# 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 printe. 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.**

# Index:

# Section 1:

# Frame Assembly

**<u>Components needed for this portion:</u>**

| | |
|---|---|
| **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** |

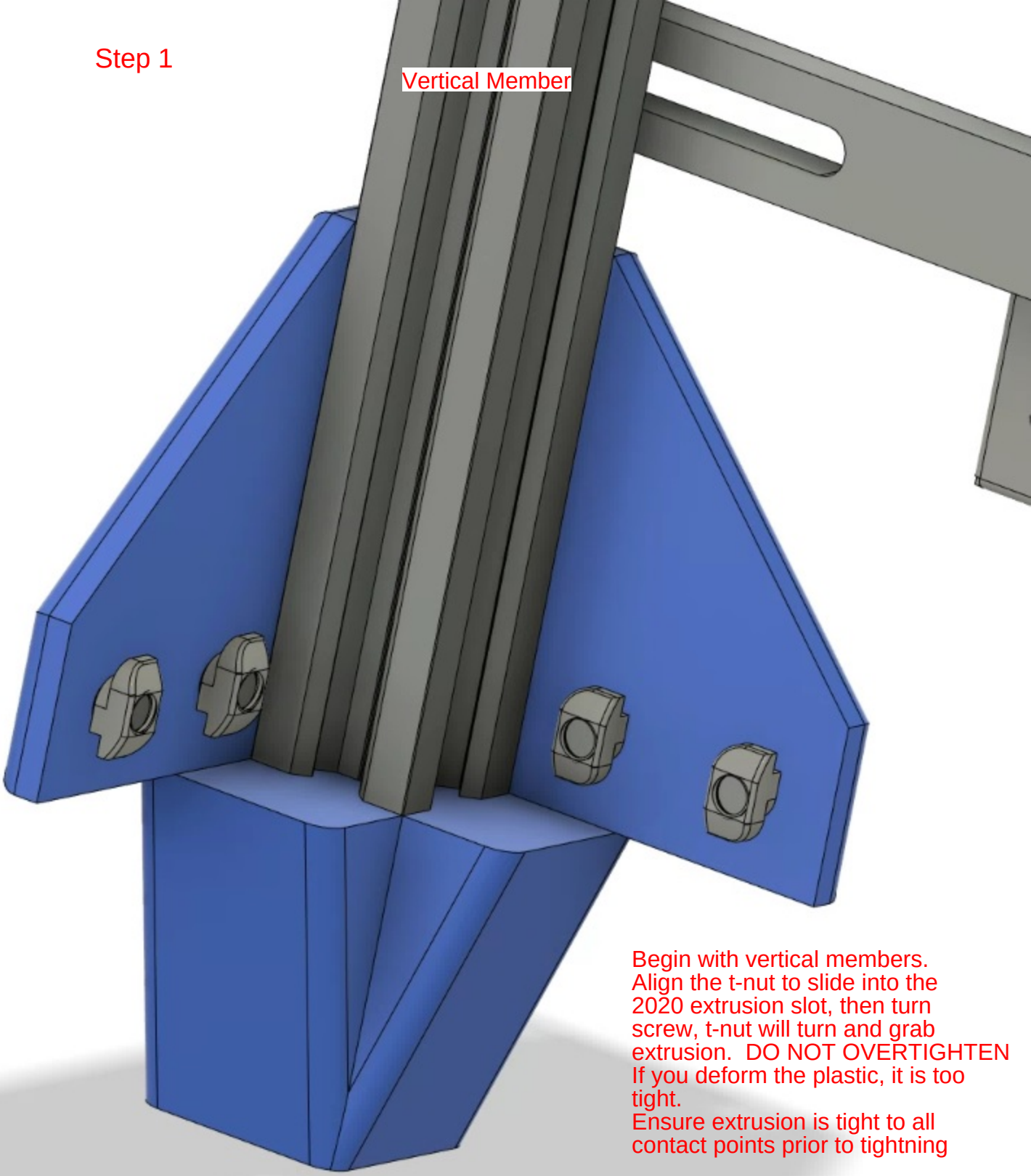
The Frame

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!

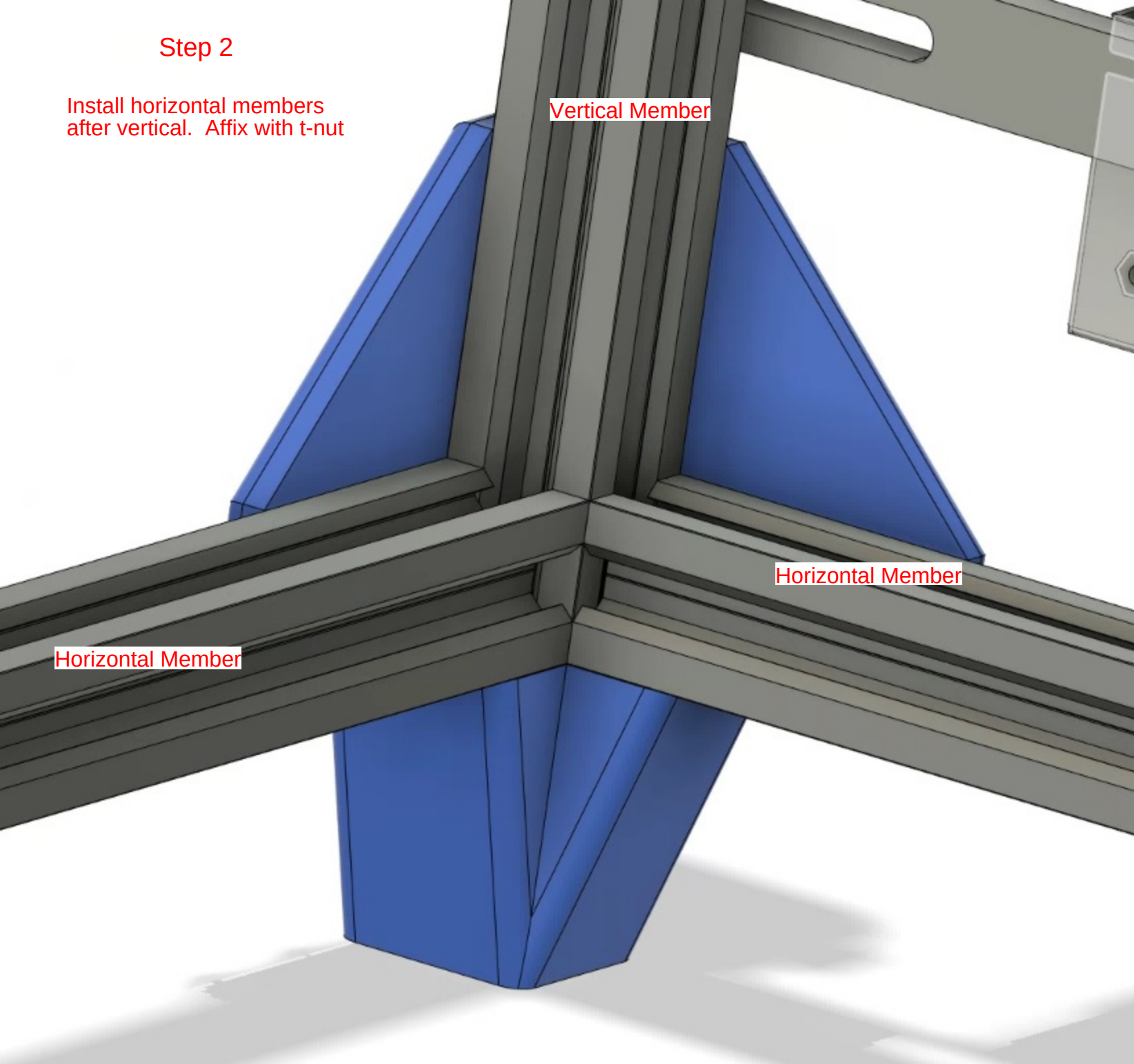
Step 1



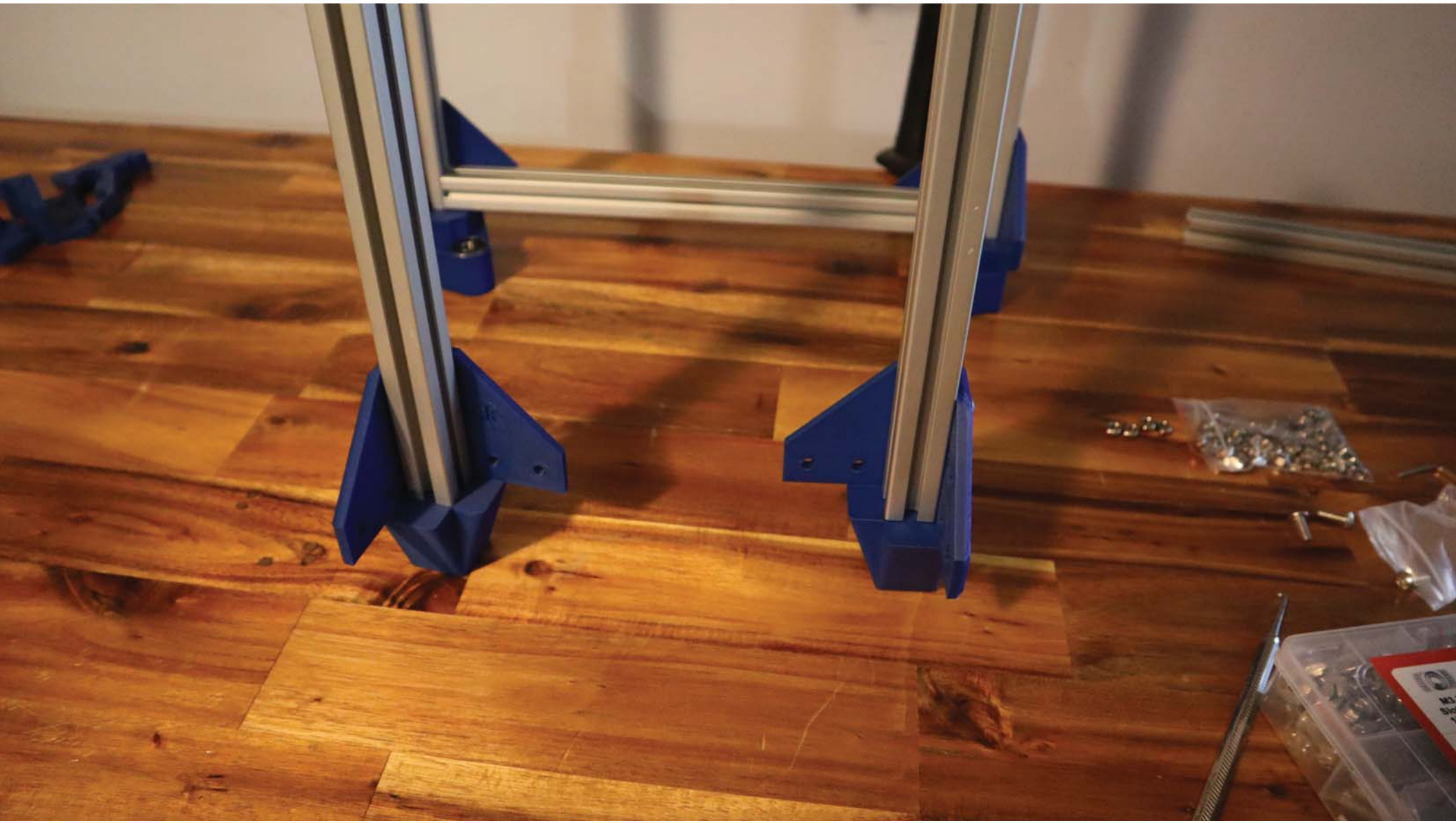

Begin with vertical members.
Align the t-nut to slide into the 2020 extrusion slot, then turn screw, t-nut will turn and grab extrusion. DO NOT OVERTIGHTEN If you deform the plastic, it is too tight.
Ensure extrusion is tight to all contact points prior to tightning

Step 2

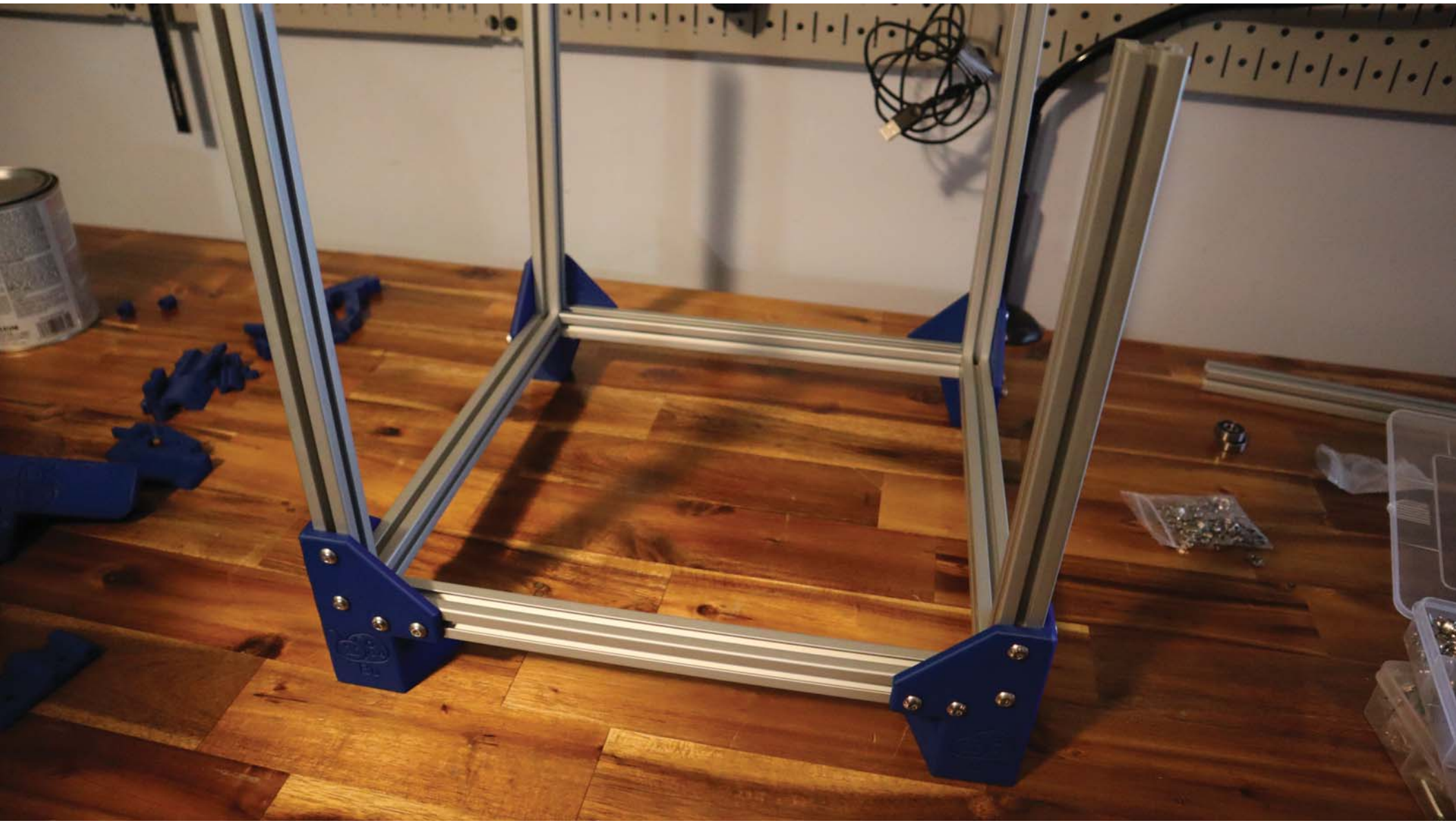
Install horizontal members after vertical. Affix with t-nut

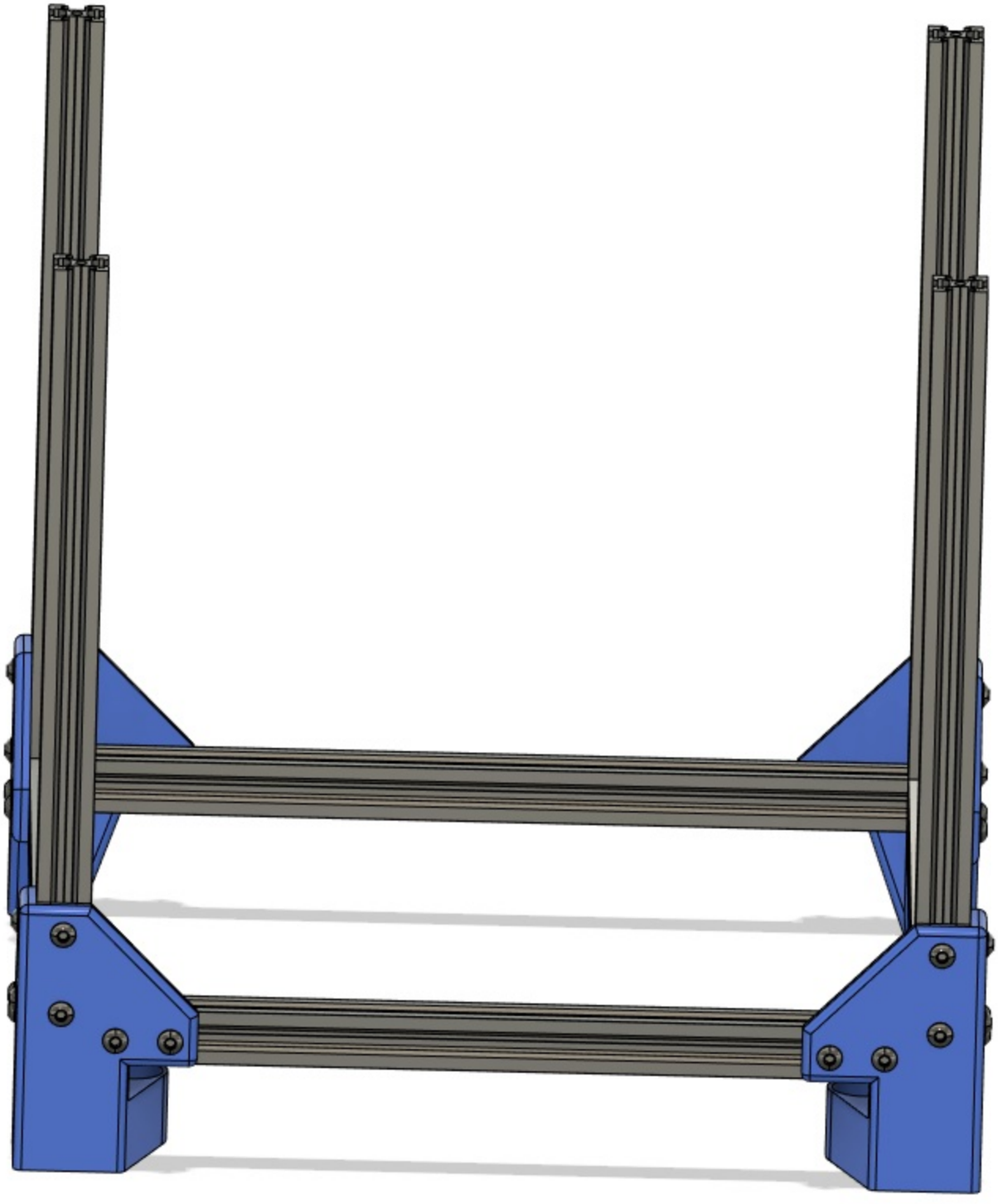


STEP 3:

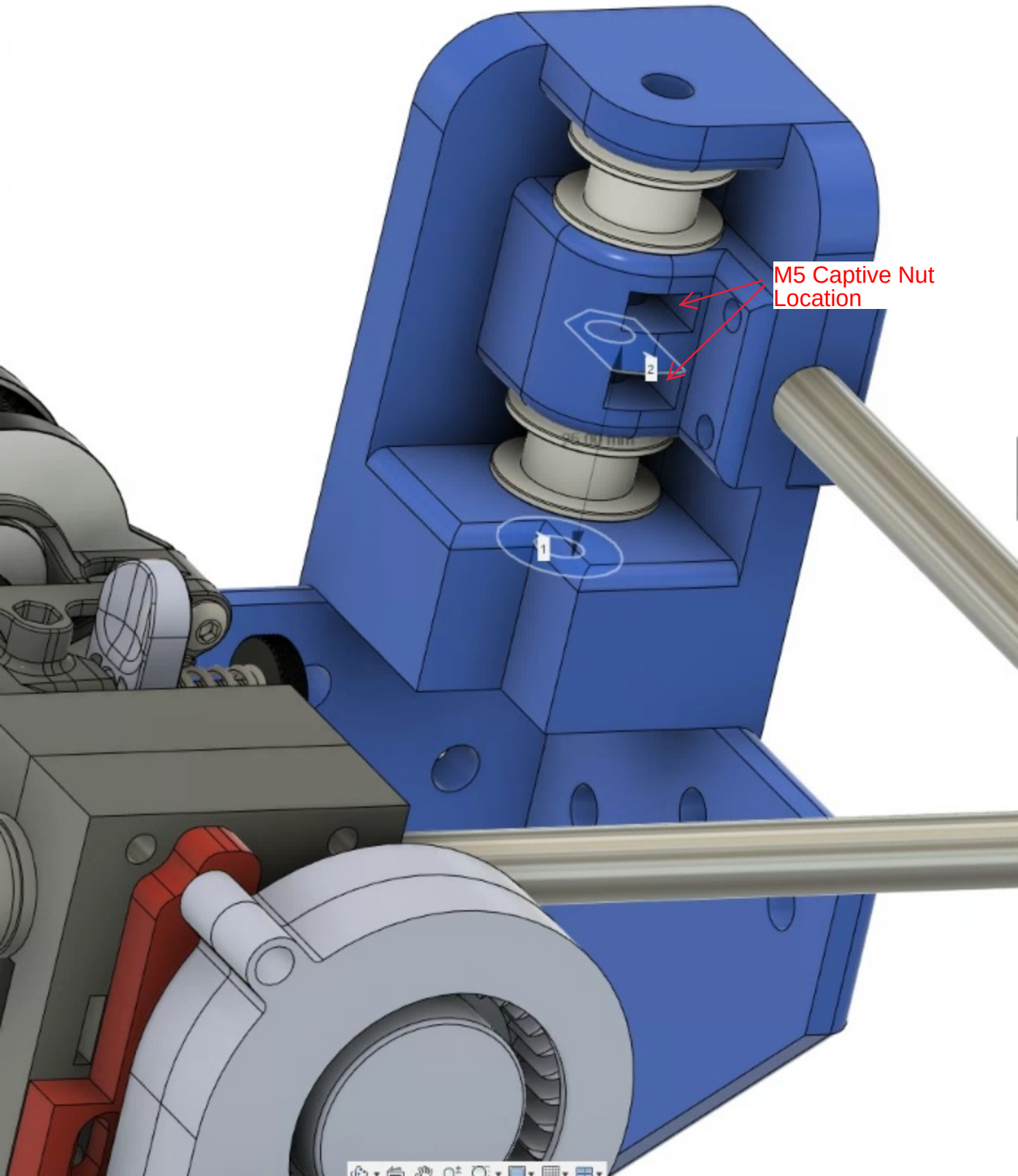


STEP 3:

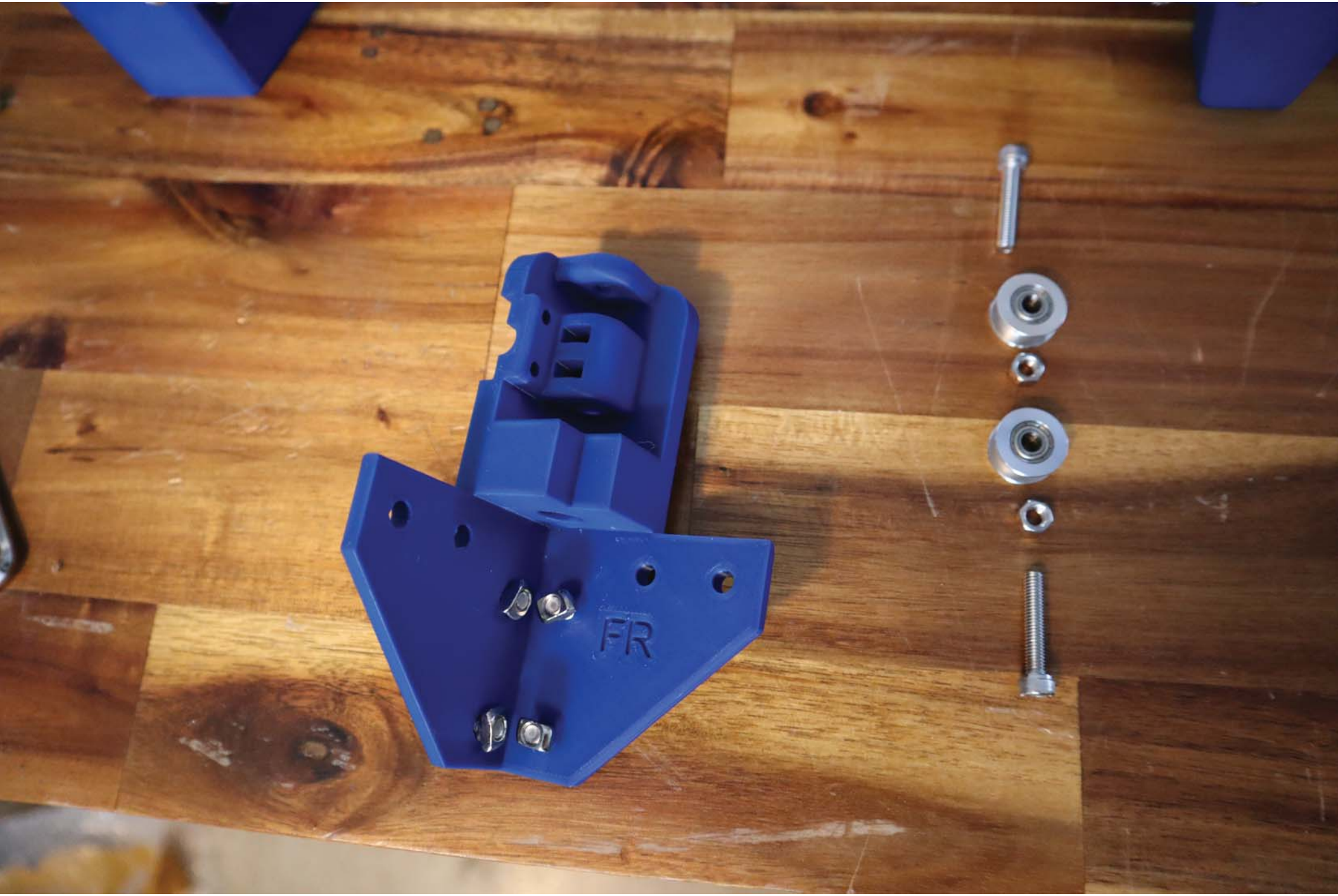




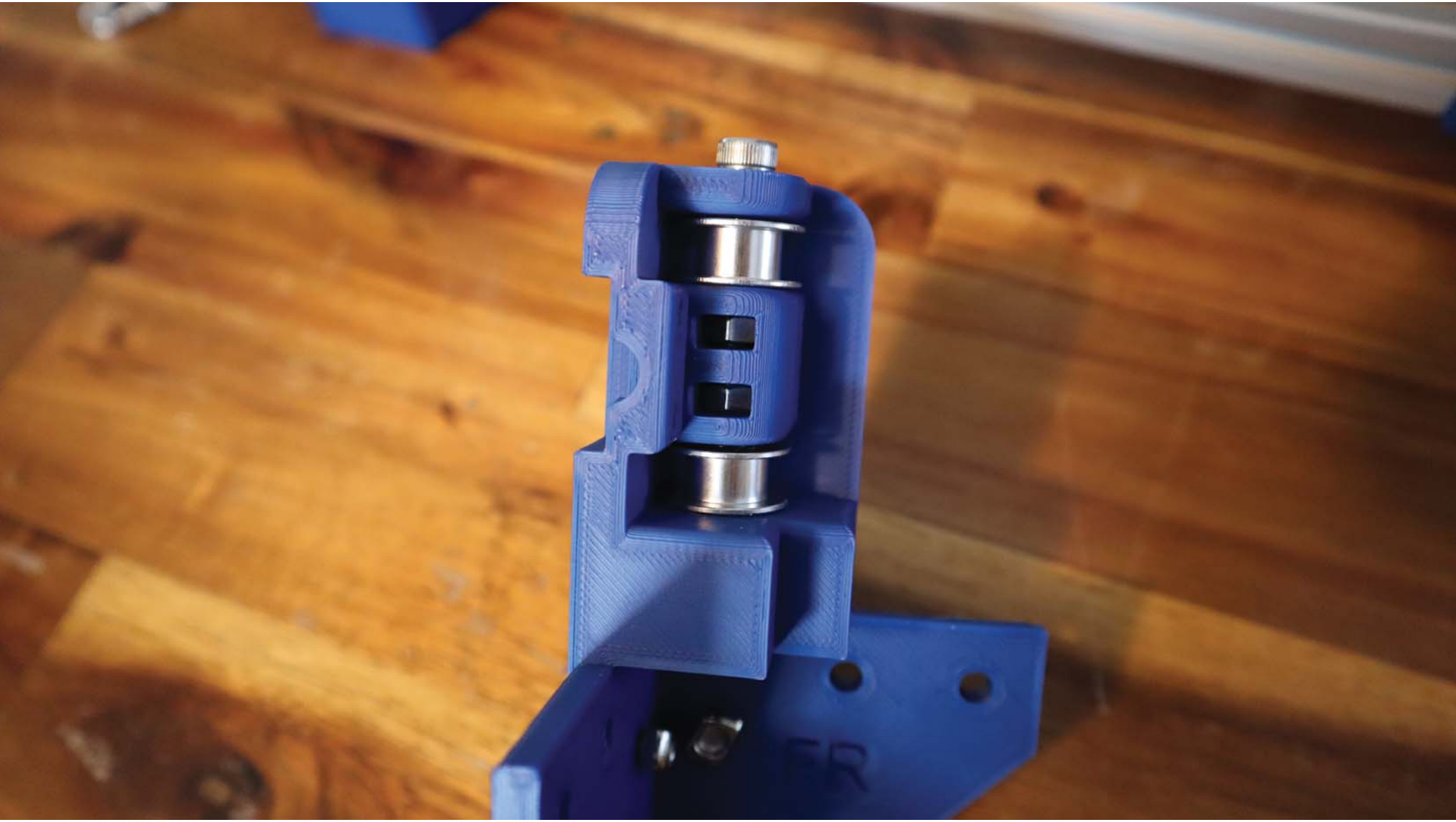
Prior to attaching the front idlers to the frame, the 20t gt2 idlers must be installed
Toothed or smooth idlers is fine, toothed is slightly more recommended
Using 2 M5 nuts per idler, insert into captive nut location
Use one M5x25 from bottom through idler and one M5x25 from top through idler. Tighten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



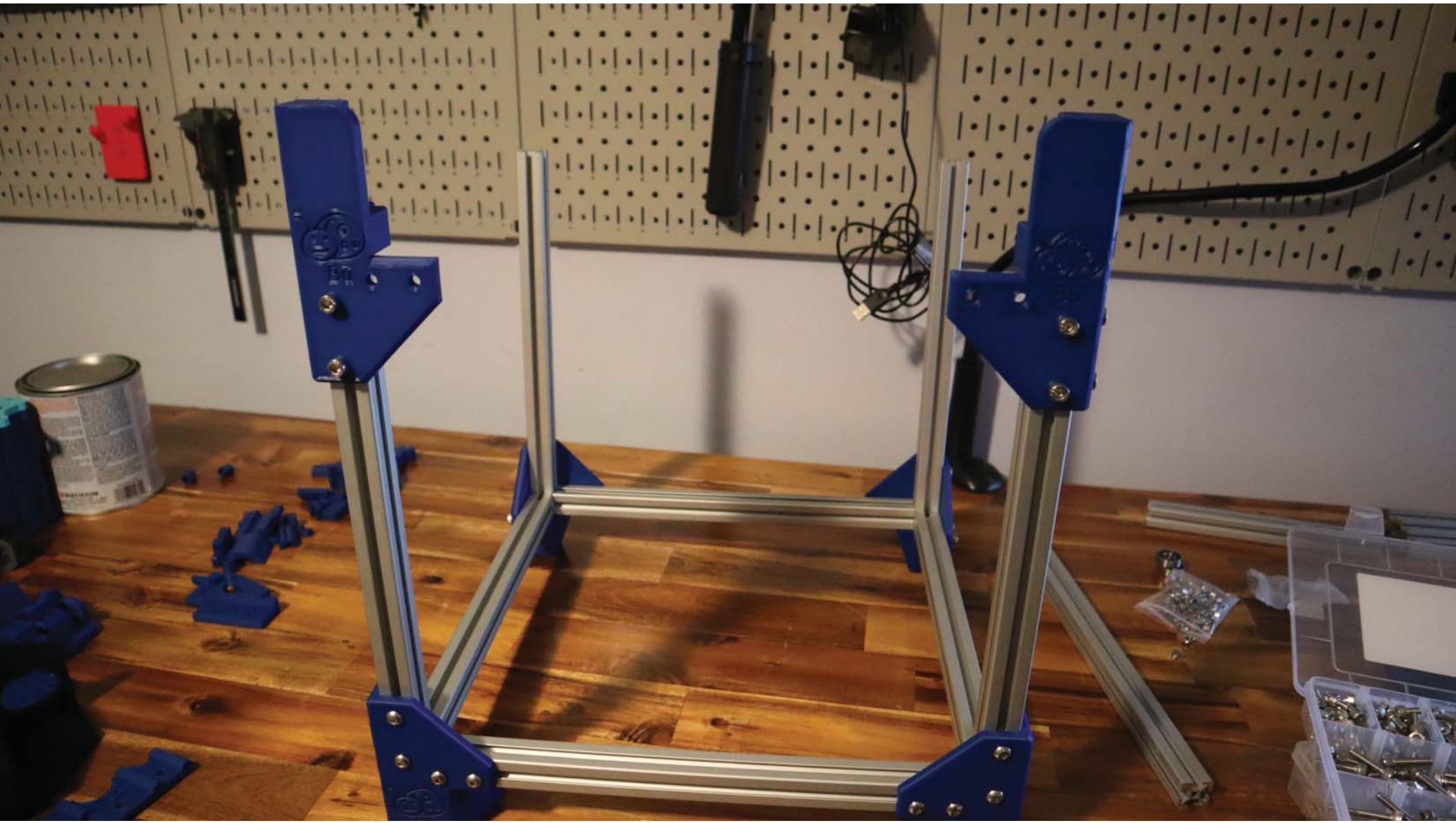
STEP 4:

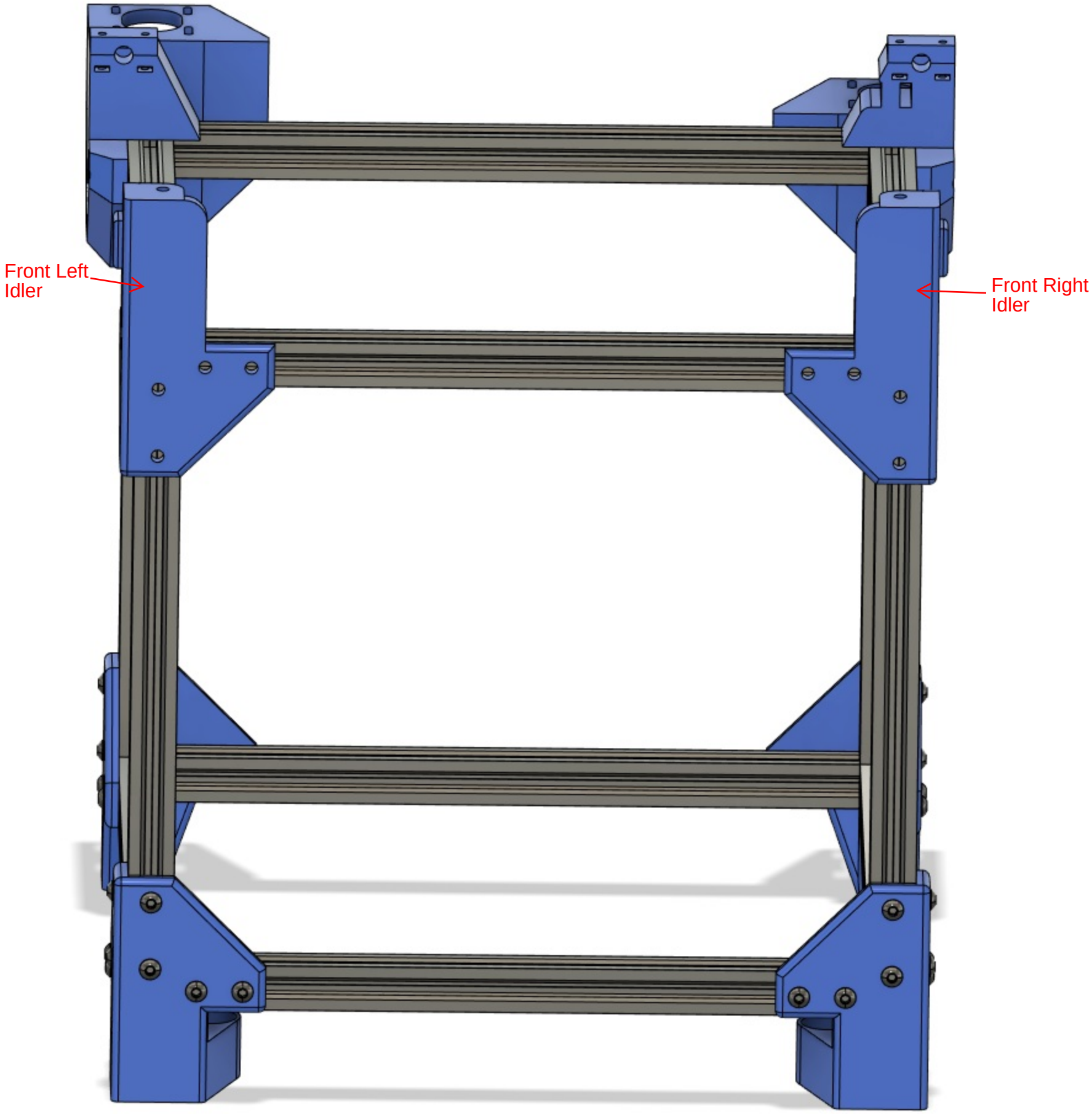


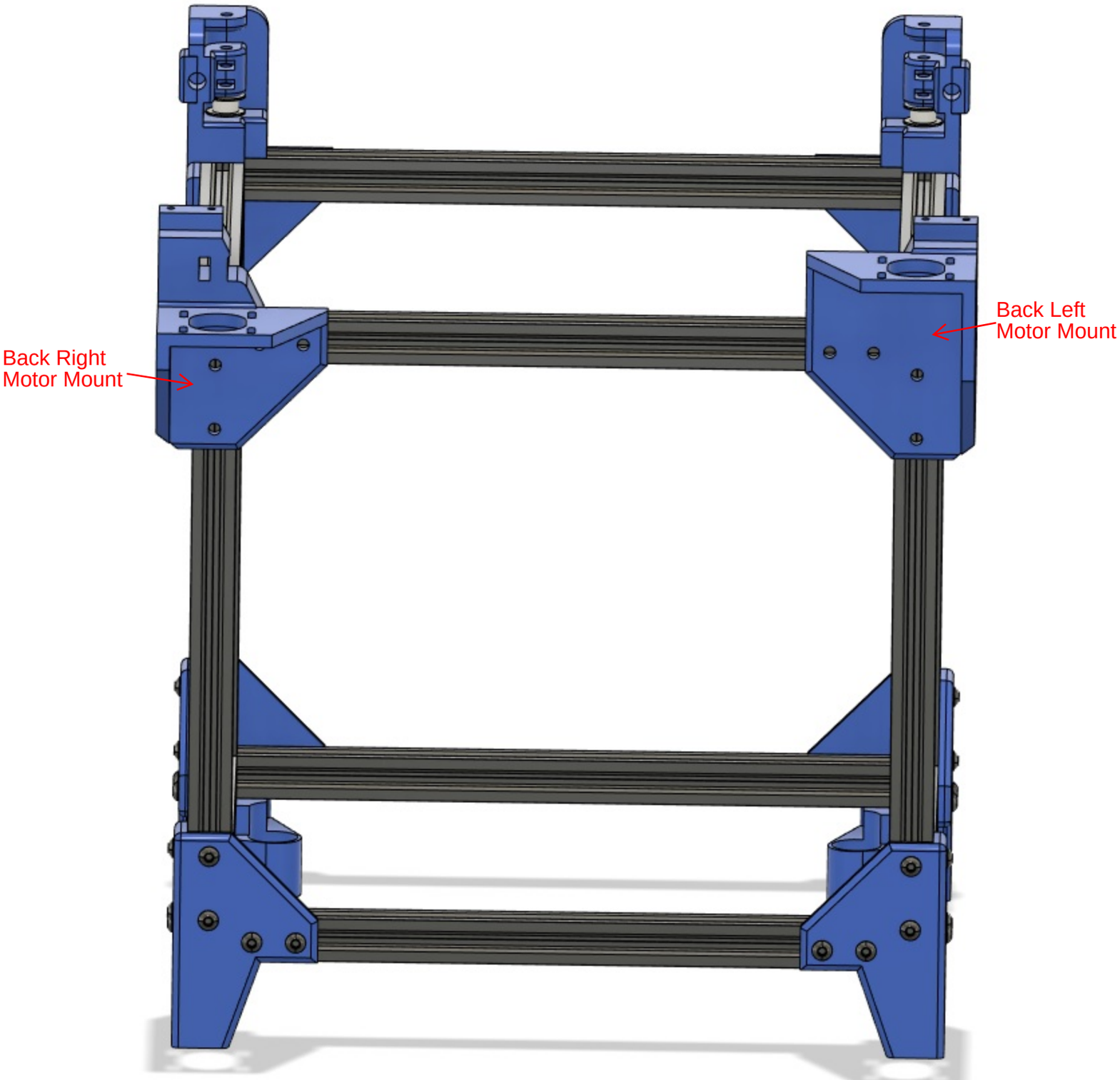
STEP 4:



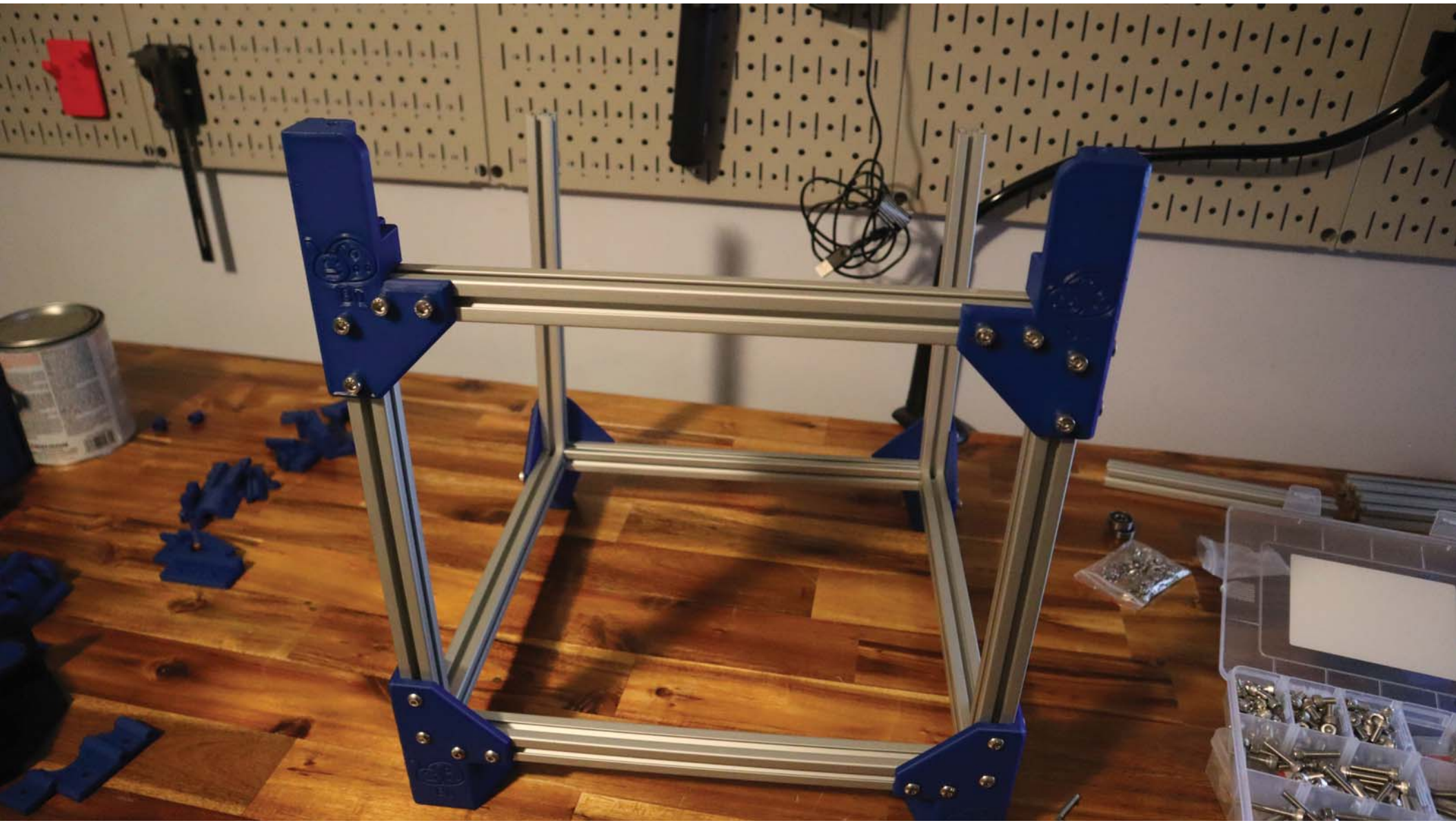
STEP 5/6:

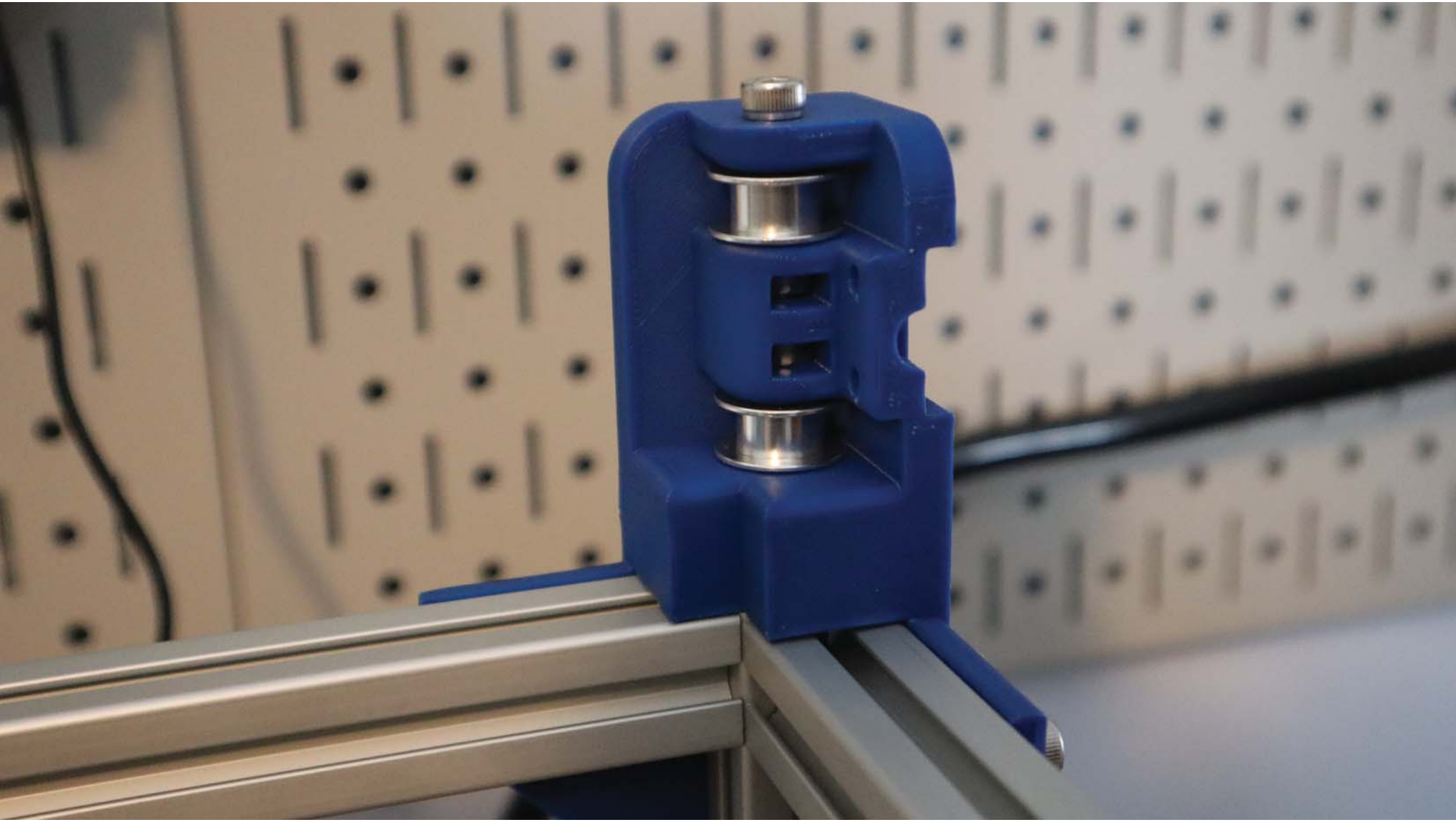



Front Left
Idler
Front Right
Idler

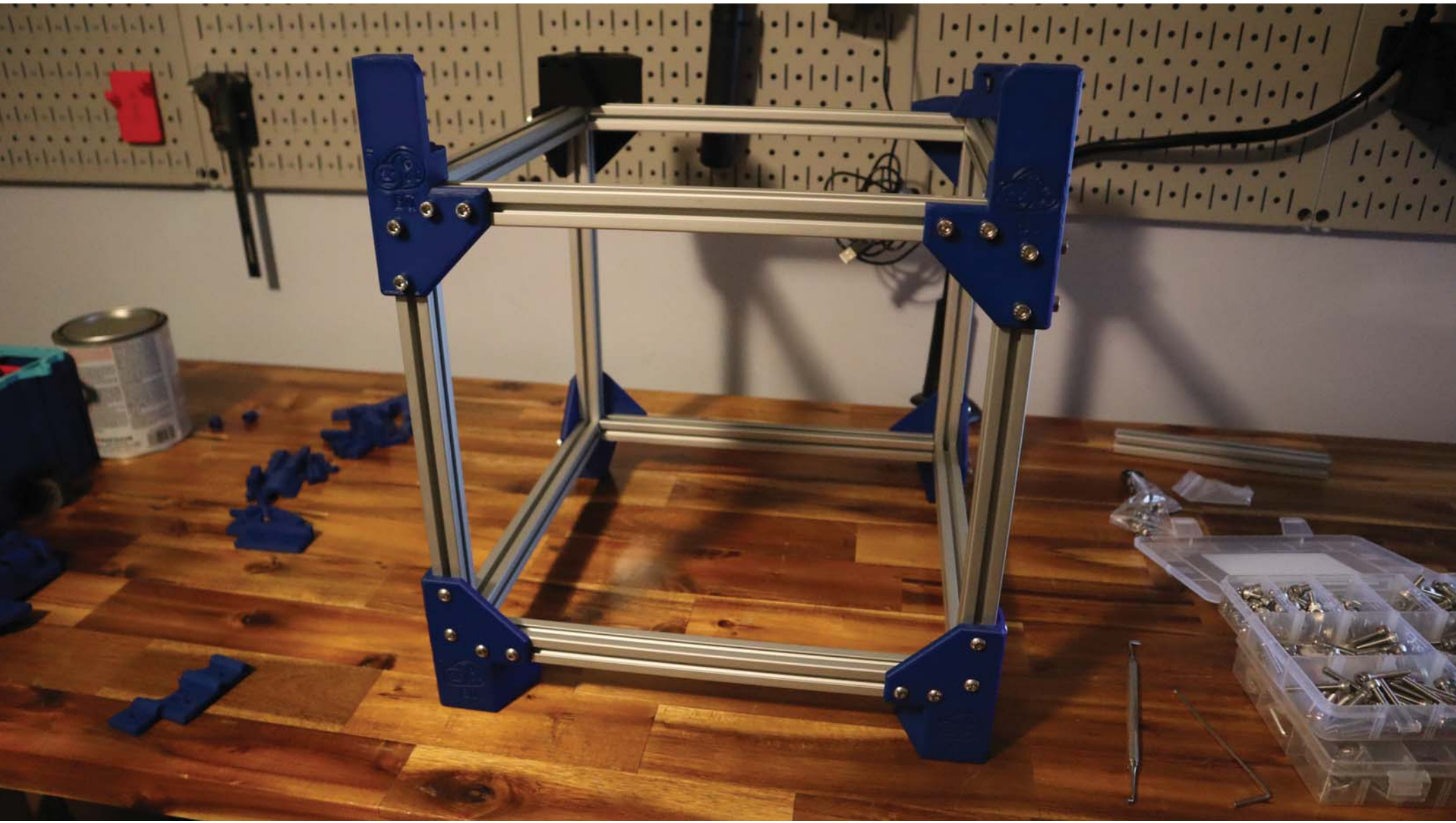

Back Right
Motor Mount
Back Left
Motor Mount

STEP 7:

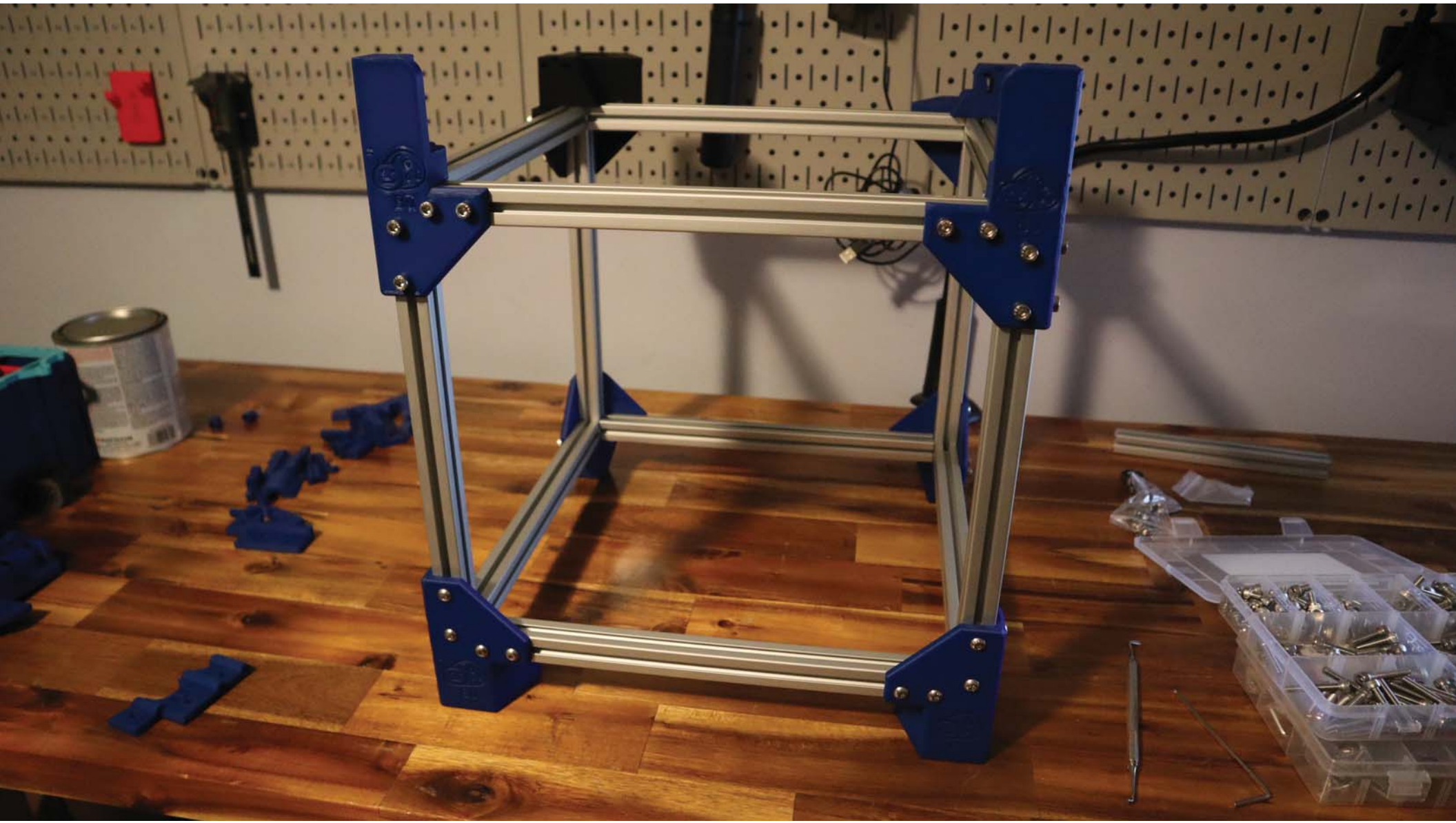




STEP 8:



COMPLETED FRAME

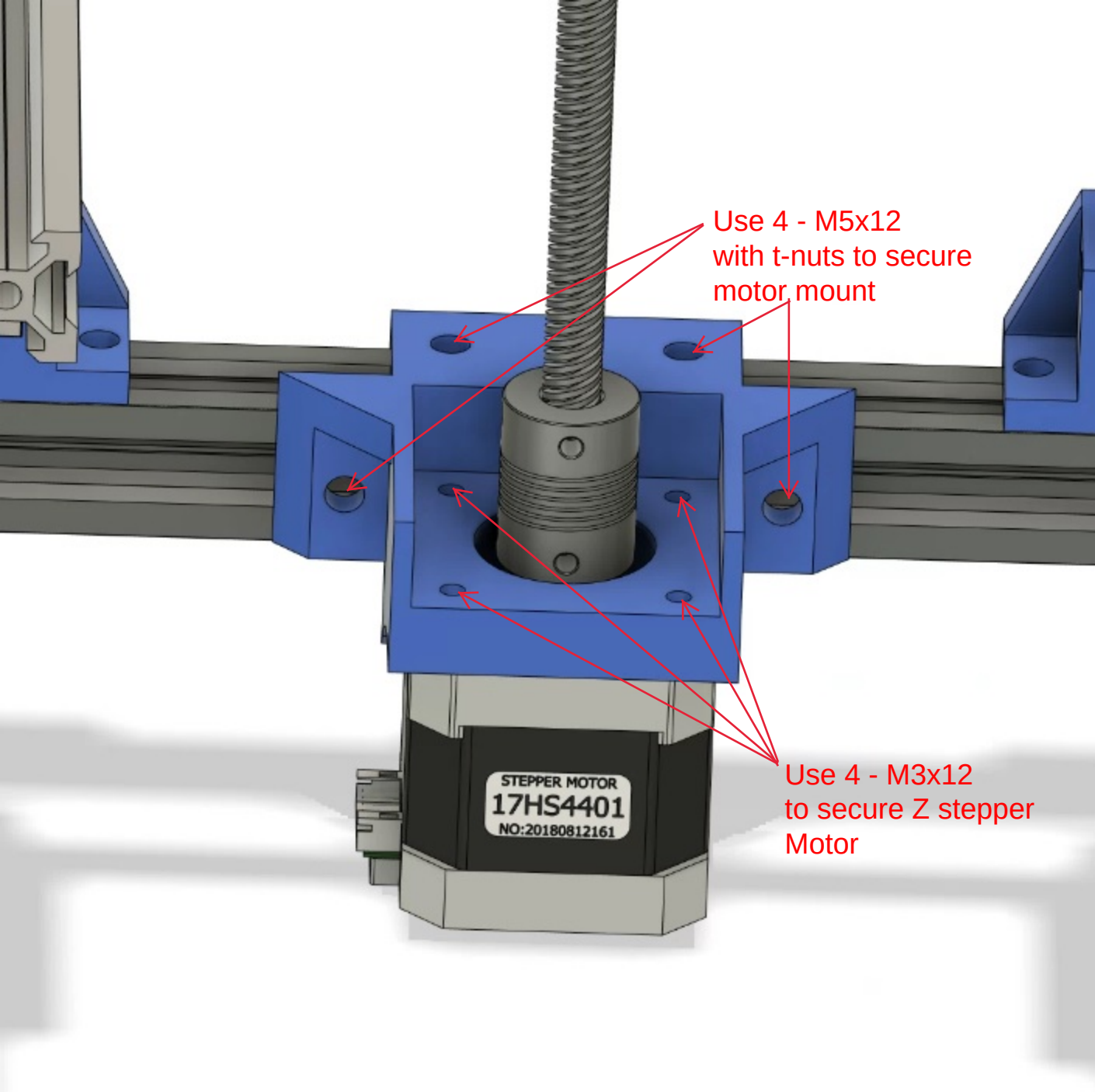


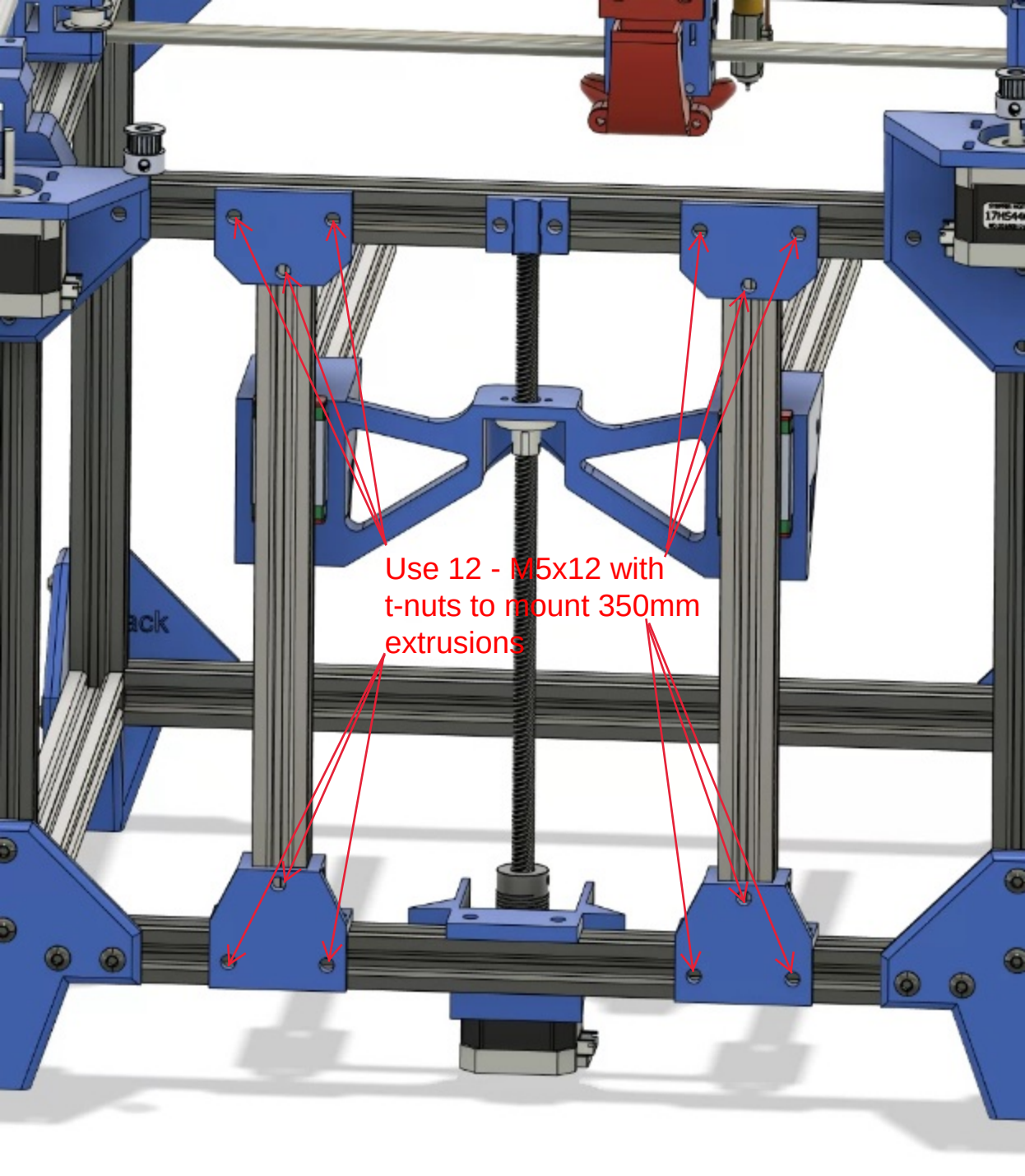
# Section 2:

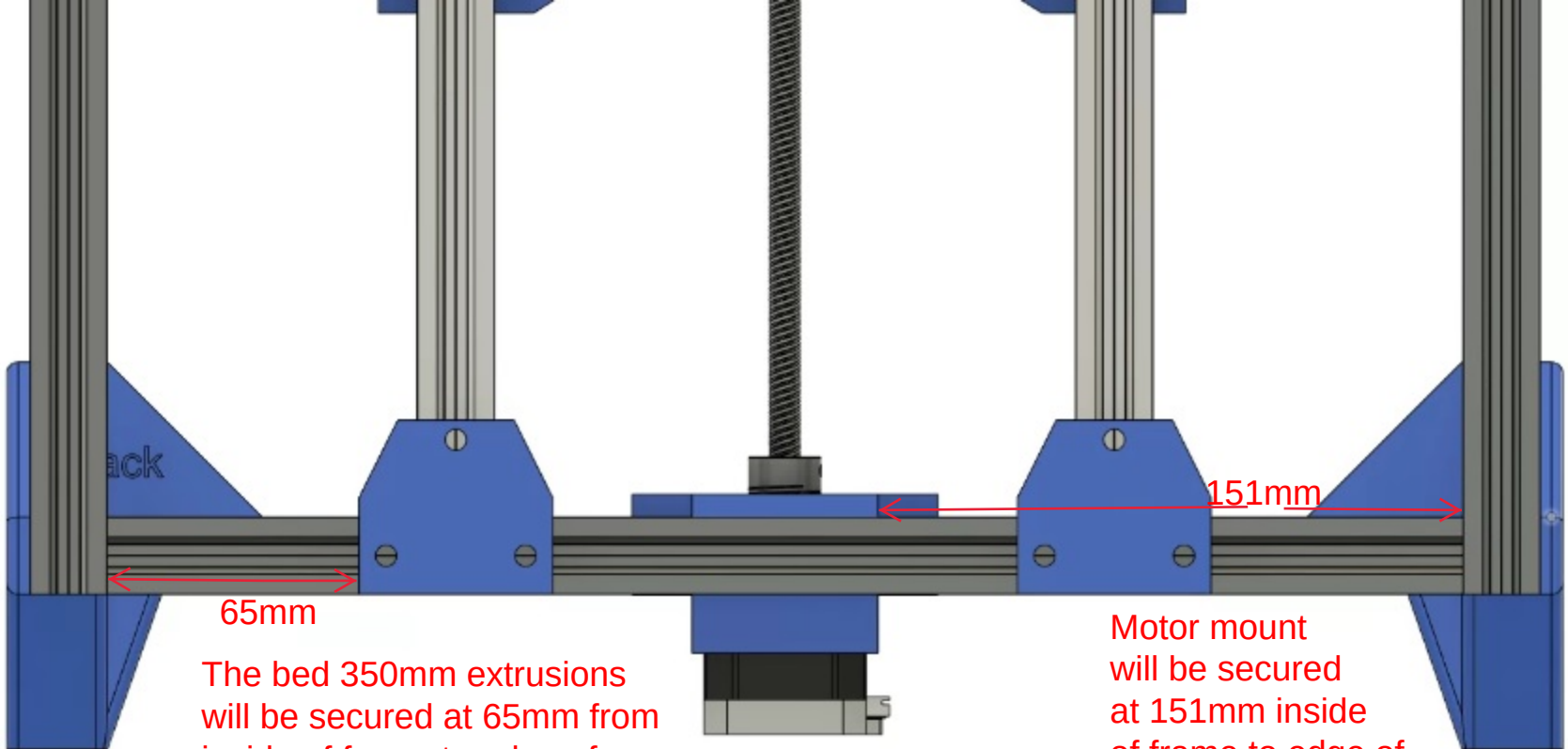
# Z System and Print Bed

**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** |

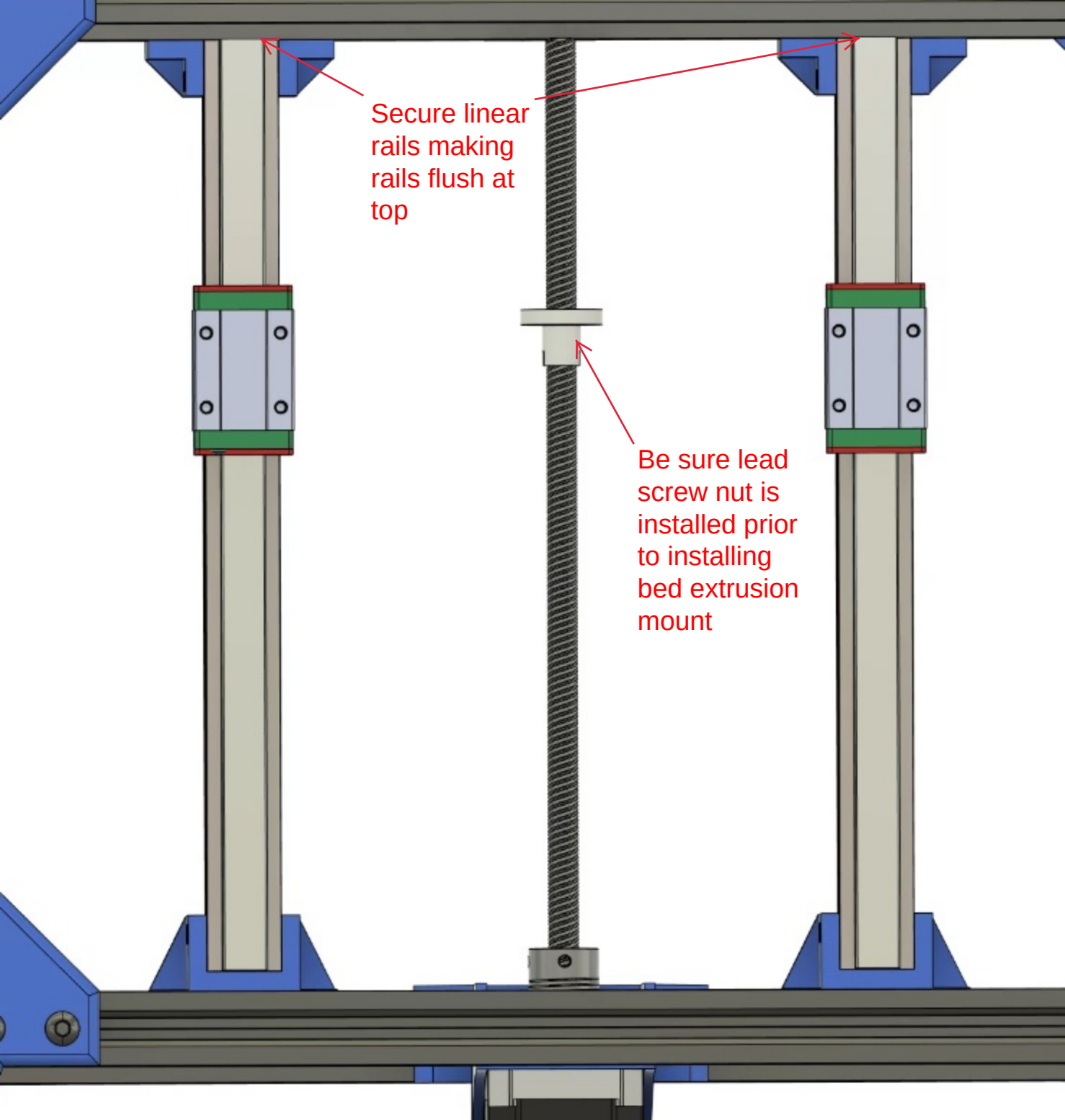

Use 4 - M5x12
with t-nuts to secure
motor mount
Use 4 - M3x12
to secure Z stepper
Motor
STEPPER MOTOR
17HS4401
NO:20180812161

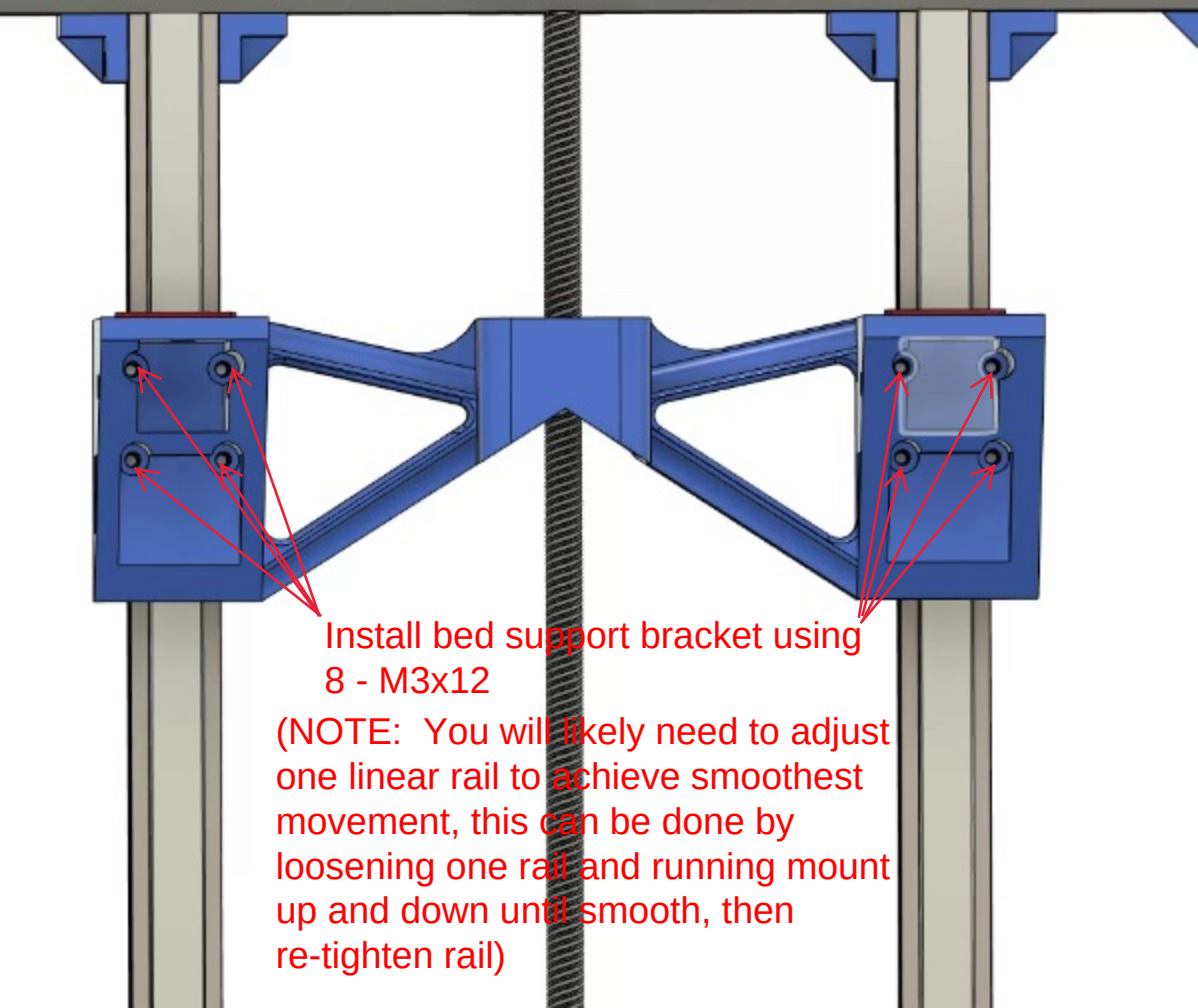

Use 12 - M5x12 with
t-nuts to mount 350mm
extrusions

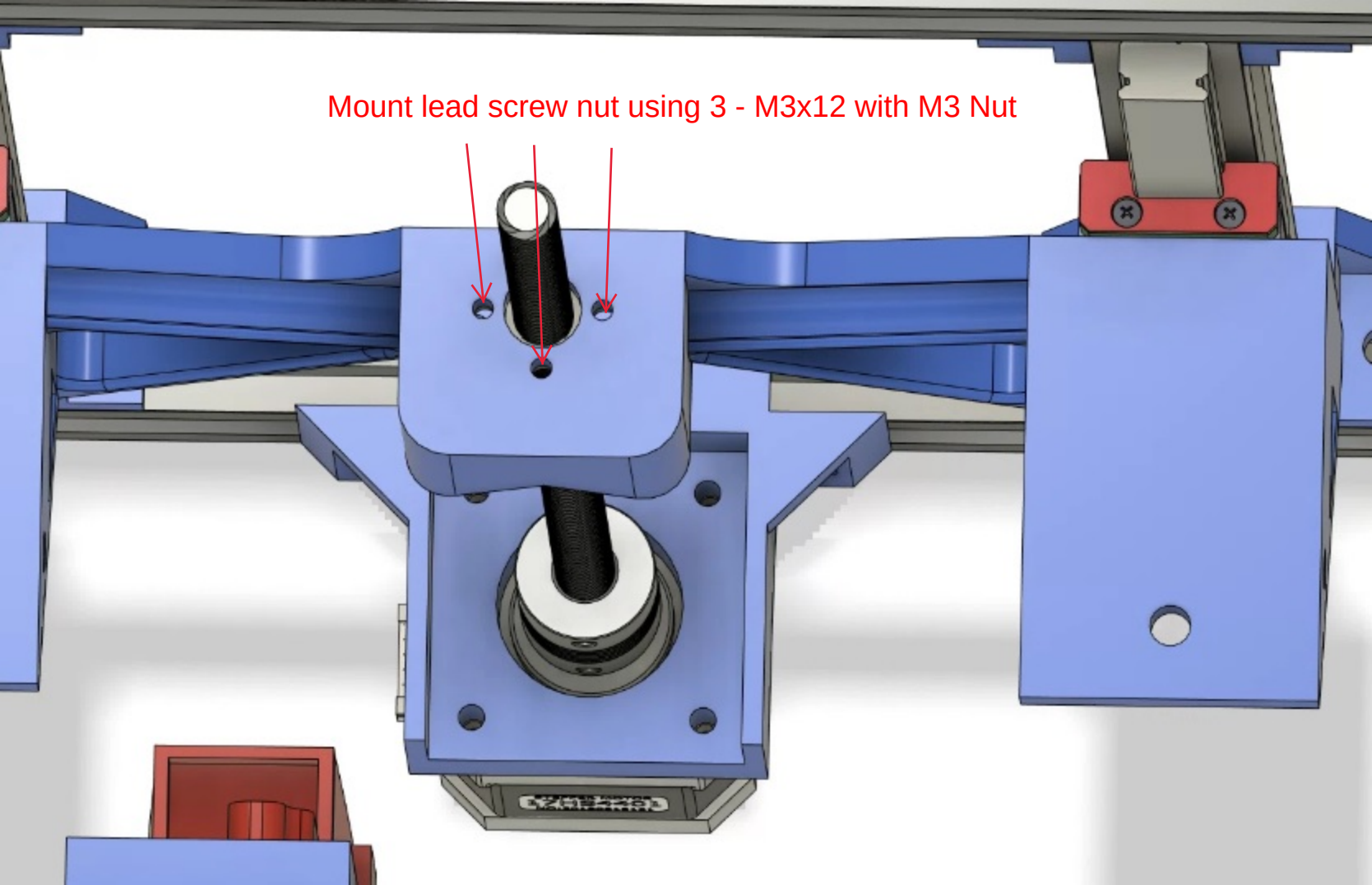


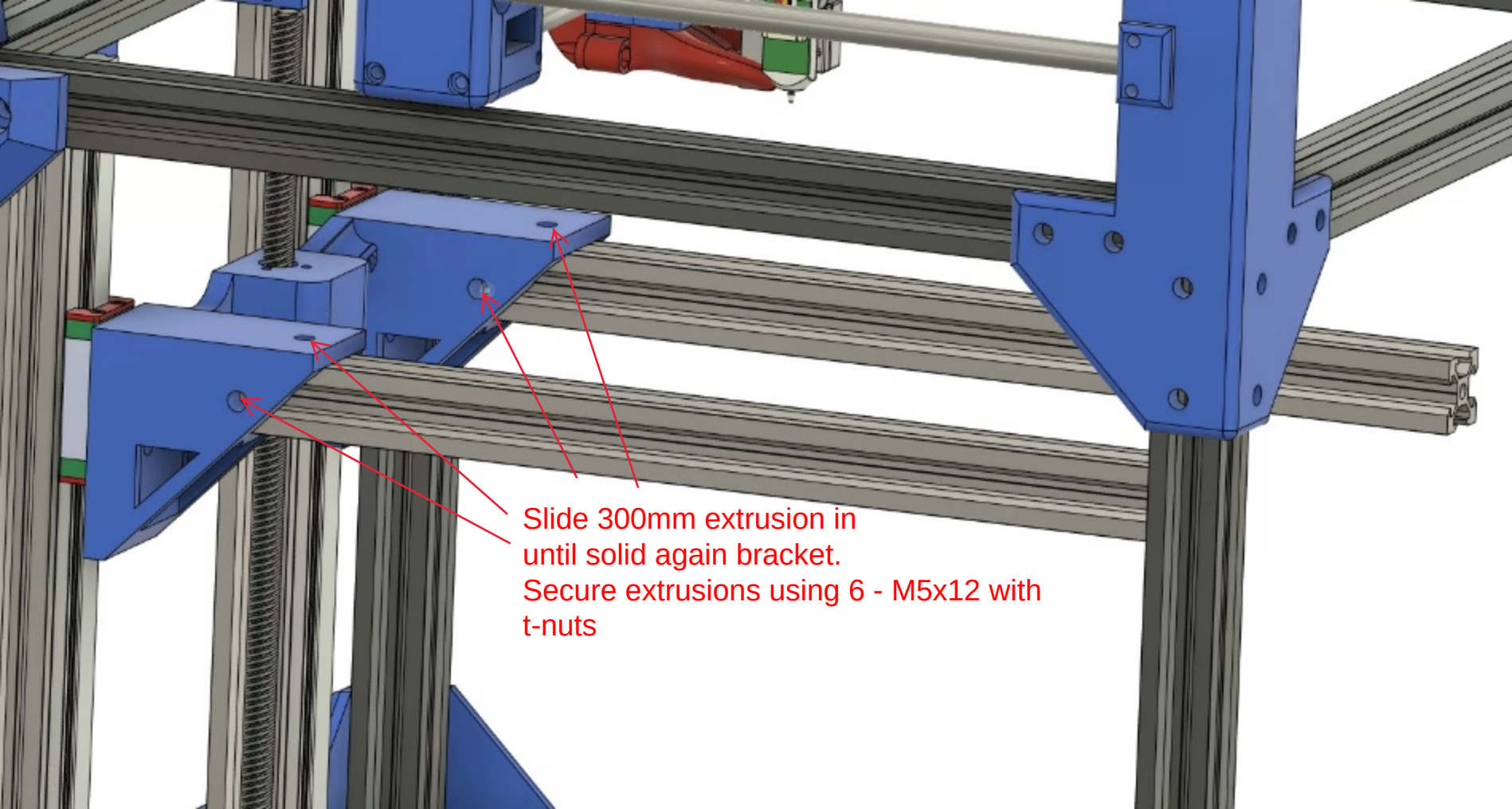

The bed 350mm extrusions will be secured at 65mm from inside of frame to edge of mount

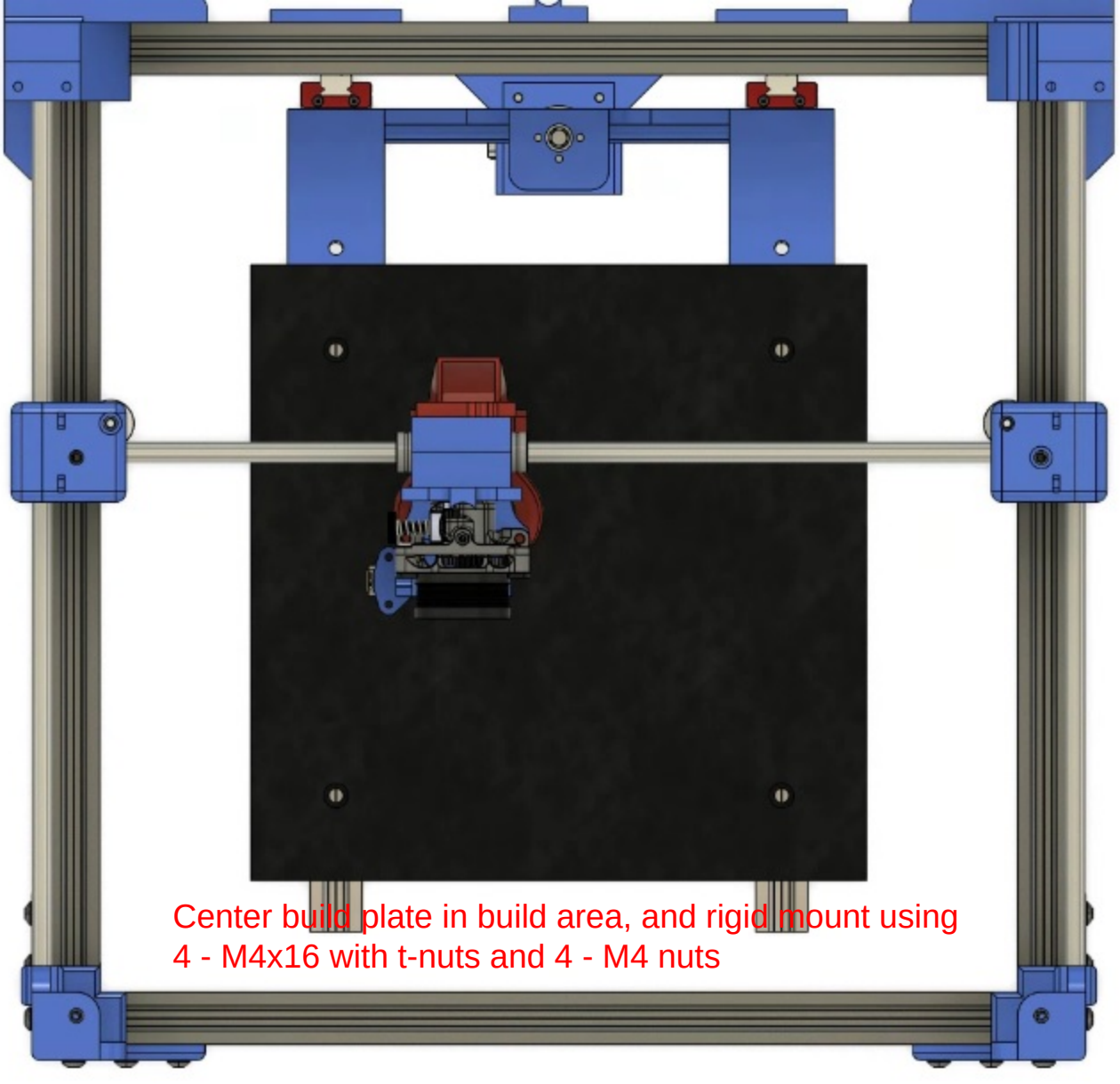
Motor mount will be secured at 151mm inside of frame to edge of mount


Secure linear rails making rails flush at top
Be sure lead screw nut is installed prior to installing bed extrusion mount

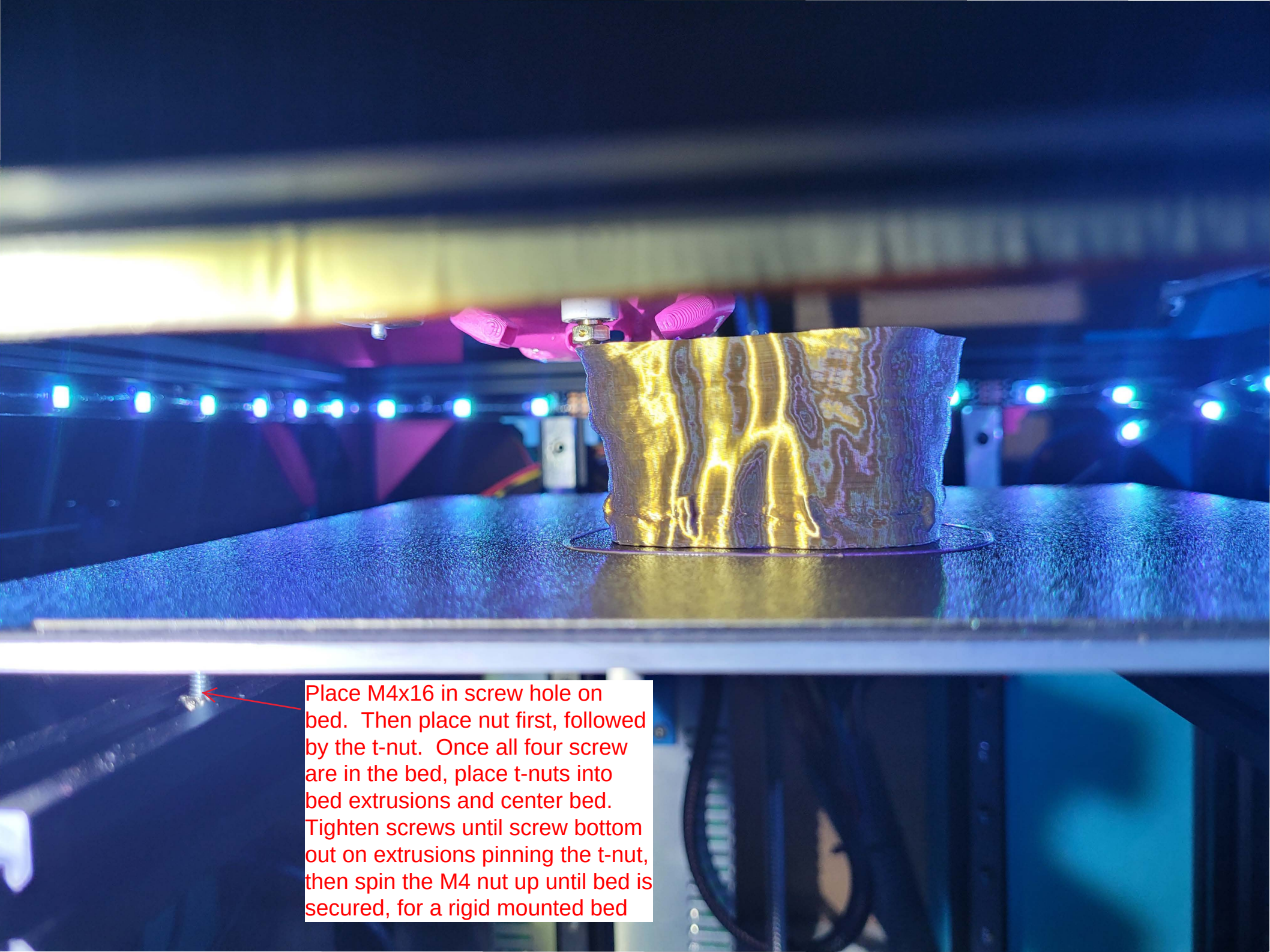

Install bed support bracket using
8 - M3x12
(NOTE: You will likely need to adjust one linear rail to achieve smoothest movement, this can be done by loosening one rail and running mount up and down until smooth, then re-tighten rail)


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

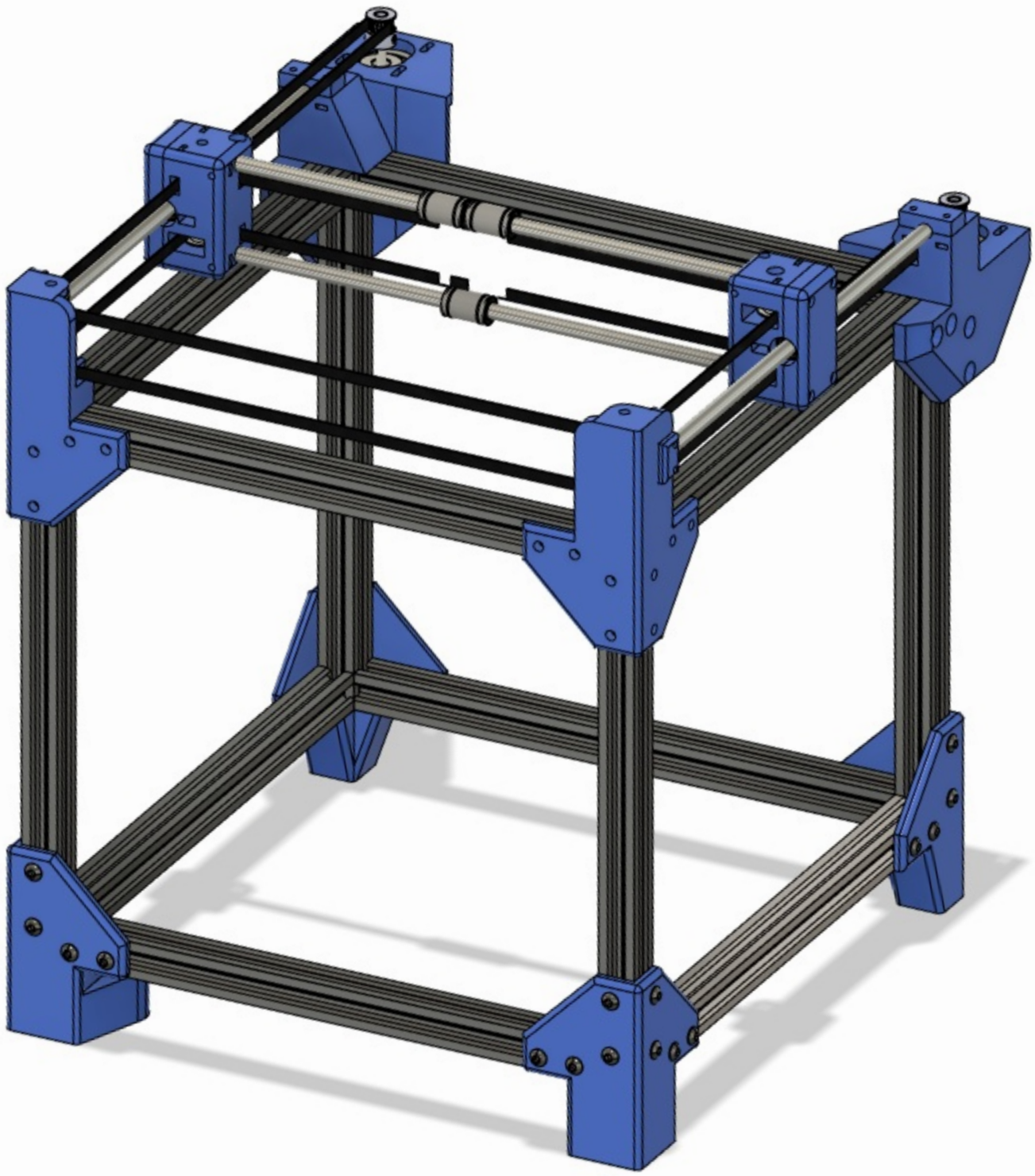

Place M4x16 in screw hole on bed. Then place nut first, followed by the t-nut. Once all four screw are in the bed, place t-nuts into bed extrusions and center bed. Tighten screws until screw bottom out on extrusions pinning the t-nut, then spin the M4 nut up until bed is secured, for a rigid mounted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

# Section 3:

# Gantry Assembly

**Components needed for this portion:**

| | |
|---|---|
| **M3x8** | **x8** |
| **M3x16** | **x8** |
| **M3x20** | **x20** |
| **M5x35** | **x4** |
| **M3 Nuts** | **x28** |
| **M5 Nuts** | **x4** |
| **300mm Linear Rods** | **x4** |
| **8mm Linear Bearings** | **x4** |
| **20t GT2 idlers** | **x4** |
| **Nema 17 Stepper Motor** | **x2** |
| **5mm Bore 20T GT2 Pulley** | **x2** |

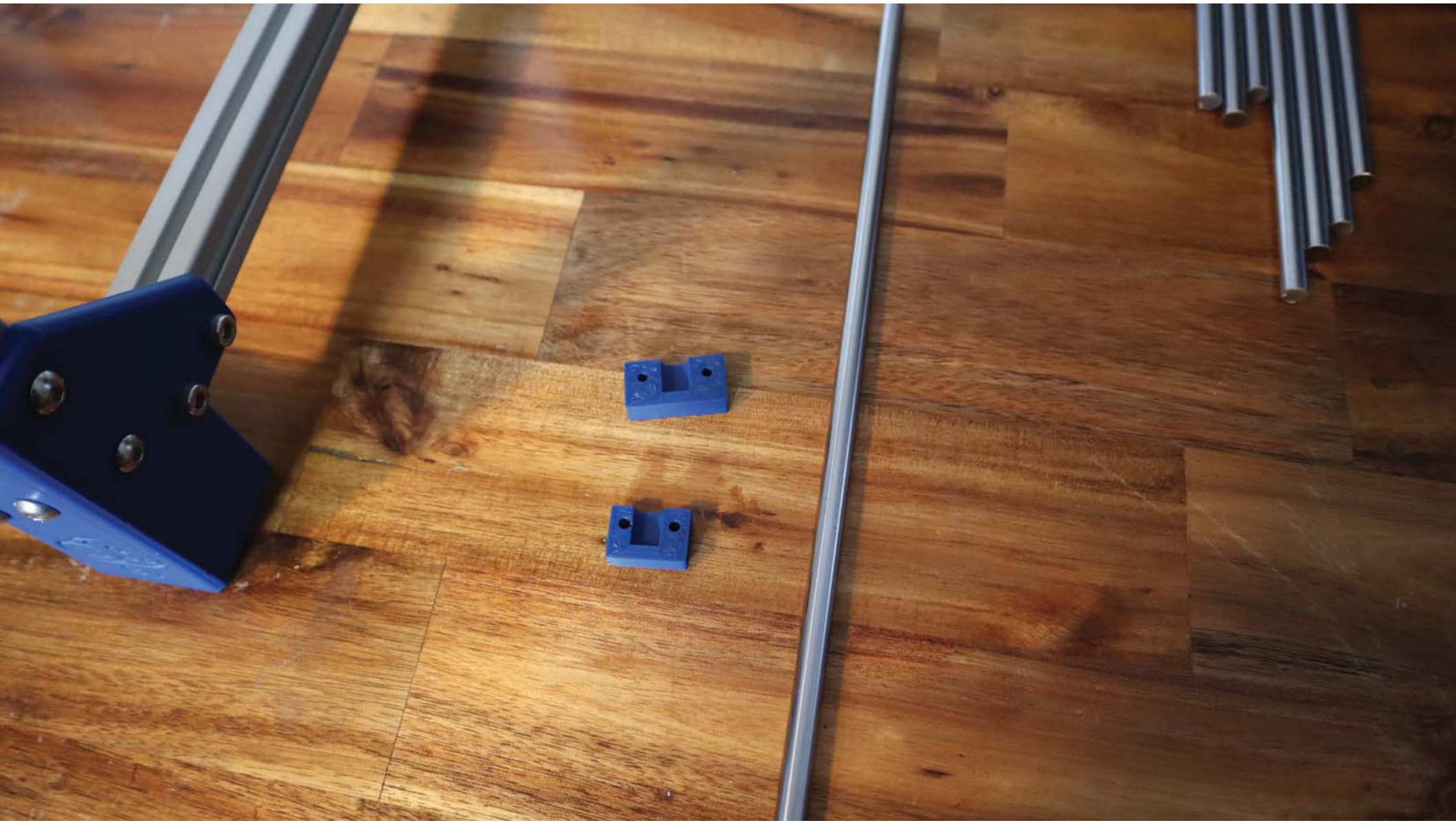


The X/Y Gantry

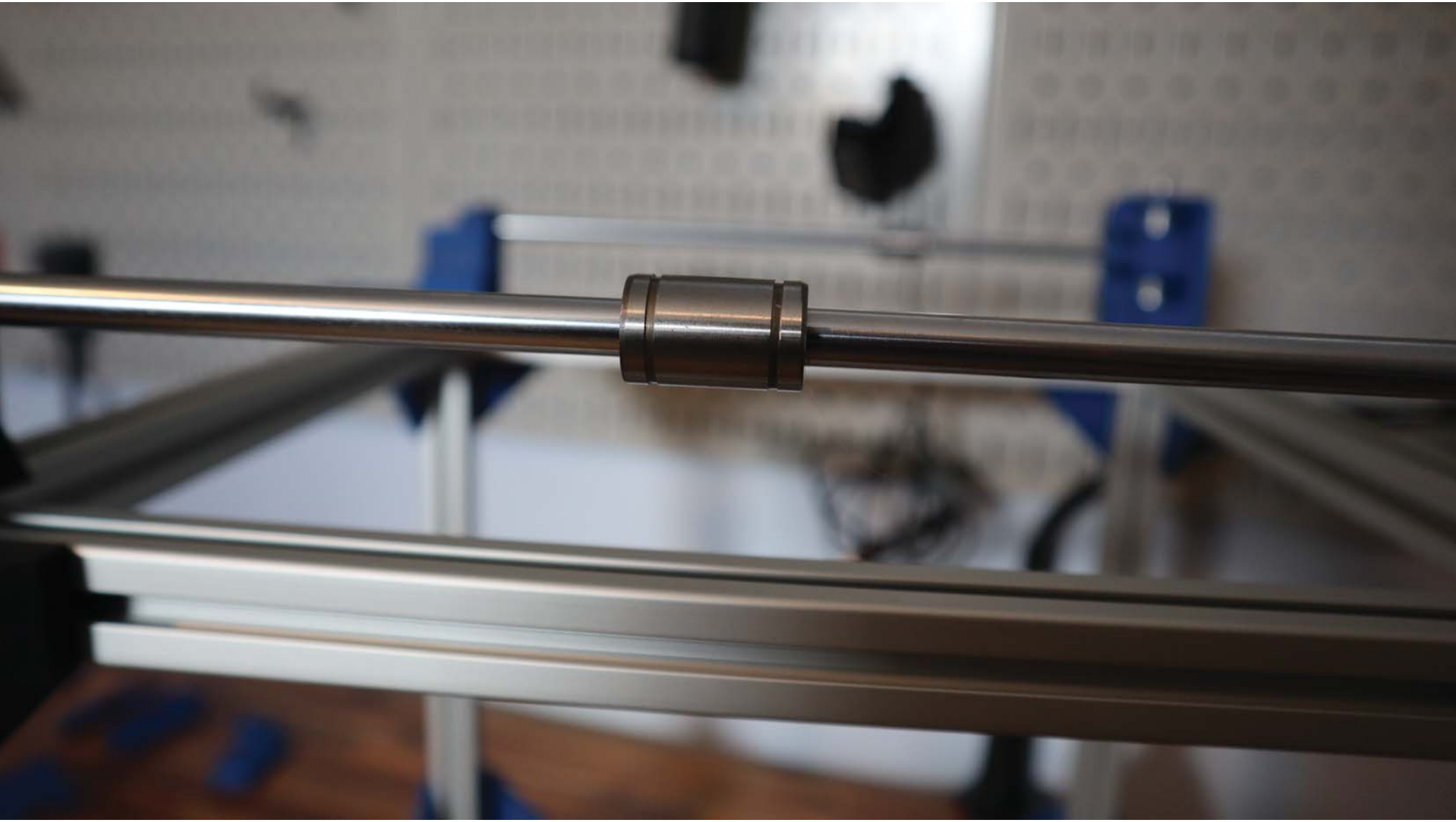
1. Place one linear bearing on each of the Y gantry linear rods.
2. Assemble the left and right Linear rods by attaching them to the corner brackets with the mount and 2 m3x20 bolts and nuts in the front, and 2 m3x16 bolts and nuts in the rear.
3. Attach the motors to the rear motor mounts using 4 m3x8 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.

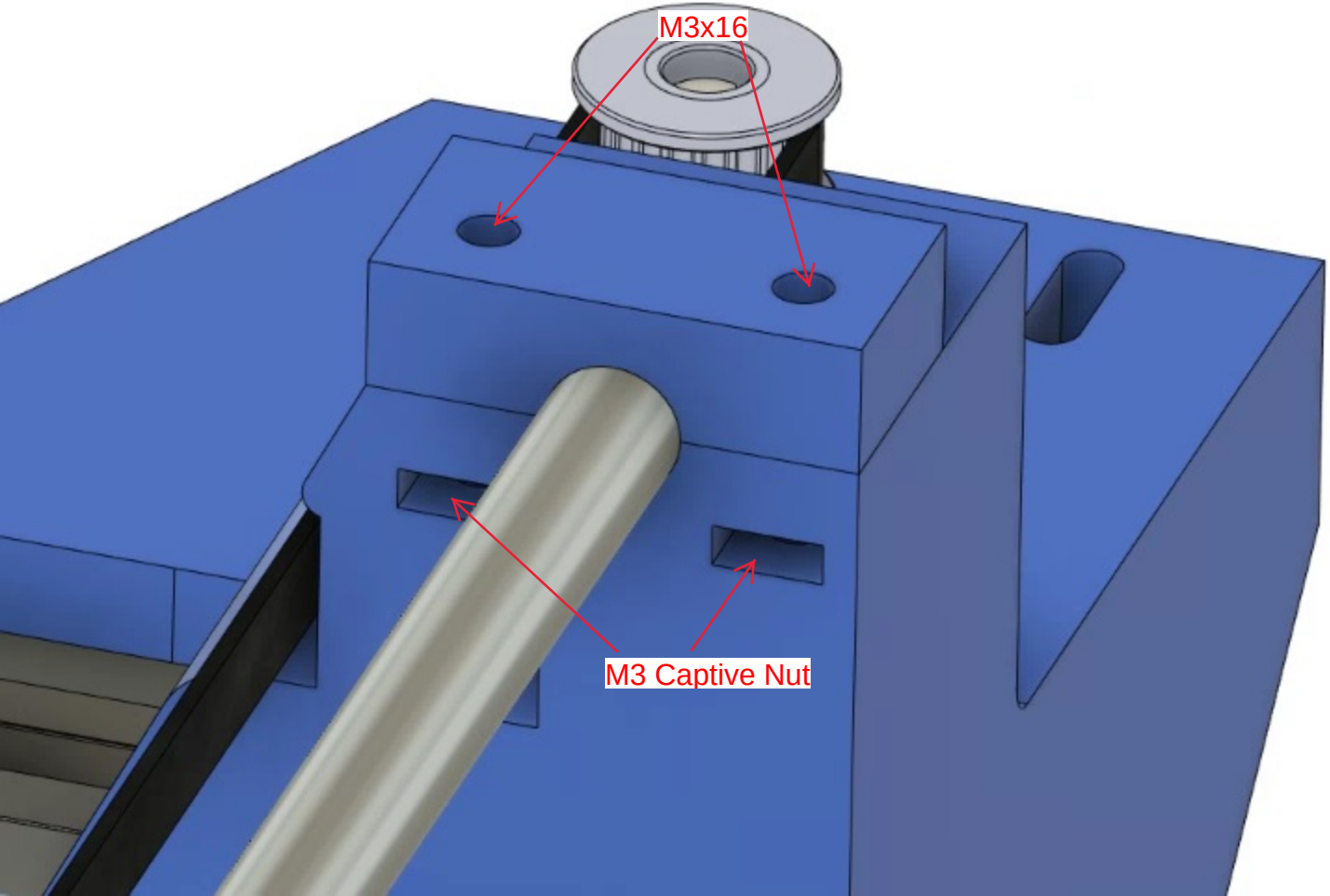
STEP 1

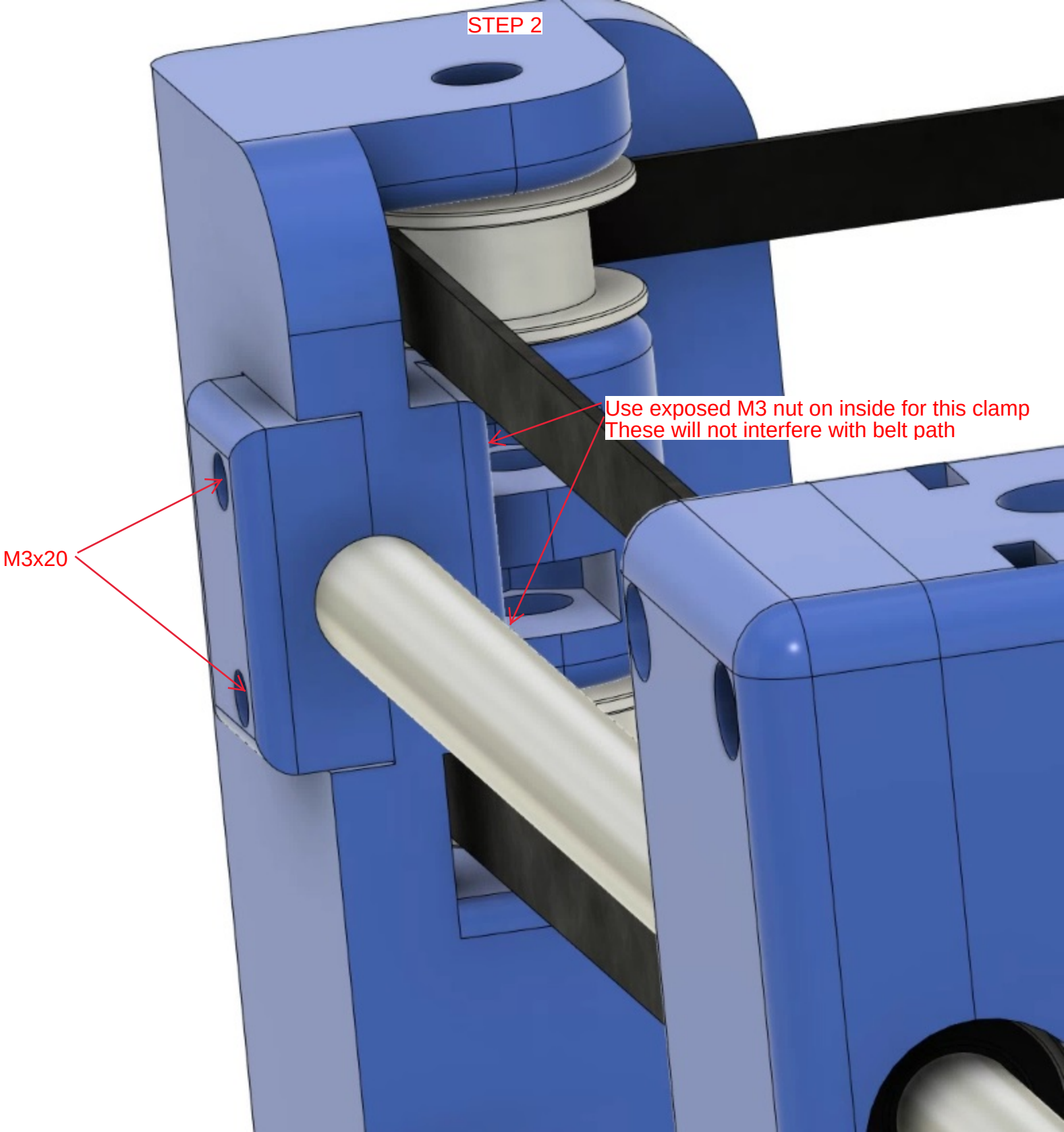


STEP 1

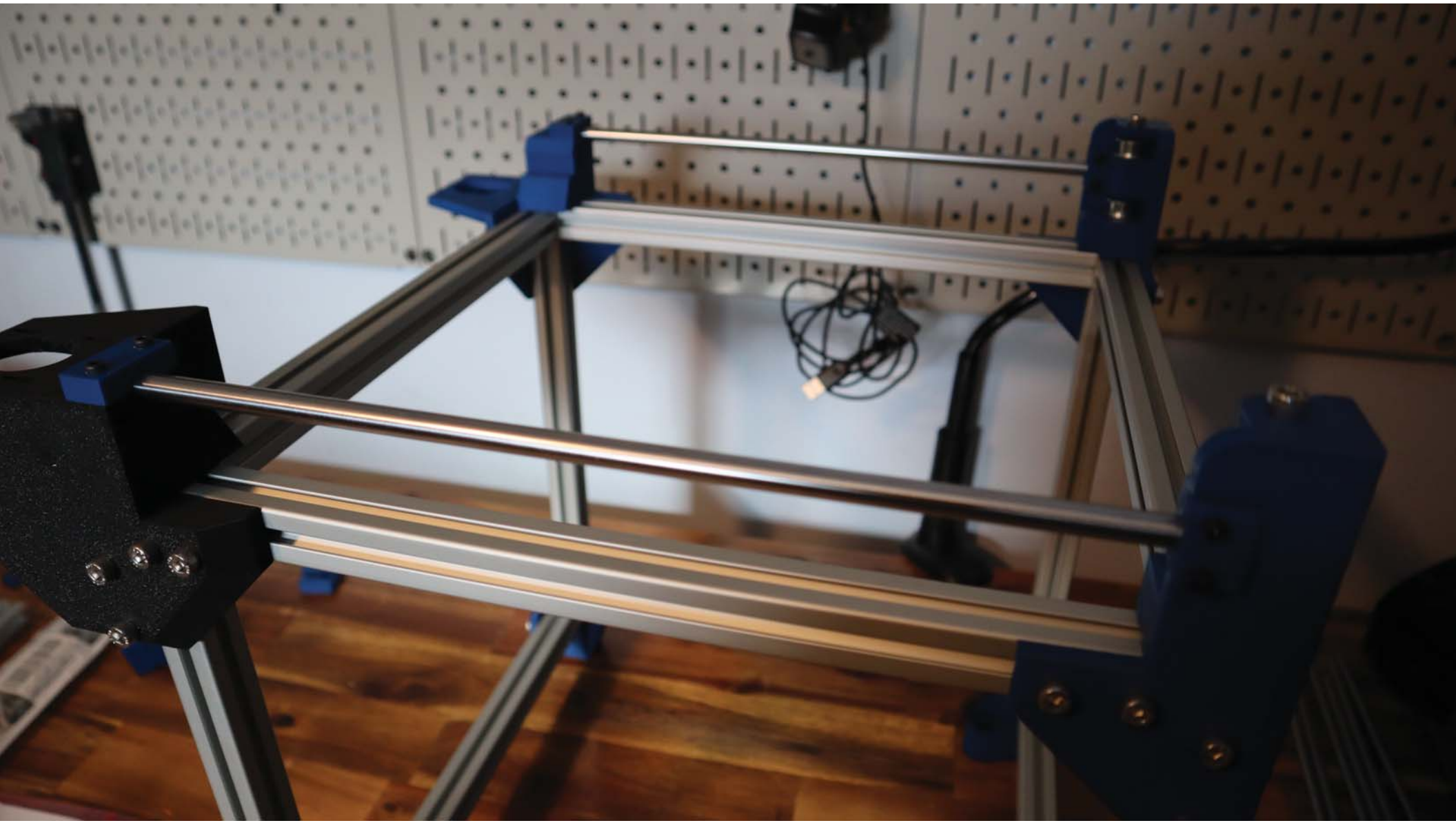


STEP 2

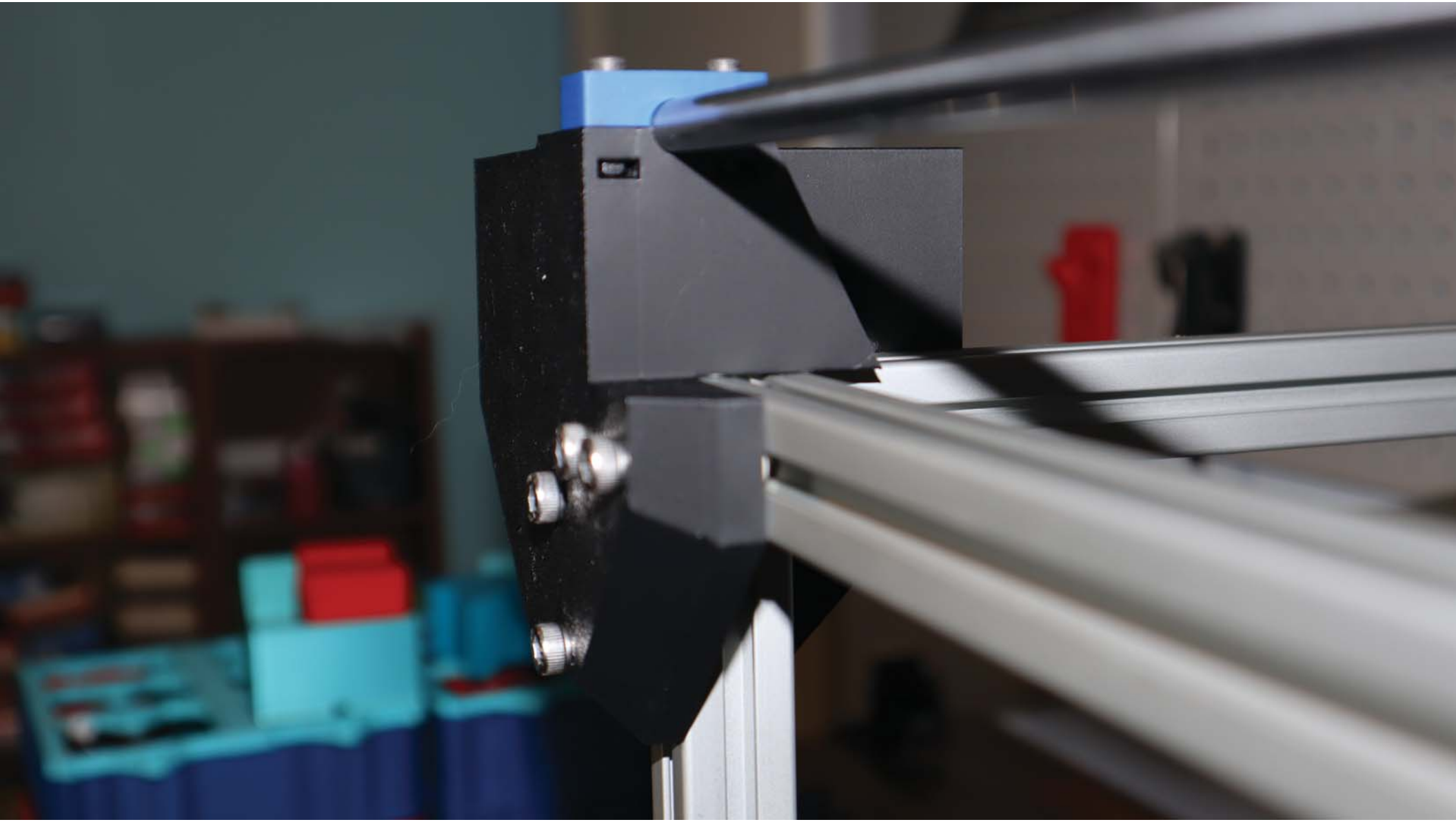



STEP 2
Use exposed M3 nut on inside for this clamp
These will not interfere with belt path
M3x20

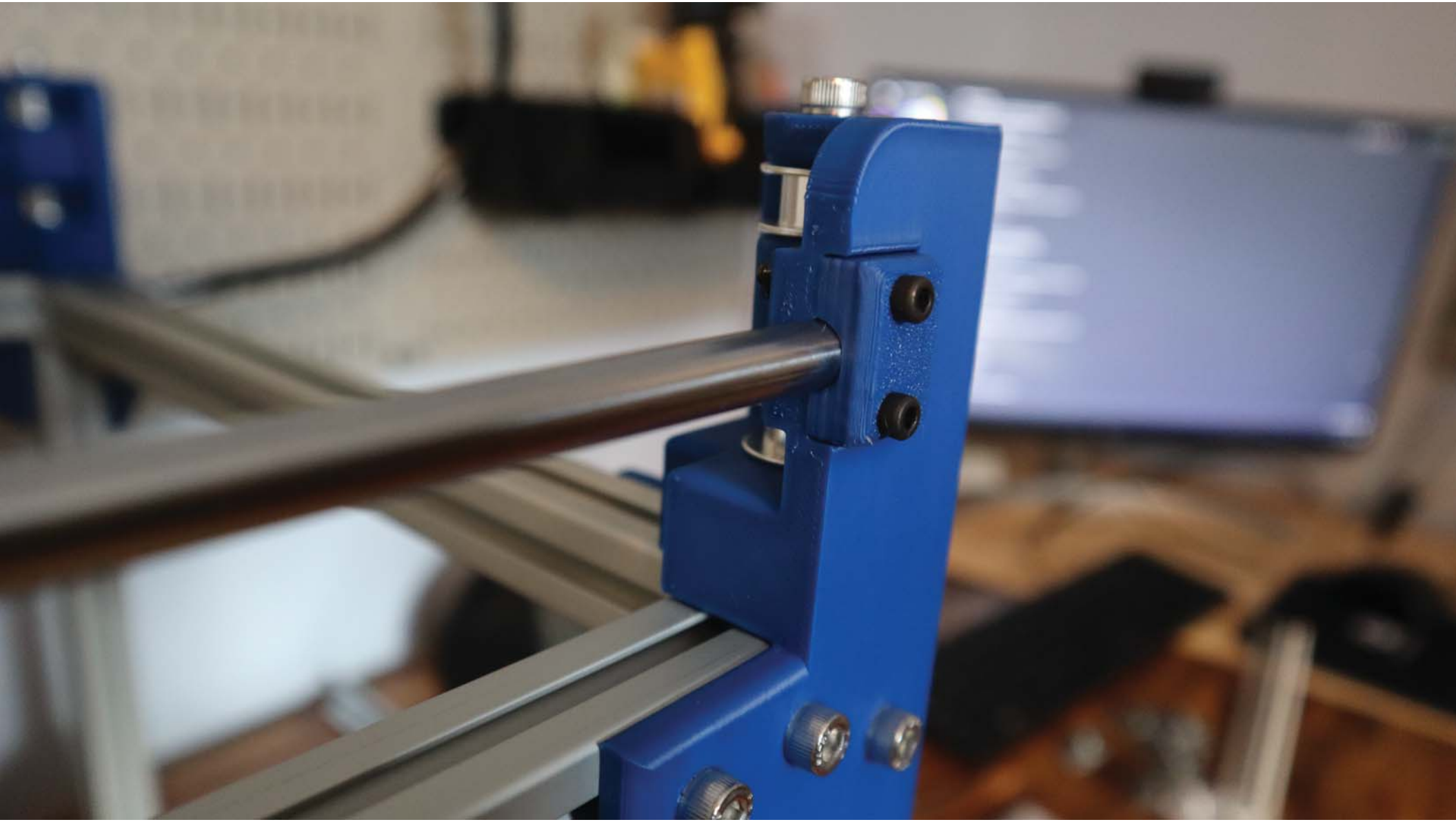
STEP 2



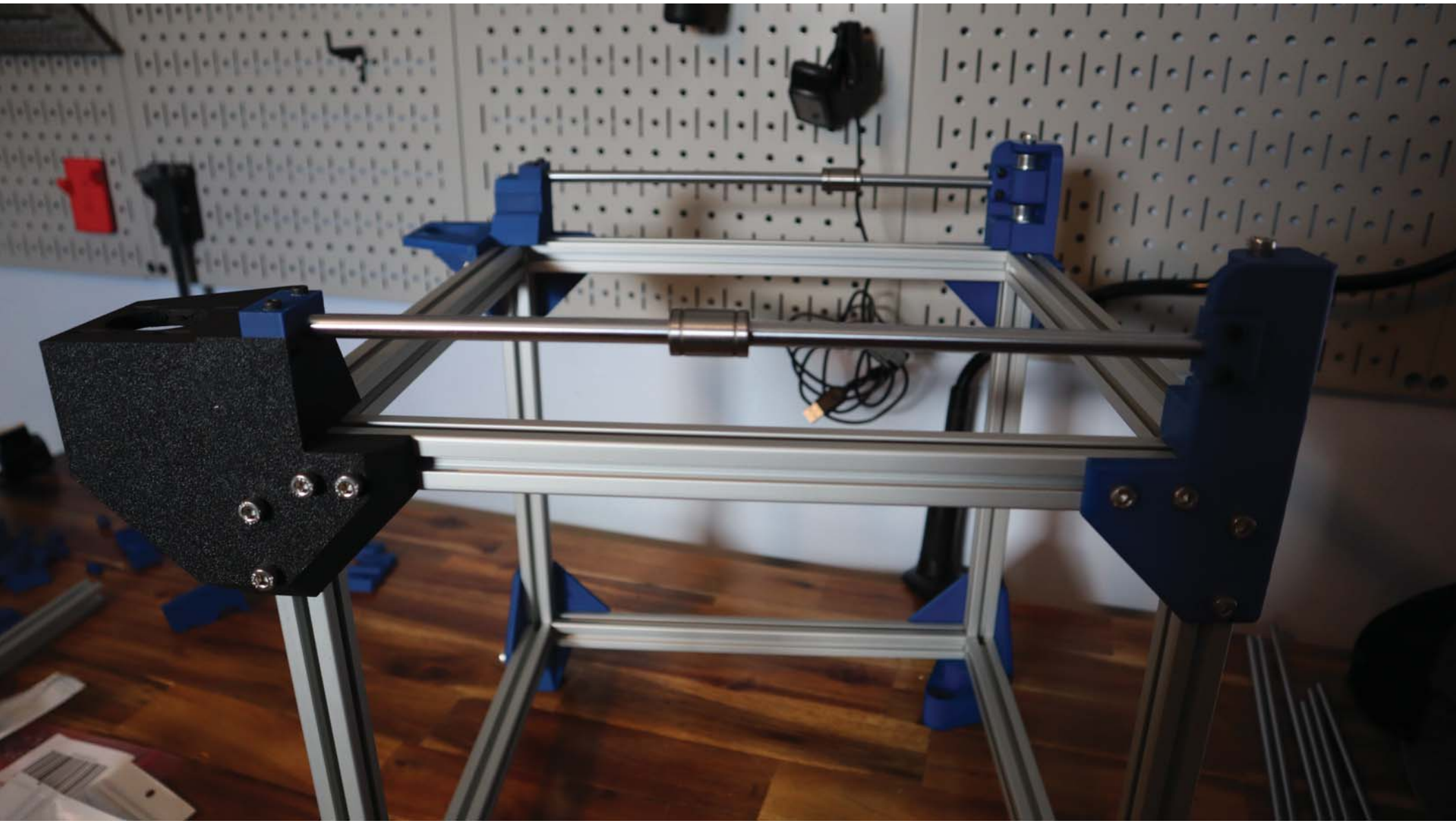
STEP 2



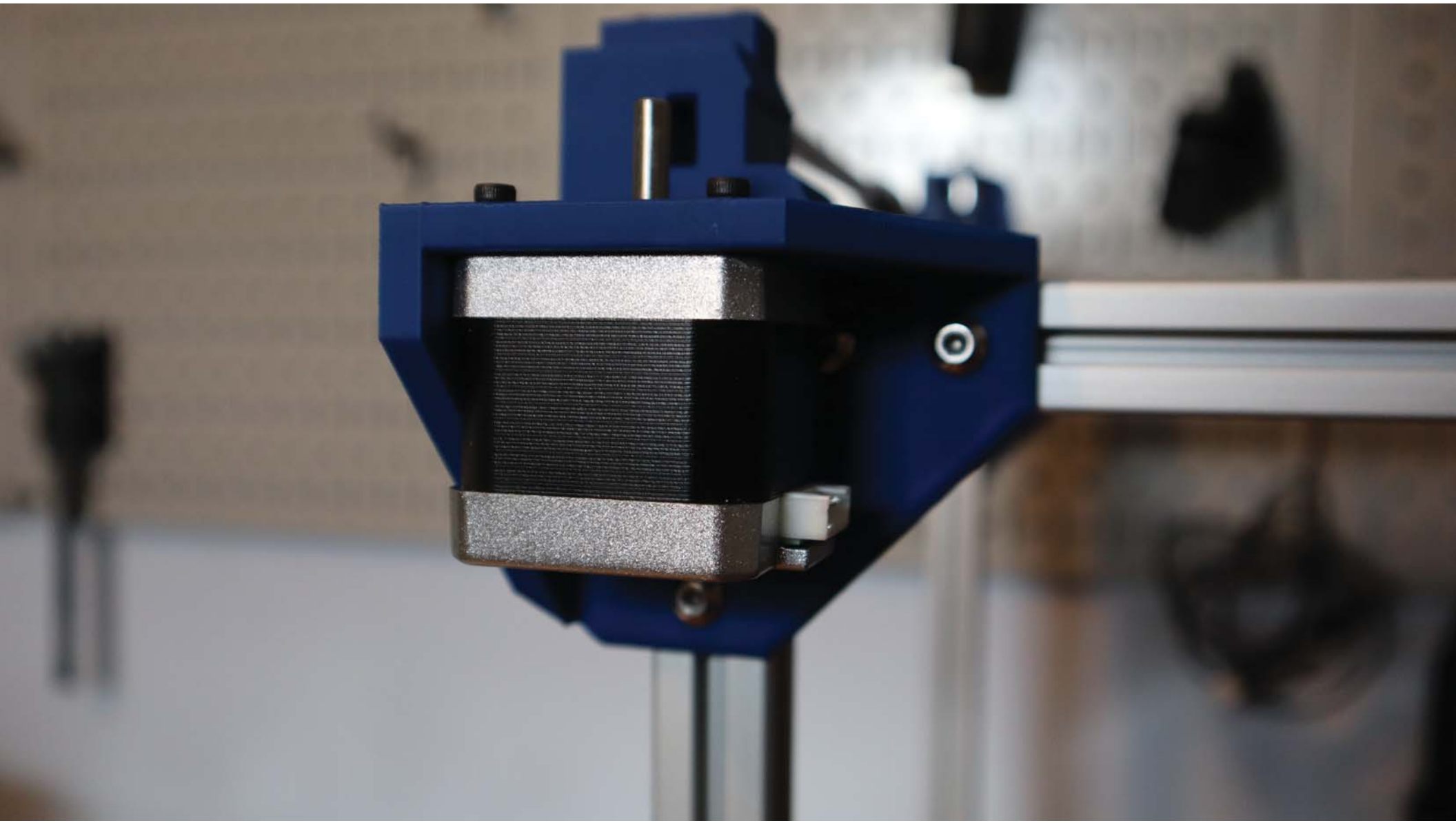
STEP 2



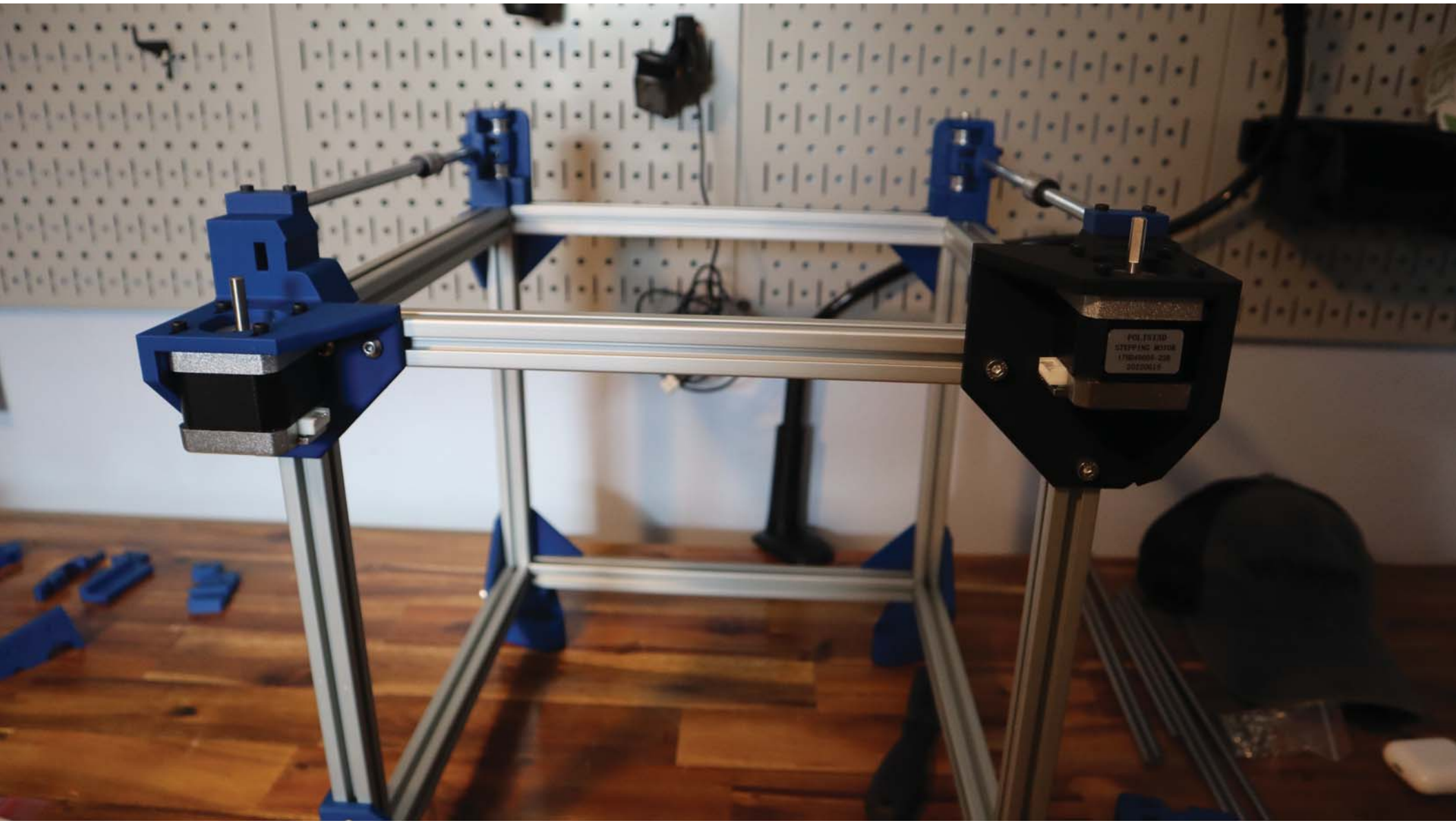
STEP 2

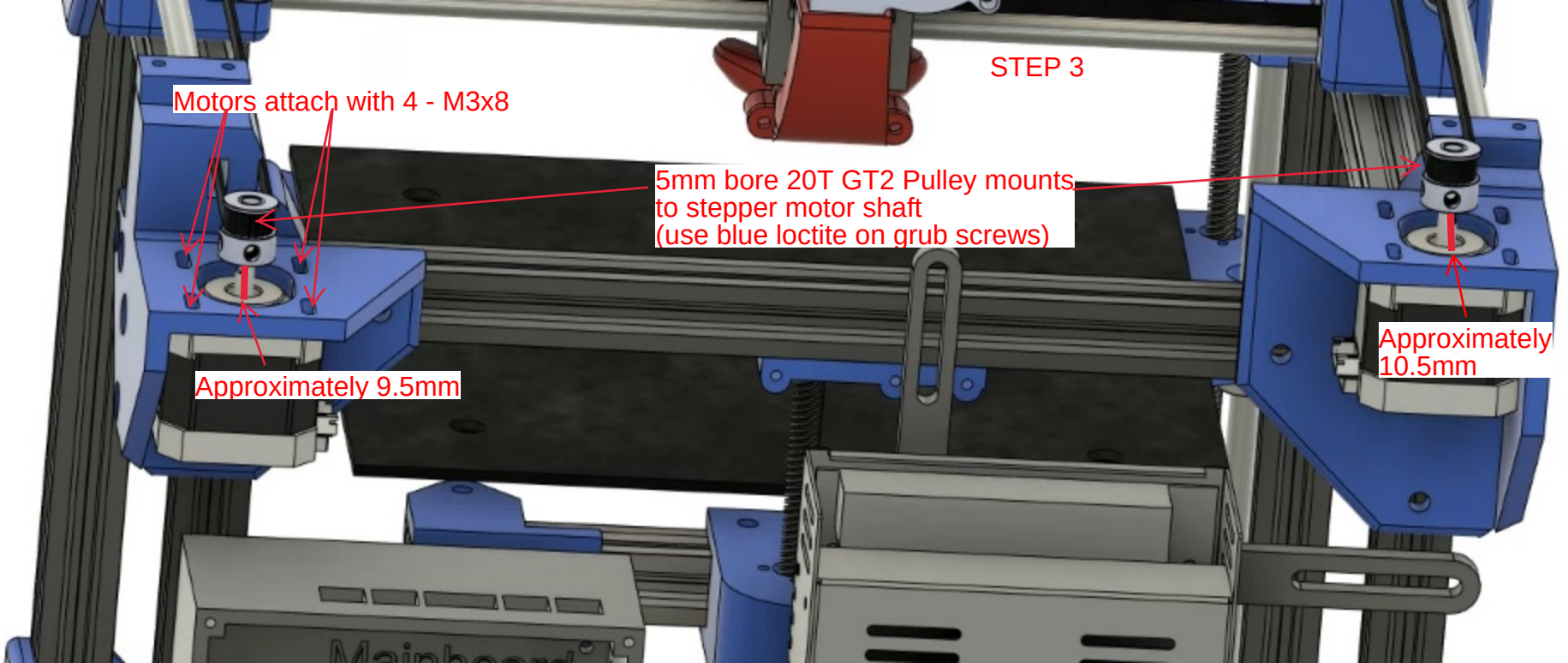


STEP 3

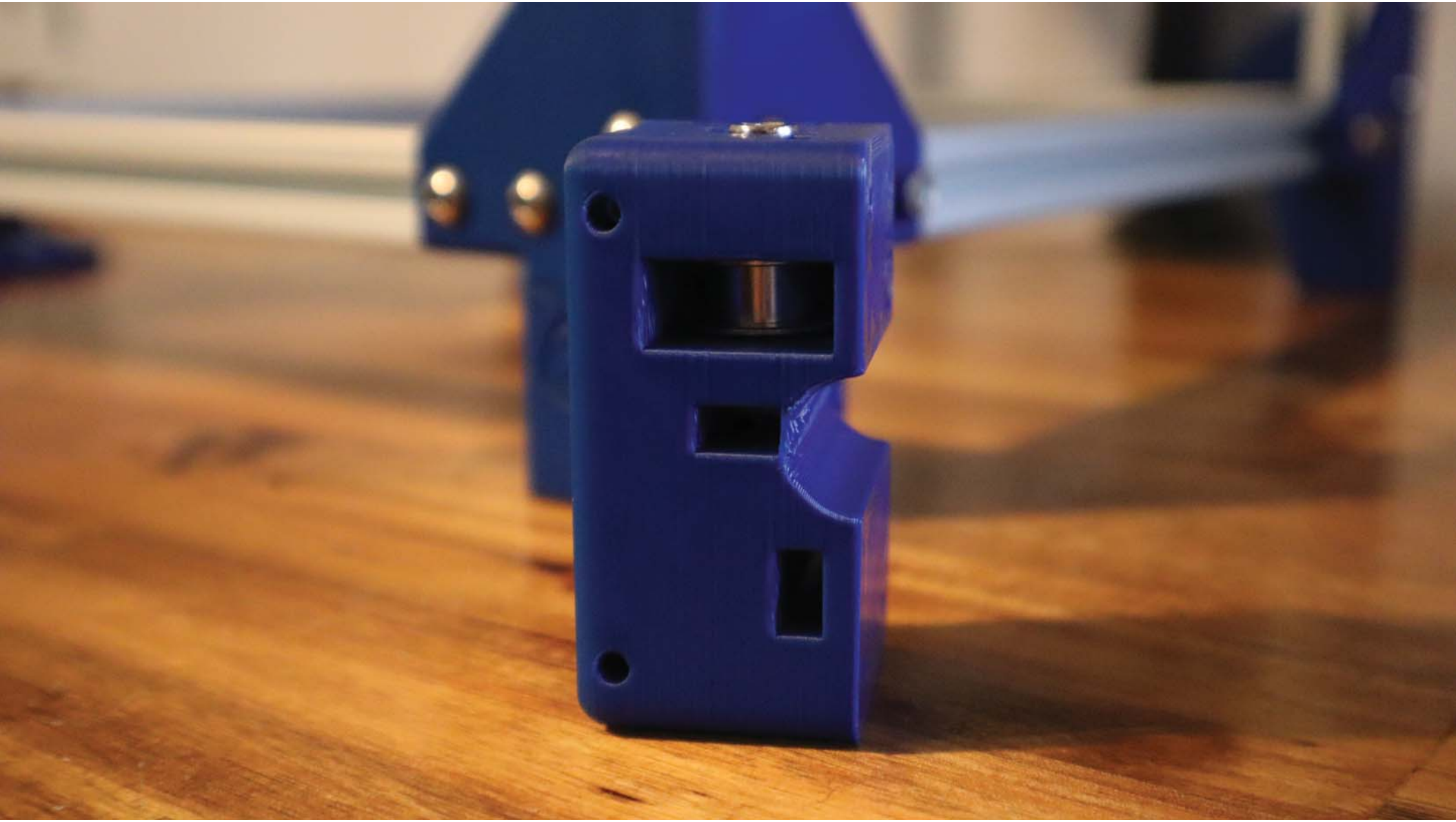


STEP 3



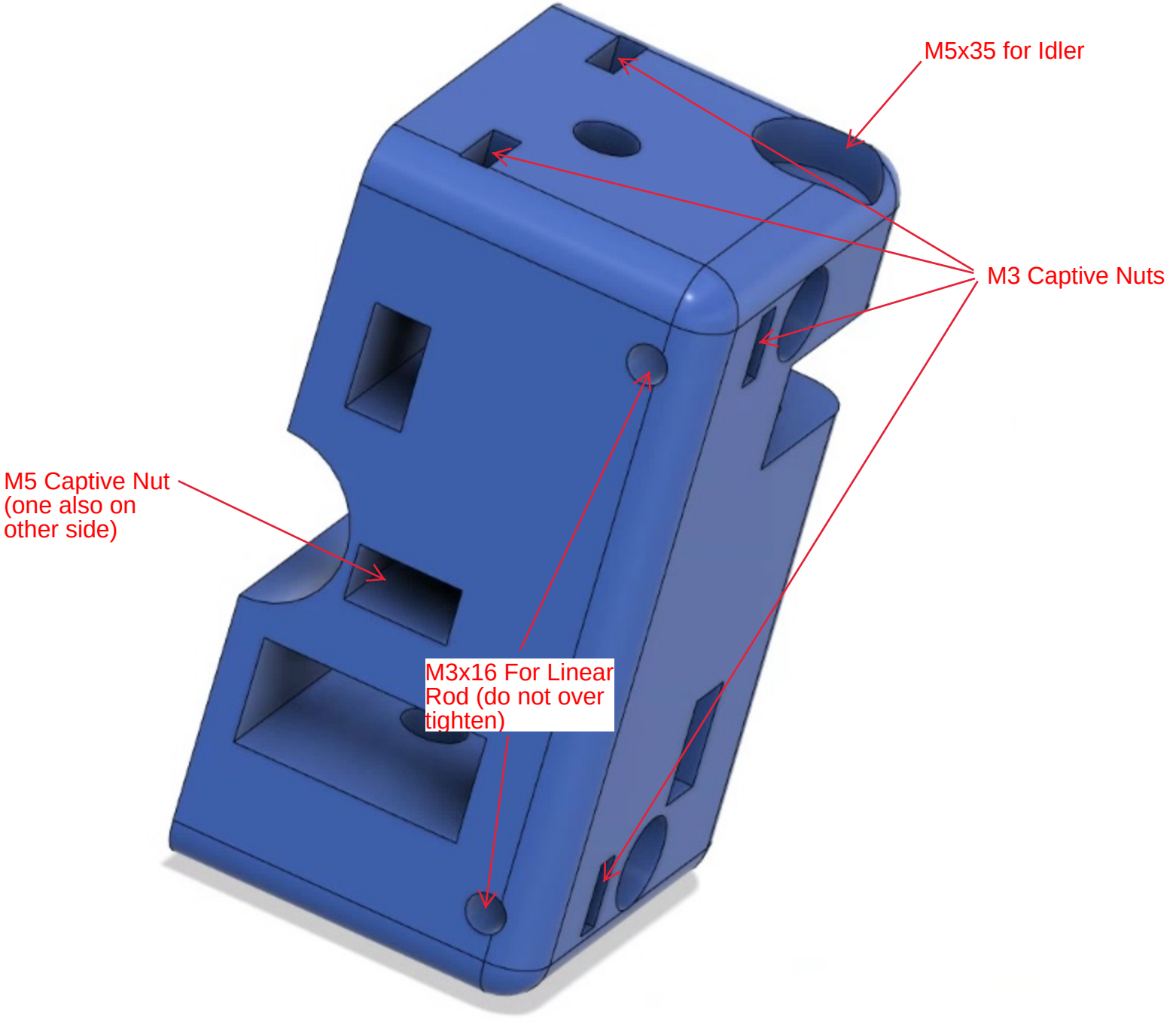

STEP 3
Motors attach with 4 - M3x8
5mm bore 20T GT2 Pulley mounts
to stepper motor shaft
(use blue loctite on grub screws)
Approximately 9.5mm
Approximately
10.5mm

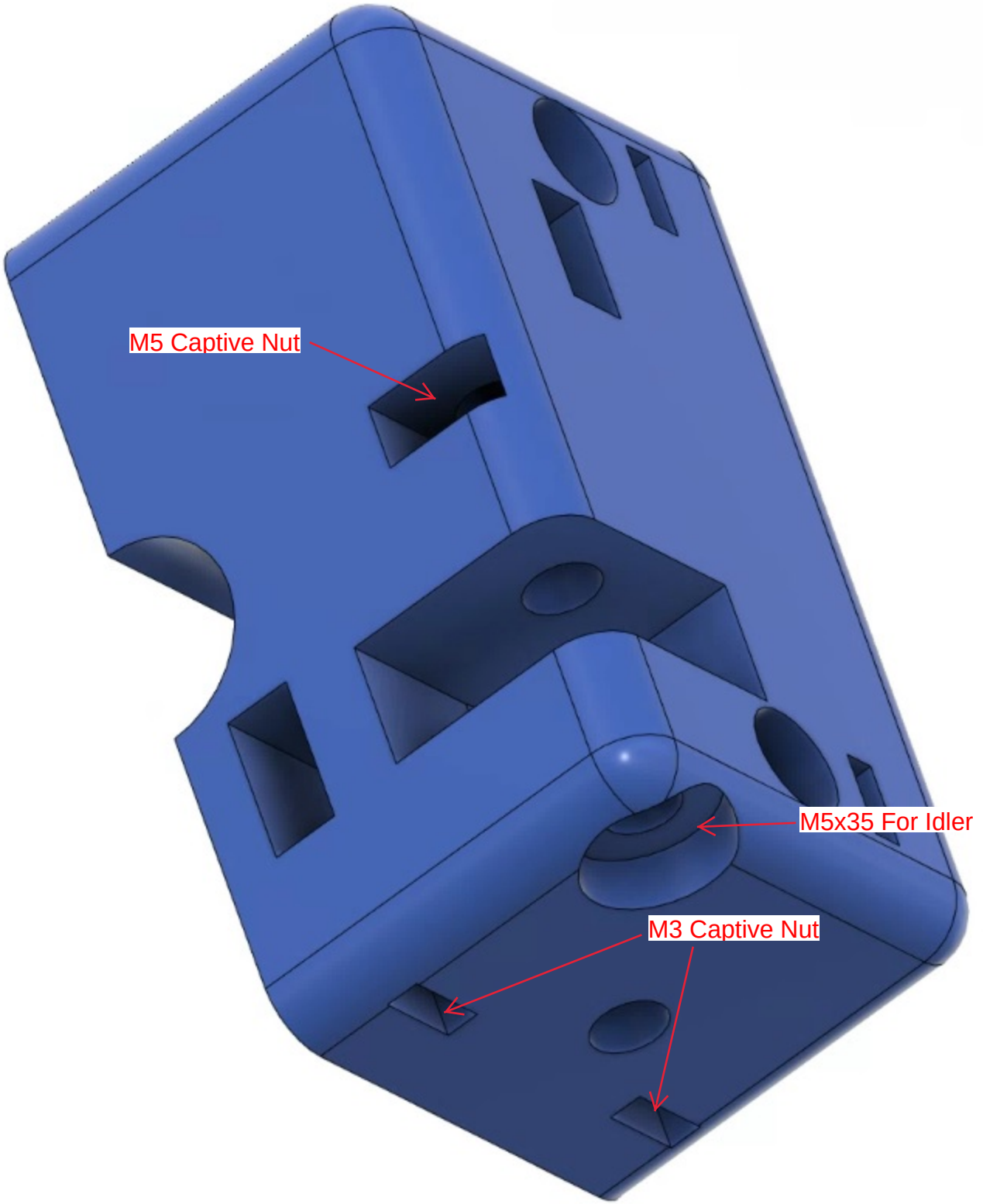
STEP 4/5

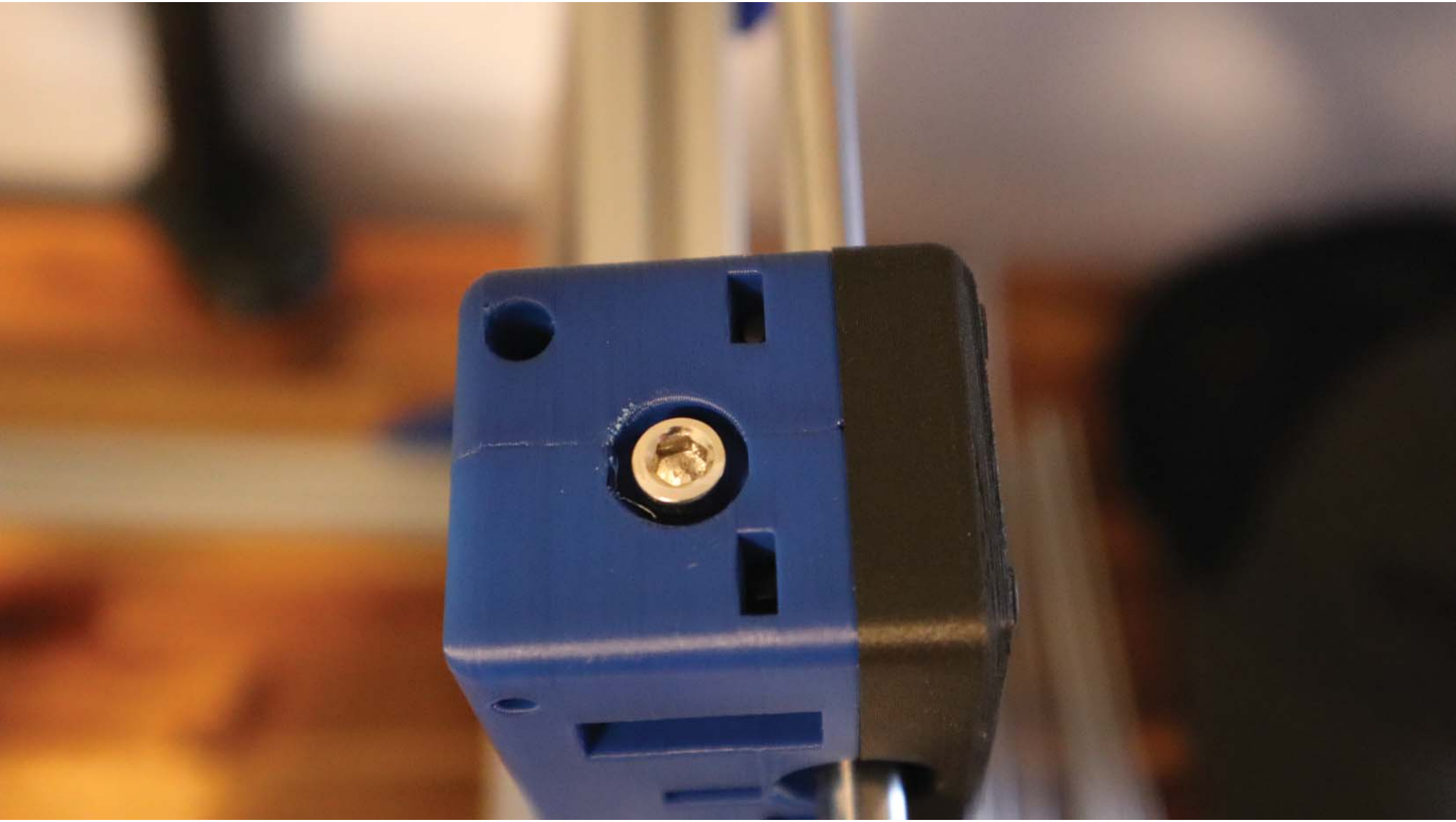


STEP 4/5

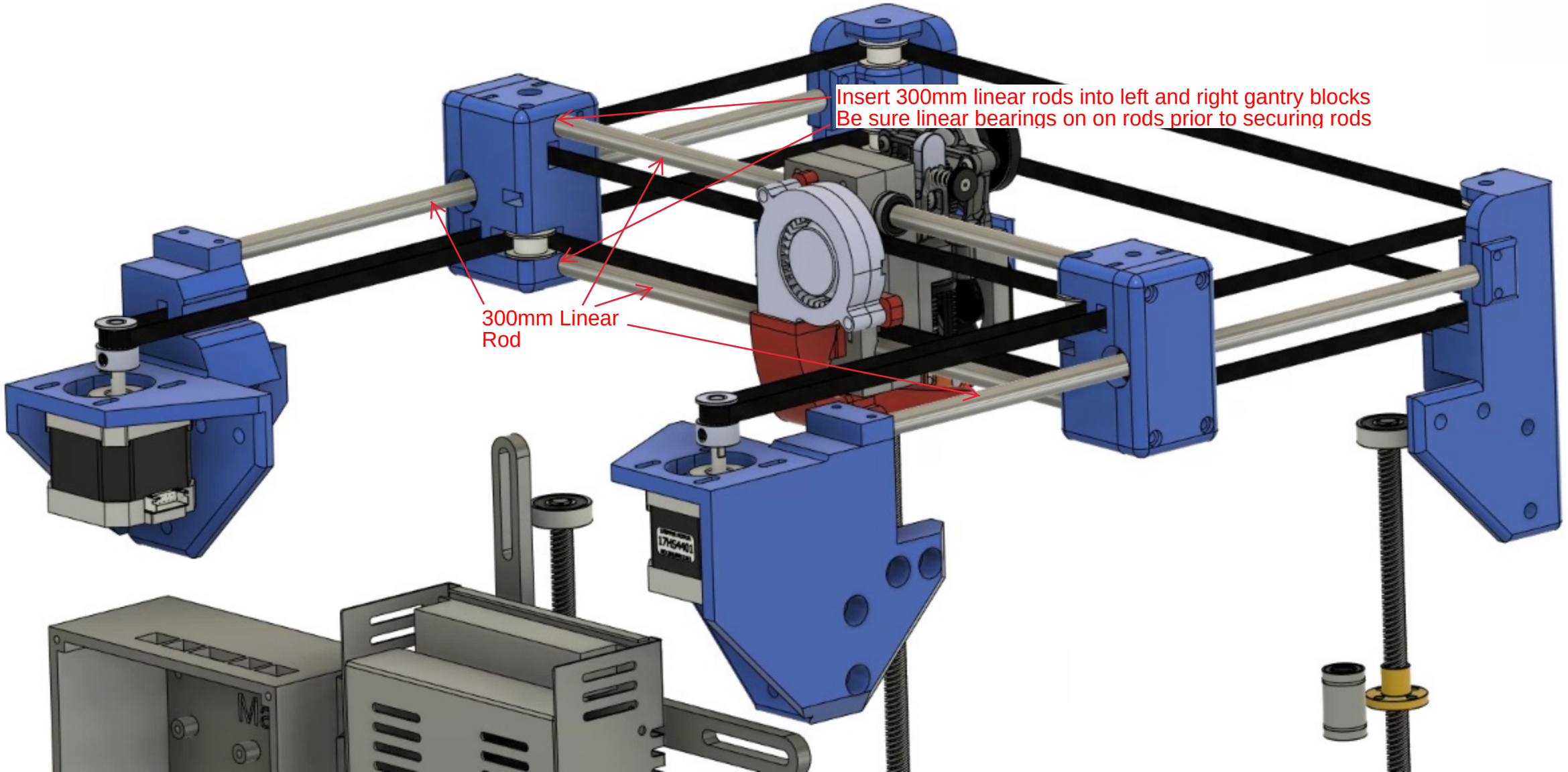
There are 6 M3 Captive Nuts on each gantry block and 2 M5



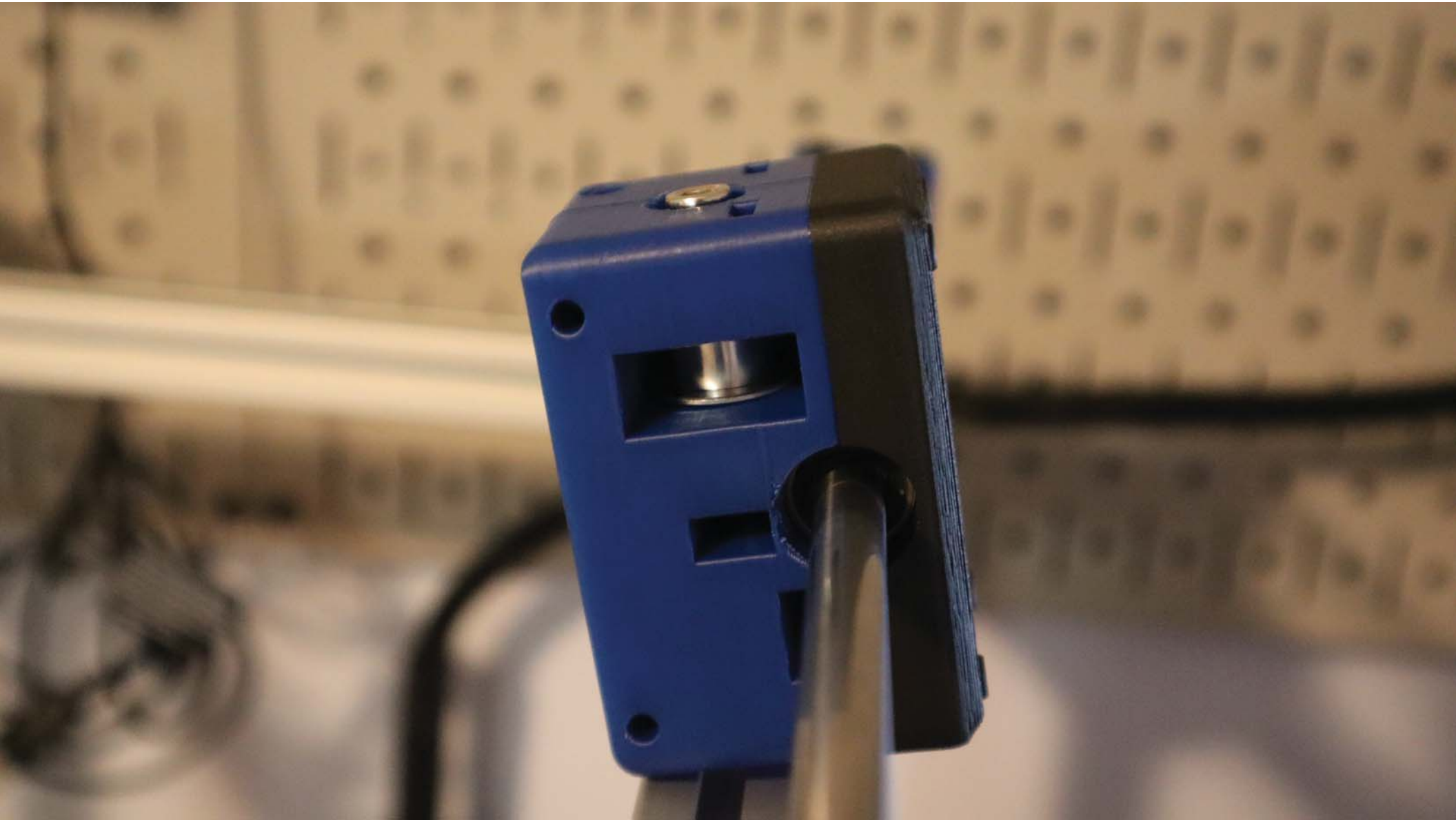

M5 Captive Nut
M5x35 For Idler
M3 Captive Nut



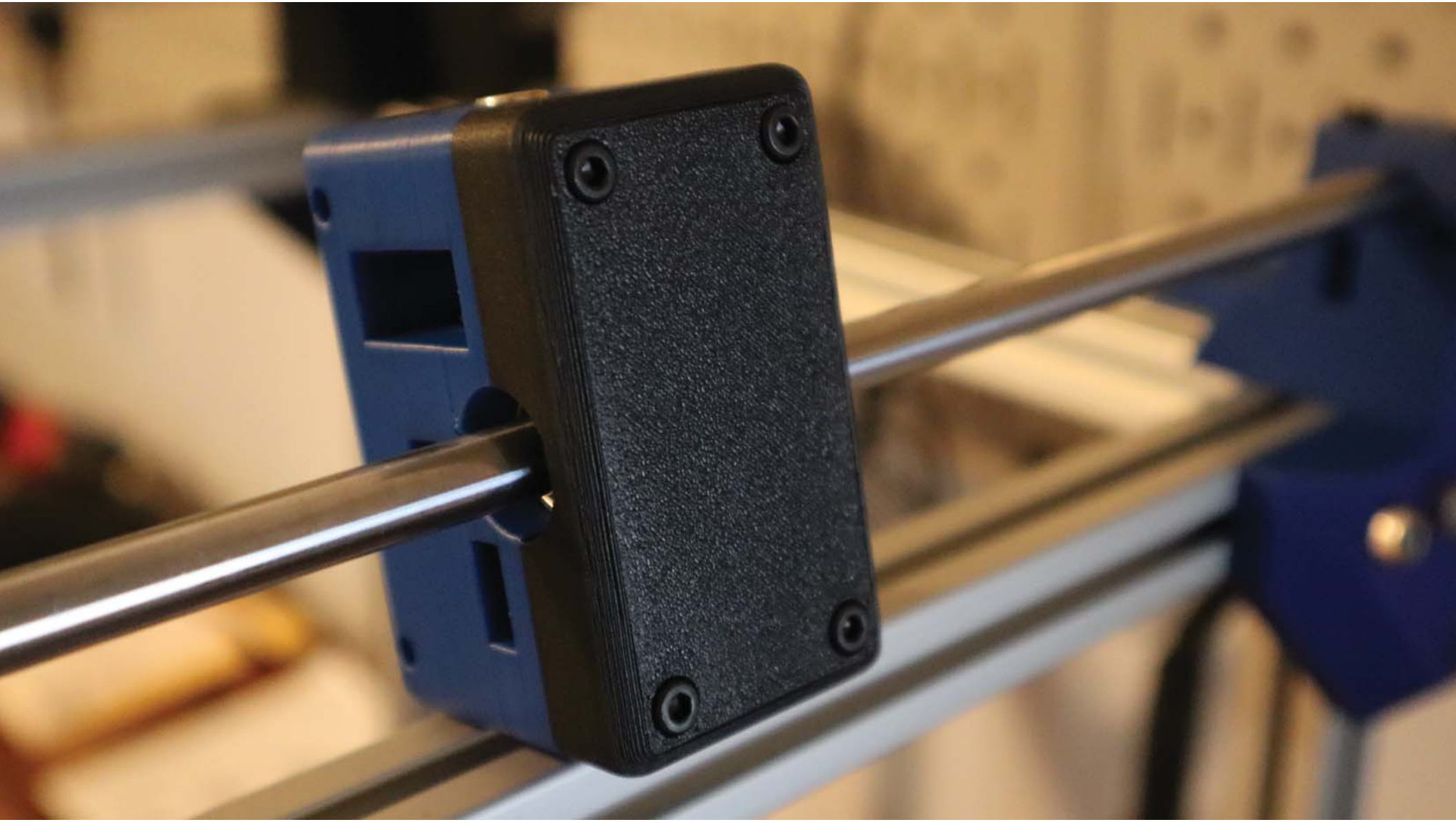
Gantry System

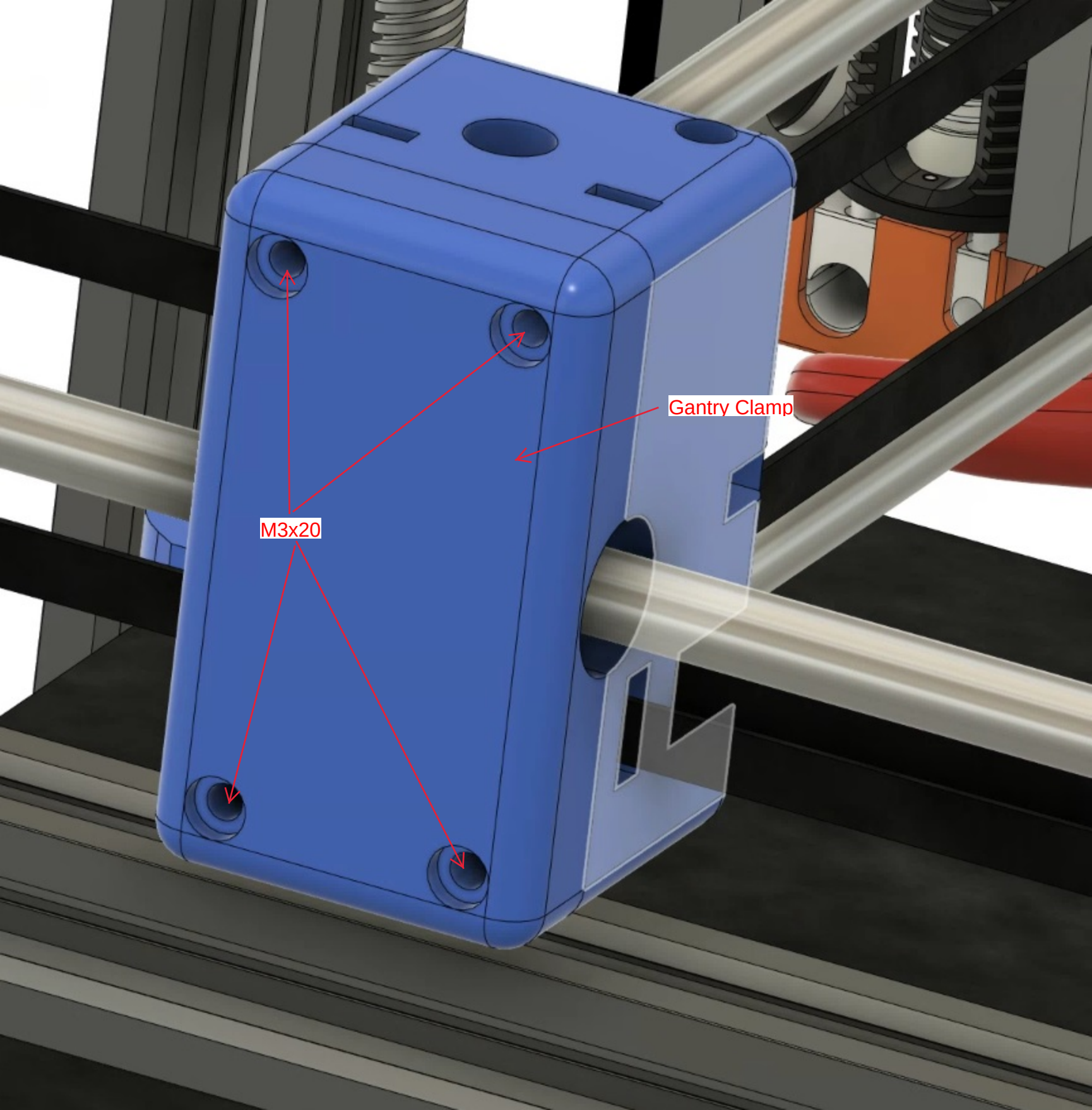


STEP 6
NOTE: INSTALL RODS PRIOR TO MOUNTING BLOCKS

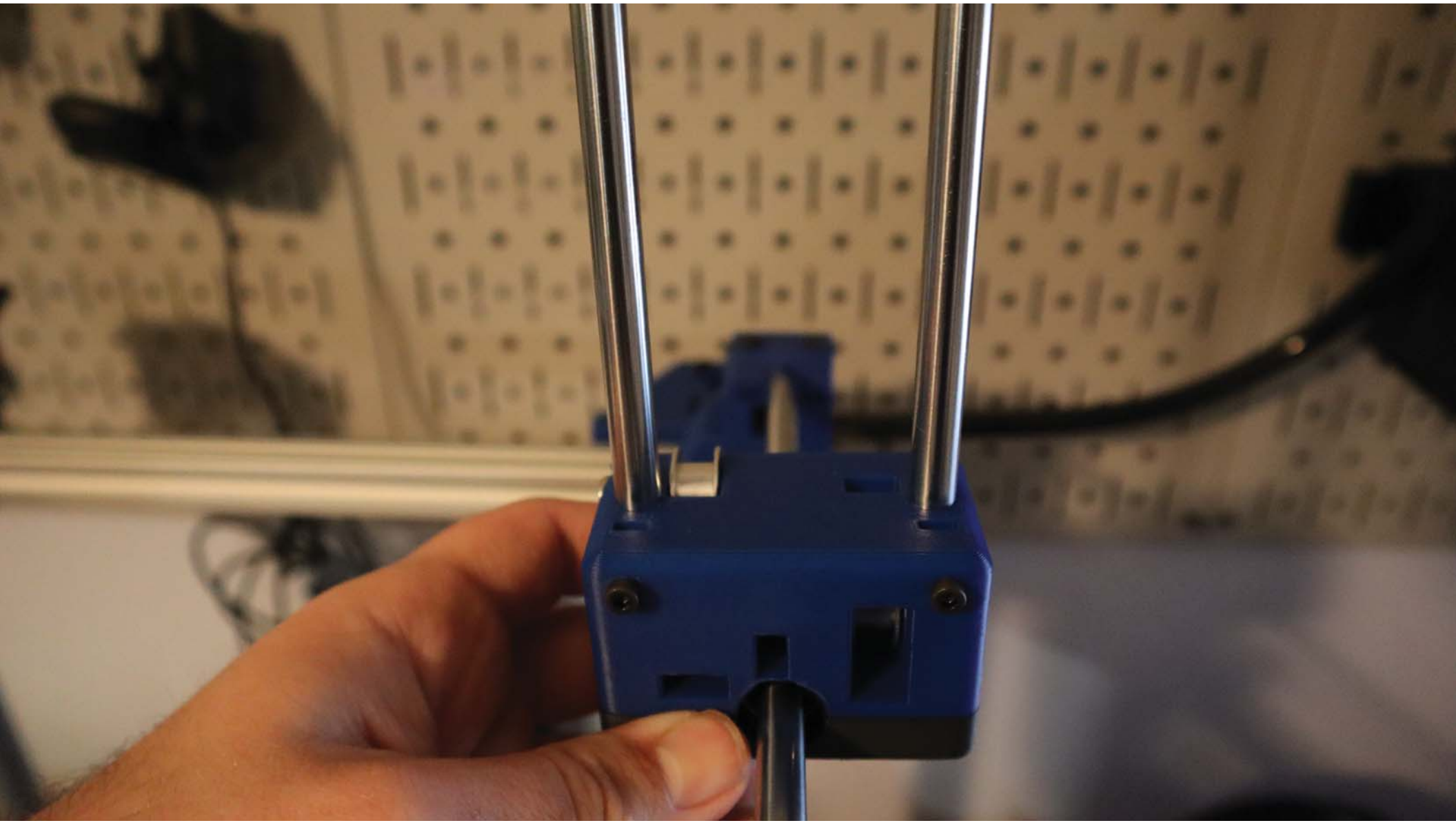


STEP 6/7
NOTE: INSTALL RODS PRIOR TO MOUNTING BLOCKS

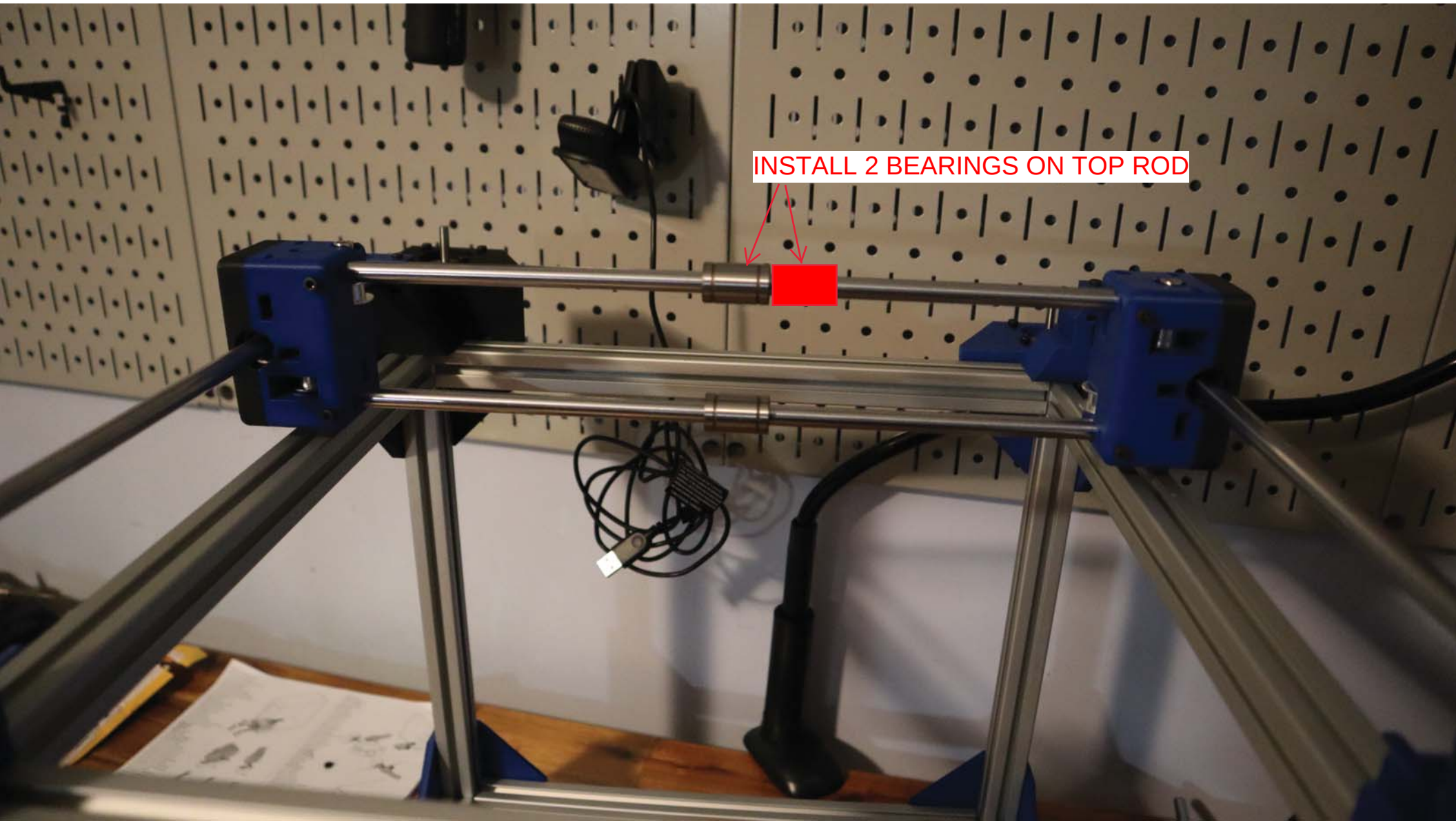


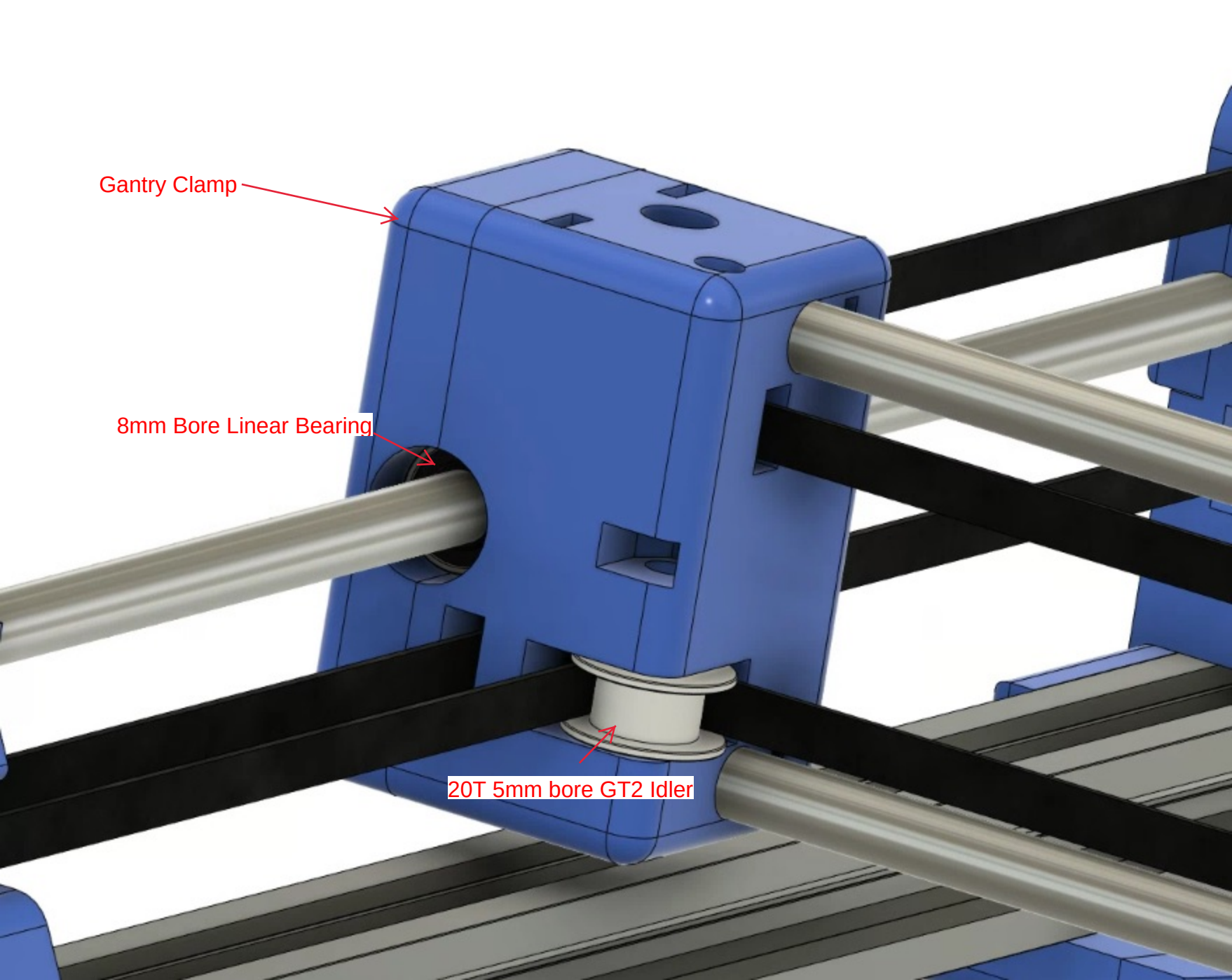

Gantry Clamp
M3x20

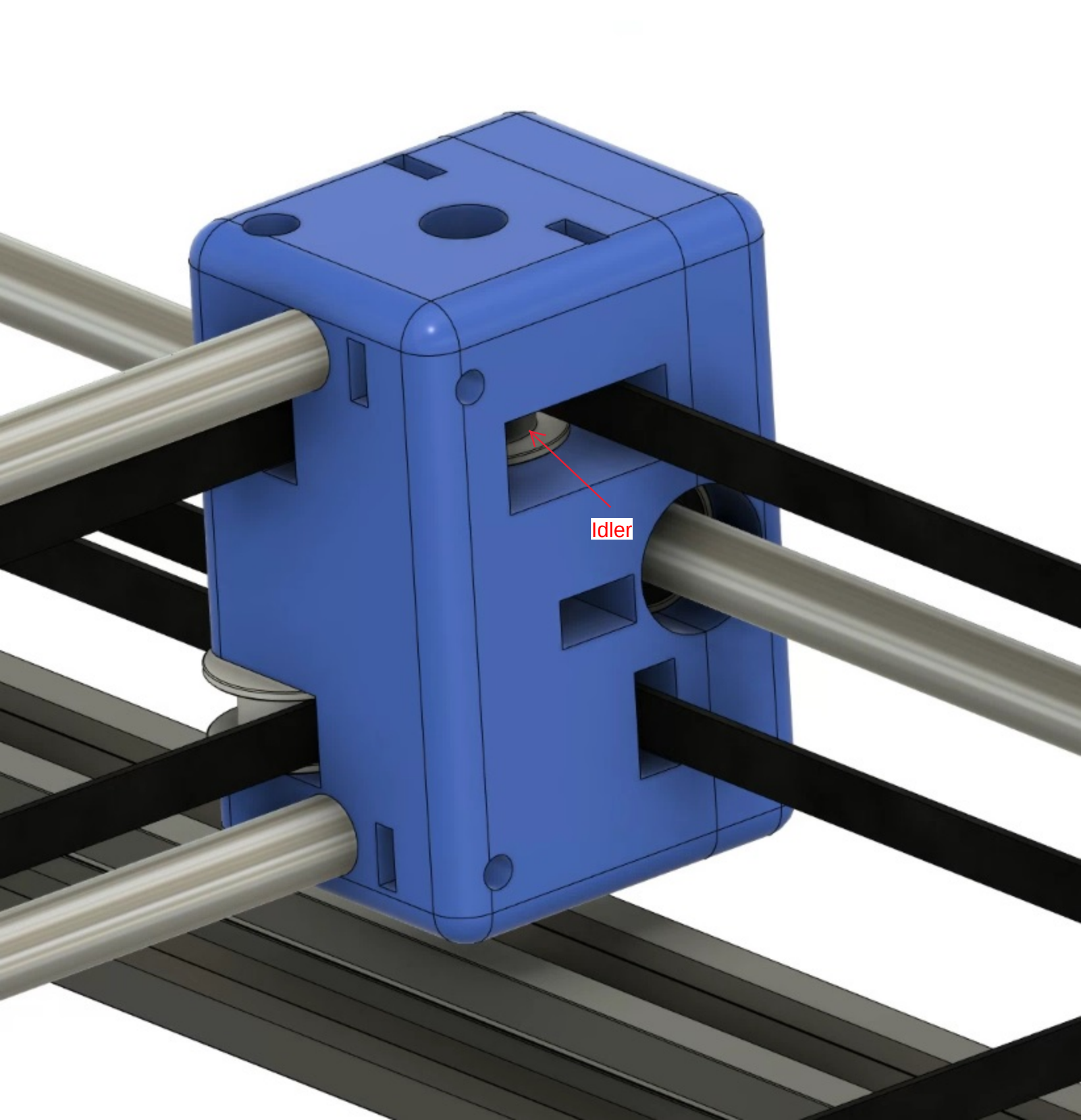
STEP 8/9/10



STEP 8/9/10




Gantry Clamp
8mm Bore Linear Bearing
20T 5mm bore GT2 Idler

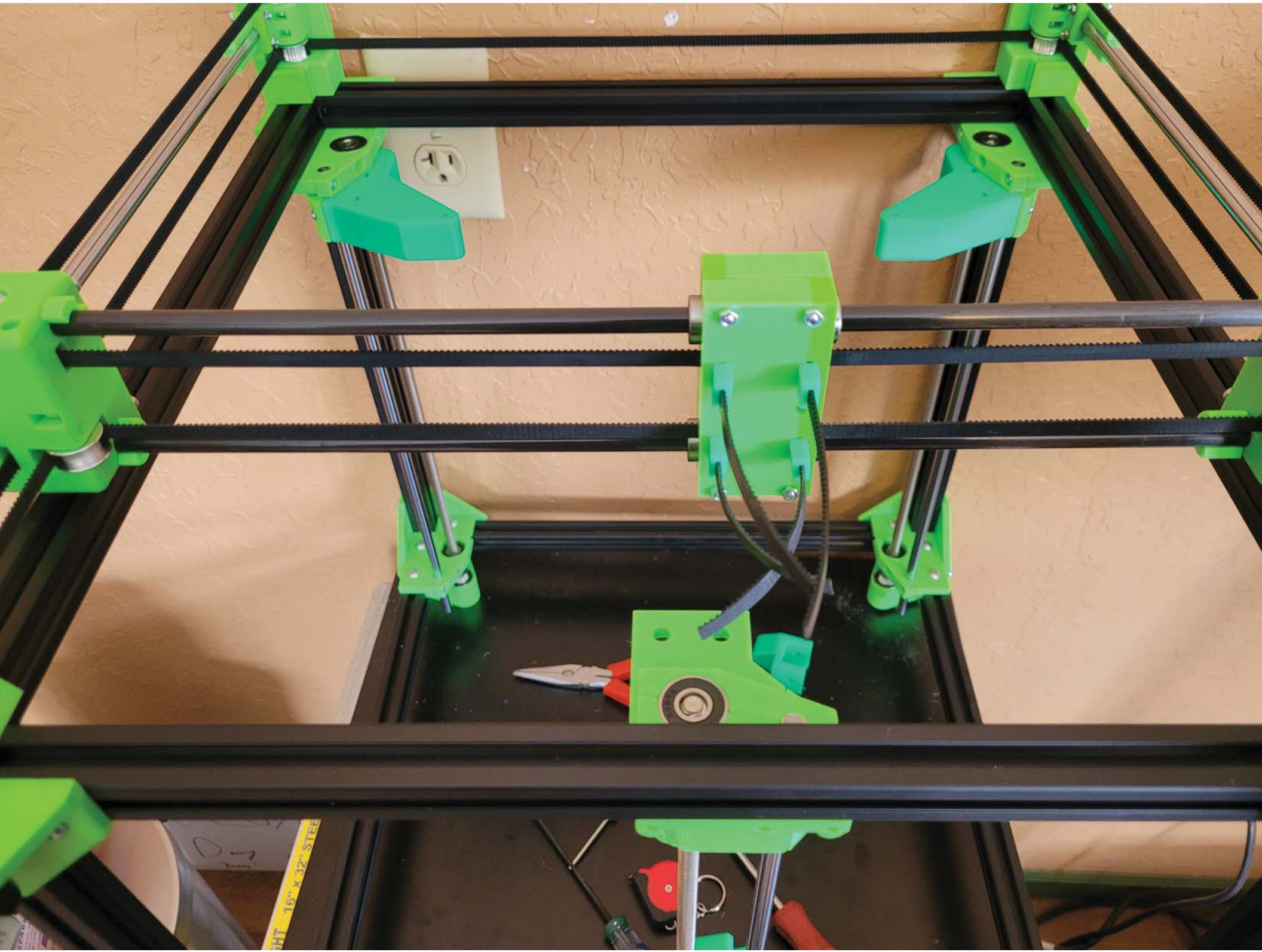

Idler

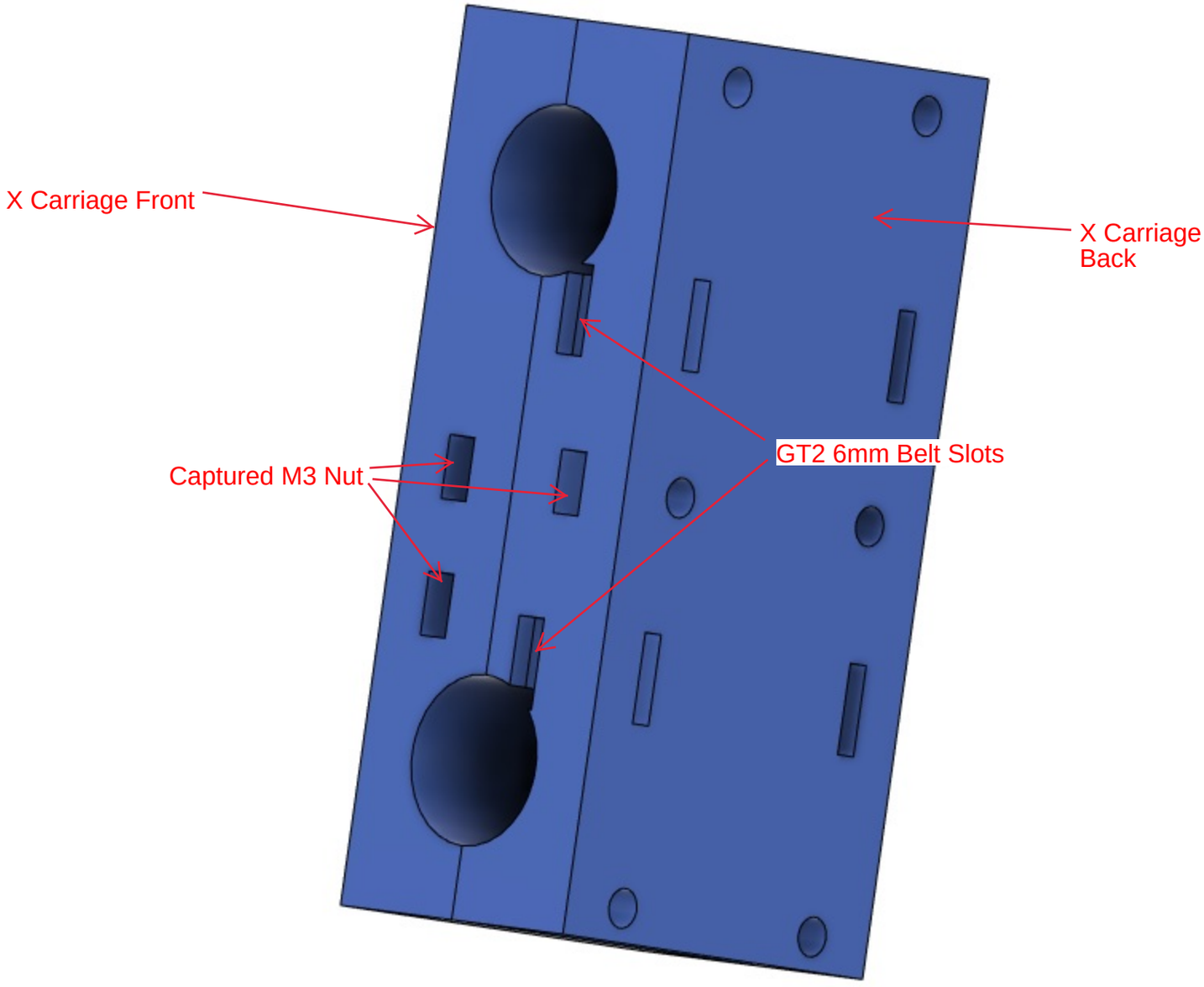
# Section 4:

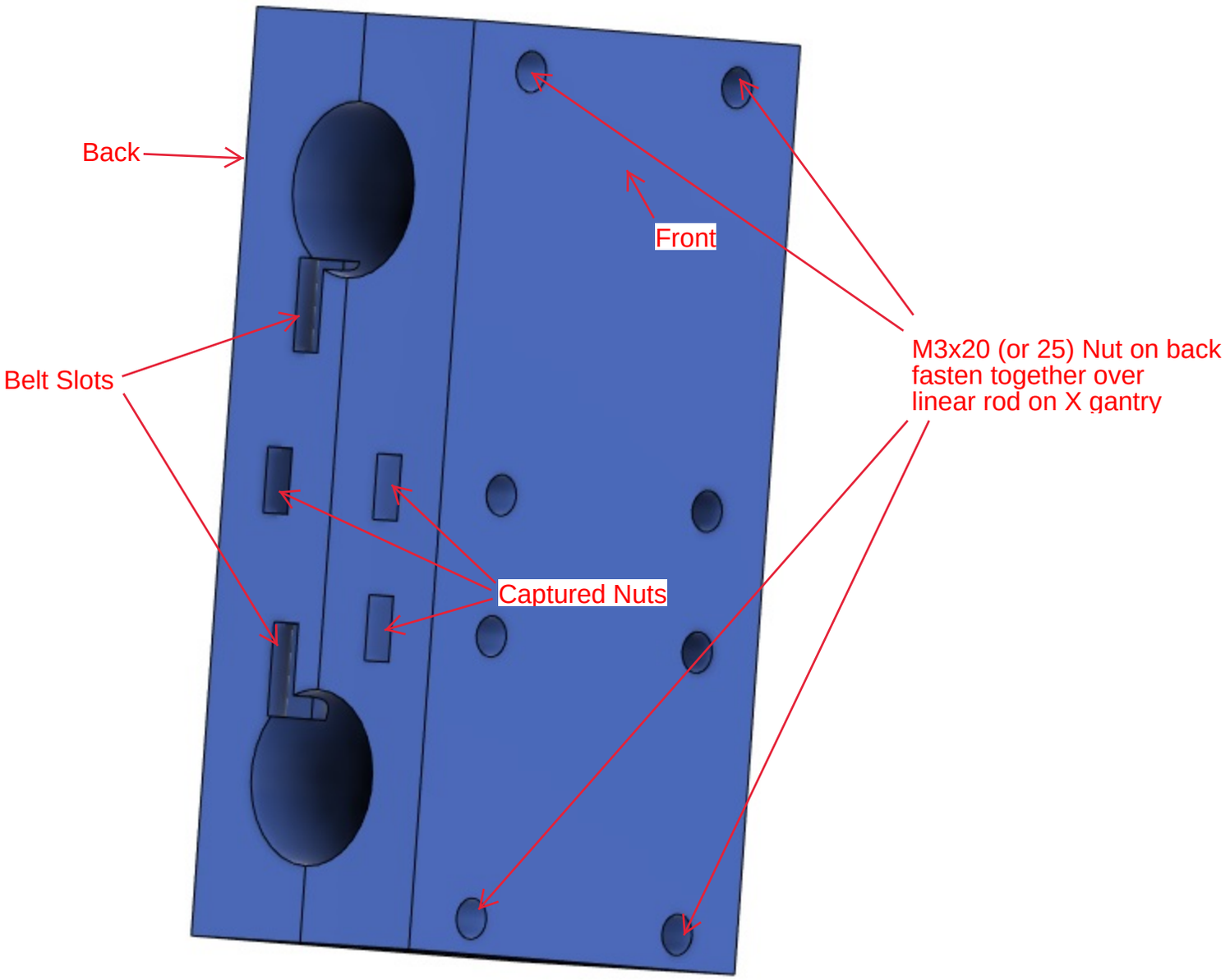
# Print Head & X/Y Belt

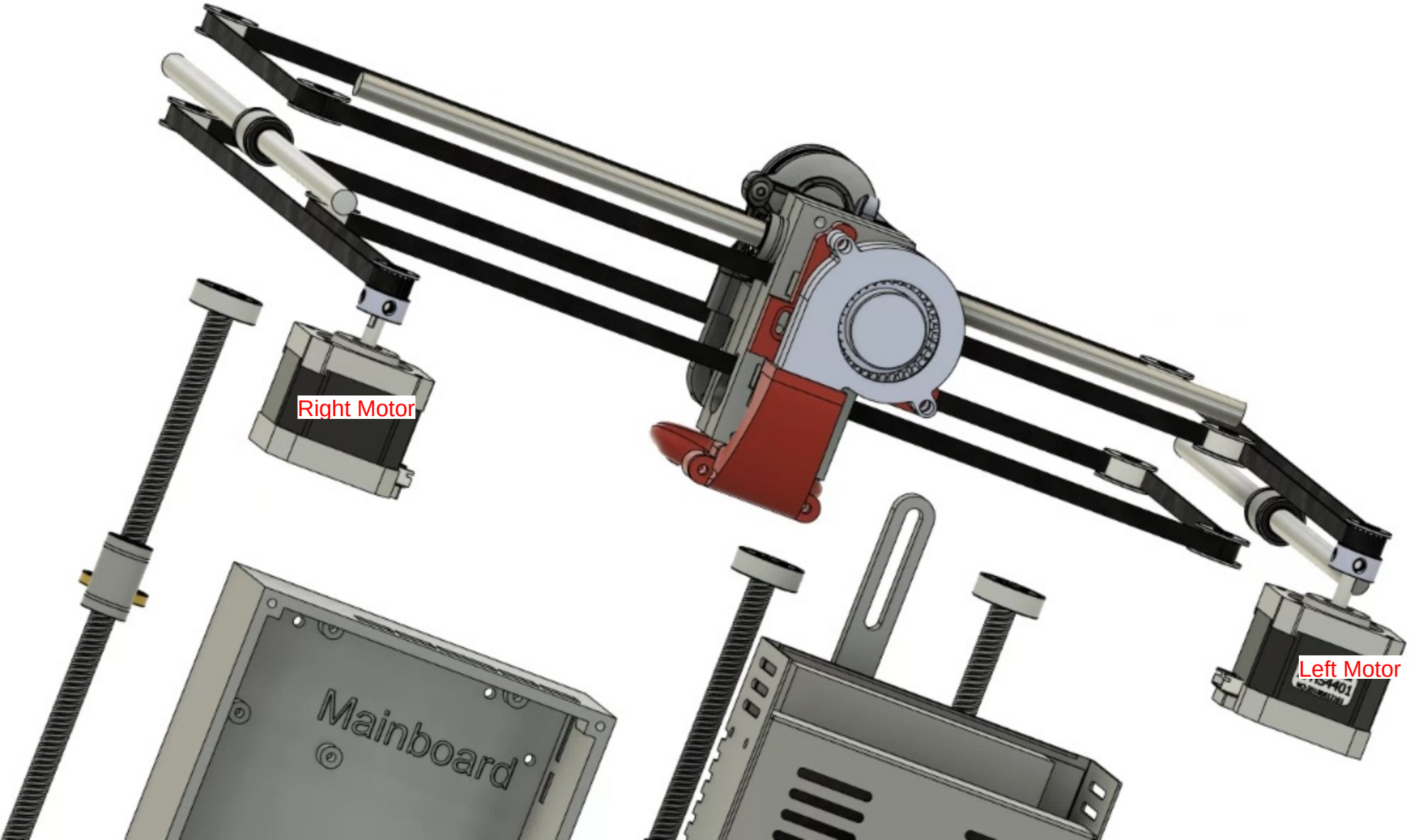
**Components needed for this portion:**

| | |
|---|---|
| **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** |

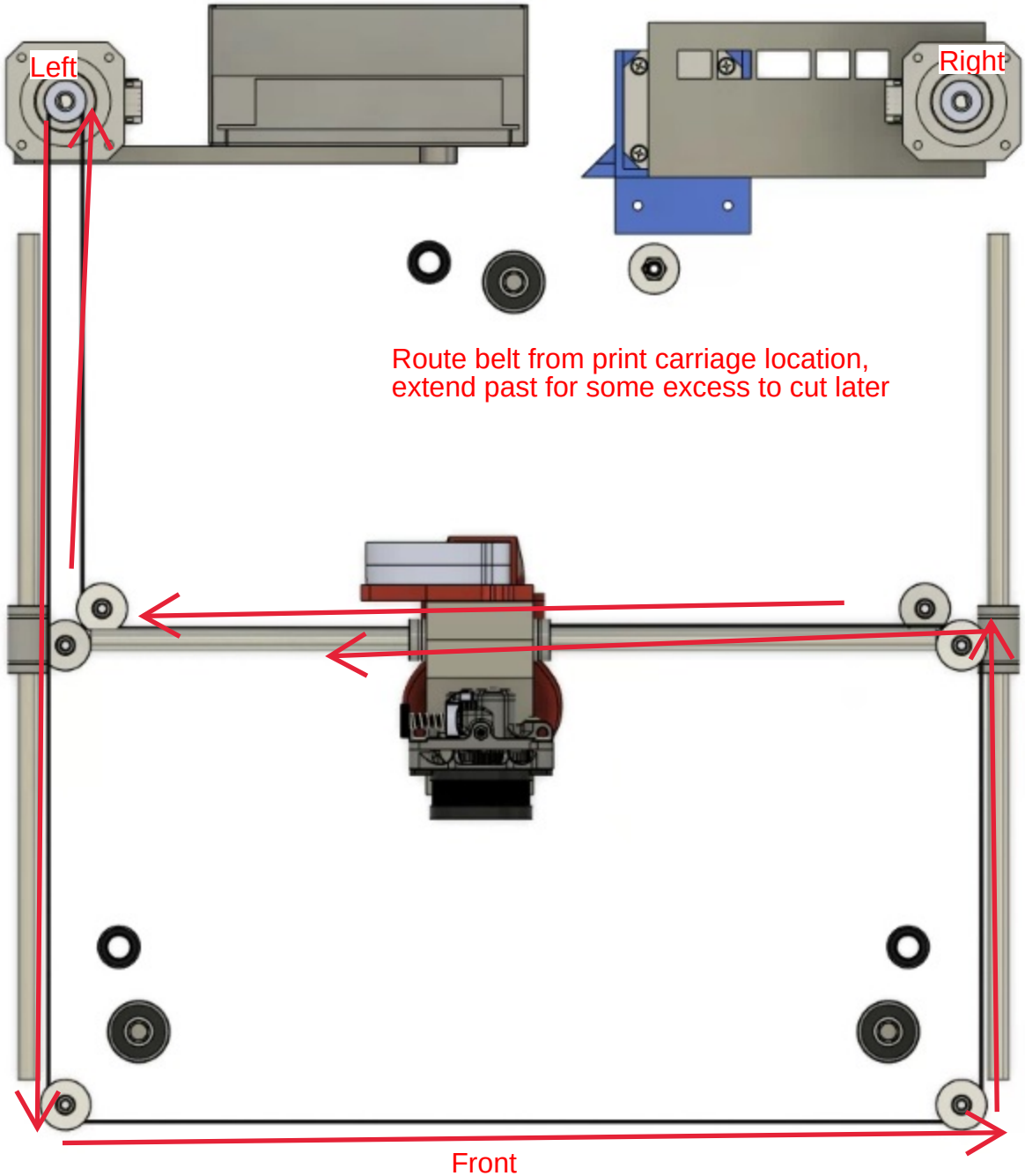


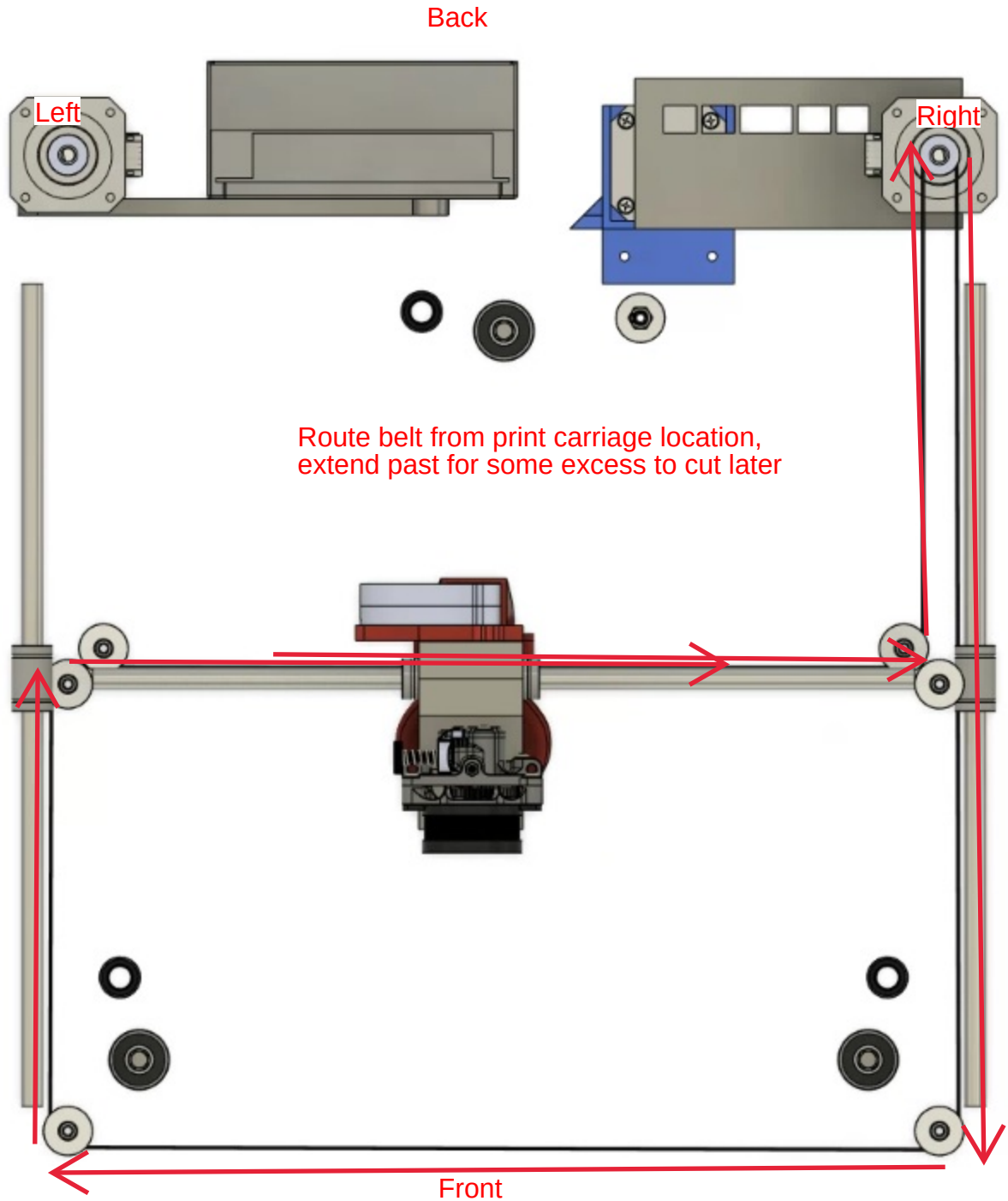

X Carriage Front
X Carriage Back
GT2 6mm Belt Slots
Captured M3 Nut

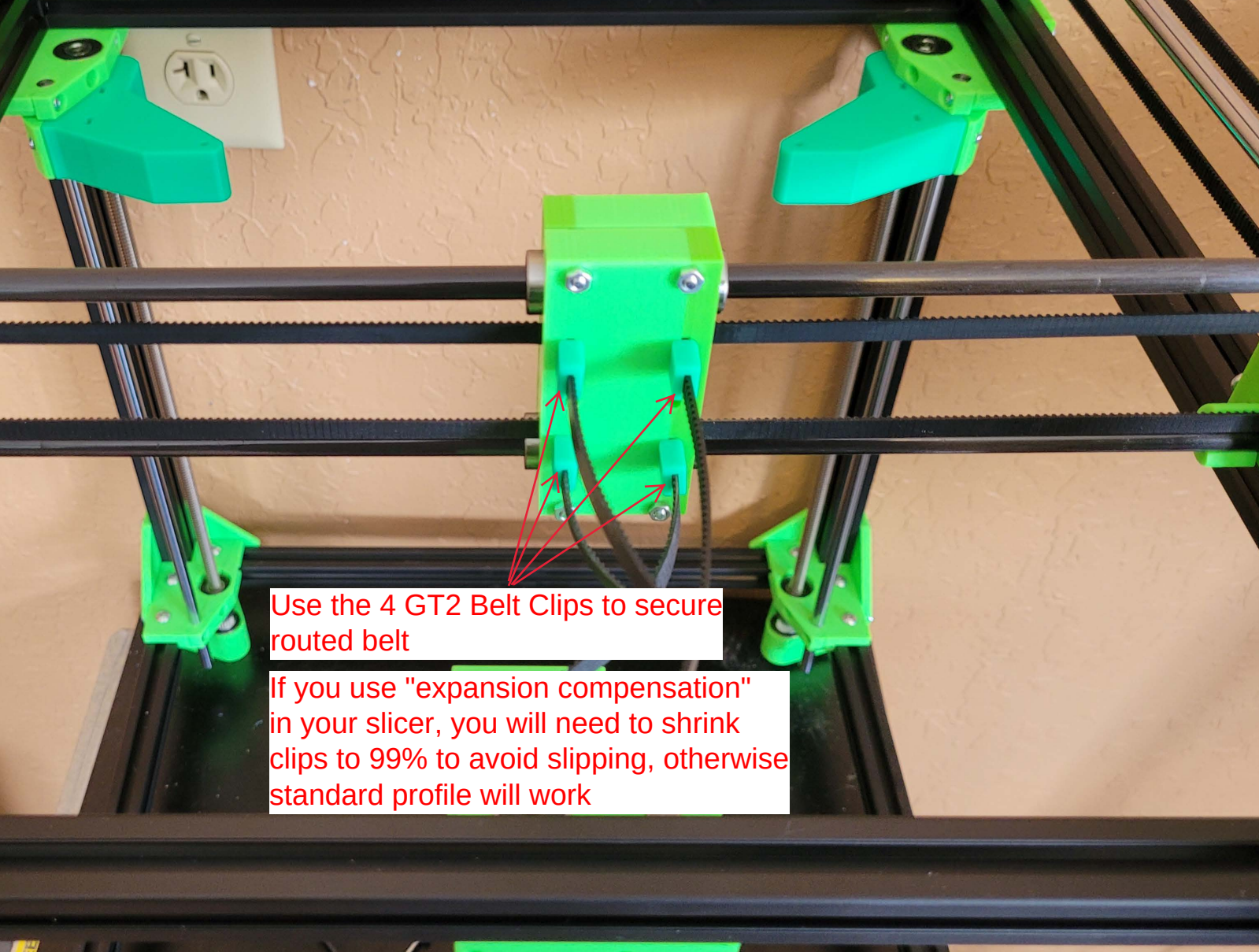

Back
Front
Belt Slots
M3x20 (or 25) Nut on back
fasten together over
linear rod on X gantry
Captured Nuts

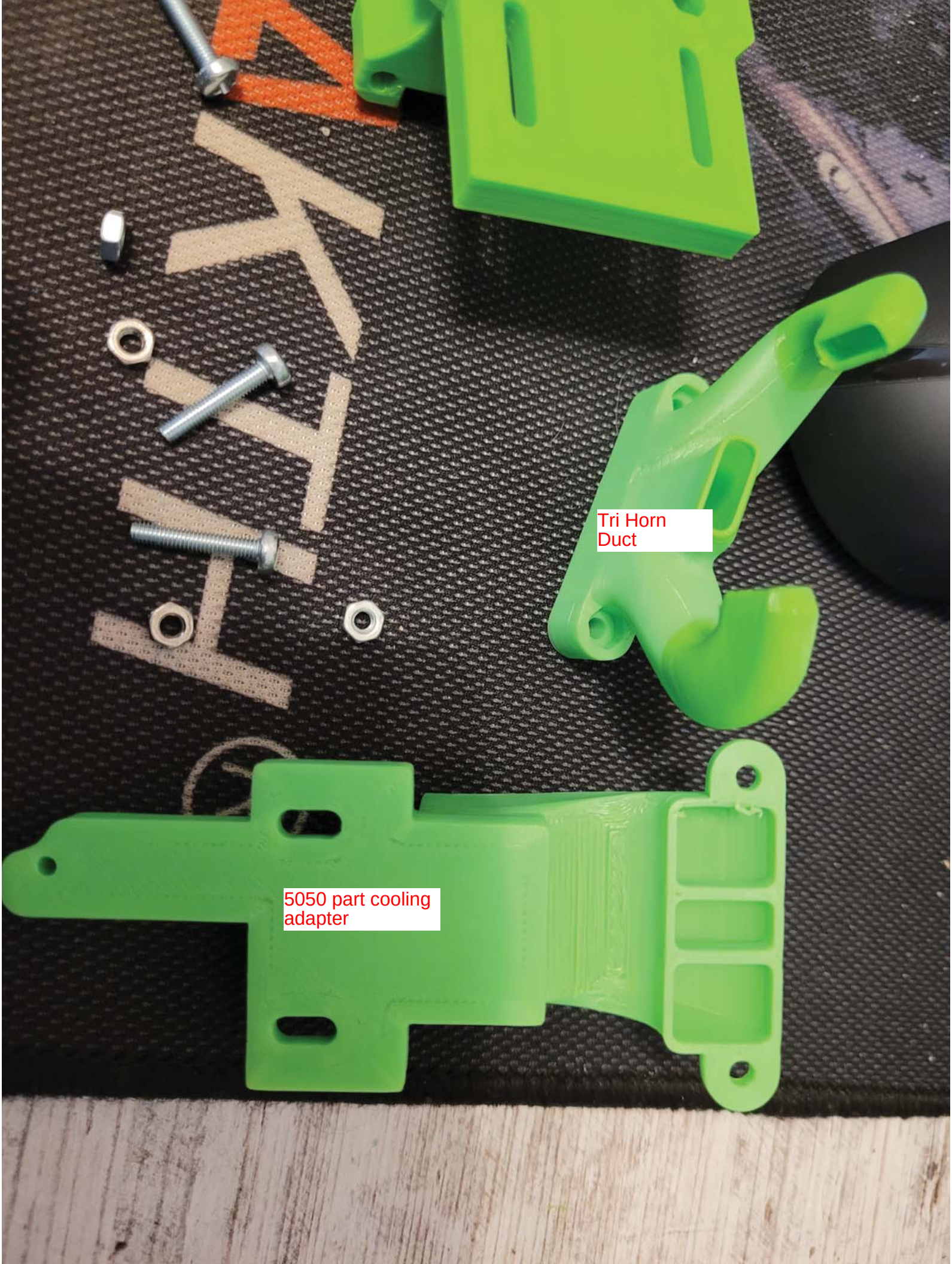

Right Motor
Left Motor
Mainboard

Back

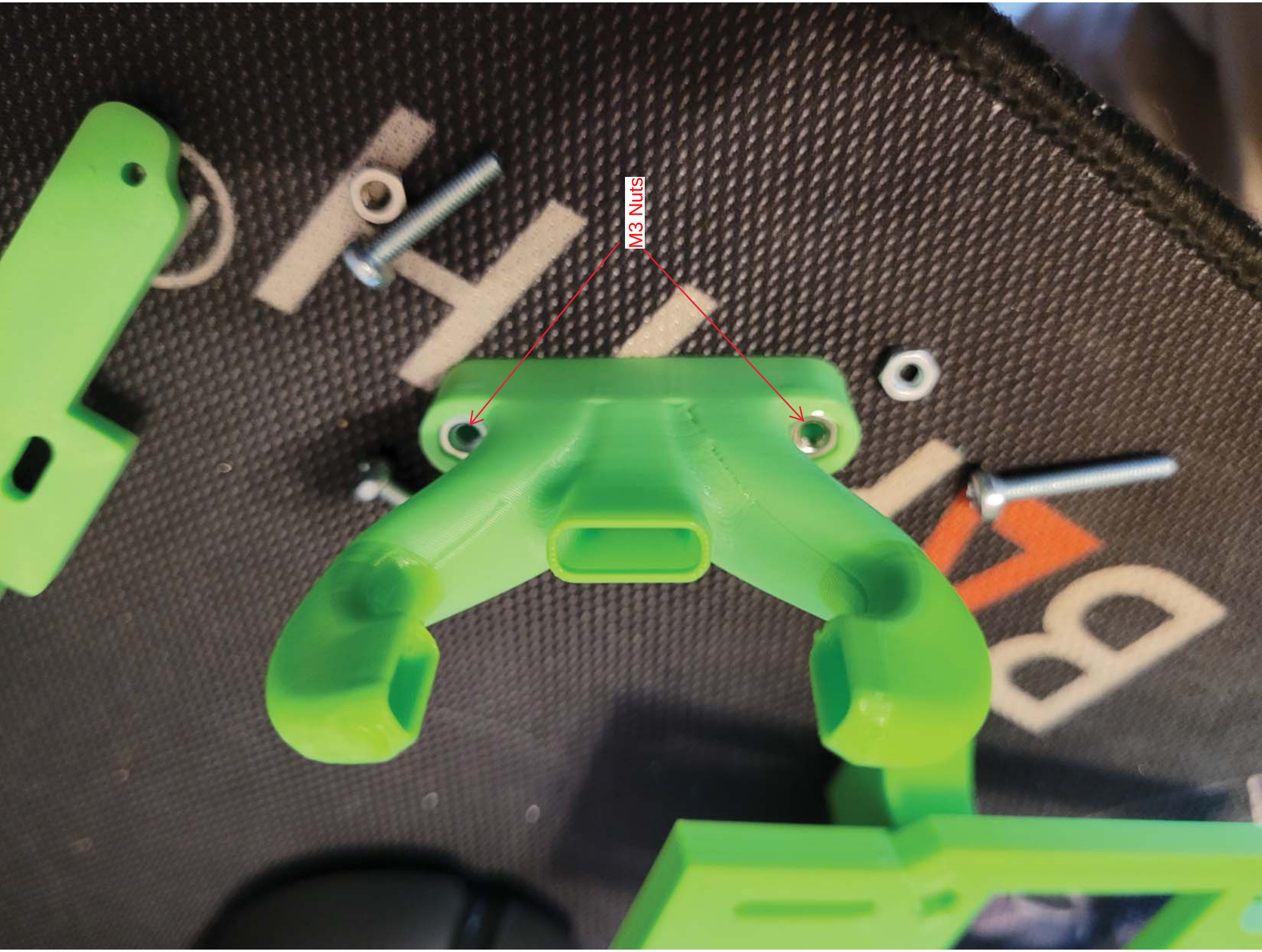

Left
Right
Route belt from print carriage location,
extend past for some excess to cut later
Front


Back
Left
Right
Route belt from print carriage location,
extend past for some excess to cut later
Front

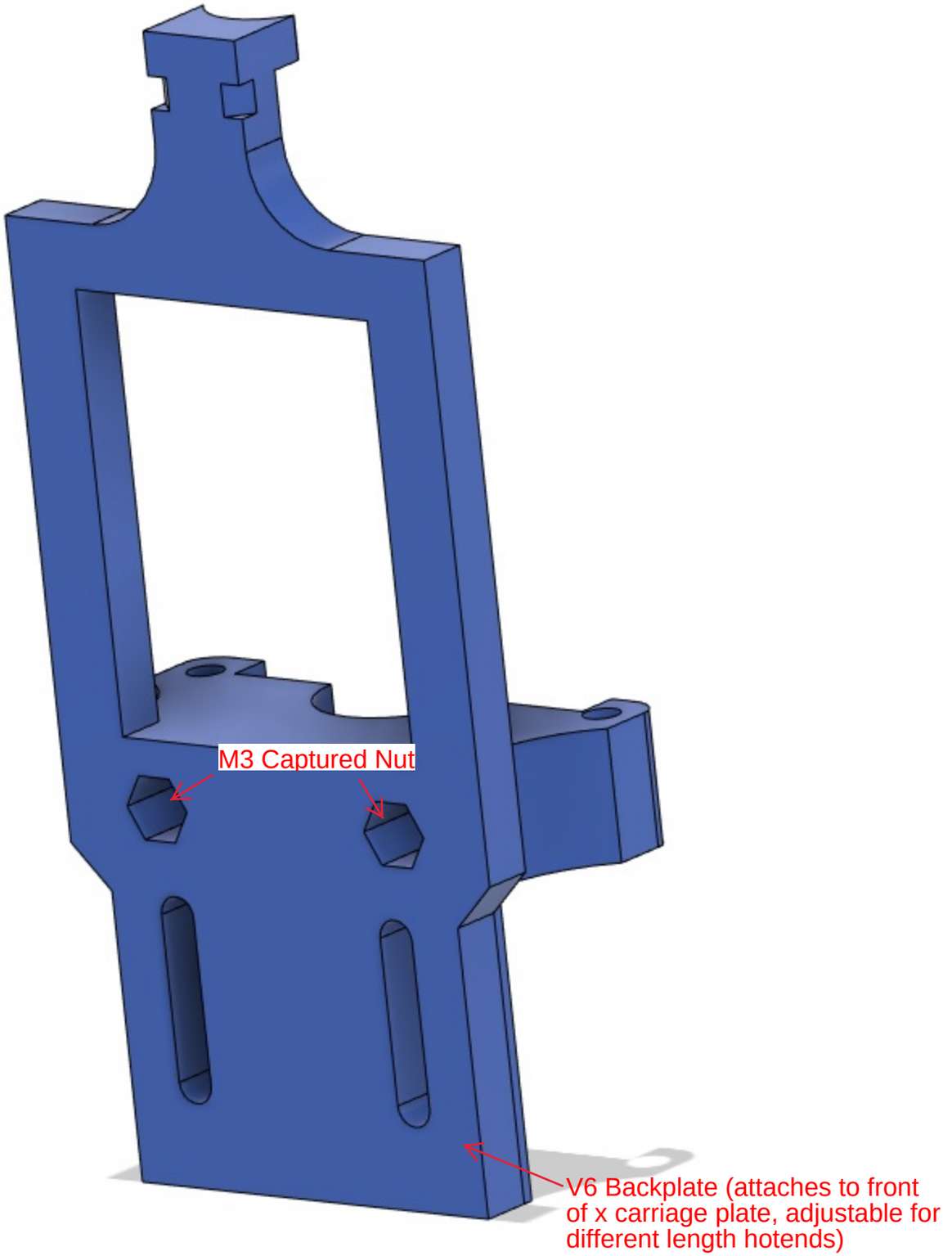

Use the 4 GT2 Belt Clips to secure routed belt
If you use "expansion compensation" in your slicer, you will need to shrink clips to 99% to avoid slipping, otherwise standard profile will work


Tri Horn
Duct
5050 part cooling
adapter

Hotend/Extruder
Plate

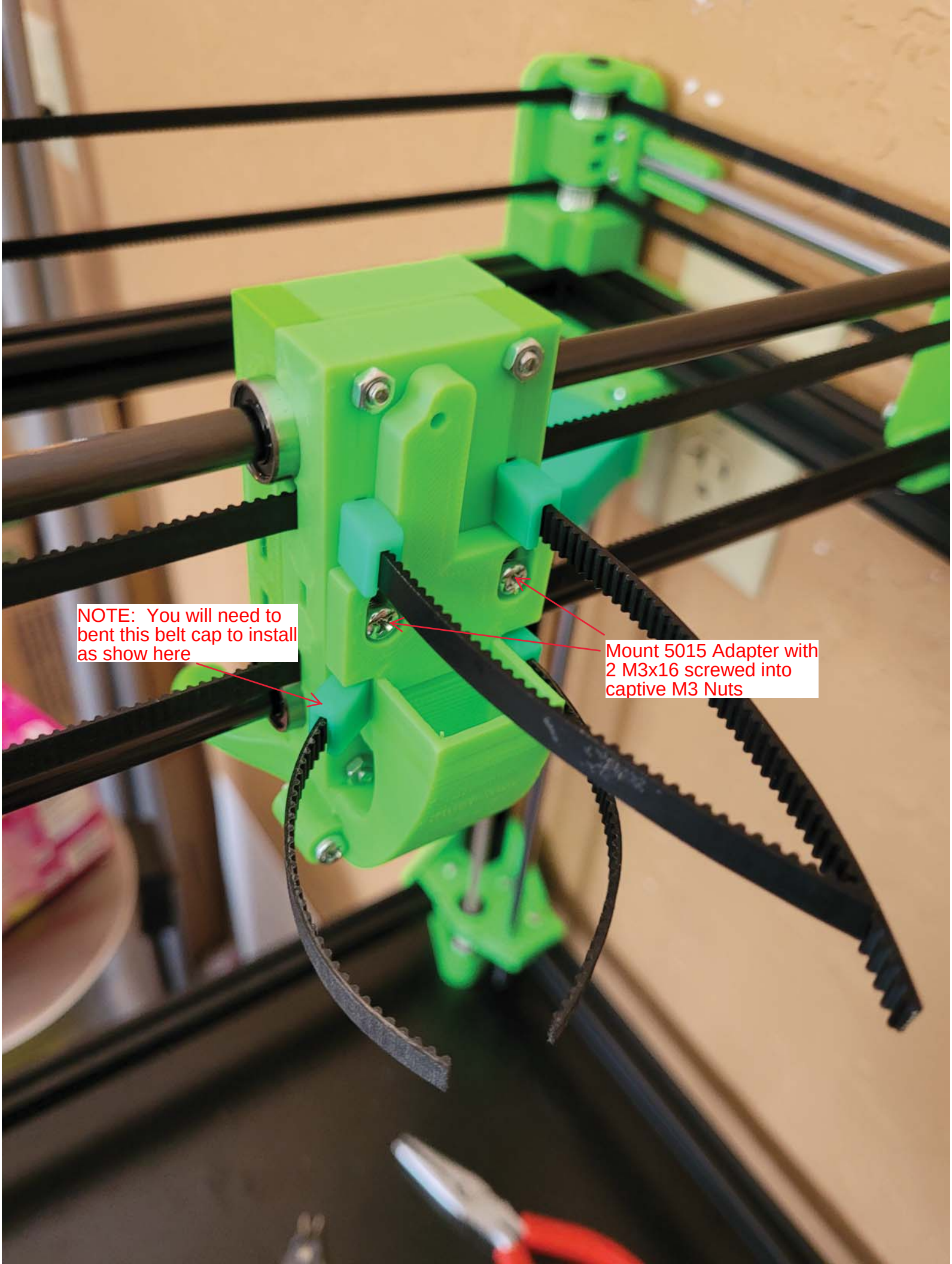

M3 Nuts

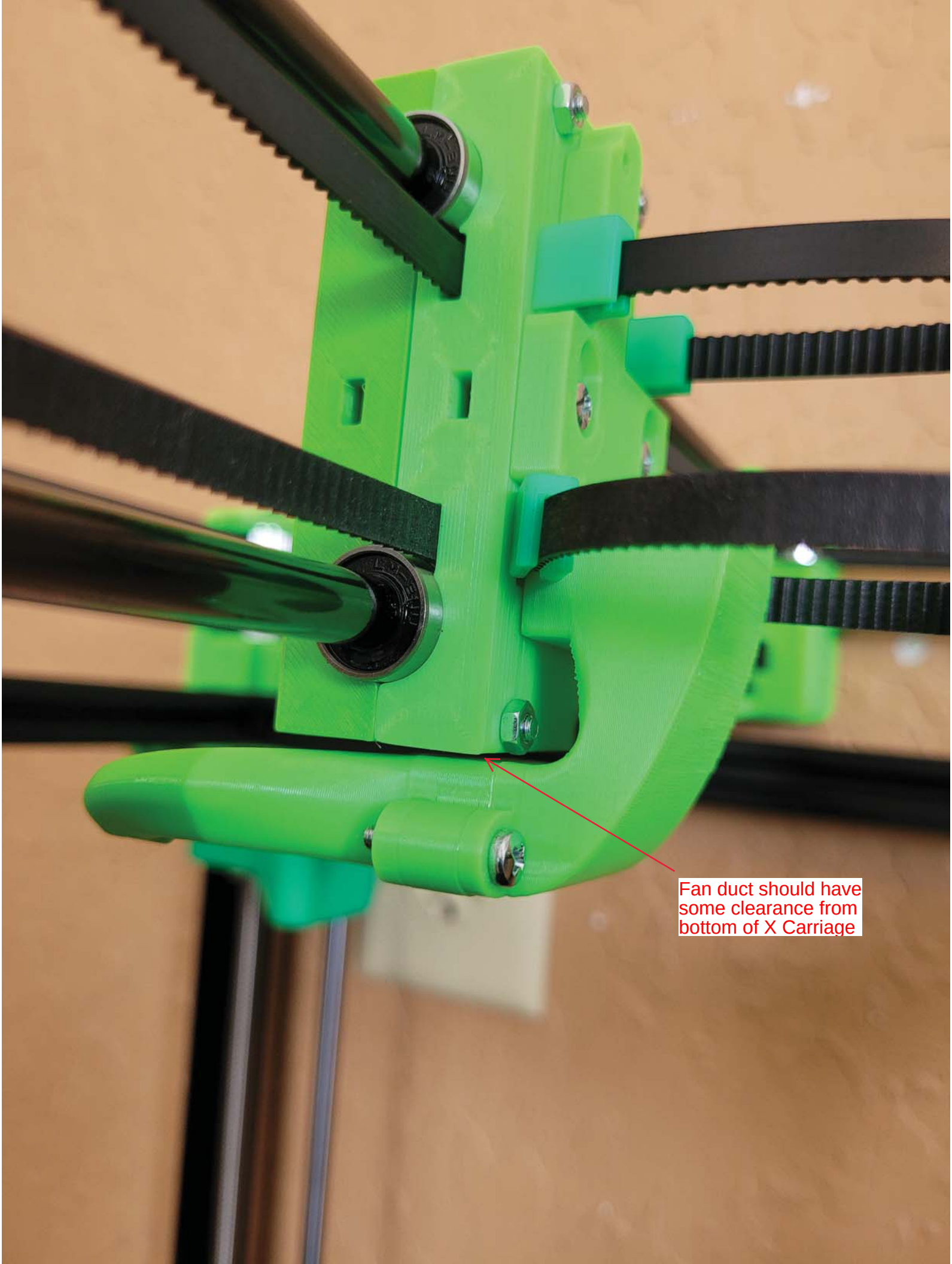

M3x16 (or 12)

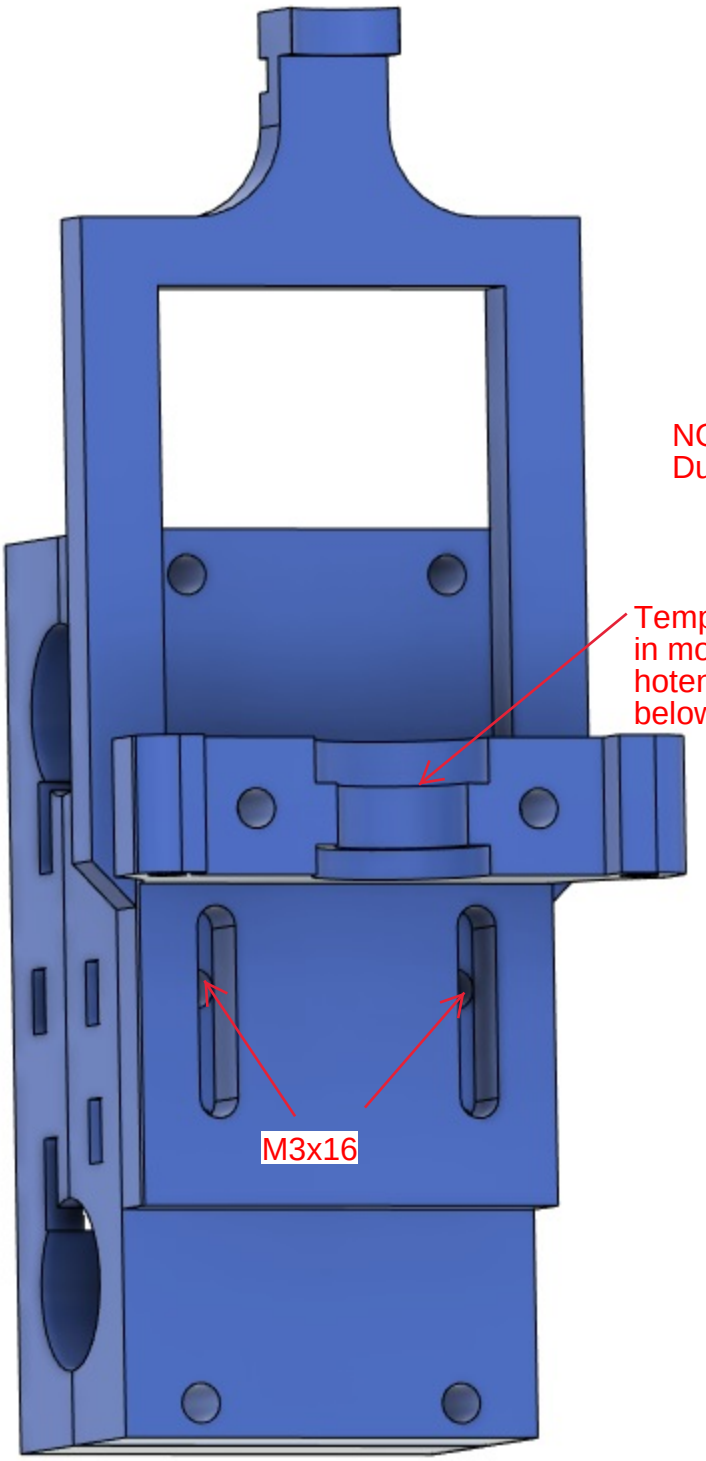

M3 Captured Nut
V6 Backplate (attaches to front of x carriage plate, adjustable for different length hotends)


M3 Nuts
Set in place,
use m3x20 to cleanly
pull the nuts all the
way into the slots

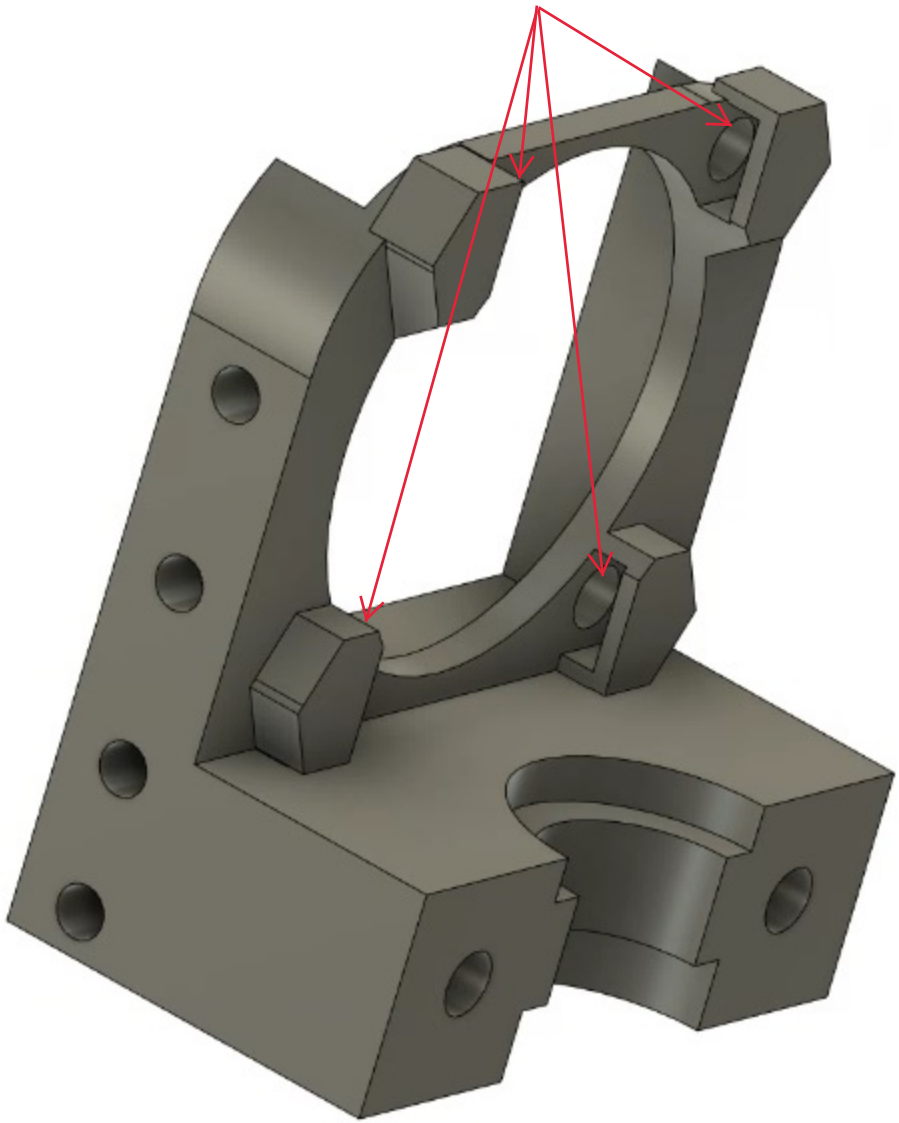

BA
KTH

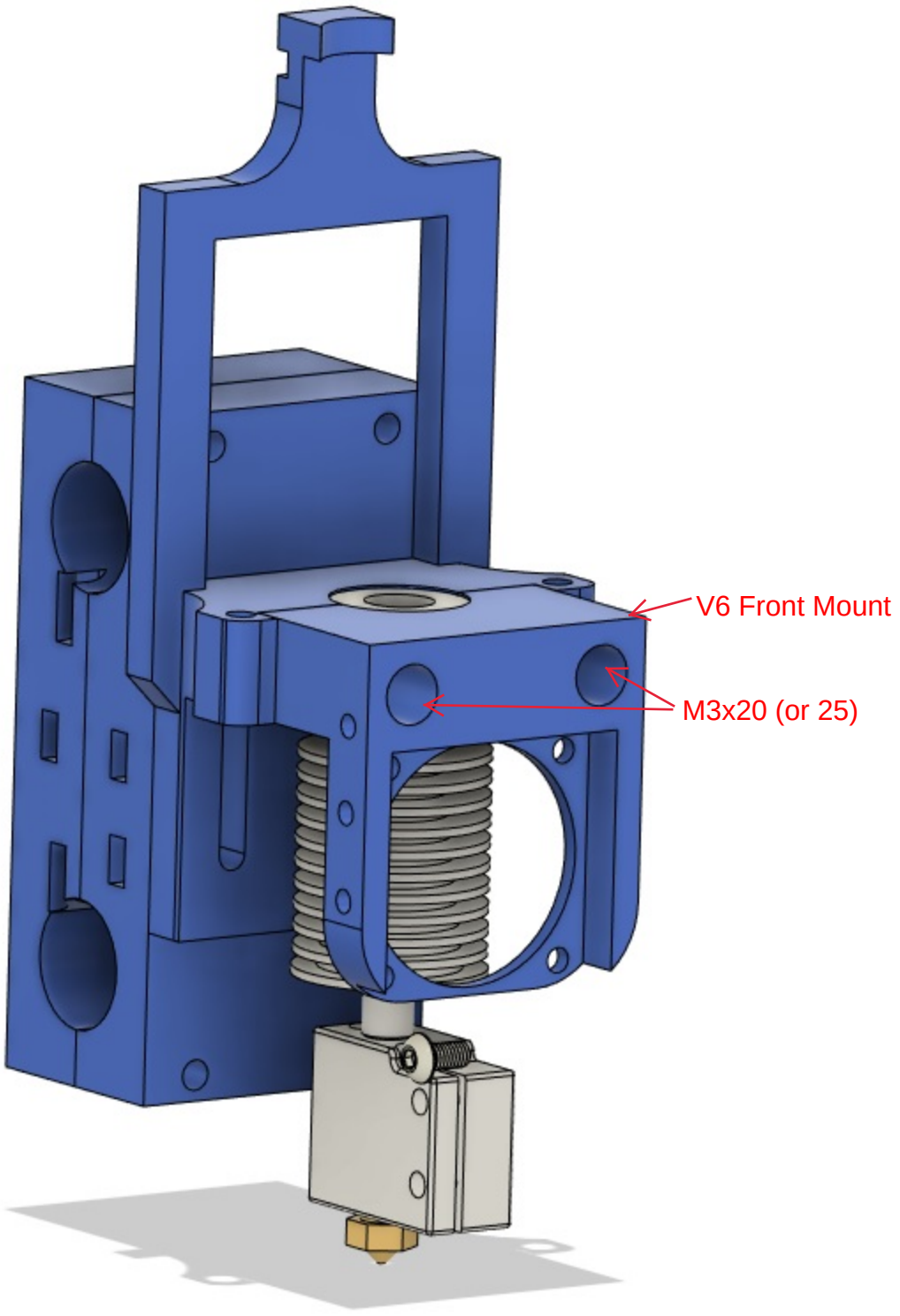

NOTE: You will need to bent this belt cap to install as show here
Mount 5015 Adapter with 2 M3x16 screwed into captive M3 Nuts

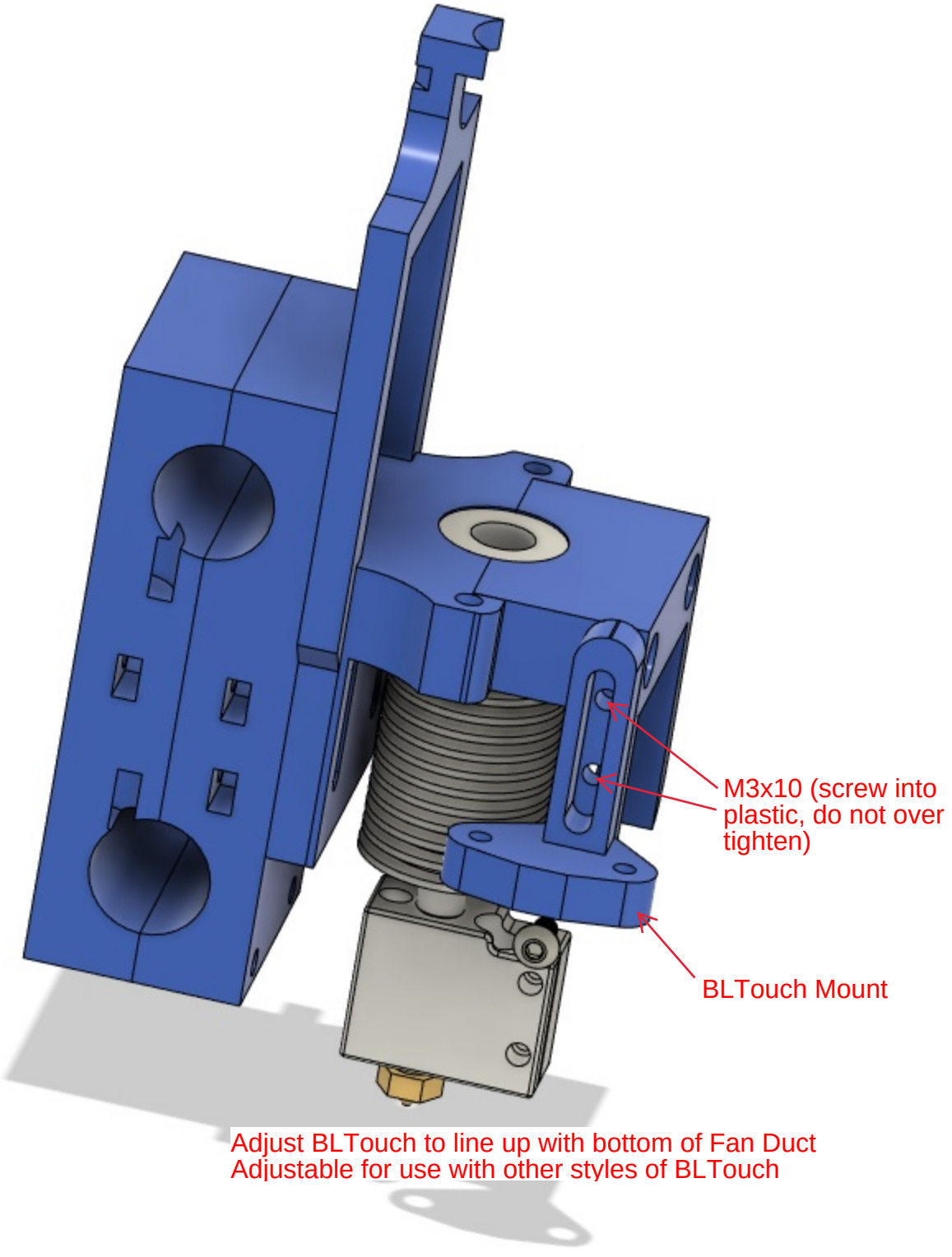

Fan duct should have some clearance from bottom of X Carriage


NOTE: Mount Cooling Duct Prior to This Step
Temporary place hotend in mount, adjust mount so hotend nozzle sits a few mm below part cooling duct
M3x16

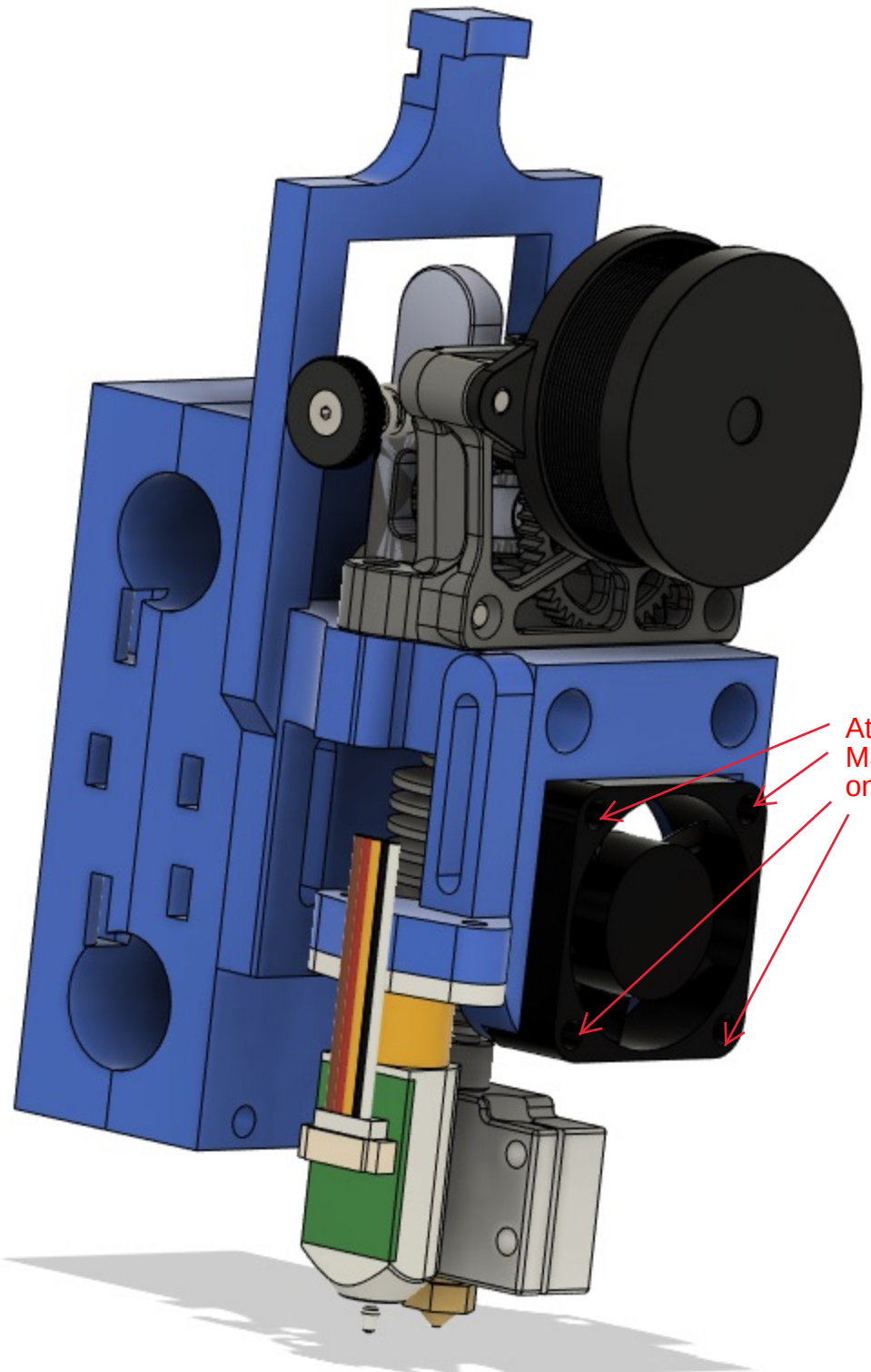
Insert captured M3 nuts prior to mounting

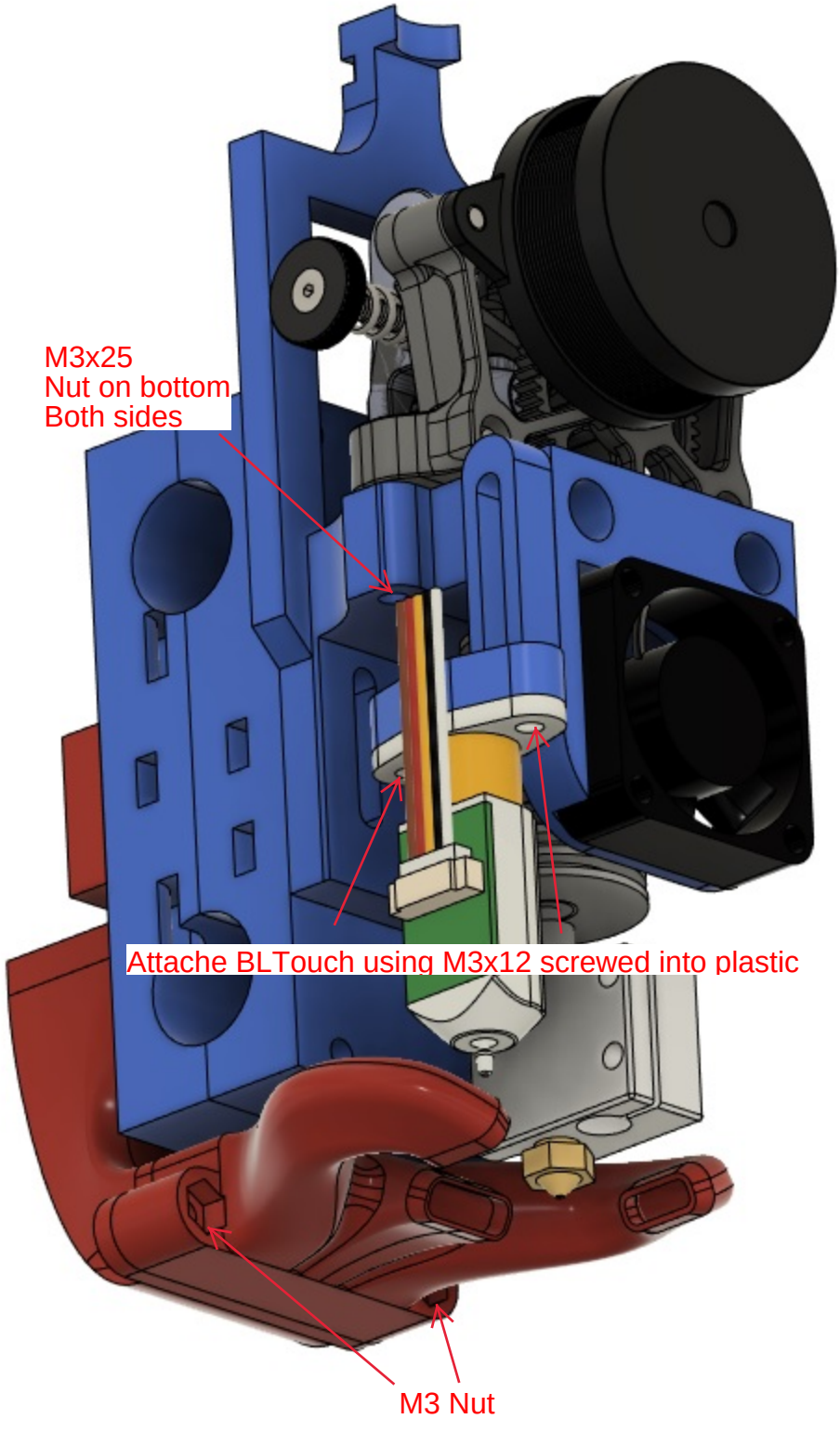


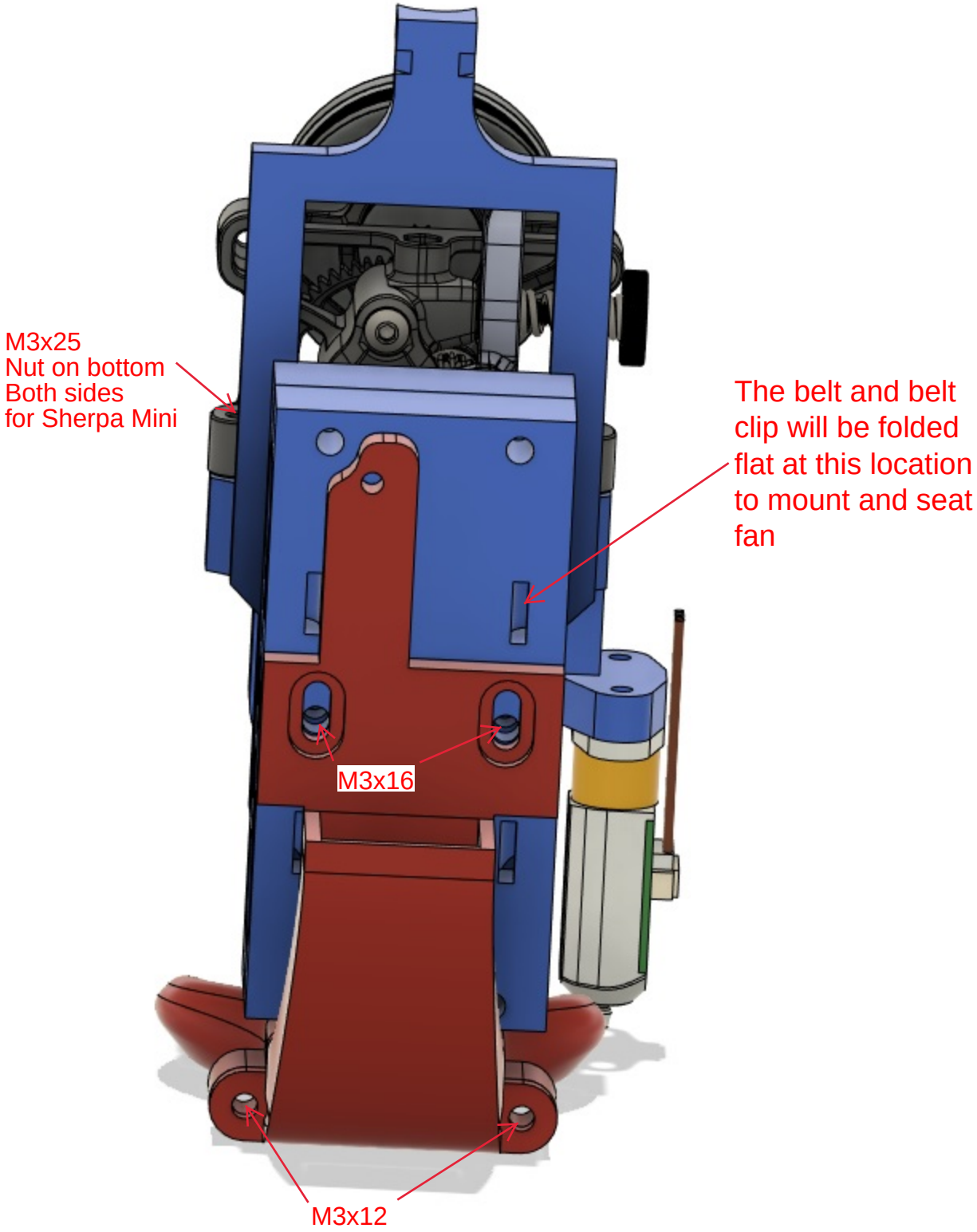

V6 Front Mount
M3x20 (or 25)

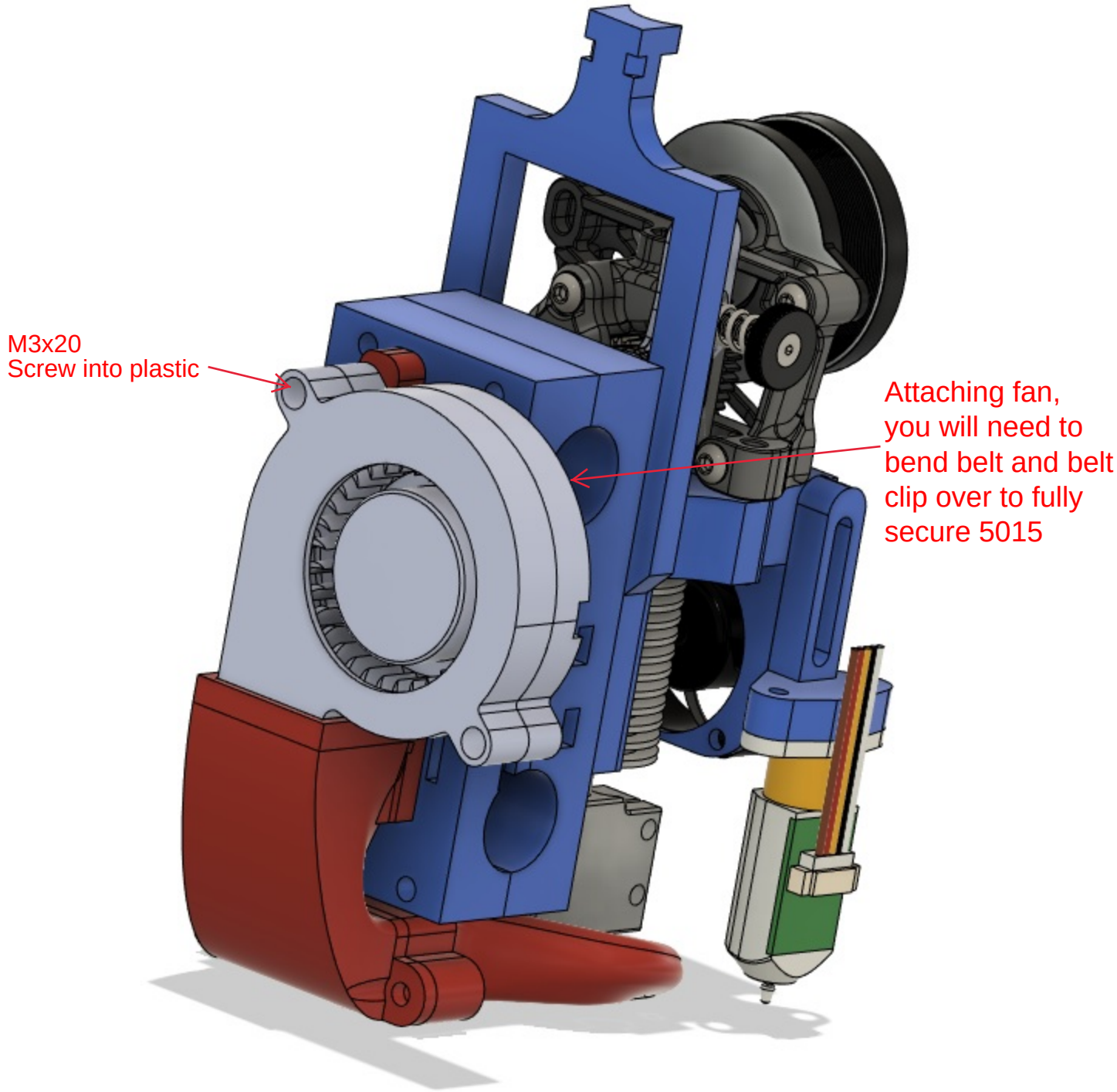


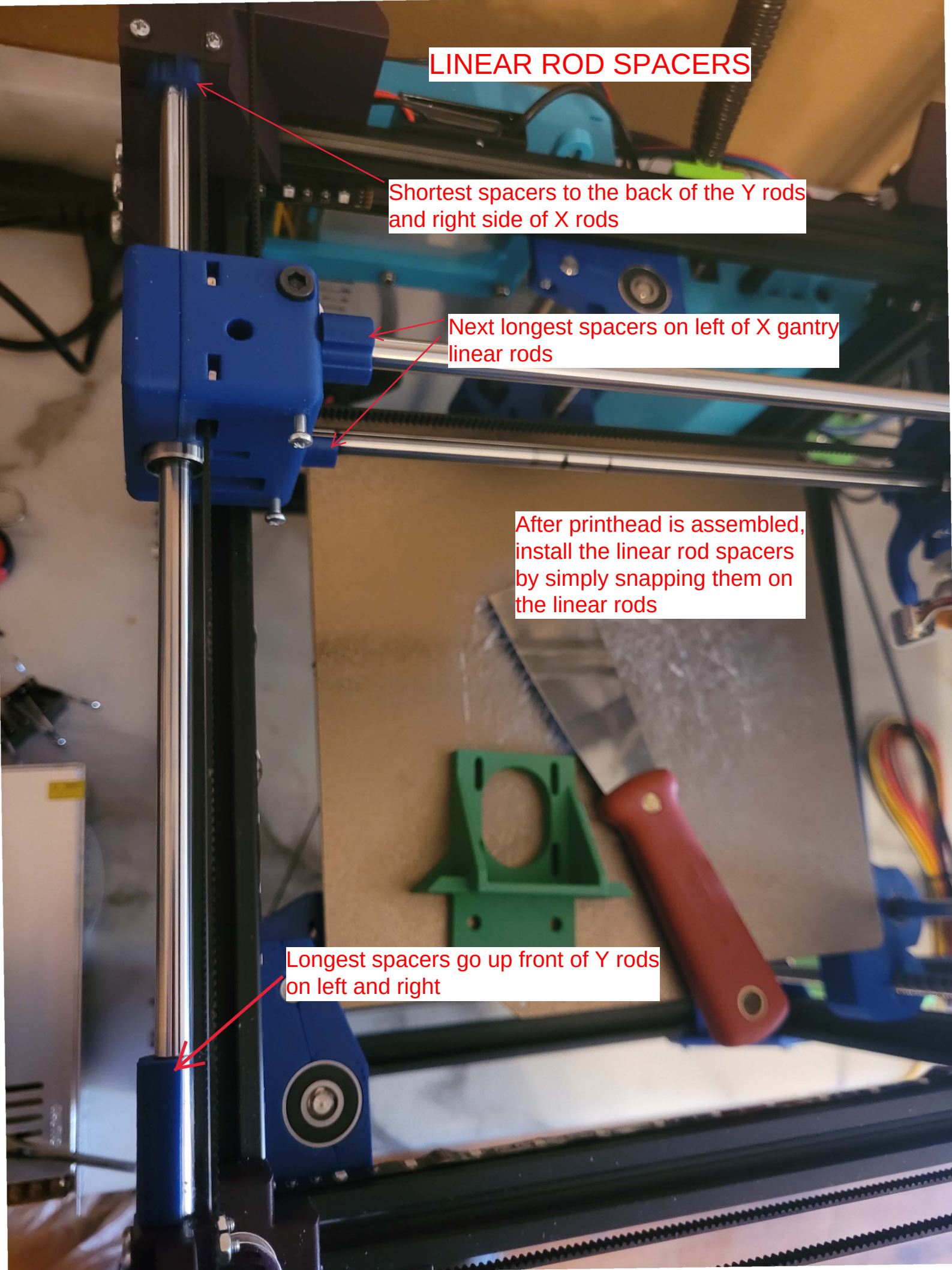

Adjust BLTouch to line up with bottom of Fan Duct
Adjustable for use with other styles of BLTouch

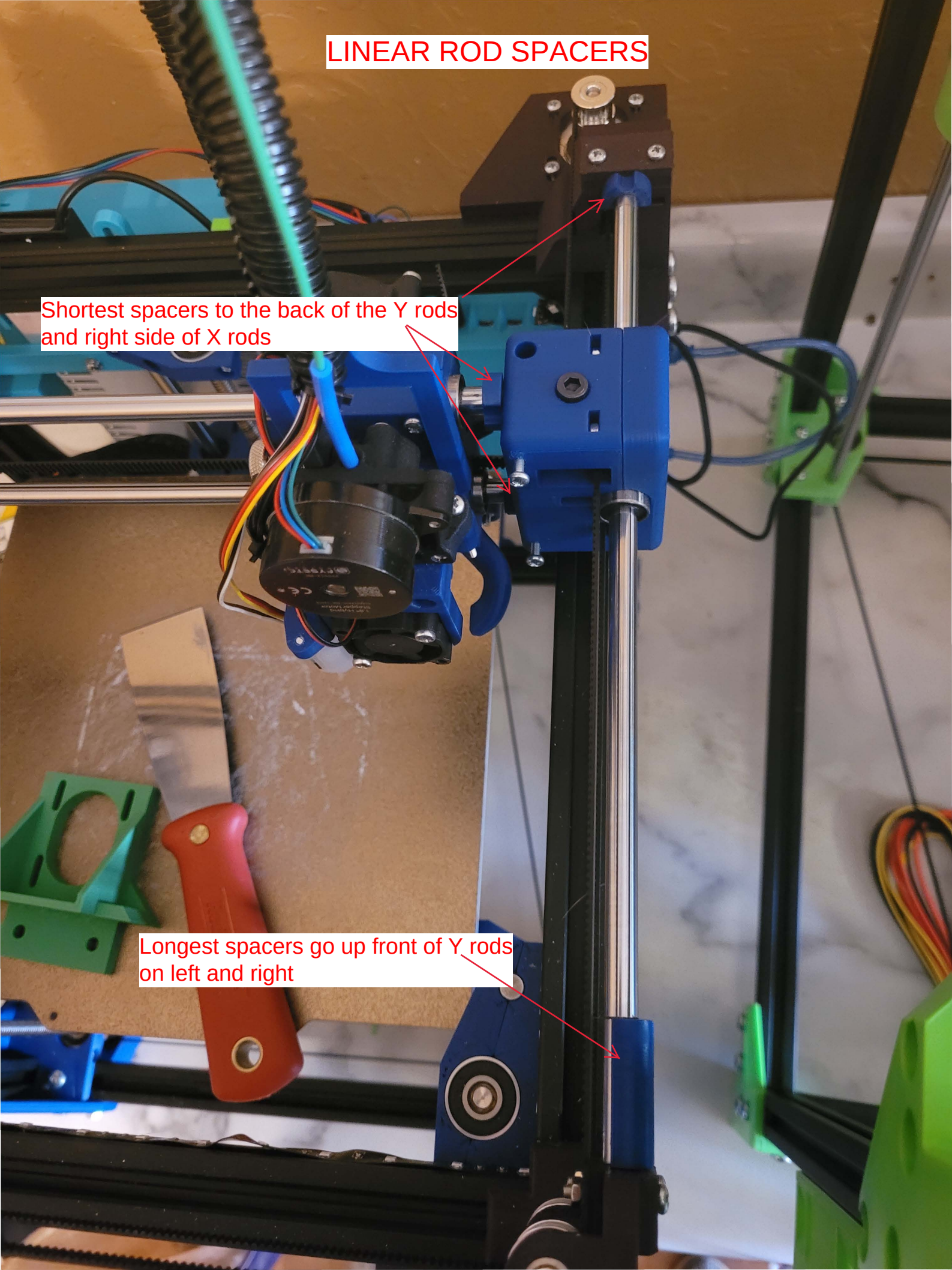

Attach 3010 fan using
M3x16 and M3 nuts
on inside of V6 Mount


M3x25
Nut on bottom
Both sides
Attache BLTouch using M3x12 screwed into plastic
M3 Nut


M3x25
Nut on bottom
Both sides
for Sherpa Mini
The belt and belt clip will be folded flat at this location to mount and seat fan
M3x16
M3x12


M3x20
Screw into plastic
Attaching fan, you will need to bend belt and belt clip over to fully secure 5015


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

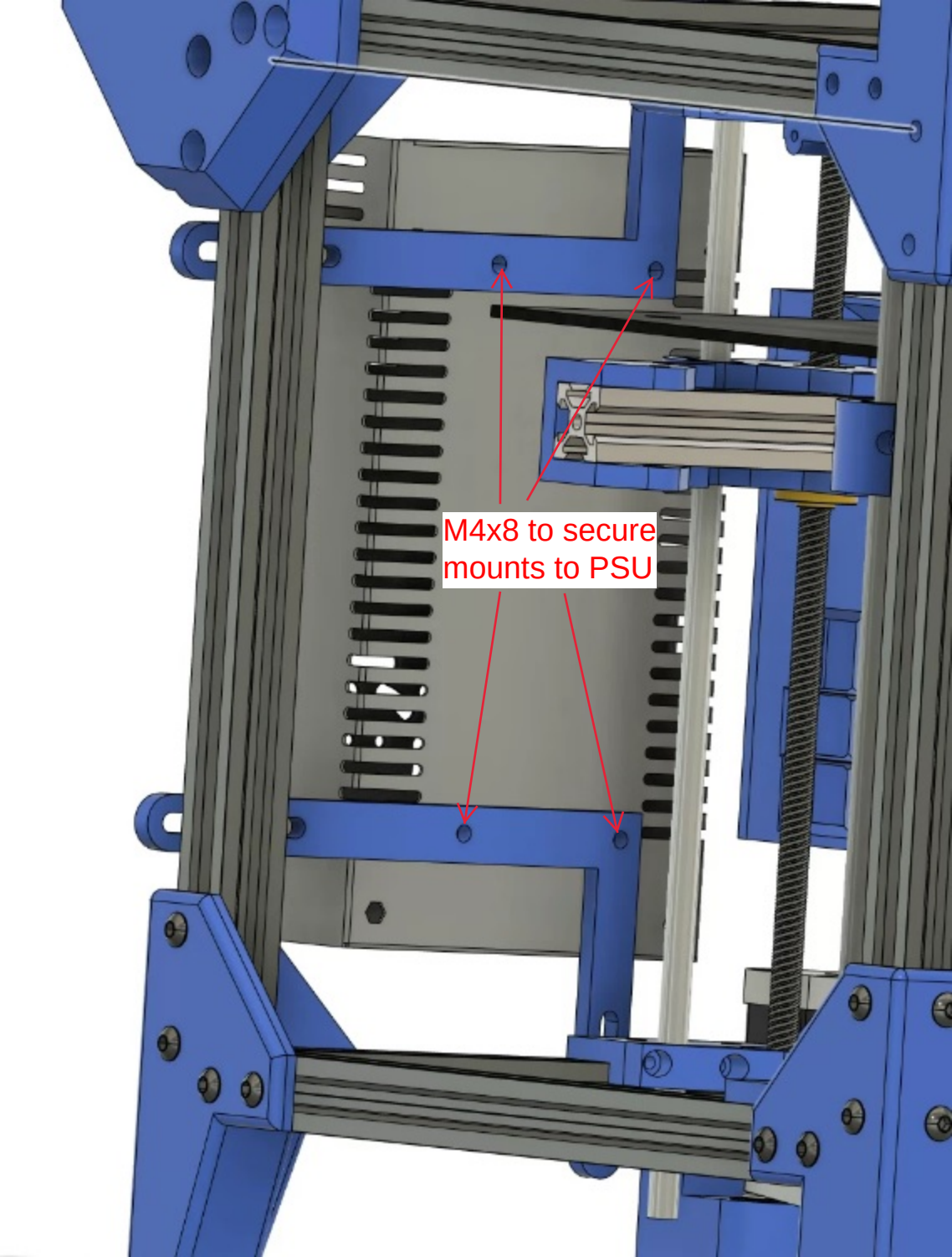

LINEAR ROD SPACERS
Shortest spacers to the back of the Y rods and right side of X rods
Longest spacers go up front of Y rods on left and right

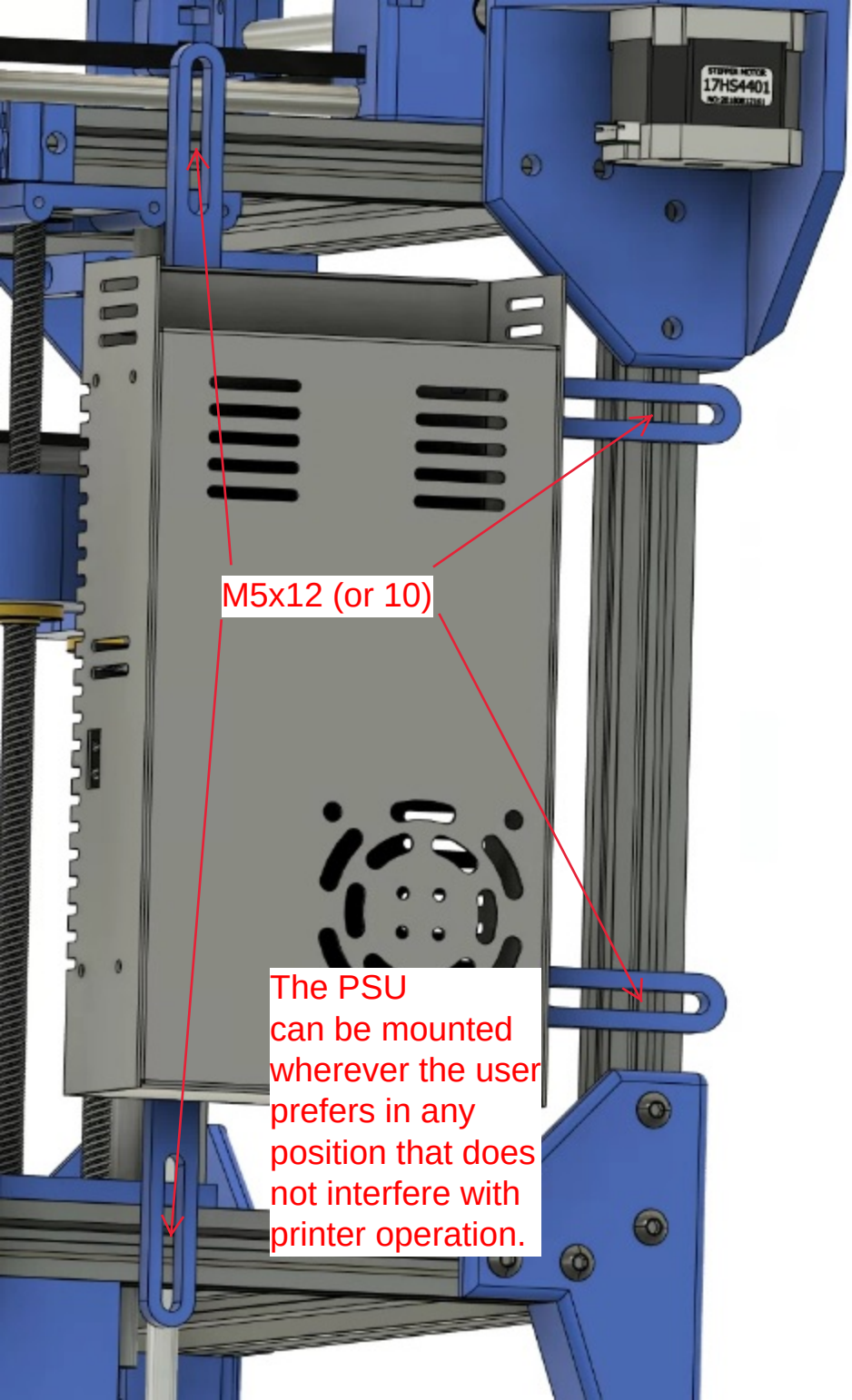
# Section 5:

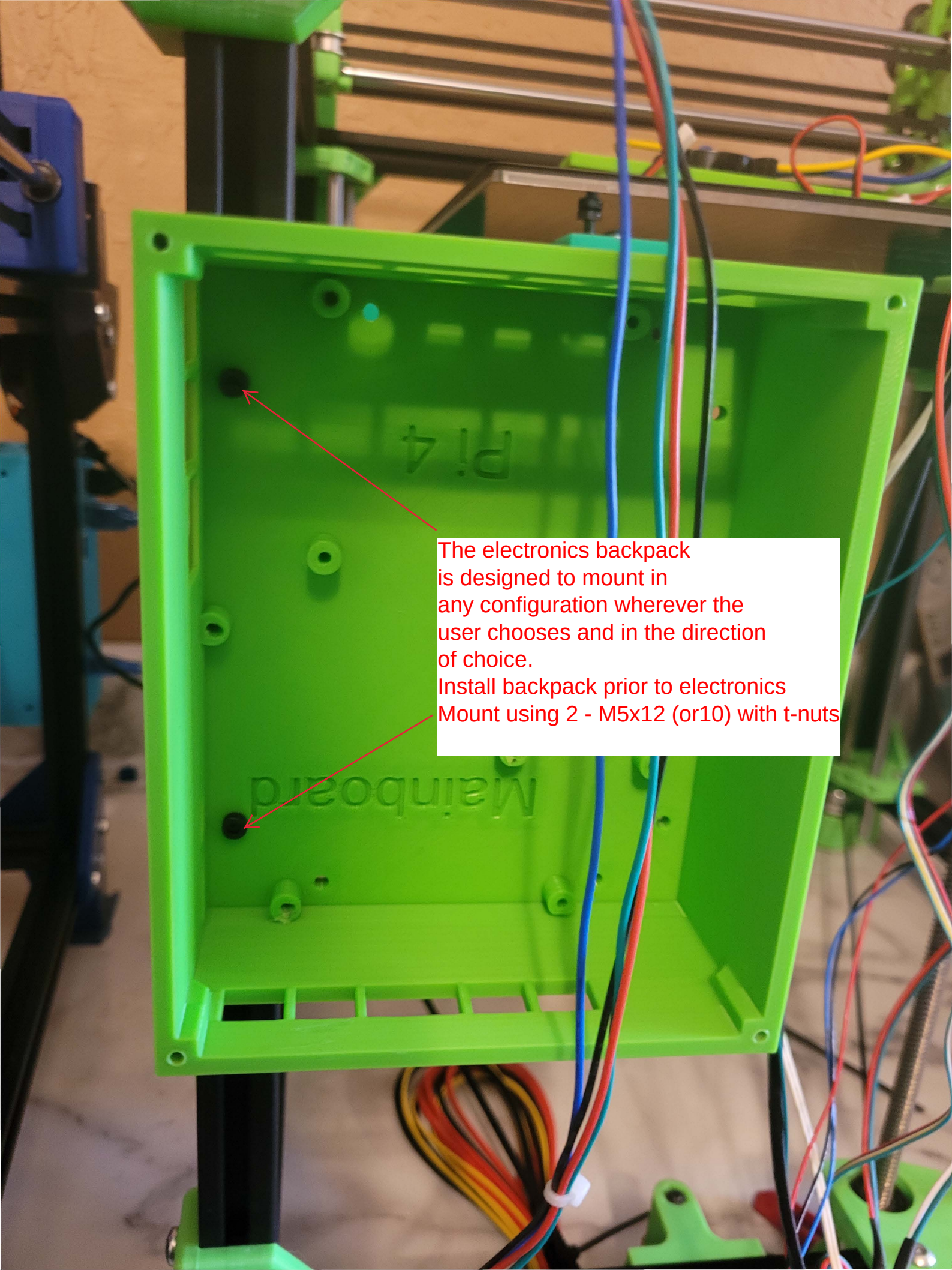
# Electronics Mounting

**Components needed for this portion:**

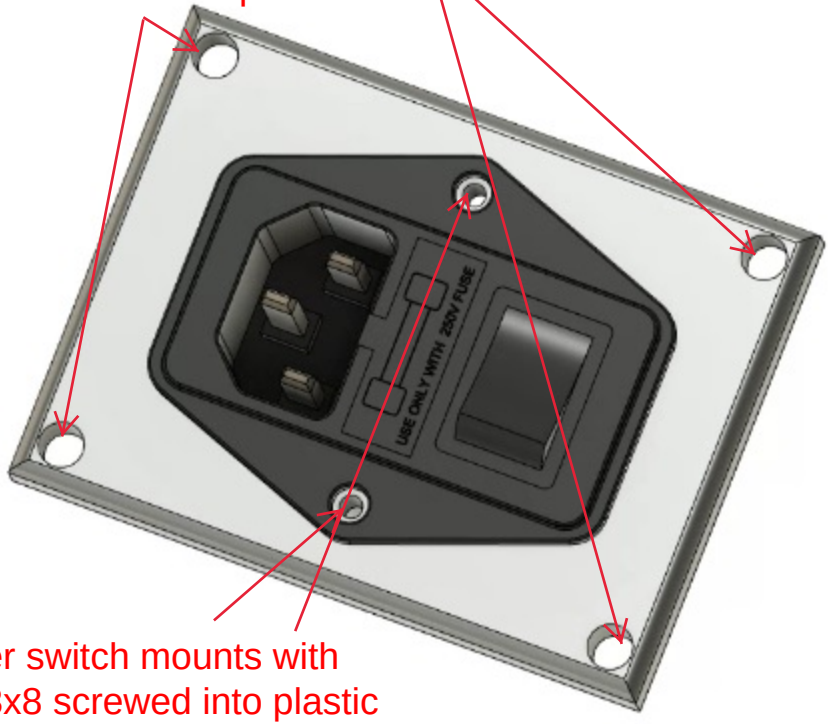
| | |
|---|---|
| **M5x12 (or 10)** | **x8** |
| **M5 T-nut** | **x8** |
| **M3x8** | **x2** |
| **M4x8** | **x4** |
| **PSU** | |
| **Power Rocker Switch** | |
| **Electronics Backpack** | |


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 - M3x8 screwed into plastic

# Section 6:

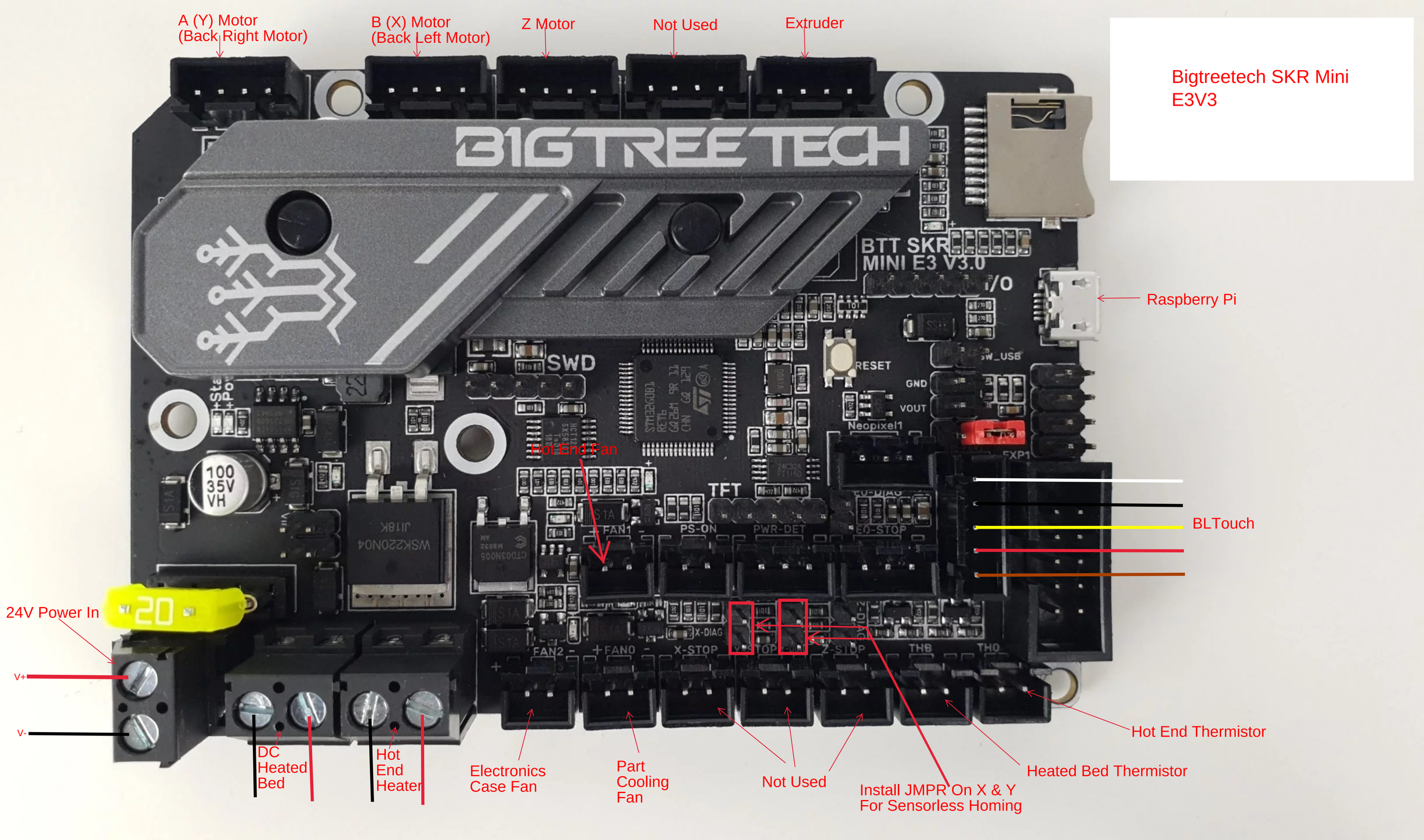
# Mainboard Wiring Diagram

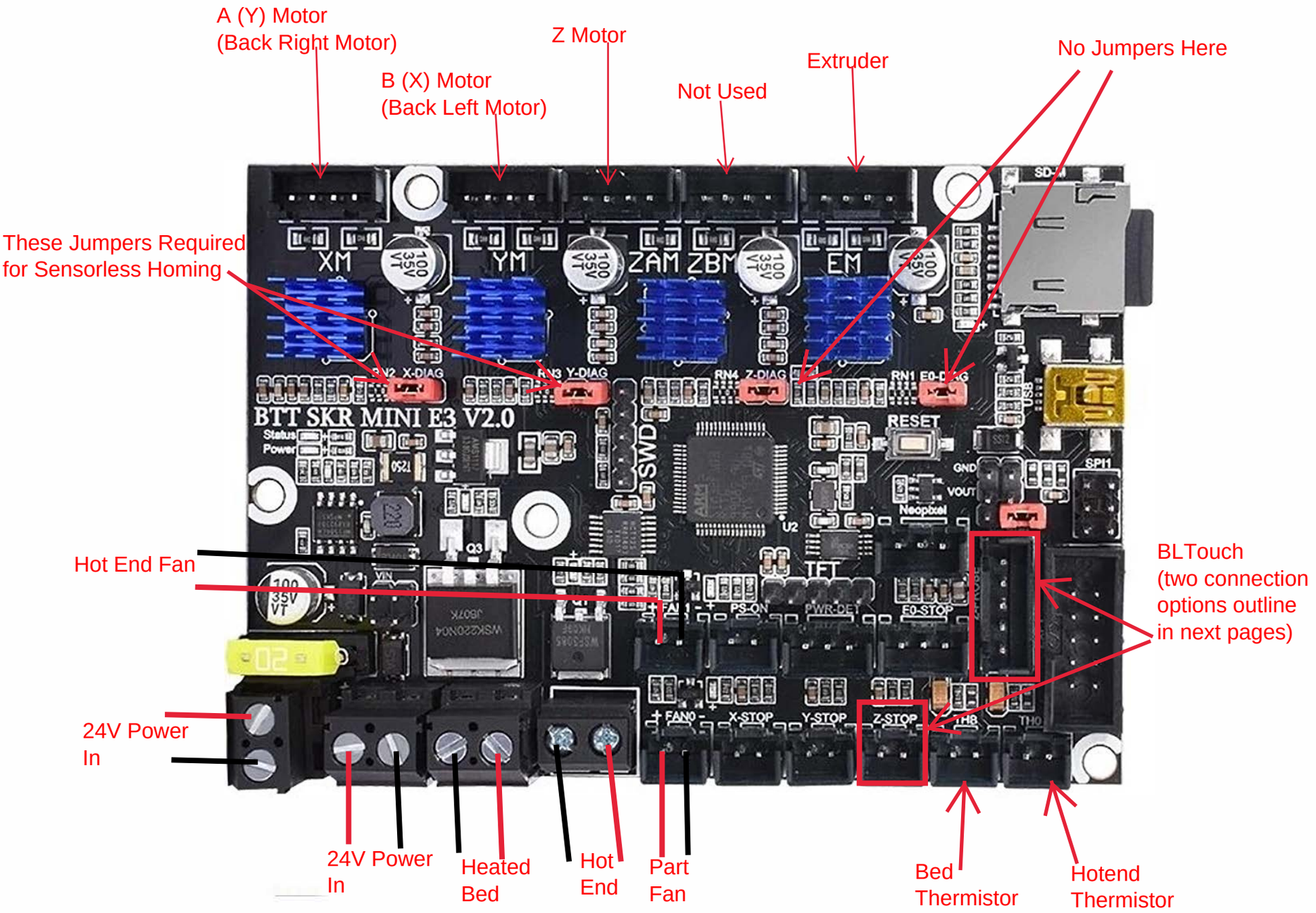
**Components needed for this portion:**

**Bigtreetech SKR Mini E3 V3**

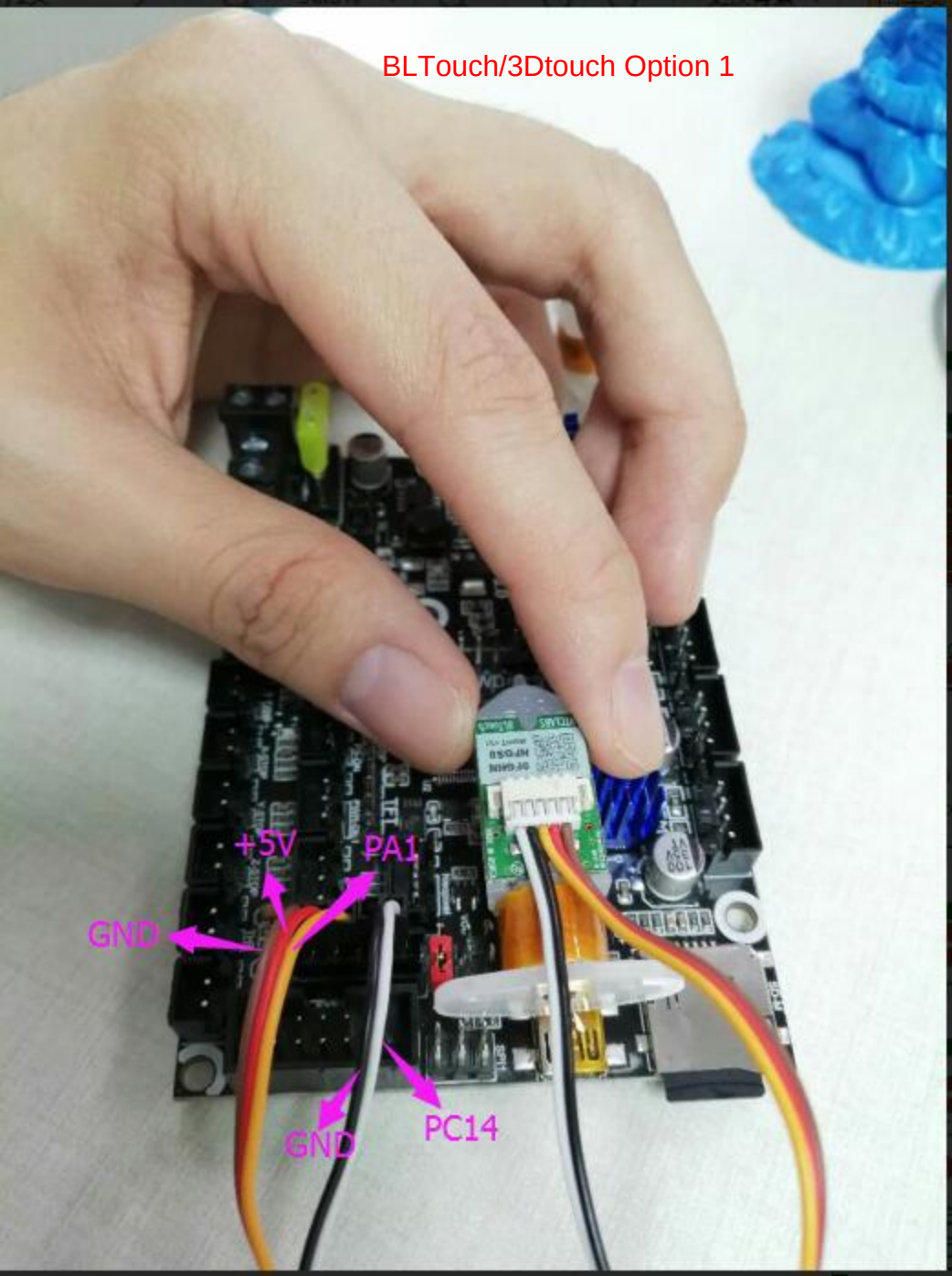
**OR**

**Bigtreetech SKR Mini E3 V2**

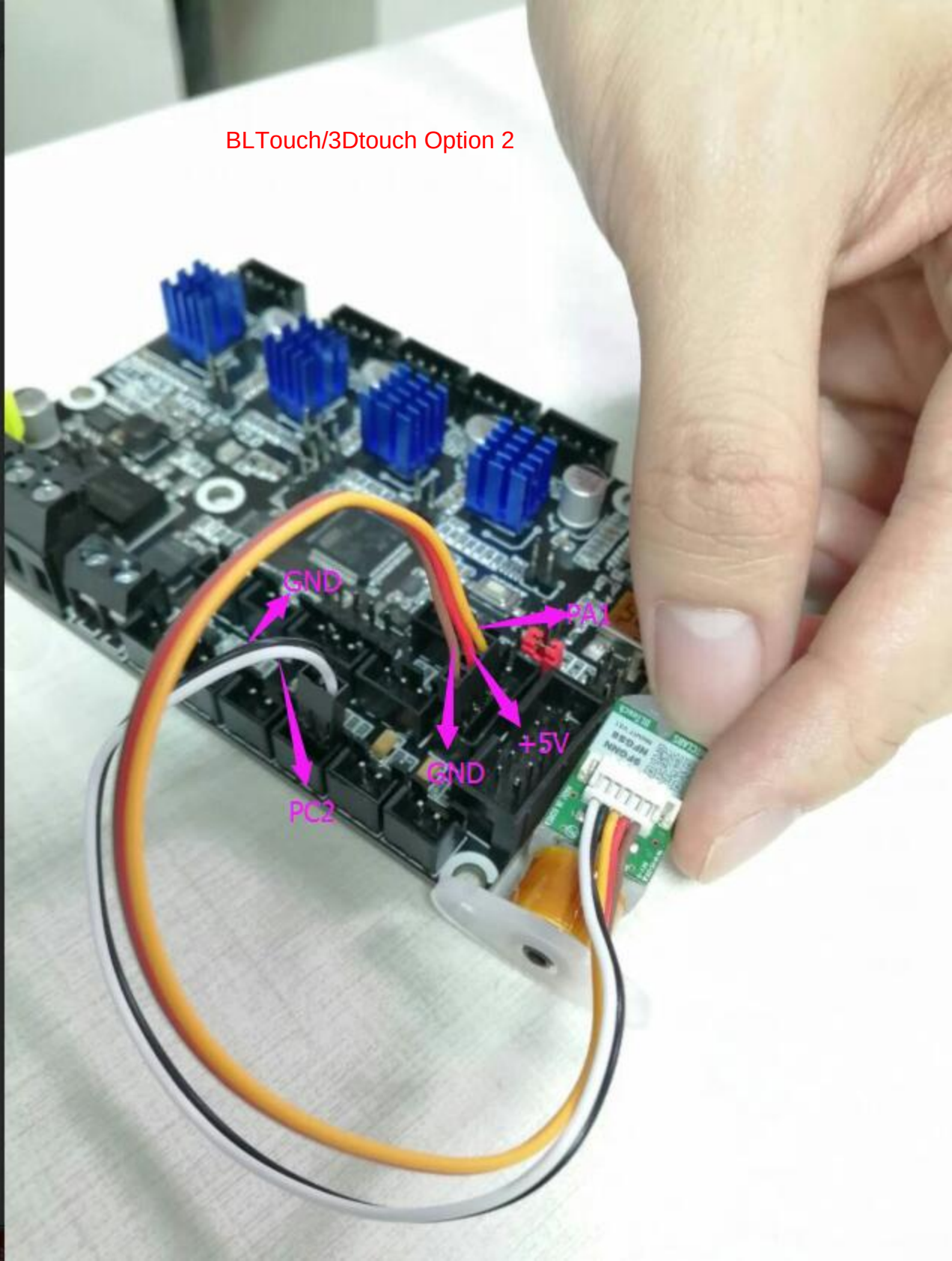

A (Y) Motor
(Back Right Motor)
B (X) Motor
(Back Left Motor)
Z Motor
Not Used
Extruder
Bigtreetech SKR Mini E3V3
BIGTREETECH
BTT SKR MINI E3 V3.0
Raspberry Pi
SWD
RESET
GND
VOUT
Neopixel1
EXP1
Hot End Fan
TFT
BLTouch
FAN1
PS-ON
PWR-DET
E0-STOP
24V Power In
V+
V-
X-DIAG
FAN2
FAN0
X-STOP
Y-STOP
Z-STOP
THB
TH0
DC
Heated
Bed
Hot
End
Heater
Electronics
Case Fan
Part
Cooling
Fan
Not Used
Install JMPR On X & Y
For Sensorless Homing
Heated Bed Thermistor
Hot End Thermistor




# Bigtreetech SKR Mini E3V2

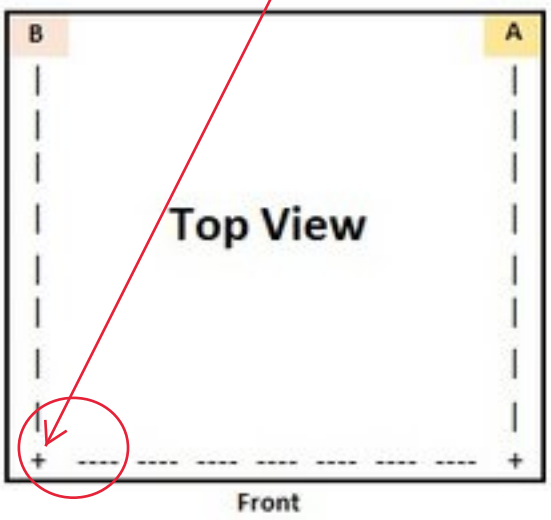

BLTouch/3Dtouch Option 1
+5V
PA1
GND
GND
PC14

BLTouch/3Dtouch Option 2



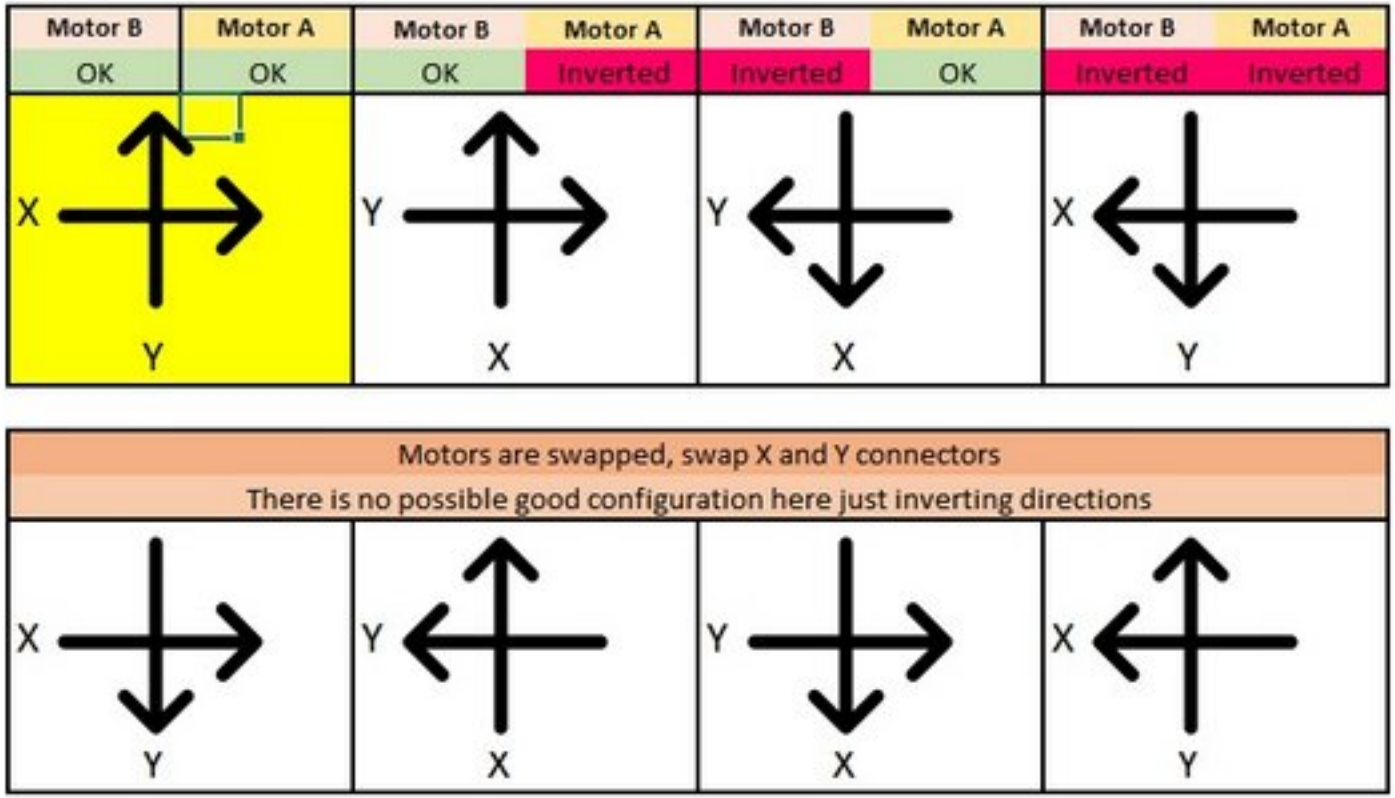
When Home_All, X will home first to the left, Then Y will home to the front, any deviation of this is incorrect. If deviation from this, it is either Dir_pin or swapped motors.

Print head should home to here




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.

## Visual Motor Configuration Guide



# 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**

**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/**

# 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**