Dominator CNC

Assembly Manual

https://pwncnc.com | 479-480-4337 | support@pwncnc.com

Changes:

1/9/2026

- Fixed issues with front legs call-outs. Swapped leg D and E
- Adjusted the initial steps regarding legs assembly to be more clear and precise.

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Table of Contents

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Last Updated 1/9/2026

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Introduction

🛠️ Welcome to the Dominator CNC Assembly Manual

Thank you for choosing the **Dominator CNC** — a machine built for precision, power, and performance. Whether you're a seasoned maker or diving into your first advanced CNC build, this guide is here to walk you through every step of the assembly process with clarity and confidence.

This manual includes:

- Clear step-by-step instructions
- Helpful tips and tool recommendations
- Visual references for each stage of assembly
- Safety guidance and setup best practices

We've designed the Dominator to be both rugged and refined — and putting it together should reflect that same balance. Take your time, follow the instructions closely, and don't hesitate to reach out if you need help along the way.

💬 Need support? Contact us anytime at support@pwncnc.com

📌 Checkout our Video Build Series: https://pwncnc.com/dominator-pro-build

Last Updated 1/9/2026

What's in the Box(s)

Your **Dominator CNC machine** ships in multiple boxes, each containing specific components. To keep things organized, here's a breakdown of what to expect:

1. 8020 Drop-Shipped Boxes

These arrive directly from 8020 and contain:

- Aluminum extrusion profiles
- Fasteners, brackets, and hardware for frame assembly
- Additionally, you may have upgrade packages, each of which should also be from 8020.

Receiving 8020 Drop-Shipped Boxes

We've partnered up with 8020 primarily because we're a small mom-n-pop shop. We do not have the infrastructure to handle thousands of pounds of aluminum extrusions that go into our Dominator Machine. This partnership is advantageous for all of us but is not free of some trouble spots.

As you're receiving the Drop-Shipped packages, please check off what you purchased with the following. If anything is missing, please bring it to our attention asap via a support@pwncnc.com ticket.

What to look for:

The **Machine** itself will be tagged like this: **Z0-CMP-NP-NR20241227-1-B**(-BLACK)

The **Legs Kit** is tagged: **Z0-CMP-NP-NR20241227-5-B**(-BLACK)

The **Gantry Upgrade** is tagged: **Z0-CMP-NP-NR20241227-2-B**(-BLACK)

The **Bed Structure Upgrade** is tagged: **Z0-CMP-NP-NR20241227-3-B**(-BLACK)

The **Bed Rigidity Upgrade** is tagged: **Z0-CMP-NP-NR20241227-4-B**(-BLACK)

The **5th Leg Upgrade** is tagged: **Z0-CMP-NP-NR20250305-2**(-BLACK)

> *See https://support.pwncnc.com/kb/section/103/ for more photographs.*

You should find the tagged code somewhere on the packing list included with each shipment.
Use the above to check off and confirm that you've received everything you ordered.

2. Electronics Package *(aka PwnCNC Conversion Kit)*

This box includes all components needed to power and control your machine:

- CNC controller (Masso G3 Touch)
- Stepper motors (2Nm or 3Nm; with the Z stepper having an embedded brake)
- Stepper Cables

- Proximity Switches and Cables
- Power Box and cord

3. Linear Motion System

This package includes:

- Linear rails (X, Y, and Z axes)
- Ball screws (preassembled with Bearing blocks, couplers, and related motion hardware)

4. Custom Machined Components, Cable Chain Parts, & Assembly Hardware

In this box, you'll find:

- Precision-machined and in-house anodized aluminum brackets and plates
- Hardware baggies (organized by step or section)
- Cable Chains and Brackets

5. Z-Carriage, Manual, and Misc

The rest of our machine components can be found in here:

- Z-Carriage & Z Proximity Switch Bracket
- One or more 80mm Spindle Mounts depending on your order
- Gantry LED Light and Cable
- Free Gifts and Extras
- Dominator Assembly Manual

📌 *Tip:* Before beginning assembly, we recommend unpacking and verifying the contents of each box against your packing list included with each shipment.

Required Tools & Workspace Setup

Required Tools

Most components in this kit are designed for ease of assembly with standard tools. Here's what you'll need:

- **Metric Hex Key Set** (Allen wrenches)
    - Custom PwnCNC hex wrenches are included in the kit for convenience
- **Open-End Wrenches or Adjustable Wrench**
- **Precision Square or Framing Square** (for aligning extrusions)

- **Digital Caliper** (for calibrating Axes and helpful for fine tuning)
- **Rubber Mallet** (for seating extrusions or bearings gently)
- **Utility Knife or Scissors** (for opening packaging)
- **Wire Cutters or Scissors** (for cable routing or spindle connections)
- **Zip Ties or Velcro Straps** (for additional cable management)

Recommended Workspace Setup

To assemble your machine comfortably and accurately, we recommend the following:

- A **clean, flat, and level work surface** (ideally 5'x5' or larger depending on machine size)
- Adequate **lighting** for detailed work
- Access to **standard 120V or 220V power** (depending on spindle and VFD requirements)
- Room to move around all sides of the machine

⚠️ *Pro Tip:*
As this is a large-format machine, **assembly is easier with two people**, especially when positioning the gantry or managing long extrusions.

⚠ Safety Guidelines

Your safety is our top priority. Please review and follow the guidelines below before assembling or operating your Dominator CNC machine.

During Assembly

- **Disconnect Power:**
  Always ensure the system is **unplugged** before connecting electronics or handling wiring.
- **Use Proper Tools:**
  Only use tools recommended in this manual. Avoid makeshift tools or forcing hardware into place.
- **Secure the Workspace:**
  Assemble the machine on a **flat, stable surface** in a well-lit area free of clutter and distractions.
- **Lift with Care:**
  Some components, especially extrusions and the gantry assembly, are heavy and awkward to handle alone. Ask for assistance when needed to avoid injury.

- **Eye Protection Recommended:**
  Wear **safety glasses** when cutting zip ties, trimming cable insulation, or performing tasks that may involve flying debris.

⚙️ During Operation

- **Do Not Operate Unattended:**
  Never leave your CNC machine running while unattended. Unexpected tool crashes, part shifts, or electrical issues can occur quickly.
- **Keep Hands Clear:**
  Stay clear of all moving parts during operation. Do not reach into the cutting area while the machine is powered on.
- **Secure Your Workpiece:**
  Always use proper clamping or fixturing to prevent materials from shifting mid-job.
- **Wear Hearing Protection:**
  Prolonged exposure to CNC operation, especially when cutting hard materials, can be loud. Ear protection is recommended.
- **Check Before Each Run:**
  Inspect tool paths, bit tightness, and workholding before starting any carve.

⚡ Electrical Safety

- **Respect Voltage Ratings:**
  Confirm your power setup matches the system's voltage requirements (e.g., 110V or 220V). Incorrect power may damage components or cause harm.
- **Avoid Wet Environments:**
  Keep the machine, VFD, and controller **dry and away from liquids**.
- **Use Proper Grounding:**
  Ensure your spindle, controller, and VFD are properly grounded to avoid shock hazards or interference.

✅ *Stay alert, take your time, and if you're unsure about a step—pause and consult the manual or contact support@pwncnc.com*. Safety is key to long-term success with your CNC machine.

Legs Kit Assembly (if applicable)

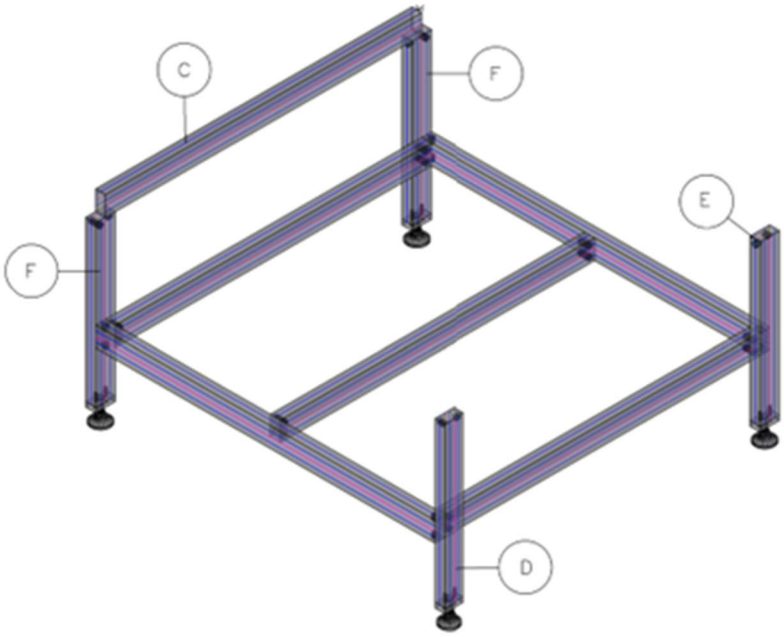
If you purchased the **Dominator Legs Kit**, begin your build here. Assembling the stand first provides a stable foundation for the rest of the machine and ensures proper alignment during frame assembly.

1. Lay out all of the extrusions and parts as described in the next section.
2. Pay particular attention to the orientation of each anchor hole and the direction they should point before tightening anything. *This is detailed on the next page*.

Identifying Extrusions & Fasteners

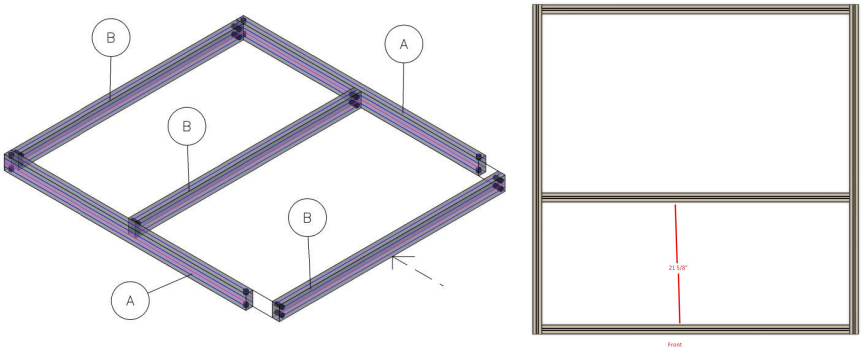
The Legs Kit will include 9 or 10 extrusions, depending on your machine size. Use these images to identify which extrusions go were.

(2) A Extrusions 54 ¼”– shelf frame
(3) B Extrusions 50 9/16” w/double anchors on either side – shelf frame
(1) C Extrusion 50 9/16”
(1) D Extrusion 25 9/16”
(1) E Extrusion 25 9/16”
(2) F Extrusions 25 9/16”
(4) Feet & Plate along with various hardware



Assembling the Shelf

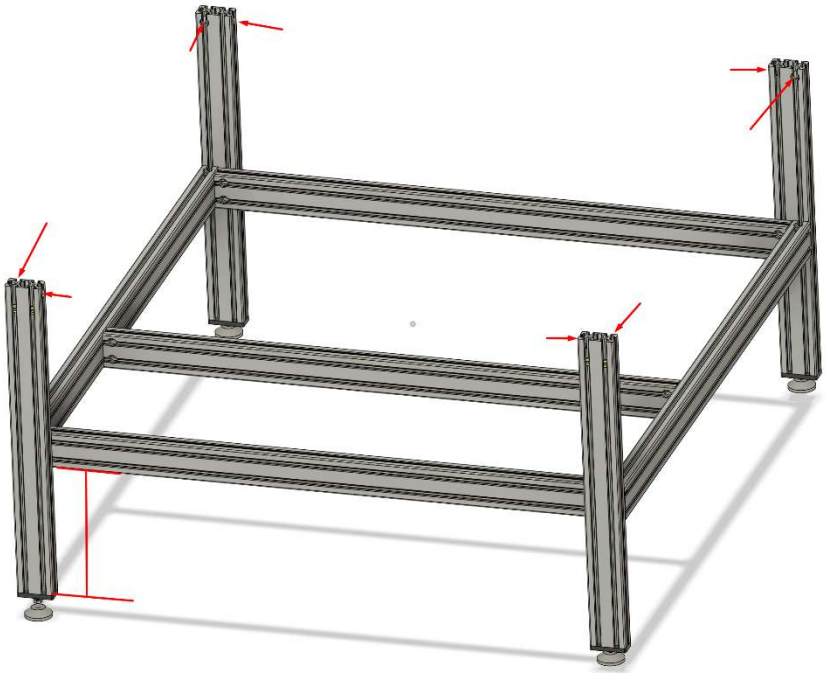
Start by laying out the A extrusions and B extrusions and retrieve the anchoring hardware from the 8020 packages. Using the anchor hardware, attach the extrusions as follows, leaving a 18.5” gap between front two B extrusions. This will allow you to easily add the 5th leg upgrade later if you add it later.



18.5” Front Shelf-Gap between two B’s.

Leg Assembly

Read the next few pages as there are several important points we'd like to make before you tackle this stage.

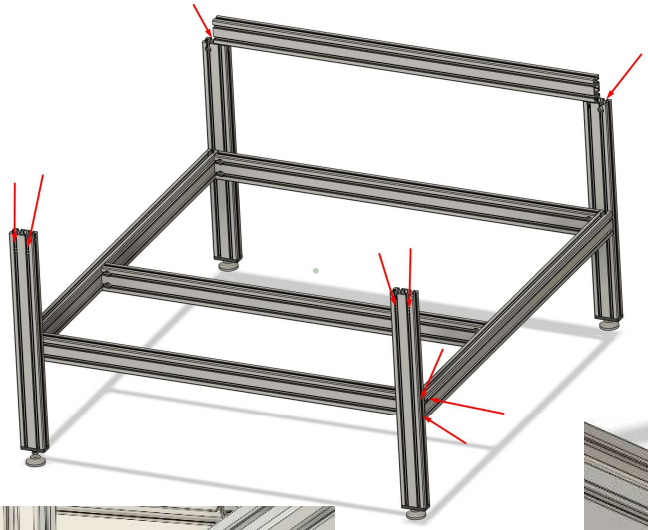


Next, you'll attach each of the 4 leg extrusions to the shelf-assembly leaving an 8" gap between the bottom of the shelf-assembly and the bottom of the leg extrusion shown below. This 8" gap will be important during leveling later.

Note that there are two threaded holes on the "bottom" of each leg extrusion this is where the footplates should be mounted. Also pay particular attention to the anchor holes at the top of each leg; See the image to the right with it's red arrows for proper orientation.

For some folks, the rear-legs have an extra anchor in the back, ignore this as it will not be used.

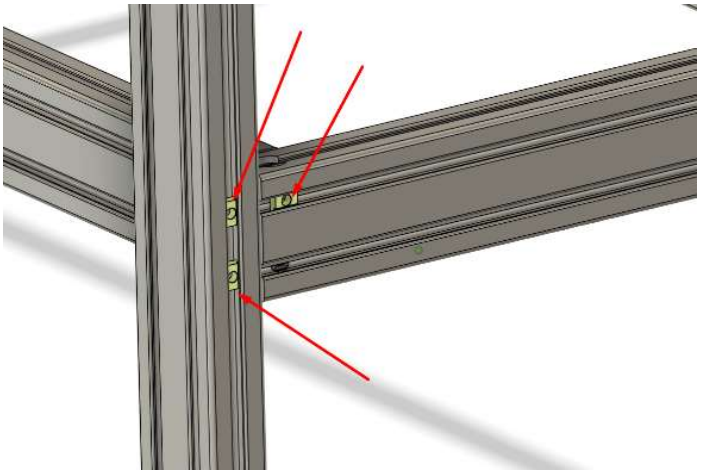
Pre-placing T-Track Nuts



In the rear legs, (2) M8 slide-in t-nuts one on either leg in the outer rear tracks.

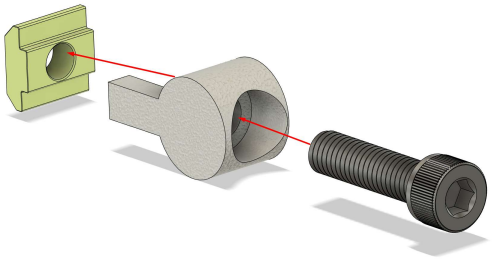
In the front legs, (4) M8 slide in t-nuts two in each leg in the front tracks.

If you're mounting the controller on the right, then insert two in the right side t-track of the right leg. Also slide a t-nut into the A extrusion along the side.

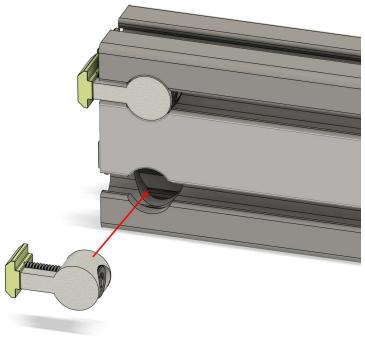


Anchors

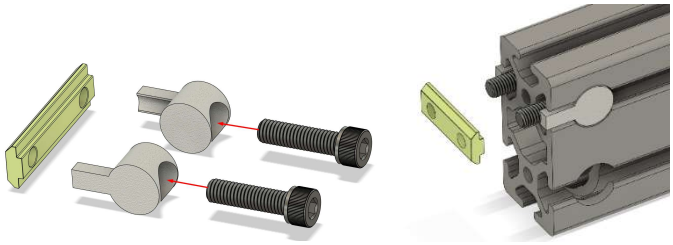
8020 uses anchors to securely attach extrusions together. According to them, there is no better and rigid method. There are a few things you should know when working with them:



It is best to loosely pre-assemble anchors prior to inserting them into extrusions.

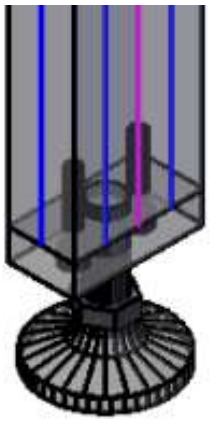


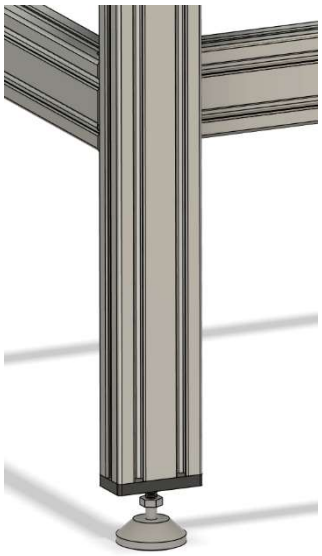
The main exception to this is with “double” anchors. In this case, it’s better to assemble the screw and anchor together first, insert them into the extrusion, then loosely attach the double t-nut.



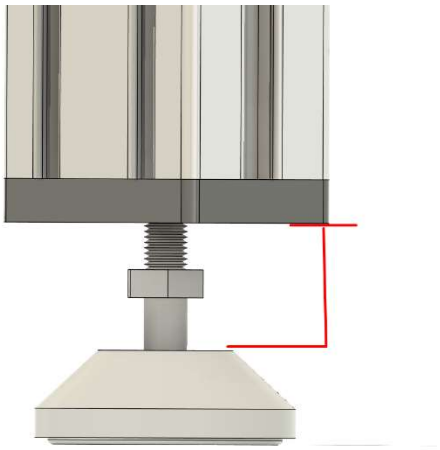
Attaching Feet

On the bottom of each leg will be a foot-plate that each leveling foot will mount onto.





Leveling



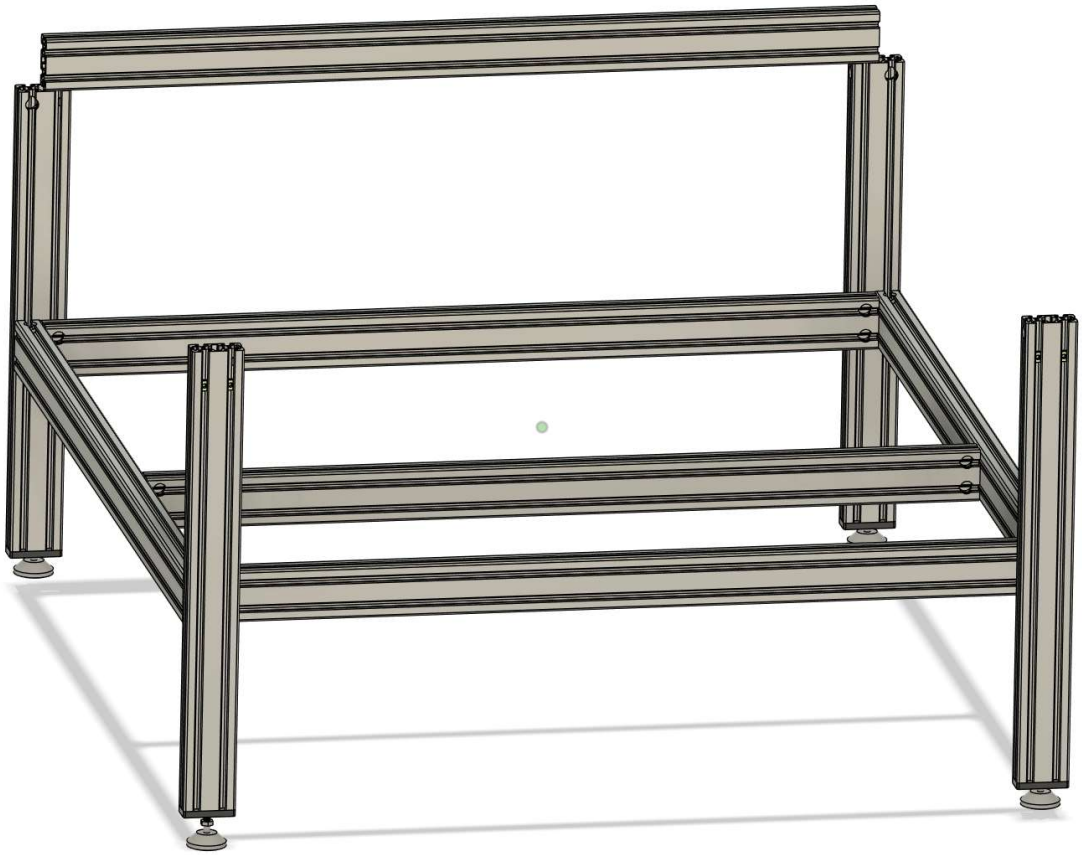
Leveling is a critical step in setting up any CNC machine. If you've already set the shelf-to-leg gap to exactly **8"** on all four legs, you're ready to move on. Use a **leveling square** or bubble level to check the shelf, and adjust each of the four **leveling feet** as needed to achieve a stable and level foundation.

Consider leaving an inch or so of threading exposed so you can easily adjust later.

Thread the nut up to the base plate to lock the leveling feet into position.

Attaching the Rear Brace

Finally, install the **horizontal rear brace extrusion** at the back of the frame.
Leave the hardware **slightly loose** for now so the rear-brace extrusion can be adjusted if necessary—you'll fully tighten it **after the machine bed is installed and aligned.**

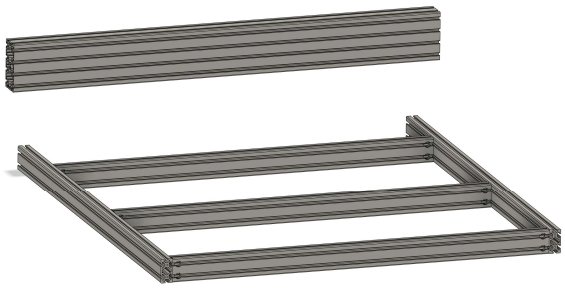


Bed Frame Assembly

The bed frame is the foundation of your Dominator Pro CNC machine, and assembling it correctly is critical to overall performance, precision, and reliability. In this section, we'll walk you through identifying extrusion profiles, aligning components, and securing the base structure. Take your time and follow each step closely to ensure a square, level, and rock-solid frame.

Identifying Extrusions & Fasteners

For the main frame of your machine's bed, you will have 5 extrusions plus one large extrusion for the gantry.



Large Gantry Extrusion:
(1pc) 57 ¼" long

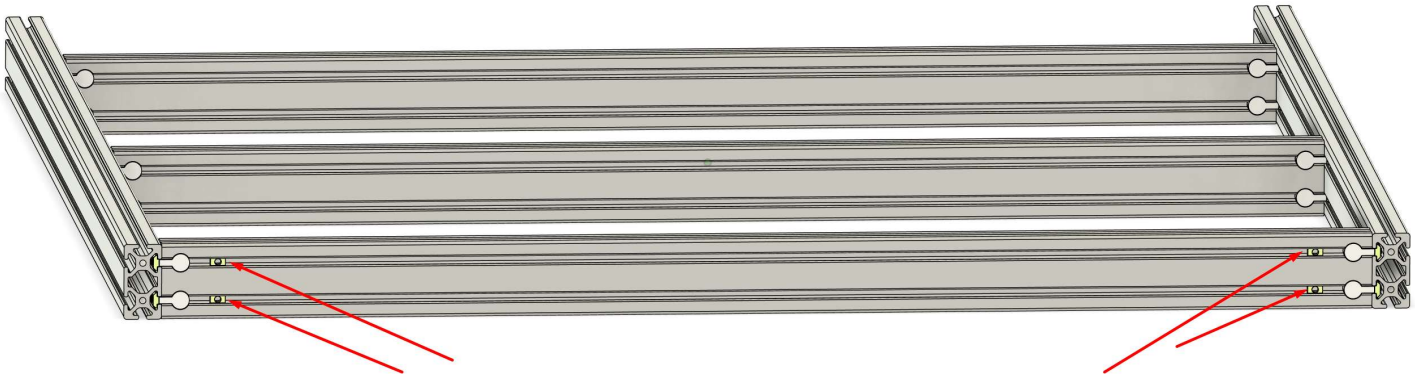
Y Extrusions:
2x4 = (2pc) 33 1/5" long
4x4 = (2pc) 57 2/5" long

X Extrusions:
2x4 = (2pc) 50 9/16" long
4x4 = (3pc) 50 9/16" long

Main Gantry Extrusion with M8 threaded holes on either side.
Y Extrusions – These will have two M8 threaded holes on either end.
X Extrusions – These will have 4 holes on both faces of the extrusion for the anchors to seat.

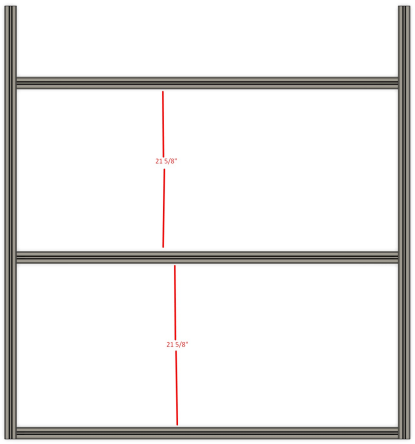
Assembling the Base Frame

Important Note: Insert (4) M8 T-Track nuts into the front machine extrusion. These are used to hold the "Y Front" aluminum panels in a later step. You should find these in "**Y Front Plate**" hardware baggie.



💡 *Pro Tip:* Also consider adding a few on-top from the "extras" hardware bag for securing your initial MDF bed base-layer. More specifically in the top-track of all three X extrusions add 3 or 4 slide-in M6 t-nuts. This will give you something to screw into when securing a basic MDF bed for your top-surface.

Begin by laying out the **Y-axis** and **X-axis extrusions**, and gather the **anchor hardware** included in the 8020 packaging. Using this hardware, assemble the frame by attaching the extrusions as shown—be sure to maintain a **21 5/8" gap between the two X-axis extrusions** for proper spacing.



2x4:
Gap 20 3/5" / Rear Gap 9 7/16"

4x4:
Front Gap: 21 5/8"
Middle Gap: 21 5/8"
Rear Gap: 9 7/16"

If you have the Legs Kit, the middle X extrusion should be directly above the shelf's middle X extrusion.

💡 *Pro Tip:* **Do not tighten until fully assembled.** For best results, assemble and secure the extrusions on a **flat and level surface**. This ensures the frame stays properly aligned and square when tightening with the included anchor hardware.

Attaching to Legs Kit (if applicable)

If you've already assembled the **Legs Kit**, now is the perfect time to **recruit a friend** to help carefully lift and place the **machine bed frame assembly** onto the stand. Teamwork makes this step easier and ensures proper alignment without straining any components.

The **Legs Kit** includes hardware specifically designed to **secure the machine bed frame to the top of each leg**. This is also the right time to **fully tighten the rear brace extrusion** to complete the base structure.

Squaring & Leveling the Frame

With the main frame fully assembled—and attached to the **Legs Kit**, if purchased—this is the ideal time to ensure your machine is **square, level, and properly aligned**. Taking the time to do this now will improve cutting accuracy, reduce mechanical strain, and ensure smooth motion along all axes.

✅ What to Check

1. **Overall Frame Level**
    - Use a **carpenter's level or digital level** to check the bed surface.
    - Place the level across both **X-axis extrusions**, as well as **diagonally across the bed**, to identify any tilt or twist.
    - Adjust the **leveling feet** on the Legs Kit (if installed) or place shims under corners as needed.
2. **Cross-Frame Squareness**
    - Measure diagonally from **corner to corner** (front-left to back-right, and front-right to back-left).
    - These two measurements should be eual—if not, adjust the extrusion corners slightly until they are.
3. **X-Axis Bed Extrusion Parallelism**
    - Measure the **gap between the two X-axis bed extrusions** at multiple points along their length.
    - This spacing should consistently match your original layout (e.g., 21 5/8"). Any deviation may cause binding or misalignment in gantry motion.
4. **Front-to-Back Alignment (Y-Axis)**
    - Check that the **Y-axis bed extrusions** are parallel to one another and perpendicular to the X-axis.
    - Use a framing square at each corner to verify 90° angles.

🛠 Adjustment Tips

- If you're having trouble achieving perfect squareness, **loosen the anchor hardware slightly**, make small adjustments, then retighten and recheck.
- Minor leveling issues can often be resolved by **adjusting the leveling feet** or by slightly loosening and repositioning the leg brackets before final tightening.

📌 *Note:* A well-leveled and squared frame sets the foundation for everything else—gantry travel, linear-rail installation, and eventual carving precision. Take your time here for best results.

Linear Y Rails & Ball Screw Installation

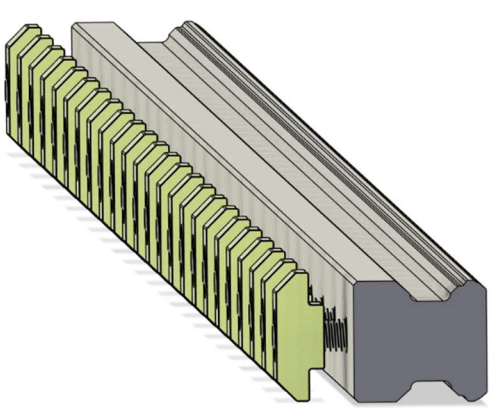
In this section, you'll assemble both the **left and right Y-axis systems**, including the **linear rail**, **ball screw**, and **front/rear Y plates**. We'll guide you through aligning and securing everything to create a smooth and stable motion system.

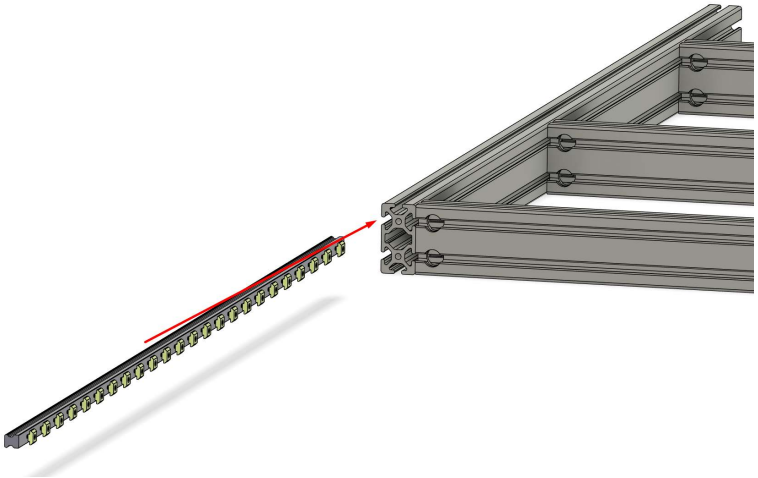
Installing Y-Axis Linear Rails

This process will be completed on **both sides of the machine**, but for now, **focus on the left side**.

Locate one of the four **linear rails** and the hardware bag labeled **"Y Linear Rail."** Inside, you should find **M4x20 socket head screws** and **M4 T-nuts**.

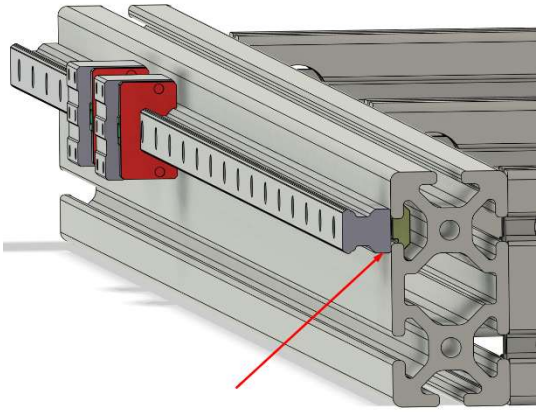
Begin by inserting an **M4x20 screw** through one of the holes in the linear rail, then **loosely thread on an M4 T-nut** from the back.
Repeat this process until **all holes in the rail are filled** with screws and T-nuts. Do not tighten yet—final alignment will be completed once the rail is positioned.





Next, **carefully slide the linear rail assembly into the left-side extrusion**, using the **top T-track channel**. Move slowly and make sure each **T-nut aligns correctly** as you guide the assembly into place from **front to back**. Taking your time here will ensure a secure and accurate fit.

With the **linear rail now seated flush against the front face of the extrusion**, it's time to **accurately align and securely fasten** it in place.



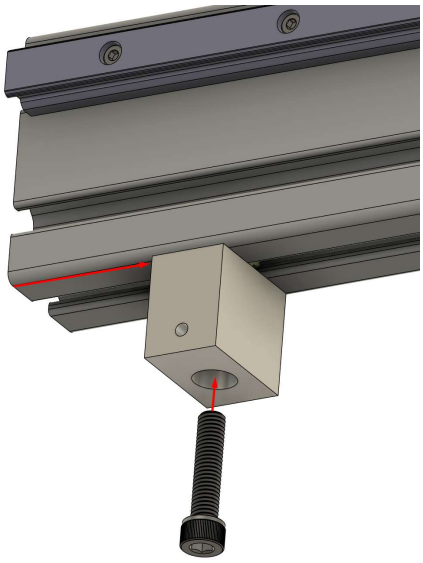
Starting at one end, ensure the rail remains straight and even along its full length. **Tighten each M4 screw gradually**, working from front to back, while double-checking that the rail stays firmly against the extrusion surface. A consistent, snug fit here is essential for smooth Y-axis motion.

Be careful not to allow the bearings to slide off from the linear rail.

Installing the Y-Axis Ball Screw Assembly

Prepare BK12's Y-Bracket

For this step, you'll need: **(1) Aluminum Bracket, (1) M8x35 Socket Head Screw, and (1) M8 T-Nut**.



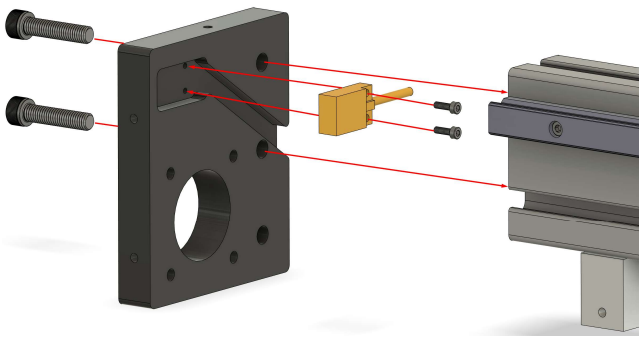
No **Legs Kit** (Left Picture) position the block **roughly 2"** from the rear end of the extrusion.

If you're using the **Legs Kit** (Right Picture), you can position the aluminum bracket **½" away from the rear**.

Thread the M8 screw into the T-nut and insert it into the extrusion but **leave it slightly loose** for now—**you'll fully tighten it in a later step**.

Installing the Rear Y Plate

The rear Y plate attaches with (2) M8x35 Socket screws, but before attaching you should pre-install the Proximity switch using (2) M3x10 Socket Screws.



The 3rd rear screw is (1) M8x25 socket and screws into the M8 t-nut you preinstalled into the rear leg.

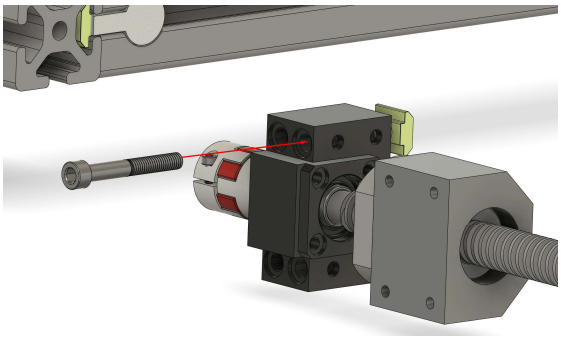
Run the proximity switch wire down the groove so it exits on the inside of the extrusion.
We will attach a cable in a later step.

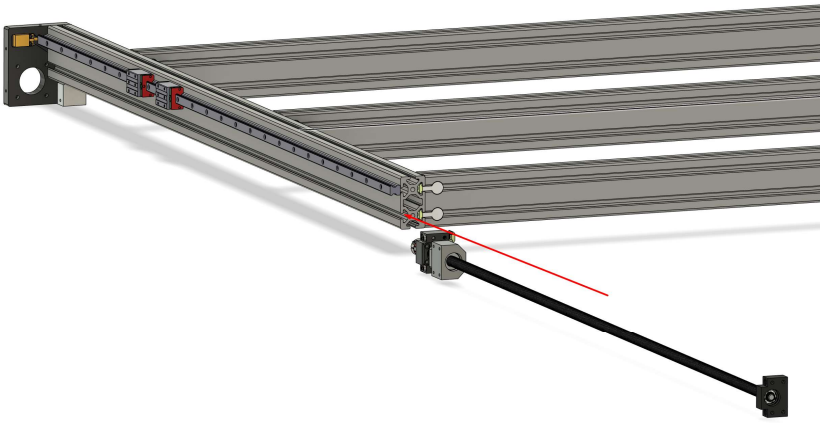
Installing the Ball Screw Assembly

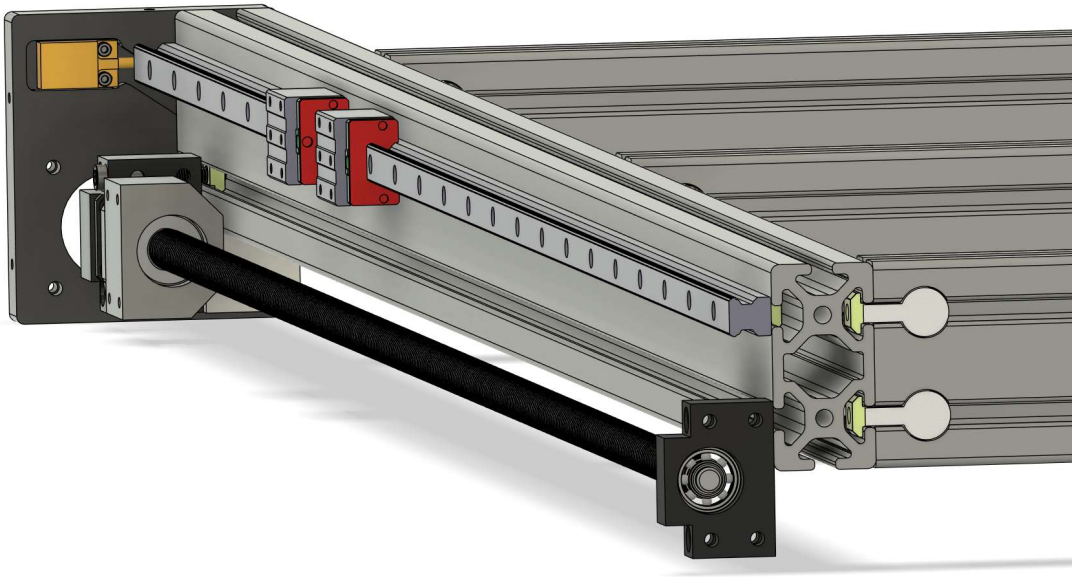
The **ball screw assembly** comes mostly pre-assembled for your convenience. To begin:

1. Insert **(1) M6x40 socket head screw** into the hole shown below and **loosely thread an M6 T-nut** onto the opposite side.
2. Slide the **T-nut into the lower T-track** of the **Y-axis extrusion**, then guide the entire ball screw assembly **toward the rear** of the machine.
3. Align the **front bearing block (BF12)** so that it sits **flush with the front edge** of the machine.

Once in position, have a **friend hold the ball screw in place** while you proceed with installing the **Front Y Plate** in the next step.

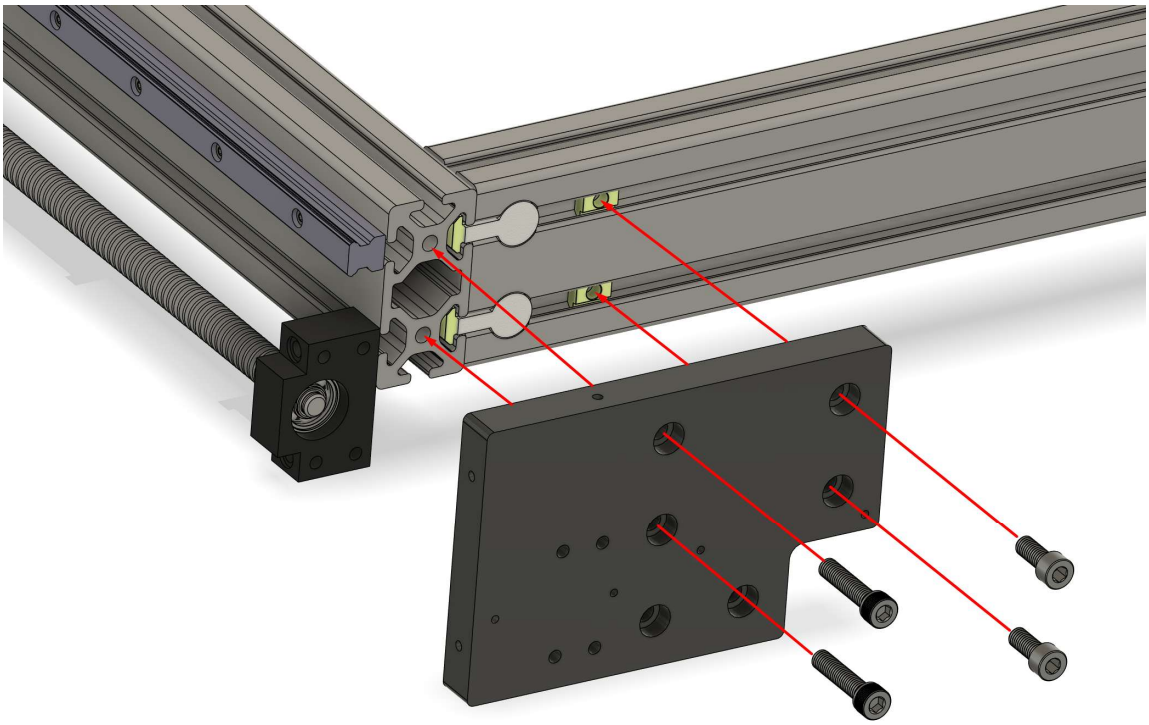




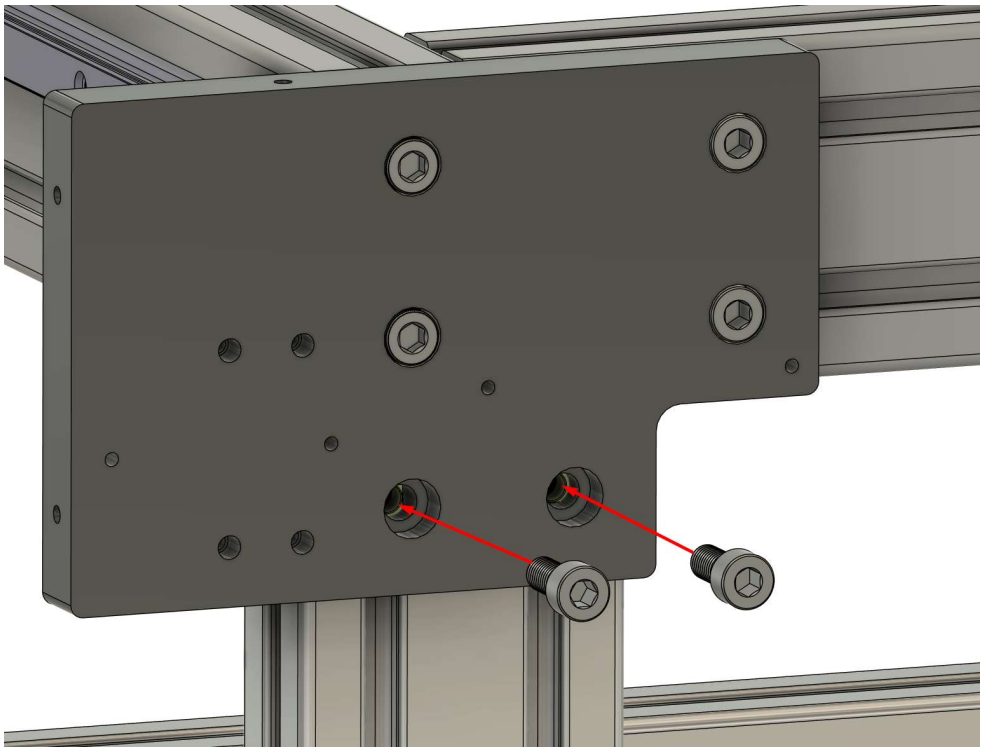


Installing the Front Y Plate

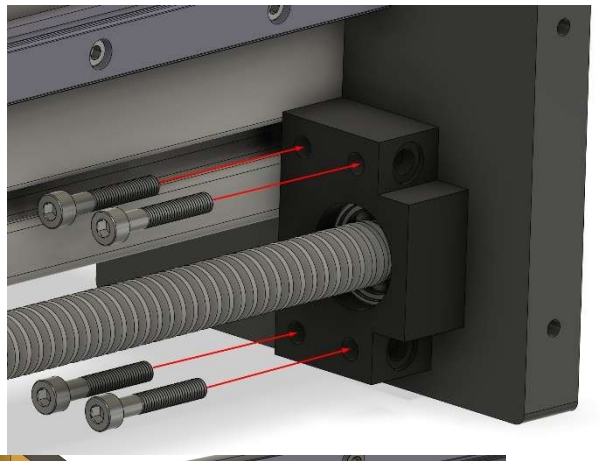
Loosely attach 2 M8x35 Socket screws into the Y extrusion and 2 M8x20 Socket screws + 2 M8 T-Nuts.



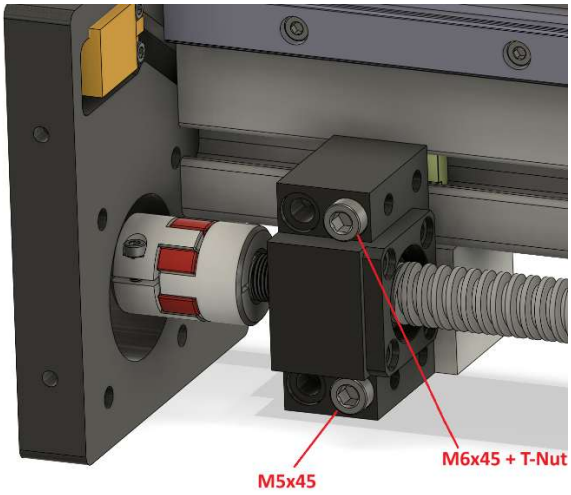
If you have the Legs kit, you'll use 2 additional M8x20 Socket screws + 2 M8 T-Nuts to secure the plate to the legs assembly as follows:

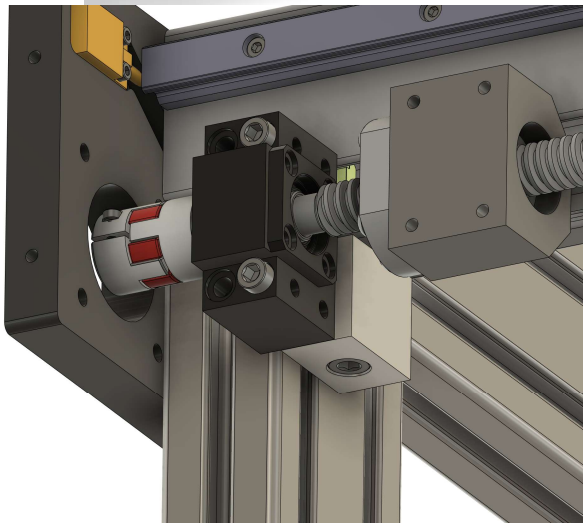


Next we'll need to finish securing the BF12 bearing block with **(4) M5x25 Socket Screws** to the front Y plate like the image to the right.

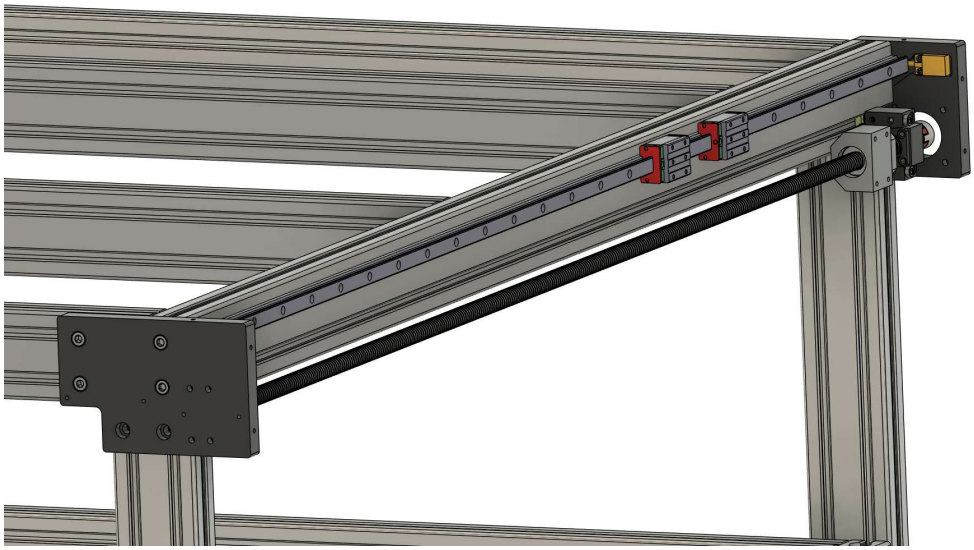


The final step in securing the ball screw assembly is to use an **M5x40 socket head screw** to attach the **rear side of the BK12 bearing block** to the **BK12 Y-bracket** that was installed earlier. Ensure the alignment is correct before tightening the screw to securely lock the assembly in place.





To complete the Y-axis assembly, **repeat the same steps** on the **right side** of the machine. Follow the same process for installing the **linear rail, ball screw assembly, and related hardware** to mirror the left-side setup. Be sure to maintain alignment and spacing for smooth and accurate motion.



Level Set #1: Great Progress!

Take a moment to step back and admire your work—you've reached a **major milestone** in the assembly of your Dominator CNC machine! Getting the **base frame, legs-kit, Y-axis rails, and ball screws** assembled is no small task, and you're well on your way to a precision-built system.

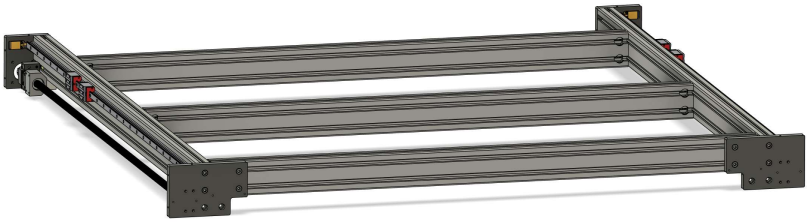
This is a great time to **pause, regroup, and double-check** your work before moving on to the next phase.

🔍 **Suggested Checklist Before Continuing:**

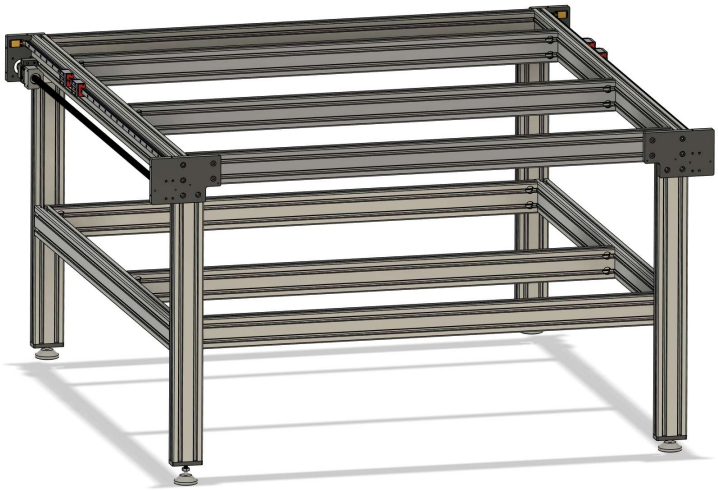
- ✅ All 4 Y plates, linear rails, and ball-screw assemblies should be slightly loose.
- ✅ Visually inspect the **entire lower frame**—is everything square and level?
- ✅ Recheck the **diagonal measurements** to confirm squareness.
- ✅ **Tighten any bolts** in the legs or machine extrusions that were left slightly loose during earlier steps.
- ✅ Ensure the **Y-axis linear rails** are flush and secure against the extrusion.
- ✅ Confirm the **ball screw assemblies** are properly aligned and seated.

Take a break, grab a drink, and pat yourself on the back—you've earned it!
When you're ready, let's move on to installing the **gantry system** and bringing this machine to life.

Without Legs:

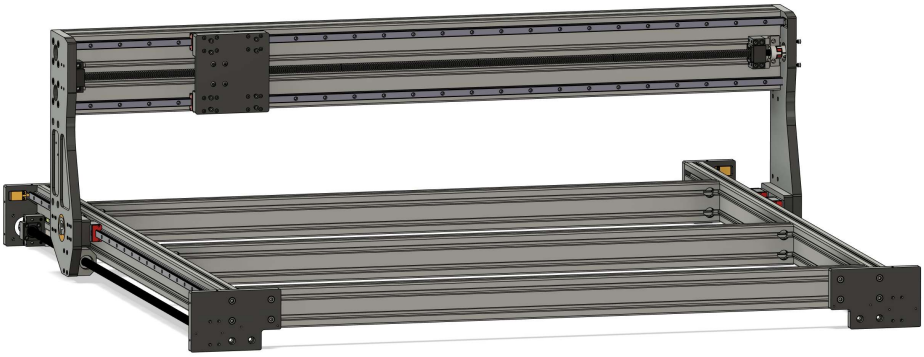


With Legs:



Installing the X Gantry

With the Y-axis assemblies complete, it's time to move on to one of the most important parts of your Dominator CNC build: the **X Gantry installation**. This step involves **preparing and assembling the main gantry extrusion** along with the **left and right gantry plates** that ride along the Y-axis.



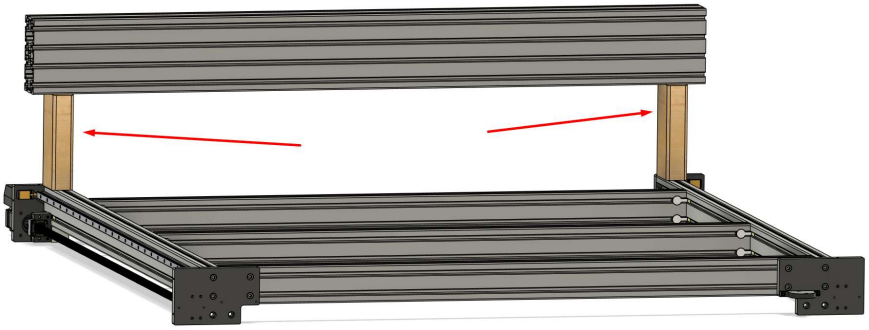
⚠️ **This step will require two people**

The X gantry is large and heavy, and proper alignment is crucial. Having a second set of hands will make the process safer, easier, and more accurate.

Take your time, follow each instruction carefully, and ensure all components are seated and secured before moving on. Once this section is complete, your Dominator will truly start to take shape!

🪵 **Pro Tip: Use Temporary Support Blocks for Easier Installation**

We recommend cutting a few **2x4 blocks to exactly 7 15/16"**. These can be placed on top of the Y extrusions to **support the weight of the X gantry** during installation, making it much easier to align the left and right gantry plates.

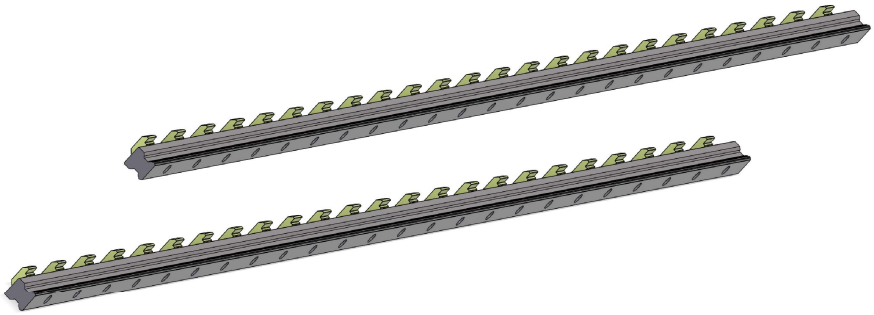


🛏️ **Planning to Install Your Bed Surface Now?**

If you're adding your **¾" MDF spoilboard** at this stage (recommended dimensions: **50" wide x 48" deep**), be sure to **reduce the height of your 2x4 blocks by ¾"** to account for the added thickness of the bed. This keeps your gantry support height consistent.

Installing the X Linear Rails

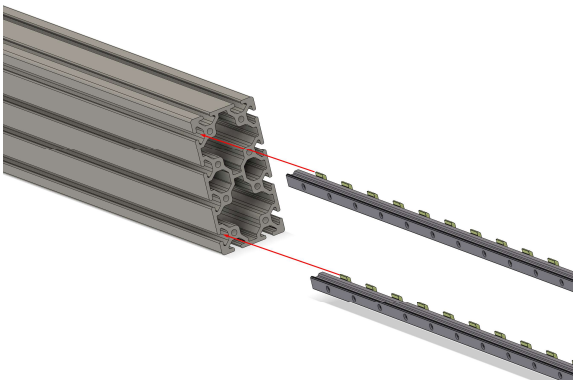
Installing the two **X-axis linear rails** follows the same process as the Y-axis rails. Begin by **inserting all M4x20 socket head screws** into the mounting holes along each rail. Then, **loosely thread an M4 T-nut** onto each screw. Once all screws and T-nuts are in place, the rails will be ready to slide into the X extrusion's T-track channel for positioning and final alignment.

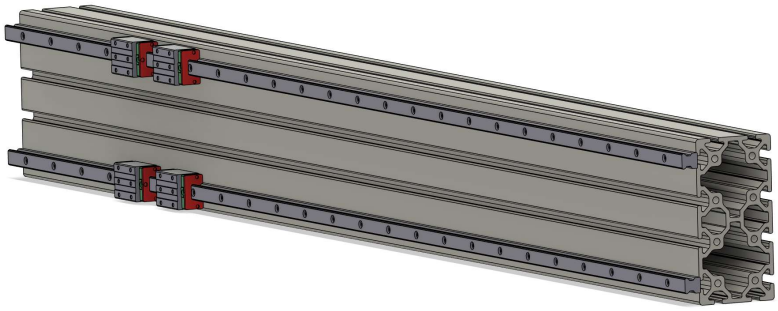


Next, **slide each X-axis linear rail assembly** into the **front face of the gantry extrusion**, making sure all **T-nuts are properly aligned** within the tracks:

- Install **one rail in the top T-track channel**
- Install **the other rail in the bottom T-track channel**

Move slowly and guide each rail when sliding it into place, confirming that each T-nut slides smoothly into place. Taking your time during this step will help ensure a precise and secure fit.





Once both rails are positioned and **seated flush** against the extrusion, **gently turn each screw until it begins to tighten**, then **back off ¼ turn**. This will hold the rails loosely in place for alignment.

⚠️ **Important:**
Accurate alignment of the X-axis rails is critical. You'll need to install the **X Carriage** before final tightening to ensure both rails are properly aligned to each other.
Also, take care not to let any **bearing blocks slide off the rails**—they can be difficult to reinsert without disassembly.

Preparing X Gantry Plates

To achieve the correct spacing for the X gantry, you'll need to install **spacer plates** onto each gantry plate.

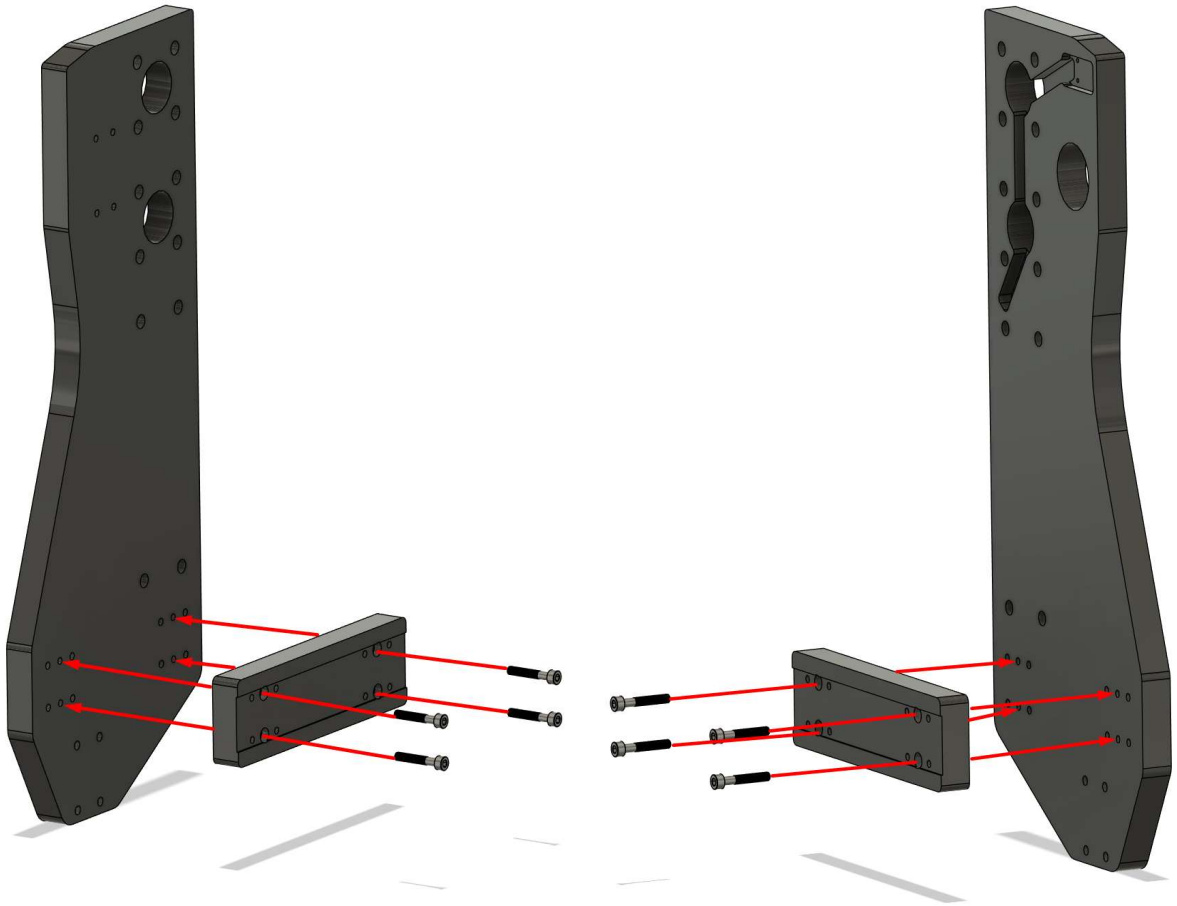
Start with the **left gantry plate**, and gather the following hardware:

- (1) **Spacer plate**
- (4) **M5x30 socket head screws**

Align the spacer plate with the designated holes on the gantry plate, then secure it using the M5 screws. The groove should be facing away from the inside gantry face.
Do not overtighten—as you could strip the aluminum, just snug enough to hold everything in place.

💡 **Pro Tip:**
Apply a small amount of **blue Loctite (threadlocker)** to each screw before tightening to help **prevent vibration from loosening hardware over time**. It's especially useful for components that won't be adjusted frequently.

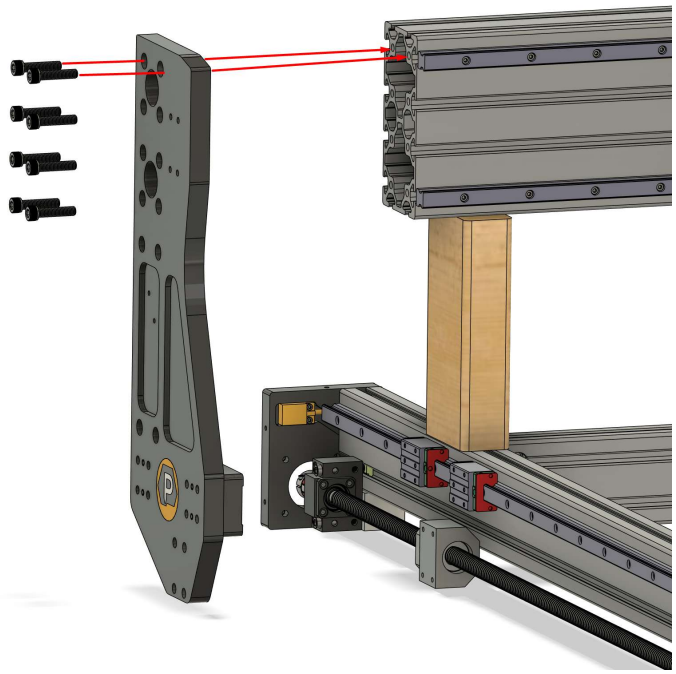
Once complete, **repeat this process on the right gantry plate** using the same components. This step ensures proper clearance and alignment when mounting the gantry to the Y-axis plates.



Installing the Left Side Gantry Assembly

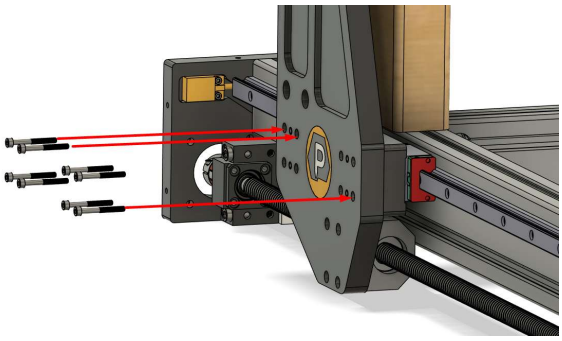
With the gantry supported on blocks above the machine bed frame, position the **left gantry plate assembly** against the side of the gantry.

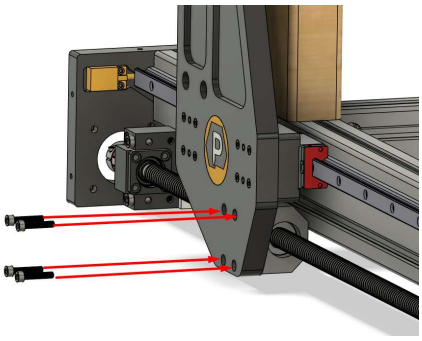
Use **eight (8) M8x35 socket head screws** to attach the plate to the gantry extrusion.
Do not fully tighten the screws yet—keeping the plate slightly loose will allow for proper alignment in the next few steps.



Next, take **eight (8) M4x35 socket head screws** and install them through the **left gantry plate** into the **linear rail bearing blocks**.

Tighten each screw just enough to hold the bearing blocks securely in place—**leave them loose for now**.





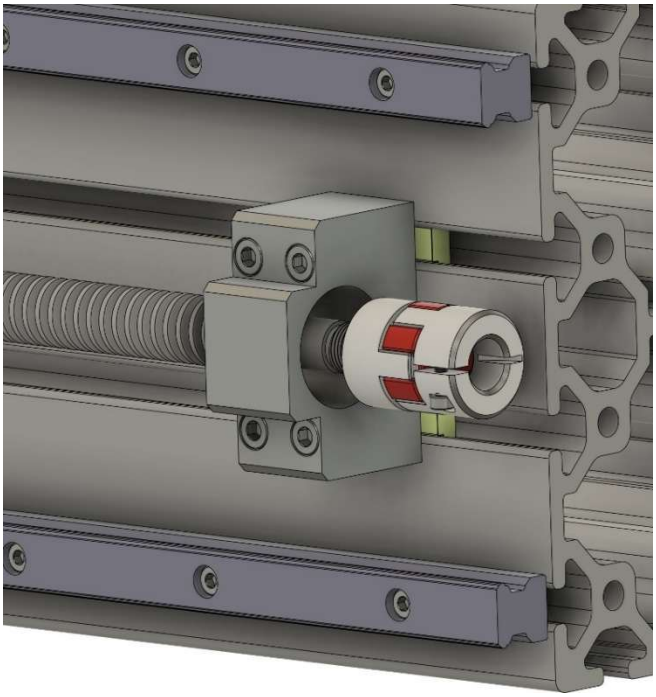
Now, take **four (4) M5x25 socket head screws** and insert them through the **gantry plate** into the **ball screw coupler**.

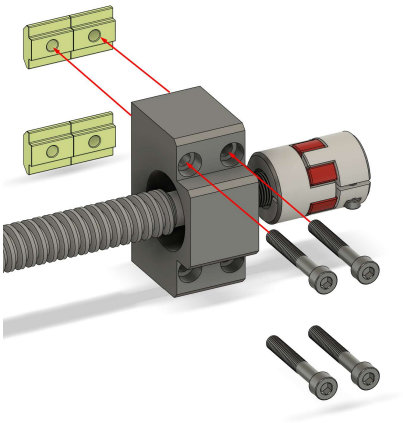
Ensure the screws are properly aligned with the coupler's threaded holes, leave them also slightly loose. This links the motion of the Y-axis ball screw directly to the gantry, enabling synchronized movement.

Prepare X Ball Screw Assembly

We've designed a custom **Block12** bearing block that mounts perfectly to our 8020 extrusions. You'll use **(4) M5x35 socket screws** plus **(4) T-Track nuts** to secure the the Block12 to your gantry extrusion.

Due to user feedback, the hardware is either included with the X screw assembly or pre-installed onto the blocks. Consider the hardware baggy parts a free extra.





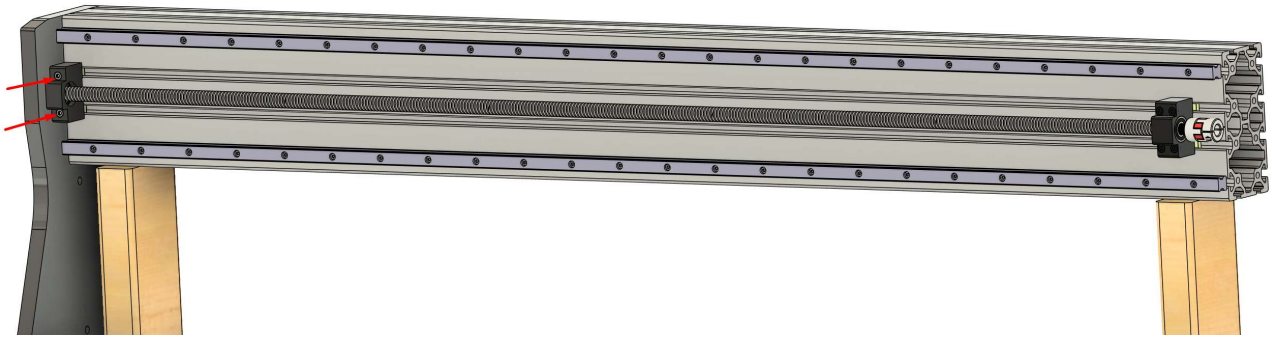
Slide the T-nuts into the extrusion's T-slot and loosely thread the screws into place.
Leave them slightly loose for now—you'll tighten them later once the X-axis ball screw is fully aligned.

Install X-Ball Screw Assembly

Finish pre-assembling the x-ball screw by installing the included hardware and twisting the t-nuts onto the ends. This will make it really easy to slide the ball screw assembly onto the gantry face. Carefully positioning the t-nuts into the two middle t-tracks of the gantry.

Slide the whole screw assembly fully into place and bump the floating block (non-coupler side) up against the left gantry plate and tighten it down using the two screws.

Leave these screws slightly loose for now—this will allow for final alignment adjustments in the next steps.



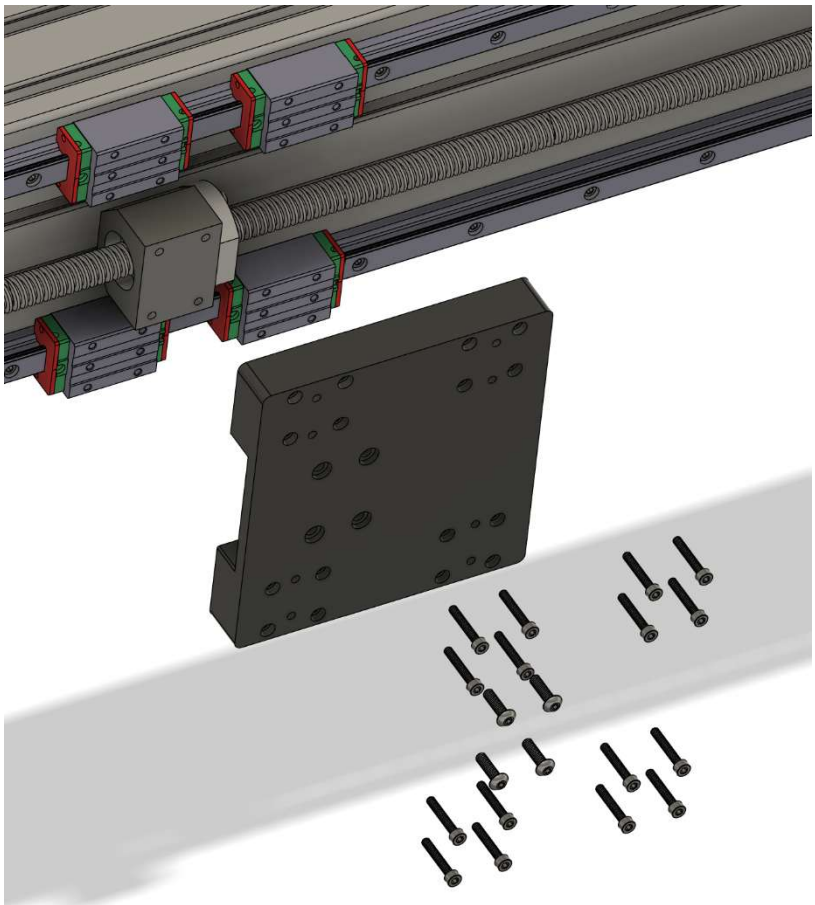
Installing the Right Side Gantry Assembly

Now it's time to install the **right-side gantry plate**.

You'll need the following hardware:

- **(8) M8x35 socket head screws** (for attaching the plate to the gantry extrusion)
- **(8) M4x35 socket head screws** (for securing the linear rail bearing blocks)
- **(4) M5x25 socket head screws** (for connecting to the ball screw coupler)

Attach the plate using the screws listed above but **leave all fasteners slightly loose** for now. We'll perform final alignment and tightening in the upcoming steps.



Install the X Plate

Grab your X-Plate and hardware bag and begin assembly.

You should find **(16) M4x25 Socket** screws for you to attach all four X bearing blocks with the X-Plate. You'll then use **(4) M5x16 Button** screws to attach the screw coupler to the backside of your X-Plate.

Be sure to align the X plate such that the 4-coupler screw-holes are on the left side.

Level Set #2: More Great Progress!

Take another moment to step back and admire your work—you are now finished assembling the main mechanical components of your new Dominator CNC machine.

This is a great time to **pause, regroup, and double-check** your work before moving on to the next phase.

🔍 **Suggested Checklist Before Continuing:**

- ✅ Visually inspect the **entire machine**—is everything square and level?
- ✅ **Tighten any bolts** that were left slightly loose during earlier steps.

Once again take a break, grab a drink, and pat yourself on the back—you've earned it!
When you're ready, let's move on to installing the **stepper motors and wiring**.

Without Legs:

With Legs:

Electronics Package

If you purchased a **Dominator with the electronics package**, this section of the manual applies to your build. The Dominator's electronics package is essentially a preconfigured version of our **Conversion Kit**.

It includes:

- A fully wired **Masso G3 Touch controller**
- **PwnCNC Power Box** containing a 36v Power Supply
- (4) **Closed-loop stepper motors** (choice between 2Nm or 3Nm options)
    - The **Z-axis motor** includes an **integrated electronic brake** for added safety
- (4) **Proximity limit switches** for accurate homing and travel limits
- A complete set of **pre-made wiring harnesses** for plug-and-play installation
- (Bonus for our Dominator customers) **LED Gantry Light + Cable**

This system is designed to be fully integrated and as streamlined as possible, ensuring a quick and reliable setup process.

The following pages provide a step-by-step walkthrough for installing our **Conversion Kit** onto the **Dominator mechanical assembly** you've just completed. Each step is designed to make the process straightforward and easy to follow.

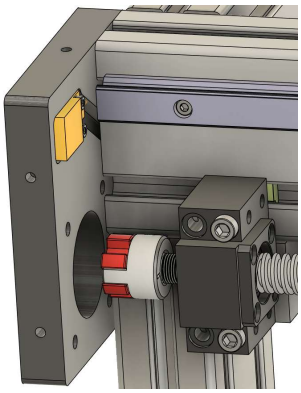
Motor Installation

To start out you'll want to identify each of the four stepper motors. You can find this in the large box with our logo on the top. It will contain 4 stepper motors with the Z stepper being the larger one as it contains an integrated brake.

Take note of the cover orientation in the above images.

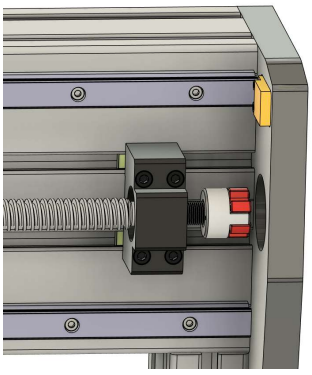
Y Stepper Installation

First step is to locate a stepper and the **(4) M5x14mm socket head screws**. Next separate the coupler so half can be attached to the stepper shaft securely. Next using the M5 screws, attach the motor to the rear Y plate. (repeat on other side)



X Stepper Installation

Repeat these steps for the X stepper:

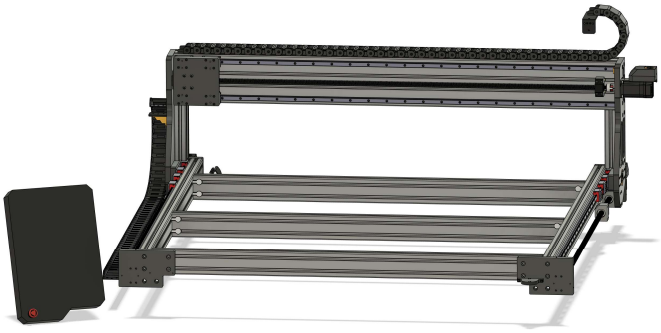


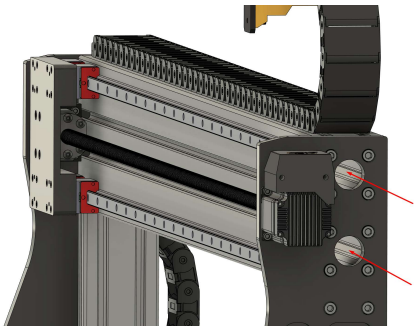
Controller Orientation – Decision Point

It's now time to decide which side of your machine you'd like your Controller. We designed the Dominator to allow you to install the controller on either the left or right side. The side you choose is the side you'll want to start routing your wires.

Right Side Controller Orientation – take note of the cable chain routing with all wiring exiting on the right side Y chain.

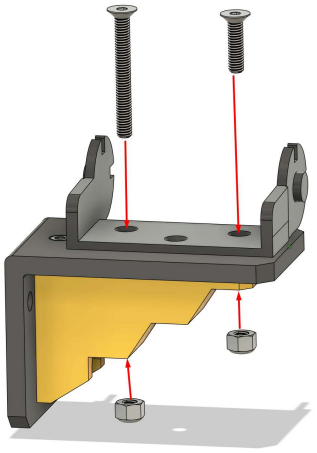
Left Side Controller Orientation – again take note of cable chain routing and all wires exiting on the left side Y chain. Also note that the X motor is still on the right side, and it's cable will need to pass through the extrusion using one of the two holes in either gantry plate.

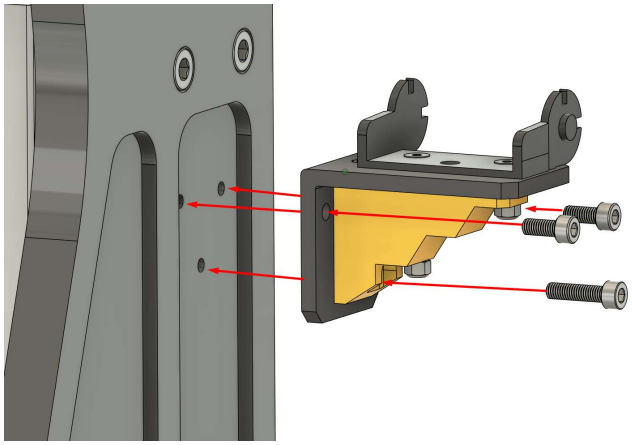




Y Chain Bracket Assembly & Install

From here on, we'll assume you are installing the controller on the right side. Detach the "Male" end from one of the cable chains and attach it to the shorter 3d printed bracket using **(1) M4x35 Triangle, (1) M4x15 Triangle, and (2) M4 Lock Nuts**.



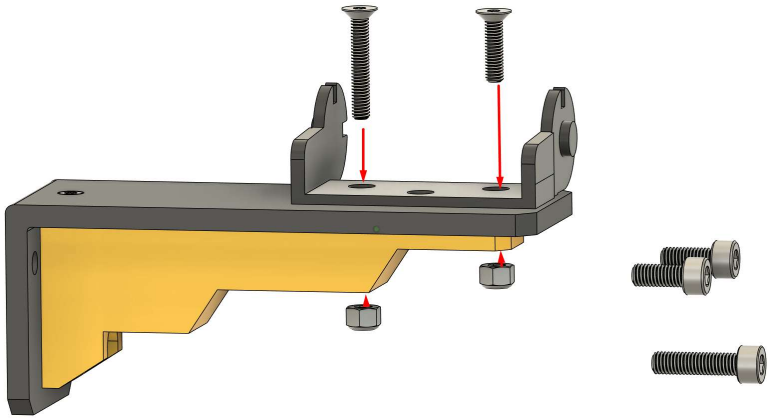


Next attach the Y-Chain bracket assembly to the right-side gantry plate using **(2) M5x12 Socket and (1) M5x20 Socket** screws.

We will attach the rest of the Y cable chain in a later step... for now we just need to know where to guide our wires and this bracket with end is perfect.

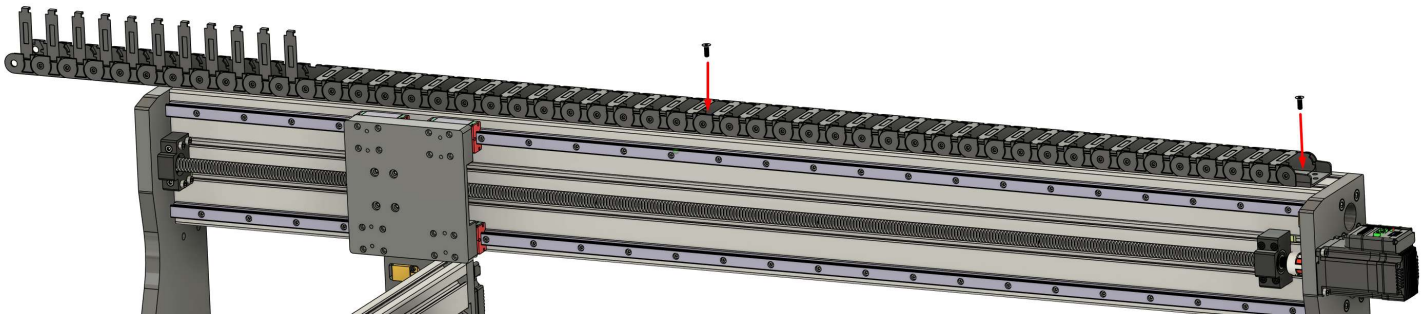
X Chain Bracket Assembly

The X chain is similar in that you'll attach the "Male" end of the cable chain to the bracket, but this time using **(1)M4x25 Triangle, (1) M4x15 Triangle, and (2) M4 Lock Nuts**. Also while you will need **(2) M5x12 Socket and (1) M5x20 Socket screws** later during installation, just set this assembly aside for now.



X Chain Installation

Now it's time to install and open up the X cable chain. It will sit along the top-side of the large gantry extrusion and attach using the two M5 T-Nuts you installed previously along with **(2) M5x14 Triangle screws**.



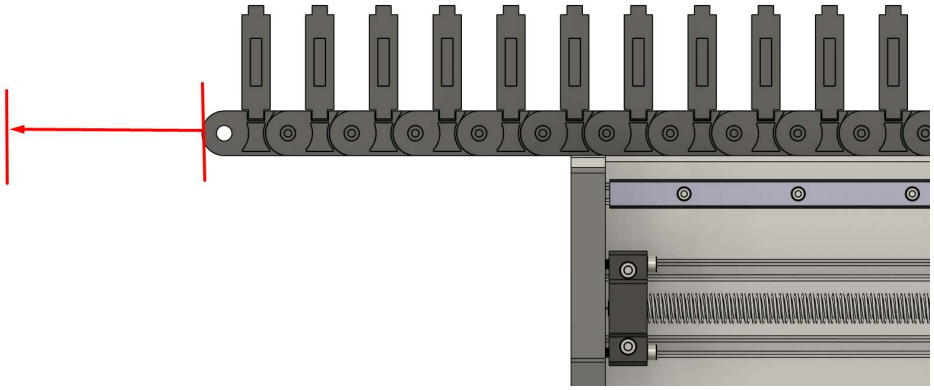
The cable chain should bump up close to the right-side gantry plate.
The M5 triangle screw in the middle, it's roughly halfway or 750mm from the right side.
Optional but advised…Use a ¼" drill bit to open a whole in one of the chain-links near the 750mm mark.

Lastly… start opening the chain so you can have easy access for running the various wires.

X-Chain Wiring

With the chain fully open you can start laying out your wires that will be contained within. On the left side of the X chain that is hanging past the left gantry, be sure your wires are sticking past the end of the chain.

- Z Motor Cable - 15" past end of cable chain.
- Z Proximity Cable – 0", this cable should come right to the end of the cable chain.
- Spindle Power Cable – 23" w/Z-Chain Upgrade
- Coolant Tubes (for water-cooled spindles) – 36" w/Z-Chain Upgrade
- ATC Motor Sensor Cable (if applicable) – 24"
- Pneumatic Tubes (if applicable) – 36"

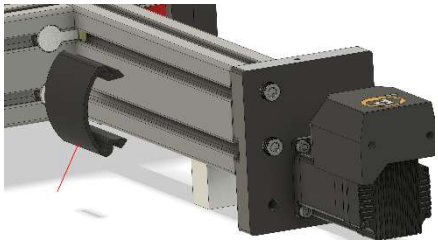


💡 *Pro Tip:* Place painters' tape at the appropriate inch mark as you're laying the cables into the X chain. This will help keep them aligned prior to closing up the X-Chain.

Wiring Steppers and Homing Sensors

It's time to start wiring up your X, Y, and B stepper cables and proximity switches.

The phoenix connectors have been pre-attached to each cable. Attach those to each motor and route cables as shown in the image below.

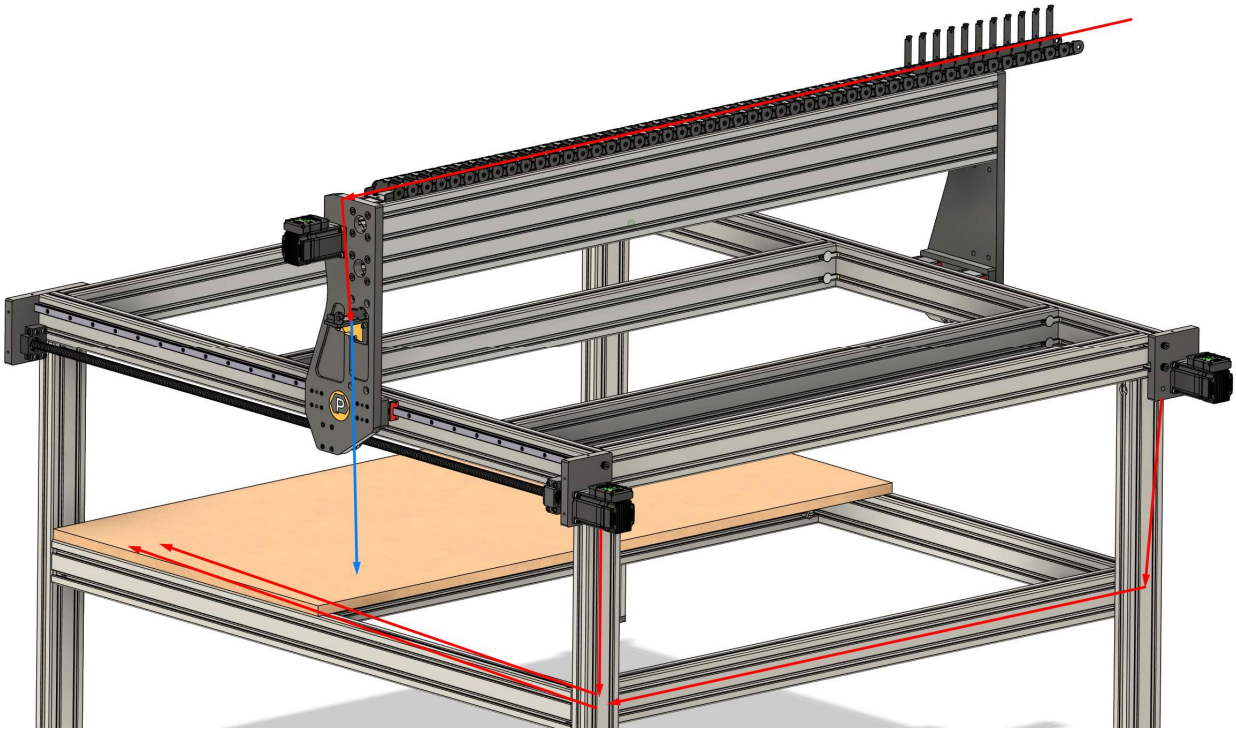


💡 *Pro Tip:* As you are running the stepper cables through cable chains and along extrusions, we have included special 3d printed snap-in wire covers. This will allow you to route your wiring in an extremely clean way. If you'd like more, we have them available on our website as well as their maker-files for those wanting to print in custom colors.

Run your cables/tubes along the X-chain and down along side the Y-Chain bracket.

The Y steppers should go down the legs and along the lower shelf.

It will be a bit messy at this stage with wires everywhere. But remember to label each cable/tube as you place it so you know each one is when you're ready to hook everything up.



Level Set #3: Electrical Progress!

By now, all spindle cables, air tubes, and signal wires should be fully routed through the X-axis drag chain.

🔍 **Suggested Checklist Before Proceeding:**

- ✅ **Y and B stepper motors** are securely mounted to the rear Y plates, with couplers installed.
- ✅ **X stepper motor** is mounted to the right-side gantry plate, with coupler installed.
- ✅ **X, Y, and B stepper motor cables** are connected to their respective motors.
- ✅ **X, Y, and B proximity sensor cables** are connected and routed neatly.

Warning – The rest of this document is still evolving. As I release each level-set build video, I will improve upon this manual until it is complete.

From this point on there is a mixture of steps and helpful tips to bring your machine across the finish line.

The plan is we will have a complete manual as the video build series comes to a close.

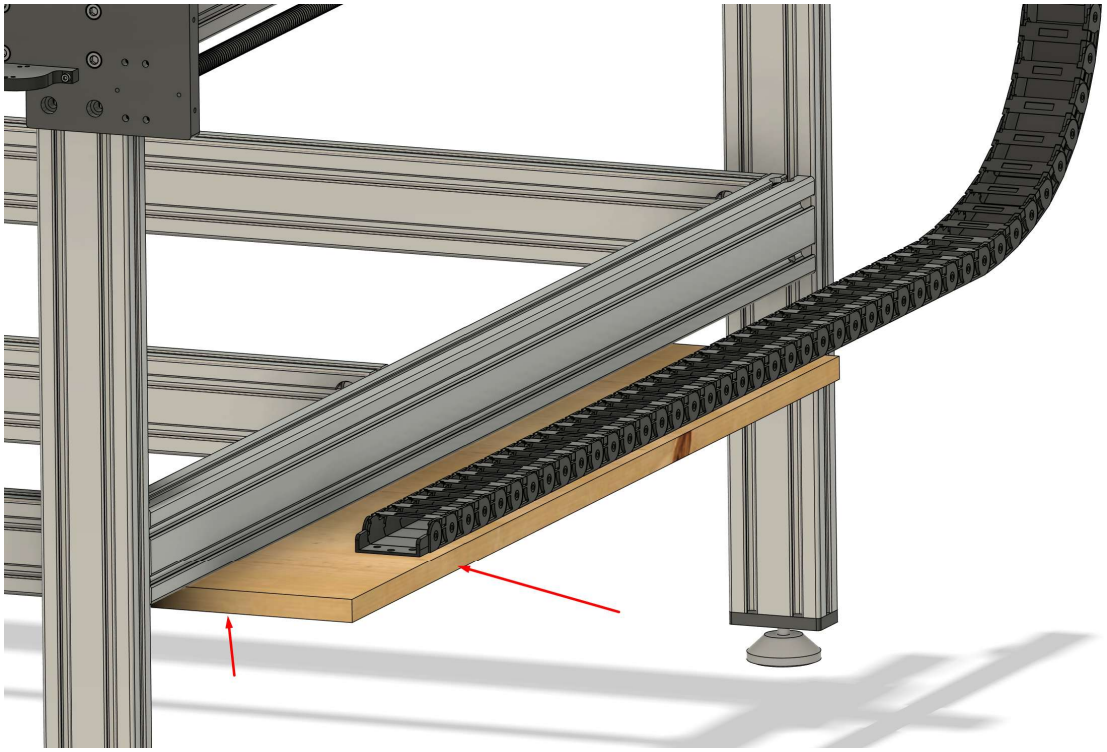
Please subscribe to our youtube channel and follow along: https://pwncnc.com/dominator-pro-build

If you'd like a pdf copy of our very latest manual, please reach out to us at support@pwncnc.com

Y Chain Installation

The other end of the Y chain is a bit tricky. There are a few possibilities, but we have not developed a solid solution we recommend across the board. For those who **do NOT have the Leg-Kit**, we recommend **simply screwing the Y chain** down to your table top.

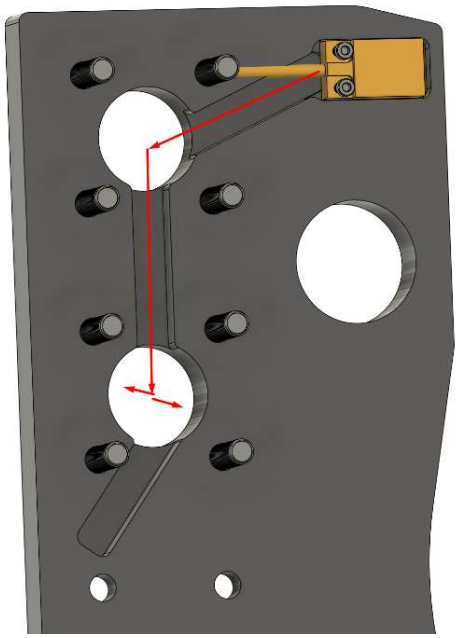
For those of you **WITH the Leg-Kit** you might consider a small piece of wood and using hardware included with the "Extras" baggy attaching it to the under-side of the lower-shelf extrusion like this:



We've purposely left this solution open-ended allowing you to tweak the mounting location of your Y cable chain as best fits your needs. This plywood solution has been our favorite solution we've explored thus far.

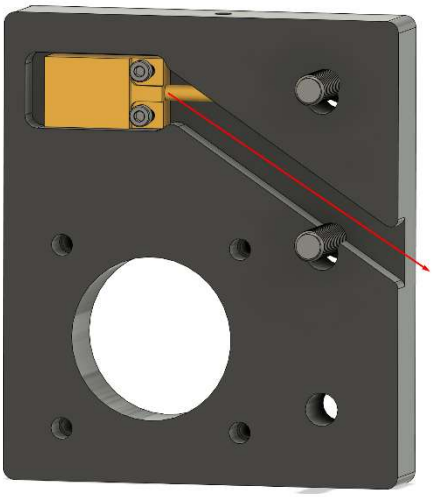
Installing Limit Switches & Sensors

There are four proximity switches all are "top-triggering" style. X and both Y's are embedded directly into the Right Gantry Plate and Both Rear Y plates respectively.



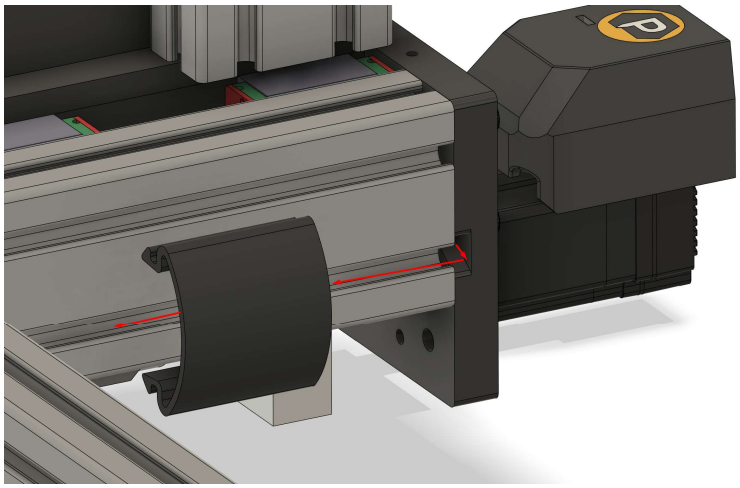
X Limit Switch

The X switch is installed into the right-side gantry plate. Use the channels to route the wire down into either inner gantry holes.
If your controller is on the left side, you'll need to run the X limit switch through the gantry similar to the X stepper cable. If it's on the right side, then simply exit one of these two holes to go immediately into the Y cable chain.



Y Limit Switches

Both Y switches also have channels in the Y Rear plates for routing their short wires through before plugging into the longer limit switch cable. The channel meets up with the extrusion's t-track.



Z Limit Switch

We will have a section on the Z-carriage later. For now, you should route the Z stepper Cable and z-limit switch cables through the X cable chain.

If you are installing a spindle or ATC, now is a great time to install those other accessories while you have the X cable chain open.

Miscellaneous

There are several accessories that fall into the miscellaneous category. This section covers some basic tips for installing these items onto your machine.

VESA Controller Mount

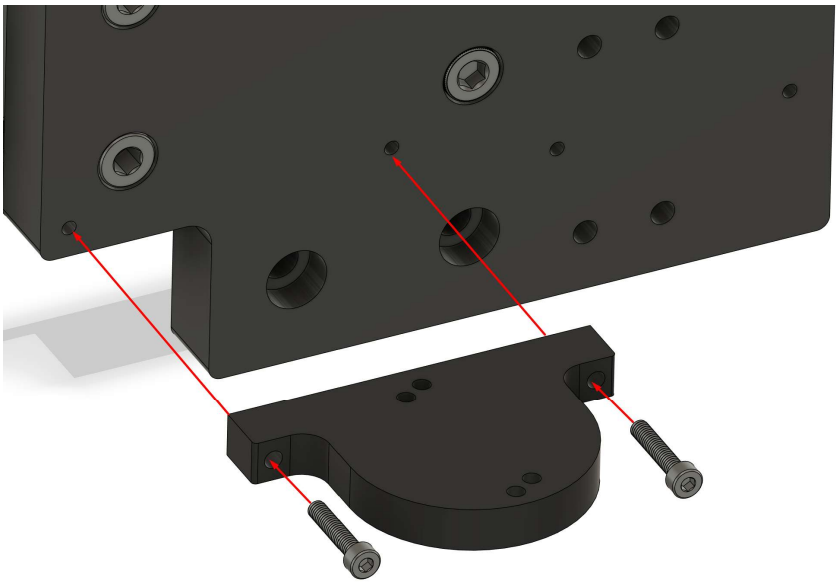
The Masso G3 Touch controller has a VESA 100mm mounting ability. We've included the perfect VESA arm which allows for awesome wire management as well as lots of articulation control.

If you have the Legs Kit, then you will also have a steel 90deg mounting bracket. This is installed onto the side of the legs giving you the perfect surface to attach the VESA articulating arm mount. Utilize some of the "Extra" hardware for attaching this to the legs.

If you do not have the Legs Kit, the included VESA articulating arm mount can be attached to a variety of surfaces. See instructions within that box for details.

Tool Setter

We've included a tool-setter pad which makes installation very easy. The pad can be mounted on either the left or right side of your machine utilizing two holes on either front Y plates.



Final Electronics Assembly

At this point all of the cables should be gathered near or around your preferred controller location. At the end of the Y cable chain is where the "dual" cables will split. Some of the connectors will go up and behind the controller while others will go to the Power Box (PB). See the inventory below for details.

Take inventory as you should have the following cables existing the Y cable chain:

3. Y Axis (Y Right) stepper cable (splits into two, one goes to power box, other to controller)
4. B Axis (Y Left) stepper cable (splits into two, one goes to power box, other to controller)
5. X Axis stepper cable (splits into two, one goes to power box, other to controller)
6. Z Axis stepper cable (splits into two, one goes to power box, other to controller)
7. Y Proximity (to power box)
8. B Proximity (to power box)
9. X Proximity (to power box)
10. Z Proximity (to power box)
11. Gantry LED (to power box)
12. Additionally, you may have multiple tubes and wires related to Spindles, ATC's, and other items.

The Power Box (PB) is best located within 2-4 feet away from the controller. Typically, this will be on a near-by shelf or really close to the Y cable chain. You'll be turning the CNC on/off via the power switch on the right side of the PB, so keep it handy.

Plugging everything together should be simple as our conversion kit components is well-labeled.

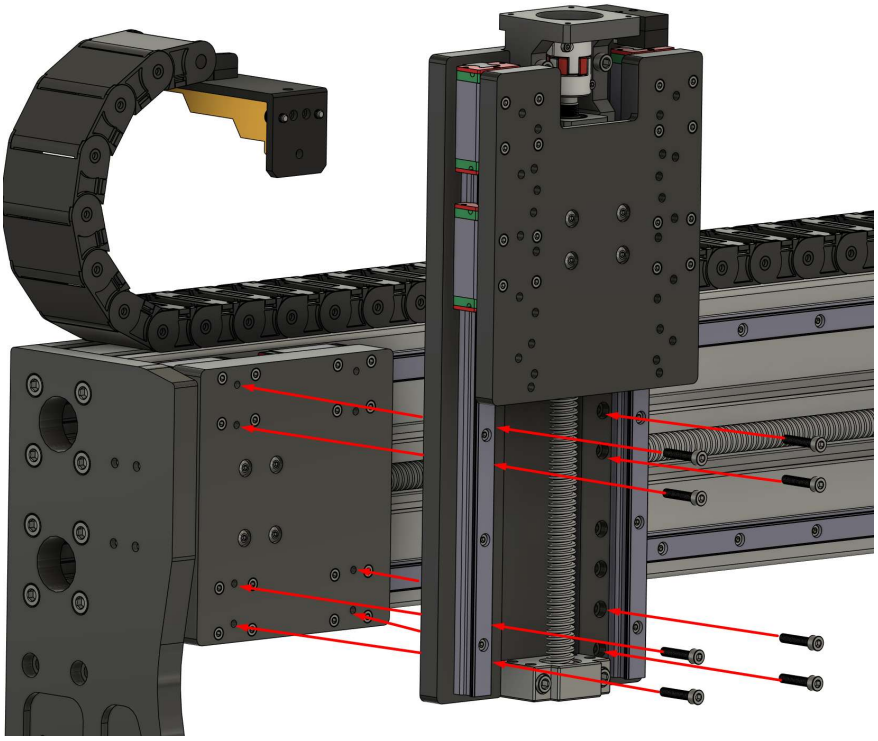
Feel free to plug everything together but wait on the AC power until the Z carriage assembly is complete.

Z-Carriage Final Assembly

The Z-Carriage is a very vital component of your machine.

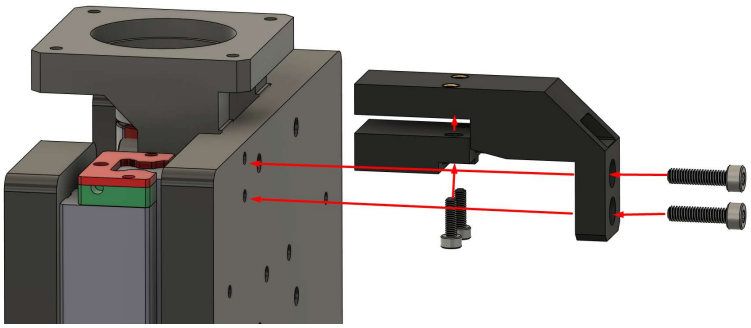
Mounting Z-Carriage

The Z-Carriage is held onto the X plate by **(8) M5x20 socket screws**. There are several holes available depending on your desired z-capacity requirements. For maximum z-clearance, use the bottom two holes in each of the four mount groupings as shown below:



Z Proximity Switch

The z proximity switch is mounted onto the top “shoulder” of the z-carriage utilizing **(2) M4x16 socket screws**. The switch itself is held into the 3d printed bracket by **(2) M3x14 socket screws**.

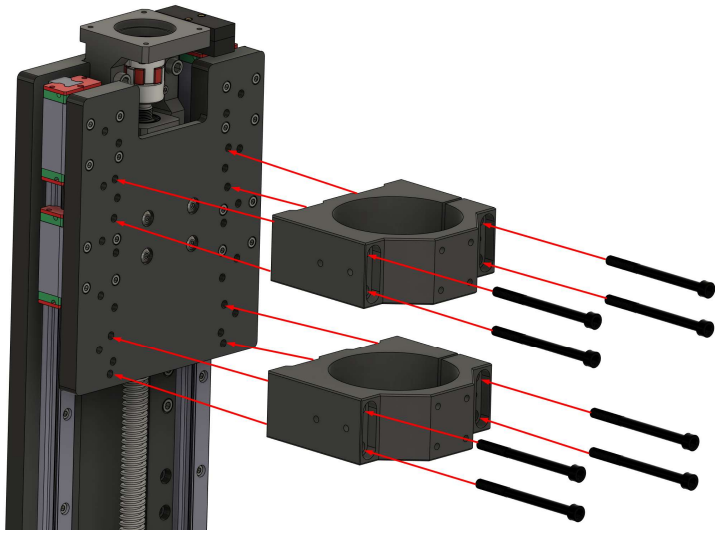


Installing the Z Stepper Motor

Attach the z-stepper motor at the top of the Z-carriage housing. We recommend facing the stepper cover to the right so it's out of the way of any wiring that comes out of the X cable chain up and over/around the stepper motor itself. Use **(4) M4x14 socket screws** to secure the motor to the motor housing atop the Z carriage.

Installing the Spindle Mount(s)

Attaching the spindle mounts will greatly depend on what kind of spindle you're installing. We can mount two of our spindle mounts onto the Z plate as shown below. By default, these are 80mm spindle mounts, but 65mm is available. We also have a variety of mounting holes for square spindles.



Software Setup & Machine Configuration

- First Power-On Checklist
- Controller Firmware & Updates
- Input/Output Configuration
- Homing & Travel Limits

Section Coming Soon!

We are always improving our documentation. If this section interests you, please reach out to support@pwncnc.com and we'll be sure to get you an updated copy of this manual when it is fully flushed out.

Calibration & First Movement

- Steps per mm Setup
- Jogging & Axis Verification
- Squaring & Tramming the Gantry
- Surfacing the Wasteboard

Section Coming Soon!

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Support & Resources

Helpful Links & Community

For community help and interaction visit any of our social websites:

- User Forums https://forum.pwncnc.com
- Facebook Users Group: https://www.facebook.com/groups/pwncnc
- Youtube Channel: https://www.youtube.com/pwncnc

Contacting PwnCNC Support

We are here to help. You can either email us at support@pwncnc.com or call 479-480-4337.

We have also published tons of information to our knowledge base website.
https://support.pwncnc.com