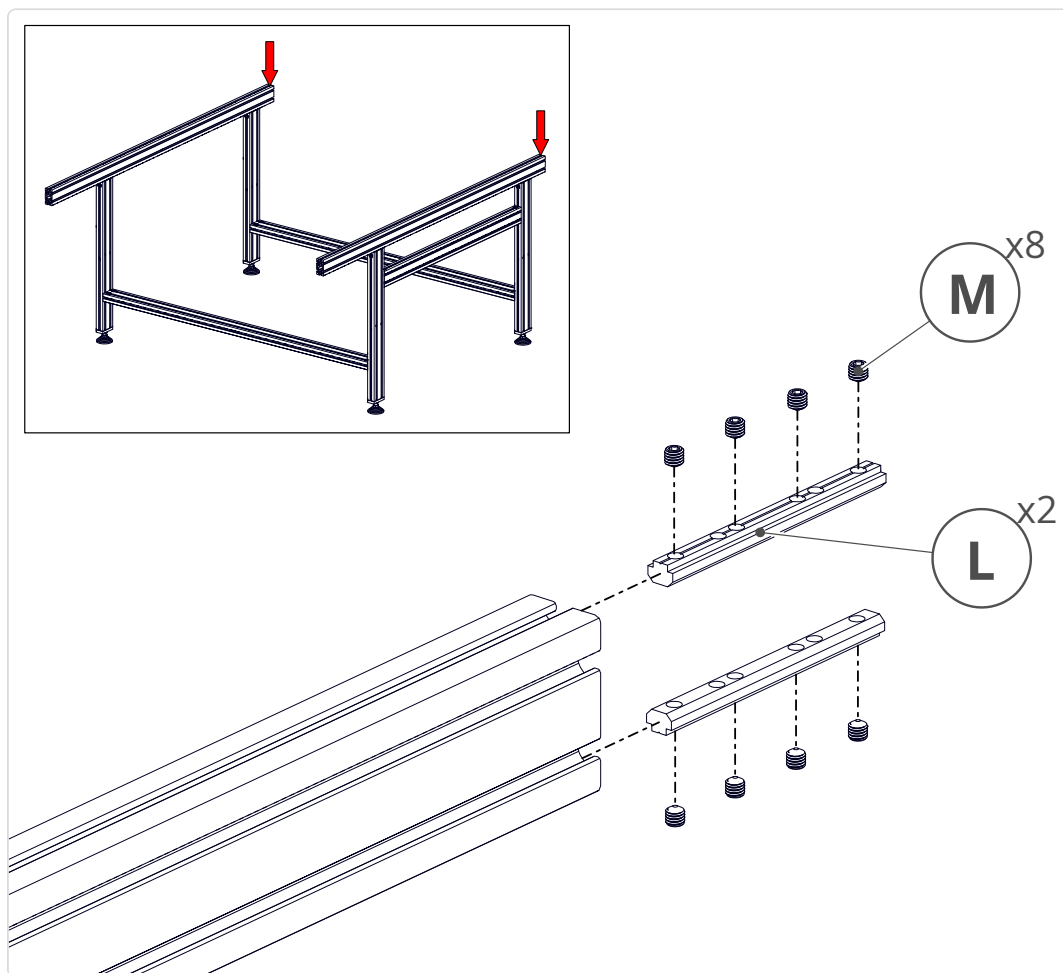


1. Position the leg assemblies 1080mm (42-1/2") apart.
2. Partially tighten the anchor fasteners on the indicated legs.

Assembly Note

The dimension shown is measured from inside edge to inside edge of the leg extrusion.

1.2.1.4



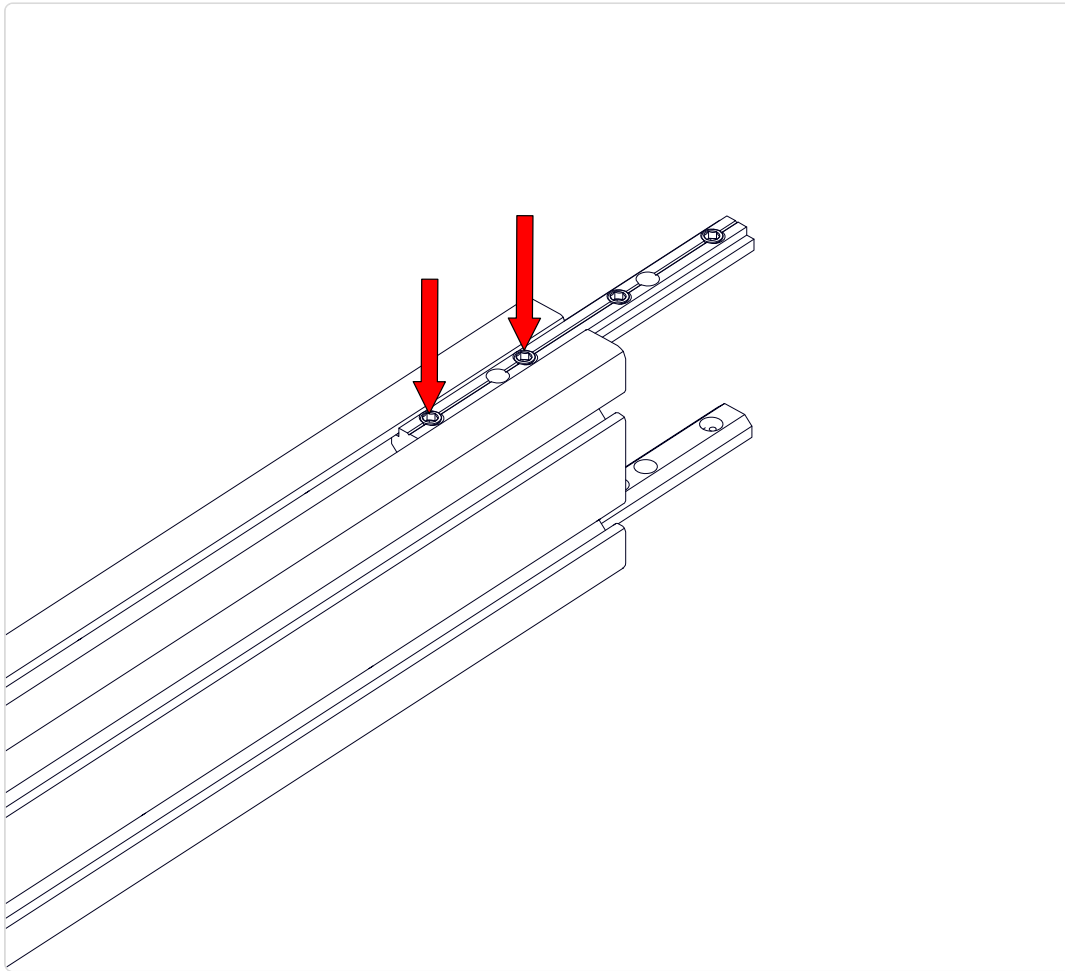
1. Thread **M8 x 8mm Set Screws** (M) into **CRP810-02 Splice Bars** (L) and slide them into the extrusion at the indicated locations



Assembly Note

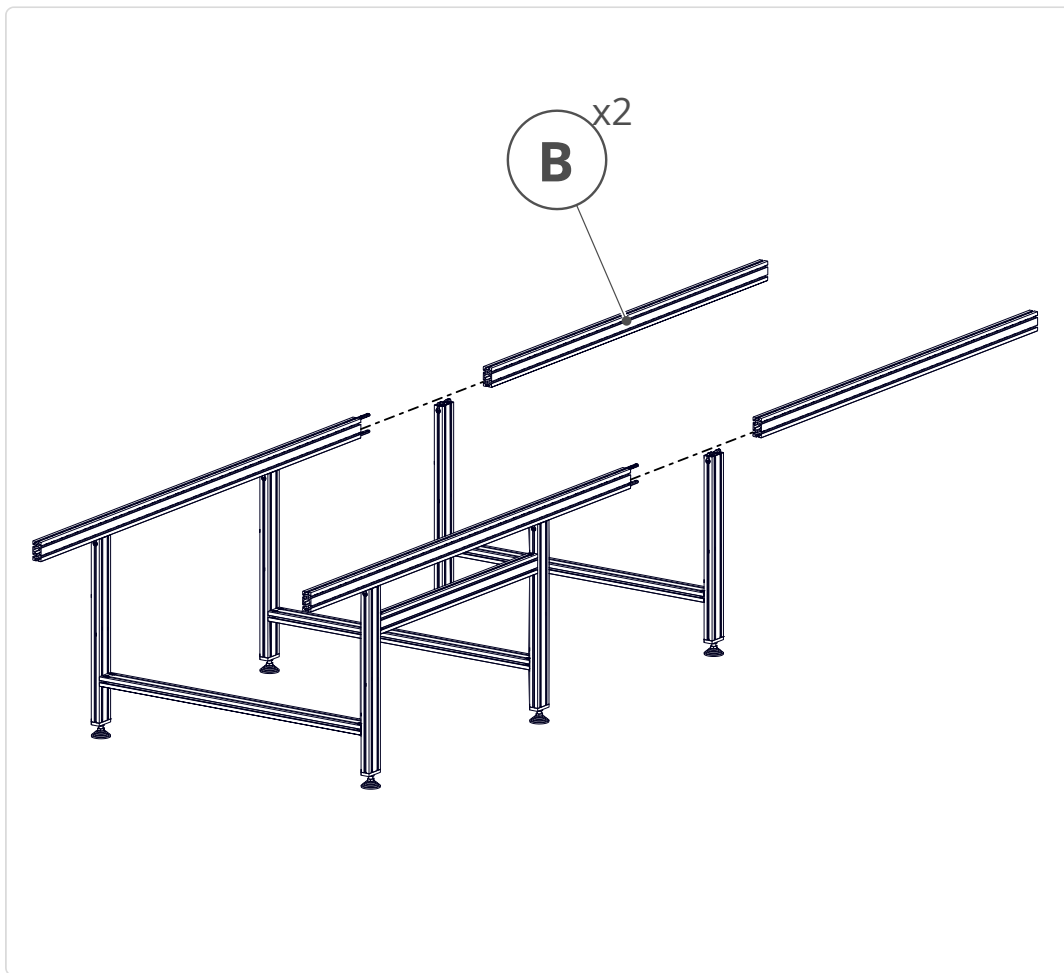
Use the t-slots on the top and bottom of the extrusion.

1.2.1.5



1. Position the splice bars as shown and fully tighten the indicated set screws on both upper and lower splice bars.

1.2.1.6



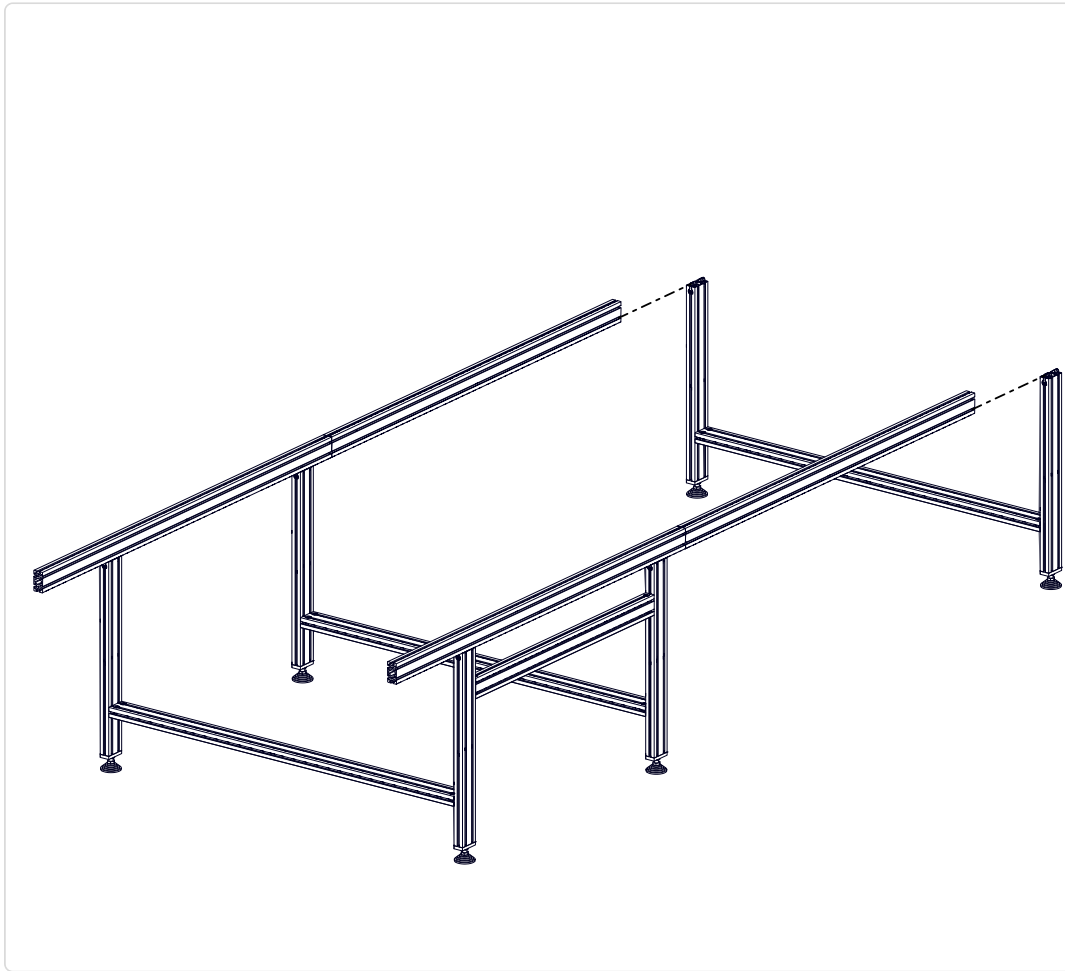
1. Slide the **4080 Frame Extrusion, 1600mm (63")** **B** onto the splice bars.



Assembly Note

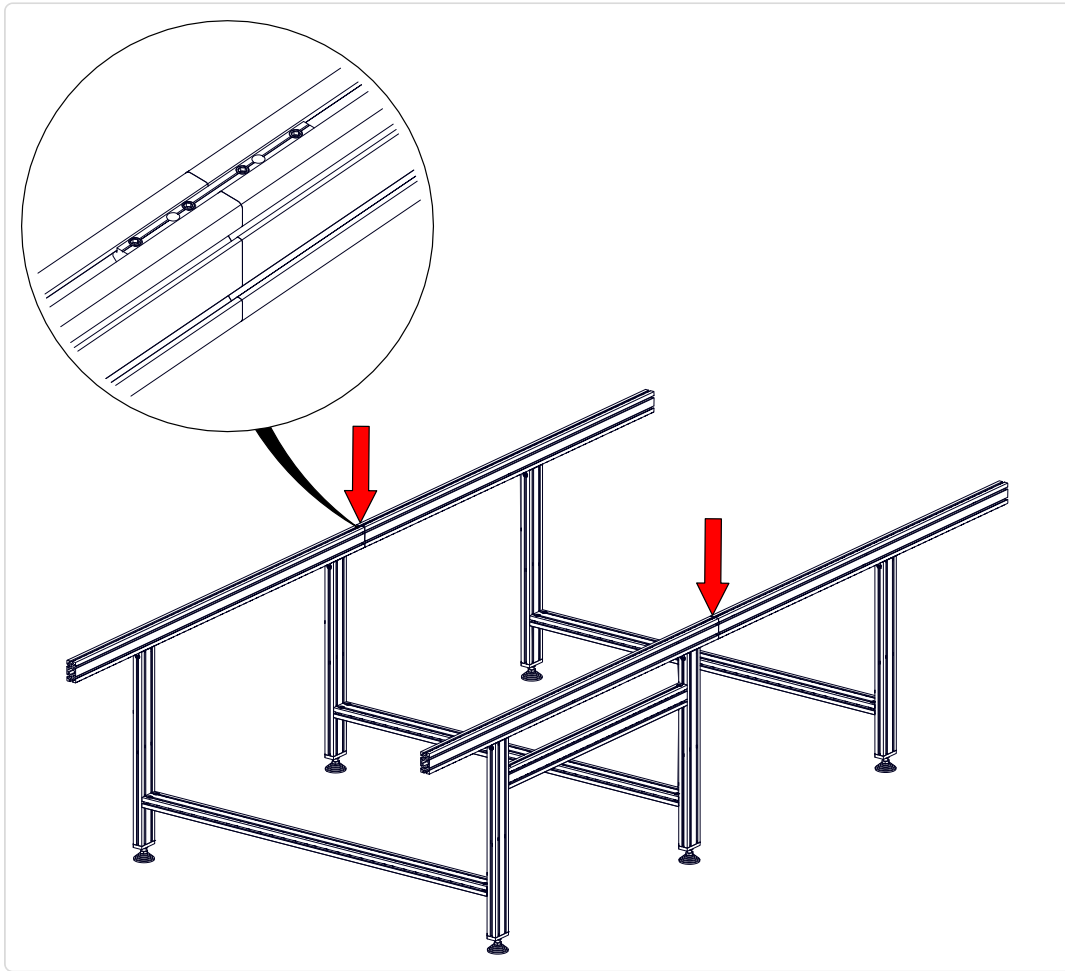
While the assembly will stand upright in the absence of applied force, be careful not to tip the assembly over.

1.2.1.7



1. Slide the third leg assembly onto the frame extrusion.

1.2.1.8



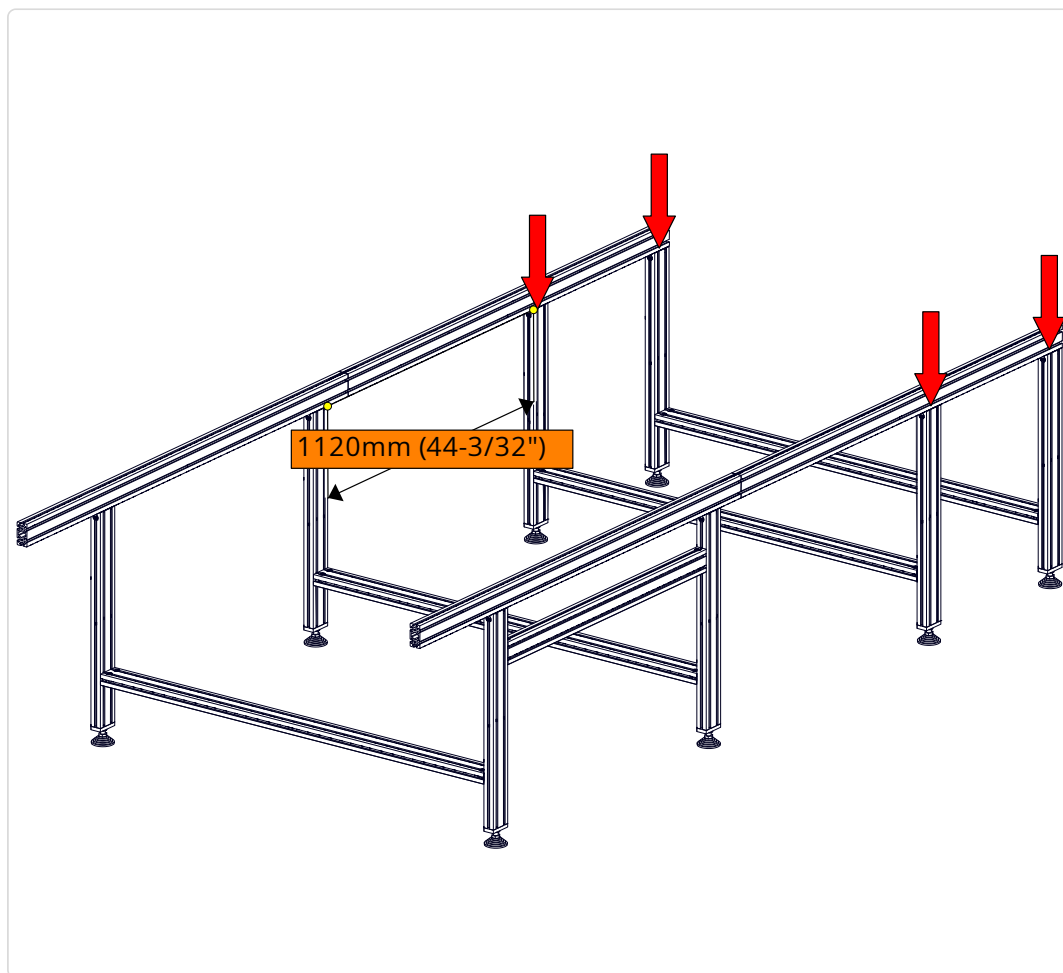
1. Bring the ends of the two frame extrusion pieces tight against each other.
2. Tighten all remaining splice bar set screws.

1.2.1.9



1. Slide the fourth leg assembly onto the frame extrusion.

1.2.1.10



1. Position the remaining leg assemblies 1120mm (44-3/32") apart, except the last leg assembly which is flush with the frame extrusion at the back of the machine.
2. Partially tighten the anchor fasteners on the remaining leg assemblies.

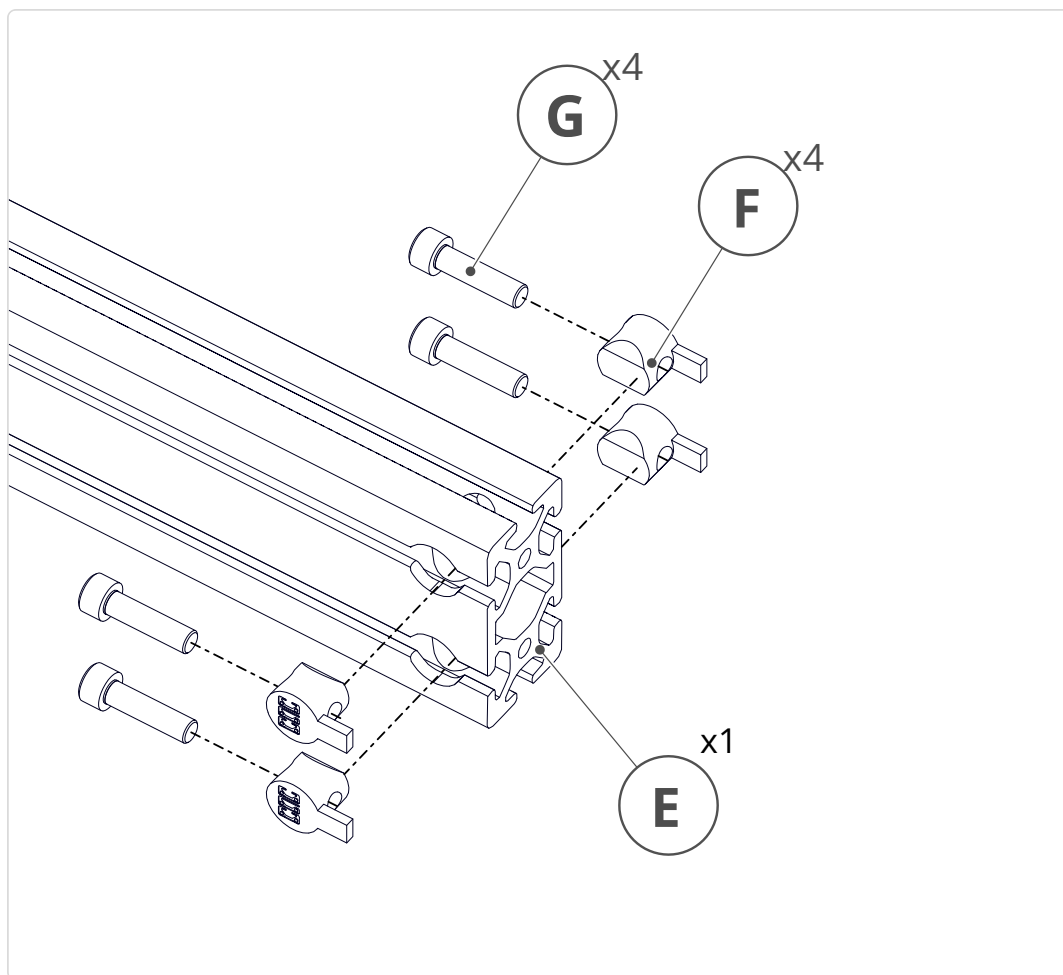


Assembly Note

The dimension shown is measured from inside edge to inside edge of the leg extrusion.

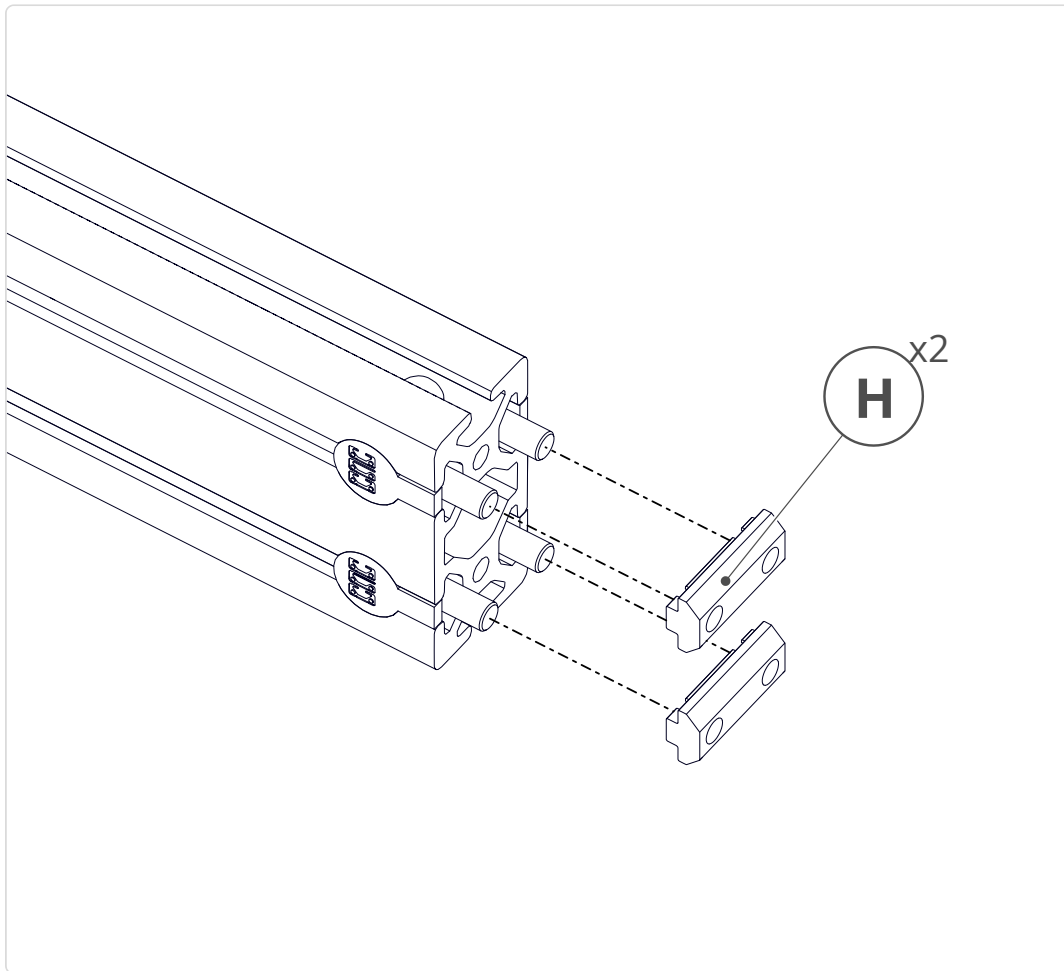
1.2.2 - Table Crossmember Assembly

1.2.2.1



1. Install M8 x 30mm Socket Head Cap Screws (G) and 40 Series Anchor Fasteners (F) into a 4080 Table Crossmember Extrusion, 1550mm (61") (E).

1.2.2.2



1. Loosely thread **CRP810-01 M8 Double Anchor Slide-in T-Nuts** (H) onto the socket head cap screws.

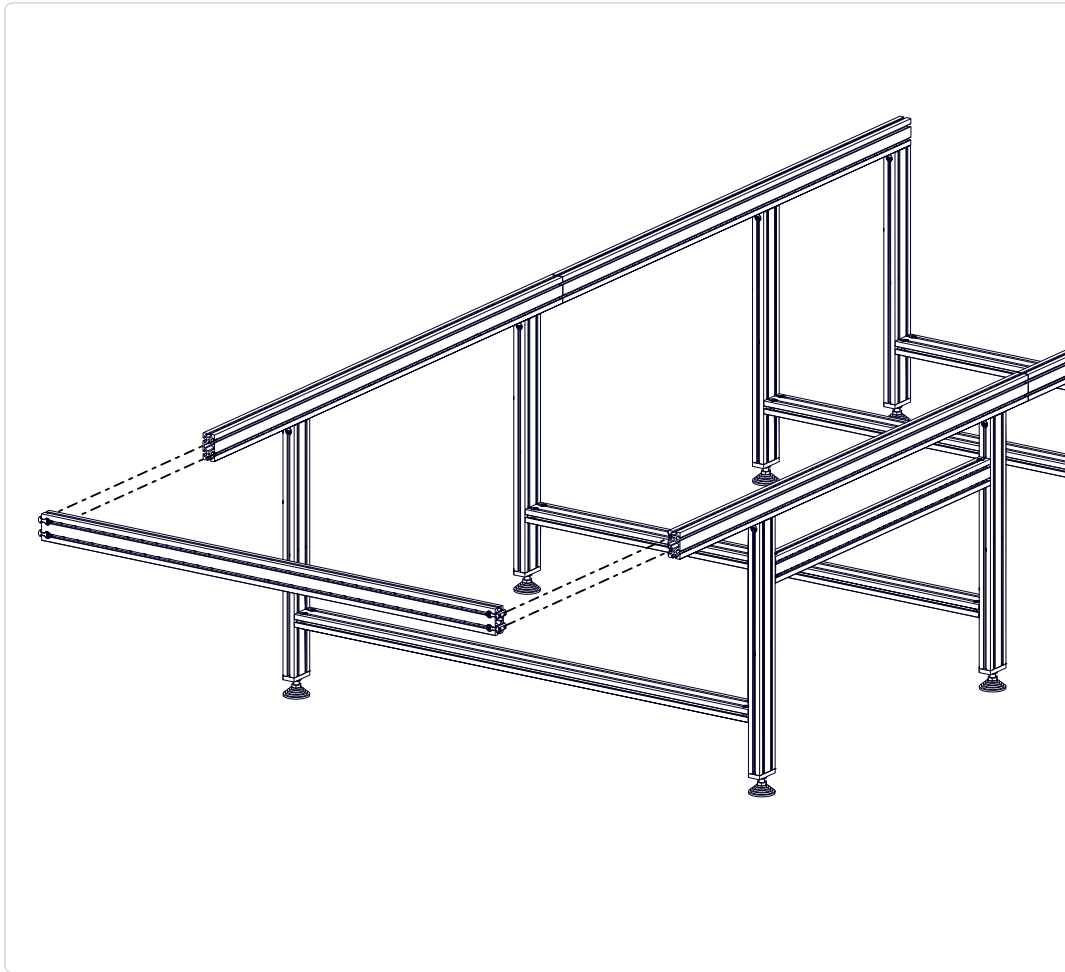
1.2.2.3



1. Repeat the previous two steps to install anchor fasteners on both sides of all table crossmembers.

1.2.3 - Table Crossmember Installation

1.2.3.1



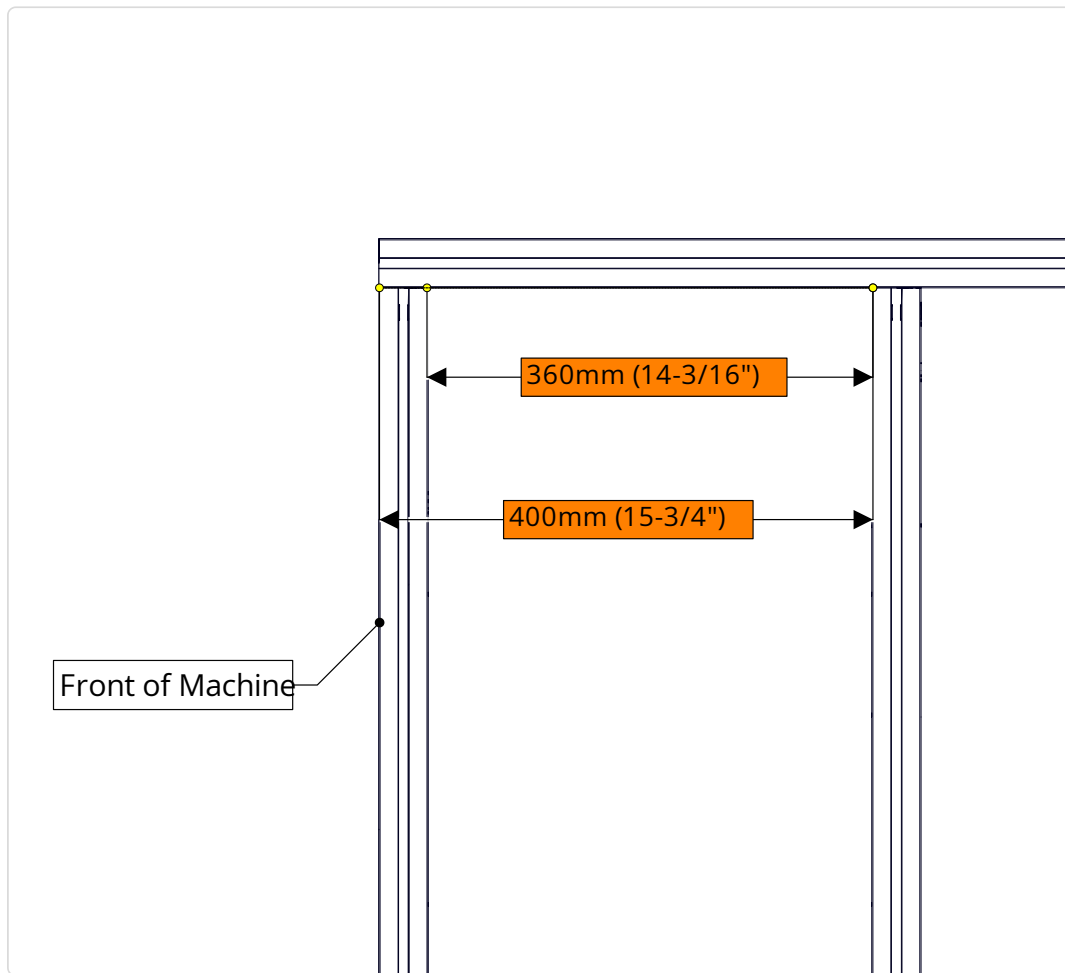
1. Slide a crossmember assembly onto the frame extrusion.

1.2.3.2



1. Repeat the previous step for all crossmembers.

1.2.3.3



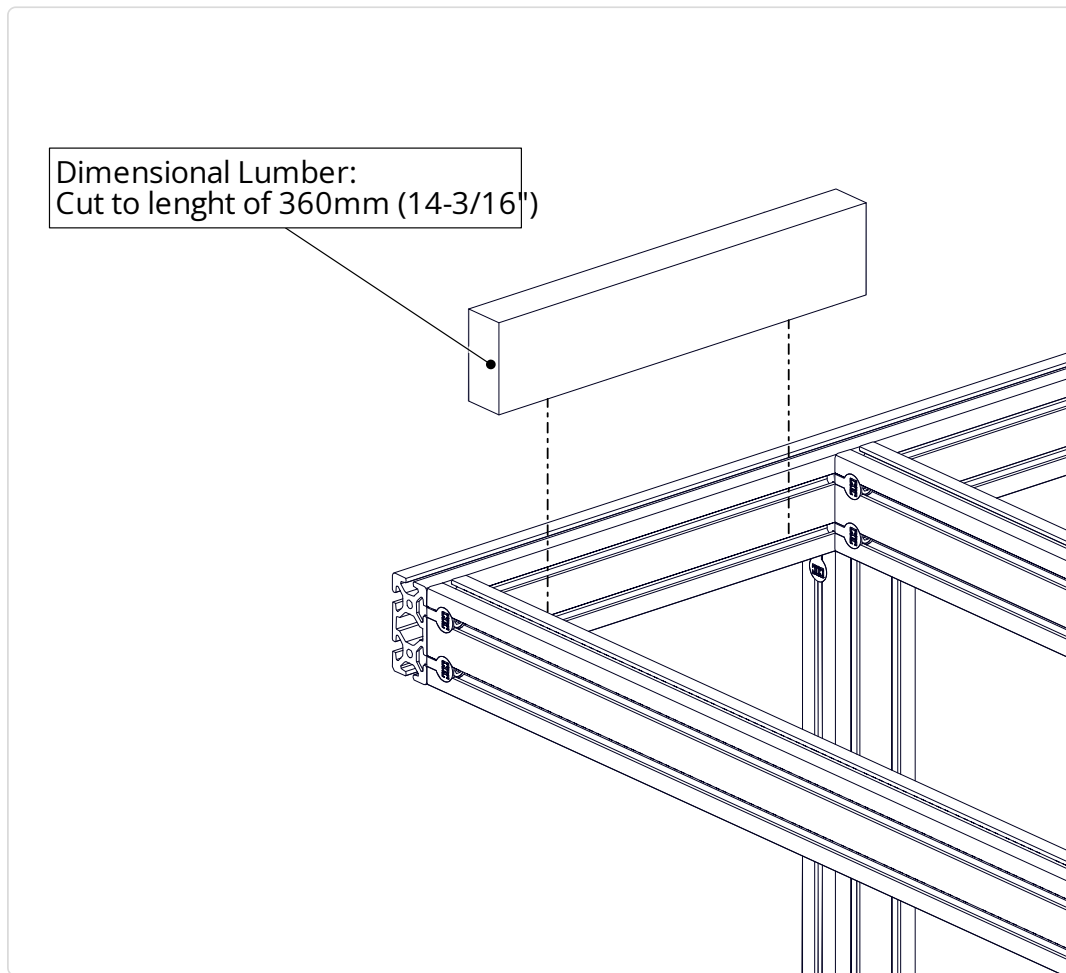
1. Position the outer crossmembers flush with the ends of the frame extrusion.
2. Position the crossmembers 360mm (14-3/16") apart (or 400mm (15-3/4") center to center).



Assembly Note

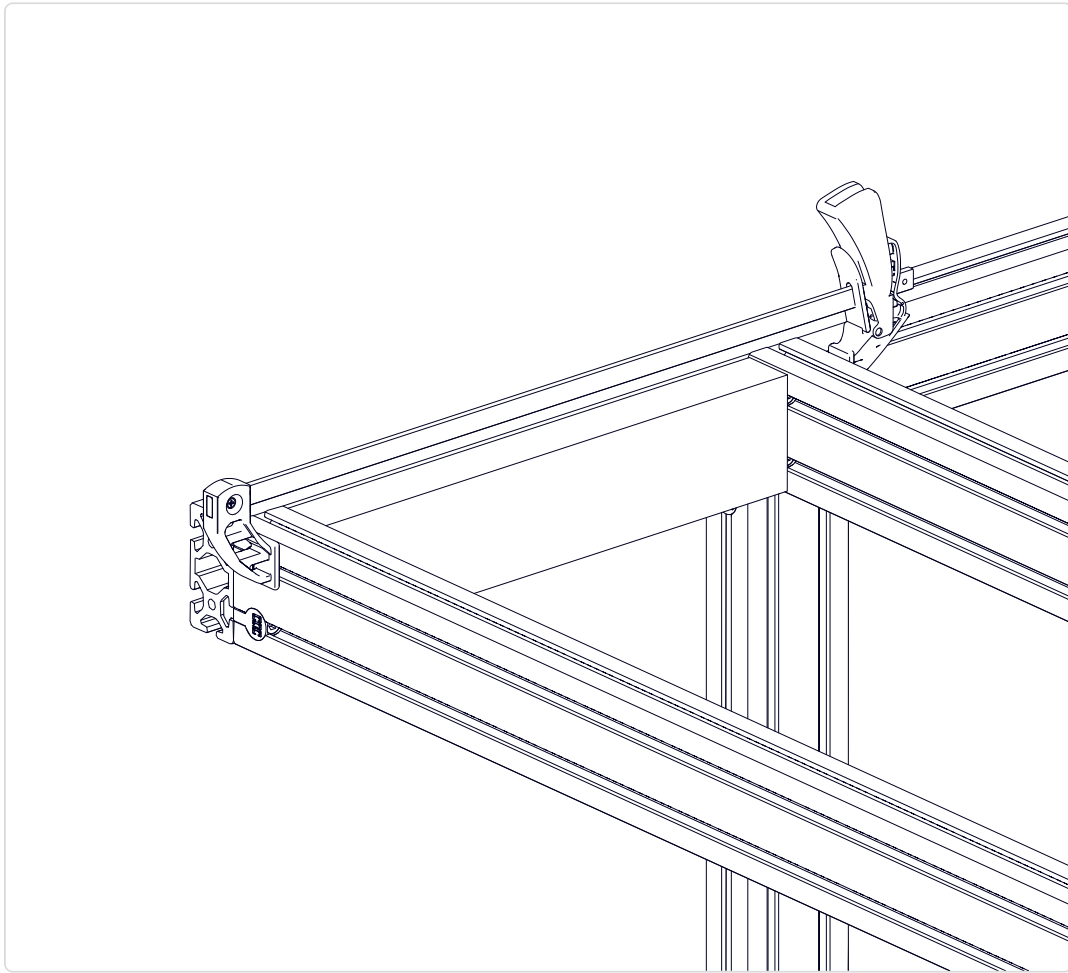
Use dimensional lumber to help position the crossmembers, as shown in the following steps.

1.2.3.4



1. Cut two pieces of dimensional lumber (a 2x4 is recommended) to a length of 360mm (14-3/16").
2. Position this piece between the crossmembers as indicated.

1.2.3.5



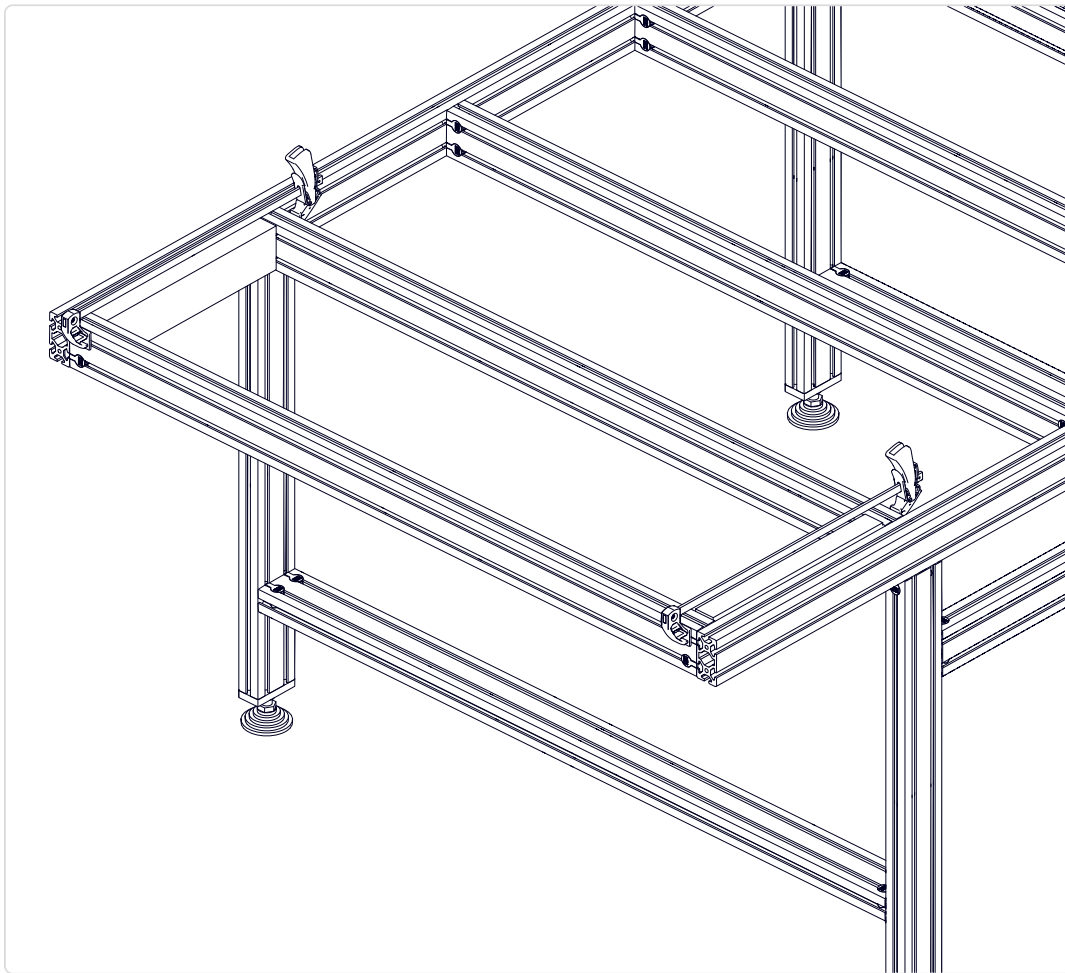
1. With the cut piece of lumber flush against the frame extrusion, clamp the crossmembers together.



Assembly Note

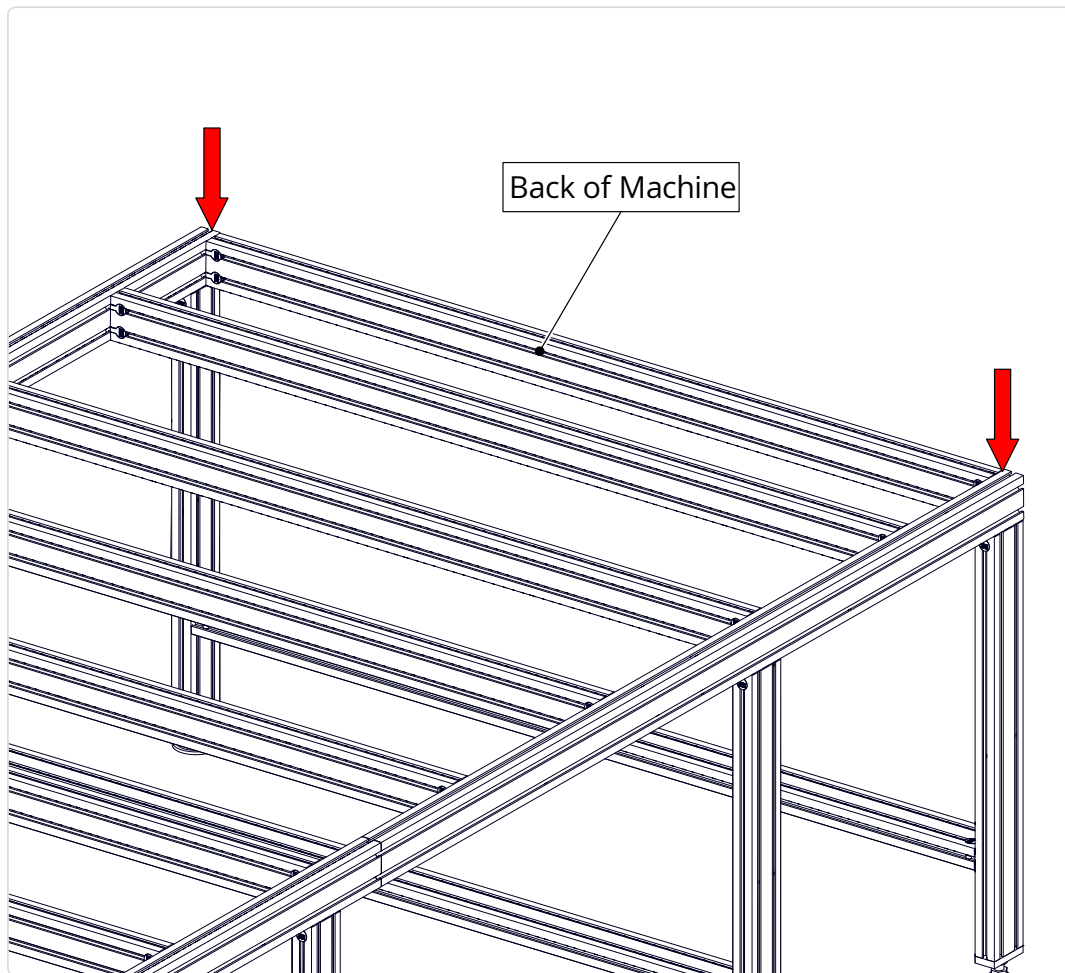
Recommended clamps are 24" Hand Trigger Clamps available at your local hardware store.

1.2.3.6



1. Repeat this process to clamp the other side of the crossmember.
2. While clamped, tighten the crossmember anchor fasteners.

1.2.3.7



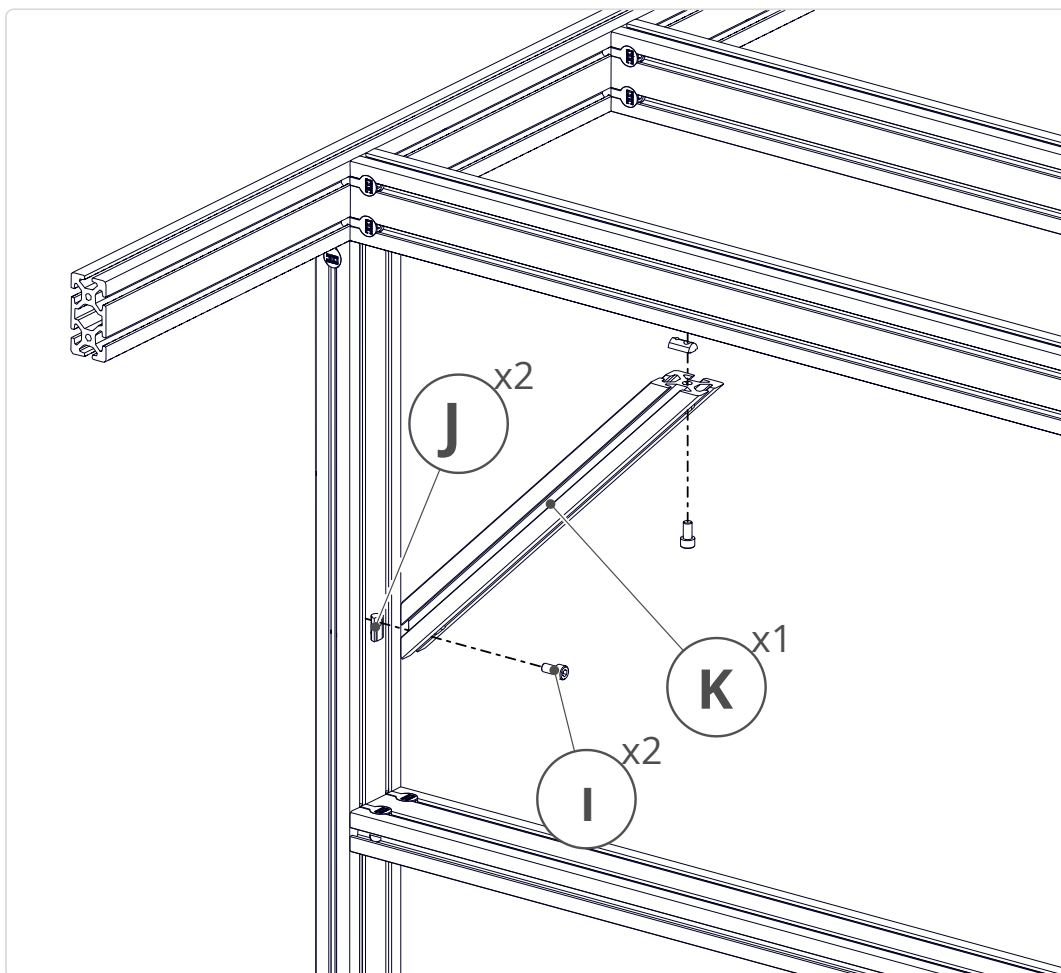
1. Repeat this process to position the remaining crossmembers, except the rear crossmember which is positioned flush against the end of the frame extrusion.



Assembly Note

The rear crossmember will have a different spacing due to the length of the machine.

1.2.3.8



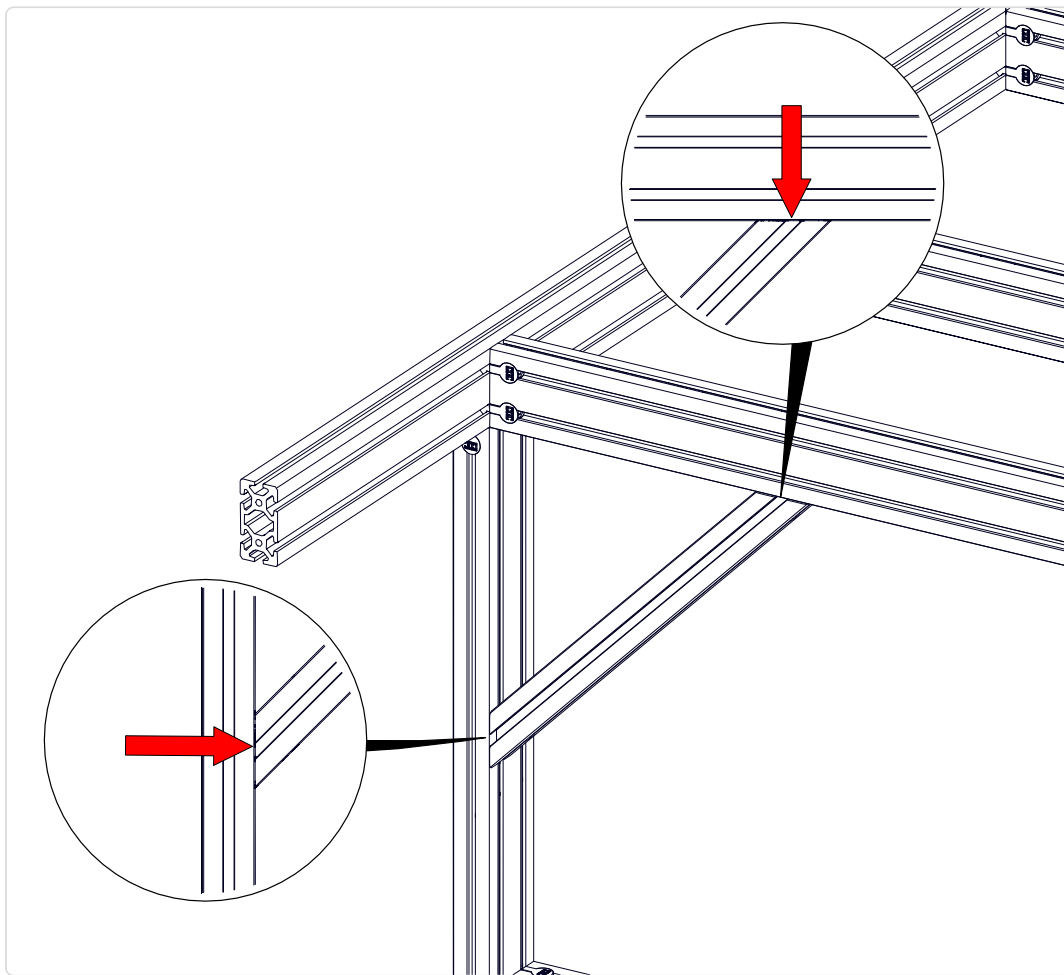
1. Attach a **CRP813-02 Leg Gusset** (K) between the leg and table crossmember using **M8 x 16mm Socket Head Cap Screws** (I) and **M8 Roll-in T-Nuts** (J).



Assembly Note

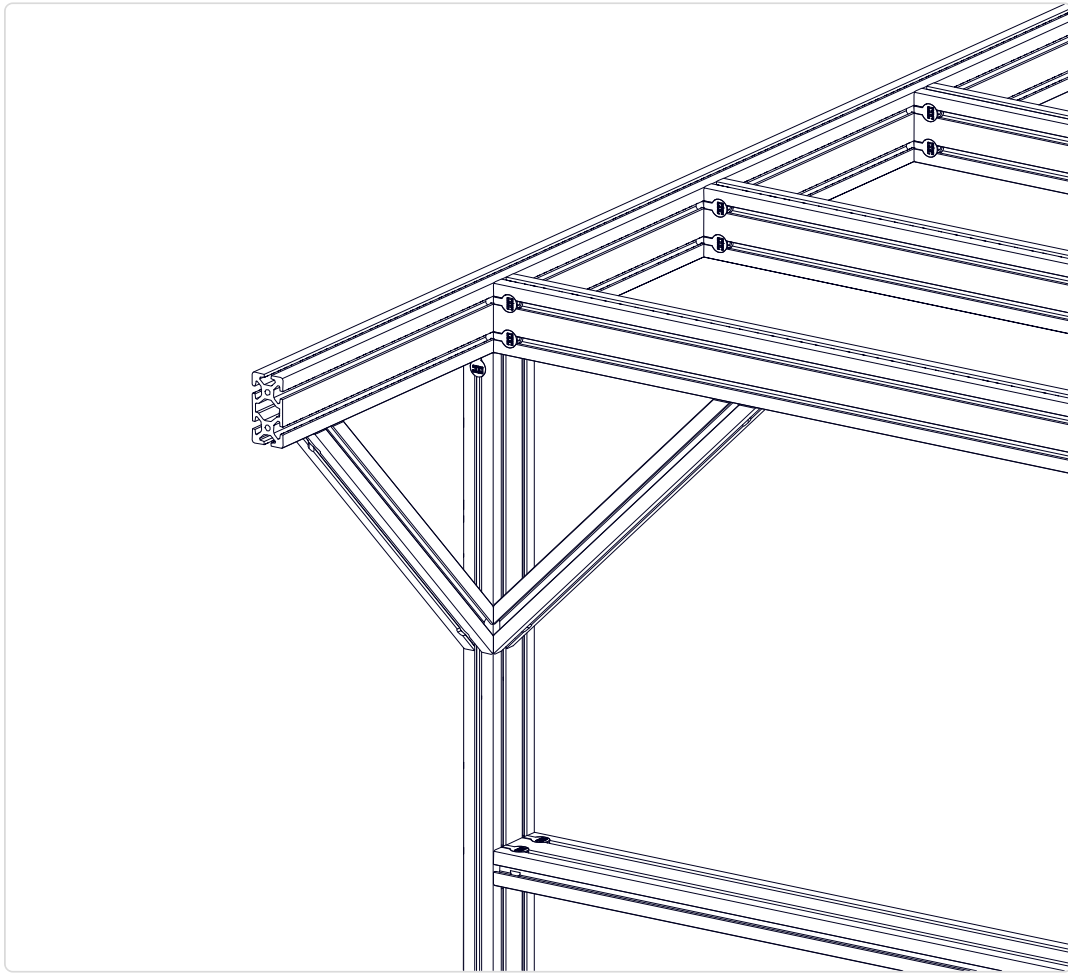
The front crossmember is hidden for illustrative purposes.

1.2.3.9



1. With each end of the gusset flush with the mating extrusion, partially tighten the gusset fasteners.

1.2.3.10



1. Use **this procedure** to install a leg gusset between the leg and frame extrusion.

1.2.3.11



1. Install two leg gussets on each of the remaining legs:

- a. One gusset between the leg and table crossmember extrusion.
- b. One gusset between the leg and frame extrusion. These gussets are oriented towards the front of the machine.

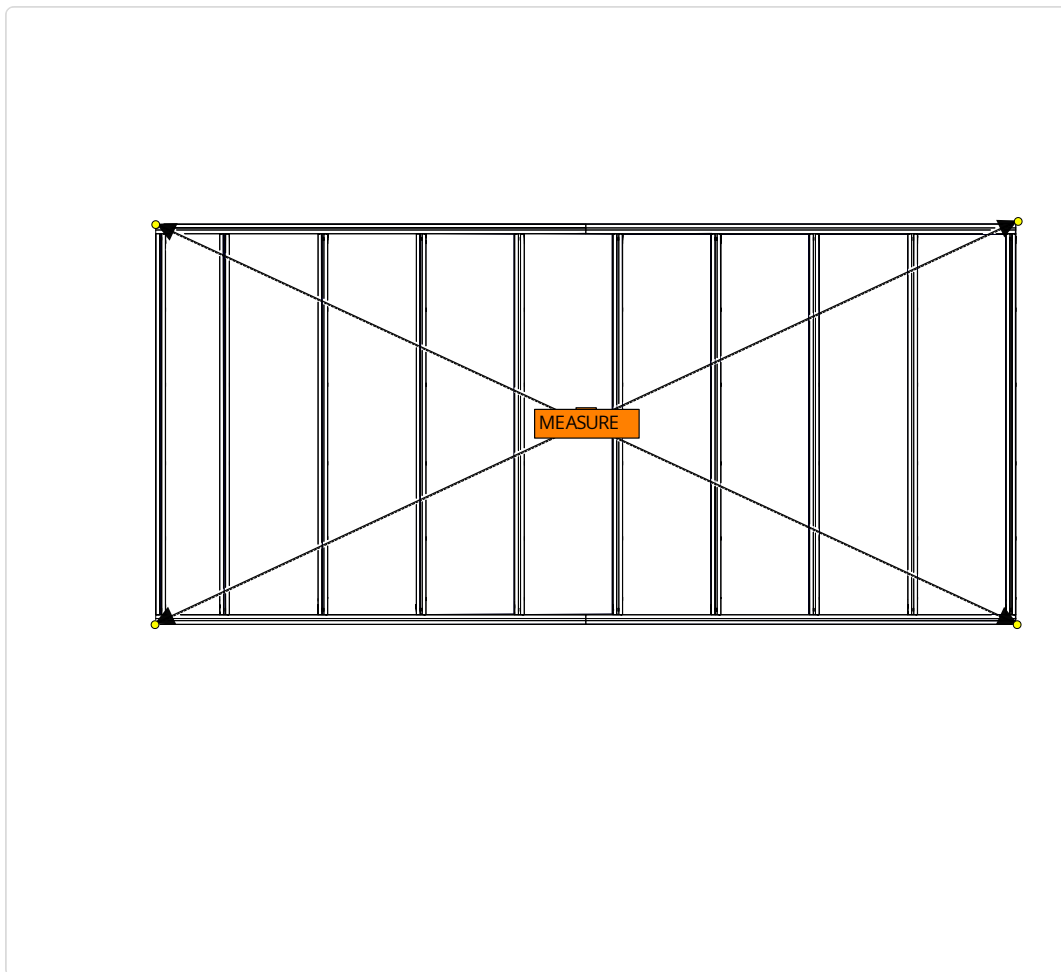


Assembly Note

One leg gusset will attach to the electronics bar extrusion, as shown.

1.2.4 - Table Squaring

1.2.4.1



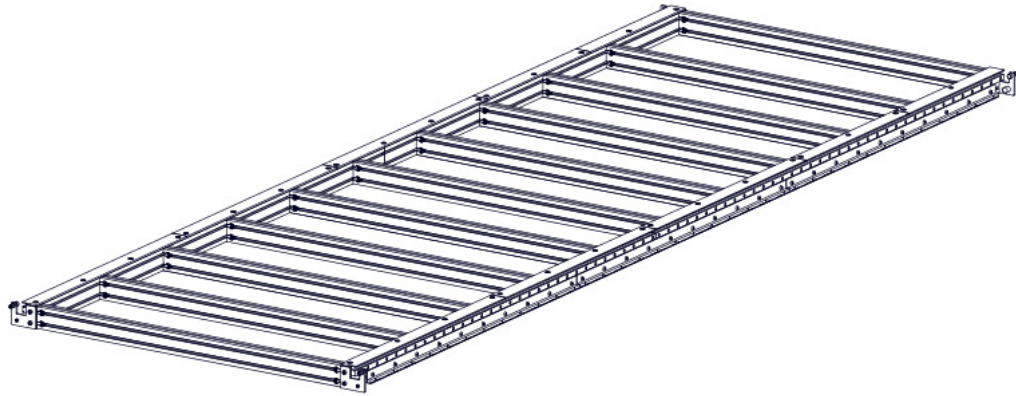
1. Measure diagonal across the table in each direction as indicated.
2. Make adjustments until the two measurements are within 1/8" or less of each other.
3. **After squaring the table, tighten all anchor fasteners and leg gusset fasteners.**



Assembly Note

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

2. Base Components



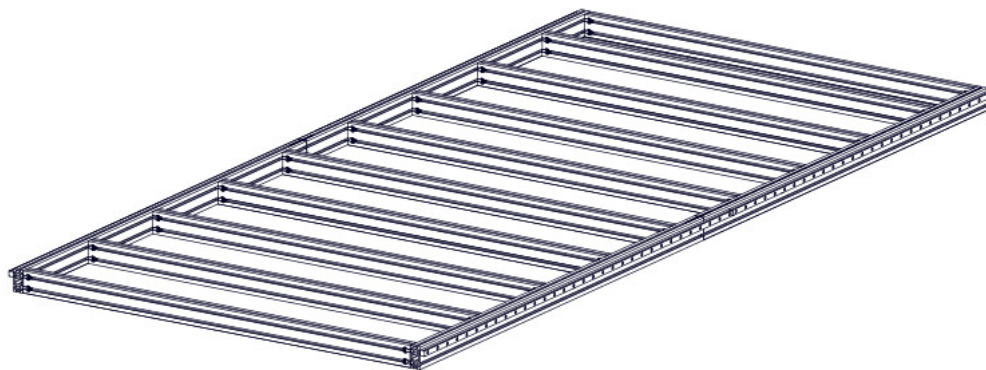
Section Note

Images may not be representative of actual machine size, however assembly steps and parts lists are specific for the machine configuration selected.

Section Note

Remaining images are shown without Avid CNC leg kit.

2.1 - Linear Rails



Parts List

ID	QTY	Part/Description	Package Label	
(A)	2	Linear Rail, 1600mm (63")	Table Rail Kit	
(B)	2	Linear Rail, 1900mm (74-13/16")	Table Rail Kit	
	1	GH20-120-FAST	Base Table Kit	
(D)	118	M5 x 20mm Socket Head Cap Screw (59 per bag)	GH20-120-FAST	>
(E)	118	M5 Slide-in T-Nut (59 per bag)	GH20-120-FAST	>
	1	Linear Rail Setting Jig Kit	Base Table Kit	
(F)	2	Rail Alignment Jig	Linear Rail Setting Jig Kit	>
(G)	4	M8 x 25mm Socket Head Cap Screw	Linear Rail Setting Jig Kit	>
(H)	4	M8 Roll-in T-Nut	Linear Rail Setting Jig Kit	>
(I)	4	GHH20CA - Linear Bearing Block	Gantry Assembly Kit	
(J)	4	M6 Flush Grease Fitting	Gantry Assembly Kit	
	1	LPRO-GREASE-KIT-19.1	Base Table Kit	
(K)	1	Grease Gun	LPRO-GREASE-KIT-19.1	>
(L)	1	Tube of Grease	LPRO-GREASE-KIT-19.1	>
(M)	1	Needle Tip Adapter	LPRO-GREASE-KIT-19.1	>



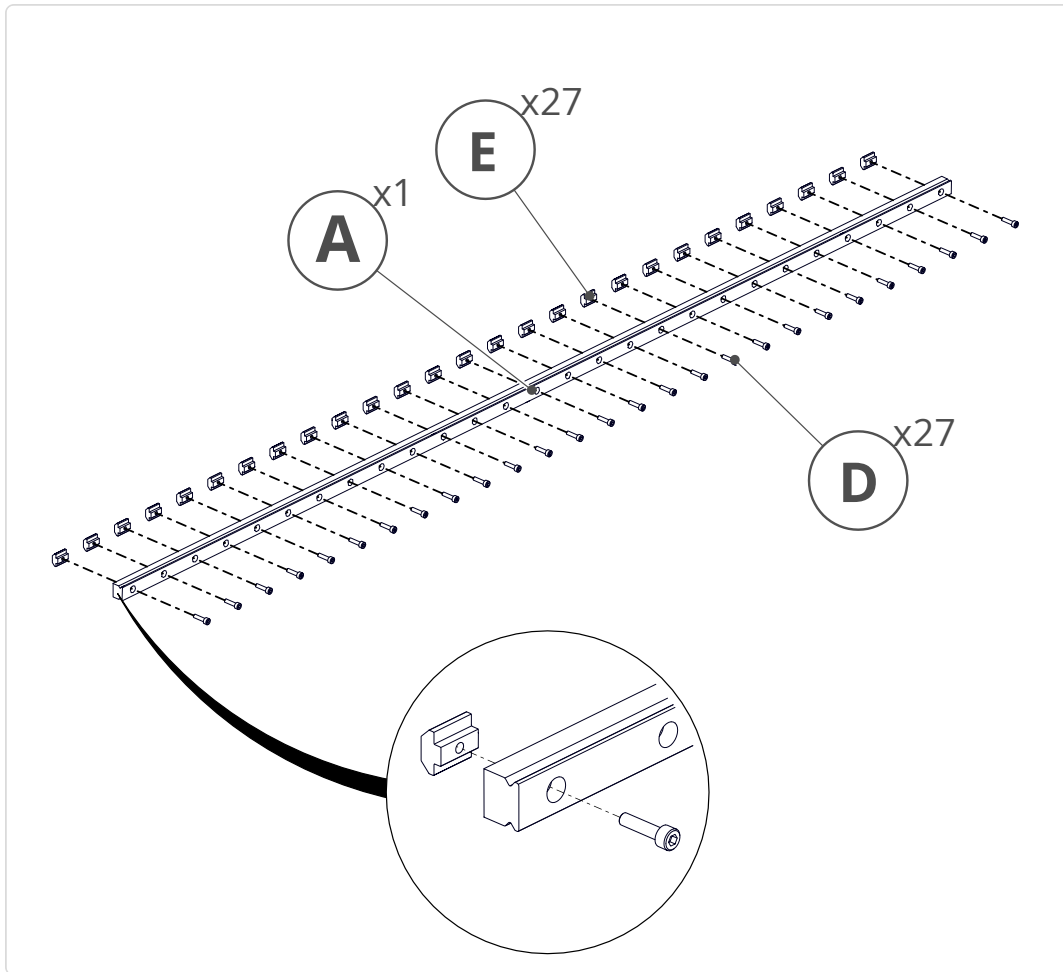
Tools List

Requirement	Tool
Required	4mm Ball-End Allen Wrench
Required	6mm Ball-End Allen Wrench
Required	Adjustable Wrench
Required	(2) Clamps
Required	Tape Measure



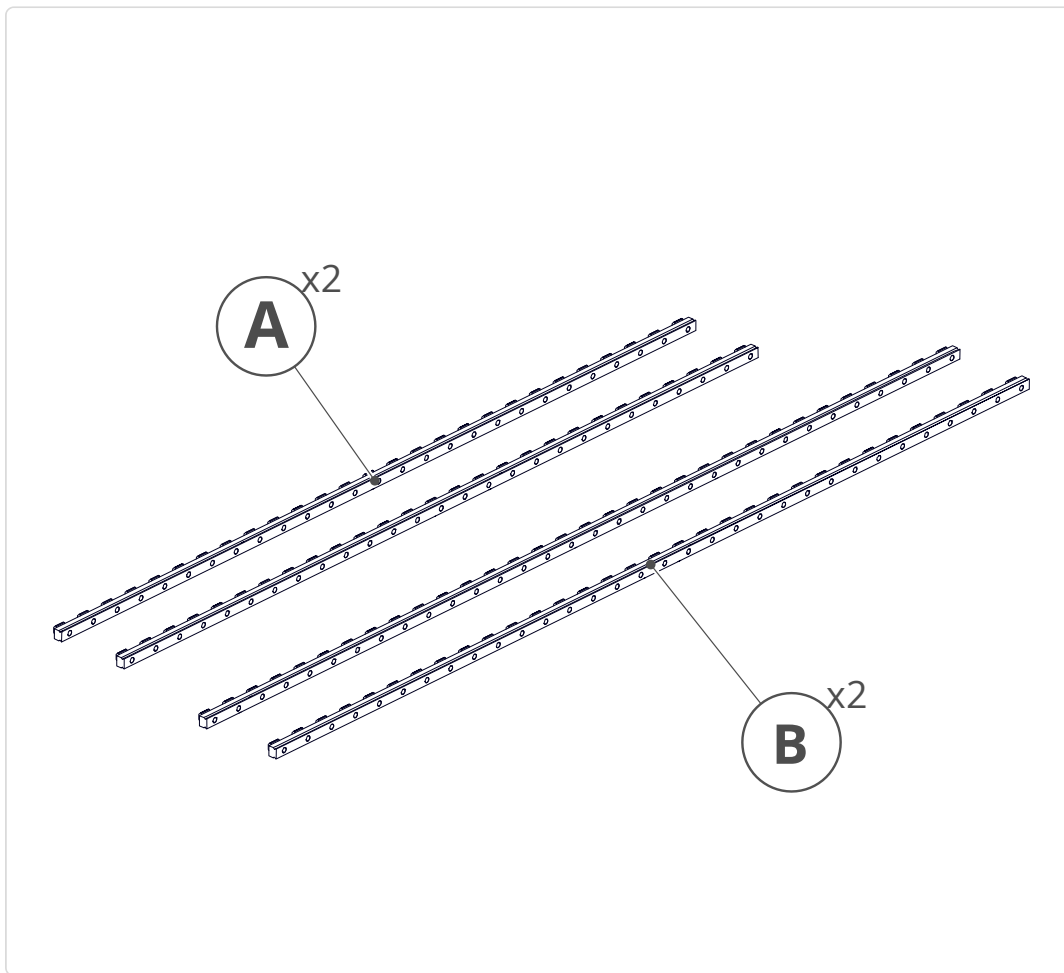
2.1.1 - Linear Rail Assembly

2.1.1.1



1. Partially thread **M5 x 20mm Socket Head Cap Screws (D)** onto **M5 Slide-in T-Nuts (E)**, through the **Linear Rail, 1600mm (63") (A)**.

2.1.1.2

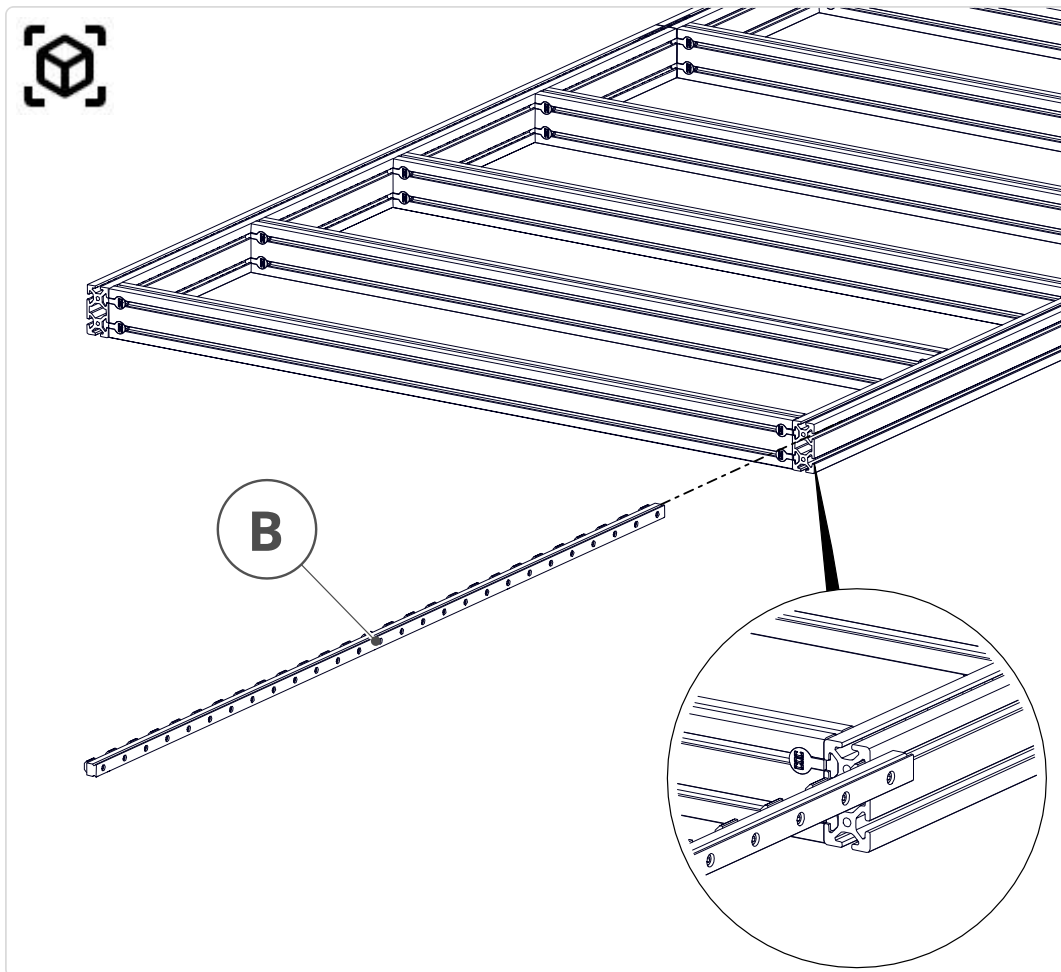


1. Use the procedure in the previous step to assemble the following linear rails:

- (2) Linear Rail, 1600mm (63") (A)
- (2) Linear Rail, 1900mm (74-13/16") (B)

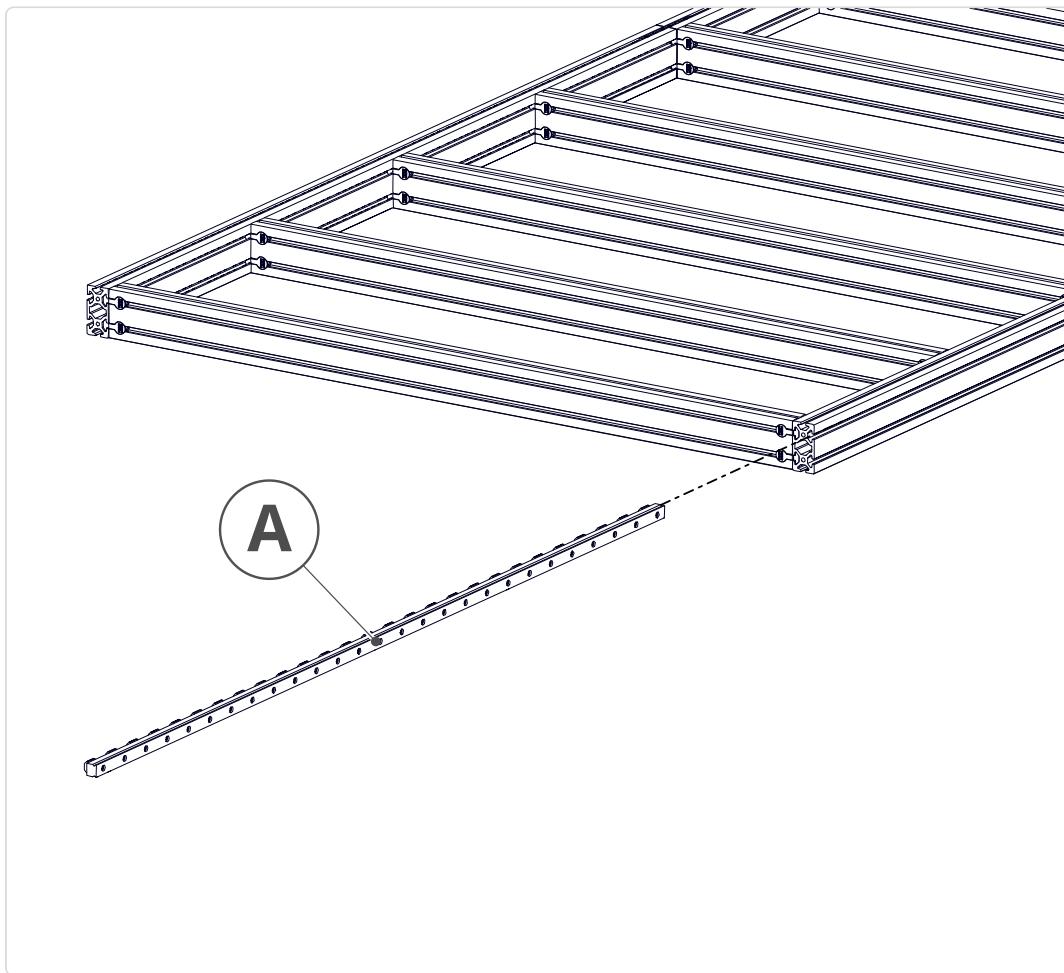
2.1.2 - Linear Rail Installation

2.1.2.1



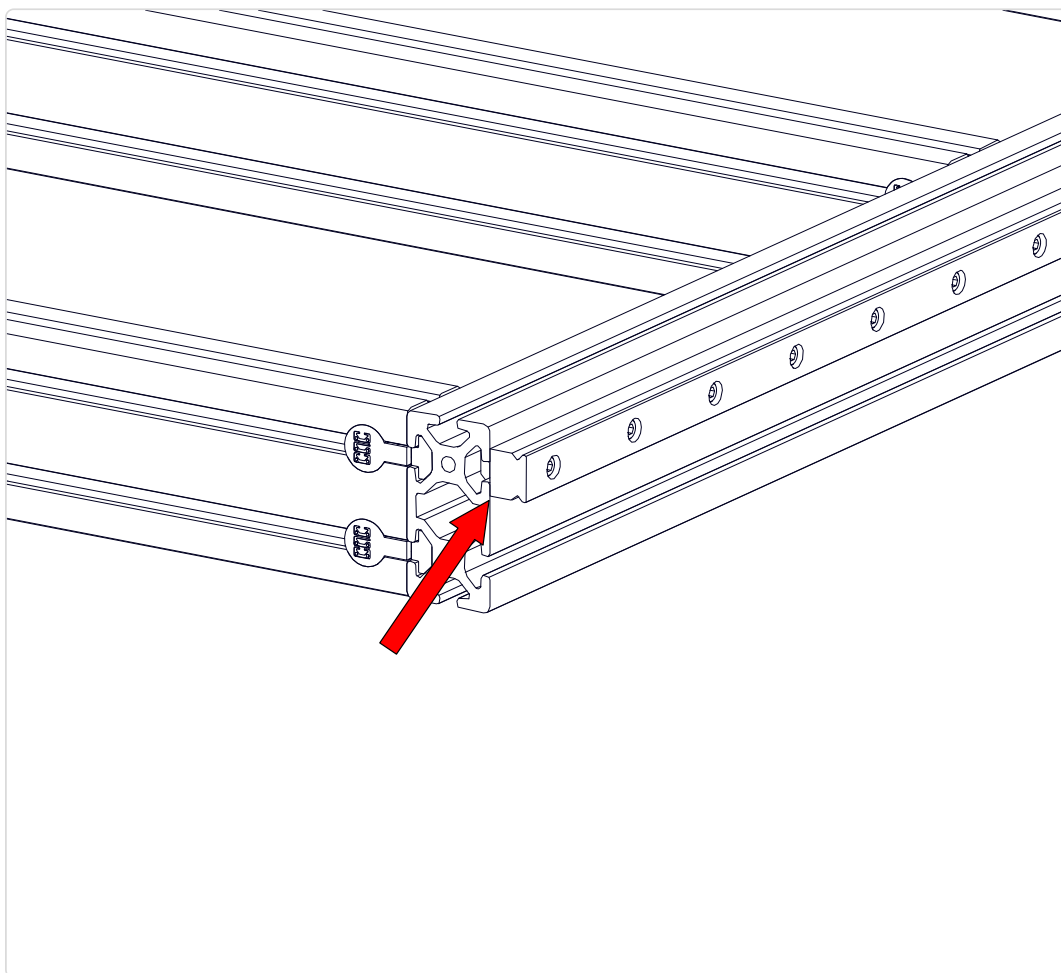
1. From the front of the machine, slide an assembled **Linear Rail, 1900mm (74-13/16")** (B) into the upper t-slot of the frame extrusion.

2.1.2.2



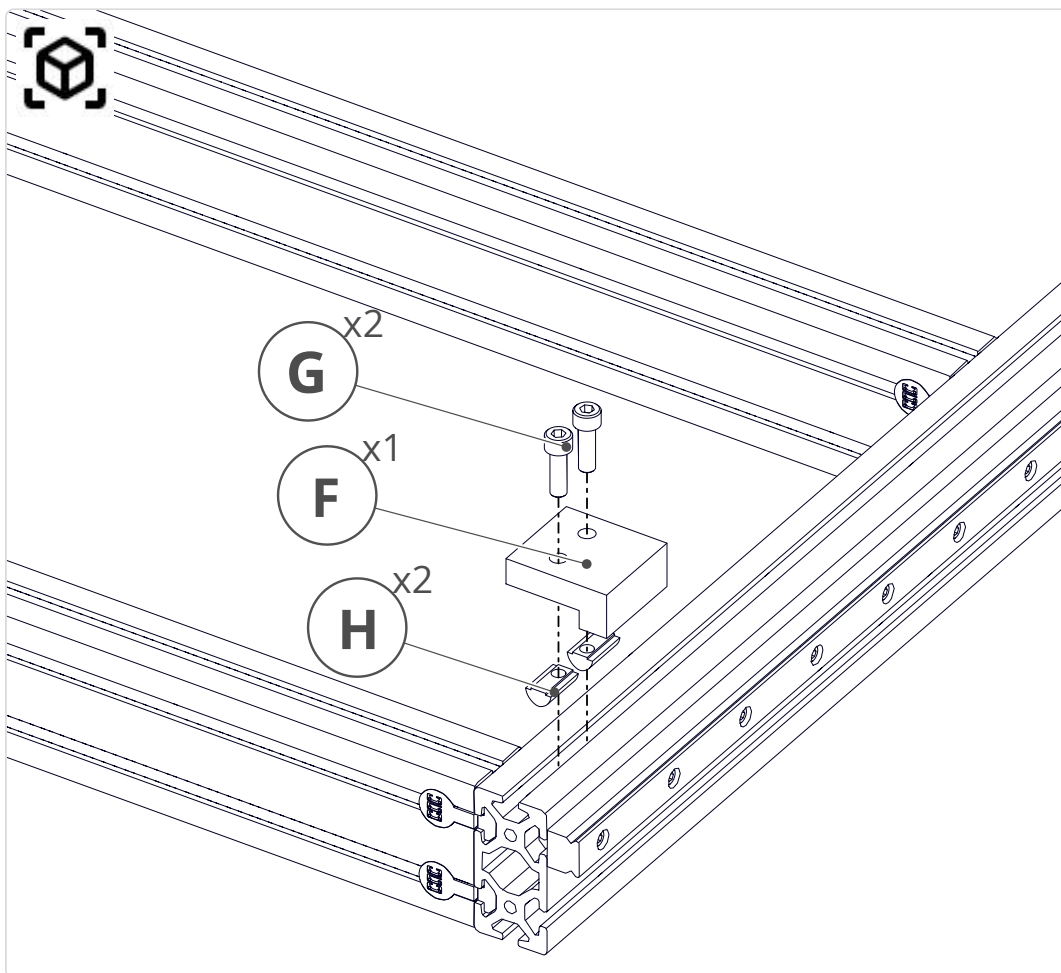
1. From the front of the machine, slide an assembled **Linear Rail, 1600mm (63")** **A** into the upper t-slot of the frame extrusion.

2.1.2.3



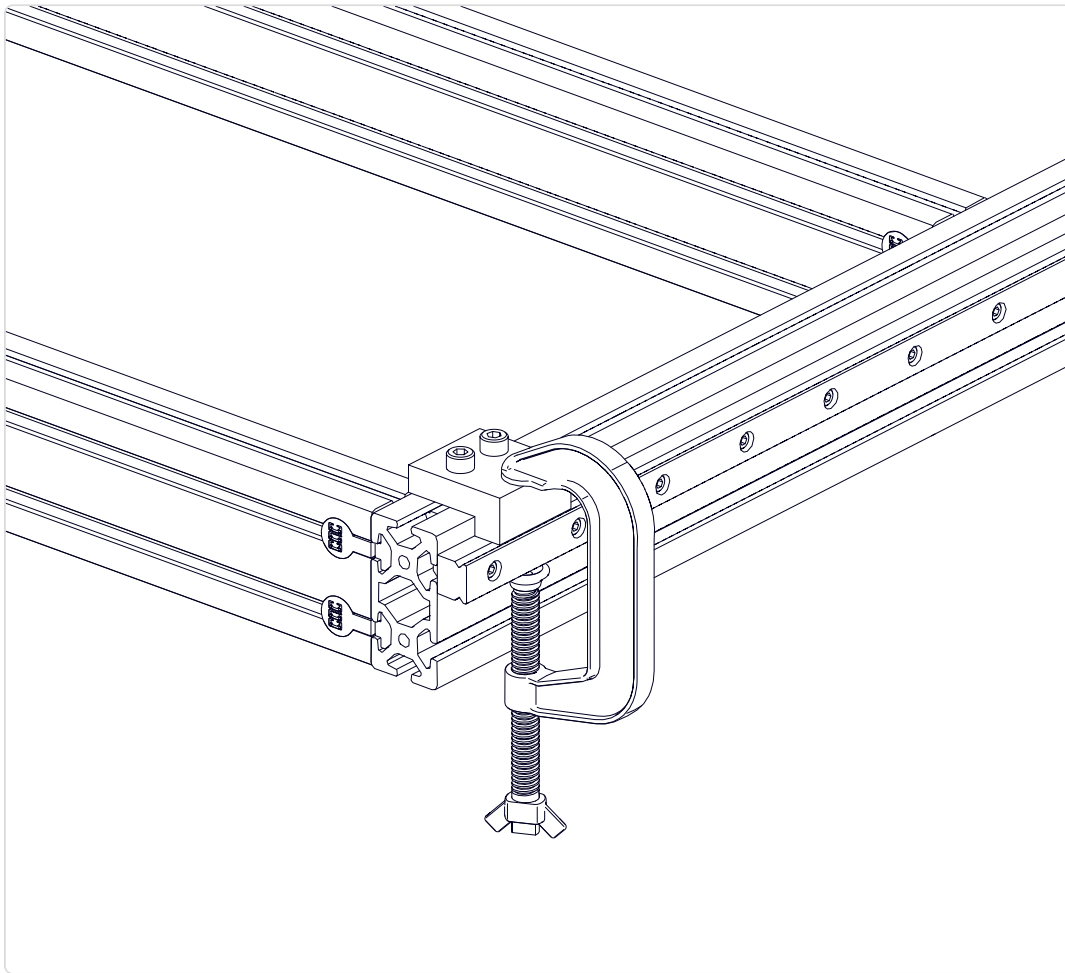
1. The ends of the linear rails should be roughly flush with the ends of the frame extrusion.

2.1.2.4



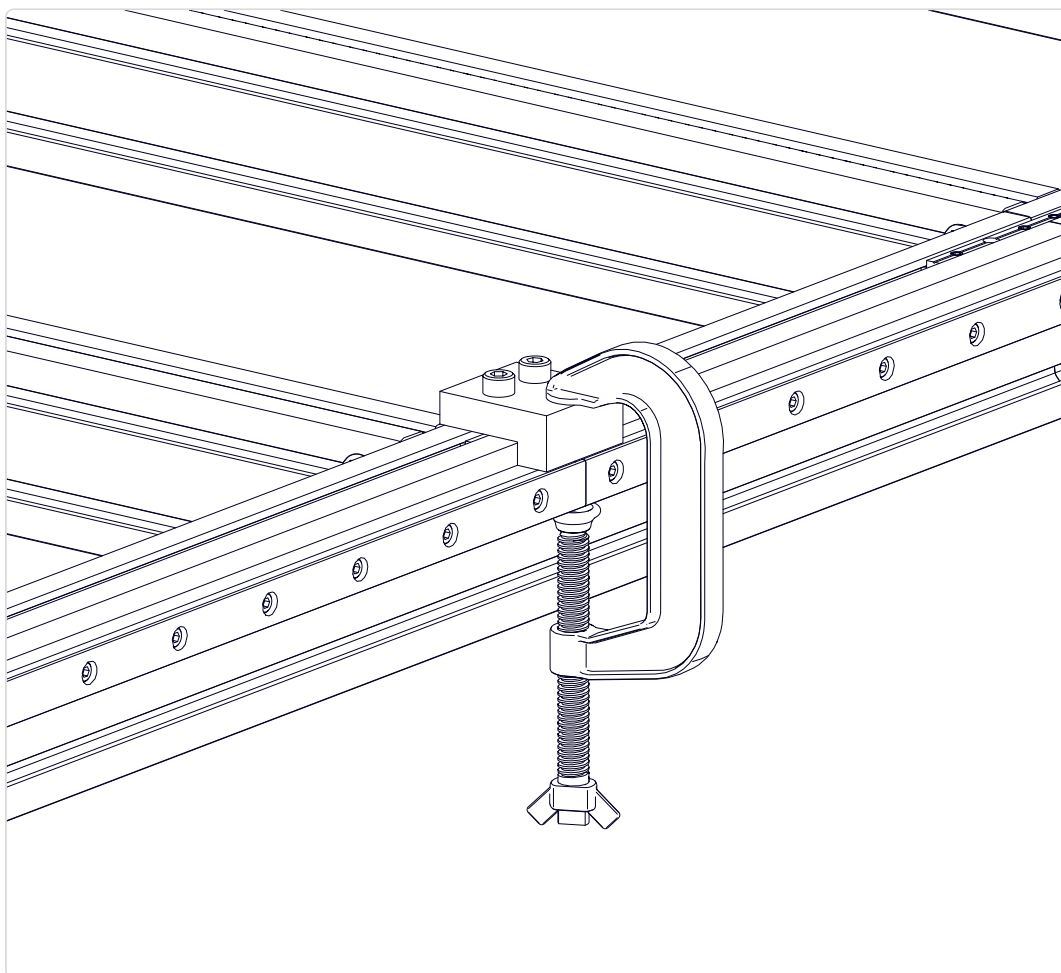
1. Attach the Rail Alignment Jig (F) to the frame extrusion using M8 x 25mm Socket Head Cap Screws (G) and M8 Roll-in T-Nuts (H).
2. Fully tighten the fasteners.

2.1.2.5



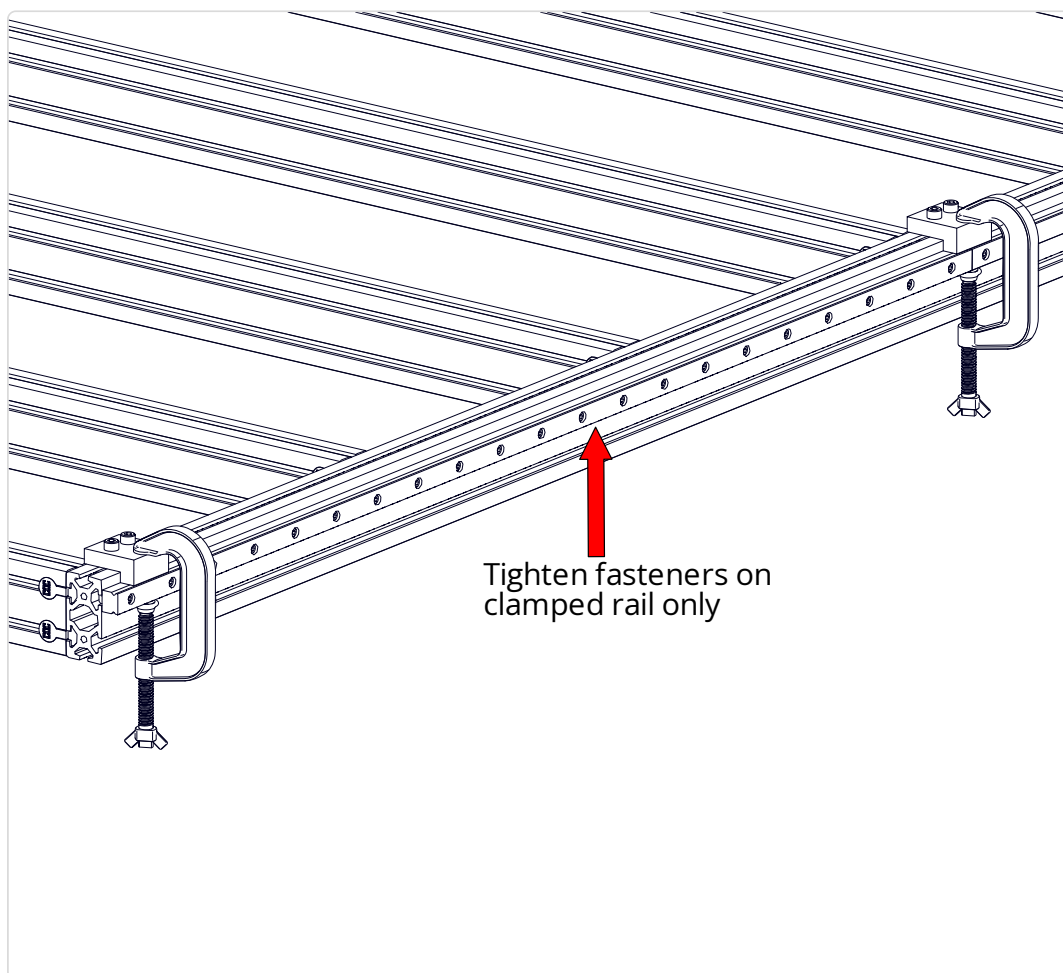
1. Clamp the end of the linear rail to the rail alignment jig.

2.1.2.6



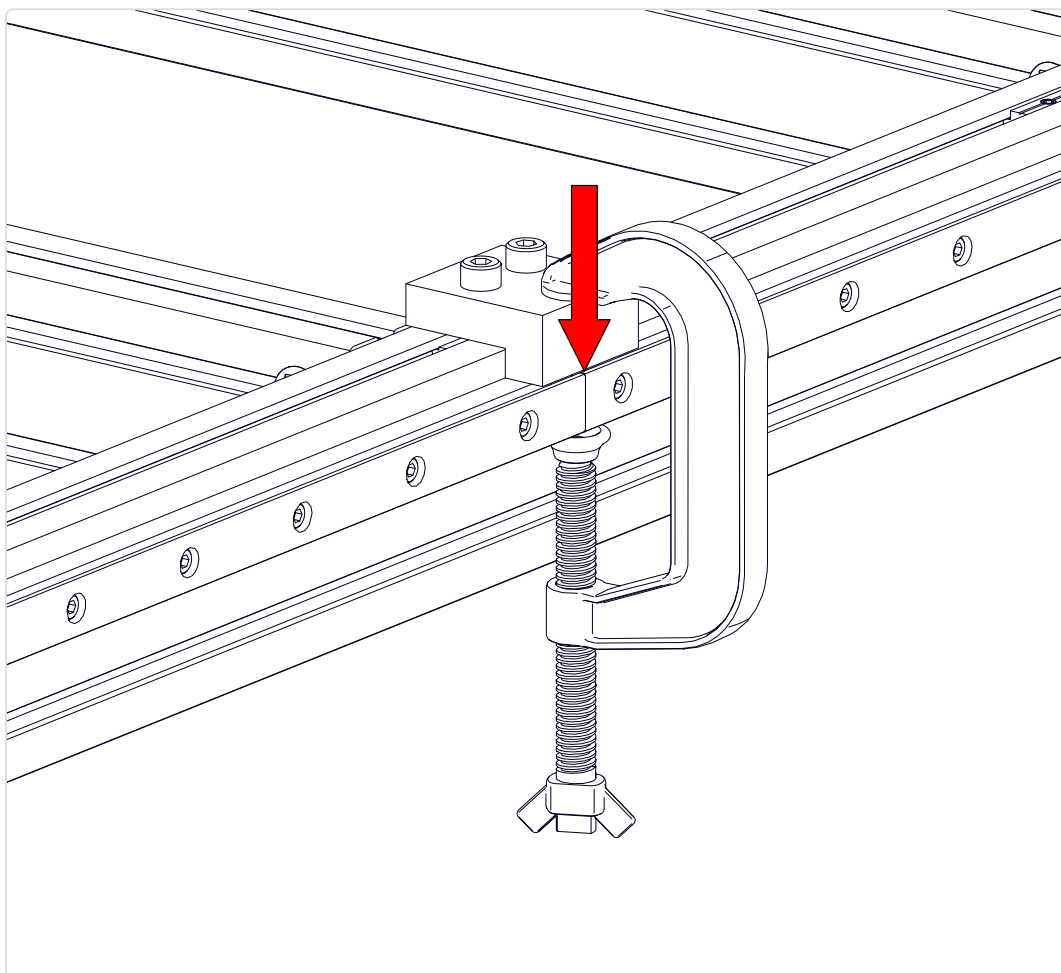
1. Repeat **this process** with the second rail alignment jig at the linear rail splice.

2.1.2.7



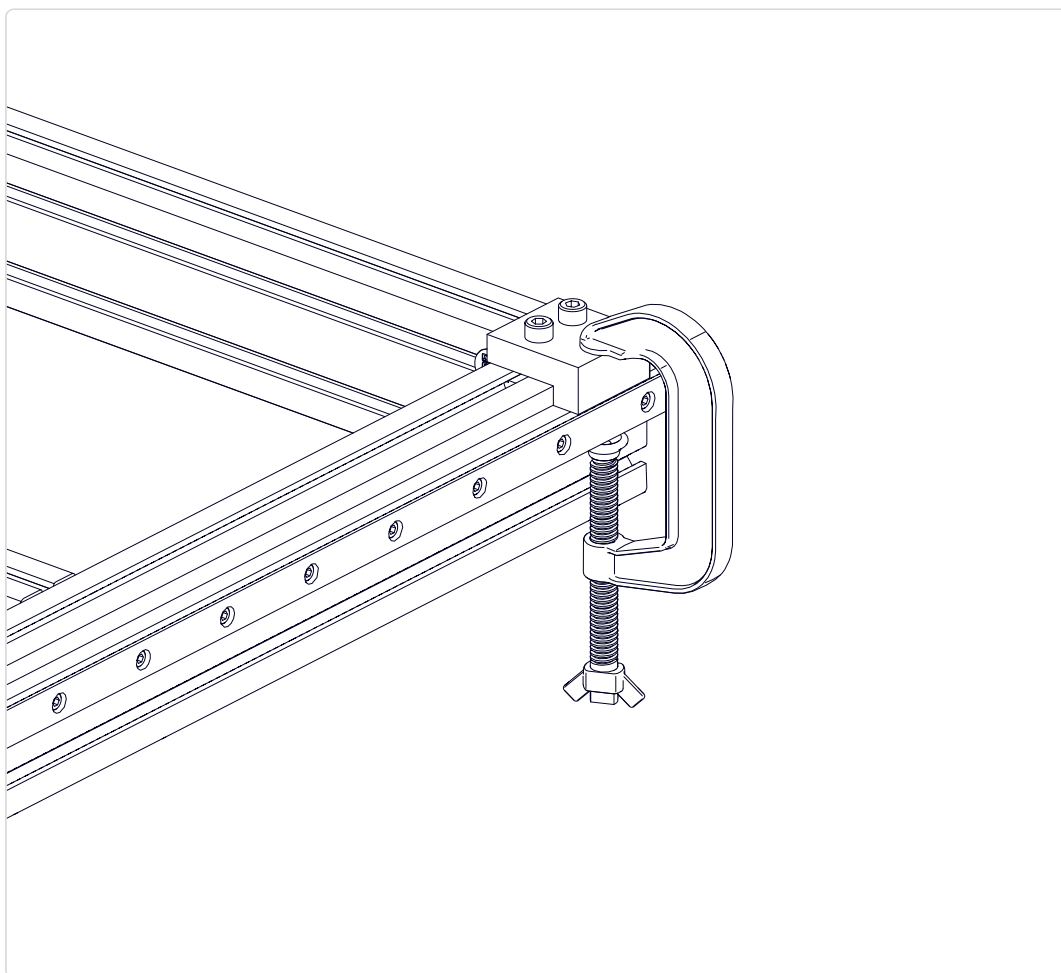
1. Fully tighten the linear rail fasteners on the clamped linear rail.

2.1.2.8



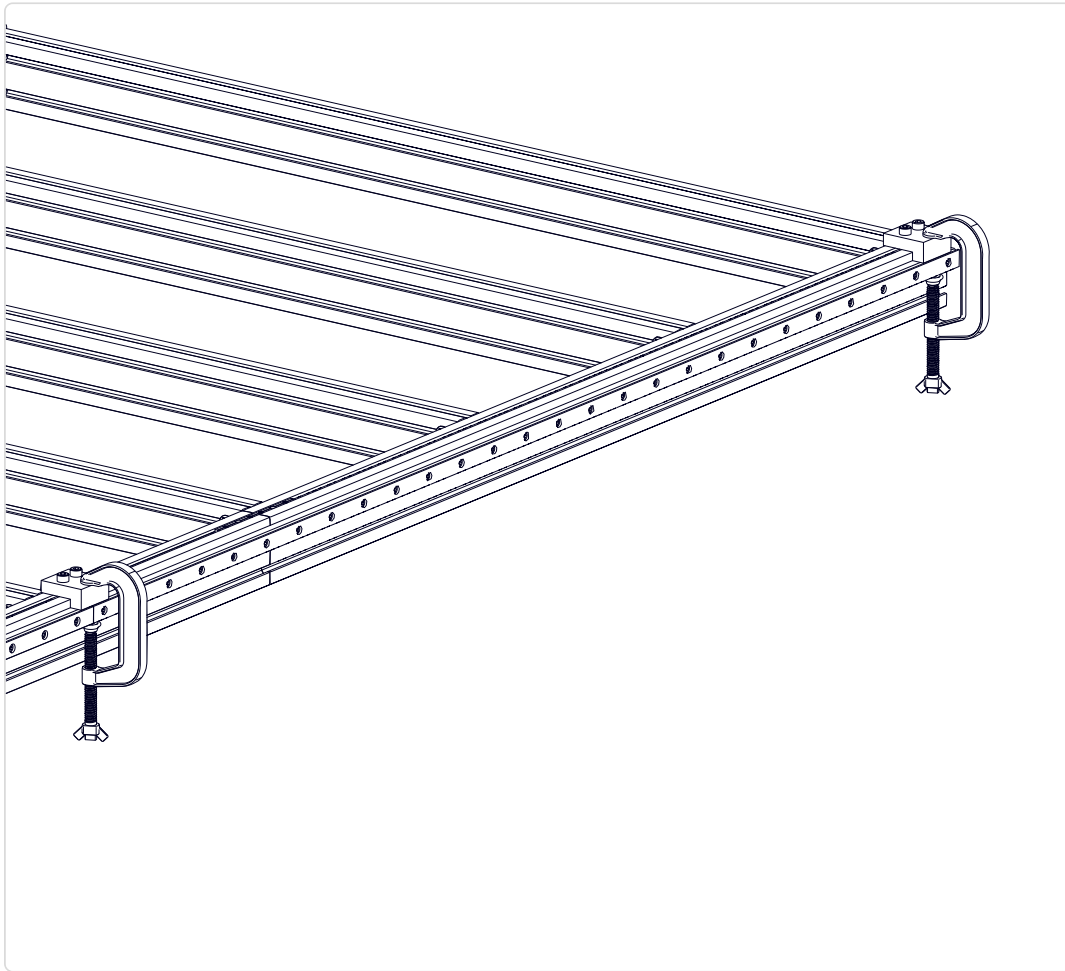
1. Ensure the linear rails are flush at the splice and leave the alignment jig clamped at this location.

2.1.2.9



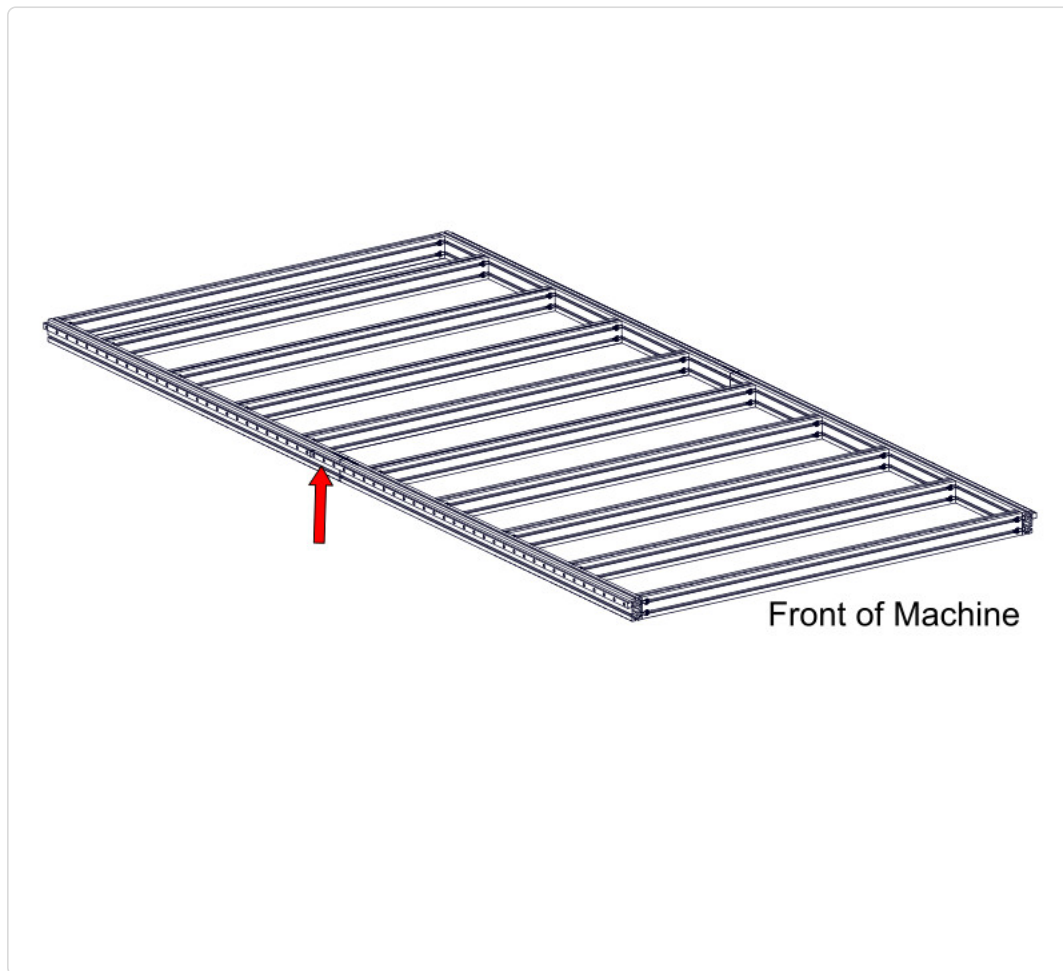
1. Move the other alignment jig to the opposite end of the machine.
2. Clamp the linear rail to the alignment jig.

2.1.2.10



1. Fully tighten the linear rail fasteners on the clamped linear rail.
2. Remove the clamps and alignment jigs.

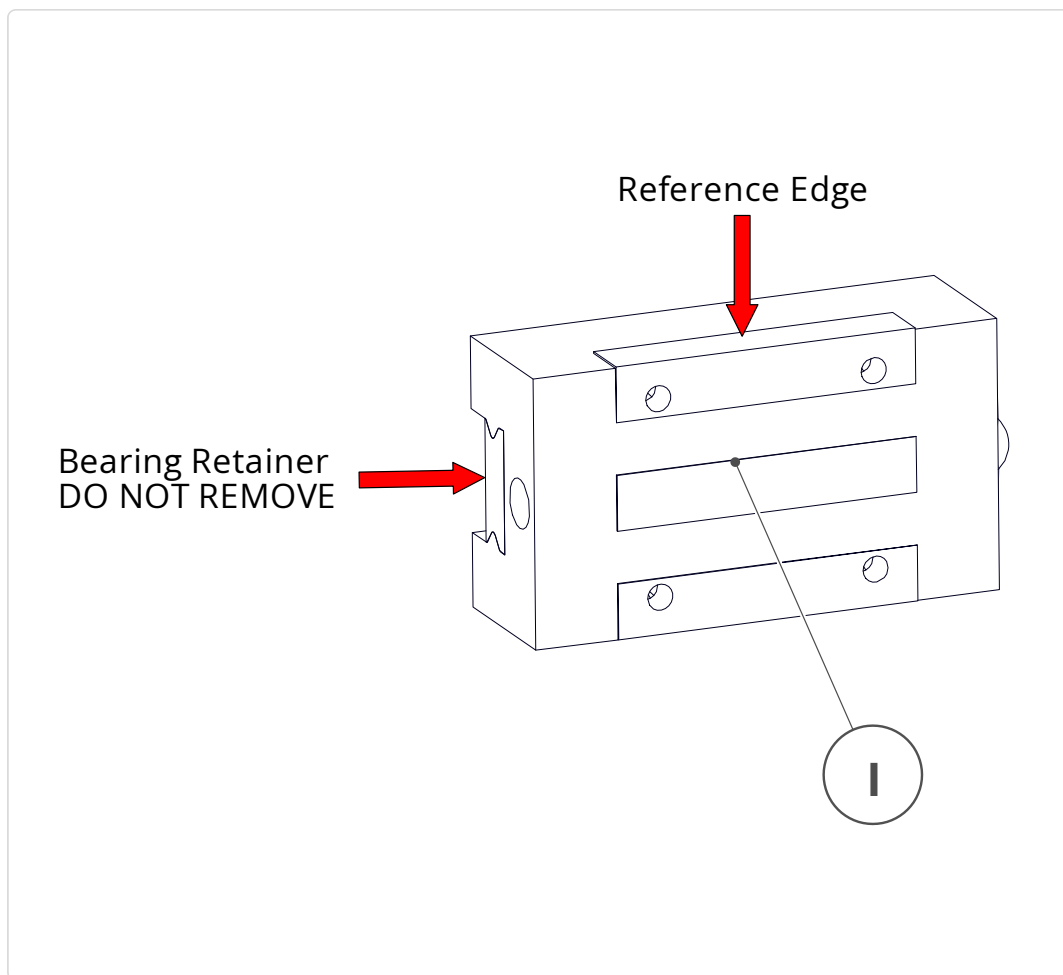
2.1.2.11



1. Repeat the **linear rail installation procedure** on the other side of the machine.

2.1.3 - Linear Bearing Block Installation

2.1.3.1



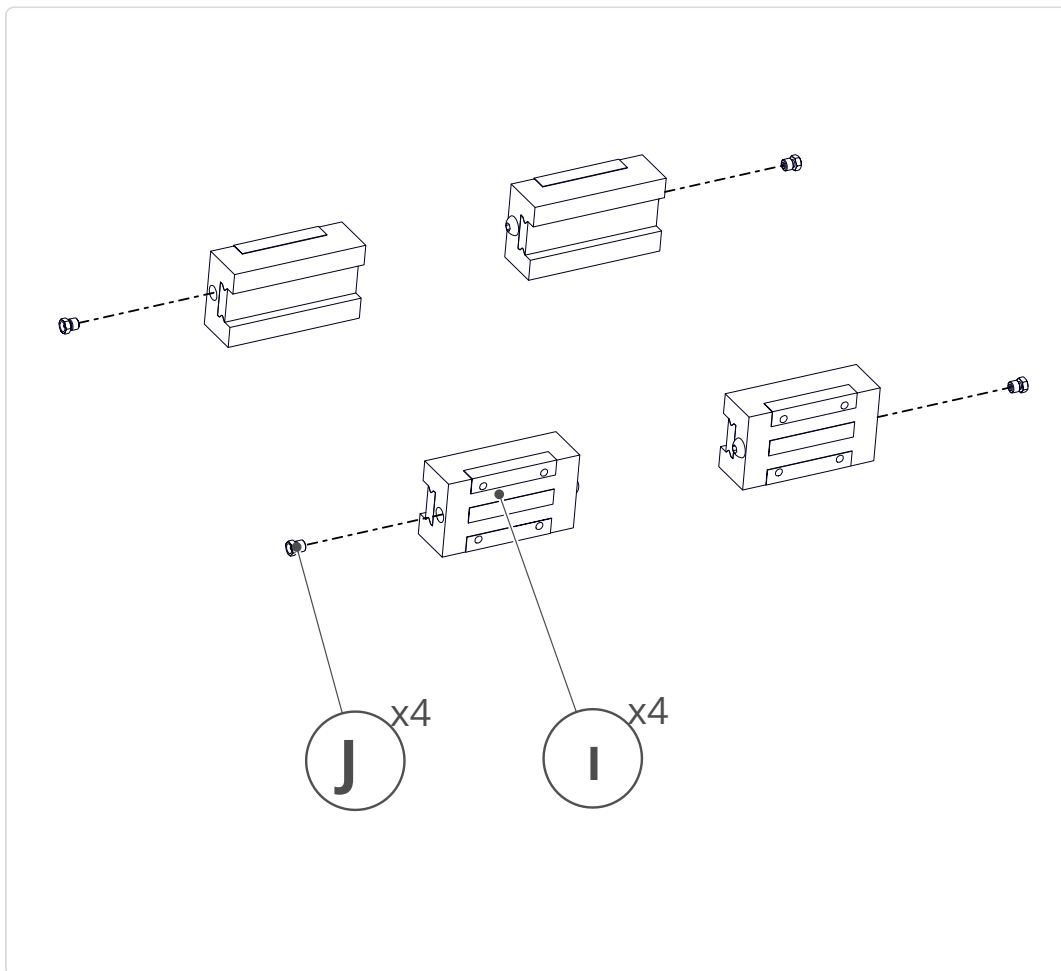
1. Identify the indicated reference edge on the **GHH20CA - Linear Bearing Block** **I**.



Assembly Note

DO NOT remove the plastic bearing retainers until instructed to do so in a future step.

2.1.3.2



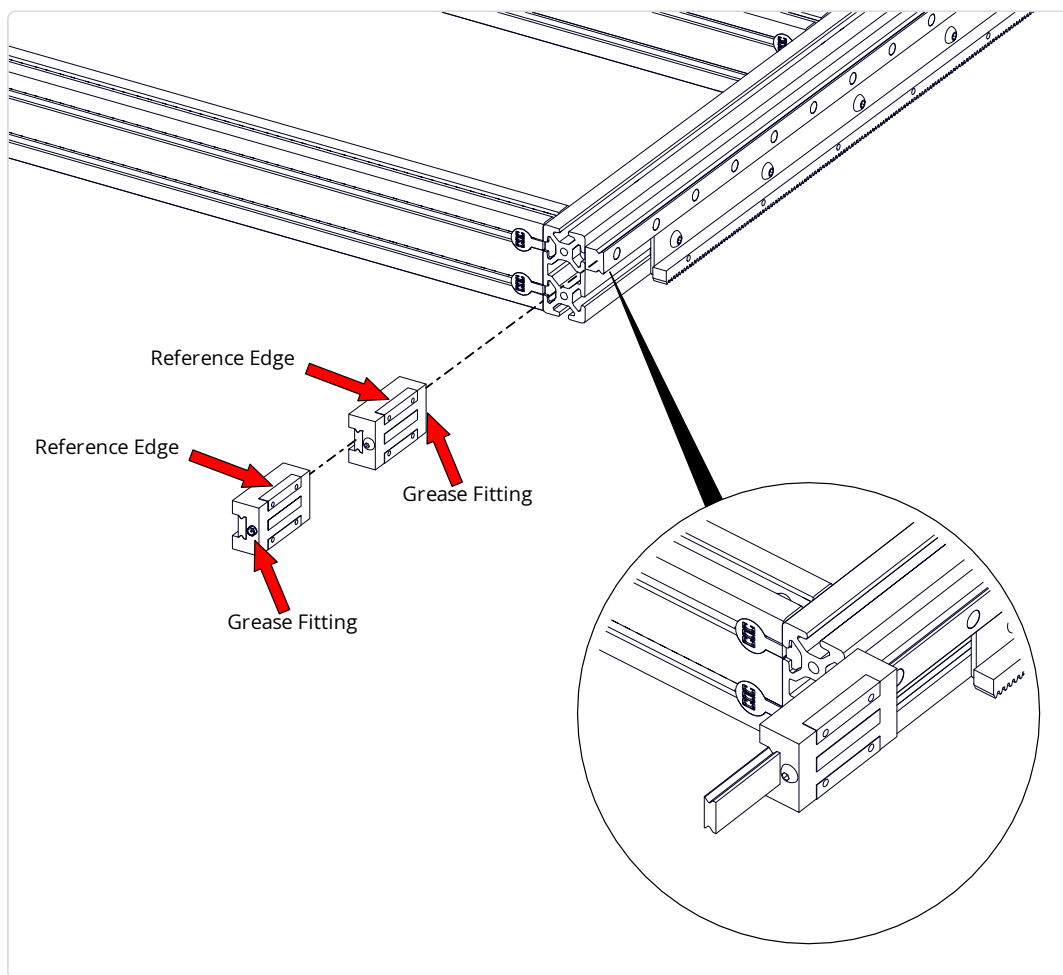
1. Thread **M6 Flush Grease Fittings** (J) into the **GHH20CA - Linear Bearing Blocks** (I), noting the orientation of the reference edge.
2. Hand tighten the grease fittings.



Assembly Note

You may need to relocate the pre-installed M6 button head cap screw to the other side of the linear bearing block.

2.1.3.3



1. On each side of the machine, slide two linear bearing blocks onto the linear rails.
2. Use the linear rail to push the plastic bearing retainer out of the linear bearing block, as shown.

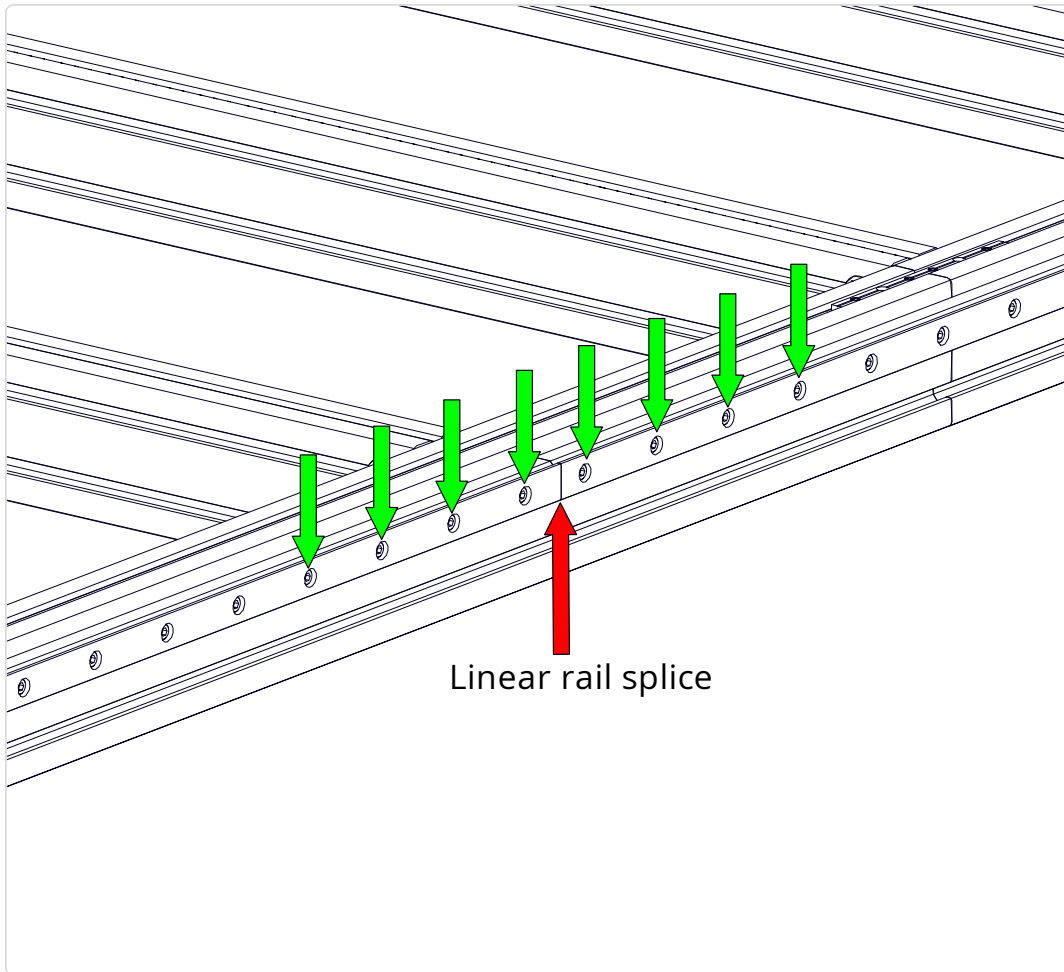


Assembly Note

Ensure the linear bearing blocks are oriented correctly. Grease fittings face away from each other and reference edges face upwards.

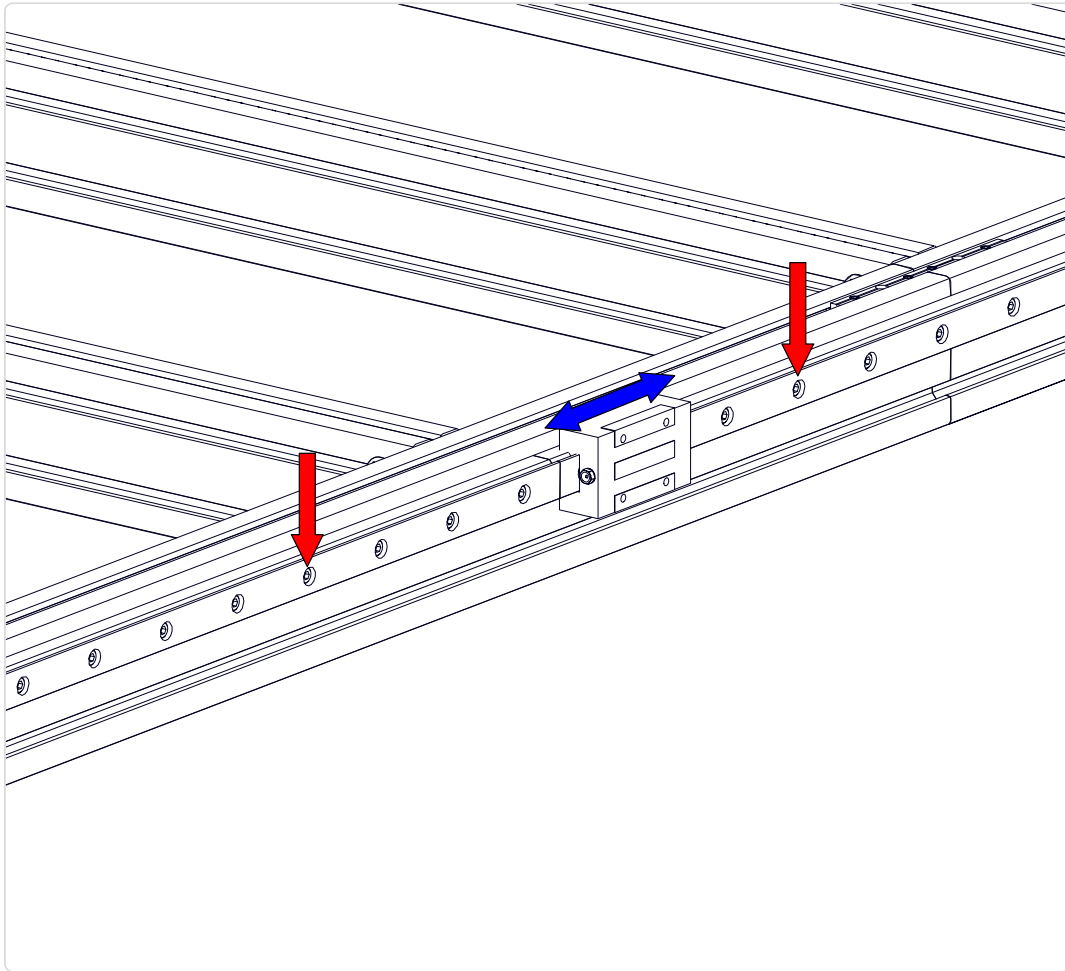
2.1.4 - Linear Rail Alignment

2.1.4.1



1. At the linear rail splice, loosen four fasteners on either side of the splice.

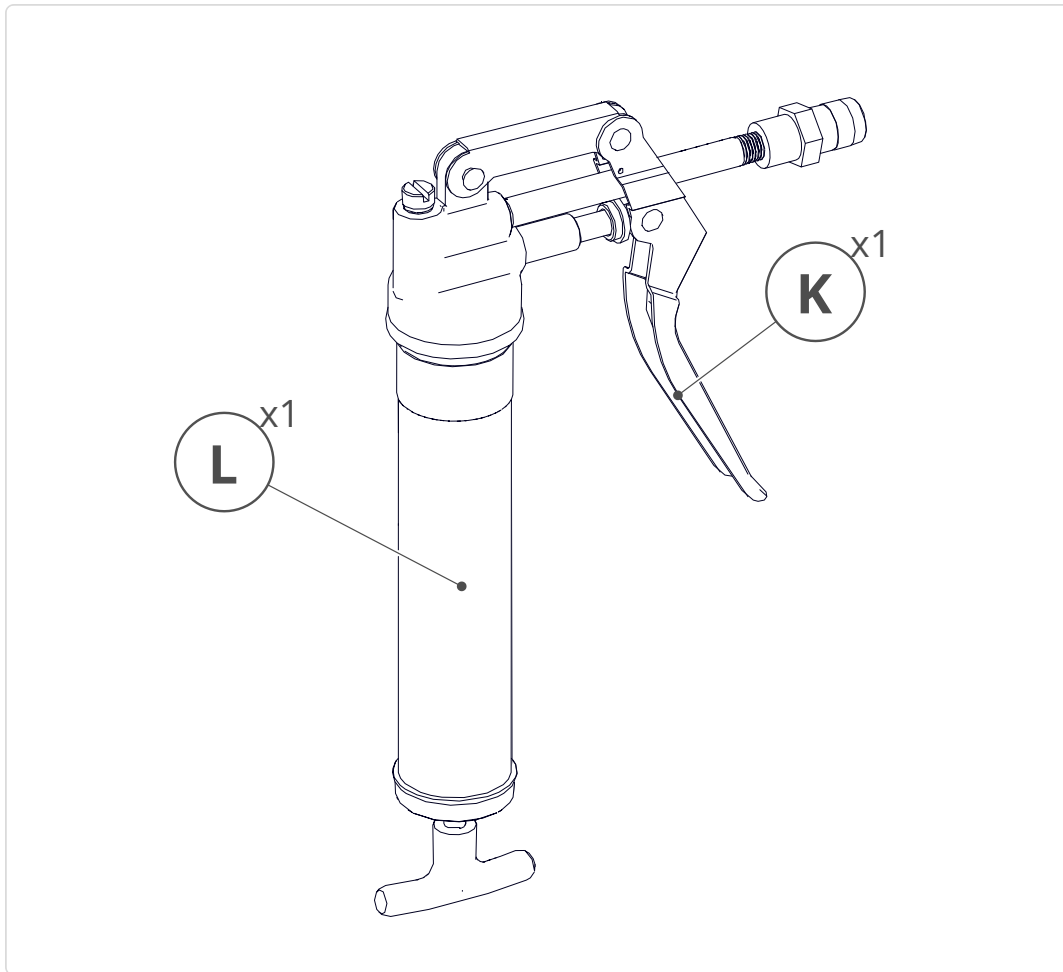
2.1.4.2



1. Alternate tightening the loosened fasteners on either side of the splice, moving in towards the splice as you move the linear bearing block back and forth across the splice.
2. Repeat **this process** at each linear rail splice location.

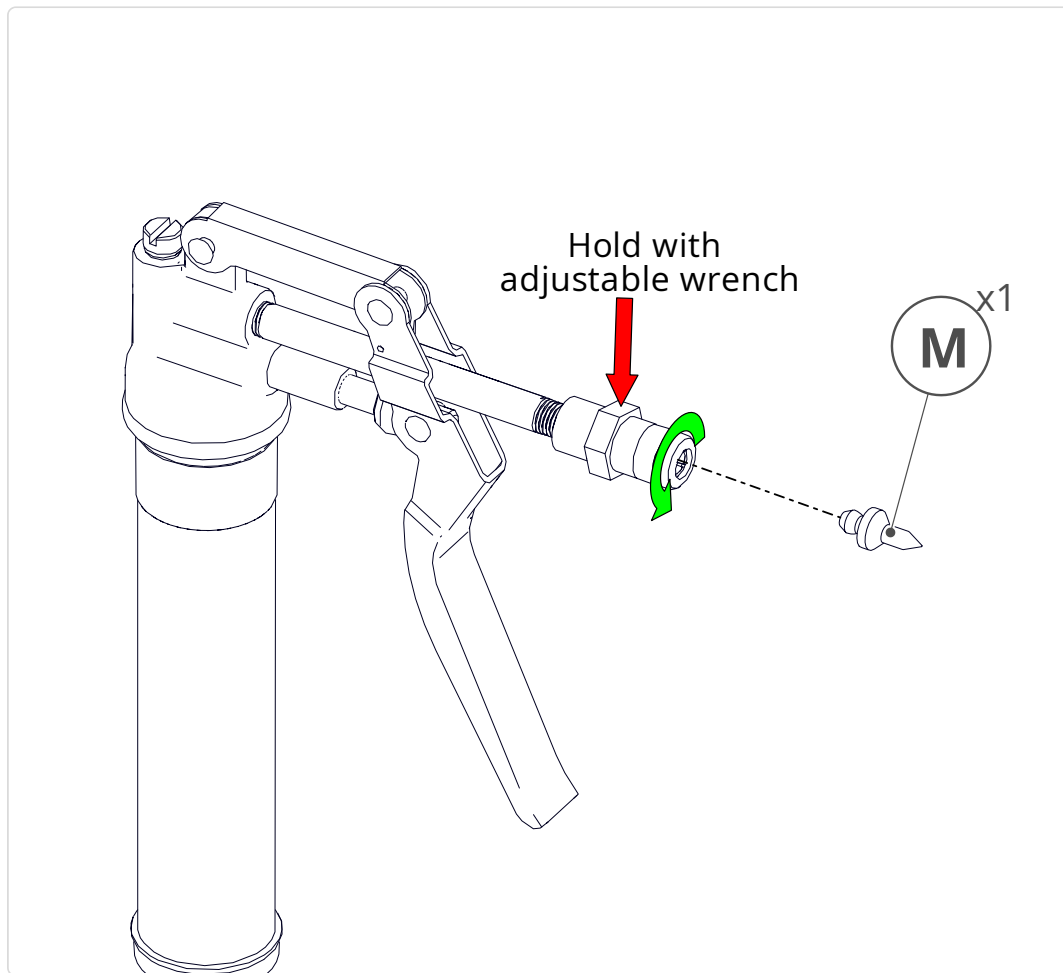
2.1.5 - Linear Bearing Block Greasing

2.1.5.1



1. Assemble the Grease Gun (K) and Tube of Grease (L), following the manufacturer's instructions.

2.1.5.2



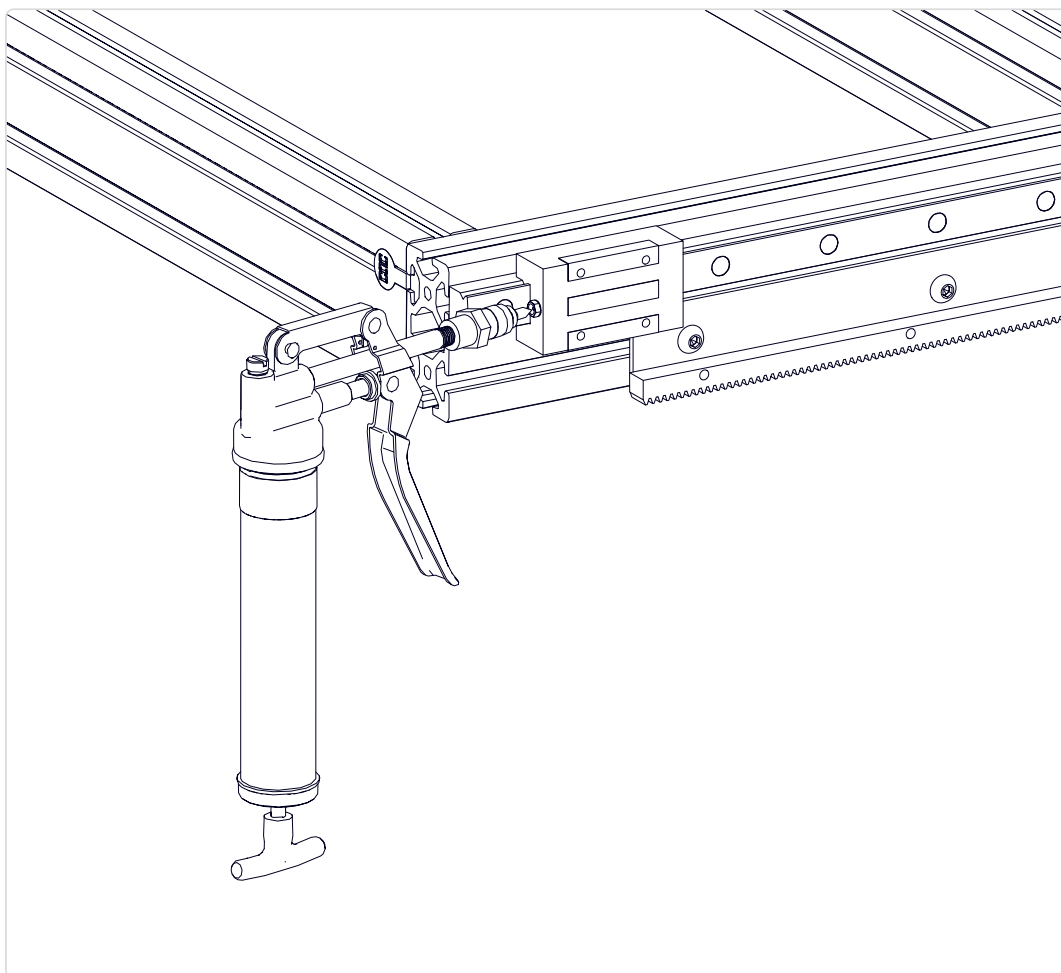
1. Loosen the end cap and install the **Needle Tip Adapter** (M) as shown.



Assembly Note

Be sure to tighten the end cap after installing the needle tip adapter.

2.1.5.3



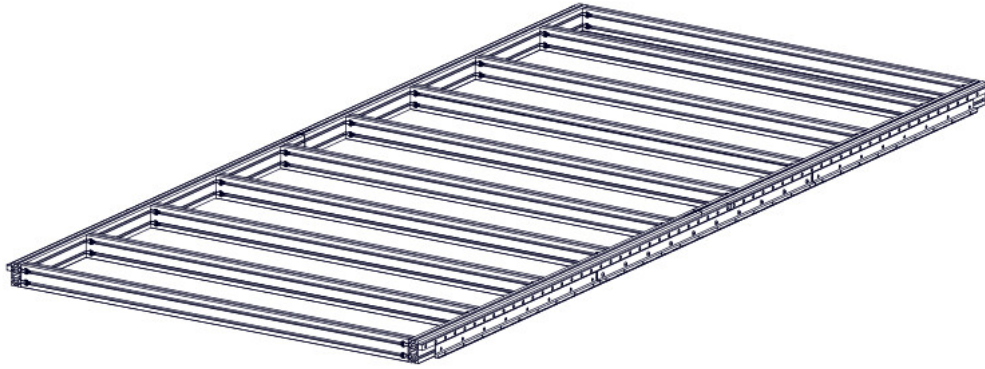
1. Ensure the grease gun is primed prior to use.
2. Lubricate the linear bearing blocks with three pumps per block.



Maintenance Note

The blocks will need to be lubricated periodically. The required interval will depend upon machine use, loads, and ambient conditions. We suggest evaluating each month by cleaning the linear rails, moving the blocks along them, and checking for a lubricant film. If a film is not present, then add one additional pump of grease to your blocks.

2.2 - Gear Rack



Parts List

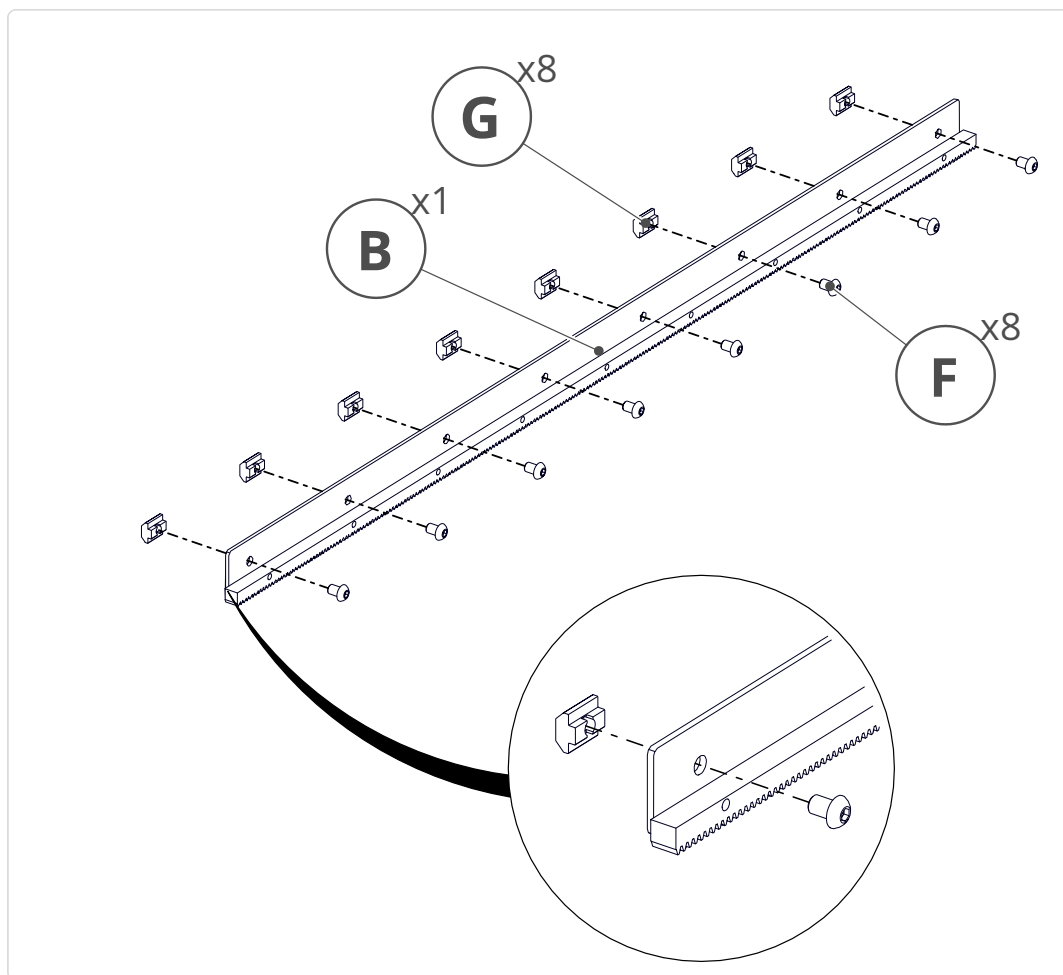
ID	QTY	Part/Description	Package Label
(B)	4	Gear Rack, 990mm (39")	Table Rail Kit
(C)	2	Gear Rack, 1320mm (52")	Table Rail Kit
	4	MGM-39-FAST-40	Base Table Kit
(F)	32	M8 x 12mm Button Head Cap Screw (8 per bag)	MGM-39-FAST-40 >
(G)	32	M8 Slide-in T-Nut (8 per bag)	MGM-39-FAST-40 >
	2	MGM-52-FAST-40	Base Table Kit
(H)	20	M8 x 12mm Button Head Cap Screw (10 per bag)	MGM-52-FAST-40 >
(I)	20	M8 Slide-in T-Nut (10 per bag)	MGM-52-FAST-40 >

Tools List

Requirement	Tool
Required	5mm Ball-End Allen Wrench
Required	Tape Measure
Required	(2) Clamps

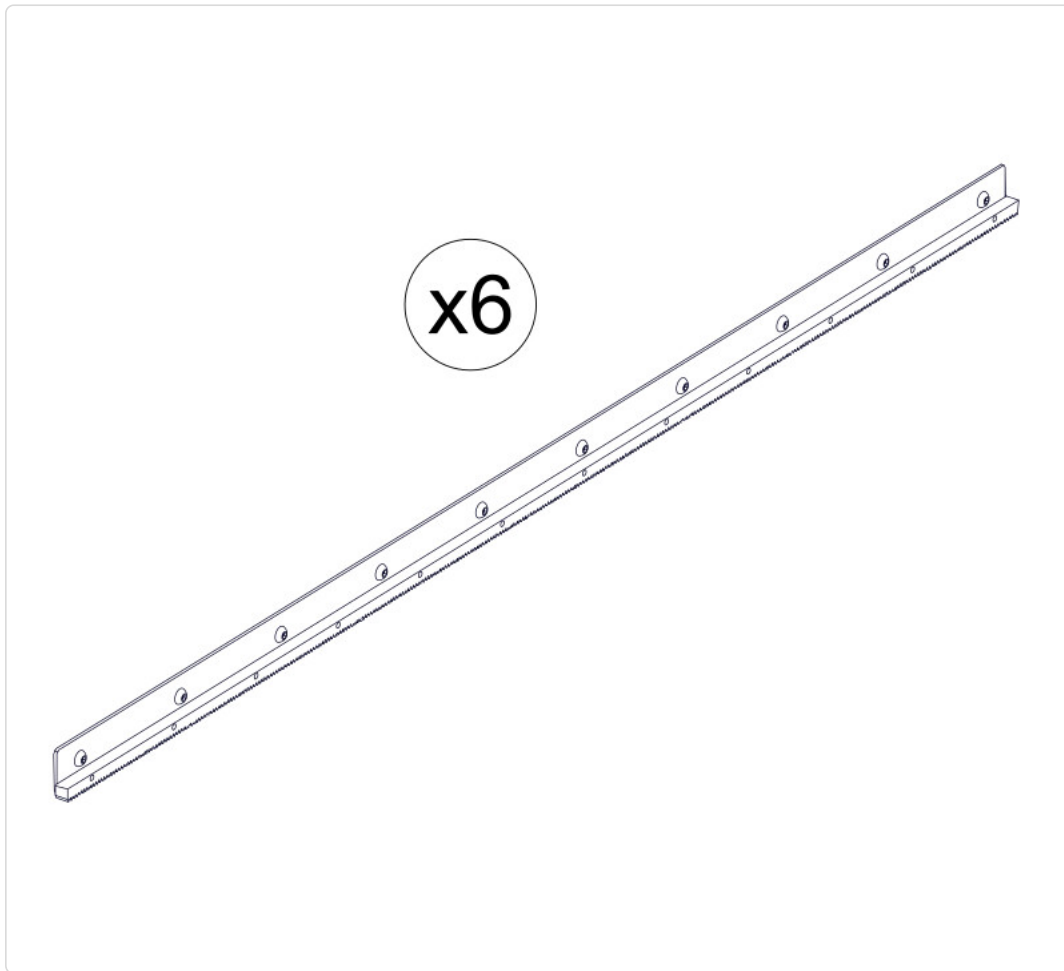
2.2.1 - Gear Rack Assembly

2.2.1.1



1. Partially thread **M8 x 12mm Button Head Cap Screws (F)** onto **M8 Slide-in T-Nuts (G)**, through the **Gear Rack, 990mm (39") (B)**.

2.2.1.2

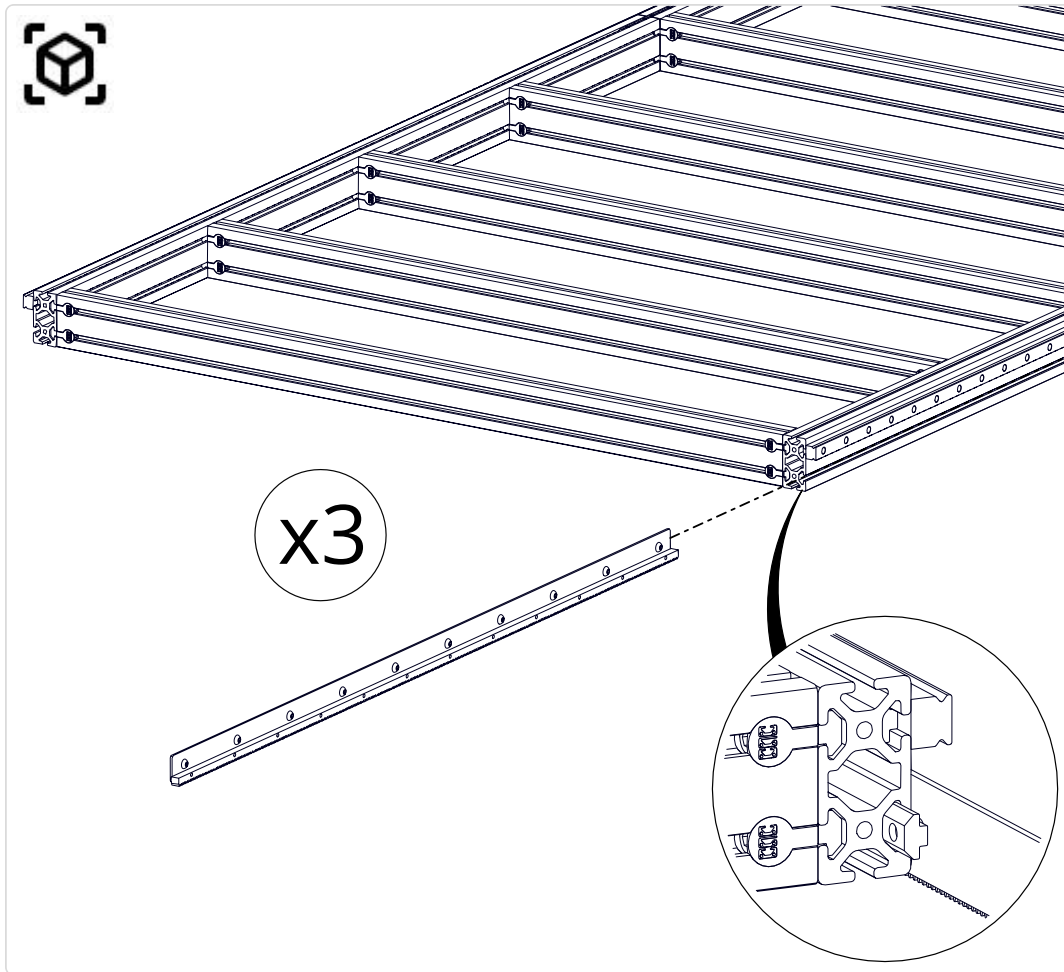


1. Use the procedure in the previous step to assemble the following gear rack sections:

- (4) Gear Rack, 990mm (39") **(B)**
- (2) Gear Rack, 1320mm (52") **(C)**

2.2.2 - Gear Rack Installation

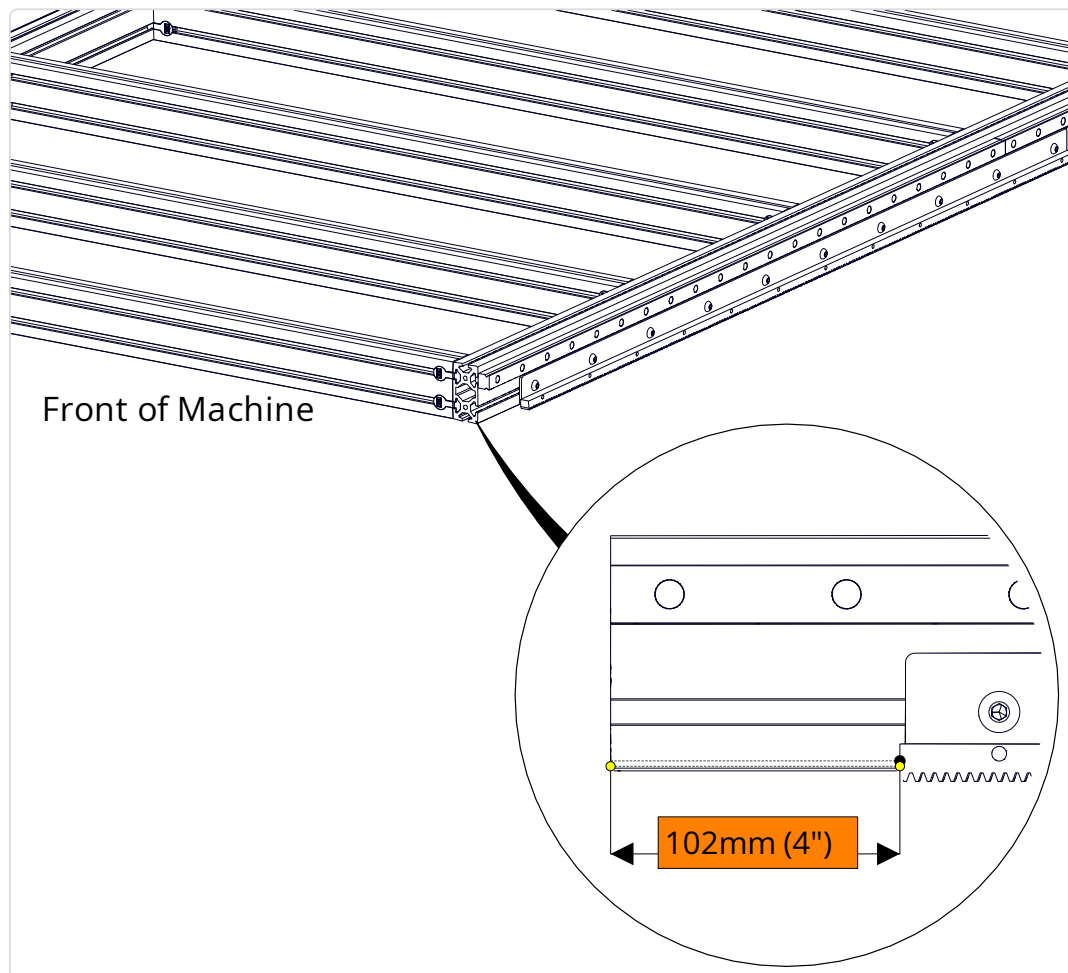
2.2.2.1



1. Slide the following assembled gear rack sections into the lower t-slot of the frame extrusion:

- (2) Gear Rack, 990mm (39") **(B)**
- (1) Gear Rack, 1320mm (52") **(C)**

2.2.2.2



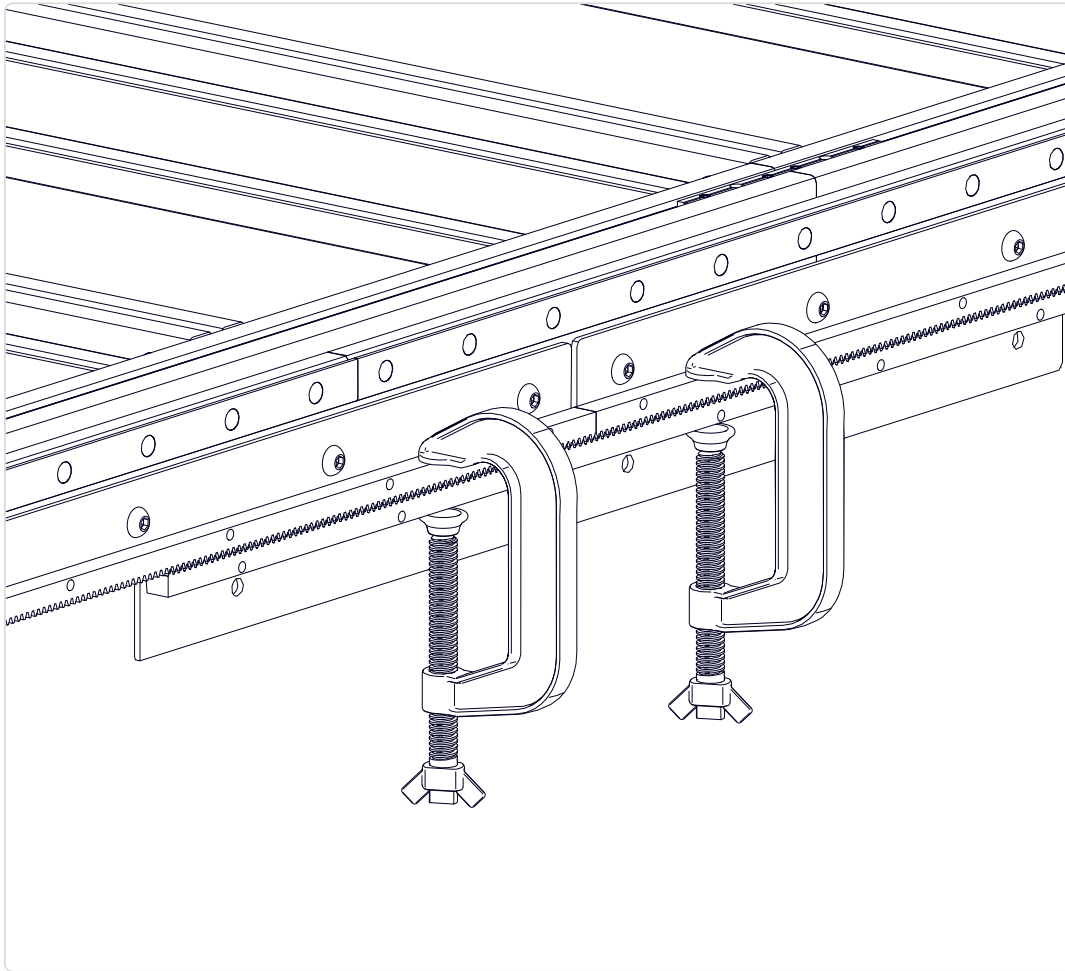
1. Position the gear rack 102mm (4") from the front of the machine.
2. Tighten the gear rack fasteners **ONLY** on the first gear rack section.



Assembly Note

Gear rack may not sit flat against extrusion until fasteners are fully tightened. This will not impact function of the gear rack.

2.2.2.3



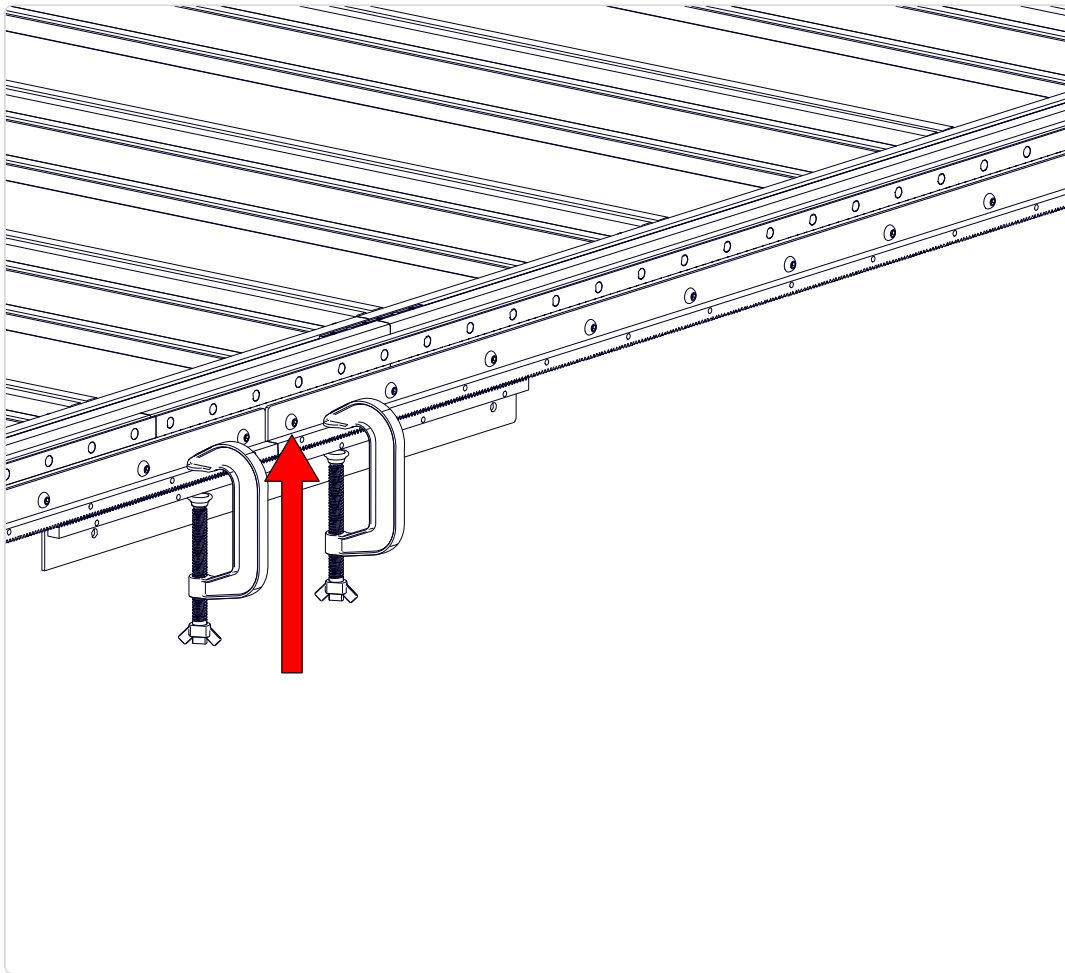
1. Clamp an additional section of gear rack to the first two sections to align the gear rack teeth.



Assembly Note

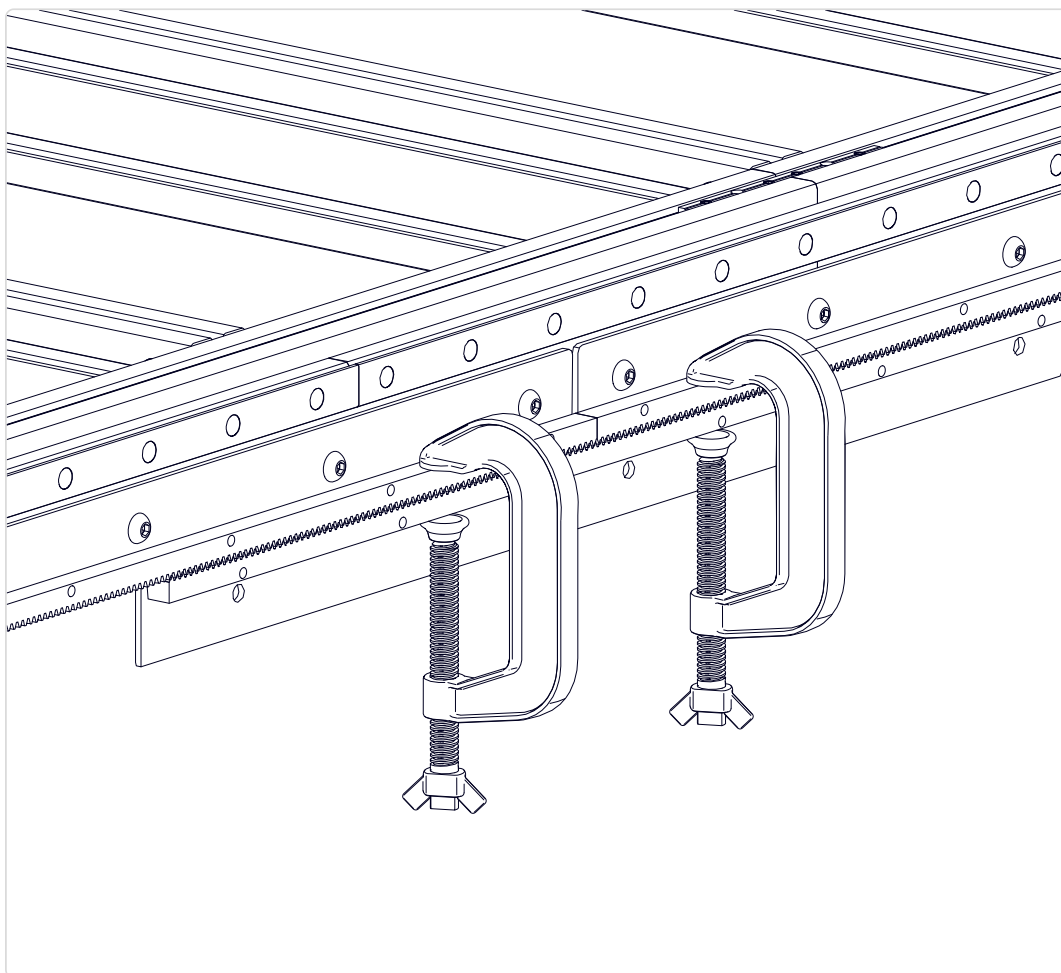
The gear rack for the gantry can be used for this purpose.

2.2.2.4



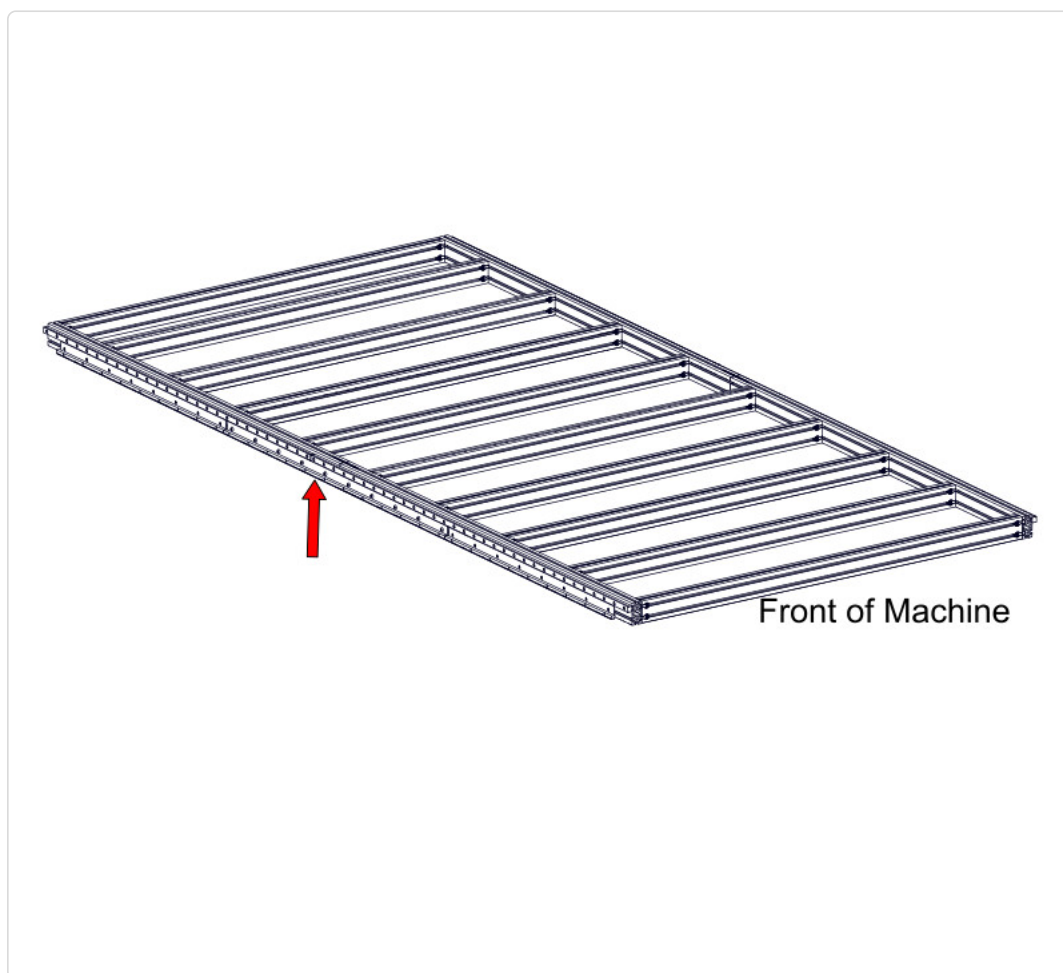
1. Start at the splice location and tighten the fasteners, working towards the opposite end of the gear rack.
2. Remove the clamps.

2.2.2.5



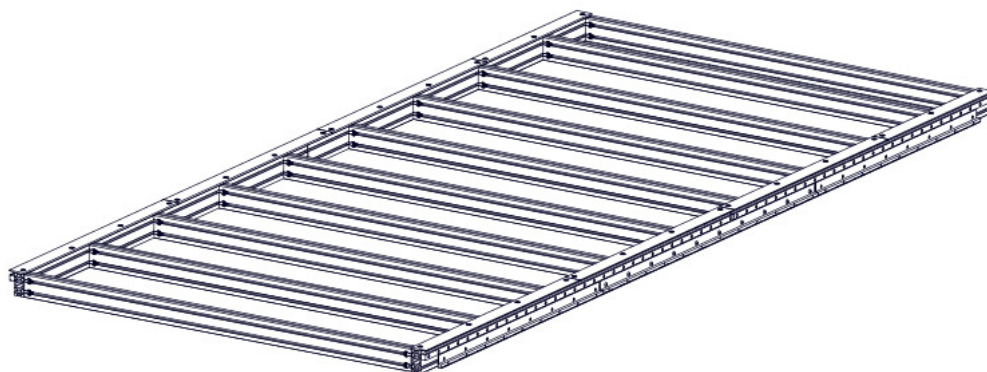
1. Repeat **this process** to align and tighten the remaining gear rack sections.

2.2.2.6



1. Repeat the **gear rack installation procedure** on the other side of the machine.

2.3 - Linear Rail Dust Covers



Parts List

ID	QTY	Part/Description	Package Label
(A)	6	Linear Rail Dust Cover, 950mm (37-3/8")	Dust Cover Kit
(B)	2	Linear Rail Dust Cover, 650mm (25-5/8")	Dust Cover Kit
	1	CRP814-00-120-FAST	Dust Cover Kit
(D)	30	M8 x 16mm Flat Head Screw	CRP814-00-120-FAST >
(E)	30	M8 Roll-in T-Nut	CRP814-00-120-FAST >

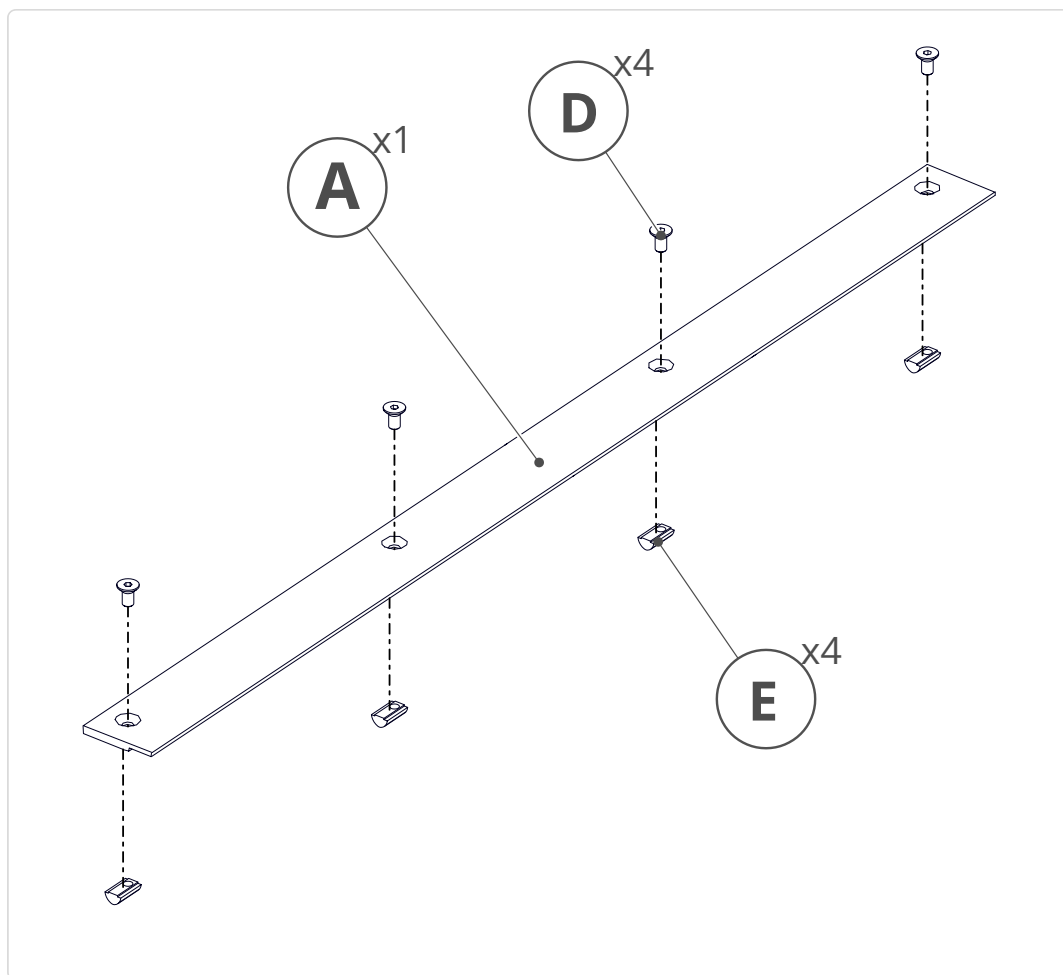
Tools List

Requirement	Tool
Required	5mm Allen Wrench



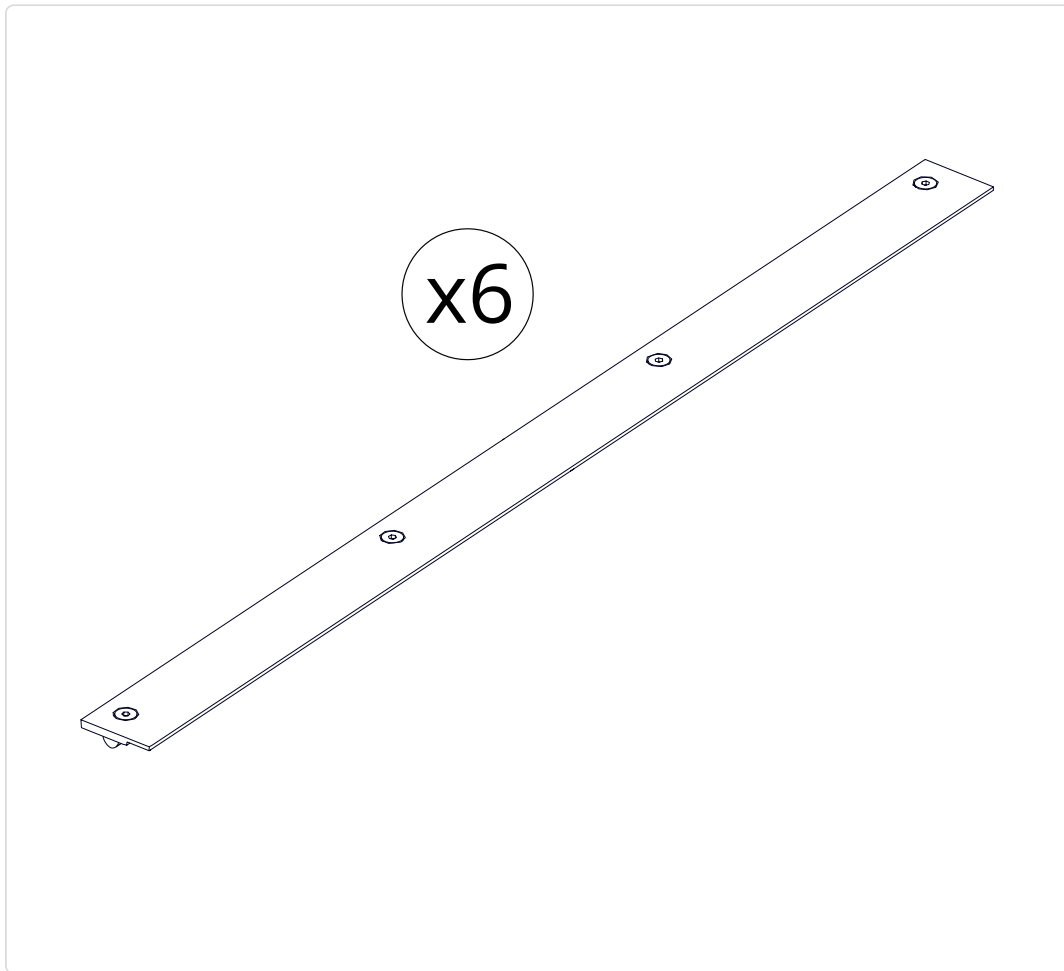
2.3.1 - Dust Cover Assembly

2.3.1.1



1. Partially thread **M8 x 16mm Flat Head Screws** (D) onto **M8 Roll-in T-Nuts** (E), through a **Linear Rail Dust Cover, 950mm (37-3/8")** (A).

2.3.1.2

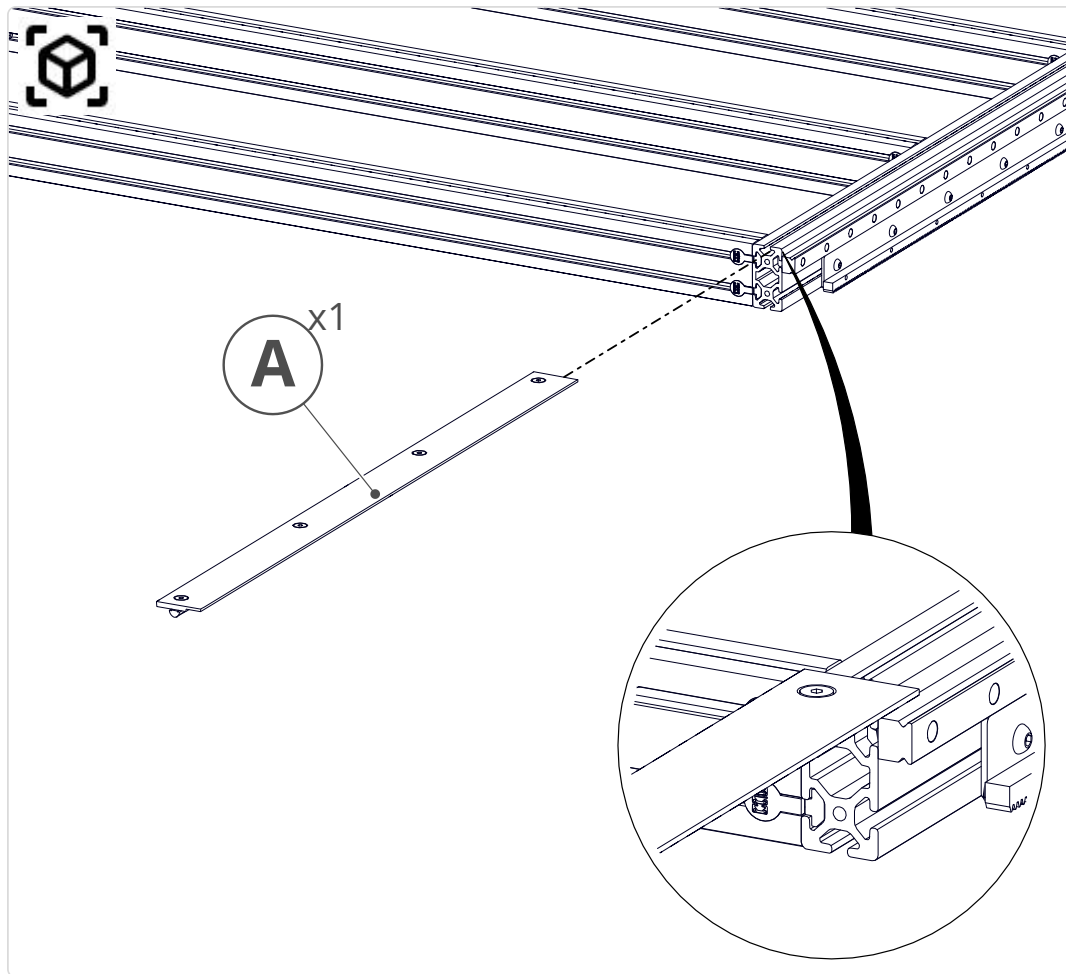


1. Use the procedure in the previous step to assemble the following dust covers:

- (4) Linear Rail Dust Cover, 950mm (37-3/8") **(A)**
- (2) Linear Rail Dust Cover, 650mm (25-5/8") **(B)**

2.3.2 - Dust Cover Installation

2.3.2.1



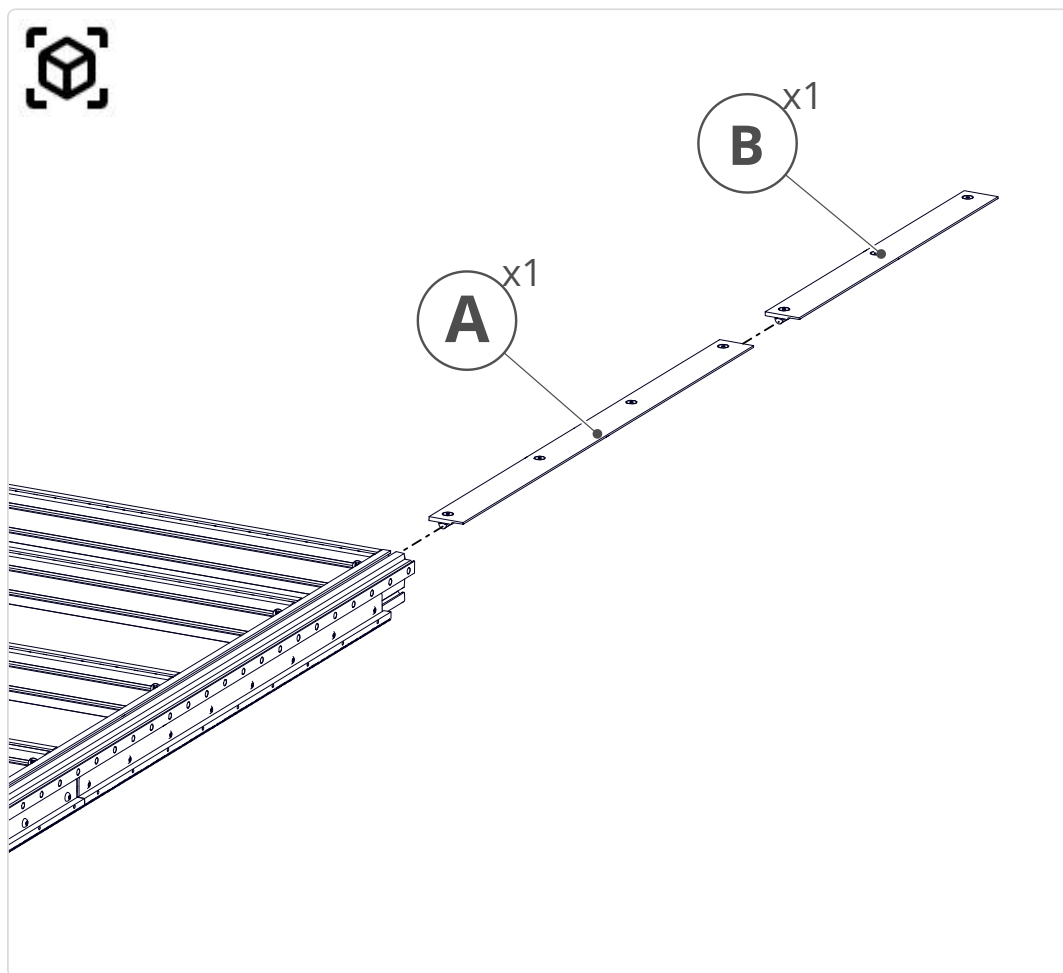
1. From the front of the machine, slide an assembled **Linear Rail Dust Cover, 950mm (37-3/8")** (A) into the top t-slot of the frame extrusion.



Assembly Note

Ensure the linear rail dust cover is oriented so it overhangs the linear rail.

2.3.2.2



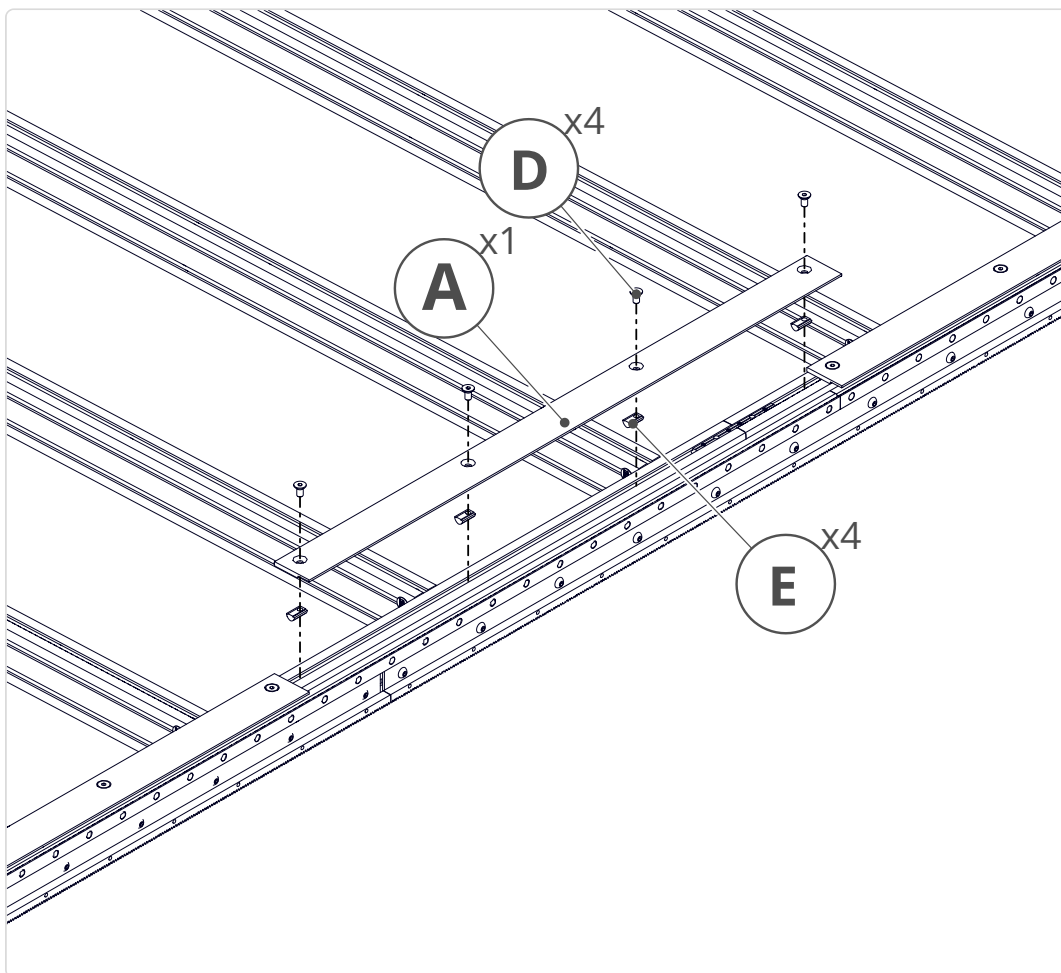
1. From the back of the machine, slide an assembled **Linear Rail Dust Cover, 950mm (37-3/8")** (A) and **Linear Rail Dust Cover, 650mm (25-5/8")** (B) into the top t-slot of the frame extrusion.



Assembly Note

If your machine is located in a space that does not allow the dust covers to be installed from the back of the machine, they can be directly installed onto the extrusion as shown in the next step.

2.3.2.3



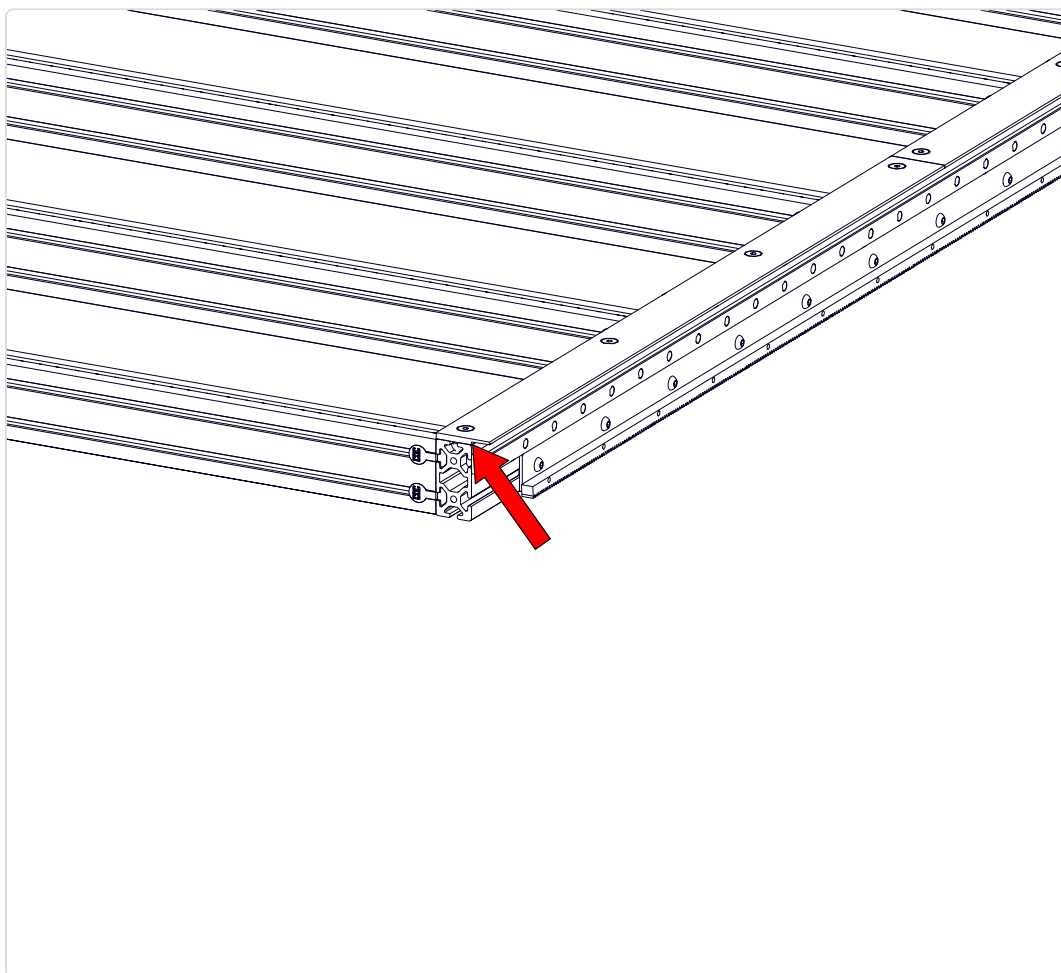
1. Attach a **Linear Rail Dust Cover, 950mm (37-3/8")** (A) to the frame extrusion using **M8 x 16mm Flat Head Screws** (D) and **M8 Roll-in T-Nuts** (E).



Assembly Note

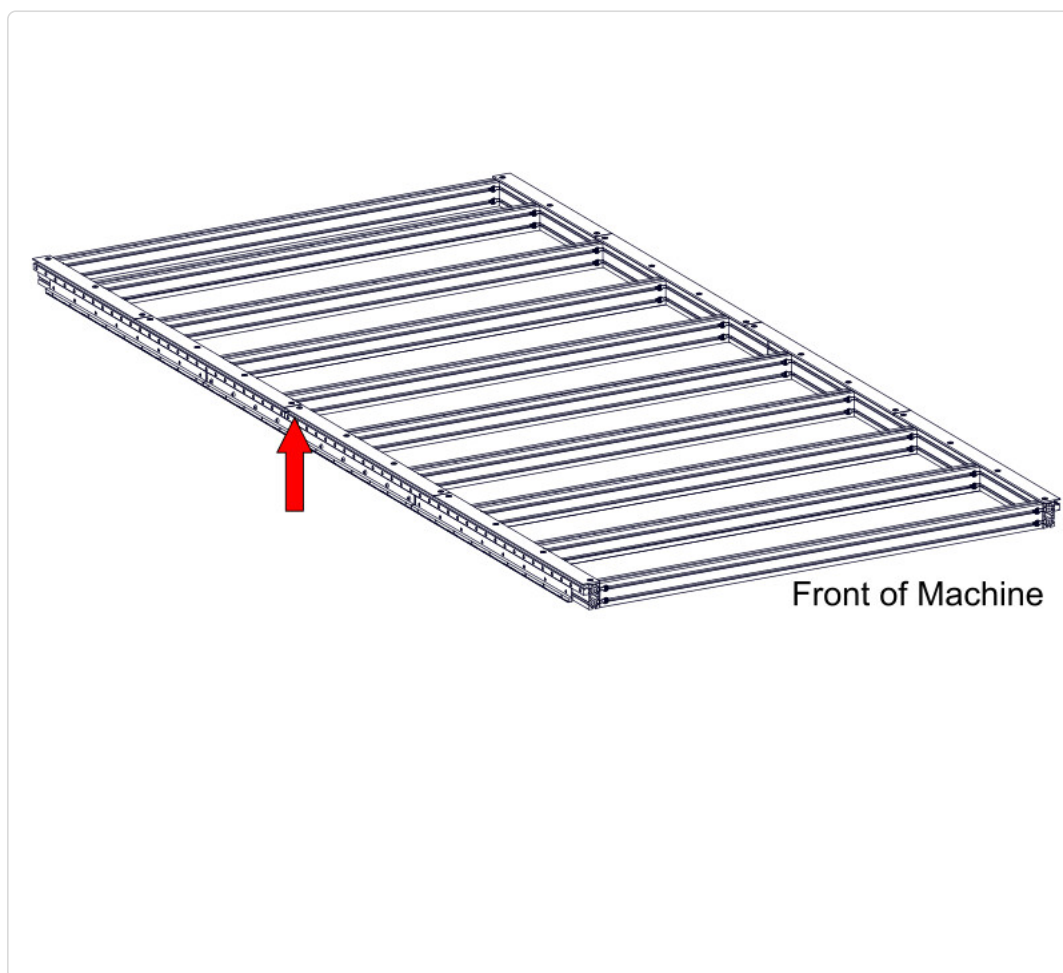
Linear rail dust cover fasteners may be omitted at extrusion splice bar locations.

2.3.2.4



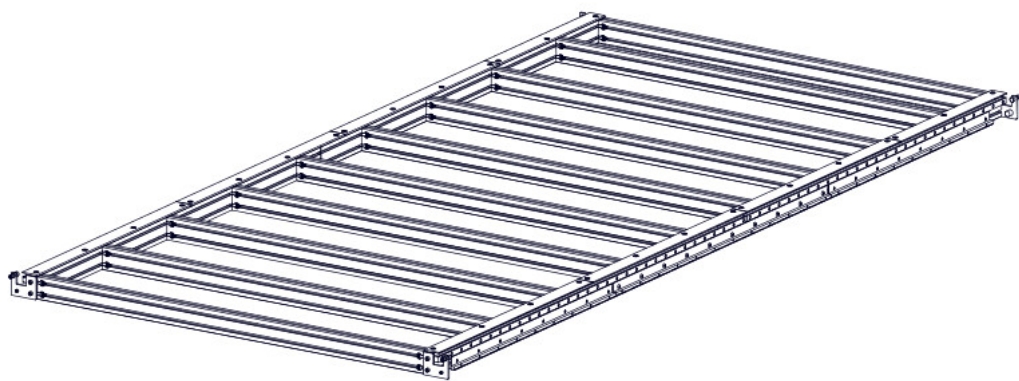
1. Position the dust covers flush with the front edge of the frame extrusion.
2. Fully tighten the dust cover fasteners.

2.3.2.5



1. Repeat **this process** to install dust covers on the other side of the machine.

2.4 - Table Bumpers



Parts List

ID	QTY	Part/Description	Package Label
	1	CRP812-00-01-19.1 PRO Table Axis Bumper Kit	Base Table Kit
(A)	4	CRP812-05 Bumper Plate	CRP812-00-01-19.1 >
(B)	4	Rubber Bumper	CRP812-00-01-19.1 >
(C)	4	M6 x 20mm Socket Head Cap Screw	CRP812-00-01-19.1 >
(D)	8	M8 x 20mm Socket Head Cap Screw	CRP812-00-01-19.1 >
(E)	3	M8 x 30mm Fine Pitch Socket Head Cap Screw	CRP812-00-01-19.1 >
(F)	3	M8 Fine Pitch Hex Jam Nut	CRP812-00-01-19.1 >
(G)	3	CRP812-02 Sensor Flag	CRP812-00-01-19.1 >

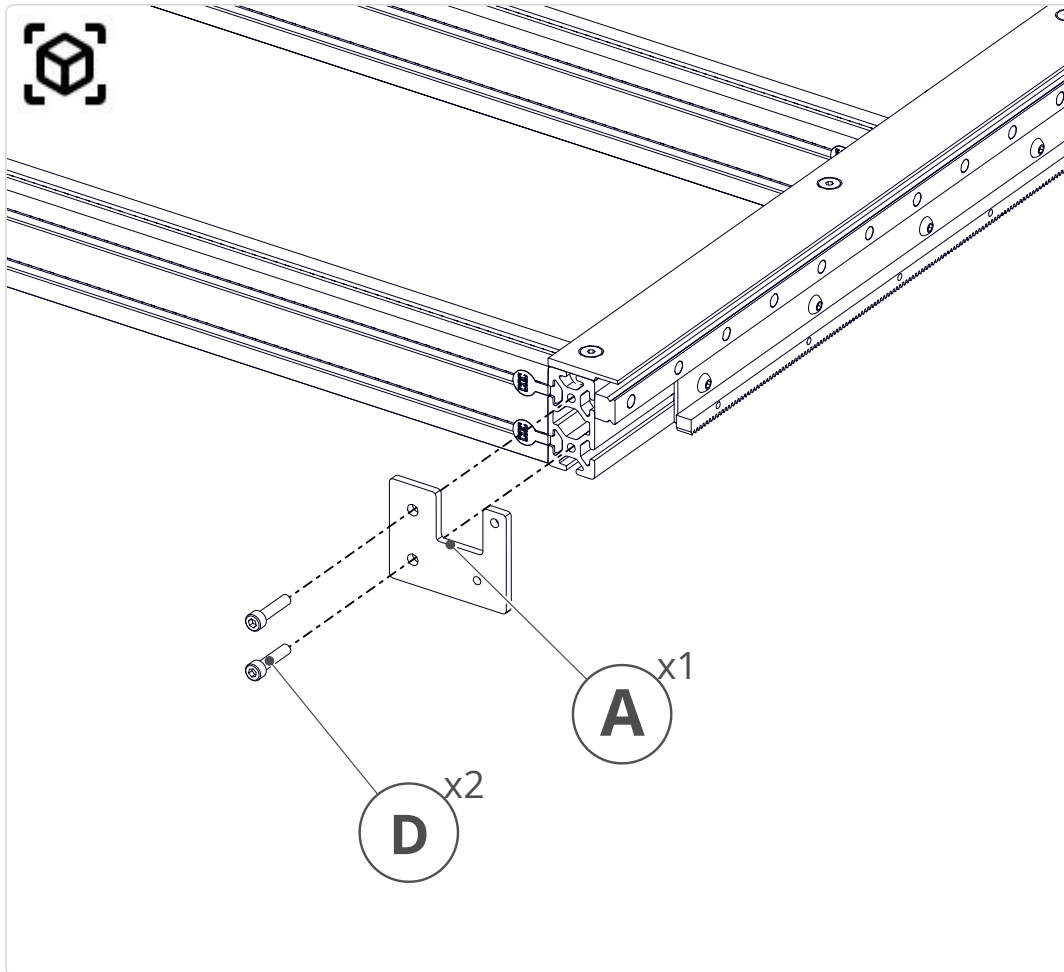
Tools List

Requirement	Tool
Required	5mm Allen Wrench
Required	6mm Allen Wrench
Required	Adjustable Wrench



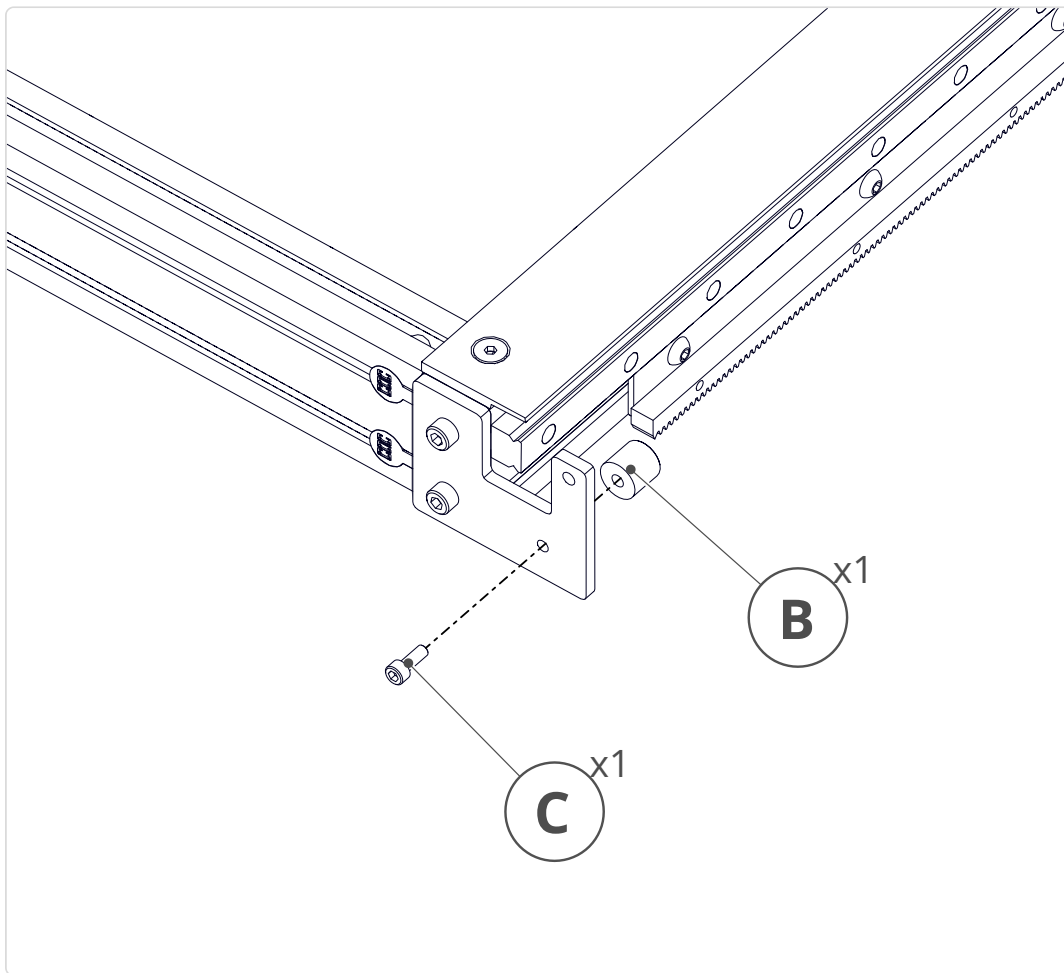
2.4.1 - Bumper Installation

2.4.1.1



1. At the front of the machine, attach a **CRP812-05 Bumper Plate** (A) to the frame extrusion using **M8 x 20mm Socket Head Cap Screws** (D).

2.4.1.2



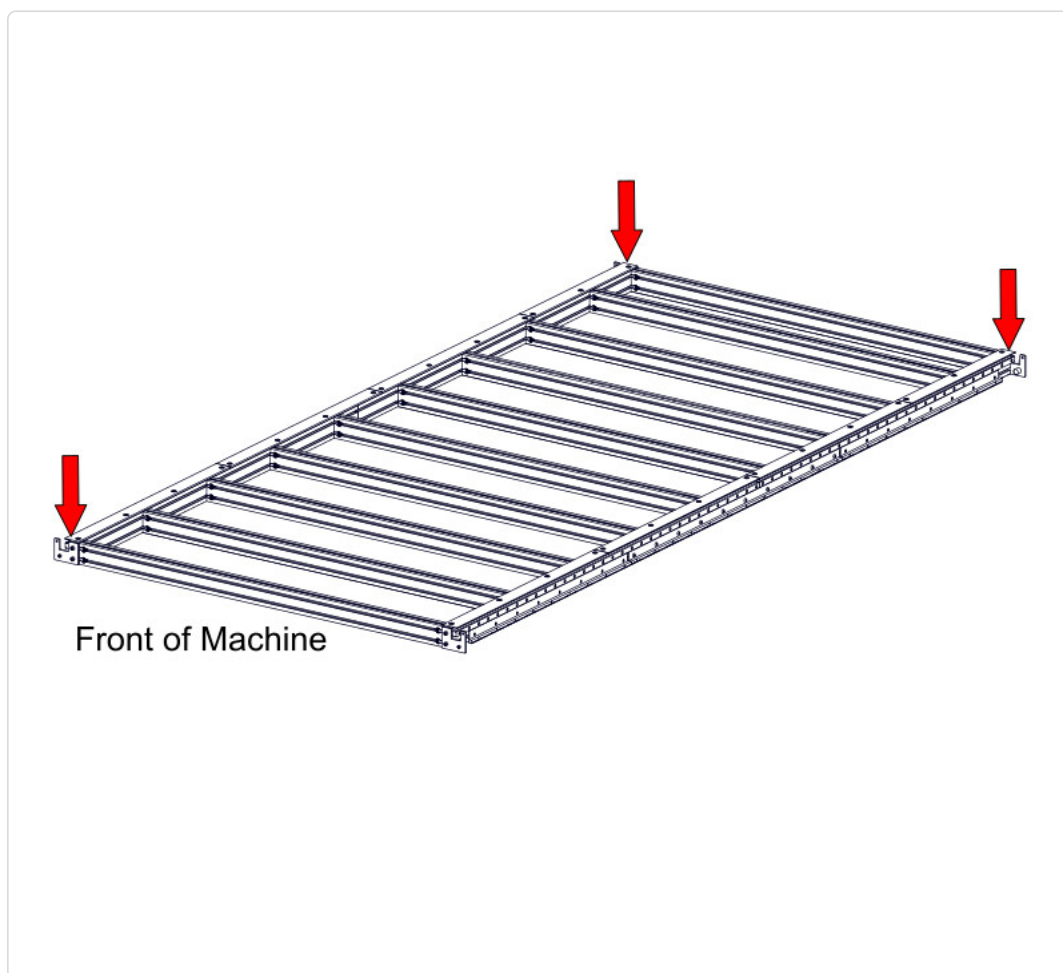
1. Attach a **Rubber Bumper (B)** to the bumper plate using an **M6 x 20mm Socket Head Cap Screw (C)**.



Assembly Note

Fully tighten the rubber bumper until it is seated against the bumper plate.

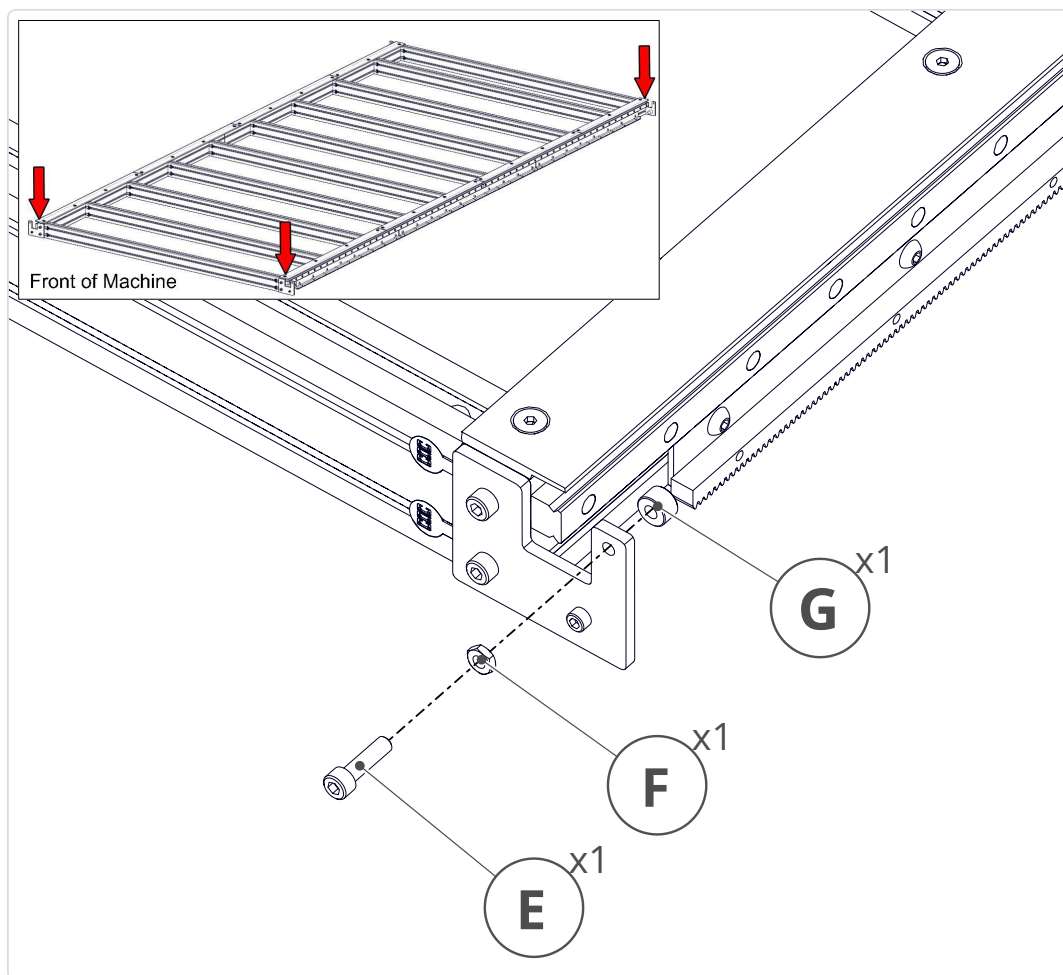
2.4.1.3



1. Repeat the **previous two steps** to install bumper plates and bumpers at the remaining corners of the machine.

2.4.2 - Sensor Flag Installation

2.4.2.1



1. At the three indicated locations, assemble a **CRP812-02 Sensor Flag** (G) on the bumper plate using an **M8 x 30mm Fine Pitch Socket Head Cap Screw** (E) and **M8 Fine Pitch Hex Jam Nut** (F).



Assembly Note

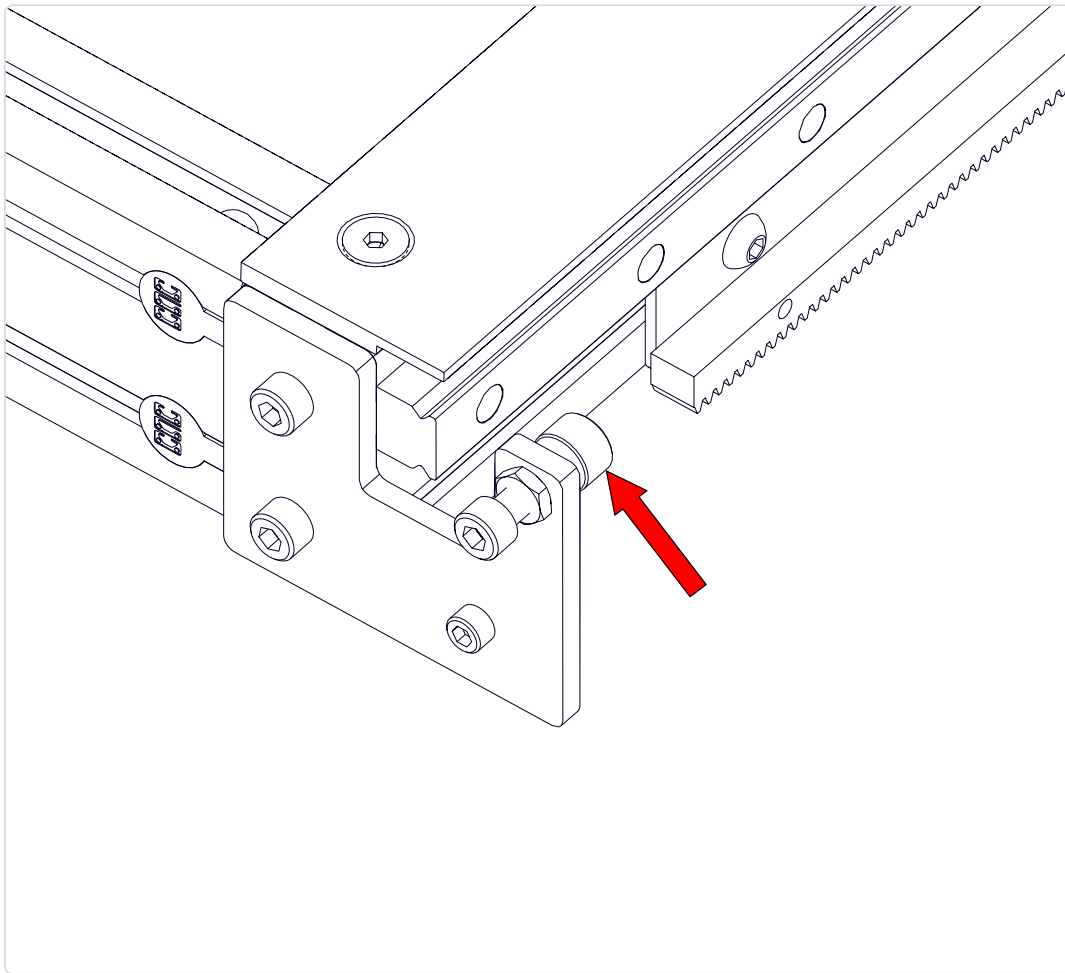
Use Blue Loctite on the threads of the sensor flag.



Alternate Cable Track Location

If locating the table cable track on the left side of the machine, the Back sensor flag should be located on the left side of the machine.

2.4.2.2



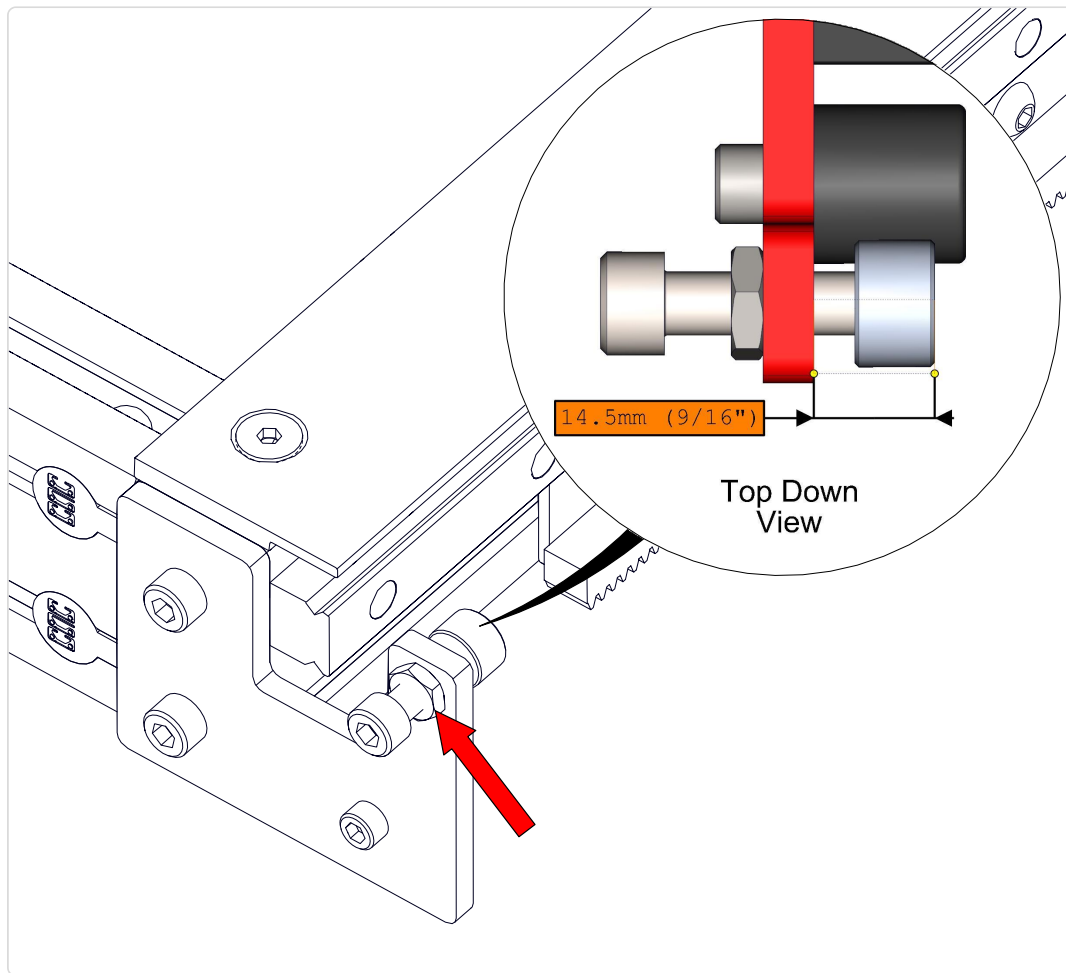
1. Fully tighten the sensor flag on the M8 fine pitch screw.



Assembly Note

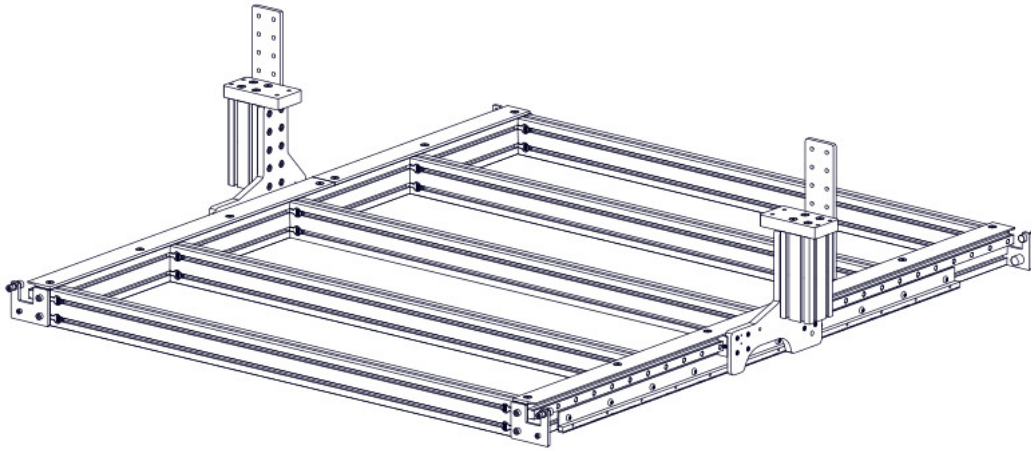
Use Blue Loctite on the threads of the sensor flag.

2.4.2.3

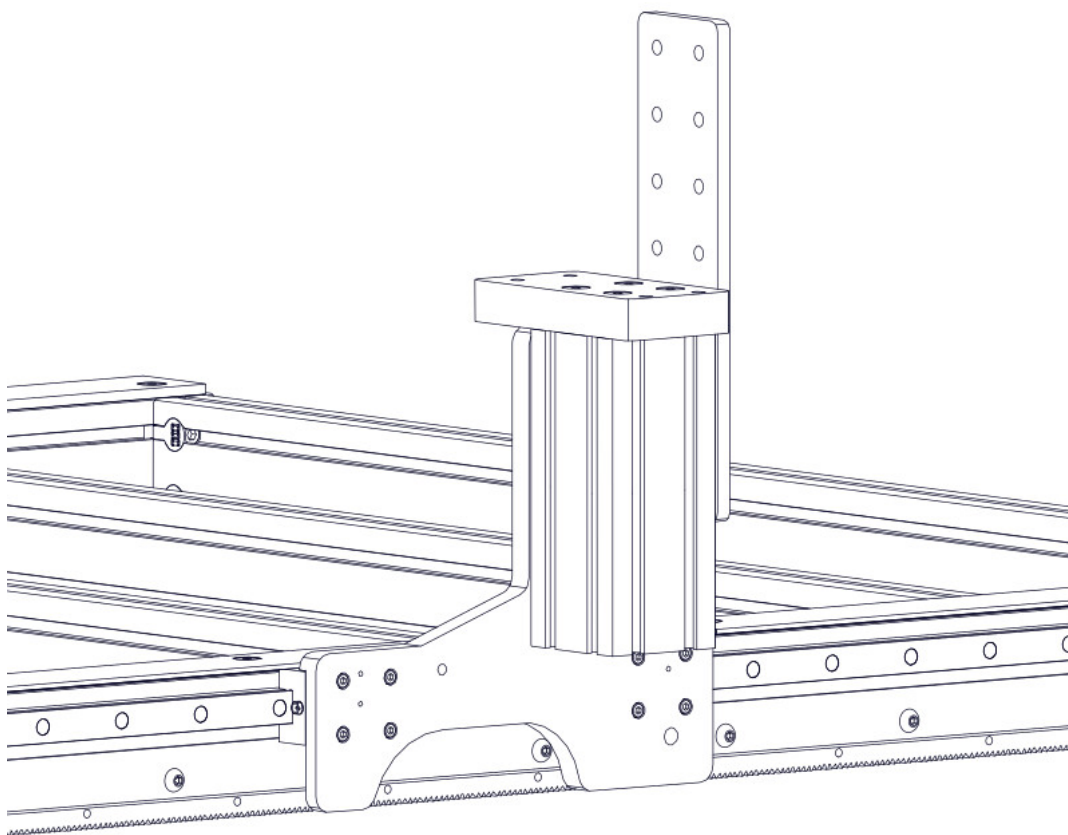


1. Adjust the M8 screw until the end of the sensor flag is 14.5mm (9/16") from the bumper plate.
2. Tighten the jam nut against the bumper plate.

3. Risers



3.1 - Riser Installation



Parts List

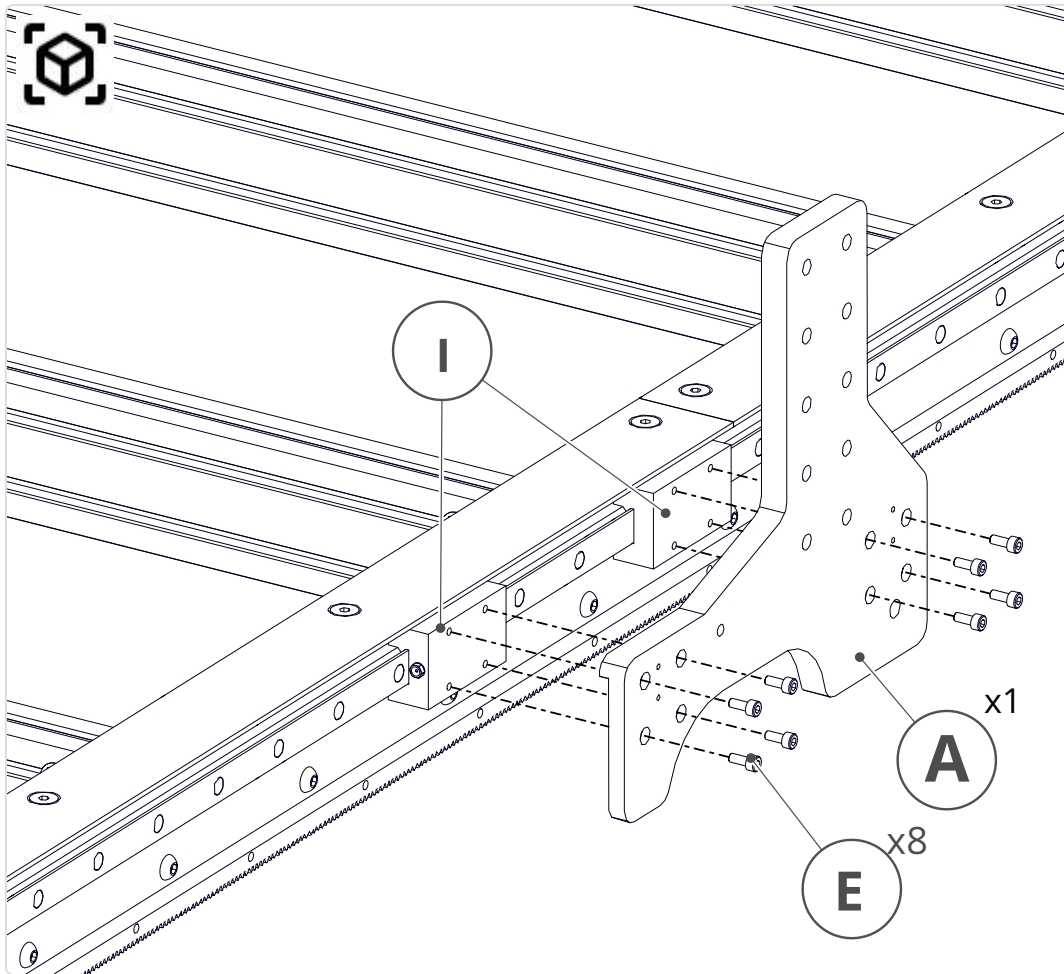
ID	QTY	Part/Description	Package Label
(A)	2	CRP820-01 Riser Plate	Gantry Assembly Kit
(B)	2	8080 Riser Extrusion, 190mm (7-1/2")	Gantry Assembly Kit
(C)	2	CRP820-02 Gantry Interface Plate	Gantry Assembly Kit
(D)	2	CRP820-10 Joining Plate	Gantry Assembly Kit
	1	CRP820-00-FAST	Gantry Assembly Kit
(E)	16	M5 x 10mm Socket Head Cap Screw	CRP820-00-FAST >
(F)	32	M8 x 20mm Socket Head Cap Screw	CRP820-00-FAST >
(G)	32	M8 Roll-in T-Nut	CRP820-00-FAST >
(H)	8	M8 x 35mm Flat Head Screw	CRP820-00-FAST >
<i>Remaining parts from CRP820-00-FAST used in future section</i>			

Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	5mm Allen Wrench
Required	6mm Allen Wrench
Required	Tape Measure

3.1.1 - Riser Plate

3.1.1.1

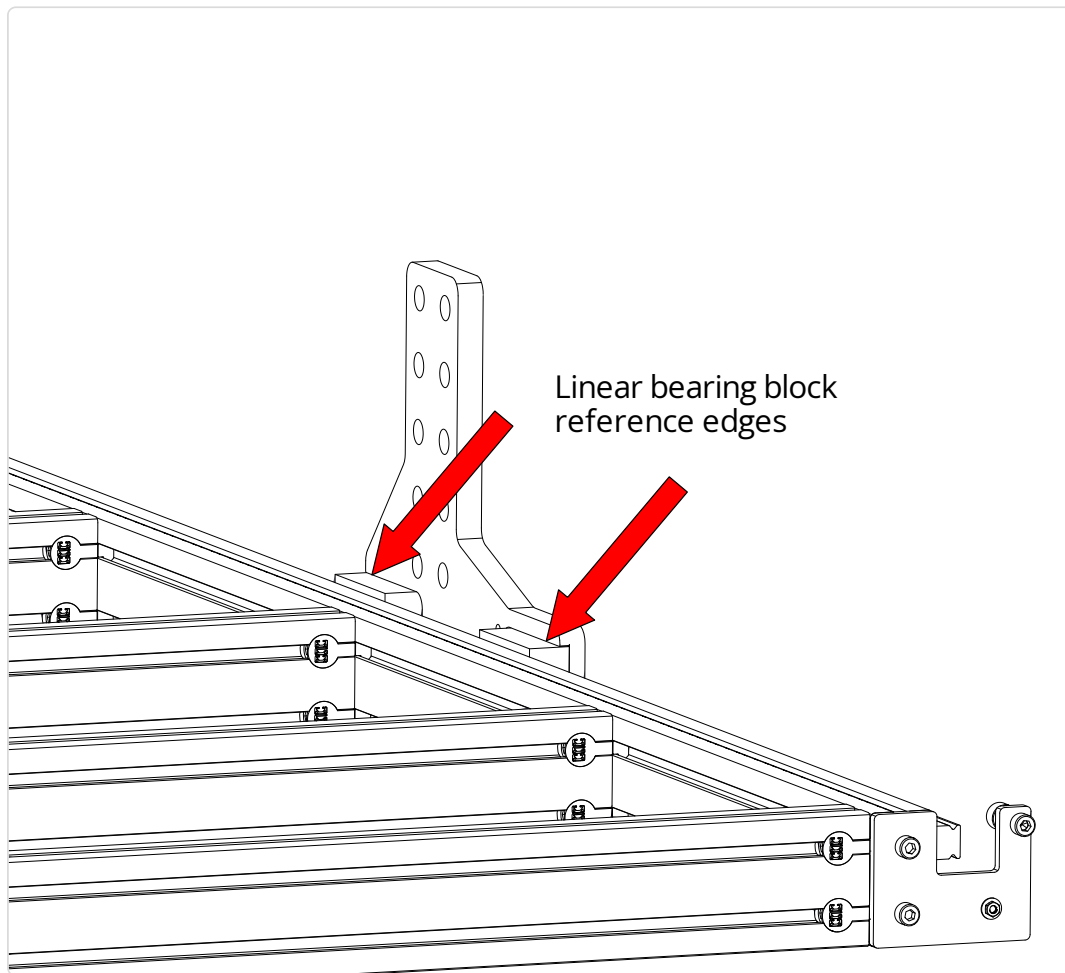


1. Install a **CRP820-01 Riser Plate (A)** onto the **Linear Bearing Blocks (I)** using **M5 x 10mm Socket Head Cap Screws (E)**. Partially tighten the fasteners.

Assembly Note

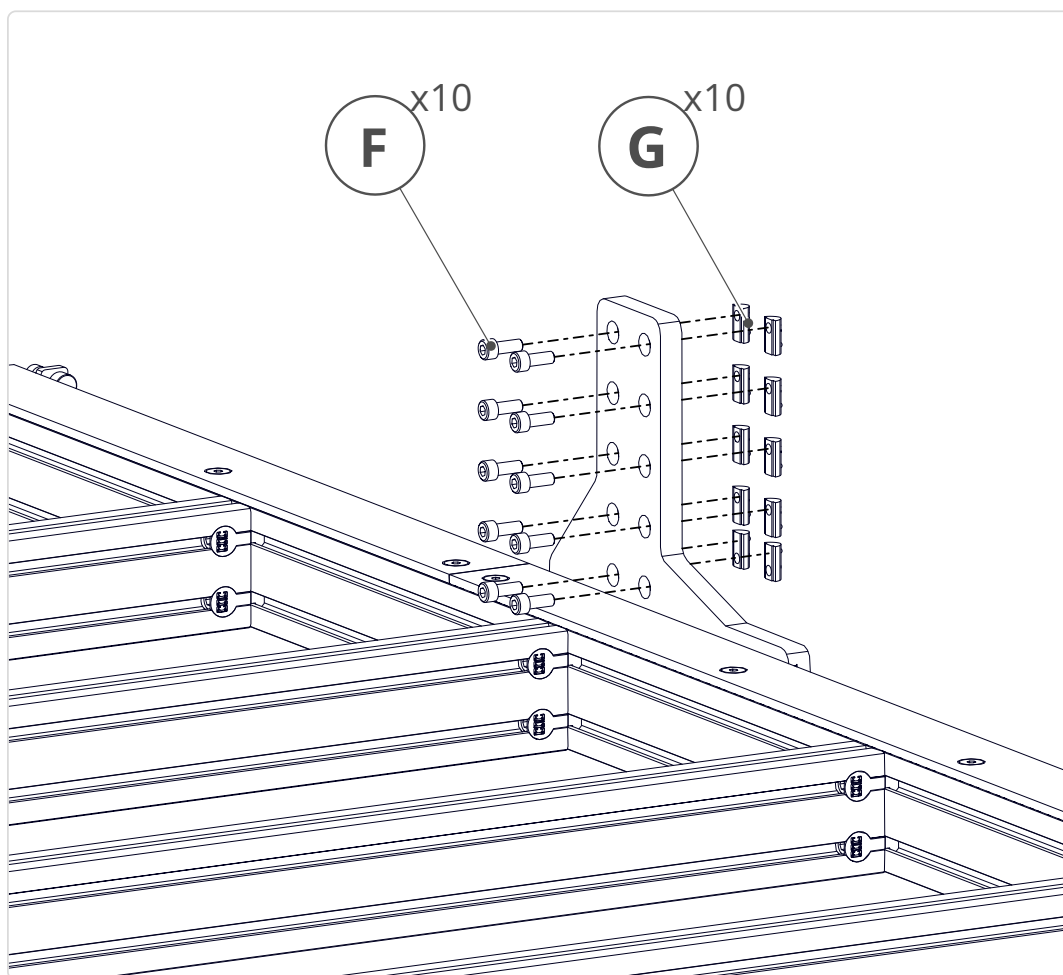
The riser plates come as a pair, with a left and right configuration. Refer to the images to ensure the correct one is used.

3.1.1.2



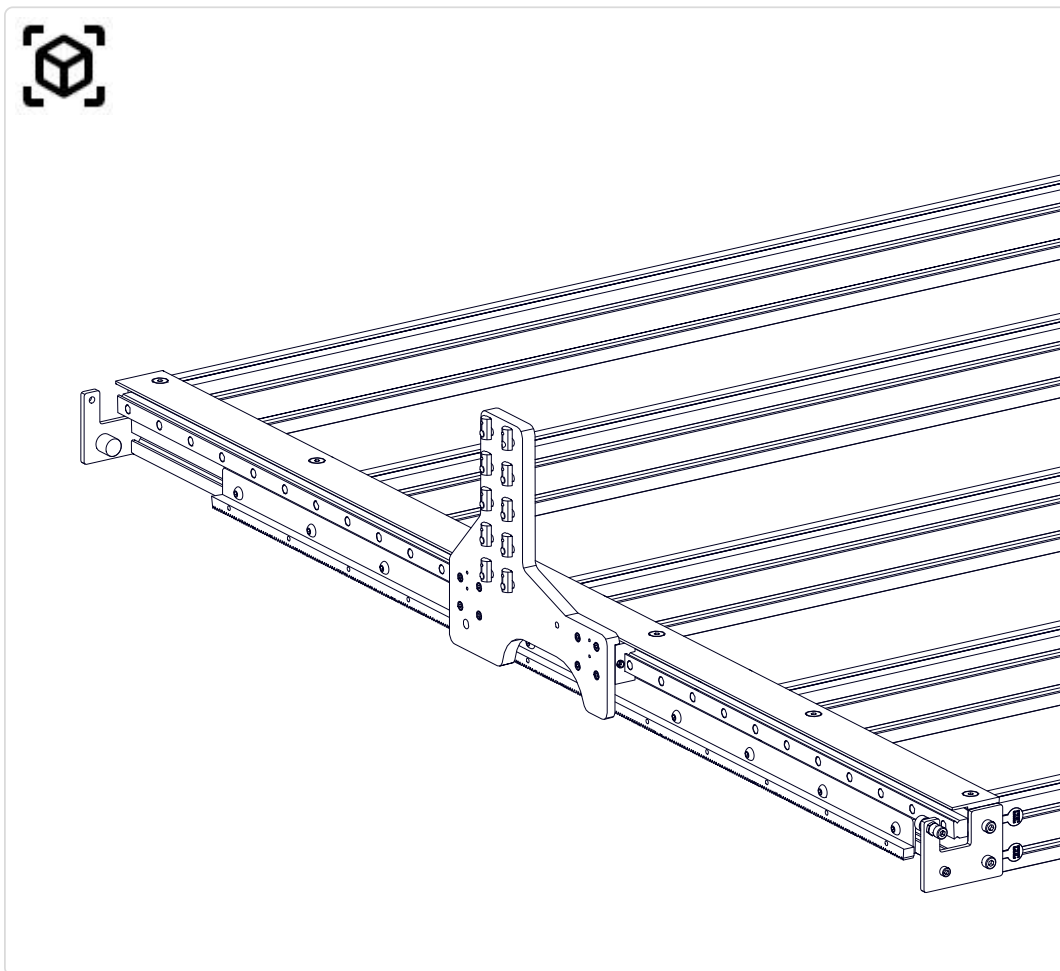
1. Ensure the riser plate sits flush on the linear bearing block reference edges.
2. Fully tighten the fasteners.

3.1.1.3



1. Partially thread **M8 Roll-in T-Nuts (G)** onto the riser plate using **M8 x 20mm Socket Head Cap Screws (F)** as indicated.

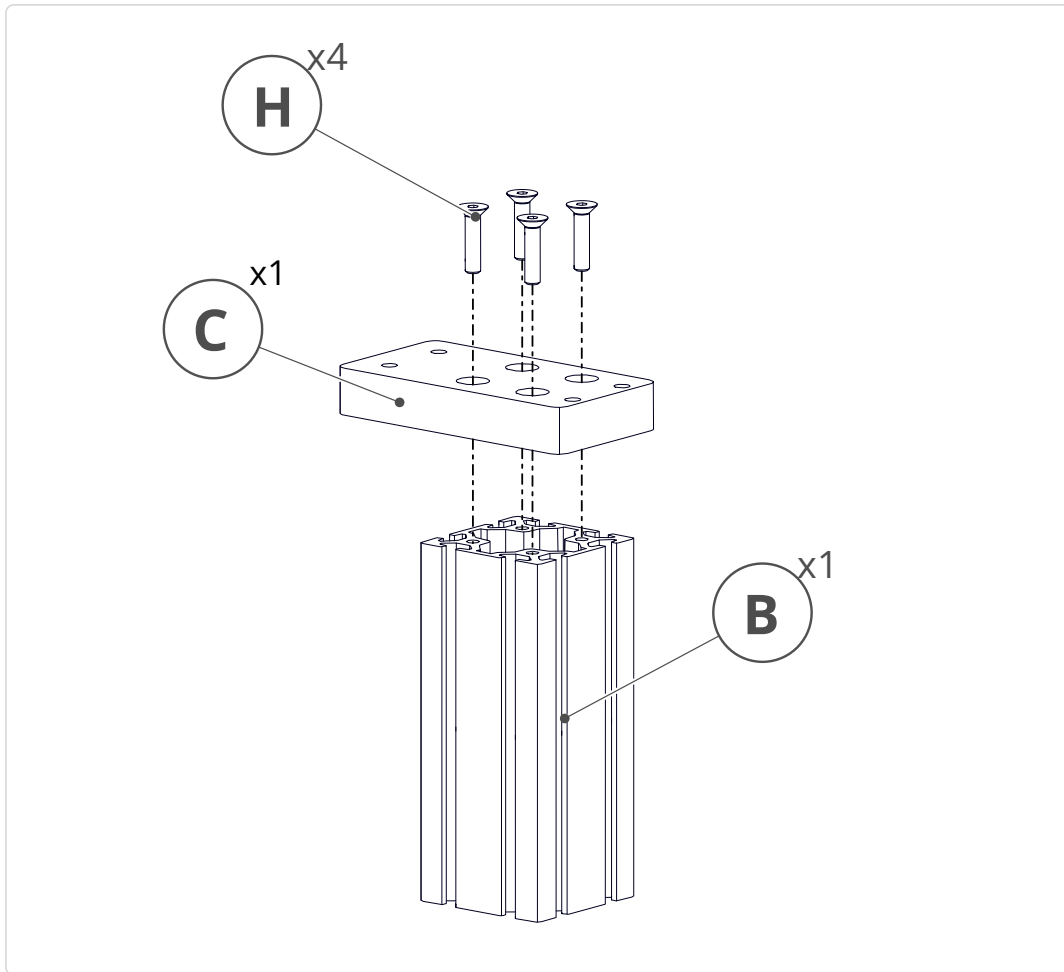
3.1.1.4



1. Repeat **this process** to install a riser plate on the other side of the machine.

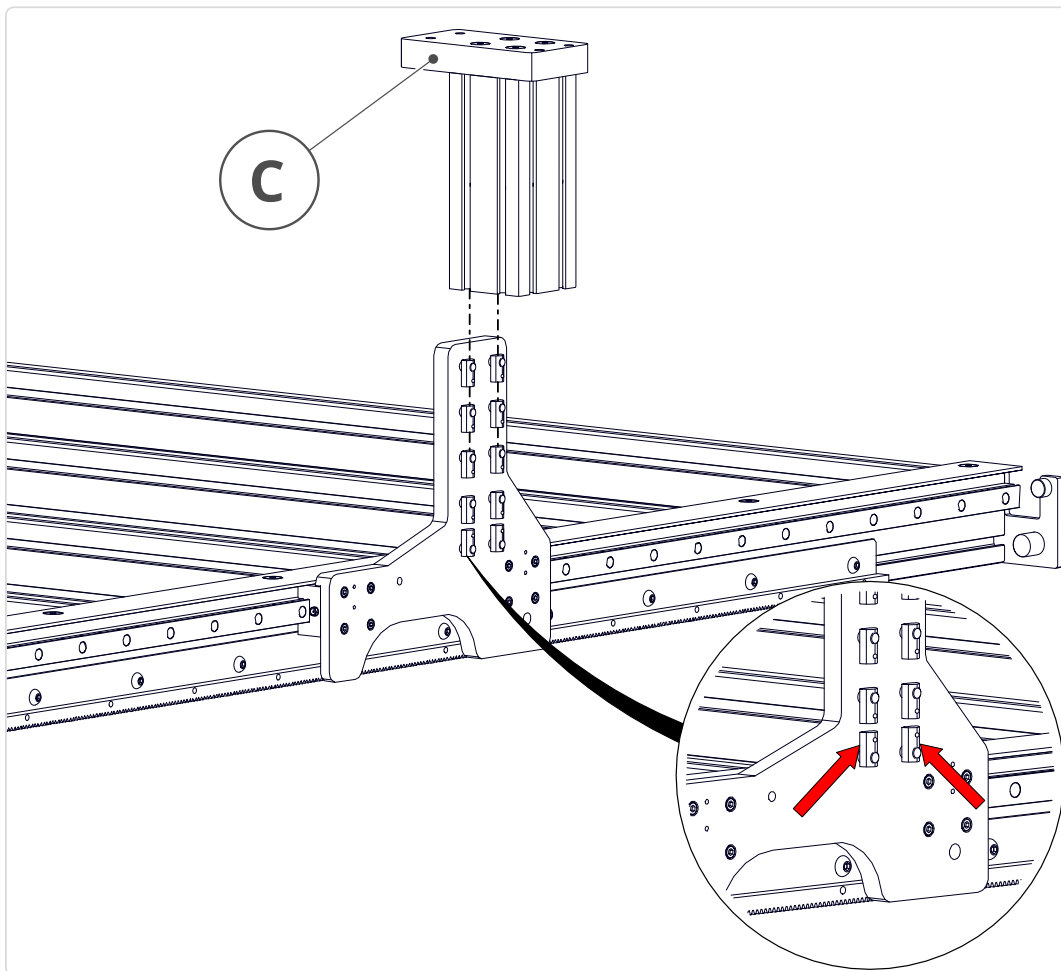
3.1.2 - Riser Extrusion

3.1.2.1



1. Install a **CRP820-02 Gantry Interface Plate (C)** onto the **8080 Riser Extrusion (B)** using **M8 x 35mm Flat Head Screws (H)**.
2. Fully tighten the fasteners.

3.1.2.2



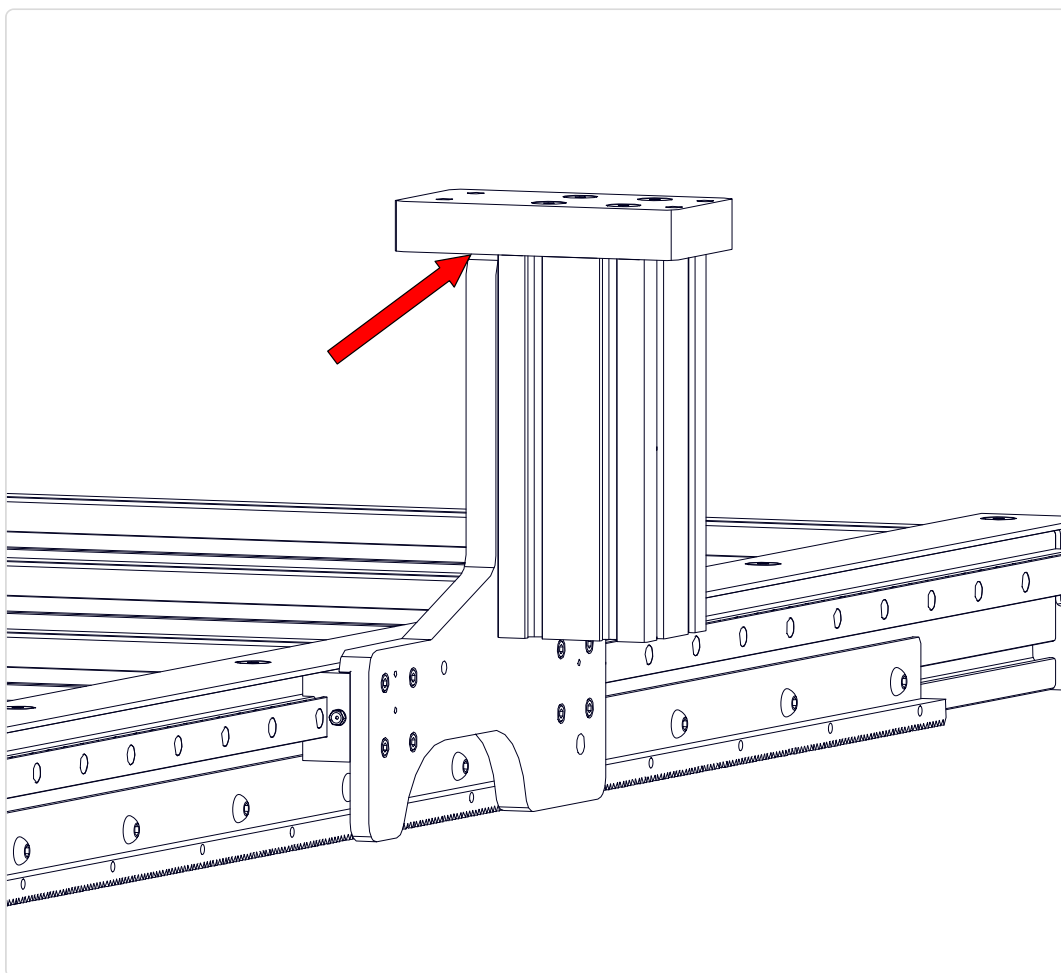
1. Slide the extrusion assembly from the previous step onto the riser plate t-nuts.



Assembly Note

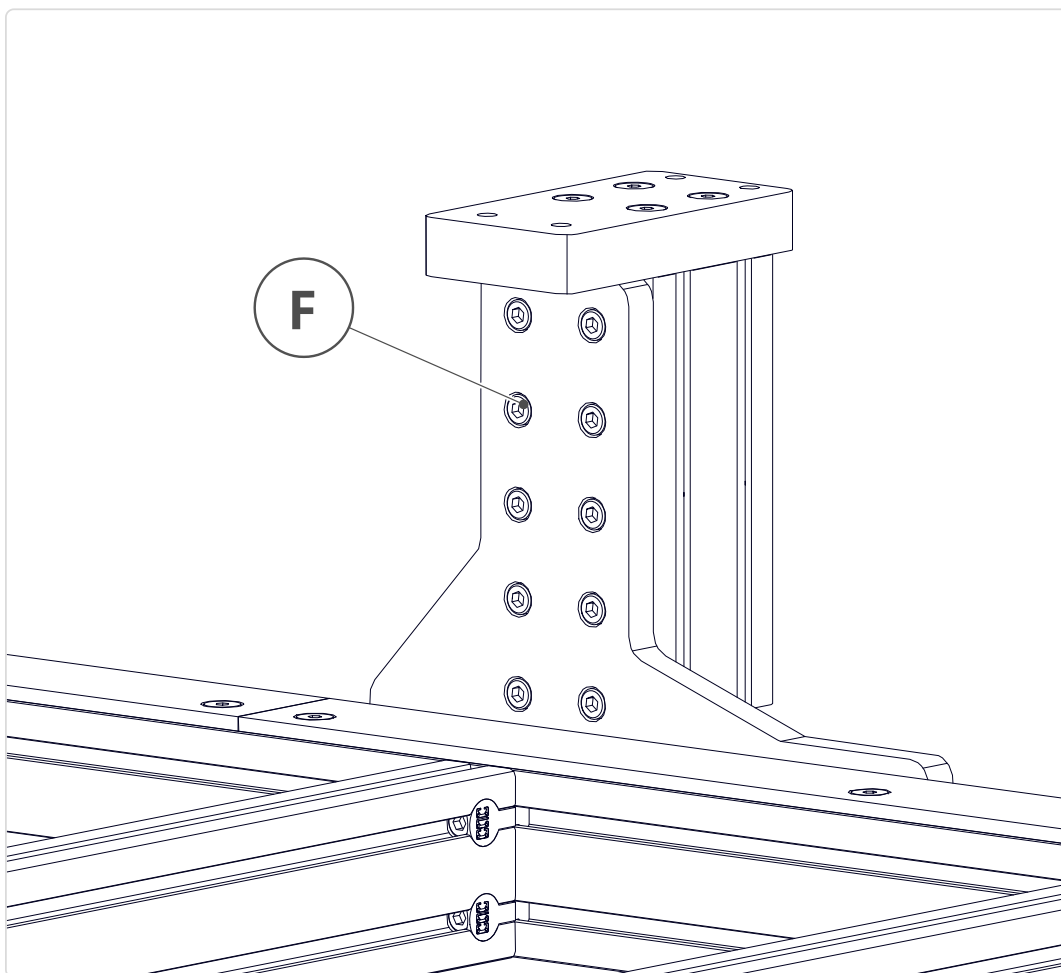
Ensure the bottom of the t-nuts on the riser plate are facing up, as indicated, and the long side of the **Gantry Interface Plate** (C) is facing towards the inside of the machine.

3.1.2.3



1. Bring the gantry interface plate flush with the top of the riser plate, as indicated.

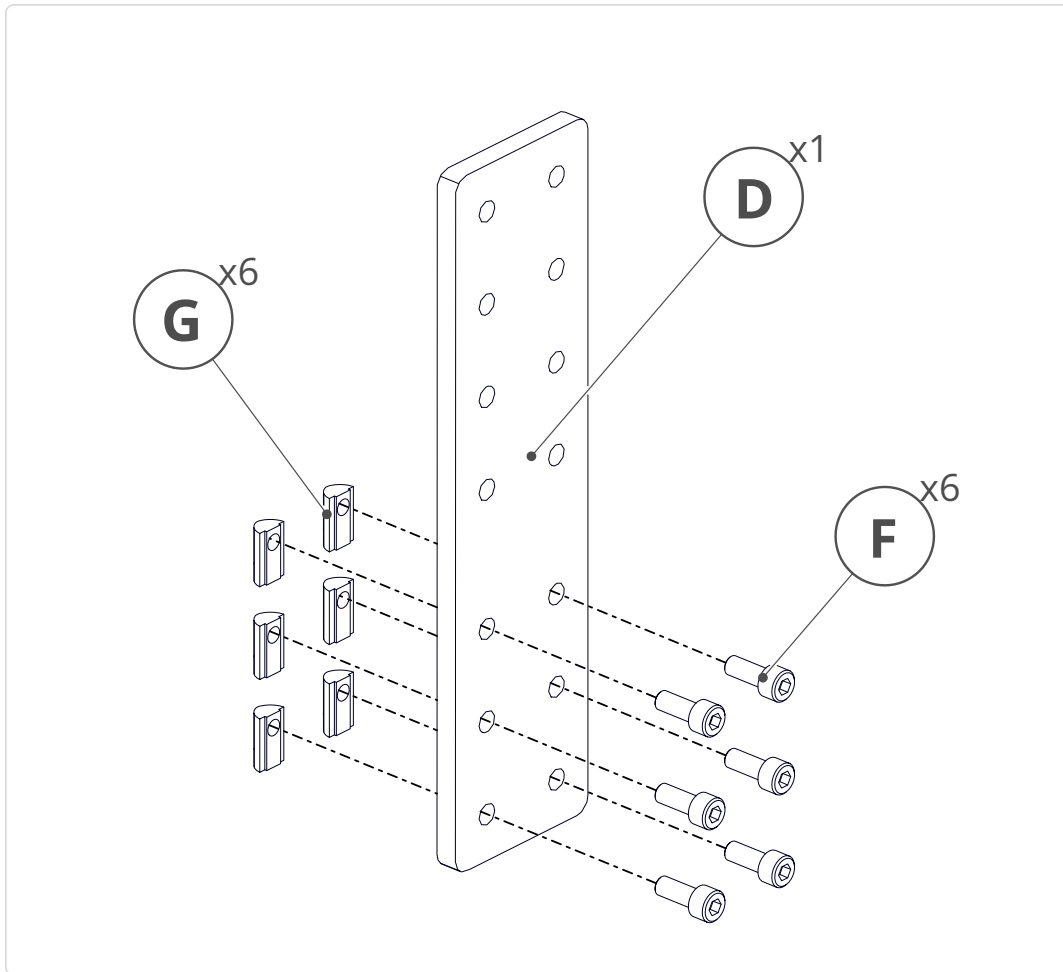
3.1.2.4



1. Fully tighten **all ten** M8 x 20mm Socket Head Cap Screw (F) riser plate fasteners.

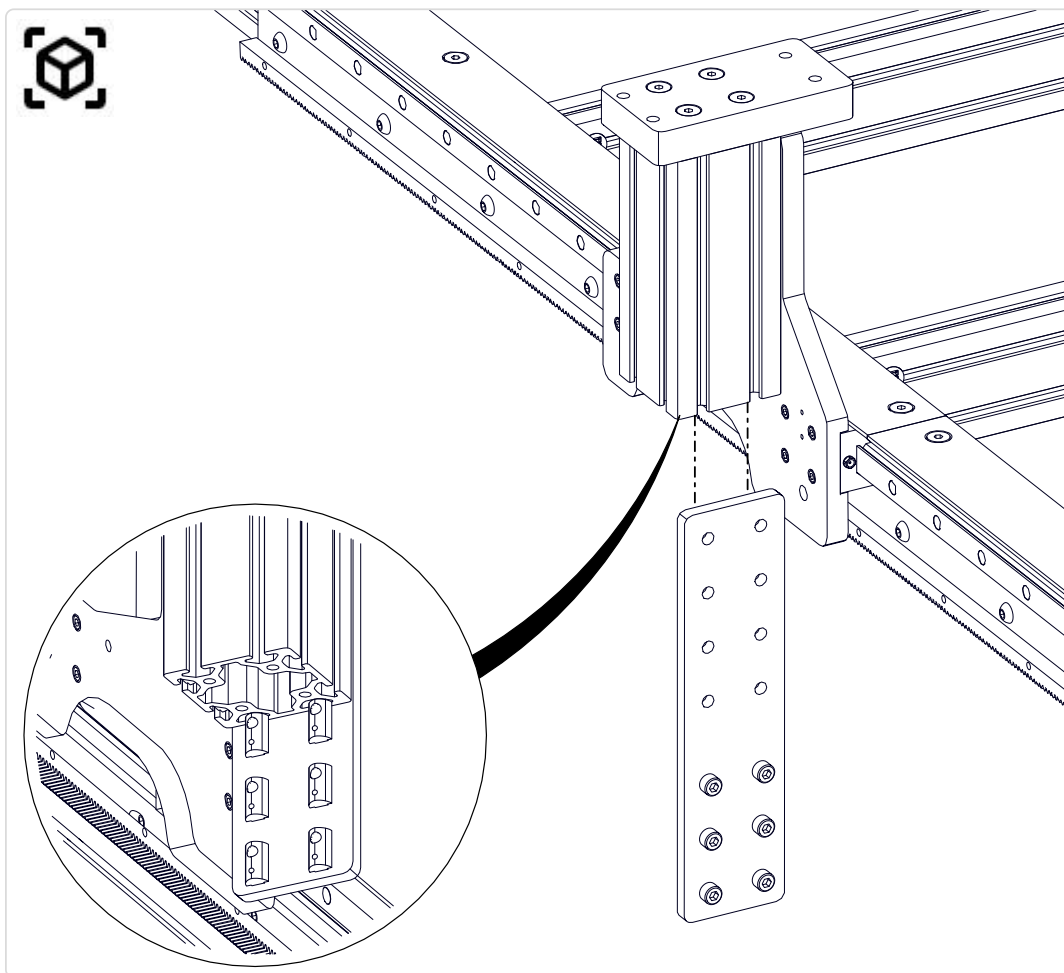
3.1.3 - Riser Joining Plate

3.1.3.1



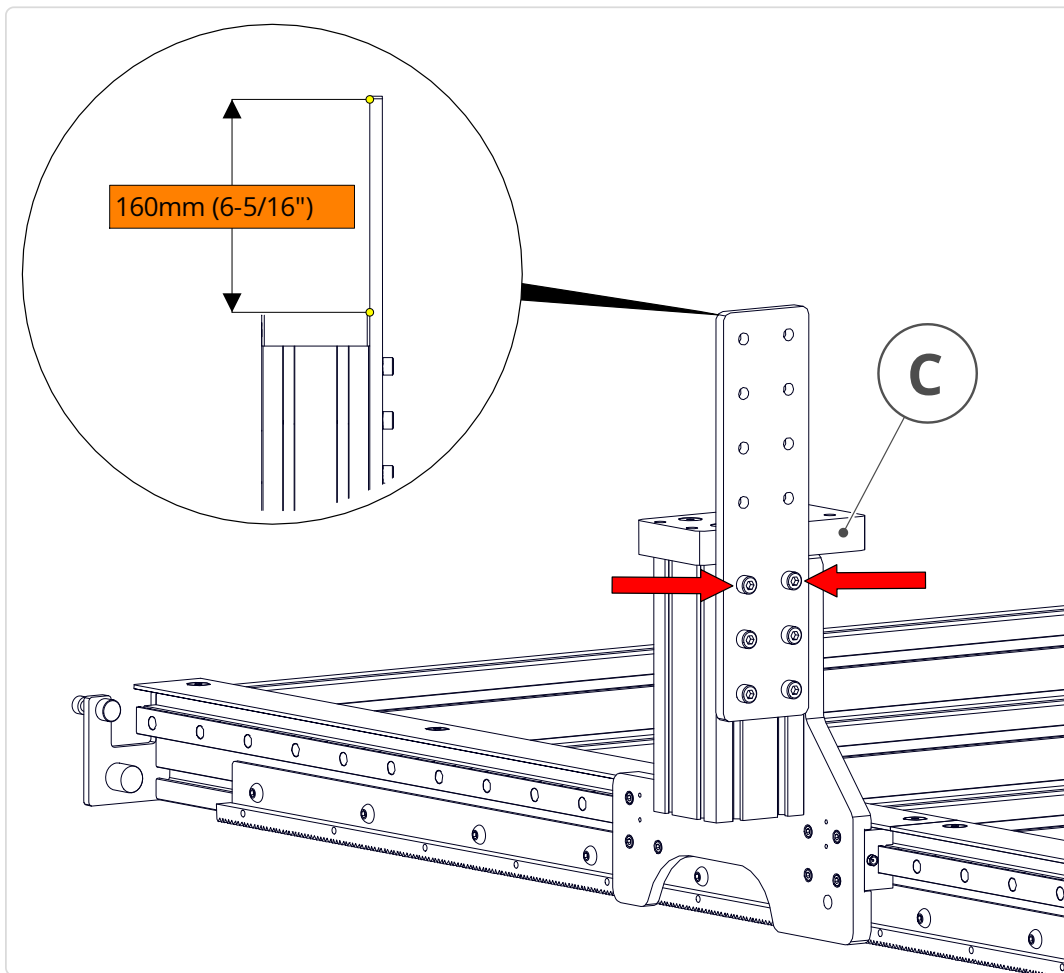
1. Partially thread **M8 Roll-in T-Nuts (G)** onto the **CPR820-10 Joining Plate (D)** using **M8 x 20mm Socket Head Cap Screws (F)**, as indicated.

3.1.3.2



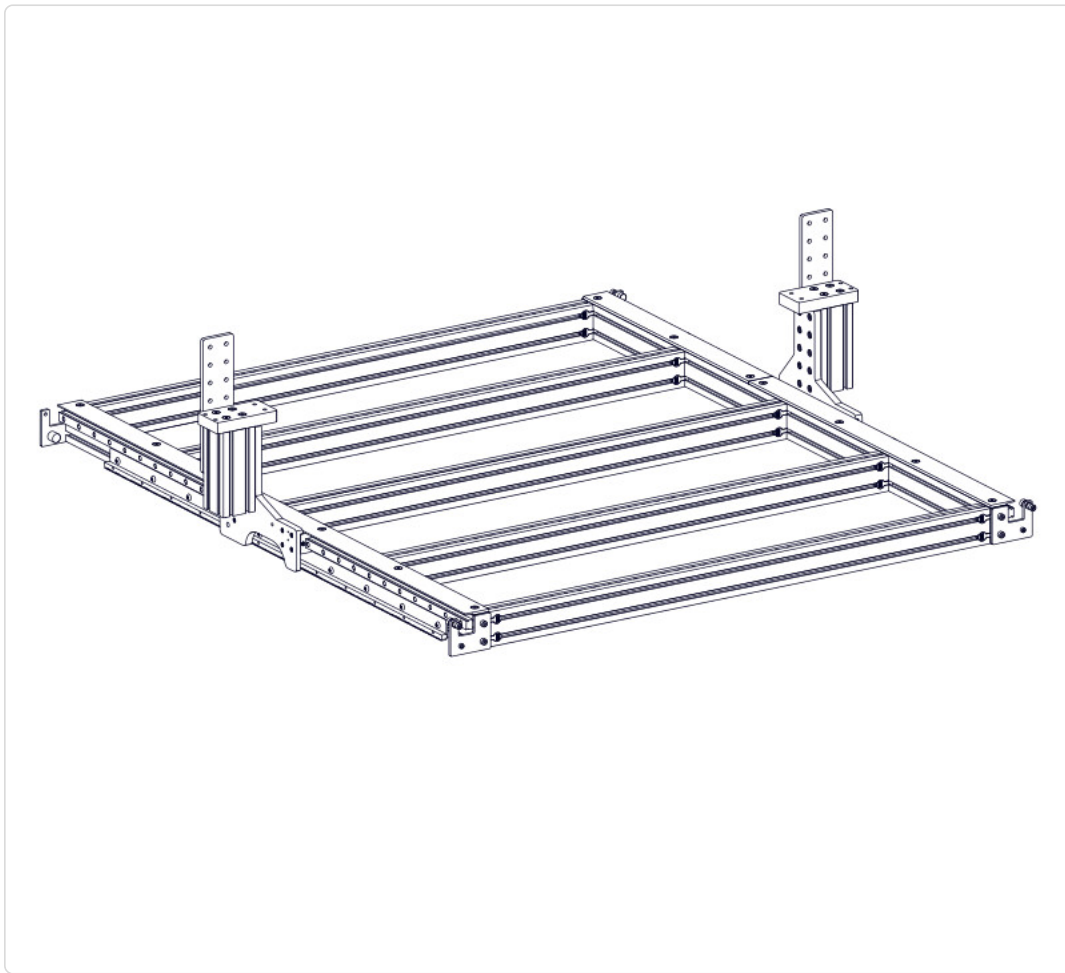
1. Slide the joining plate onto the riser extrusion.

3.1.3.3



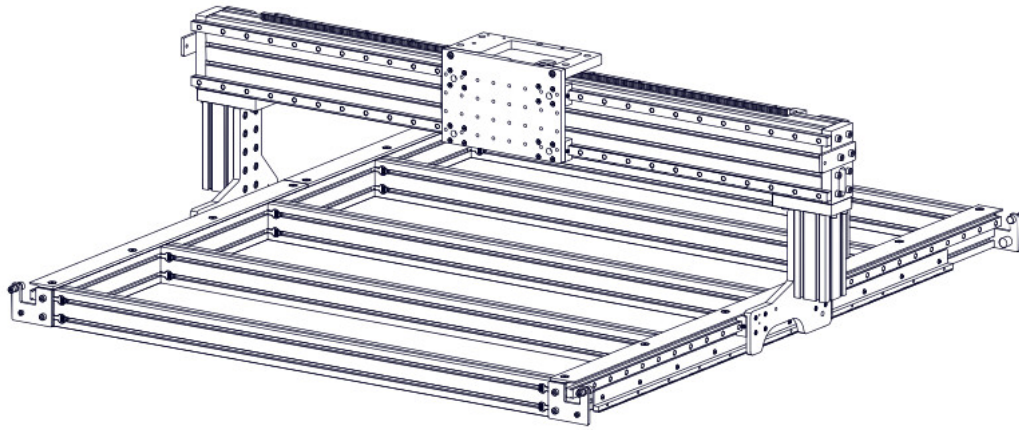
1. Position the top the joining plate 160mm (6-5/16") above the **Gantry Interface Plate** (C).
2. Tighten the two indicated fasteners (red arrows) to hold the joining plate in place.

3.1.3.4

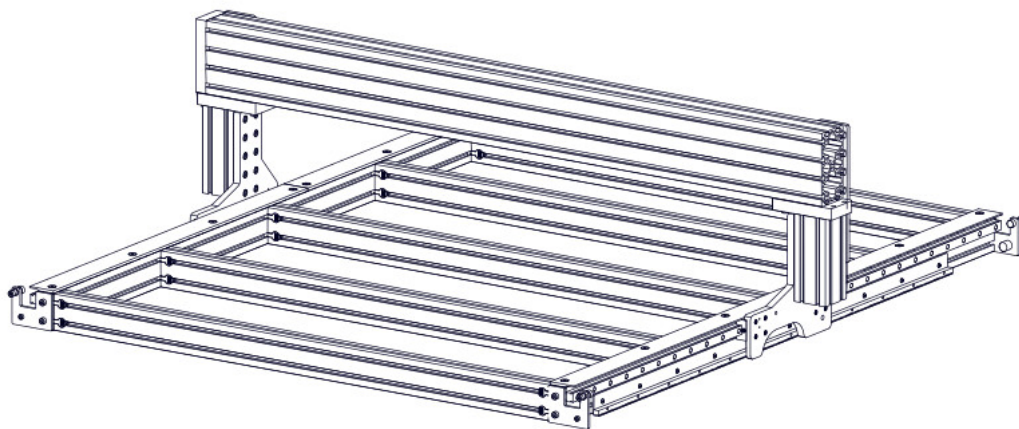


1. Repeat **this process** to assemble the riser on the other side of the machine.

4. Gantry



4.1 - Gantry Extrusion



Parts List

ID	QTY	Part/Description	Package Label
(A)	1	8016 Gantry Extrusion, 1850mm (72-13/16")	Machine Kit Extrusion
	1	CRP833-00 Gantry End Cap Kit	Gantry Assembly Kit
(B)	1	CRP830-03 Gantry End Cap	CRP833-00 Gantry End Cap Kit >
(C)	6	M8 x 35mm Socket Head Cap Screw	CRP833-00 Gantry End Cap Kit >
	1	CRP820-00-FAST	Gantry Assembly Kit
(D)	20	M8 Roll-in T-Nut	CRP820-00-FAST >
(E)	4	M8 x 35mm Socket Head Cap Screw	CRP820-00-FAST >
(F)	8	M8 x 20mm Socket Head Cap Screw	CRP820-00-FAST >
<i>Remaining parts from CRP833-00 and CRP820-00-FAST used in future section</i>			

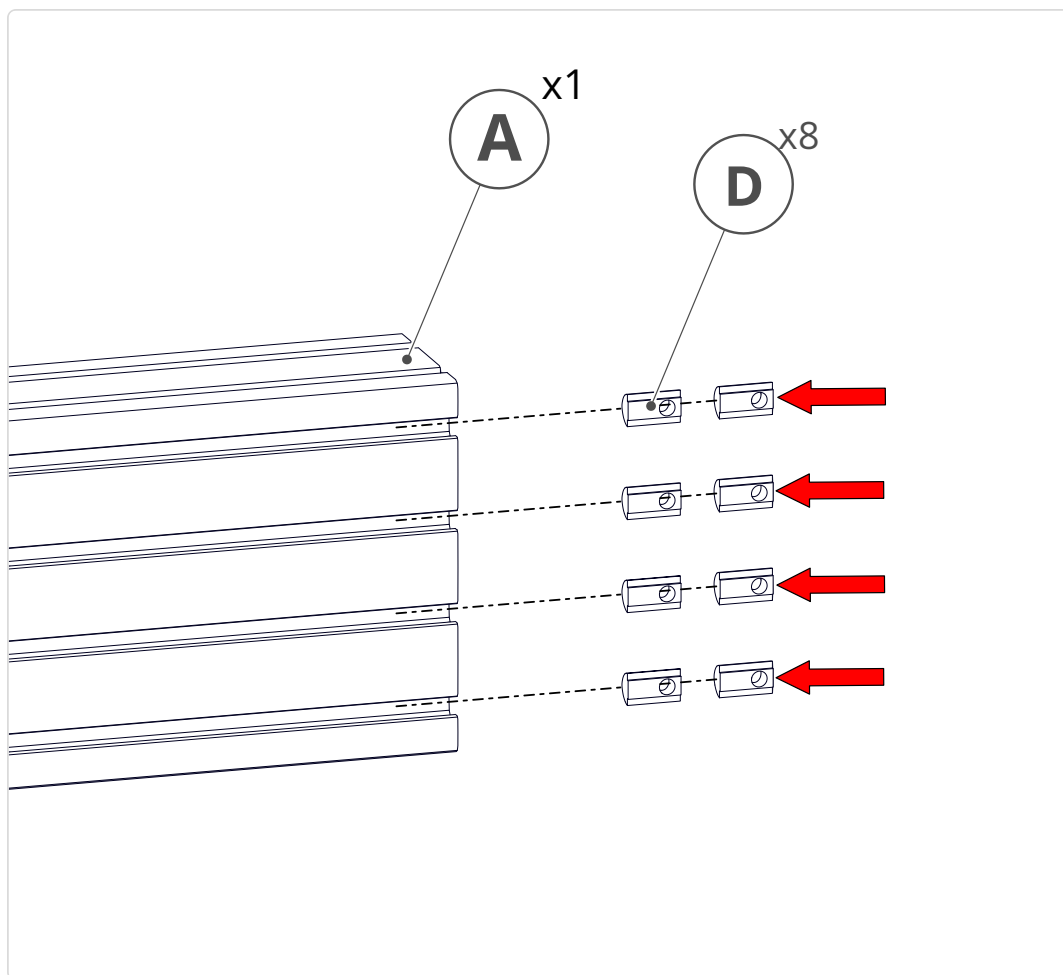
Tools List

Requirement	Tool
Required	6mm Allen Wrench



4.1.1 - Extrusion Assembly

4.1.1.1



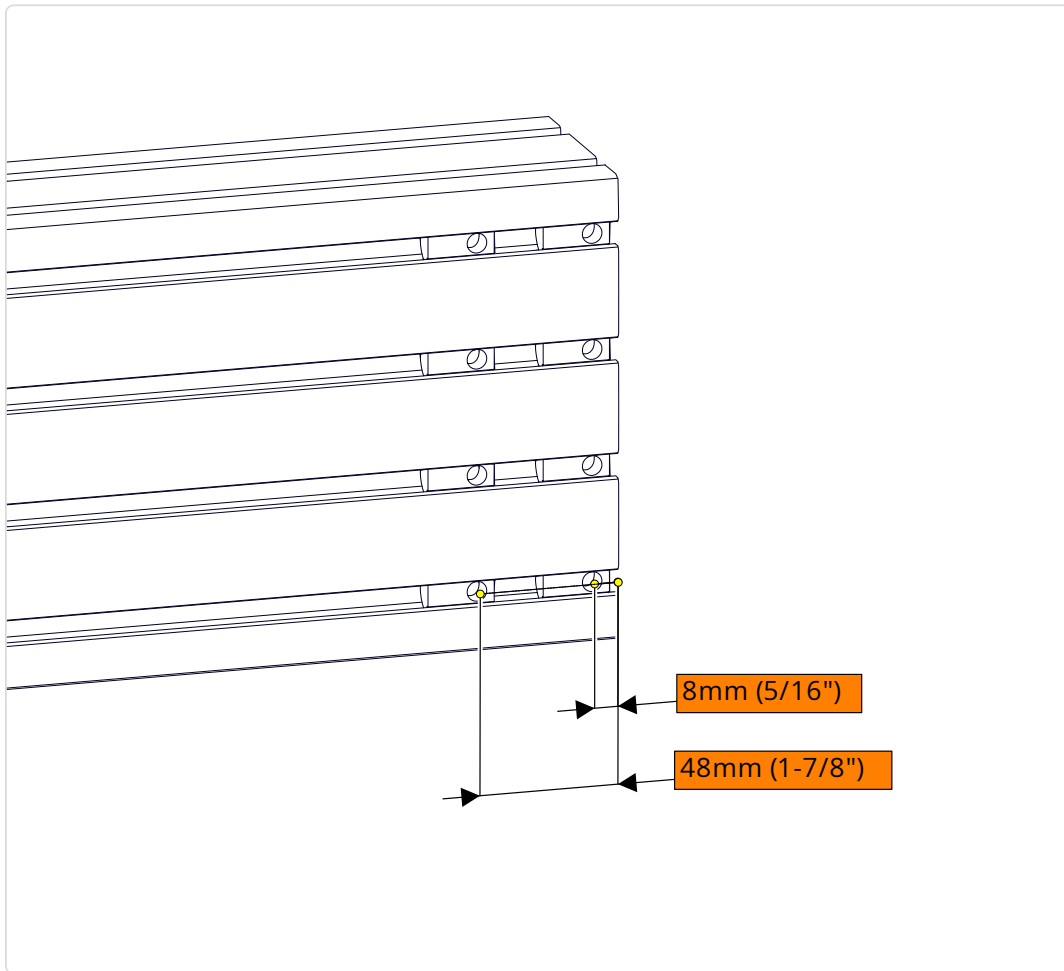
1. Slide **M8 Roll-in T-Nuts (D)** into the **8016 Gantry Extrusion (A)** T-Slots.



Assembly Note

Ensure the indicated (red arrows) t-nuts are in the correct orientation.

4.1.1.2



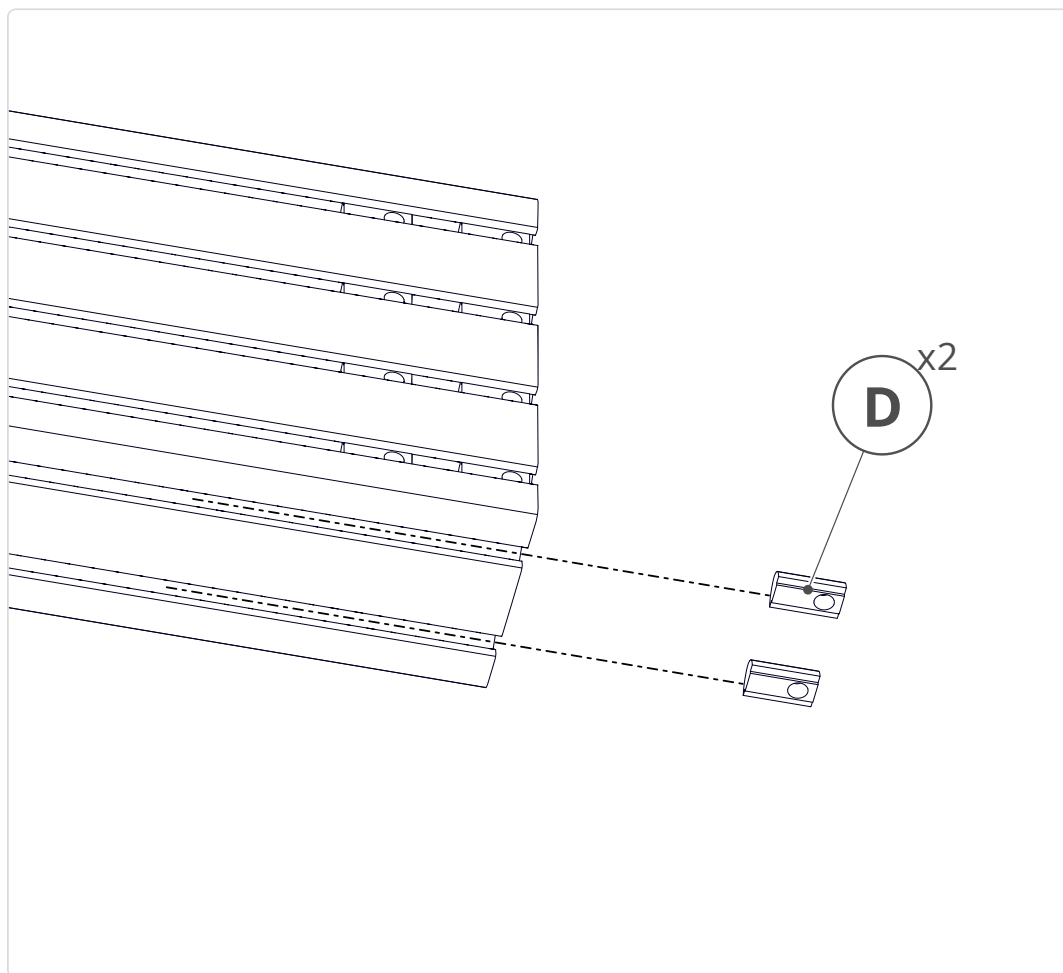
1. Position the t-nuts to the dimensions shown.



Assembly Note

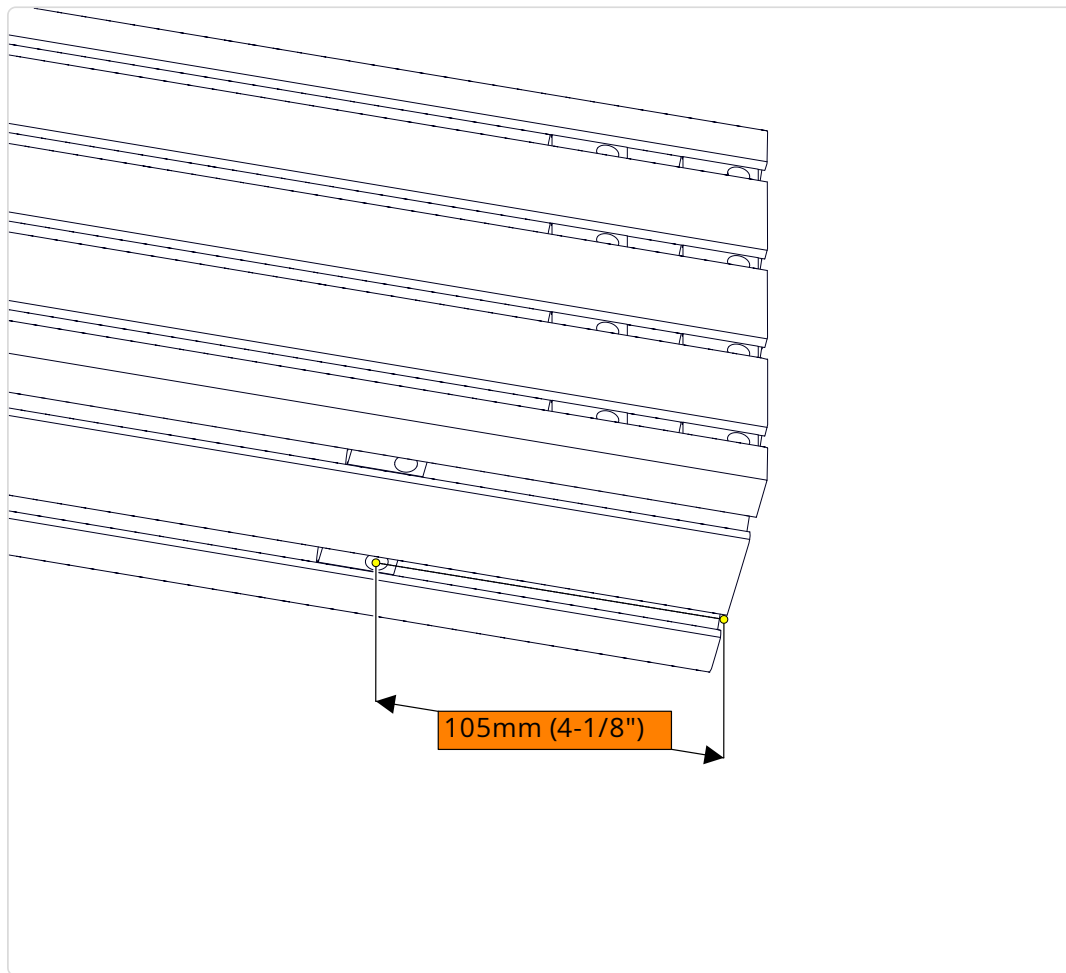
Dimensions shown are from the end of the extrusion to the center of the t-nut hole.

4.1.1.3



1. Slide **M8 Roll-in T-Nuts** (D) into the bottom gantry extrusion t-slots.

4.1.1.4



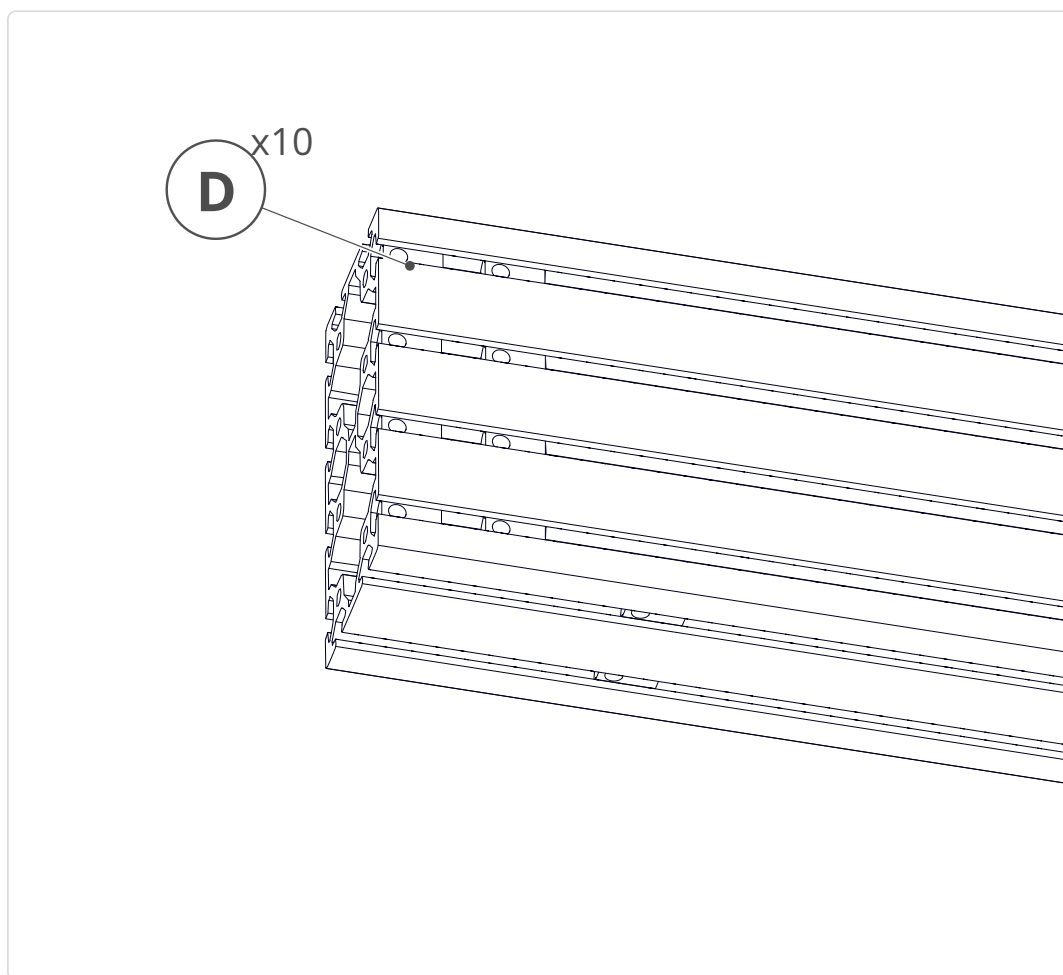
1. Position the bottom t-nuts to the dimension shown.



Assembly Note

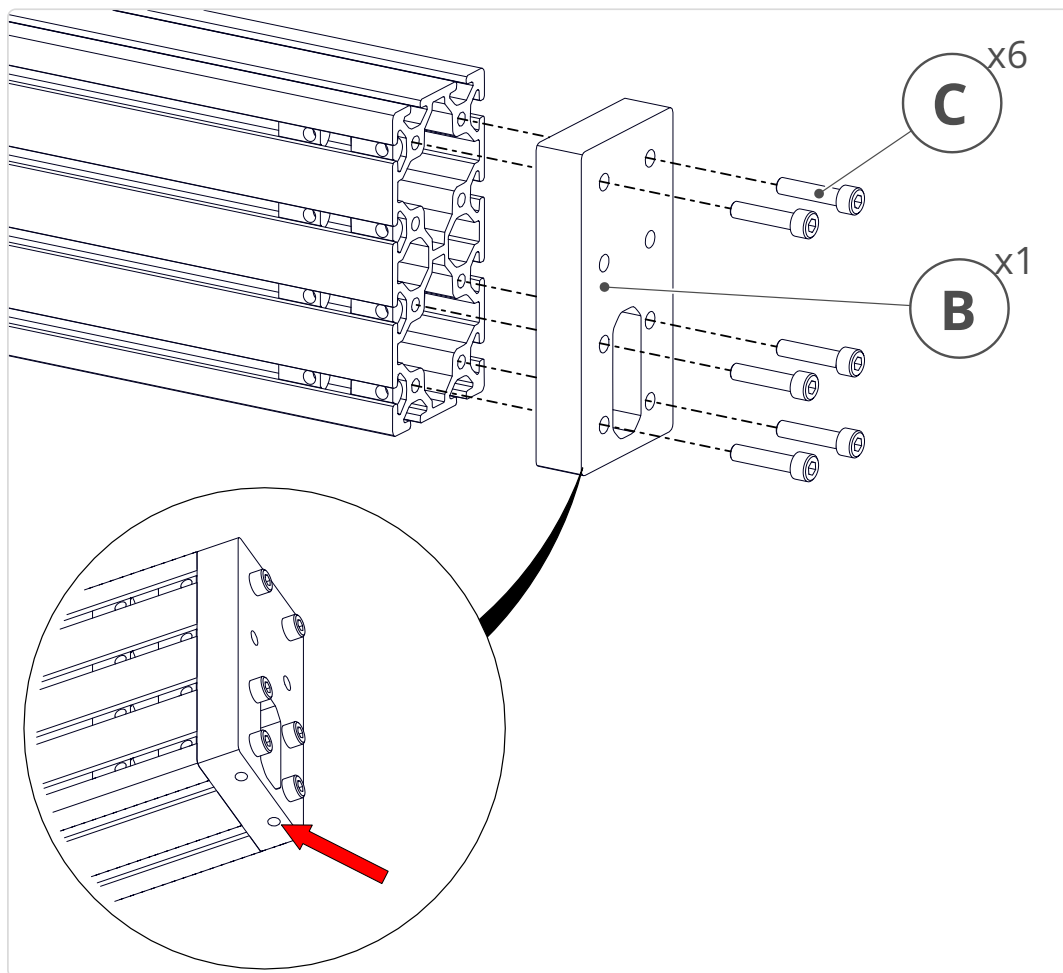
Dimensions shown are from the end of the extrusion to the center of the t-nut hole.

4.1.1.5



1. Repeat **these steps** to install M8 Roll-in T-Nuts (D) on the other end of the gantry extrusion.

4.1.1.6



1. With the t-nuts in the extrusion facing you, install a **CRP830-03 Gantry End Cap (B)** onto the right end of the extrusion using **M8 x 35mm Socket Head Cap Screws (C)**.

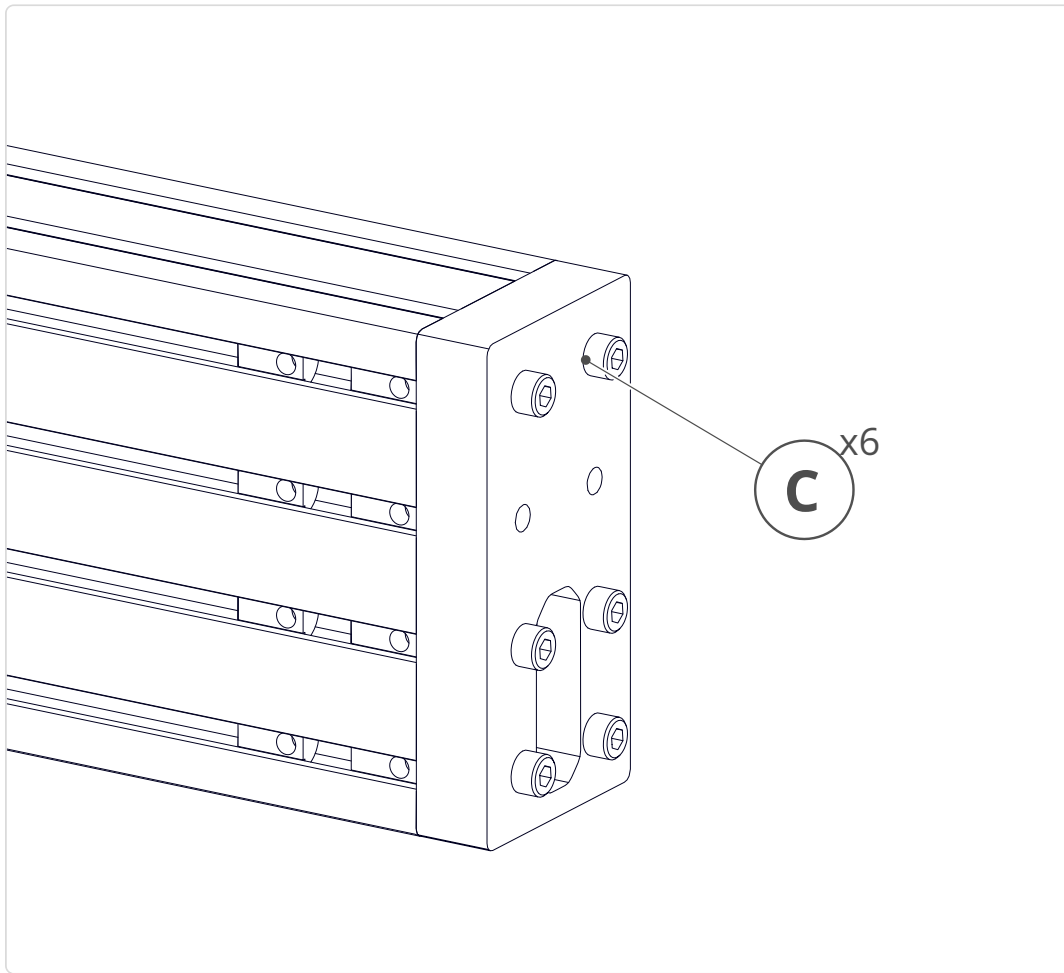
Assembly Note

Orient the gantry end cap with the tapped holes on the bottom biased towards the outside of the extrusion.

Assembly Note

Do not install fasteners in the remaining two holes of the gantry end cap; these will be used when mounting the gantry bumpers.

4.1.1.7



1. Fully tighten the **M8 x 35mm Socket Head Cap Screws (C)**.

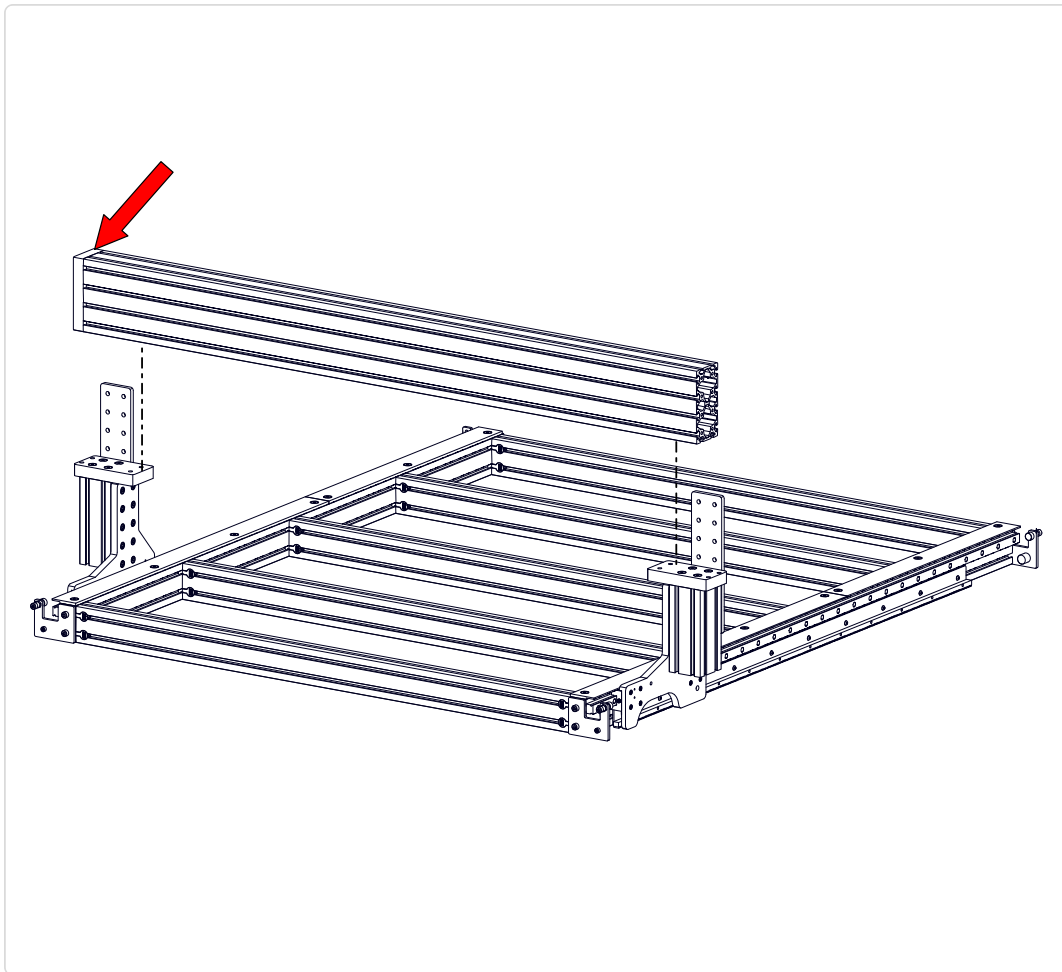


Assembly Note

Do not install the gantry end cap on the other side of the extrusion. You will need access to the extrusion t-slots in future steps.

4.1.2 - Extrusion Installation

4.1.2.1



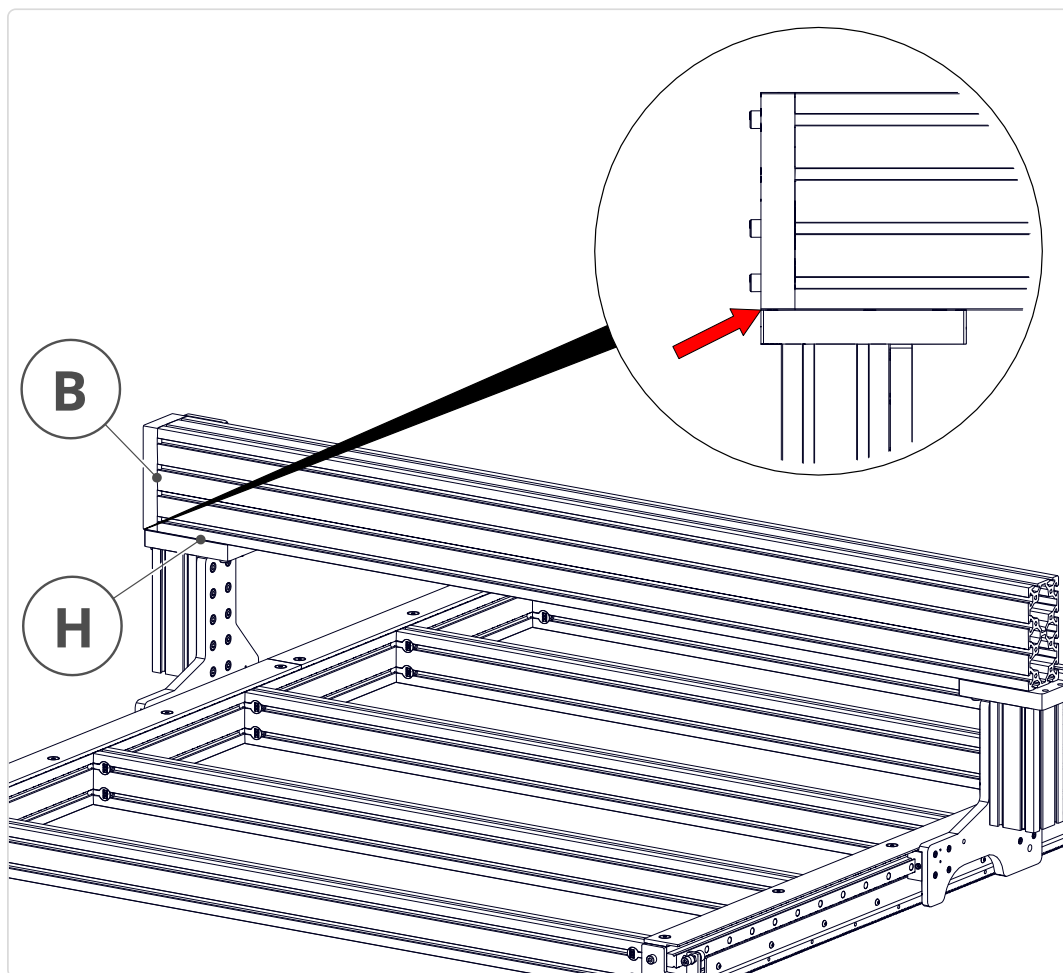
1. Carefully lower the gantry extrusion onto the risers.
2. Note the orientation of the extrusion, with the installed end cap on the indicated side.



Assembly Note

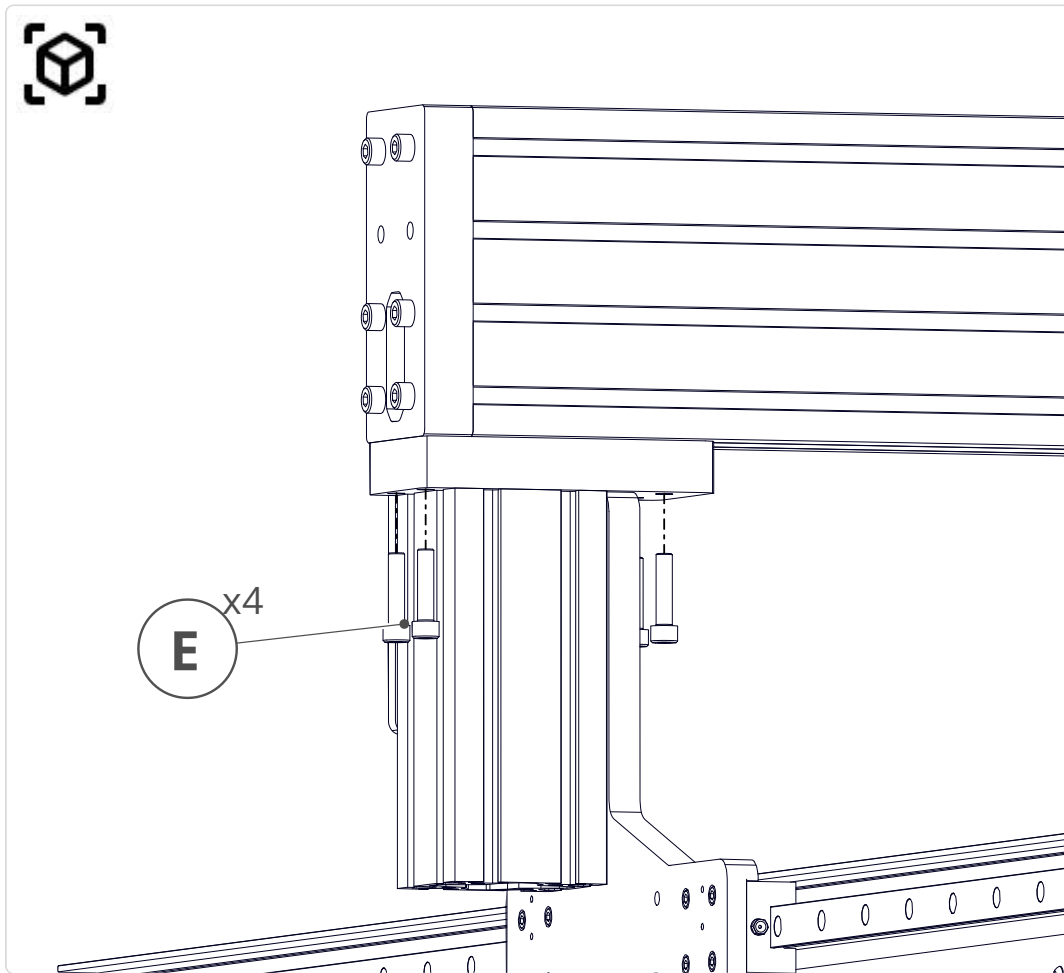
This step is made easier by sliding the risers to the front of the machine, as shown.

4.1.2.2



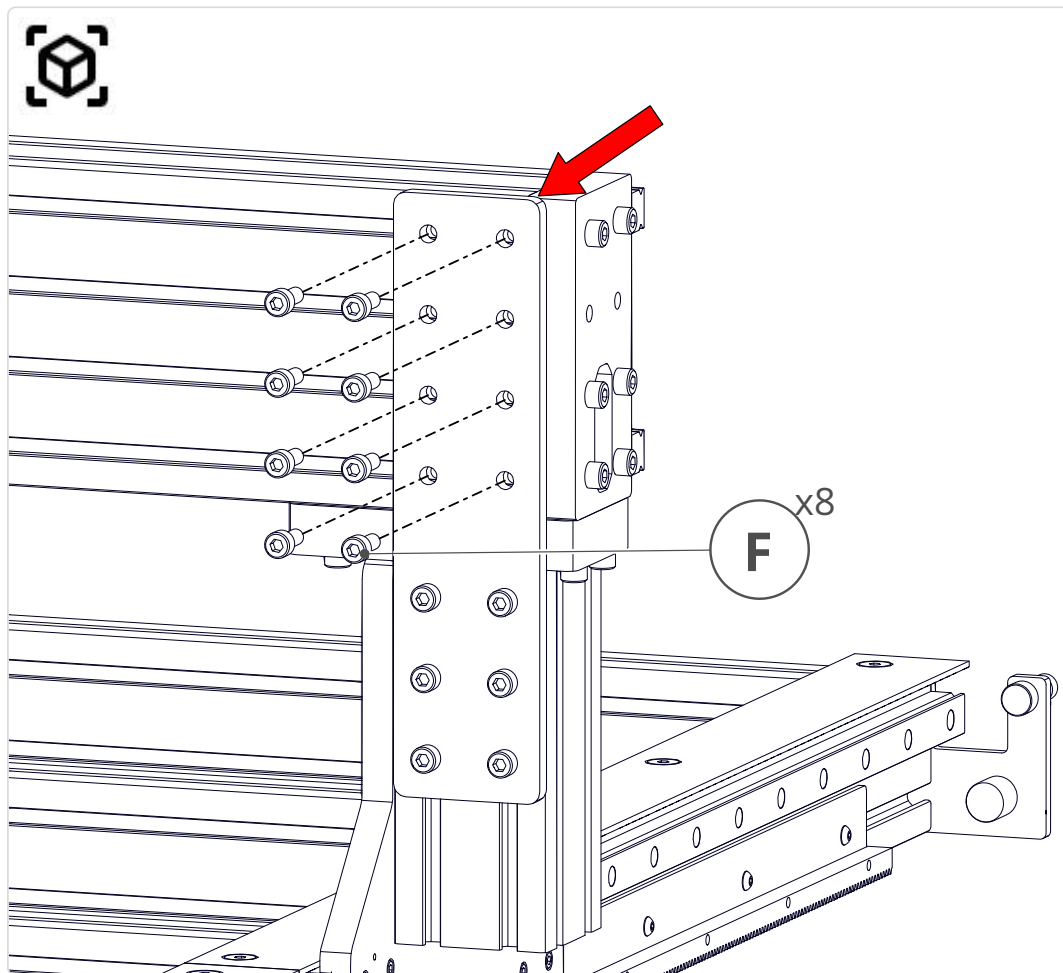
1. Bring the **Gantry End Cap (B)** flush with the **Gantry Interface Plate (H)**, as shown.

4.1.2.3



1. On the side with the gantry end cap, attach the gantry using **M8 x 35mm Socket Head Cap Screws (E)**, partially tightening the fasteners.

4.1.2.4



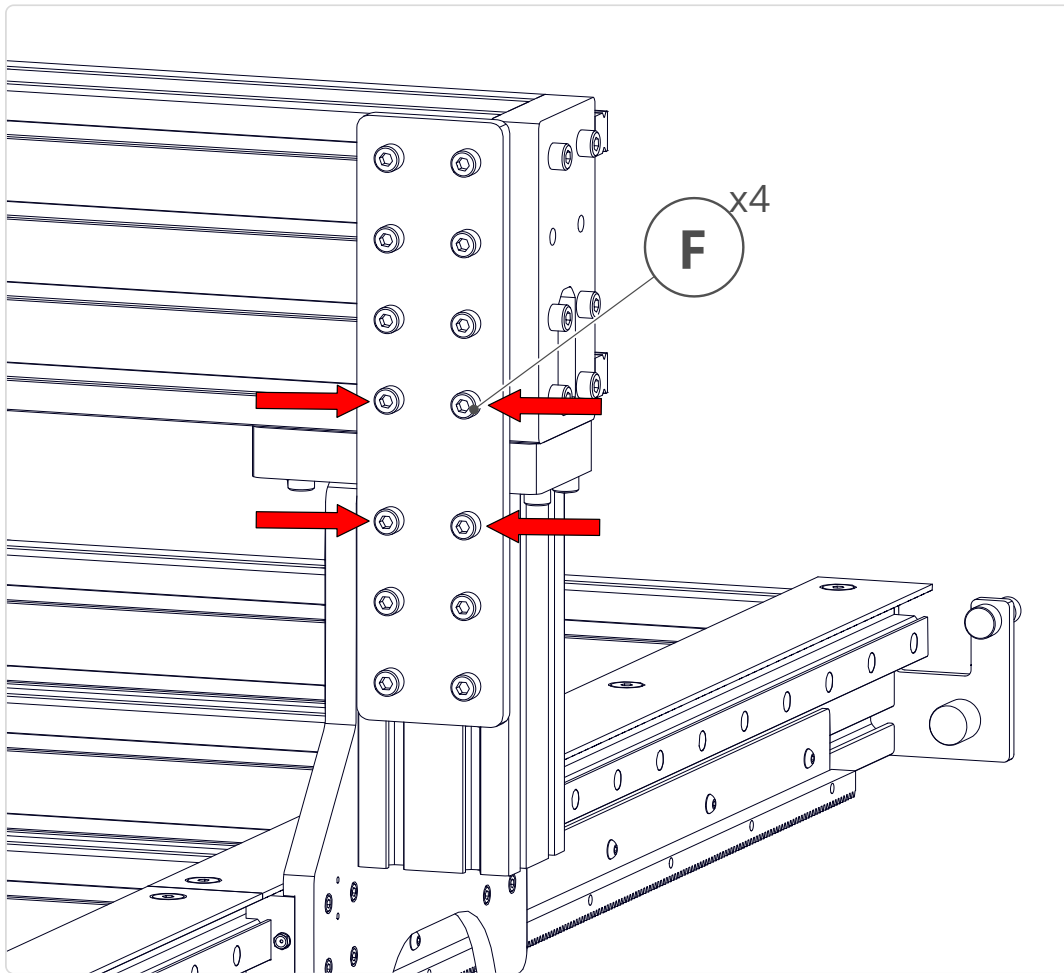
1. Thread **M8 x 20mm Socket Head Cap Screws (F)** into the t-nuts, partially tightening the fasteners.



Assembly Note

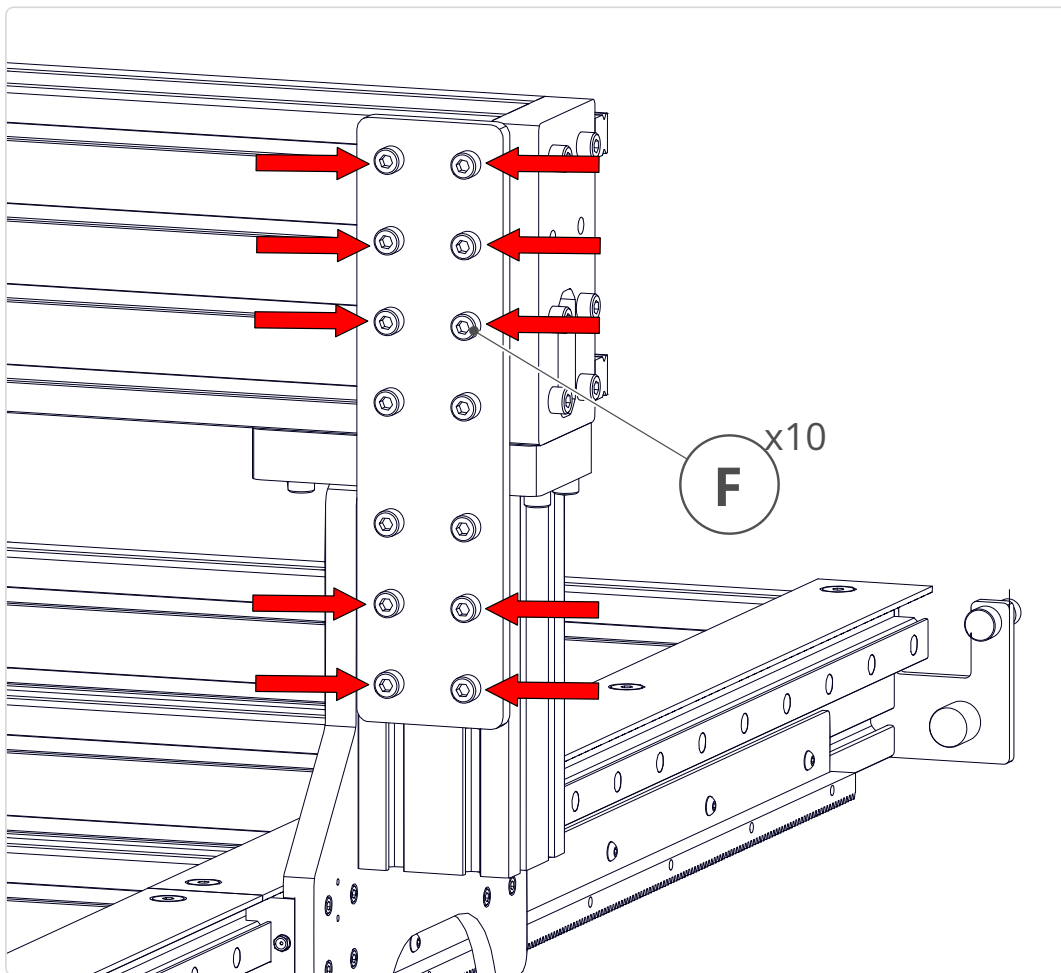
Ensure the top of the joining plate is flush with the top of the gantry extrusion, as indicated by the red arrow.

4.1.2.5



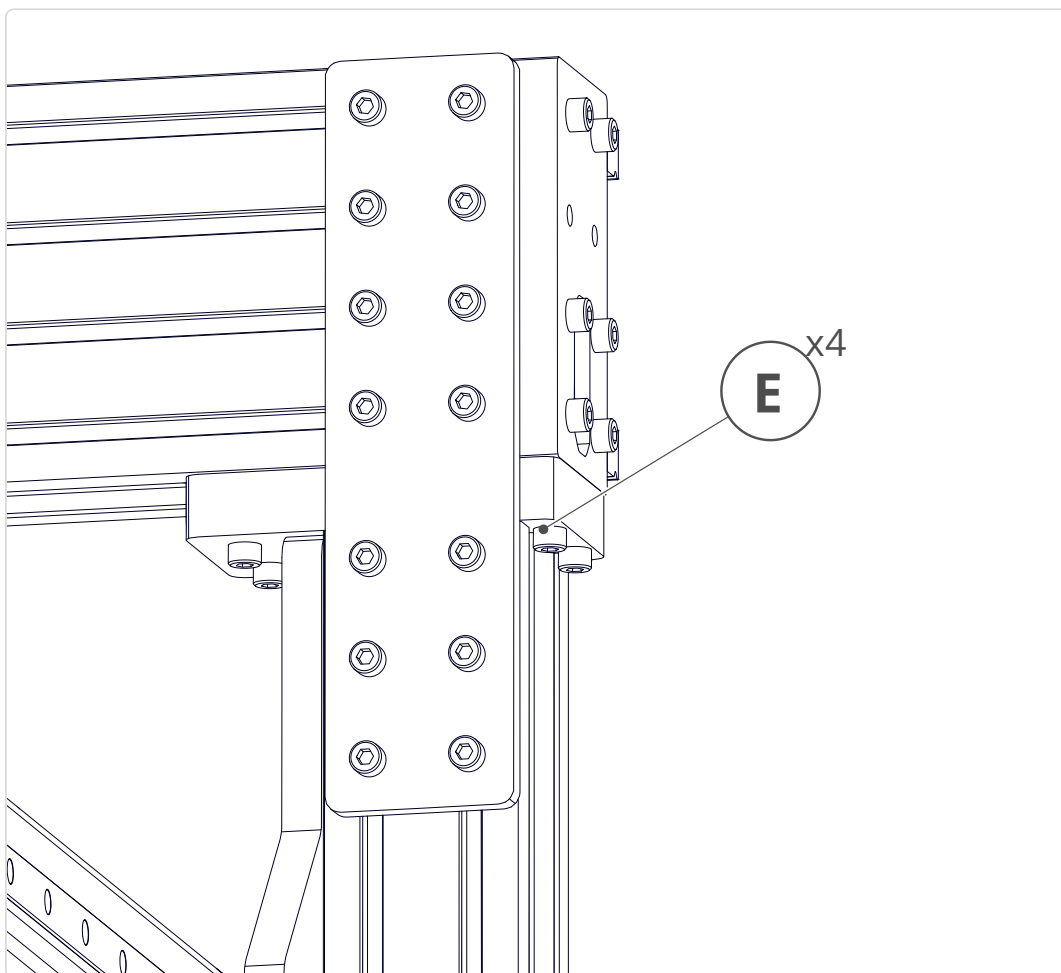
1. Fully tighten the four indicated **M8 x 20mm Socket Head Cap Screws (F)**.

4.1.2.6



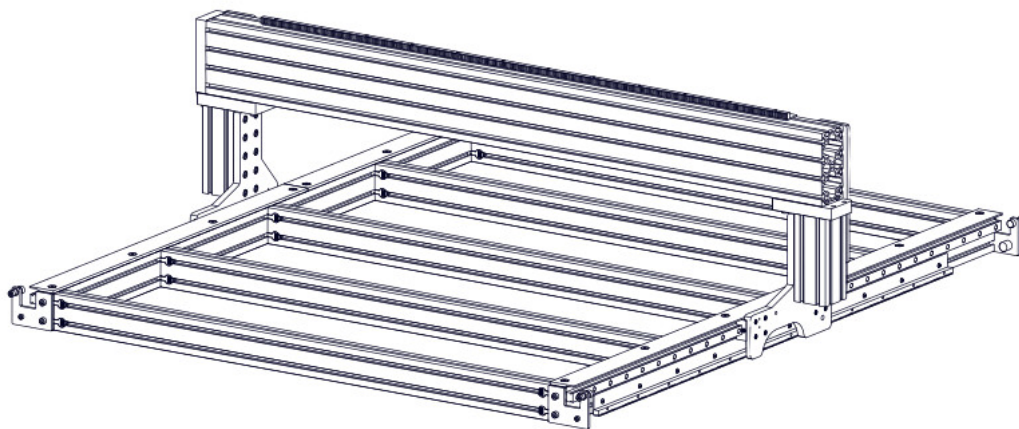
1. Fully tighten the remaining indicated **M8 x 20mm Socket Head Cap Screws (F)**.

4.1.2.7



1. Fully tighten the **M8 x 35mm Socket Head Cap Screws** **E**.

4.2 - Gear Rack



Parts List

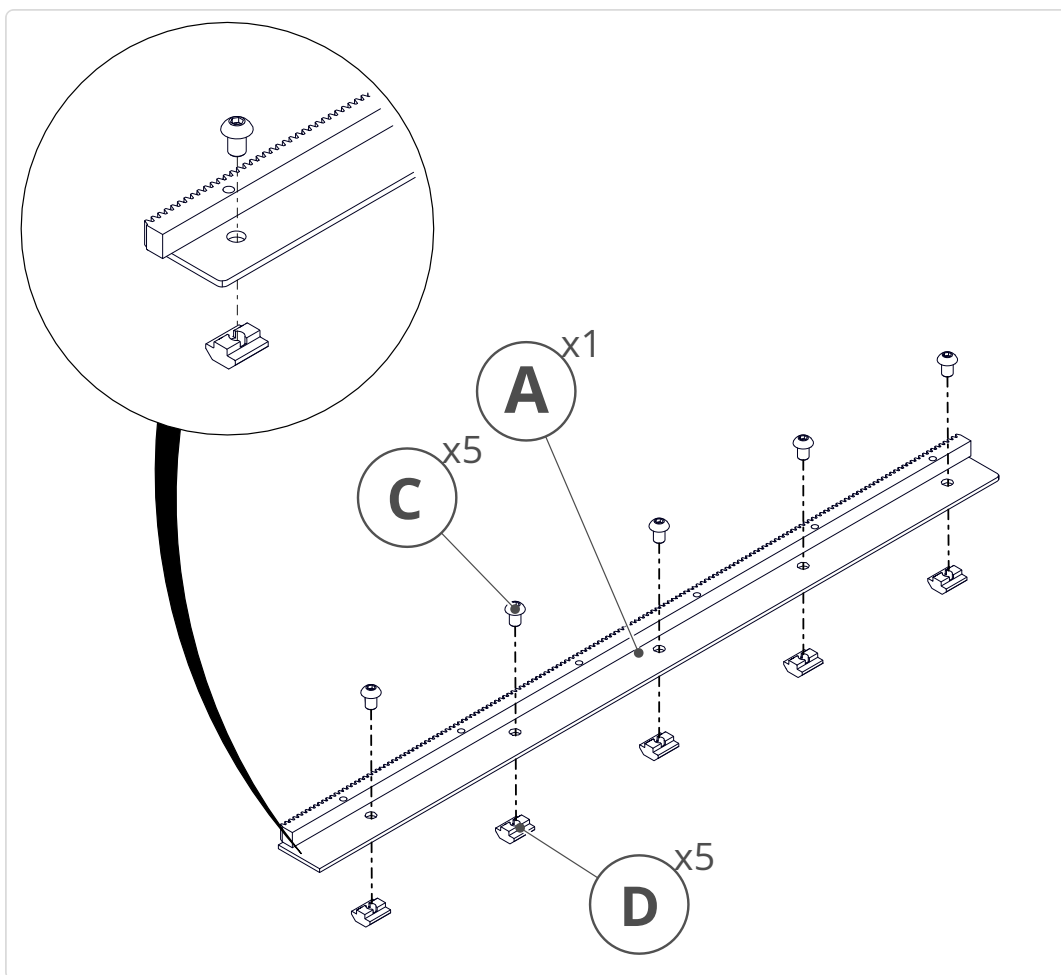
ID	QTY	Part/Description	Package Label
(A)	1	Gear Rack, 660mm (26")	Gantry Rail Kit
(B)	1	Gear Rack, 990mm (39")	Gantry Rail Kit
	1	MGM-26-FAST-40	Gantry Assembly Kit
(C)	5	M8 x 12mm Button Head Cap Screw	MGM-26-FAST-40 >
(D)	5	M8 Slide-in T-Nut	MGM-26-FAST-40 >
	8	MGM-39-FAST-40	Gantry Assembly Kit
(E)	8	M8 x 12mm Button Head Cap Screw	MGM-39-FAST-40 >
(F)	8	M8 Slide-in T-Nut	MGM-39-FAST-40 >
(G)	1	MG-SPLICE, Gear Rack Splice	Gantry Assembly Kit

Tools List

Requirement	Tool
Required	5mm Allen Wrench
Required	Tape Measure
Required	(2) Clamp

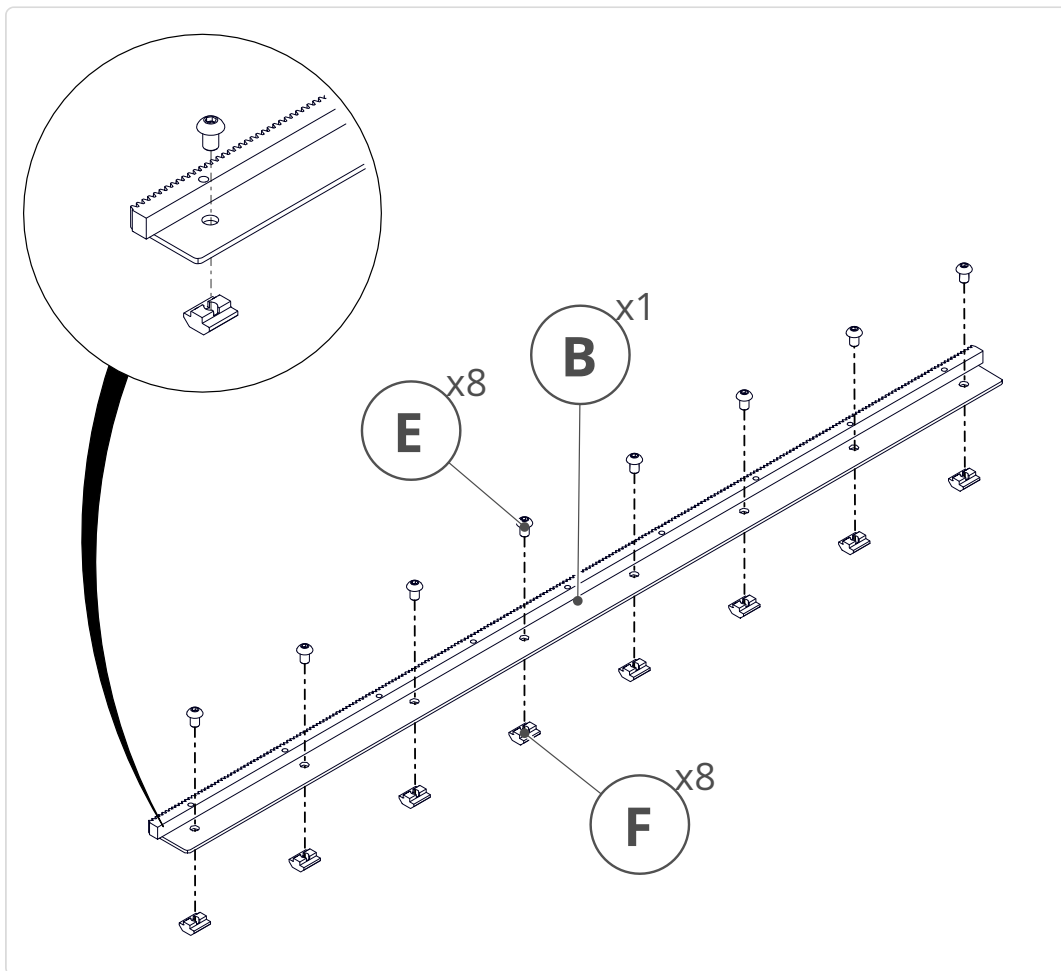
4.2.1 - Gear Rack Assembly

4.2.1.1



1. Partially thread **M8 x 12mm Button Head Cap Screws (C)** onto **M8 Slide-in T-Nuts (D)**, through the **Gear Rack, 660mm (26") (A)**.

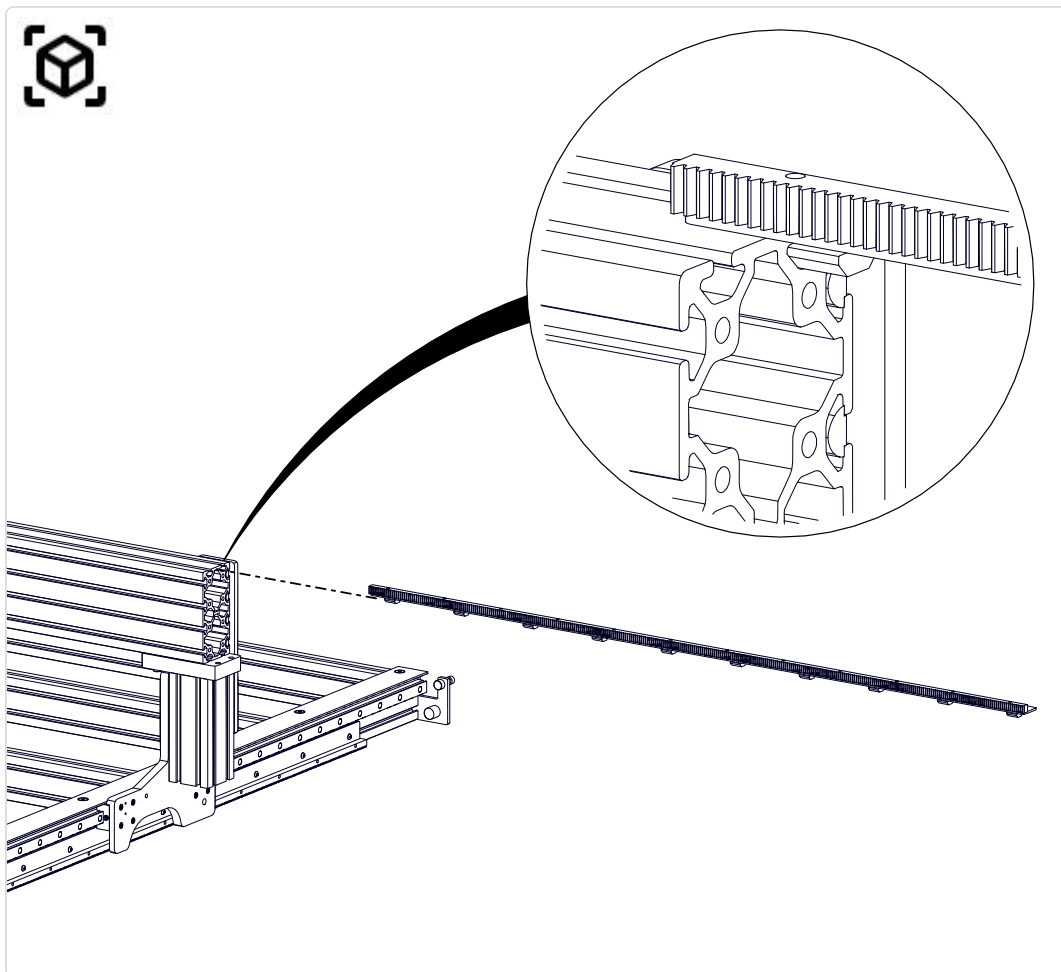
4.2.1.2



1. Partially thread **M8 x 12mm Button Head Cap Screws (E)** onto **M8 Slide-in T-Nuts (F)**, through the **Gear Rack, 990mm (39") (B)**.

4.2.2 - Gear Rack Installation

4.2.2.1



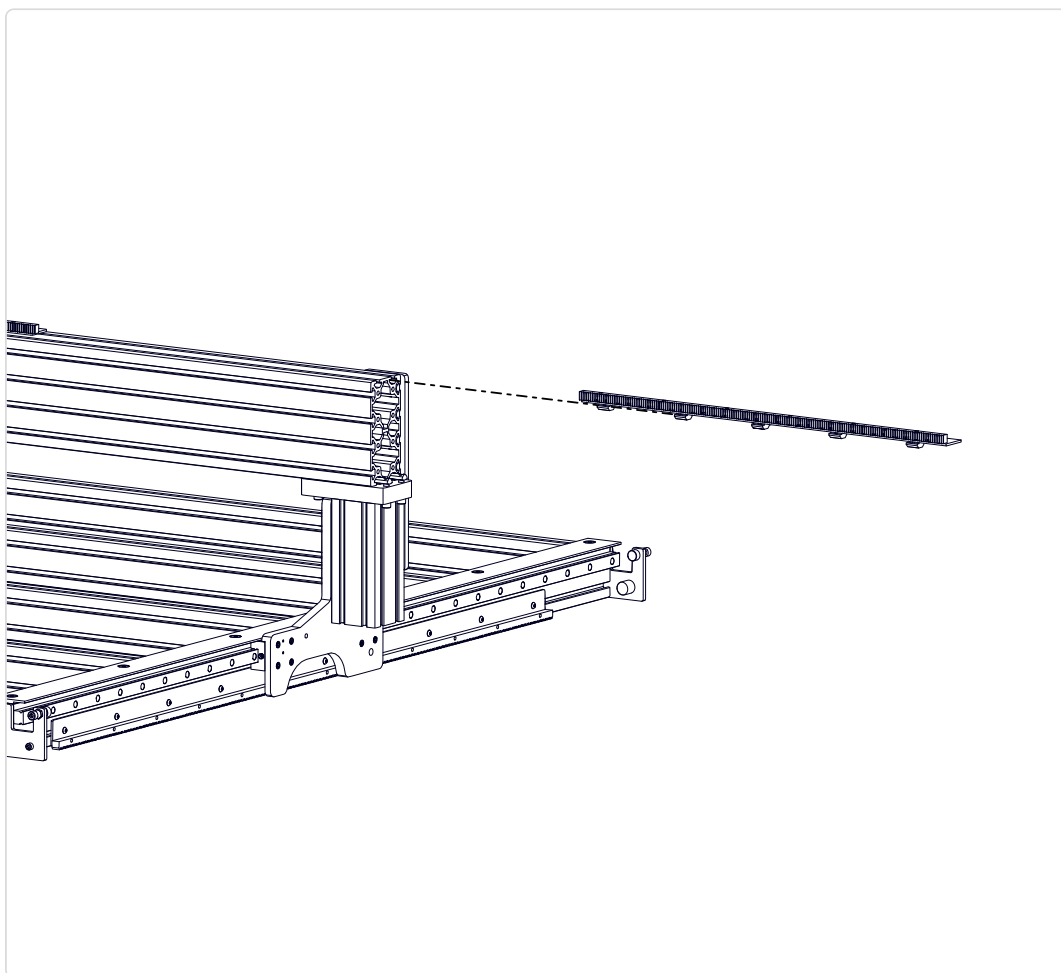
1. Slide an assembled section of gear rack into top rear t-slot of the gantry extrusion.



Assembly Note

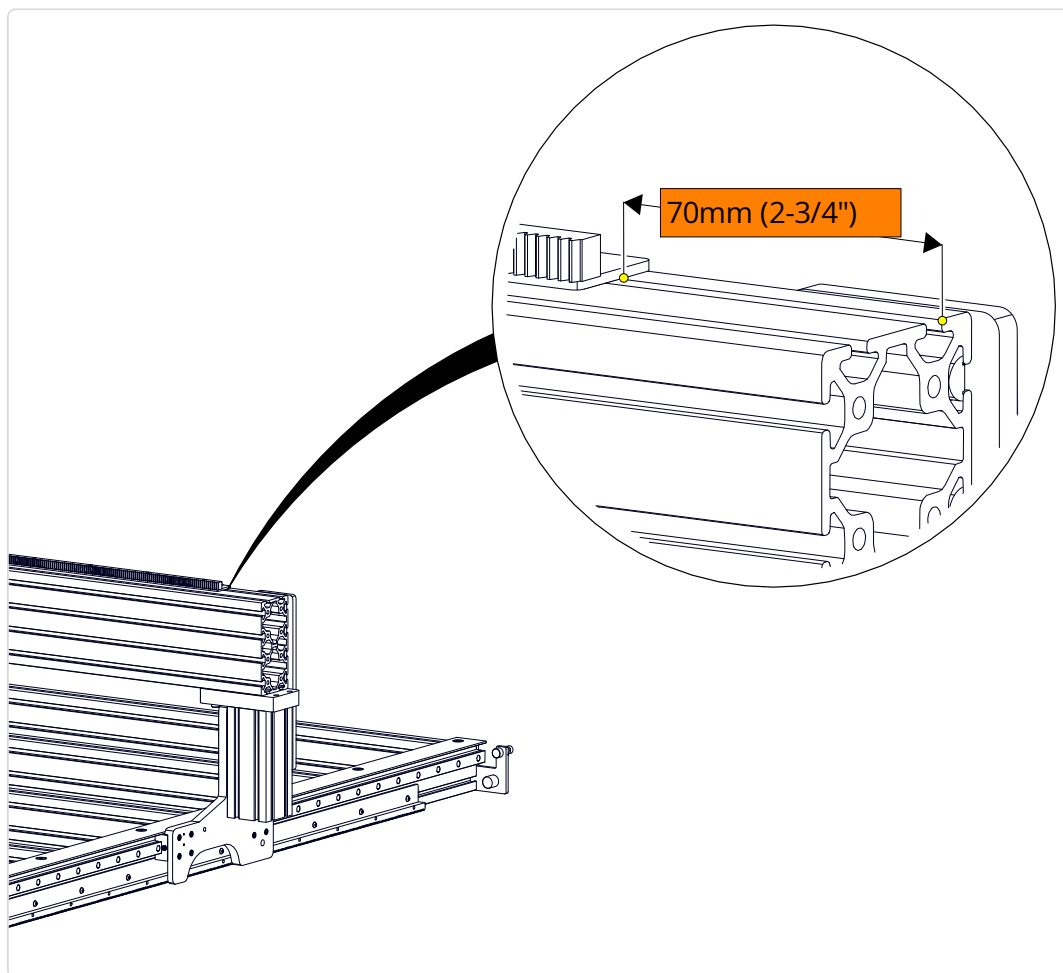
Ensure the gear rack teeth are facing towards the front of the machine.

4.2.2.2



1. Slide the second assembled gear rack section into the same t-slot.

4.2.2.3



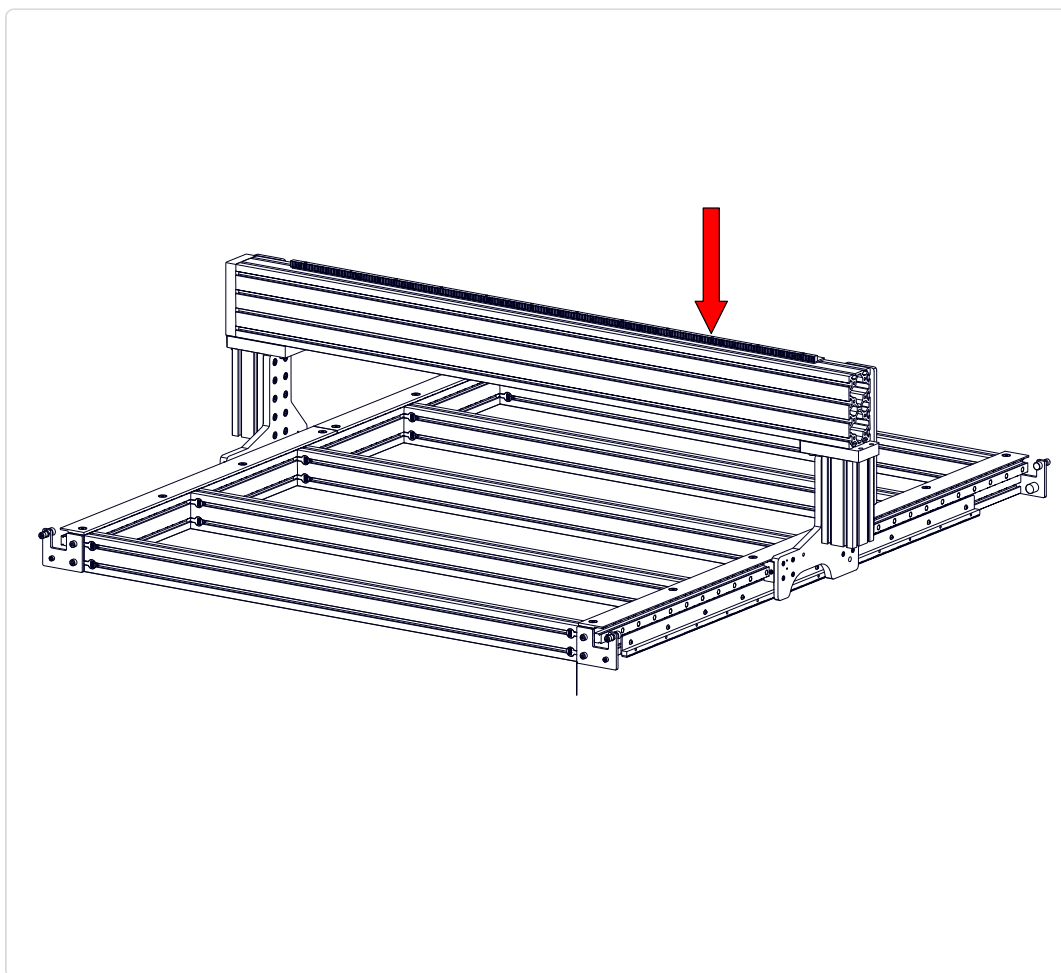
1. Position the gear rack 70mm (2-3/4") from the right end of the gantry extrusion.



Assembly Note

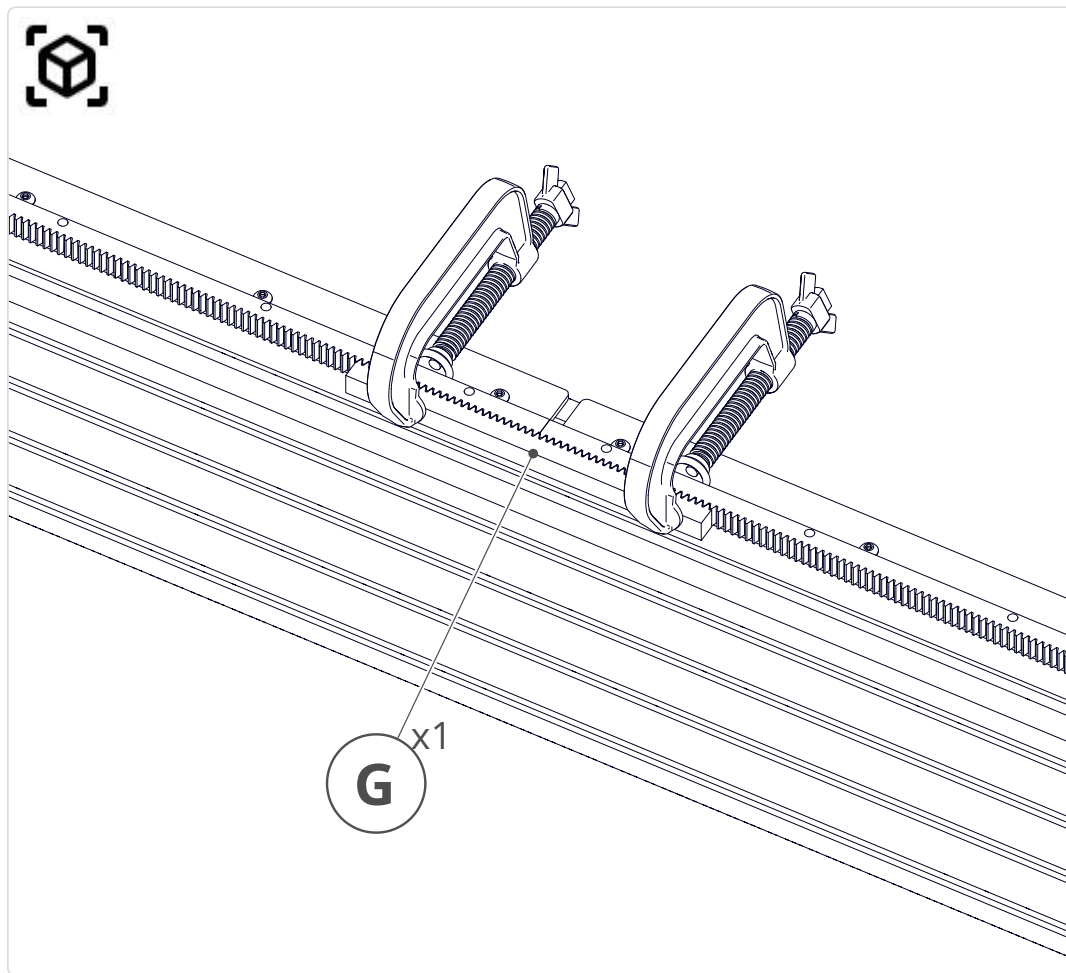
Looking from the front of the machine, the measurement shown is from the right end of the gantry.

4.2.2.4



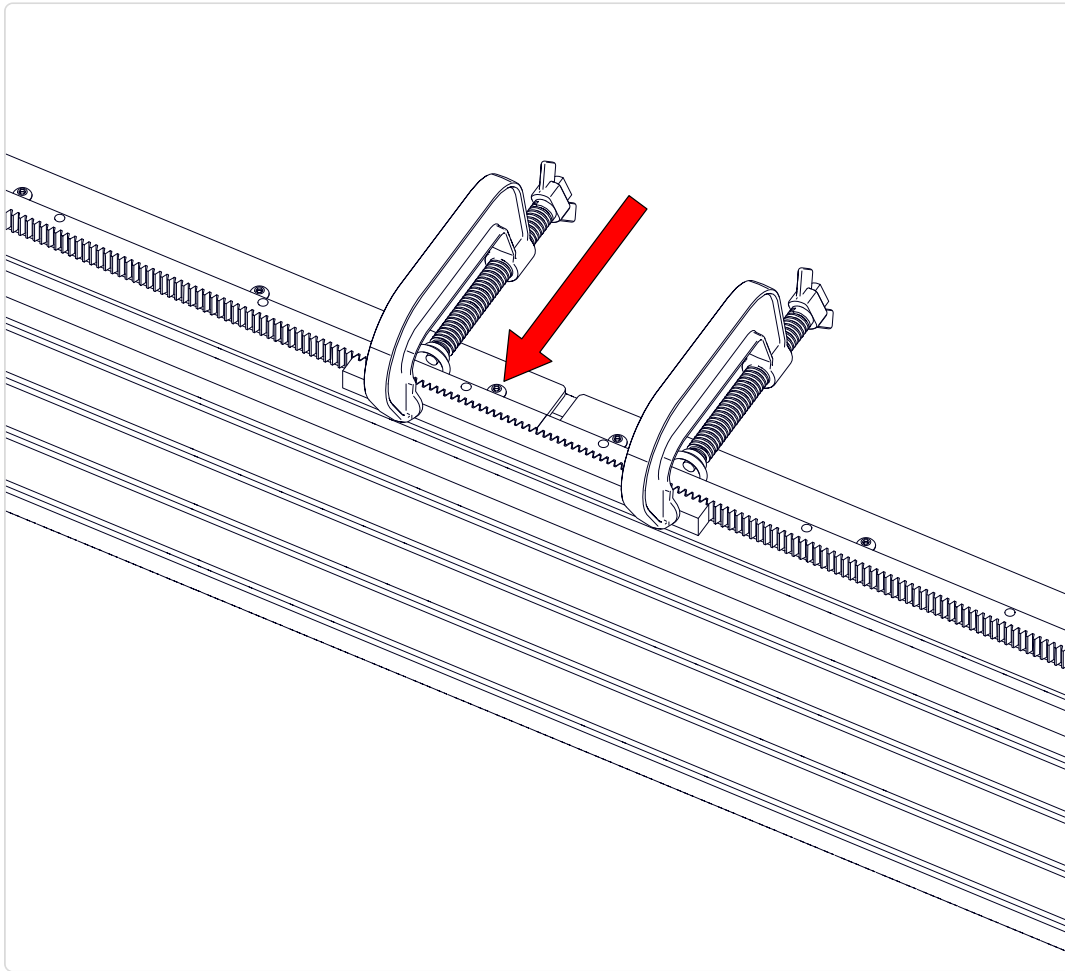
1. Fully tighten the fasteners on the gear rack section located on the right side of the gantry only.

4.2.2.4



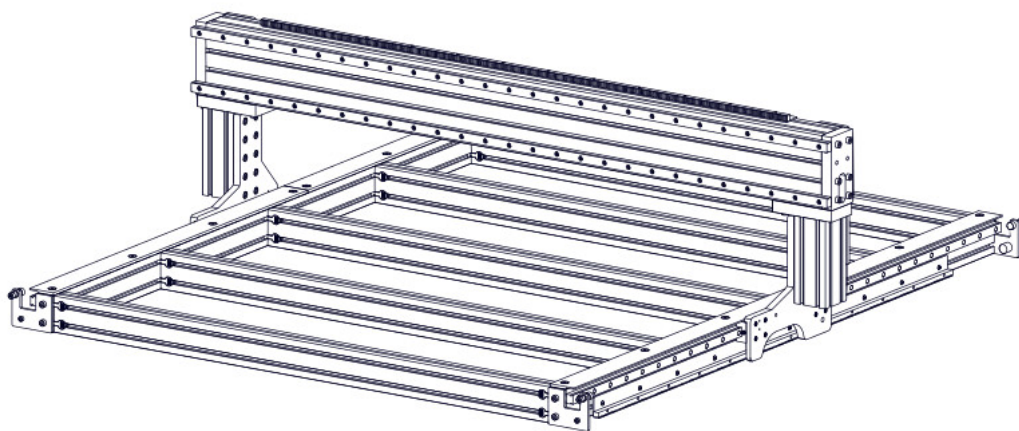
1. Clamp the **Gear Rack Splice** (G) to the two sections to align the gear rack teeth.

4.2.2.5



1. Start at the splice location and tighten the fasteners, working towards the opposite end of the gear rack.
2. Remove clamps and gear rack splice.

4.3 - Linear Rails



Parts List

ID	QTY	Part/Description	Package Label
(A)	2	Linear Rail, 1900mm (74-13/16")	Steel Tube
	2	GH20-60-FAST	Gantry Assembly Kit
(B)	60	M5 x 20mm Socket Head Cap Screw (30 per bag)	GH20-60-FAST >
(C)	60	M5 Slide-in T-Nut (30 per bag)	GH20-60-FAST >
	1	CRP833-00 Gantry End Cap Kit	Gantry Assembly Kit
(D)	1	CRP830-03 Gantry End Cap	CRP833-00 >
(E)	6	M8 x 35mm Socket Head Cap Screw	CRP833-00 >
	1	CRP820-00-FAST	Gantry Assembly Kit
(F)	4	M8 x 35mm Socket Head Cap Screw	CRP820-00-FAST >
(G)	8	M8 x 20mm Socket Head Cap Screw	CRP820-00-FAST >
	1	Linear Rail Setting Jig Kit	Base Table Kit
(H)	2	Rail Alignment Jig	Linear Rail Setting Jig Kit >
(I)	4	M8 x 25mm Socket Head Cap Screw	Linear Rail Setting Jig Kit >
(J)	4	M8 Roll-in T-Nut	Linear Rail Setting Jig Kit >
(K)	4	GHH20CA - Linear Bearing Block	Gantry Assembly Kit
(L)	4	M6 Flush Mount Grease Fitting	Gantry Assembly Kit

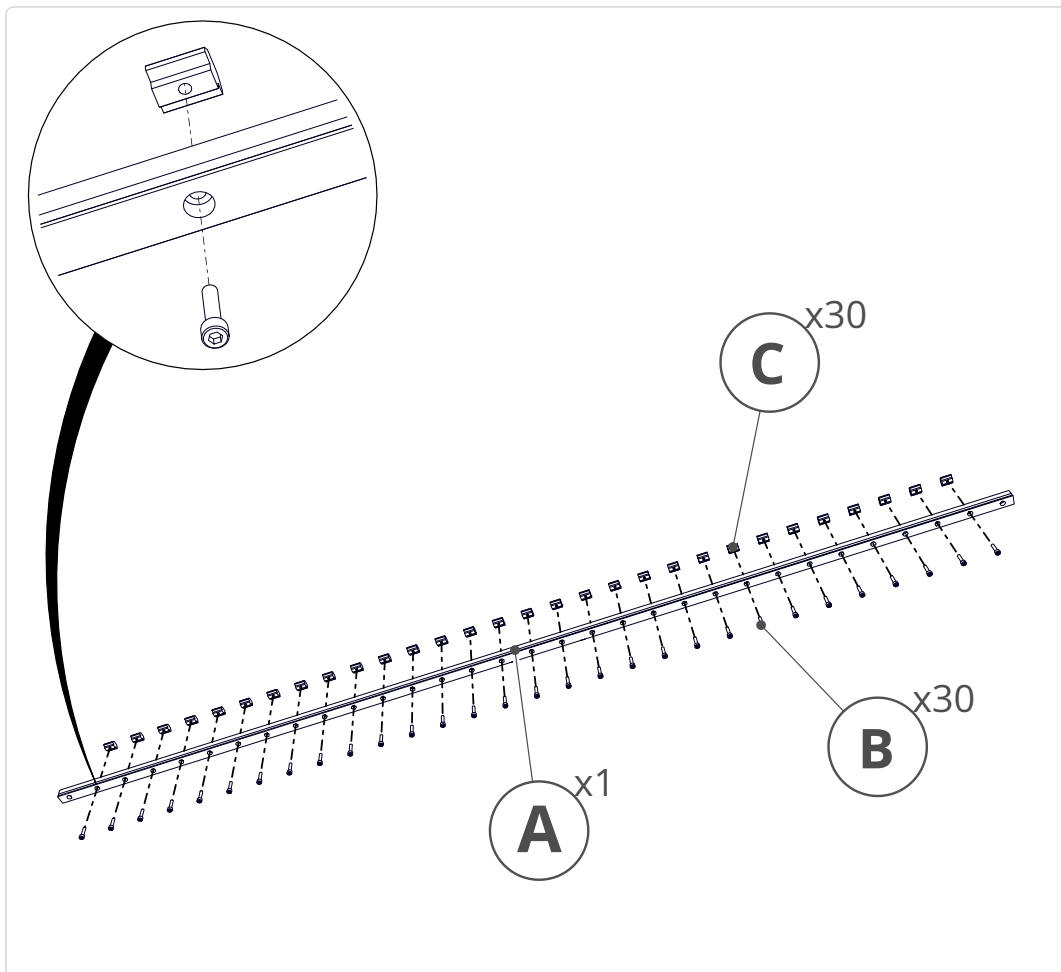
Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	6mm Allen Wrench
Required	(2) Clamp



4.3.1 - Linear Rail Assembly

4.3.1.1



1. Partially thread **M5 x 20mm Socket Head Cap Screws (B)** onto **M5 Slide-in T-Nuts (C)**, through the **Linear Rail, 1900mm (74-13/16") (A)**.



Assembly Note

The outermost hole on each side of the linear rail will not use a fastener.

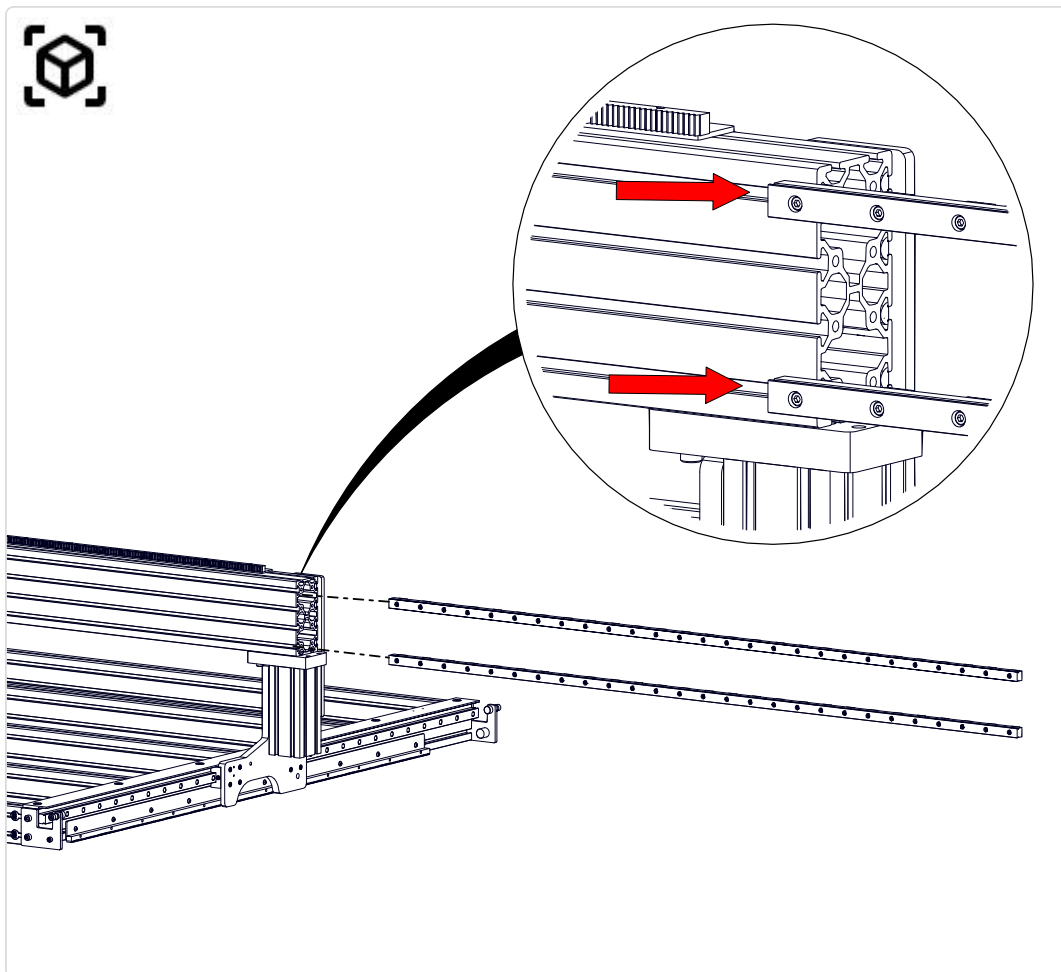
4.3.1.2



1. Repeat the previous step to assemble the second linear rail.

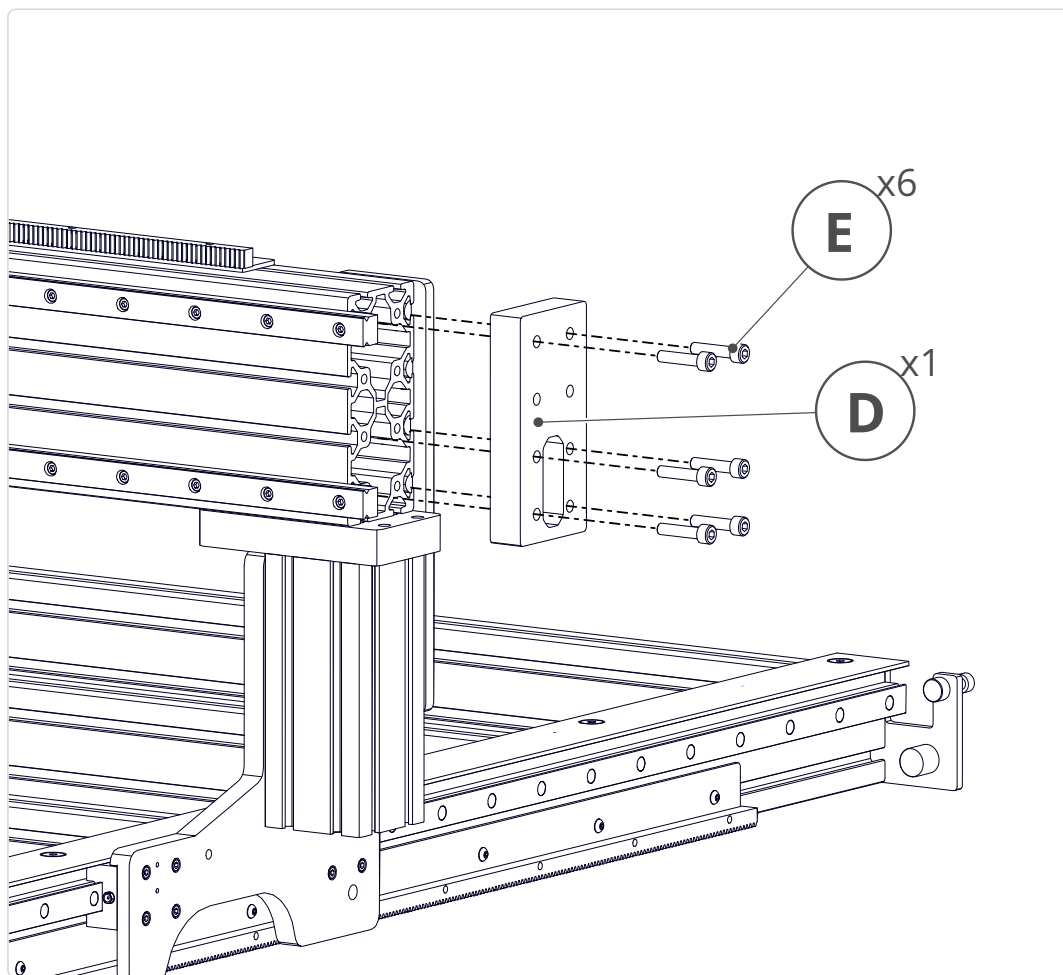
4.3.2 - Linear Rail Installation

4.2.2.1



1. Slide the assembled linear rails onto the front of the gantry extrusion, using the top and bottom t-slots.

4.2.2.2



1. Install the **CRP830-03 Gantry End Cap (D)** using **M8 x 35mm Socket Head Cap Screws (E)**.
2. Fully tighten the fasteners.



Assembly Note

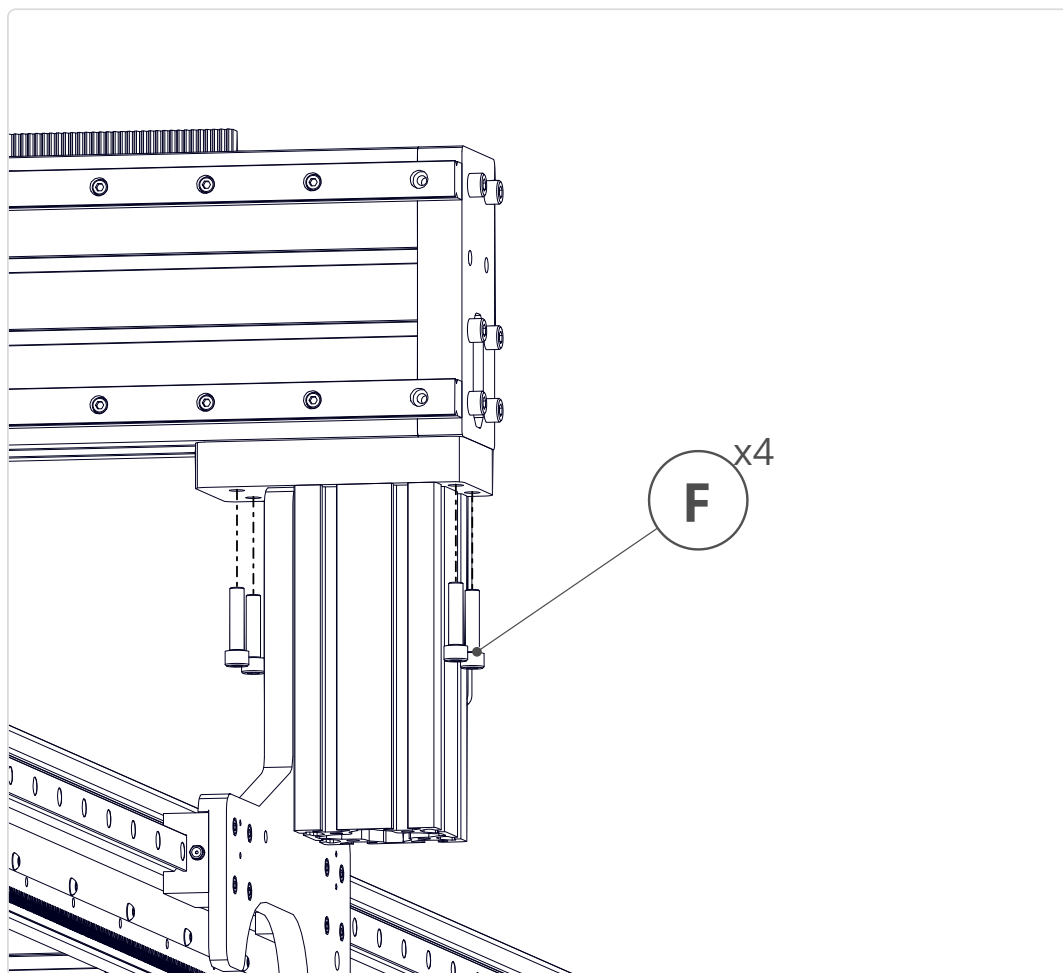
Orient the gantry end cap with the tapped holes on the bottom biased towards the outside of the machine.



Assembly Note

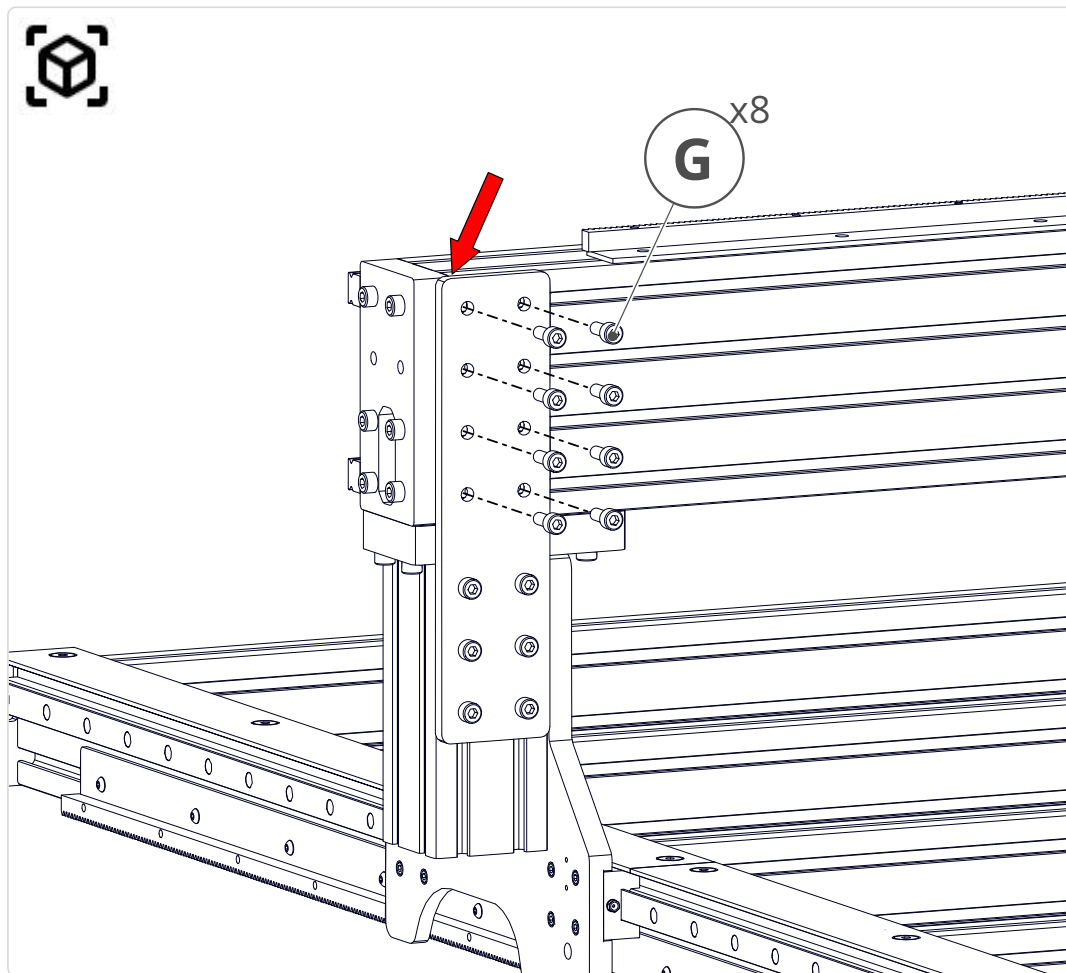
Do not install fasteners in the remaining two holes of the gantry end cap; these will be used when mounting the gantry bumpers.

4.3.2.1



1. Install and partially tighten the indicated **M8 x 35mm Socket Head Cap Screws** (F).

4.2.2.4



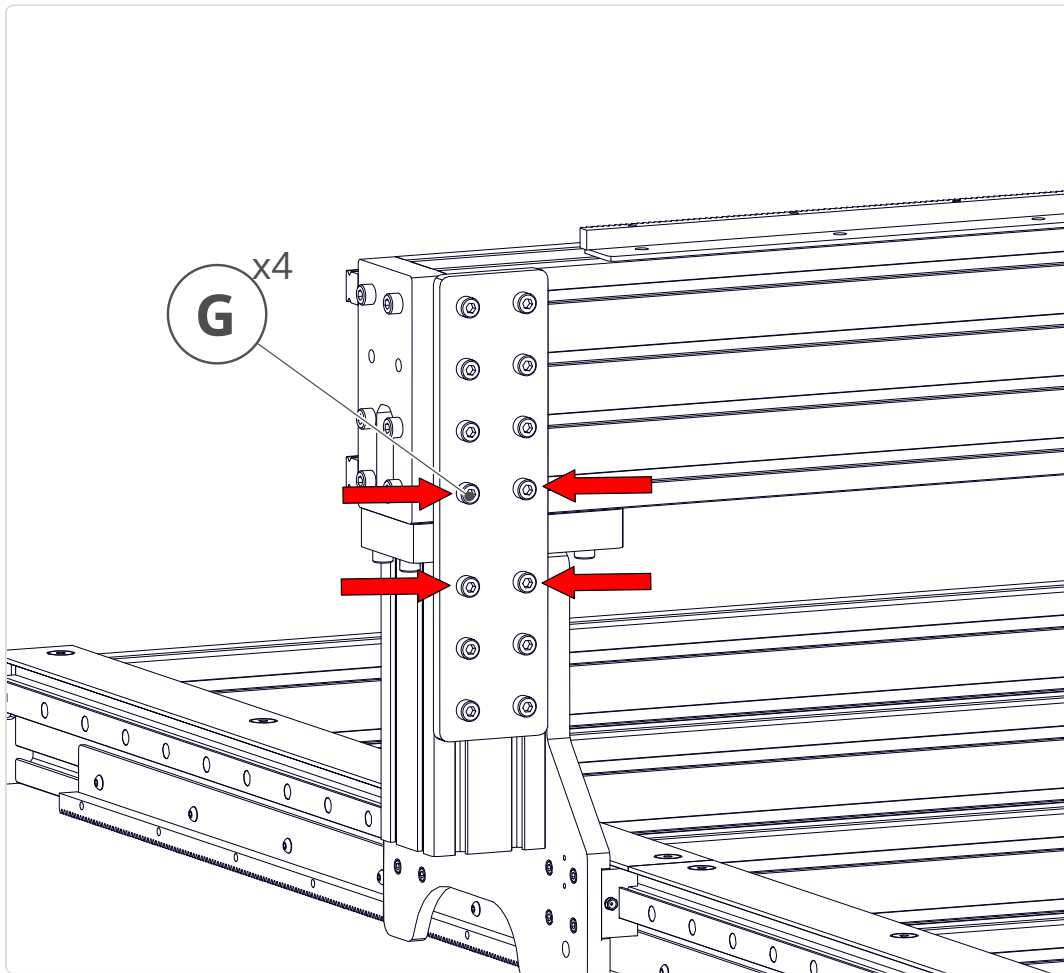
1. Install and partially tighten the remaining **M8 x 20mm Socket Head Cap Screws (G)** into the gantry extrusion.



Assembly Note

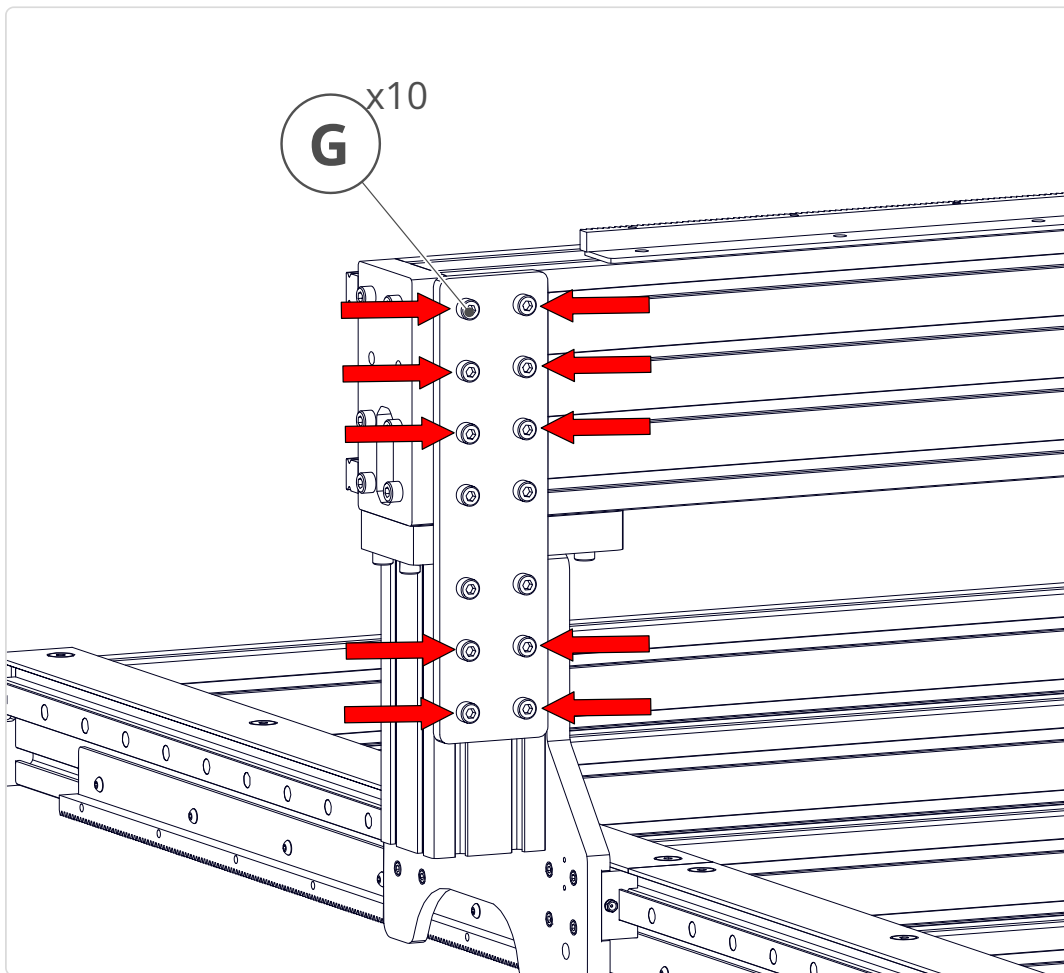
Ensure the top of the joining plate is flush with the top of the gantry extrusion, as indicated by the red arrow.

4.3.2.2



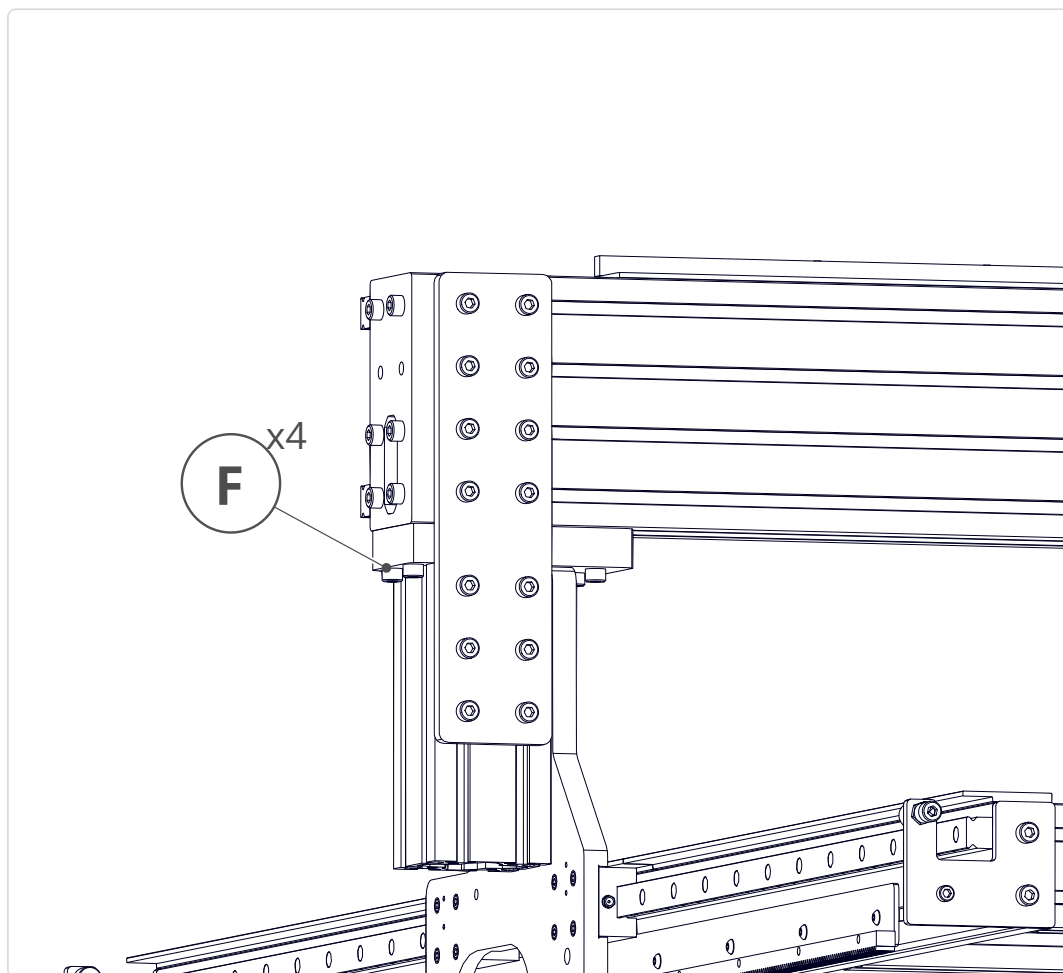
1. Fully tighten the four indicated **M8 x 20mm Socket Head Cap Screws** **G**.

4.2.2.6



1. Fully tighten the remaining indicated **M8 x 20mm Socket Head Cap Screws** (G).

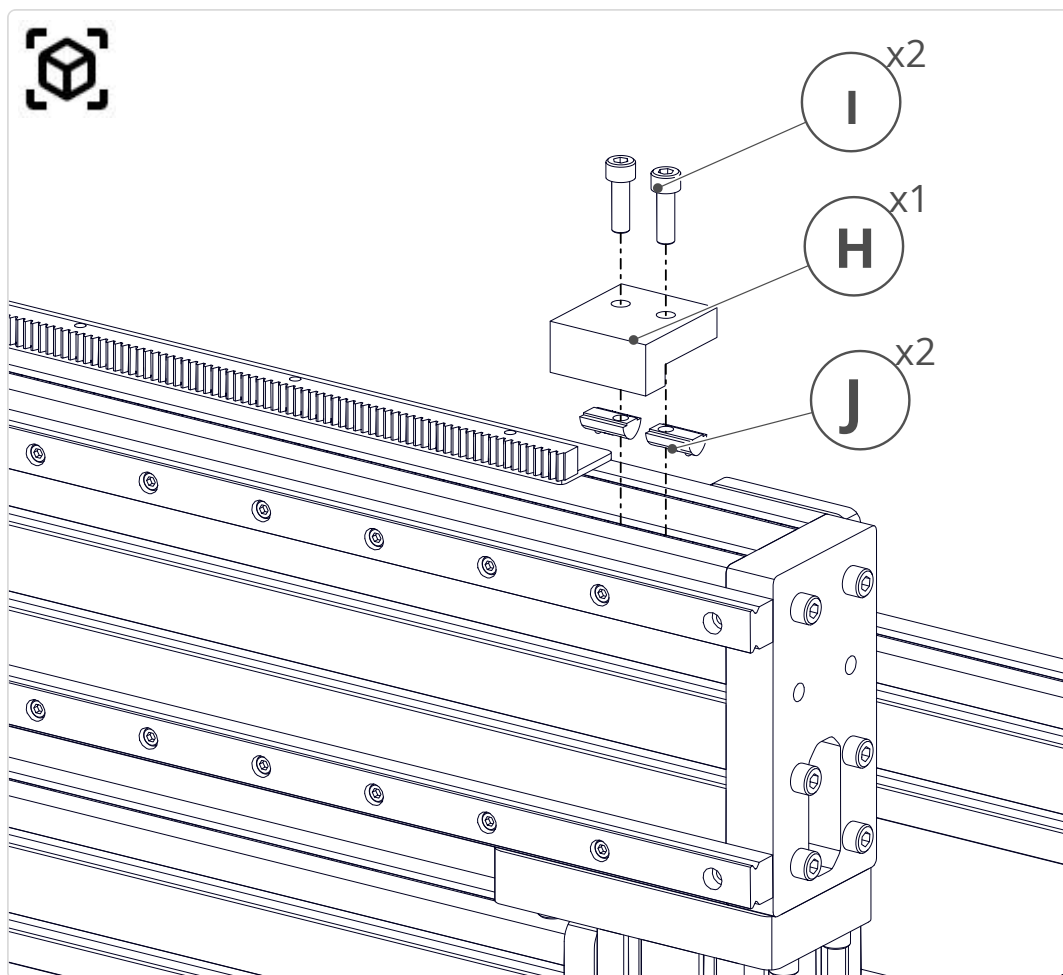
4.3.2.3



1. Fully tighten the M8 x 35mm Socket Head Cap Screws **F**.

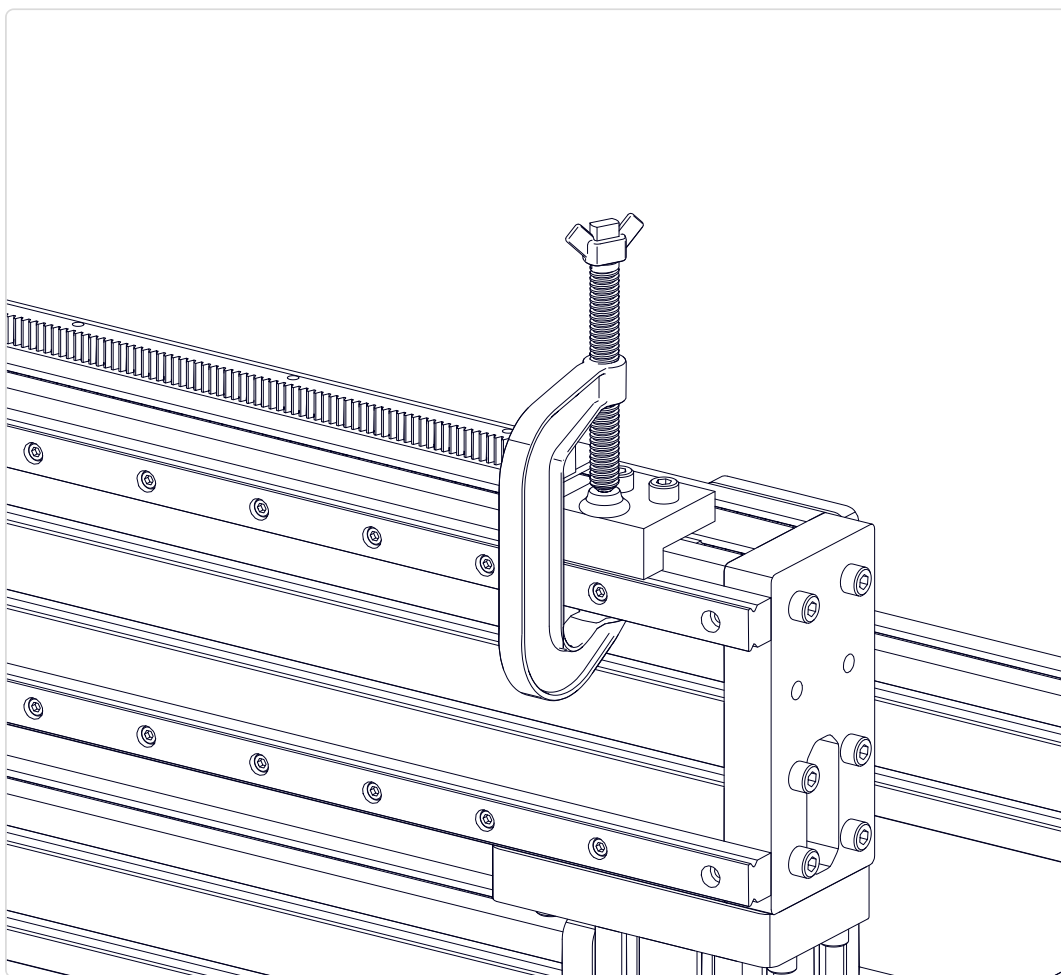
4.3.3 - Linear Rail Alignment

4.3.3.1



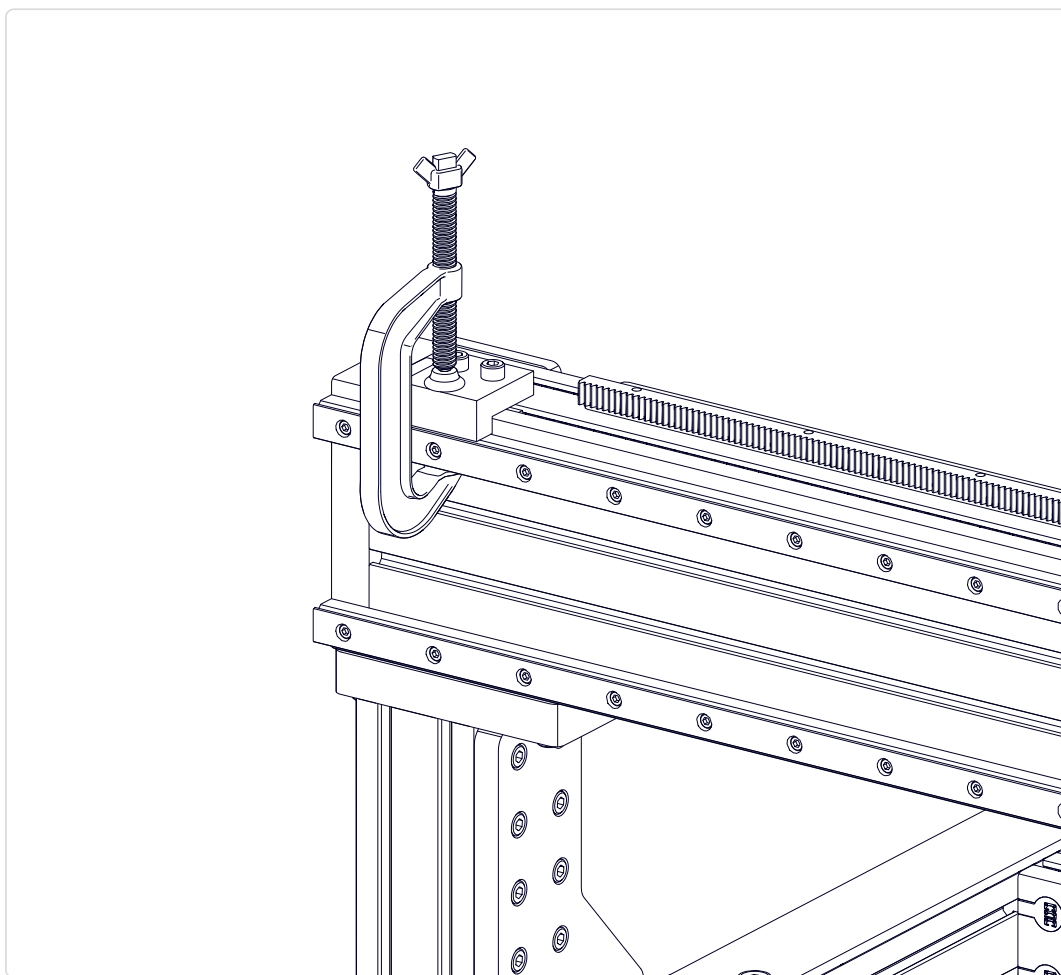
1. Attach the Rail Alignment Jig (H) using M8 x 25mm Socket Head Cap Screws (I) and M8 Roll-in T-Nuts (J).

4.3.3.2



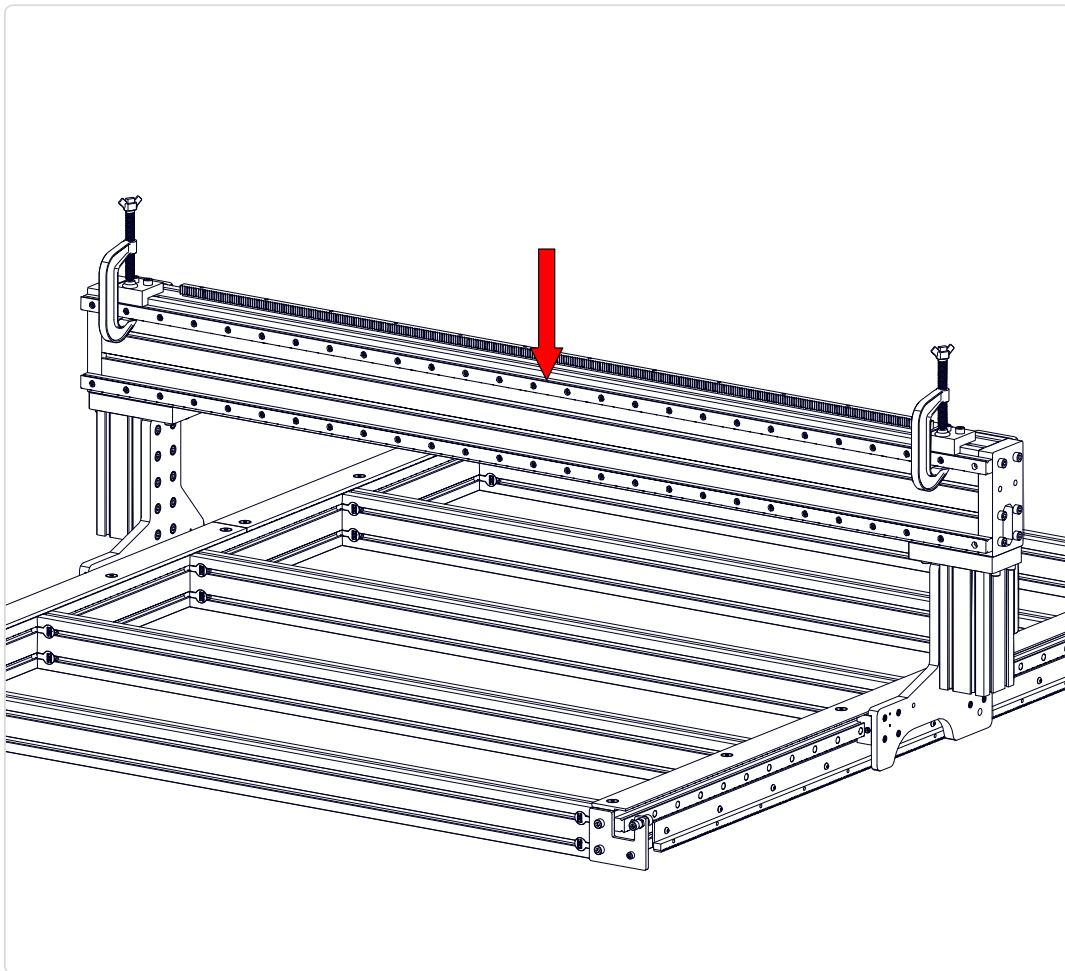
1. Clamp the end of the linear rail to the rail alignment jig as indicated.

4.3.3.3



1. Repeat **this process** to clamp the other side of the linear rail.

4.3.3.4



1. Fully tighten the linear rail fasteners only on the clamped linear rail.
2. After tightening, remove the clamps and rail alignment jigs.

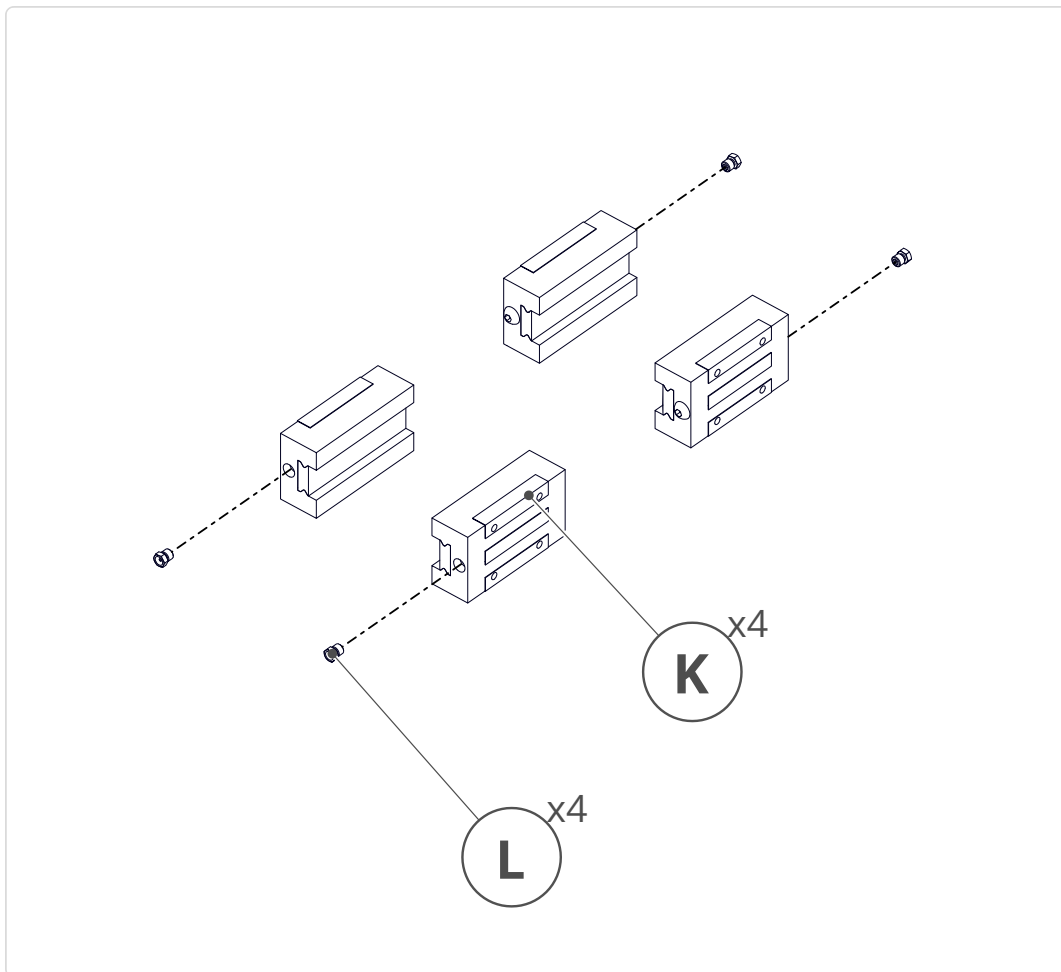


Assembly Note

Partially tighten the lower linear rail fasteners. These will be fully tightened after the gantry carriage assembly is installed.

4.3.4 - Linear Bearing Block Installation

4.3.4.1

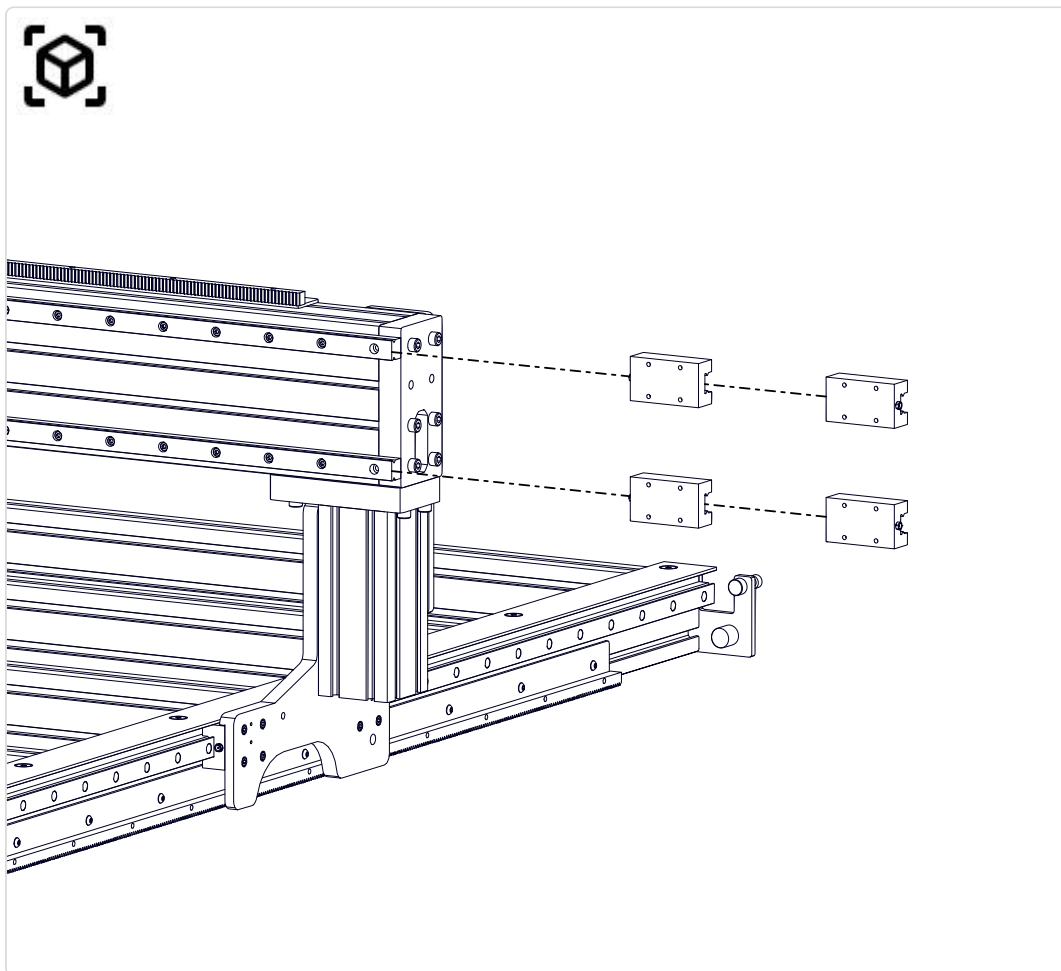


1. Thread **Grease Fittings (L)** into the **Linear Bearing Blocks (K)** as indicated and hand tighten.
2. Orientation of the linear bearing block reference edges is not important for installation on the gantry.

Assembly Note

DO NOT remove the plastic bearing retainers at this time.

4.3.4.2



1. Slide the linear bearing blocks onto the rails as indicated, with the grease fittings facing away from each other.



Assembly Note

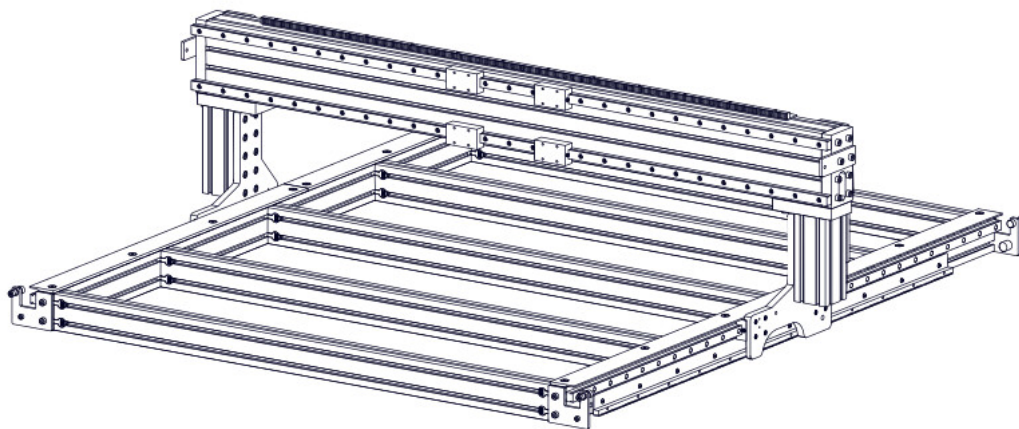
Refer to the Base Components section for the correct procedure to remove the plastic bearing retainers.



Assembly Note

Follow the same procedure used in the Base Components to grease the linear bearing blocks.

4.4 - Gantry Bumper Plates & Sensor Flags



Parts list

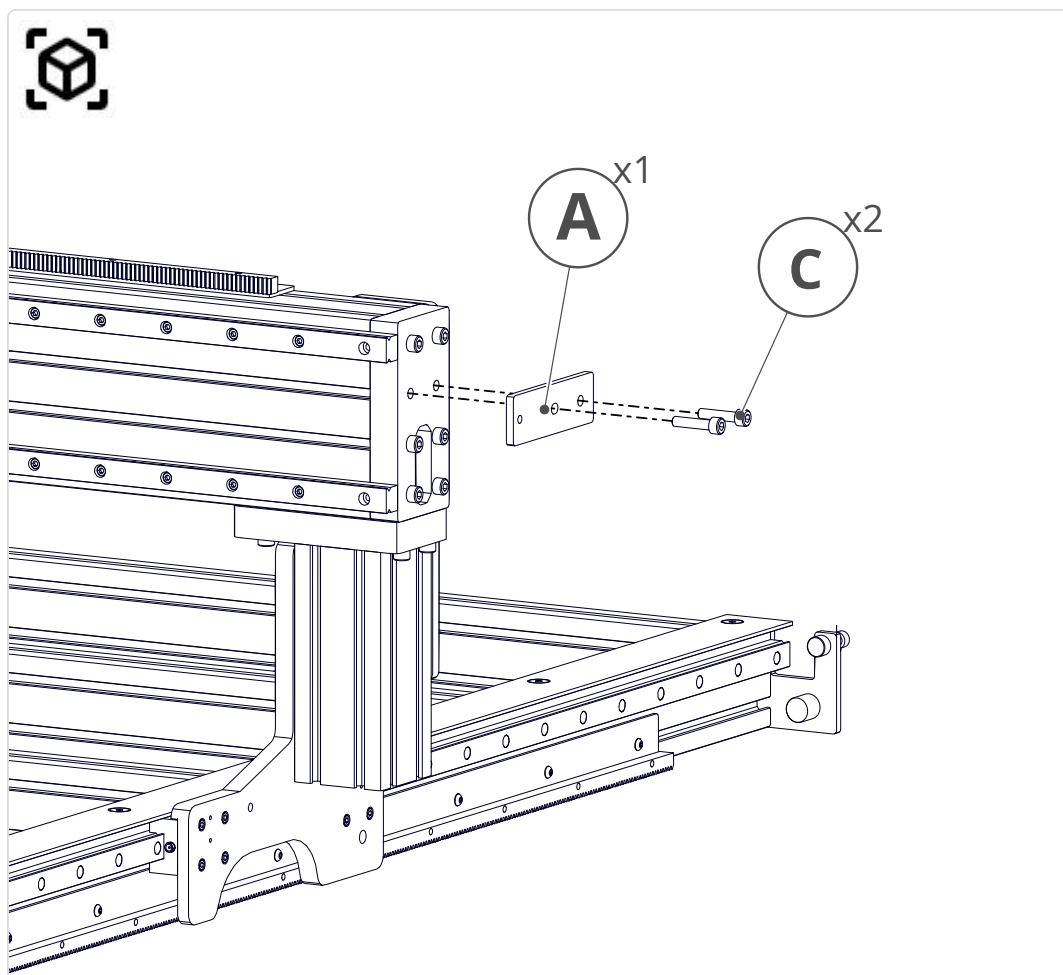
ID	QTY	Part/Description	Package Label
	1	CRP831-00-19.1 Gantry Axis Bumper Kit	Gantry Assembly Kit
(A)	2	CRP831-01 Bumper Plate	CRP831-00-19.1 >
(B)	4	M8 x 50mm Socket Head Cap Screw	CRP831-00-19.1 >
	1	CRP831-02-00 Gantry Sensor Flag Kit	Gantry Assembly Kit
(C)	4	M8 Roll-in T-Nut	CRP831-02-00 >
(D)	4	M8 x 25mm Socket Head Cap Screw	CRP831-02-00 >
(E)	2	CRP831-02 Sensor Flag	CRP831-02-00 >
Remaining parts from CRP831-00-19.1 used in future section			

Tools List

Requirement	Tool
Required	6mm Allen Wrench

4.4.1 - Bumper Plate Installation

4.4.1.1



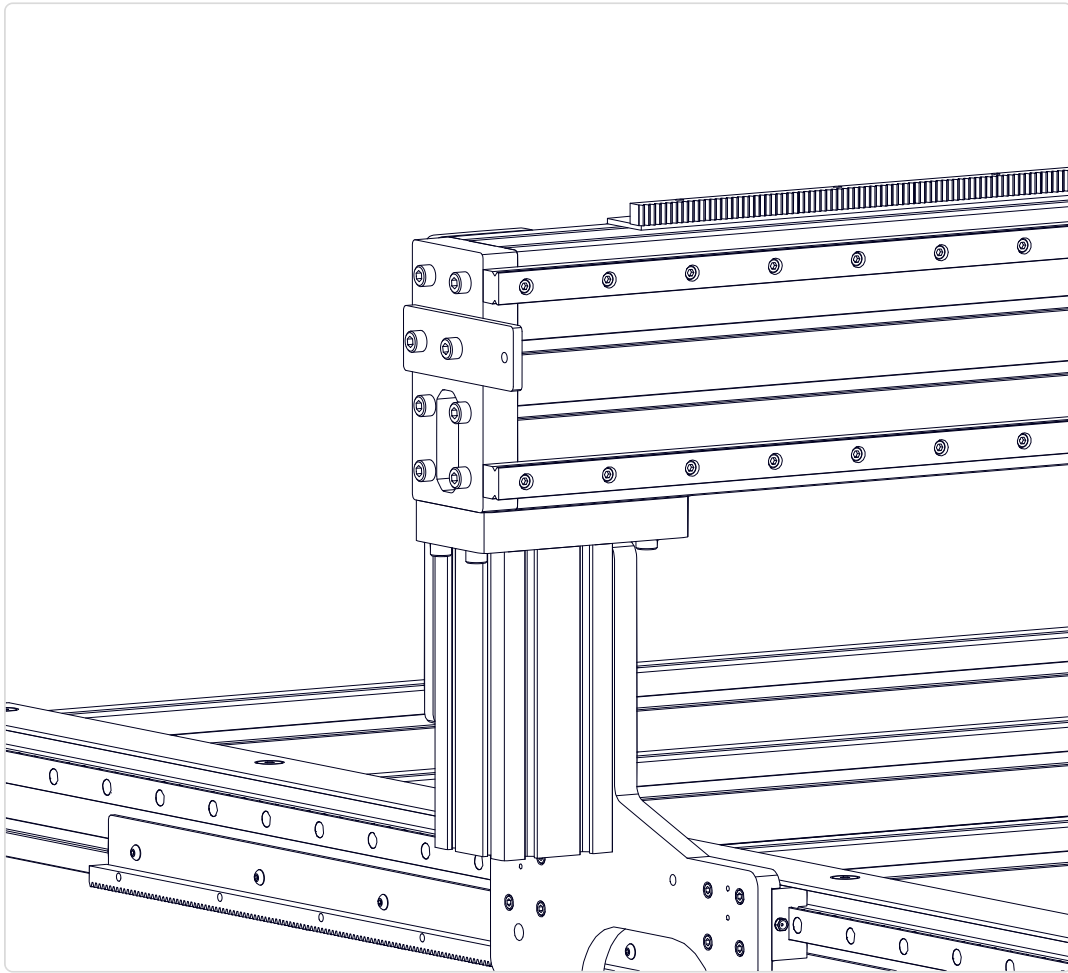
1. Attach the **CRP831-01 Bumper Plate (A)** to the gantry end cap using **M8 x 50mm Socket Head Cap Screws (B)**.



Assembly Note

The rubber bumpers will be installed on the bumper plate after installation of proximity sensors in Section 9.

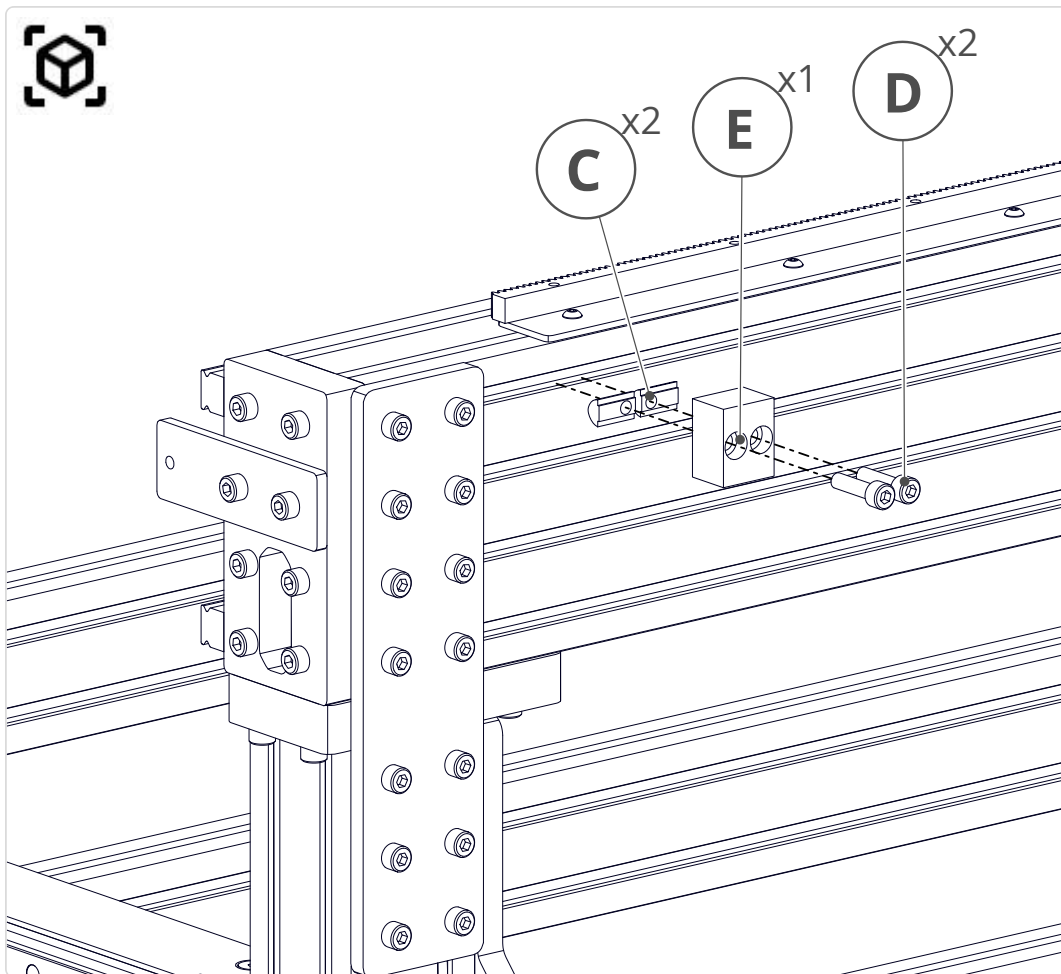
4.4.1.2



1. Repeat this process to install a bumper plate on the other side of the gantry.

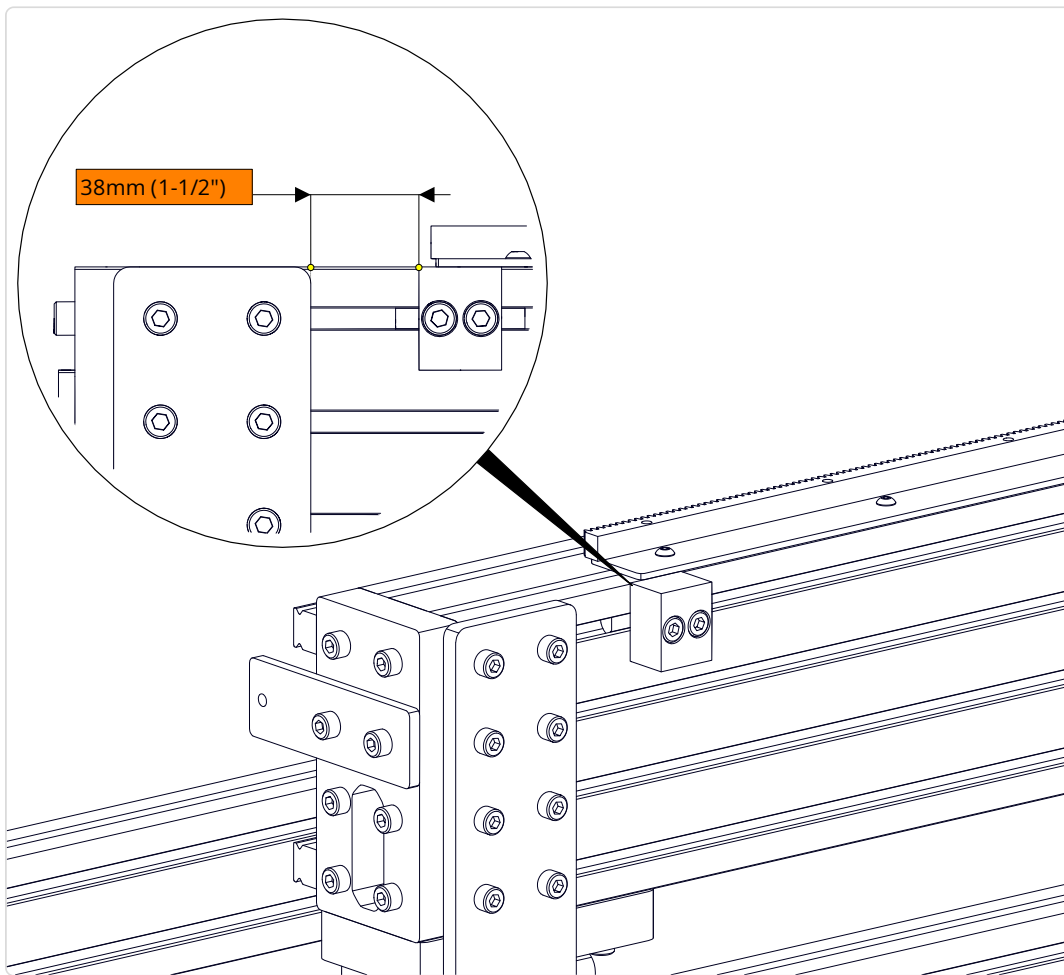
4.4.2 - Gantry Sensor Flag Installation

4.4.2.1



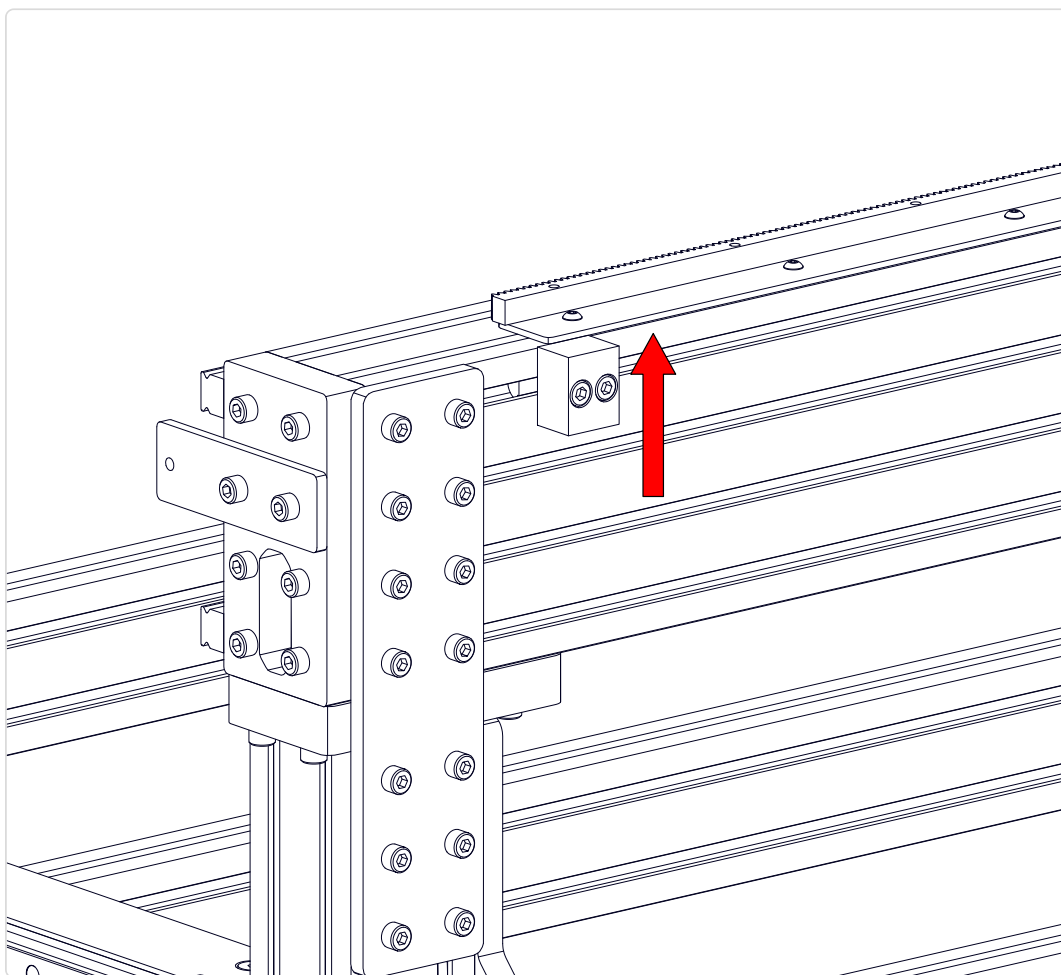
1. Attach a **CRP831-02 Sensor Flag (E)** to the gantry using **M8 x 25mm Socket Head Cap Screws (D)** and **M8 Roll-in T-Nuts (C)**, partially tightening the fasteners.

4.4.2.2



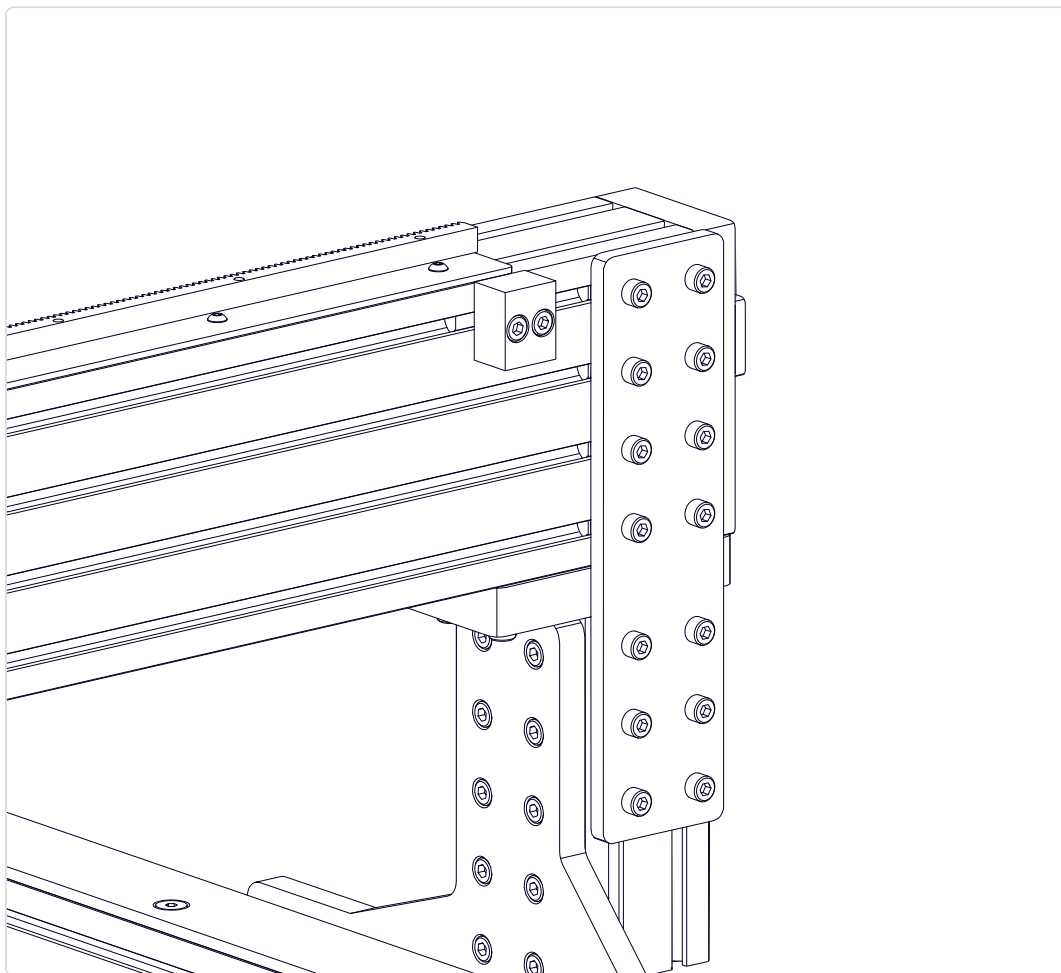
1. Position the sensor flag 38mm (1-1/2") from the joining plate as indicated.

4.4.2.3



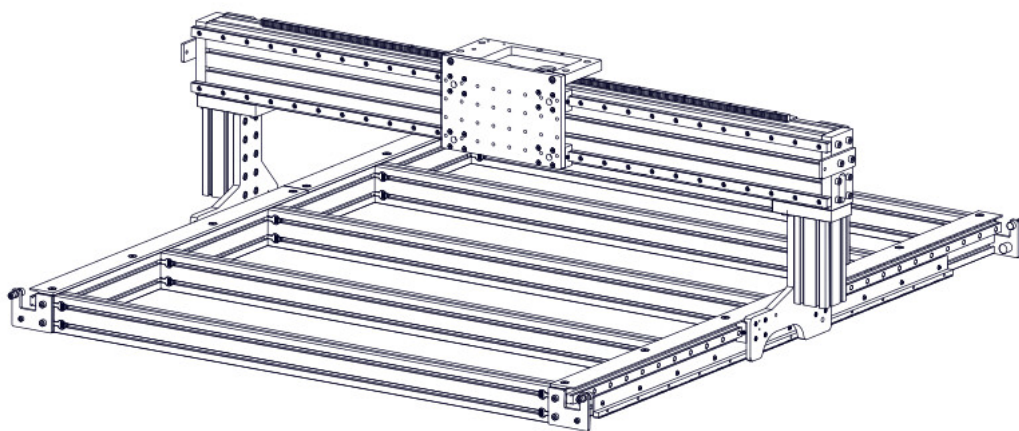
1. Bias the sensor flag towards the top of the gantry extrusion.
2. Fully tighten the sensor flag fasteners.

4.4.2.4



1. Repeat **this process** to install a sensor flag on the other end of the gantry.

4.5 - Gantry Carriage



Parts List

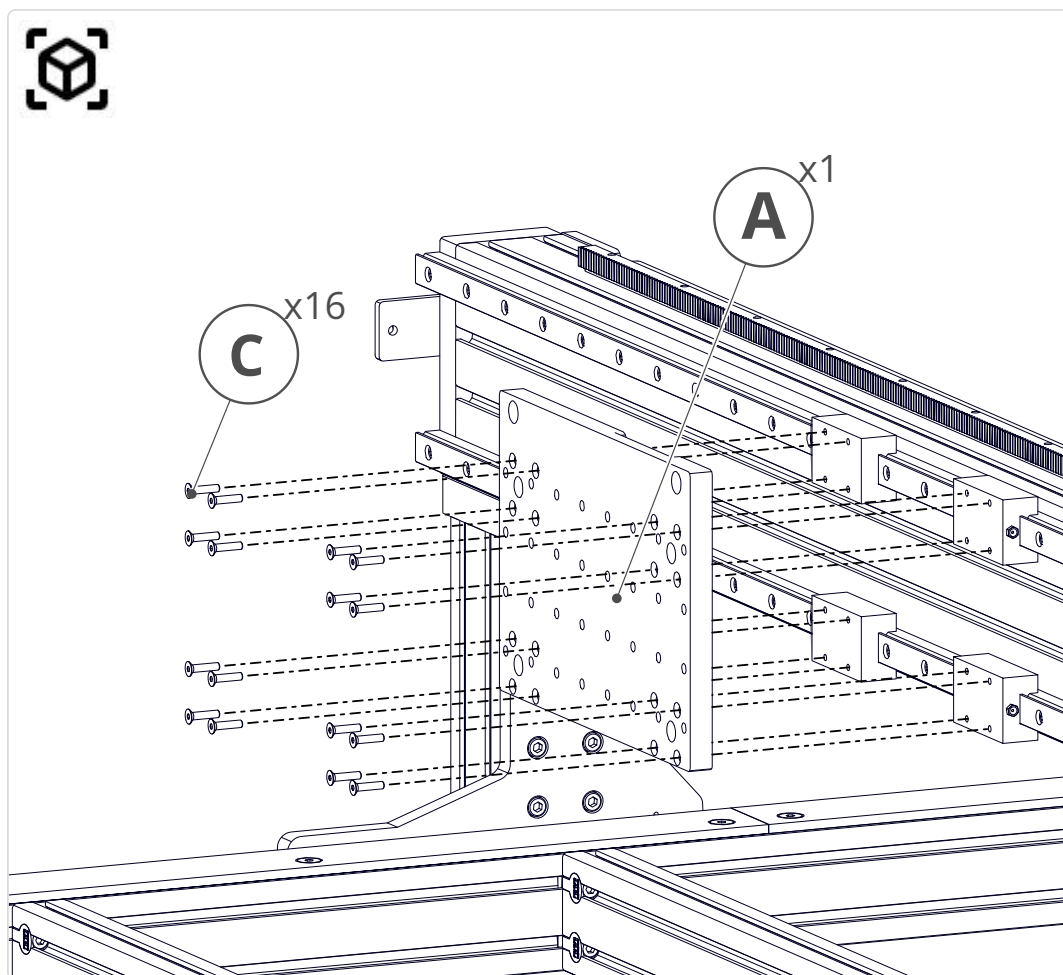
ID	QTY	Part/Description	Package Label
(A)	1	CRP830-01 Gantry Plate	Gantry Assembly Kit
(B)	1	CRP830-02 Gantry R&P Plate	Gantry Assembly Kit
	1	CRP832-00-FAST	Gantry Assembly Kit
(C)	16	M5 x 22mm Flat Head Cap Screw	CRP832-00-FAST >
(D)	2	M8 x 20mm Dowel Pin	CRP832-00-FAST >
(E)	2	M8 x 20mm Socket Head Cap Screw	CRP832-00-FAST >

Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	6mm Allen Wrench

4.5.1 - Gantry Carriage Installation

4.5.1.1



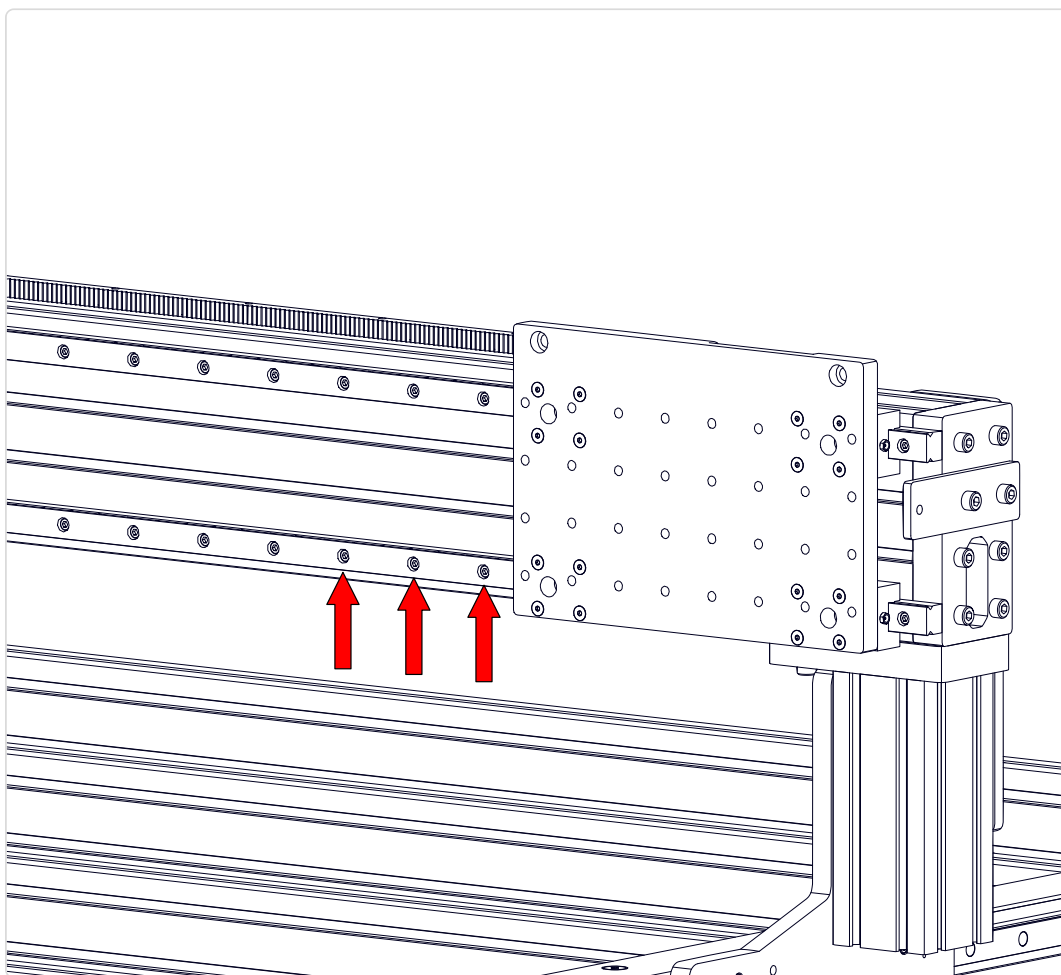
1. Attach the **CRP830-01 Gantry Plate (A)** to the linear bearing blocks using **M5 x 22mm Flat Head Screws (C)**.



Assembly Note

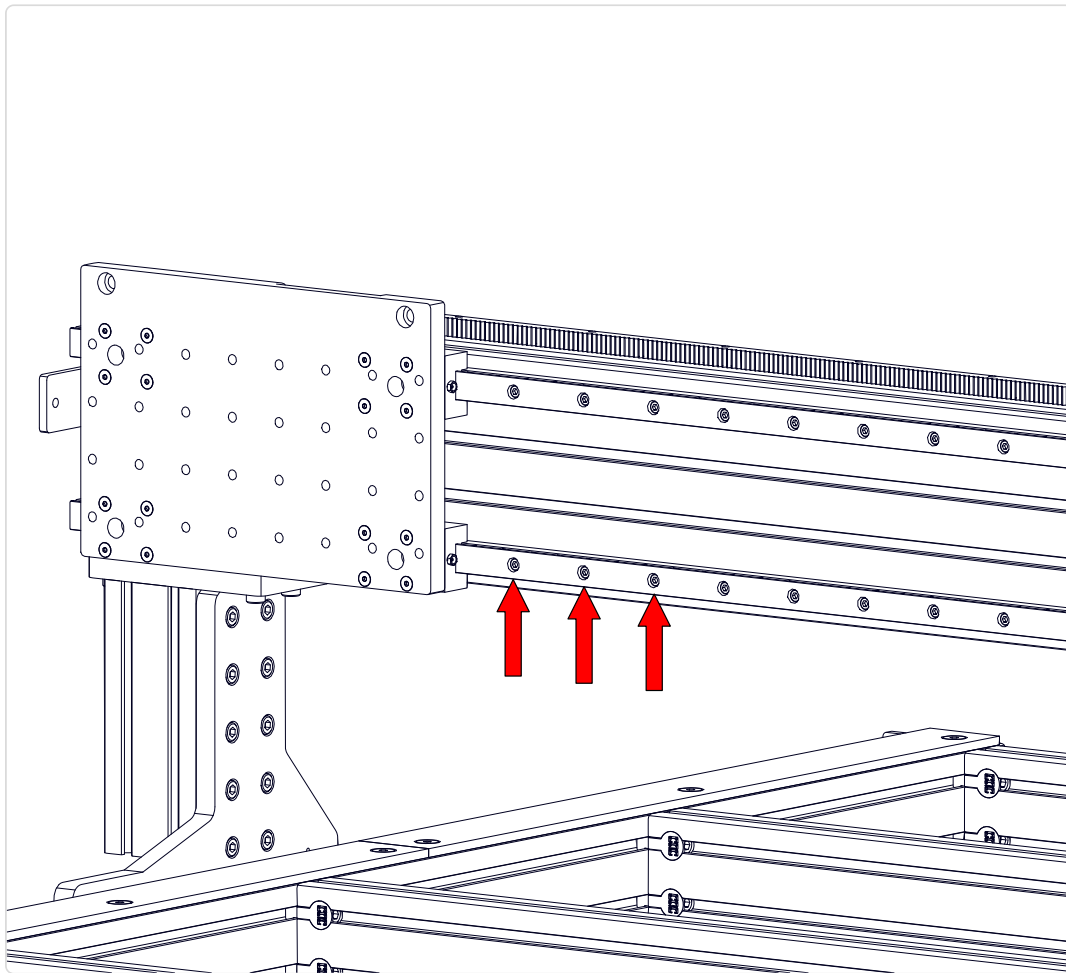
Ensure correct orientation of the gantry plate. The cutout on the back of the plate will be on the top and facing towards the gantry.

4.5.1.2



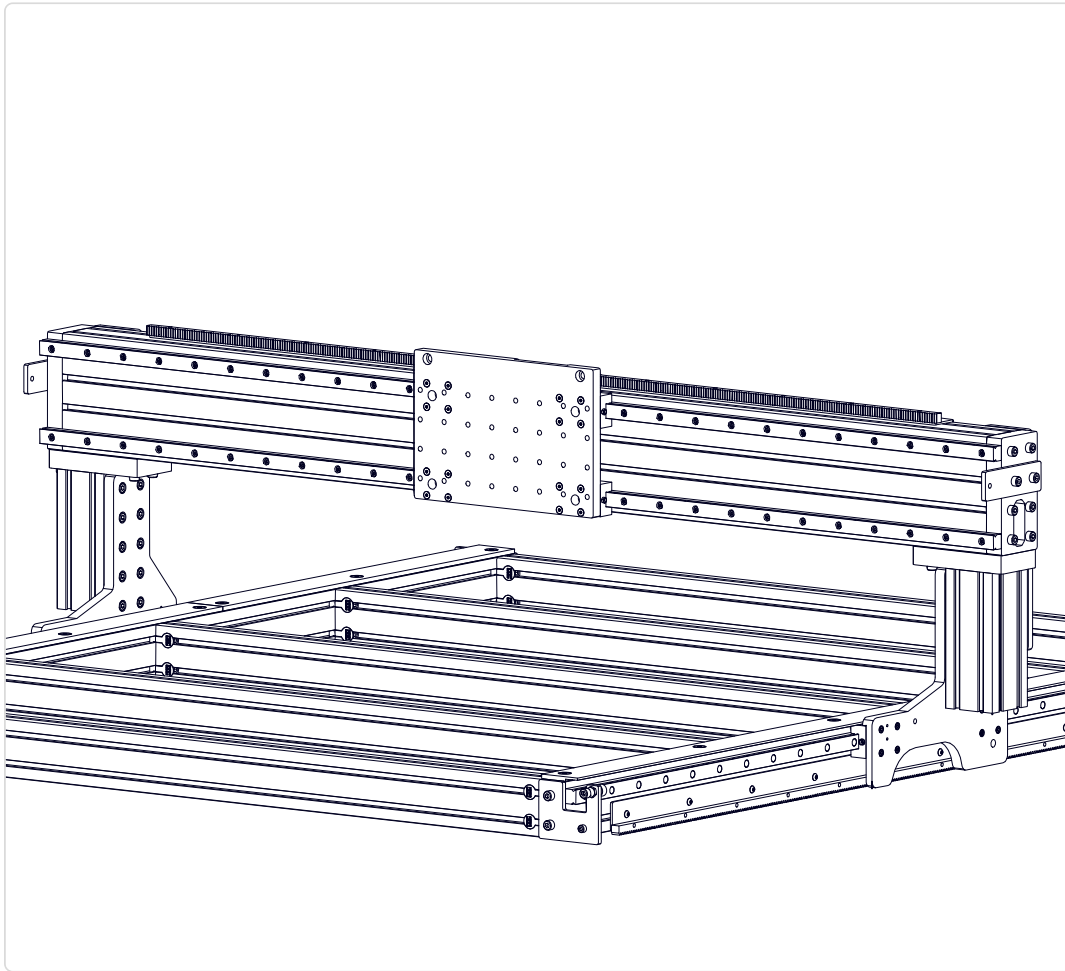
1. Slide the gantry plate to one end of the gantry.
2. Tighten the three indicated linear rail fasteners near the gantry plate.

4.5.1.3



1. Slide the gantry plate to the other end of the gantry.
2. Tighten the three indicated linear rail fasteners near the gantry plate.

4.5.1.4



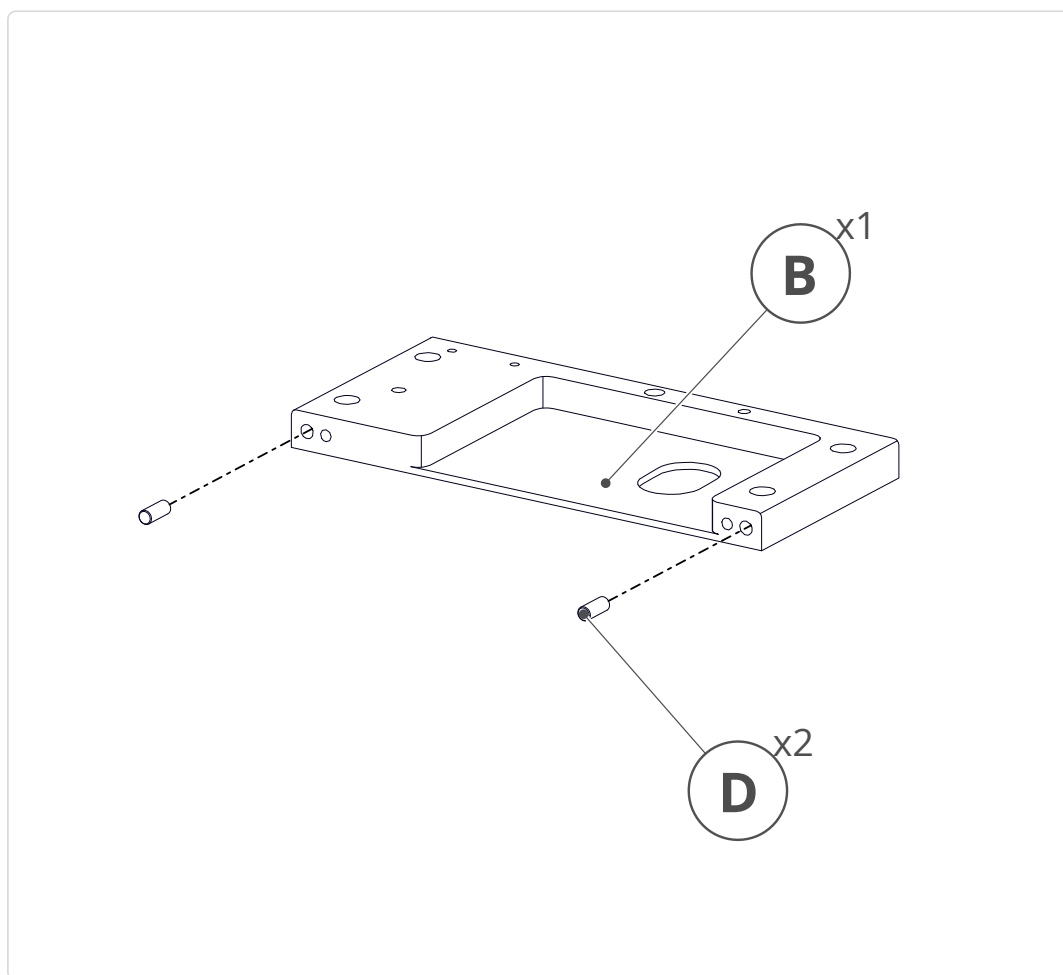
1. Fully tighten the remaining lower linear rail fasteners.



Assembly Note

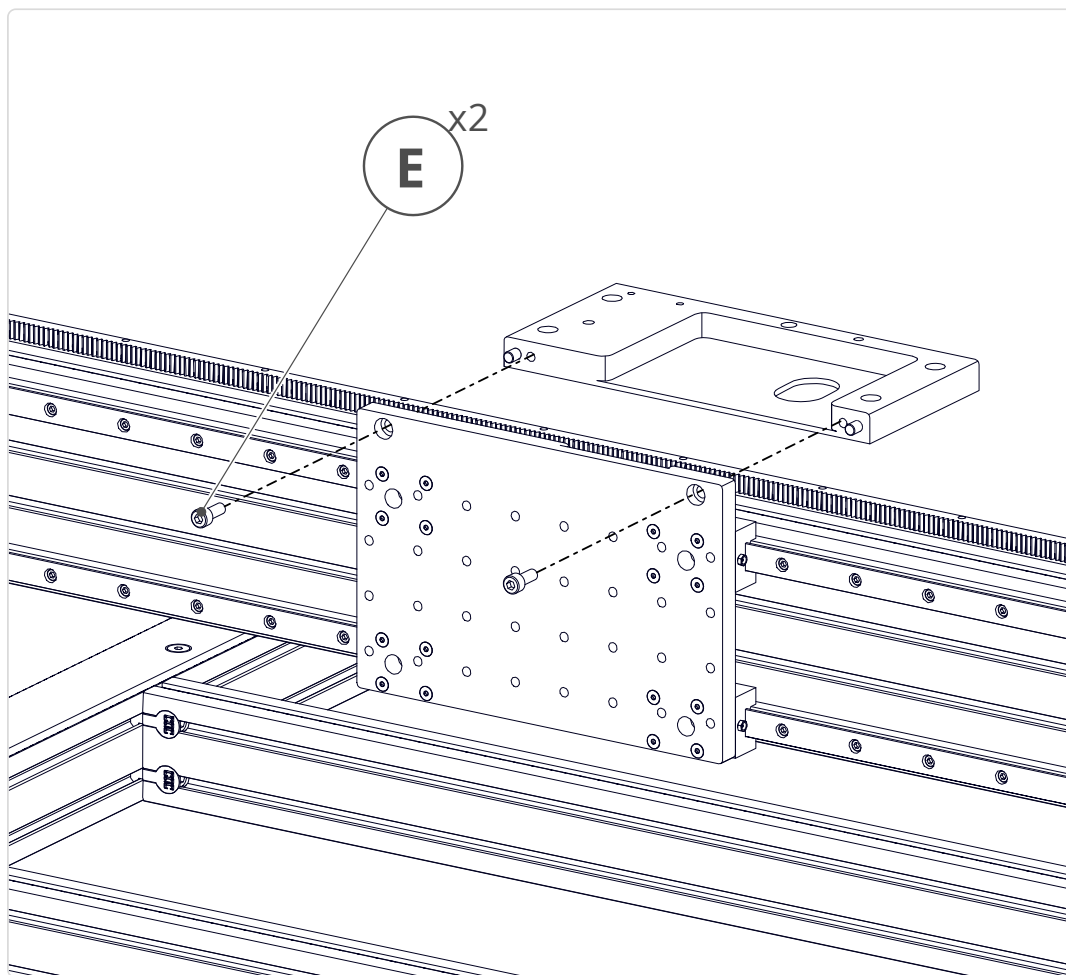
You will need to move the gantry plate along the gantry to access all of the fasteners. During this operation it will be normal to feel some resistance.

4.5.1.5



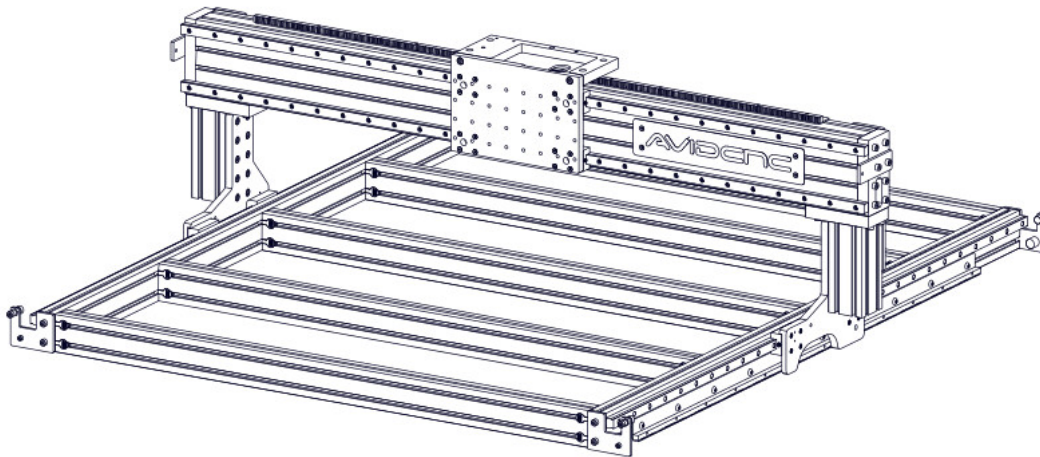
1. Install **M8 x 20mm Dowel Pins (D)** into the **CRP830-02 Gantry R&P Plate (B)** as indicated.

4.5.1.6



1. Attach the gantry R&P plate to the gantry plate using **M8 x 20mm Socket Head Cap Screws (E)**.
2. Fully tighten the fasteners.

4.6 - Avid CNC Nameplate



Parts List

ID	QTY	Part/Description	Package Label
(A)	1	Avid CNC Nameplate	Cable Track Kit
	1	CRP834-00-HW	Cable Track Kit
(B)	4	M5 x 12mm Flat Head Screw	CRP834-00-HW >
(C)	4	M5 Roll-in T-Nut	CRP834-00-HW >

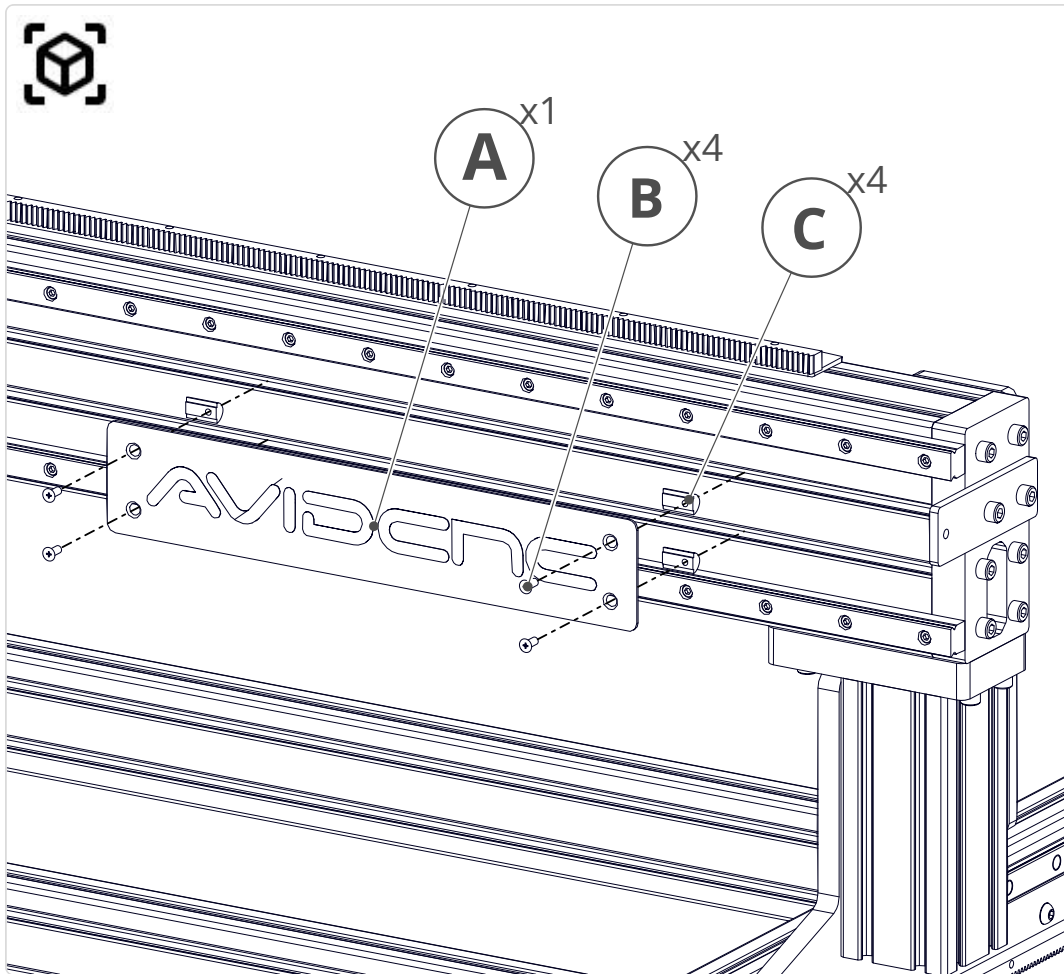
Tools List

Requirement	Tool
Required	3mm Allen Wrench
Required	Tape Measure



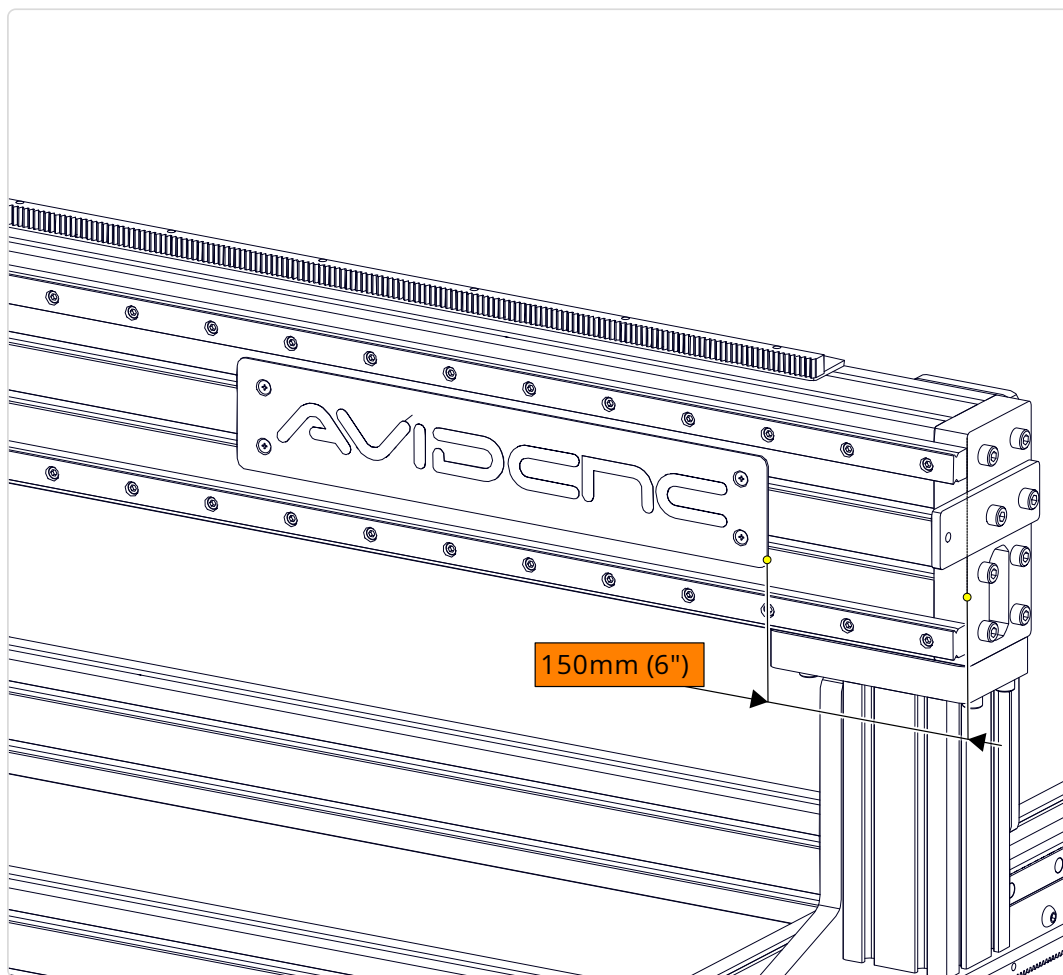
4.6.1 - Nameplate Installation

4.6.1.1



1. Attach the **Avid CNC Nameplate (A)** to the gantry extrusion using **M5 x 12mm Flat Head Screws (B)** and **M5 Roll-in T-Nuts (C)**.
2. Partially tighten the fasteners.

4.6.1.2



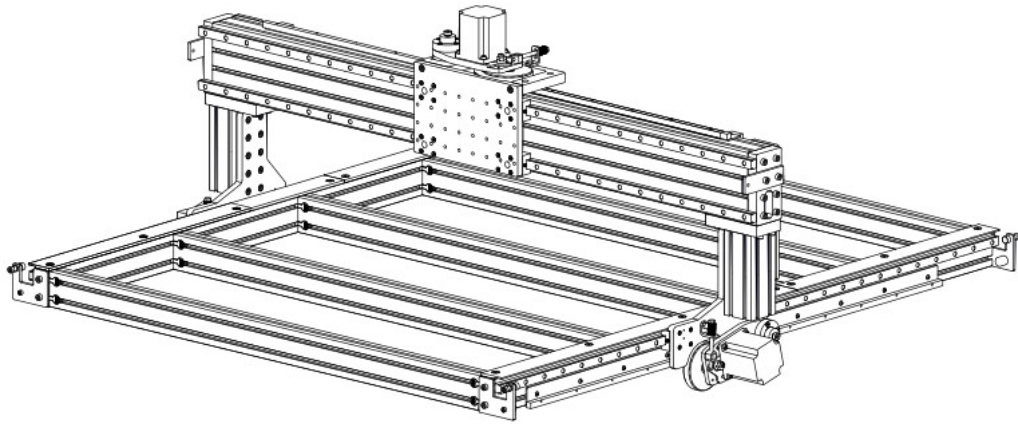
1. Position the nameplate approximately 150mm (6") from the end of the gantry.
2. Fully tighten the fasteners.



Assembly Note

This dimension is not critical; the nameplate can be positioned anywhere along the gantry.

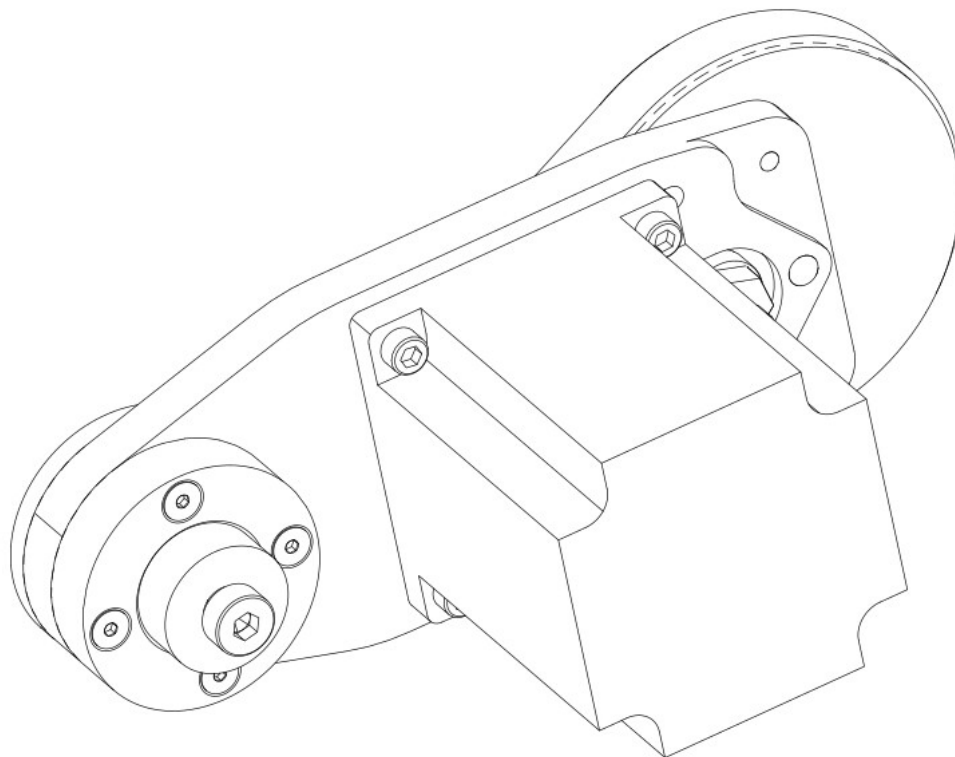
5. Rack and Pinion Drive



Section Note

Simplified models will not depict gear teeth on the motor pulleys or drive spindles.

5.1 - R&P Drive Assembly



Parts List

ID	QTY	Part/Description	Package Label	
(A)	3	NEMA 34 Motor	Motors	
(B)	3	CRP301-03 - NEMA 34 Motor Pulley	CRP320-00-S500-19.1	
(C)	3	R&P Drive Plate	CRP320-00-S500-19.1	
(D)	3	CRP325-00 - PRO NEMA 34 Spindle Assembly	CRP320-00-S500-19.1	
	3	CRP320-00-FAST-500-19.1	CRP320-00-S500-19.1	
(E)	12	M6 Hex Nut (4 per bag)	CRP320-00-FAST-500-19.1	>
(F)	3	NEMA 34 R&P Drive Belt (1 per bag)	CRP320-00-FAST-500-19.1	>
(G)	3	5/16" Flat Washer (1 per bag)	CRP320-00-FAST-500-19.1	>
(H)	15	M6 x 22mm Socket Head Cap Screw (5 per bag)	CRP320-00-FAST-500-19.1	>
(I)	3	Cam Tensioner (1 per bag)	CRP320-00-FAST-500-19.1	>
Remaining parts from CRP320-00-FAST-500-19.1 used in next section				

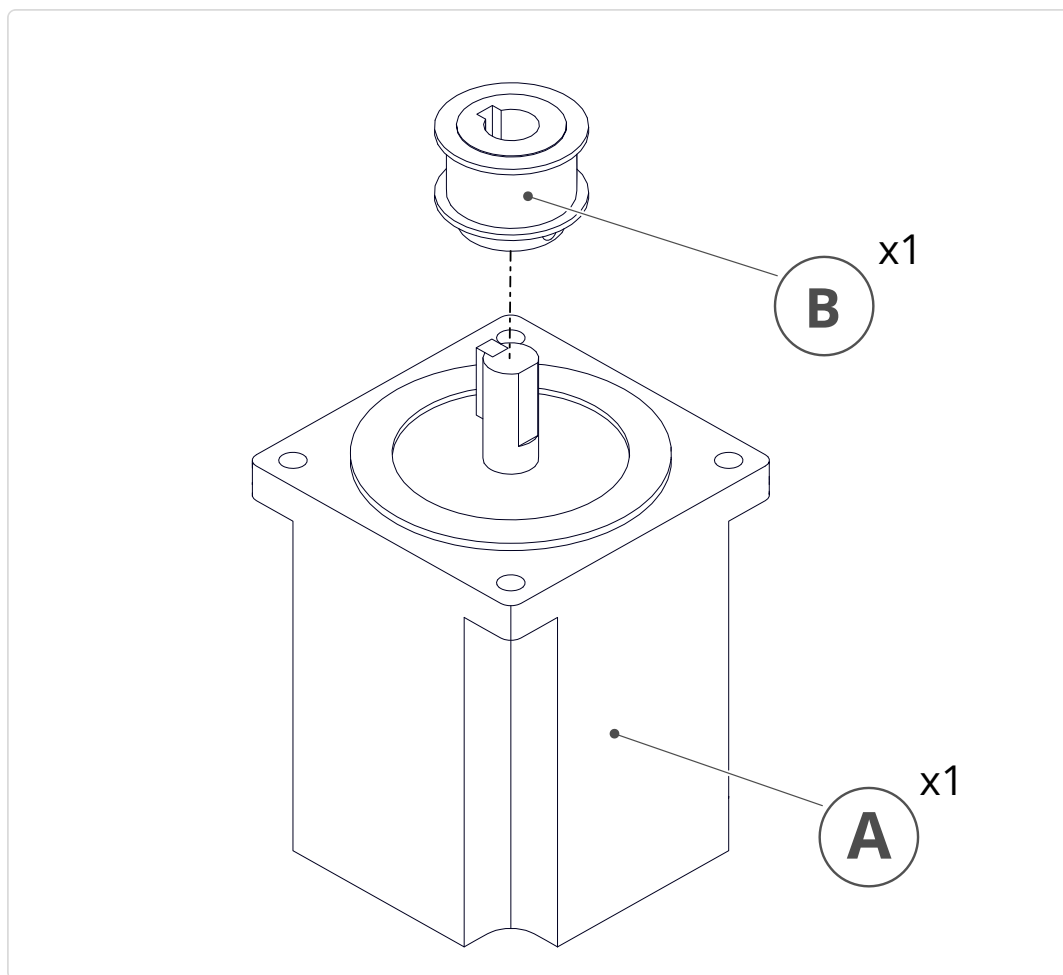
Tools List

Requirement	Tool
Required	3/32" Allen Wrench
Required	1/4" Allen Wrench
Required	5mm Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure
Recommended	16mm Combination Wrench



5.1.1 - Motor Assembly

5.1.1.1



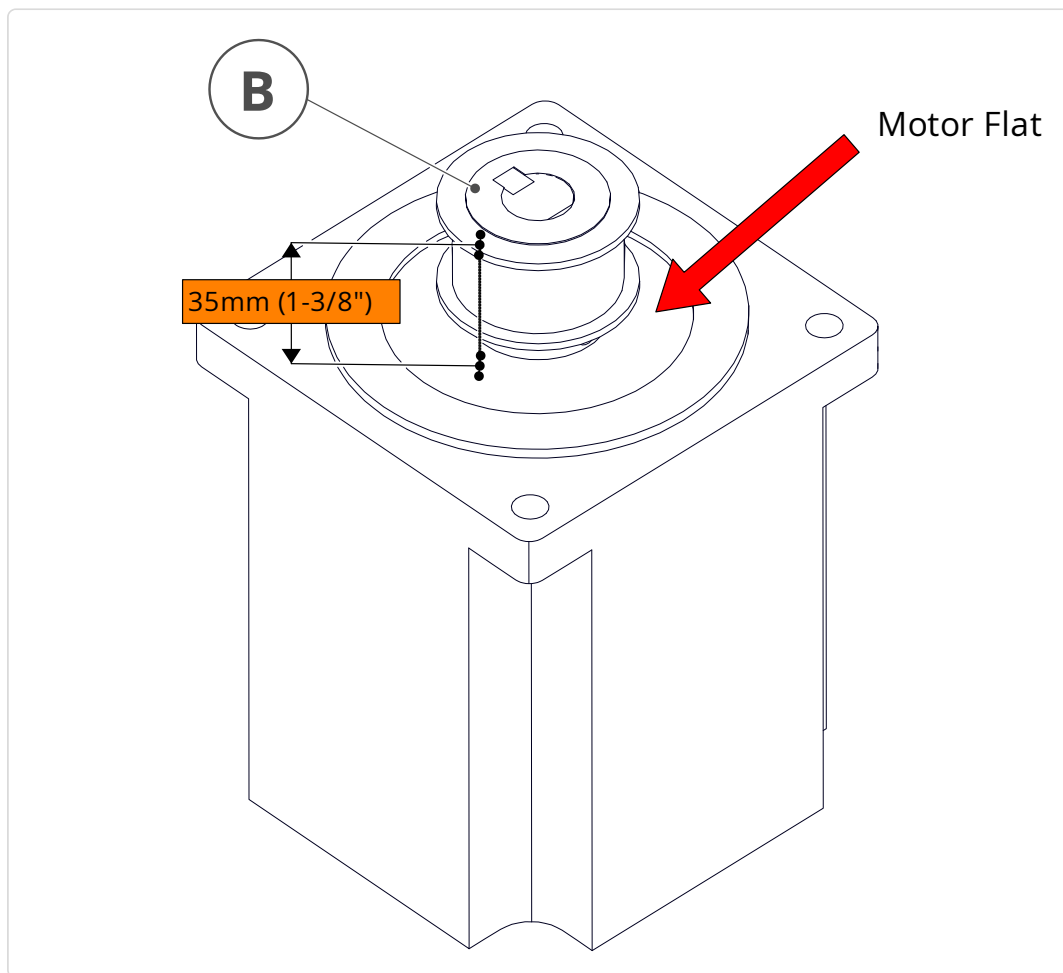
1. Slide the **NEMA 34 Motor Pulley (B)** onto the shaft of the **NEMA 34 Motor (A)** as indicated.



Assembly Note

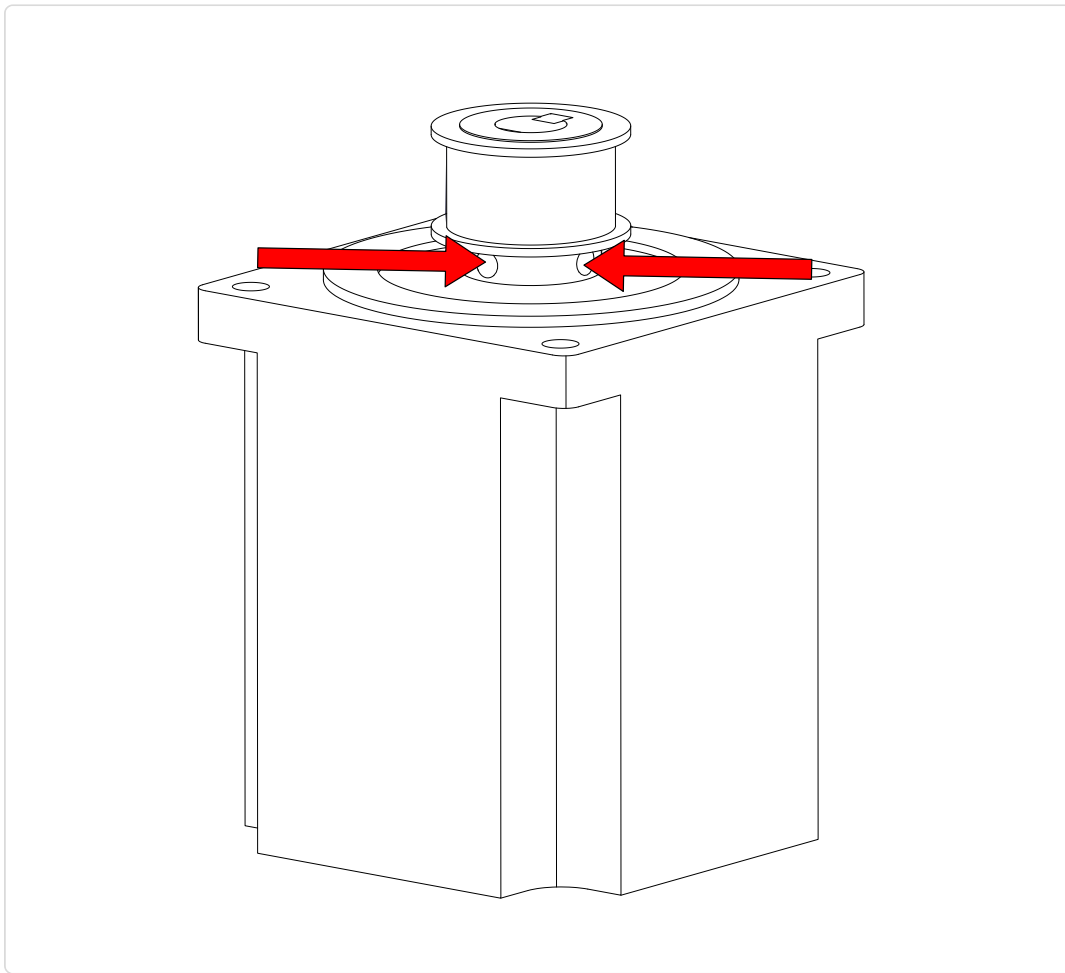
Ensure the motor keys are installed into the shaft prior to installing the pulley. Motor keys will either be pre-installed or included in a small bag.

5.1.1.2



1. Adjust the **NEMA 34 Motor Pulley (B)** such that the top of the pulley is 35mm (1-3/8") from the bottom of the motor flat.

5.1.1.3



1. Apply blue thread locker to the set screws (thread locker not included).
2. Fully tighten the set screws.

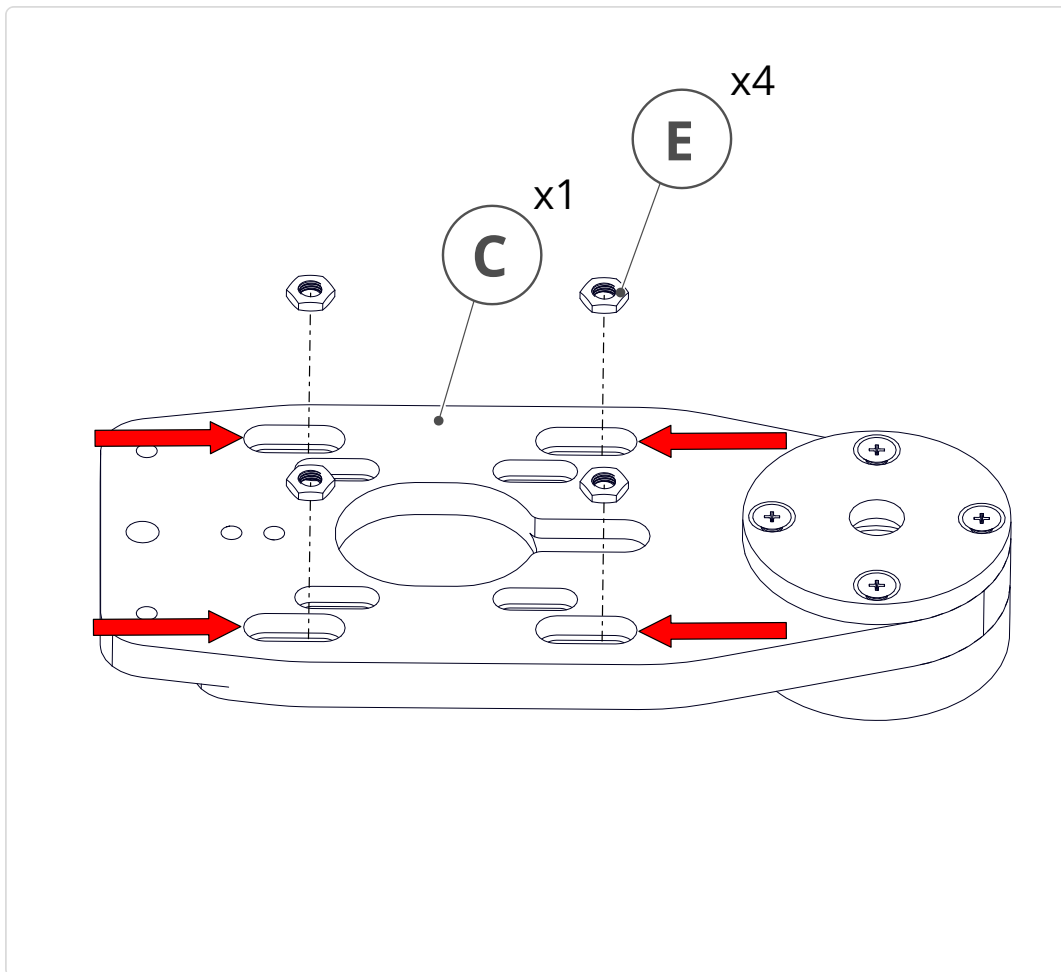


Assembly Note

Do not over tighten, but ensure fasteners are completely seated.

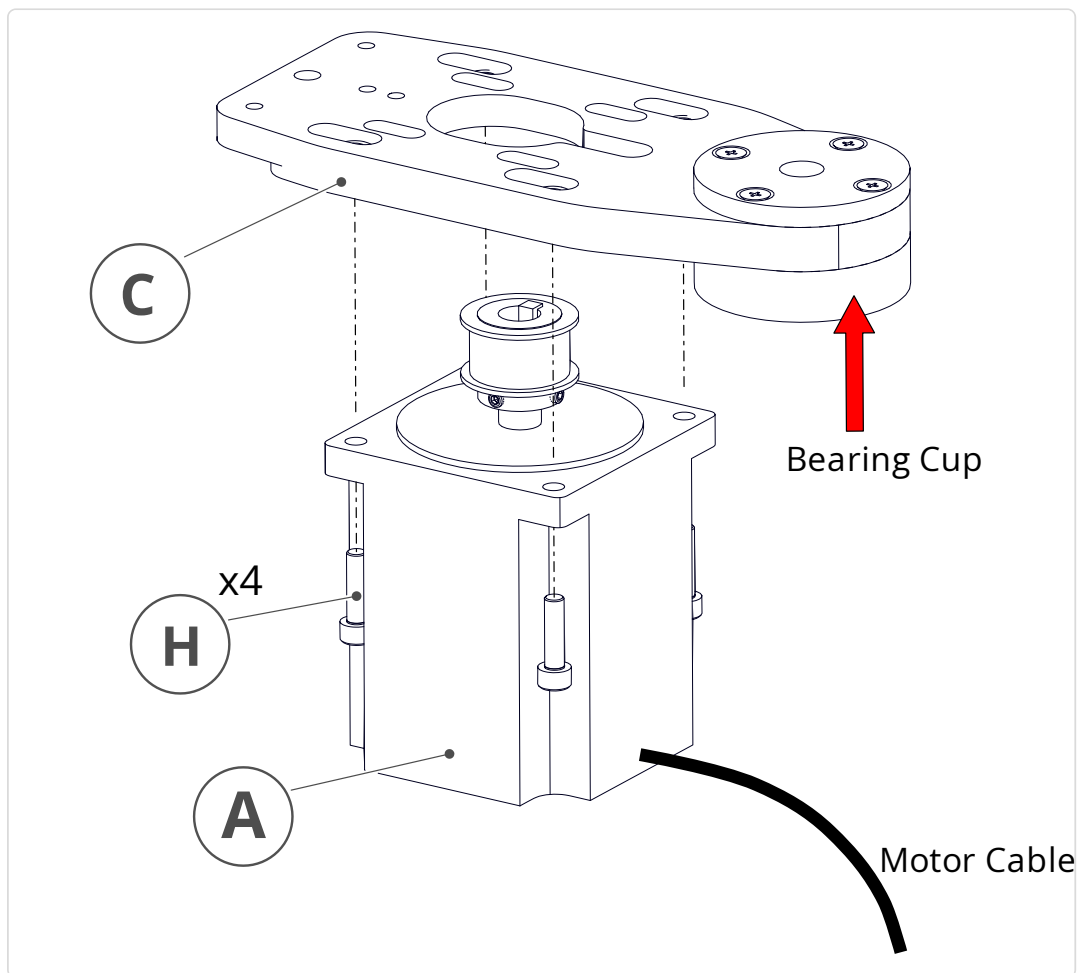
5.1.2 - Drive Plate Assembly

5.1.2.1



1. Set the **M6 Hex Nuts** (E) in the indicated slots on the **Rack and Pinion Drive Plate** (C).

5.1.2.2



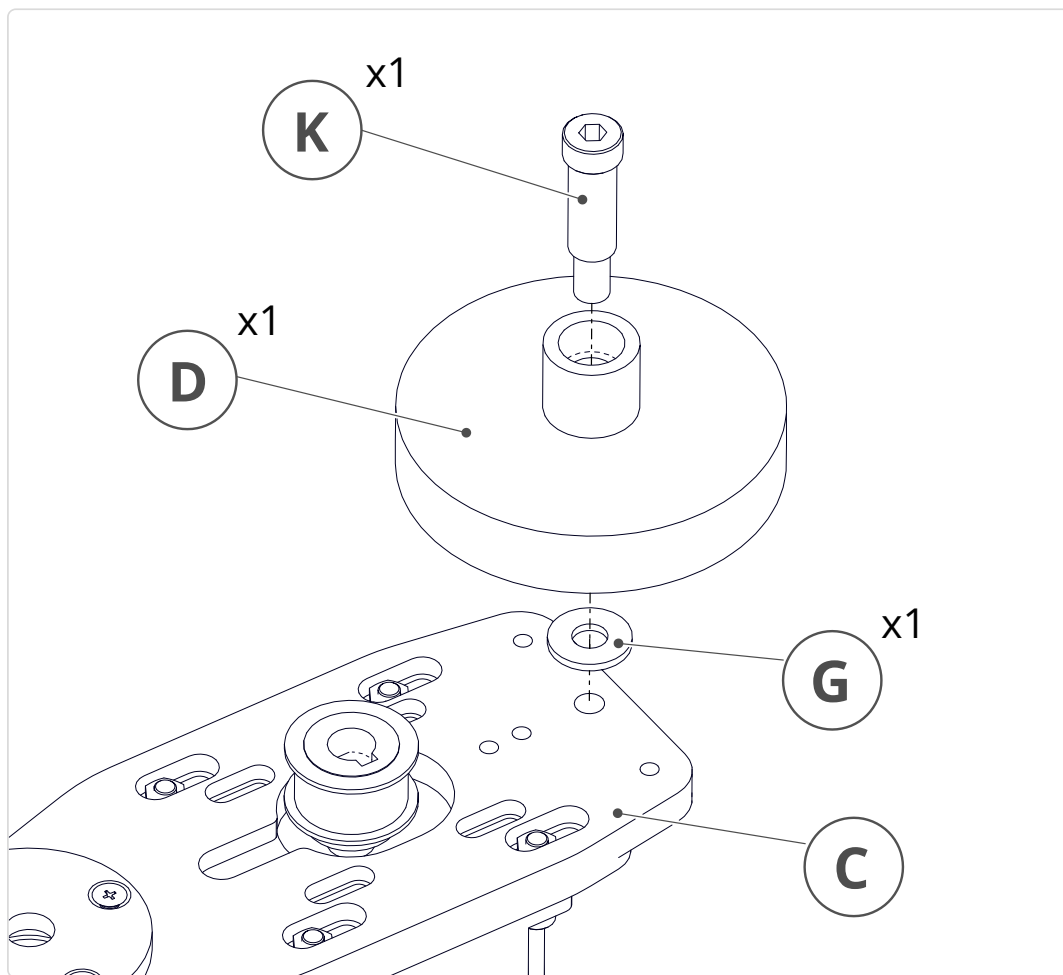
1. Attach the **NEMA 34 Motor (A)** to the **Rack and Pinion Drive Plate (C)** using **M6 x 22mm Socket Head Cap Screws (H)**.
2. Partially tighten the fasteners.



Assembly Note

Orient the motor with the motor cable pointing towards the bearing cup.

5.1.2.3



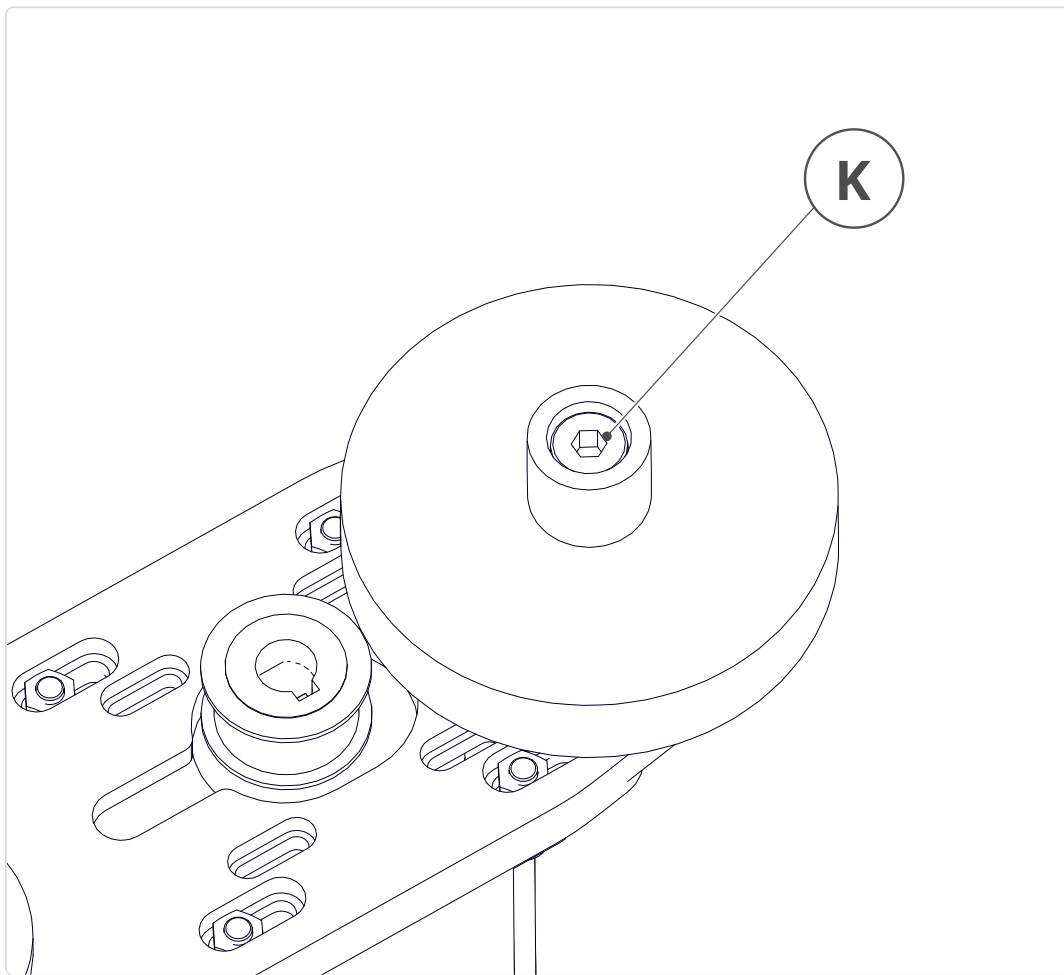
1. Attach the **Spindle Assembly** (D) to the **Rack and Pinion Drive Plate** (C) using the **CRP320-09 Drive Spindle Shaft** (K) and **5/16" Washer** (G).



Assembly Note

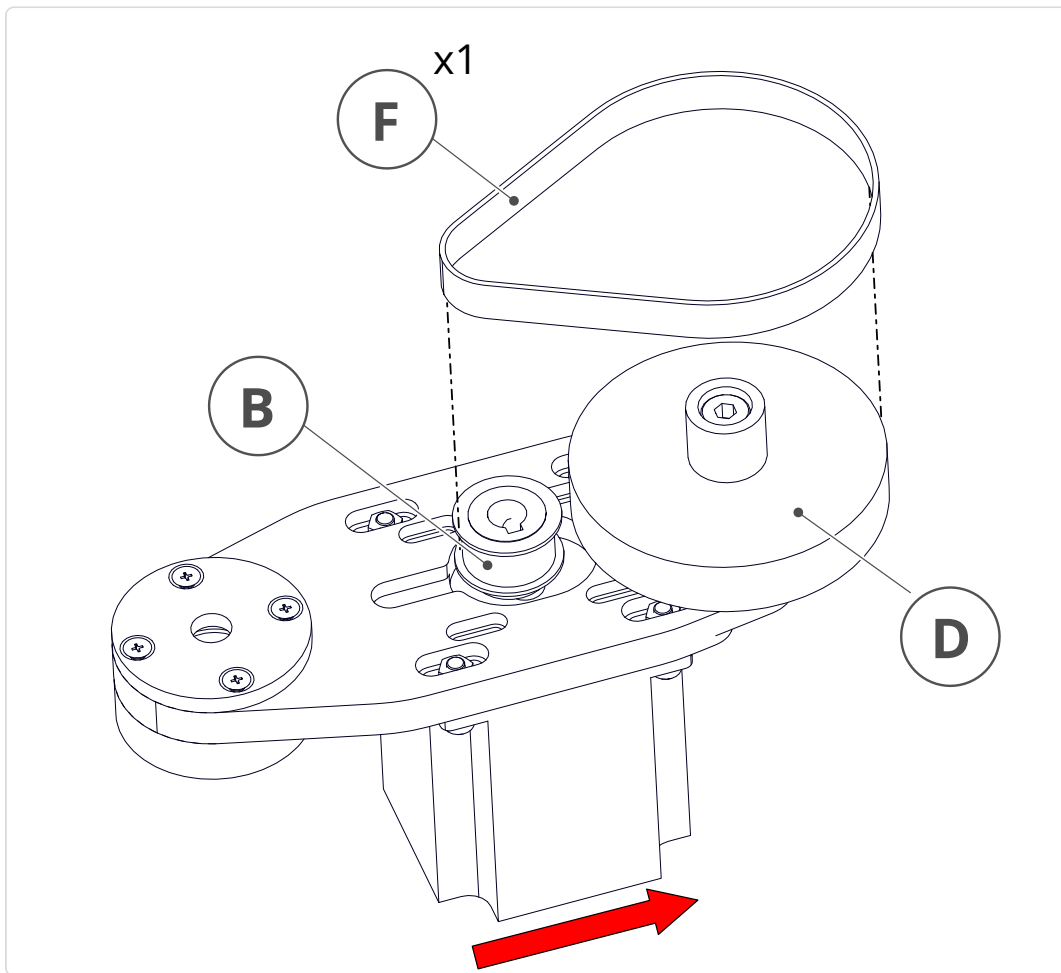
The spindle assembly may already have the drive spindle shaft installed, held in place with a plastic hex nut for protection during shipping. The plastic hex nut needs to be removed prior to installing the spindle and can be discarded.

5.1.2.4



1. Fully tighten the **CRP320-09 Drive Spindle Shaft** **K**.

5.1.2.5



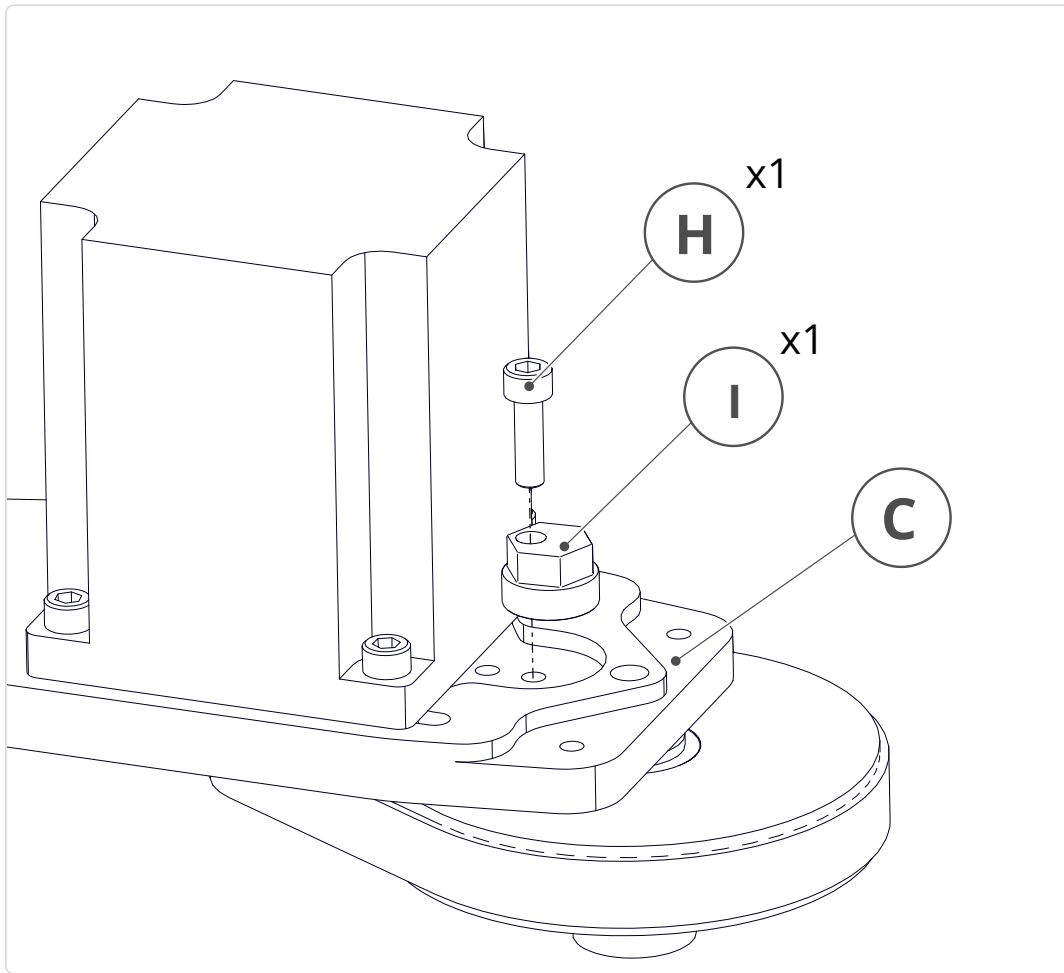
1. Slide the **NEMA 34 R&P Drive Belt** (F) over the **Motor Pulley** (B) and **Spindle Assembly** (D).



Assembly Note

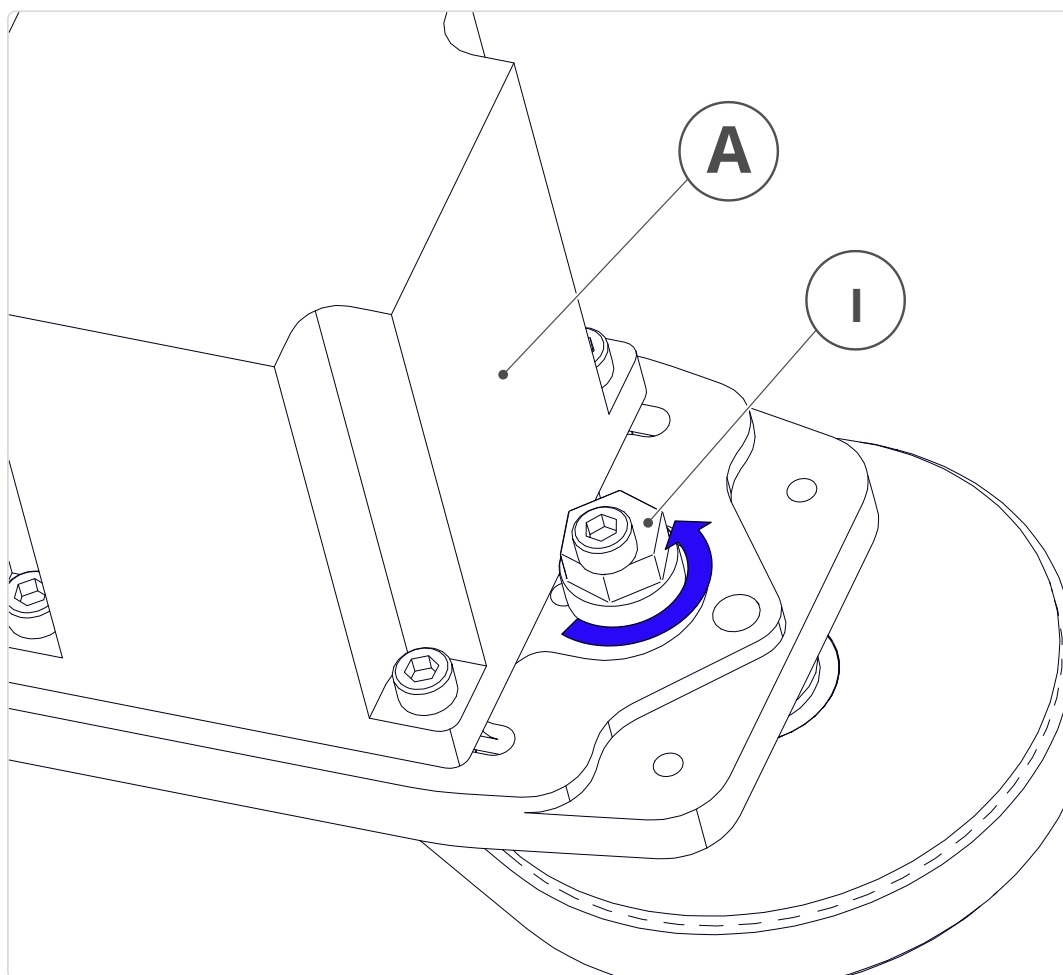
It may be necessary to slide the motor closer to the spindle assembly as indicated.

5.1.2.6



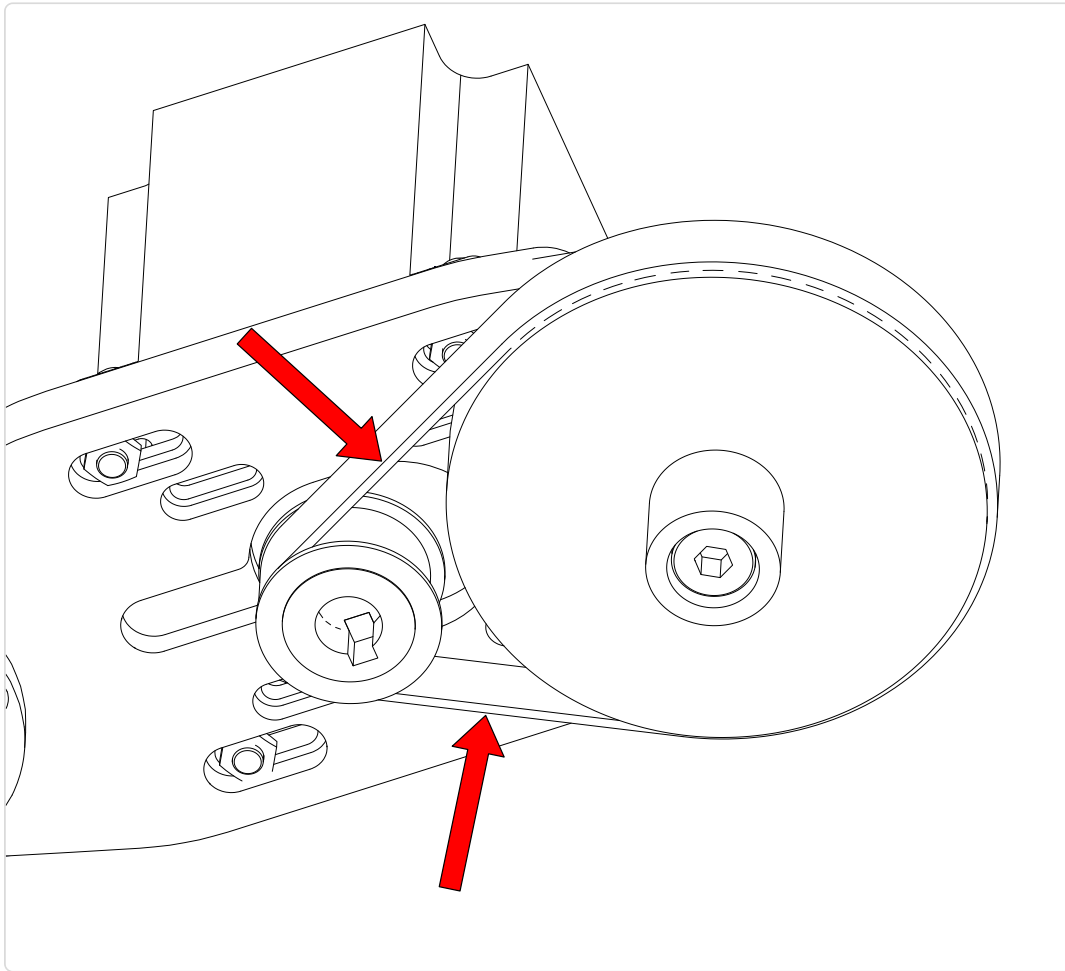
1. Attach the **Cam Tensioner** (I) to the **Rack and Pinion Drive Plate** (C) using an **M6 x 22mm Socket Head Cap Screw** (H).

5.1.2.7



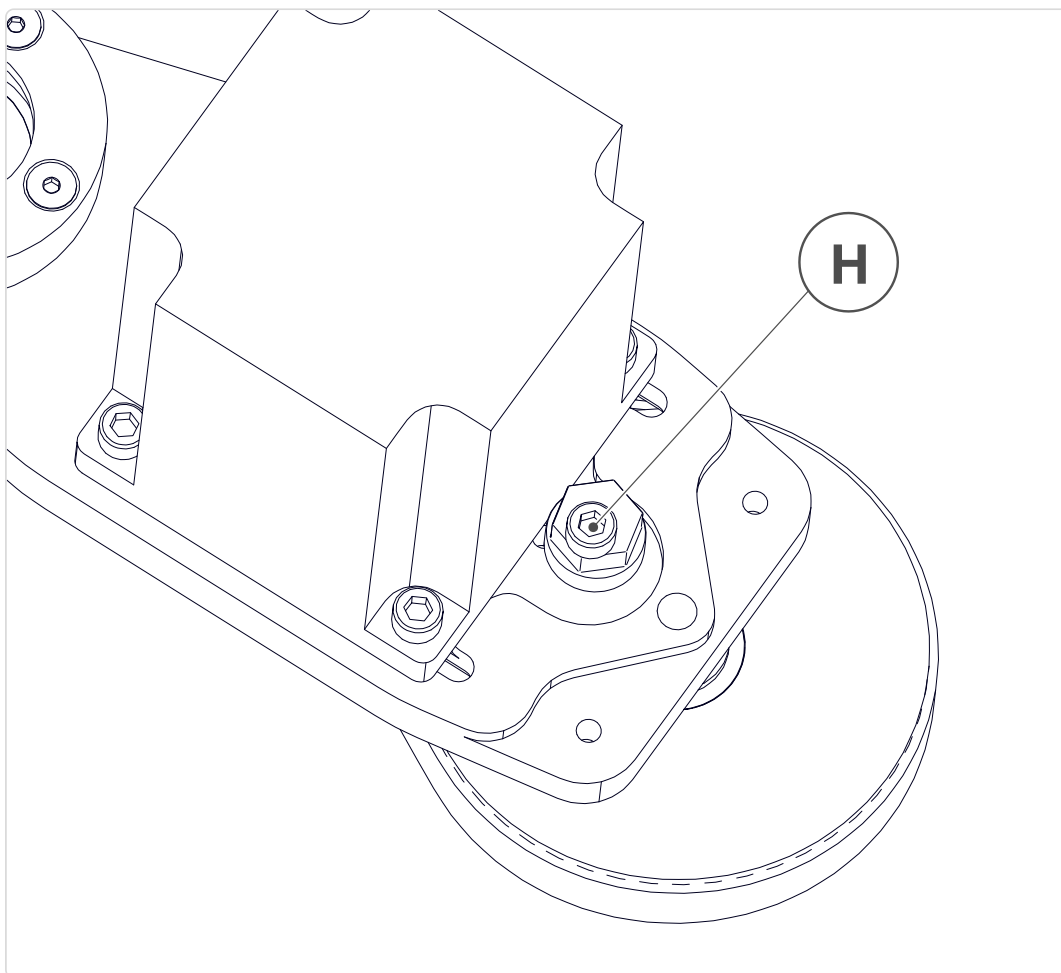
1. Use a 16mm wrench to turn the **Cam Tensioner** (I) against the **NEMA 34 Motor** (A).

5.1.2.8



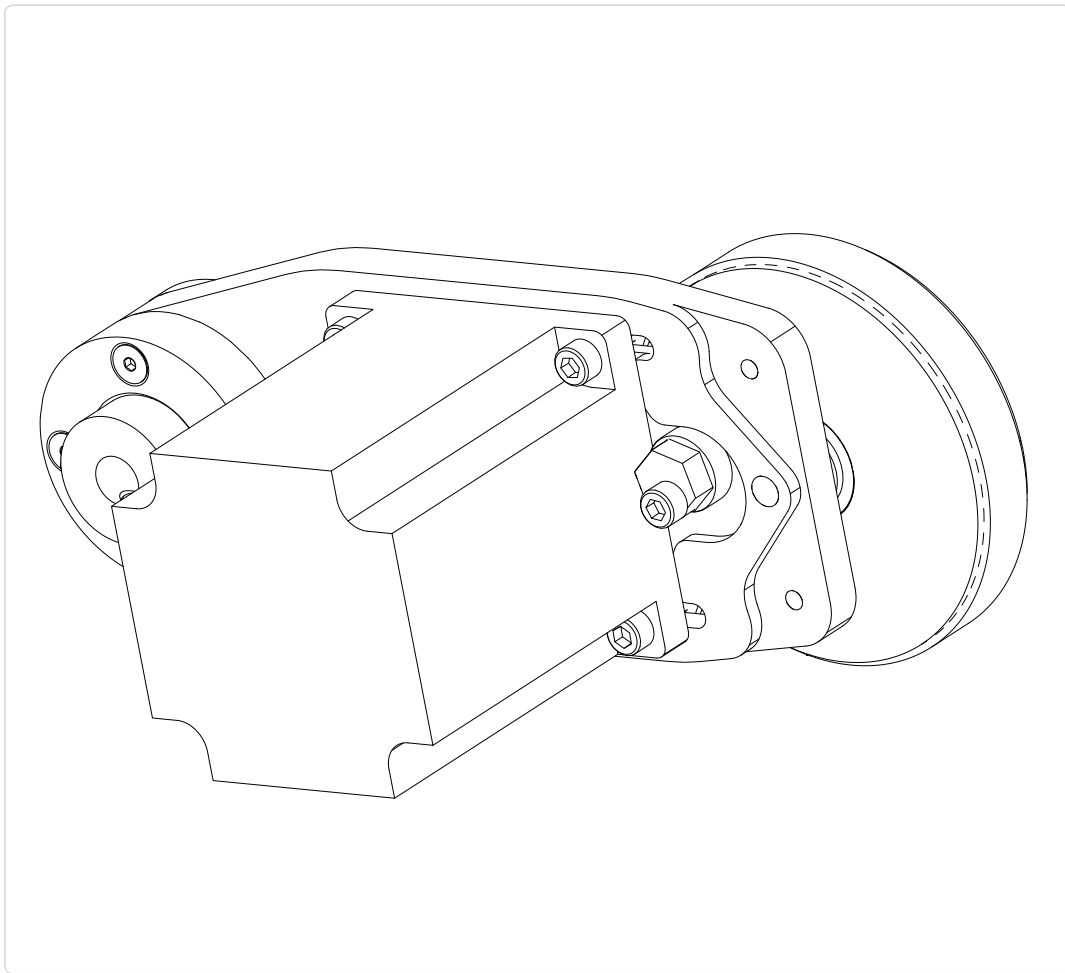
1. Hold the cam tensioner against the motor to generate belt tension. The belt should be tight enough such that the belt can only be squeezed 2-3mm (1/16" - 1/8") with your fingers at the indicated locations.

5.1.2.9



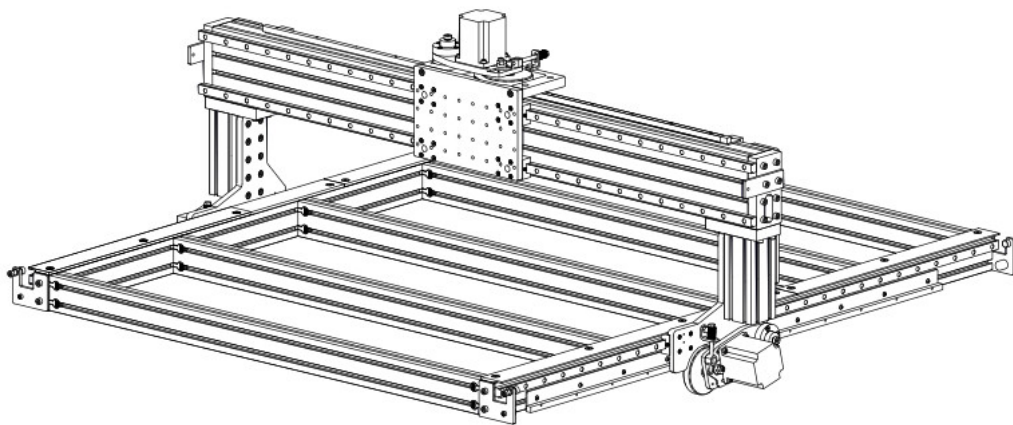
1. With the belt tensioned, fully tighten **all five M6 x 22mm Socket Head Cap Screws** (H).

5.1.2.10



1. Repeat **this process** to assemble three rack and pinion drive assemblies.

5.2 - R&P Drive Installation



Parts List

ID	QTY	Part/Description	Package Label	
	3	CRP320-00-TEN-19.1	CRP320-00-S500-19.1	
(A)	3	R&P Tension Post <i>(1 per bag)</i>	CRP320-00-TEN-19.1	>
(B)	3	R&P Tension Bracket <i>(1 per bag)</i>	CRP320-00-TEN-19.1	>
(C)	3	M6 x 12mm Flat Head Screw <i>(1 per bag)</i>	CRP320-00-TEN-19.1	>
(D)	3	M8 x 14mm Hex Cap Screw <i>(1 per bag)</i>	CRP320-00-TEN-19.1	>
(E)	3	M8 x 90mm Hex Cap Screw <i>(1 per bag)</i>	CRP320-00-TEN-19.1	>
(F)	6	M8 Flat Washer <i>(2 per bag)</i>	CRP320-00-TEN-19.1	>
(G)	3	Die Spring <i>(1 per bag)</i>	CRP320-00-TEN-19.1	>
	3	CRP320-00-FAST-500-19.1	CRP320-00-S500-19.1	
(H)	3	Eccentric Collar Bearing Cap <i>(1 per bag)</i>	CRP320-00-FAST-500-19.1	▼
(I)	3	Pivot Shaft <i>(1 per bag)</i>	CRP320-00-FAST-500-19.1	▼

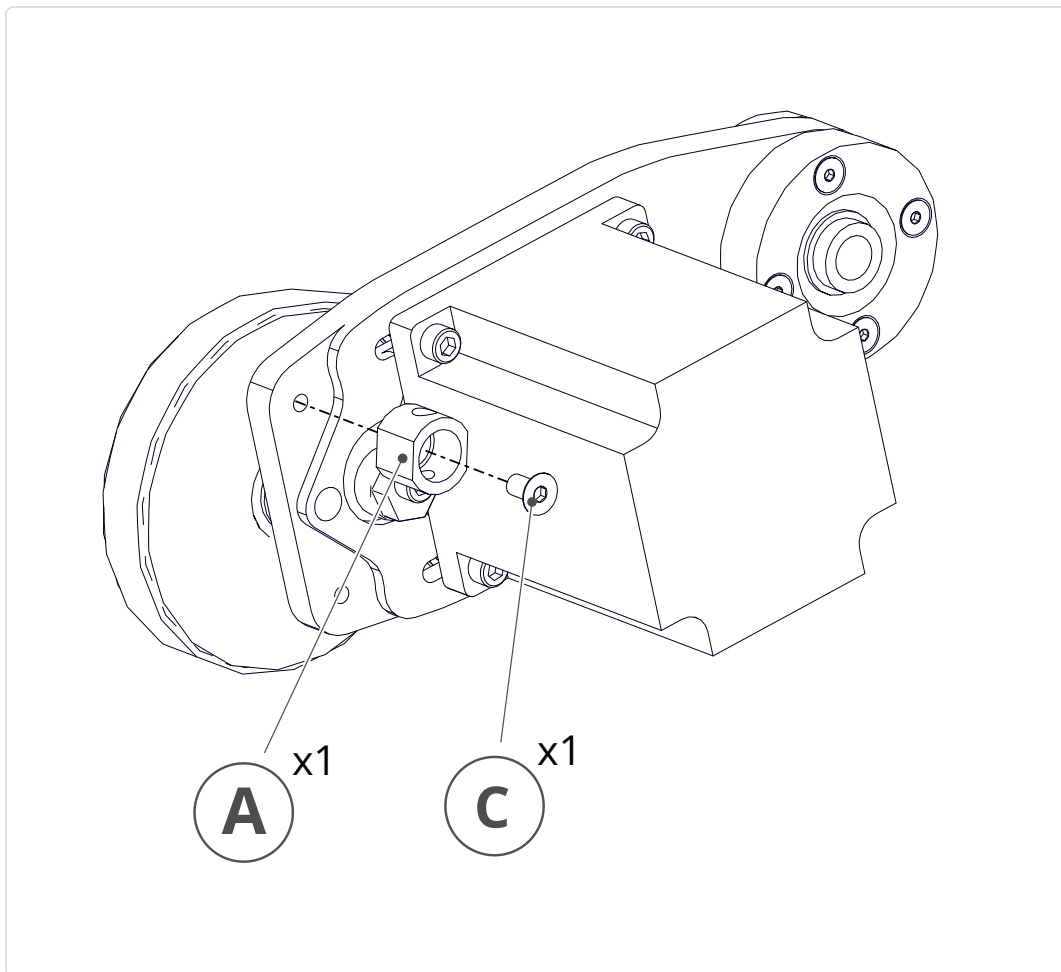
Tools List

Requirement	Tool
Required	1/4" Allen Wrench
Required	3mm Allen Wrench
Required	4mm Allen Wrench
Required	6mm Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure
Recommended	13mm Combination Wrench
Recommended	Torque Wrench
Recommended	1/4" Allen Socket



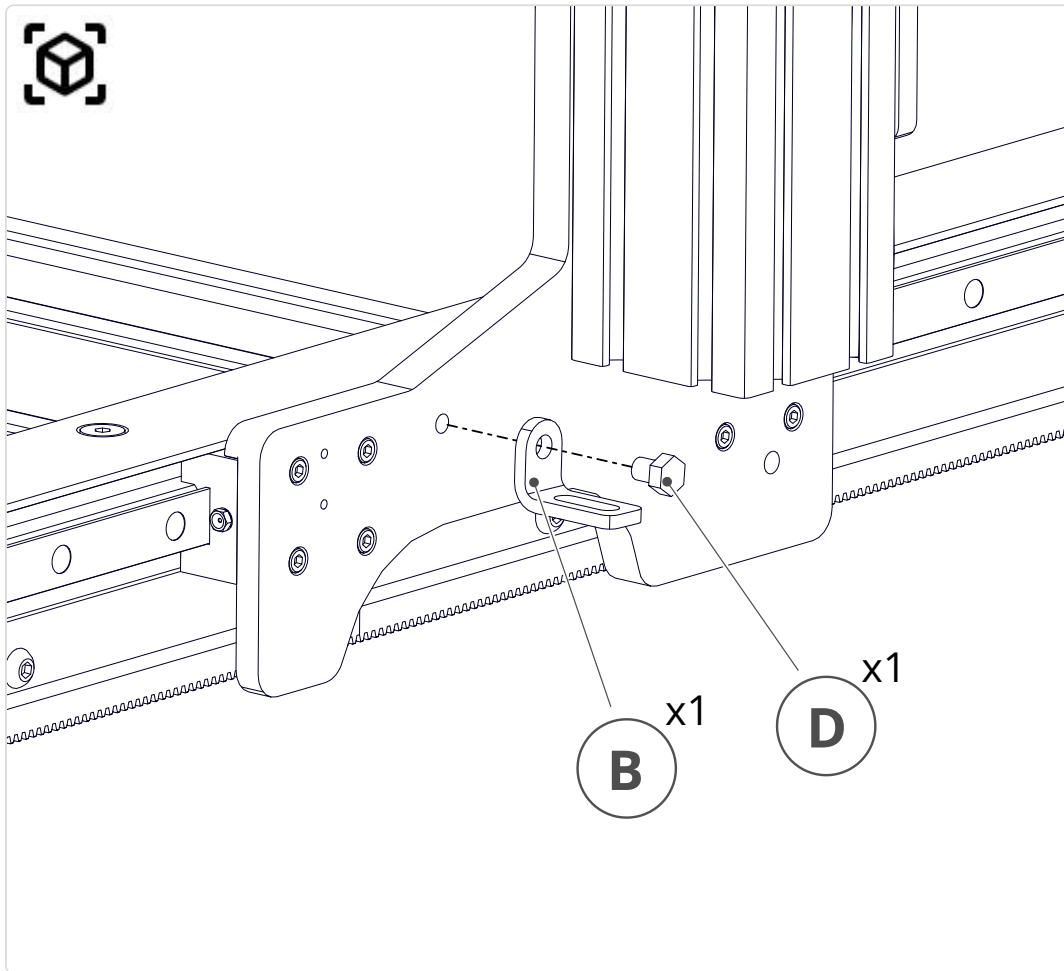
5.2.1 - Table R&P Drive

5.2.1.1



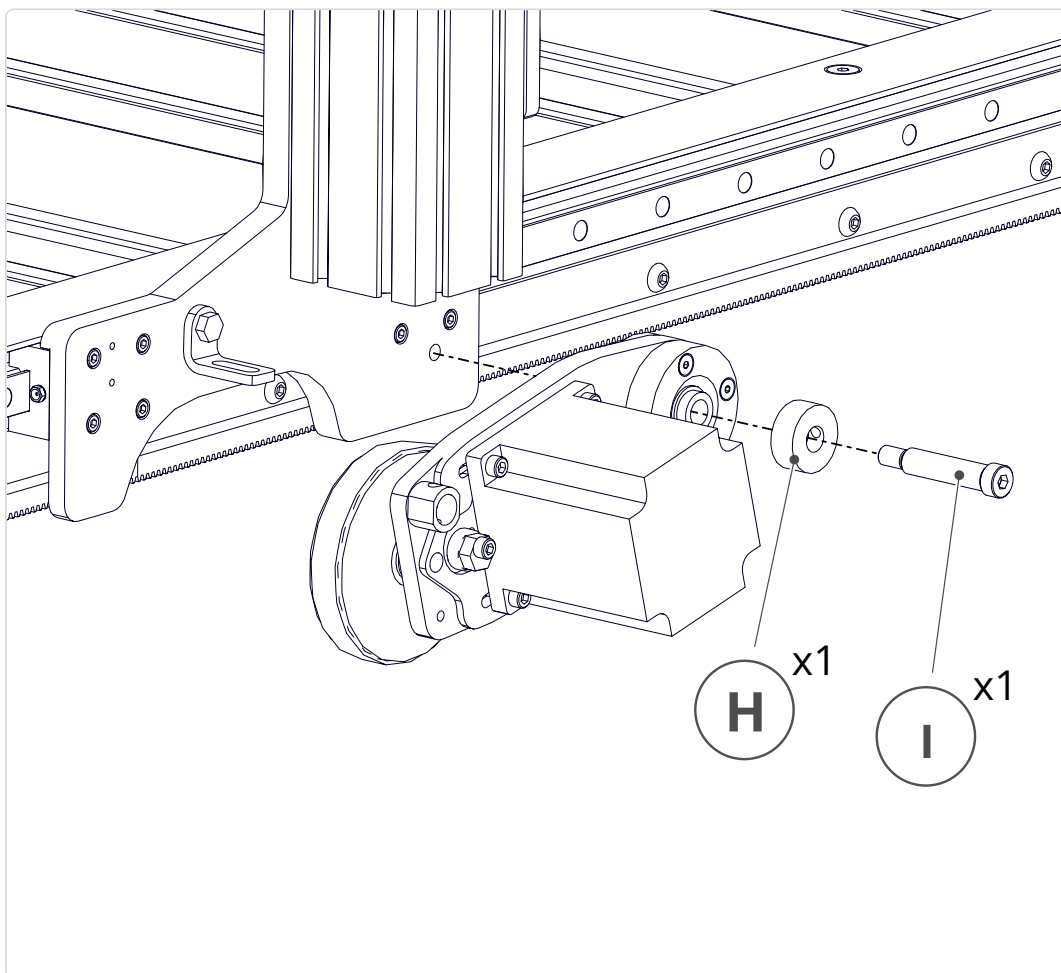
1. Attach the **R&P Tension Post** (A) to the R&P drive assembly using an **M6 x 12mm Flat Head Screw** (C), as indicated.
2. Partially tighten the fastener.

5.2.1.2



1. Attach the **Tension Bracket (B)** to the riser plate using an **M8 x 14mm Hex Cap Screw (D)**.
2. Partially tighten the fastener.

5.2.1.3



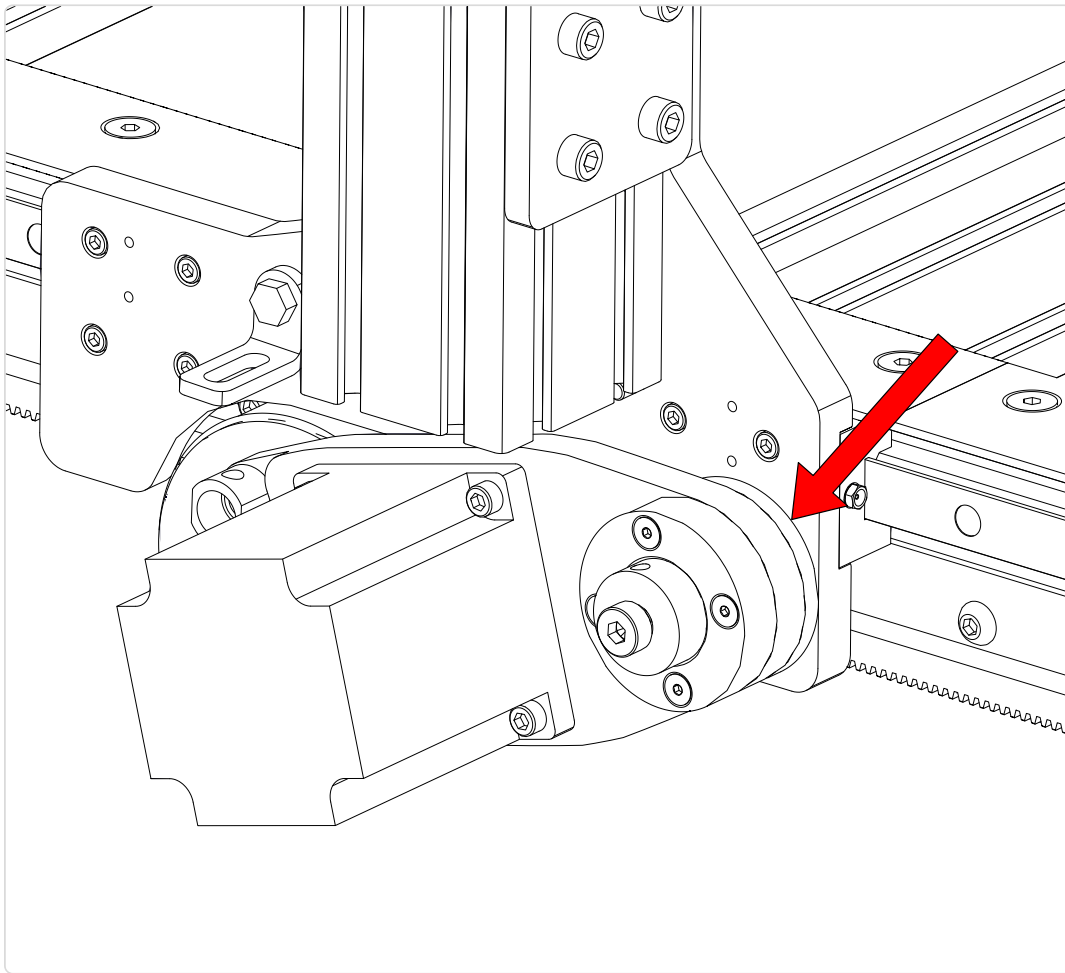
1. Attach the R&P assembly to the riser plate as indicated, using the **Pivot Shaft** **I** and **Eccentric Collar Bearing Cap** **H**.



Assembly Note

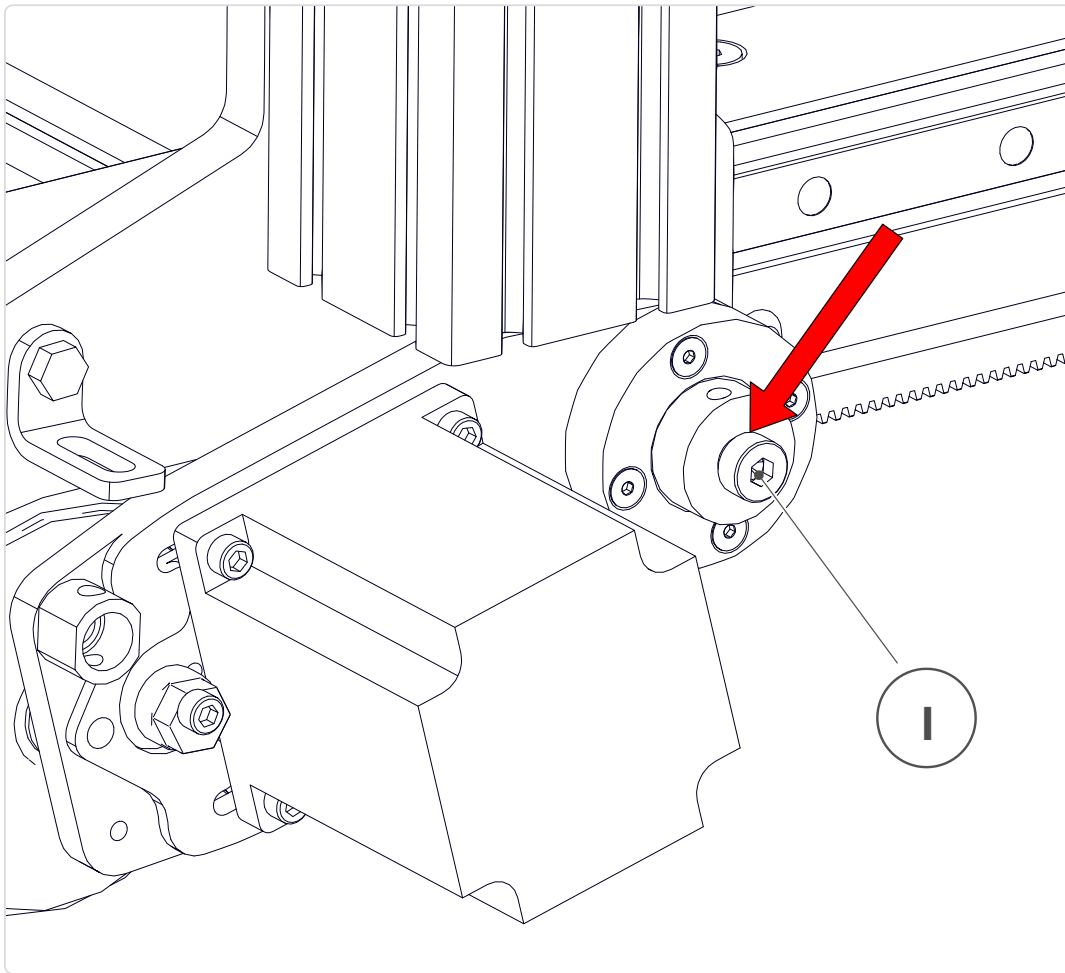
Ensure the eccentric collar bearing cap is oriented correctly. It will fit over the eccentric collar bearing pre-installed in the R&P drive plate.

5.2.1.4



1. Ensure the R&P assembly is fully seated on the riser plate as indicated.

5.2.1.5



1. Fully tighten the **Pivot Shaft** **I** taking care not to over tighten the bolt.

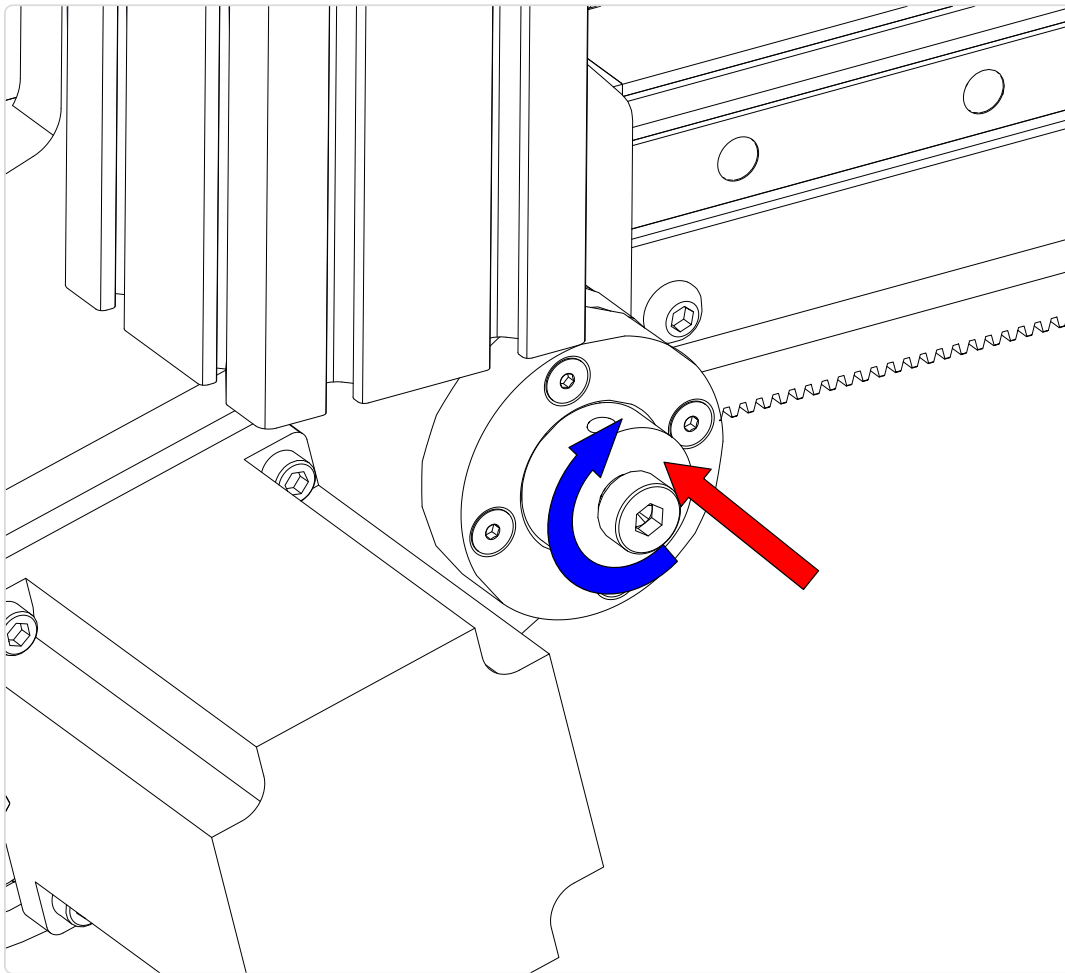
Torque Specification

If available, use a torque wrench to torque the pivot shaft to 142 in-lbf (16.1 Nm).

Assembly Note

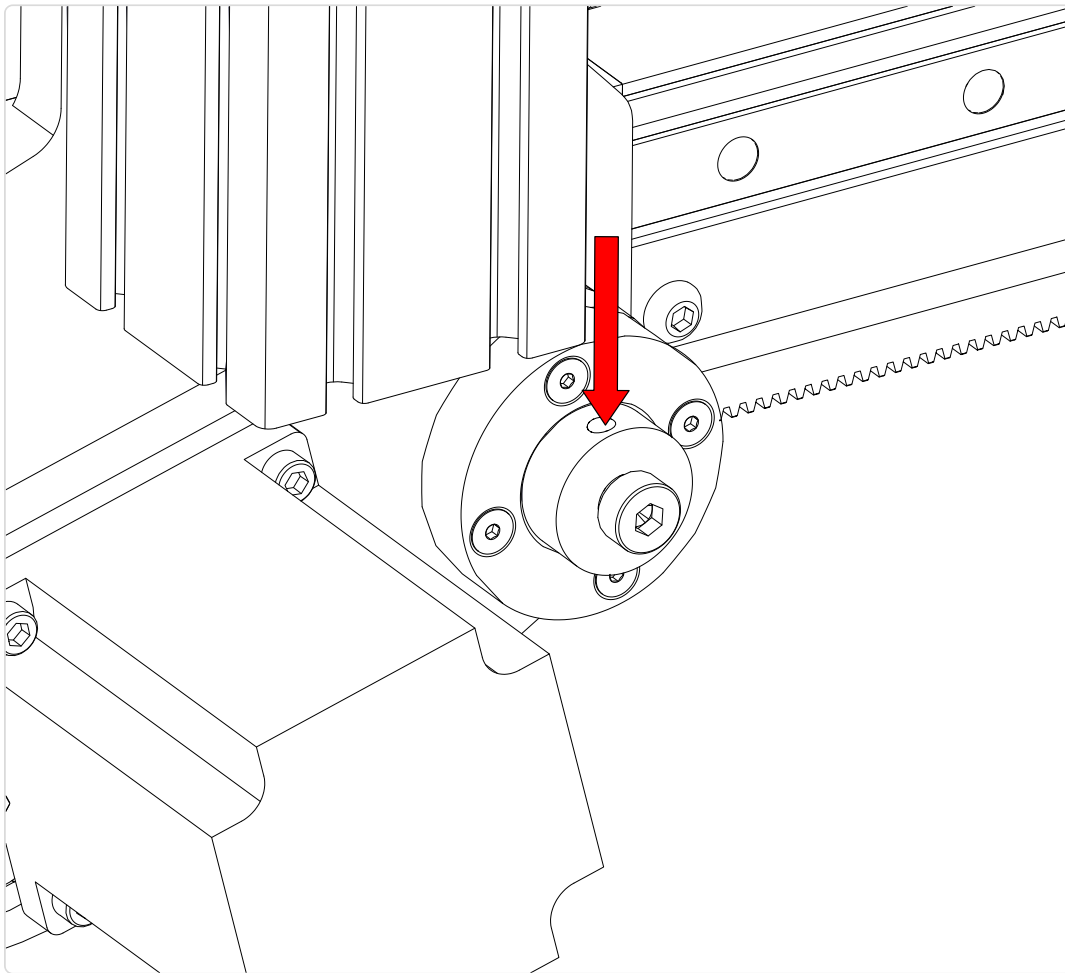
There will be a gap between the head of the pivot shaft and the eccentric collar bearing cap, as shown by the arrow.

5.2.1.6



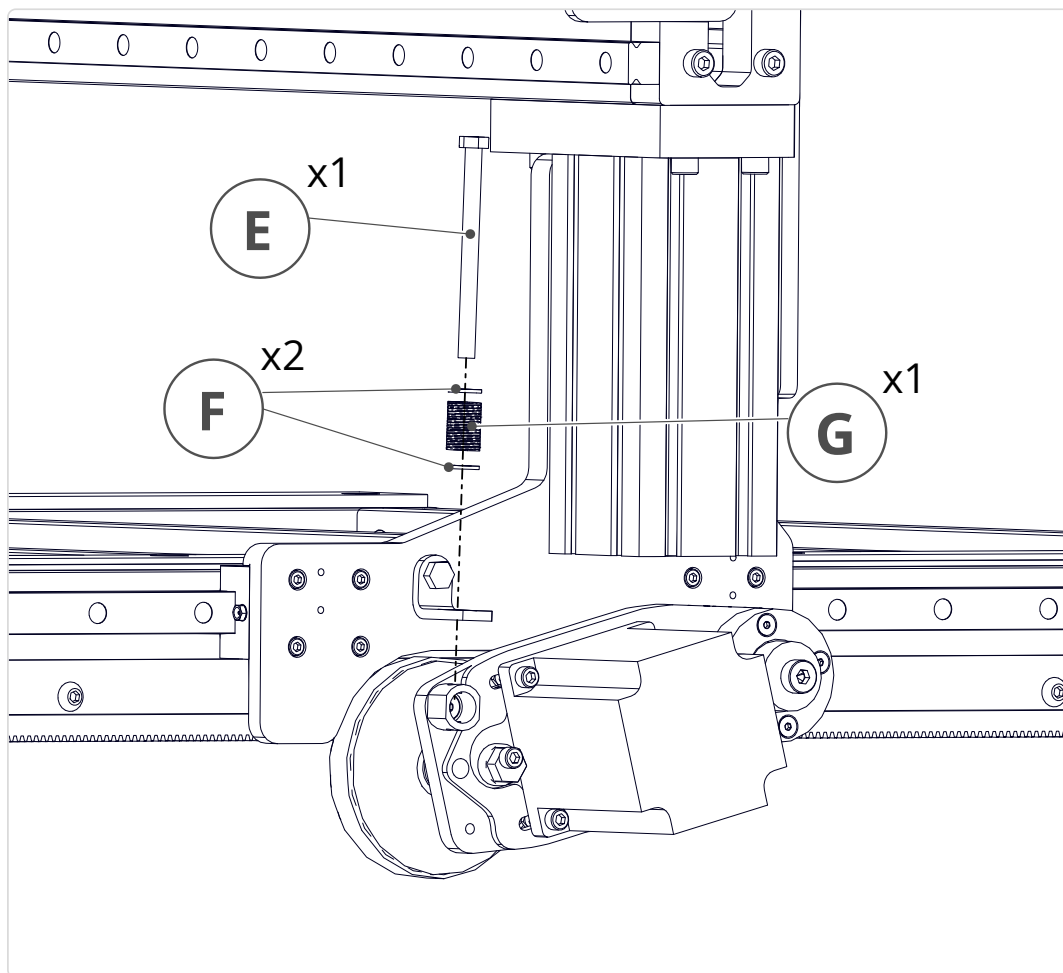
1. While pushing in on the eccentric collar bearing cap, rotate it in the clockwise direction until the bearing starts rotating inside the R&P plate.
2. Hold the eccentric collar bearing cap in this position while proceeding to the next step.

5.2.1.7



1. Tighten the set screw on the side of the eccentric collar bearing cap.

5.2.1.8



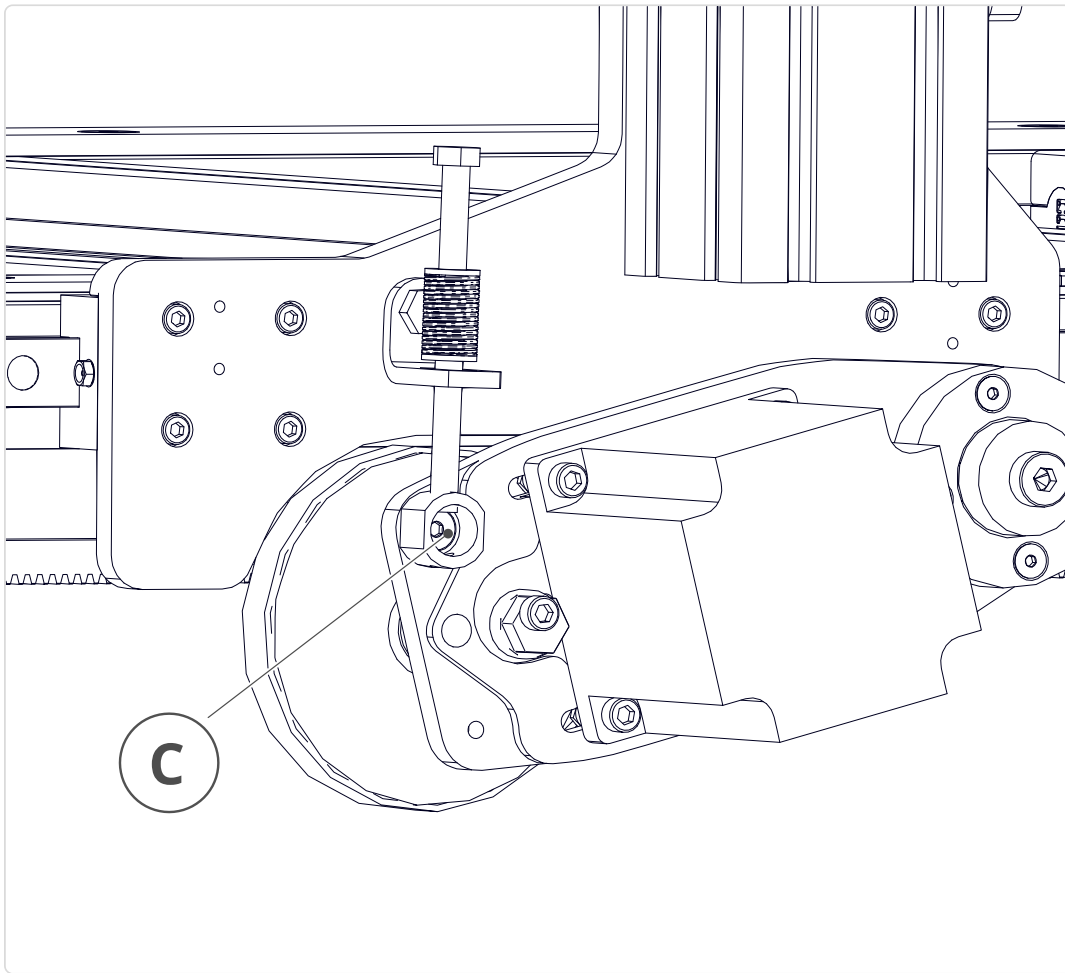
1. Install the M8 x 90mm Hex Cap Screw (E), M8 Flat Washers (F), and Die Spring (G) as indicated.



Assembly Note

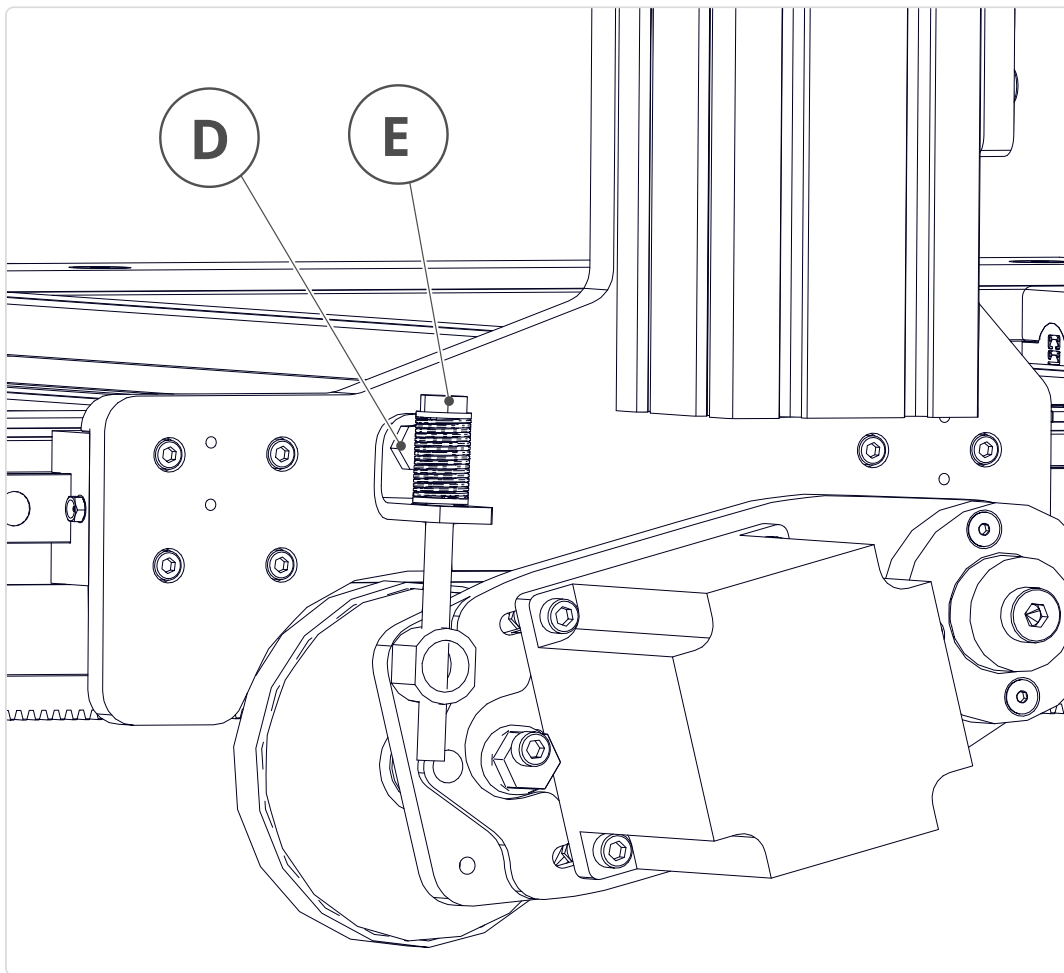
Only thread the screw through the first hole of the tension post.

5.2.1.9



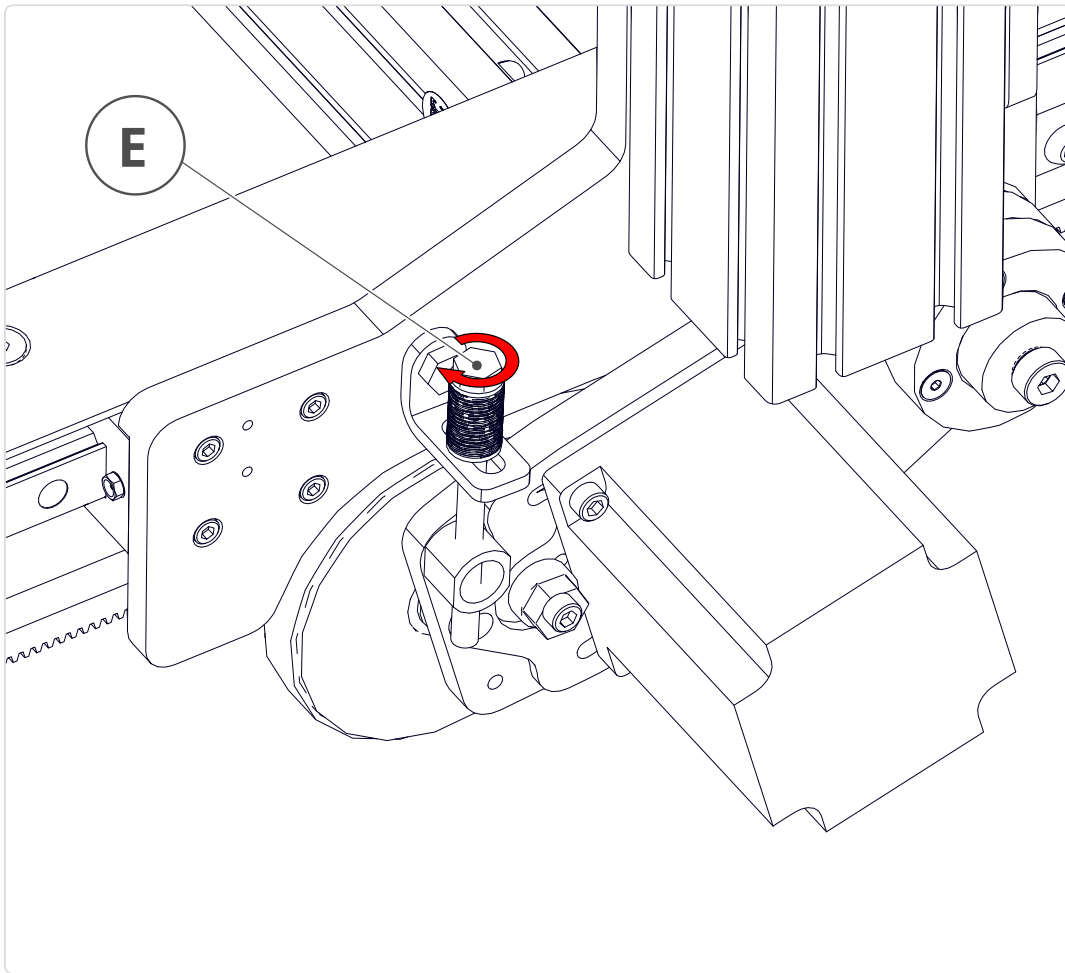
1. Tighten the **M6 x 12mm Flat Head Screw** **C**.

5.2.1.10



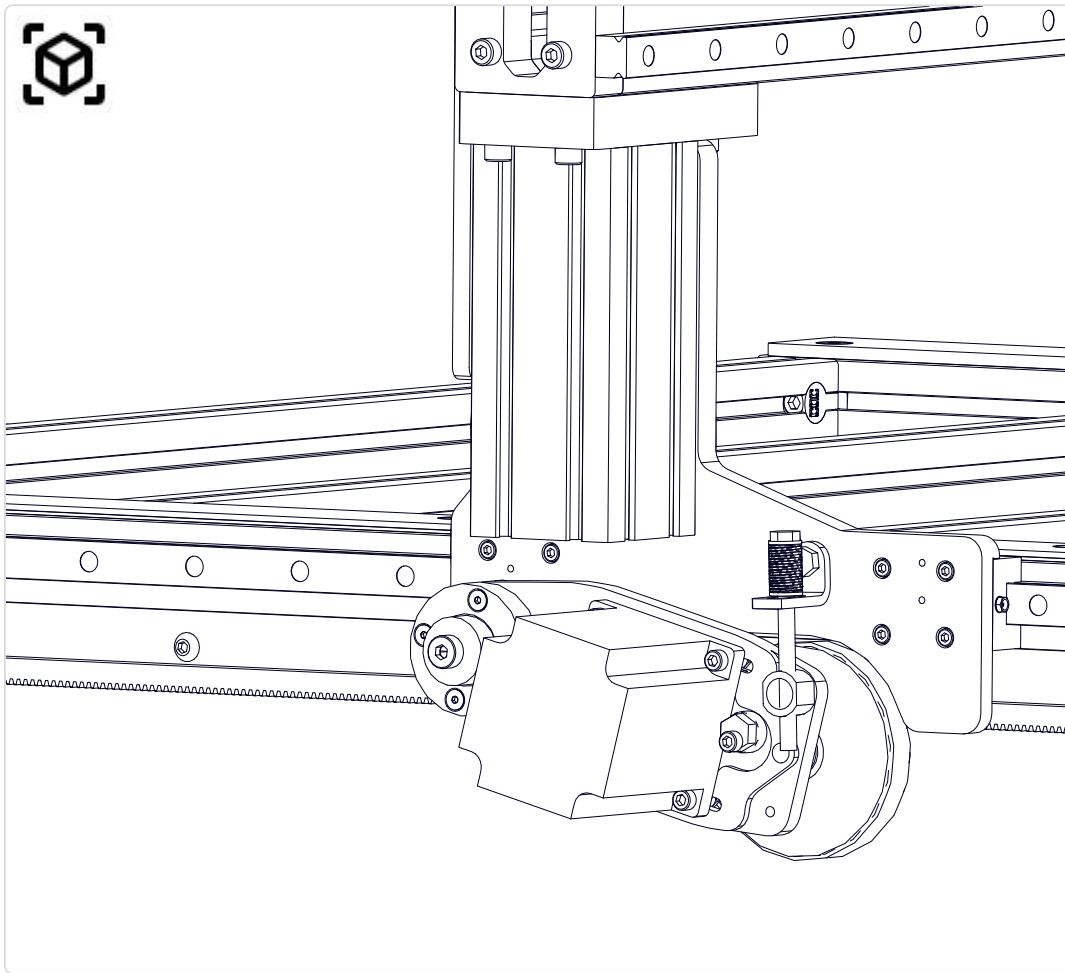
1. Continue threading in the **M8 x 90mm Hex Cap Screw (E)** until the spring is seated, but not compressed.
2. Fully tighten the **M8 x 14mm Hex Cap Screw (D)**.

5.2.1.11



1. Tighten the **M8 x 90mm Hex Cap Screw** **E** **three** revolutions to tension the R&P assembly.

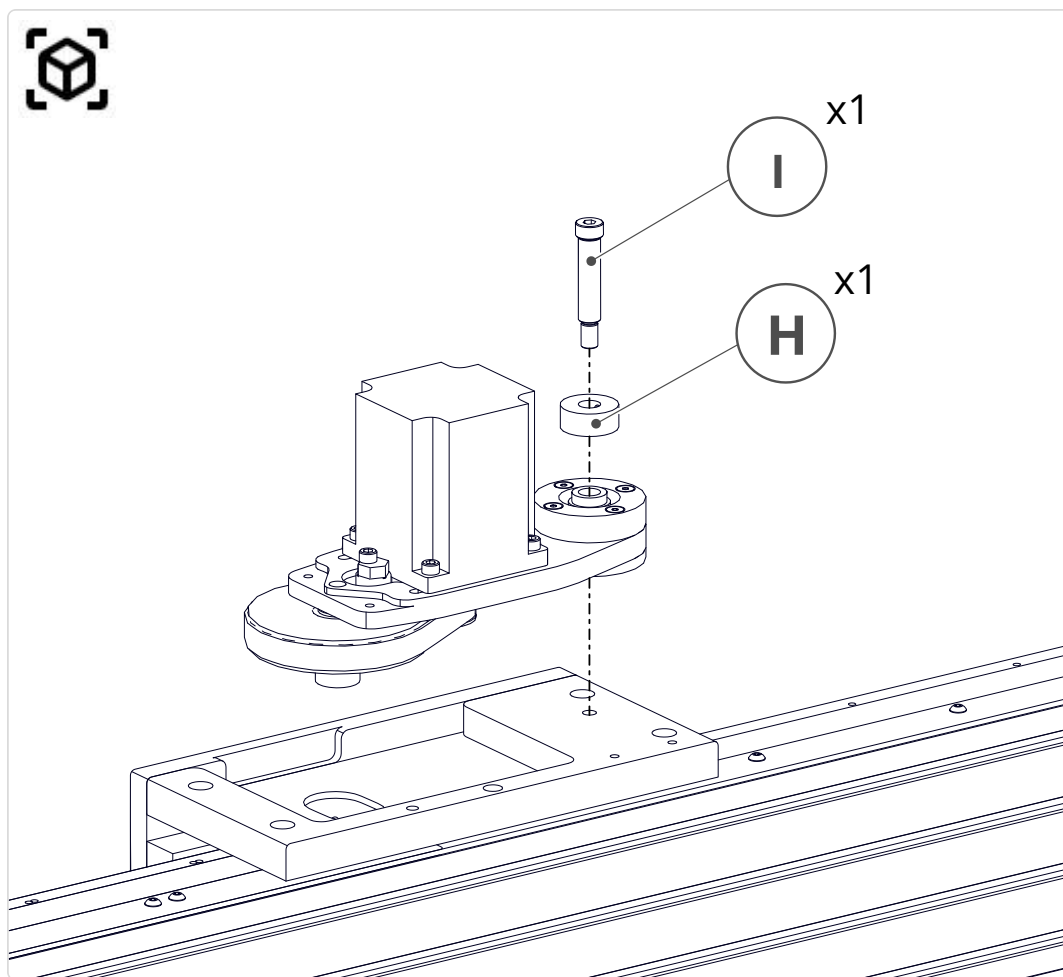
5.2.1.12



1. Repeat **this process** on the other side of the machine.

5.2.2 - Gantry R&P Drive

5.2.2.1



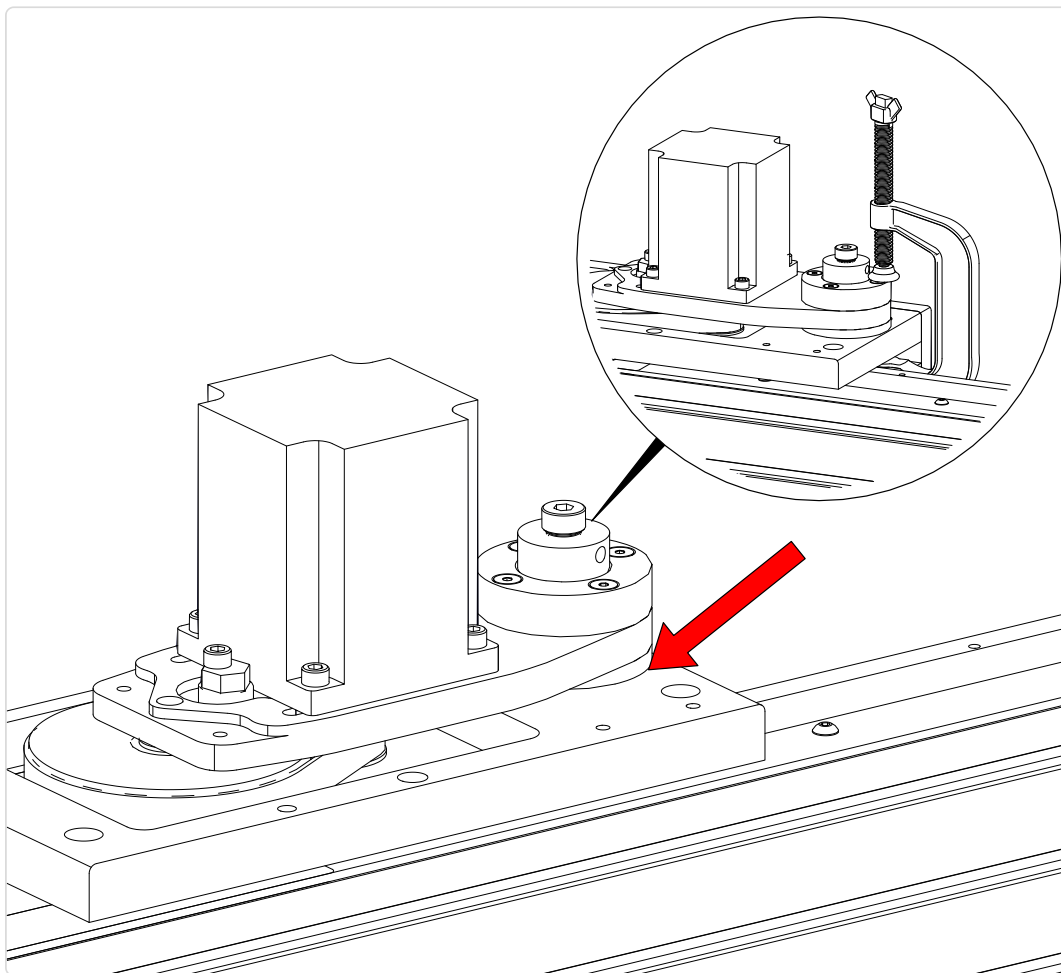
1. Attach the R&P assembly to the gantry R&P plate as indicated, using the **Pivot Shaft (I)** and **Eccentric Collar Bearing Cap (H)**.



Assembly Note

Ensure the eccentric collar bearing cap is oriented correctly. It will fit over the eccentric collar bearing pre-installed in the R&P drive plate.

5.2.2.2



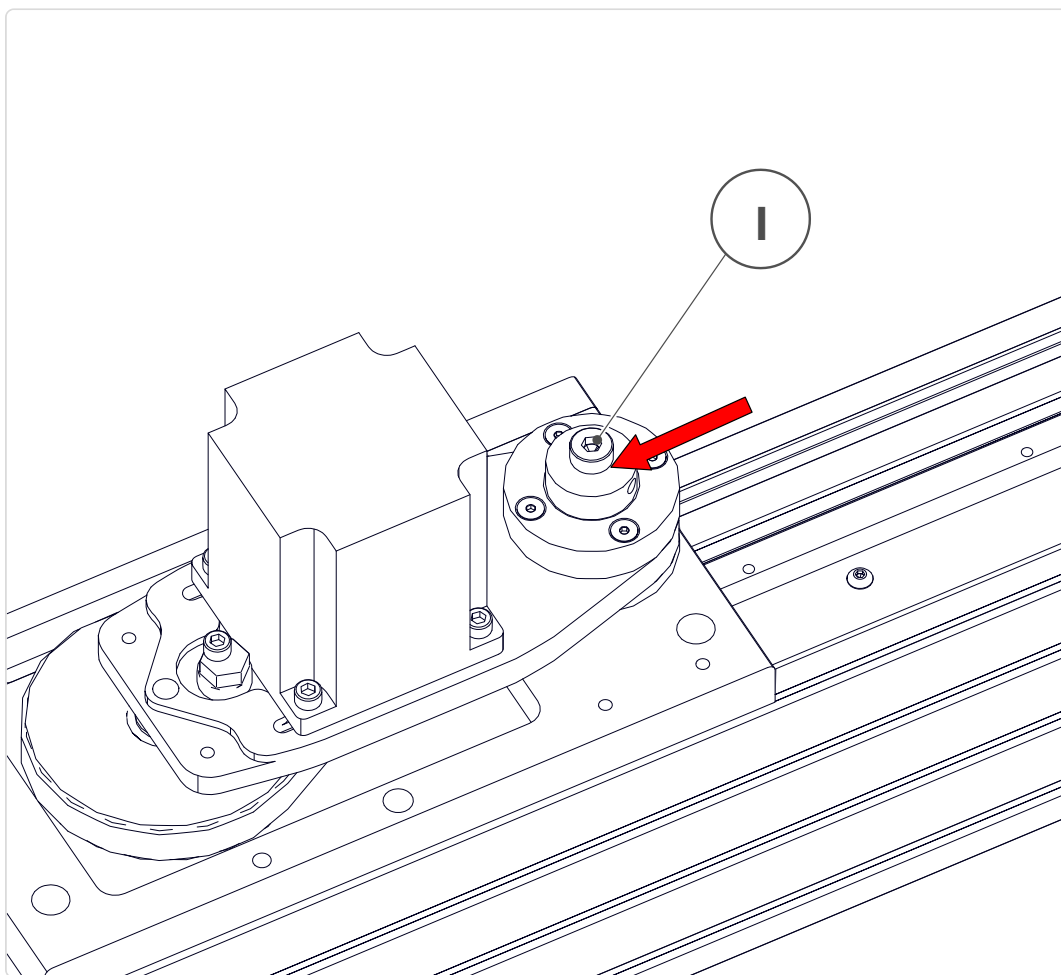
1. Ensure the R&P assembly is fully seated on the gantry R&P plate.



Assembly Note

A clamp can be used to keep the R&P assembly fully seated while performing the next steps.

5.2.2.3



1. Fully tighten the **Pivot Shaft** (I) taking care not to over tighten the bolt.

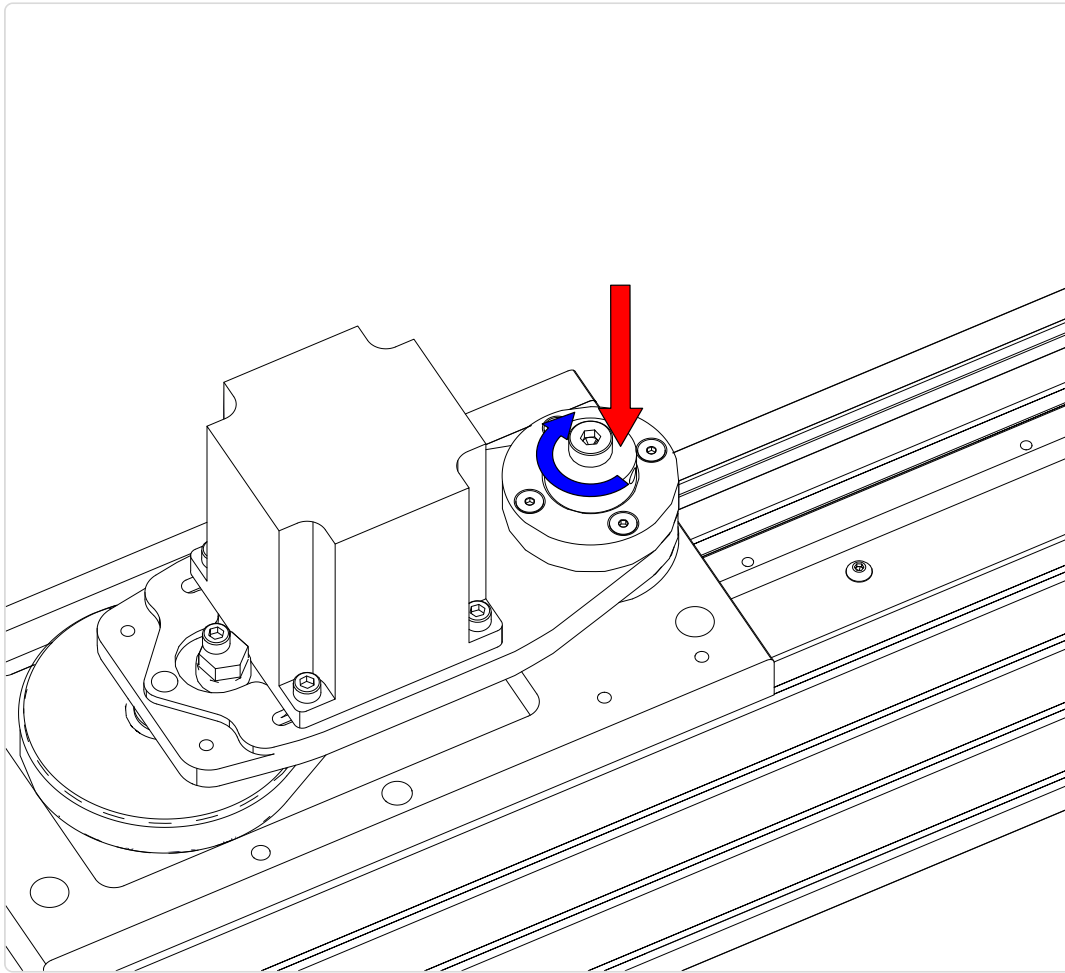
Torque Specification

If available, use a torque wrench to torque the pivot shaft to 142 in-lbf (16.1 Nm).

Assembly Note

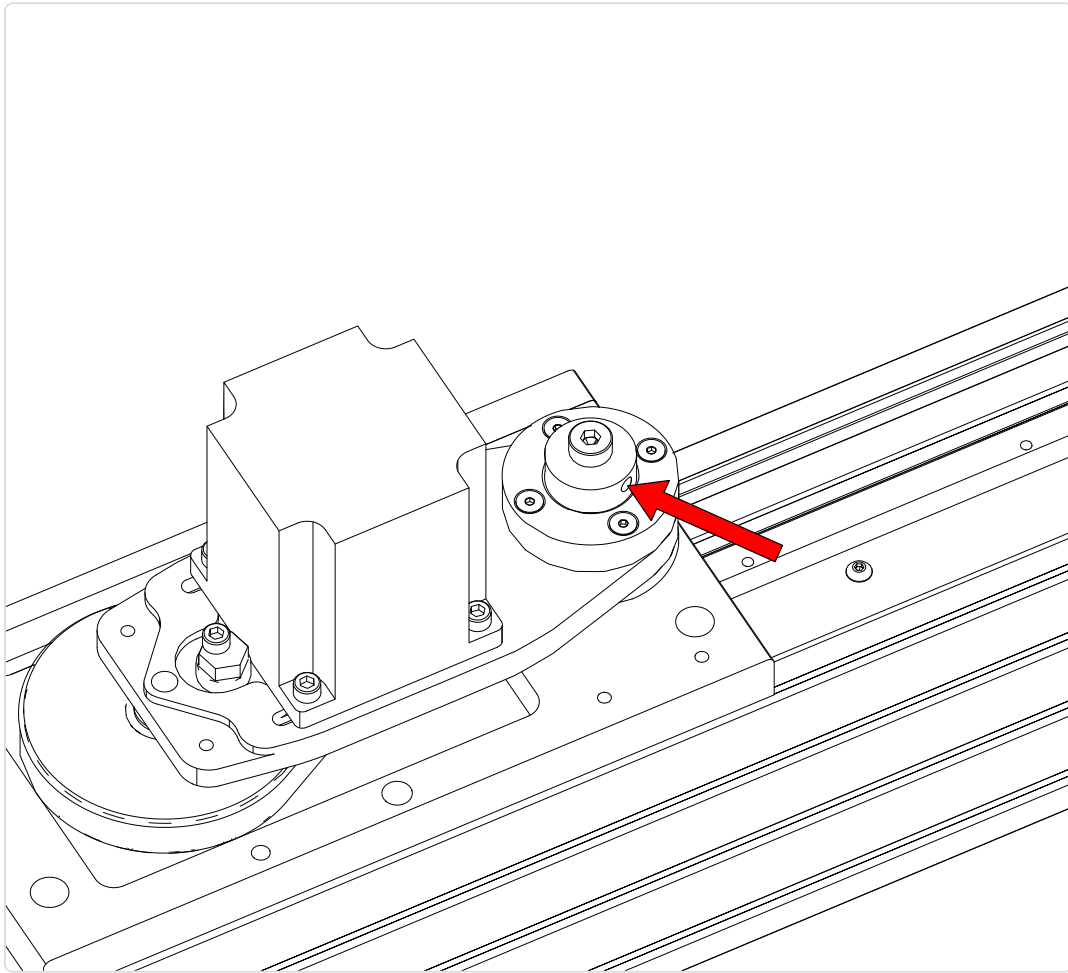
There will be a gap between the head of the pivot shaft and the eccentric collar bearing cap, as shown by the arrow.

5.2.2.4



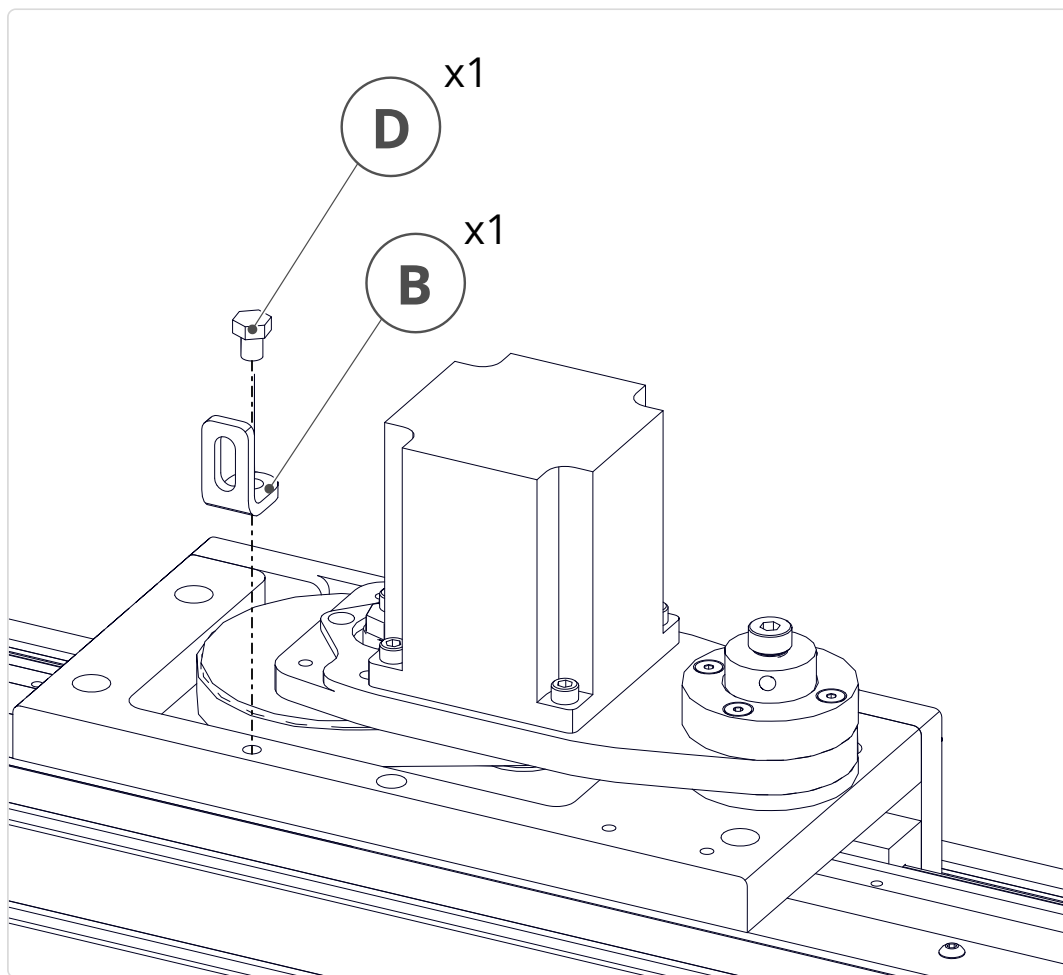
1. While pushing down on the eccentric collar bearing cap, rotate it in the clockwise direction until the bearing starts rotating inside the R&P plate.
2. Hold the eccentric collar bearing cap in this position while proceeding to the next step.

5.2.2.5



1. Tighten the set screw on the side of the eccentric collar bearing cap.

5.2.2.6

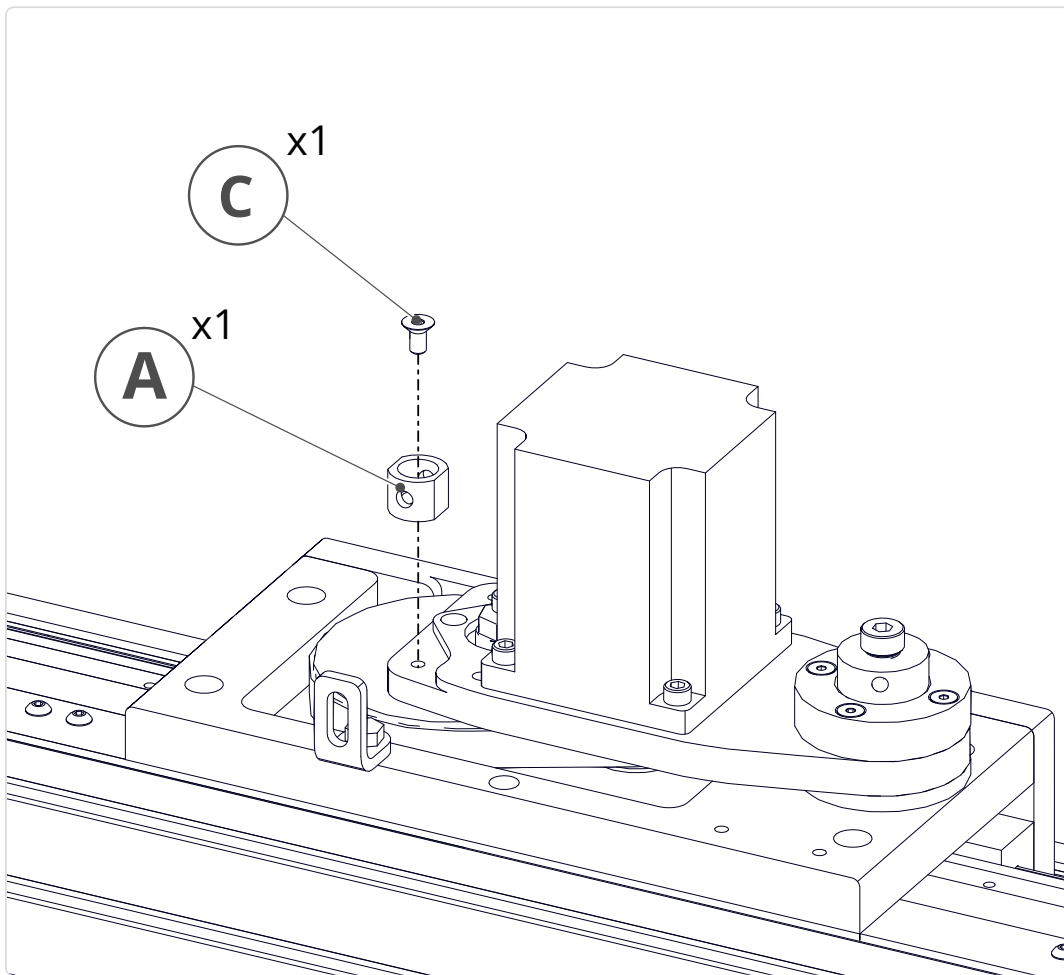


1. Attach the **Tension Bracket** (B) to the gantry R&P plate using an **M8 x 14mm Hex Cap Screw** (D).
2. Partially tighten the fastener.

Assembly Note

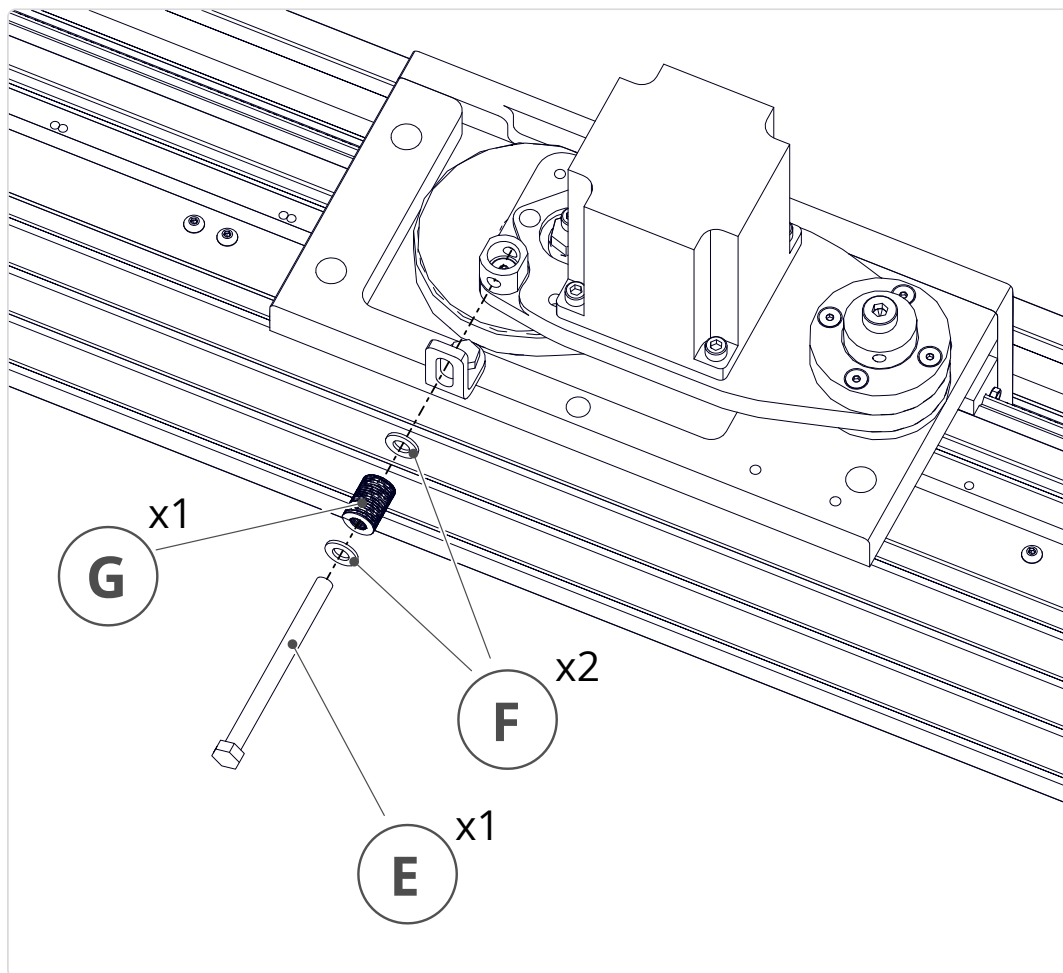
Note the orientation of the tension bracket is different than when installing on the table axes.

5.2.2.7



1. Attach the R&P Tension Post (A) to the R&P drive assembly using an M6 x 12mm Flat Head Screw (C), as indicated.
2. Partially tighten the fastener.

5.2.2.8



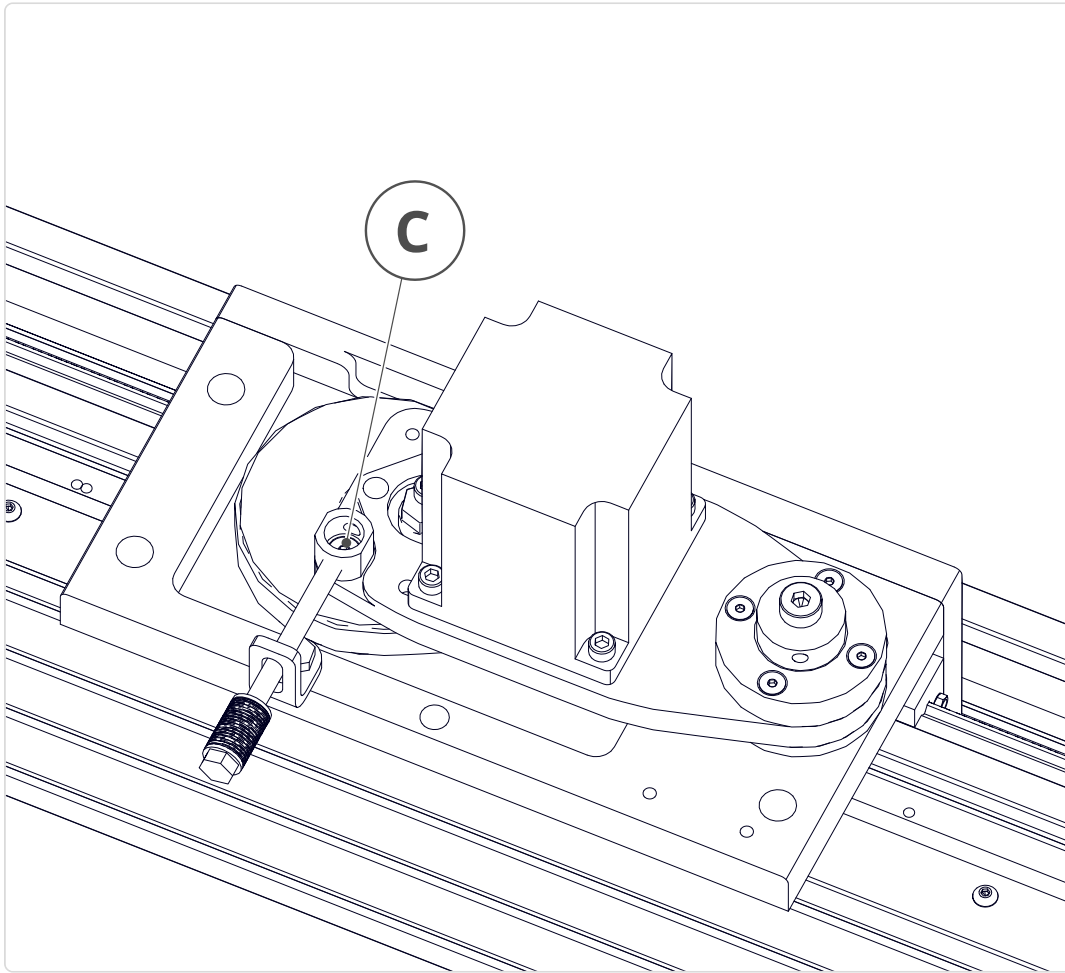
1. Install the M8 x 90mm Hex Cap Screw (E), M8 Flat Washers (F), and Die Spring (G) as indicated.



Assembly Note

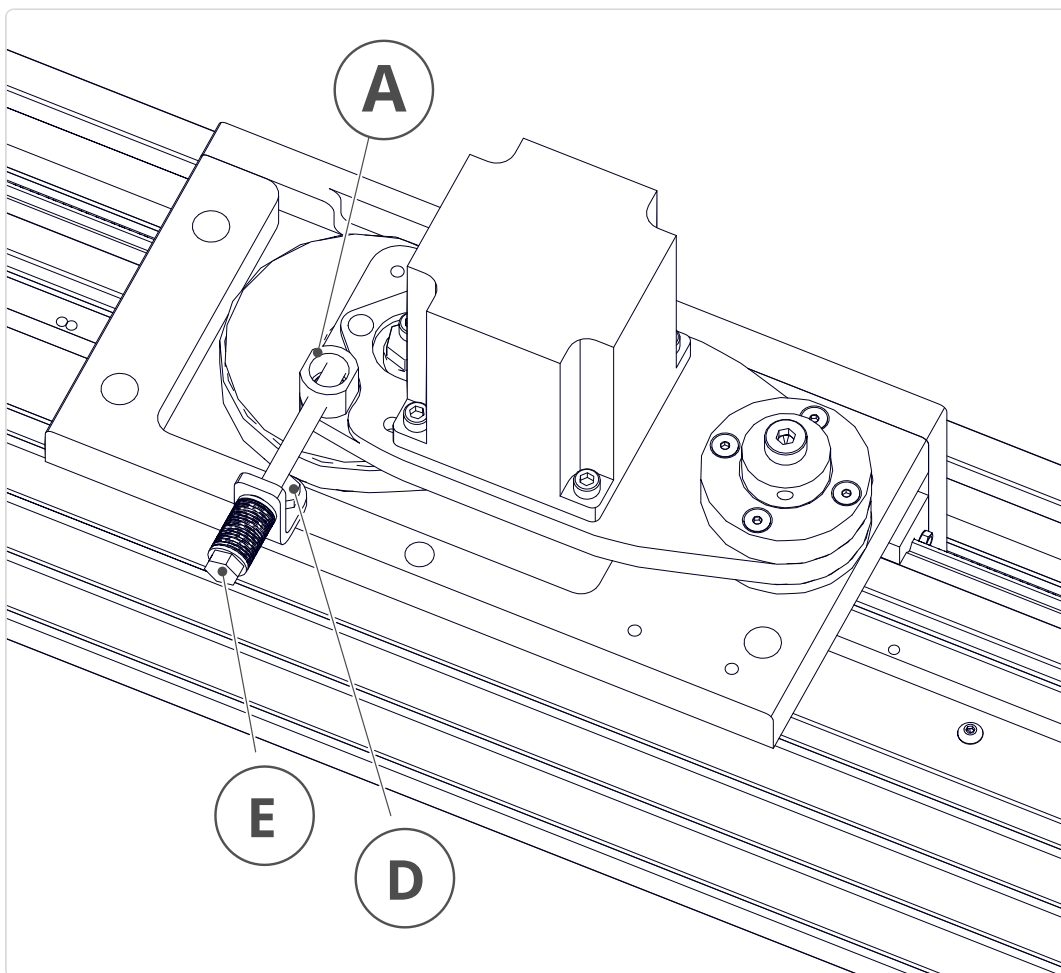
Only thread the screw through the first hole of the tension post.

5.2.2.9



1. Tighten the **M6 x 12mm Flat Head Screw** **C**.

5.2.2.10

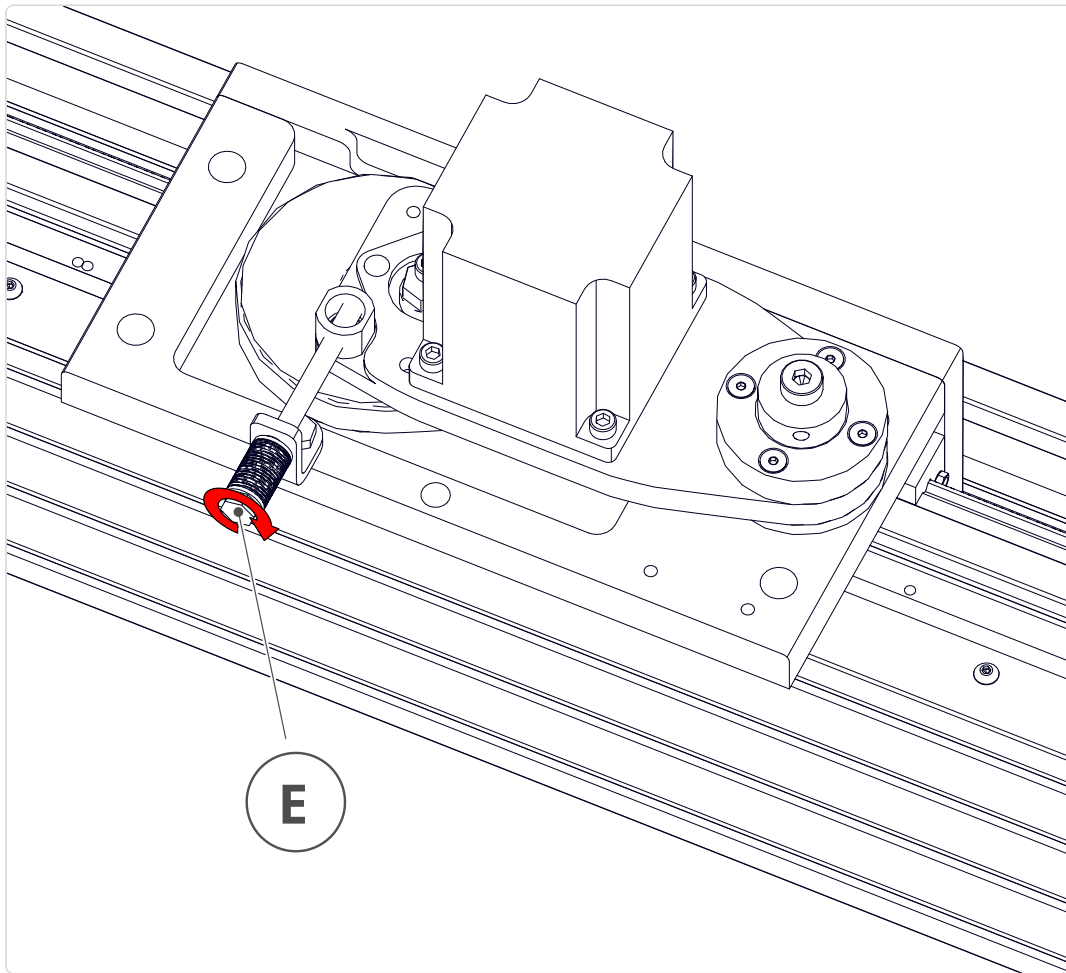


1. Continue threading in the **M8 x 90mm Hex Cap Screw (E)** until the spring is seated, but not compressed.
2. Fully tighten the **M8 x 14mm Hex Cap Screw (D)**.

Assembly Note

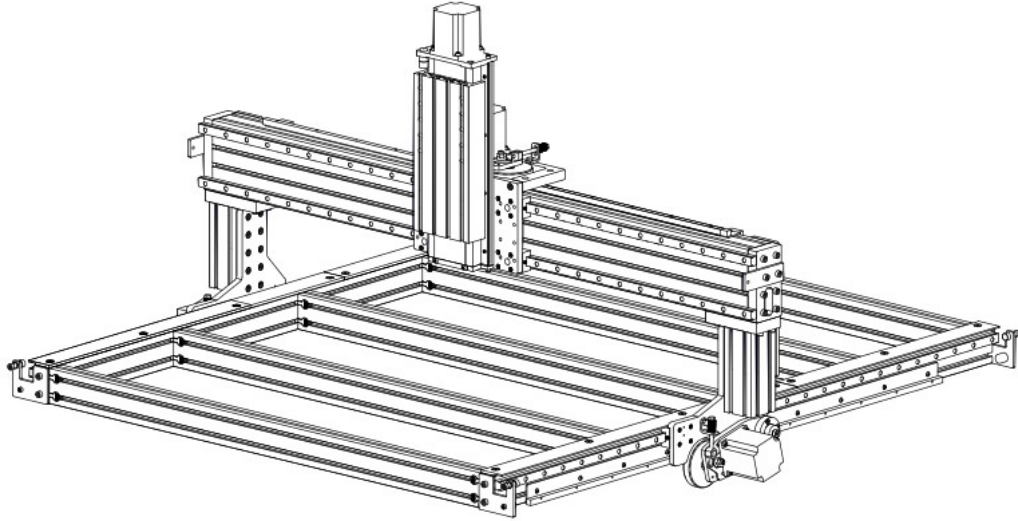
It is acceptable if the **M8 x 90mm Hex Cap Screw (E)** does not thread through the second side of the **R&P Tension Post (A)**.

5.2.2.11

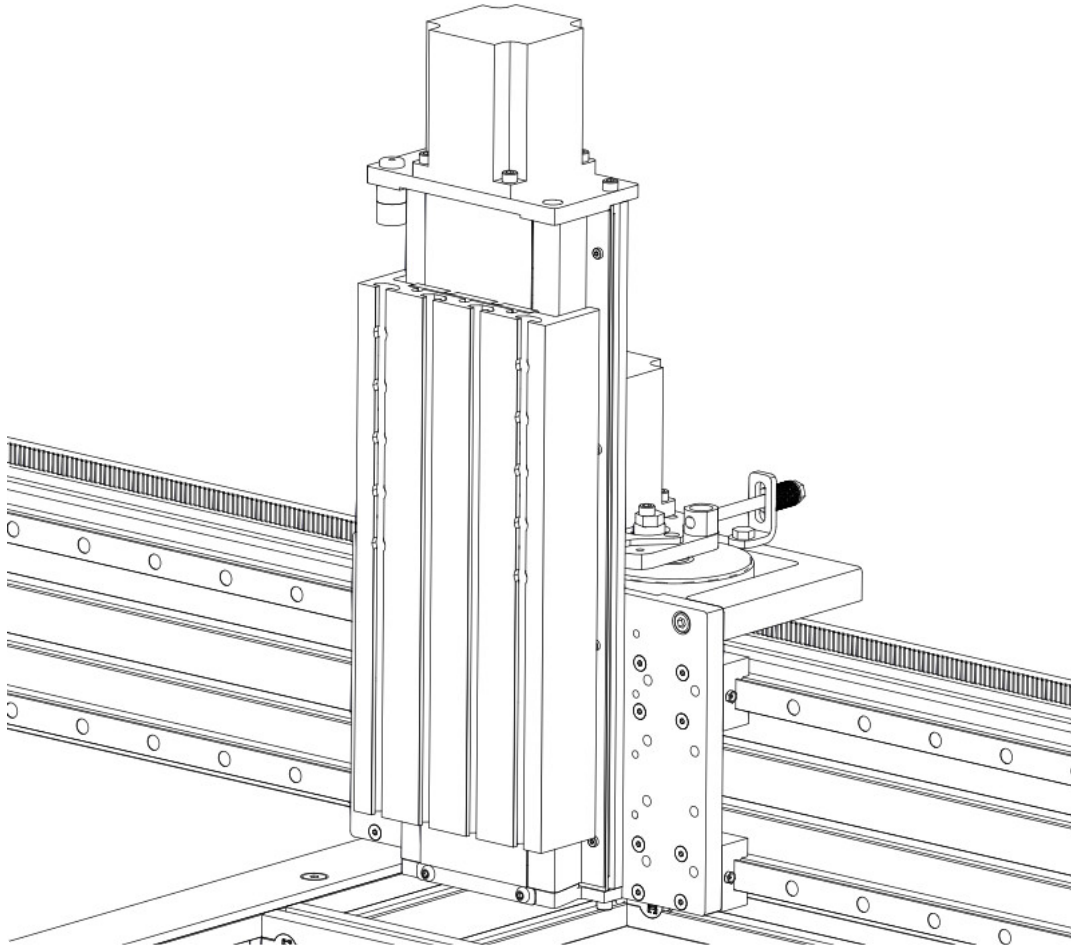


1. Tighten the **M8 x 90mm Hex Cap Screw** (E) **three** revolutions to tension the R&P assembly.

6. Z Axis



6.1 - Z Axis Installation



Parts List

ID	QTY	Part/Description	Package Label
(A)	1	CRP840-00 Ballscrew Z Axis	Z Axis
(B)	1	NEMA 34 Motor	Electronics
(C)	1	Oldham Coupler	Z Axis
	1	CRP840-00-FAST-18.3	Z Axis
(D)	8	M8 x 25mm Flat Head Screw	CRP840-00-FAST-18.3 >
(E)	4	M6 x 16mm Socket Head Cap Screw	CRP840-00-FAST-18.3 >
<i>Remaining parts from CRP840-00-FAST-18.3 are not used</i>			

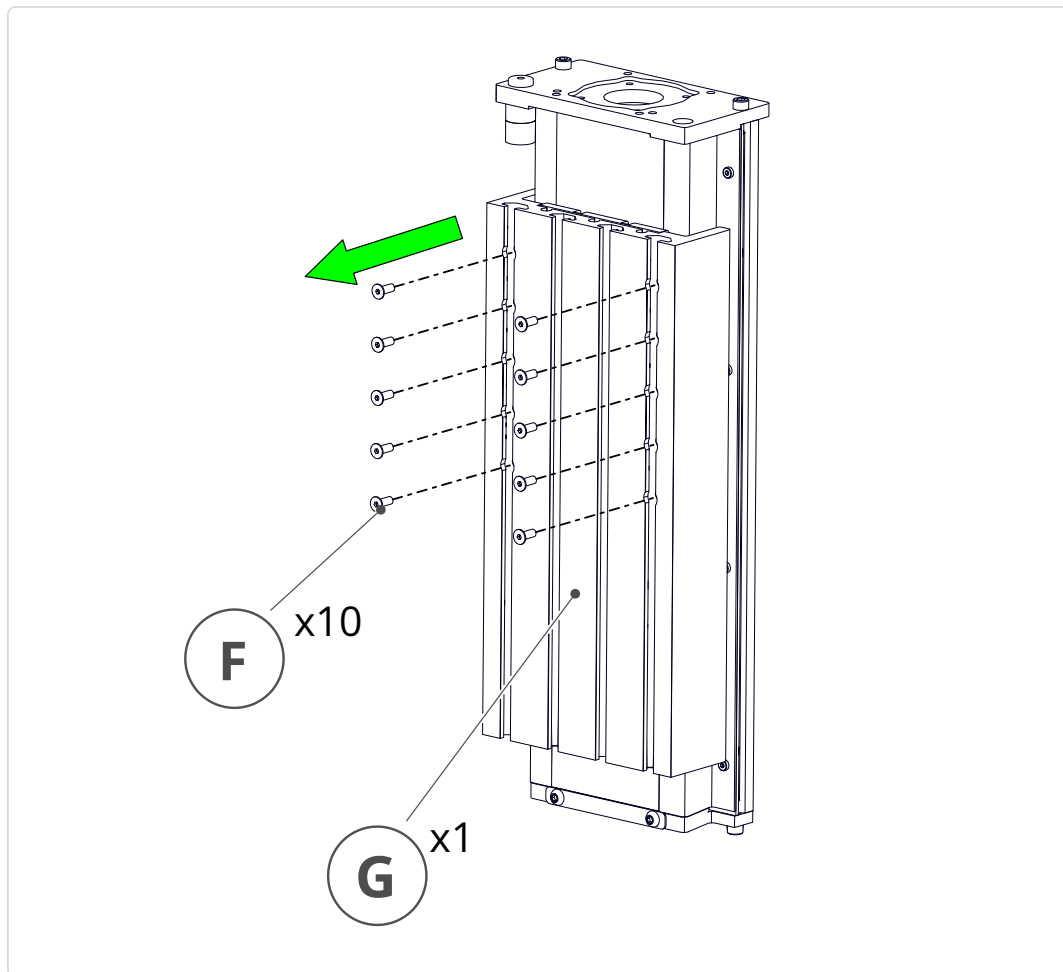
Tools List

Requirement	Tool
Required	2.5mm Allen Wrench
Required	3mm Allen Wrench
Required	5mm Allen Wrench
Required	Tape Measure



6.1.1 - Z Axis Attachment

6.1.1.1



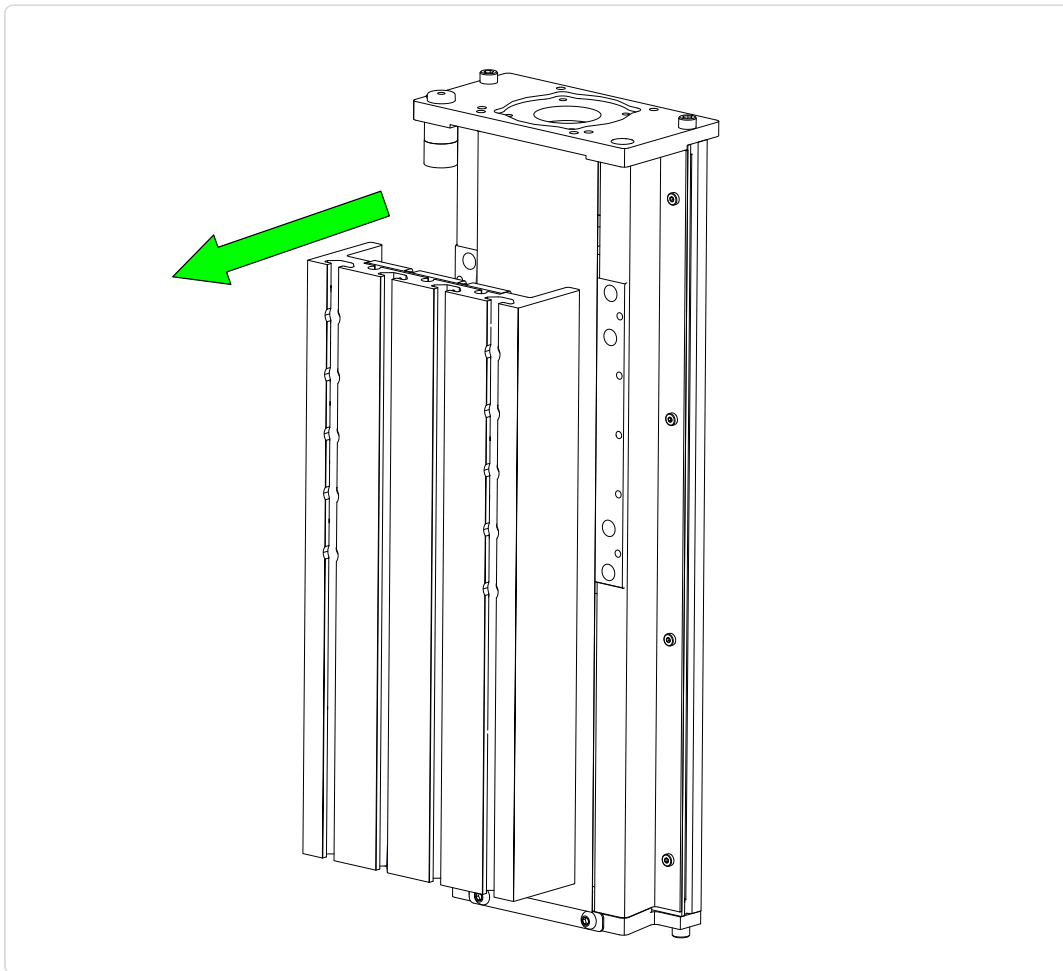
1. Remove the pre-installed **moving plate screws** (F) holding the **moving plate** (G) to the Z axis.



Assembly Note

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

6.1.1.2



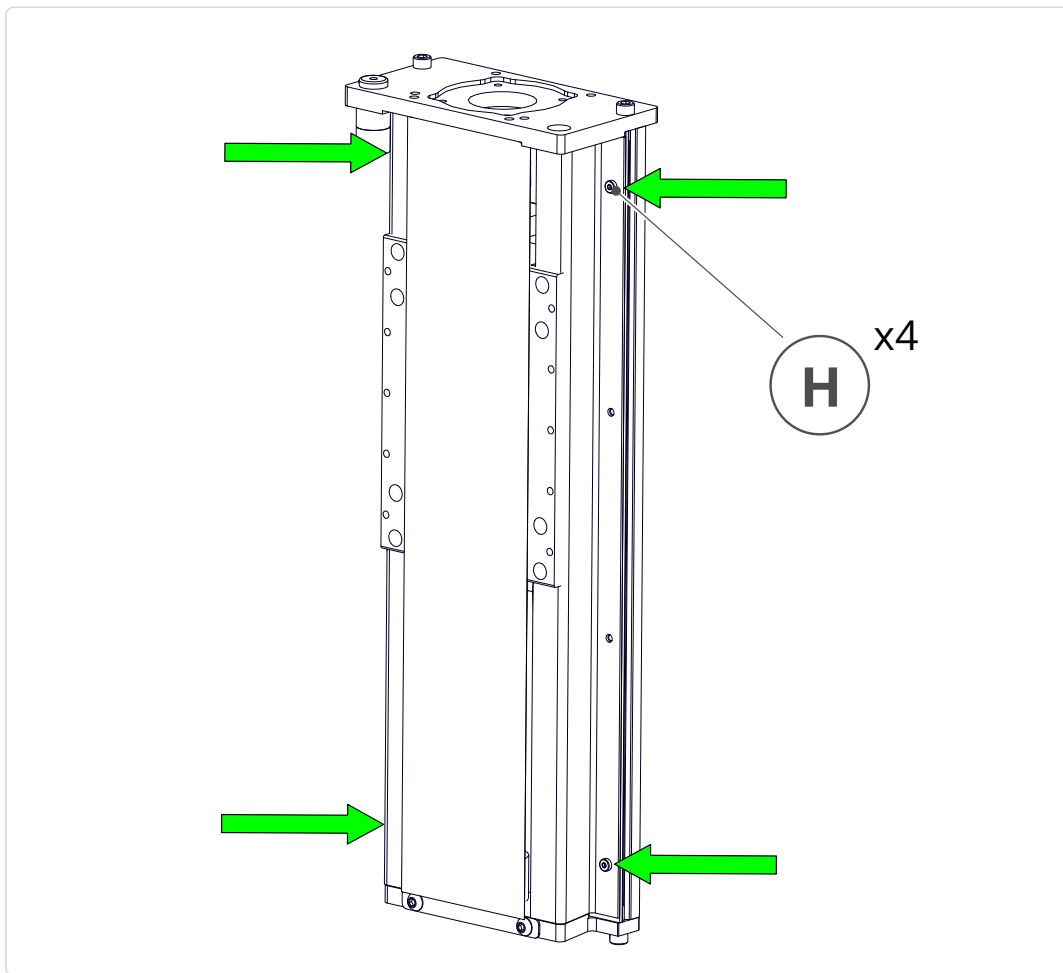
1. Remove the moving plate and set aside.



Assembly Note

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

6.1.1.3

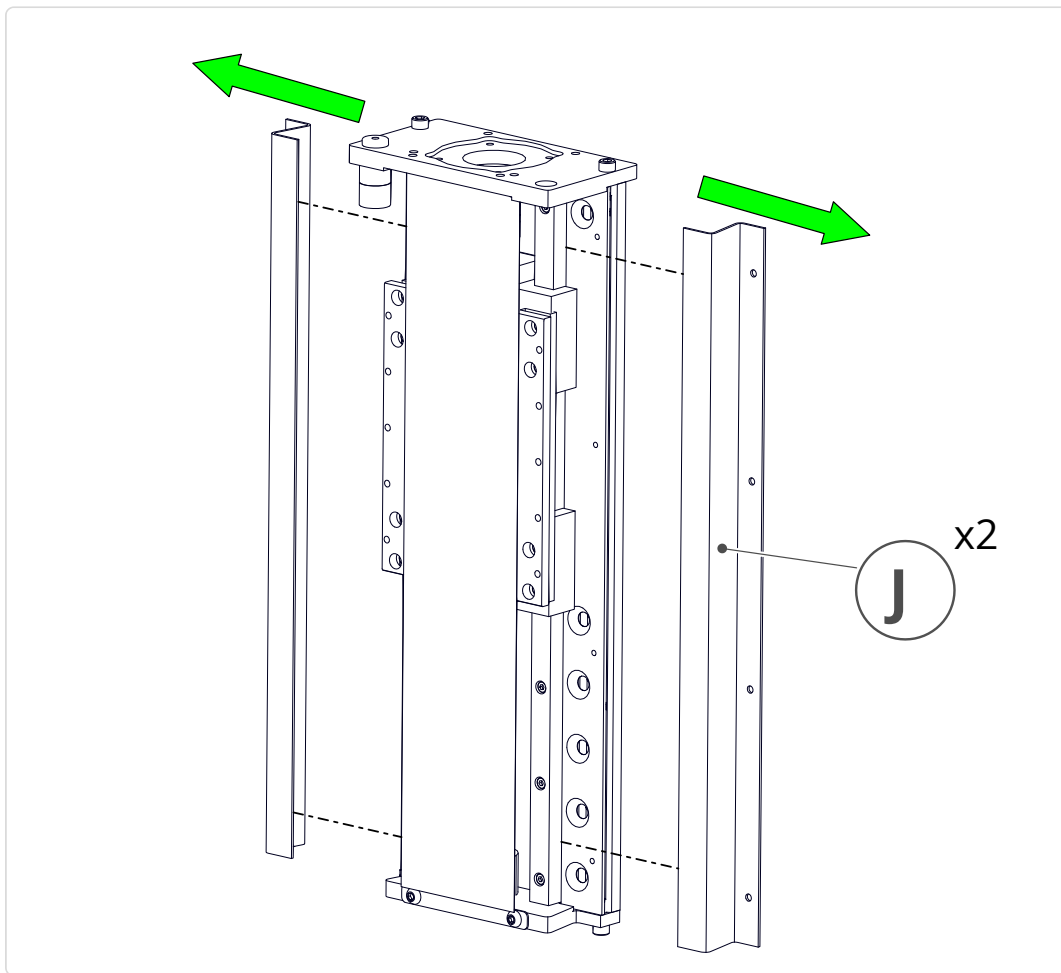


1. Remove the pre-installed **dust cover screws** (H) holding the metal dust covers to the Z axis.

Assembly Note

The remaining screws for the dust covers are included in a bag with the Z axis.

6.1.1.4



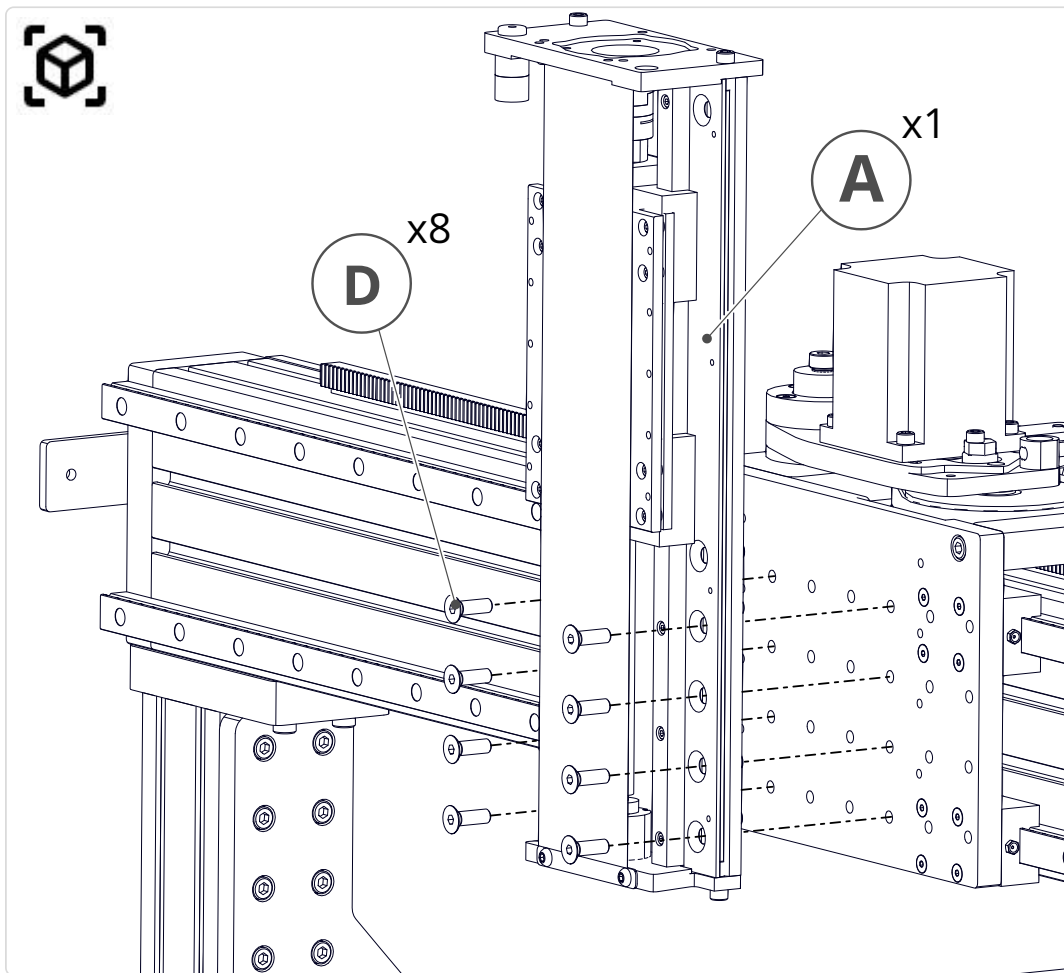
1. Remove the metal dust covers (J).



Assembly Note

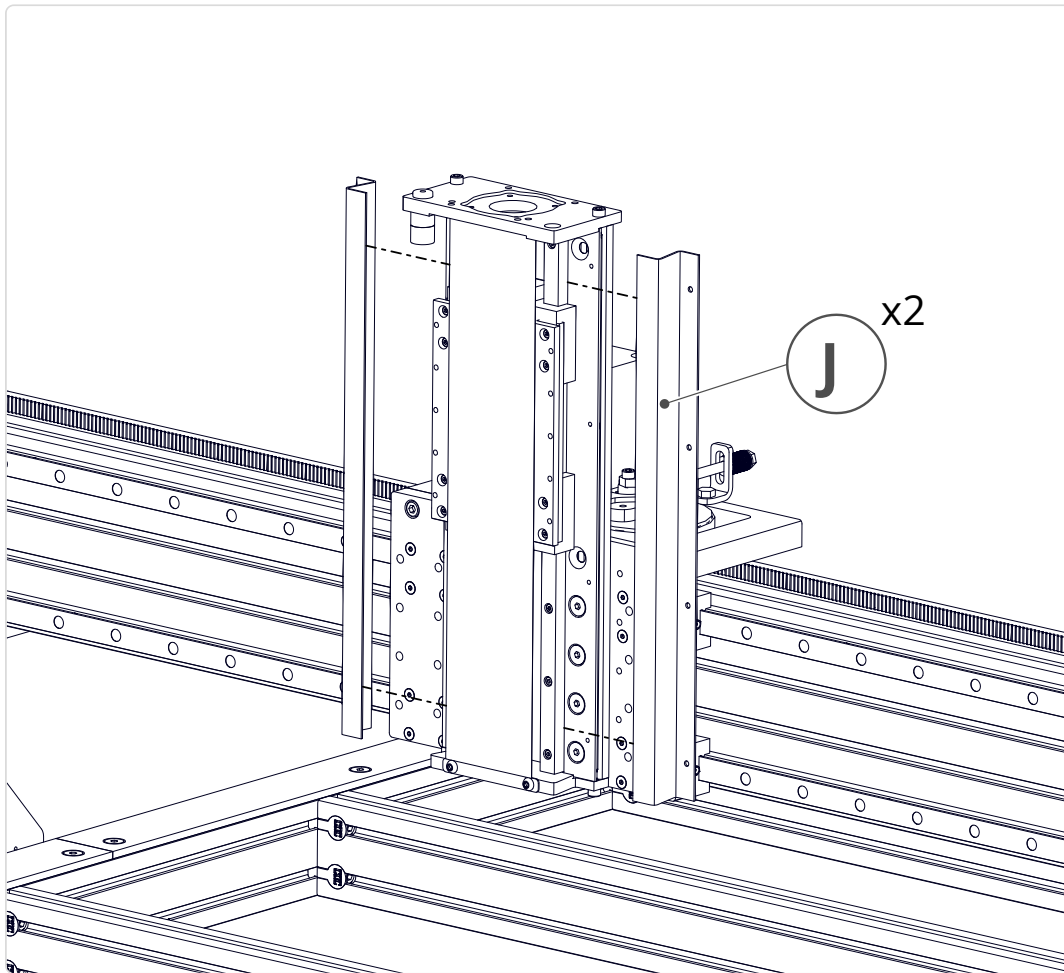
Set aside the dust cover and screws that were removed, these will be reinstalled after mounting the Z axis.

6.1.1.5



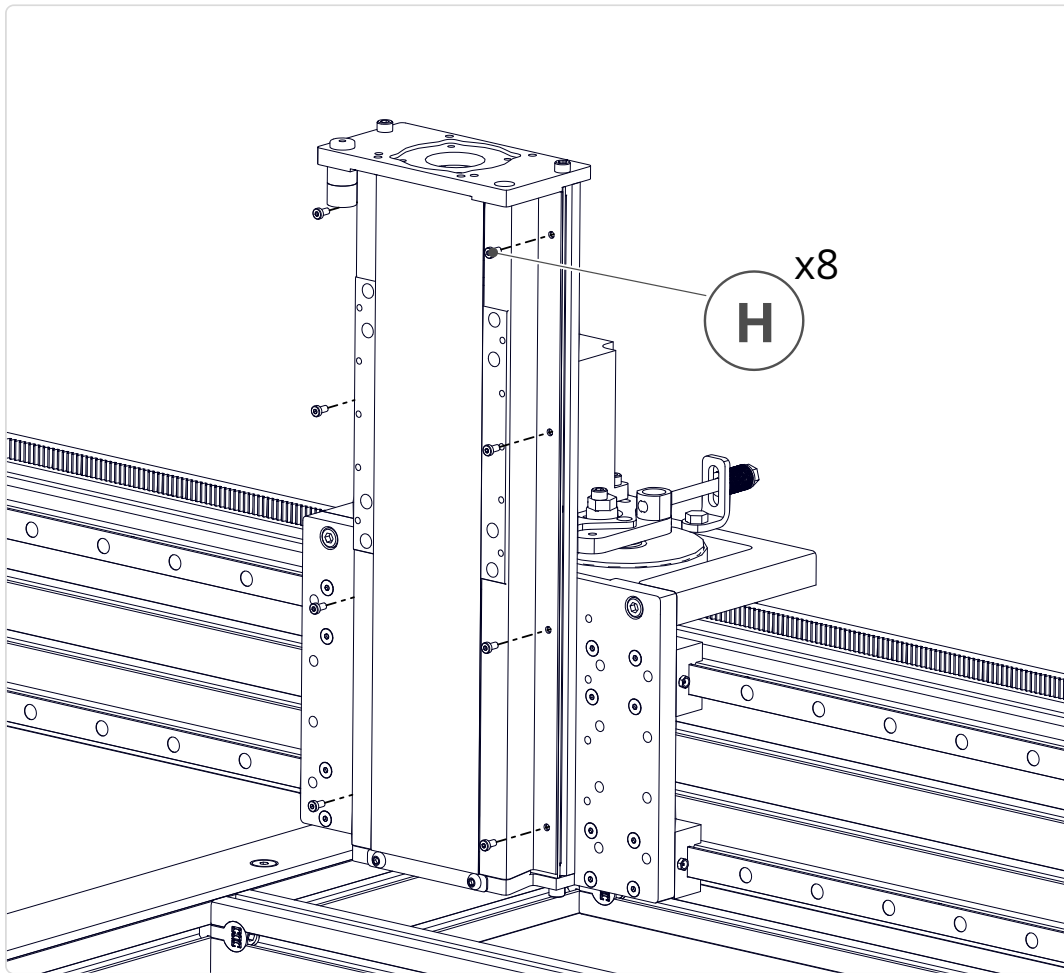
1. Attach the **Ballscrew Z Axis (A)** to the gantry plate using **M8 x 25mm Flat Head Screws (D)**.
2. Fully tighten all eight fasteners.

6.1.1.6



1. Slide the **metal dust covers** (J) (removed in previous steps) back on the Z axis as indicated.

6.1.1.7

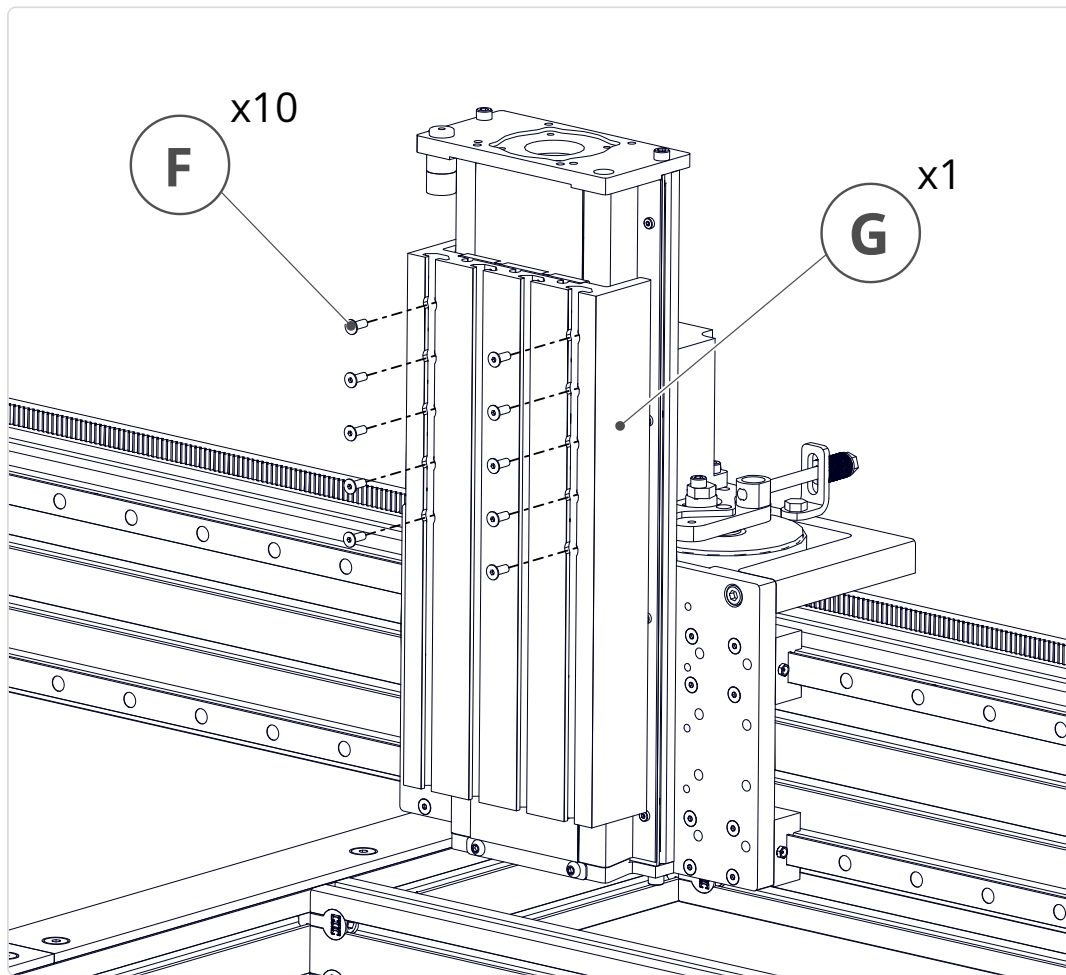


1. Attach the metal dust covers using the **dust cover screws** **H** removed in previous steps.

Optional extended Z Axis

If installing a 12" Z axis, you will install 10 dust cover screws.

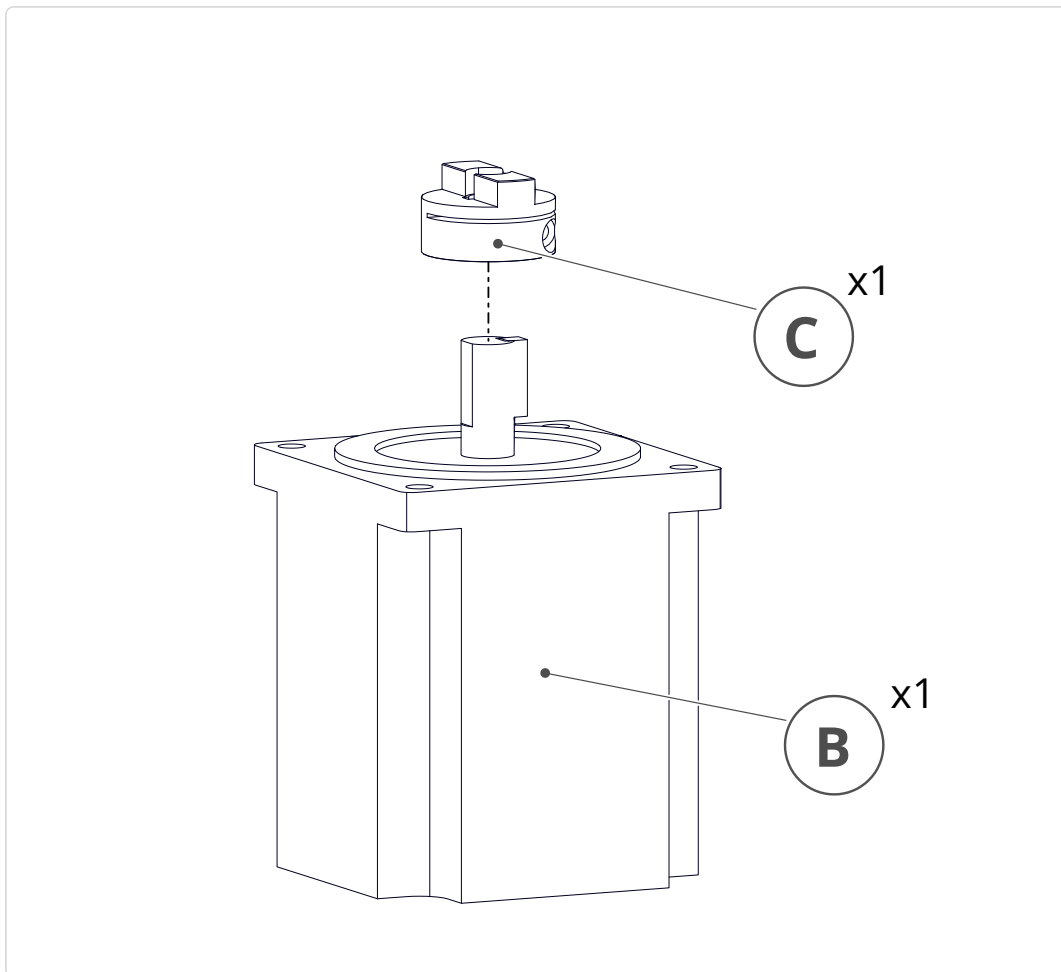
6.1.1.8



1. Attach the moving plate (G) to the Z axis using the moving plate screws (F) removed in previous steps.

6.1.2 - Motor Installation

6.1.2.1



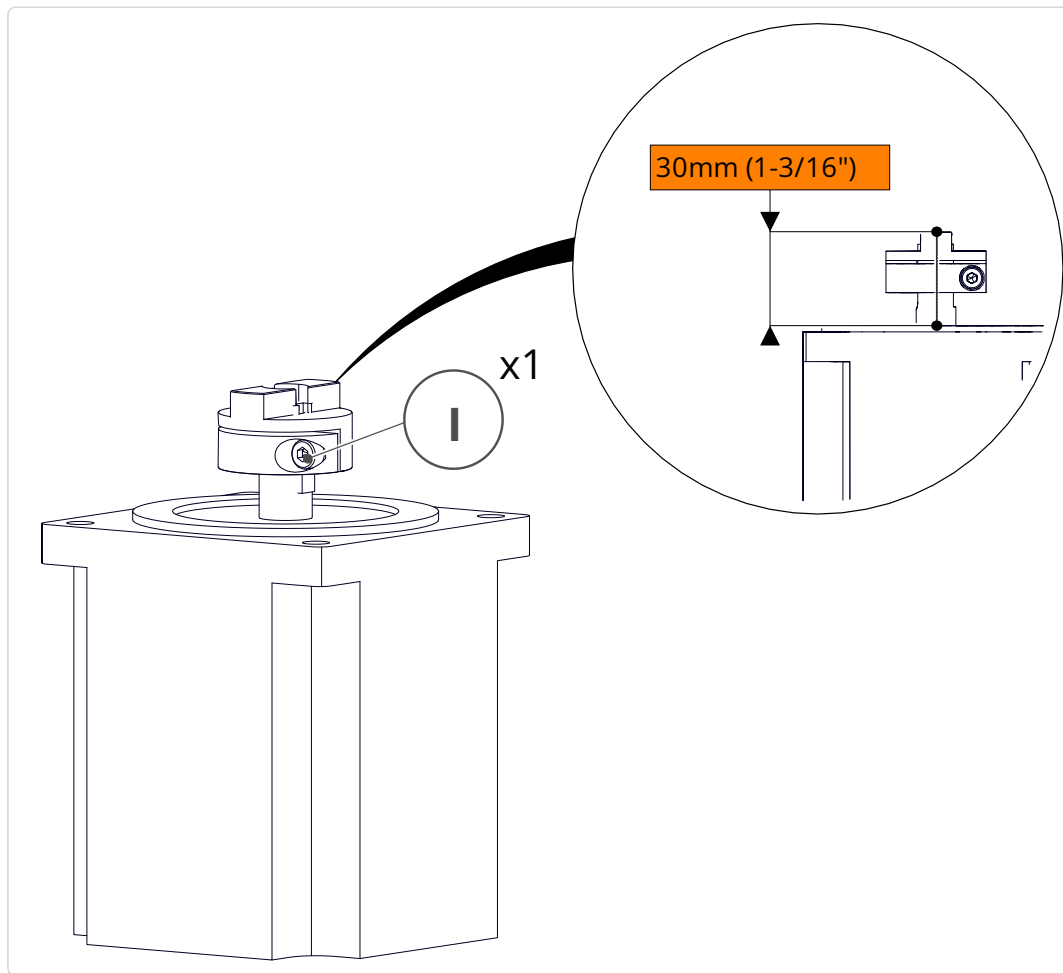
1. Slide the motor half of the **Oldham Coupler** (C) onto the **NEMA 34 Motor** (A) as indicated.



Assembly Note

Align the key in the motor shaft with the slot in the Oldham coupler.

6.1.2.2

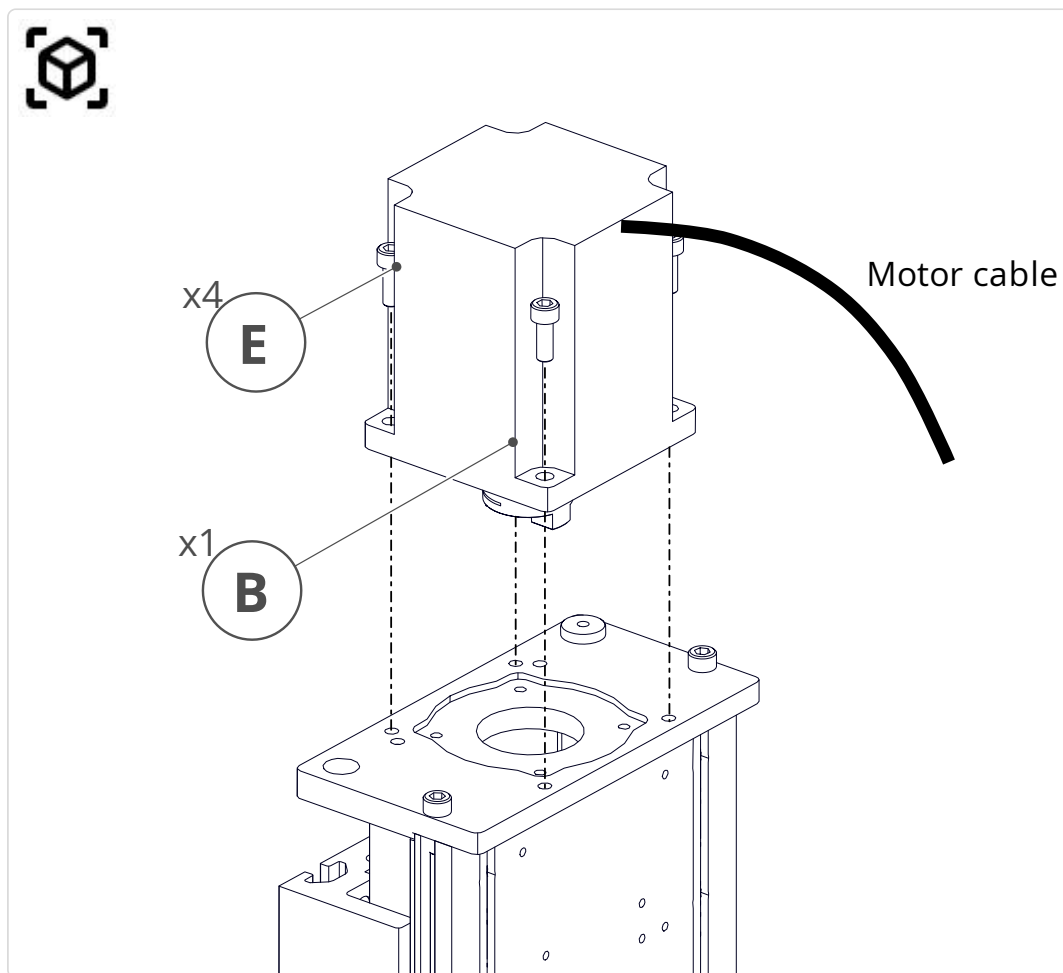


1. Position the Oldham coupler to the dimension shown.
2. Tighten the pre-installed **clamping screw** ① on the Oldham coupler.

Assembly Note

The dimension shown is from the bottom of the motor boss to the top of the Oldham coupler.

6.1.2.3



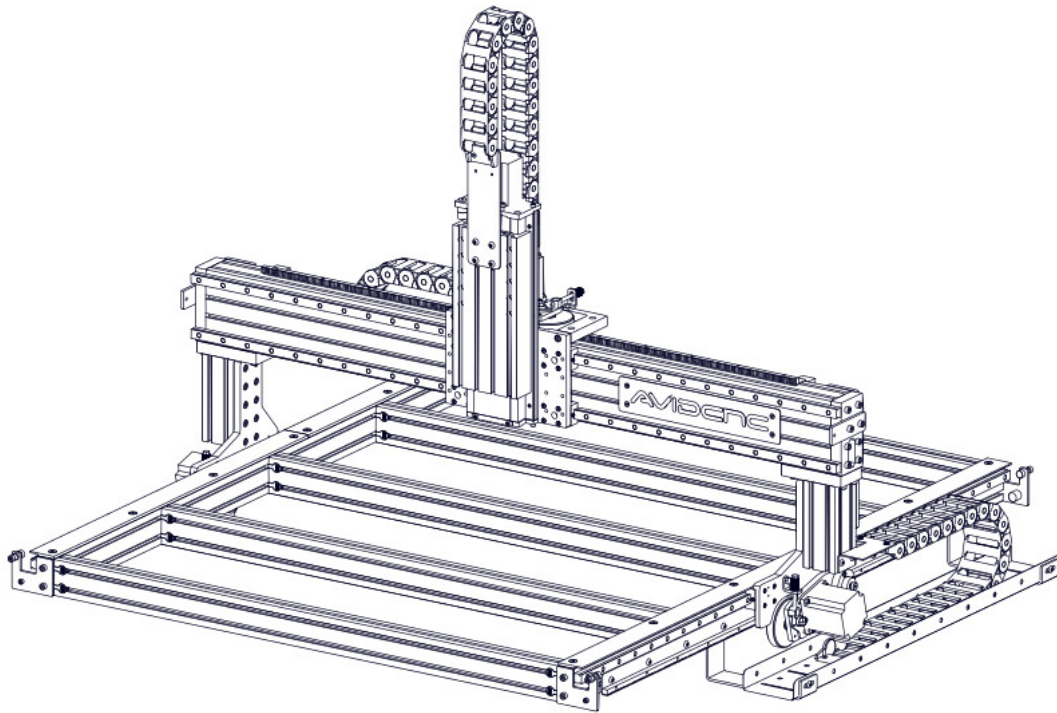
1. Install the assembled **NEMA 34 Motor (B)** onto the Z axis using **M6 x 16mm Socket Head Cap Screws (E)**.



Assembly Note

Orient the motor with the motor cable towards the back of the machine.

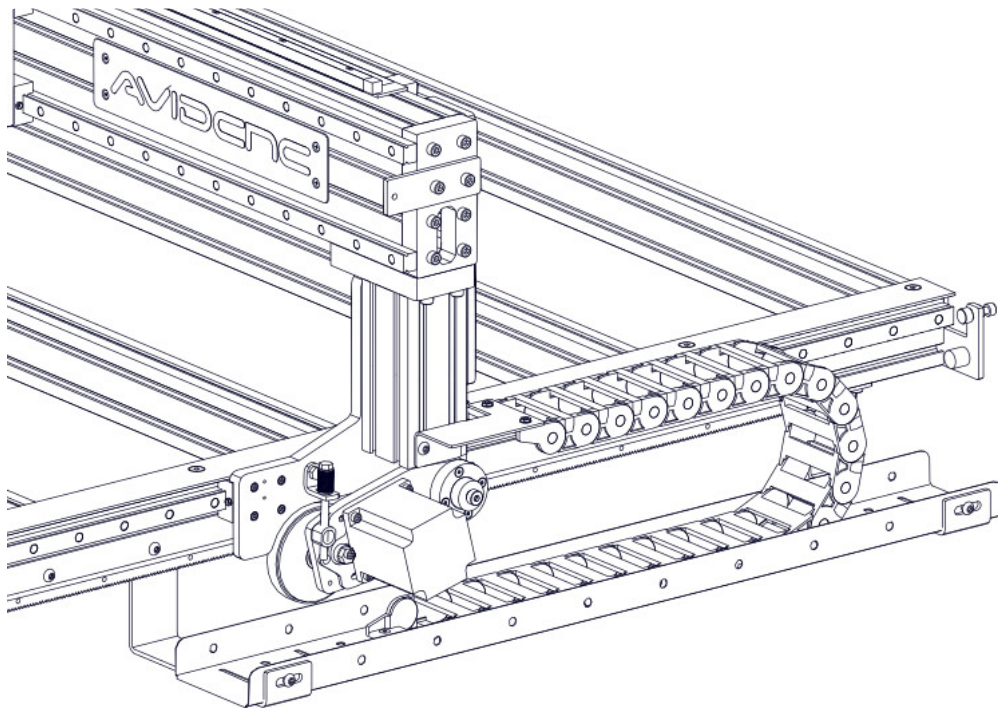
7. Cable Track



Section Note

Images may not be representative of actual machine size, however assembly steps and parts lists are specific for the machine configuration selected.

7.1 - Table Cable Track



Parts List

ID	QTY	Part/Description	Package Label
(A)	2	QT40x125B Cable Track Tray	Cable Track
(C)	4	CRP150-03 Cable Tray Bracket	Cable Track
(D)	1	CRP150-08 Riser Cable Track Bracket	Cable Track
(E)	1	75mm Cable Track Section	Cable Track
	1	CT-PRO-FAST-20.2	Cable Track
(F)	2	M8 x 12mm Button Head Cap Screw	CT-PRO-FAST-20.2 >
(G)	2	M8 Roll-in T-Nut	CT-PRO-FAST-20.2 >
(H)	2	M6 x 12mm Flat Head Screw	CT-PRO-FAST-20.2 >
(J)	2	M6 Hex Jam Nut	CT-PRO-FAST-20.2 >
	2	CT-TRAY-TABLE-PRO-FAST-20.2	Cable Track
(K)	4	M8 x 12mm Button Head Cap Screw (2 per bag)	CT-TRAY-TABLE-PRO-FAST-20.2 >
(L)	8	M8 x 16mm Socket Head Cap Screw (4 per bag)	CT-TRAY-TABLE-PRO-FAST-20.2 >
(M)	8	M8 Roll-in T-Nut (4 per bag)	CT-TRAY-TABLE-PRO-FAST-20.2 >
(N)	4	M8 Hex Flange Nut (2 per bag)	CT-TRAY-TABLE-PRO-FAST-20.2 >
Remaining parts from CT-PRO-FAST-20.2 used in future section			



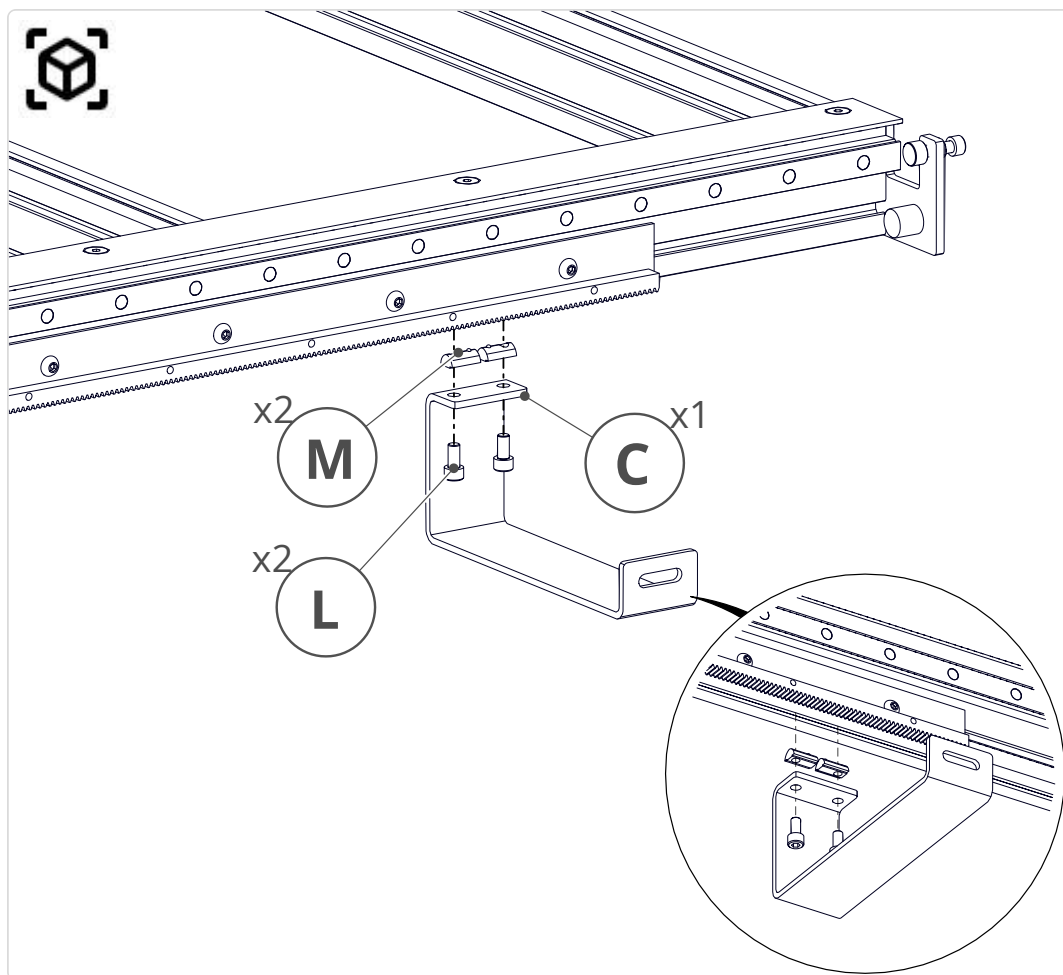
Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	5mm Allen Wrench
Required	6mm Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure
Recommended	10mm Combination Wrench
Recommended	13mm Combination Wrench



7.1.1 - Cable Track Tray Installation

7.1.1.1

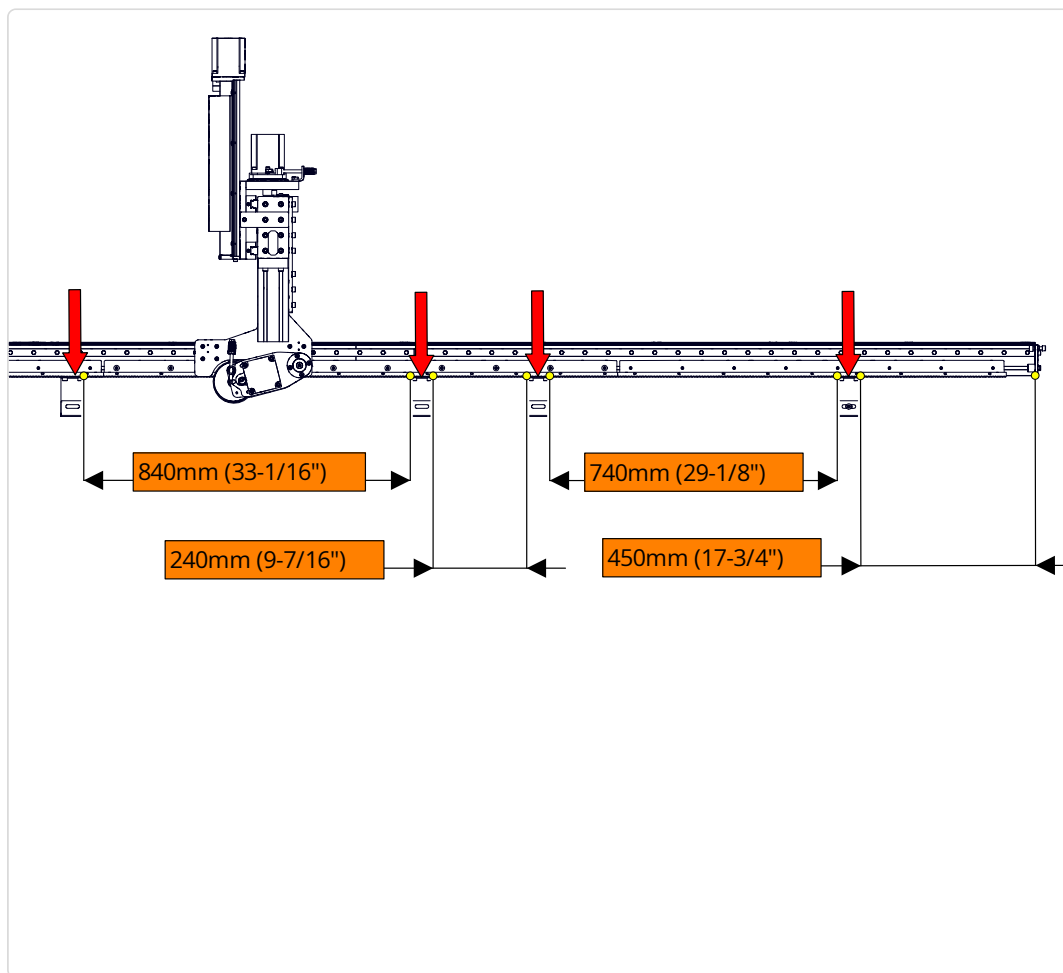


1. Attach a **CRP150-03 Cable Tray Bracket (C)** to the underside of the table extrusion using **M8 x 16mm Socket Head Cap Screws (L)** and **M8 Roll-in T-Nuts (M)**.
2. Only partially tighten the fasteners to allow positioning in next steps.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, install the cable tray brackets on the left side of the machine.

7.1.1.2

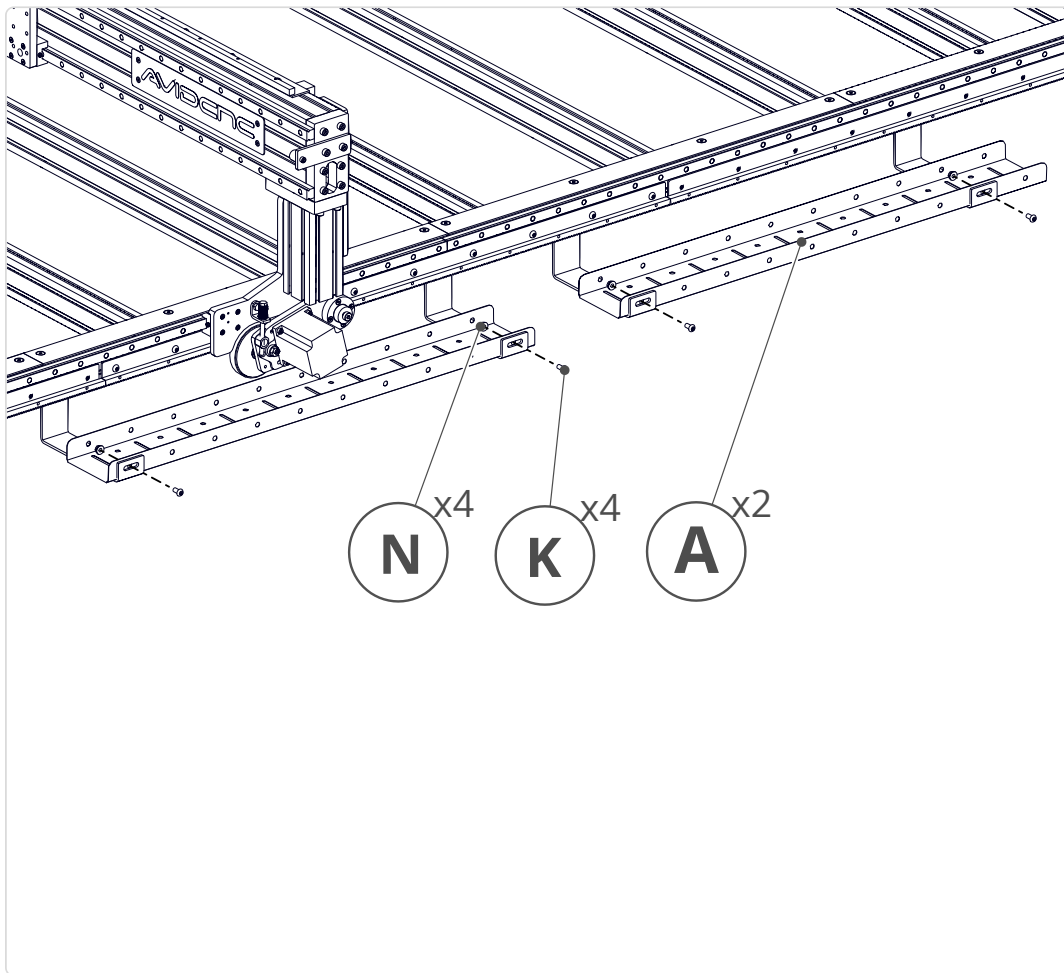


1. Repeat the previous step to attach the remaining cable tray brackets and position as indicated.
2. Fully tighten the fasteners.

Assembly Note

Dimensions shown are from the back of the machine.

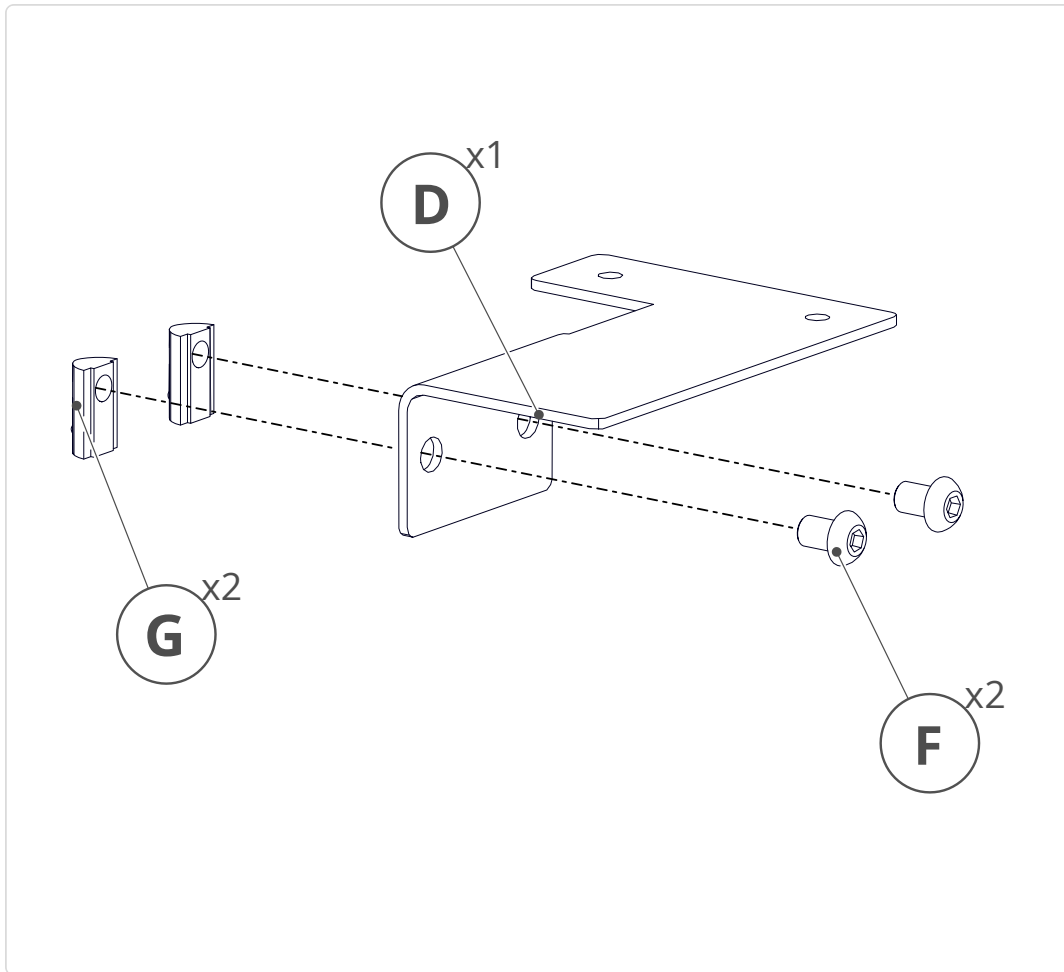
7.1.1.3



1. Attach two QT40x125B Cable Track Trays (A) to the cable tray brackets using M8 x 12mm Button Head Cap Screws (K) and M8 Hex Flange Nuts (N).

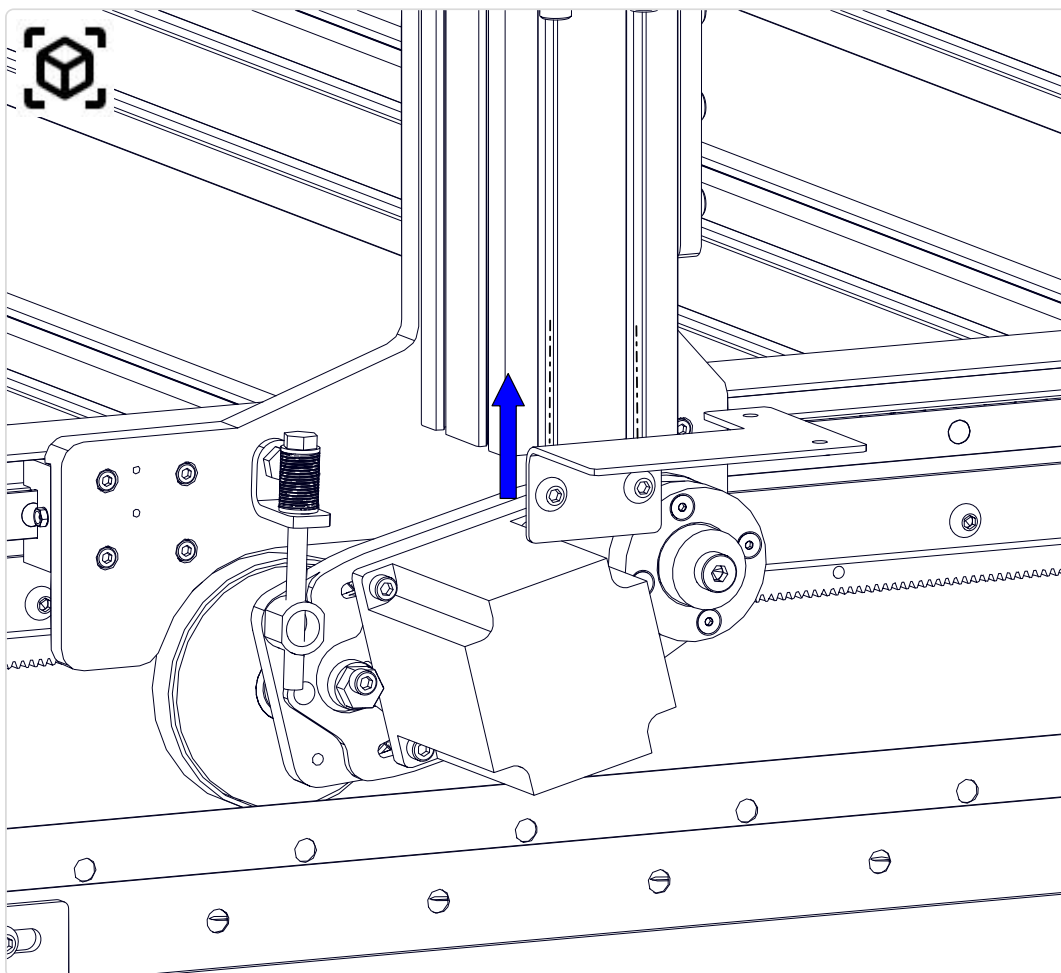
7.1.2 - Cable Track Installation

7.1.2.1



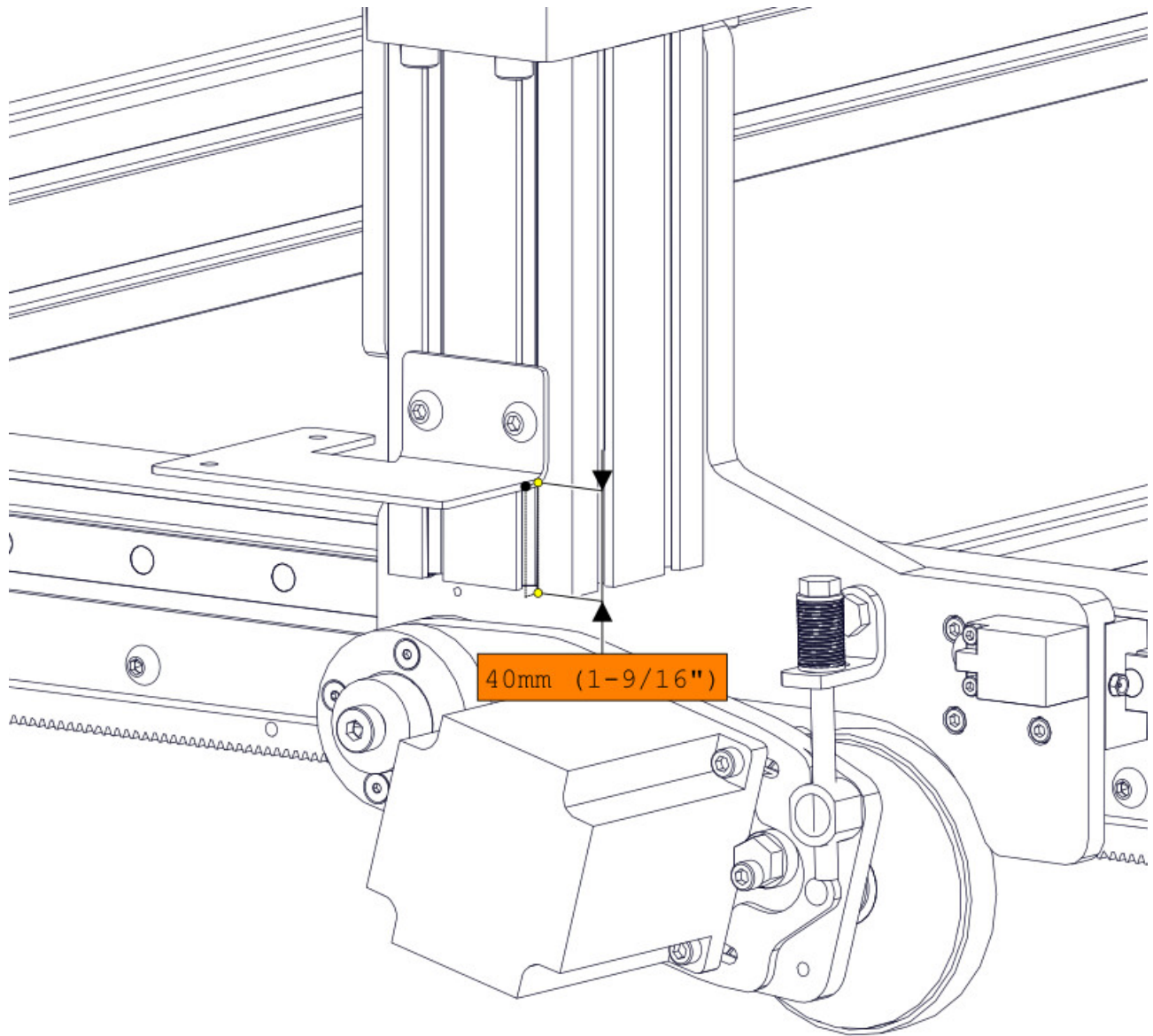
1. Partially thread **M8 x 12mm Button Head Cap Screws (F)** onto **M8 Roll-in T-Nuts (G)**, through the **CRP150-08 Riser Cable Track Bracket (D)**.

7.1.2.2

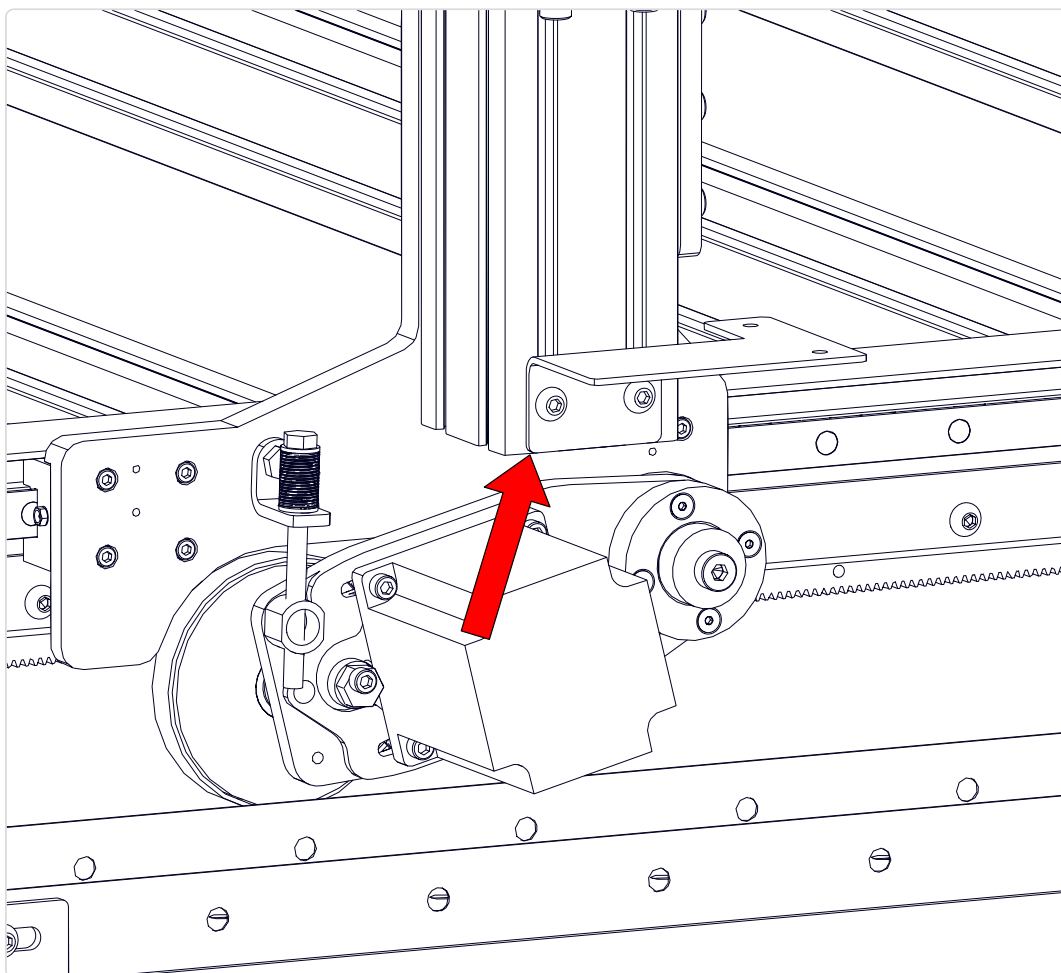


1. Slide the assembled riser cable track bracket into the riser extrusion, as indicated.

If locating the table cable track on the left side of the machine, rotate the riser cable track bracket upside down and install on the left side of the machine. Position the bracket 40mm (1-9/16") from the bottom of the riser extrusion.

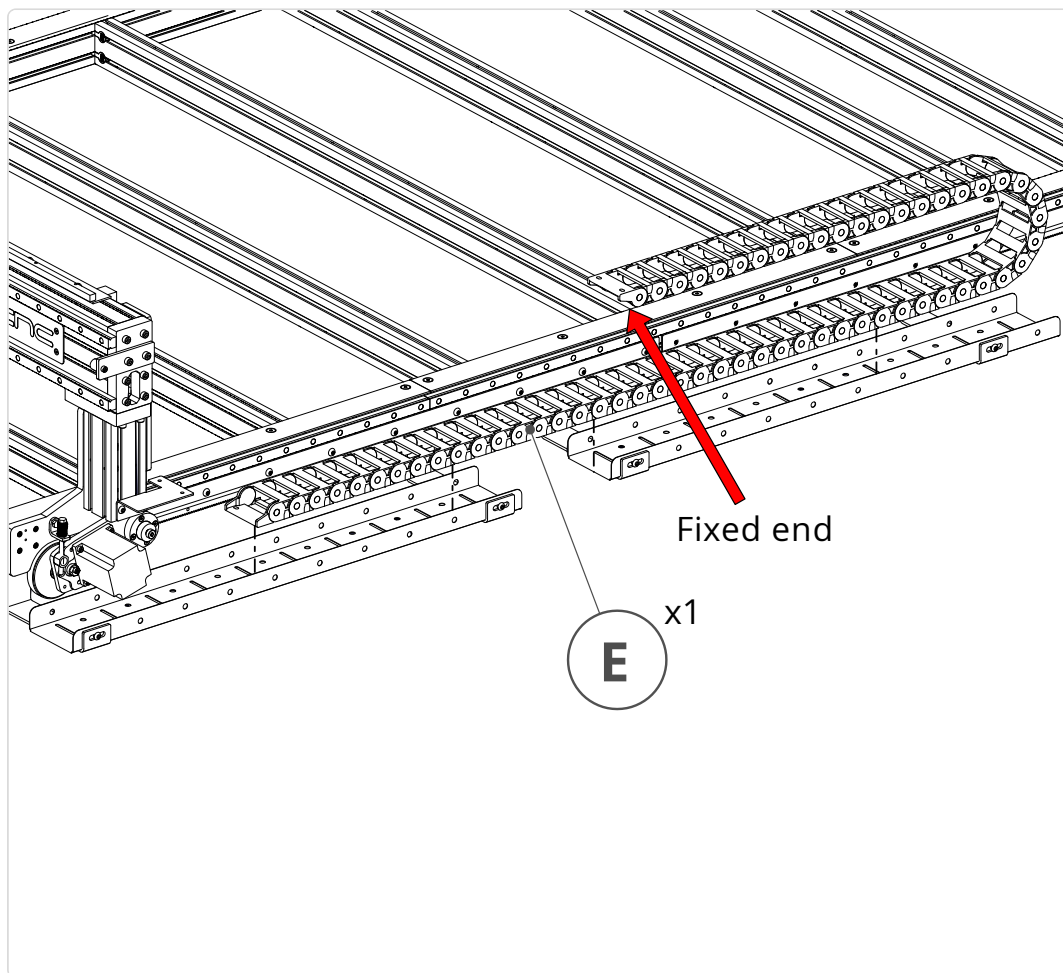


7.1.2.3



1. Position the riser cable track bracket flush with the bottom of the riser extrusion.
2. Fully tighten the fastener.

7.1.2.4



1. Place the **75mm Cable Track Section (E)** into the cable track tray, oriented with the fixed end at the front of the tray.

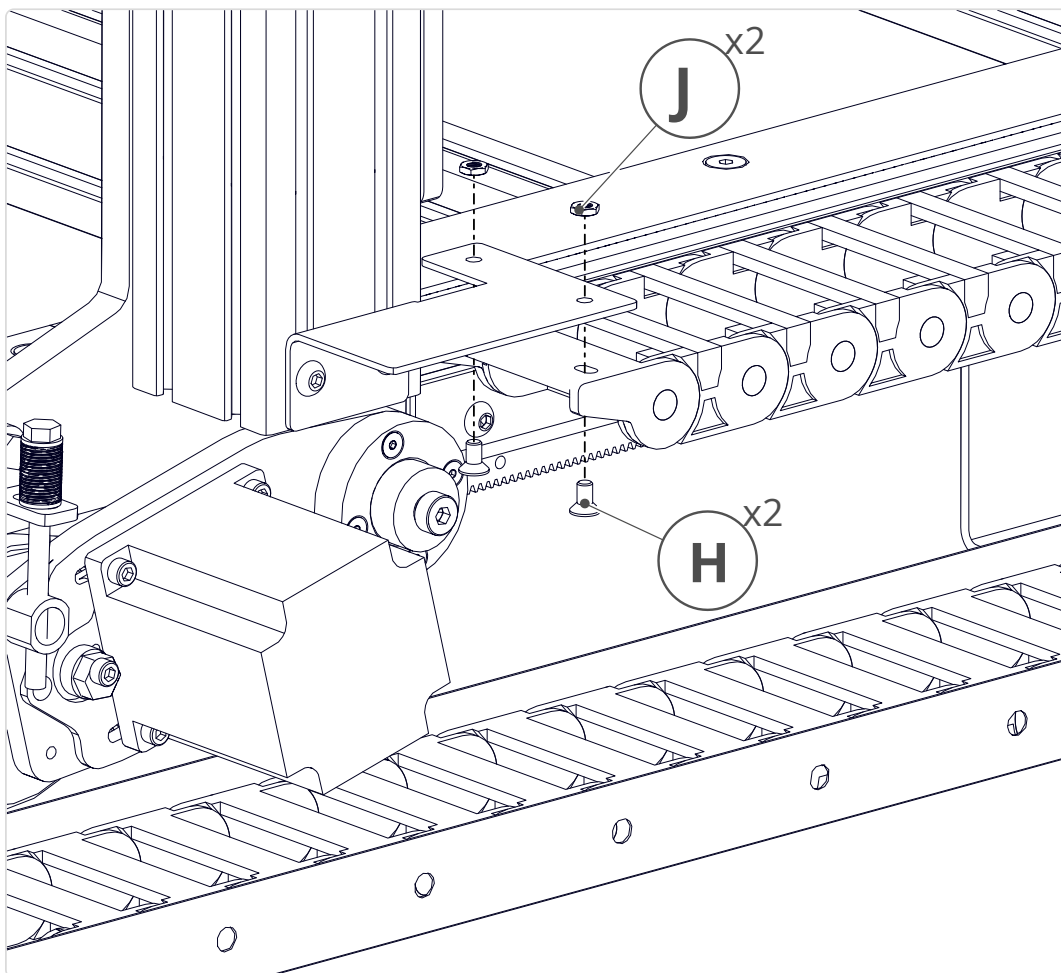


Assembly Note

To determine which cable track section to use, measure the width. The 75mm cable track section is approximately 75mm (3") wide.

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

7.1.2.4



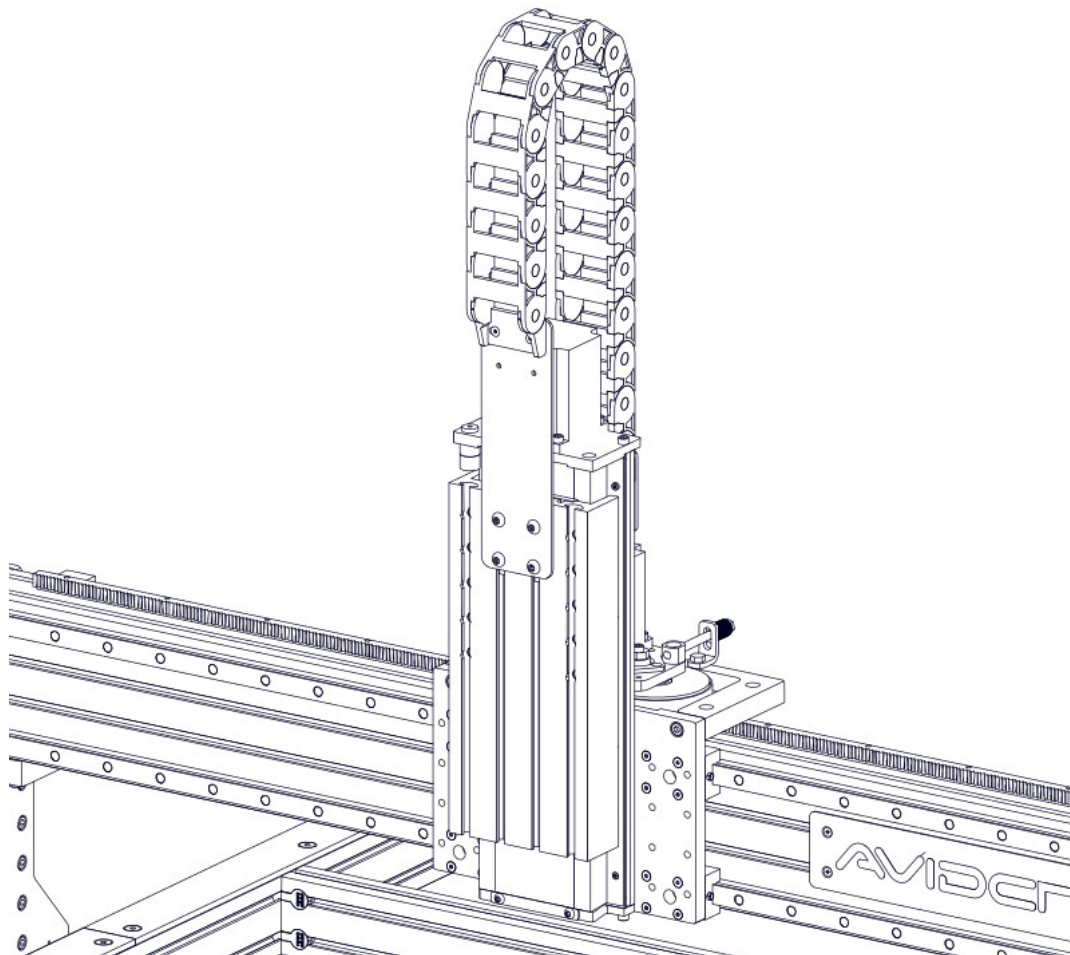
1. Attach the cable track section to the riser cable track bracket using **M6 x 12mm Flat Head Screws (H)** and **M6 Hex Jam Nuts (J)**.



Assembly Note

The other end of the cable track section will be attached after electronics installation.

7.2 - Z Axis Cable Track



Parts List

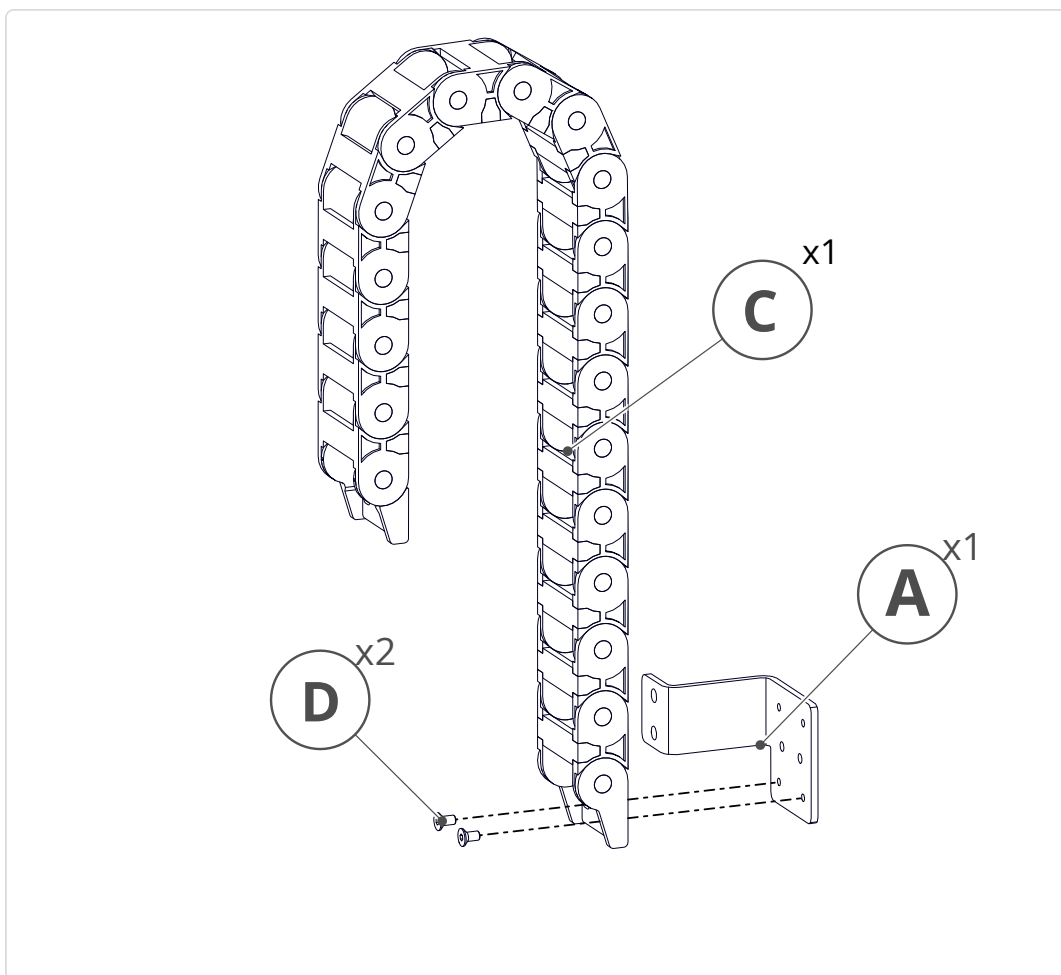
ID	QTY	Part/Description	Package Label
(A)	1	CRP150-10 Z Axis Cable Track Bracket, Back	Cable Track
(B)	1	CRP150-13 Z Axis Cable Track Bracket, Front	Cable Track
(C)	1	50mm Cable Track Section (18 links)	Cable Track
	1	CT-Z-PRO-FAST-21.1	Cable Track
(D)	4	M6 x 12mm Flat Head Screw	CT-Z-PRO-FAST-21.1 >
(E)	2	M8 x 16mm Socket Head Cap Screw	CT-Z-PRO-FAST-21.1 >
(F)	4	M8 x 12mm Button Head Cap Screw	CT-Z-PRO-FAST-21.1 >
(G)	6	M8 Roll-in T-Nut	CT-Z-PRO-FAST-21.1 >

Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	6mm Allen Wrench
Required	Tape Measure

7.2.1 - Cable Track Installation

7.2.1.1



1. Attach the **CRP150-10 Z Axis Cable Track Bracket, Back (A)** to the free end of the **50mm Cable Track Section (18 links) (C)** using **M6 x 12mm Flat Head Screws (D)**.



Assembly Note

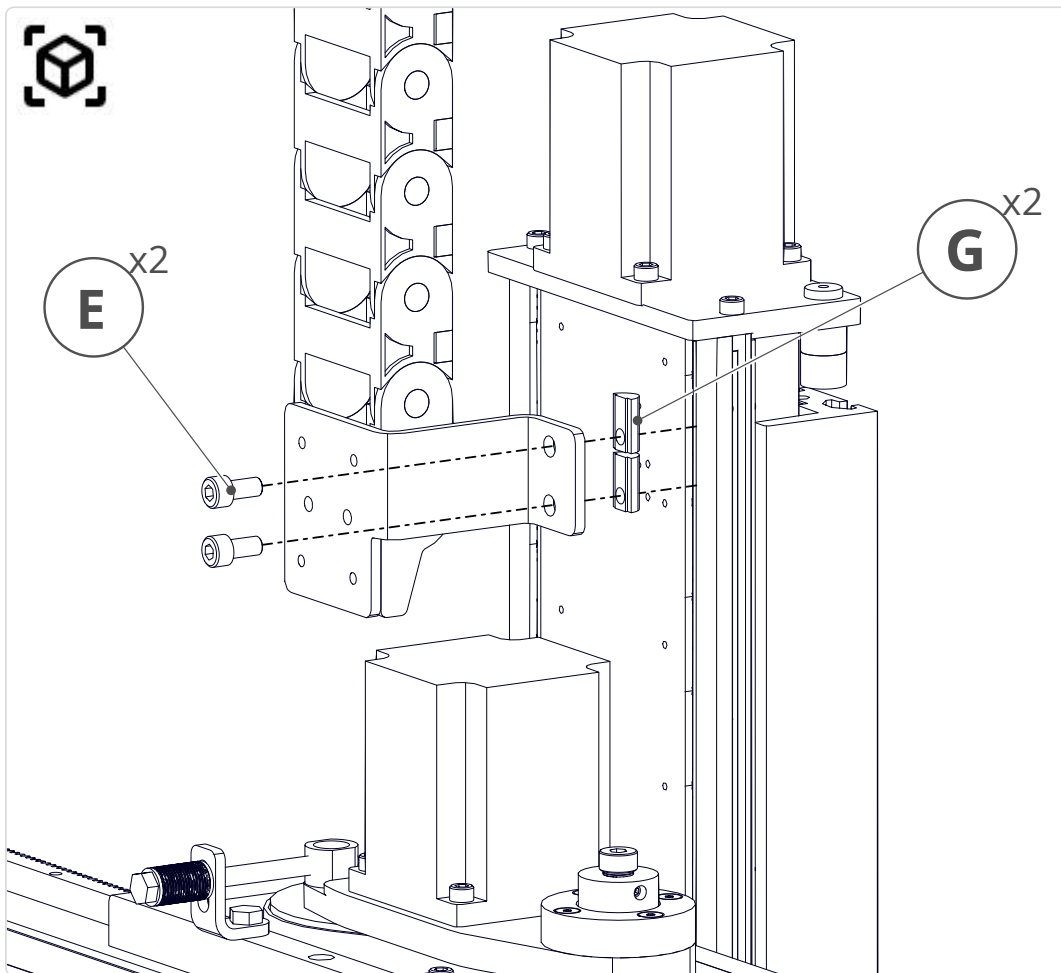
The free end of the cable track section is the one that can rotate independently.



Assembly Note

To differentiate between the 50mm cable track section used on the Z axis versus the gantry, note the orientation of the cable track ends in the image.

7.2.1.2



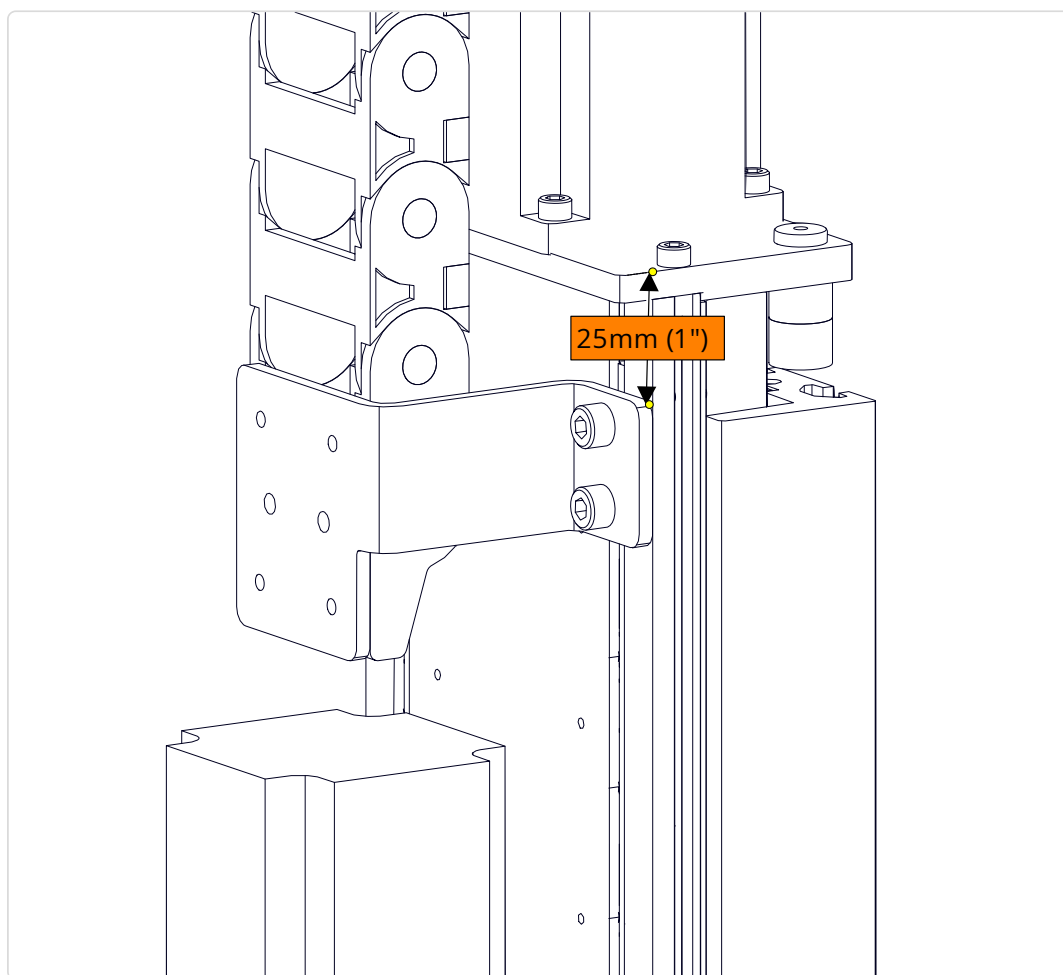
1. Attach the Z axis cable track bracket to the back of the Z axis using **M8 x 16mm Socket Head Cap Screws (D)** and **M8 Roll-in T-Nuts (G)**.
2. Partially tighten the fasteners.



Assembly Note

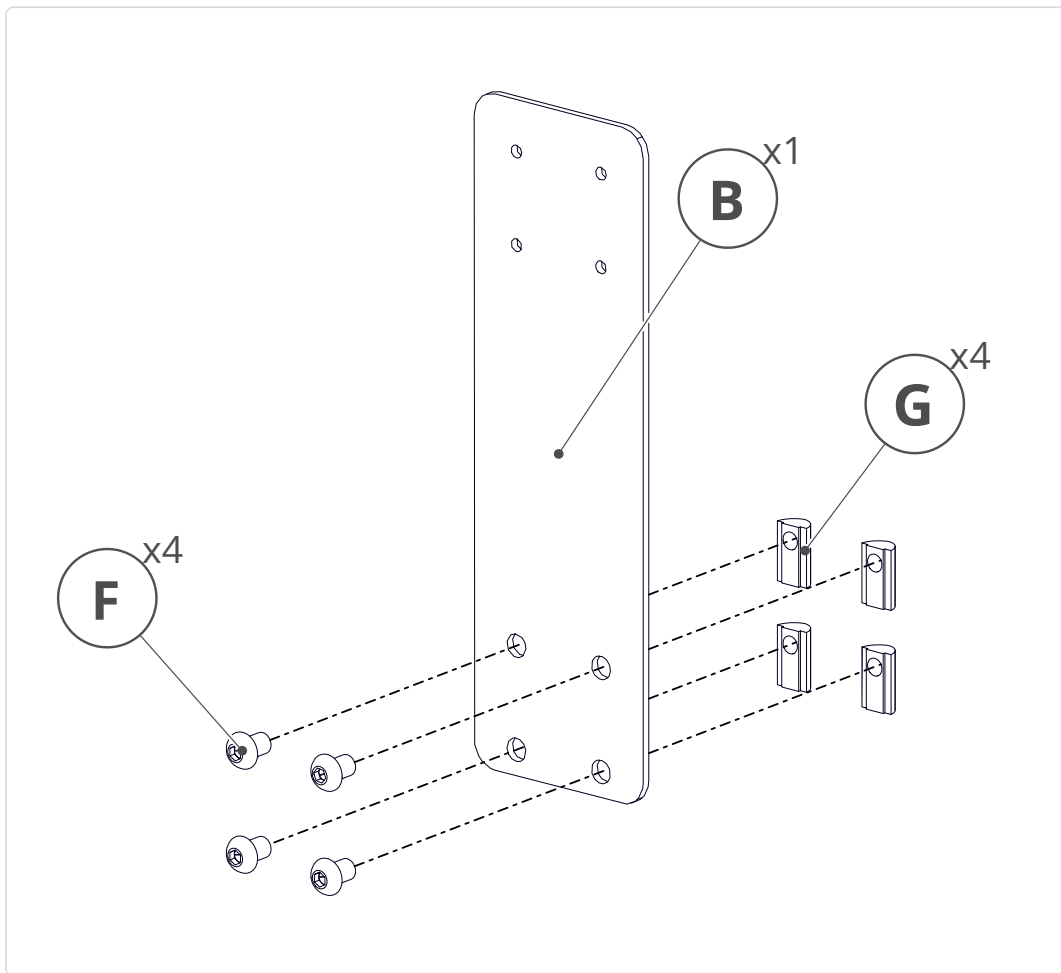
When installing the T-Nuts, take care to prevent them from sliding down the T-Slot.

7.2.1.3



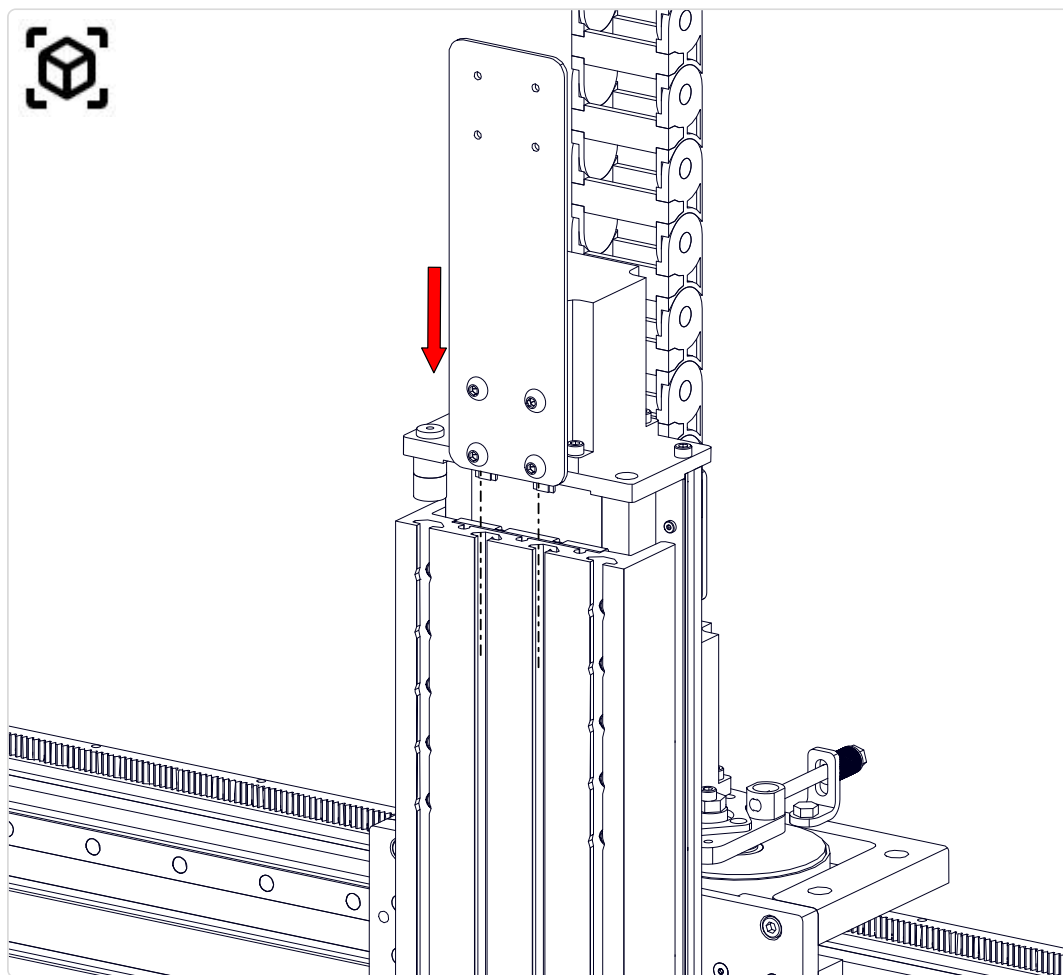
1. Position the bracket 25mm (1") from the top of the Z axis, as indicated.
2. Fully tighten the fasteners.

7.2.1.4



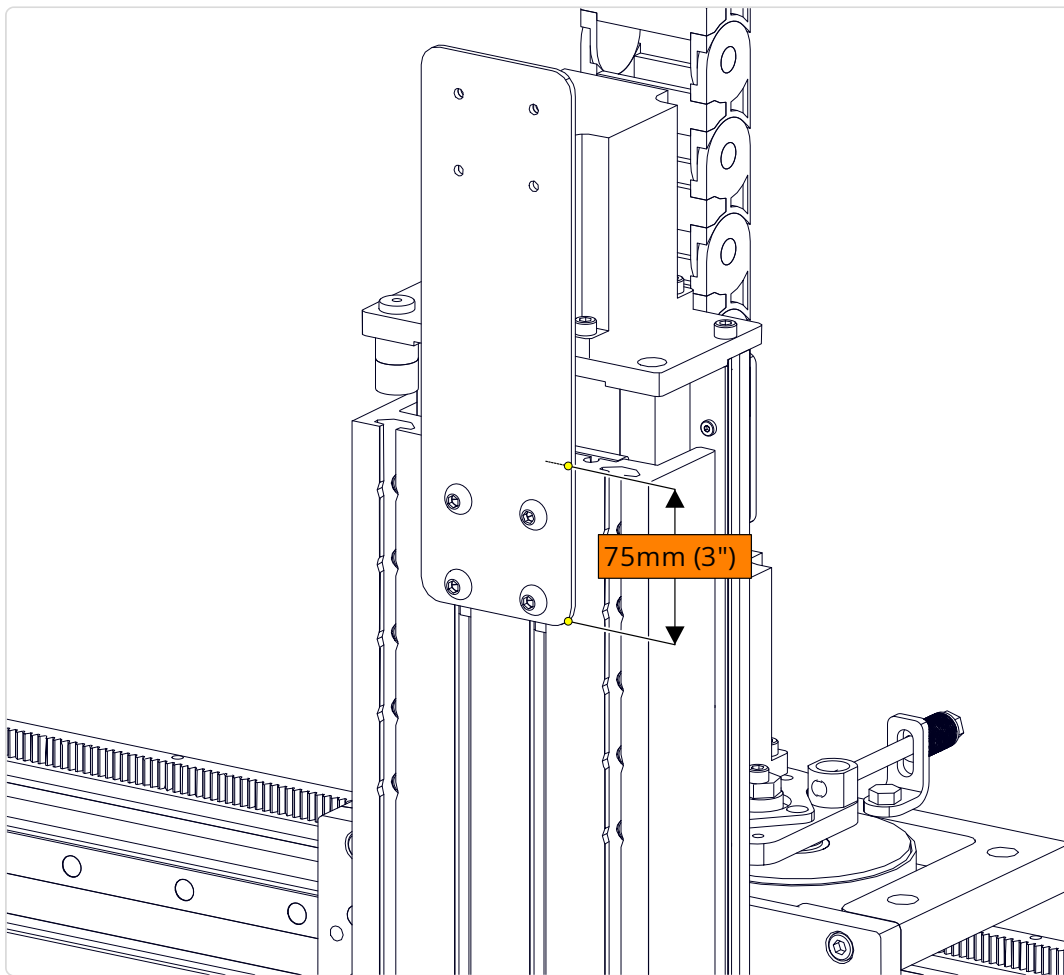
1. Partially thread **M8 x 12mm Button Head Cap Screws (F)** onto **M8 Roll-in T-Nuts (G)**, through the **CRP150-13 Z Axis Cable Track Bracket, Front (B)**.

7.2.1.5



1. Slide the assembled Z axis cable track bracket into the middle two T-Slots of the Z axis moving plate.
2. Partially tighten the fasteners.

7.2.1.6



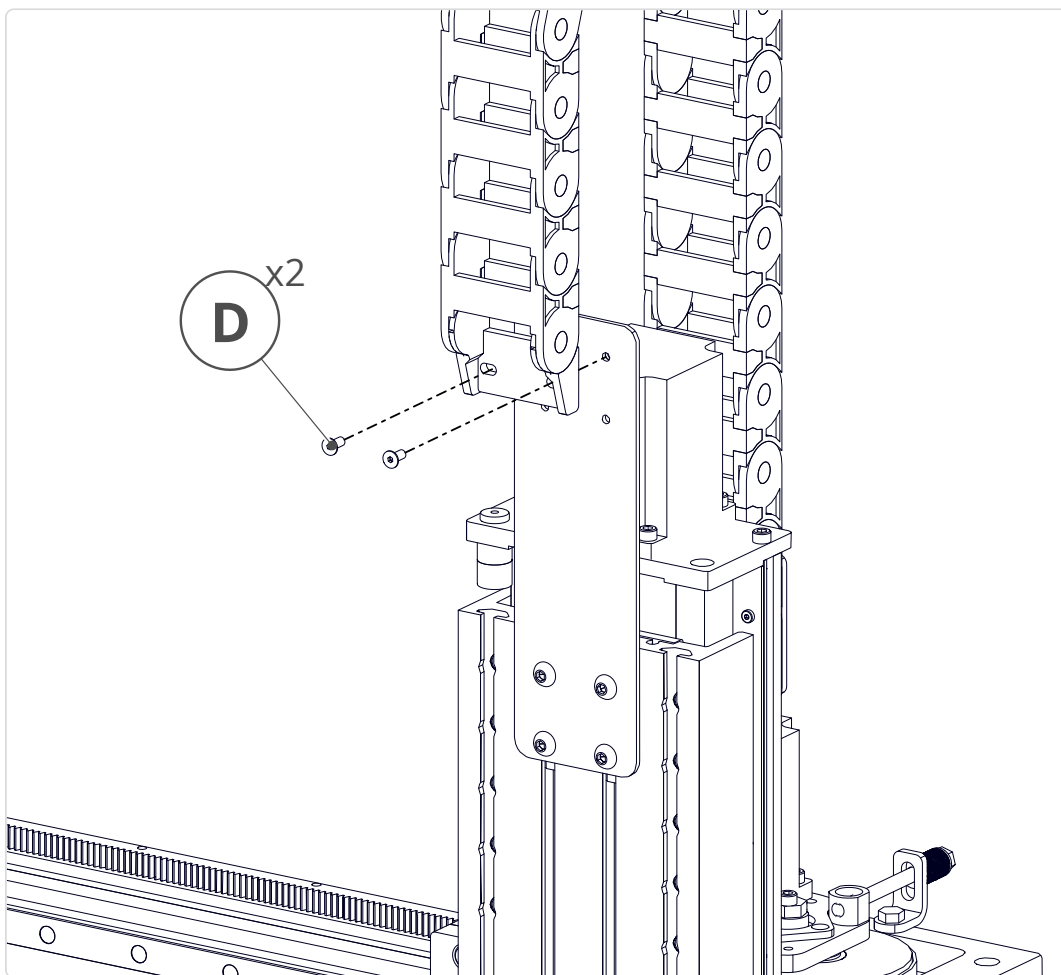
1. Position the bracket 75mm (3") from the top of the Z axis moving plate, as indicated.
2. Fully tighten the fasteners.



Assembly Note

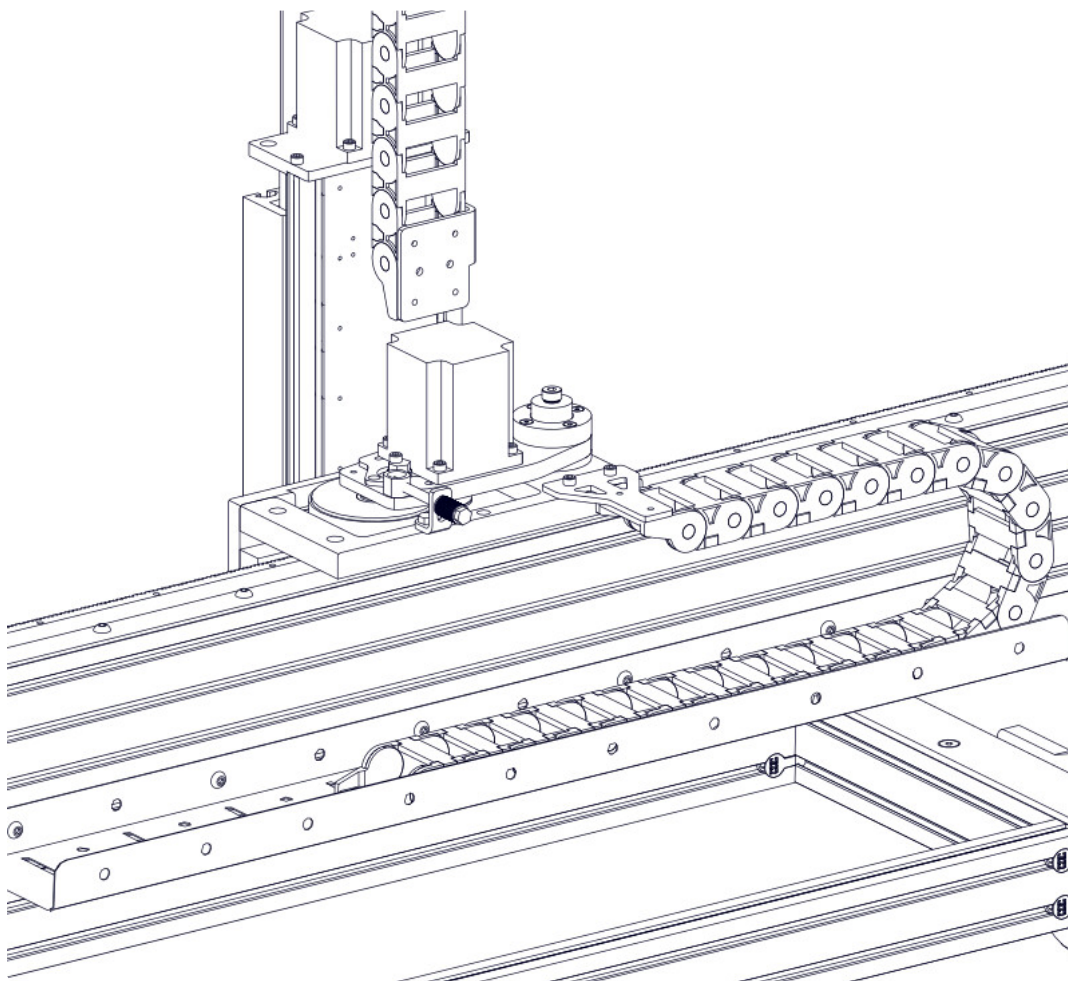
If you need to minimize the overall height of your CNC machine, this bracket can be installed lower on the Z axis moving plate. This dimension will be determined based on the mounting position of your spindle.

7.2.1.7



1. Attach the cable track section to the bracket using **M6 x 12mm Flat Head Screws (D)**.

7.3 - Gantry Cable Track



Parts list

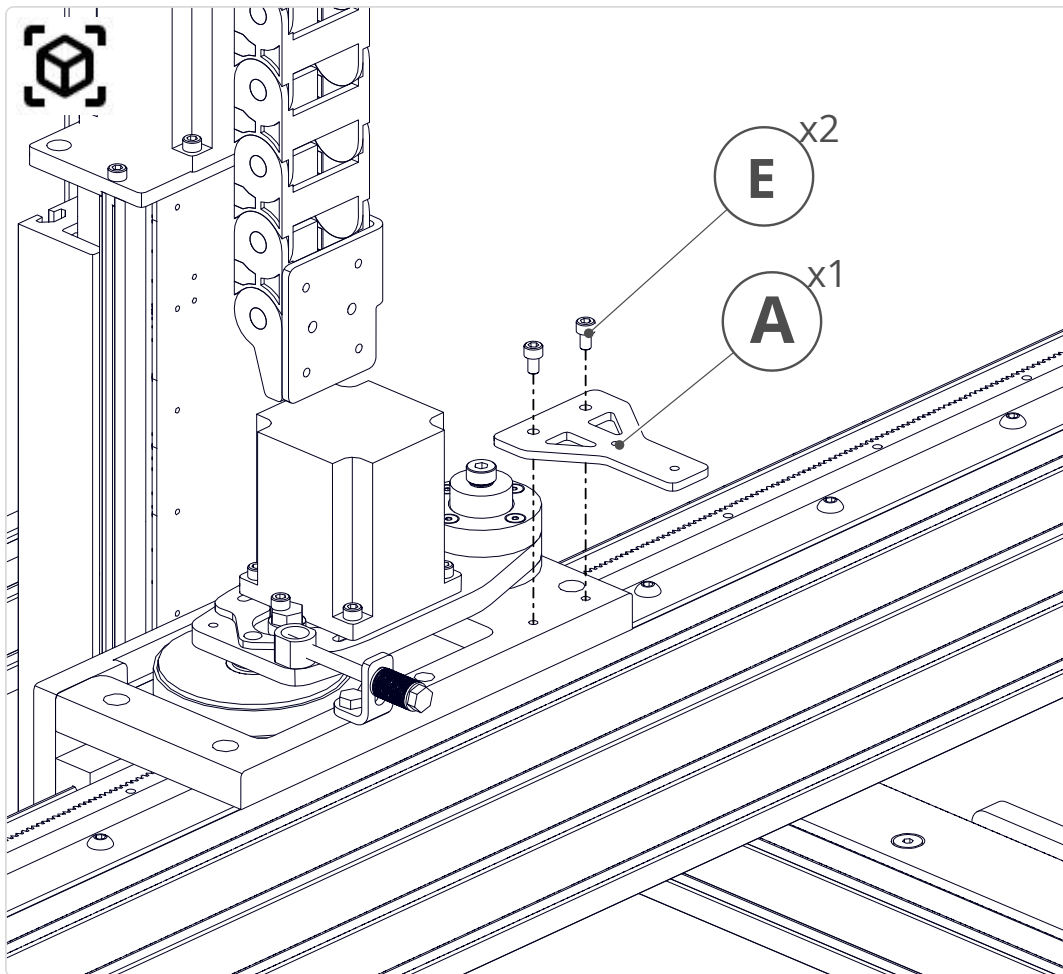
ID	QTY	Part/Description	Package Label
(A)	1	CRP150-09 Gantry Cable Track Bracket	Cable Track
(B)	1	QT40x125B Cable Track Tray	Cable Track
(D)	1	50mm Cable Track Section	Cable Track
	1	CT-PRO-FAST-20.2	Cable Track
(E)	2	M6 x 12mm Socket Head Cap Screw	CT-PRO-FAST-20.2 >
(F)	2	M6 x 12mm Flat Head Screw	CT-PRO-FAST-20.2 >
	1	CT-TRAY-GANTRY-PRO-FAST-20.2	Cable Track
(I)	5	M8 x 12mm Button Head Cap Screw	CT-TRAY-GANTRY-PRO-FAST-20.2 >
(J)	5	M8 Roll-in T-Nut	CT-TRAY-GANTRY-PRO-FAST-20.2 >
Remaining parts from CT-PRO-FAST-20.2 used in future section			

Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	5mm Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure

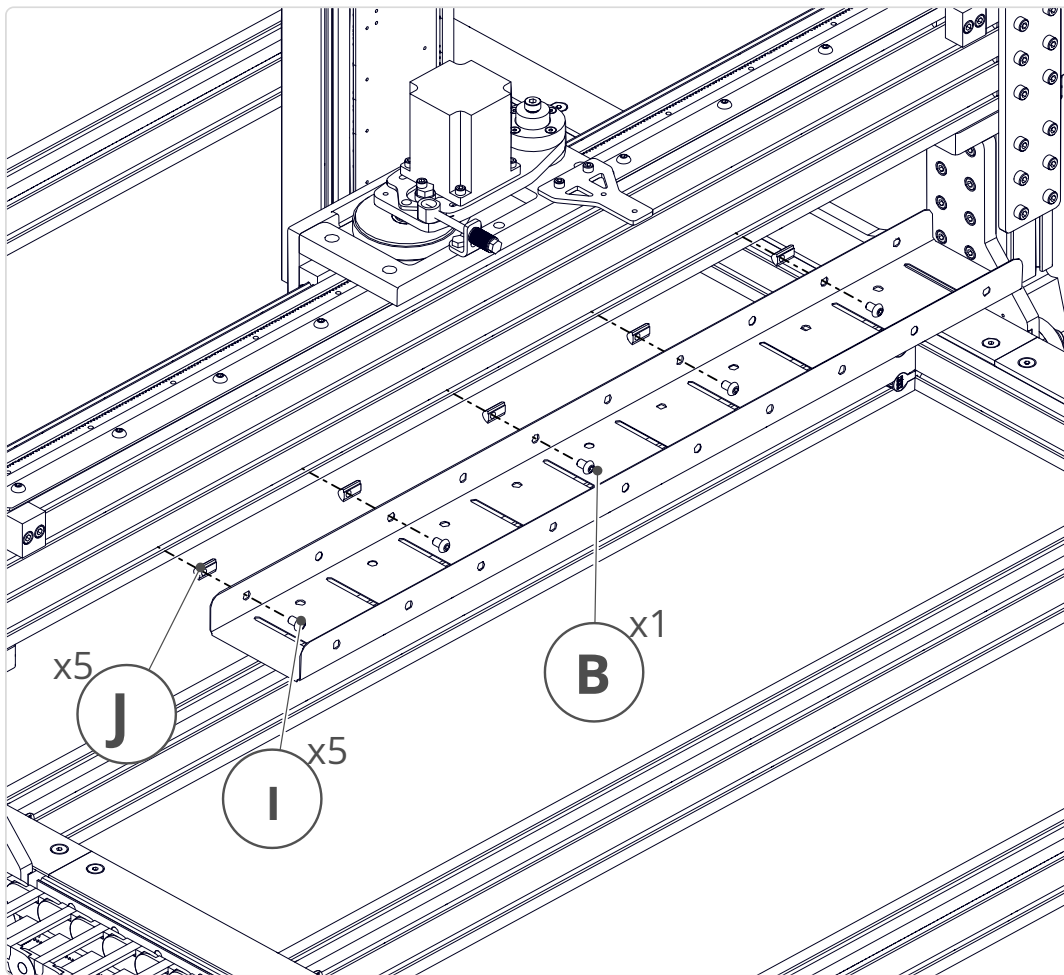
7.3.1 - Cable Track Tray Installation

7.3.1.1



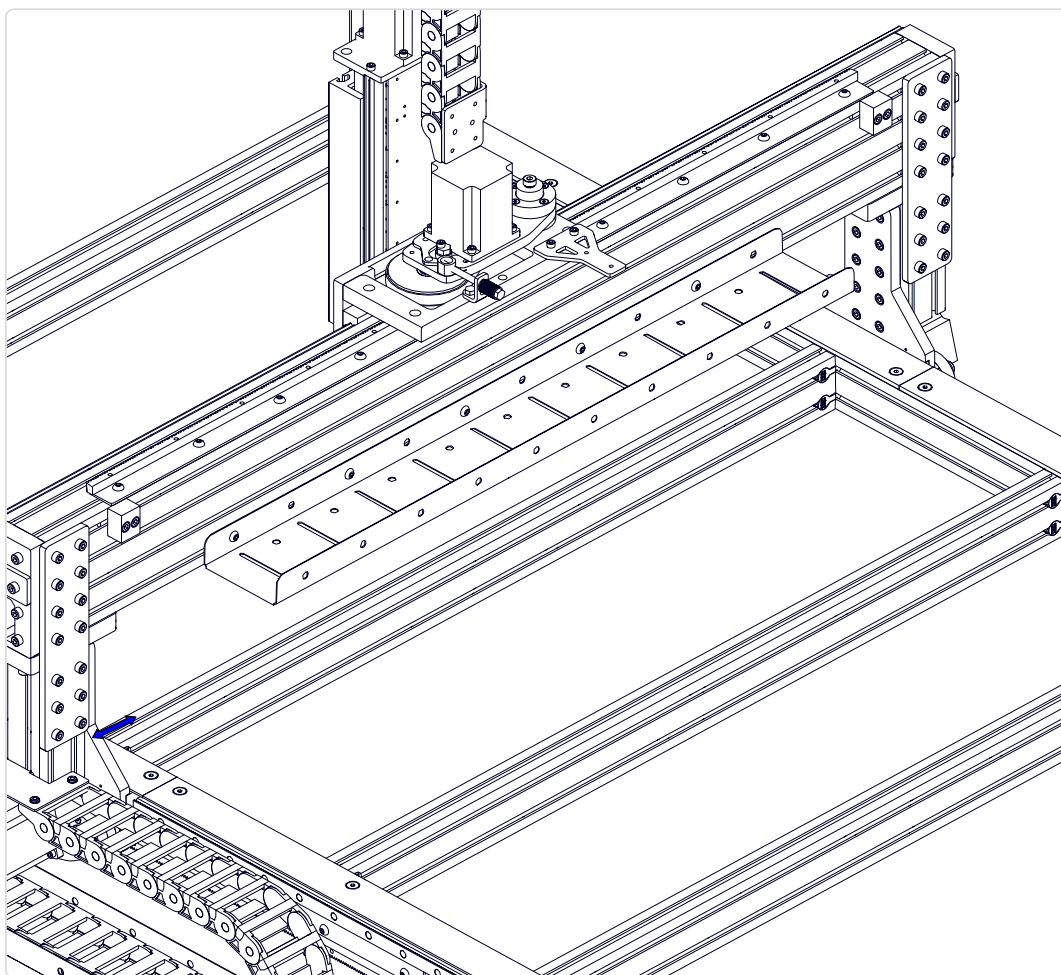
1. Attach the **CRP150-09 Gantry Cable Track Bracket** (A) to the gantry R&P plate using **M6 x 12mm Socket Head Cap Screws** (E).

7.3.1.2



1. Attach a QT40x125B Cable Track Tray (B) to the bottom T-Slot on the gantry extrusion using M8 x 12mm Button Head Cap Screws (I) and M8 Roll-in T-Nuts (J).
2. Partially tighten the fasteners.

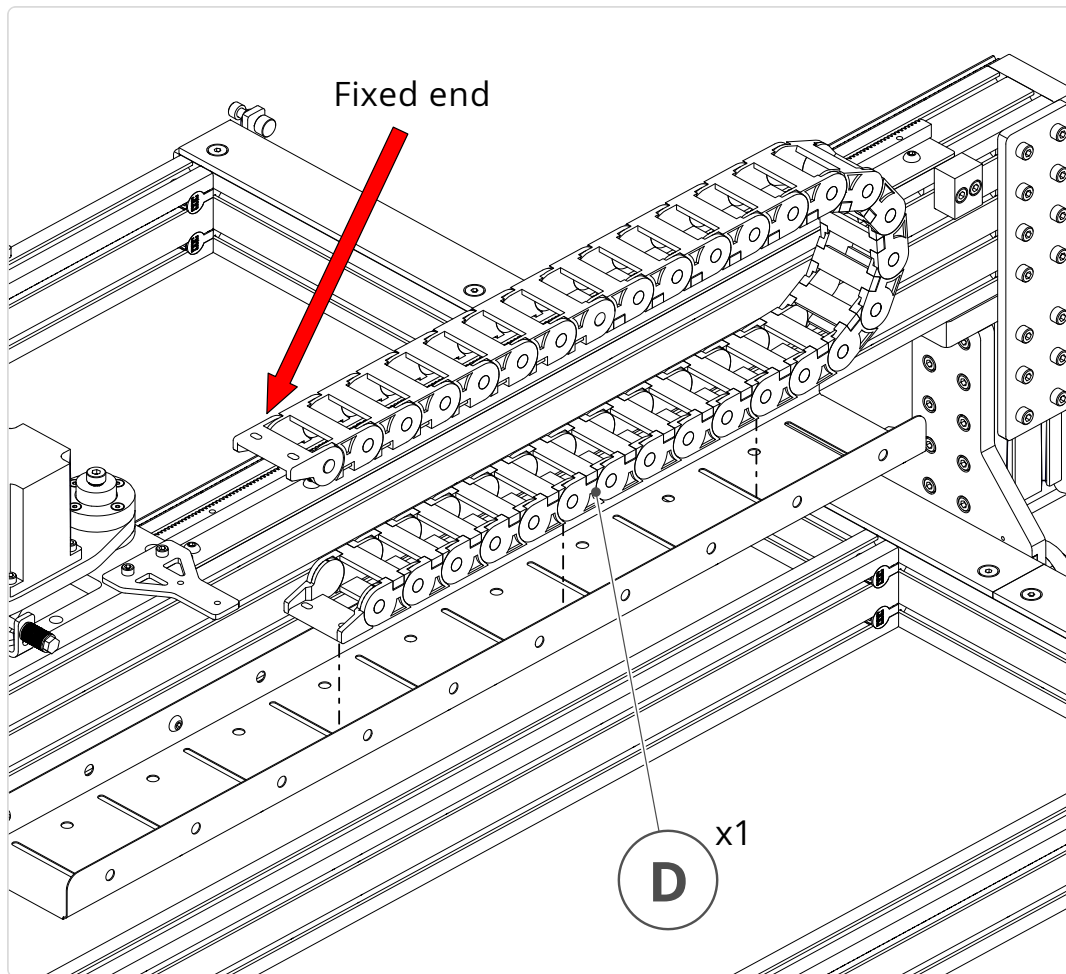
7.3.1.3



1. Center the cable track trays between the ends of the gantry and fully tighten the fasteners.

7.3.2 - Cable Track Installation

7.3.2.1



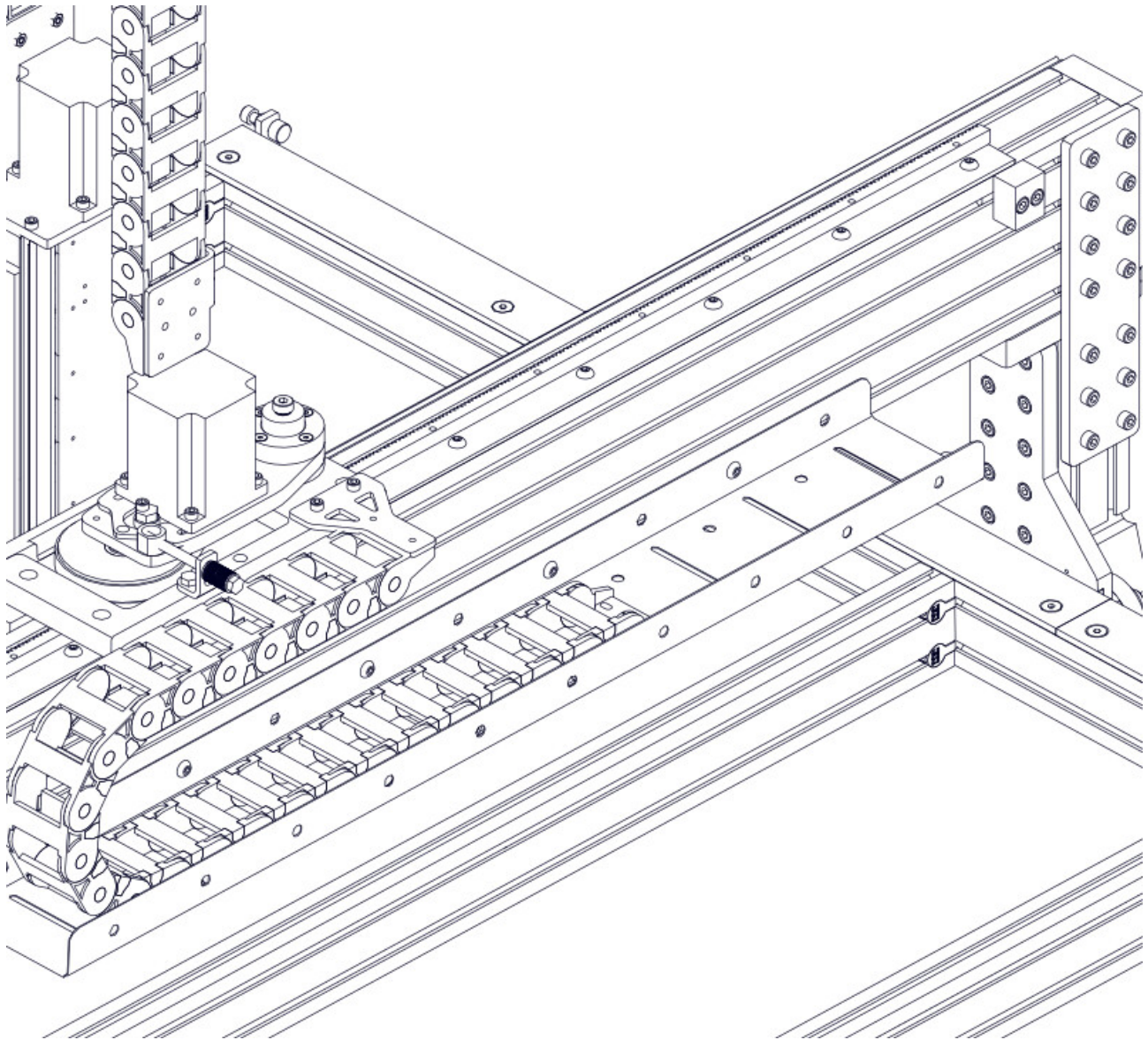
1. Place the **50mm Cable Track Section (D)** into the cable track tray, oriented with the fixed end on the bottom.



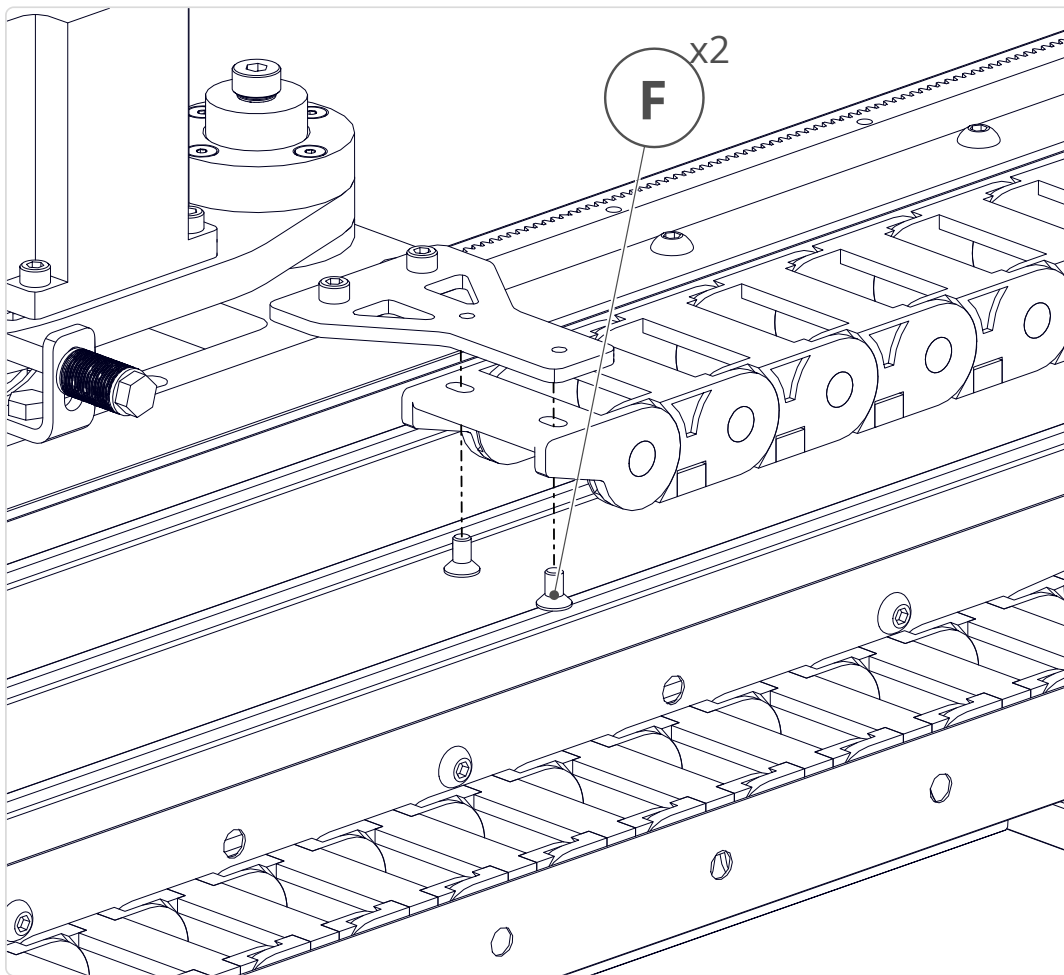
Assembly Note

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

If locating the table cable track on the left side of the machine, orient the cable track section so the cables exit the cable track towards the left side of the machine.



7.3.2.2



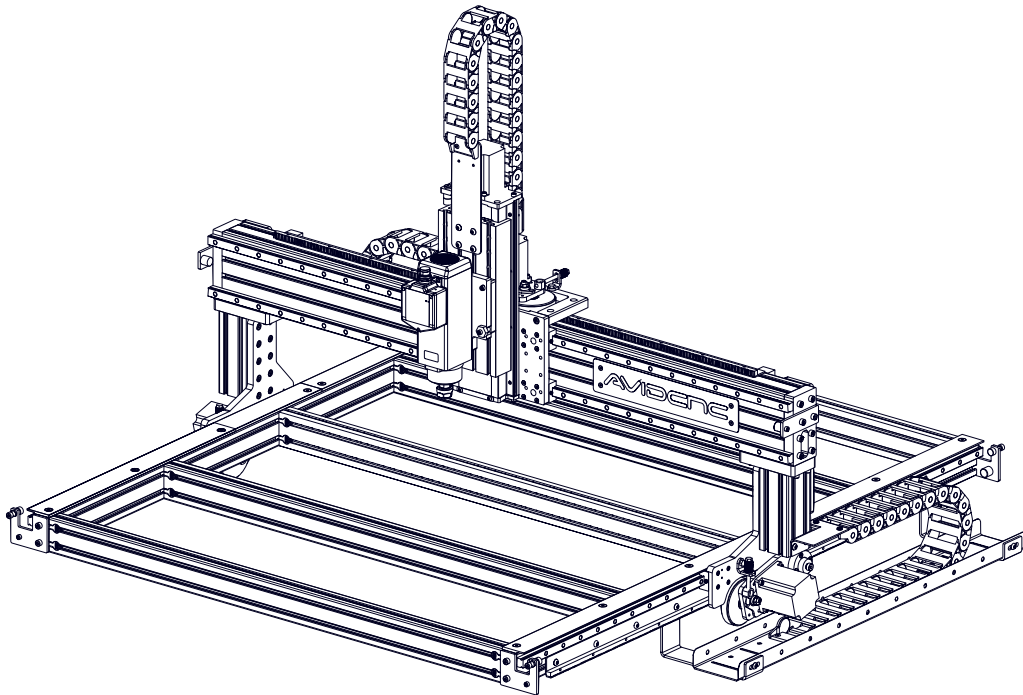
1. Attach the cable track section to the gantry cable track bracket using **M6 x 12mm Flat Head Screws (F)**.



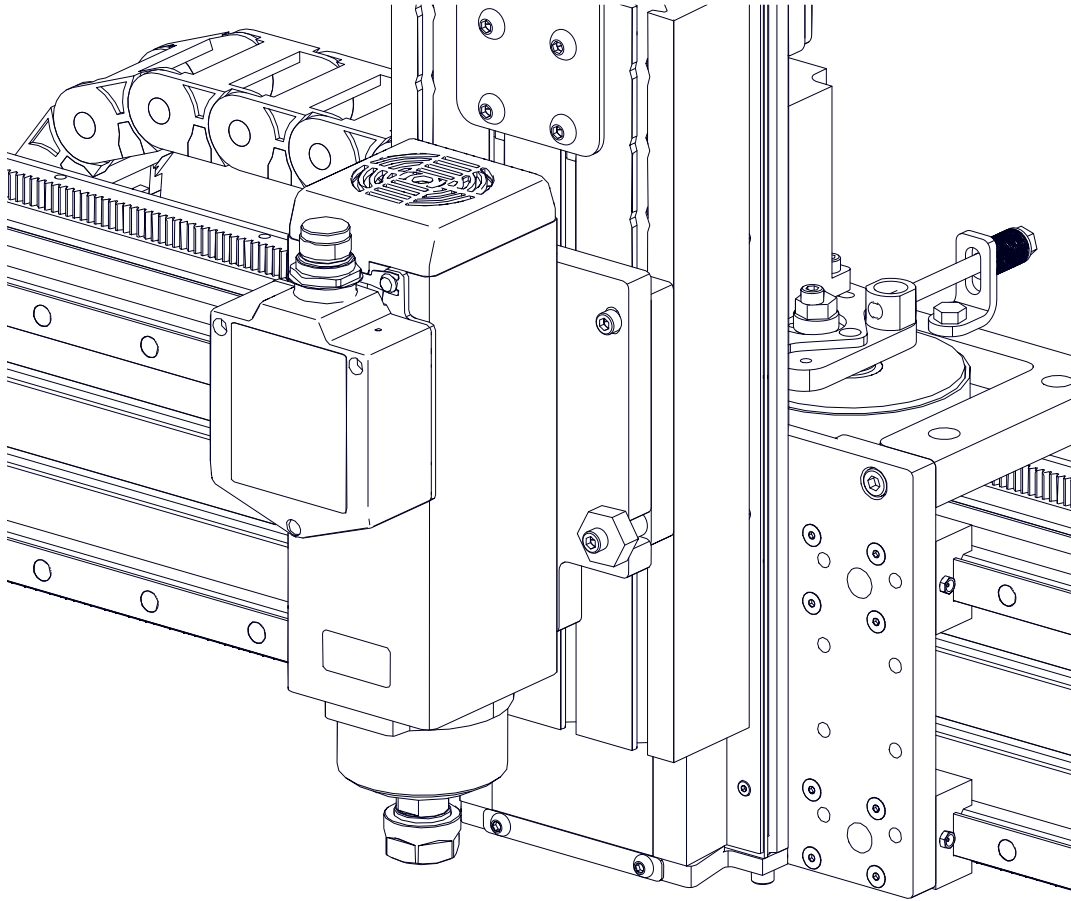
Assembly Note

The other end of the cable track section will be attached after electronics installation.

8. Accessories



8.1 - Spindle Installation



Parts List

ID	QTY	Part/Description	Package Label
(A)	1	4 HP Avid CNC Spindle	Spindle Kit
(B)	1	CRP144-33 Base Adapter	Spindle Kit
(C)	1	CRP144-21 Tramming Plate	Spindle Kit
	1	CRP144-03-FAST-SPINDLE-21.1	Spindle Kit
(D)	4	M8 x 16mm Socket Head Cap Screw	CRP144-03-FAST-SPINDLE-21.1 >
(E)	4	M6 x 16mm Socket Head Cap Screw	CRP144-03-FAST-SPINDLE-21.1 >
(F)	4	M8 Roll-in T-Nut	CRP144-03-FAST-SPINDLE-21.1 >
	1	CRP144-21-FAST-21.2	Spindle Kit
(G)	1	B3X-HIT Eccentric Bushing	CRP144-21-FAST-21.2 >
(H)	1	M8 Shoulder Bolt - 10mm x 16mm	CRP144-21-FAST-21.2 >
(I)	2	M8 x 30mm Socket Head Cap Screw	CRP144-21-FAST-21.2 >
(J)	1	M8 x 35mm Socket Head Cap Screw	CRP144-21-FAST-21.2 >
<i>Remaining parts from CRP144-03-FAST-SPINDLE-21.1 are not used</i>			

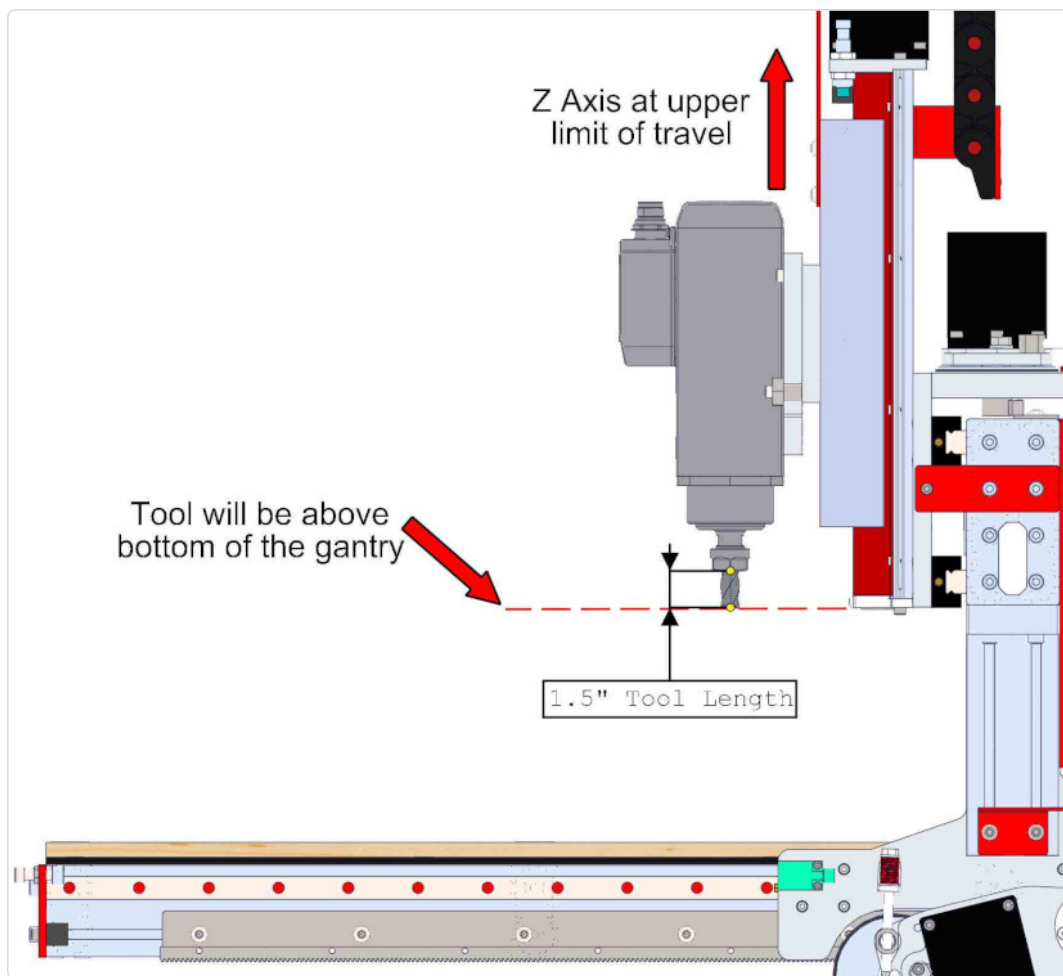
Tools List

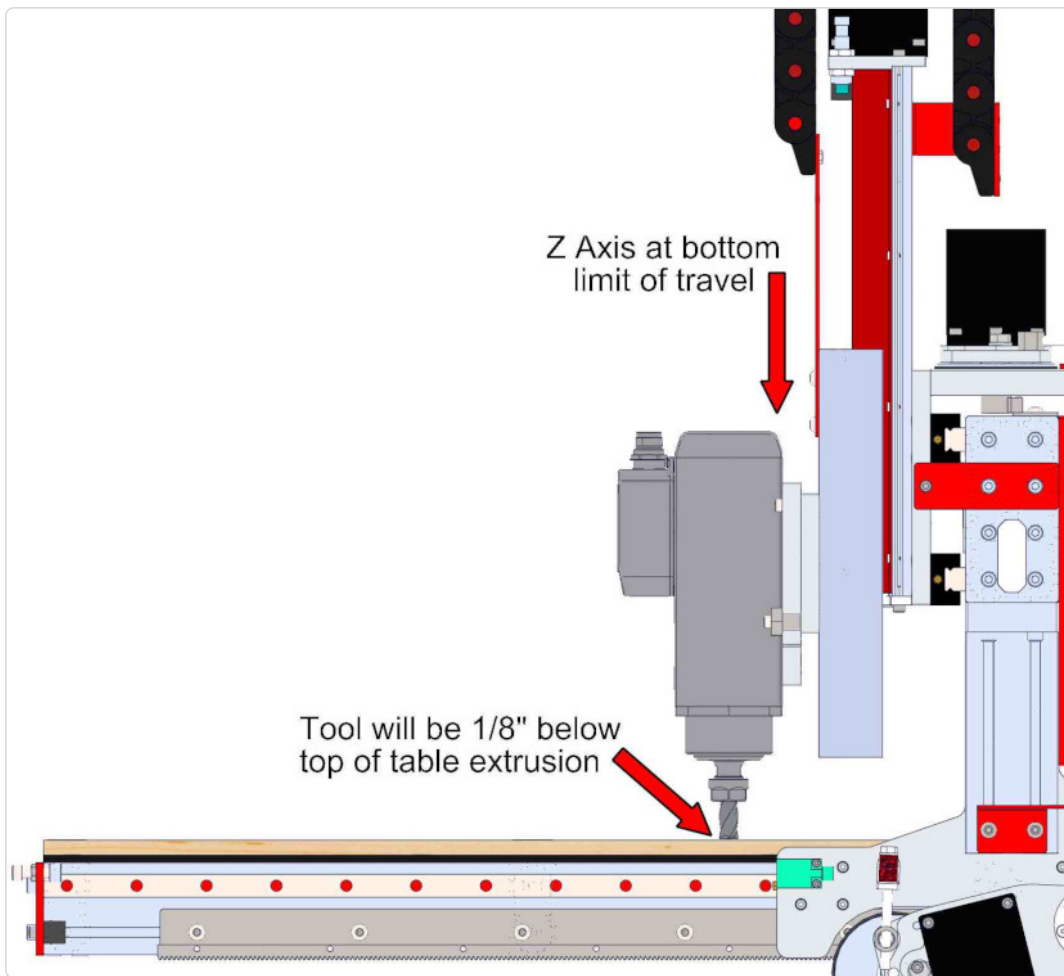
Requirement	Tool
Required	5mm Allen Wrench
Required	6mm Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure



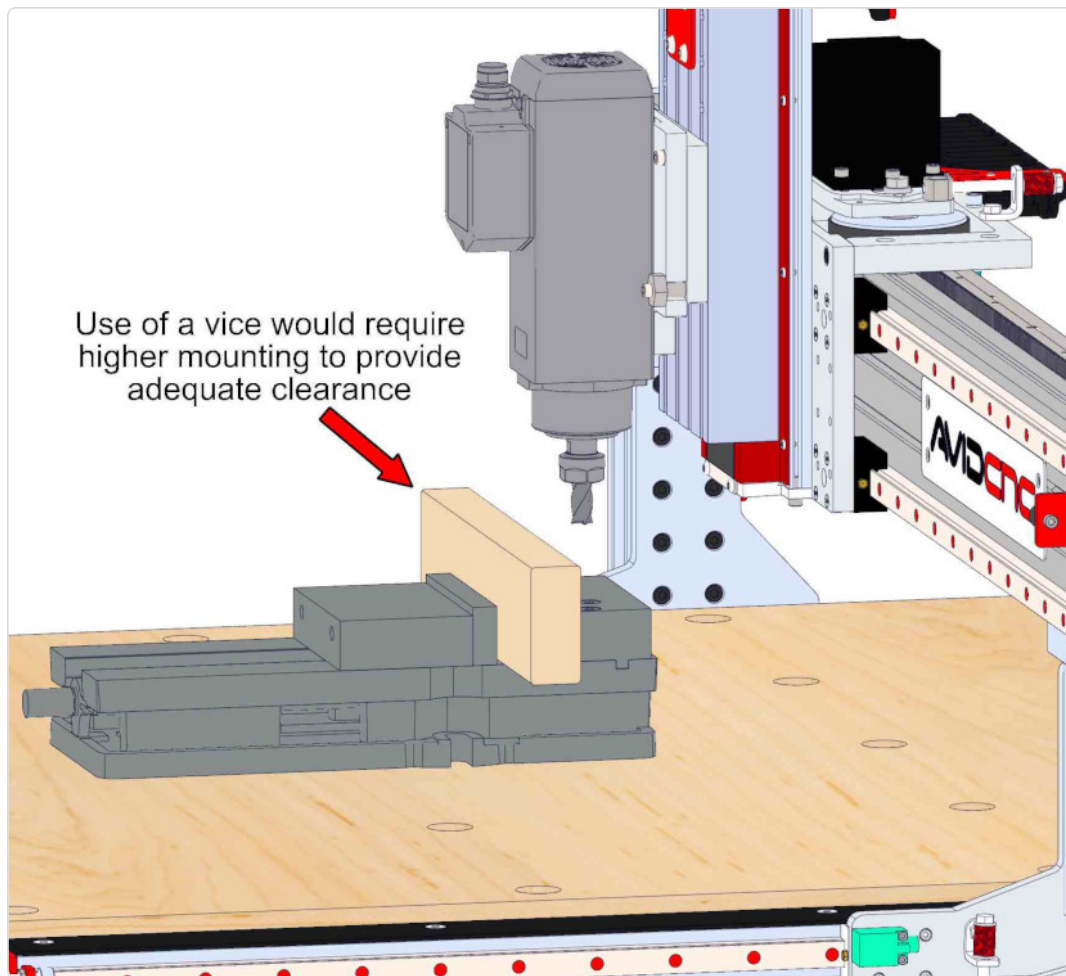
8.1.1 - Installation Overview

The design of our Ballscrew Z-Axis Moving Plate allows the spindle mount to be located at various heights to fit your particular application. The instructions specify a mounting height that will be applicable in most use cases. The figures below show the vertical range of an example tool using this mounting location.

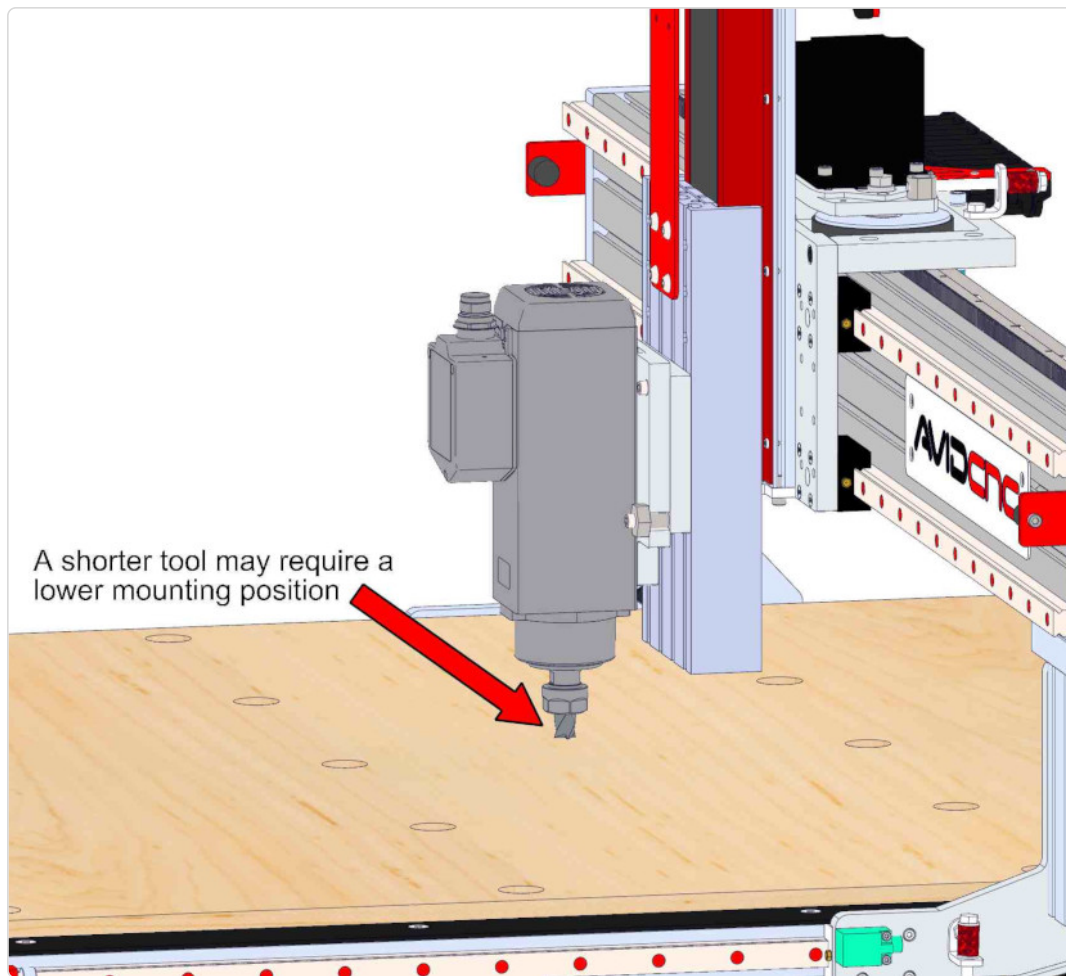




The examples above applies for a PRO CNC machine configured with an 8" Z-Axis and 8" Gantry Height, using a tool with a length of 1.5". If you are using a different machine configuration or tool length, you will need to adjust your router or spindle mount location accordingly.



Many situations will require a different mounting location than the one specified in these instructions. For example if a vise is used to hold work pieces, a higher mounting position may be required.

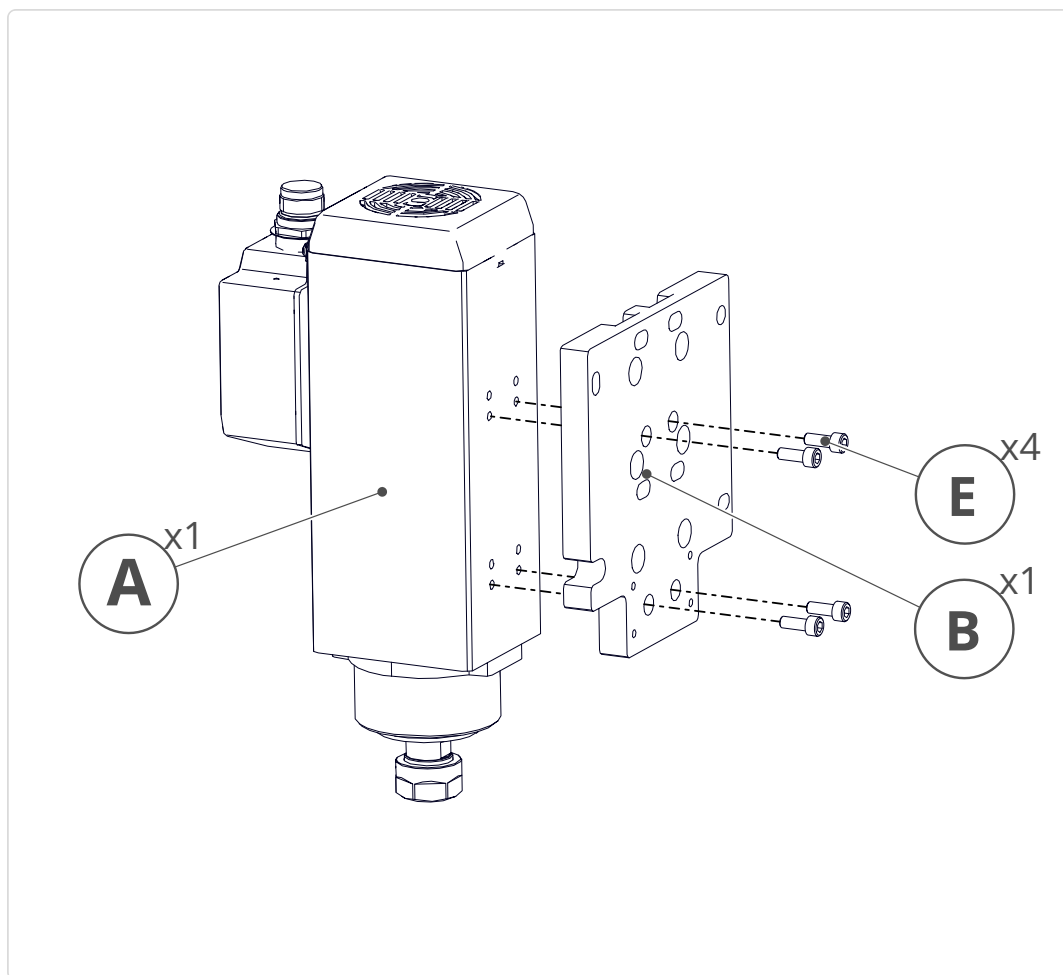


If shorter tools are commonly used, it may be necessary to position the router or spindle in a lower position.

Whatever mounting position you choose, it is recommended to mount the base adapter/tramming plate in the highest position possible while still allowing the vertical range required.

8.1.2 - Base Adapter

8.1.2.1



1. Attach the **CRP144-33 Base Adapter (B)** to the **4 HP Avid CNC Spindle (A)** using **M6 x 16mm Socket Head Cap Screws (E)**.
2. Fully tighten the fasteners.

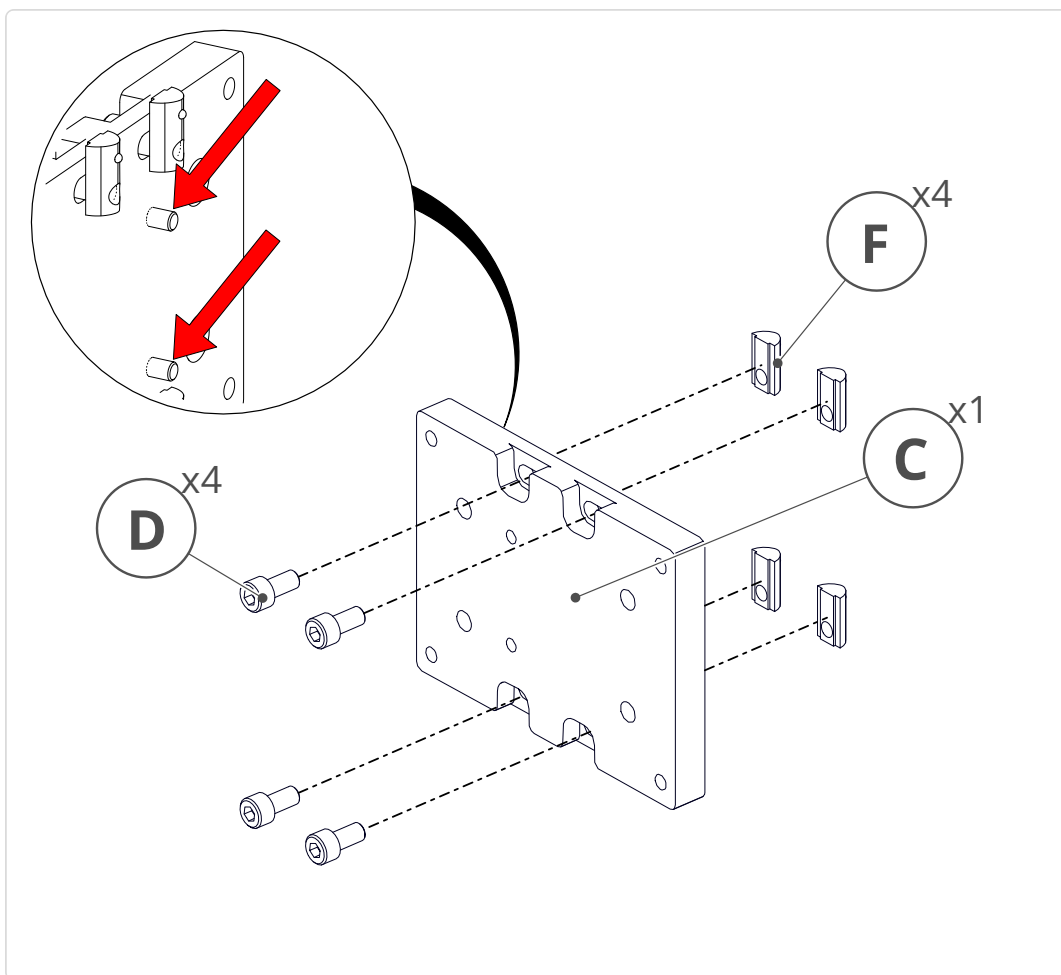


Assembly Note

Use the lower set of mounting holes on the spindle

8.1.3 - Tramming Mount

8.1.3.1



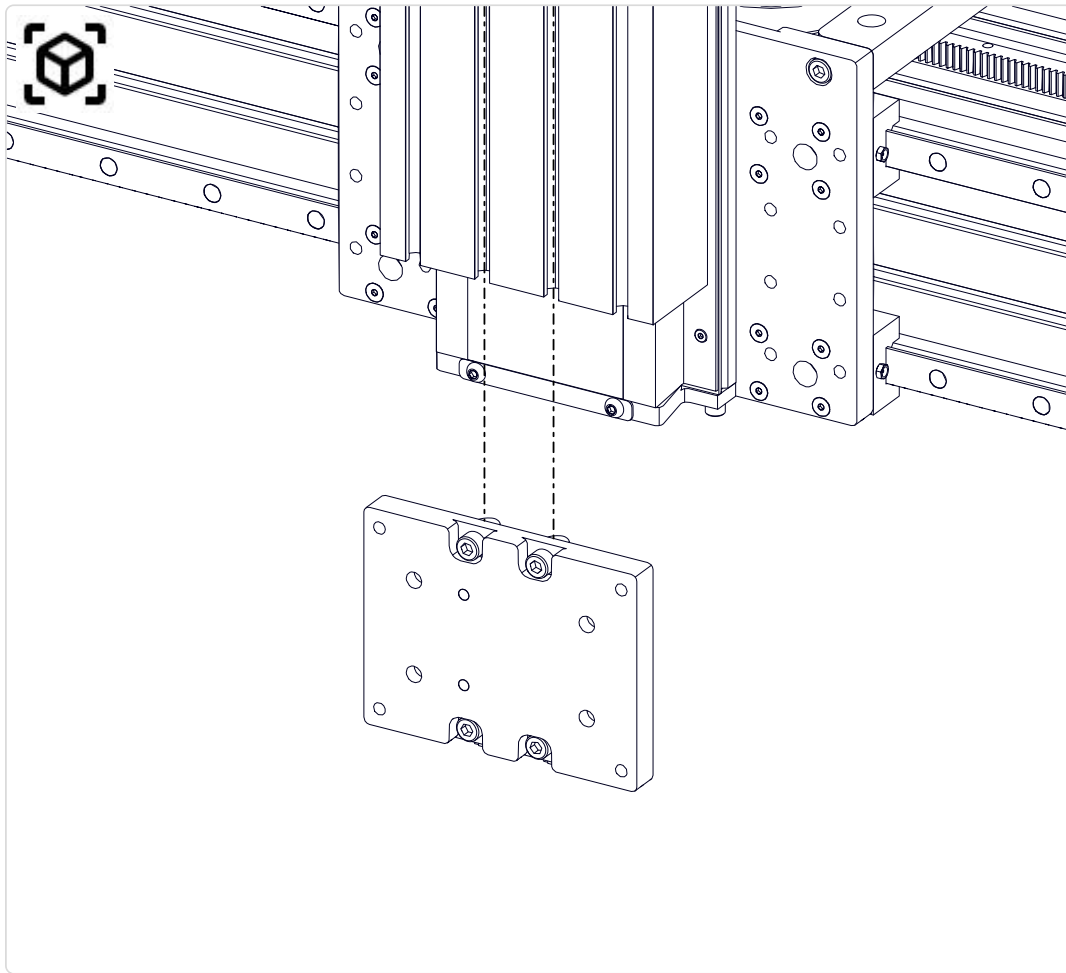
1. Partially thread **M8 x 16mm Socket Head Cap Screws (D)** onto **M8 Roll-in T-Nuts (F)**, through the **CRP144-21 Tramming Plate (C)**.



Assembly Note

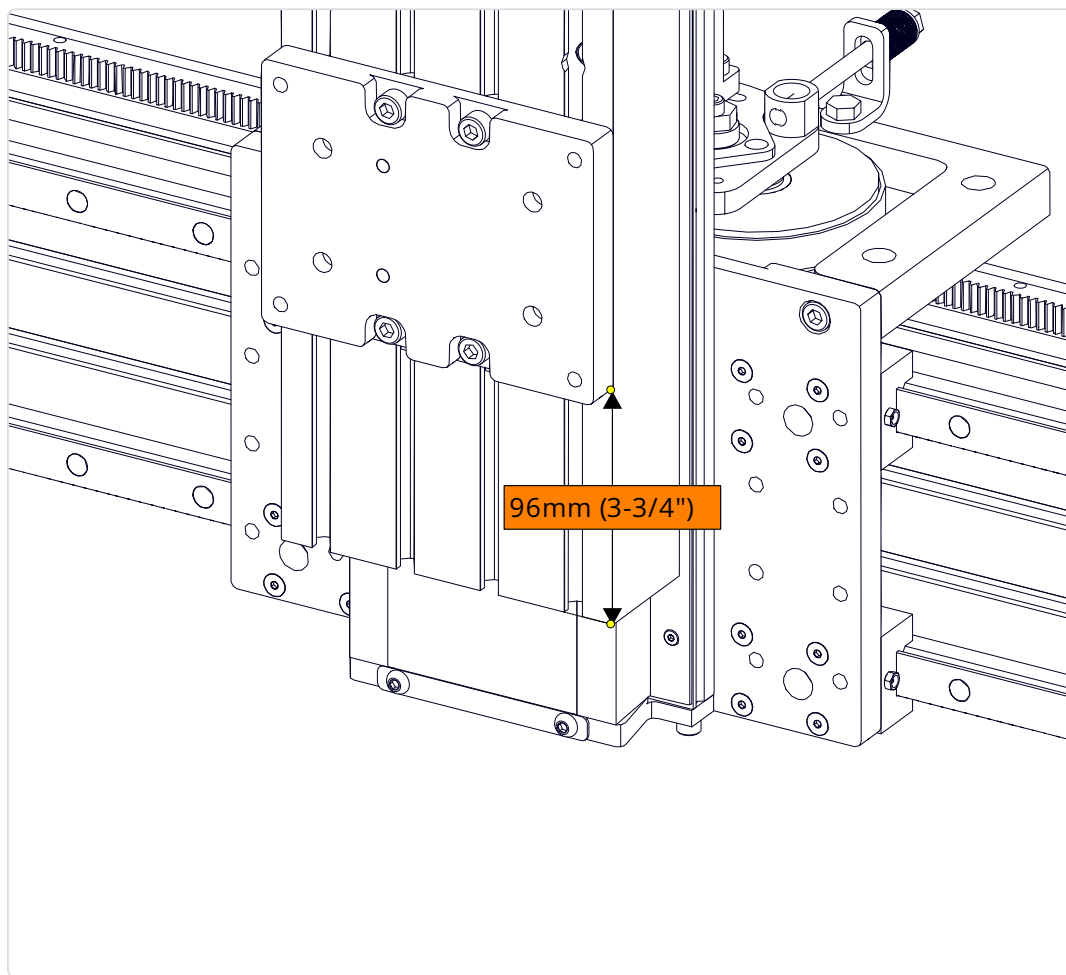
Orient the tramming plate with the dowels on the same side at the T-Nuts.

8.1.3.2



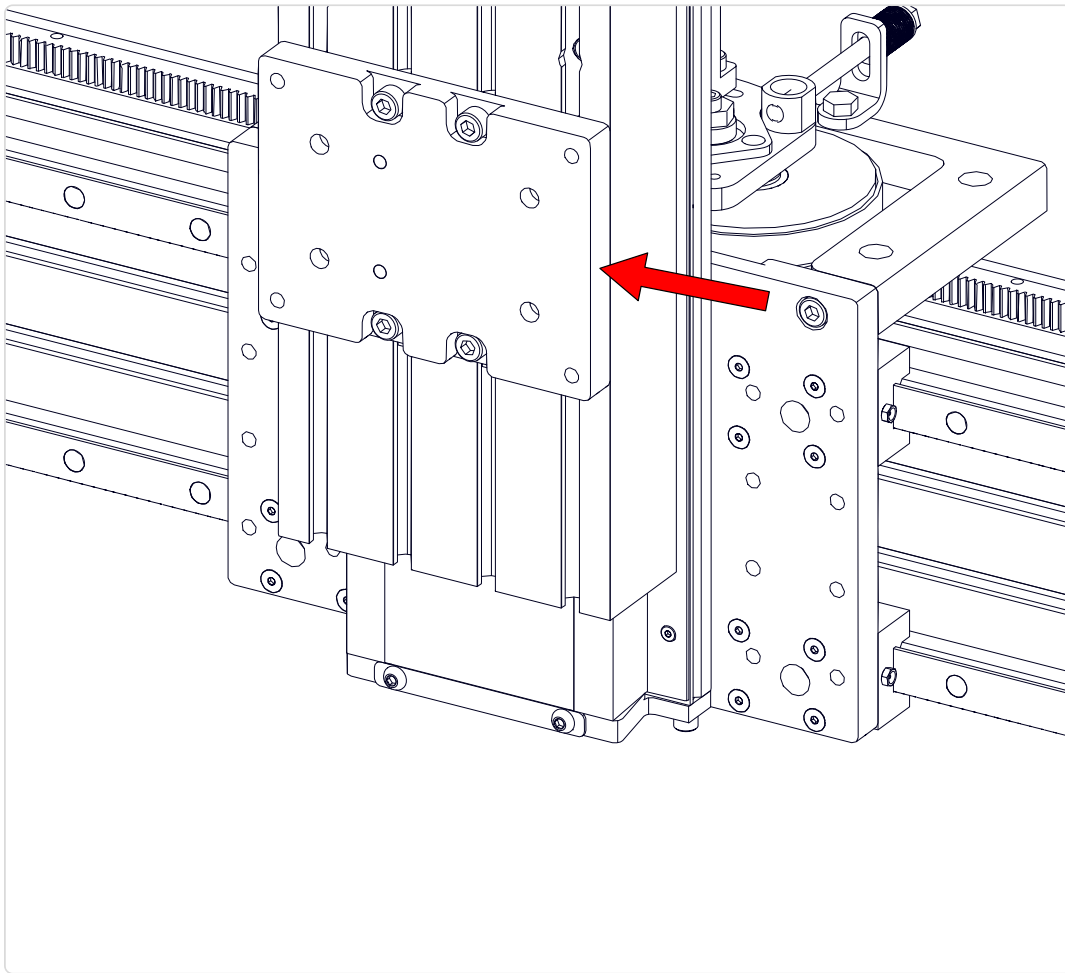
1. Slide the assembled tramming plate into the middle two T-Slots on the Z Axis.

8.1.3.3



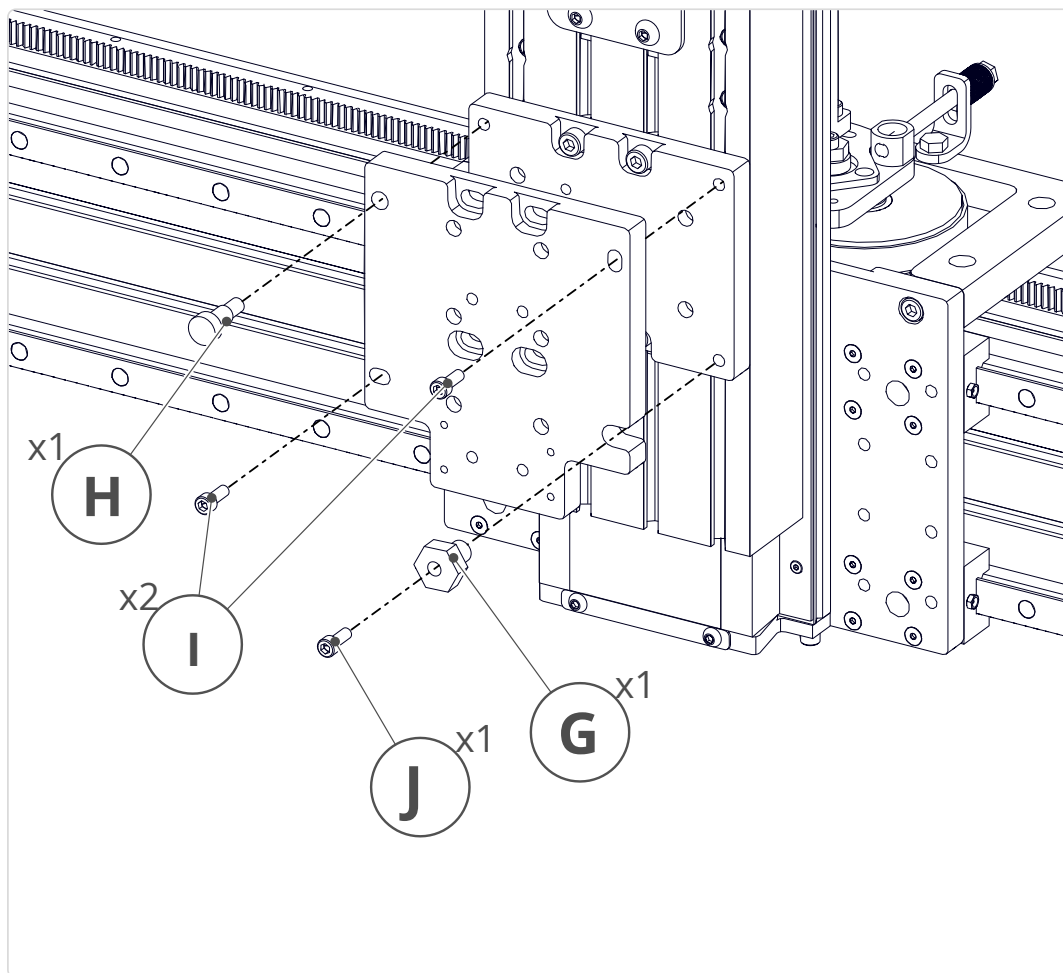
1. Position the tramming plate 96mm (3-3/4") from the bottom of the Z Axis moving plate, as shown.
2. Partially tighten the fasteners.

8.1.3.4



1. While applying pressure on the tramming plate in the indicated direction, fully tighten the fasteners.

8.1.3.5



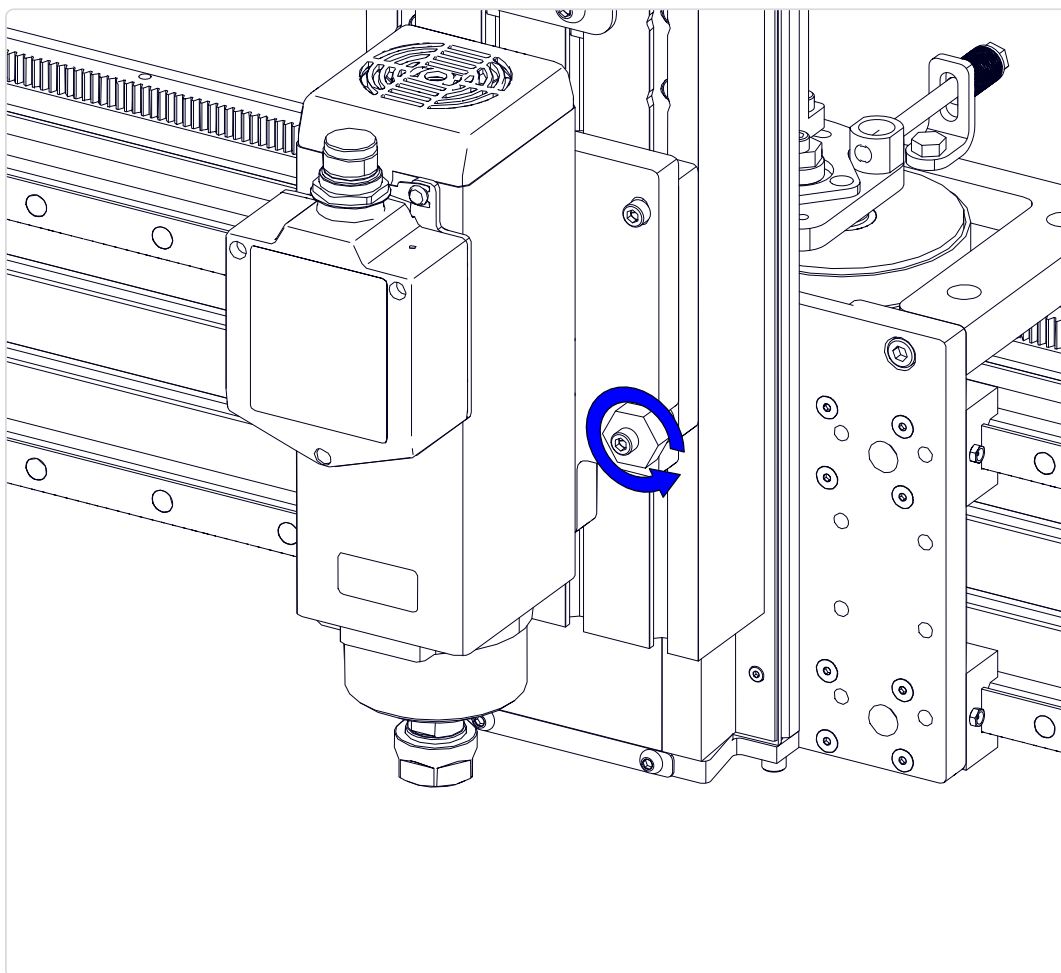
1. Install the base adapter (that's attached to the spindle) onto the tramming plate using an **M8 Shoulder Bolt (H)**, **M8 x 30mm Socket Head Cap Screws (I)**, and **M8 x 35mm Socket Head Cap Screw (J)** (installed through the **B3X-HIT Eccentric Bushing (G)**).
2. Fully tighten the fasteners.



Assembly Note

The spindle is hidden for illustrative purposes.

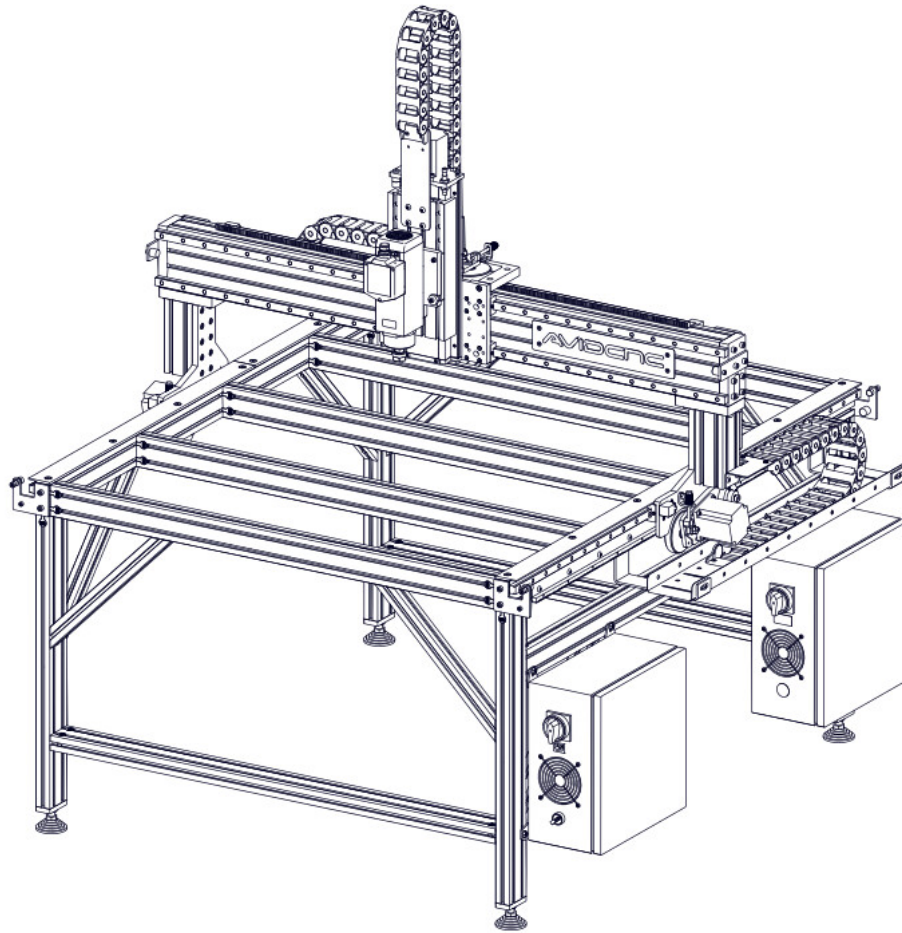
8.1.3.6



1. Following the assembly of your machine, our **Tramming Instructions** show how to make test cuts to determine if the tram needs to be adjusted. If so, slightly loosen all four mounting fasteners (those installed in the previous step) and rotate the eccentric bushing. Re-tighten the fasteners after adjusting the tram.



9. Electronics



9.1 - Supplemental Videos

Pro-Build: Installing Avid CNC Electronics (<https://youtu.be/dpnxHS2gpP0>)

This Pro-Build video provides a walk-through of the electronics installation and is supplementary to the written instructions in this section. Be sure to reference the written instructions as they contain the correct cable lengths and sensor installation procedures for your specific machine.

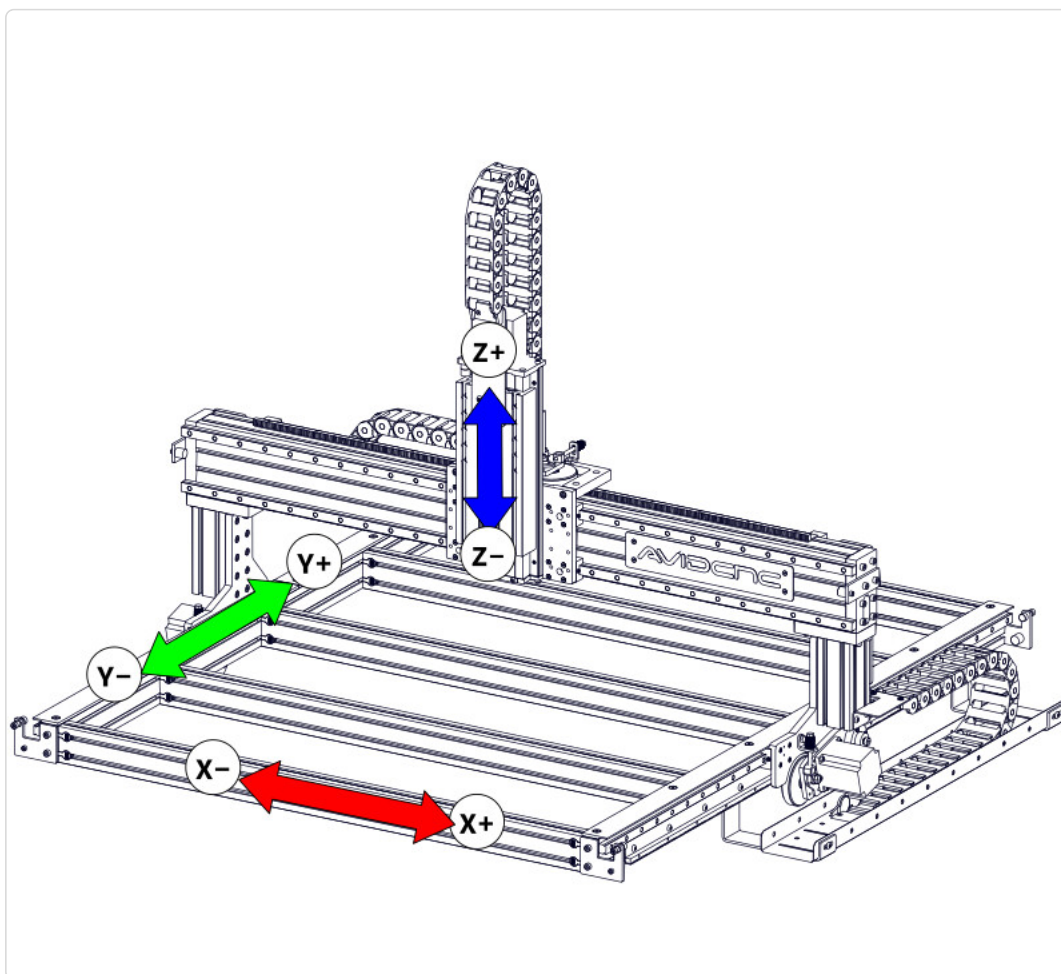
Pro-Tip: CNC Proximity Sensors (<https://youtu.be/IJHH1cBcJNc>)

This Pro-Tip video explains how proximity sensors work, what they do, and why they're needed.



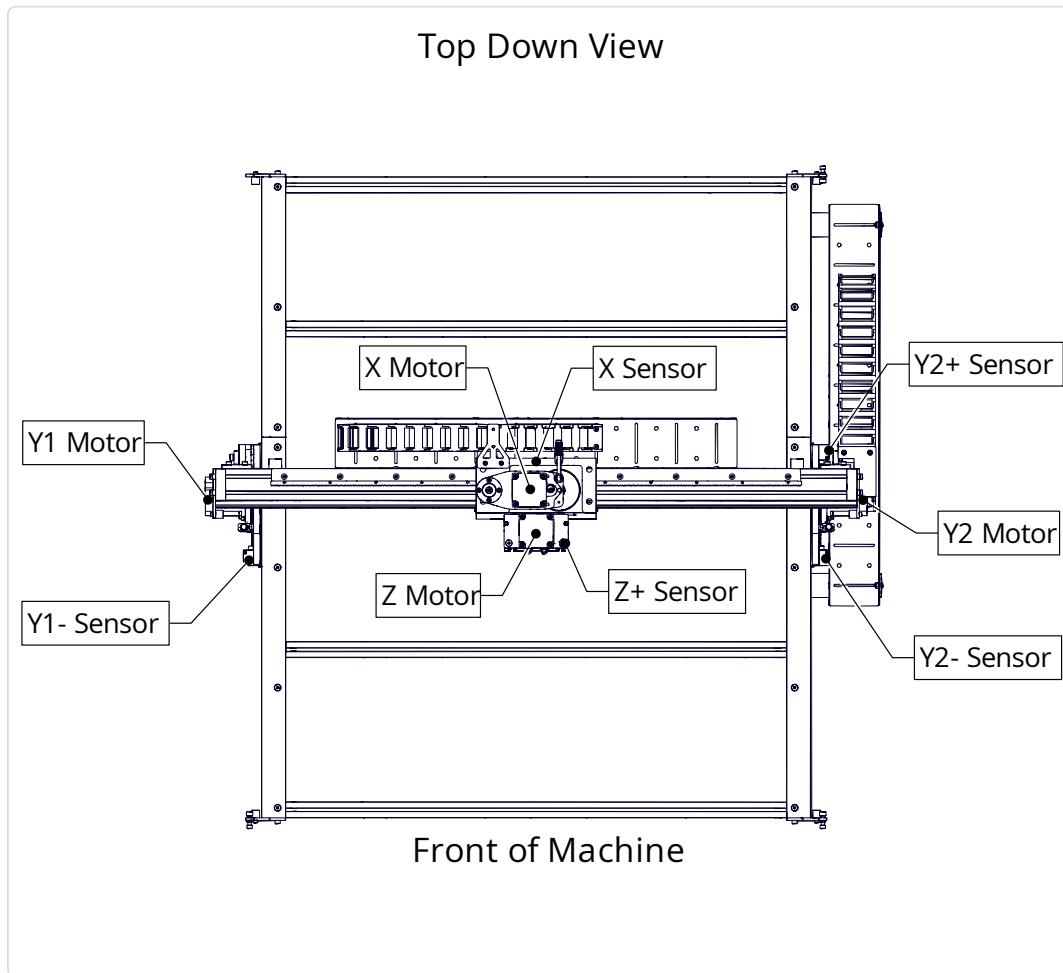
9.2 - Preparation

9.2.1 - Axes and Sign Convention



These axis and sign conventions correspond to Avid CNC's Mach4 configuration. The color of each axis will be used when labeling motor and sensor cables.

9.2.2 - Motor and Sensor Locations



When necessary, reference this image to determine the location of each motor and sensor.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, the Y2+ sensor will be located on the left side of the machine.

9.2.3 - Cable Labeling



Prior to routing motor and sensor cables on the machine, it is recommended to label each cable with the appropriate motor or sensor connection (reference tables below). Using colored labels will make cable identification easier.

Motor Cables

Motor	Color	Cable
X	RED	28'
Y1	GREEN	28'
Z	BLUE	28'
Y2	ORANGE	20'

Sensor Cable

Sensor	Color	Cable
Y1-	GREEN	28' w/ straight connector
Z+	BLUE	28' w/ right-angle connector
X	RED	28' w/ right-angle connector
Y2-	ORANGE	20' w/ straight connector
Y2+	PURPLE	20' w/ straight connector

↔ **Alternate Cable Track Location**

If locating the table cable track on the left side of the machine, swap the Y1 and Y2 motor cable lengths and swap the Y1- and Y2- sensor cable lengths.



9.3 - Proximity Sensors

Parts List

ID	QTY	Part/Description	Package Label
	1	PROX-PF-03-M12-19.1 Proximity Sensor Kit	Electronics
(A)	2	NBN8-12GM50-E0-V1 Cylindrical Proximity Sensor	PROX-PF-03-M12-19.1 >
(B)	3	NBB7-F10-E0-V1 Cube Proximity Sensor	PROX-PF-03-M12-19.1 >
(C)	6	M4 x 25mm Socket Head Cap Screw	PROX-PF-03-M12-19.1 >
	1	CRP831-00-19.1 Gantry Axis Bumper Kit	Gantry Assembly Kit
(D)	2	Rubber Bumper	CRP831-00-19.1 >
(E)	2	M6 x 20mm Socket Head Cap Screw	CRP831-00-19.1 >
	1	28' Proximity Sensor Cable w/ Right-angle Connector	Electronics

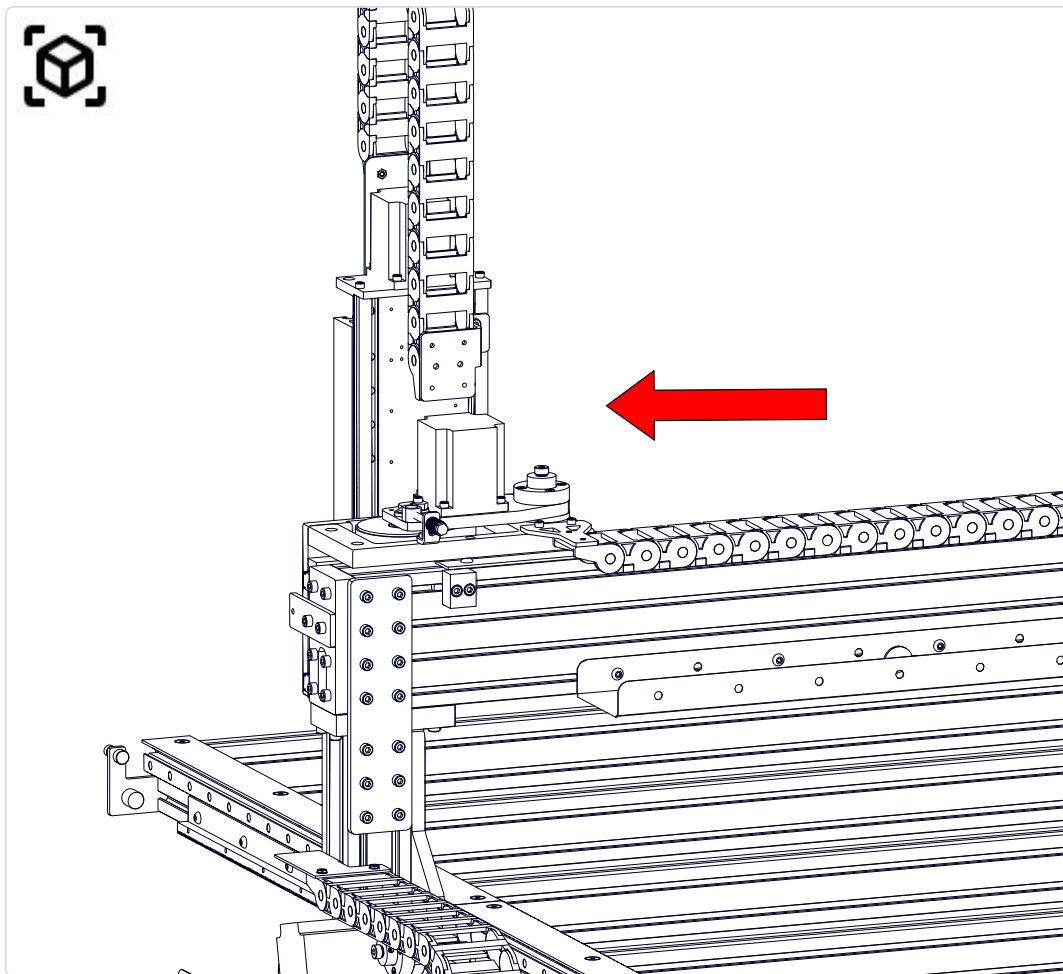
Tools List

Requirement	Tool
Required	3mm Allen Wrench
Required	5mm Allen Wrench
Required	Adjustable Wrench
Required	Tape Measure
Recommended	17mm Combination Wrench



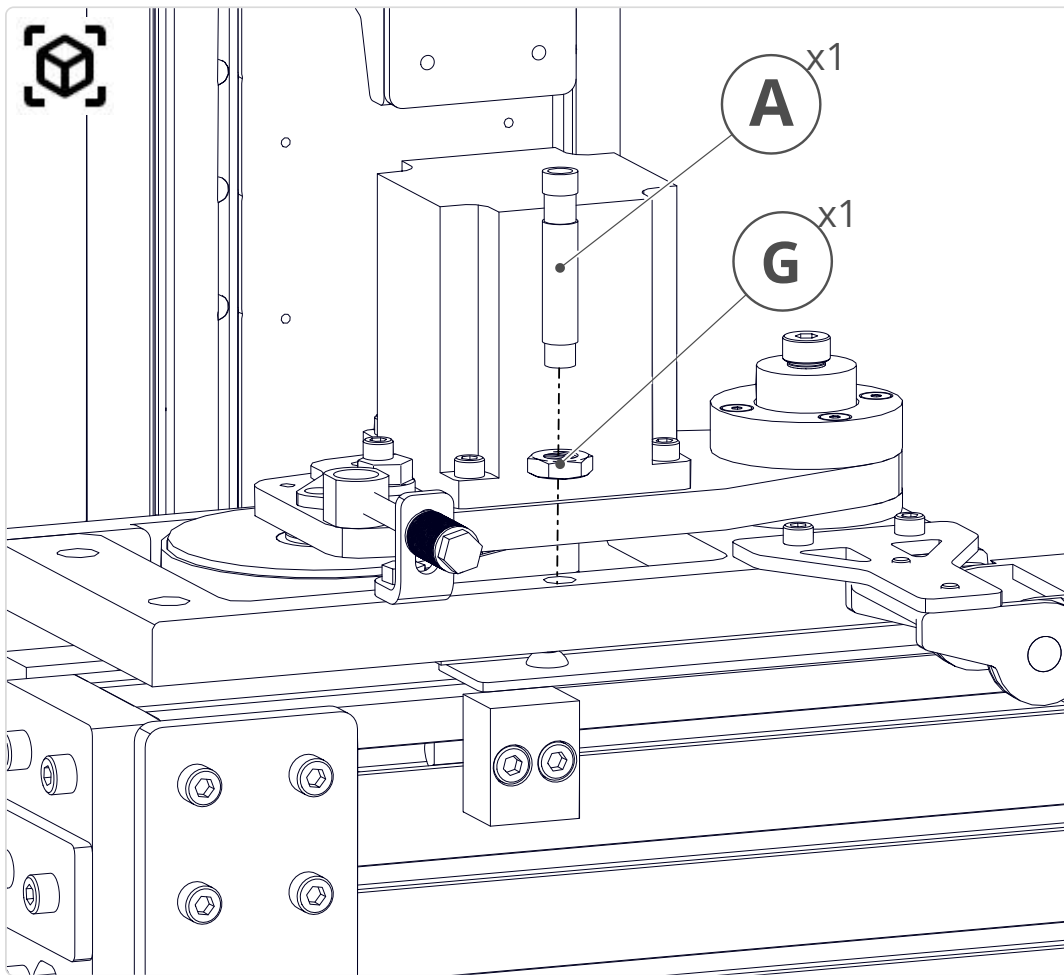
9.3.1 - X Axis Sensor Installation

9.3.1.1



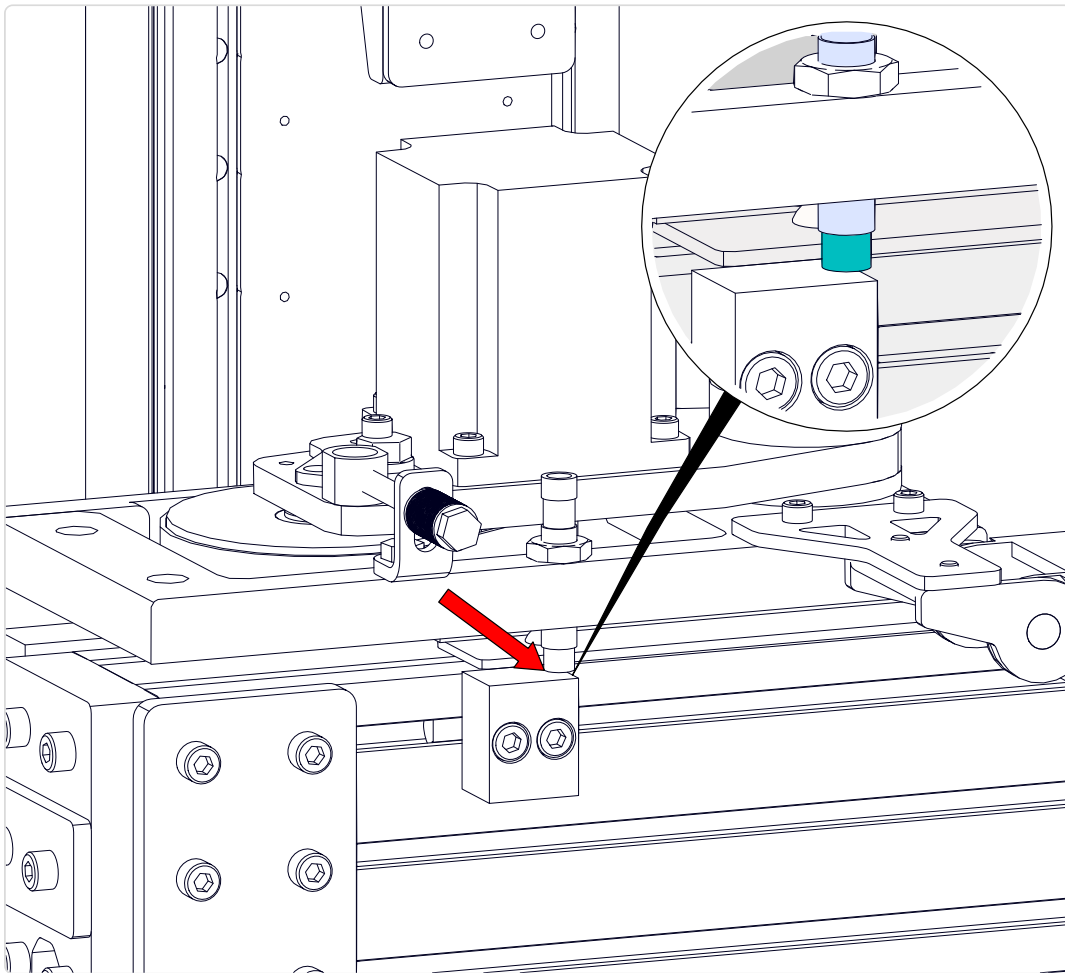
1. Move the gantry carriage to the end of the gantry.

9.3.1.2



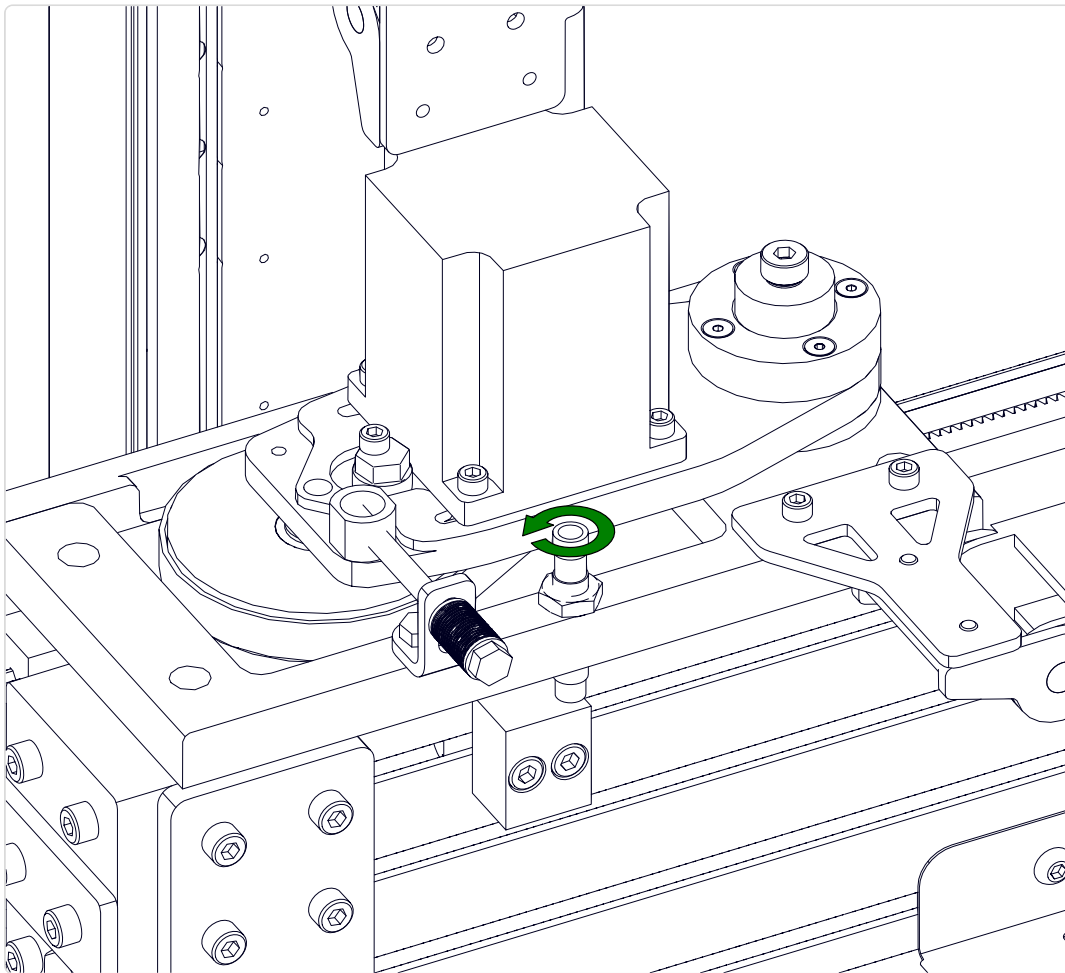
1. Install an **M12 x 1.0 Hex Jam Nut (G)** onto a **NBN8-12GM50-E0-V1 Cylindrical Proximity Sensor (A)**.
2. Thread the sensor into the gantry R&P plate.

9.3.1.3



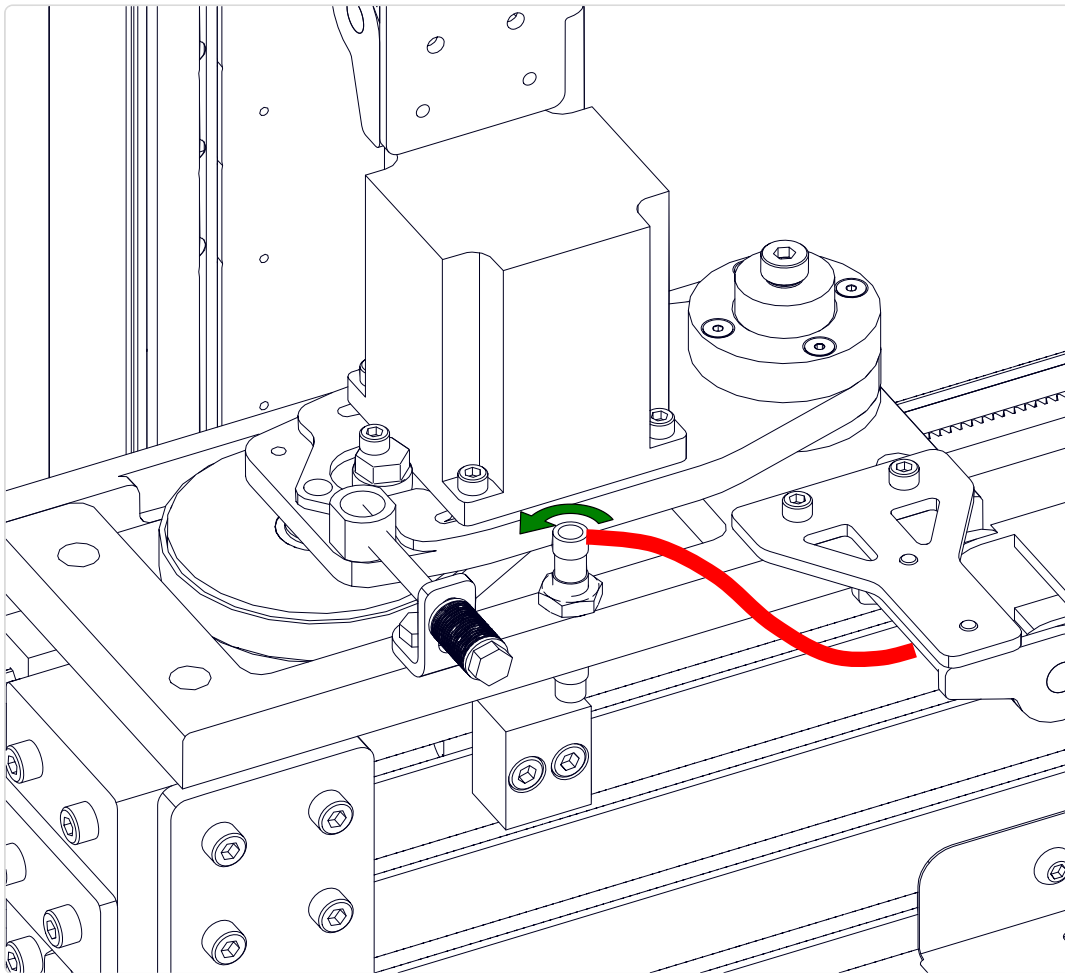
1. Continue threading the sensor clockwise until it touches the sensor flag, as shown.

9.3.1.4



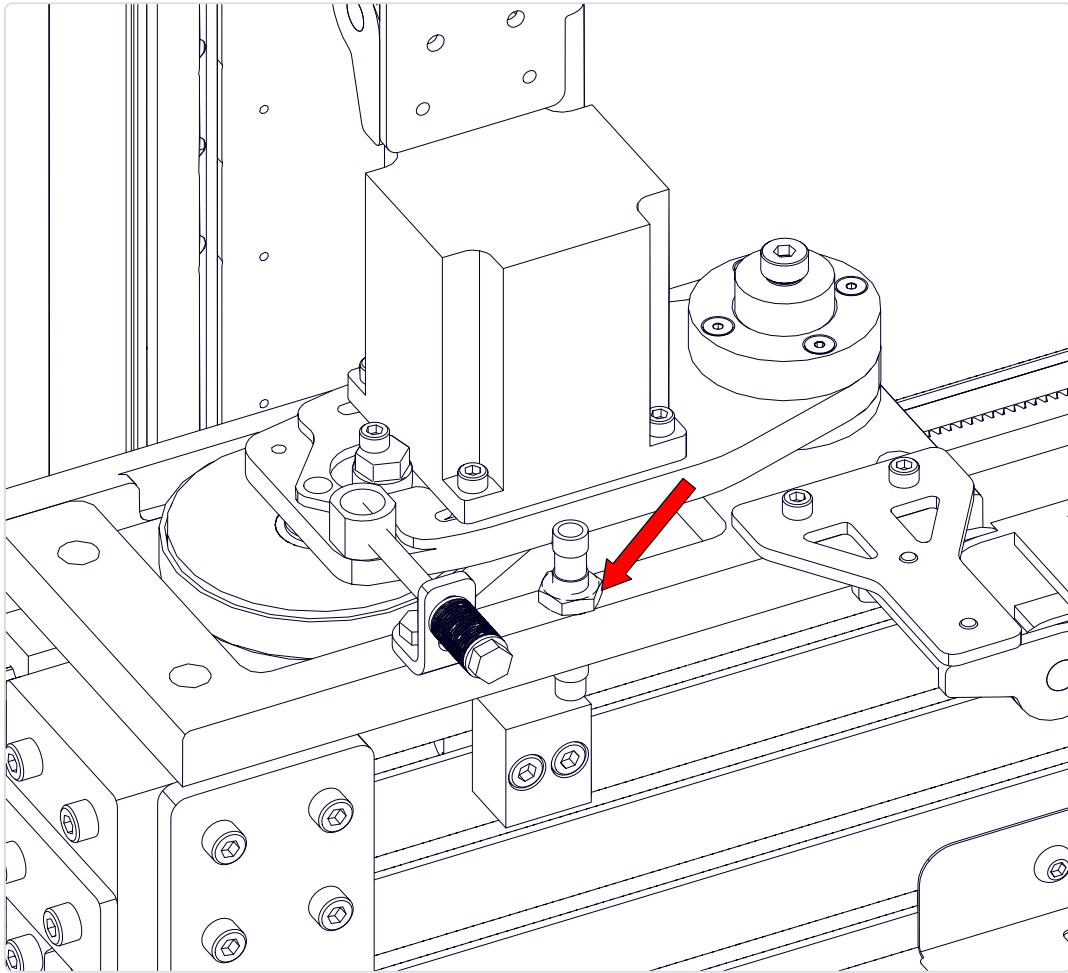
1. Thread the sensor counterclockwise three complete turns.

9.3.1.5



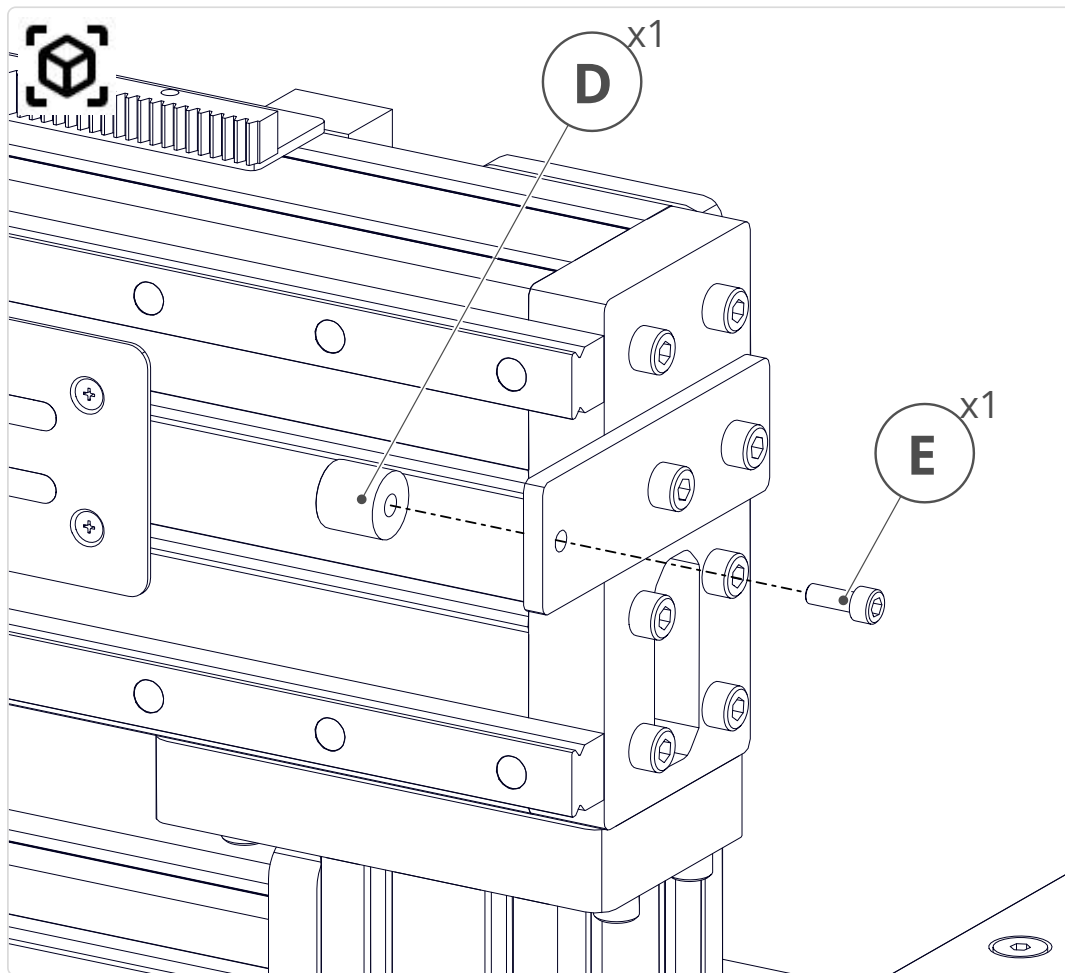
1. Continue threading the sensor counterclockwise until the X sensor cable (with right-angle connector) can be attached to the sensor with the cable oriented towards the cable track, as shown.

9.3.1.6



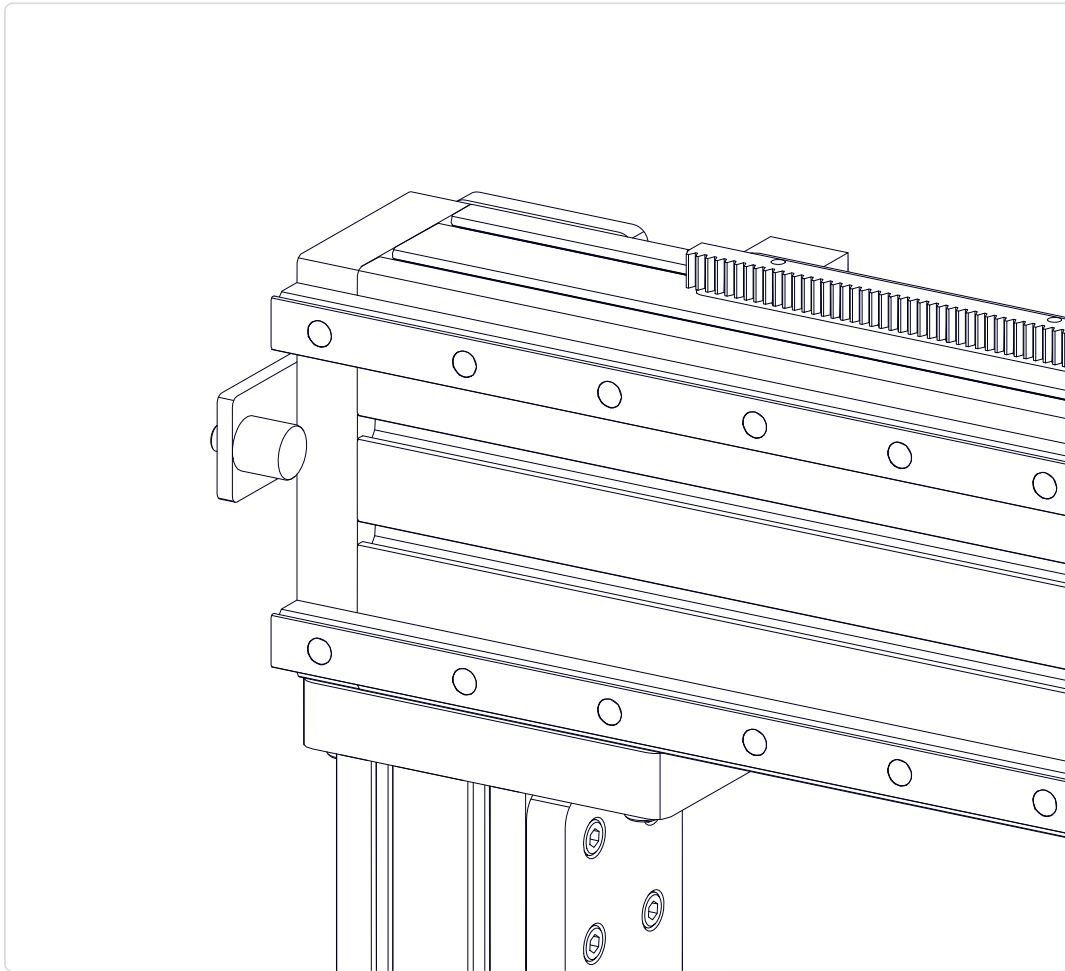
1. Fully tighten the sensor's M12 jam nut.

9.3.1.7



1. Attach a Rubber Bumper **(D)** to the bumper plate using an M6 x 20mm Socket Head Cap Screw **(E)**.

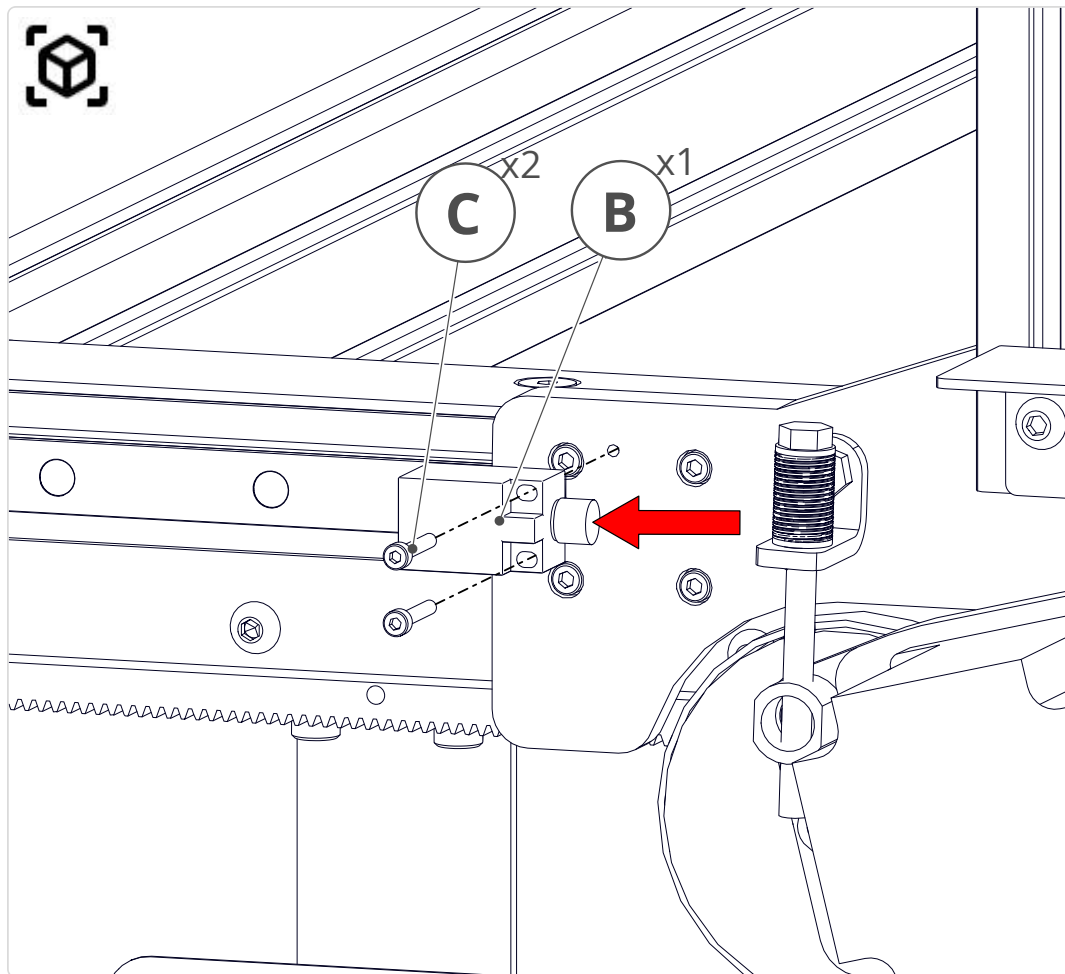
9.3.1.8



1. Repeat the previous step to install a rubber bumper on the other side of the gantry.

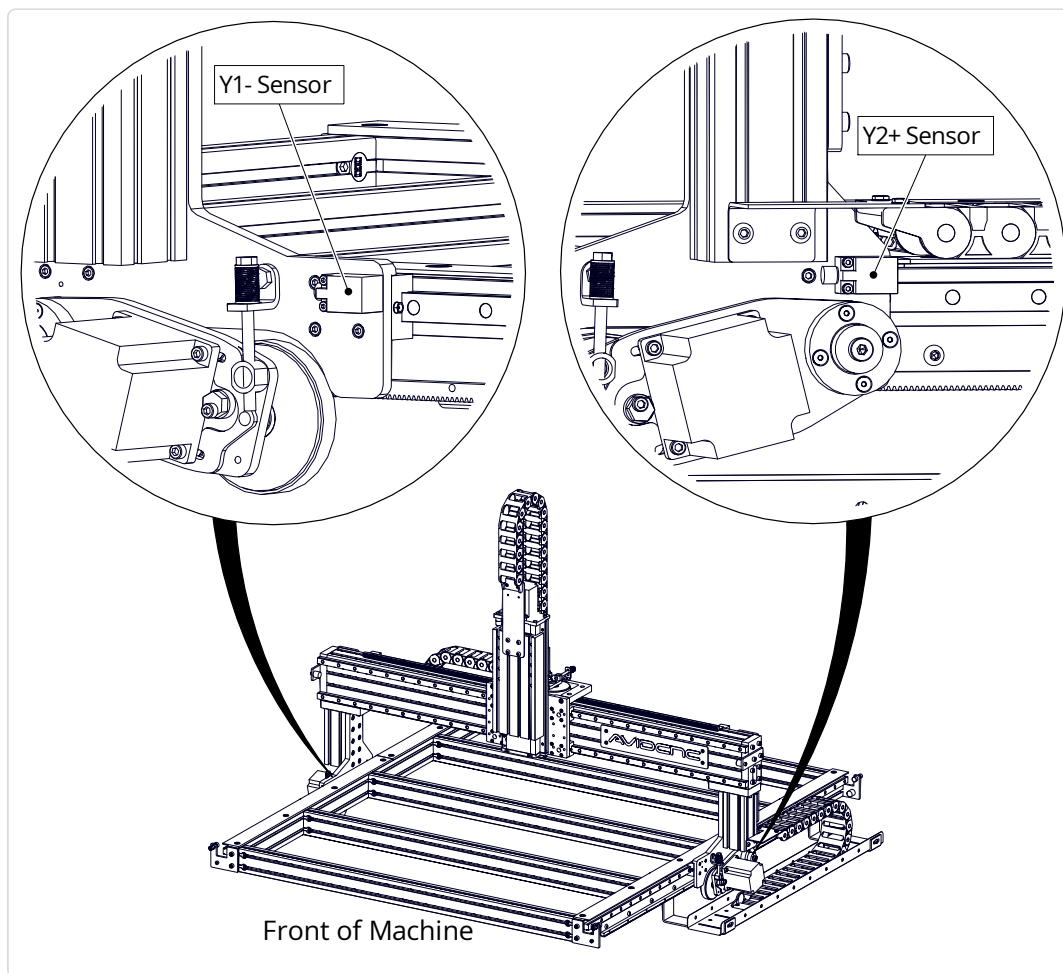
9.3.2 - Y Axis Sensor Installation

9.3.2.1



1. Prior to installing the **NBB7-F10-E0-V1 Cube Proximity Sensor (B)**, attach the Y2- sensor cable to the sensor.
2. Attach the sensor to the riser plate using **M4 x 25mm Socket Head Cap Screws (C)**.

9.3.2.2



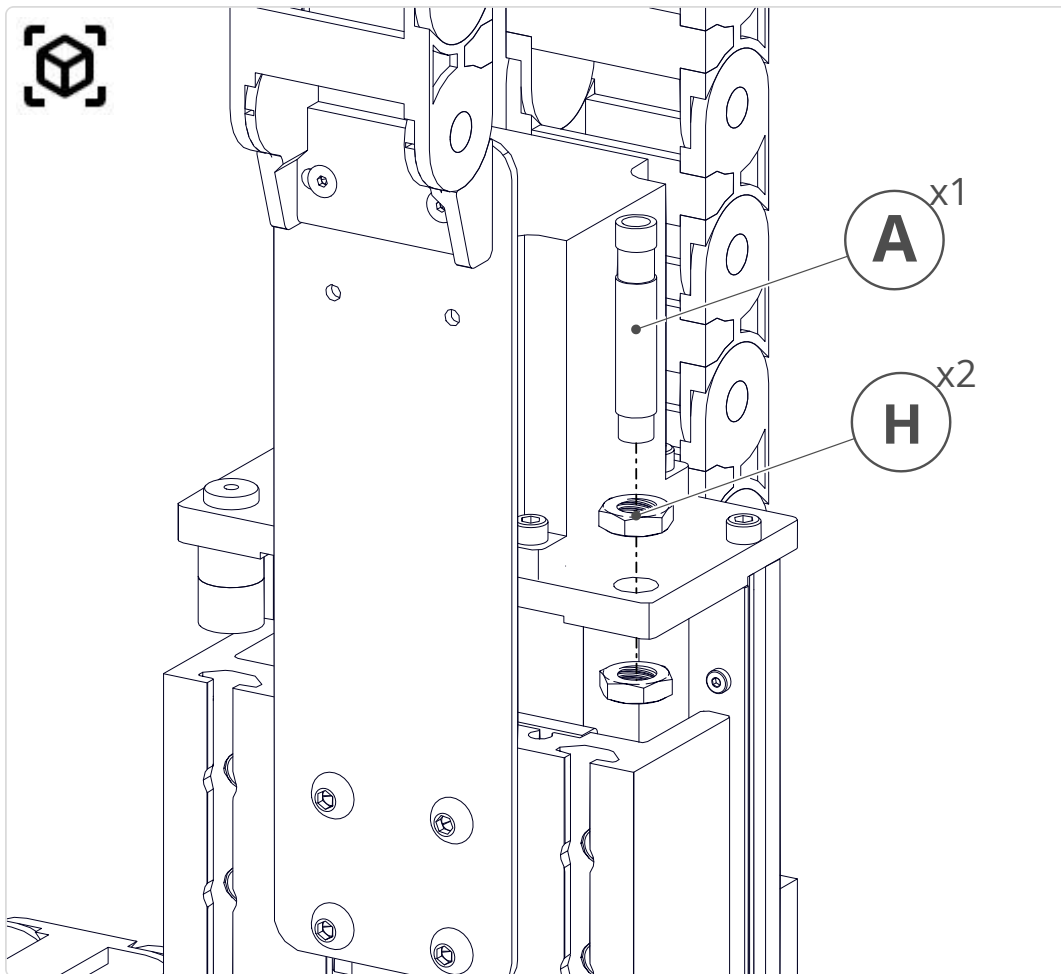
1. Repeat the previous step to install the Y1- and Y2+ sensors.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, install the Y2+ sensor on the left side of the machine.

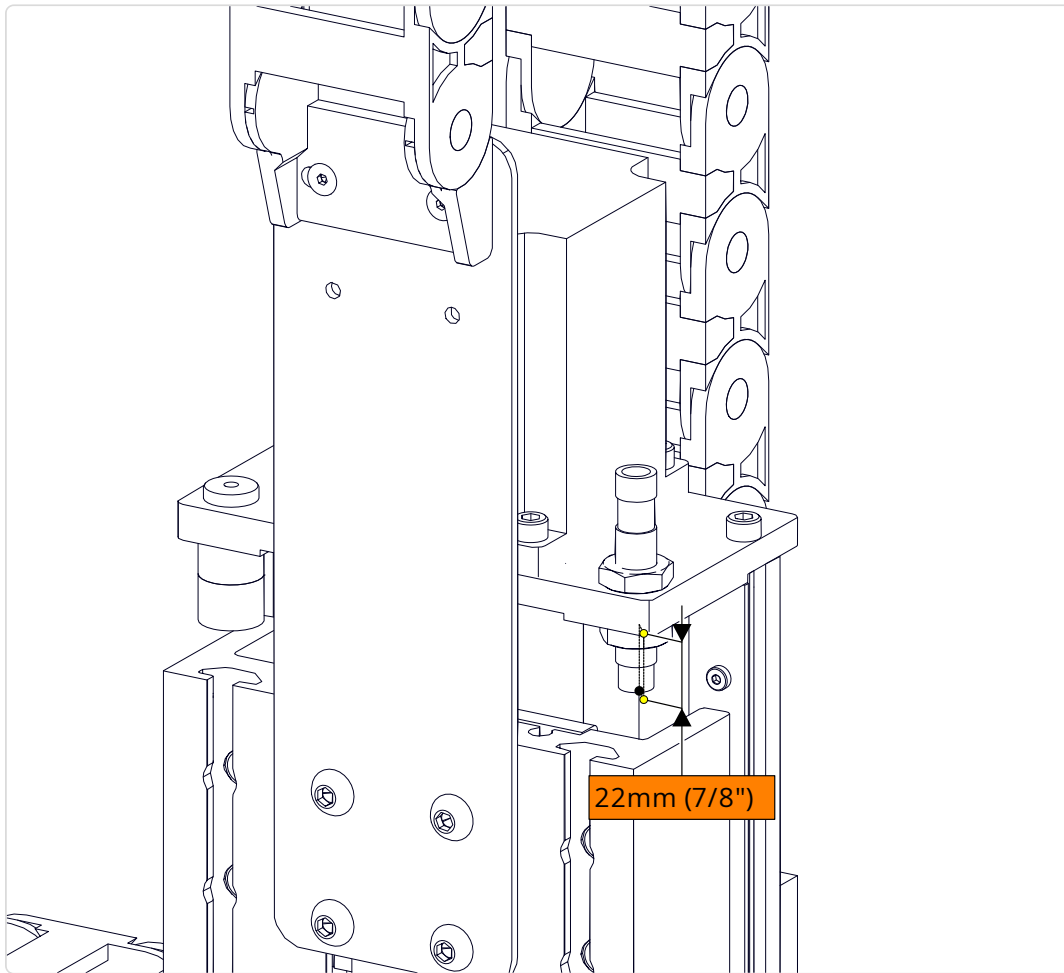
9.3.3 - Z Axis Sensor Installation

9.3.3.1



1. Install a **NBN8-12GM50-E0-V1 Cylindrical Proximity Sensor** (A) onto the Z axis motor plate using two **M12 x 1.0 Hex Jam Nuts** (H).

9.3.3.2



1. Position the sensor 22mm (7/8") from the bottom of the Z axis motor plate.
2. Fully tighten the M12 jam nuts.

9.4 - Cable Installation

Parts List

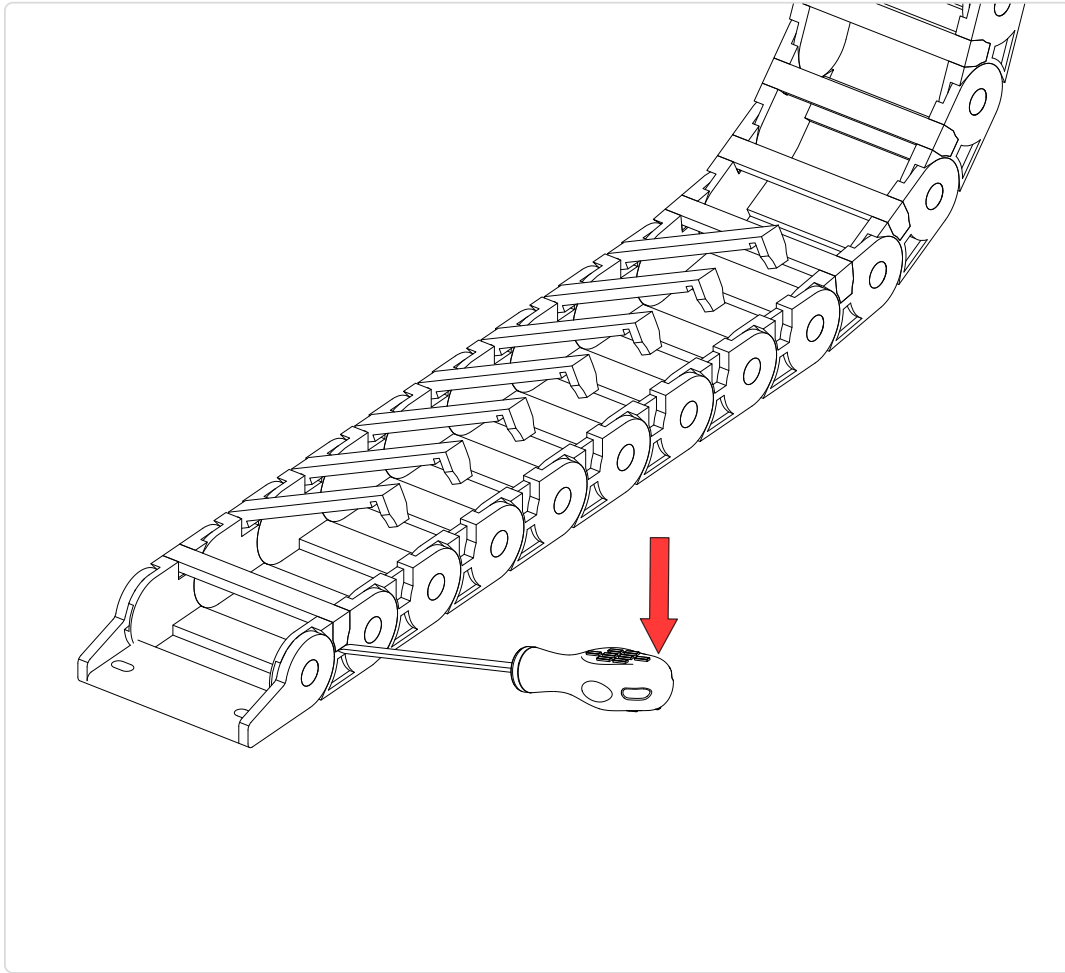
ID	QTY	Part/Description	Package Label
C	1	M23 6 Conductor Spindle Cable	Electronics
		Proximity Sensor Cables (reference <i>sensor cable table</i>)	
		CNC Motor Cables (reference <i>motor cable table</i>)	

Tools List

Requirement	Tool
Required	Standard (Flat Tip) Screwdriver



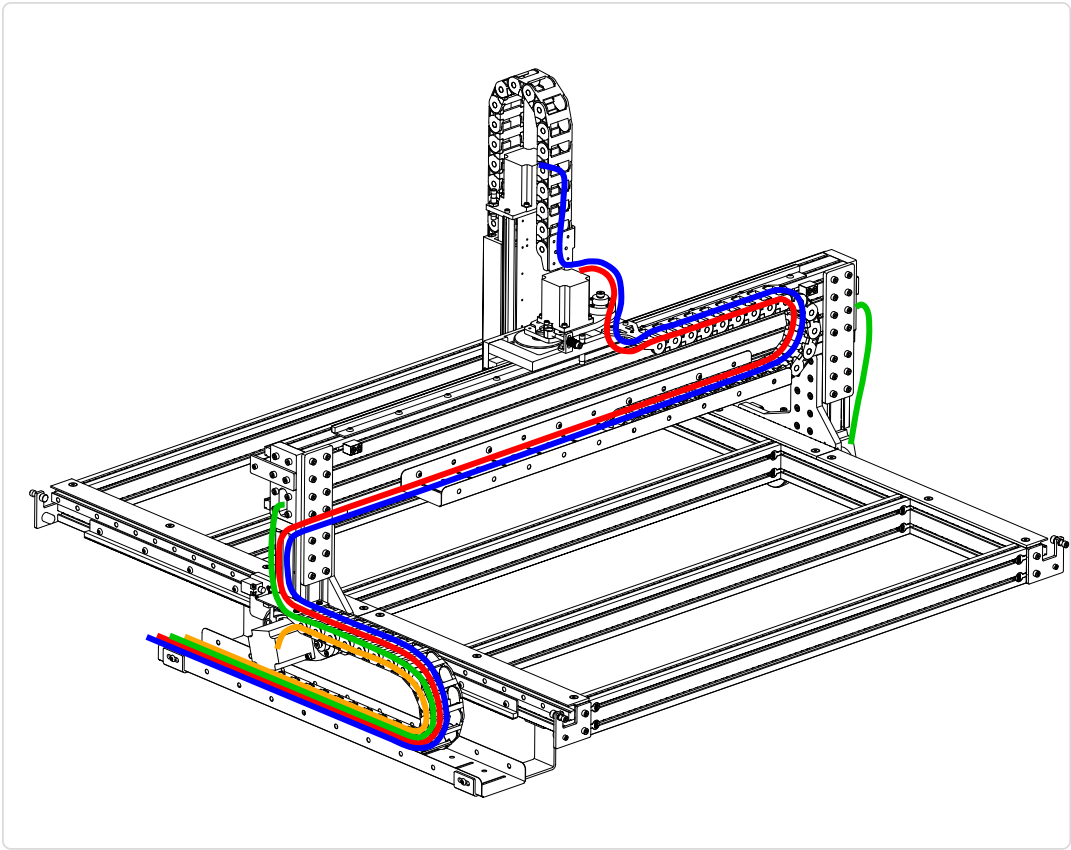
9.4.1 - Cable Track Preparation



1. Prior to routing cables through the cable track, it is recommended to open each cable track link using a small screwdriver.

9.4.2 - Cable Routing

9.4.2.1



Motor Cable Routing

Motor	Color	Cable Length	Cable Routing Path
X	RED	28'	Through gantry cable track and table cable track
Y1	GREEN	28'	Through gantry extrusion and table cable track
Z	BLUE	28'	Through gantry cable track and table cable track
Y2	ORANGE	20'	Through table cable track

- 1. Connect each motor cable to their respective motor.
- 2. Route the cable as indicated in the image and table.

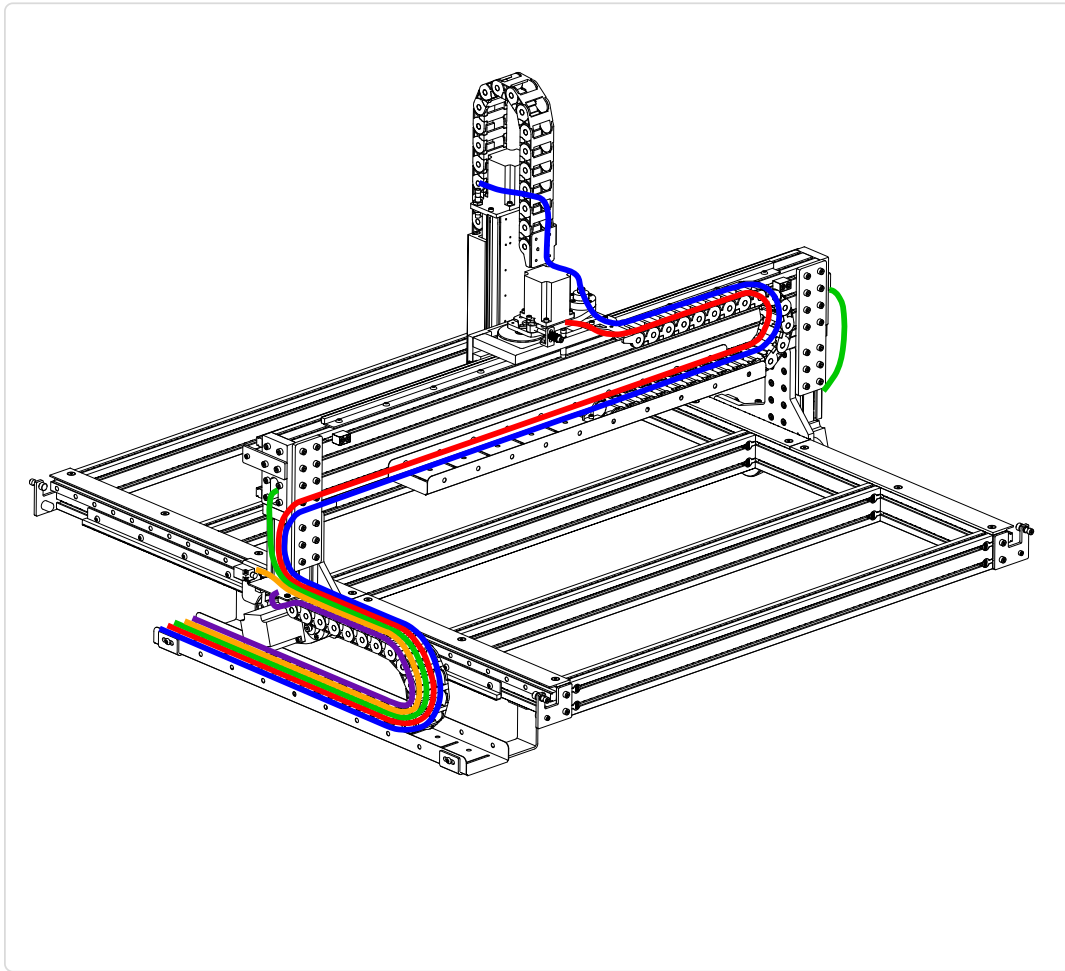
↔ **Alternate Cable Track Location** ▾

If locating the table cable track on the left side of the machine, swap the cable lengths and cable routing paths for the Y1 and Y2 motor cables.





9.4.2.2



1. Connect each sensor cable to their respective sensor.
2. Route the cable as indicated in the image and table. (see next page)

Sensor Cable Routing

Sensor	Color	Cable Length	Cable Routing Path
Y1-	GREEN	28' w/ straight connector	Through gantry extrusion and table cable track
Z+	BLUE	28' w/ right-angle connector	Through gantry cable track and table cable track
X	RED	28' w/ right-angle connector	Through gantry cable track and table cable track
Y2-	ORANGE	20' w/ straight connector	Through table cable track
Y2+	PURPLE	20' w/ straight connector	Through table cable track



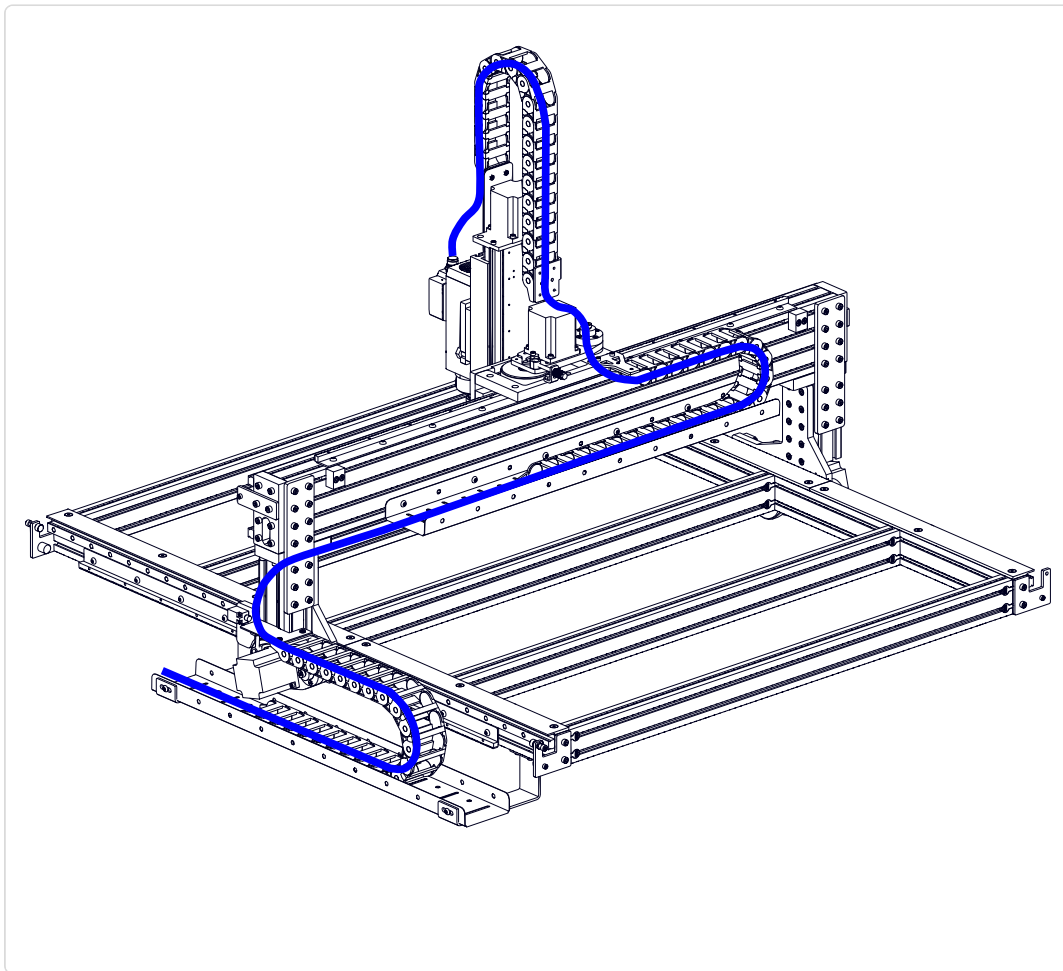
Alternate Cable Track Location



If locating the table cable track on the left side of the machine, swap the cable lengths and cable routing paths for the Y1- and Y2- sensor cables.



9.4.2.3



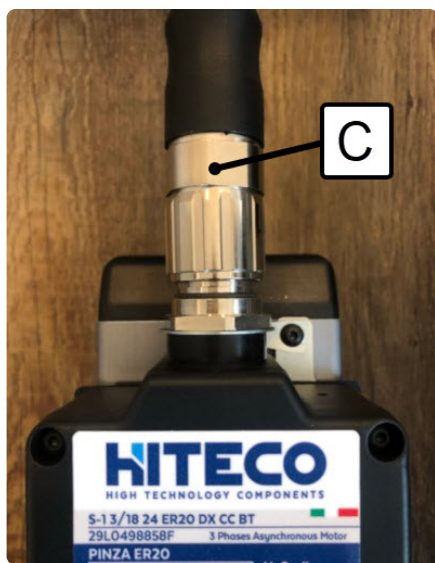
Accessory Cable Routing

Connection	Color	Cable	Cable Routing Path
Spindle	BLUE	M23 Spindle Cable	Through Z axis cable track, gantry cable track, and table cable track

1. Route the spindle cable as indicated (connection to the spindle will be completed in future steps).
2. If you are adding a Laser Kit, visit [Laser Assembly](#) to route the described components now, then return to this document.

9.4.3 - Spindle Connections

9.4.3.1



M23 Cable Seated



M23 Cable Tightened

1. Connect the female end of the **M23 6 Conductor Spindle Cable** (C) to the spindle. Ensure the connector is seated before tightening.



Assembly Note

It may be necessary to rotate the M23 cable to allow it to seat properly. During this process you will feel the connector drop into place when the pins and sockets of the connector align.

9.5 - Cable Track Positioning

Parts List

ID	QTY	Part/Description	Package Label
	1	CT-PRO-FAST-20.2	Cable Track
(A)	4	M6 x 12mm Flat Head Screw	CT-PRO-FAST-20.2 >
(B)	4	M6 Flat Washer	CT-PRO-FAST-20.2 >
(C)	4	M6 Hex Jam Nut	CT-PRO-FAST-20.2 >

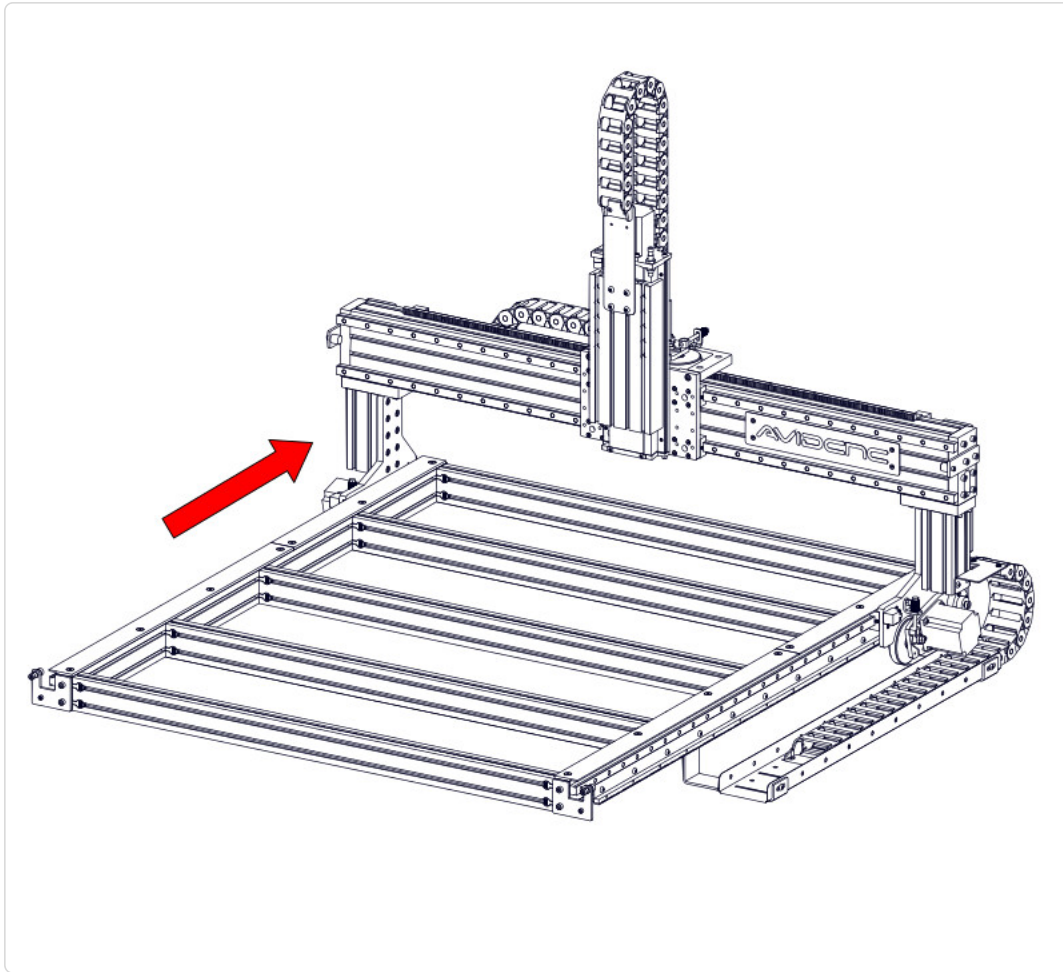
Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	Adjustable Wrench



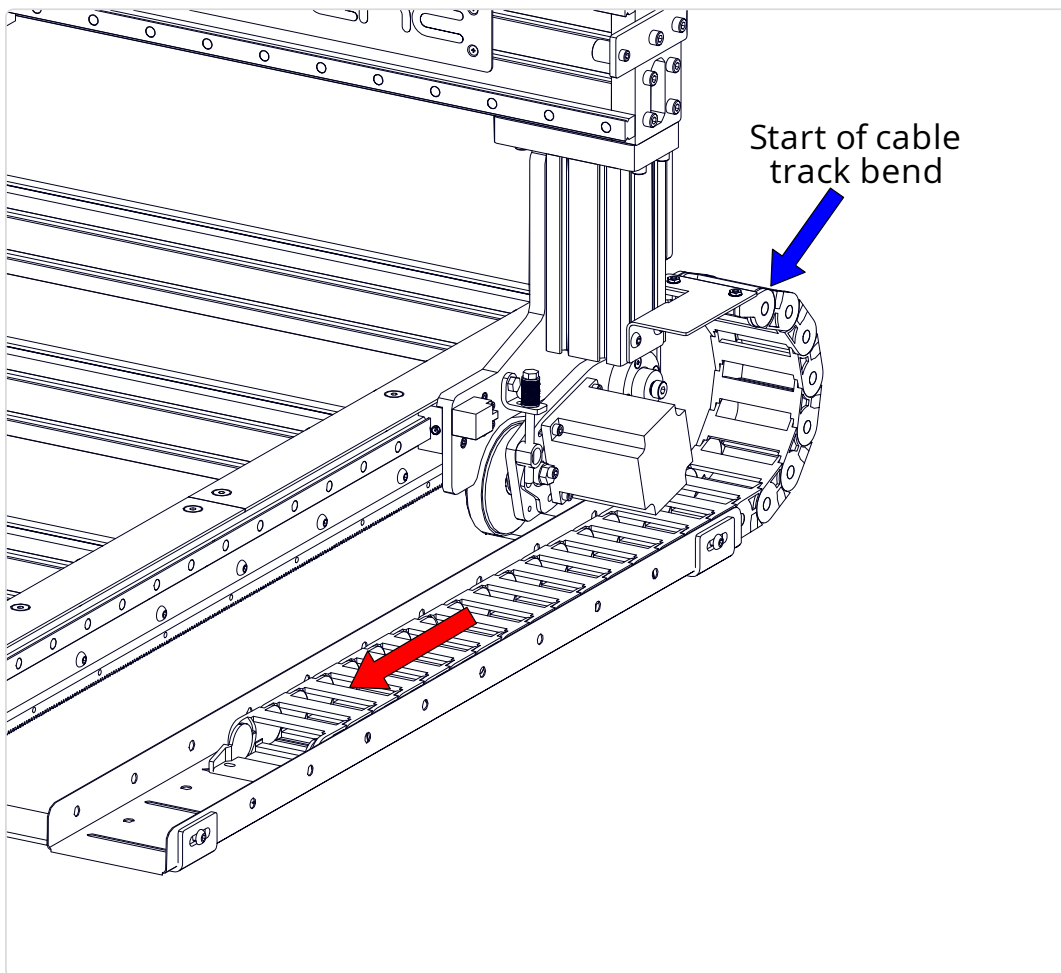
9.5.1 - Table Cable Track

9.5.1.1



1. Move the gantry to the back of the machine.

9.5.1.2



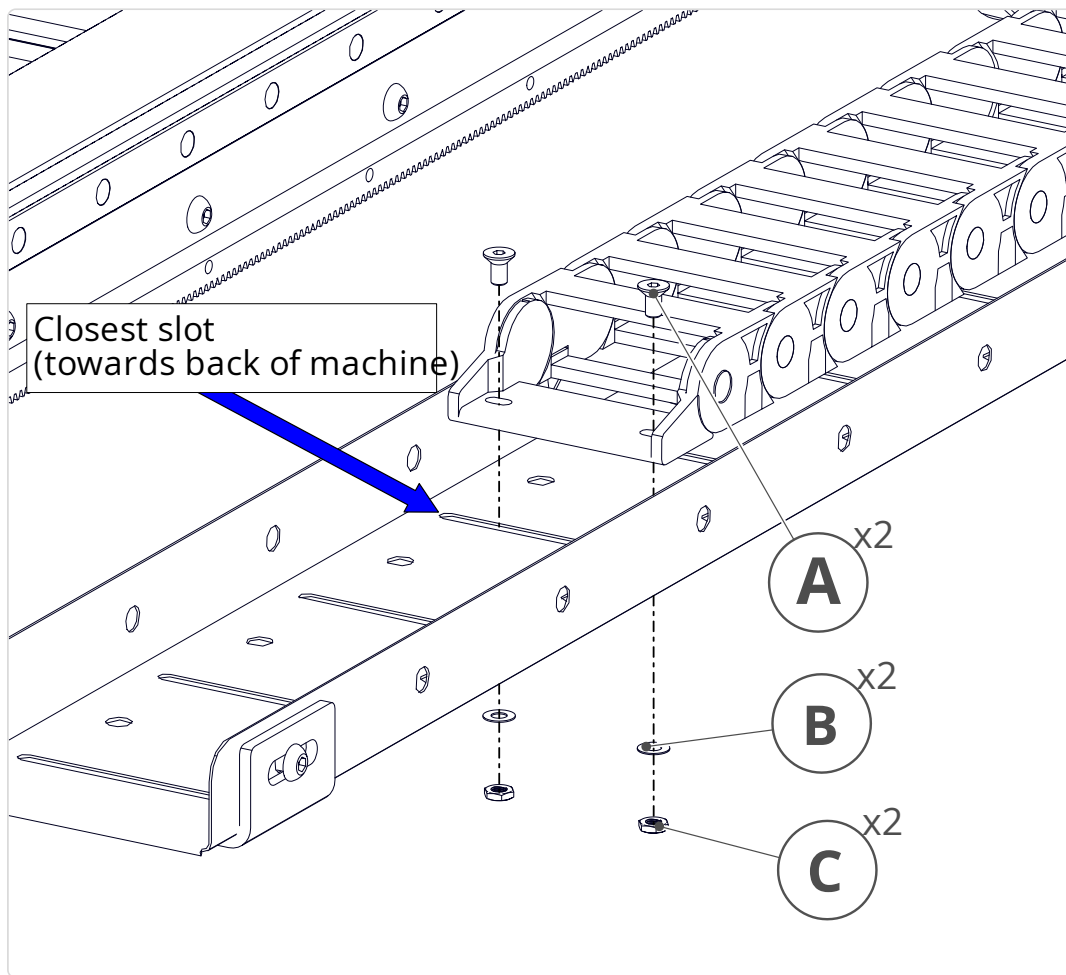
1. Move the cable track towards the front of the cable track tray until the start of the cable track bend is located at the riser cable track bracket.



Assembly Note

Keep the cable track in this position while fastening in the next step.

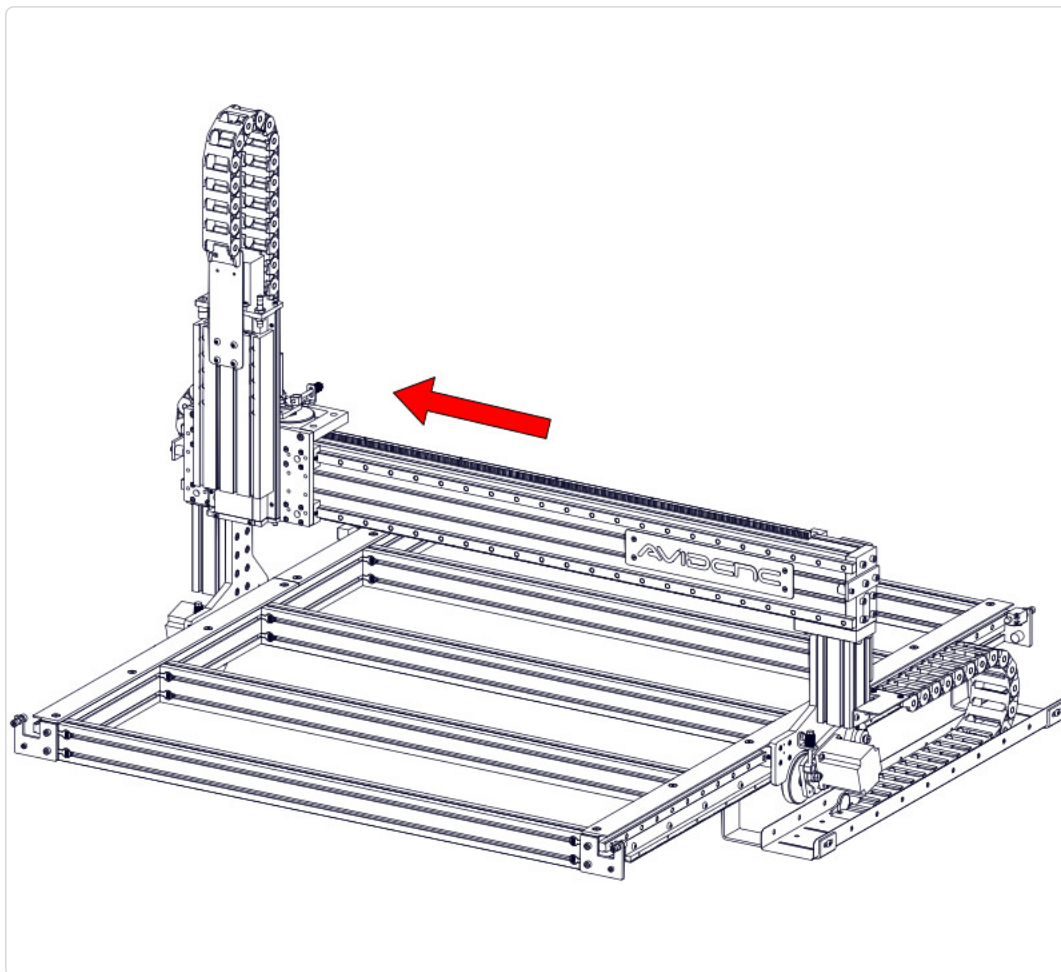
9.5.1.3



1. Attach the cable track to the closest slot, towards the back of the machine, using **M6 x 12mm Flat Head Screws (A)**, **M6 Flat Washers (B)**, and **M6 Hex Jam Nuts (C)**.

9.5.2 - Gantry Cable Track

9.5.2.1

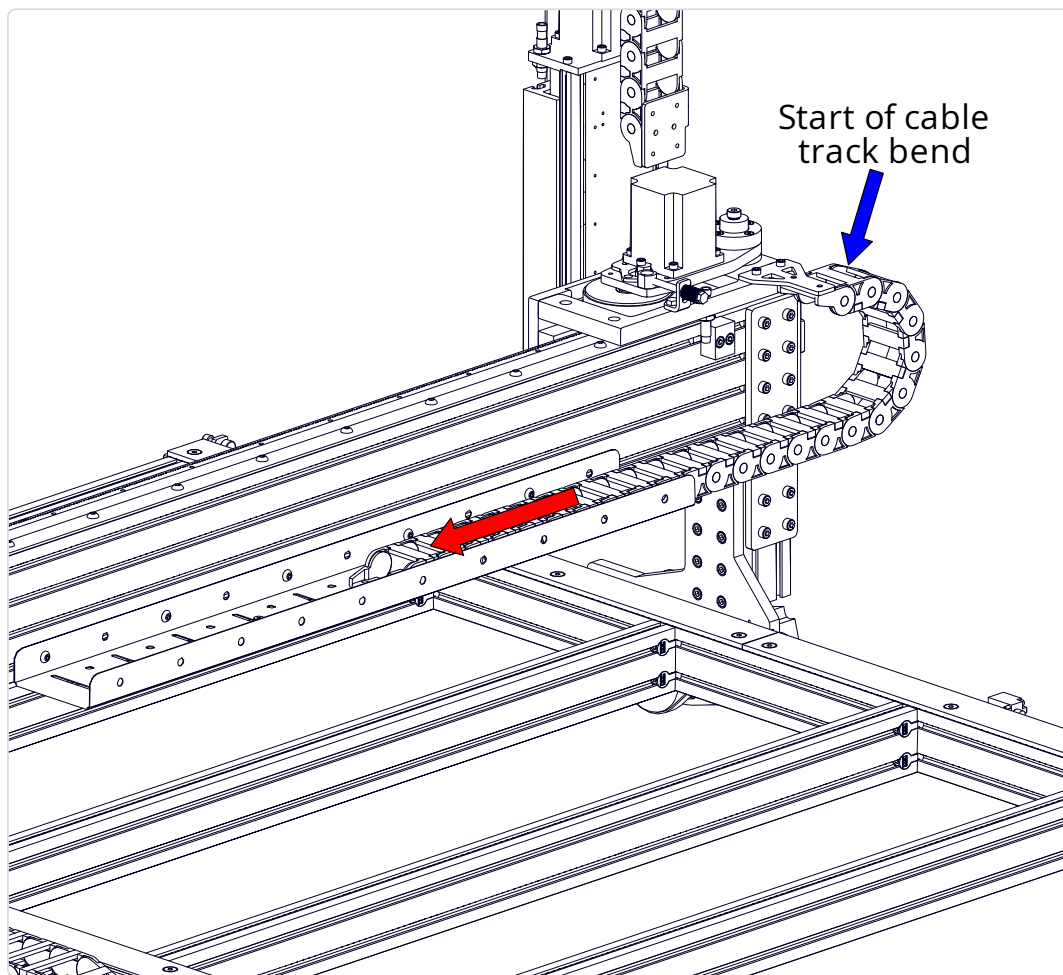


1. Move the gantry to the left end of the machine (looking from the front).

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, move the gantry to the right end of the machine.

9.5.2.2



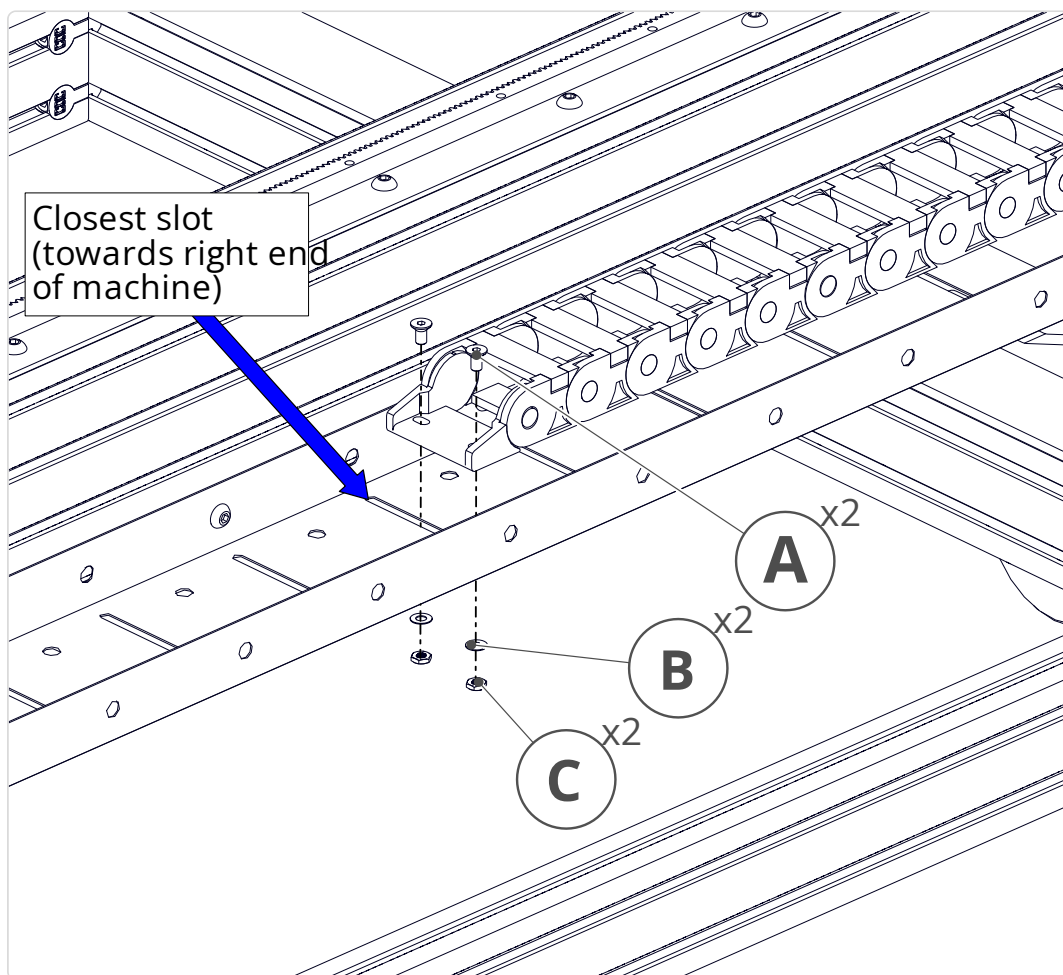
1. Move the cable track towards the left end of the cable track tray (looking from the back of the machine) until the start of the cable track bend is located at the gantry cable track bracket.



Assembly Note

Keep the cable track in this position while fastening in the next step.

9.5.2.3



1. Attach the cable track to the closest slot, towards the right end of the machine, using **M6 x 12mm Flat Head Screws (A)**, **M6 Flat Washers (B)**, and **M6 Hex Jam Nuts (C)**.

9.6 - Control Box Connections

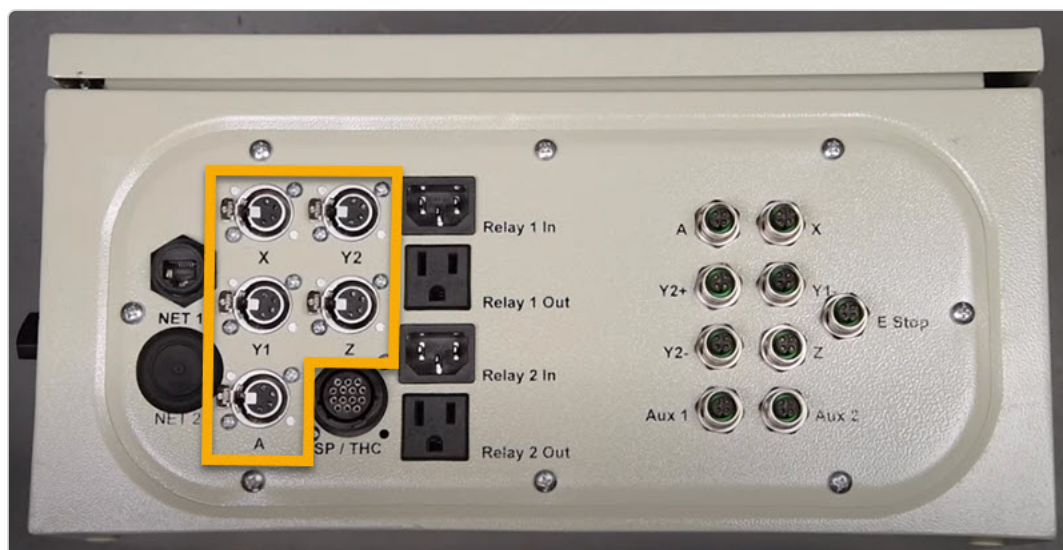
It is recommended to make all connections (detailed in this section) to the Plug and Play CNC Control Box prior to mounting it on the machine.

Parts List

ID	QTY	Part/Description	Package Label
	1	Plug and Play CNC Control Box	Electronics
	1	Plug and Play Spindle/VFD Control Box	Electronics
(A)	1	Emergency Stop Cable, 20'	Electronics
(B)	1	CRP830-00E-01-BASE Emergency Stop	Electronics
(C)	1	C13 Power Cable	Electronics
(D)	1	Ethernet Cable, 10'	Electronics
(E)	1	CRP860-01E SP/THC Cable	Electronics
(G)	1	Auto Z and Corner Finding Touch Plate (<i>optional accessory</i>)	

9.6.1 - Plug and Play CNC Controller

9.6.1.1

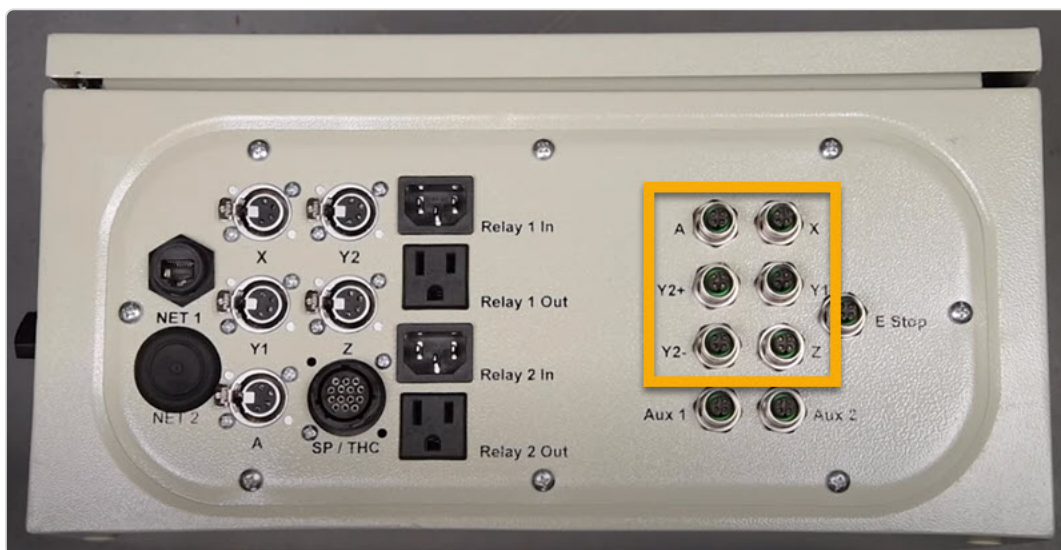


1. Connect each motor cable to the appropriate motor port.

Assembly Note

The A motor port is used for either a CNC Rotary Axis, or the U axis (second Z axis) on a dual-use machine.

9.6.1.2



1. Connect each sensor cable to the appropriate sensor port.

Assembly Note

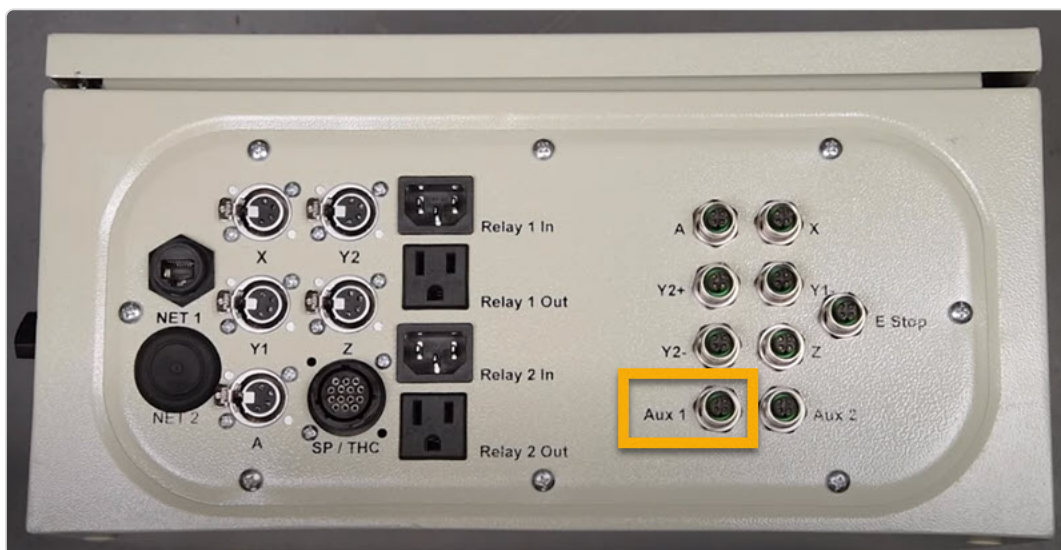
The A sensor port is used for the sensor on a CNC Rotary Axis.

9.6.1.3



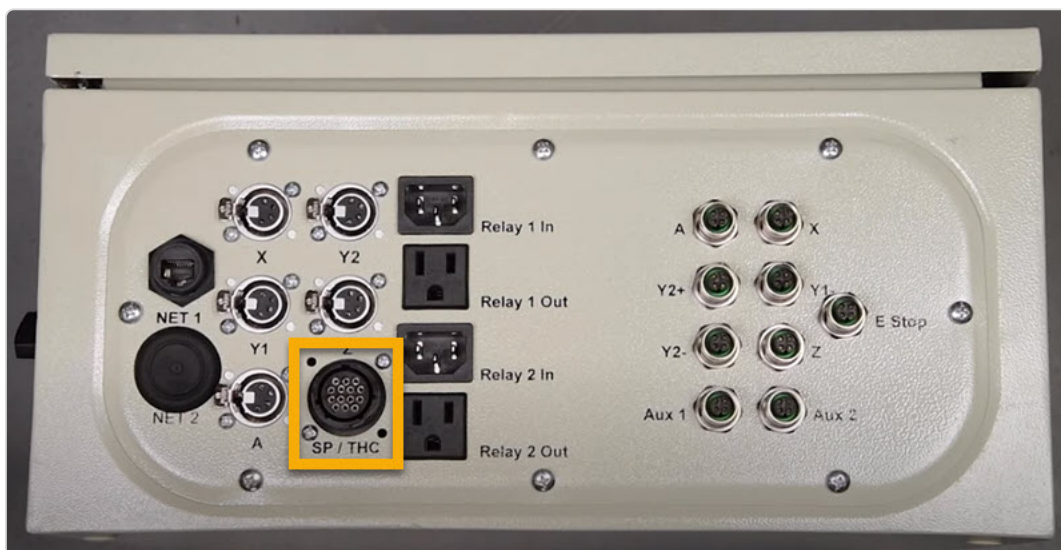
1. Connect the **Emergency Stop Cable, 20'** (A) to the E Stop port.
2. Connect the other end of this cable to the **CRP830-00-01-BASE Emergency Stop** (B).

9.6.1.4



1. Connect the optional **Auto Z and Corner Finding Touch Plate** **G** to the Aux 1 port.

9.6.1.5



1. Connect the **CRP860-01E SP/THC Cable** (E) to the SP/THC port.
2. This cable will be connected to the Plug and Play Spindle / VFD Control Box in a future step.

9.6.1.6



1. Connect the **Ethernet Cable, 10'** (D) to the NET 1 port.
2. Connect the other end of the Ethernet cable to your control PC.

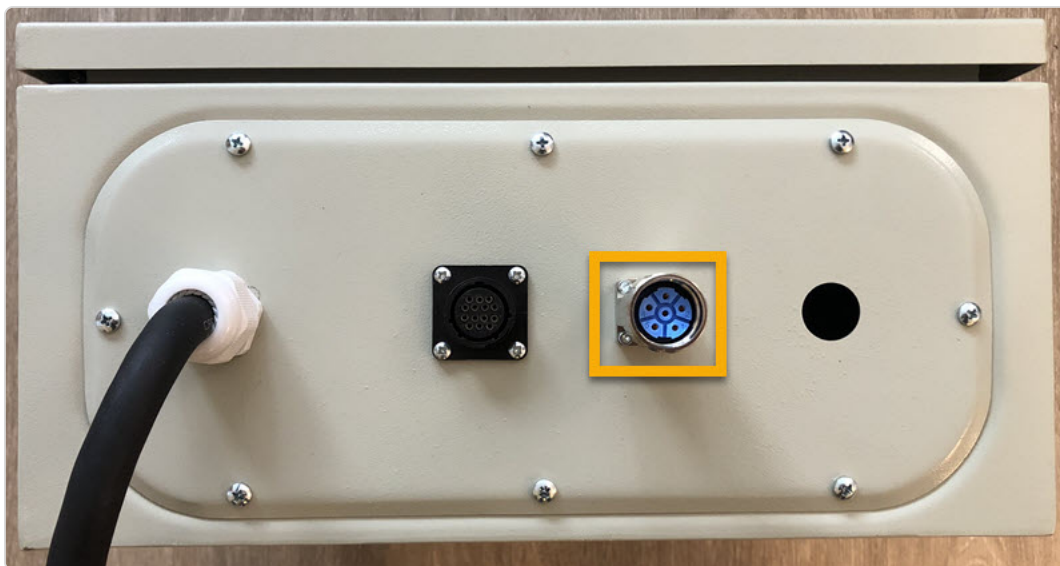
9.6.1.7

If you are adding a Laser Kit, visit [Laser Assembly](#) to make the proper connections, then return to this document.



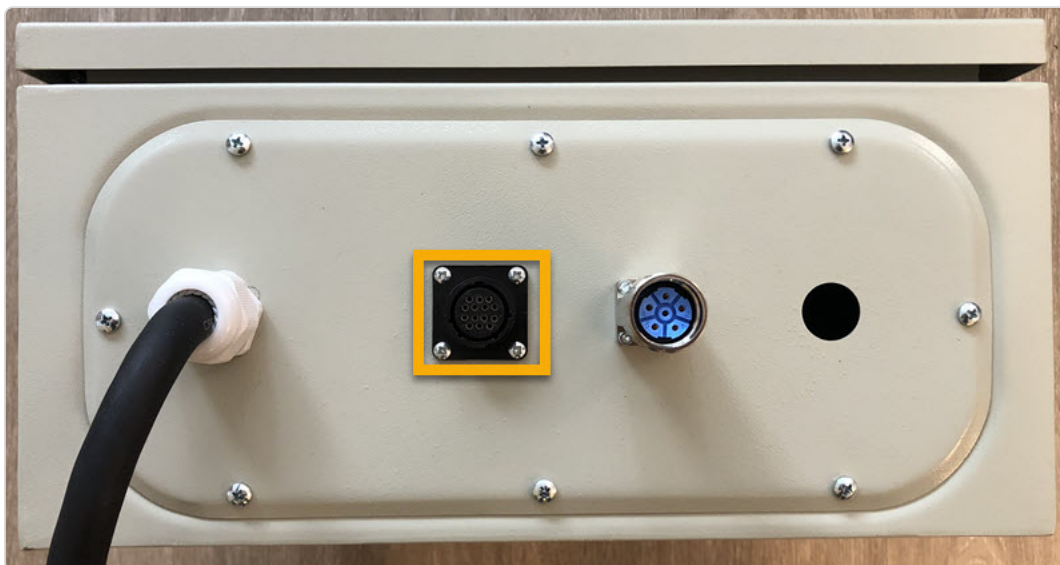
9.6.2 - Plug and Play Spindle/VFD System

9.6.2.1



1. Connect the M23 spindle cable to the indicated port on the Plug and Play Spindle/VFD Control Box.

9.6.2.2



1. Connect the SP/THC cable to the indicated port.

9.7 - Control Box Installation

Parts List

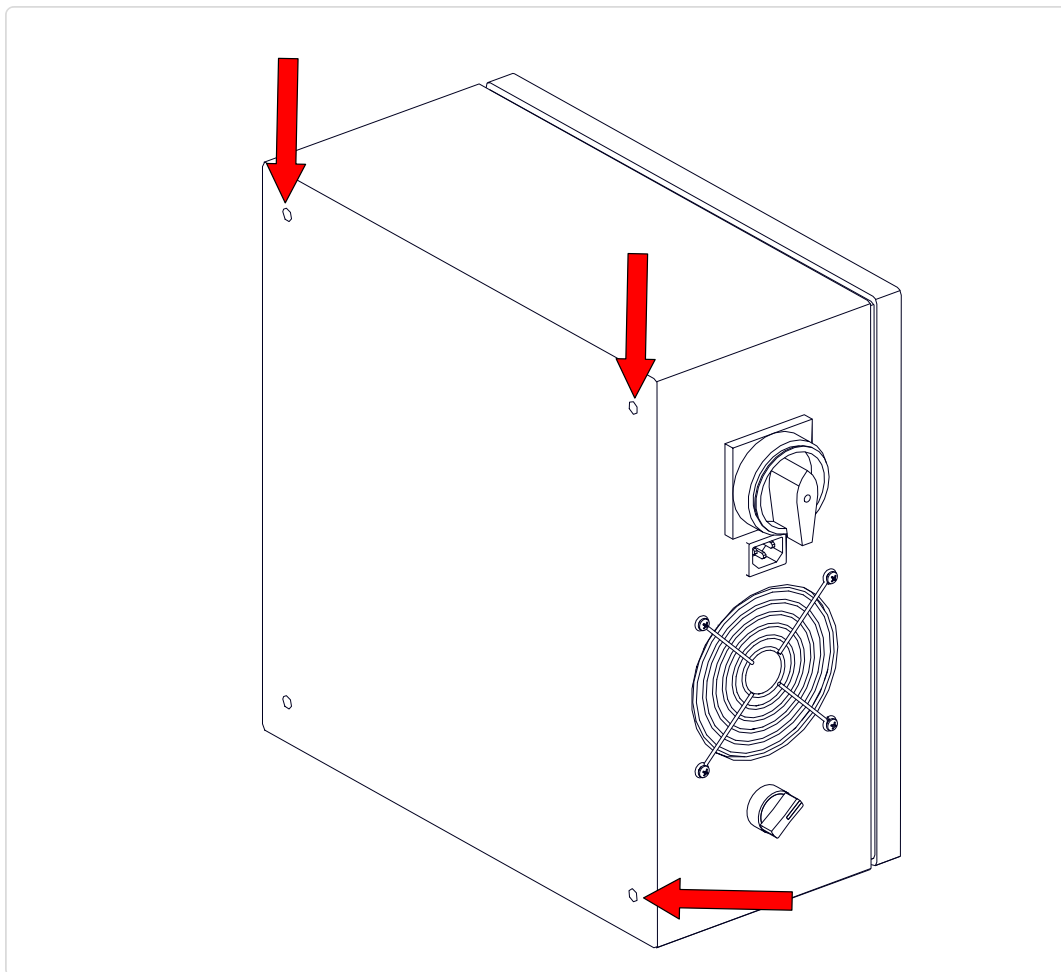
ID	QTY	Part/Description	Package Label
	2	KEY-HW-BAG	Electronics
(A)	6	M8 x 20mm Hex Bolt (3 per bag)	KEY-HW-BAG >
(B)	6	M8 Hex Nut (3 per bag)	KEY-HW-BAG >
(C)	6	Mounting Bracket (3 per bag)	KEY-HW-BAG >
	1	CRP813-00-ELCBAR-HW-BAG	Base Table Kit
(D)	6	M8 x 25mm Set Screw	CRP813-00-ELCBAR-HW-BAG >
(E)	6	M8 Hex Flange Nut	CRP813-00-ELCBAR-HW-BAG >
(F)	6	M8 Roll-in T-Nut	CRP813-00-ELCBAR-HW-BAG >
Remaining parts from KEY-HW-BAG are not used			

Tools List

Requirement	Tool
Required	4mm Allen Wrench
Required	Adjustable Wrench
Required	Standard (Flat Tip) Screwdriver
Recommended	13mm Combination Wrench

9.7.1 - Plug and Play CNC Controller

9.7.1.1

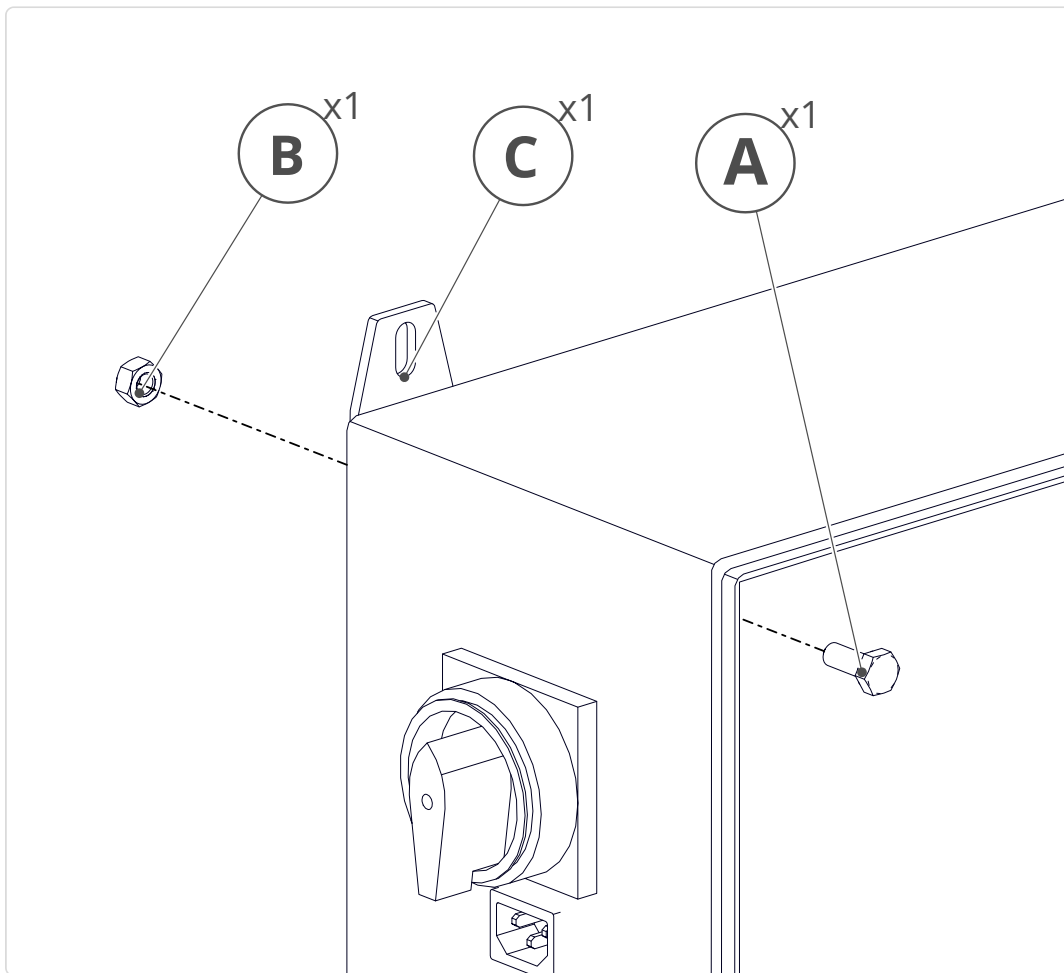


1. At the indicated locations, remove the plastic plugs from the Plug and Play CNC Control Box.

↔ Alternate Cable Track Location

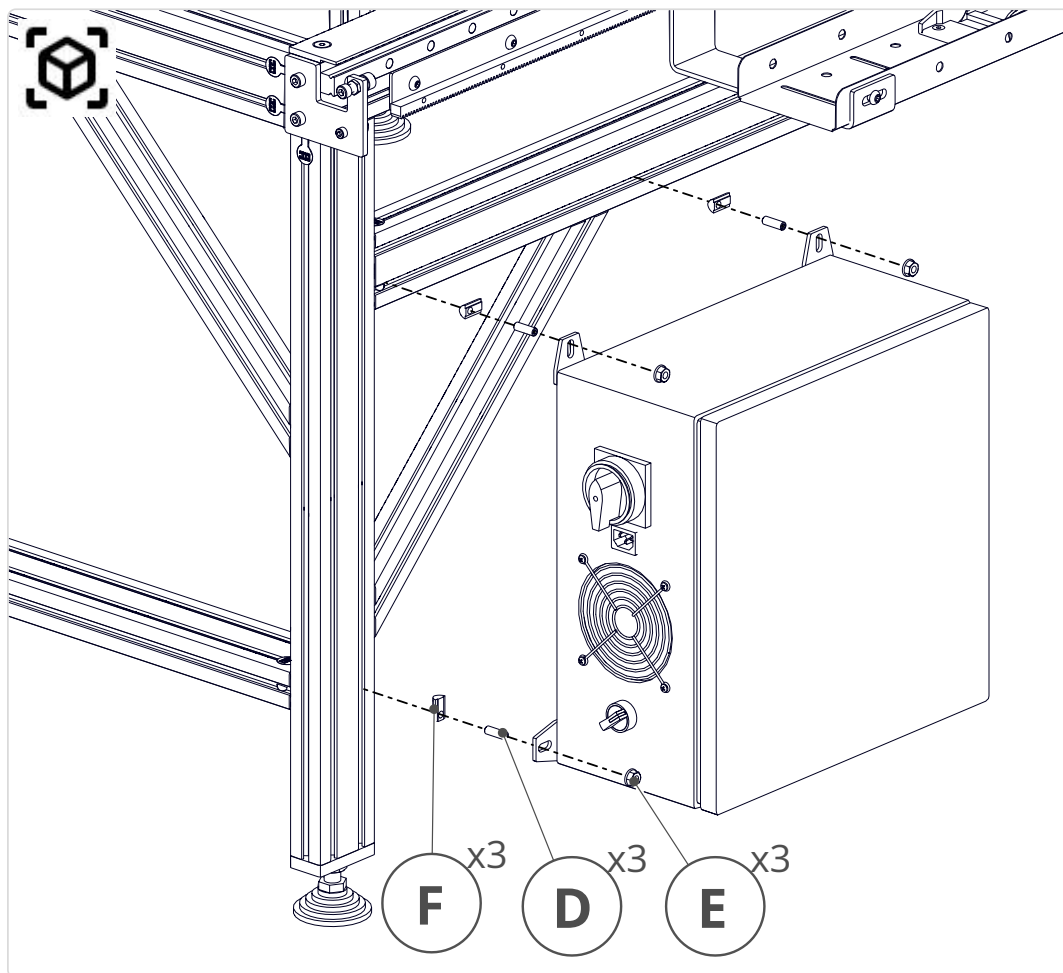
If locating the table cable track on the left side of the machine, remove the plug from the bottom left instead of the bottom right.

9.7.1.2



1. At the locations with removed plugs, attach a **Mounting Bracket (C)** using **M8 x 20mm Hex Bolts (A)** and **M8 Hex Nuts (B)**.

9.7.1.3



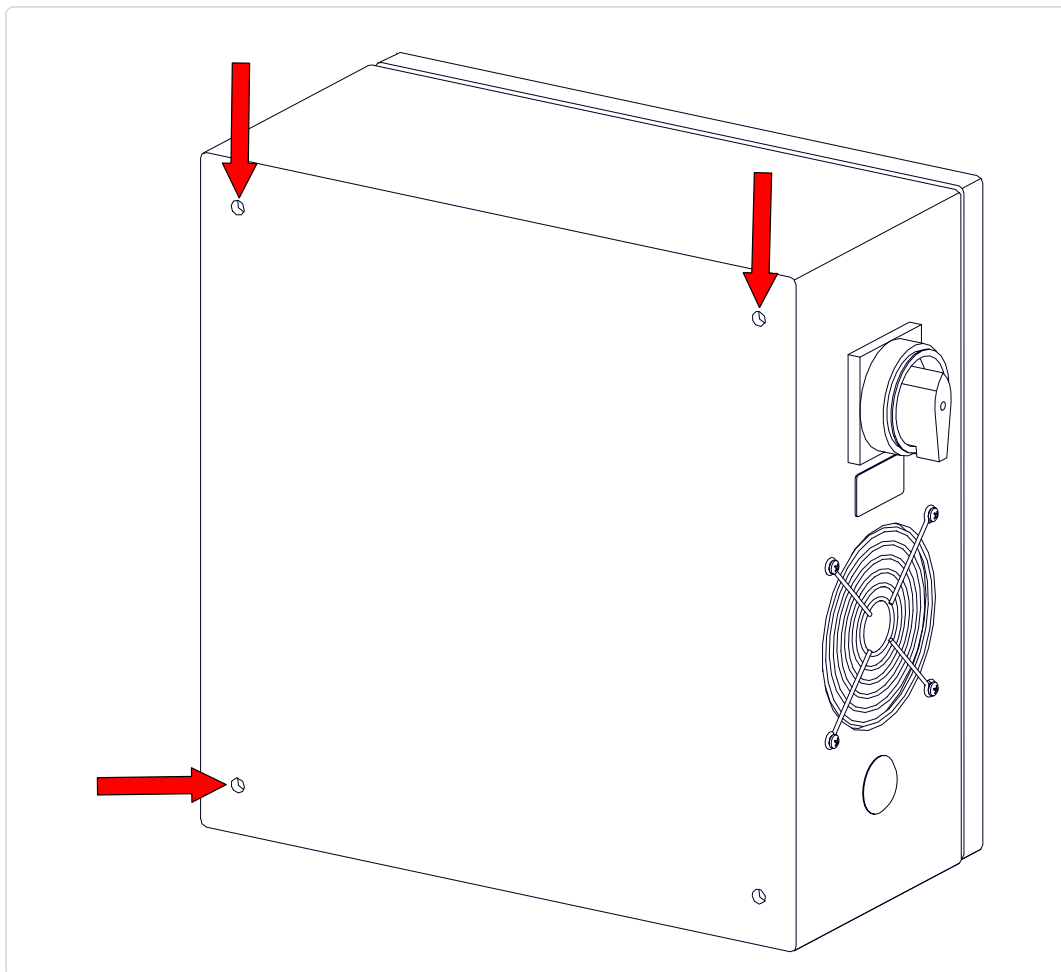
1. Attach the CNC control box to the leg kit using **M8 x 25mm Set Screws (D)**, **M8 Hex Flange Nuts (E)**, and **M8 Roll-in T-Nuts (F)**.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, attach the CNC control box to the left side of the machine.

9.7.2 - Plug and Play Spindle/VFD System

9.7.2.1

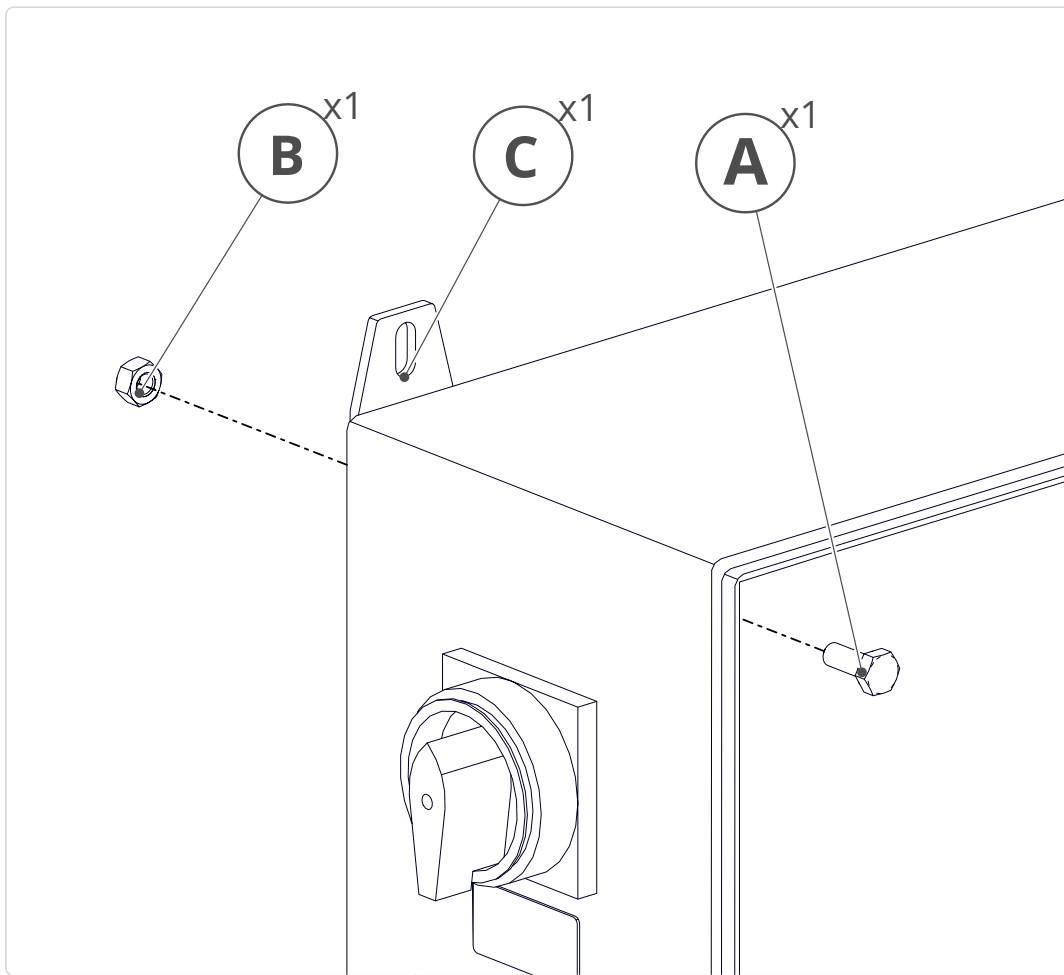


1. At the indicated locations, remove the plastic plugs from the Plug and Play Spindle/VFD Control Box.

↔ Alternate Cable Track Location

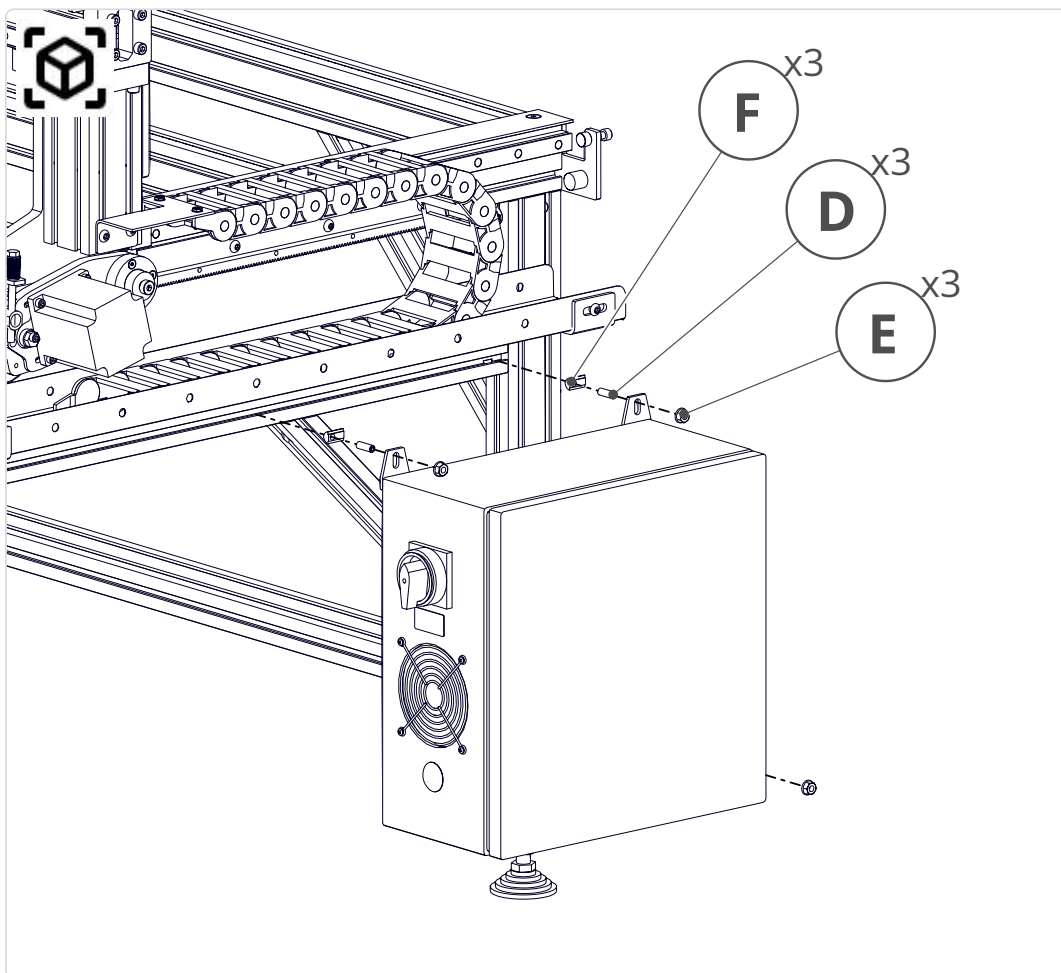
If locating the table cable track on the left side of the machine, remove the plug from the bottom right instead of the bottom left.

9.7.2.2



1. At the locations with removed plugs, attach a **Mounting Bracket (C)** using **M8 x 20mm Hex Bolts (A)** and **M8 Hex Nuts (B)**.

9.7.2.3



1. Attach the VFD control box to the leg kit using **M8 x 25mm Set Screws (D)**, **M8 Hex Flange Nuts (E)**, and **M8 Roll-in T-Nuts (F)**.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, attach the VFD control box to the left side of the machine.

9.7.3 - Laser Controller

If you are adding a Laser Kit, visit [Laser Assembly](#) to mount the Laser controller, then return to this document.



9.8 - Cable Management

Parts List

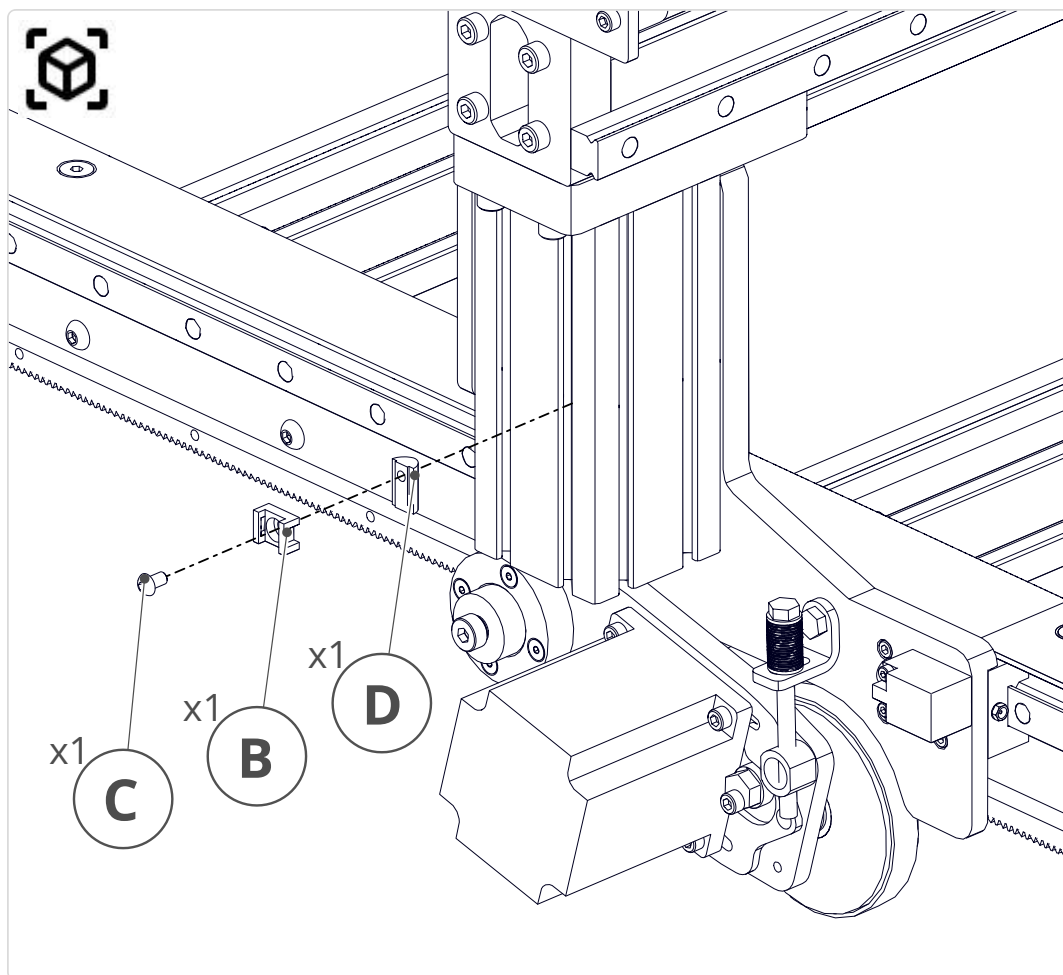
ID	QTY	Part/Description	Package Label
(A)	1	CRP150-07 Cable Bracket	Cable Track
	1	CT-PRO-FAST-20.2	Cable Track
(B)	3	Cable Tie Mount	CT-PRO-FAST-20.2 >
(C)	3	M6 x 10mm Button Head Cap Screw	CT-PRO-FAST-20.2 >
(D)	3	M6 Roll-in T-Nut	CT-PRO-FAST-20.2 >
(E)	2	M8 x 12mm Button Head Cap Screw	CT-PRO-FAST-20.2 >
(F)	2	M8 Roll-in T-Nut	CT-PRO-FAST-20.2 >

Tools List

Requirement	Tool
Required	3mm Allen Wrench
Required	5mm Allen Wrench
Recommended	Cable Ties

9.8.1 - Cable Tie Mounts

9.8.1.1

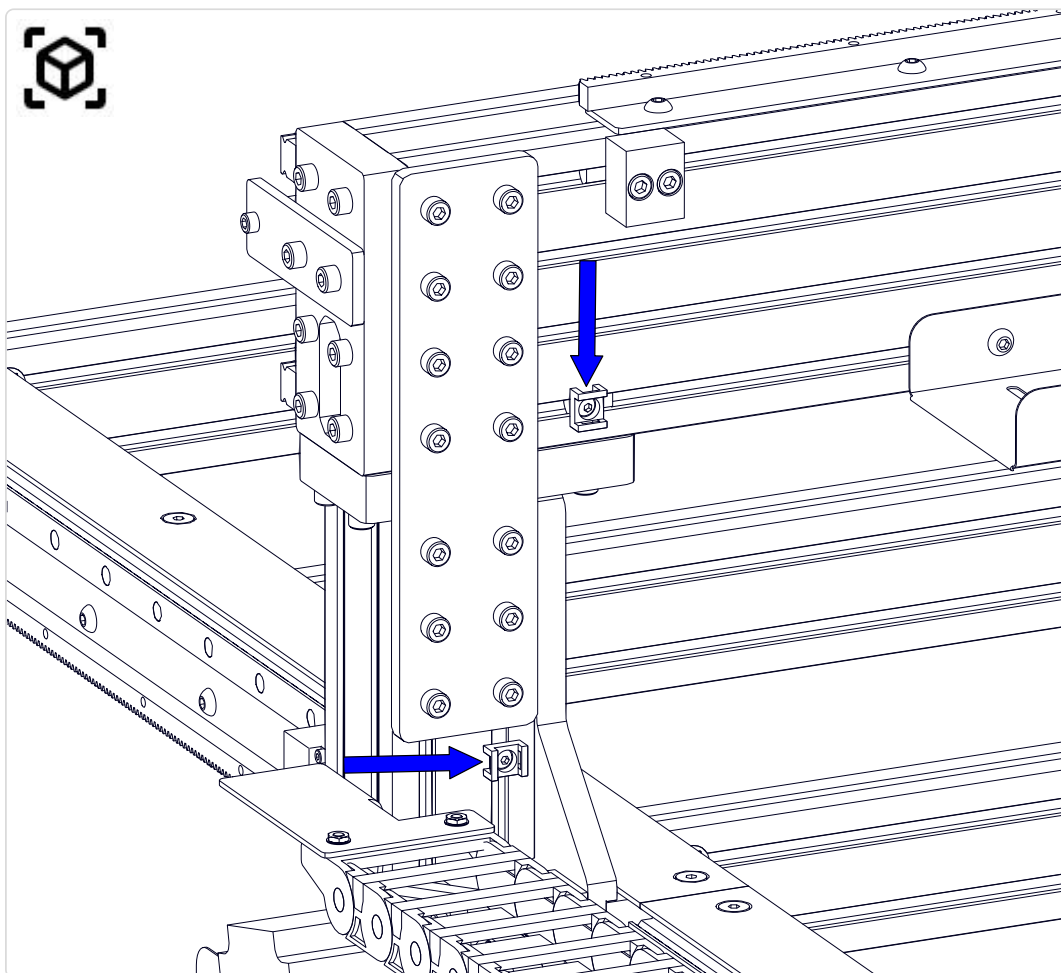


1. Attach a **Cable Tie Mount (B)** to the riser extrusion using an **M6 x 12mm Button Head Cap Screw (E)** and **M6 Roll-in T-Nut (F)**.

↔ Alternate Cable Track Location

If locating the table cable track on the left side of the machine, attach the the cable tie mount on the opposite side of the machine.

9.8.1.2

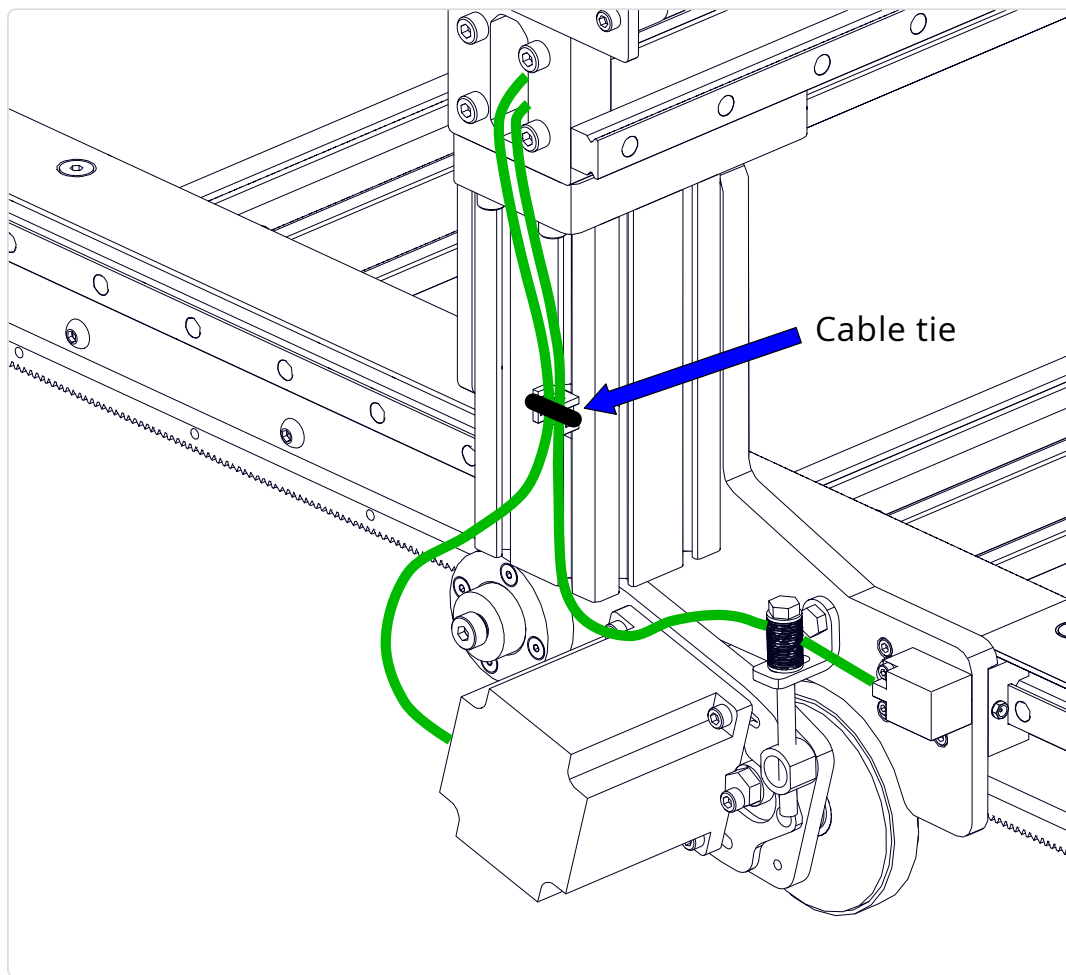


1. Repeat previous step to attach two additional cable tie mounts at the indicated locations.

↔ Alternate Cable Track Location

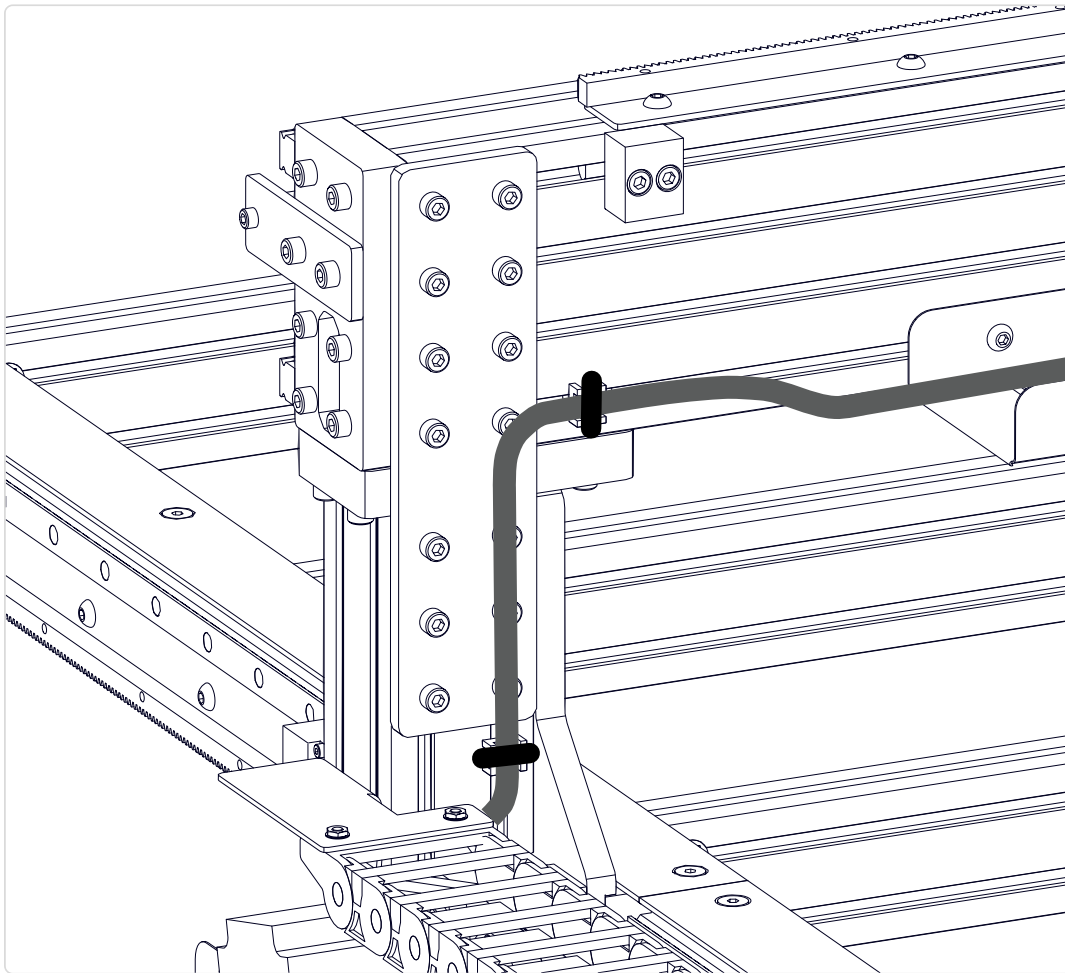
If locating the table cable track on the left side of the machine, attach the cable tie mounts on the opposite side of the machine.

9.8.1.3



1. Use a cable tie to secure the Y- sensor cable and Y1 motor cable to the cable tie mount.

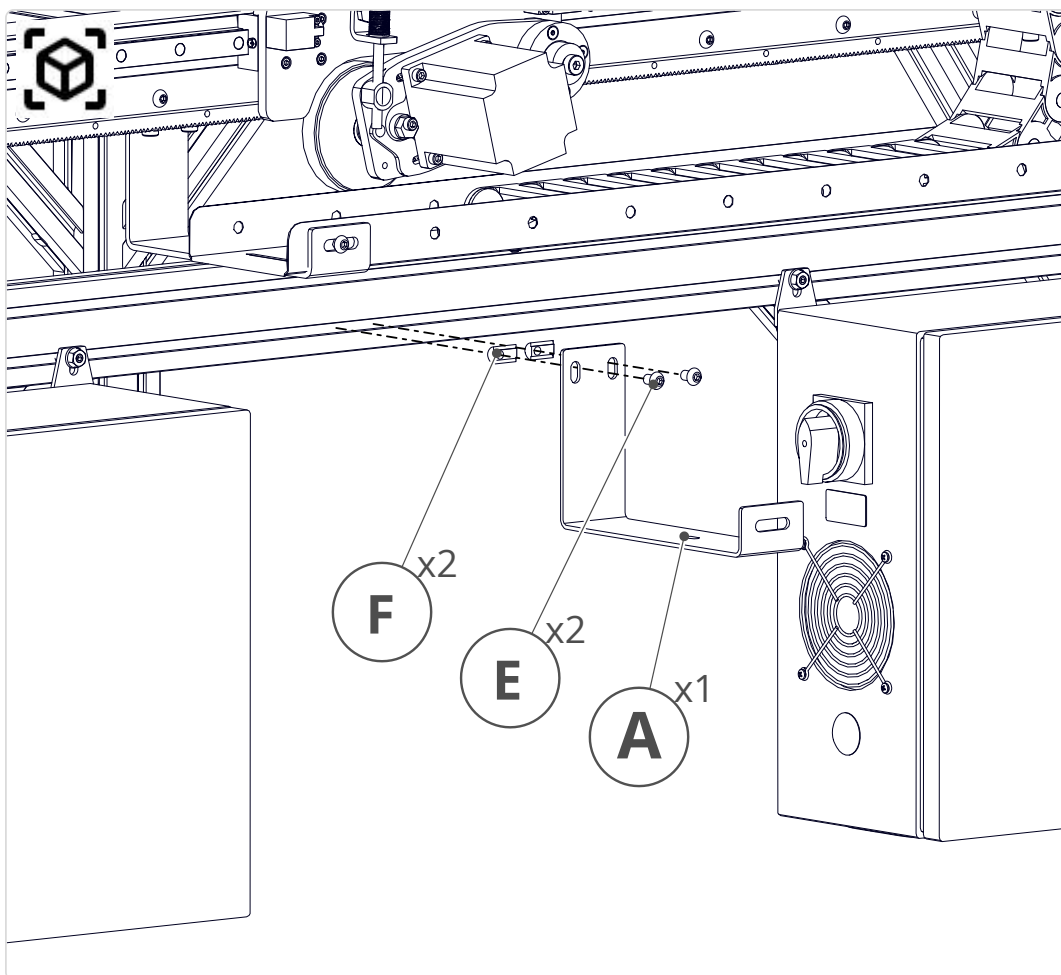
9.8.1.4



1. Use cable ties to secure the cables routed from the gantry cable track to the table cable track.

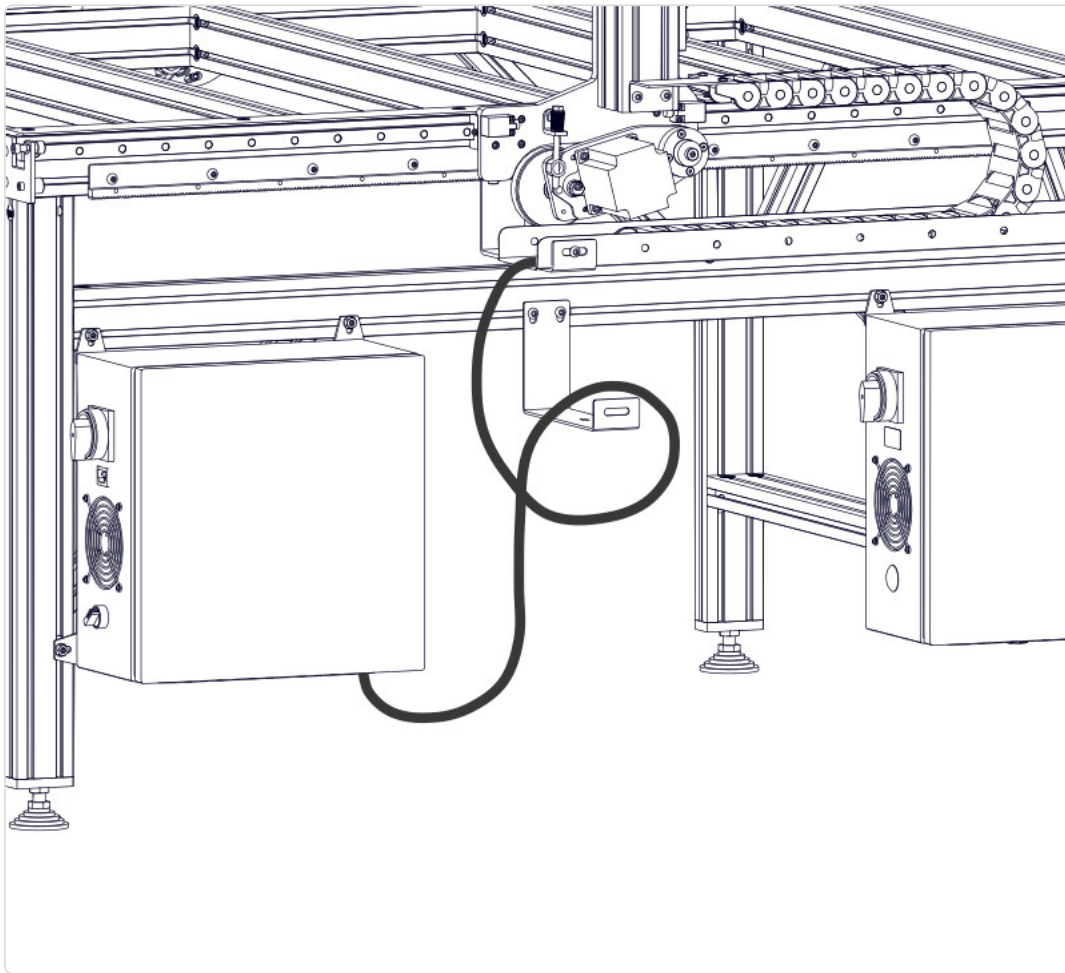
9.8.2 - Cable Bracket

9.8.2.1



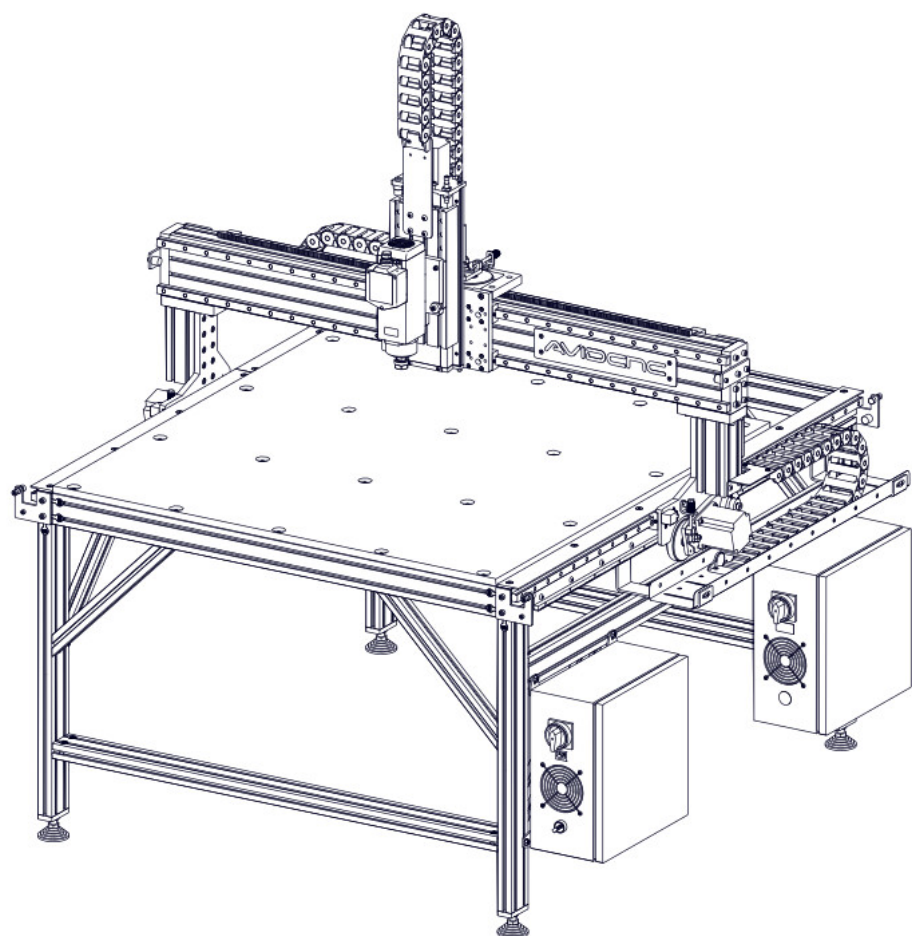
1. Attach the **CRP150-07 Cable Bracket** (A) to the electronics mounting bar using **M8 x 12mm Button Head Cap Screws** (E) and **M8 Roll-in T-Nuts** (F).

9.8.2.2



1. Coil any excess length of cables and hang on the cable bracket.

10. Machine Setup



10.1 - Final Assembly

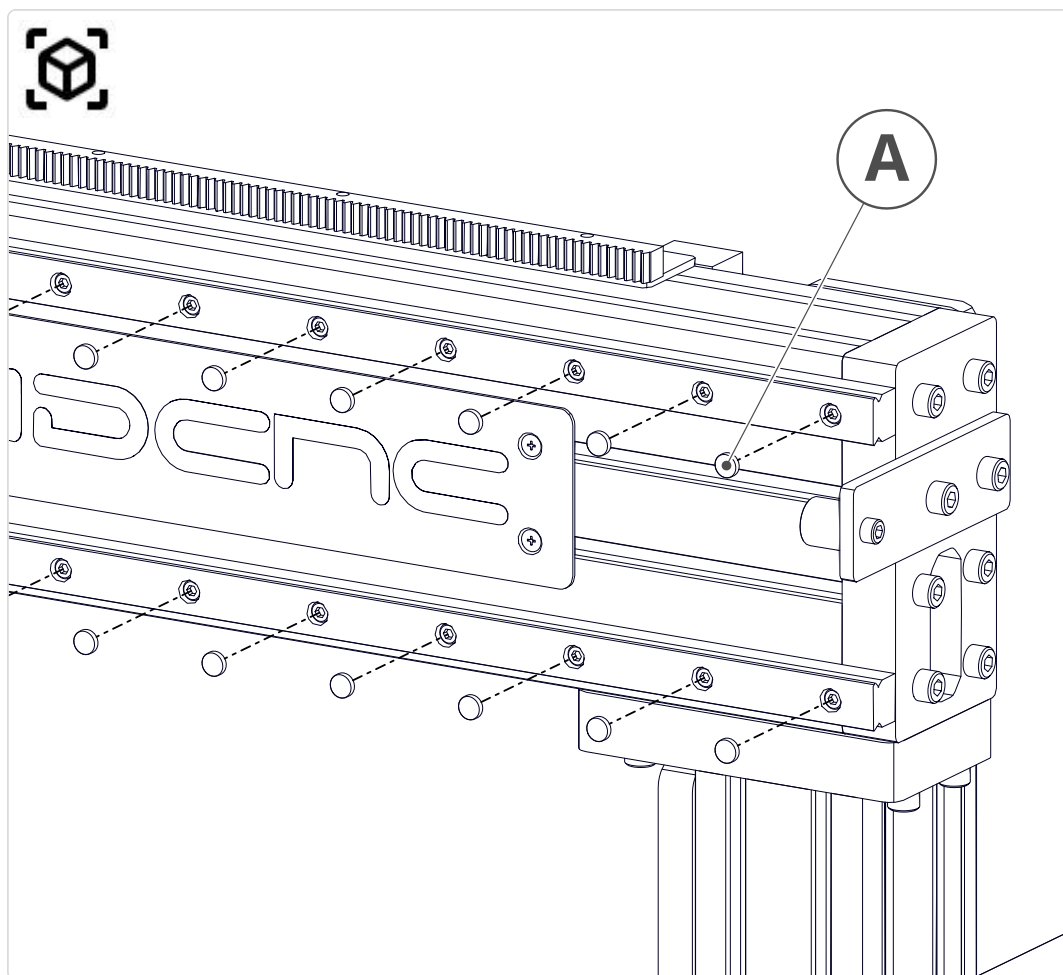
Parts List

ID	QTY	Part/Description	Package Label
A	182	GHH20-COVERS Linear Rail Hole Cover	Base Table Kit



10.1.1 - Linear Rail Hole Covers

10.1.1.1



1. Install a **GHH20-COVERS Linear Rail Hole Cover** (A) in each hole of the linear rails.
2. Repeat this process for both the table and gantry linear rails.

Assembly Note

We recommend install the linear rail hole covers after your machine is assembled and running.

10.2 - Next Steps

- **Plug & Play CNC Control System Technical Manual**
(<https://www.avidcnc.com/support/instructions/electronics/pnp/manual/>)
Basic use instructions, major component overview and safety mechanisms for the Avid CNC controller.
- **Spindle / VFD System Technical Manual**
(<https://www.avidcnc.com/support/instructions/accessories/spindles/setup/CRP800setup/>)
System requirements and initial setup information.
- **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.



10.3 - Spoilboard

Parts List

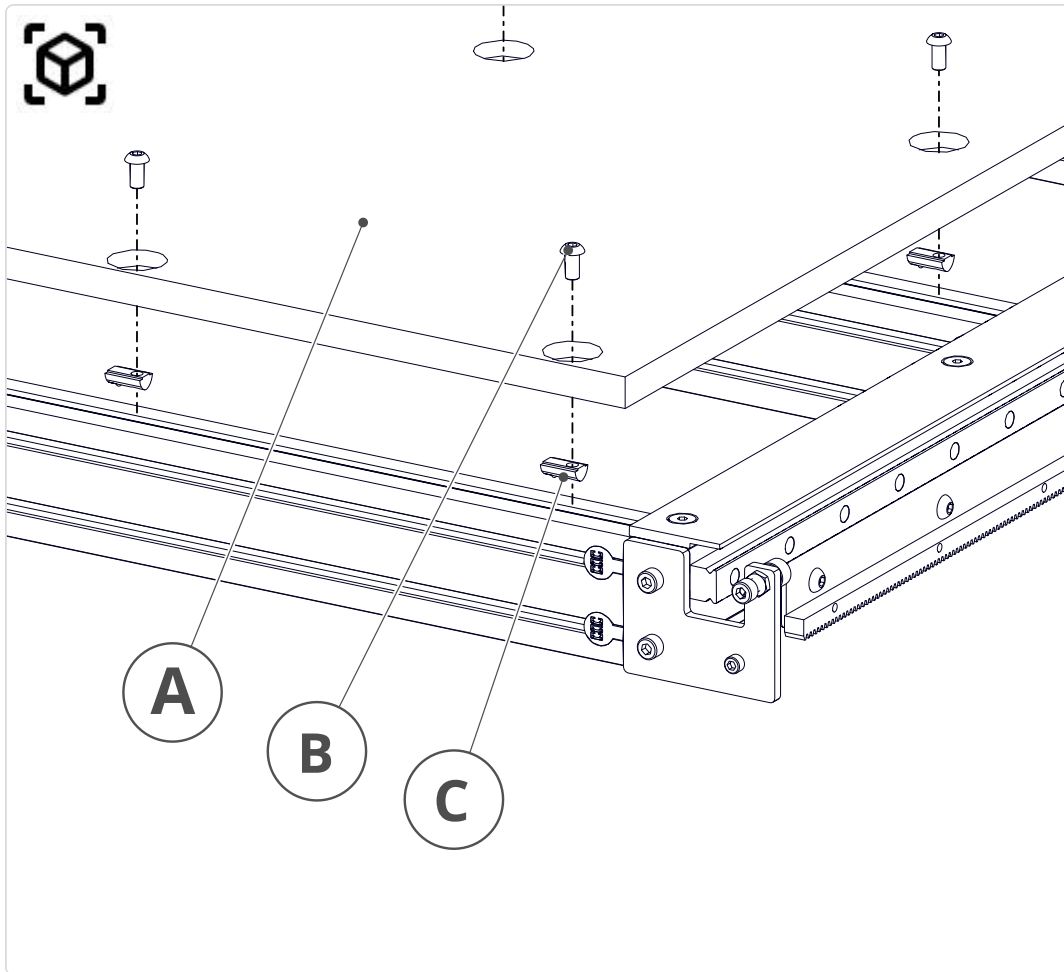
ID	QTY	Part/Description	Package Label
(A)	1	Spoilboard (<i>not included</i>)	
	1	CRP816-00-60120 Spoilboard Fastener Kit	Base Table Kit
(B)	54	M8 x 16mm Button Head Cap Screw	Spoilboard Fastener Kit >
(C)	54	M8 Roll-in T-Nut	Spoilboard Fastener Kit >

Tools List

Requirement	Tool
Required	6mm Allen Wrench

10.3.1 - Spoilboard Installation

10.3.1.1



1. Attach the Spoilboard (A) to the table crossmembers using M8 x 16mm Button Head Cap Screws (B) and M8 Roll-in T-Nuts (C).