



Assembly Manual

Small package. Big fun. Micron.

Introduction	03
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Frame	06
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This printer wouldn't have happened if it were not for all the hard work from the following users on the Voron Discord and Døm Discord

- TheWarolf
- L.e.o.p.a.r.d
- deepfriedheroin
- faithblinded
- zruncho
- Finn
- DocSparky
- gfunnymoney

STL FILE KEY

The STL files naming convention is the same as for VORON designs, namely :

PRIMARY COLOR

Example z_drive_main_a_x2.stl

These files will have nothing at the start of the filename.

ACCENT COLOR

Example [a]_z_motor_mount_a_x2.stl

These files will have "[a]" to the front to mention that they are intended to be printed with an accent color.

QUANTITY REQUIRED

Example [a]_z_motor_mount_a_x2.stl

If a file ends with "_x#", that is telling you the quantity of that part required to build this system..

PRINT GUIDELINES

The print guidelines are also the same as for VORON designs, namely :

FDM MATERIAL

As with the standard Voron Design printers, It is recommended to print these parts in ABS.

LAYER HEIGHT

Recommended : 0.2mm

EXTRUSION WIDTH

Recommended : Forced 0.4mm

INFILL PERCENTAGE

Recommended : 40%

INFILL TYPE

Grid, Gyroid, Honeycomb, Triangle or Cubic.

WALL COUNT

Recommended : 4

SOLID TOP/BOTTOM LAYERS

Recommended : 5

SUPPORTS REQUIRED

None at all.

HOW TO GET HELP

If you need assistance with your build you can head over the DOOMCUBE Discord group and post your questions (typically in the « micron » channel). It is the primary development channel involving the Micron! You can also check the Github page for the latest releases.



DISCORD

<https://discord.gg/doomcube>

GitHub

<https://github.com/hartk1213/Micron>

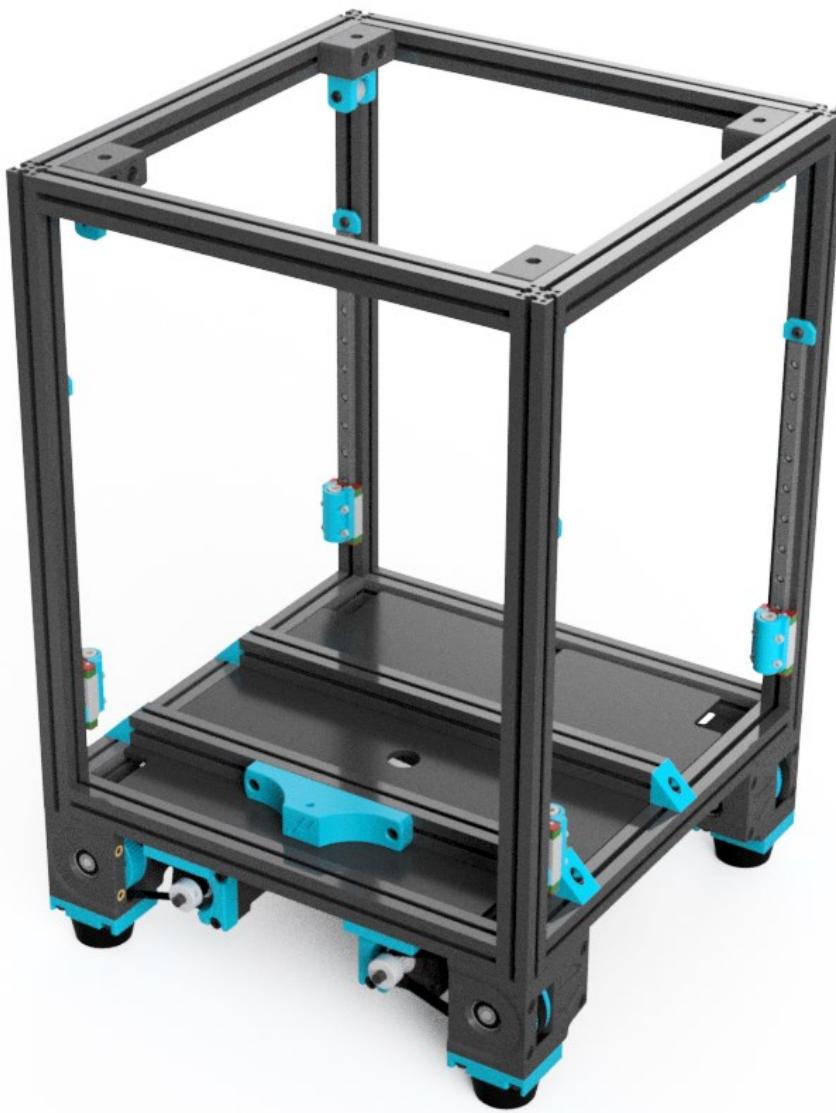


Note:

Look for this logo throughout the manual
to take you to the github page for that part.

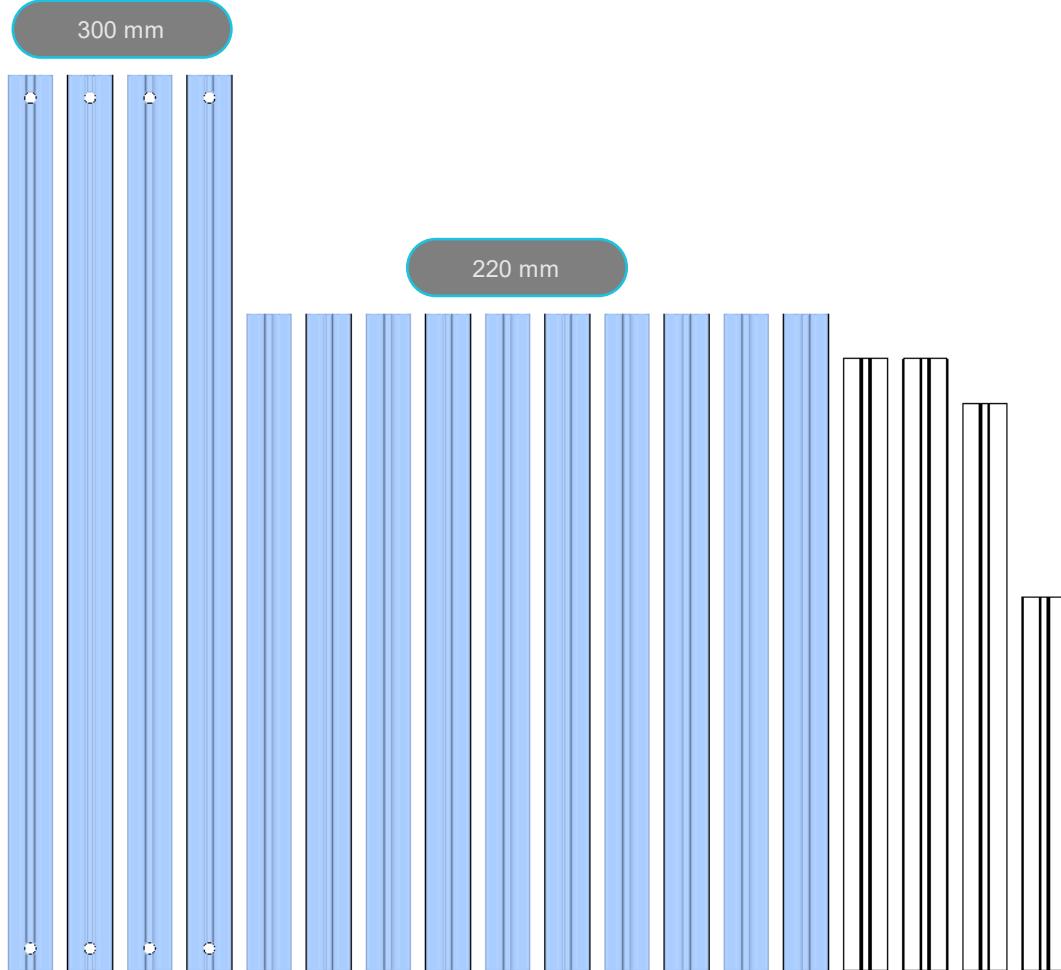
FRAME

MICRON



GATHERING EXTRUSIONS

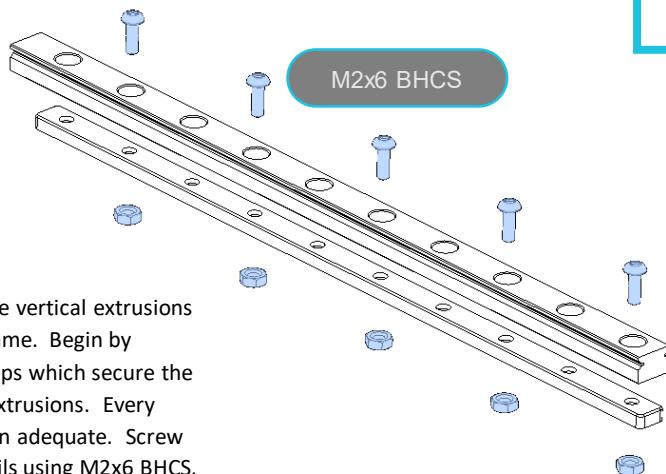
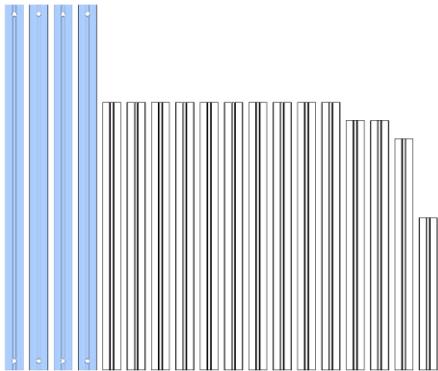
MICRON



GETTING EXTRUSIONS TOGETHER

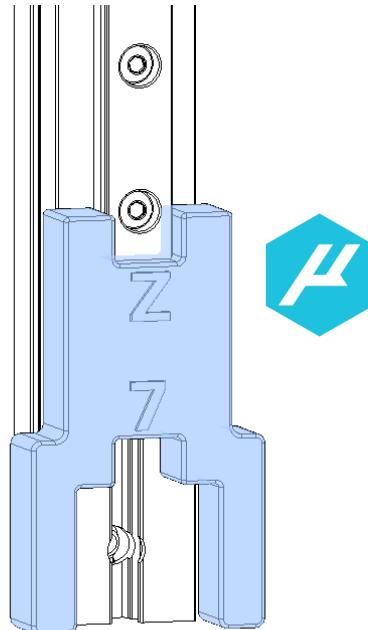
Separate the extrusions you're going to need for this section of the build. We've laid out all the parts you should have and highlighted the ones that will be used in the following sections.

Z RAIL



Z RAILS

The Z rails attach to the vertical extrusions before building the frame. Begin by loading the M2 nut traps which secure the Z rails to the vertical extrusions. Every other hole is more than adequate. Screw the nut traps to the rails using M2x6 BHCS, leaving them loose enough so they may be easily slid into place on the extrusions. We will align and secure them in the next step.



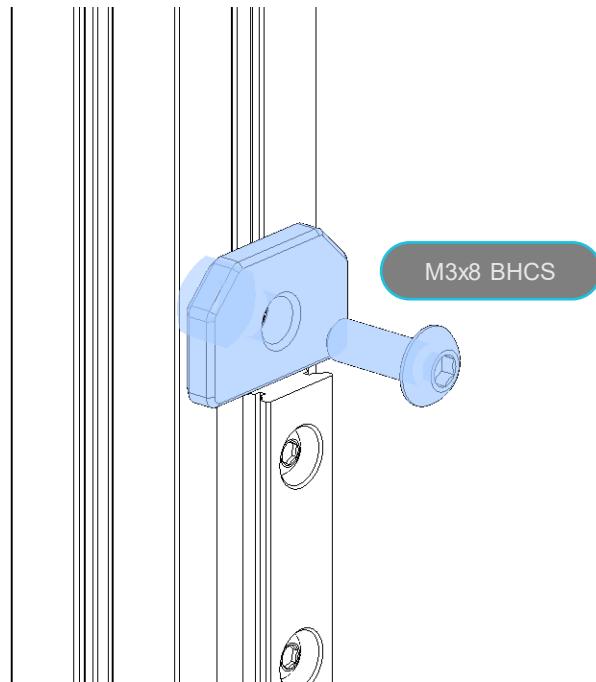
MICRON

Z RAILS ALIGNMENT

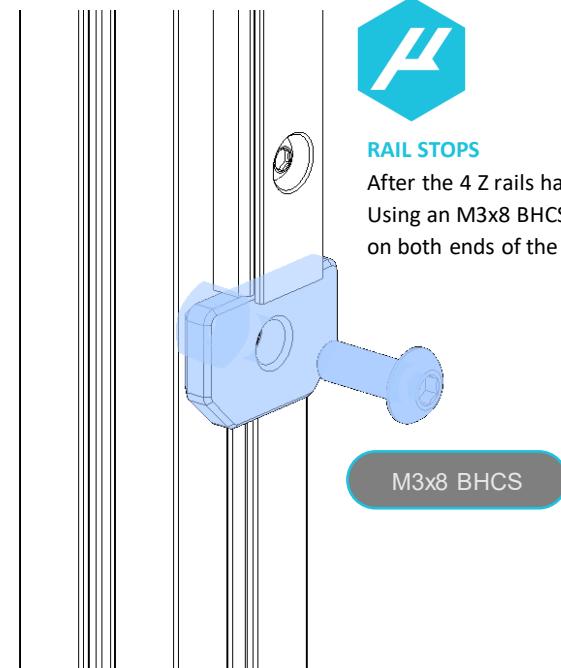
Stand up one of the vertical extrusions and use the printed rail alignment tool as shown to align the bottom of the rail. It should end up ~36mm from the bottom of the vertical extrusion. Use a second rail alignment tool on the upper half of the rail, using the section marked '7', to properly center the rail on the extrusion. Repeat this process for all 4 Z extrusions and rails.

Z RAIL STOPS

MICRON



M3x8 BHCS



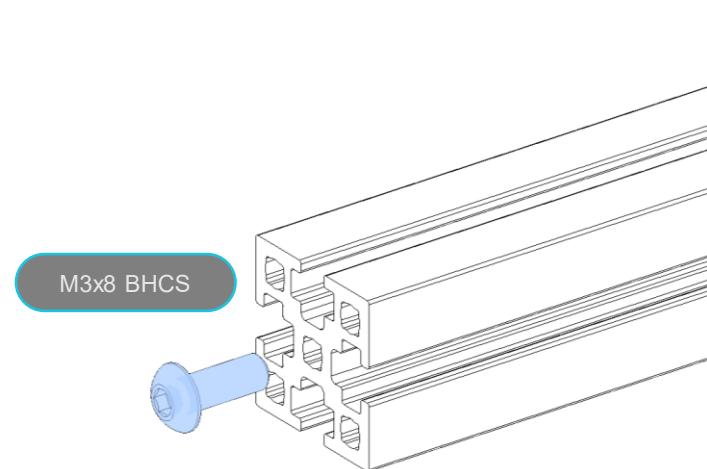
RAIL STOPS

After the 4 Z rails have been installed.
Using an M3x8 BHCS install the rail stops
on both ends of the Z rails.

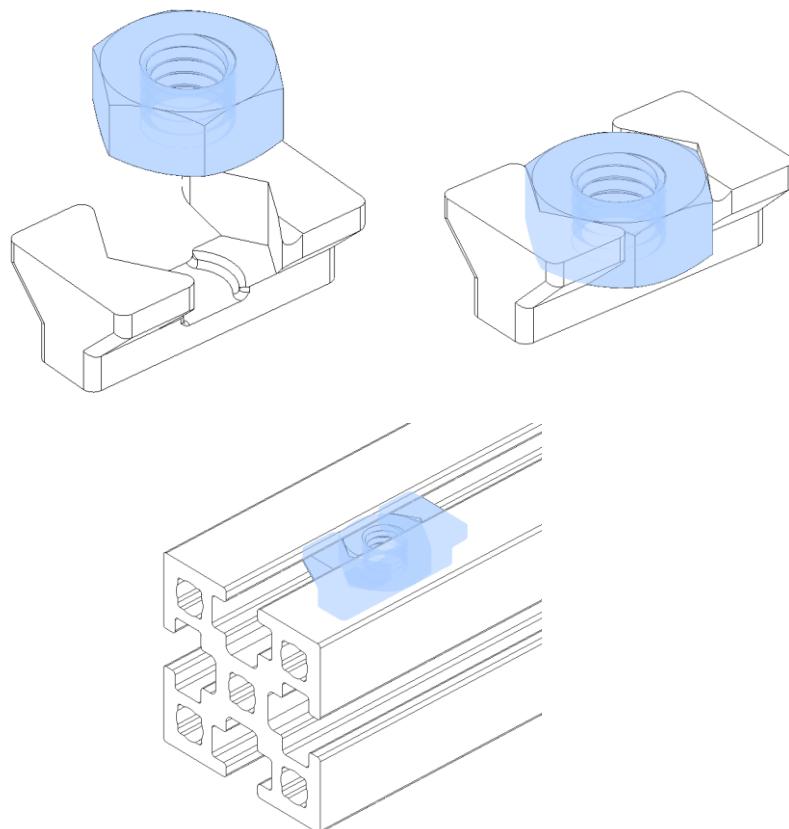
M3x8 BHCS

BLIND JOINTS

BLIND JOINT ASSEMBLY DESCRIPTION.

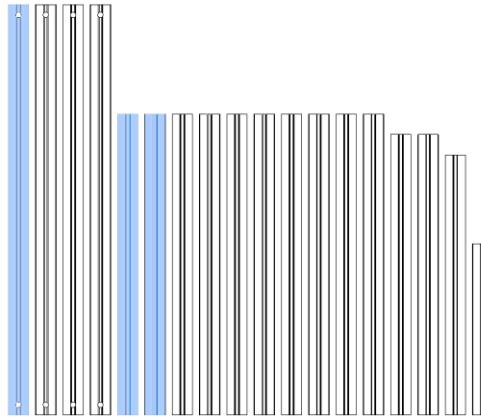
**NO DROP NUTS (OPTIONAL)**

To make it easier to align the preloaded nuts, you can use the printed holders referred to from now on as NDN that keep them from falling out.

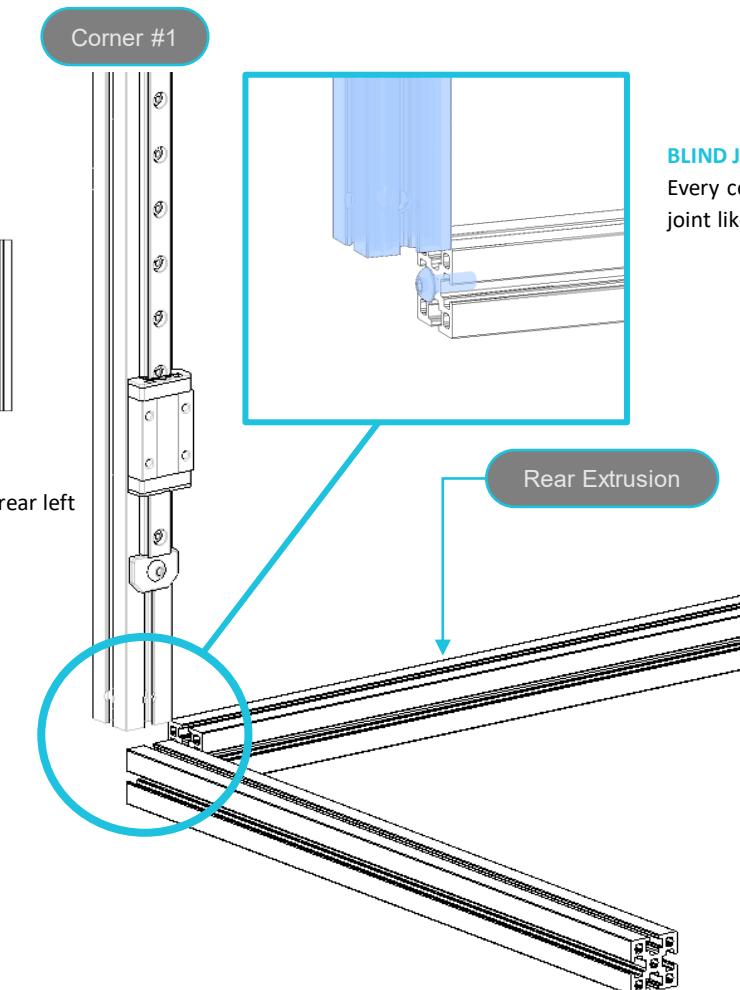


ASSEMBLE FIRST CORNER

MICRON



Corner #1

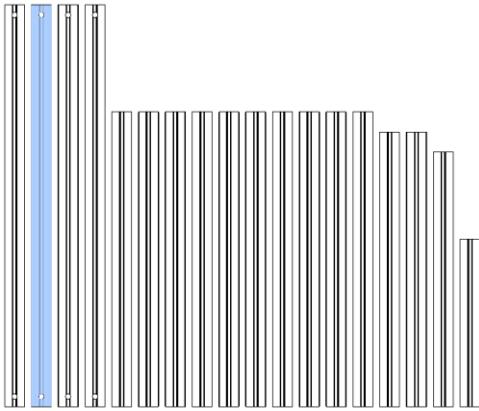


CORNER #1

Corner #1 will always be the rear left corner when referenced.

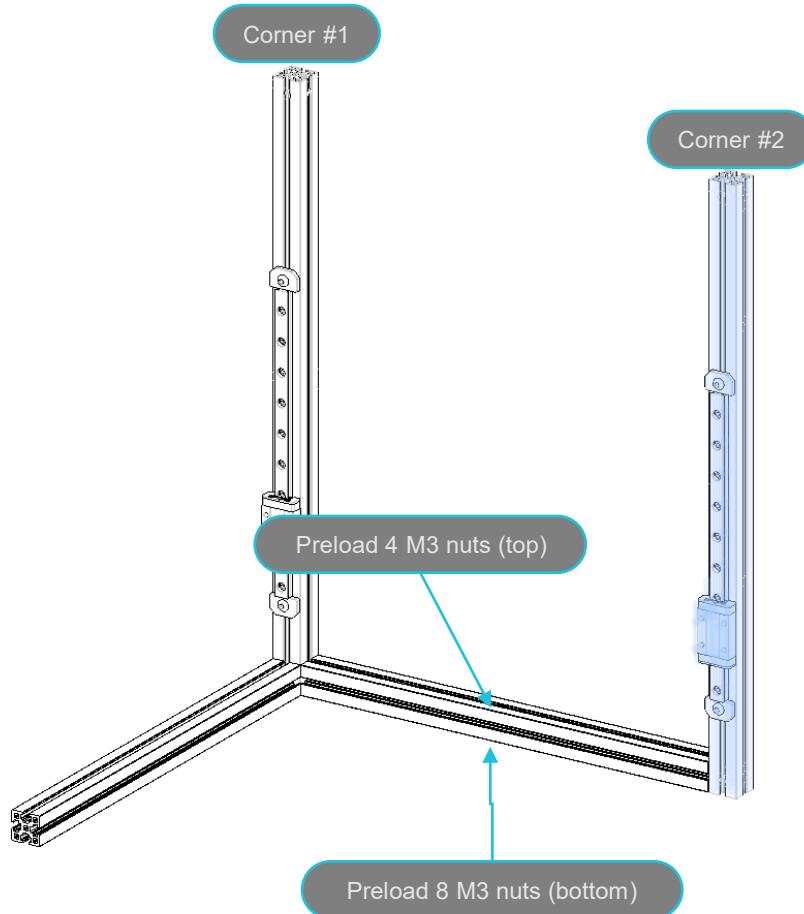
ASSEMBLE SECOND CORNER

MICRON

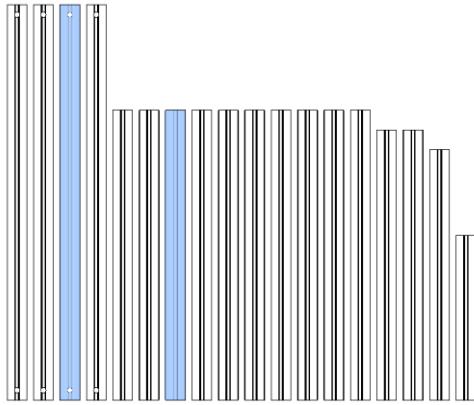


SECOND CORNER

Before attaching the 2nd vertical extrusion, you need to preload 4 m3 nuts on top, and 8 m3 nuts on the bottom of the extrusion.

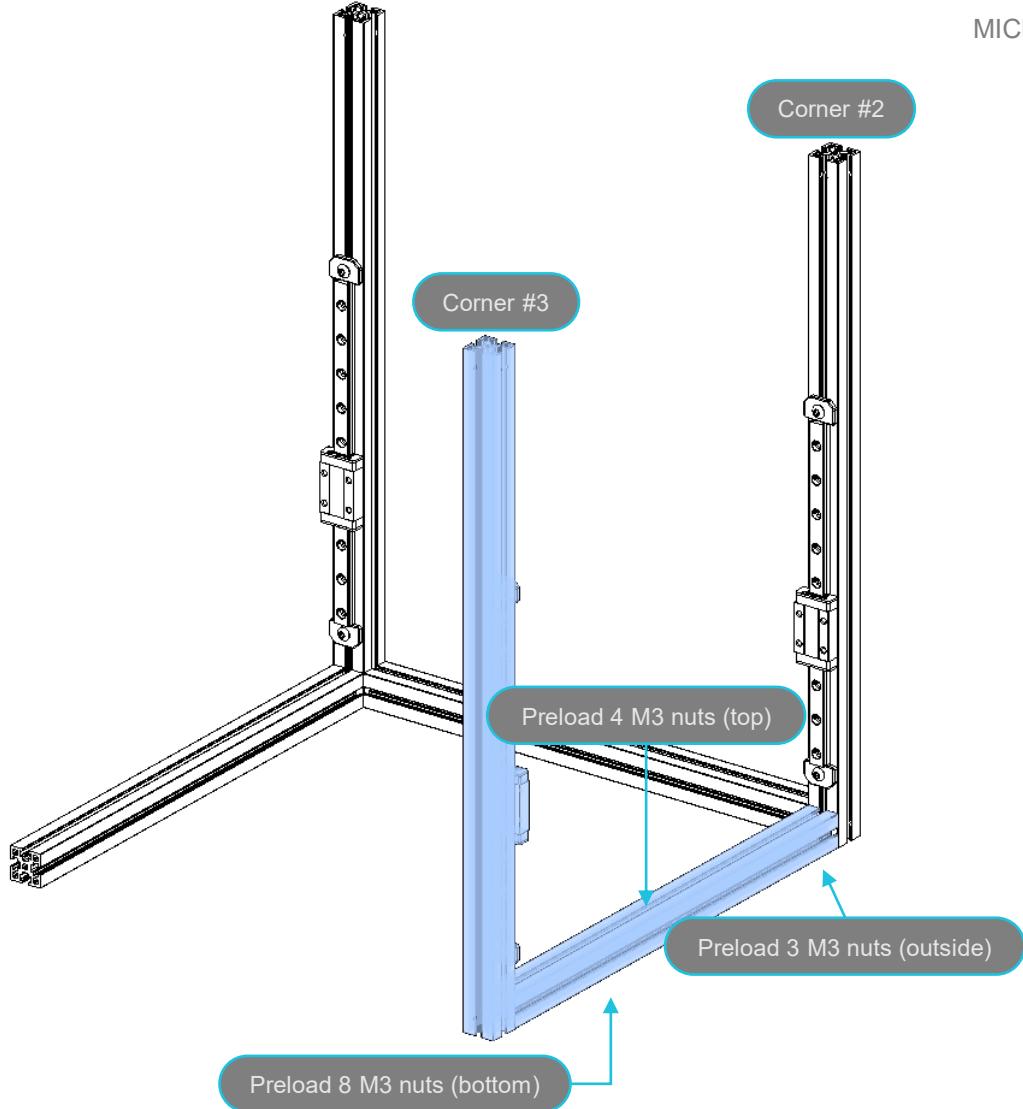


ASSEMBLE THIRD CORNER



Corner #1

MICRON

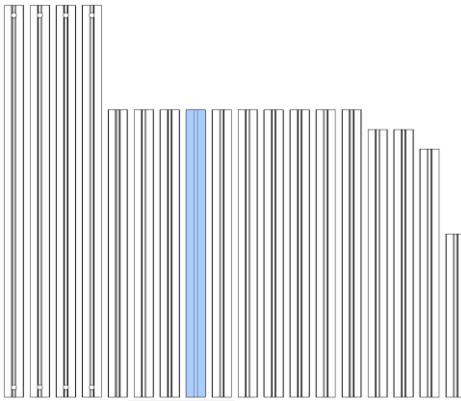


THIRD CORNER

In the same way to the previous step, the horizontal extrusion needs 4 m3 nuts on top and 8 m3 nuts on the bottom. In addition, you need 3 m3 nuts on the outside of the extrusion as well.

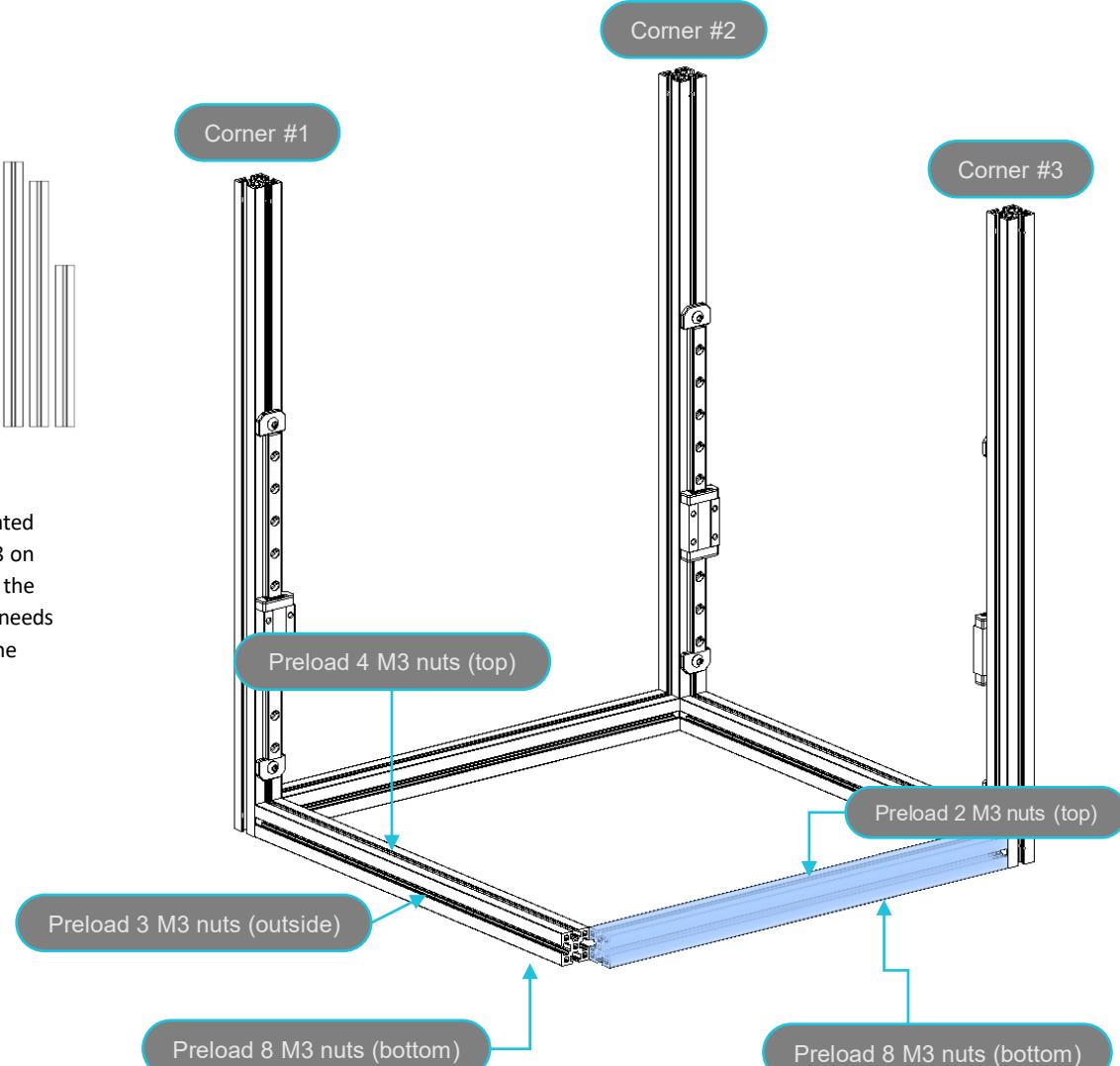
FINAL LOWER EXTRUSION

MICRON

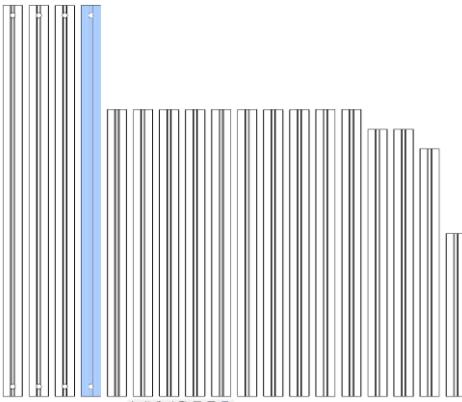


FINAL LOWER EXTRUSION

The final lower extrusion which is located on the front needs 2 on the top, and 8 on the bottom. You also need to preload the nuts in the first side extrusion, which needs 4 on top, 3 on the outside, and 8 on the bottom

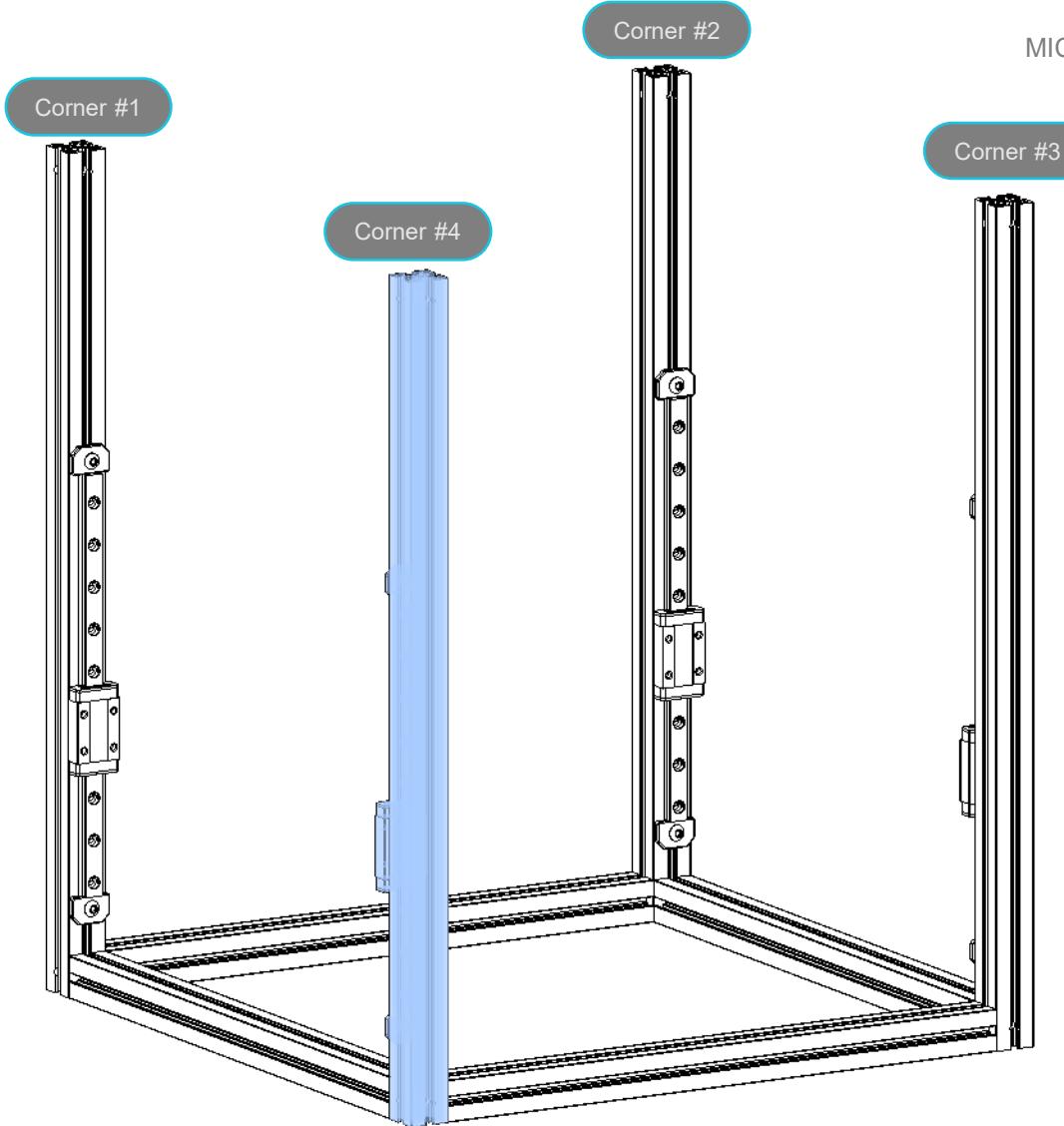


ASSEMBLE THE FOURTH CORNER

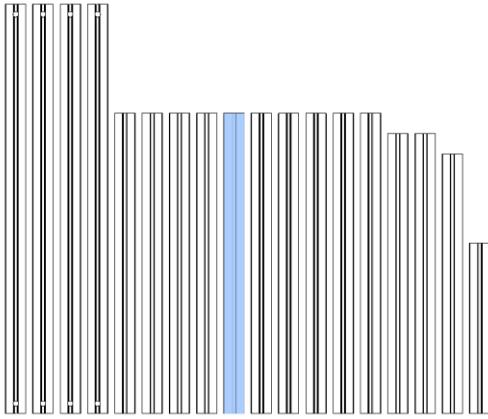


FOURTH CORNER

The final vertical extrusion will now be installed.



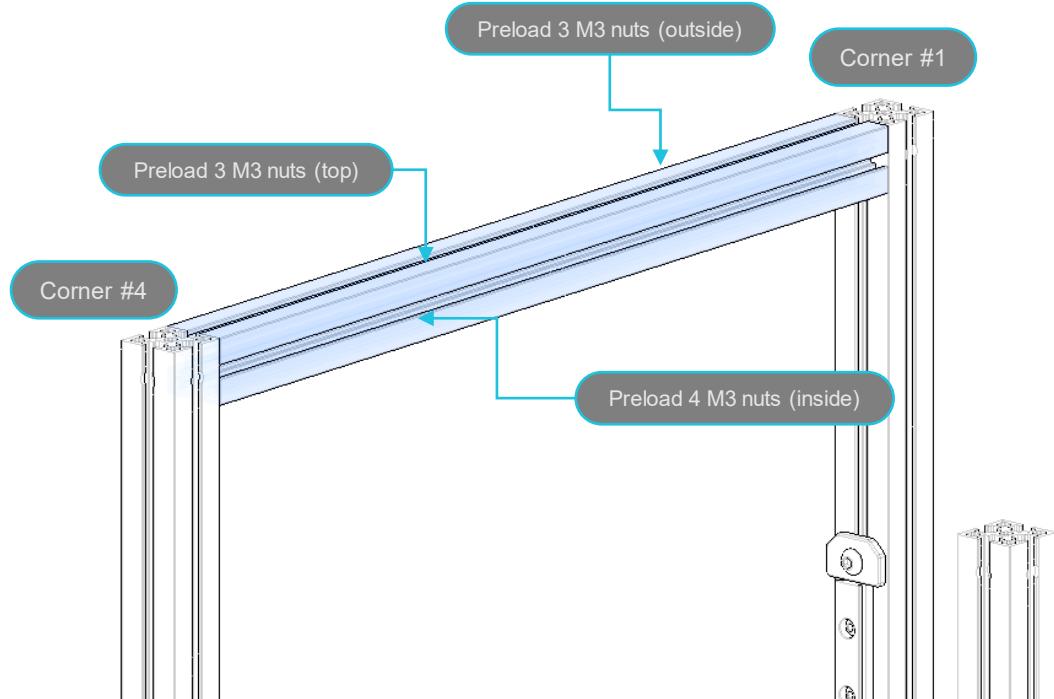
TOP OF FRAME



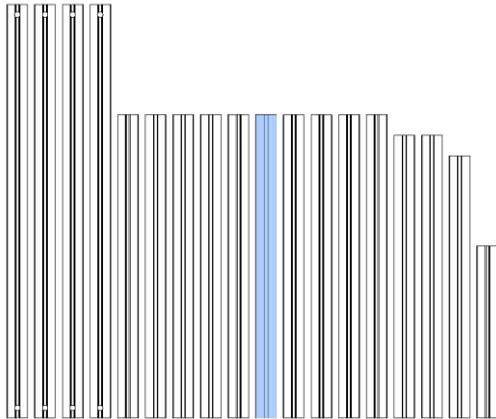
TOP OF FRAME

The first of the top extrusions needs 4 nuts on the inside, 3 on top, and 3 on the outside.

MICRON



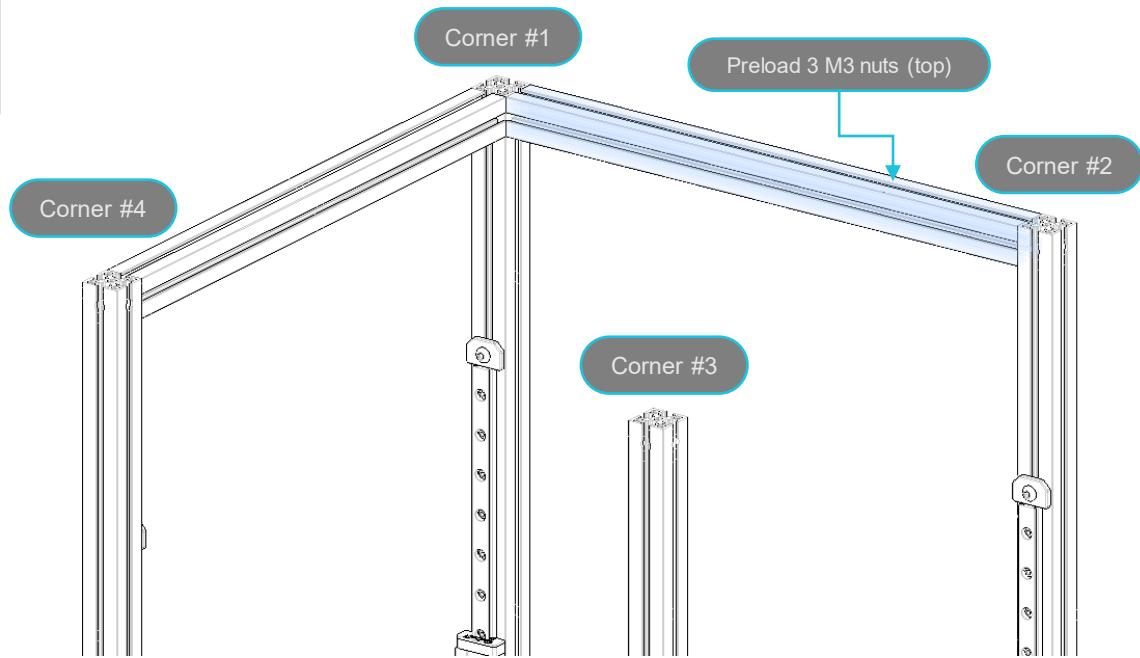
TOP OF FRAME



MICRON

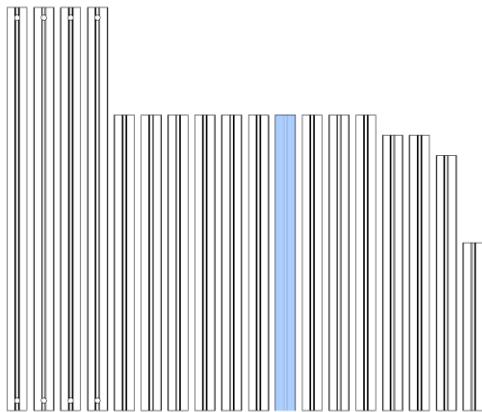
TOP OF FRAME

The rear of the top extrusions needs only 3 nuts in the top of it



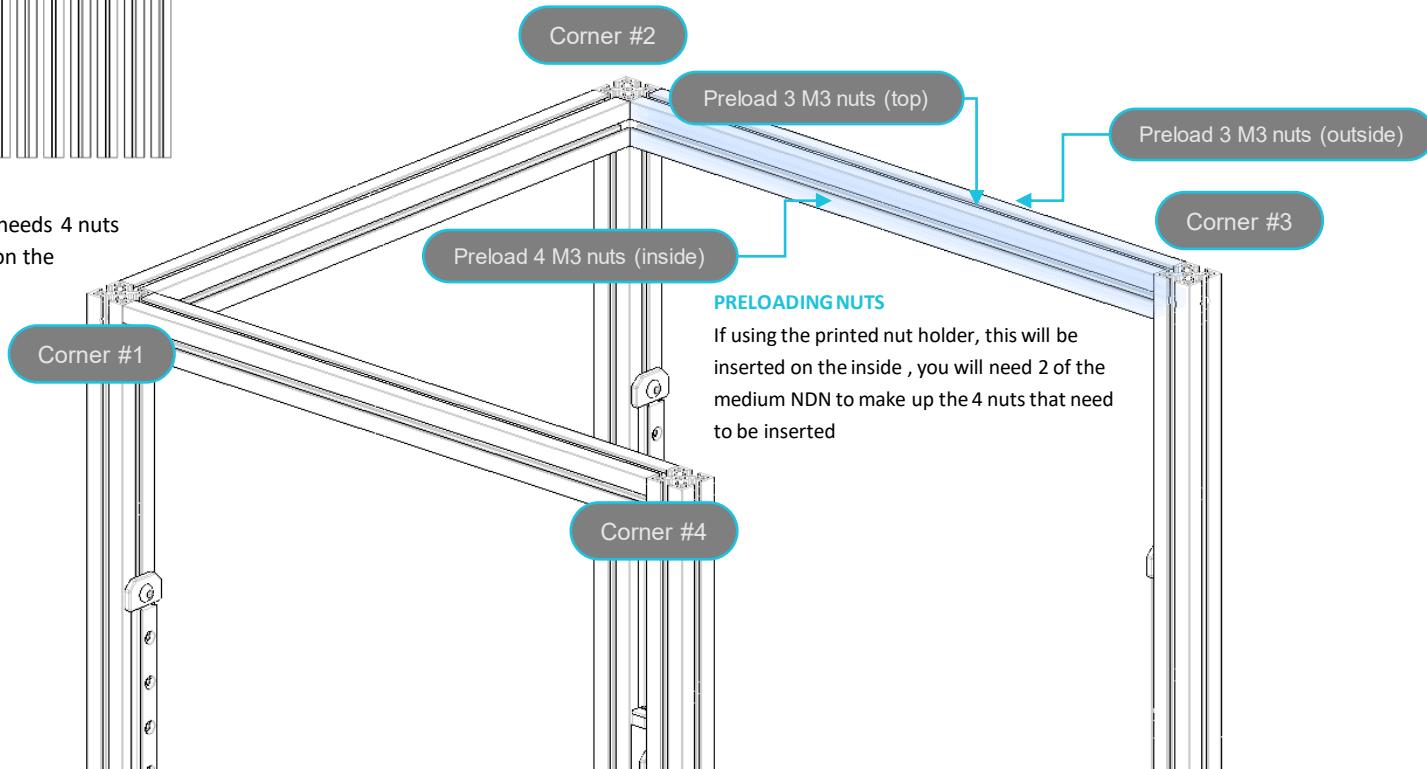
TOP OF FRAME

MICRON

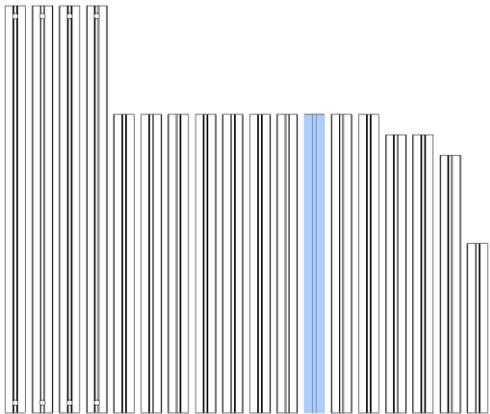


TOP OF FRAME

The first of the top extrusions needs 4 nuts on the inside, 3 on top, and 3 on the outside.



FRAME



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TOP OF FRAME

The final top extrusion requires 3 preloaded nuts

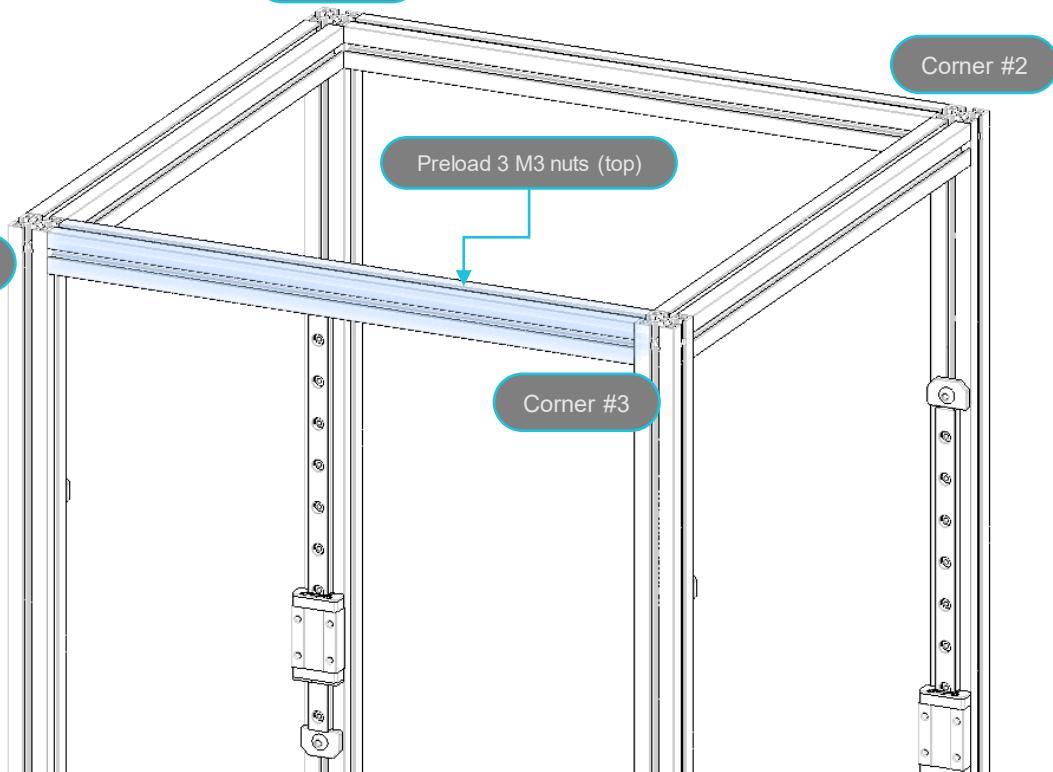
Corner #4

Corner #1

Corner #2

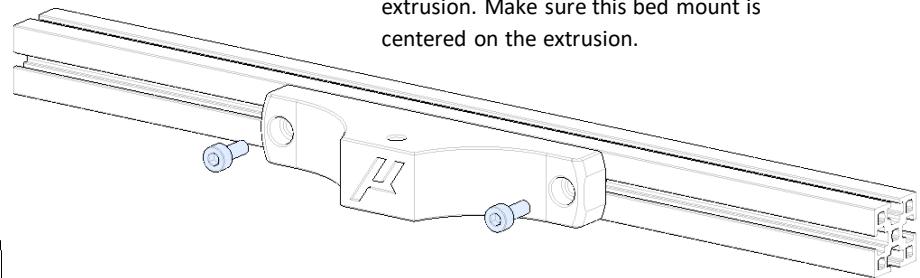
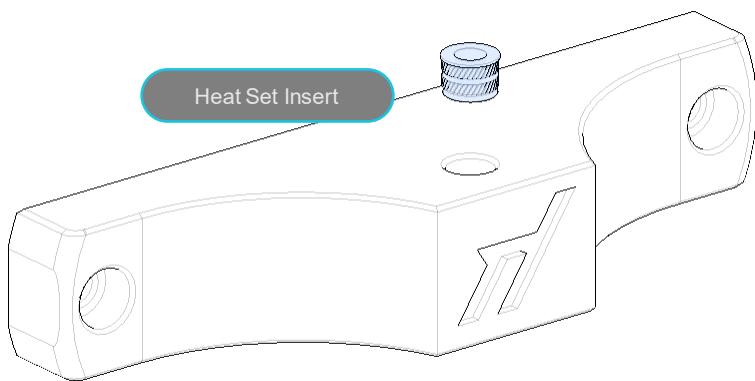
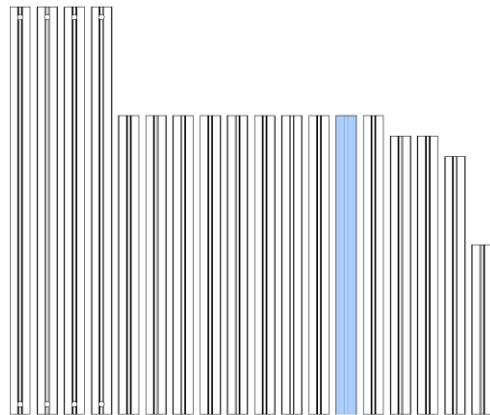
Preload 3 M3 nuts (top)

Corner #3



FRONT BED MOUNT

MICRON

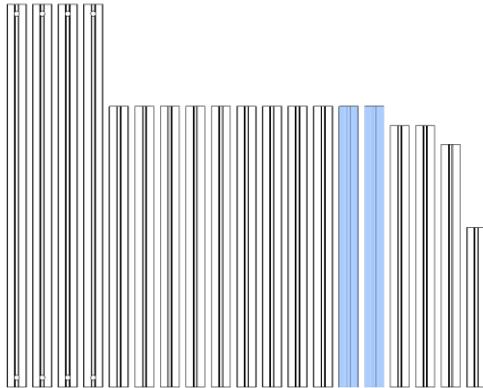


FRONT BED MOUNT

After the heat set has been inserted, make sure that is mounted in the center of the extrusion. Make sure this bed mount is centered on the extrusion.

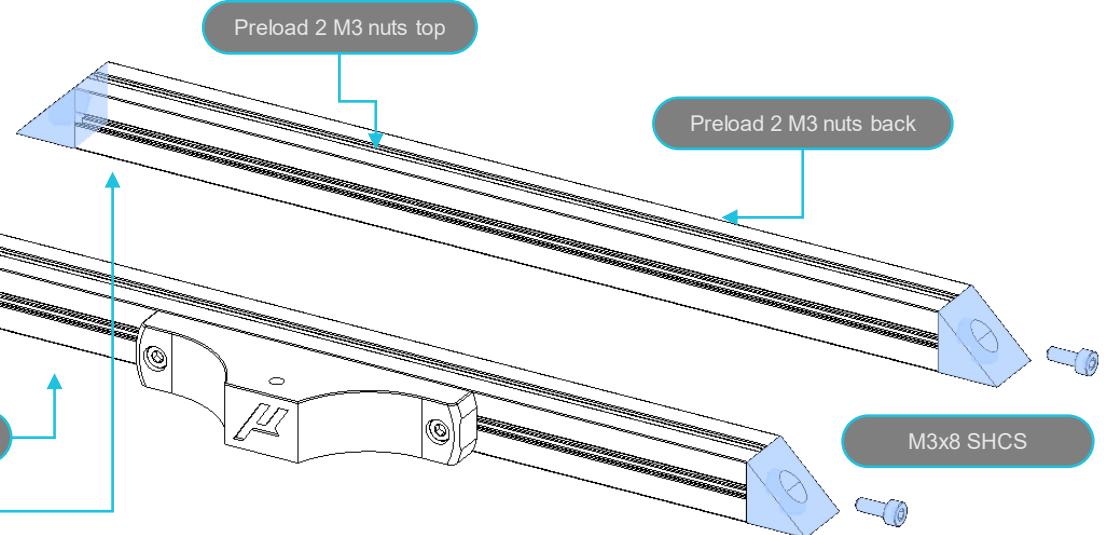
BED EXTRUSIONS

MICRON



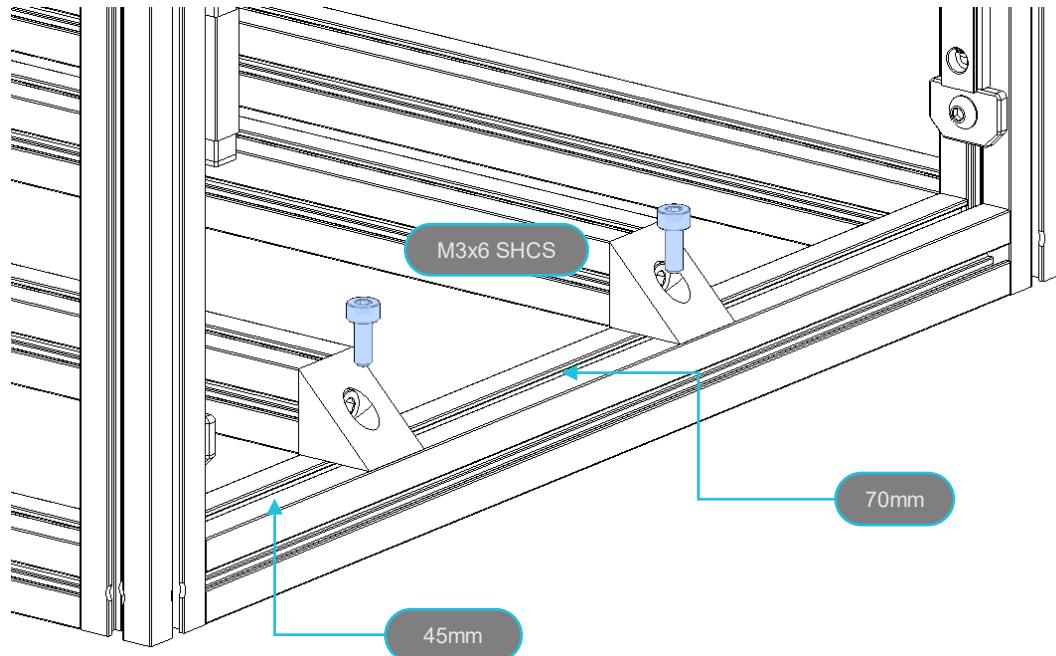
BED EXTRUSIONS

Before you attach the 4 angled brackets, you need to make sure you preload all the M3 nuts. Then screw in the 1515 angled brackets to the ends of both bed extrusions using M3x8 SHCS



BED EXTRUSIONS

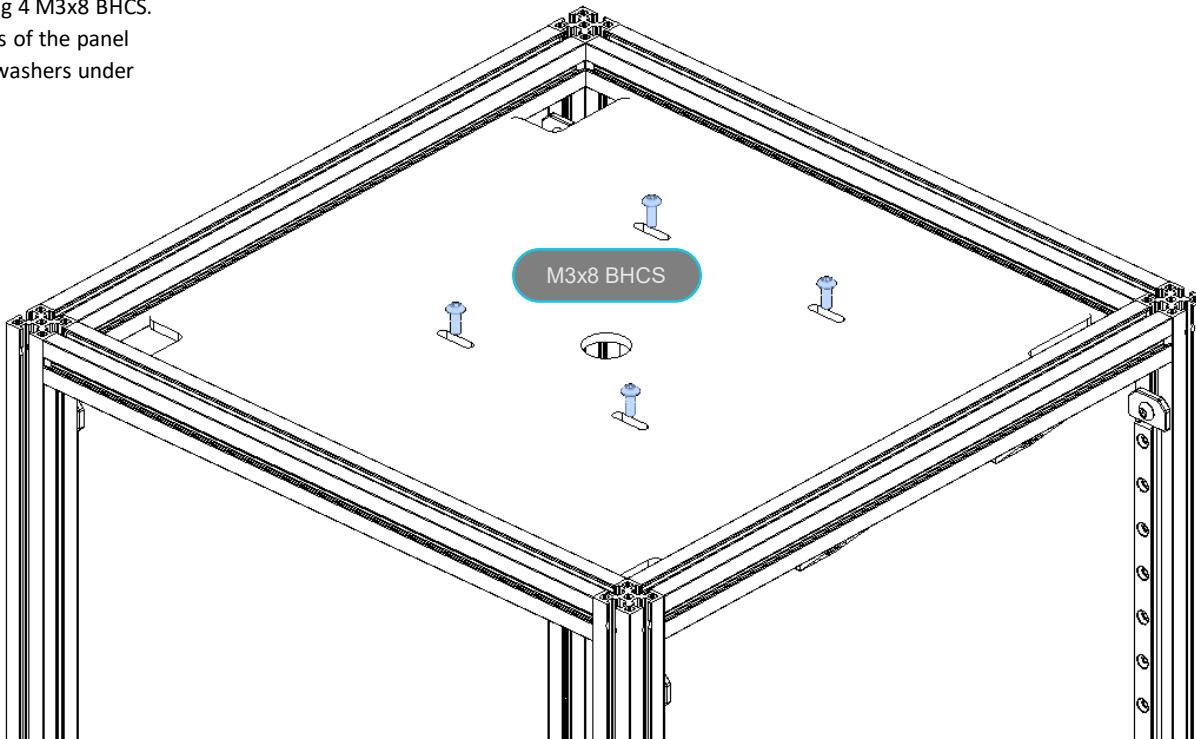
Mount the bed extrusion as shown, making sure to space them out 45mm from the front and then 70mm apart



DECK PANEL

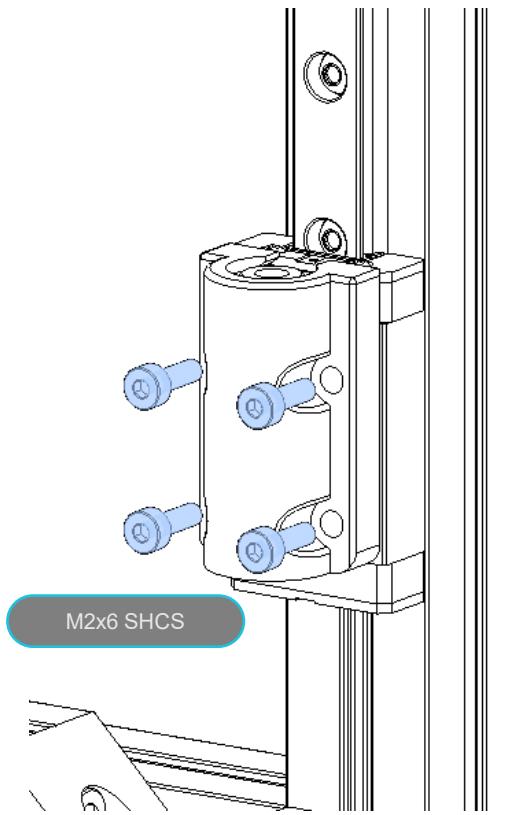
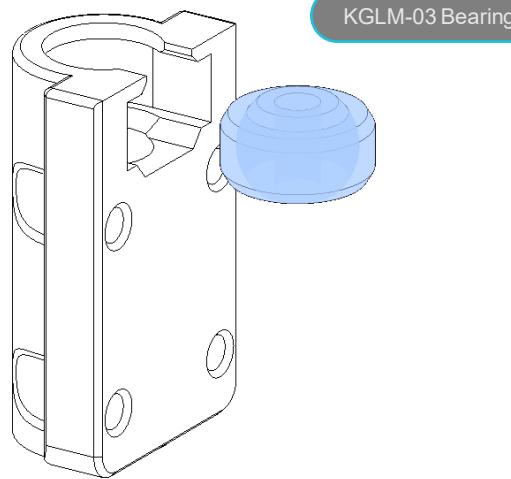
Install the deck panel , using 4 M3x8 BHCS.

Depending on the thickness of the panel
you may or may not need washers under
the screws



Z JOINTS

Install the 4 KGLM-03 bearings into the printed part. Attach these to the Z rail carriages using 4 M2x6 SHCS

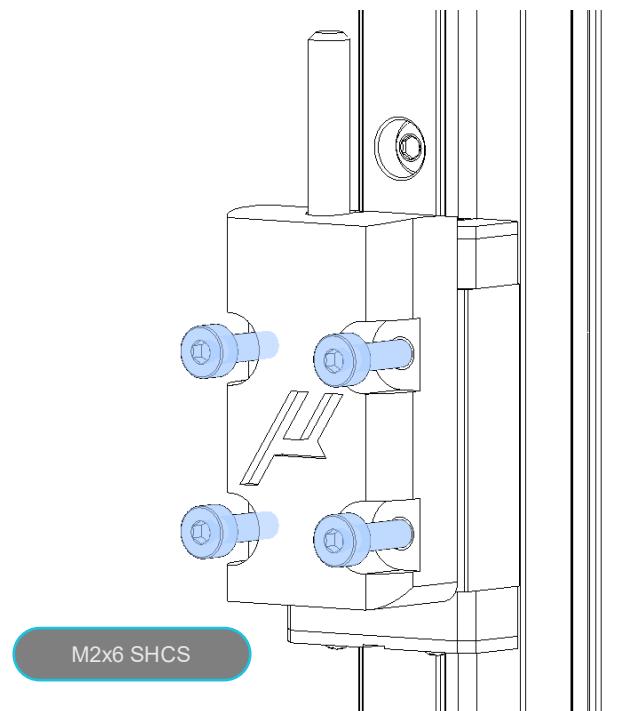
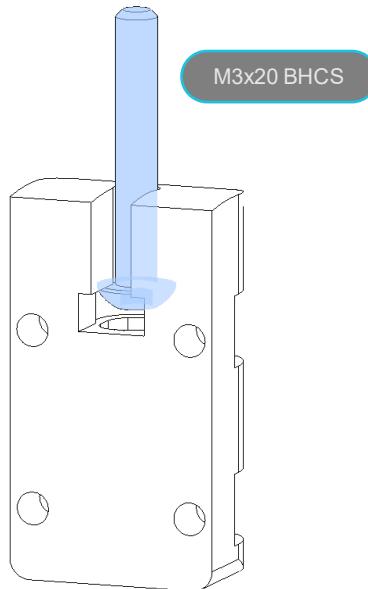


Z JOINTS (Option 2)

MICRON

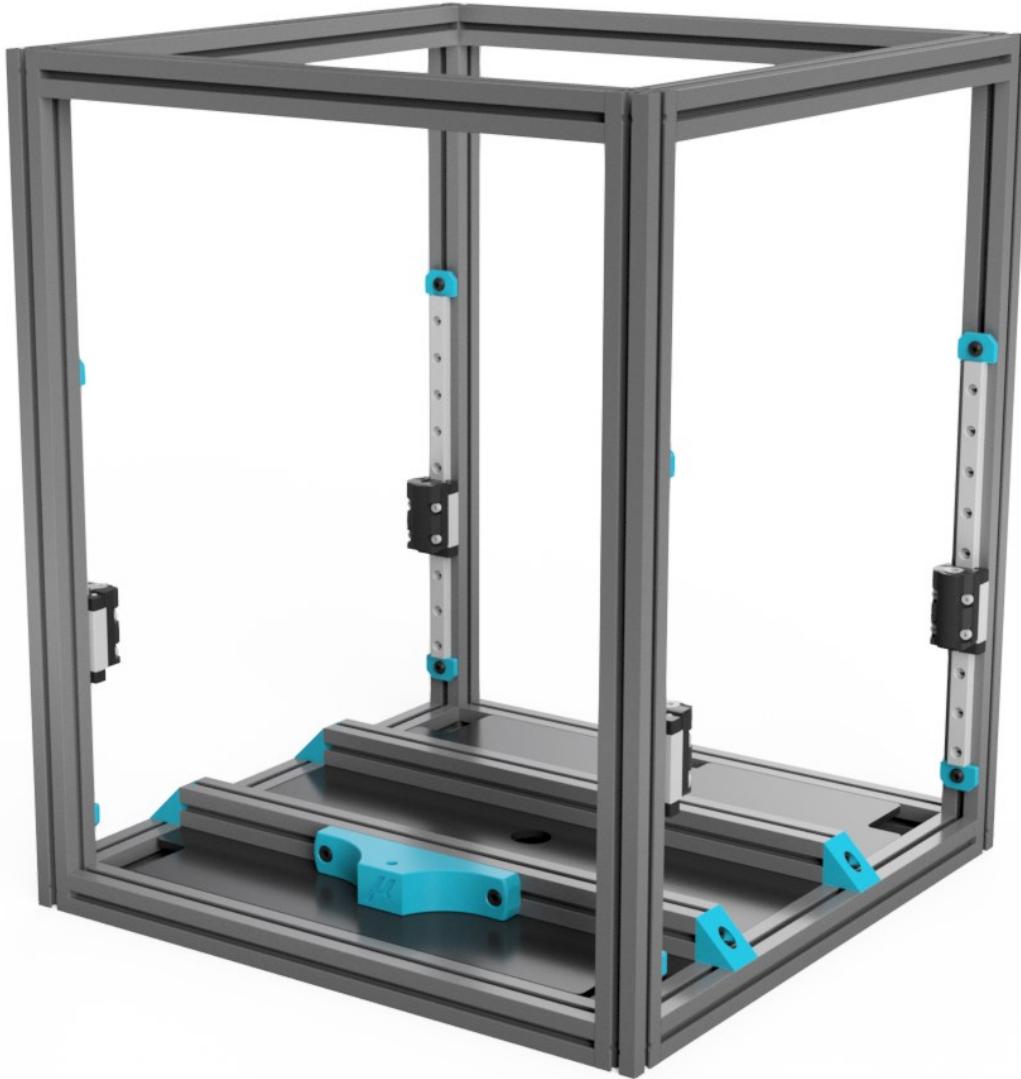
Z JOINTS

Attach these to the Z rail carriages using 4
M2x6 SHCS



FRAME

MICRON

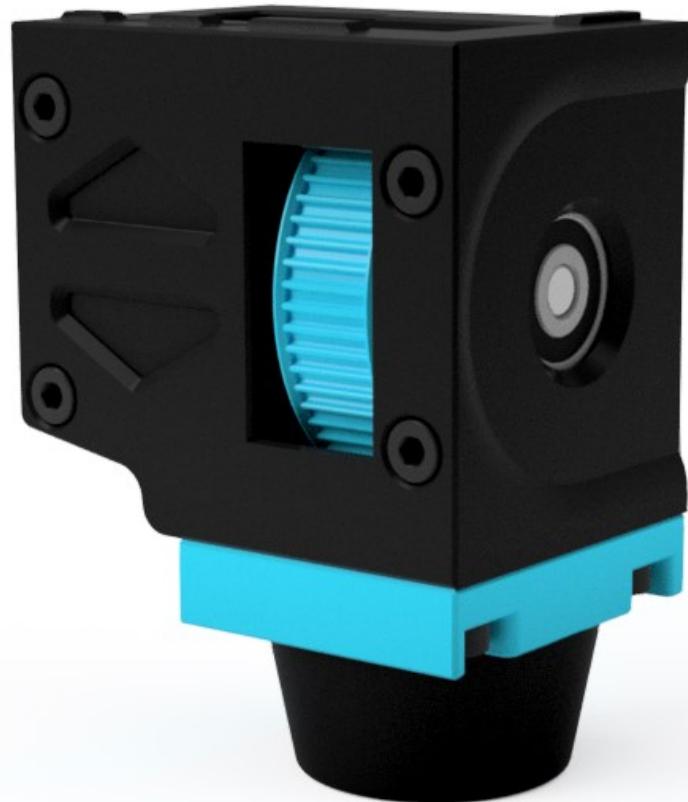


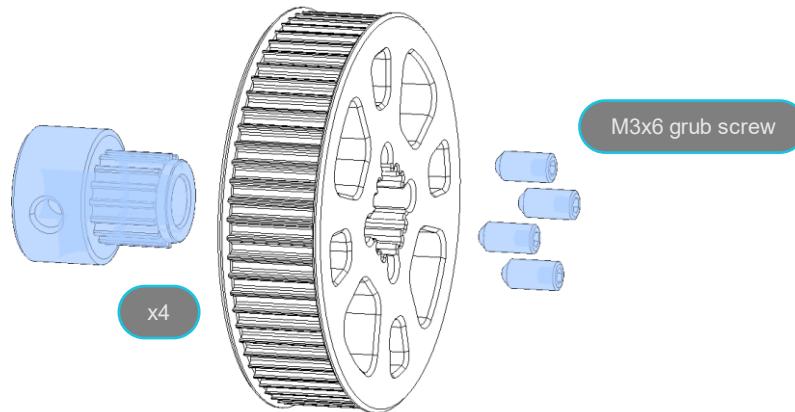
FRAME

At this point your frame should be looking like this.

Z DRIVES

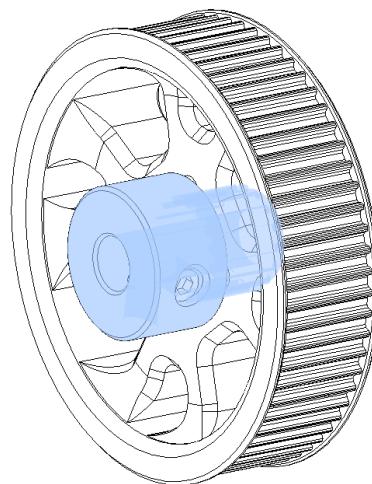
MICRON





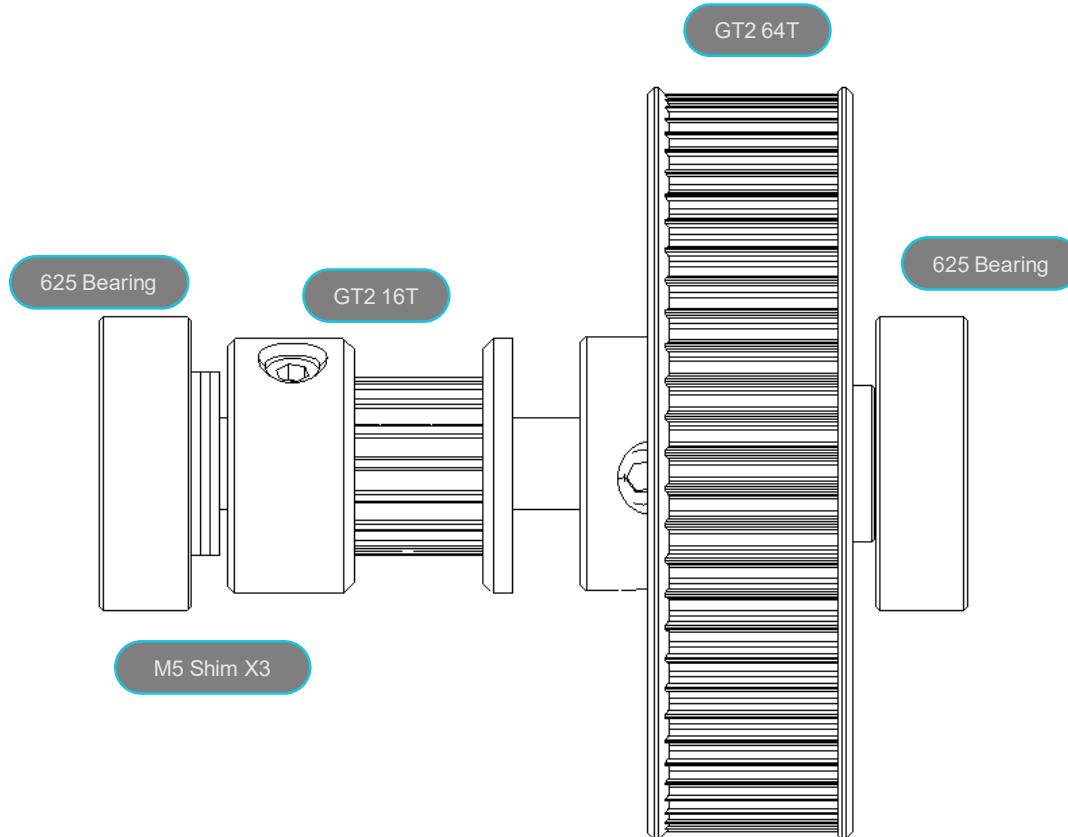
ASSEMBLING 64T PULLEY

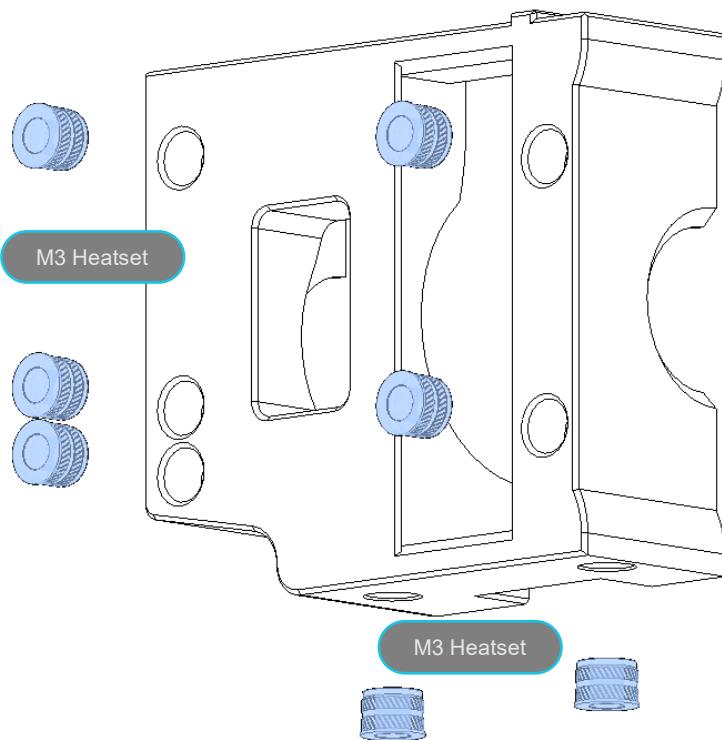
Assembly of the printed 64T pulley is simple. Observe that one side of the printed part is flat, and the other concave. Insert a deflanged 16T pulley into the socket on the concave side of the printed part, as shown below. Use 4 M3x6 grub screws to lock the two components together. Repeat for all 4 64T gears.



Z DRIVE SHAFT ASSEMBLY

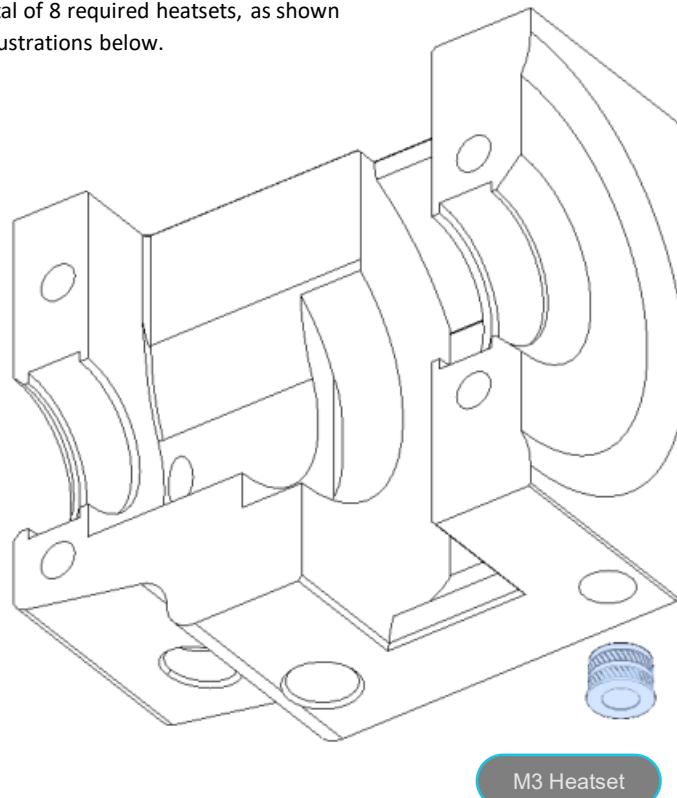
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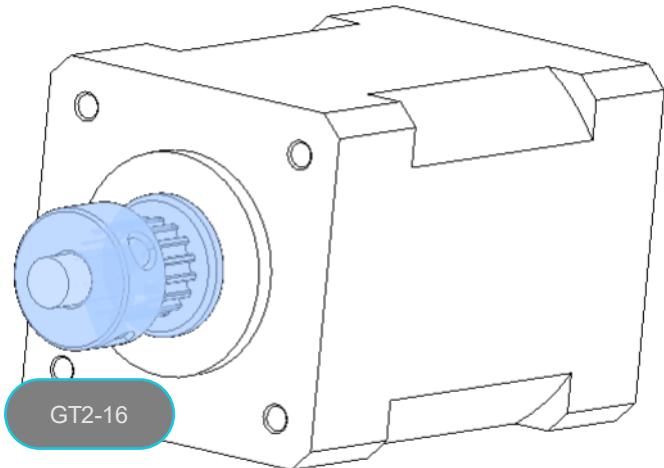
Z DRIVE ASSEMBLY

Begin by installing the heatset inserts into the Z drive parts. Each pair of Z drive halves has a total of 8 required heatsets, as shown in the illustrations below.



Z MOTOR PULLEY ASSEMBLY

MICRON

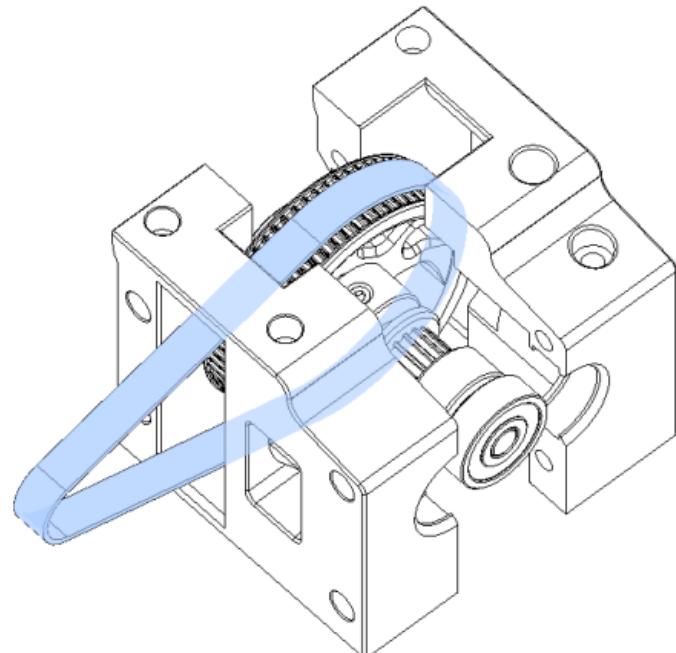


Z MOTOR PULLEY

To continue with the Z drive assembly, attach a GT2 16T pulley as shown to each of the 4 Z motors. Tighten one of the set screw just tight enough to keep the pulleys from falling off. DO NOT USE LOCTITE AT THIS POINT! We will determine the precise positioning of these pulleys once the motors are mounted to the printer. For now, we are just putting the pulleys in place, so we don't have to slide them on to mounted motors.

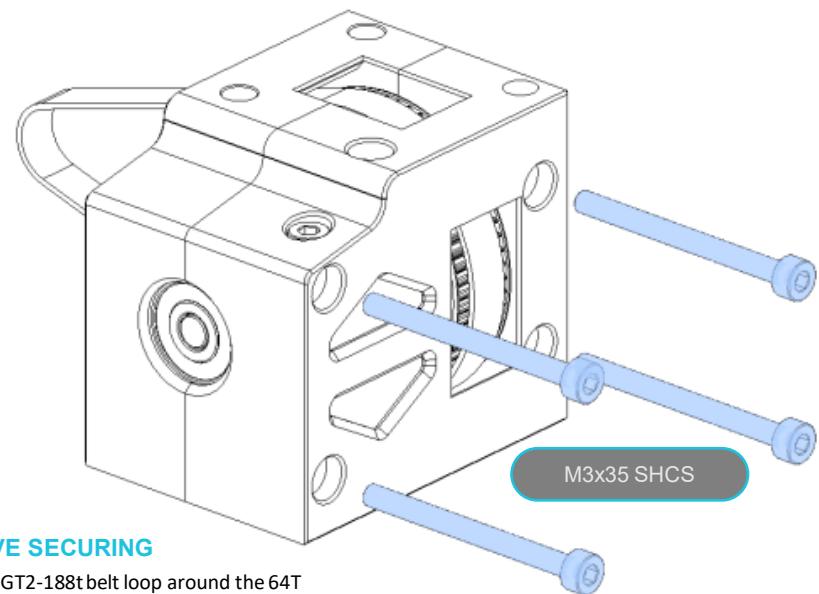
Z DRIVE ASSEMBLY

MICRON



Z DRIVE BELT

Add the GT2-188t belt loop around the 64T pulley before closing it off.

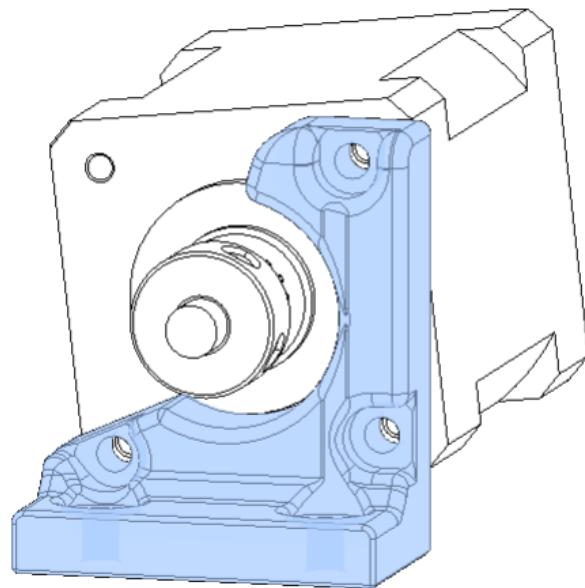


Z DRIVE SECURING

Add the GT2-188t belt loop around the 64T pulley before closing it off.

Z MOTOR MOUNT

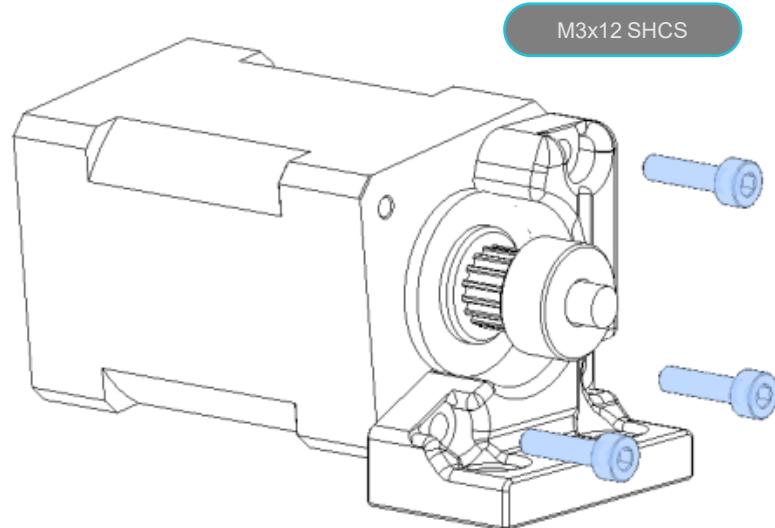
MICRON



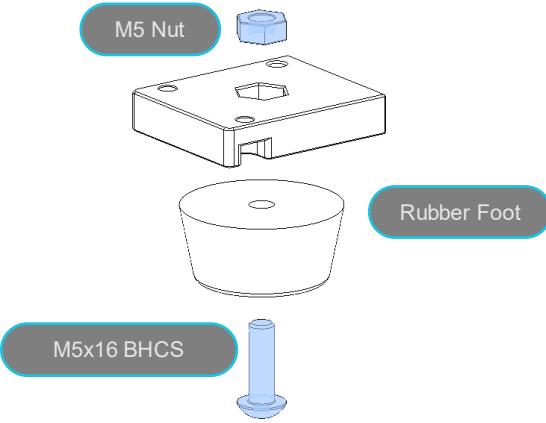
Z MOTOR MOUNT

Z motor mount is best used with the wires for the z to be facing down or towards the inside of the printer

Note: The motor is on a slight angle in relation to the motor mount.

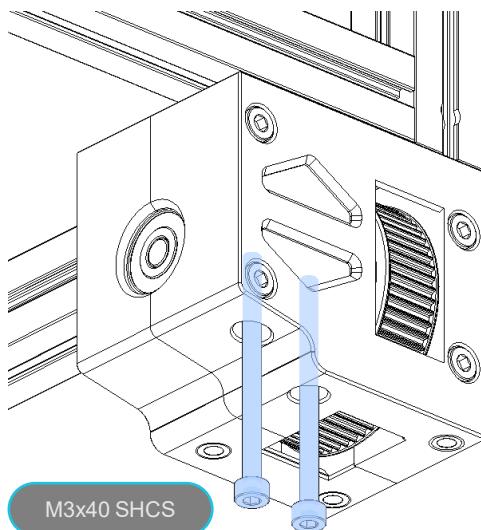


Z DRIVES MOUNTING



FEET ASSEMBLY

To assemble the Z drive cap / feet, you need to insert an M5 nut into the drive cover



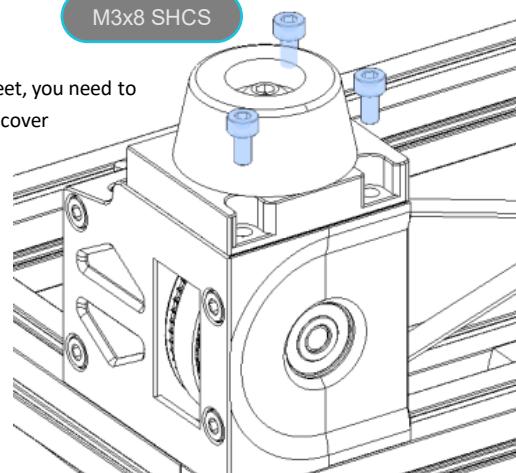
Z DRIVE MOUNT

Z Drive is mounted using the new M3x40 bolts. If you installed the printed NDN nut holder then this is where you will use that to secure the drive housing.

MICRON

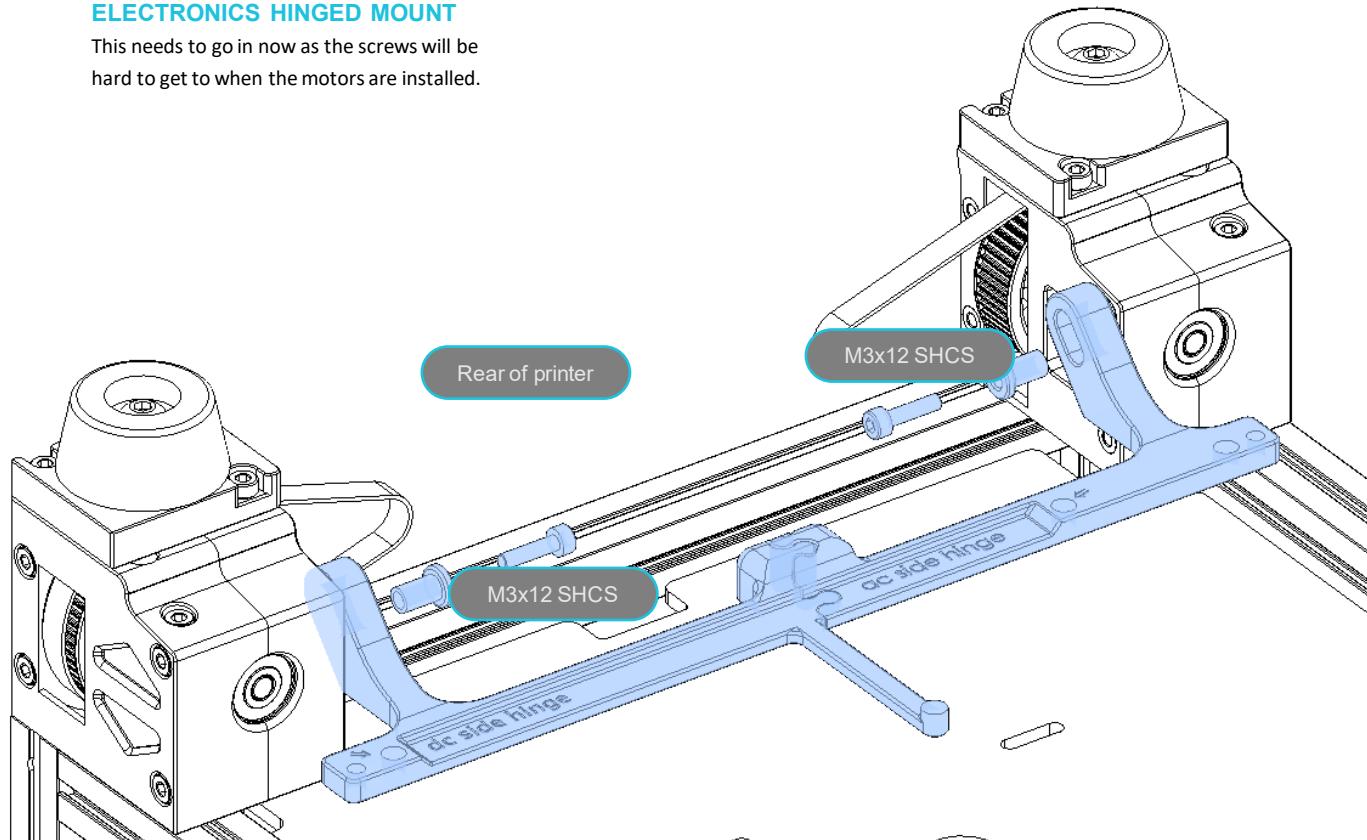
FEET ASSEMBLY

To assemble the Z drive cap / feet, you need to insert an M5 nut into the drive cover



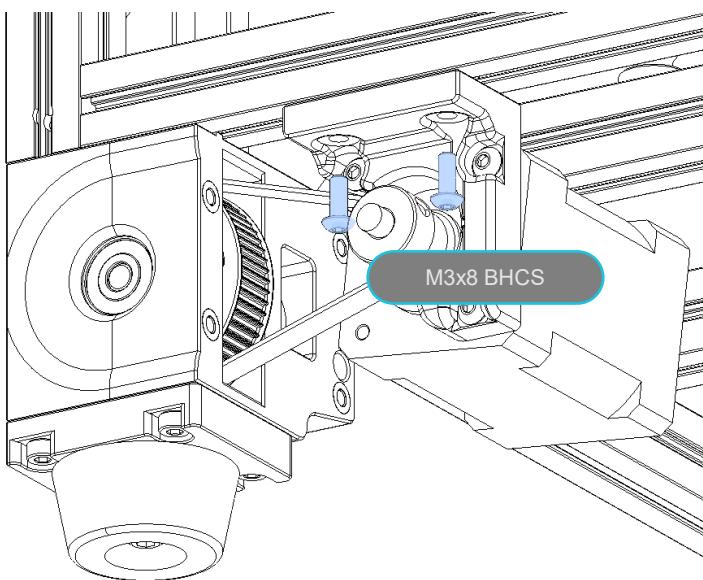
ELECTRONICS HINGED MOUNT

This needs to go in now as the screws will be hard to get to when the motors are installed.



Z MOTOR MOUNTING

MICRON



Z MOTOR MOUNTING

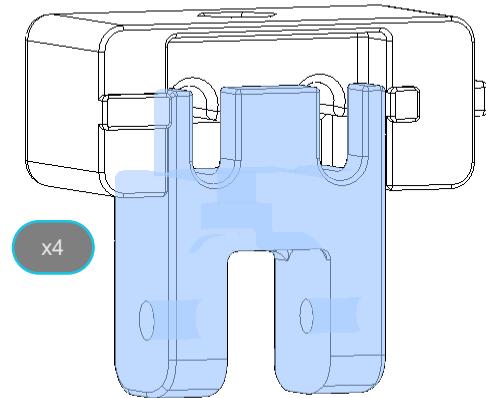
Using 2 M3x8 BHCS and the printed nut holder on this side attach the Z motor. This is when you will tension the 188 tooth belt loop. The motor should be

Z IDLERS

MICRON

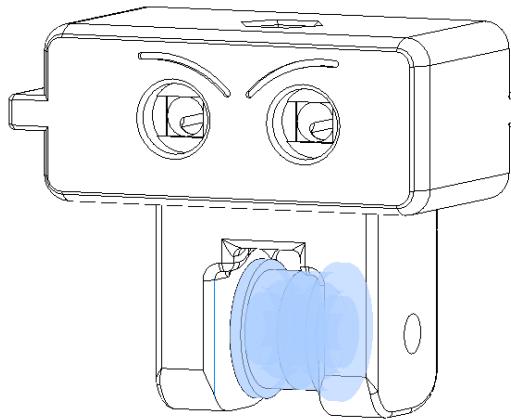
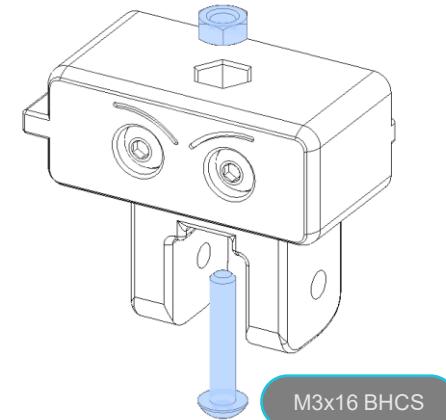


Z IDLERS



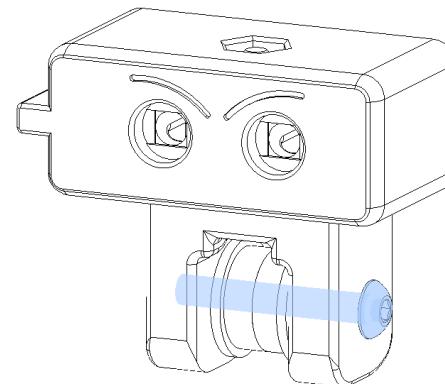
Z TENSIONER

Slide the tensioner into the main body securing them together with an M3x16 BHCS and M3 hex nut.



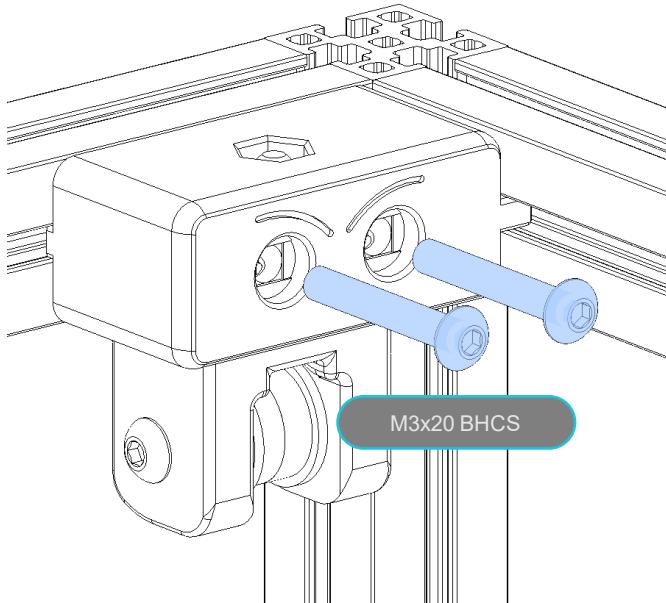
Z TENSIONER PULLEY

Take the F623 bearing stack and place them between the idler securing them using an M3x20. Note the direction the screw is going.



MICRON

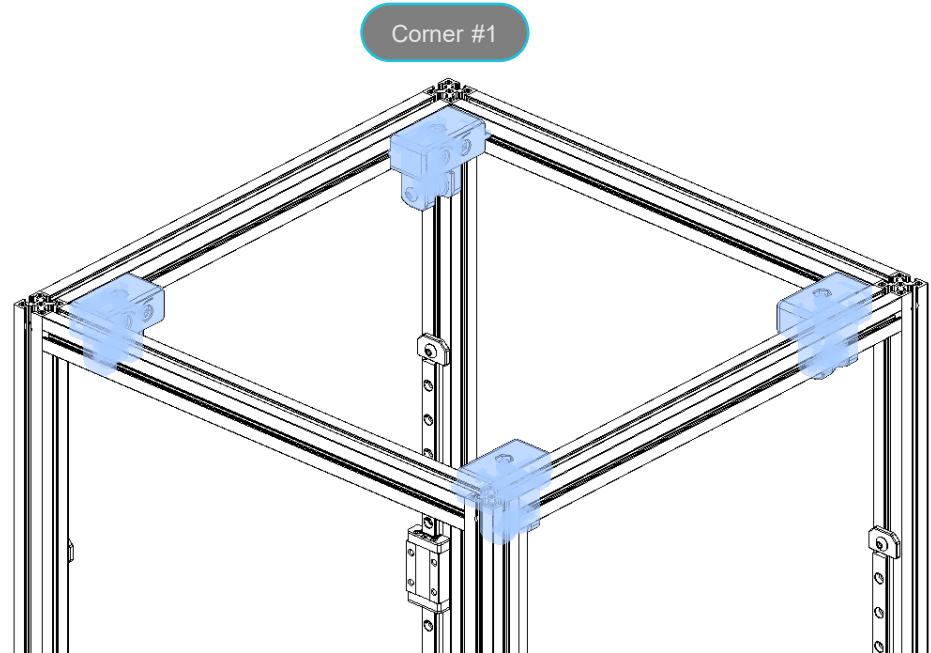
Z IDLERS



Z IDLER MOUNTING

mounting the Z idlers on the top of the frame along the side extrusion. These can be mounted using the printed nut holders as well.

MICRON



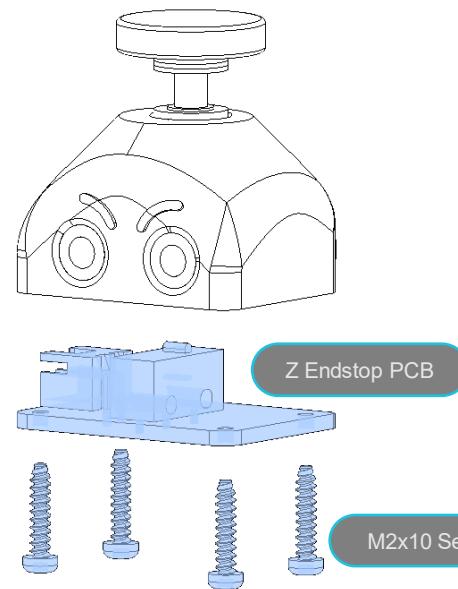
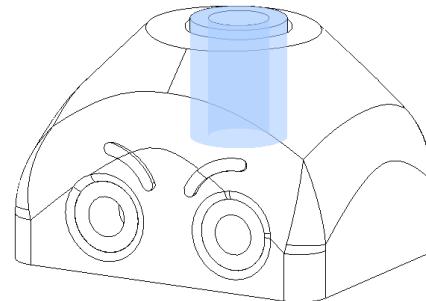
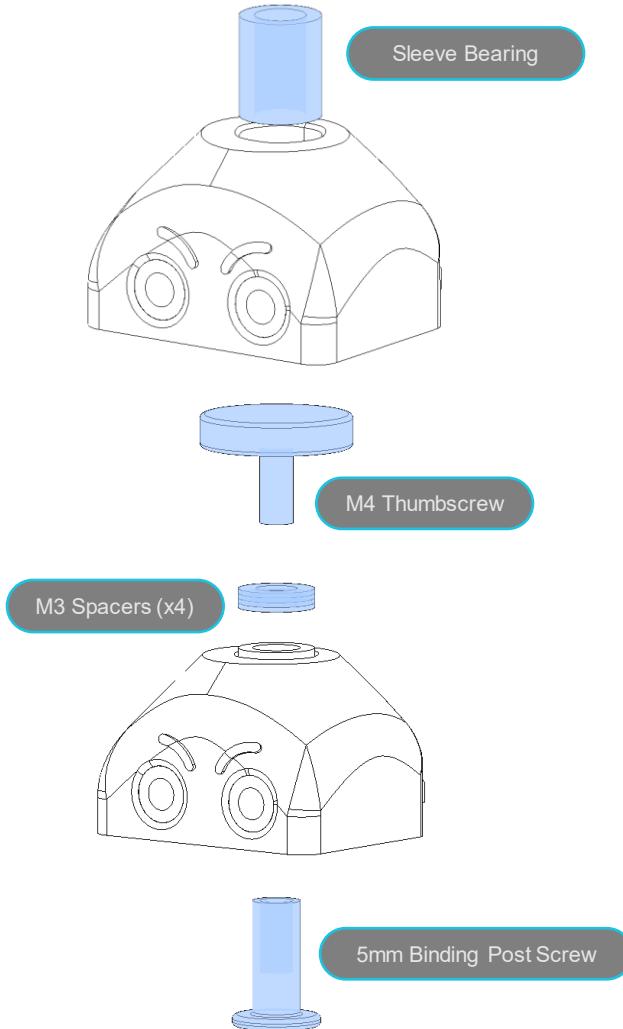
Z ENDSTOP

MICRON



Z ENDSTOP ASSEMBLY

MICRON

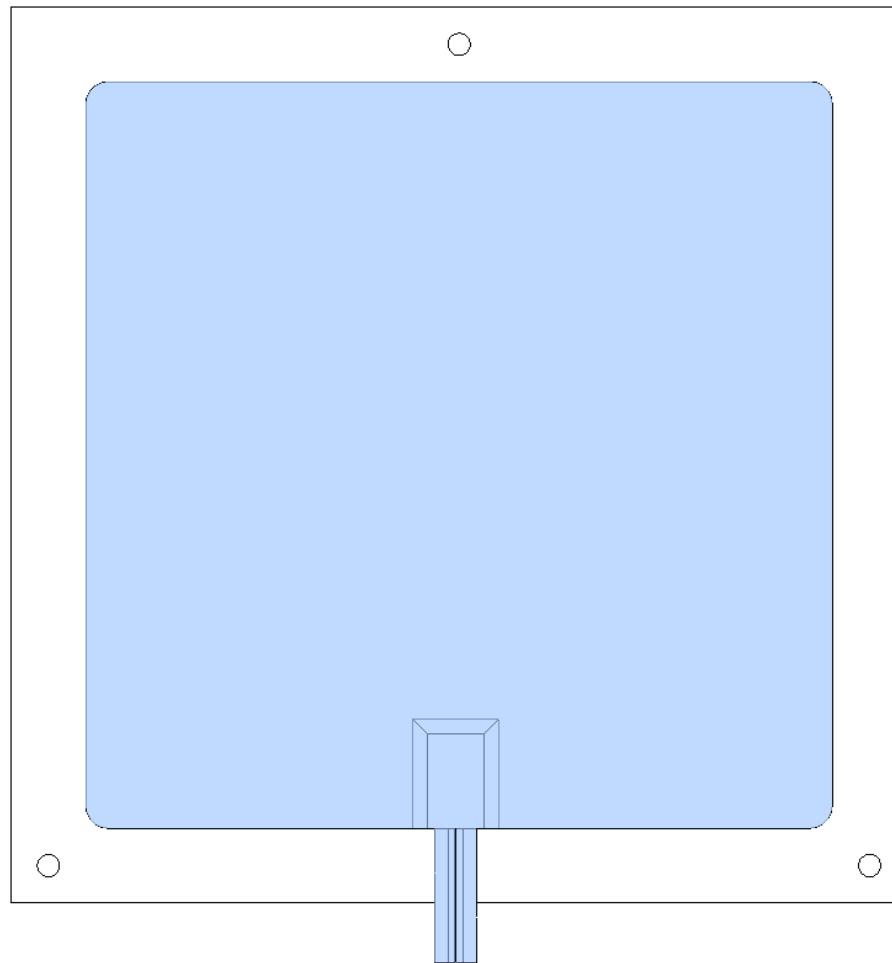


BED HEATER

MICRON

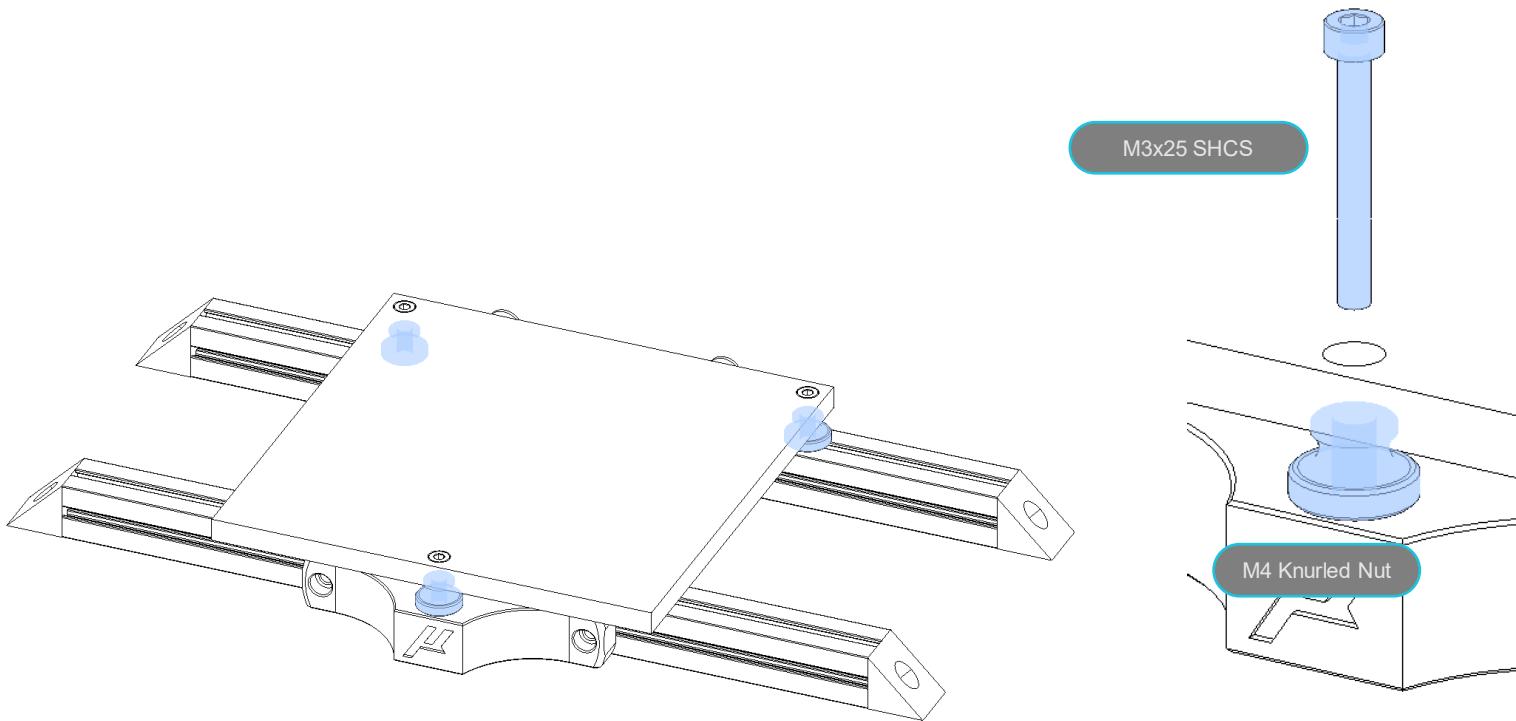
BED HEATER

The bed uses a silicone heater this can be powered by either AC mains voltage or DC 24v. Make sure if you use an AC mains voltage bed to add a ground wire as well as a thermal fuse in line on the L line of the mains wiring.



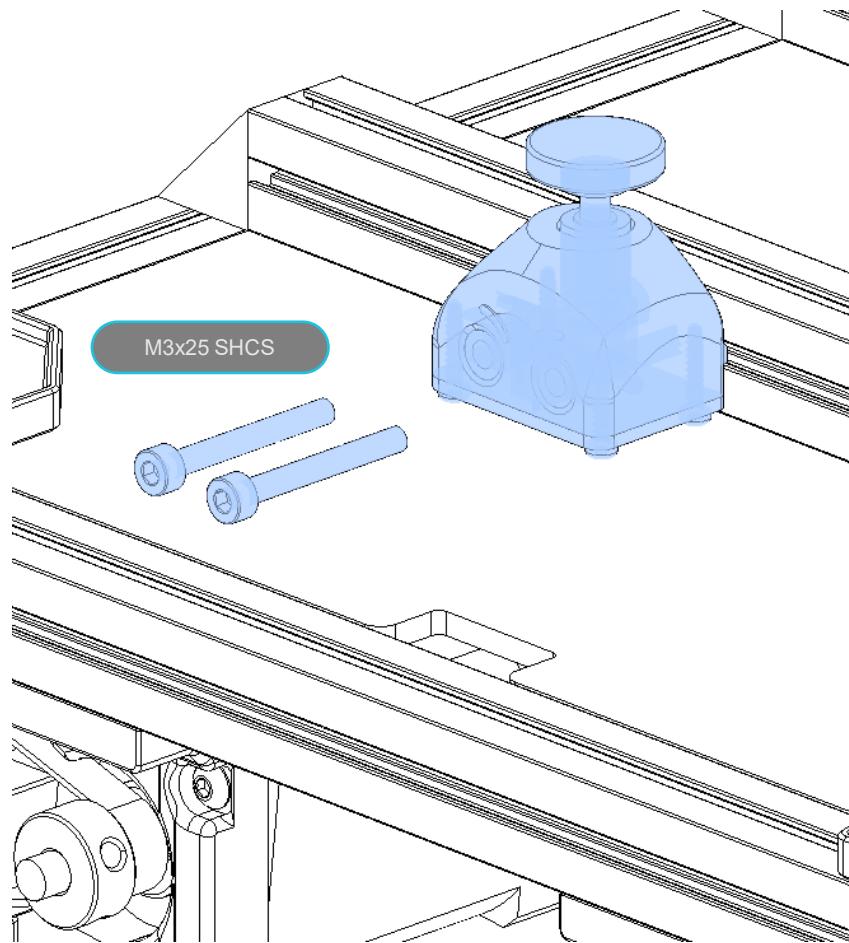
BED ASSEMBLY

MICRON



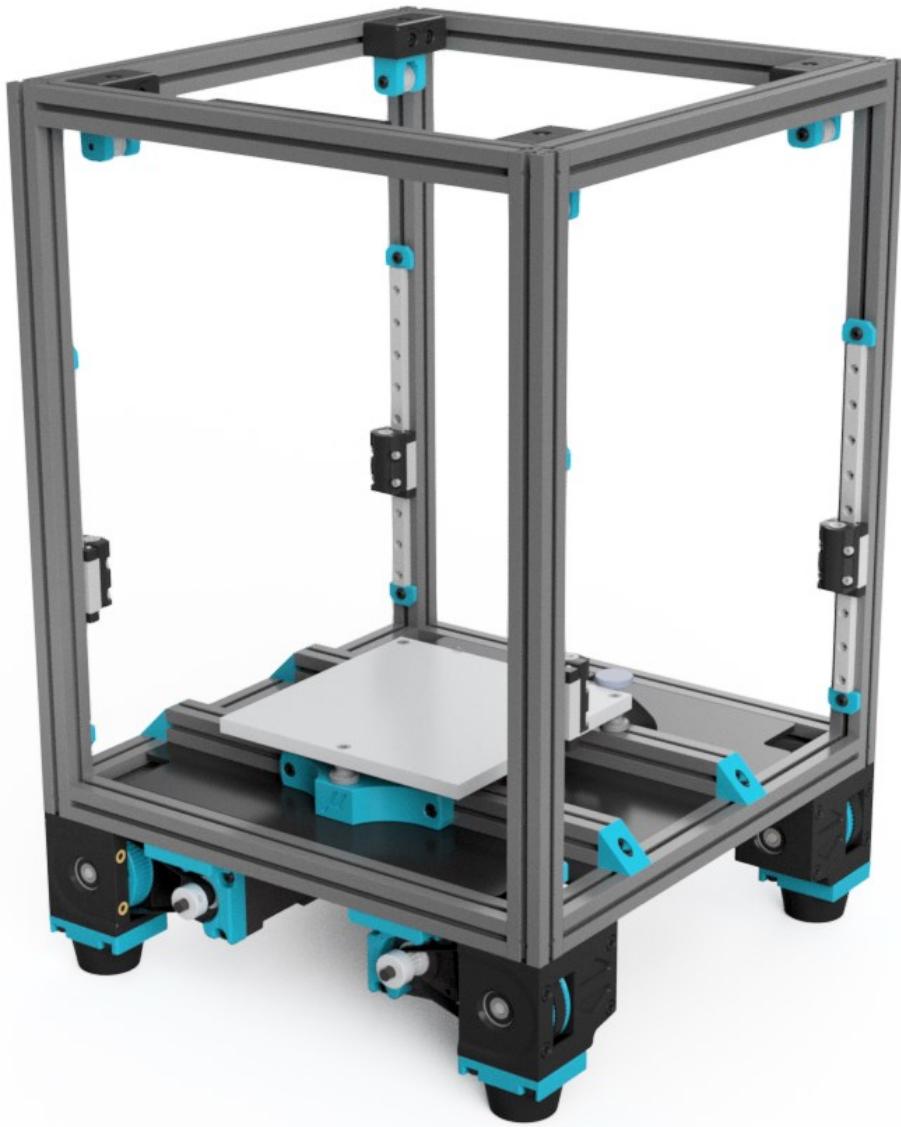
Z ENDSTOP MOUNTING

Mount the Z endstop along the back side of the rear bed extrusion, doesn't really matter exactly where, as you will finalize that later with the firmware.



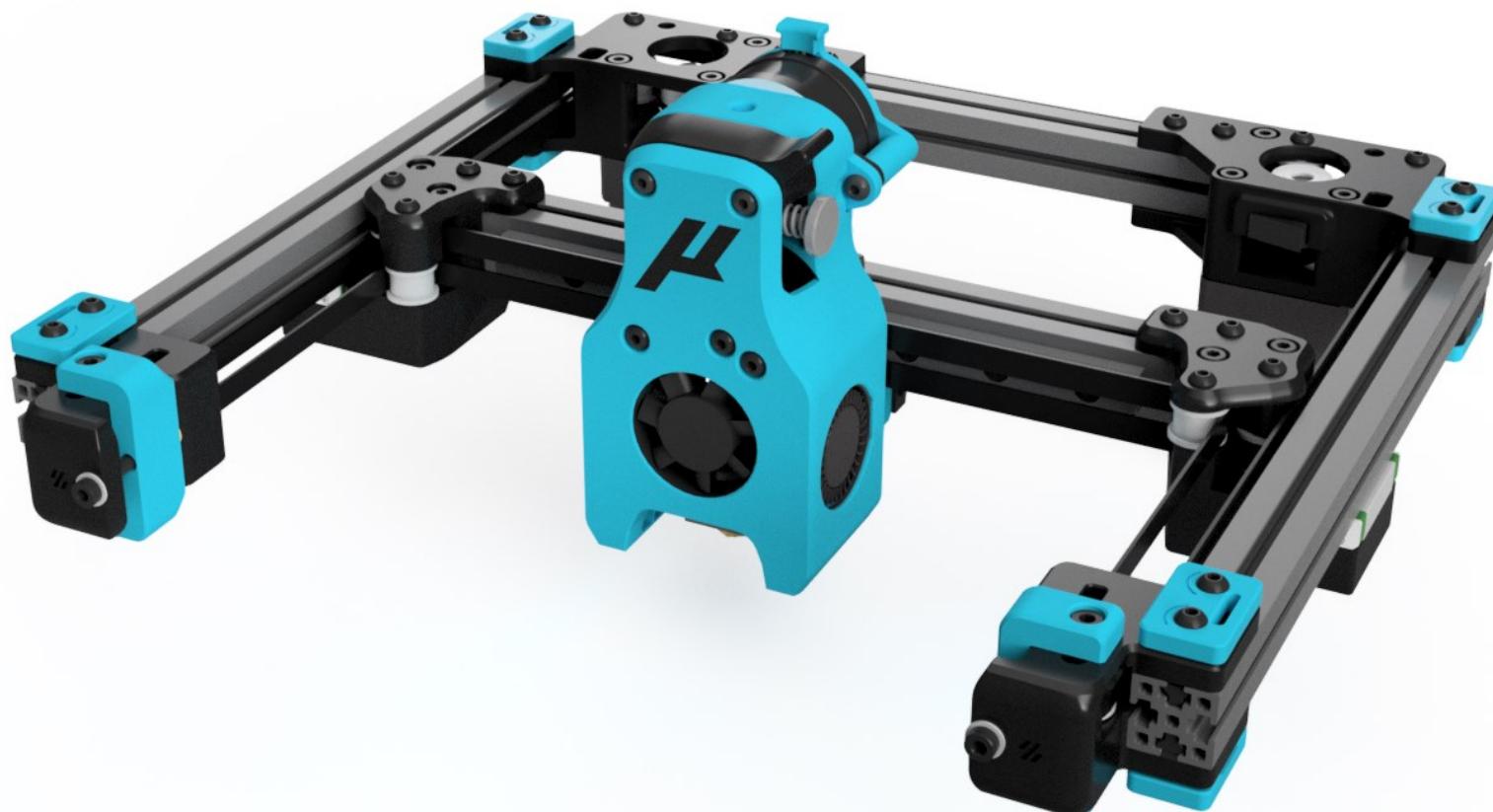
FRAME

MICRON



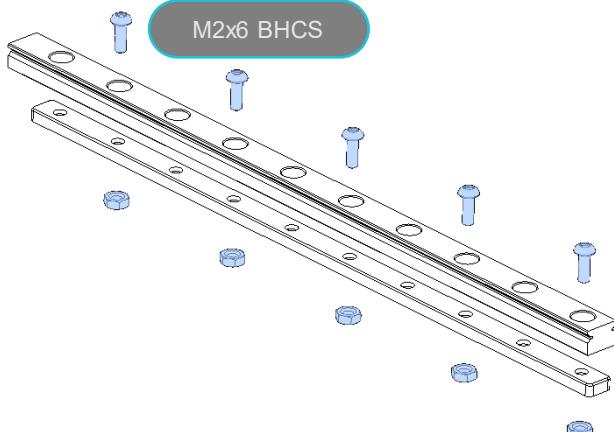
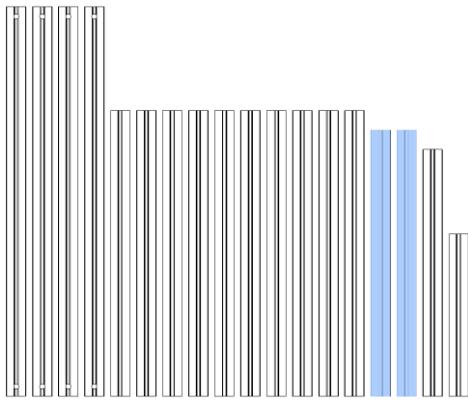
GANTRY

MICRON



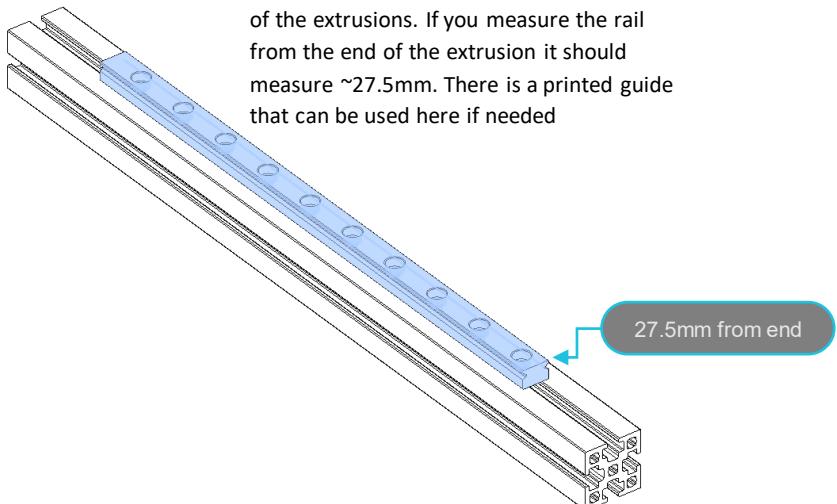
Y AXIS LINEAR RAILS

MICRON



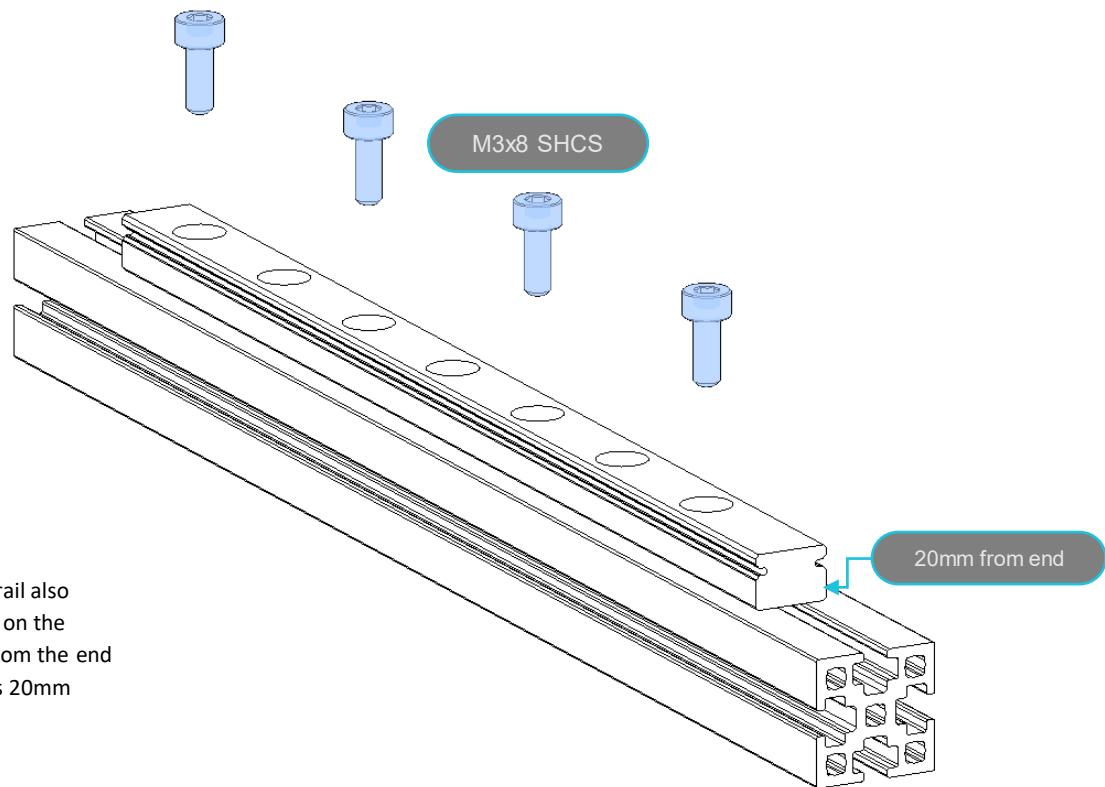
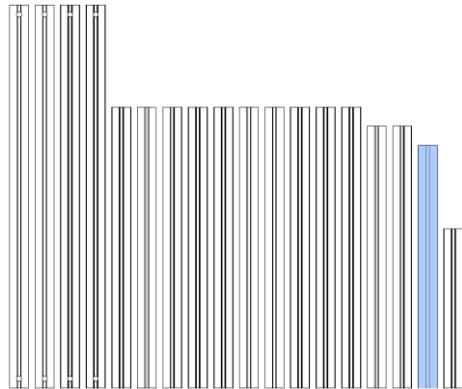
Y AXIS LINEAR RAILS

There are 2 linear rails on the Y-axis and they both need to be exactly in the center of the extrusions. If you measure the rail from the end of the extrusion it should measure ~27.5mm. There is a printed guide that can be used here if needed



X AXIS LINEAR RAIL

MICRON

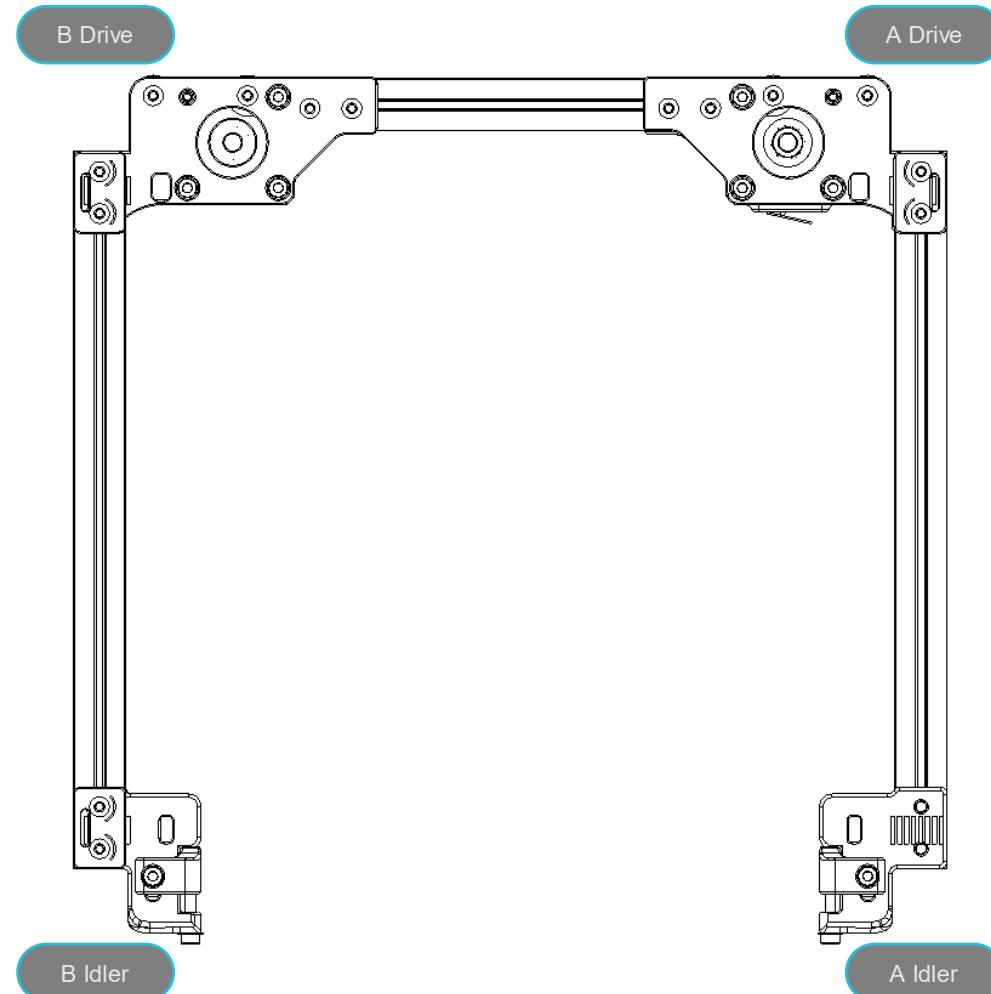


X Axis Linear Rail

As with the Y linear rail , the X rail also needs to be perfectly centered on the extrusion. The measurement from the end of the rail to end of extrusion is 20mm

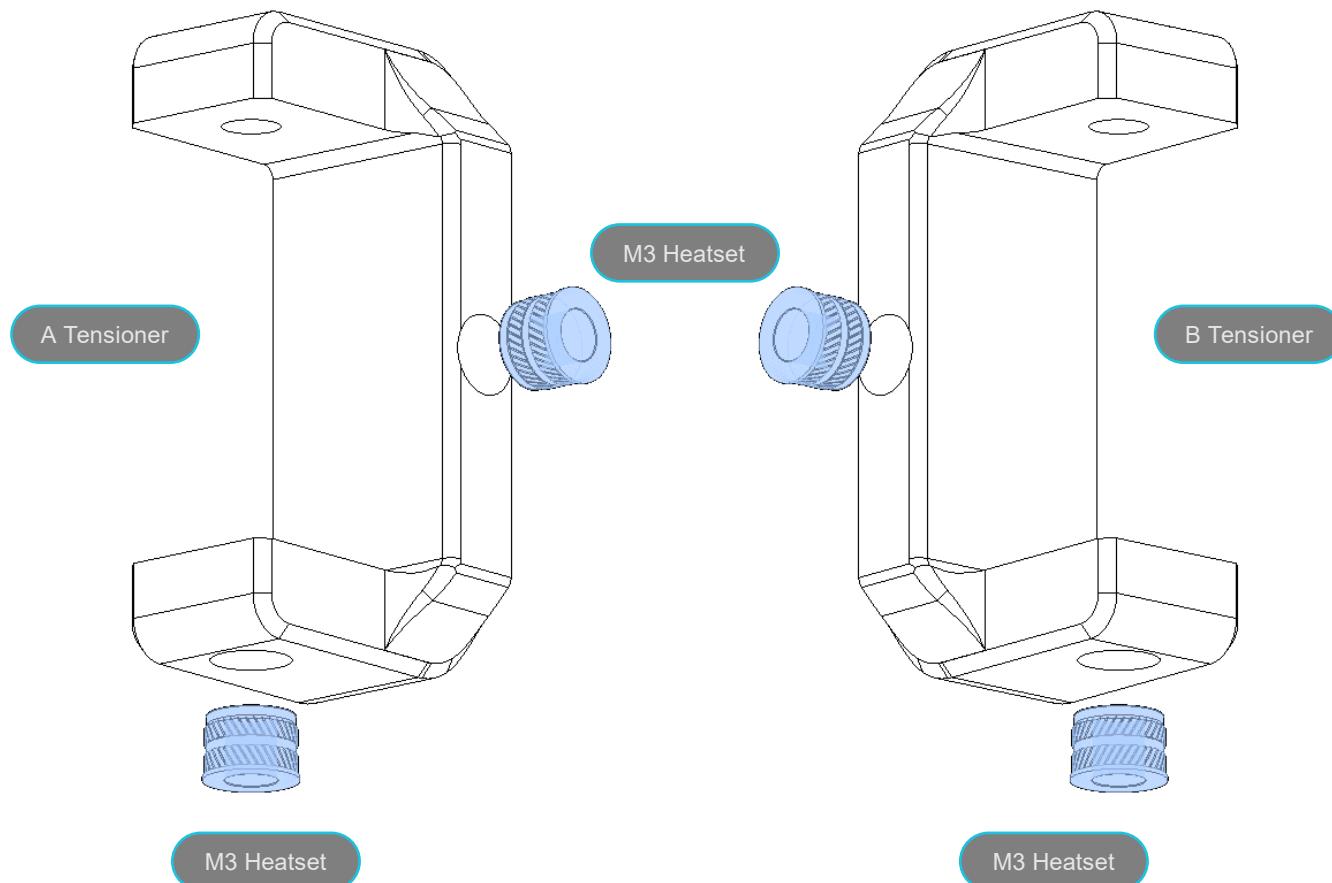
GANTRY FRAME OVERVIEW

MICRON



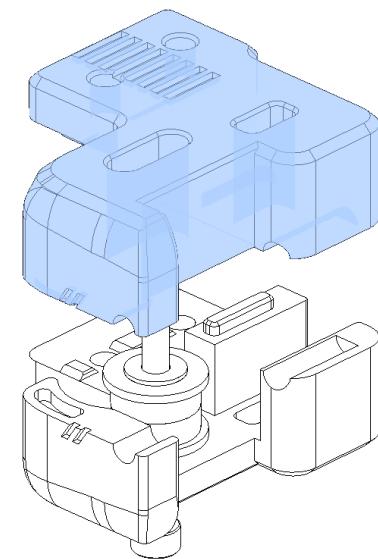
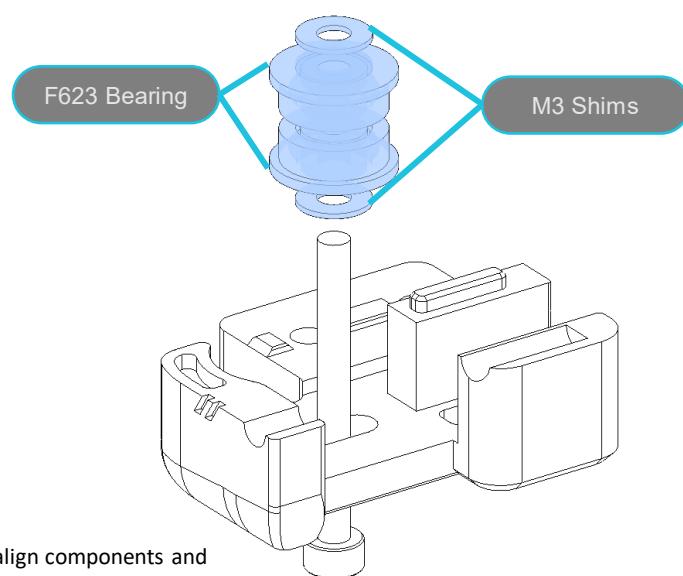
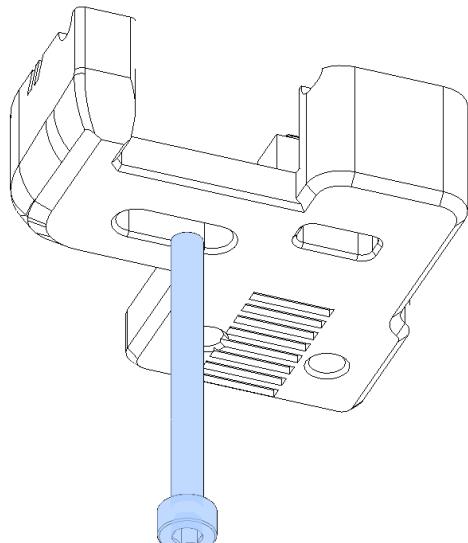
A/B IDLERS

MICRON



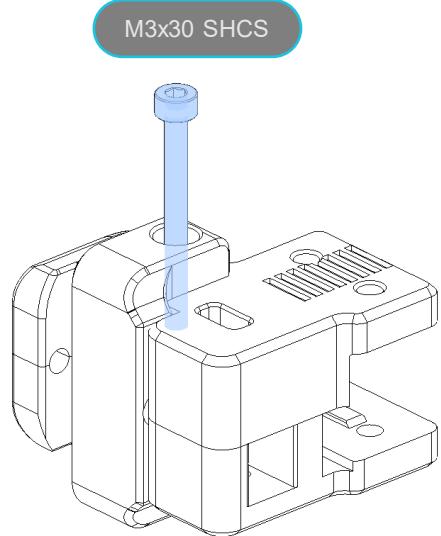
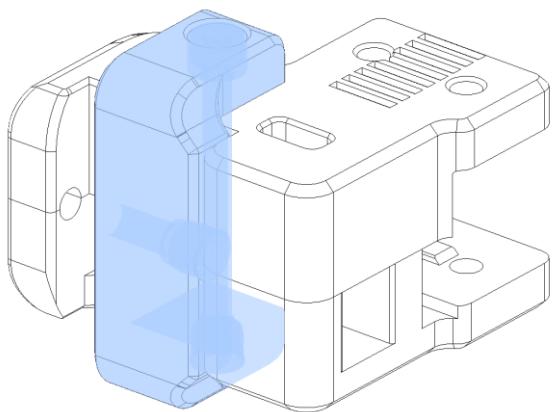
A/B IDLERS

MICRON

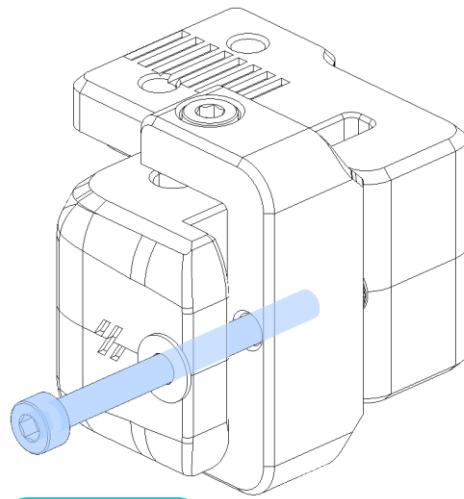


ASSEMBLY AID

This screw is used to align components and will be removed in a later step

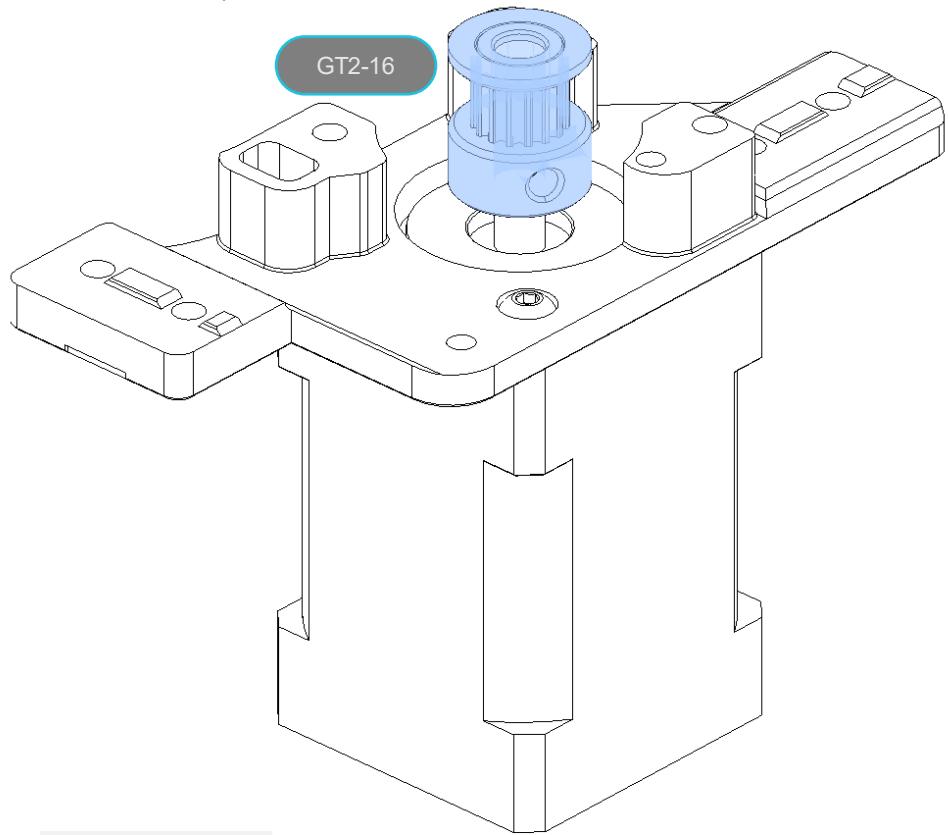
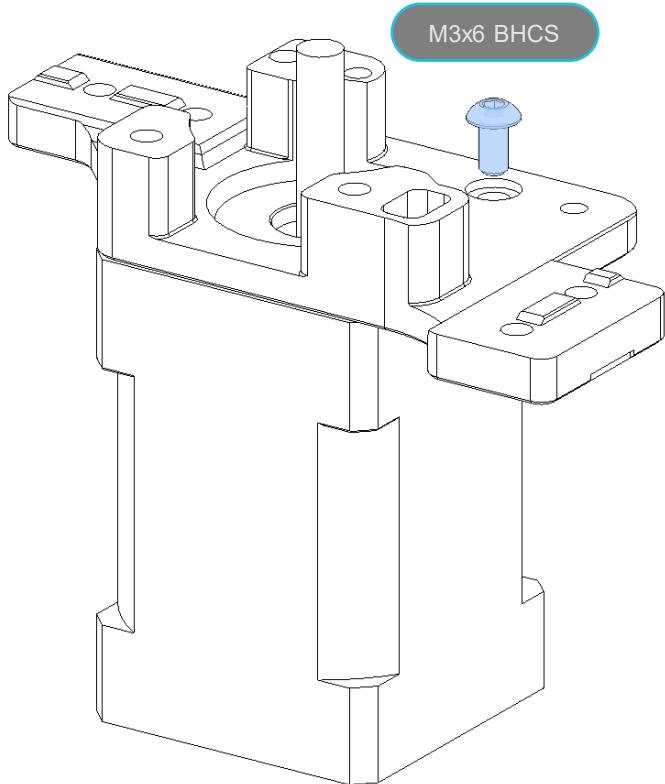
**REMOVE ASSEMBLY AID**

Remove the assembly aid screw as you insert the tensioner screw and slide the tension arm into place.



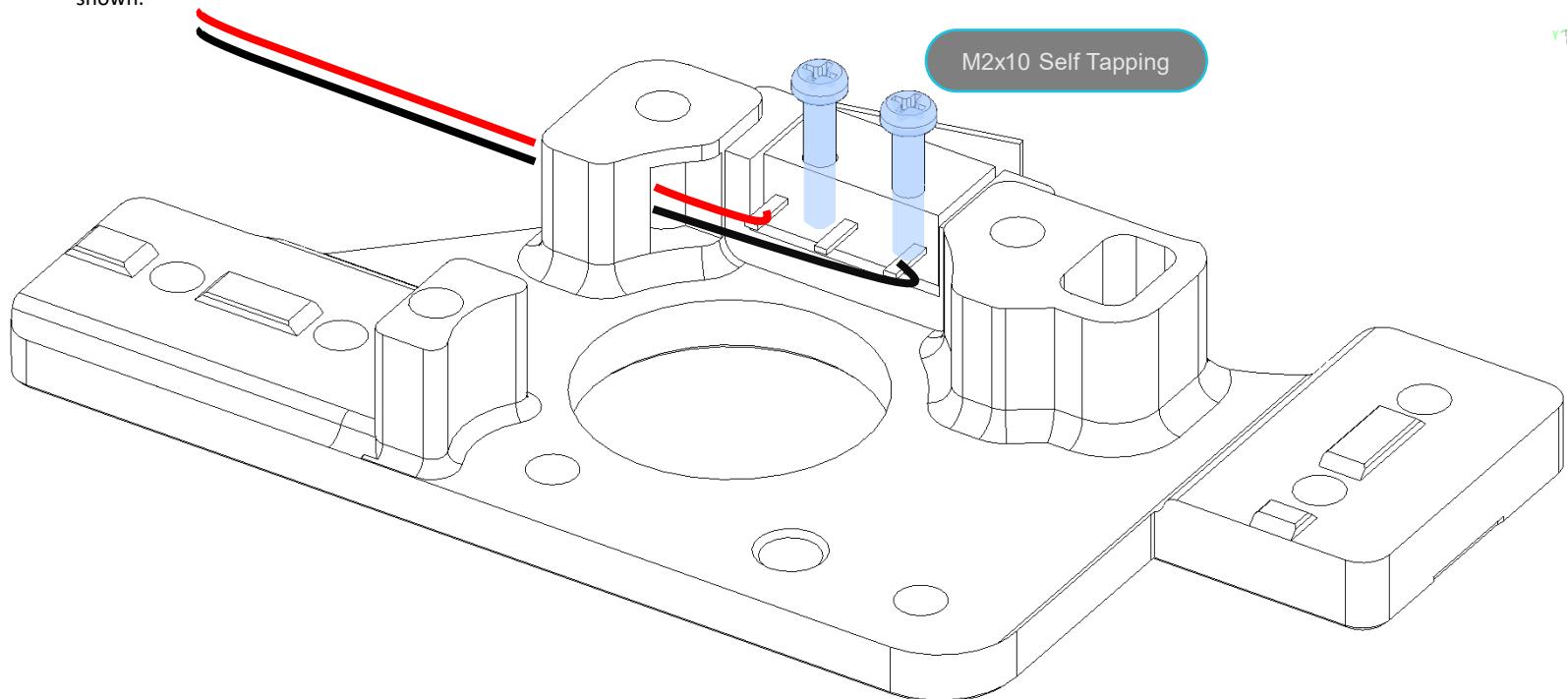
A MOTOR PULLEY

To attach the A drive stepper, orient the motor so the wiring is facing in towards the middle of the printer . Using 1 m3x6 BHCS to secure the stepper to the lower half of the A drive. Install a GT2-16 tooth pulley on the stepper as shown. Don't tighten it down just yet until you run the belts later in the assembly.



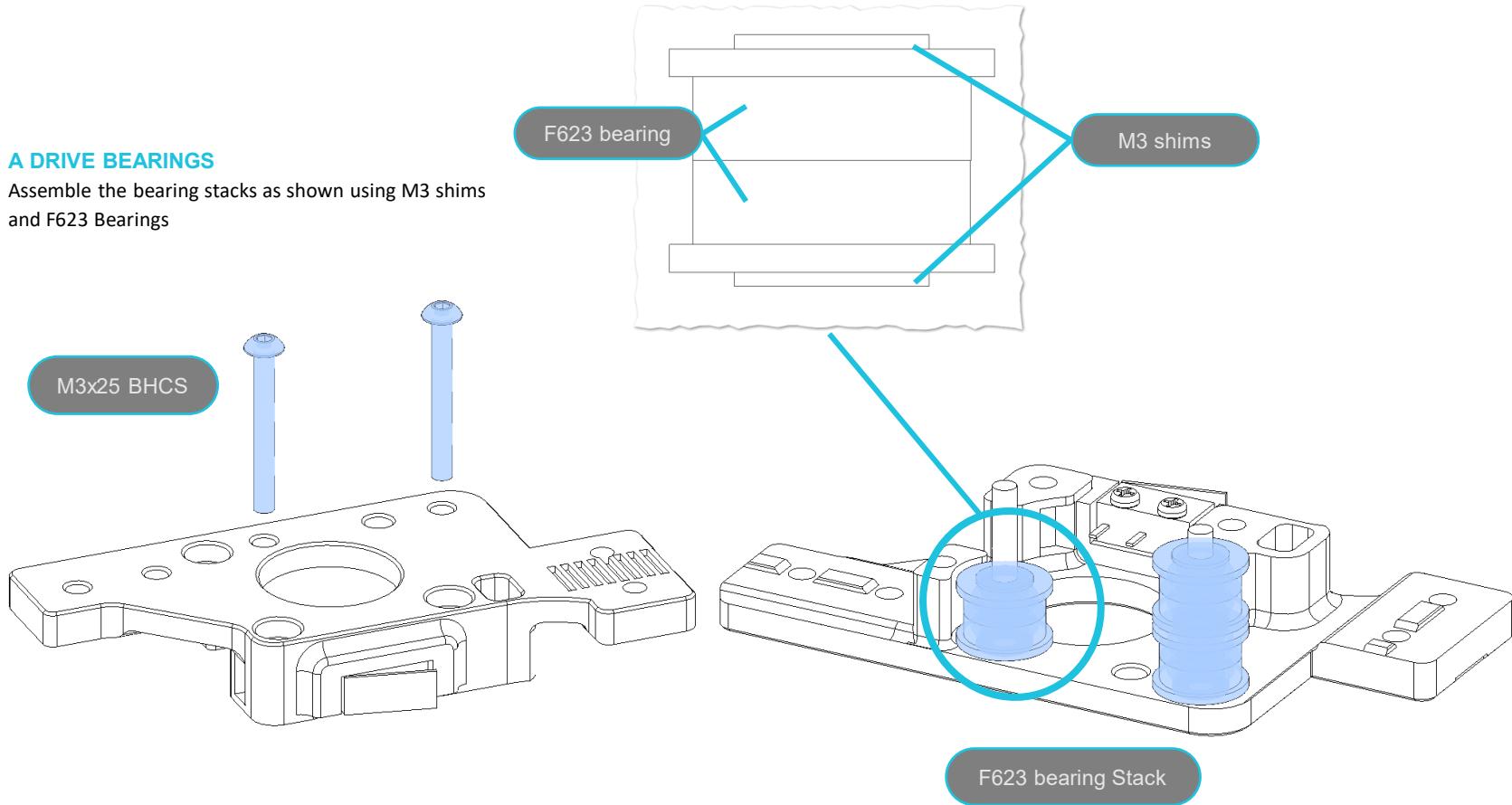
A DRIVE UPPER / Y ENDSTOP

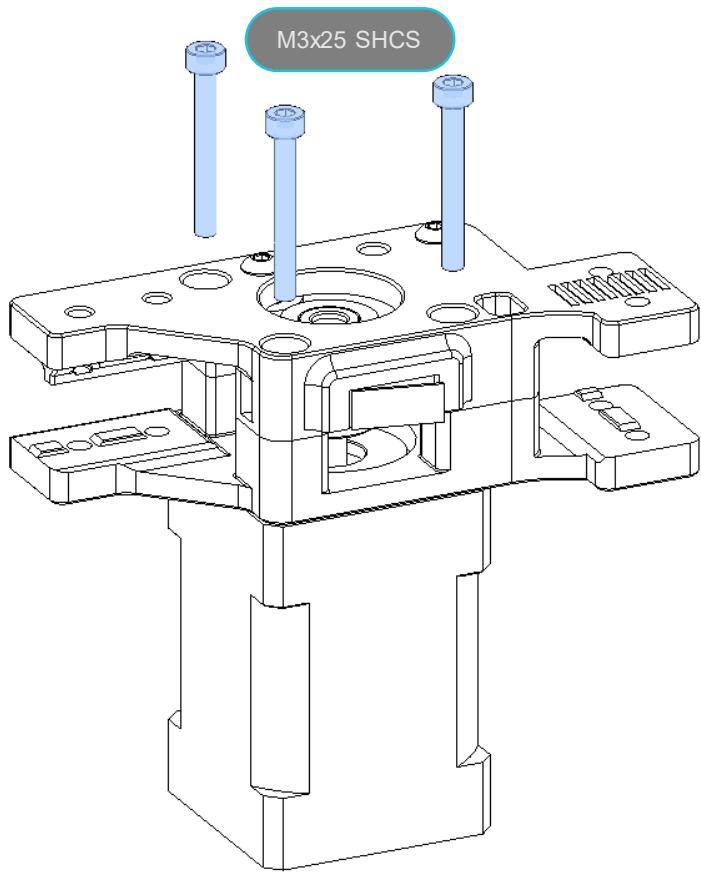
Start by installing the Y endstop switch into the upper A drive, securing it with 2 m2x10 self tapping screws. Insert 2 wires into the hole next to the microswitch and solder them to the 2 outer pins as shown.



A DRIVE BEARINGS

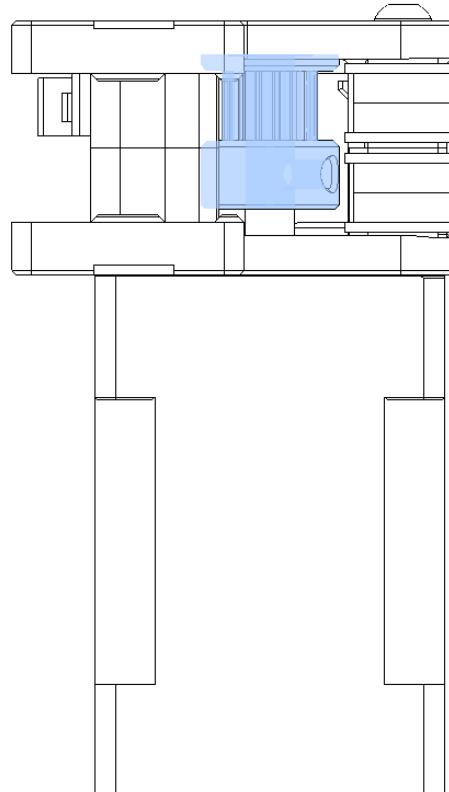
Assemble the bearing stacks as shown using M3 shims and F623 Bearings





A DRIVE PULLEY

Now is time to align the drive pulley with the top bearings and tighten the grub screw.

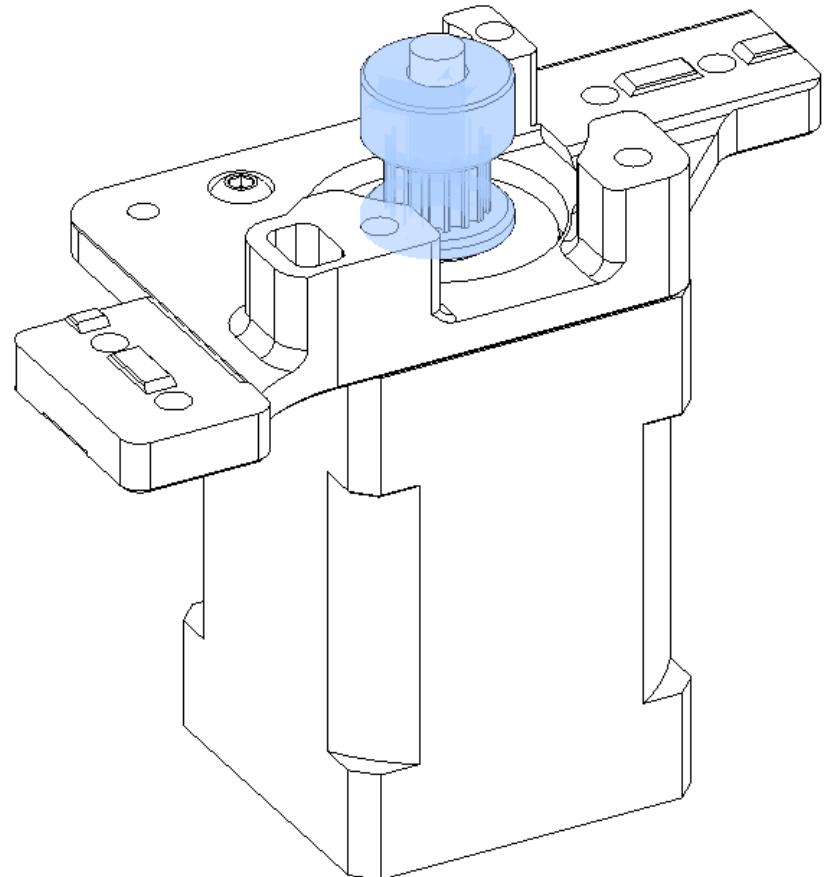
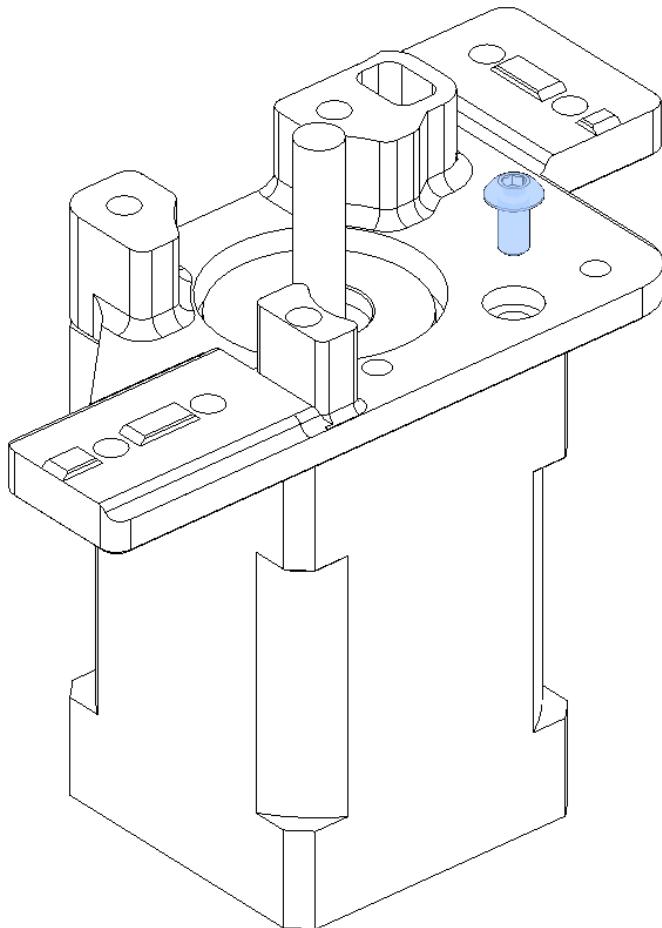


B DRIVE

B MOTOR PULLEY

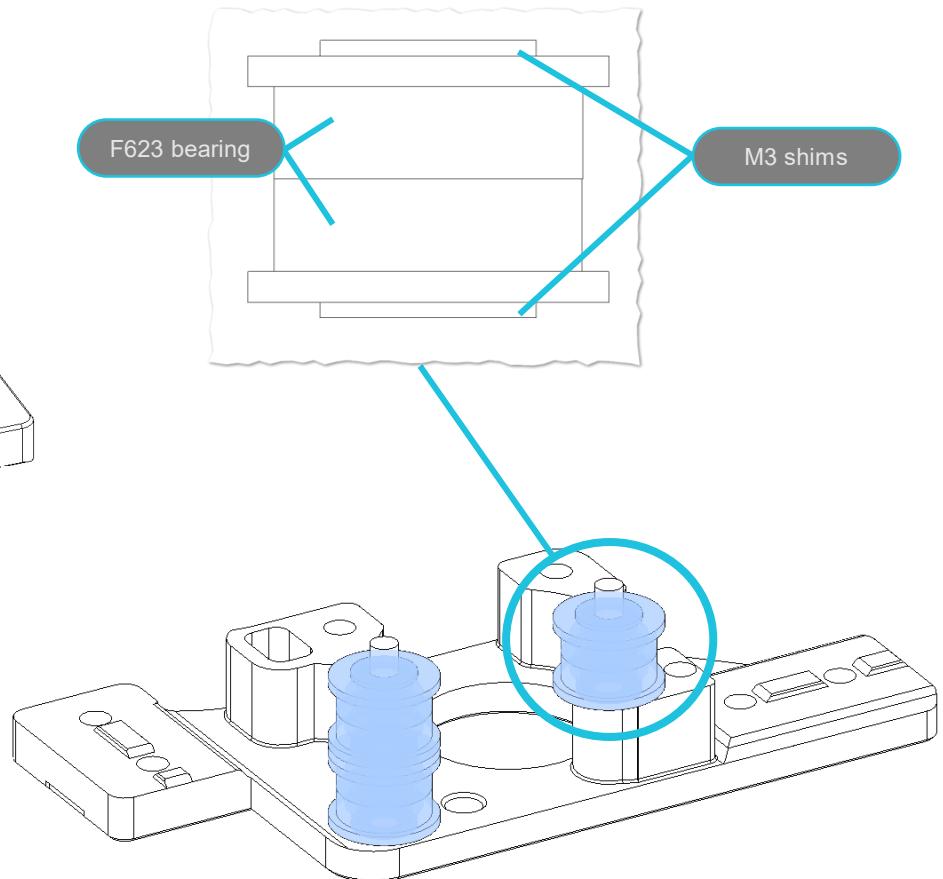
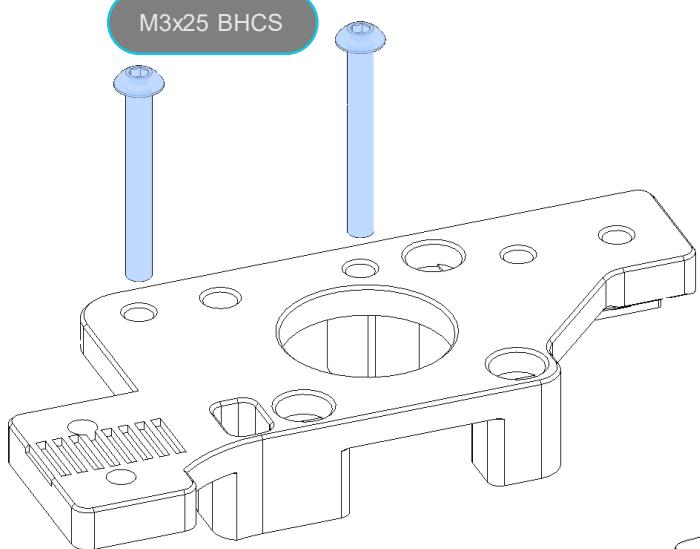
To attach the B drive stepper, orient the motor so the wiring is facing in towards the middle of the printer . Using 1 m3x6 BHCS to secure the stepper to the lower half of the B drive. Install a GT2-16 tooth pulley on the stepper as shown. Don't tighten it down just yet until you run the belts later in the assembly.

MICRON

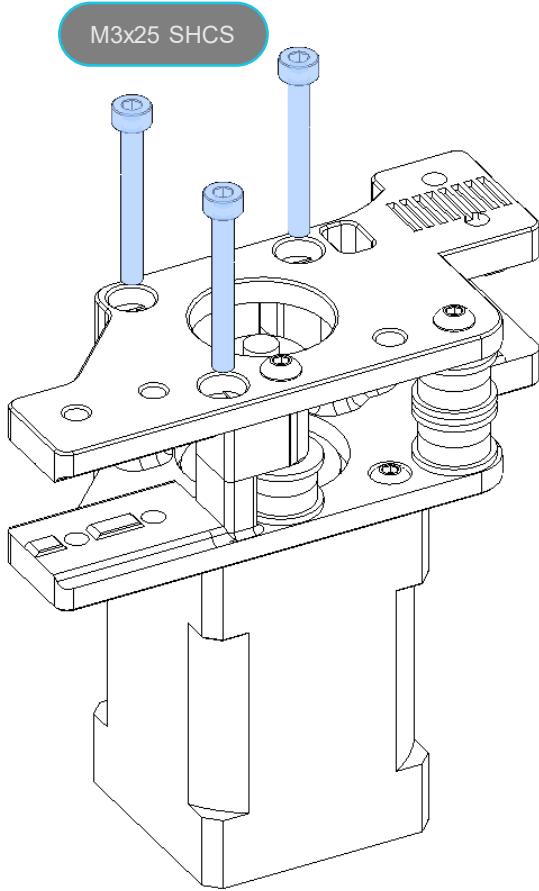


B DRIVE BEARINGS

Assemble the bearing stacks as shown using M3 shims
and F623 Bearings



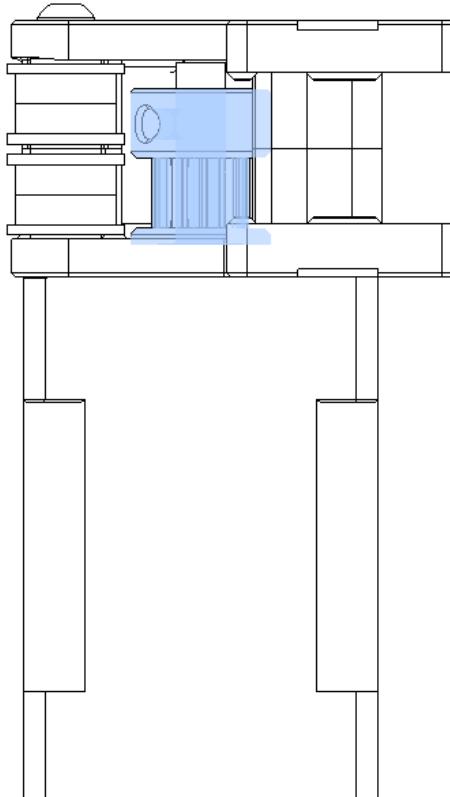
FRAME



MICRON

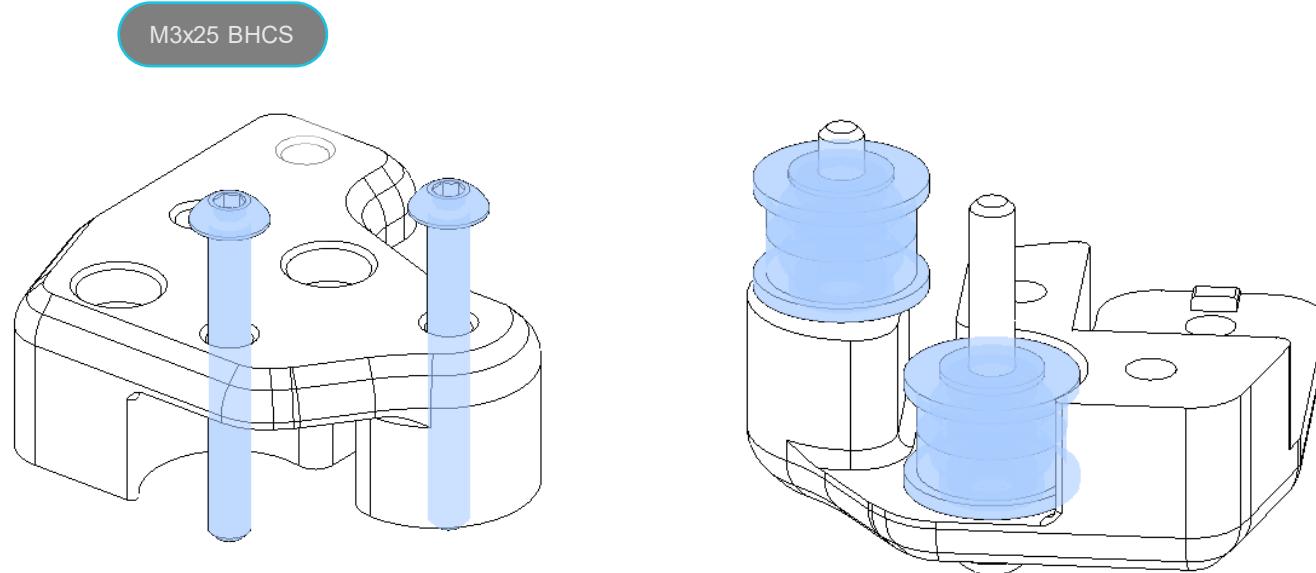
B DRIVE PULLEY

Now is time to align the drive pulley with the top bearings and tighten the grub screw.



LEFT XY JOINT ASSEMBLY

MICRON

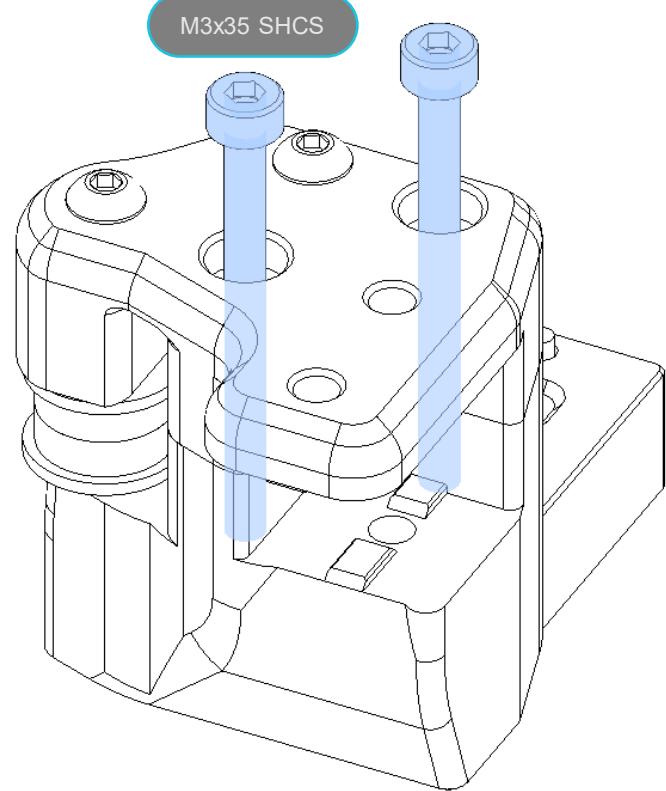
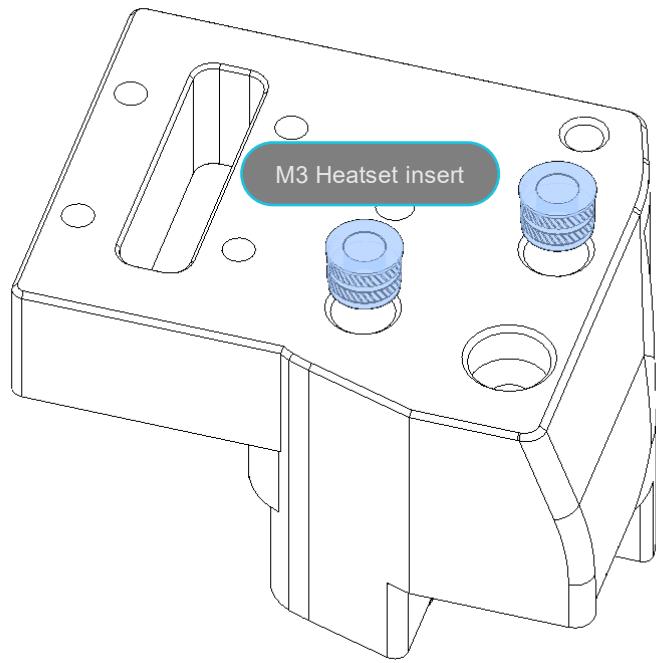


LEFT XY JOINT BEARING STACKS

See previous examples for how to assemble these. We use the same bearings and fasteners used in other steps.

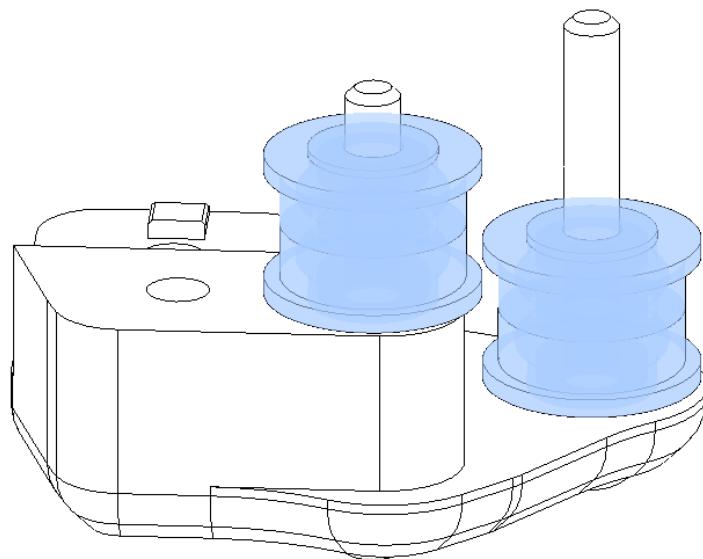
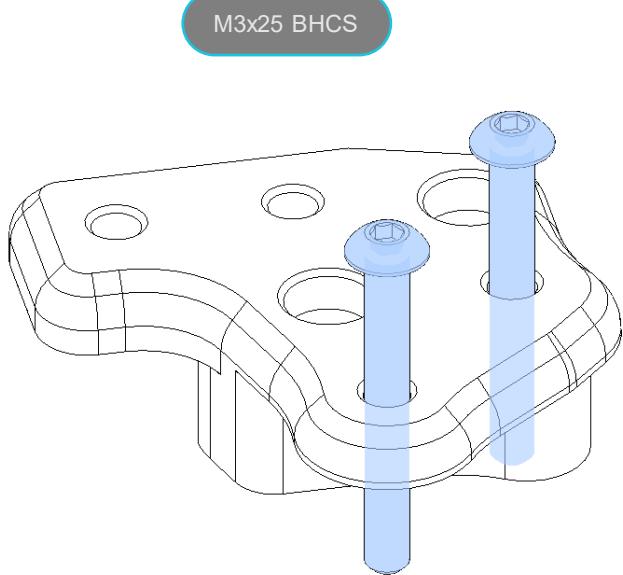
LEFT XY JOINT CONTINUED

MICRON



RIGHT XY JOINT

MICRON

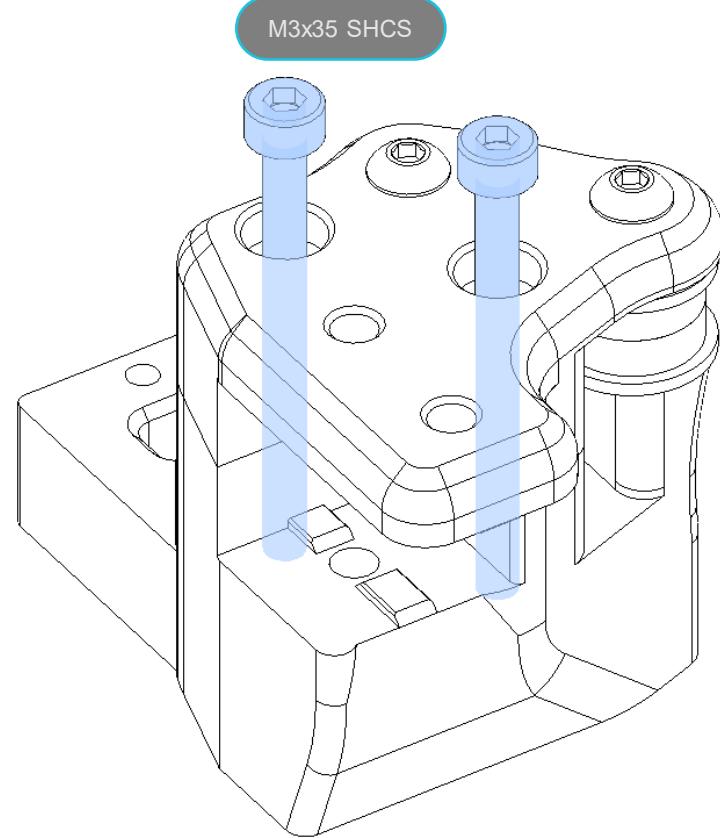
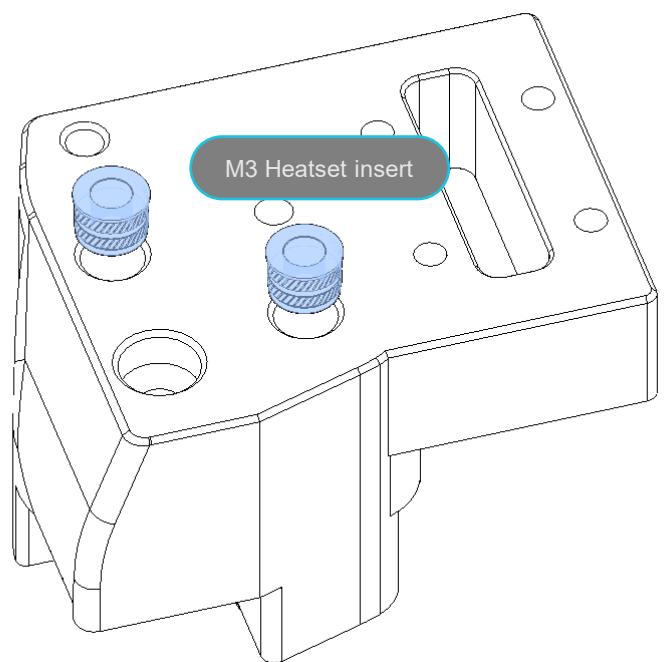


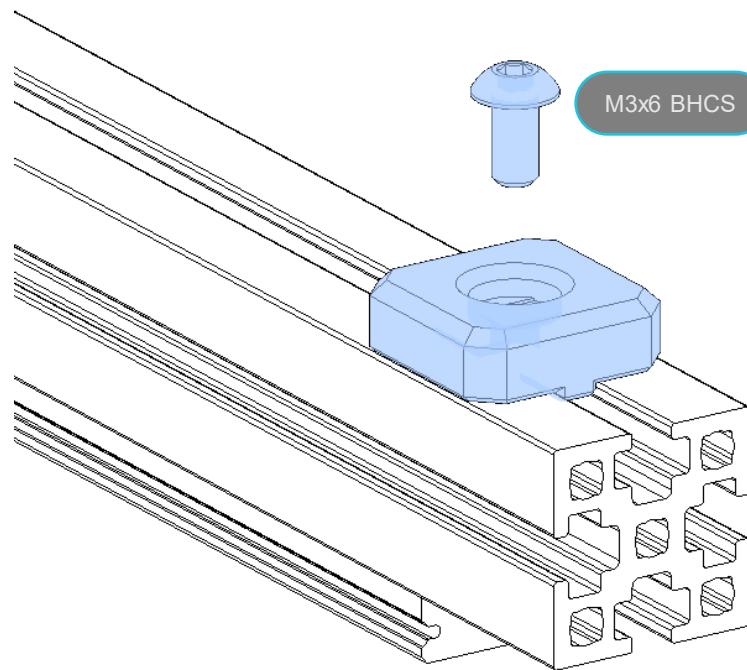
RIGHT XY JOINT BEARING STACKS

See previous examples for how to assemble these. We use the same bearings and fasteners used in other steps.

RIGHT XY JOINT CONTINUED

MICRON



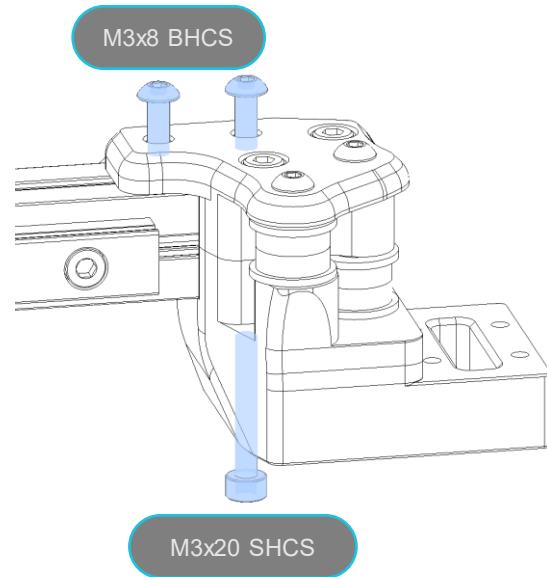
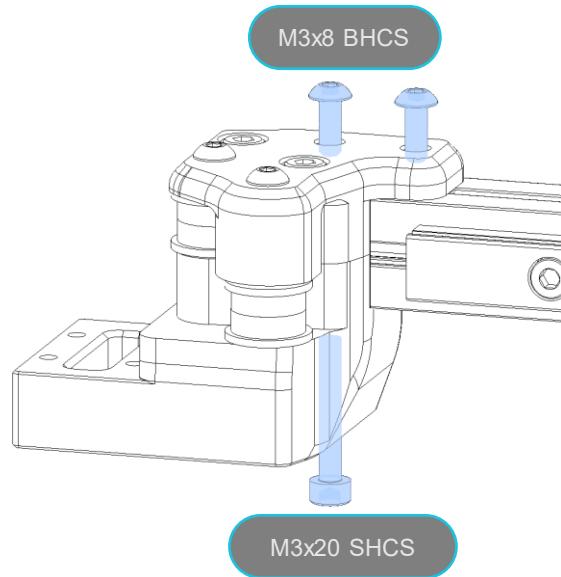


Y Endstop extender

The Y endstop needs this little printed part to make sure it gets hit properly. This should be installed 8mm from the end of the extrusion. This gets installed on the opposite side of the MGN9C x rail.

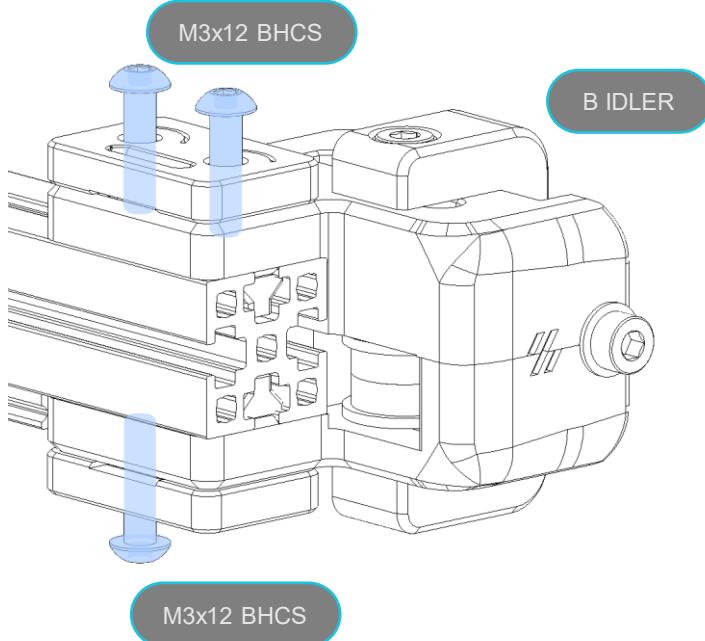
XY JOINTS

MICRON



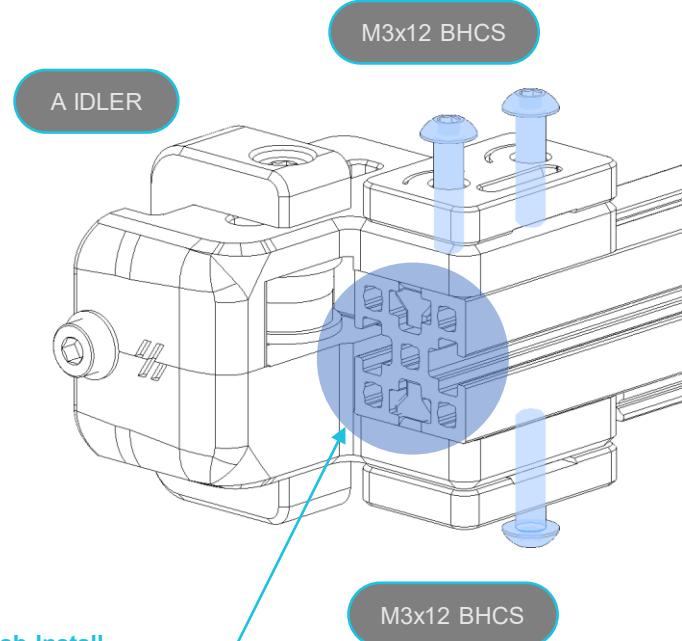
AB IDLERS

MICRON



Belt Clamps

The belt clamps can go on now as well even though the z belts are not going in.

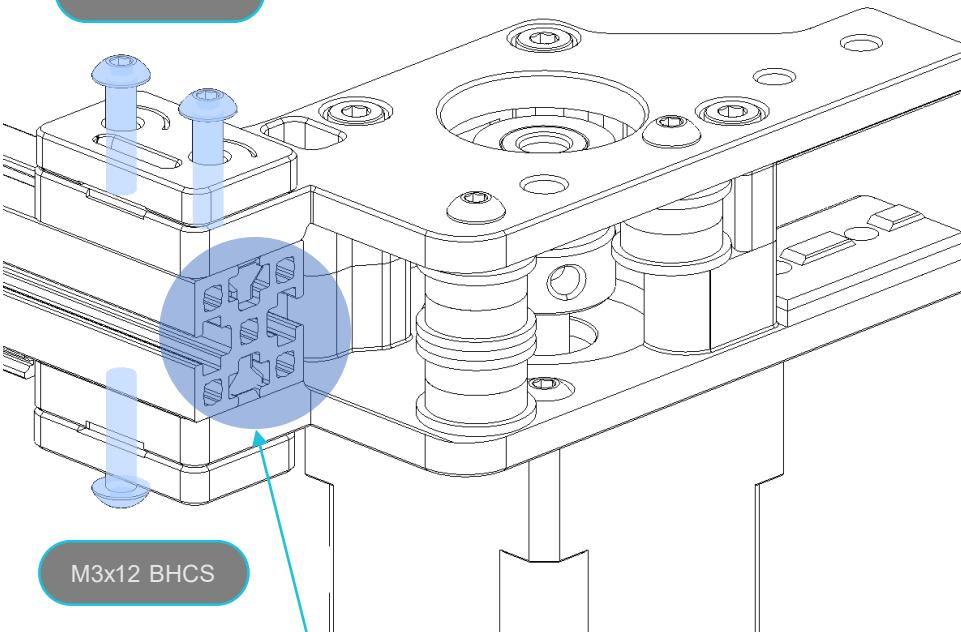


Flush Install

The front idlers need to be installed flush with the end of the Y gantry extrusions.

Belt Clamps

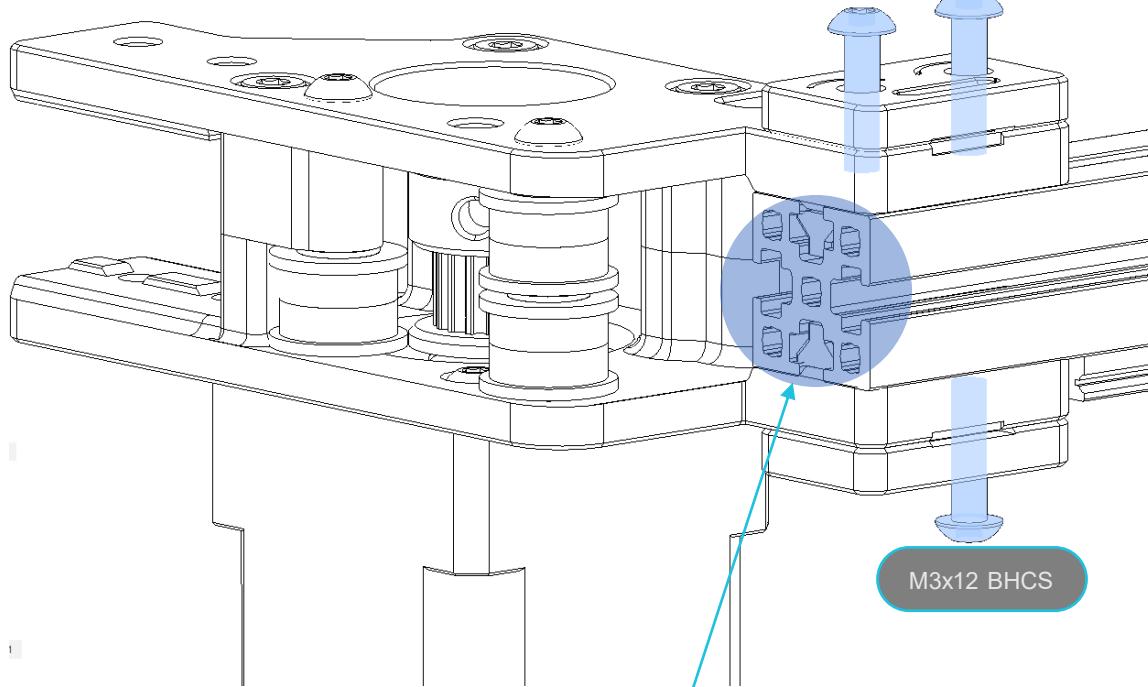
The belt clamps can go on now as well even though the z belts are not going in.

**Flush Install**

The rear of the A drive needs to be installed flush with the end of the Y gantry extrusions.

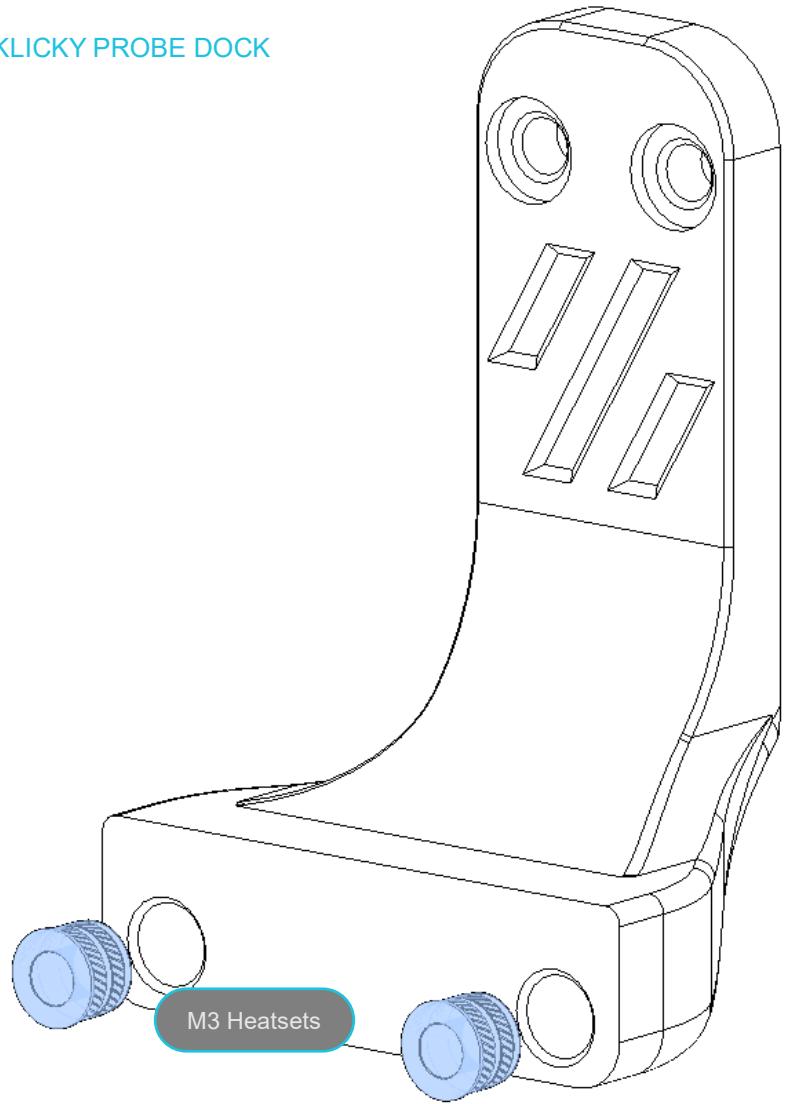
Belt Clamps

The belt clamps can go on now as well even though the z belts are not going in.

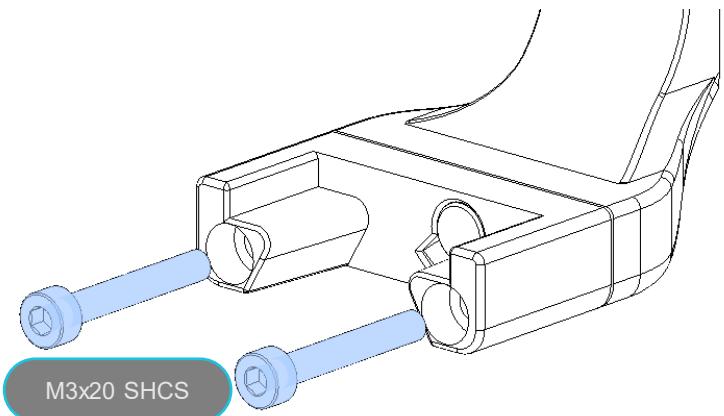
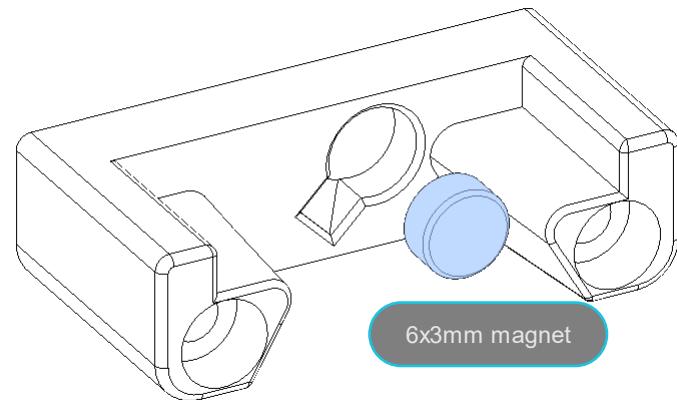
**Flush Install**

The rear of the A drive needs to be installed flush with the end of the Y gantry extrusions.

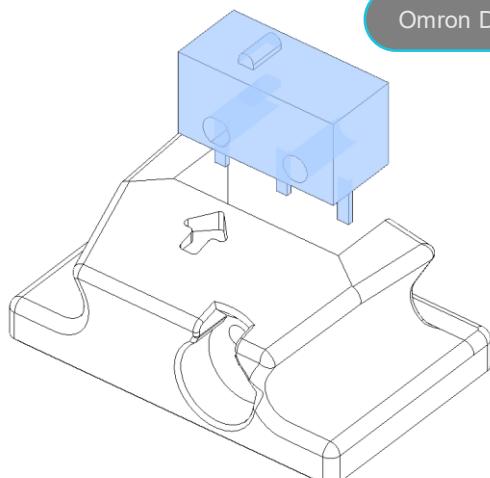
KLICKY PROBE DOCK



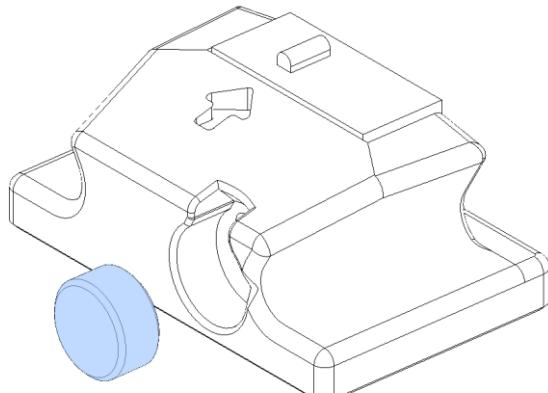
MICRON



KLICKY PROBE

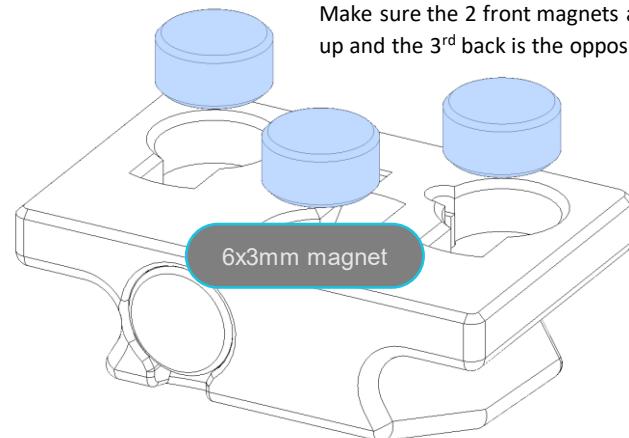


Omron D2F



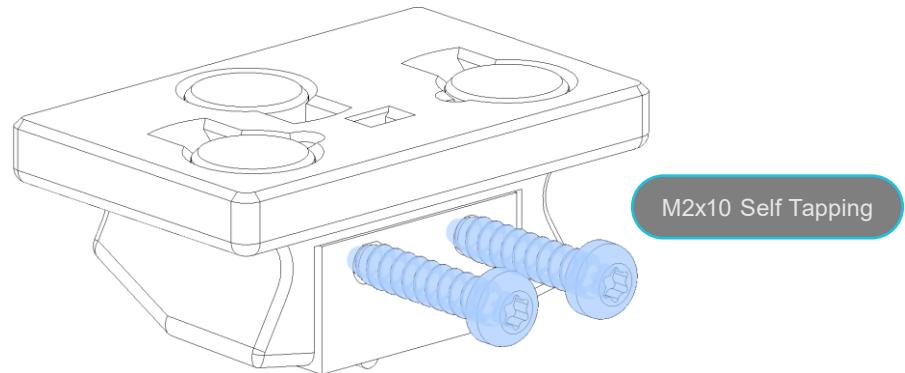
6x3mm magnet

MICRON



Magnet Install

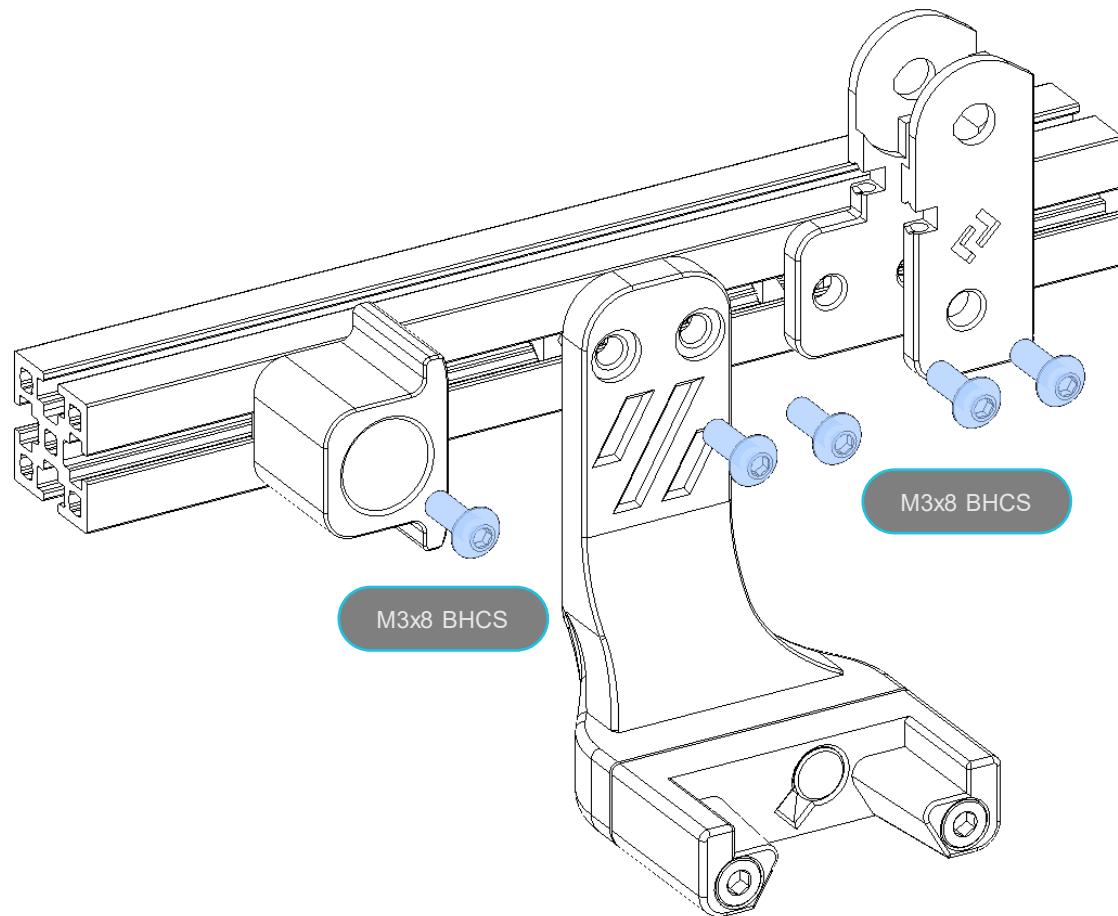
Make sure the 2 front magnets are facing the same way up and the 3rd back is the opposite



M2x10 Self Tapping

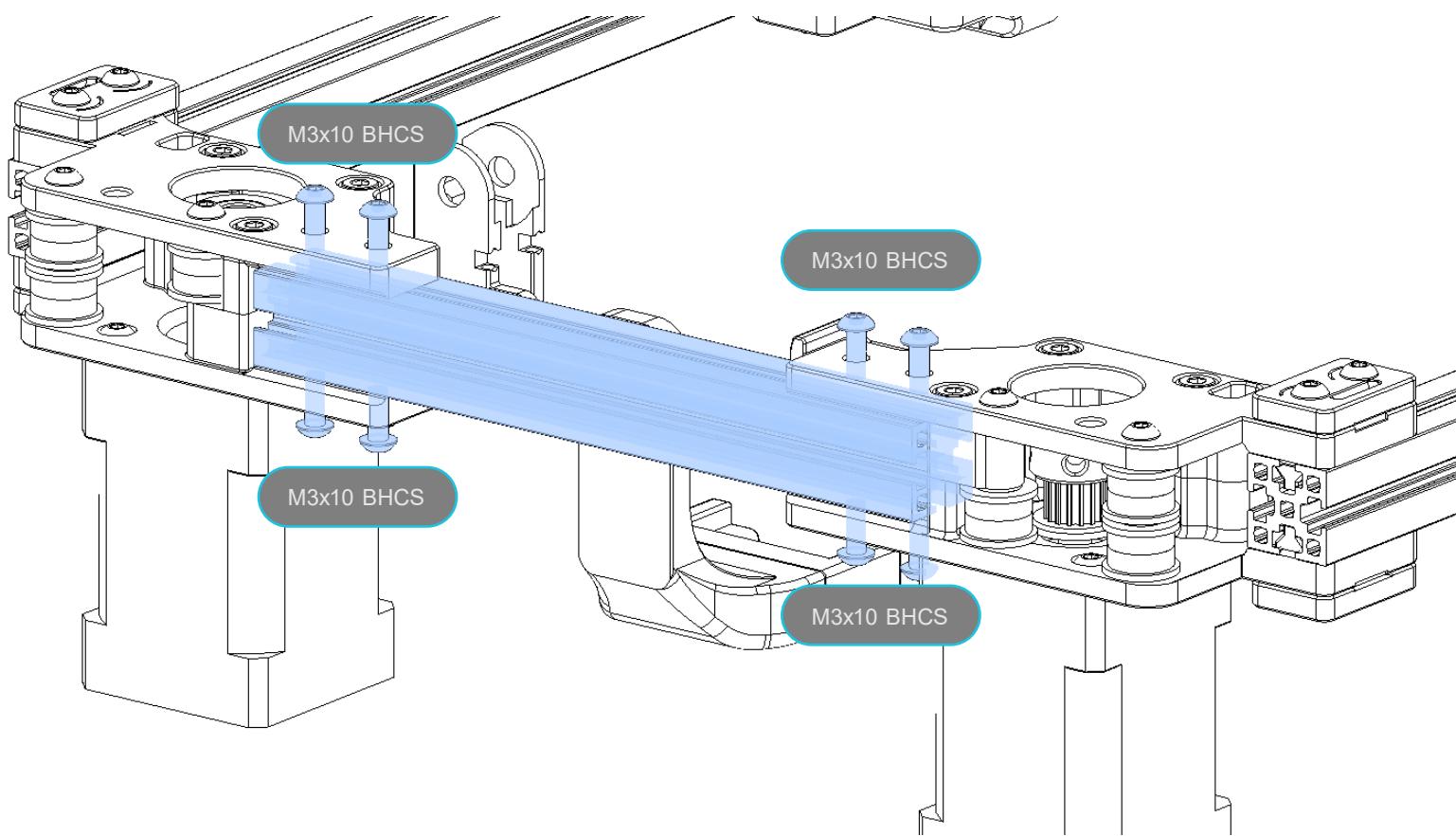
REAR GANTRY FRAME

MICRON

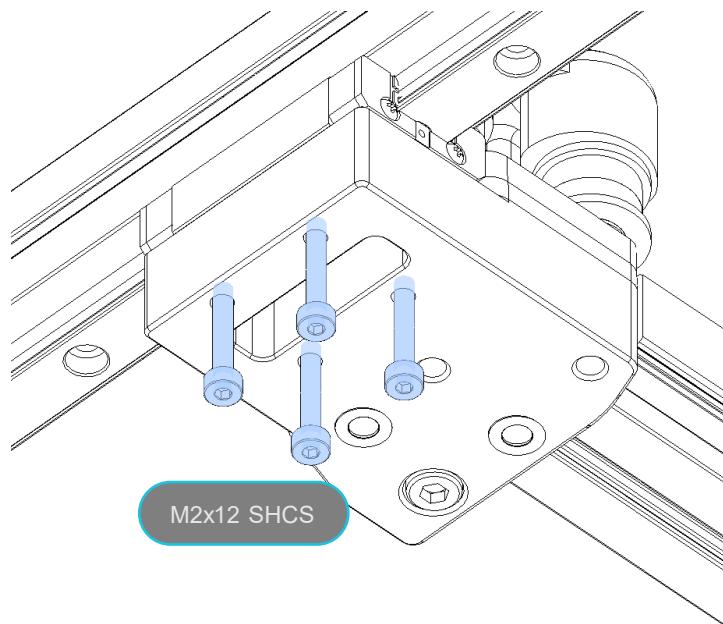


REAR GANTRY FRAME ASSEMBLY

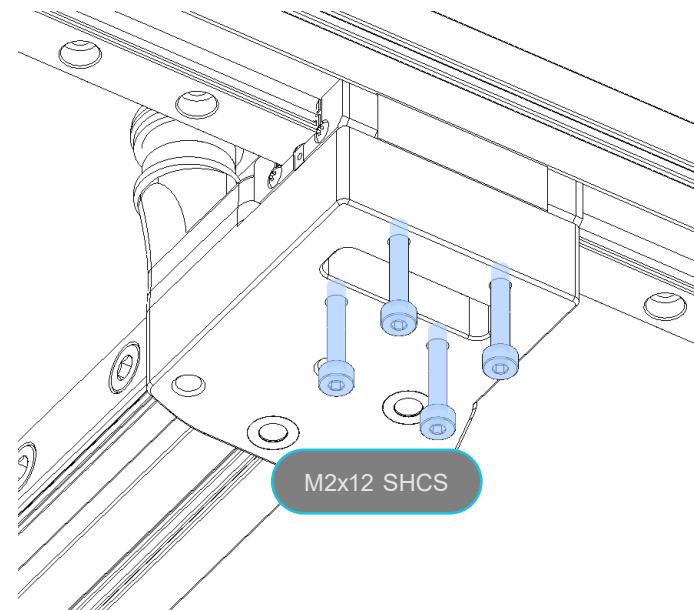
MICRON

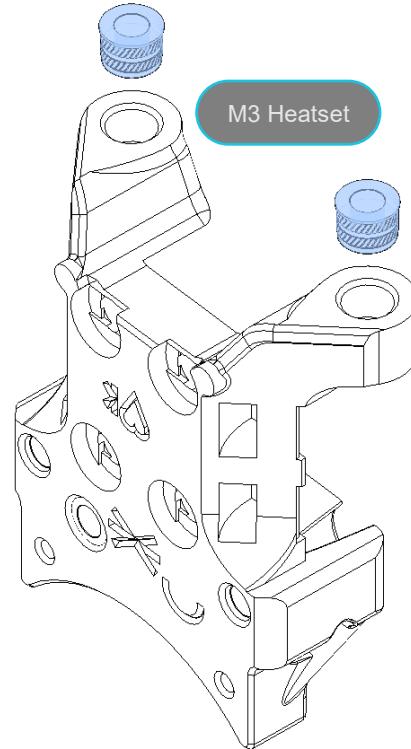
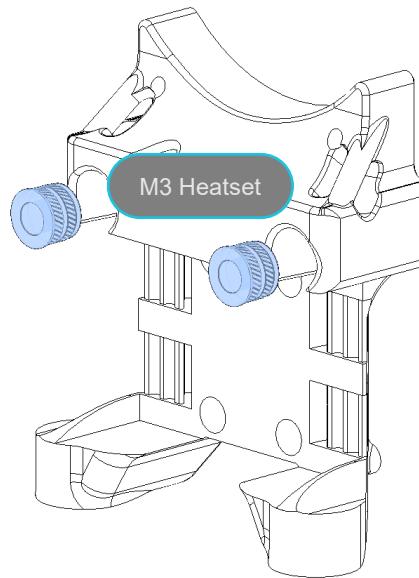
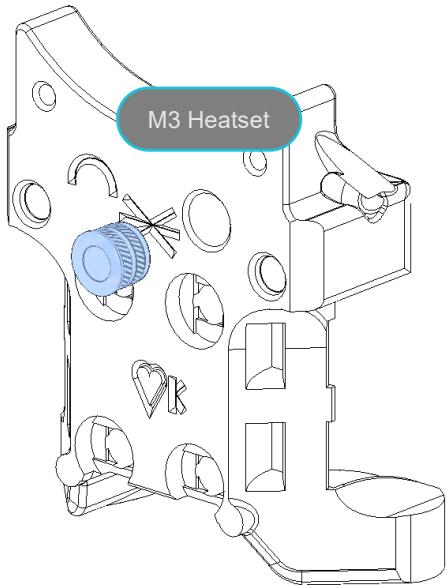


X AXIS



MICRON



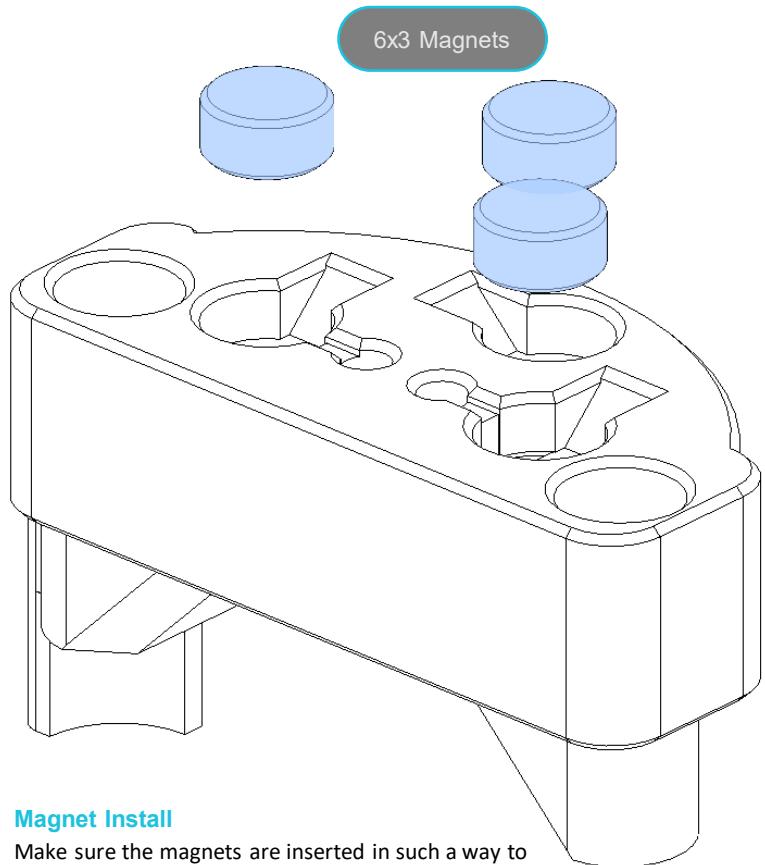


Prepare the X Carriage

Prepare the x carriage by inserting the 5 M3 heatsets
inserts that are needed to attached the toolhead/ probe

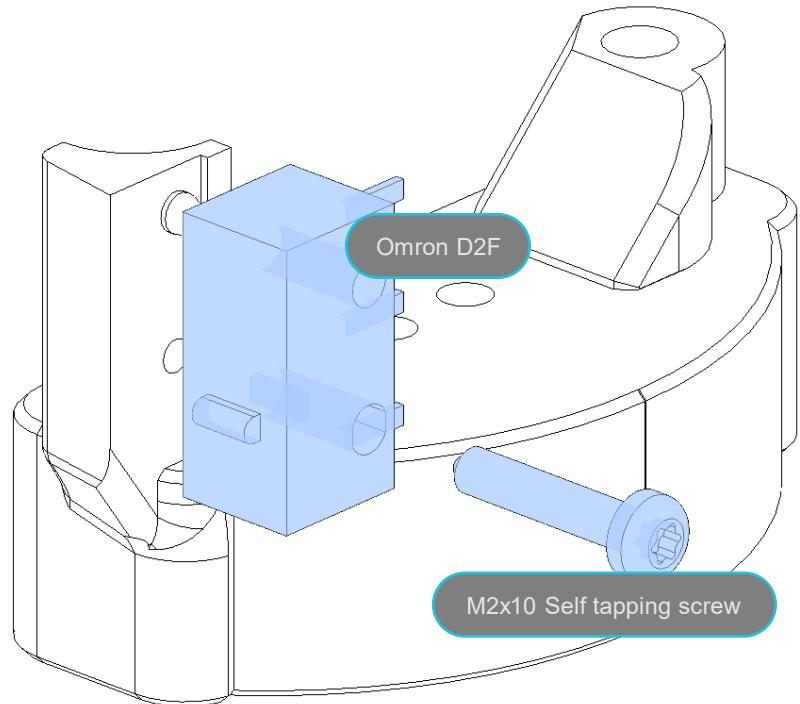
CARRIAGE PROBE MOUNT

MICRON



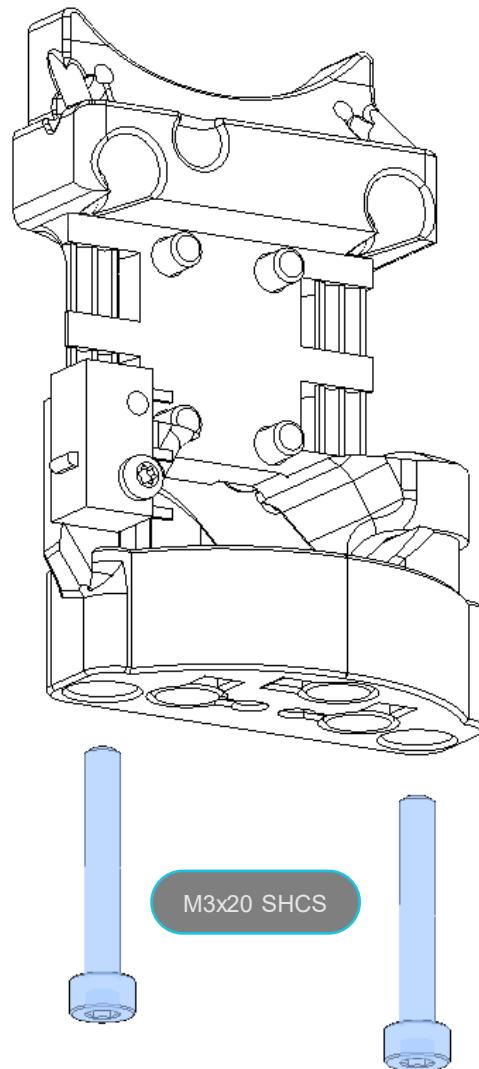
Magnet Install

Make sure the magnets are inserted in such a way to attract the klicky probe that was assembled on pg 70.



X CARRAIGE PROBE MOUNT ASSEMBLY

MICRON

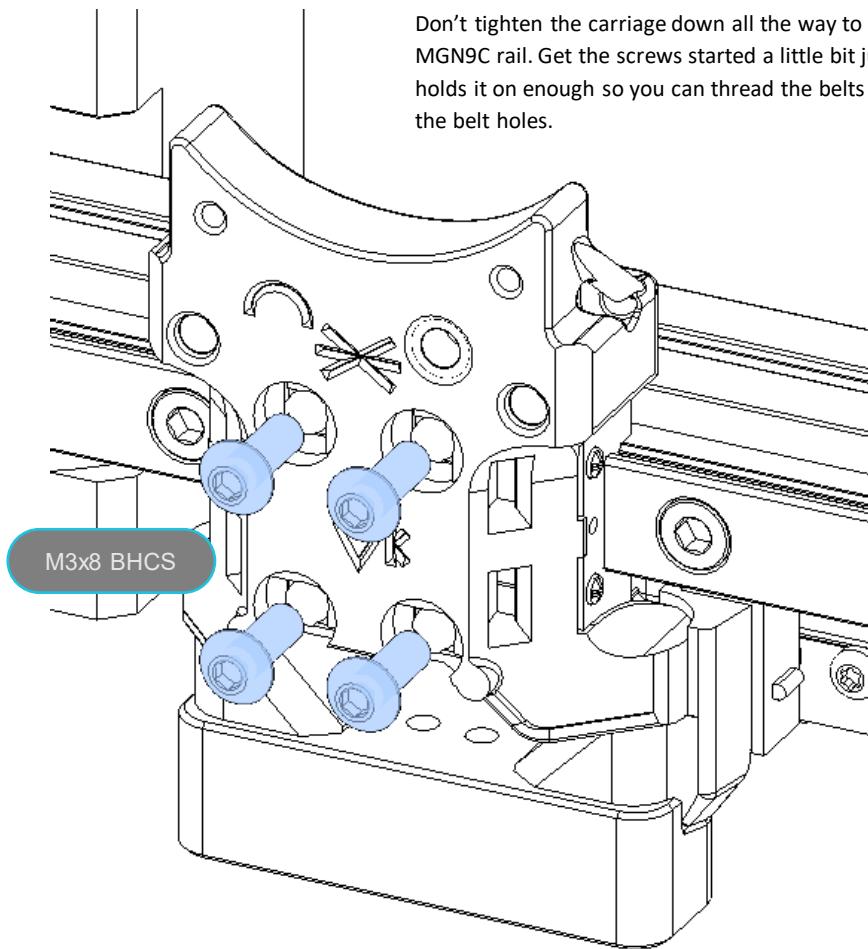


CARRAIGE MOUNTING

MICRON

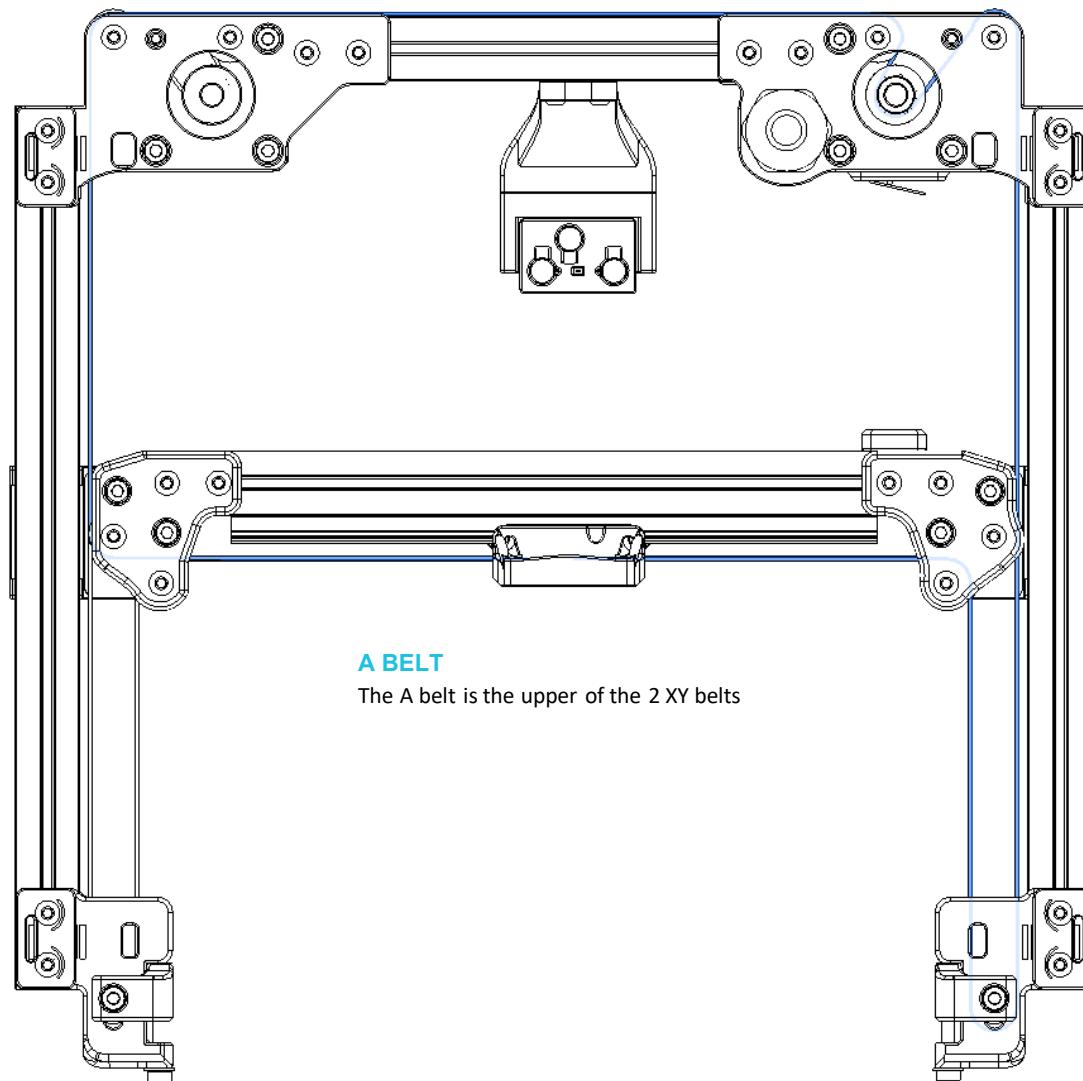
CARRAIGE MOUNTING

Don't tighten the carriage down all the way to the MGN9C rail. Get the screws started a little bit just so it holds it on enough so you can thread the belts through the belt holes.



A BELT

MICRON

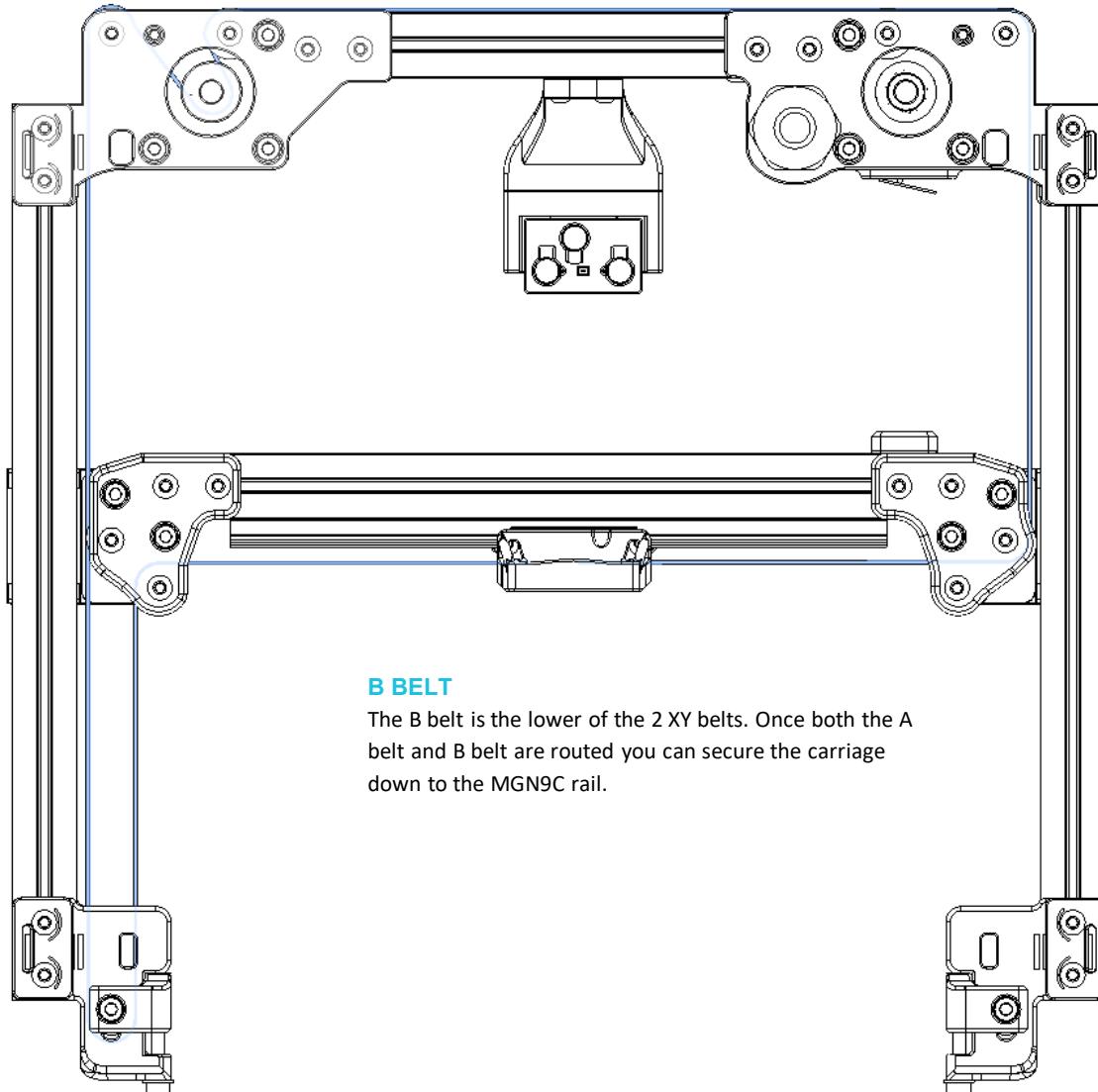


A BELT

The A belt is the upper of the 2 XY belts

B BELT

MICRON



B BELT

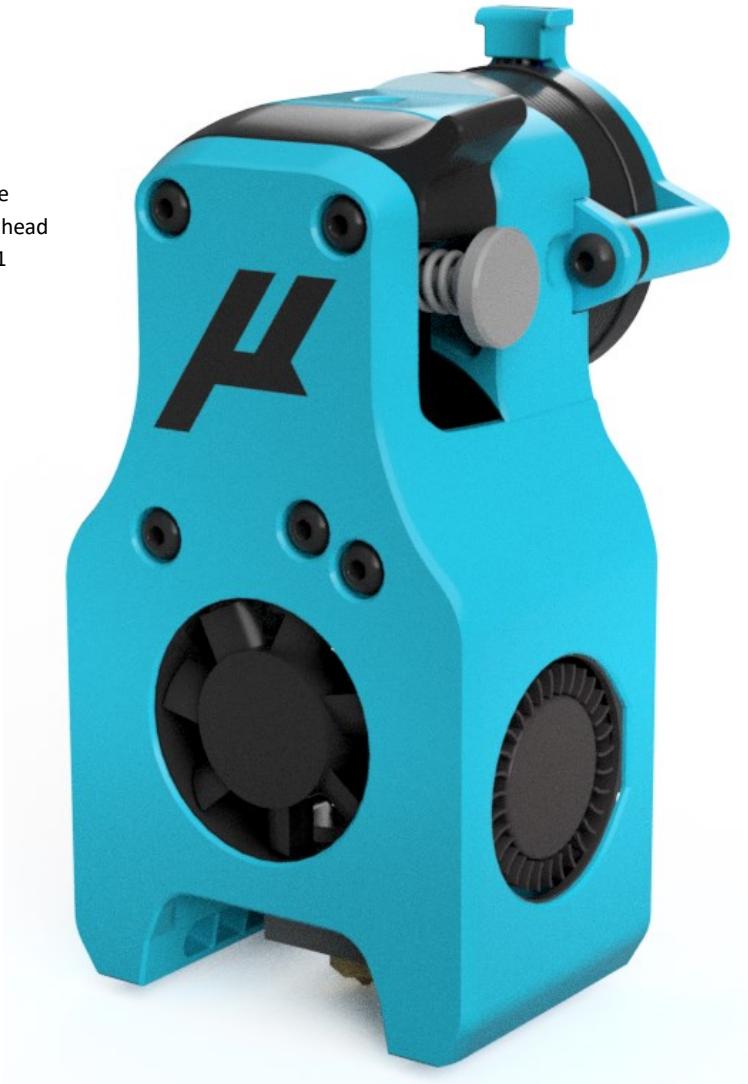
The B belt is the lower of the 2 XY belts. Once both the A belt and B belt are routed you can secure the carriage down to the MGN9C rail.

MINI AFTERBURNER

MICRON

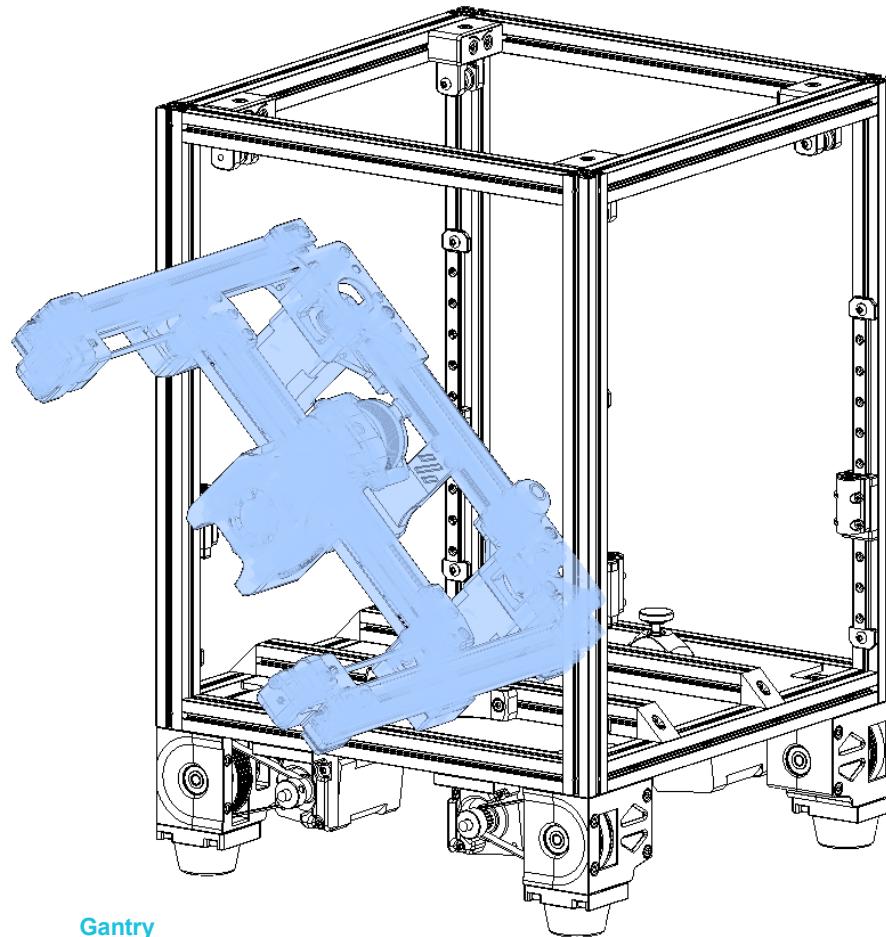
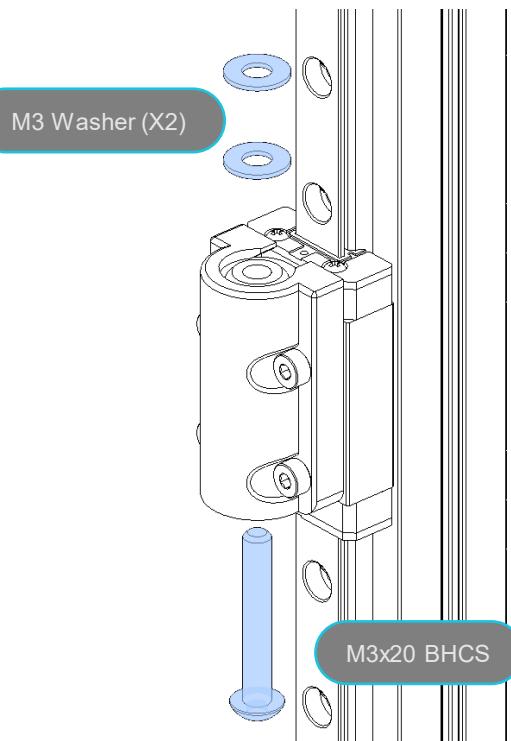
Mini Afterburner

This manual is not going to go over the assembly of the Mini Afterburner toolhead as that can be found in the Voron V0.1 assembly manual



Z Joints

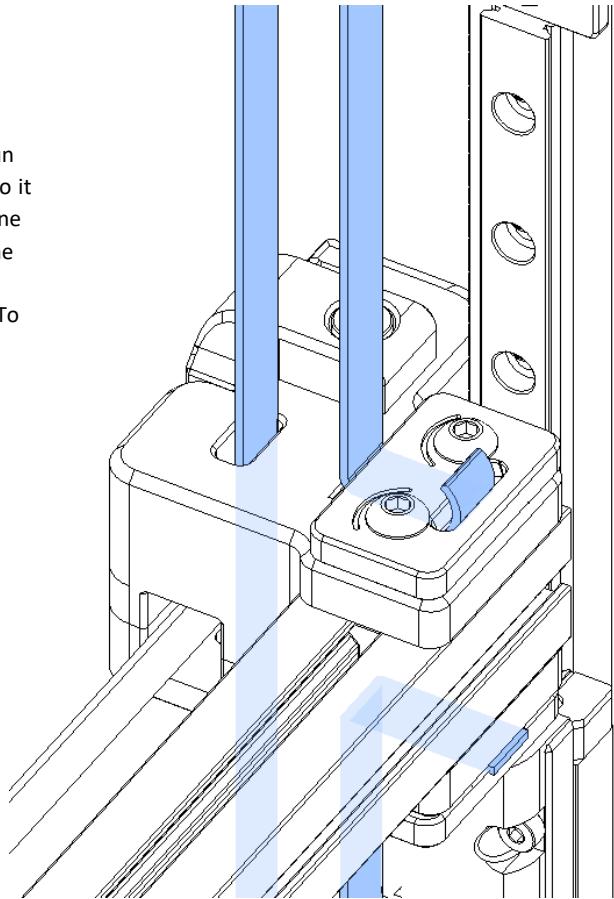
Insert an M3x20 and 2 M3 washers on to the Z joint in preparation for the gantry.

**Gantry**

Now that the gantry is fully assembled you can now install it in the printer , its easiest if you tilt the gantry to slide it in. This will just get set on the Z joints from previous step.

Z Belts

Now that the gantry is installed you can run the Z belts to hole it up. The best way to do it is by loosening the idlers / ab drives and line up the belt, so it is flush with the end of the rail extrusion and then rout the rest of the belt around the idler and drive assembly. To end the belt run the belt goes down and then comes back up through the slit in the belt clamp.



FRAME

MICRON



B DRIVE

MICRON

TEMPLATE

MICRON