

BugBu 260 V1 Assembly Guide

(Recommended print settings for printer parts is no less than 6 walls and no less than 20% infill) Print part as oriented and part description tells you quantity of parts and if supports are needed.

Welcome to the assembly guide for the BugBu corexy printer. This guide will serve as assembly instructions for the printer. It is a “260” as this is the approximate build volume of the printer. Upon completion, the printable area will be approximately 235x/235y/300z for the unless you put on a Bambu build plate. If you opt to use a Bambu build plate on the ender bed, you will have some overhang of the 235x235 plate, but in testing it did not cause issue and would give a printable area of 260x/250y/300z.

Any questions during assembly, please contact someone within the group on Discord here <https://discord.gg/kHFhCXZnxb>

The github <https://github.com/Rolls17/BugBu> as well as printables <https://www.printables.com/model/415677-bugbu-corexy-3d-printer> will have the most recent updates in STL’s and CAD. Please refer to the github page for all slicer configurations and klipper firmware configurations or updates.

This is meant to be an affordable corexy build that is relatively easy to build, high print speed, and quality prints. Any feedback is always welcome as we are always striving to make it better with a great experience for all users.

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Section 1:

Frame Assembly

Components needed for this portion:

M5x12 or (M5x10) Button Head Screws x64

M5 T-nuts x64

M5x25 Button Head Screws x4

M5 Nuts x4

Back Feet x4

Front Left Idler x1

Front Right Idler x1

Back Left Motor Mount x1

Back Right Motor Mount x1

350mm 2020 Extrusions x8

400mm 2020 Extrusions x4

The Frame

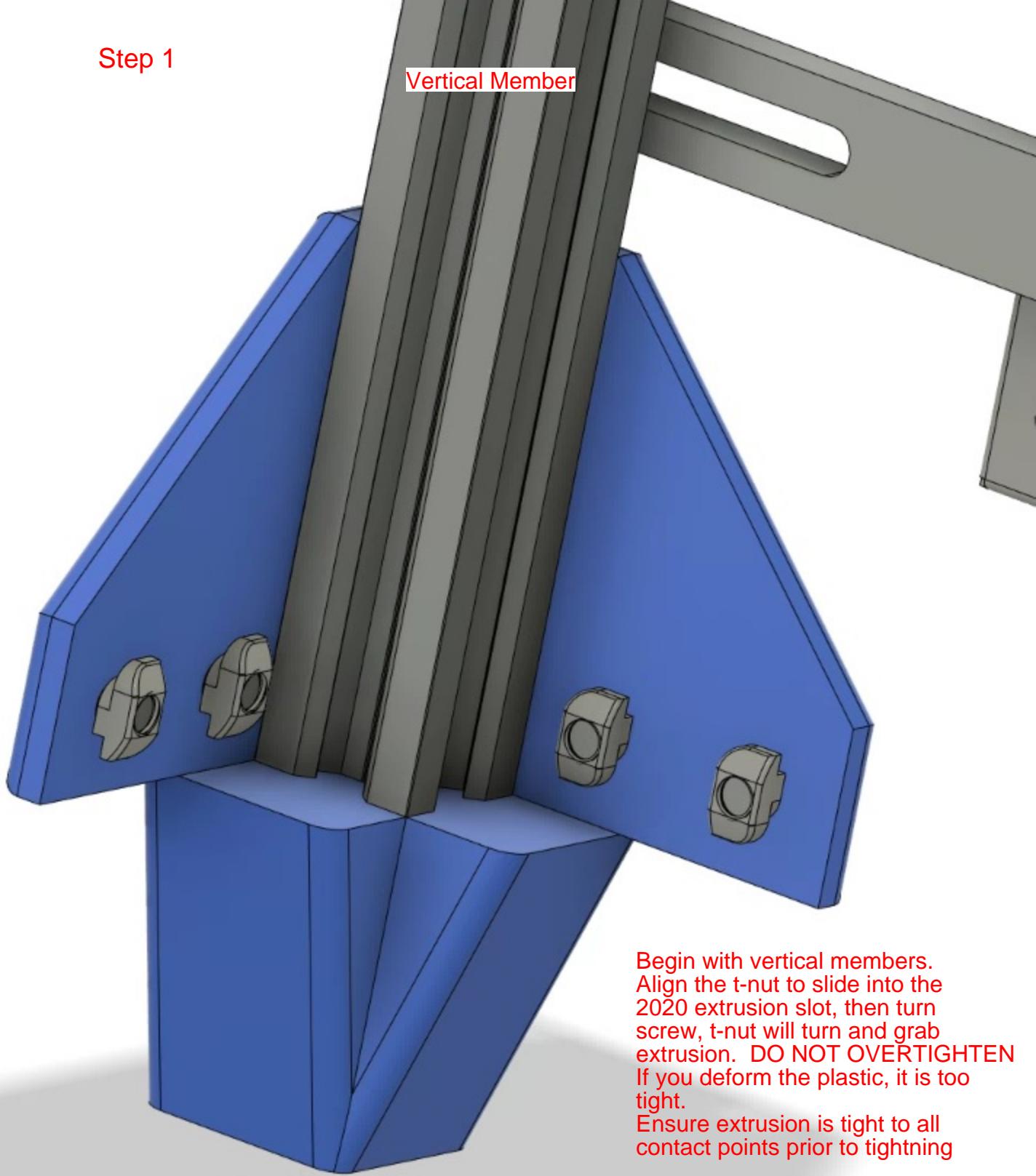
1. Using 4 m5x12 screws and T nuts, insert the vertical 400mm extrusions into the feet first.
2. Using 2 m5x12 screws and T nuts on each side, insert the horizontal 350mm extrusion between the two verticals. Ensuring a strict 90 degree angle on both sides, using a speed square or other square is recommended prior to fully securing all 4 screws.
3. Repeat steps 1 & 2 for all of the lower horizontal frame and vertical extrusions
4. Begin assembly on the upper frame by inserting two GT20 20T or toothless idlers into the top front brackets. Insert an M5 nut into the captive slot, and secure with 1 M5x25 bolt from the top, and 1 M5x25 bolt from the bottom. Do not over tighten these bolts, as that will cause binding on the idlers.
5. Start in one corner and attaching the bracket to the vertical 400mm extrusion using 4 m5x12 screws and T nuts.

**NOTE: While in most cases the screw type (button head, socket head, etc) are interchangeable, there is not enough clearance for a socket head m5 bolt on the motor mount brackets. Ensure to use button head bolts otherwise you will not be able to mount the motor.

6. Attach the next top corner in the same manner.
7. Using 2 m5x12 screws and T nuts on either side, connect the two corners using a 350mm extrusion.
8. Repeat this process working your way around the top frame until it is complete.
9. Congratulations on completing the assembly of the BugBu Frame!

Step 1

Vertical Member



Begin with vertical members.
Align the t-nut to slide into the
2020 extrusion slot, then turn
screw, t-nut will turn and grab
extrusion. DO NOT OVERTIGHTEN
If you deform the plastic, it is too
tight.
Ensure extrusion is tight to all
contact points prior to tightening

Step 2

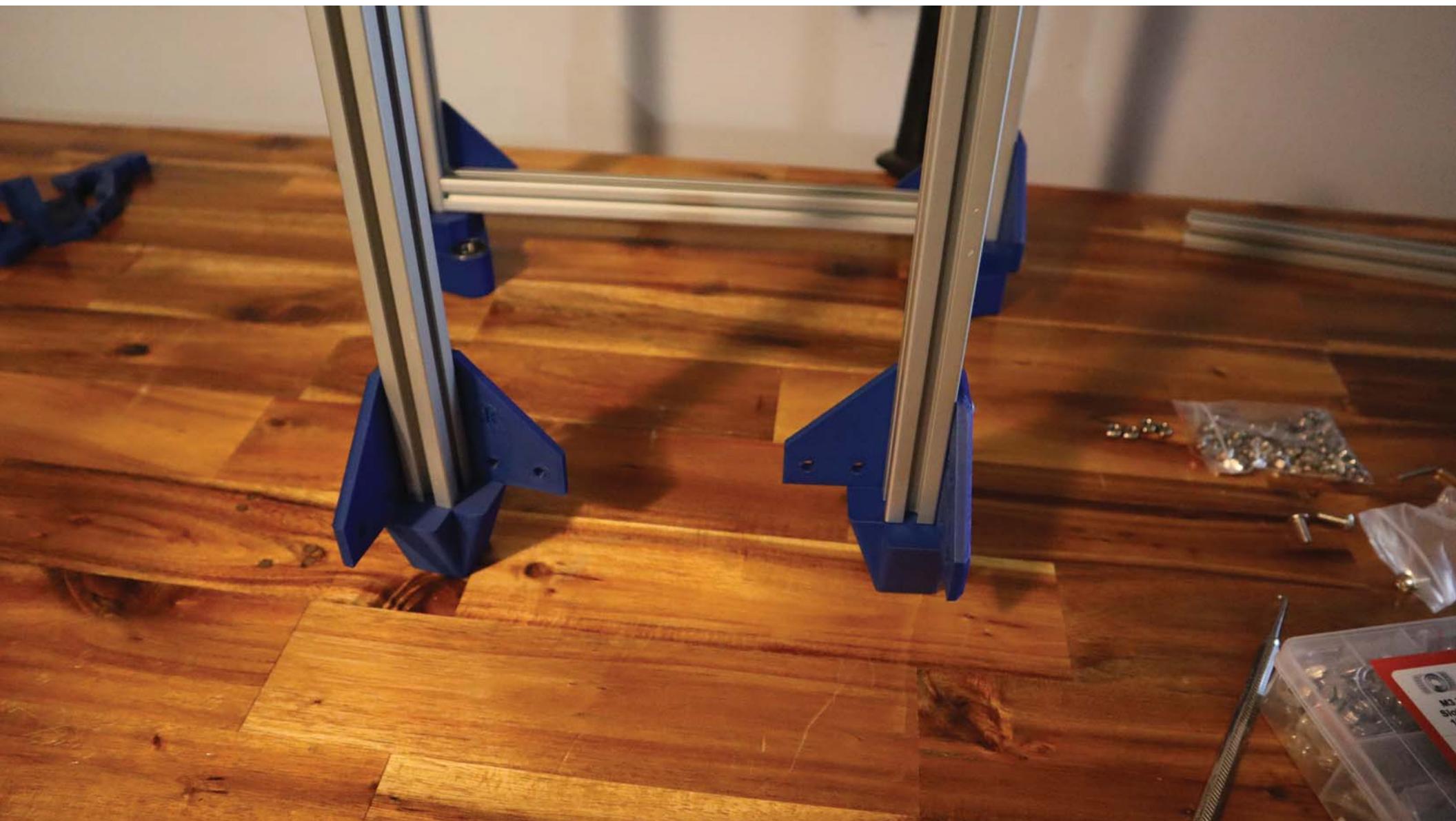
Install horizontal members
after vertical. Affix with t-nut

Vertical Member

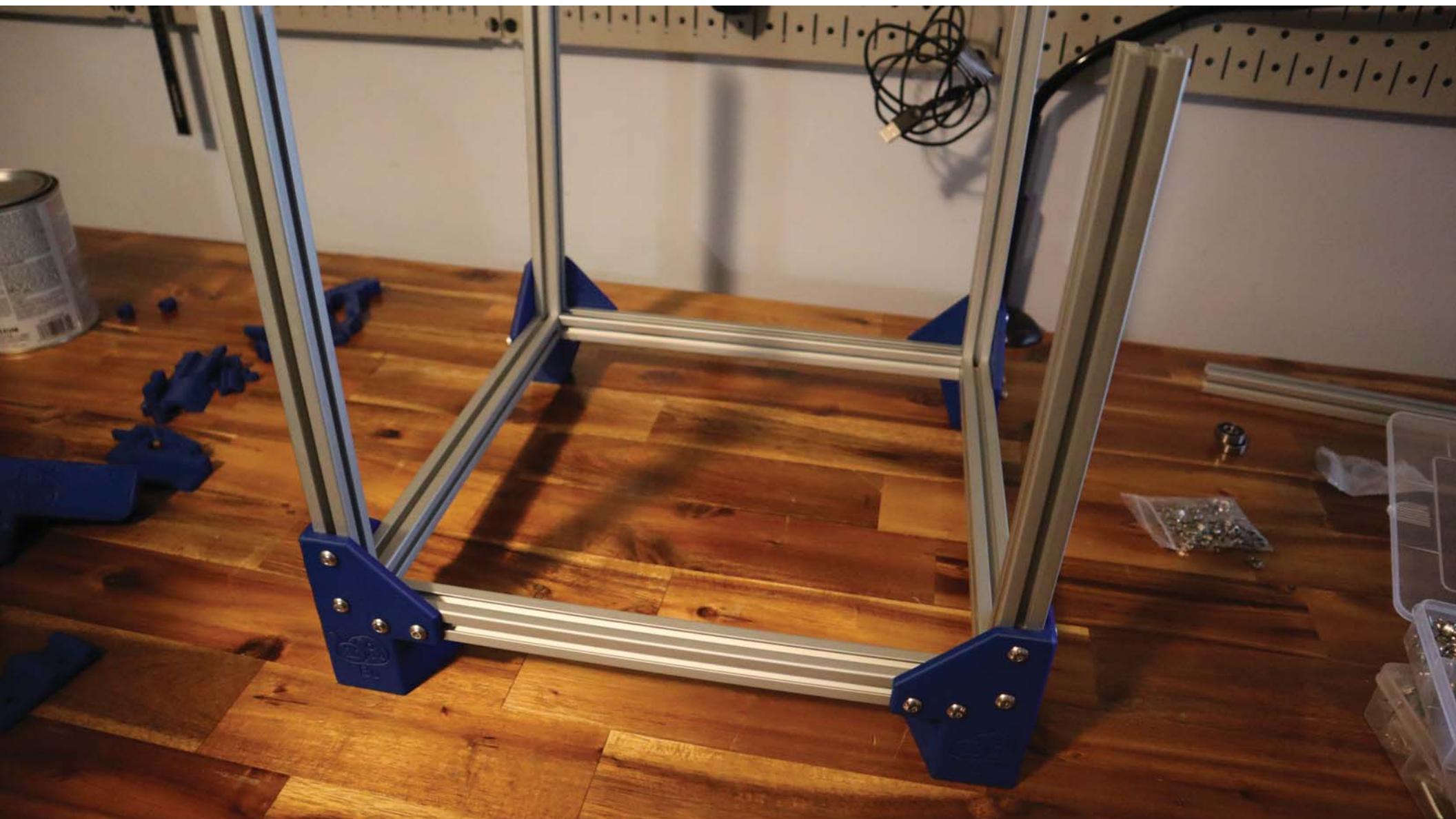
Horizontal Member

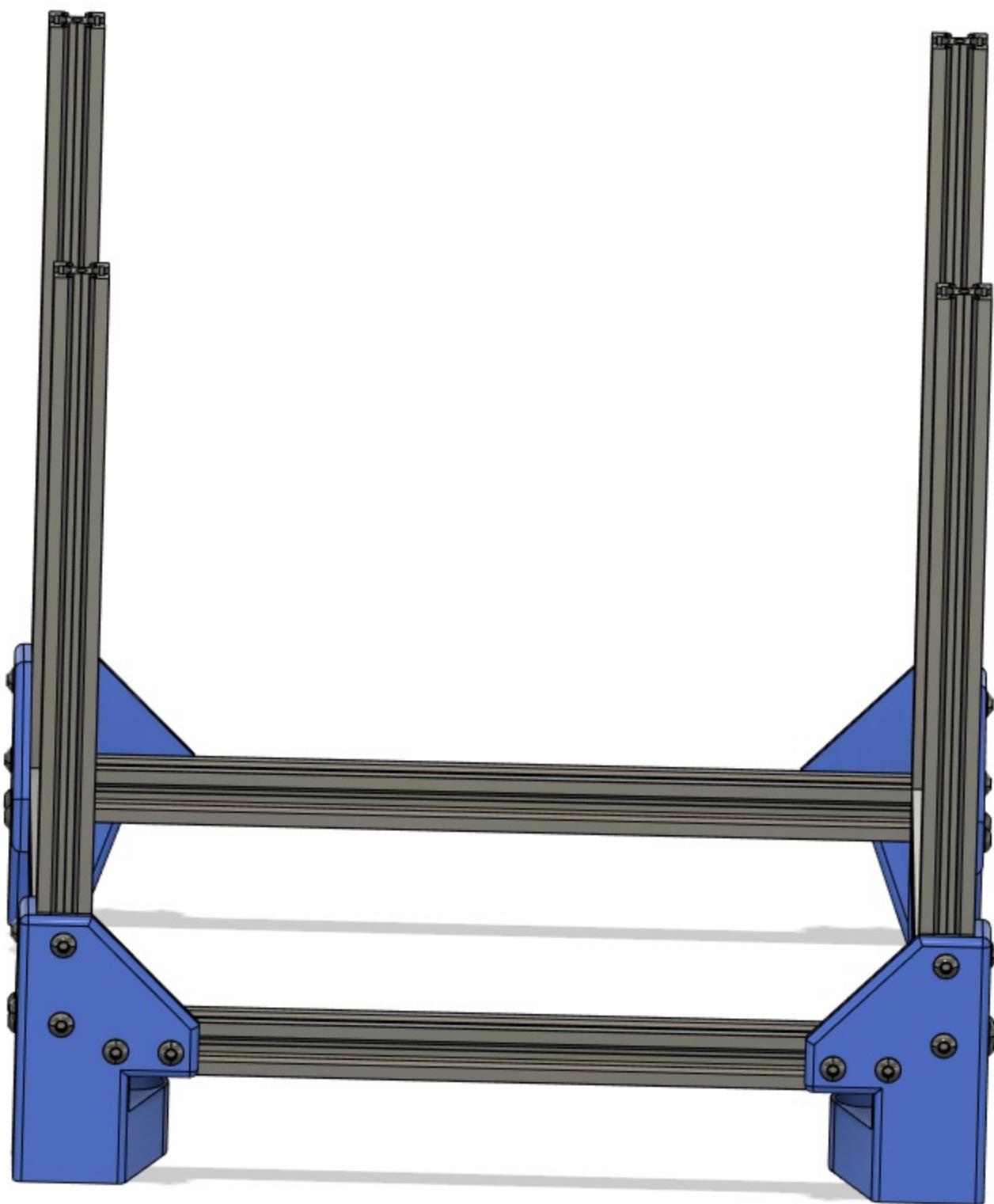
Horizontal Member

STEP 3:

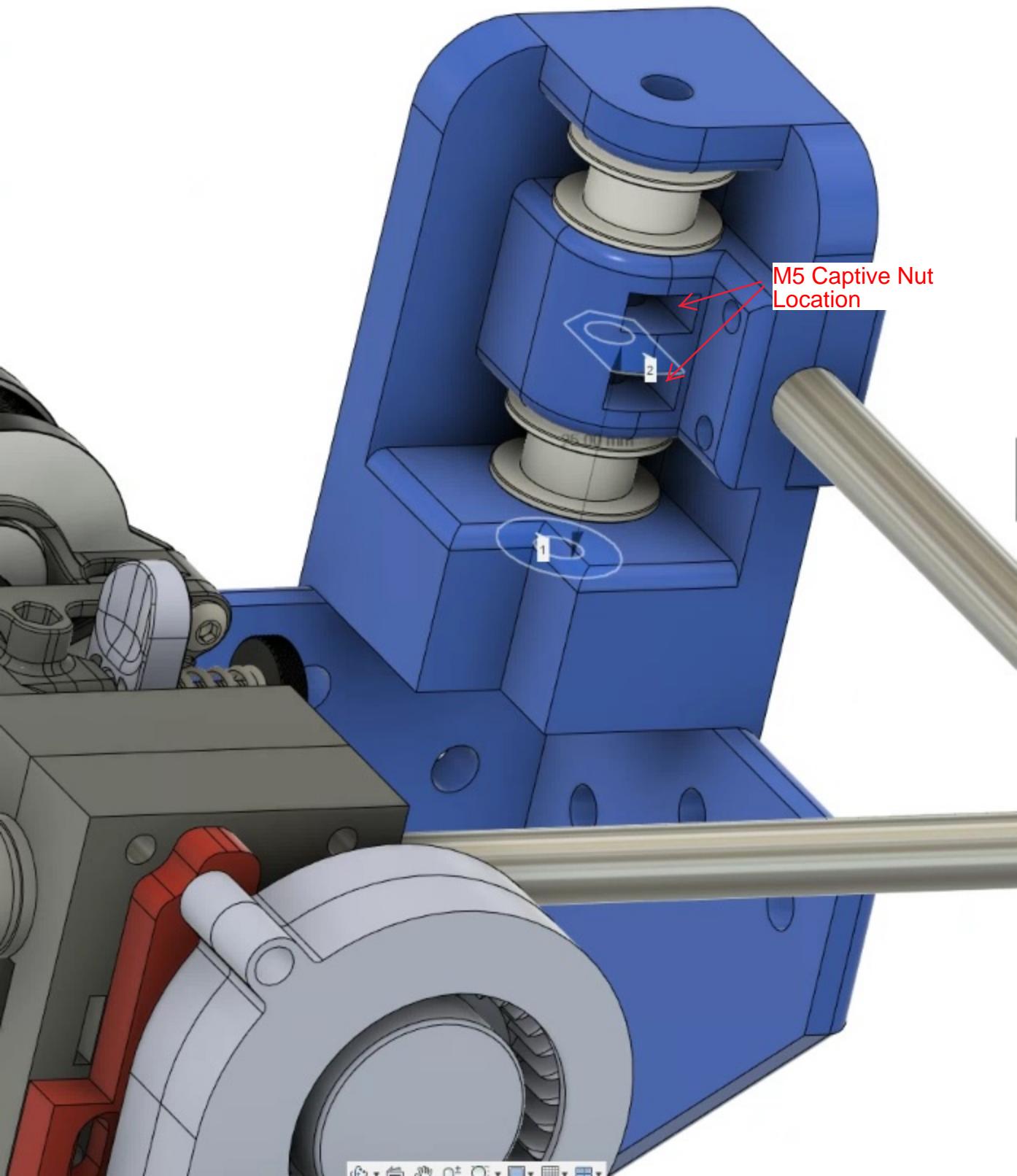


STEP 3:

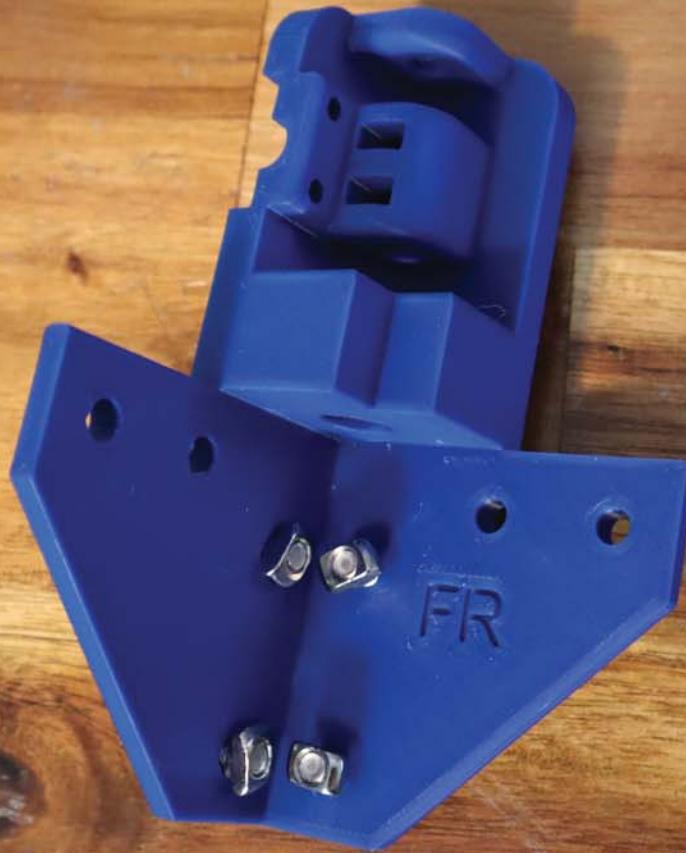




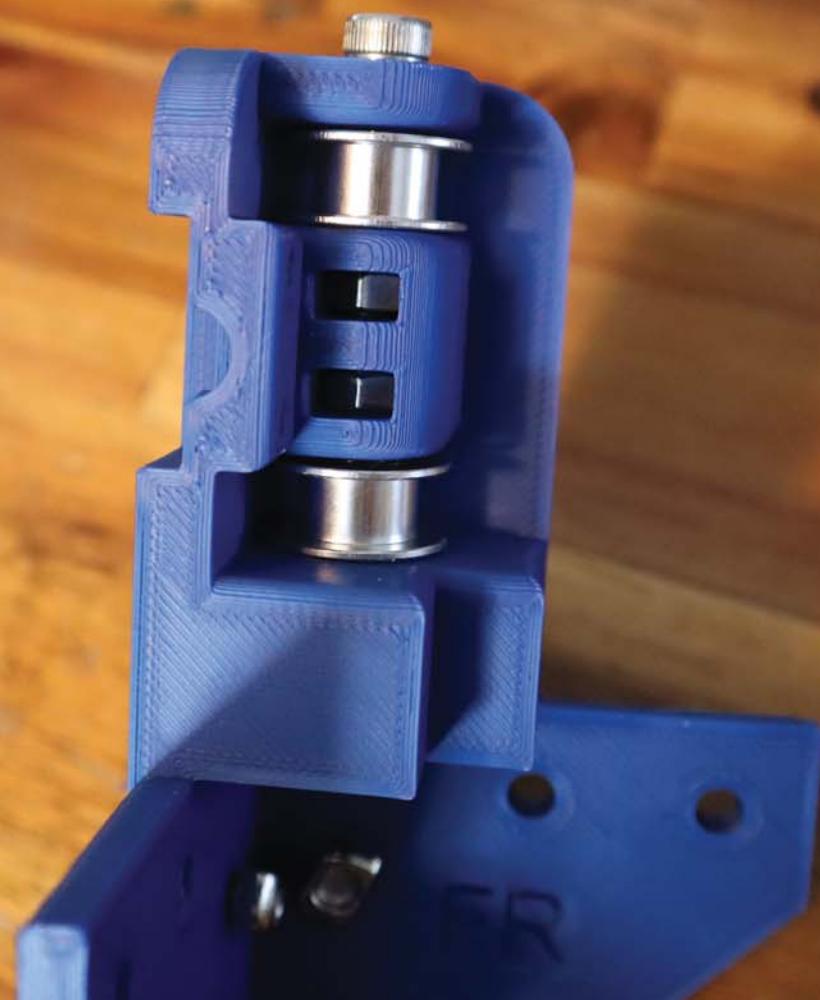
Prior to attaching the front idlers to the frame, the 20t gt2 idlers must be installed
Toothed or smooth idlers is fine, toothed is slightly more recommended
Using 2 M5 nuts per idler, insert into captive nut location
Use one M5x25 from bottom through idler and one M5x25 from top through
idler. Tighten bolts, do not over tighten.



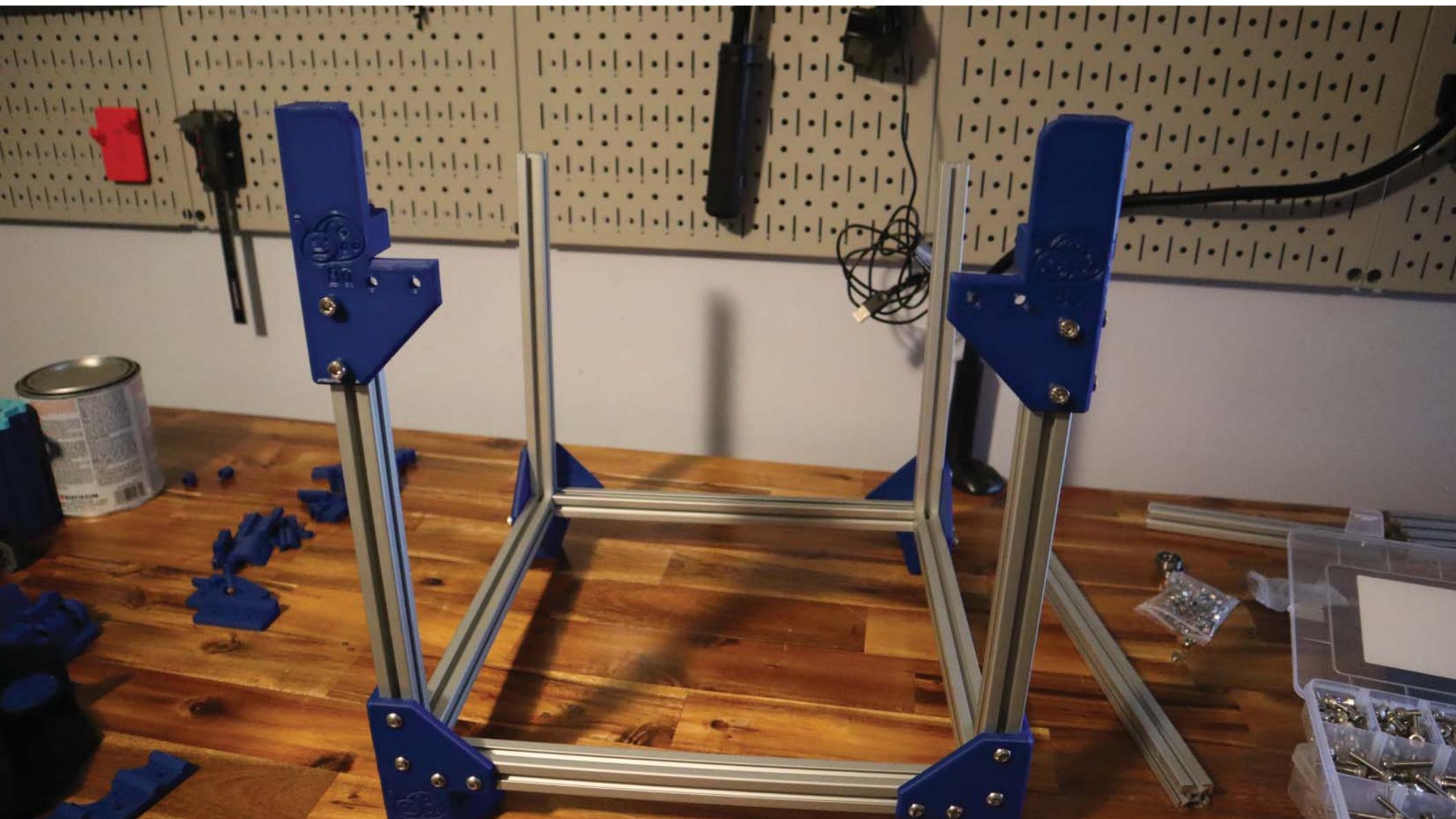
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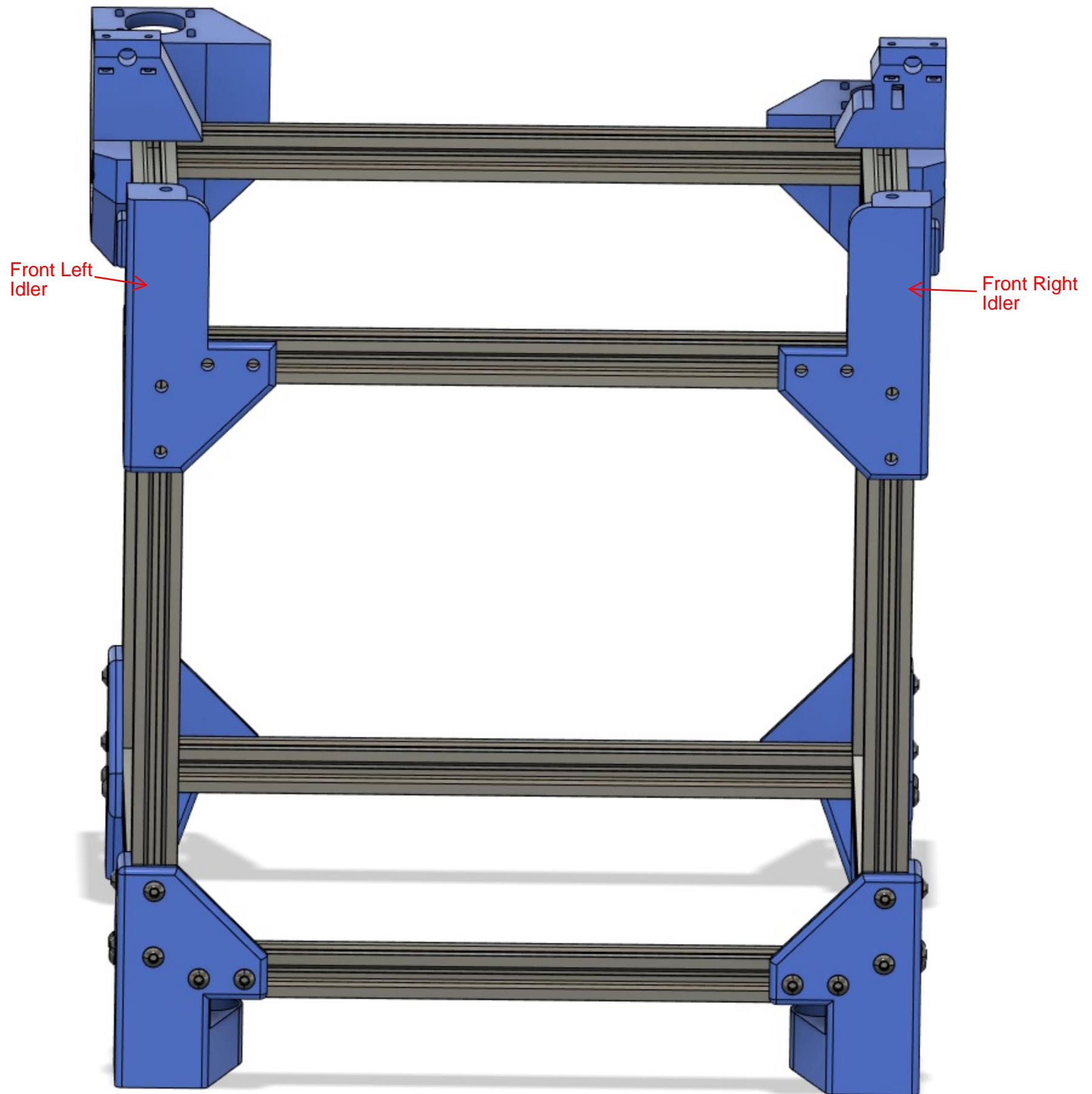


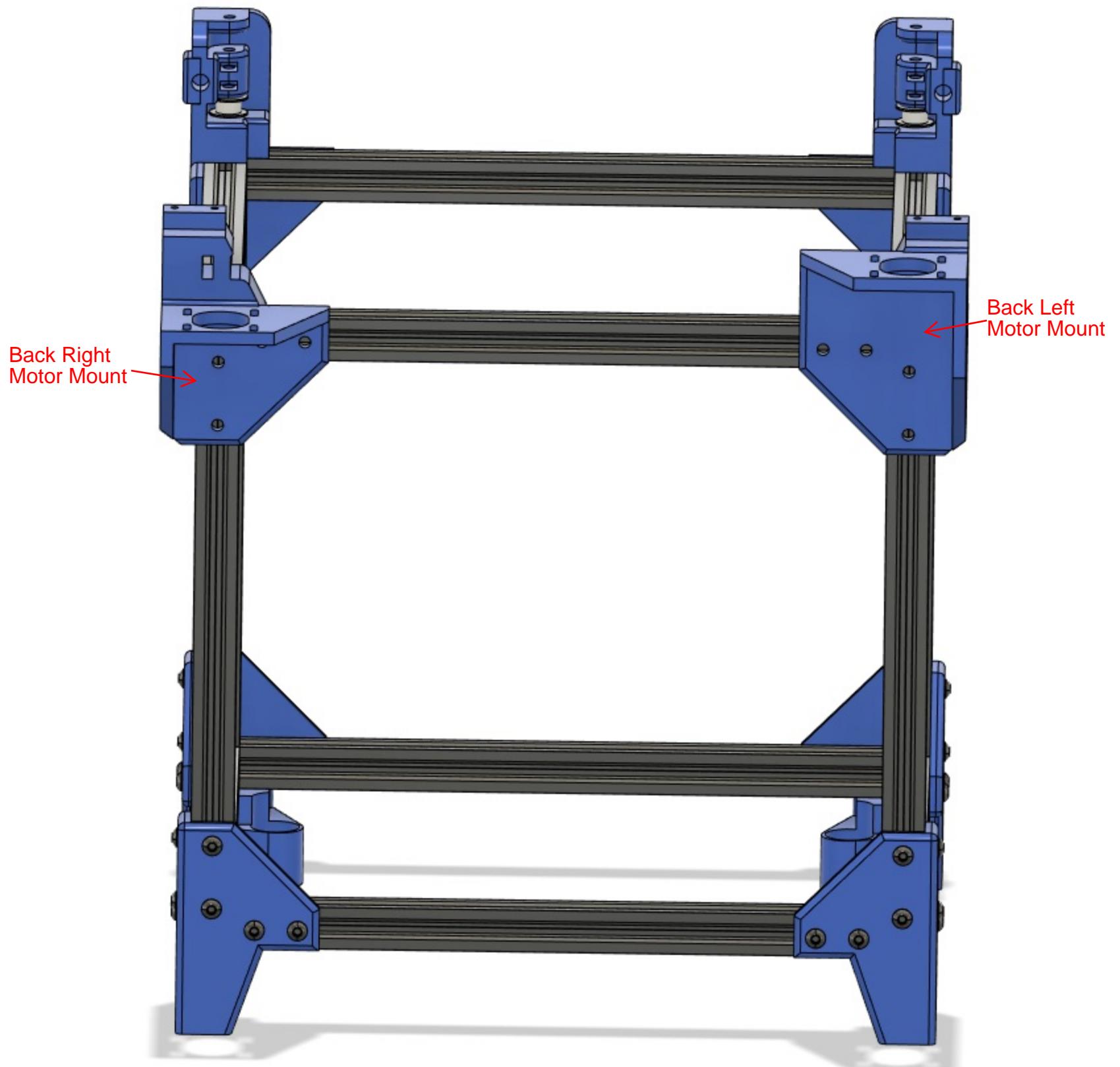
STEP 4:



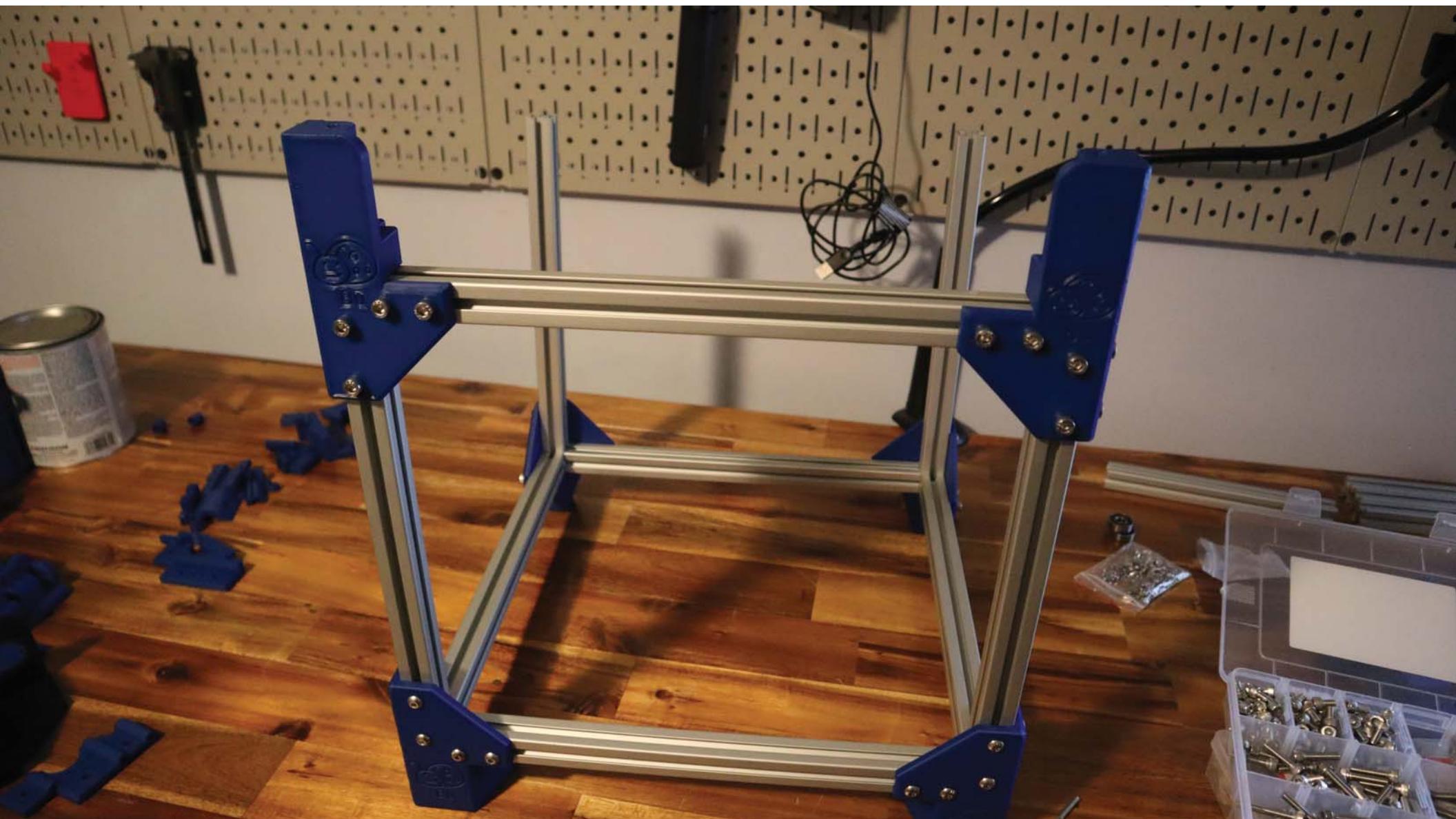
STEP 5/6:

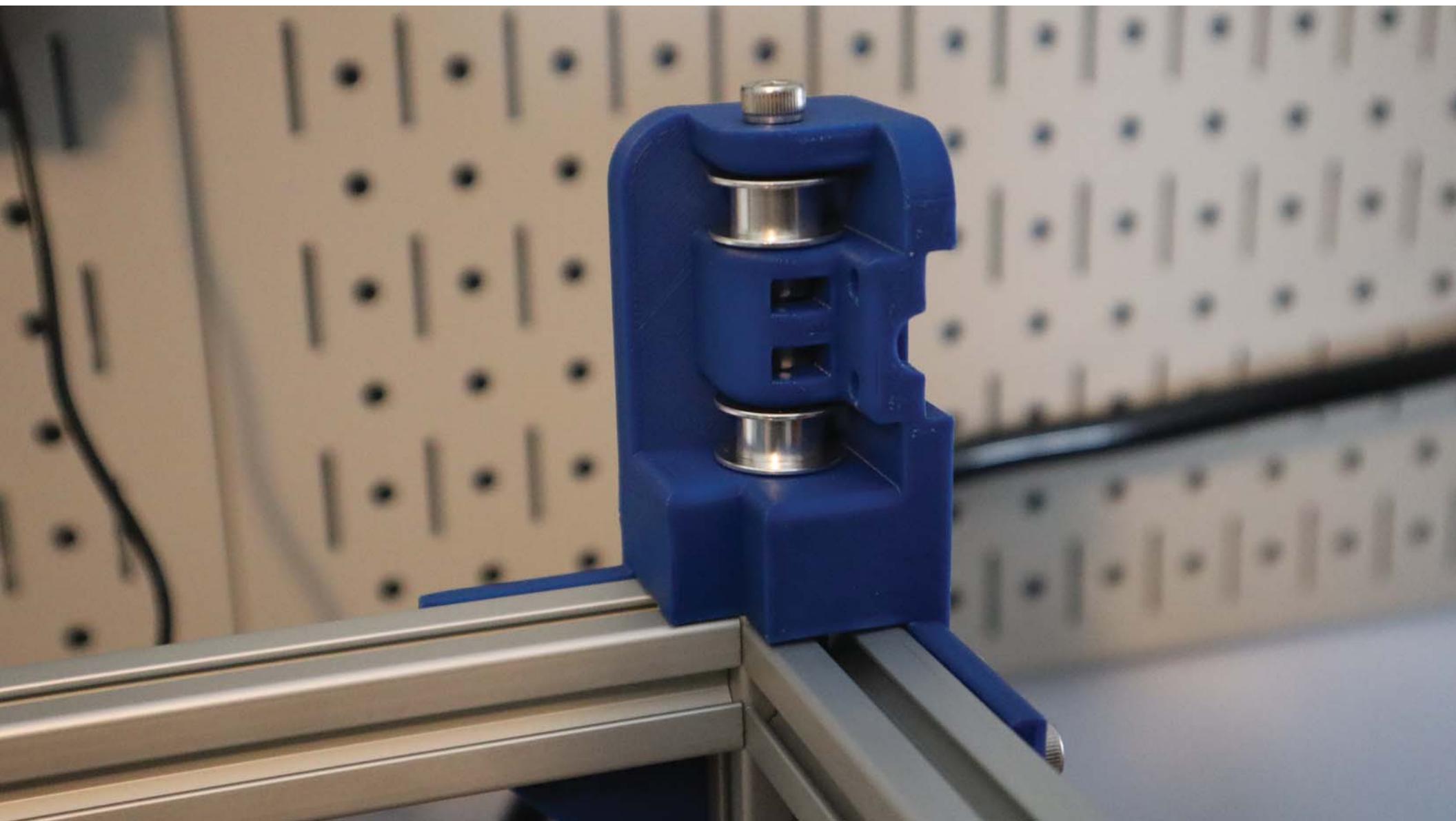


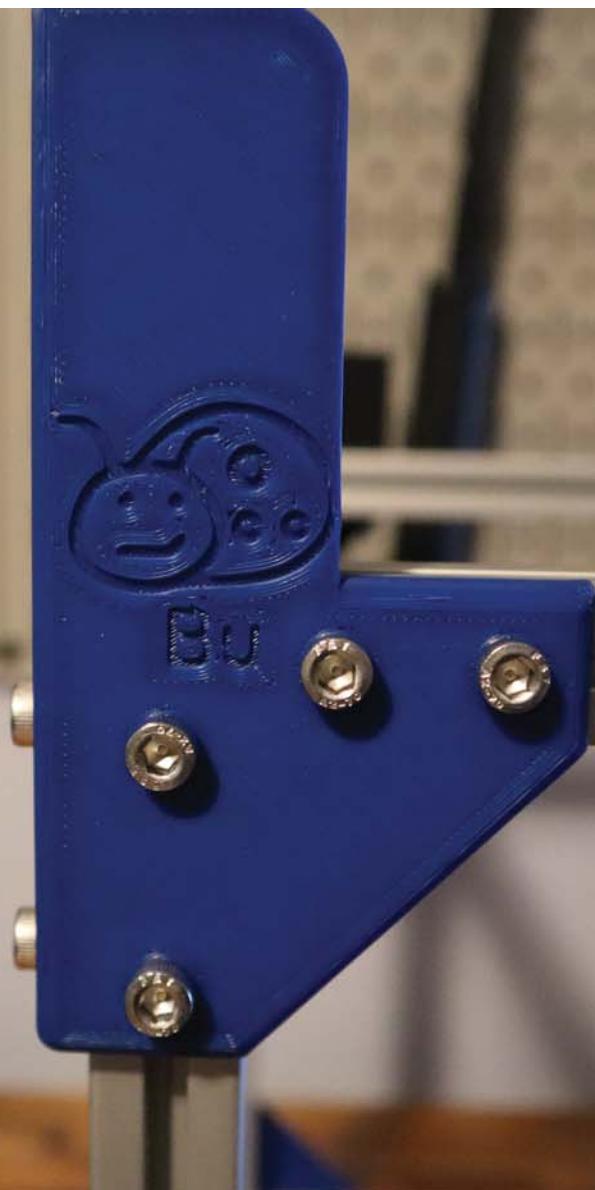




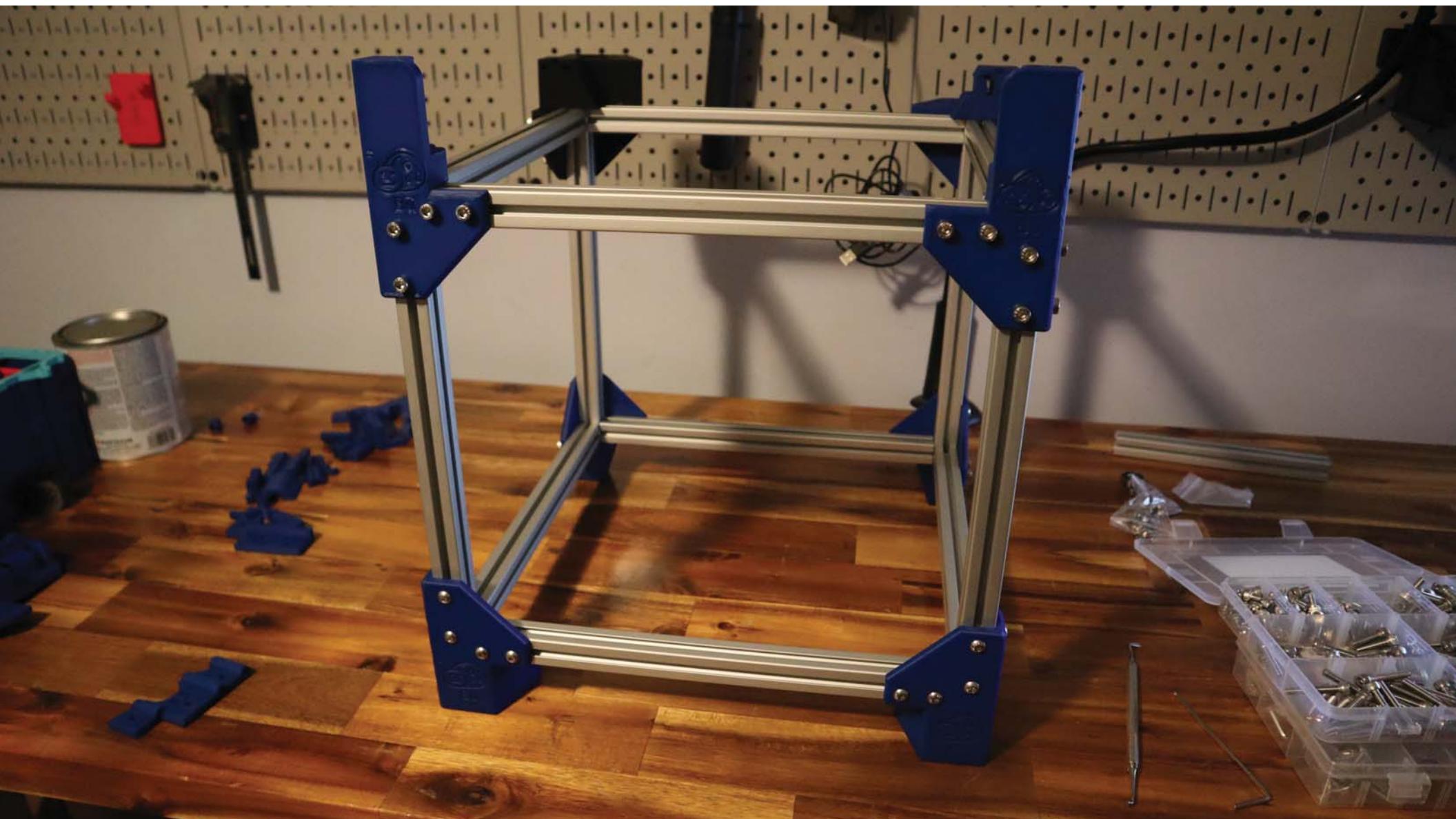
STEP 7:



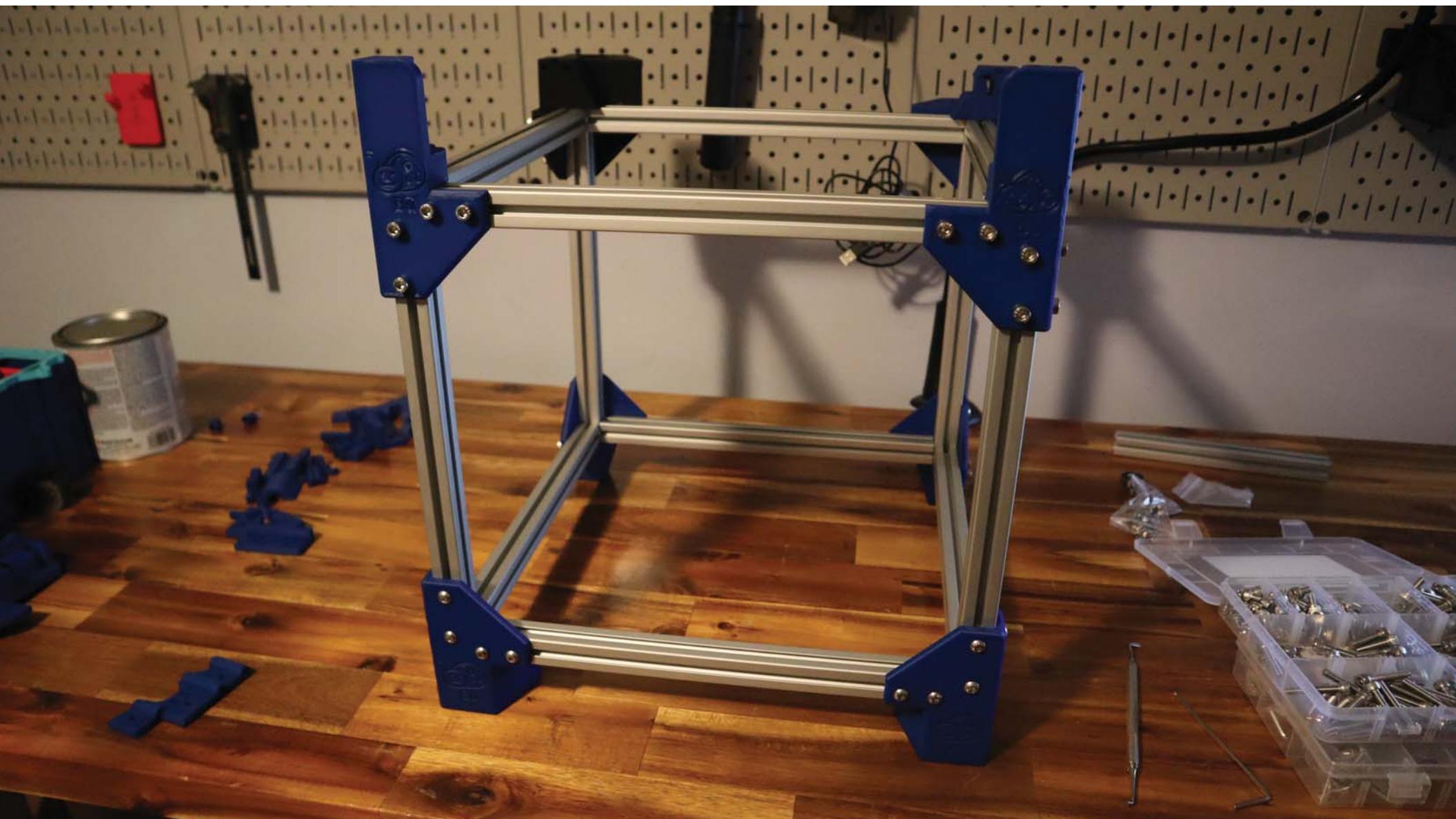




STEP 8:



COMPLETED FRAME

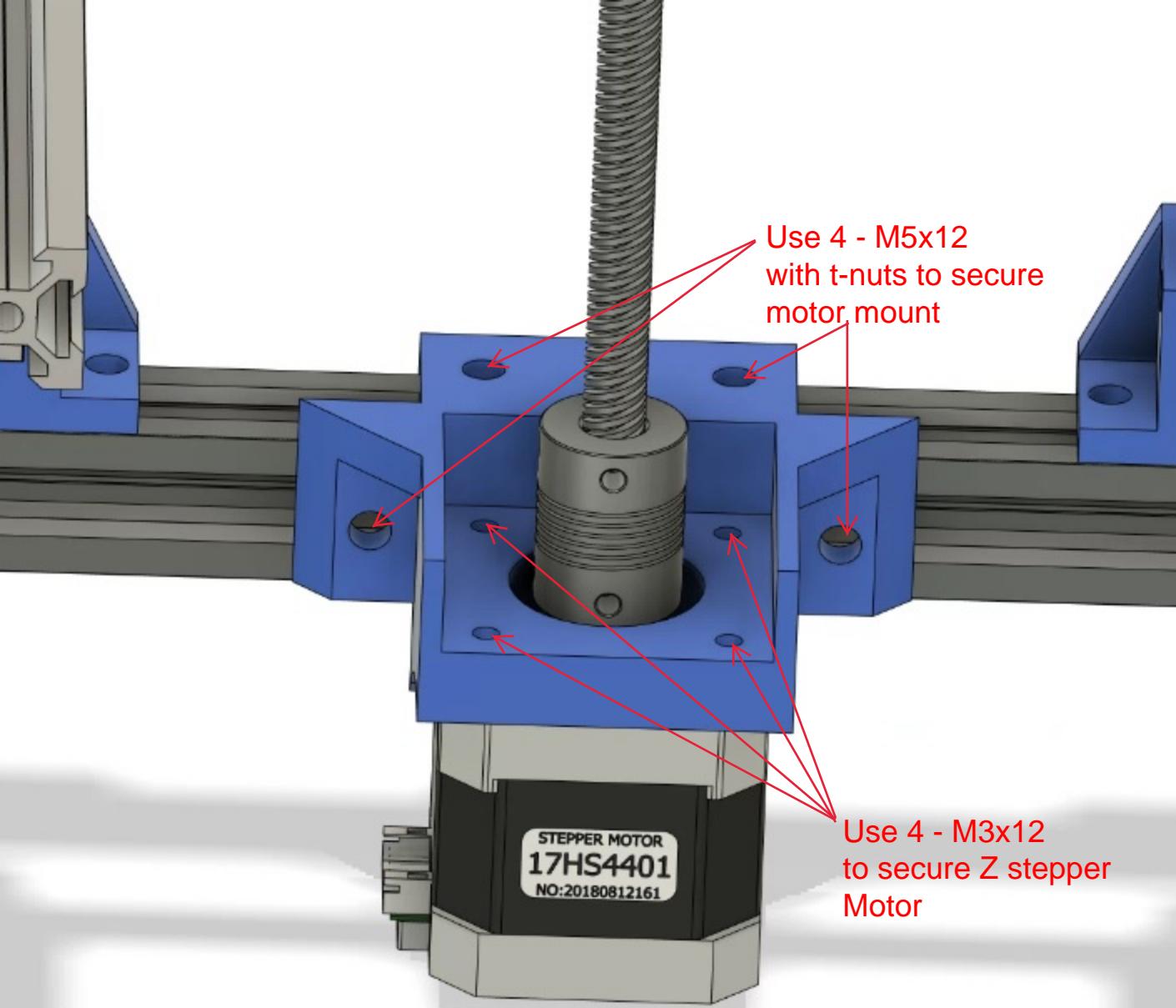


Section 2:

Z System and Print Bed

Components needed for this portion:

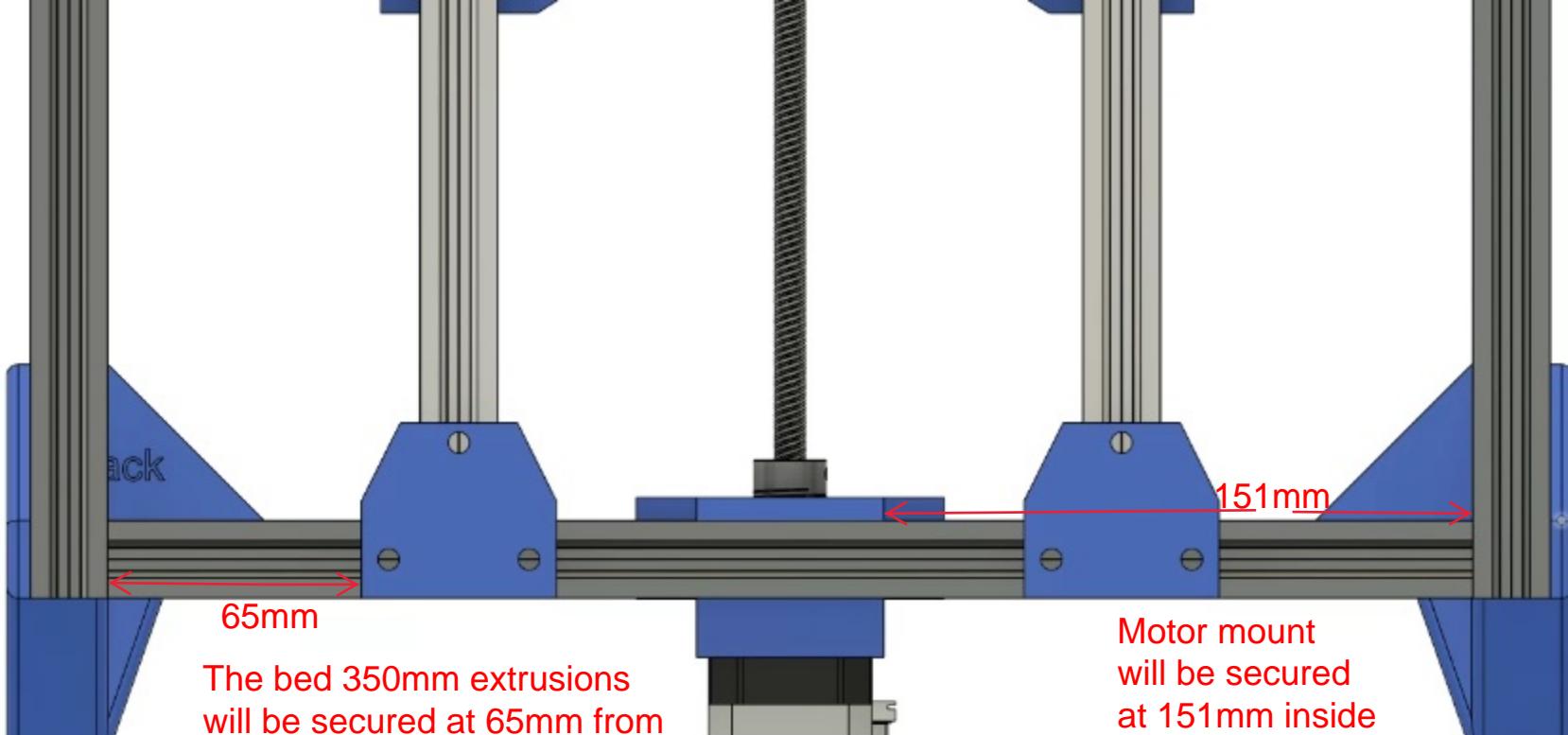
350mm x 8mm 4 start 8x8 Lead Screw	x1
5mm-8mm Coupler	x1
Lead Screw Nut	x1
M5x12 (or 10)	x24
M5 T-nut	x24
M3x12	x8
M3x8	x8
M3x8 T-nut	x8
5MM to 8MM Bore Coupler	x1
350mm MGN12H Linear Rail	x2
350mm 2020 Extrusion	x2
300mm 2020 Extrusion	x2
Ender 3 24v 235x235 Heated Bed	x1
M4x16	x4
M4 T-nut	x4
M4 Nut	x4



Use 4 - M5x12
with t-nuts to secure
motor mount

Use 4 - M3x12
to secure Z stepper
Motor

Use 12 - M5x12 with
t-nuts to mount 350mm
extrusions



65mm

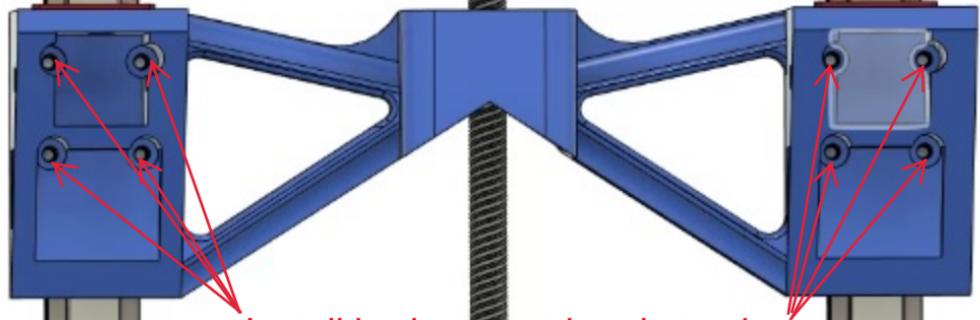
The bed 350mm extrusions
will be secured at 65mm from
inside of frame to edge of
mount

151mm

Motor mount
will be secured
at 151mm inside
of frame to edge of
mount

Secure linear rails making rails flush at top

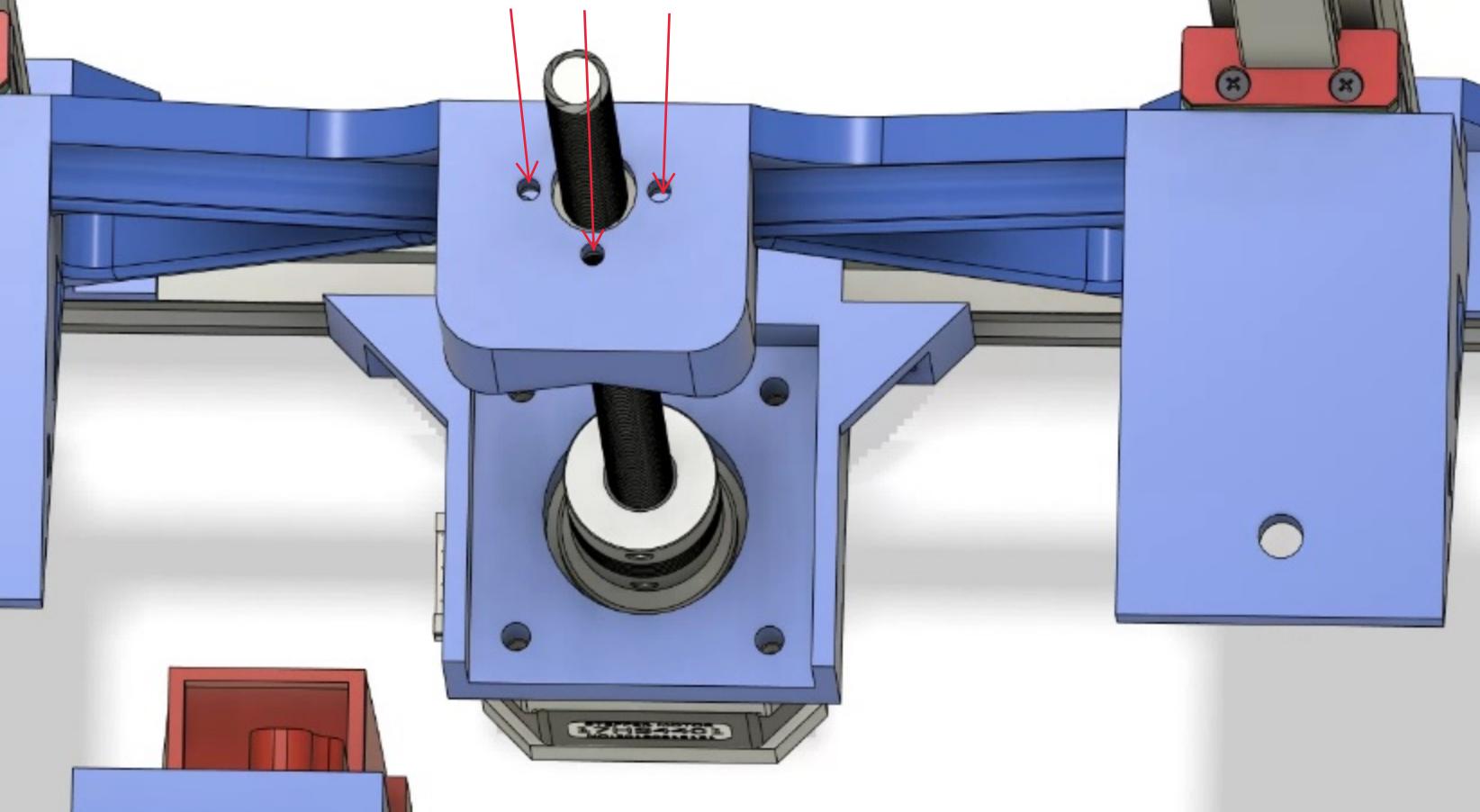
Be sure lead screw nut is installed prior to installing bed extrusion mount

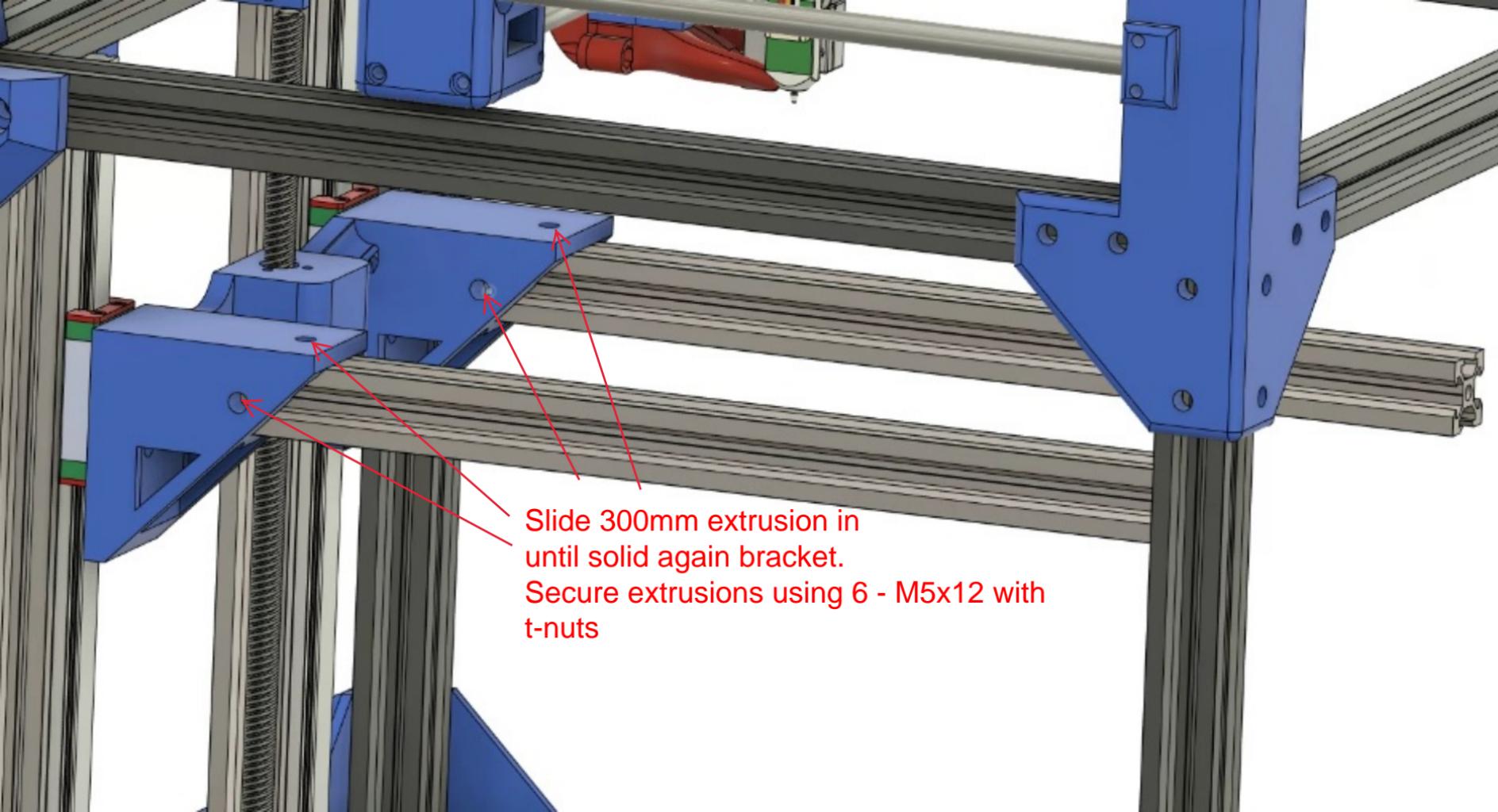


Install bed support bracket using
8 - M3x12

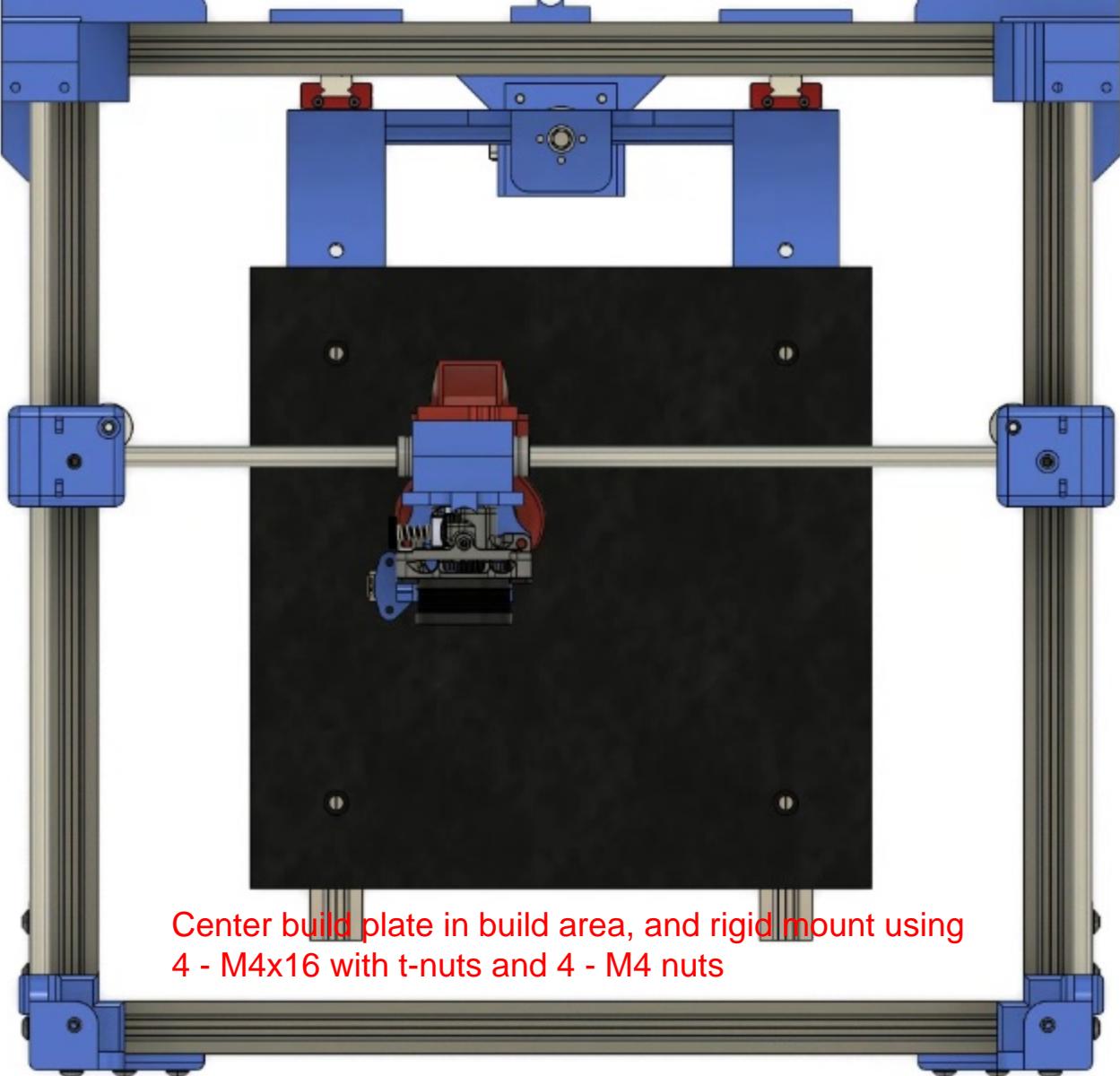
(NOTE: You will likely need to adjust one linear rail to achieve smoothest movement, this can be done by loosening one rail and running mount up and down until smooth, then re-tighten rail)

Mount lead screw nut using 3 - M3x12 with M3 Nut

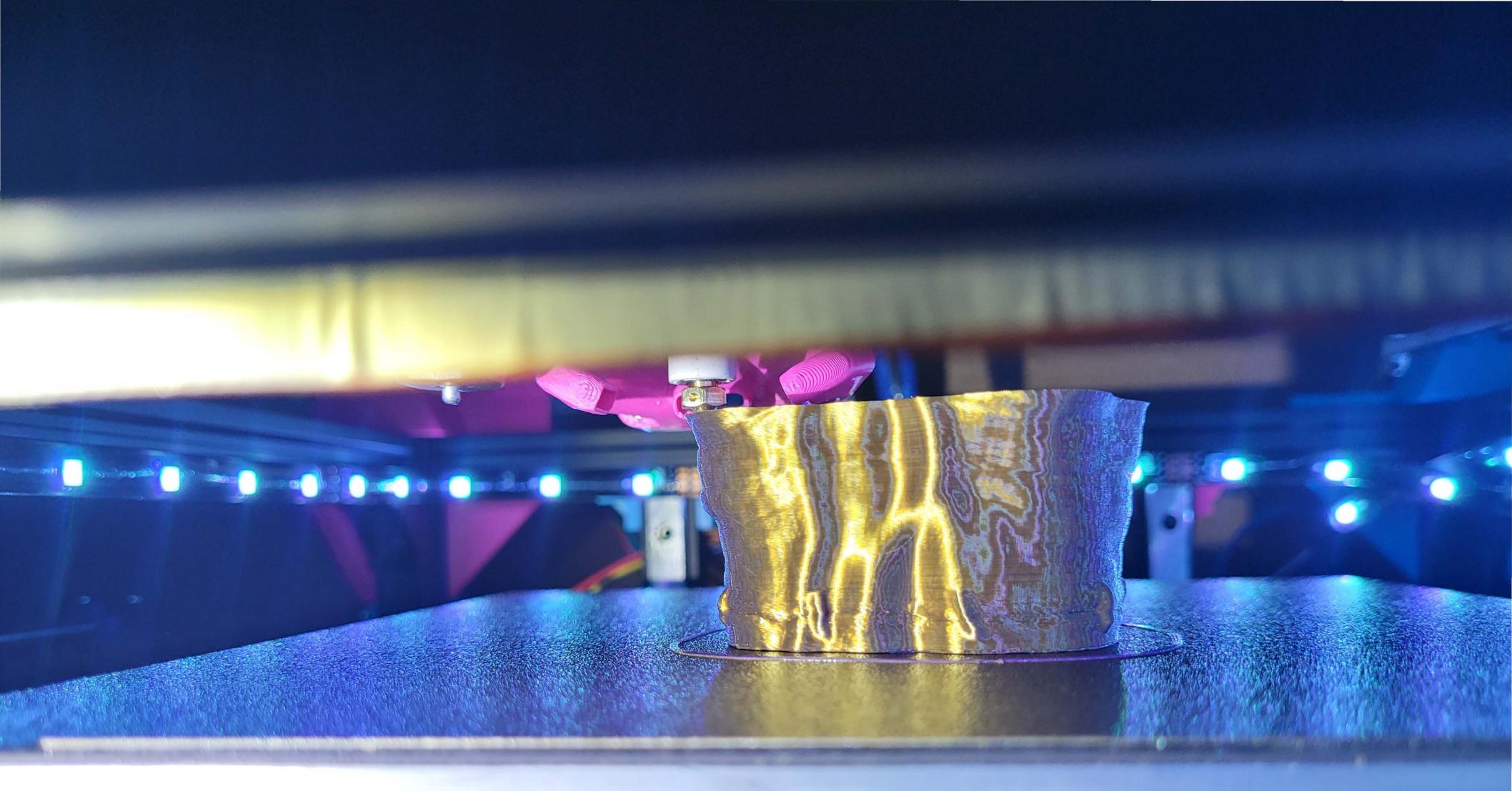




Slide 300mm extrusion in
until solid again bracket.
Secure extrusions using 6 - M5x12 with
t-nuts



Center build plate in build area, and rigid mount using
4 - M4x16 with t-nuts and 4 - M4 nuts



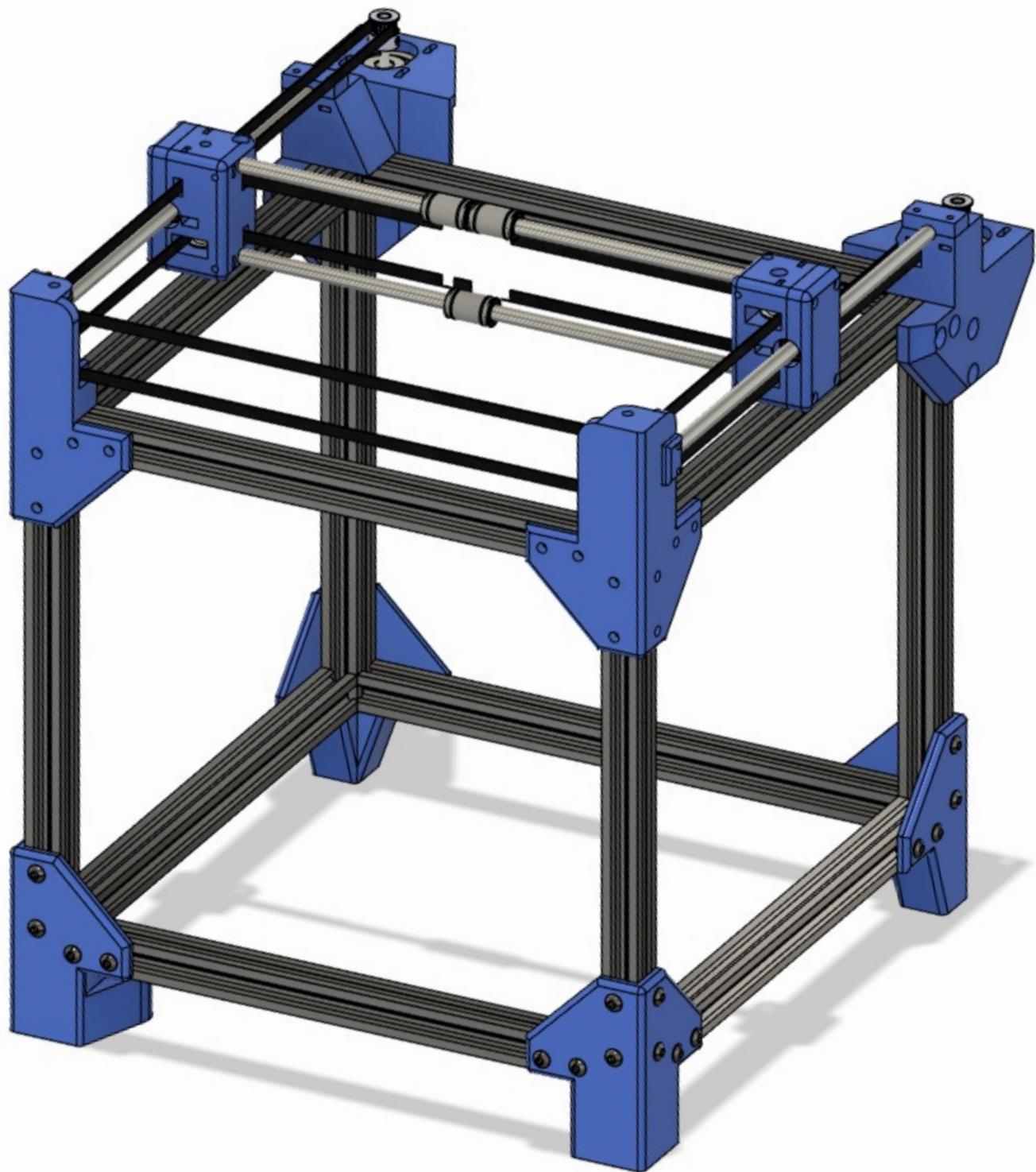
Place M4x16 in screw hole on bed. Then place nut first, followed by the t-nut. Once all four screw are in the bed, place t-nuts into bed extrusions and center bed. Tighten screws until screw bottom out on extrusions pinning the t-nut, then spin the M4 nut up until bed is secured, for a rigid mounted bed

Section 3:

Gantry Assembly

Components needed for this portion:

M3x8	x8
M3x16	x8
M3x20	x20
M5x35	x4
M3 Nuts	x28
M5 Nuts	x4
350mm Linear Rods	x4
8mm Linear Bearings	x4
20t GT2 idlers	x4
Nema 17 Stepper Motor	x2
5mm Bore 20T GT2 Pulley	x2



The X/Y Gantry

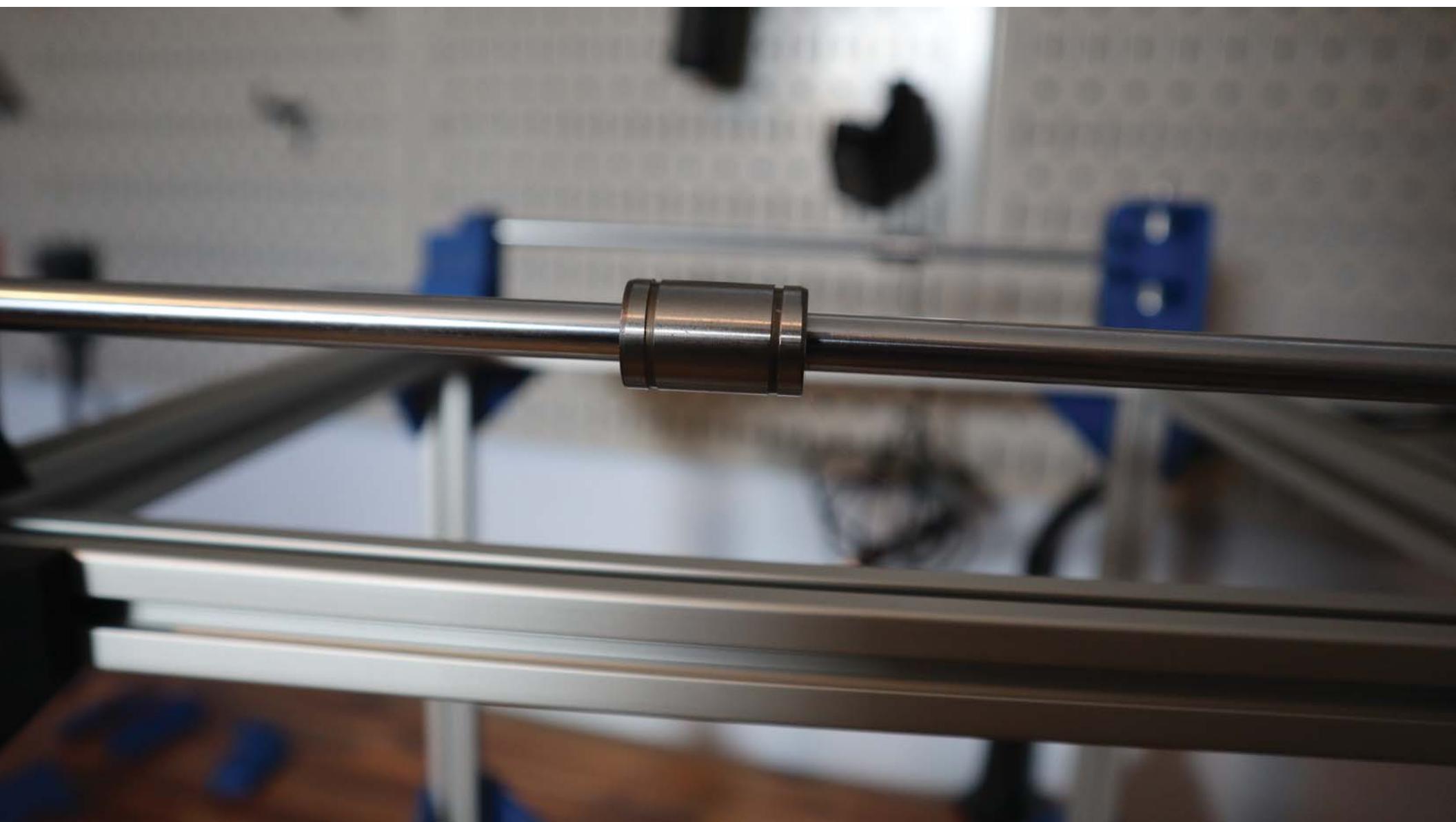
1. Place one linear bearing on each of the Y gantry linear rods.
2. Assemble the left and right Linear rods by attaching them to the corner brackets with the mount and 2 m3x20 bolts and nuts in the front, and 2 m3x16 bolts and nuts in the rear.
3. Attach the motors to the rear motor mounts using 4 m3x8 bolts each. Ensure that the connector on each motor is facing in.
4. Using 2 m5x35 bolts and nuts, insert the captive m5 nuts into the holes on the X gantry mount. Insert the gt2 toothless idler into the recess and slide the m5x35 bolt through and screw into the captive nut. Repeat for the bottom. Do not over tighten, as this will cause binding on the idlers.
5. Repeat for the other side of the X gantry.
6. Place two linear bearings on top linear rod, one linear bearing on bottom rod. **Install linear rods in gantry blocks prior to fastening to the Y rails!** Using 4 captive m3 nuts and 4 m3x20 bolts, secure the two halves of the X gantry mount to the linear bearing. Be sure to keep the large half toward the center, and use the correct mount on the left and right side.
7. Repeat the previous step for the opposite side.
8. Insert an m3 nut into the captive slot next to the linear rod slot. Insert the linear rods into one side of the X gantry and secure with an m3x16 bolt. Do not over tighten.
9. Place one linear bearing on each linear rod.
10. Remove the front mount from the opposite X linear rod. Move the X gantry all the way forward and line up the Y gantry rods with the holes in the opposite mount. Slide the linear rods into the holes and secure with two captive m3 nuts and 2 m3x16 bolts. Do not over tighten.

NOTE: Use caution when flipping the printer around once gantry is assembled prior to the X/Y belt being installed. Once gantry is installed, it can move quickly when moving or flipping the printer prior to the belts being installed which can cause pinch or impact to use causing harm. Designer cannot be held liable for building of this printer as each user does so at their own risk.

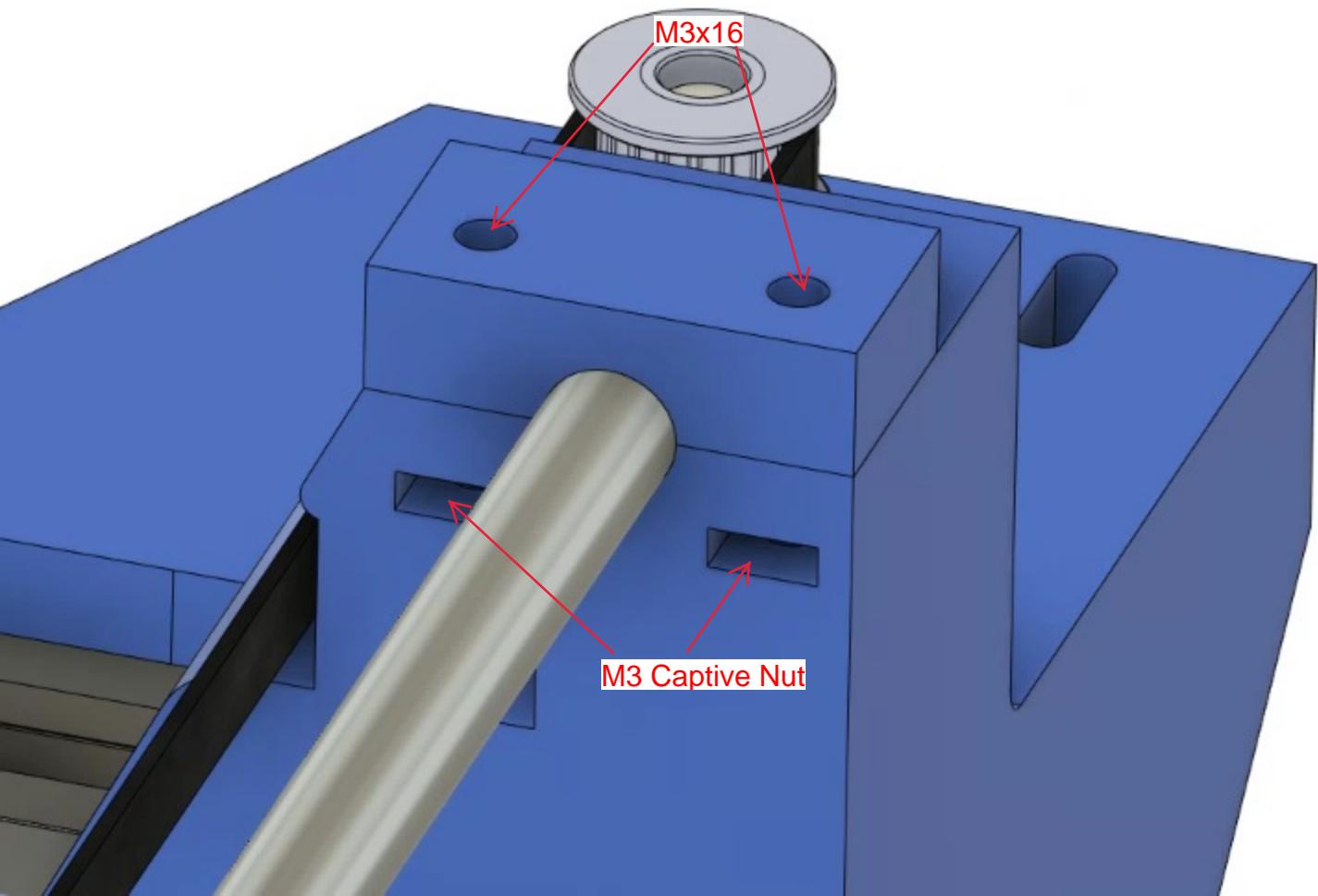
STEP 1



STEP 1



STEP 2

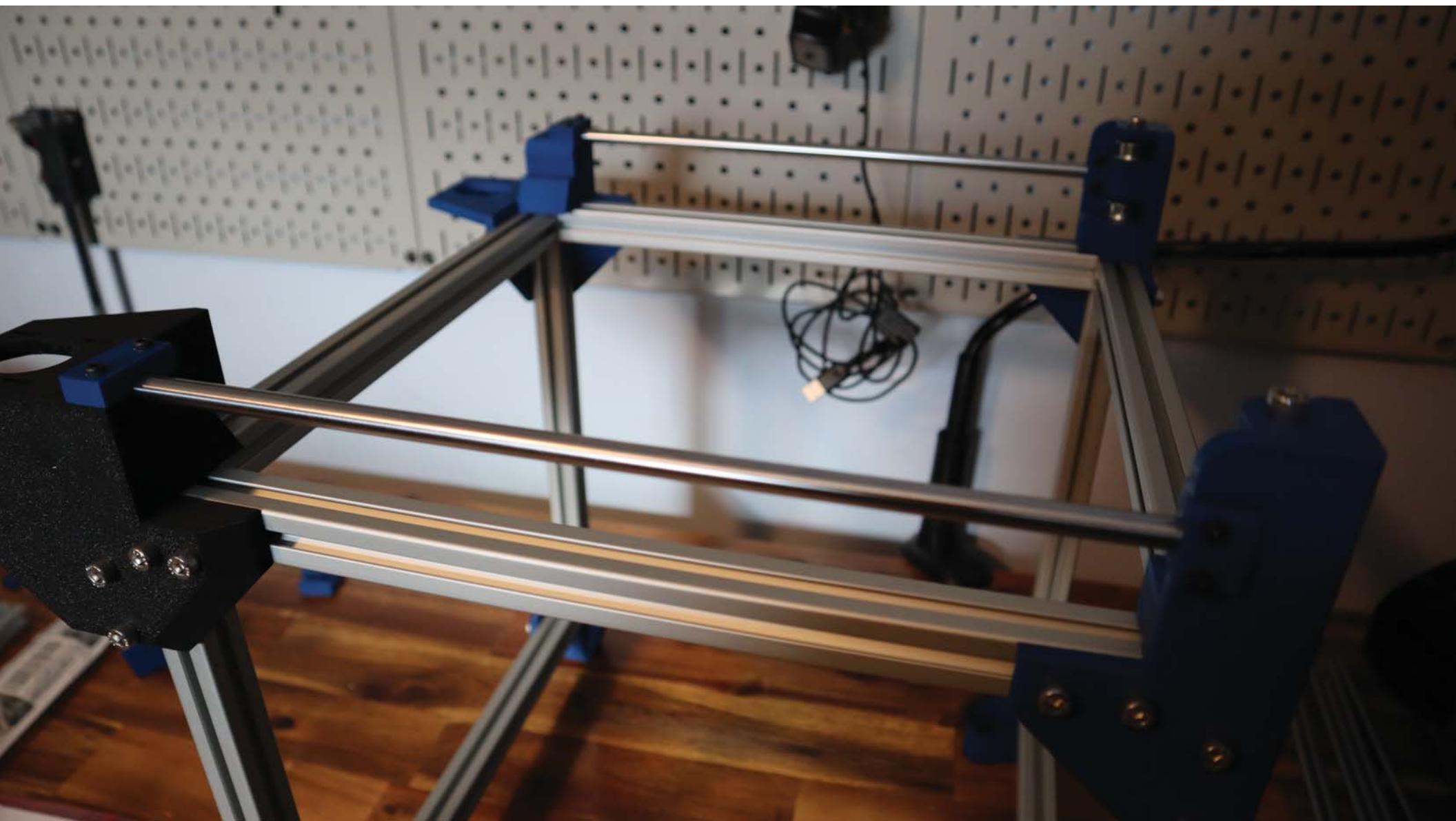


STEP 2

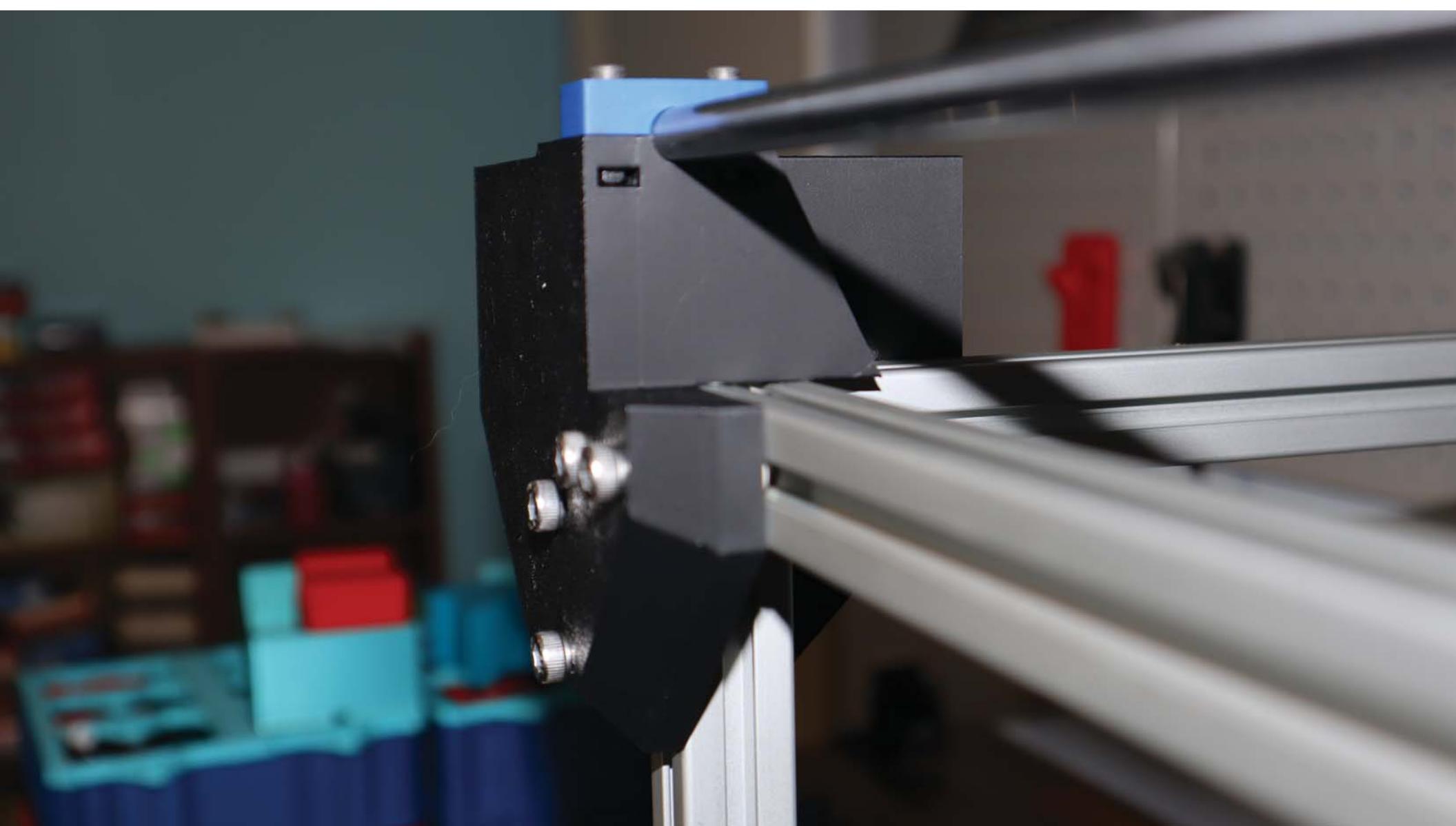
Use exposed M3 nut on inside for this clamp
These will not interfere with belt path

M3x20

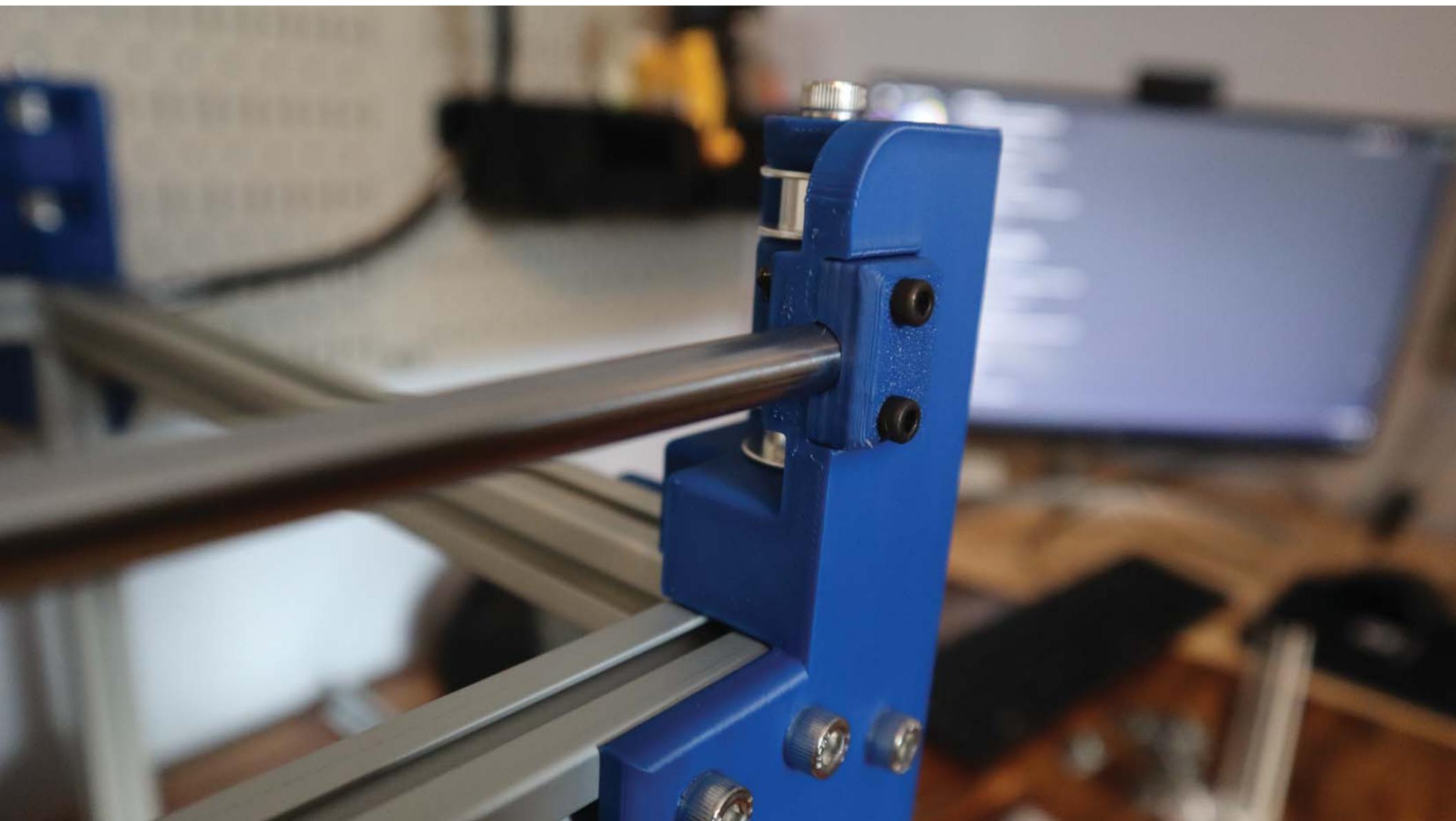
STEP 2



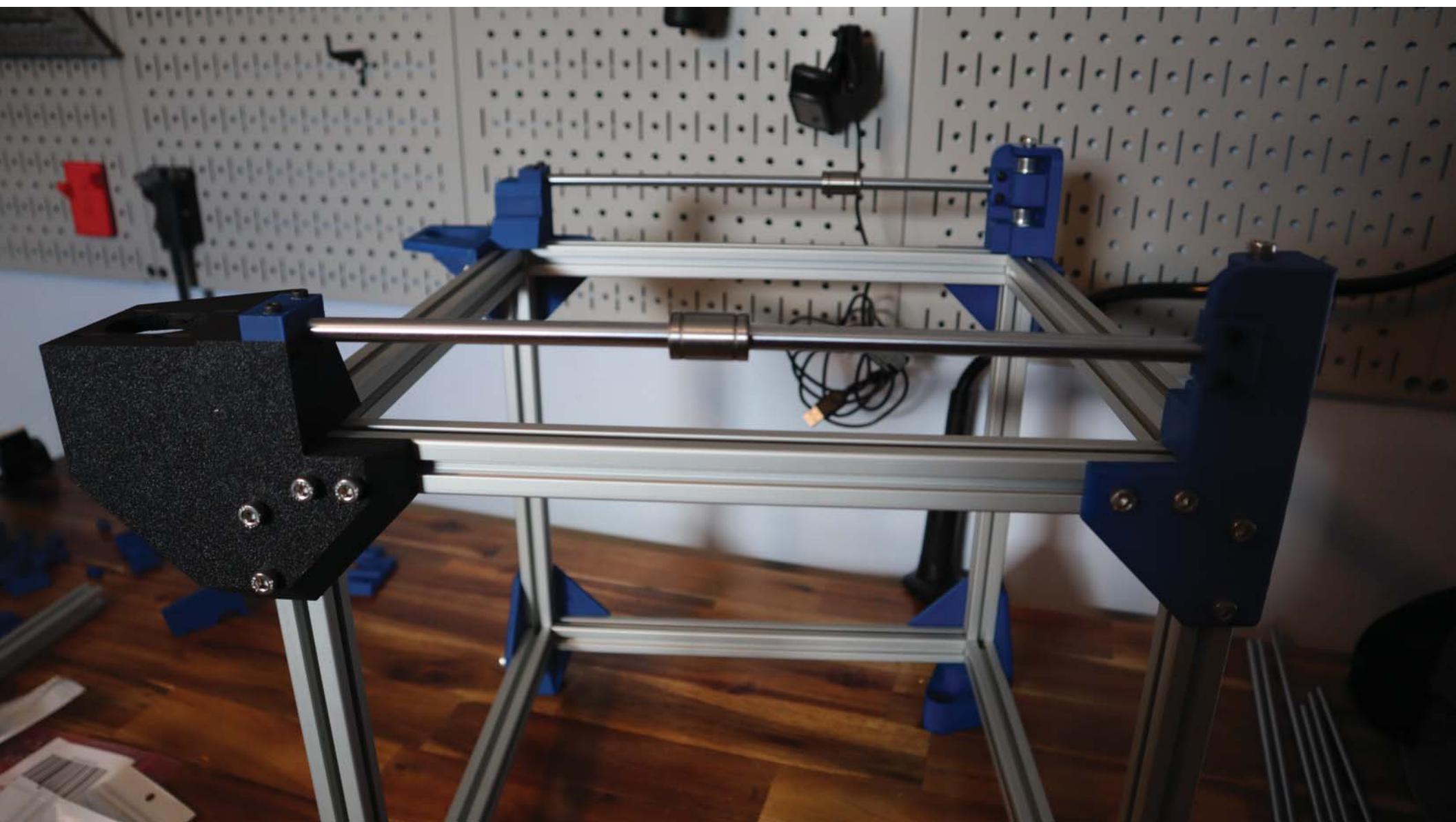
STEP 2



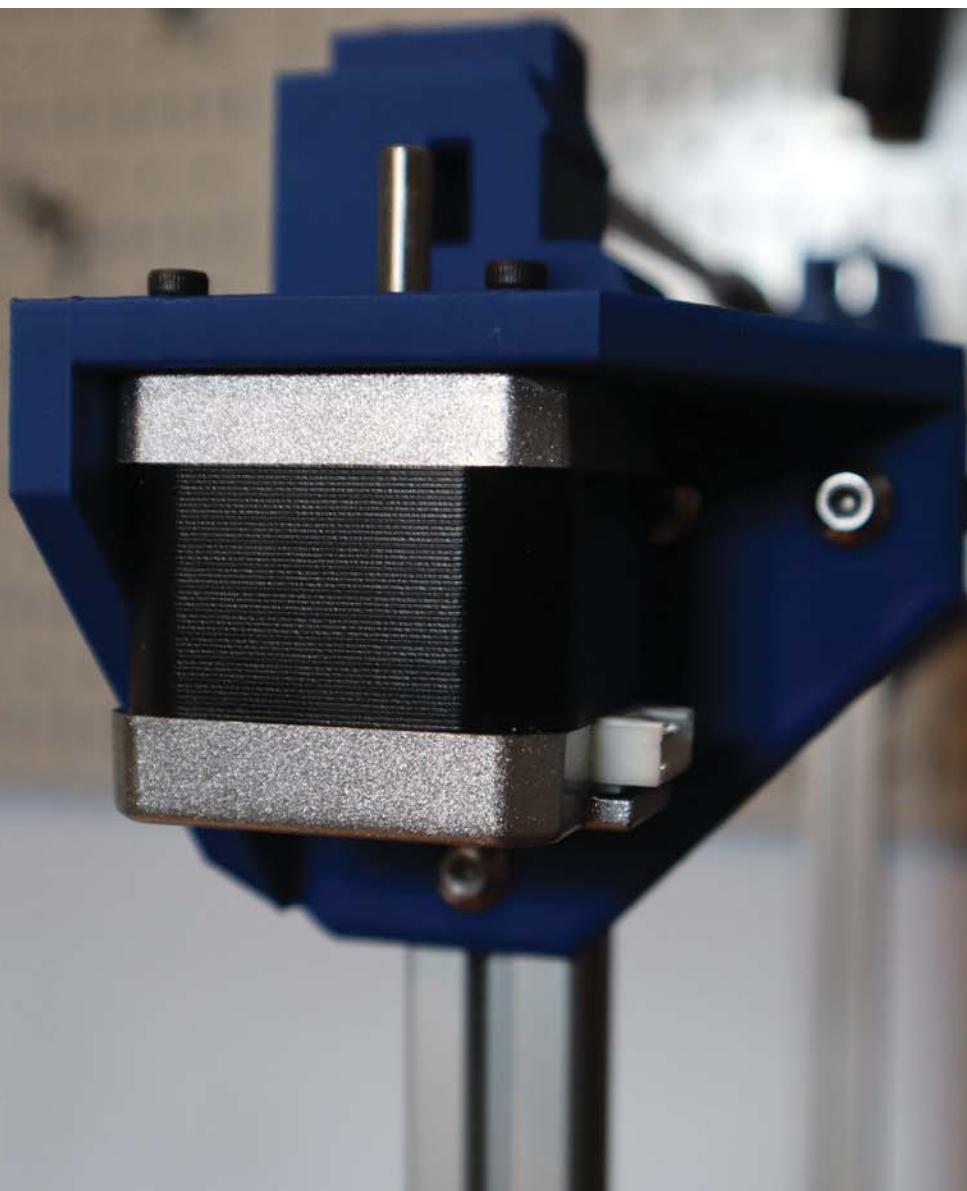
STEP 2



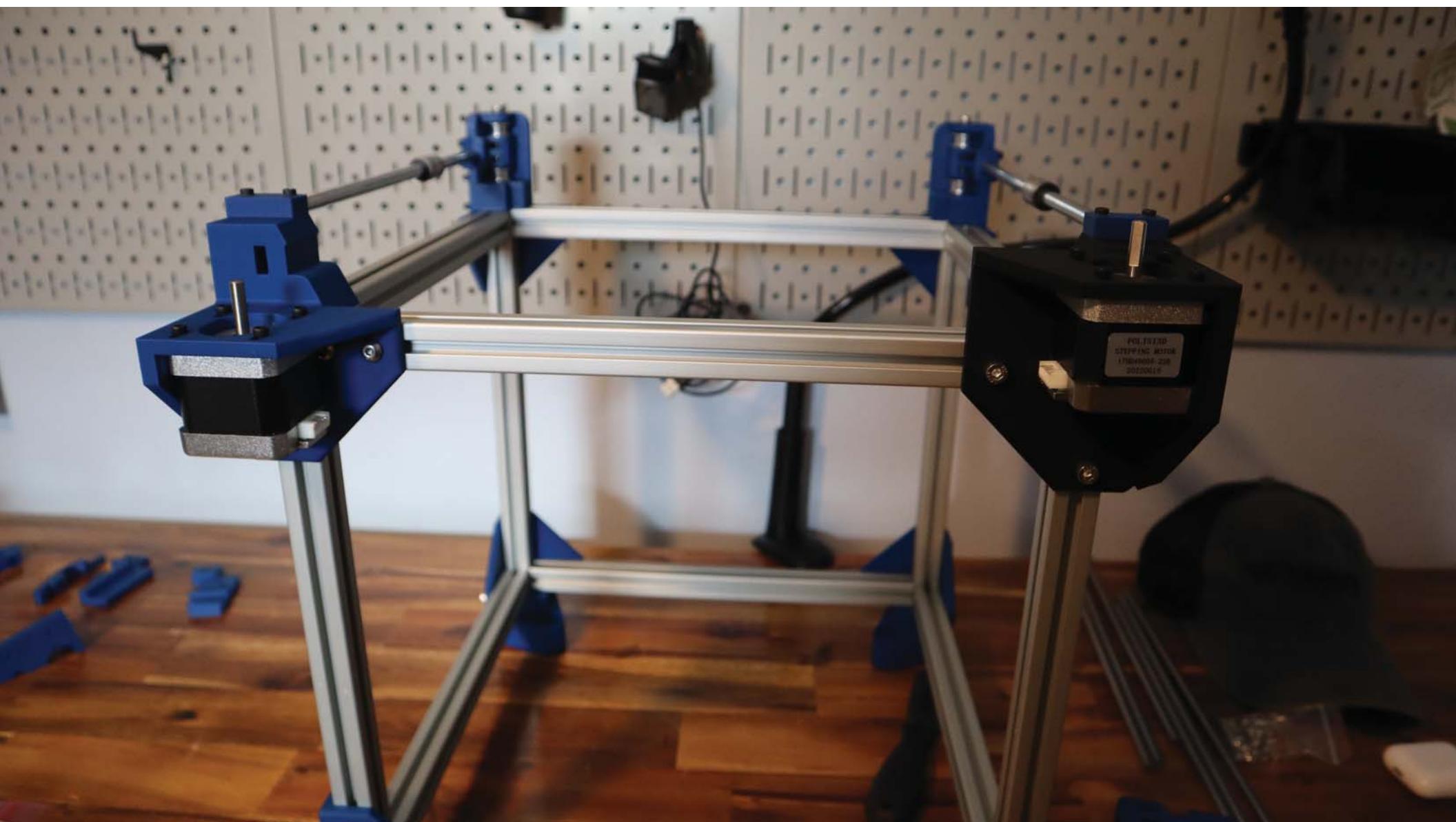
STEP 2



STEP 3



STEP 3



STEP 3

Motors attach with 4 - M3x8

Approximately 9.5mm

5mm bore 20T GT2 Pulley mounts
to stepper motor shaft
(use blue loctite on grub screws)

Approximately
10.5mm

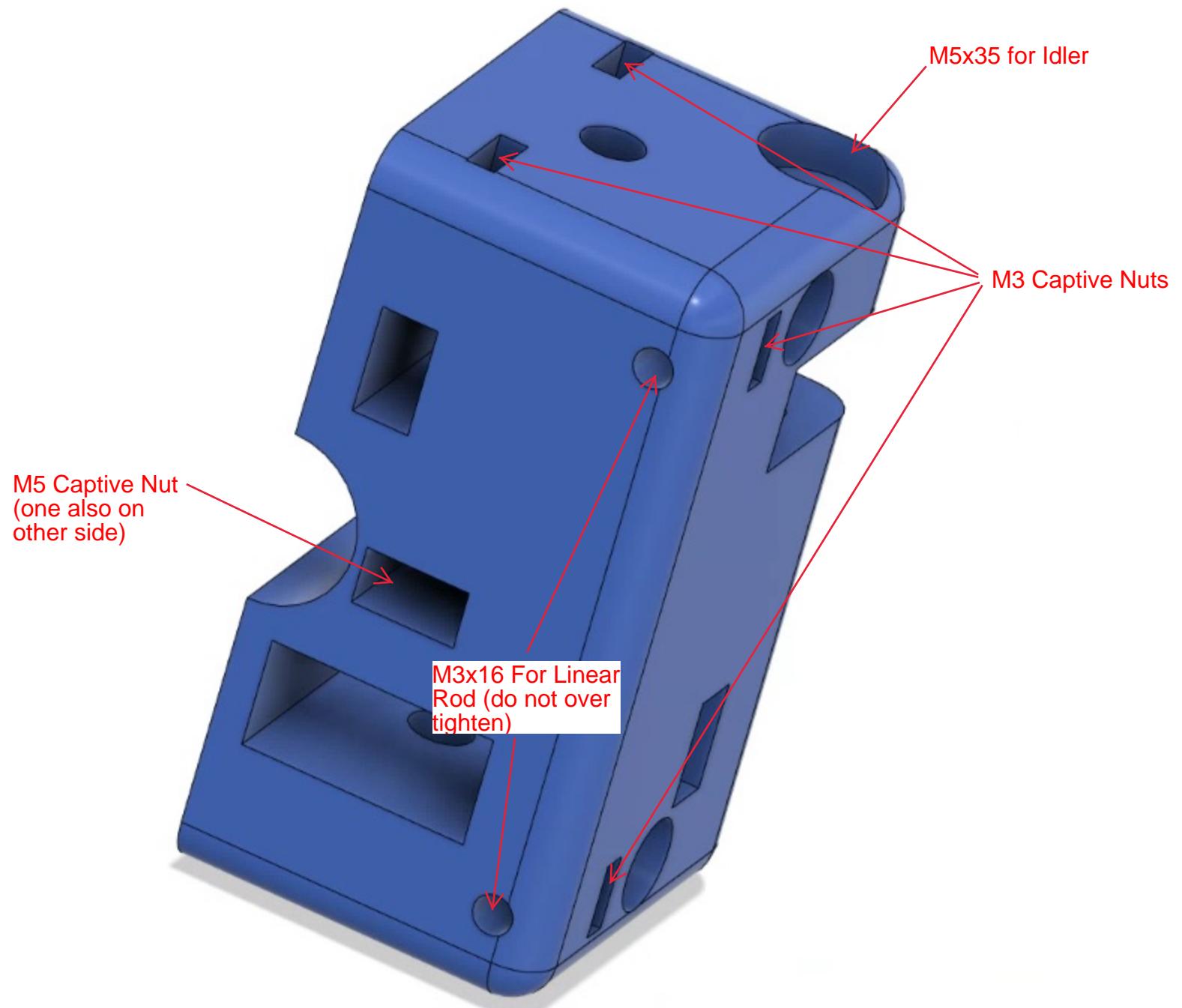
STEP 4/5

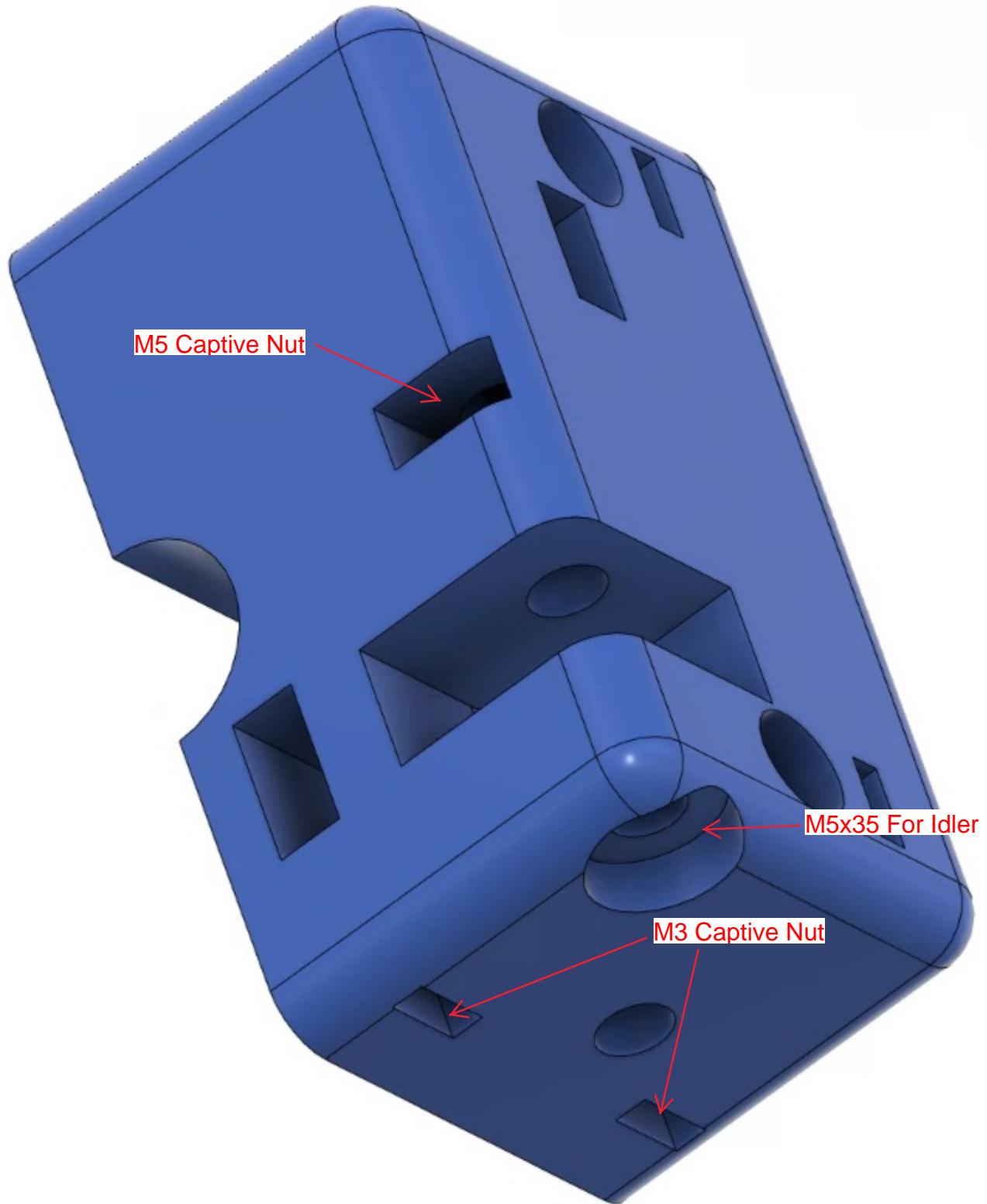


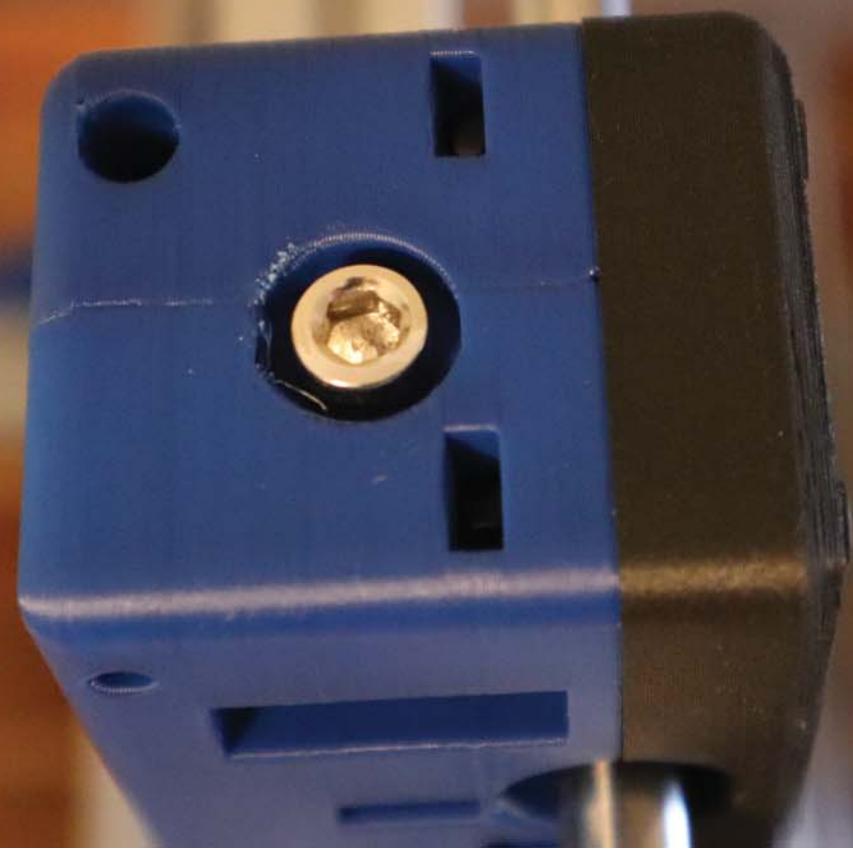
STEP 4/5



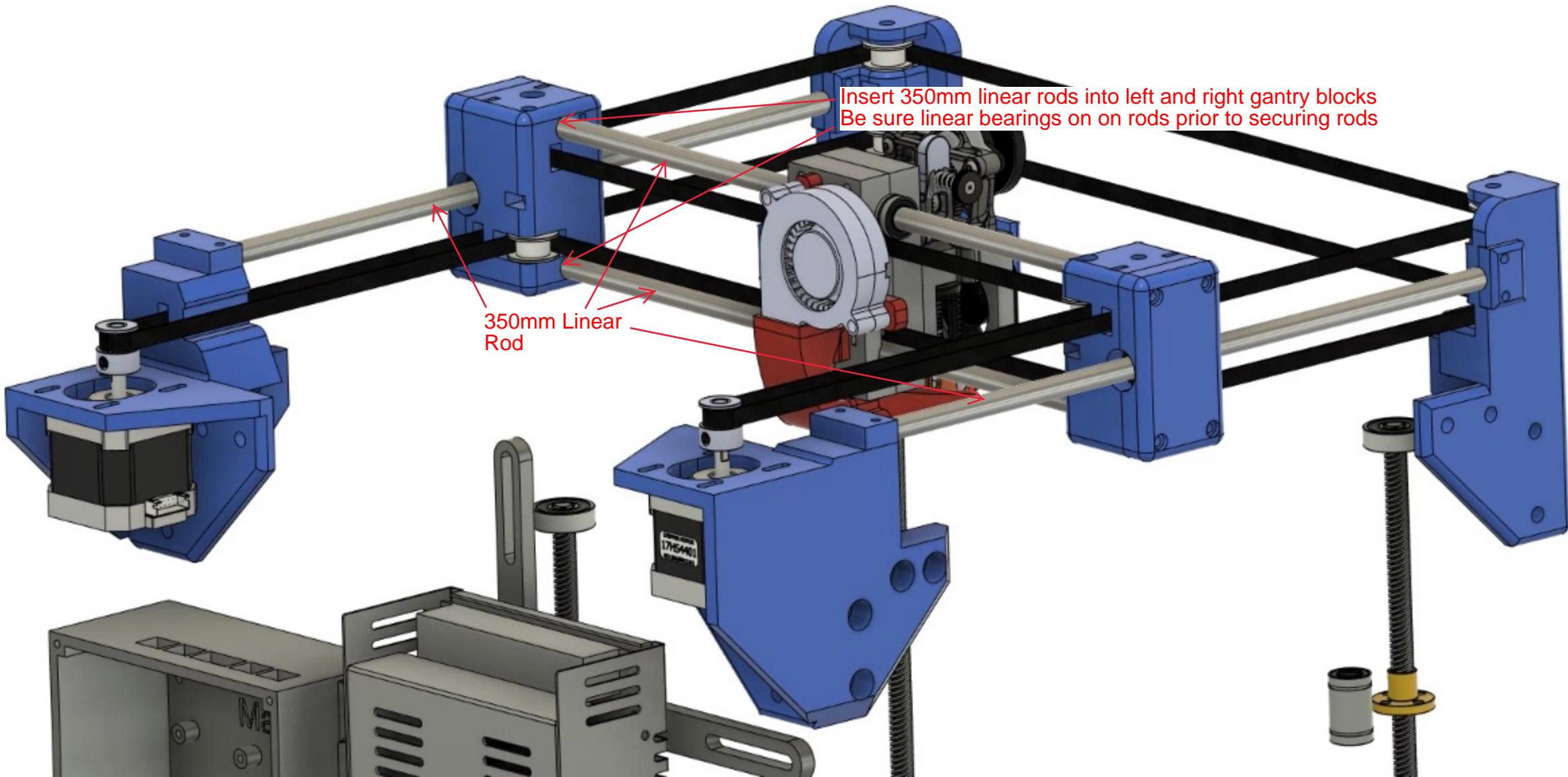
There are 6 M3 Captive Nuts on each gantry block and 2 M5







Gantry System

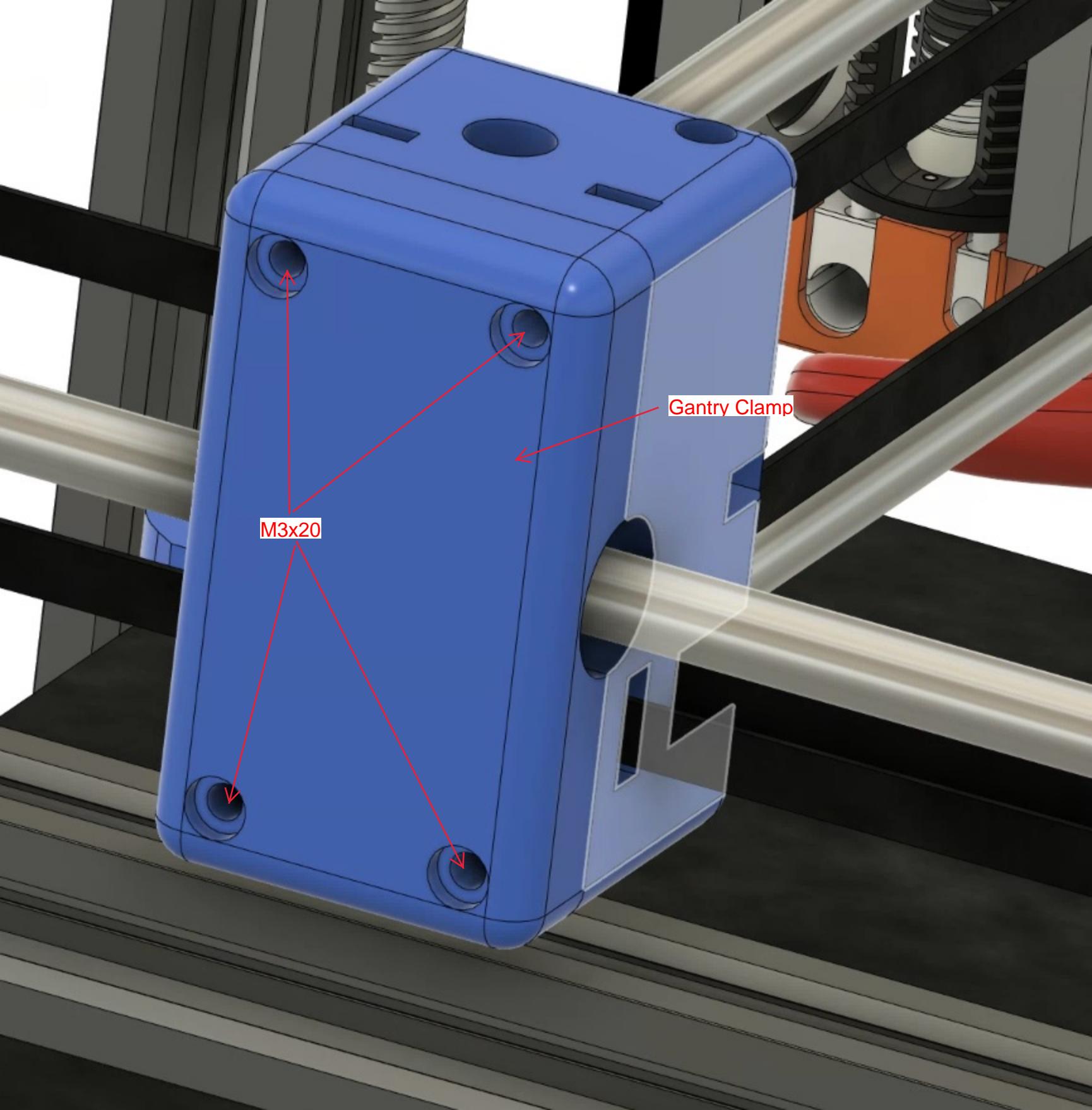


STEP 6
NOTE: INSTALL RODS PRIOR TO MOUNTING BLOCKS



STEP 6/7
NOTE: INSTALL RODS PRIOR TO MOUNTING BLOCKS

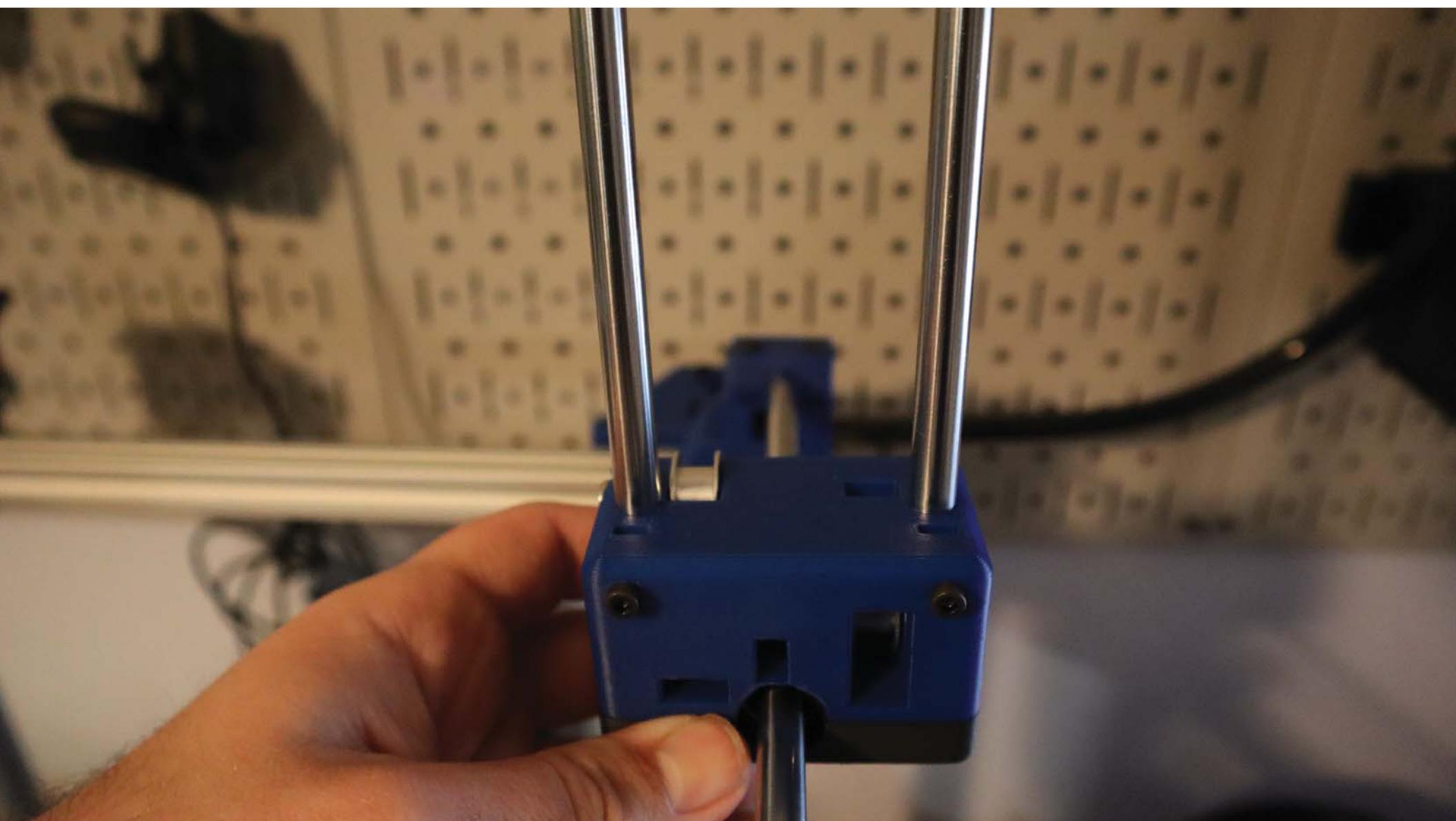




M3x20

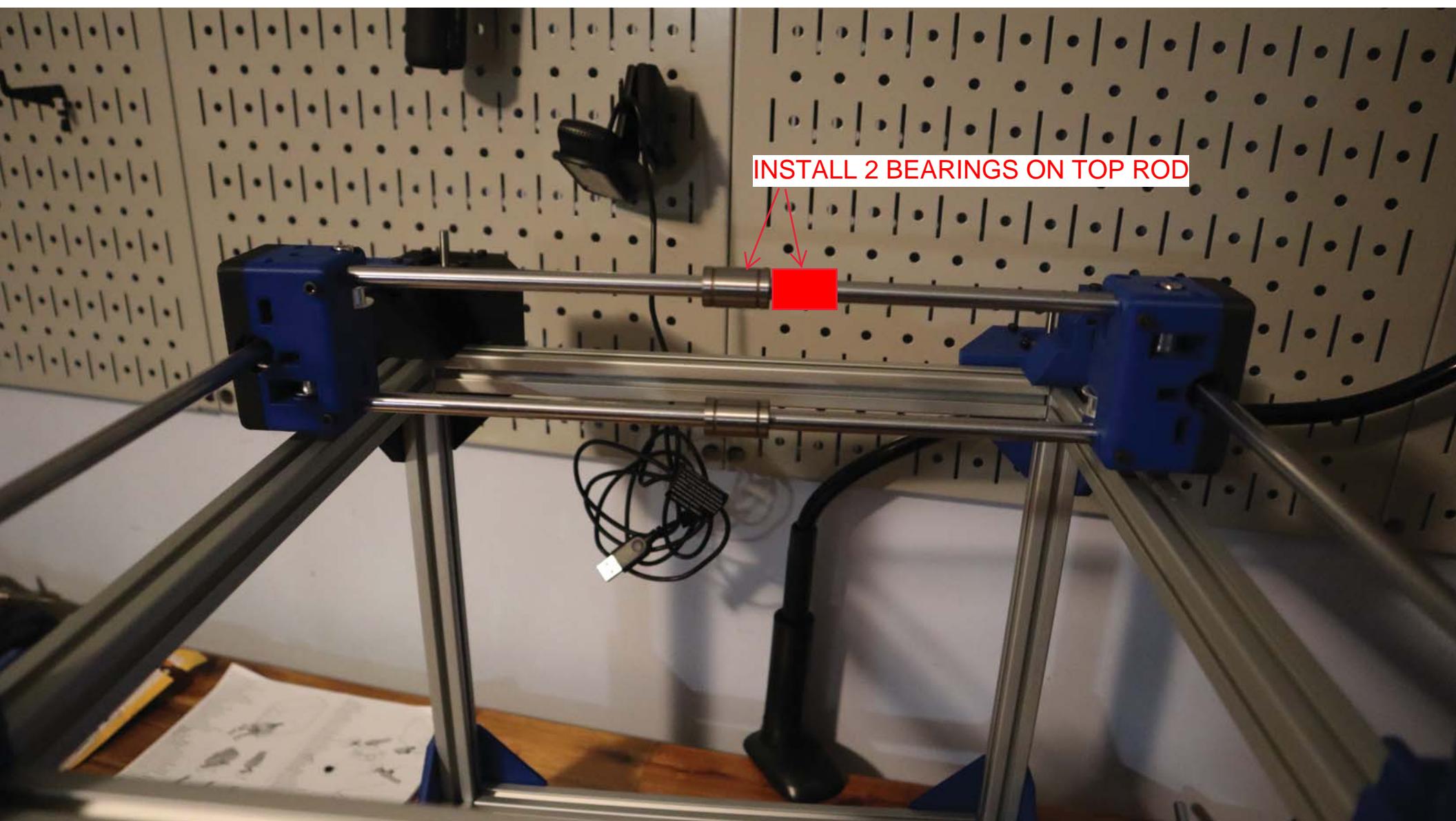
Gantry Clamp

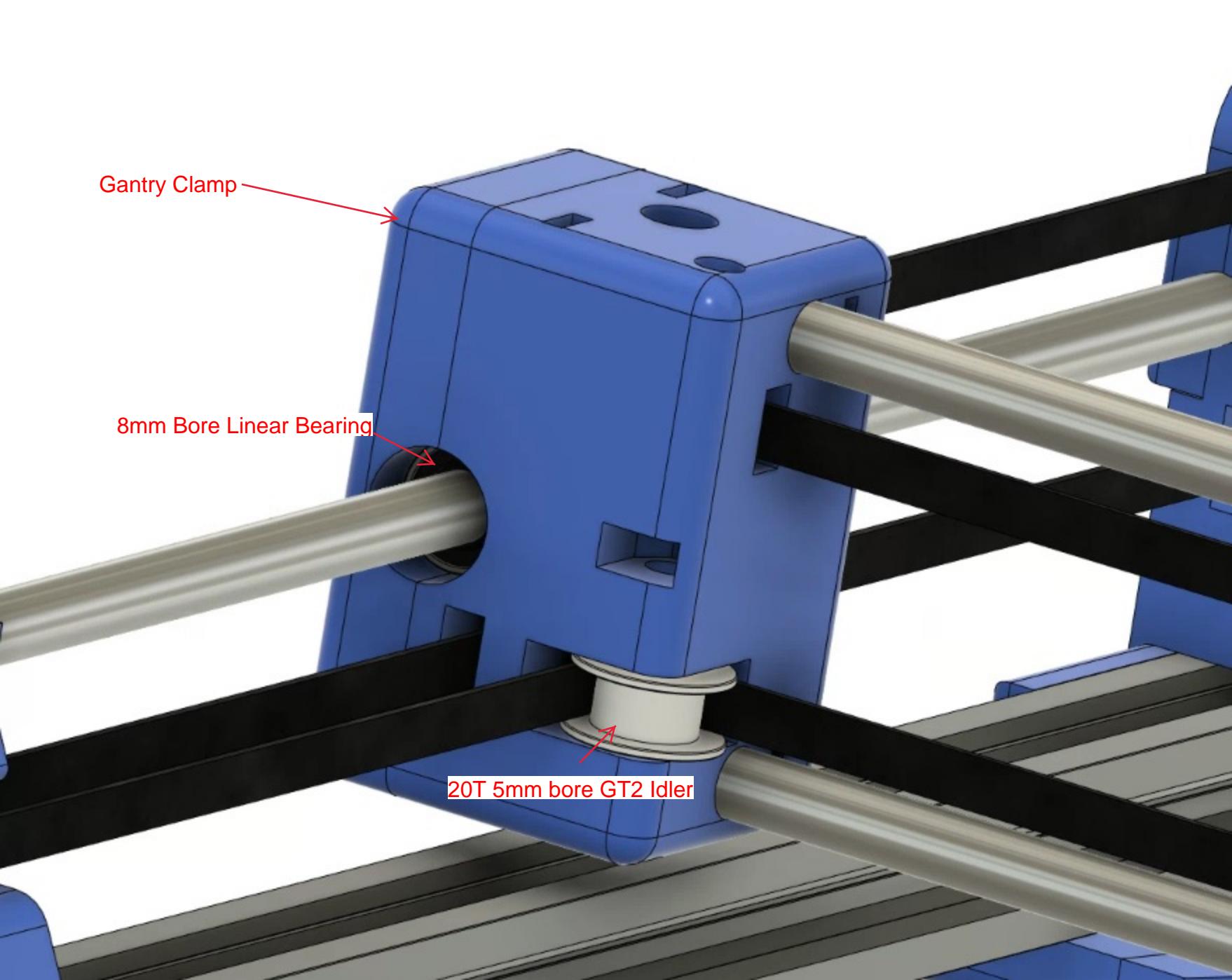
STEP 8/9/10



STEP 8/9/10

INSTALL 2 BEARINGS ON TOP ROD

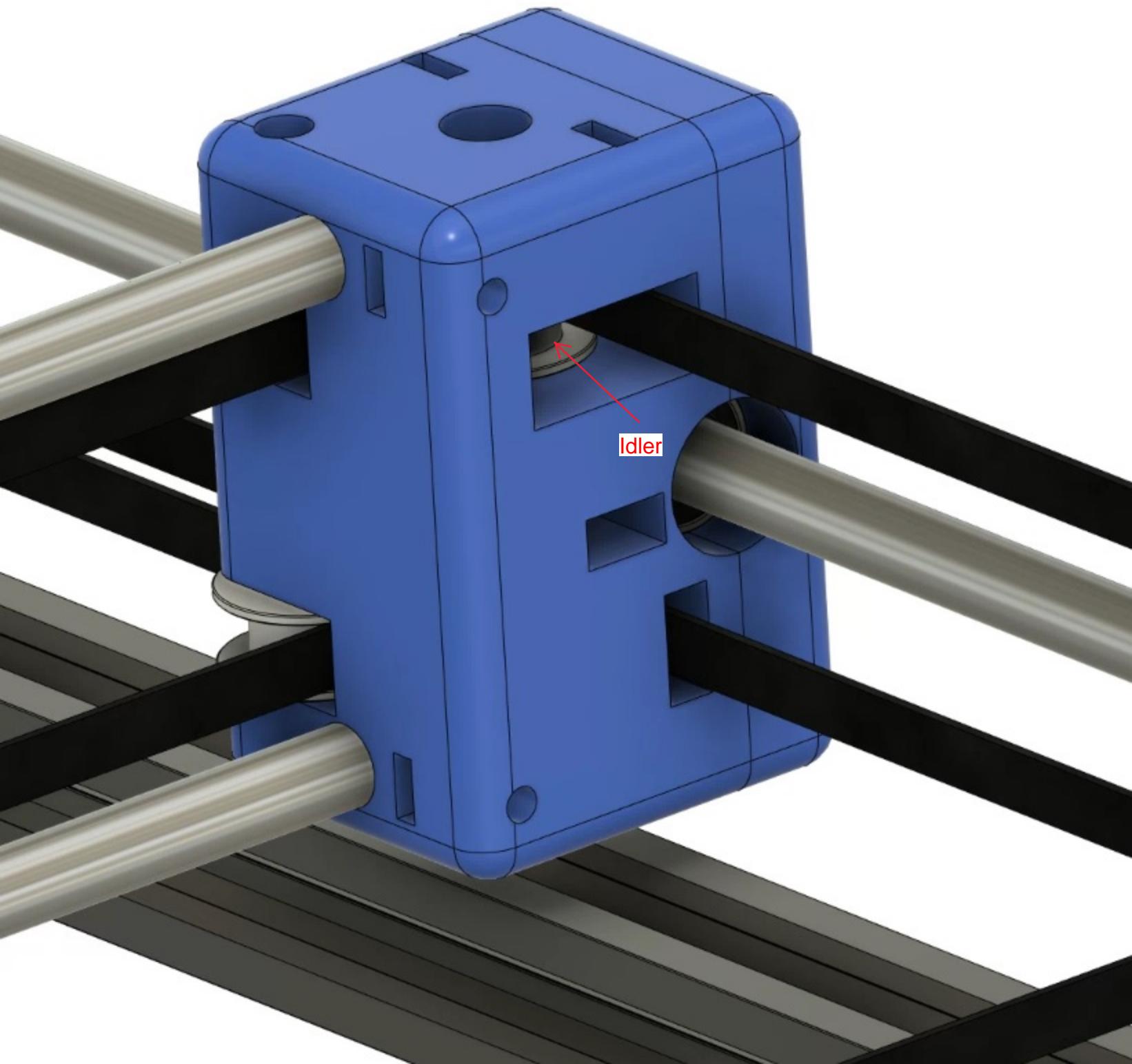




Gantry Clamp

8mm Bore Linear Bearing

20T 5mm bore GT2 Idler



Idler

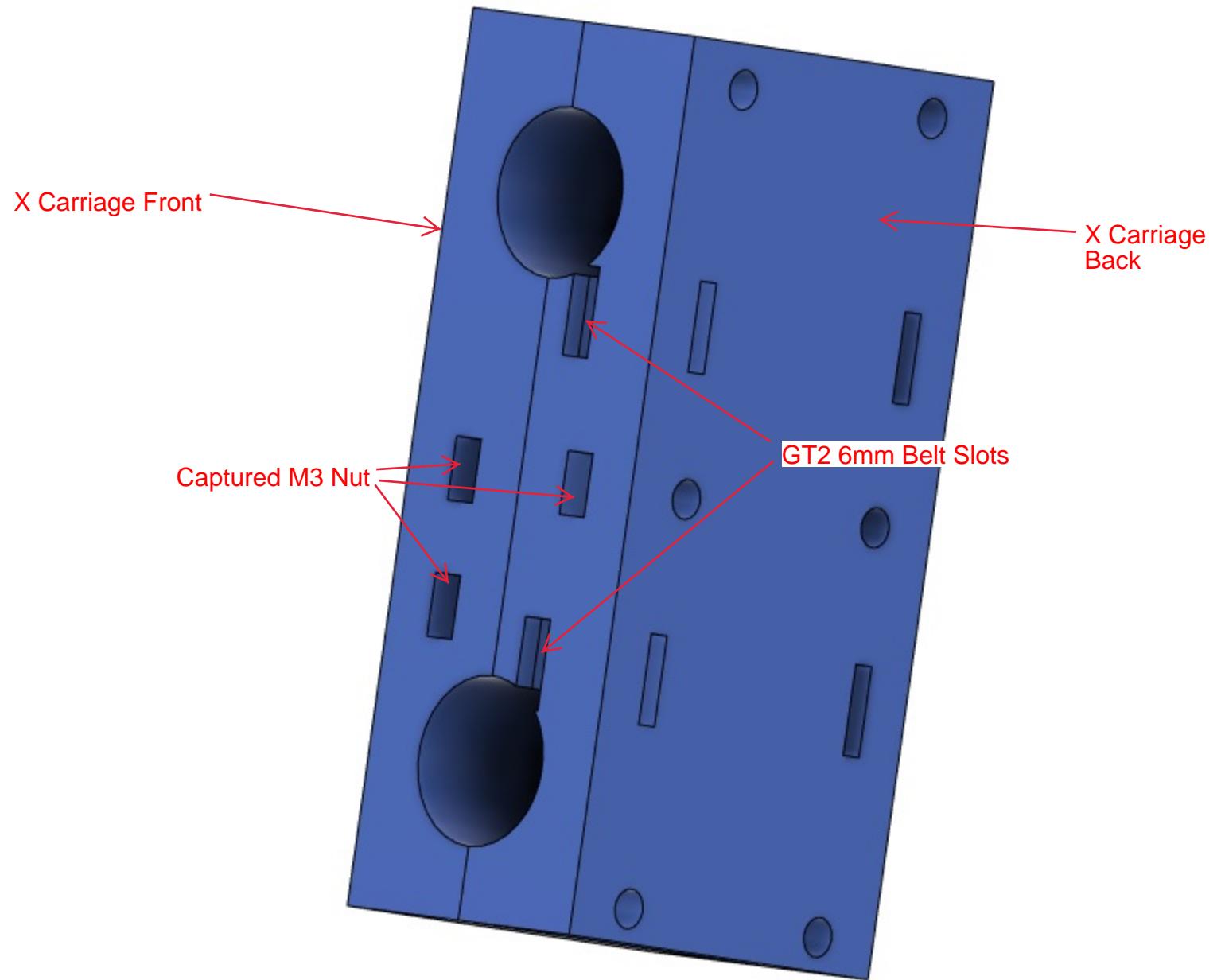
Section 4:

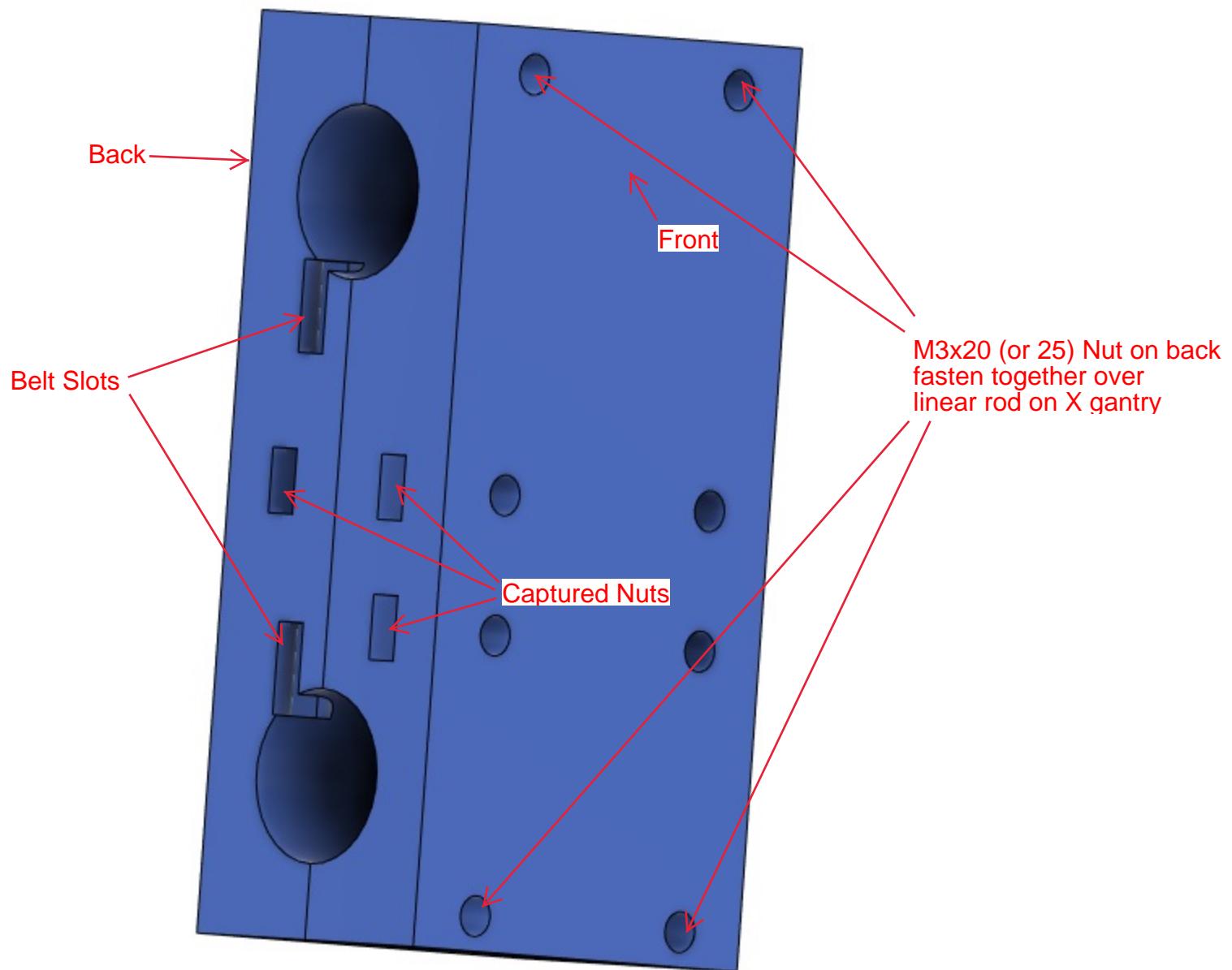
Print Head & X/Y Belt

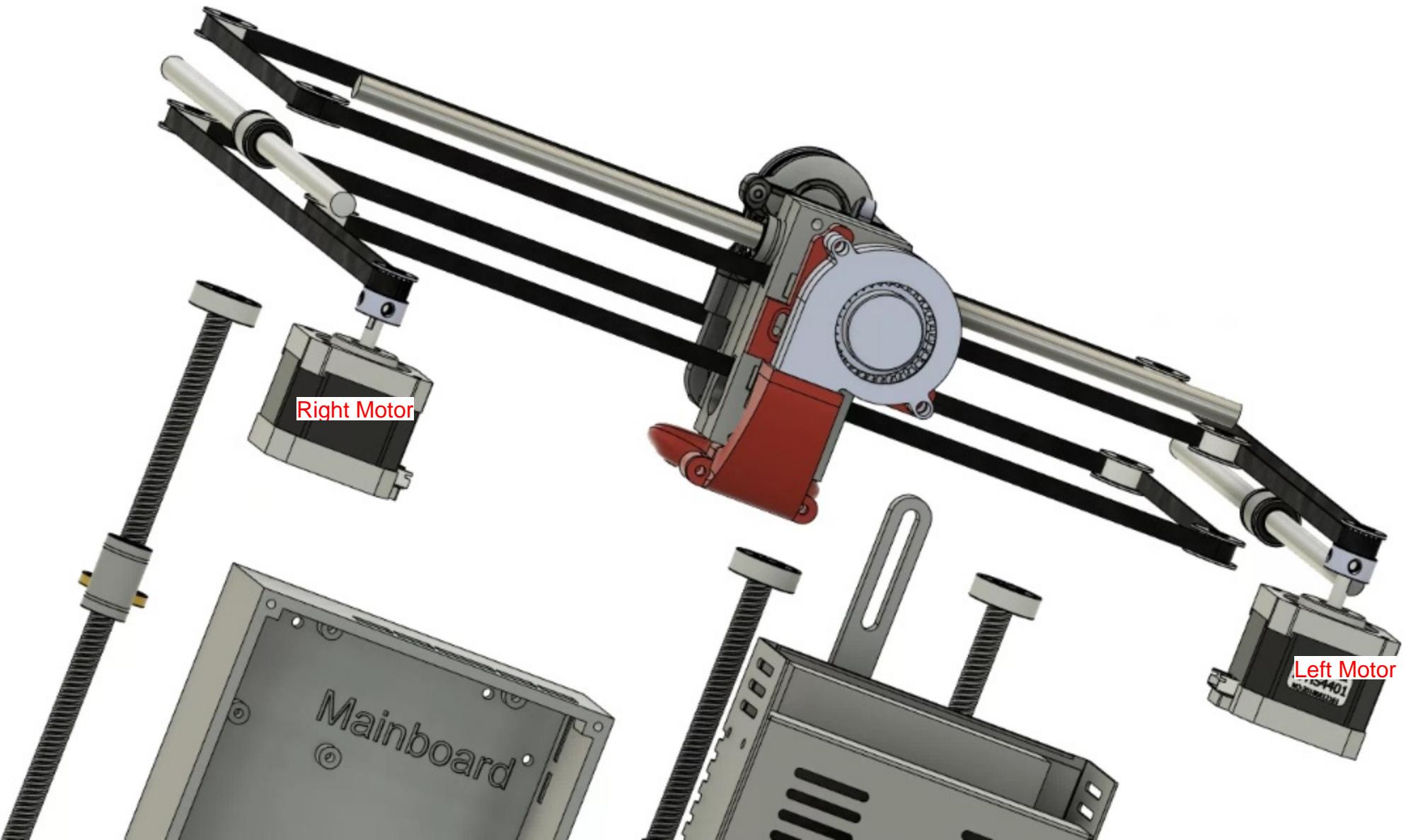
Components needed for this portion:

M3x16	x6
M3x20 (or 25)	x7
M3x25	x2
M3x12	x6
M3x10	x2
M3 Nut	x16
3010 24V Fan	x1
5015 24v Blower Fan	x1
J-head (V6) Hot End	x1
Sherpa Mini Extruder	x1
BLTouch	x1
GT2 6mm Belt Approximately 5m	x1

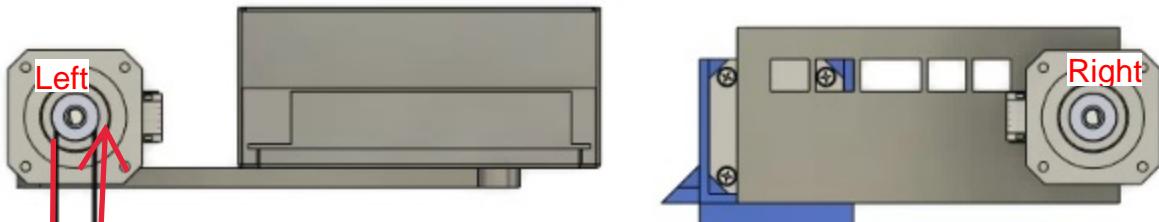




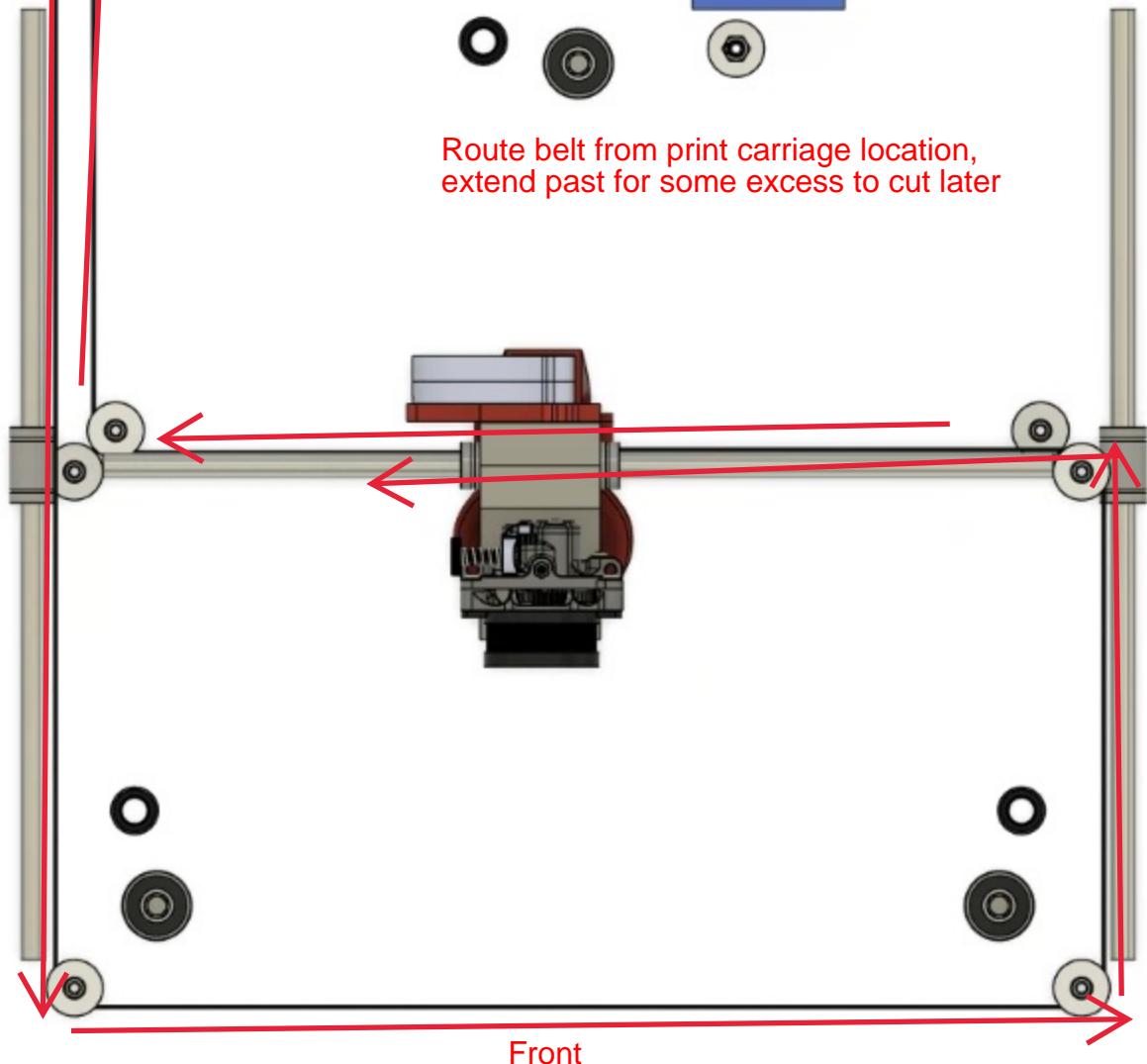




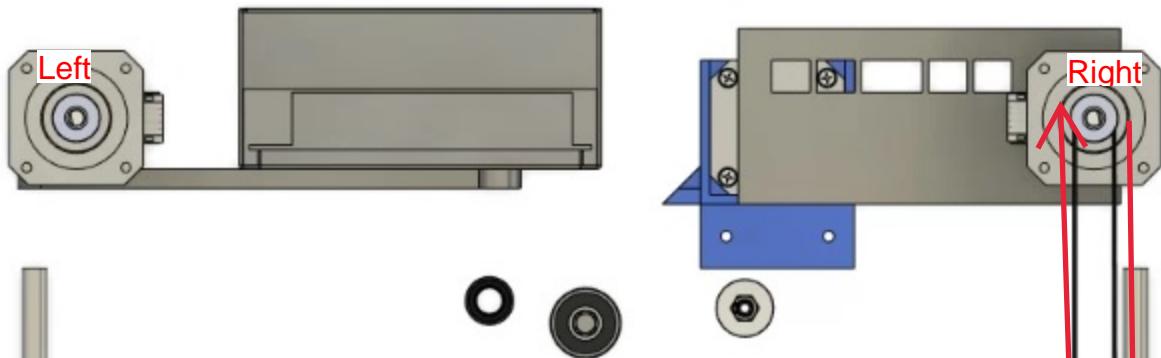
Back



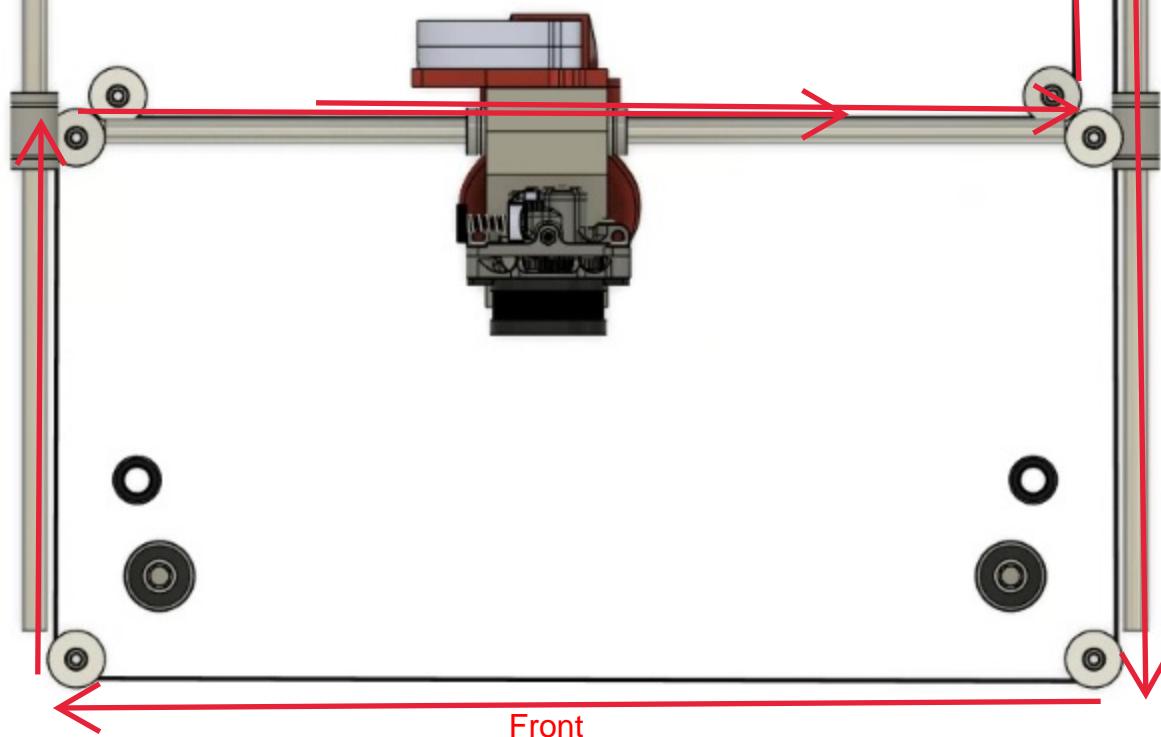
Route belt from print carriage location,
extend past for some excess to cut later



Back



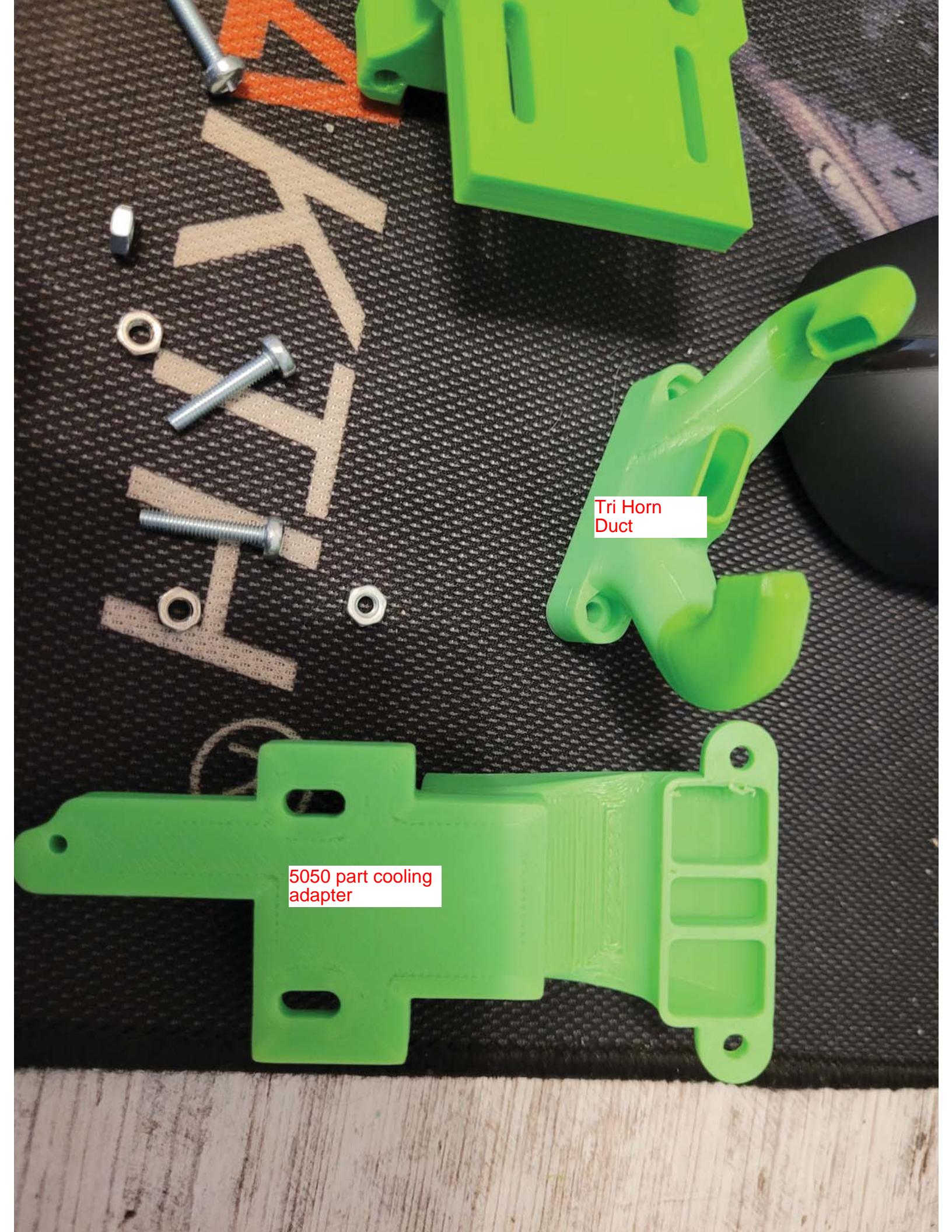
Route belt from print carriage location,
extend past for some excess to cut later





Use the 4 GT2 Belt Clips to secure
routed belt

If you use "expansion compensation"
in your slicer, you will need to shrink
clips to 99% to avoid slipping, otherwise
standard profile will work

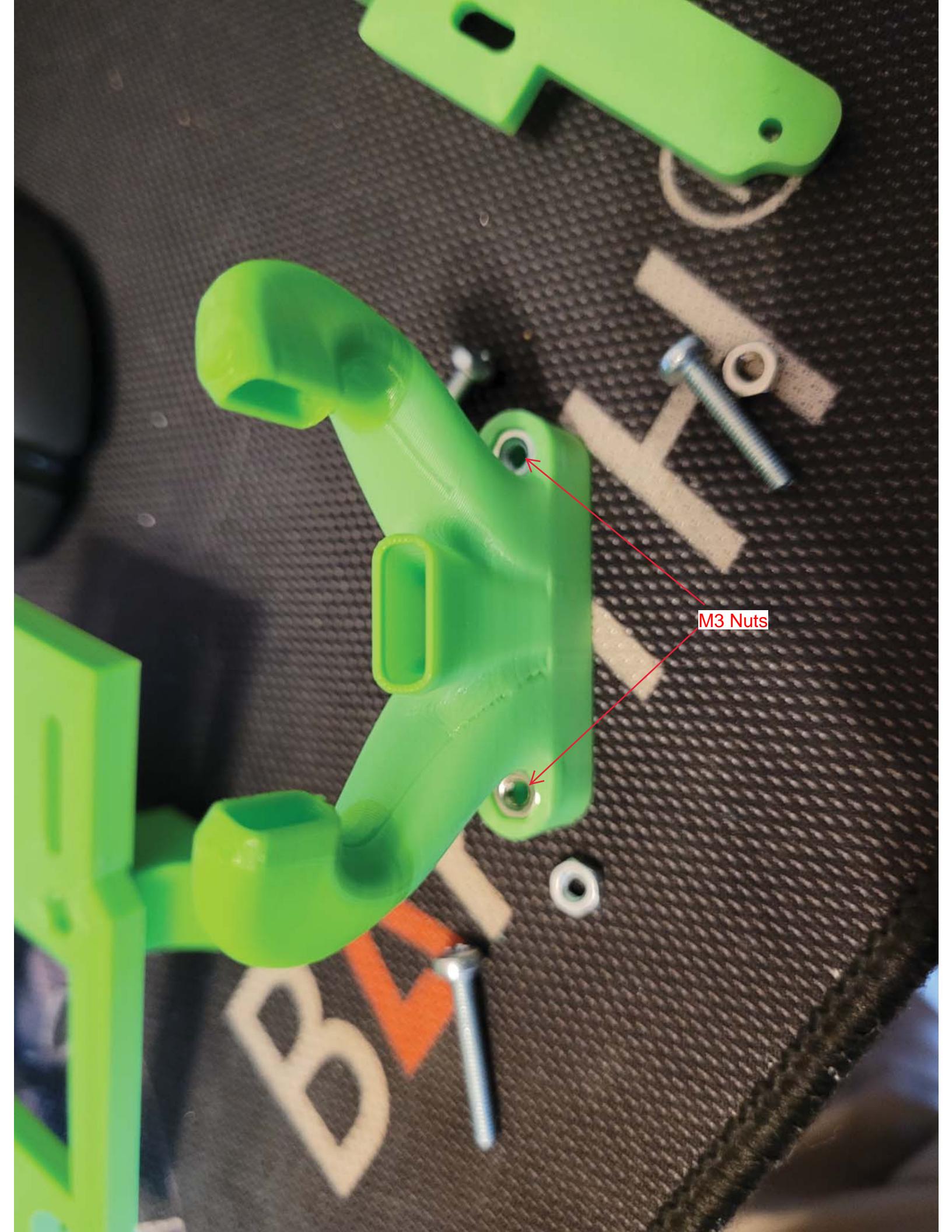


Tri Horn Duct

5050 part cooling
adapter



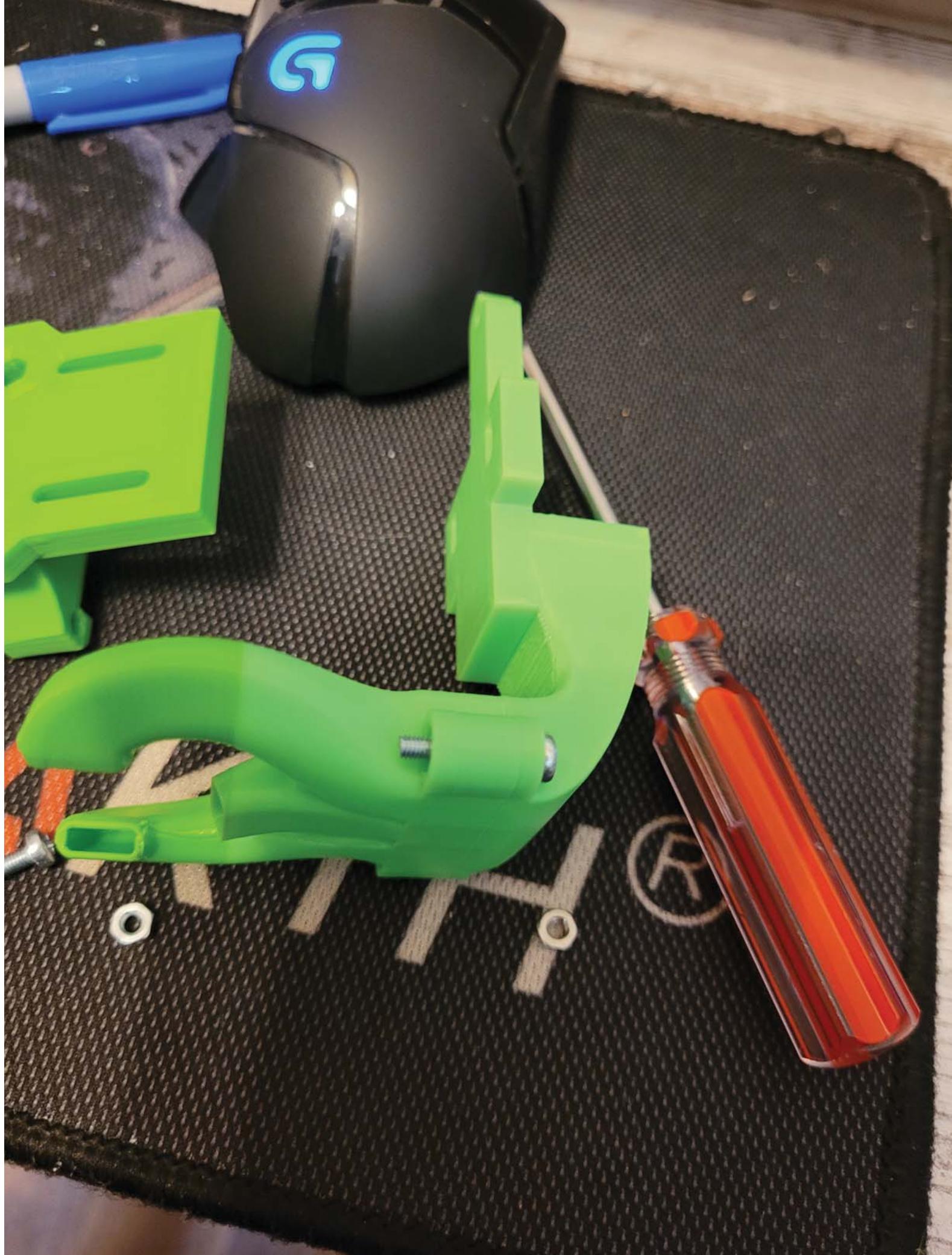
Hotend/Extruder
Plate

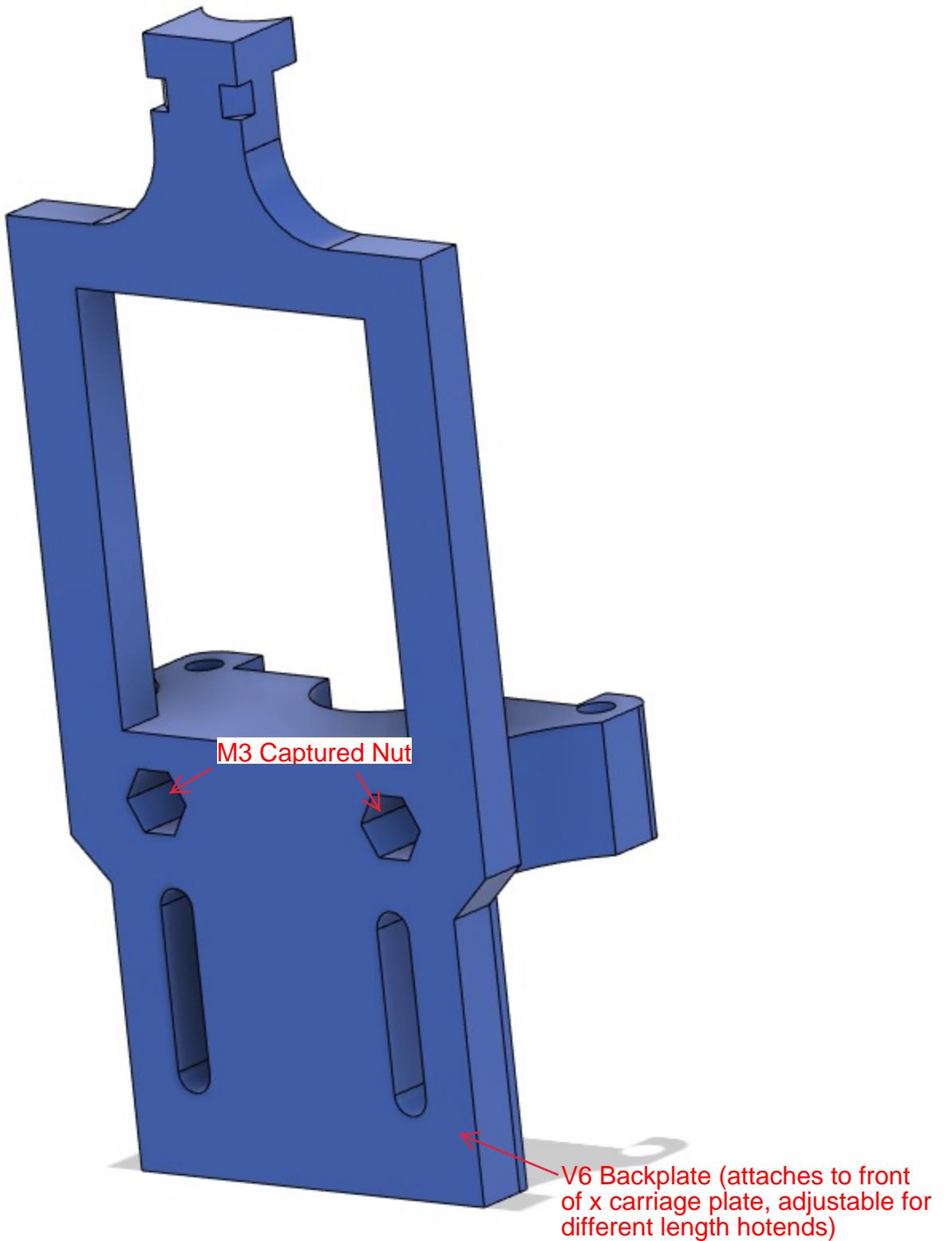


M3 Nuts



M3x16 (or 12)







M3 Nuts

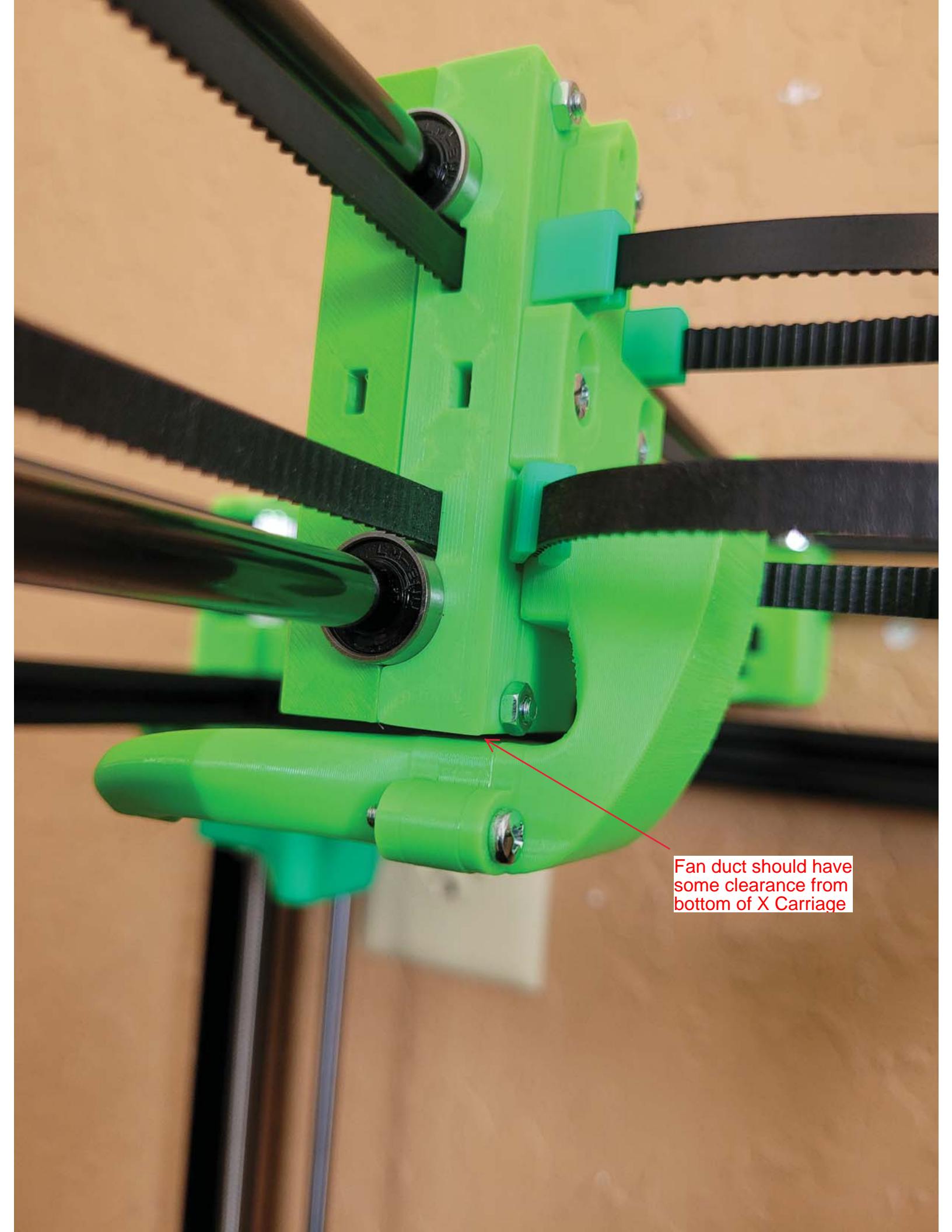
Set in place,
use m3x20 to cleanly
pull the nuts all the
way into the slots

G

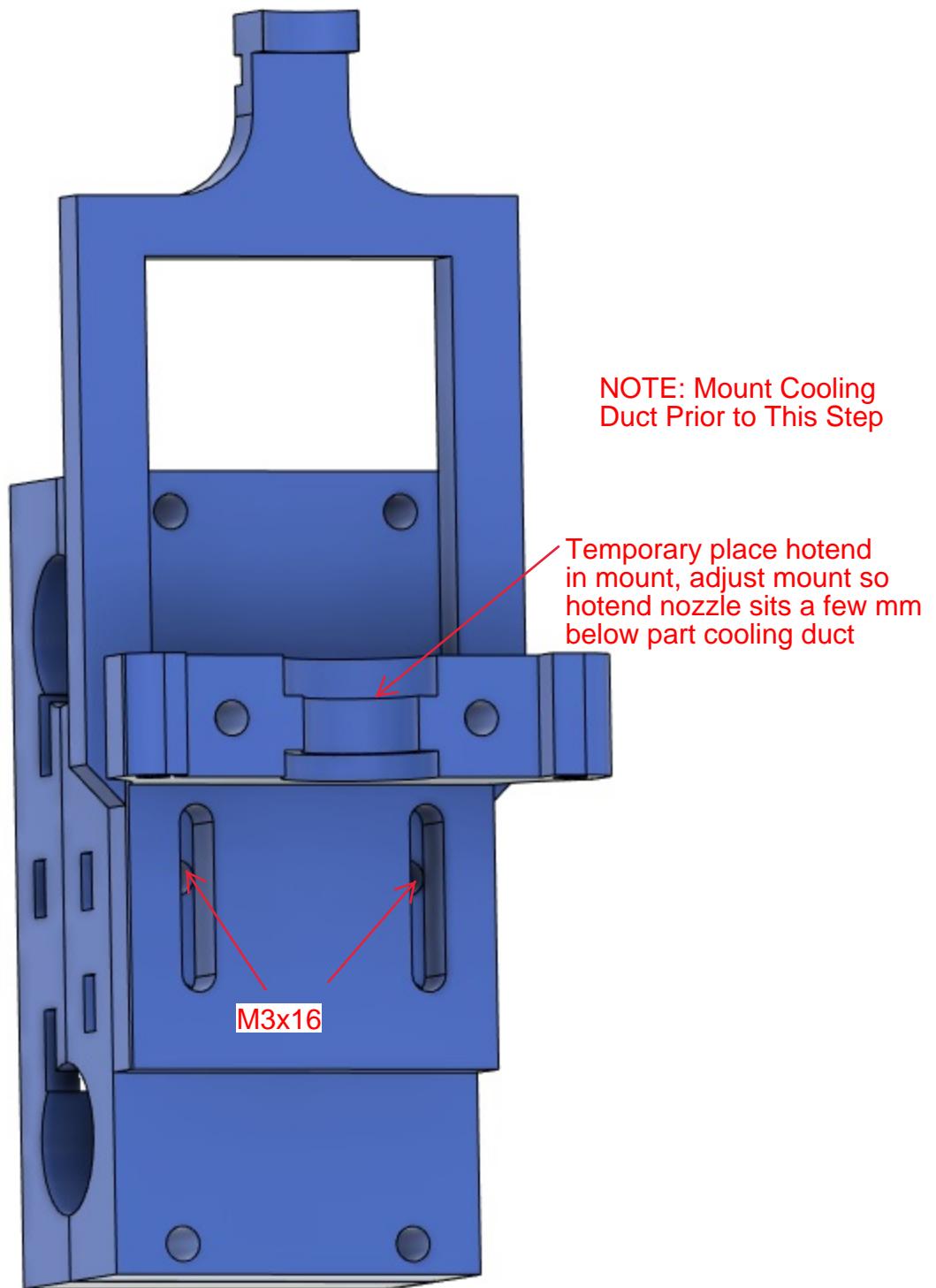
BATHT

NOTE: You will need to
bend this belt cap to install
as show here

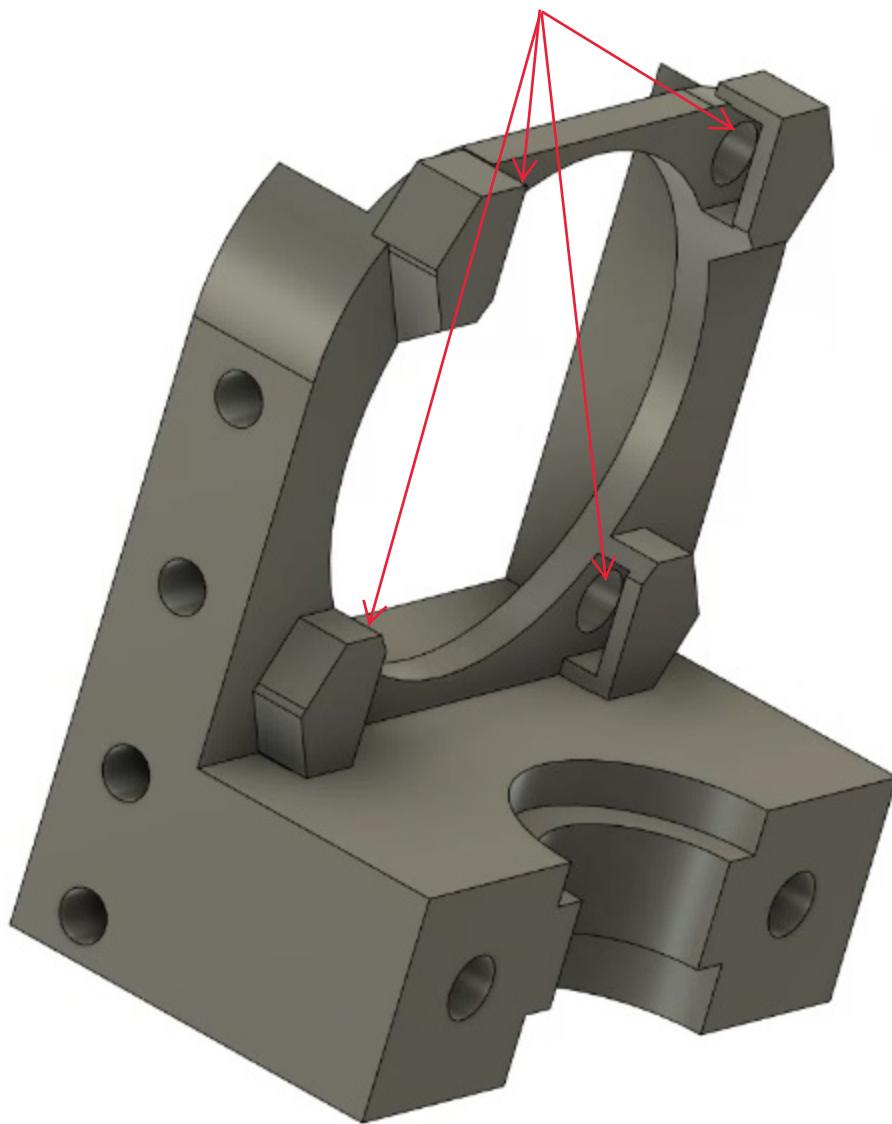
Mount 5015 Adapter with
2 M3x16 screwed into
captive M3 Nuts

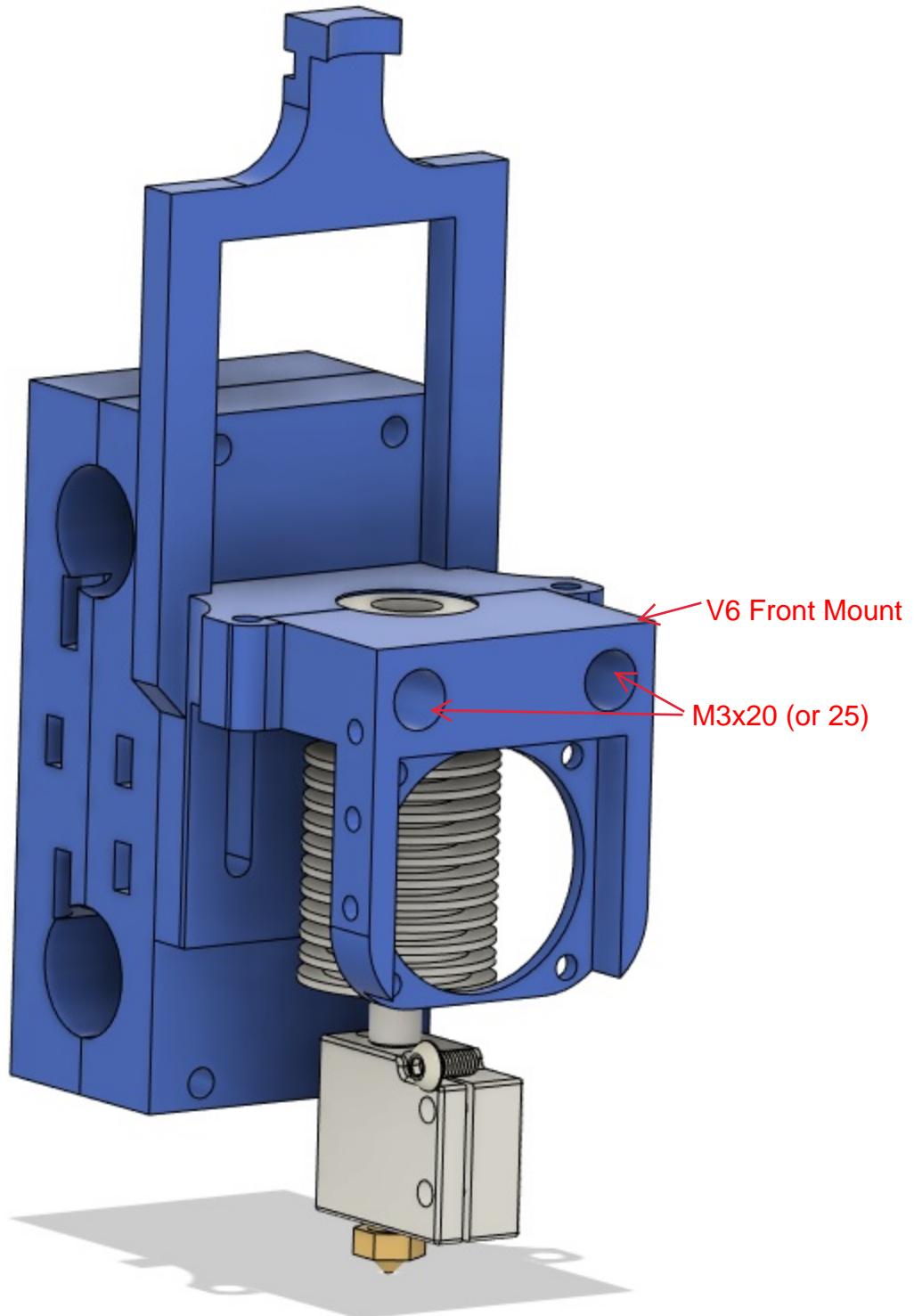


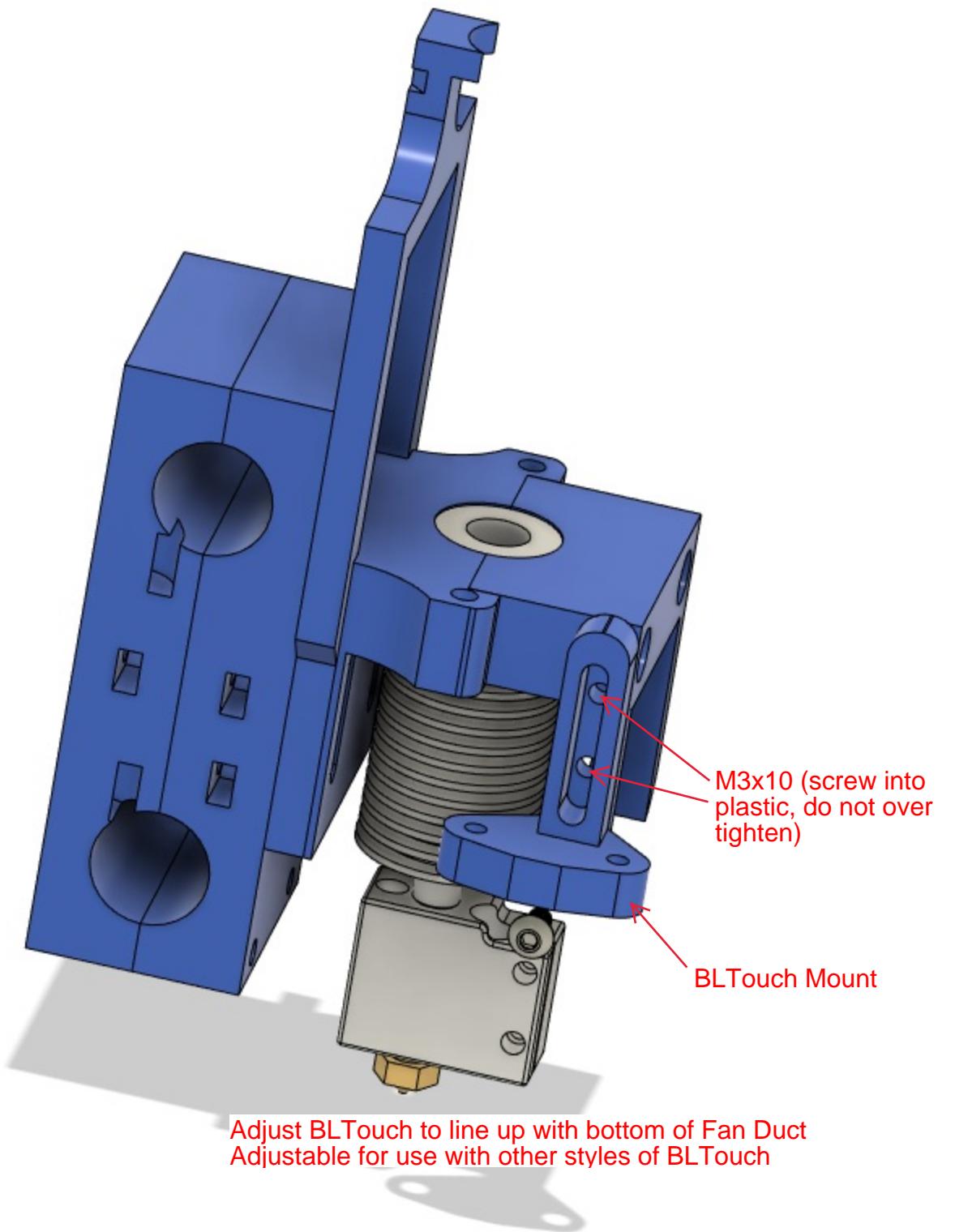
Fan duct should have some clearance from bottom of X Carriage

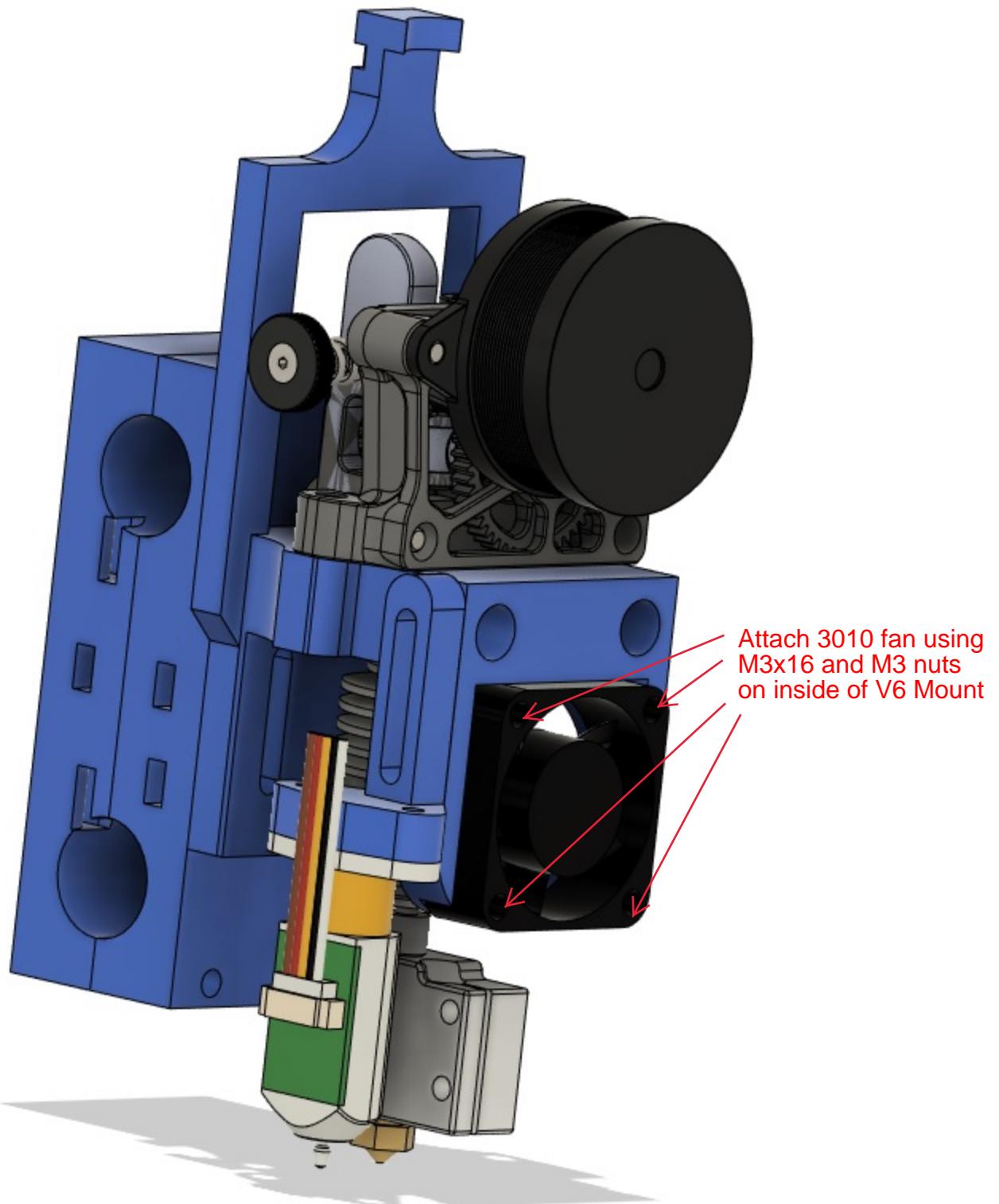


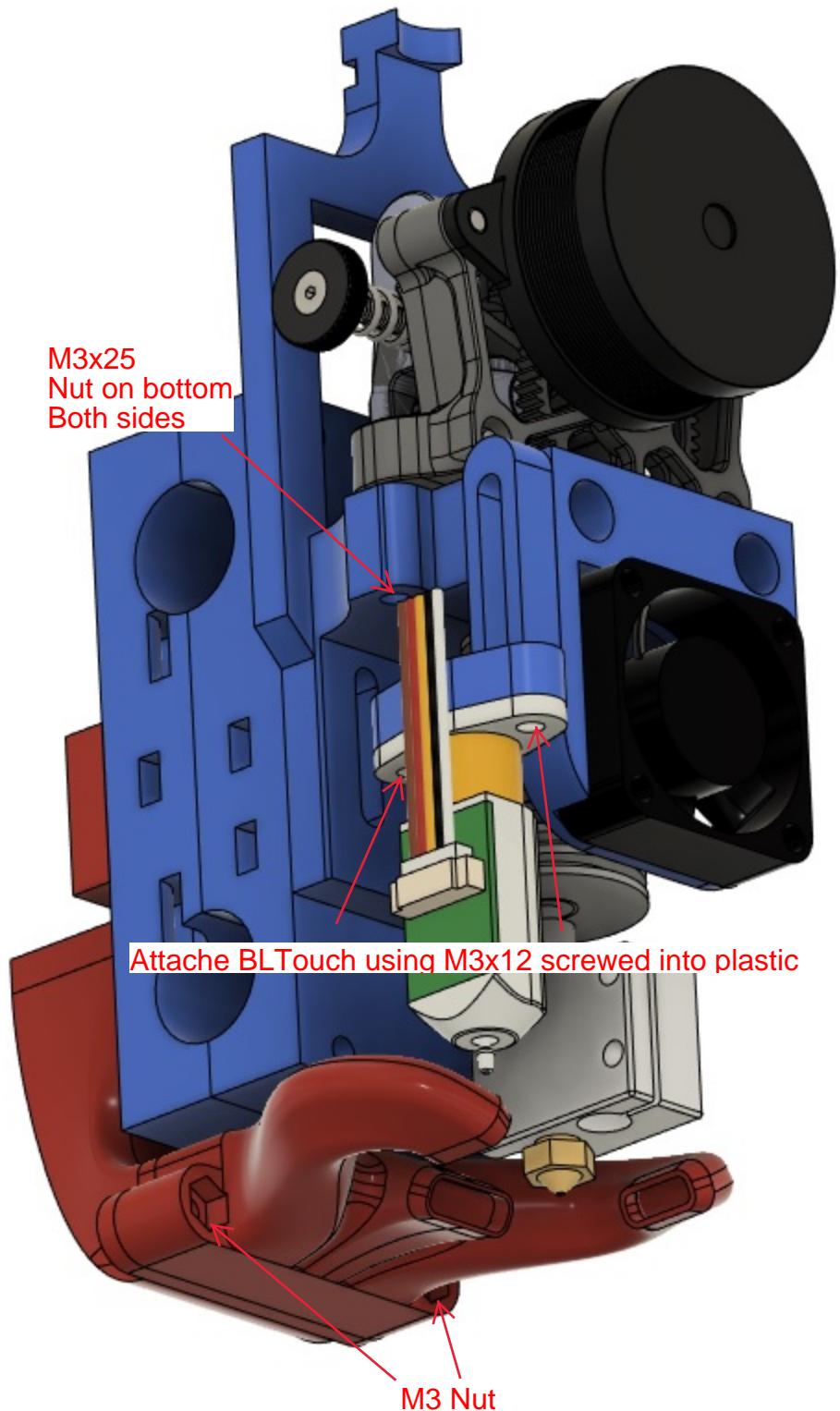
Insert captured M3 nuts prior to mounting

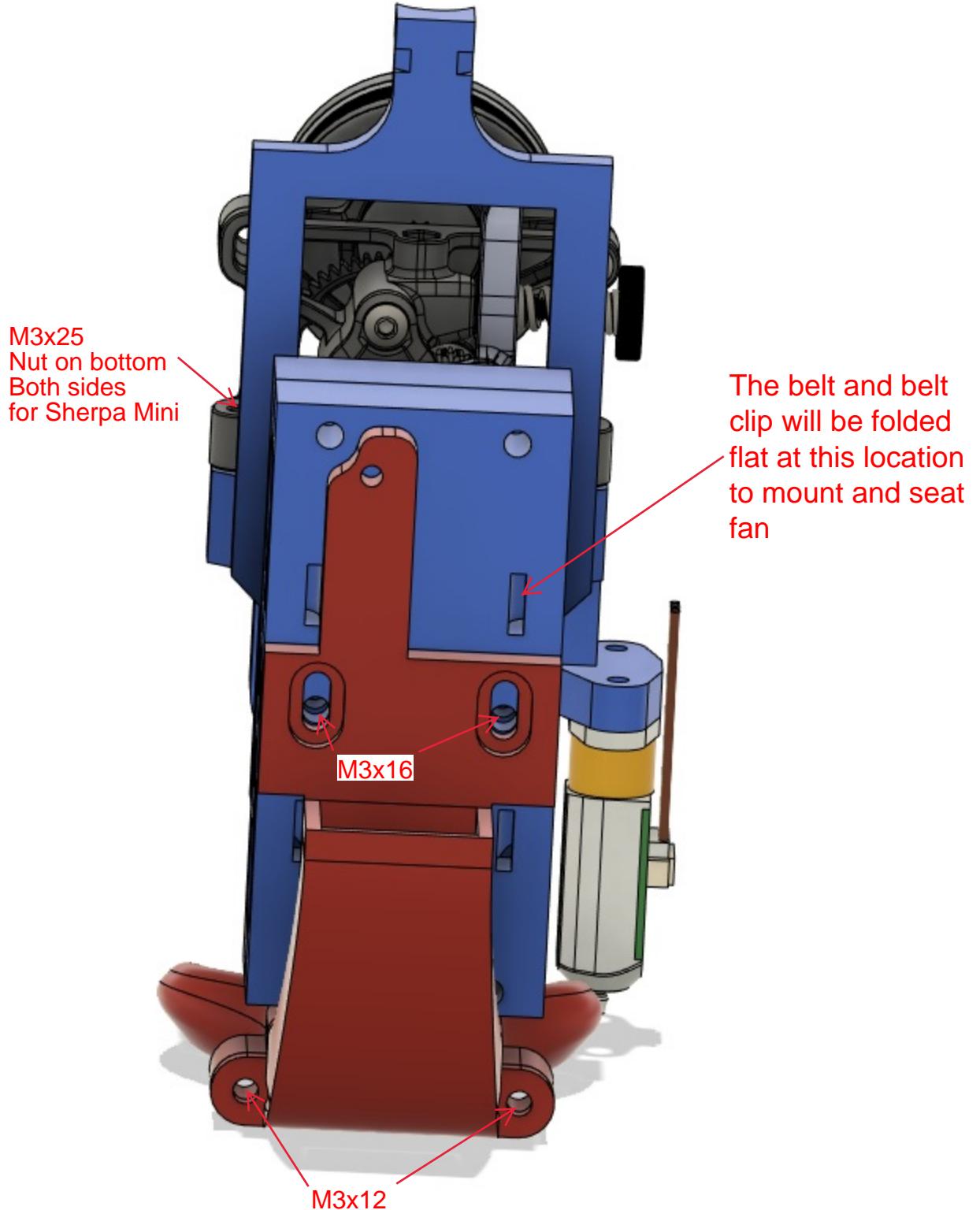


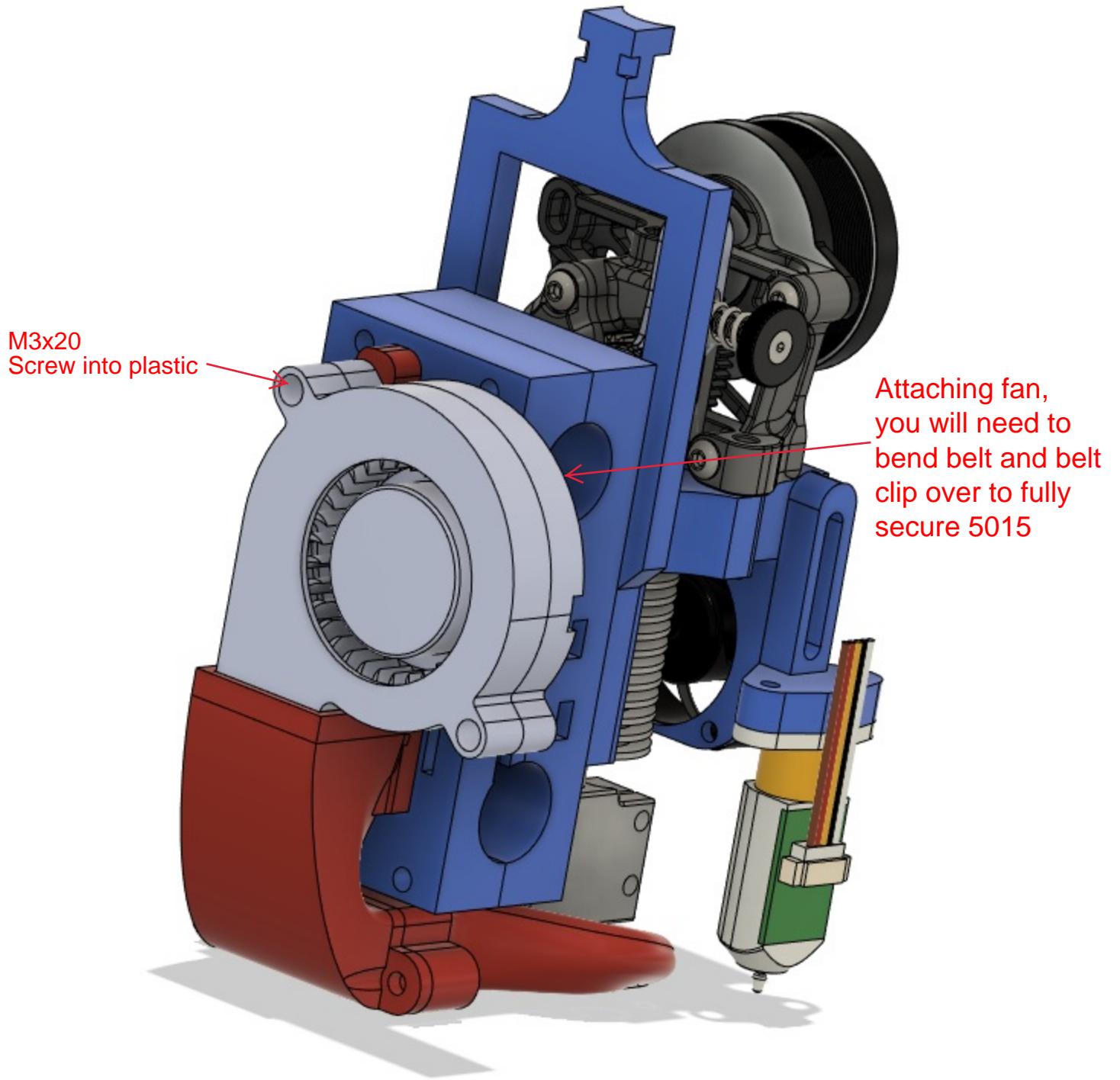












LINEAR ROD SPACERS

Shortest spacers to the back of the Y rods
and right side of X rods

Next longest spacers on left of X gantry
linear rods

After printhead is assembled,
install the linear rod spacers
by simply snapping them on
the linear rods

Longest spacers go up front of Y rods
on left and right

LINEAR ROD SPACERS

Shortest spacers to the back of the Y rods
and right side of X rods

Longest spacers go up front of Y rods
on left and right

Section 5:

Electronics Mounting

Components needed for this portion:

M5x12 (or 10) **x8**

M5 T-nut **x8**

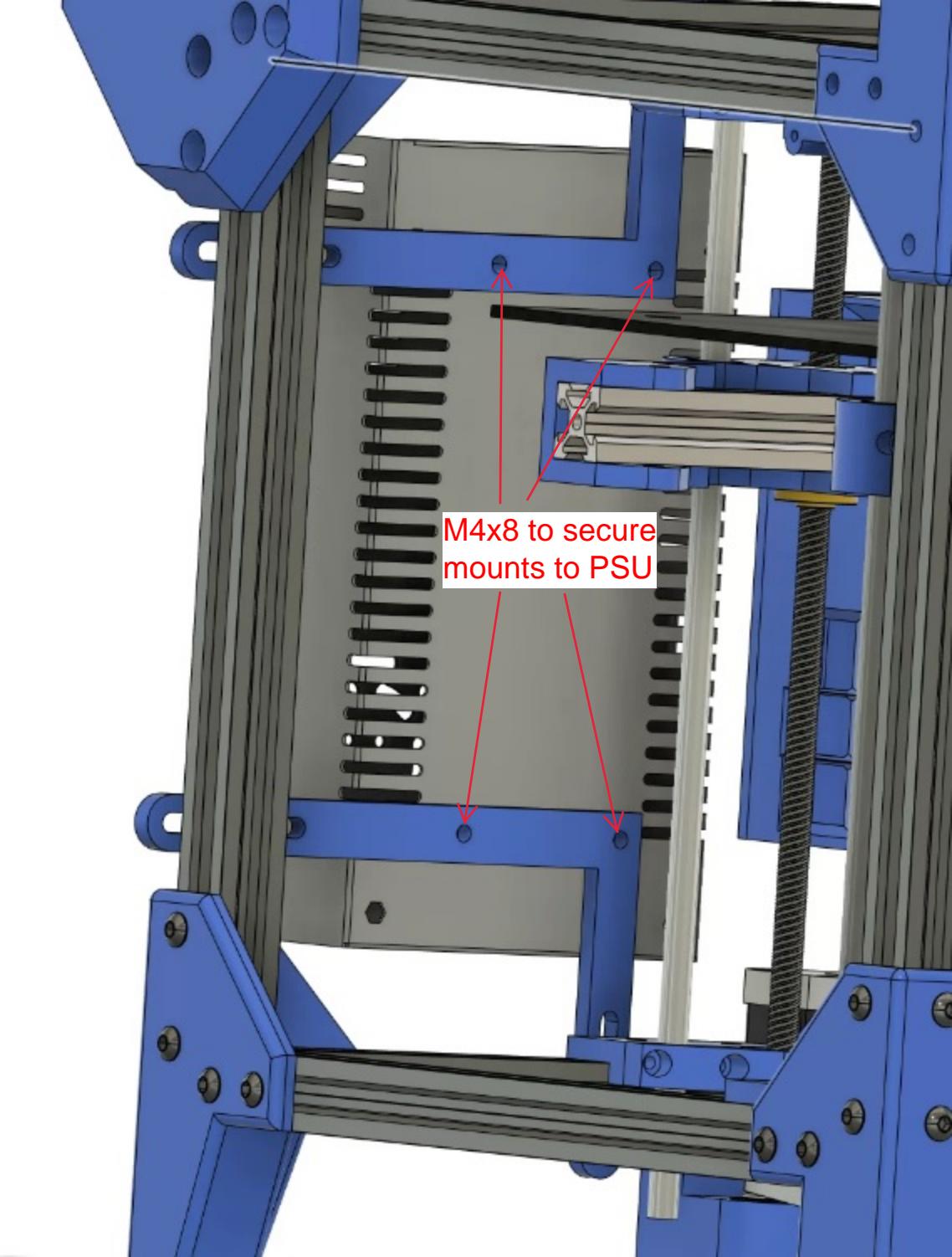
M3x8 **x2**

M4x8 **x4**

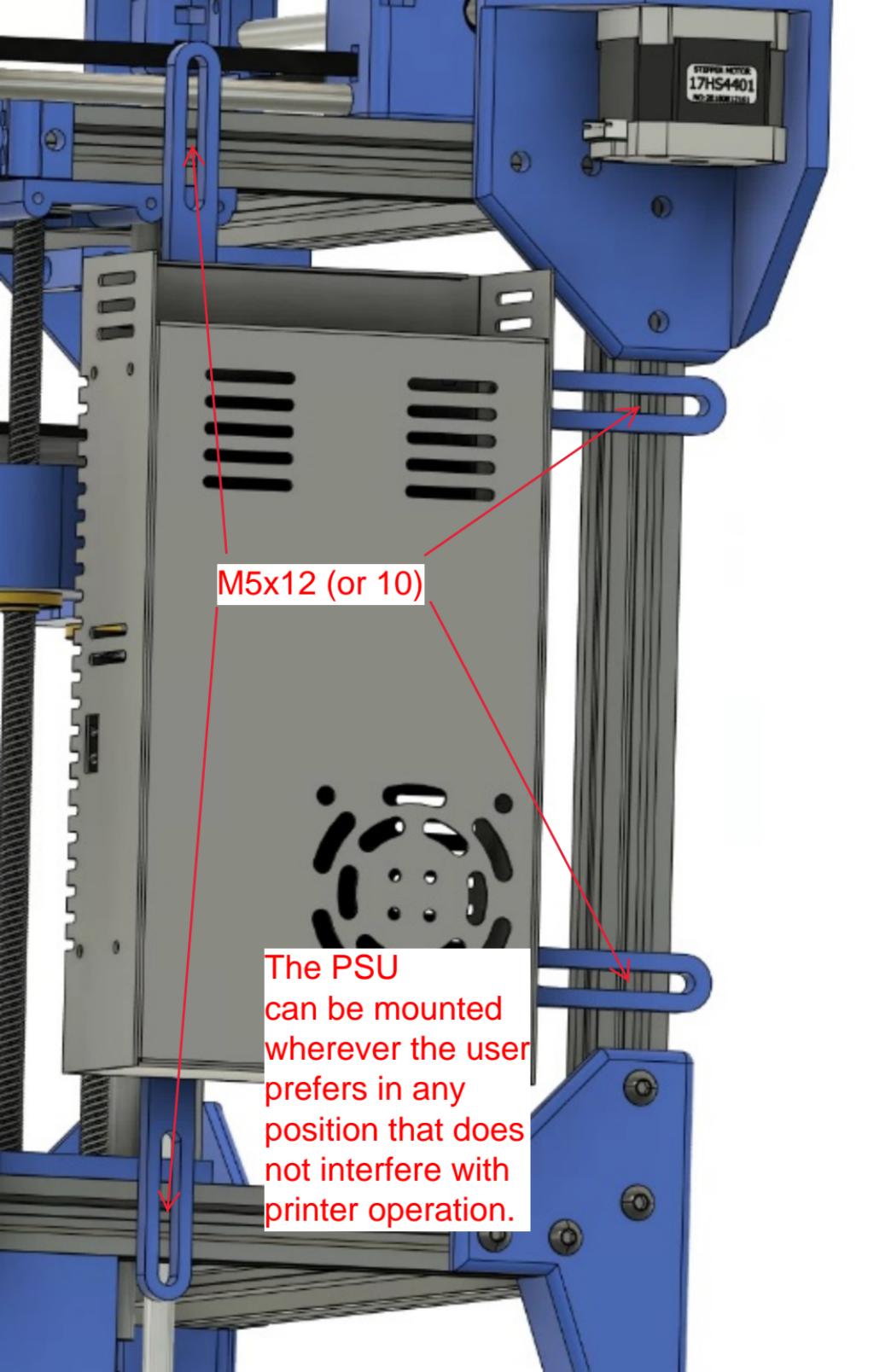
PSU

Power Rocker Switch

Electronics Backpack



M4x8 to secure
mounts to PSU

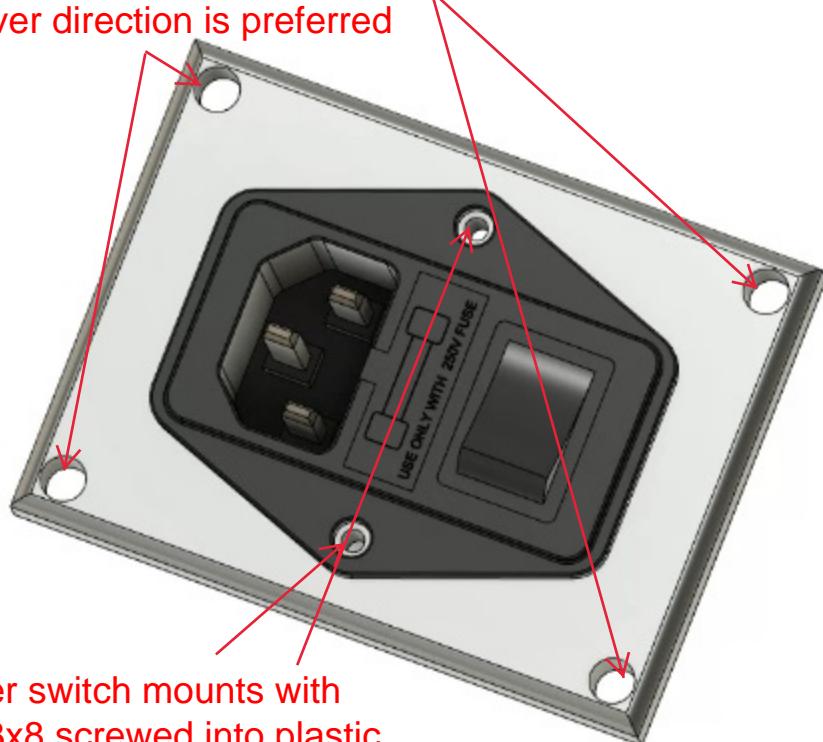


M5x12 (or 10)

The PSU
can be mounted
wherever the user
prefers in any
position that does
not interfere with
printer operation.

The electronics backpack is designed to mount in any configuration wherever the user chooses and in the direction of choice.
Install backpack prior to electronics
Mount using 2 - M5x12 (or10) with t-nuts

The rocker switch mount, like the electronics backpack is designed to mount in the location of the users choosing so long as it does not interfere with printer operation. It attaches using 2 - M5x12 (or 10) with t-nuts facing whichever direction is preferred



Rocker switch mounts with
2 - M5x12 screwed into plastic

Section 6:

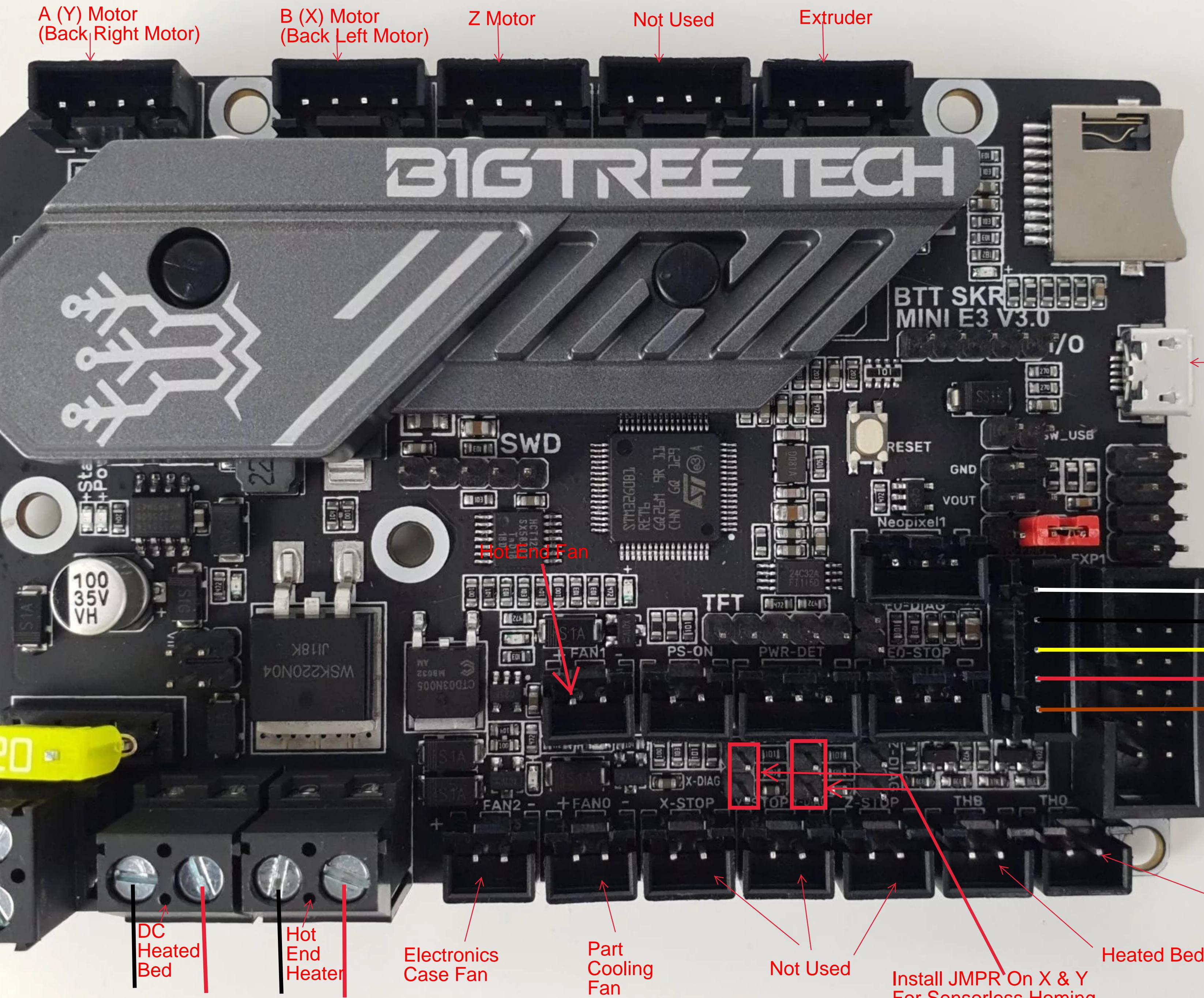
Mainboard Wiring Diagram

Components needed for this portion:

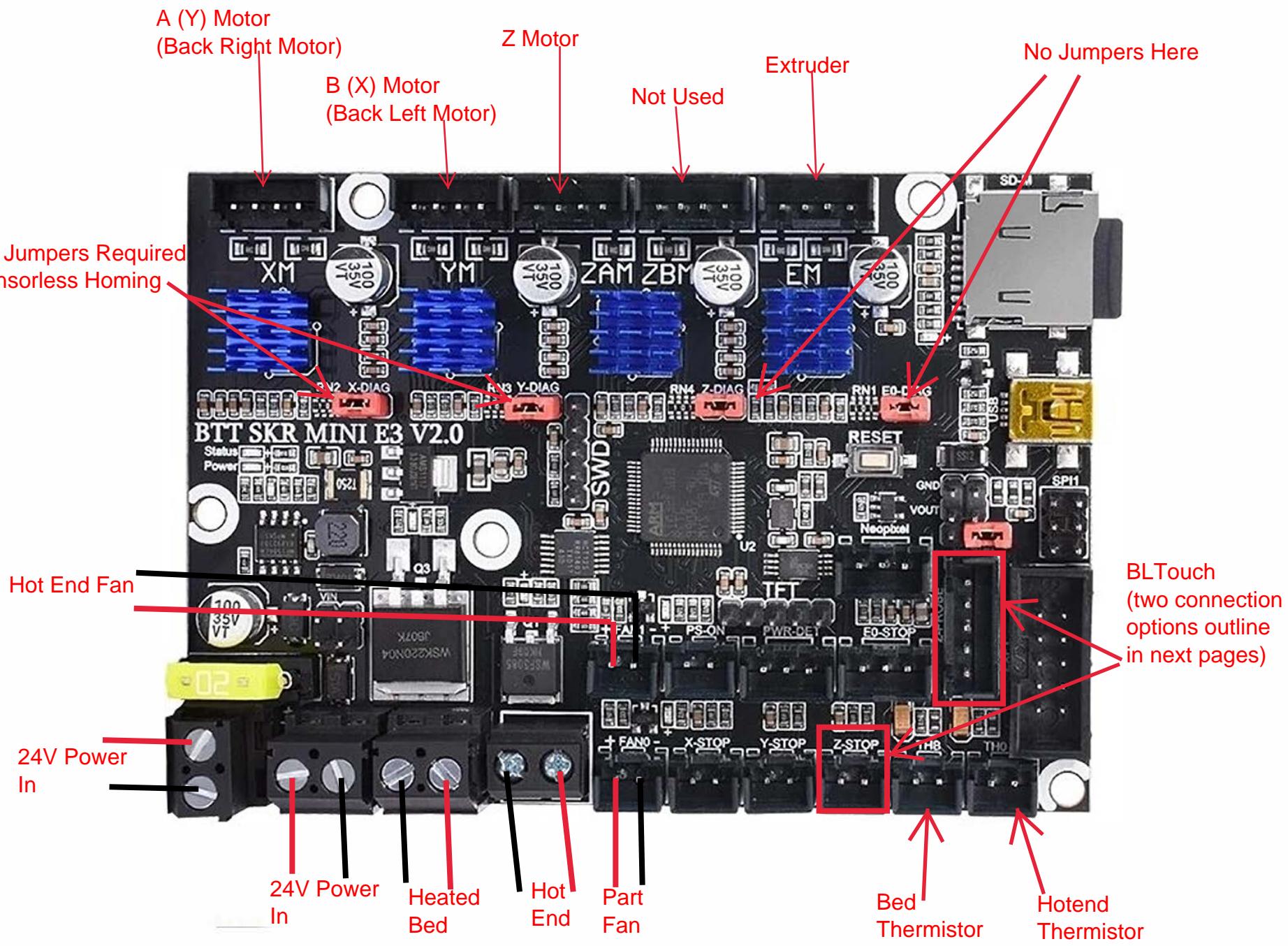
Bigtreetech SKR Mini E3 V3

OR

Bigtreetech SKR Mini E3 V2

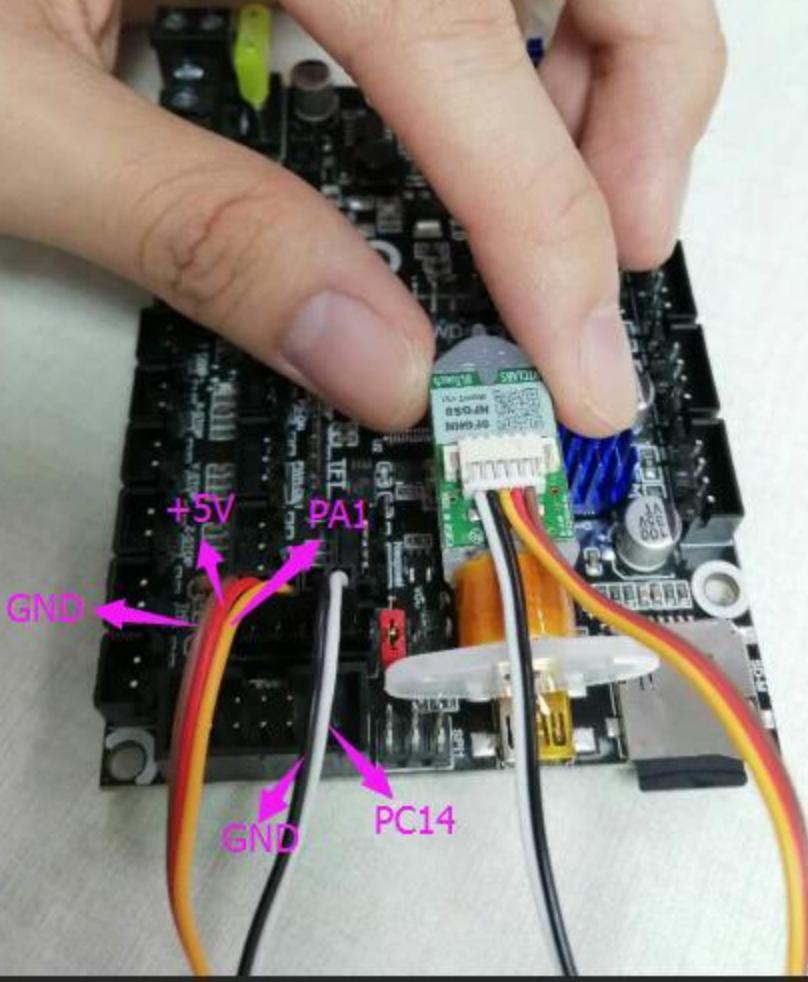


Bigtreetech SKR Mini
E3V3

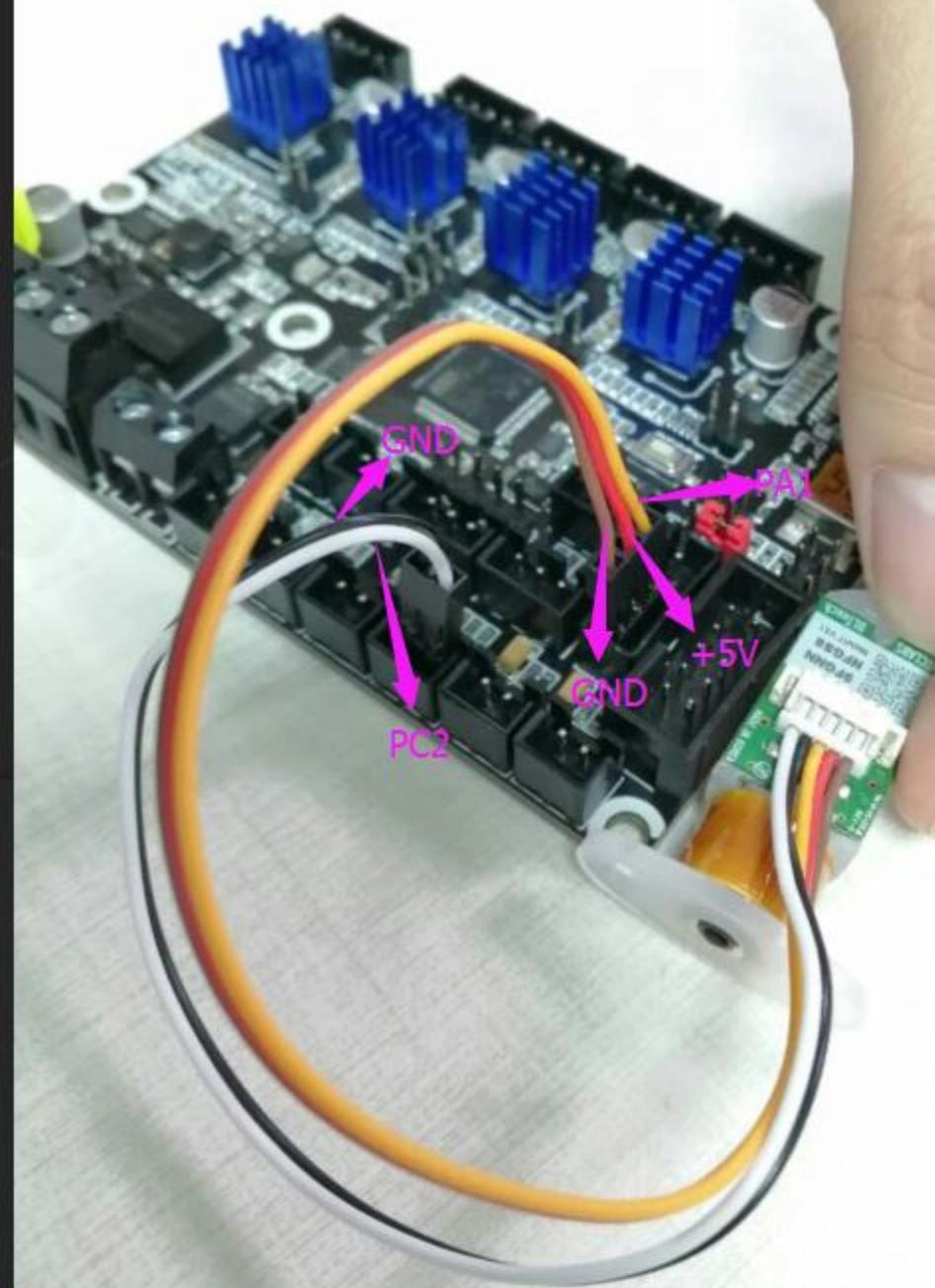


Bigtreetech SKR Mini E3V2

BLTouch/3Dtouch Option 1



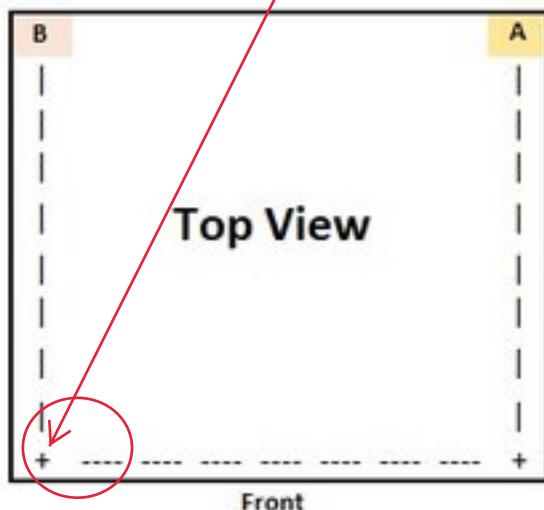
BLTouch/3Dtouch Option 2



Print head should home to here

When Home_All, X will home first to the left, Then Y will home to the front, any deviation of this is incorrect. If deviation from this, it is either Dir_pin or swapped motors.

Visual Motor Configuration Guide



You can invert the direction of a motor by turning its connector 180 degrees or toggling the inverted flag (!) for the motor in the firmware. The arrows indicate the positive direction for move commands.

Motor B	Motor A	Motor B	Motor A	Motor B	Motor A	Motor B	Motor A
OK	OK	OK	Inverted	Inverted	OK	Inverted	Inverted

Motors are swapped, swap X and Y connectors							
There is no possible good configuration here just inverting directions							

Section 7:

Pi Setup and Firmware Install

Components needed for this portion:

Micro SD for Pi, and Micro SD for Firmware Flash

Computer and Micro SD Reader for Computer

Internet Access

While I'm sure everyone would love to read 100 or more pages on this, please just use the following YouTube setup guide to walk you through the process of Klipper on your Pi, and flashing your mainboard:

https://www.youtube.com/watch?v=FjMZzW_WVQ8

Section 8:

Initial Startup

Components needed for this portion:

Completed Printer, Pi setup and operational, and you PC

[**https://gadgetangel.org/build/startup/index#initial-startup-checks**](https://gadgetangel.org/build/startup/index#initial-startup-checks)

Yes, another link.... Why, because Voron has done an excellent job laying out the information in a step by step fashion for easy initial startup. PLEASE NOTE: The Voron guide calls to PID tune your bed to 100c, this is not recommended. Recommended PID tuning temps are 60c for the bed, and 220c for the hotend. Outside of that, please follow the Voron guide.

Once the operation is confirmed and operational, use the following link to perfectly tune your new 3d corexy printer.

[**https://ellis3dp.com/Print-Tuning-Guide/**](https://ellis3dp.com/Print-Tuning-Guide/)

LAST PAGE!!!!

Congratulations!

You now have completed your BugBu, and are hopefully getting great prints, at fast speeds, and smiling ear to ear!

If you made it this far, and you thought the information was informative and the project was fun, please consider donating.... SOME OF YOUR TIME.... Helping others get the same enjoyment.

Remember, we are a community built upon a foundation of experimentation and idea sharing, so please consider helping others on their journey, and always know, no one began as a professional, and everyone including me and you started at the beginning as the annoying new guy. So please also be respectful.

Sincerely,

Rolls17, Chewy2420, Computermedic78, & Noxin