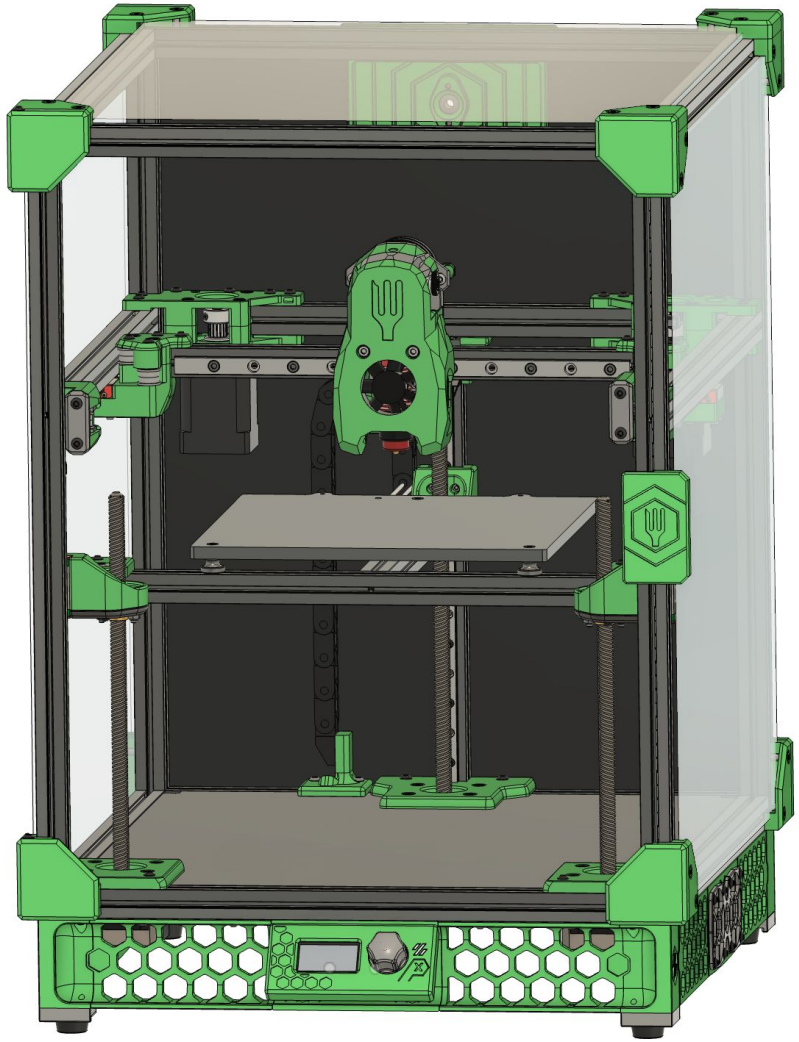

SALAD FORK MANUAL

Honey, I shrank the Trident!

VERSION 2024-05-13

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ACKNOWLEDGEMENTS

This project could not have happened without the support of the great team of testers and reviewers. They have contributed their time, feedback, ideas and designs, and most importantly their patience with me as this evolved over time.

I am truly grateful for all of their help throughout this entire process. **Thank you all!**

PART PRINTING SETTINGS AND GUIDELINES

These are the recommended settings and materials for building your Salad Fork, as they have been tested extensively and produce successful results.

3D PRINTING PROCESS

Fused Deposition Modeling (FDM)

MATERIAL

ABS/ASA

LAYER HEIGHT

Recommended: 0.2mm

EXTRUSION WIDTH

Recommended: Forced 0.4mm

INFILL TYPE

Grid, Gyroid, Honeycomb, Triangle or Cubic

INFILL PERCENTAGE

Recommended: 40%

WALL COUNT

Recommended: 4

SOLID TOP/BOTTOM LAYERS

Recommended: 5

FILE NAMING

The STL files all follow a common naming pattern to make it easier to understand which color to print with and how many copies of a part are required.

PRIMARY COLOR

A_Drive_Frame_Lower_x1.stl
These files will have nothing at the start of the filename.

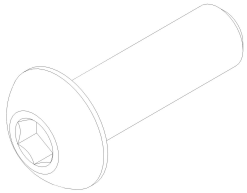
ACCENT COLOR

[a]_Tensioner_Carrier_A_x1.stl
Parts which are intended to be printed in your accent color start with “[a]” in the file name

These parts will also be called out with an asterisk when used in the manual: *

QUANTITY REQUIRED

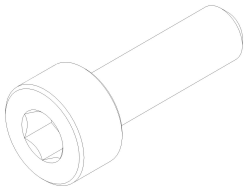
Electronics_fan_mount_x2.stl
All files end with the number of copies required, in most cases this is only 1. This example requires 2 copies of the part.



BUTTON HEAD CAP SCREW (BHCS)

Metric fastener with a domed shaped head and hex drive.

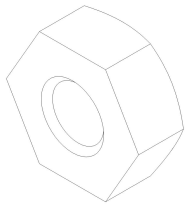
ISO 7380-1



SOCKET HEAD CAP SCREW (SHCS)

Metric fastener with a cylindrical shaped head and hex drive.

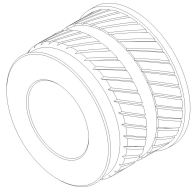
ISO 4762 / DIN 912



HEX NUT

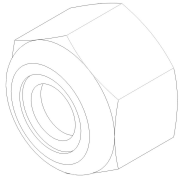
Hex nuts couple with bolts to create a solid, secure joint. These are used in M2, M3 and M5 sizes throughout this manual.

ISO 4032 / DIN 934



HEAT SET INSERT

Heat the inserts with a soldering iron so that they melt the plastic when installed. As the plastic cools, it solidifies around the knurls and ridges on the insert for excellent resistance to both torque and pull-out.



LOCK NUT

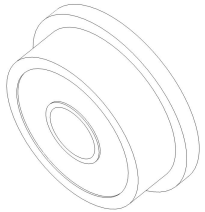
A variant of the hex nut, these nuts contain a nylon insert to prevent loosening under vibration or other loads.

KNURLED NUT

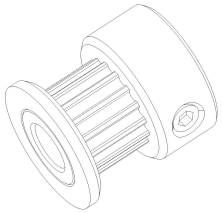
These special nuts have a taper cut into them, and have a smaller side and a larger side. These are used in M4 size for this printer.

DIN 466-B

GE5C SPHERICAL BEARING
This is a compound bearing with an inner and outer shell which allow rotation in multiple directions.

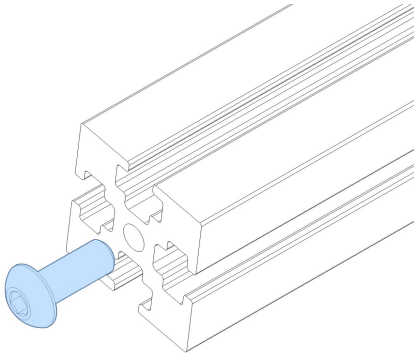


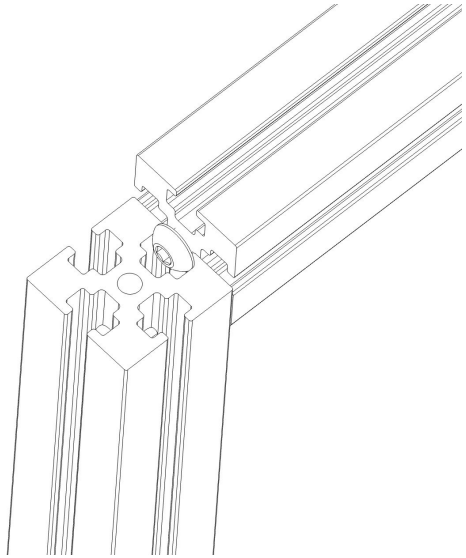
F623 BEARING
A ball bearing with a flange used in various gantry locations.



PULLEY
GT2 pulley used in the motion system

M3 SHIM
This is a ground shim, not a common stamped washer. These are machined to be flat and a consistent size, unlike stamped washers which can vary greatly.

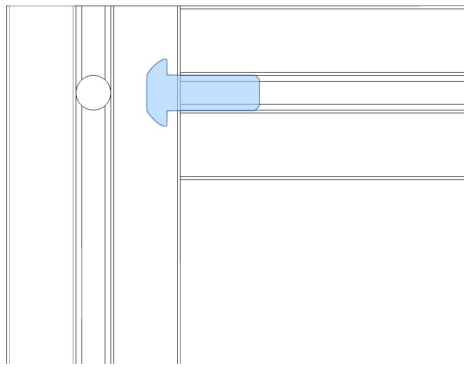


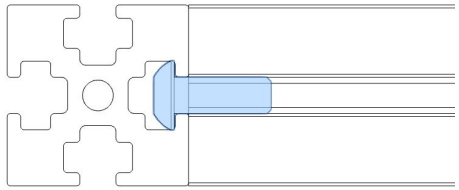


BLIND JOINT BASICS

Blind joints provide a cost-effective and rigid assembly method.

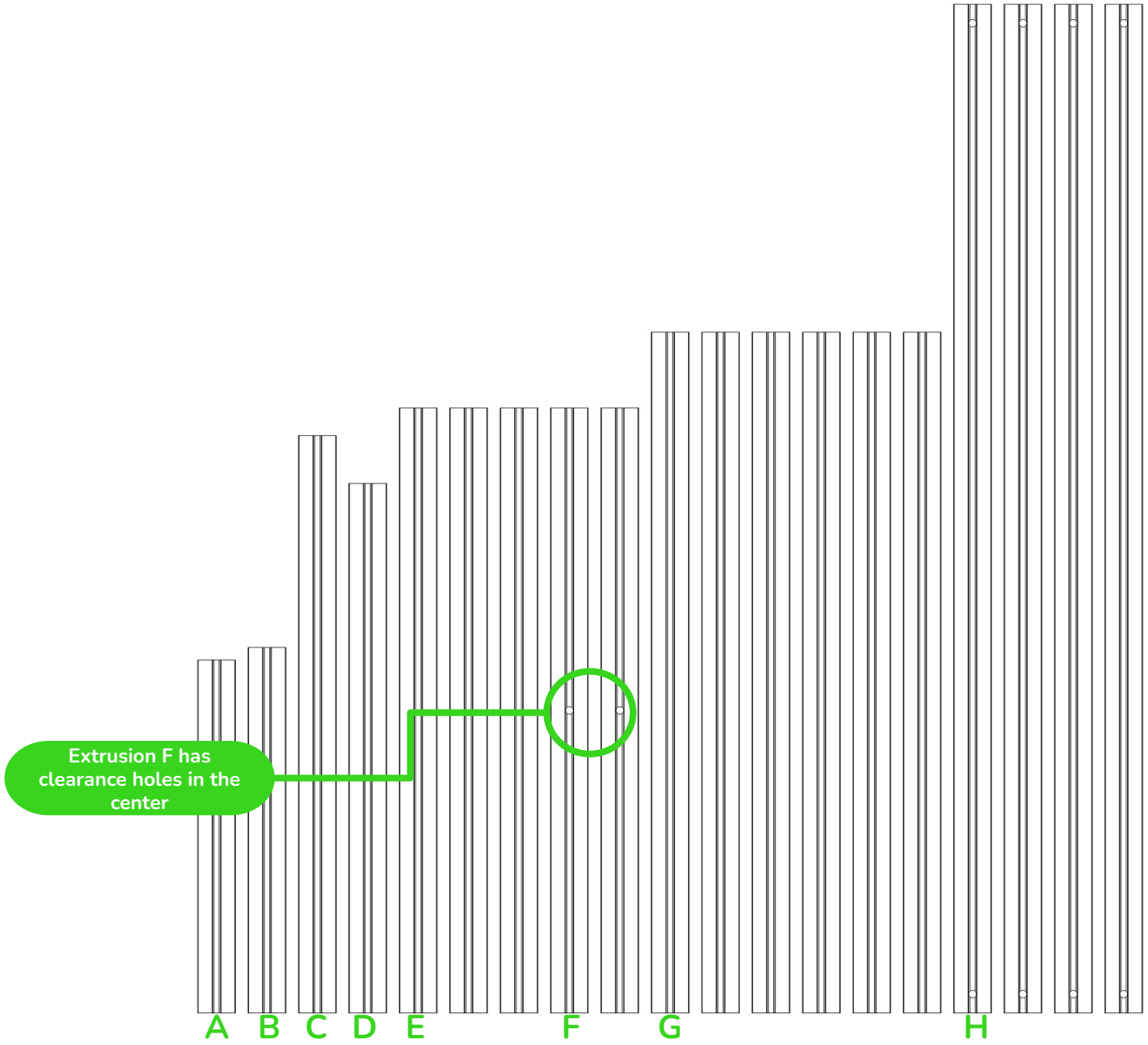
The head of a BHCS is slid into the channel of another extrusion, and fastened using a hex driver through the small access hole.





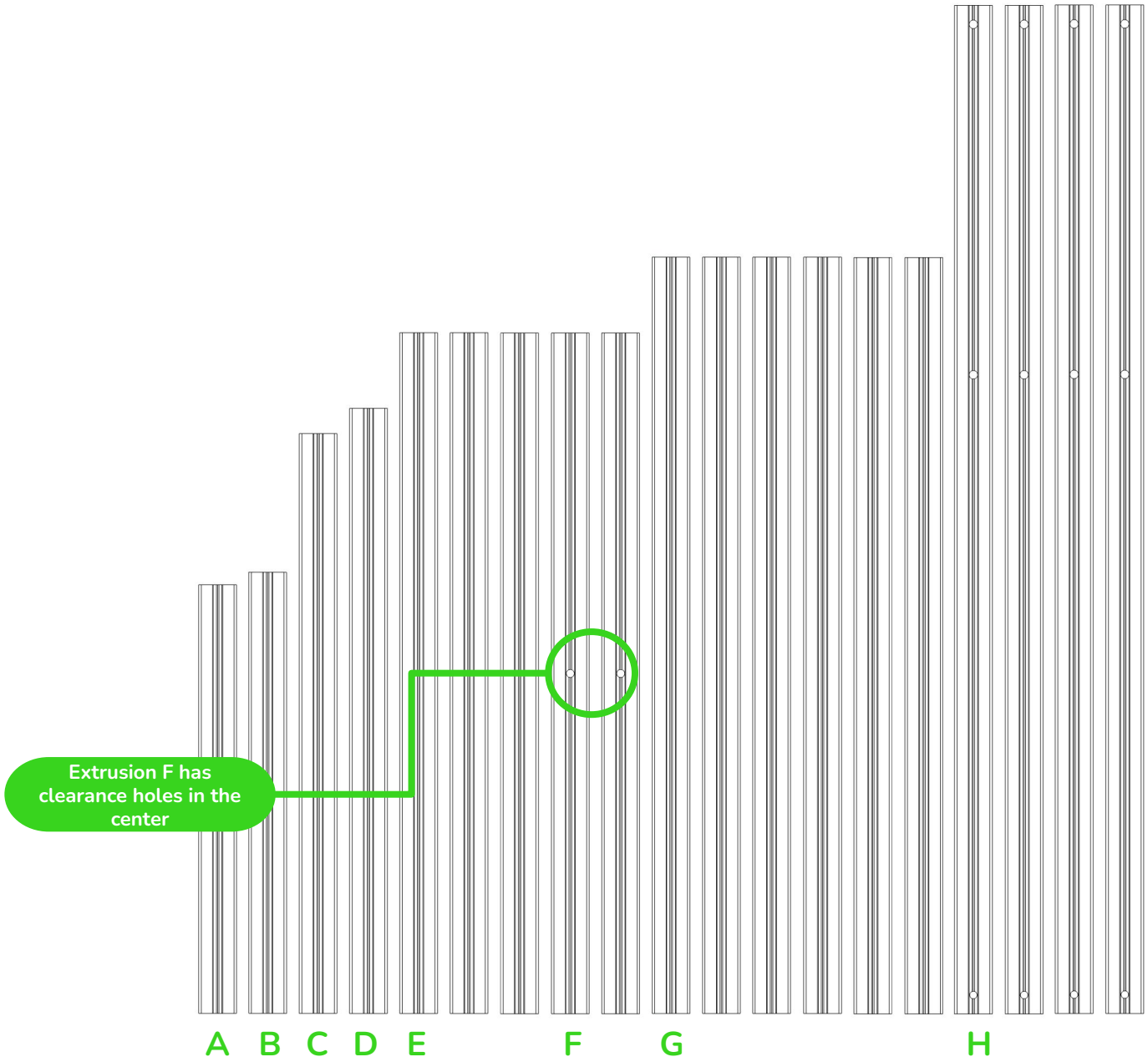
EXTRUSIONS FOR 120mm SALAD FORK

LABEL	LENGTH	QTY
A	140	1
B	145	1
C	229	1
D	210	1
E	240	3
F	240	2
G	270	6
H	400	4



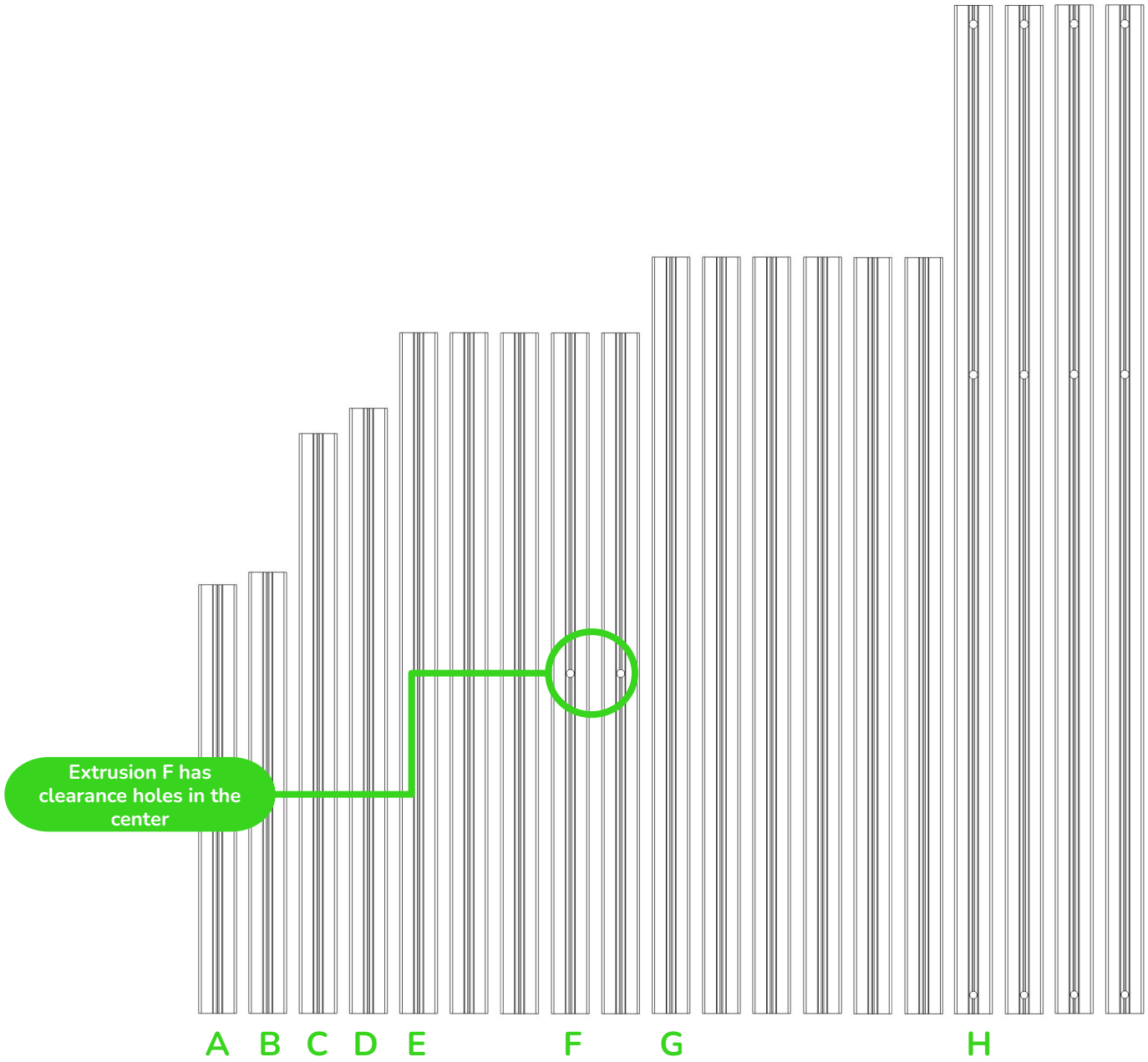
EXTRUSIONS FOR 160mm SALAD FORK

LABEL	LENGTH	QTY
A	170	1
B	175	1
C	229	1
D	240	1
E	270	3
F	270	2
G	300	6
H	400	4



EXTRUSIONS FOR 180mm SALAD FORK

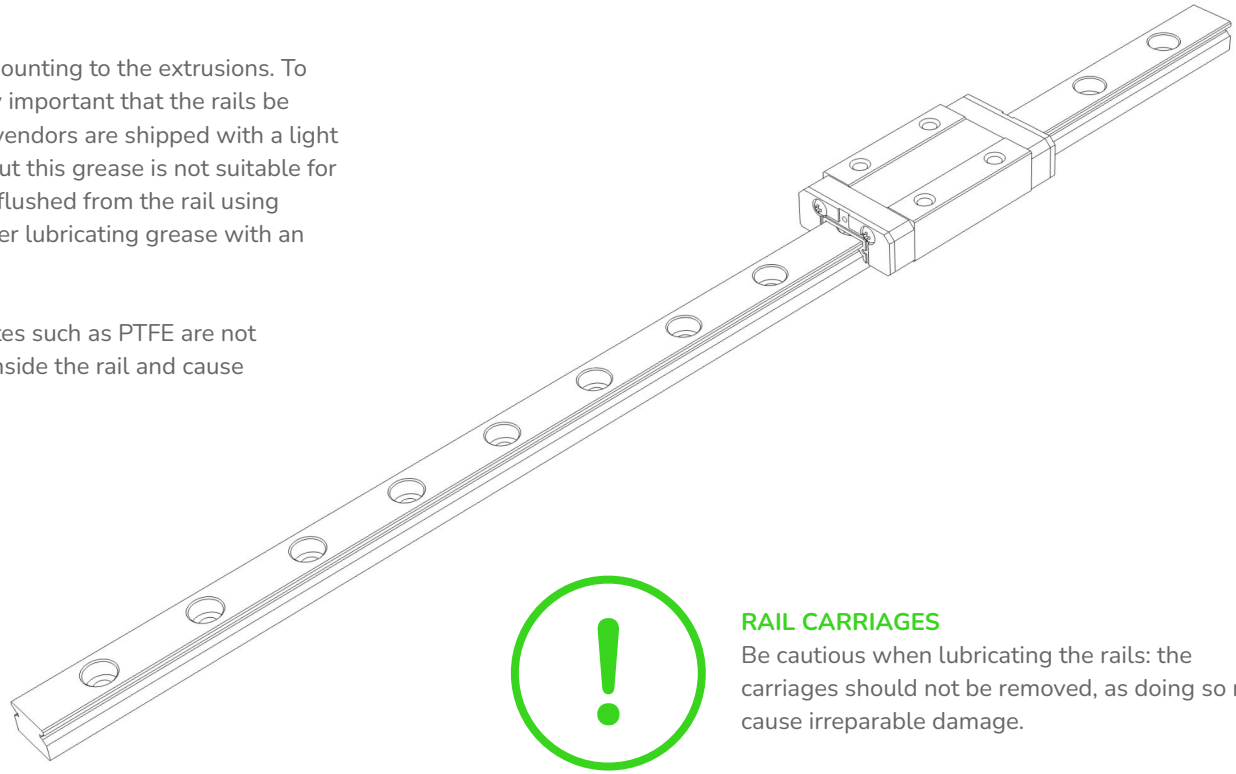
LABEL	LENGTH	QTY
A	190	1
B	195	1
C	229	1
D	260	1
E	290	3
F	290	2
G	320	6
H	400	4



LINEAR RAILS - PREPARATION AND MOUNTING

In this step we will be preparing all 6 linear rails for mounting to the extrusions. To ensure a smooth gliding motion and long life, it is very important that the rails be properly prepared prior to mounting. Many rails from vendors are shipped with a light grease to protect the rail in manufacture and transit, but this grease is not suitable for use in the print environment. This grease needs to be flushed from the rail using isopropyl alcohol (IPA), and then replaced with a proper lubricating grease with an EP2 rating.

Please be aware that greases which contain particulates such as PTFE are not suitable for this purpose, as the particles can jam up inside the rail and cause excessive wear and grinding.



RAIL CARRIAGES

Be cautious when lubricating the rails: the carriages should not be removed, as doing so may cause irreparable damage.

WHICH RAIL TO USE?

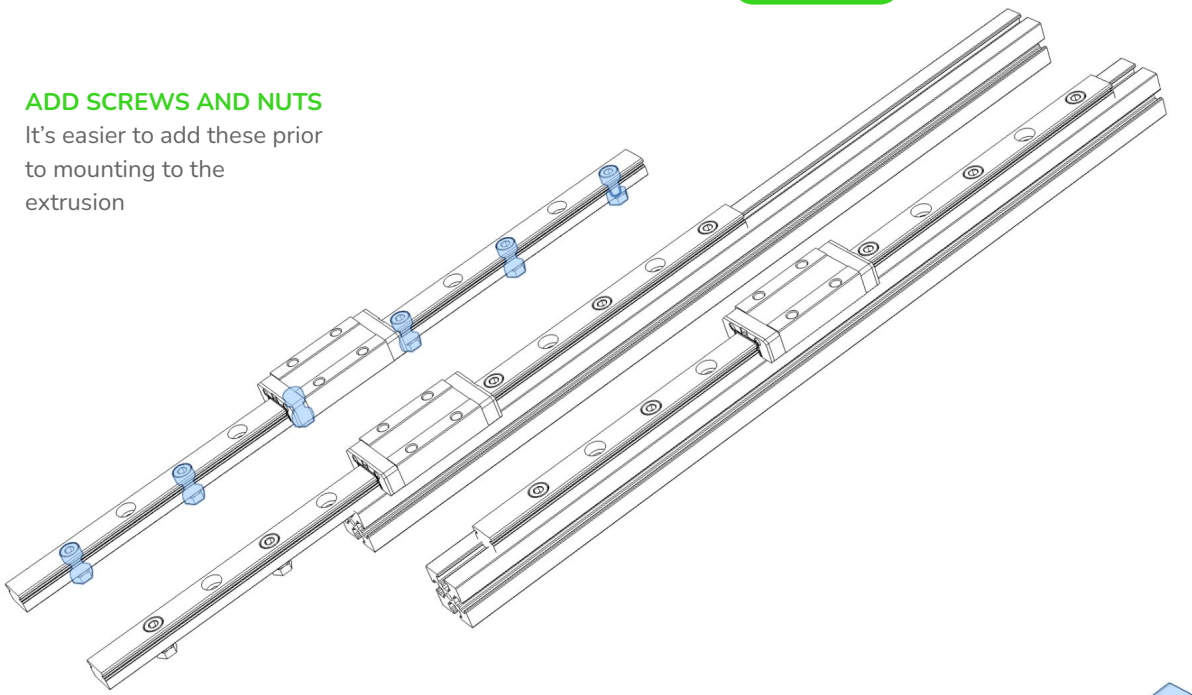
120mm	MGN9H-180
160mm	MGN9H-210
180mm	MGN9H-230

D Extrusion

M3x6 SHCS

ADD SCREWS AND NUTS

It's easier to add these prior to mounting to the extrusion

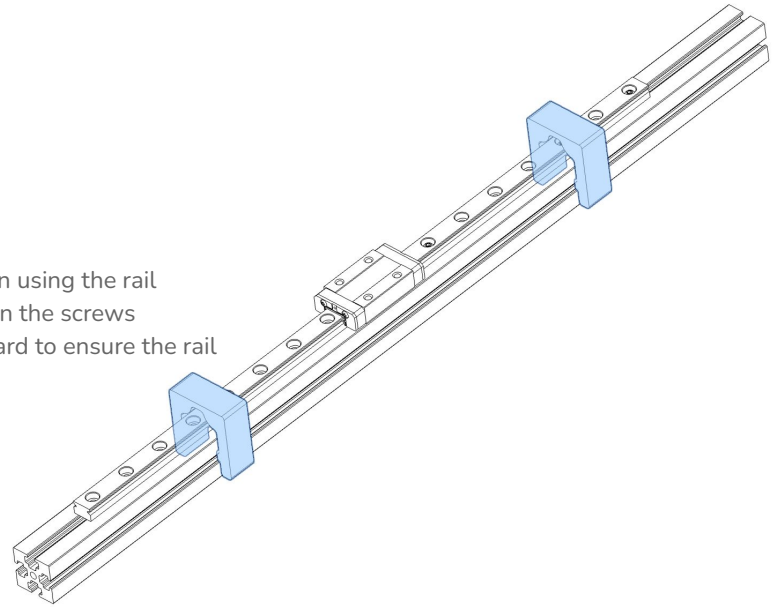


NUT BAR?

If your vendor has provided a machined nut bar for the rails, use that instead of the M3 nuts

CENTER AND TIGHTEN

Center the rail on the extrusion using the rail guides, and then gently tighten the screws starting from the center outward to ensure the rail sits flush on the extrusion



WHICH RAILS TO USE?

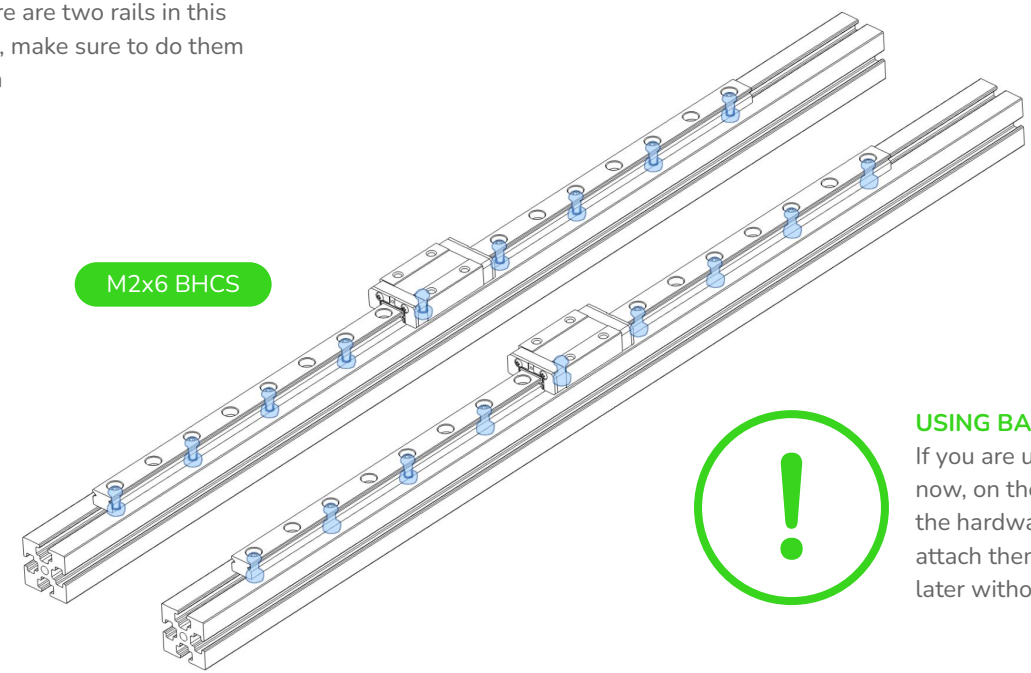
120mm	MGN7H-200
160mm	MGN7H-230
180mm	MGN7H-250

TWO RAILS

There are two rails in this step, make sure to do them both

G Extrusion

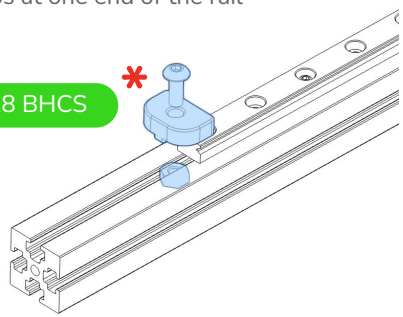
M2x6 BHCS



RAIL STOPS

The Y and Z rails have printed rail stops at one end of the rail

M3x8 BHCS

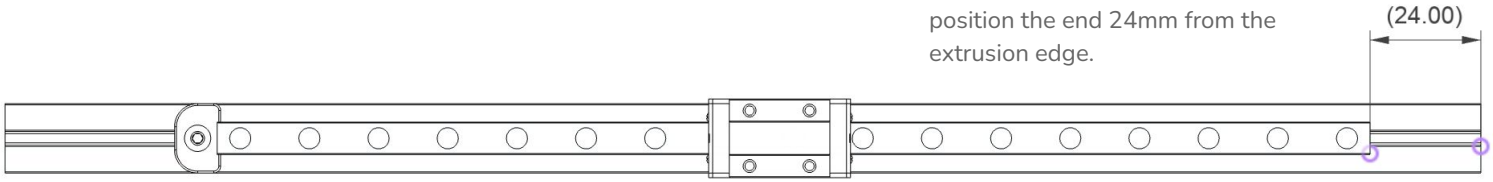


USING BACKERS?

If you are using extrusion backers, add them now, on the opposite side of the rail. Use the hardware provided by your vendor to attach them. You won't be able to add them later without disassembly.

Y RAIL POSITIONING

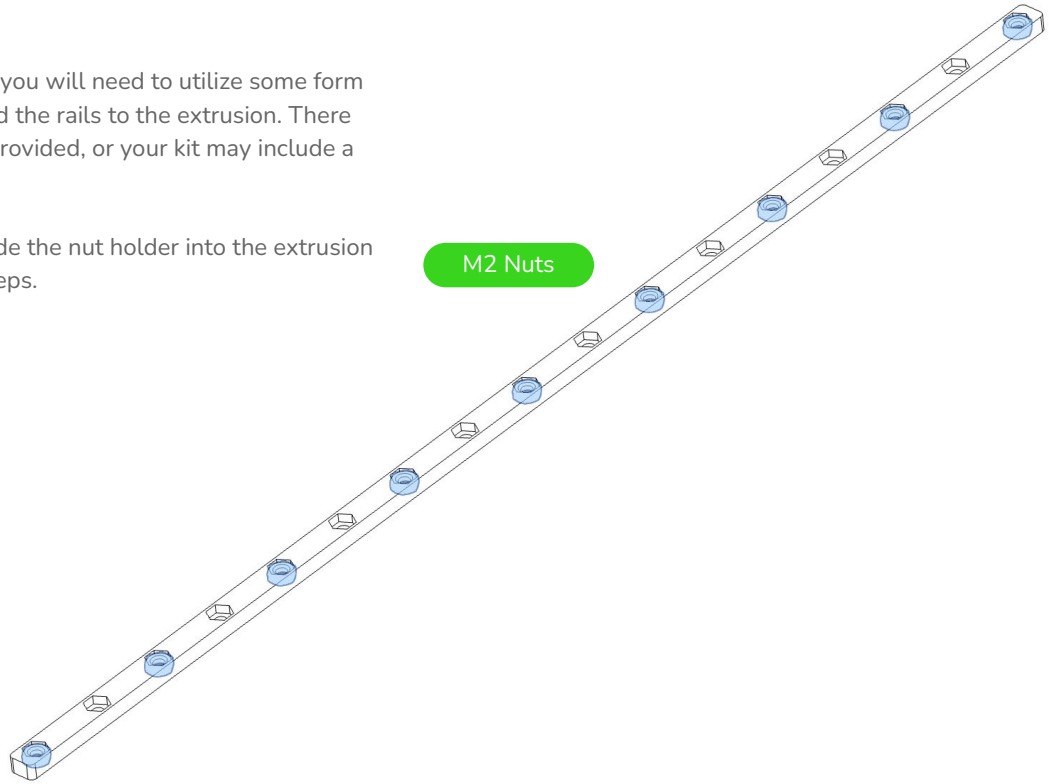
Use the centering guides to align the rails on the extrusion, and position the end 24mm from the extrusion edge.



NUT HOLDERS

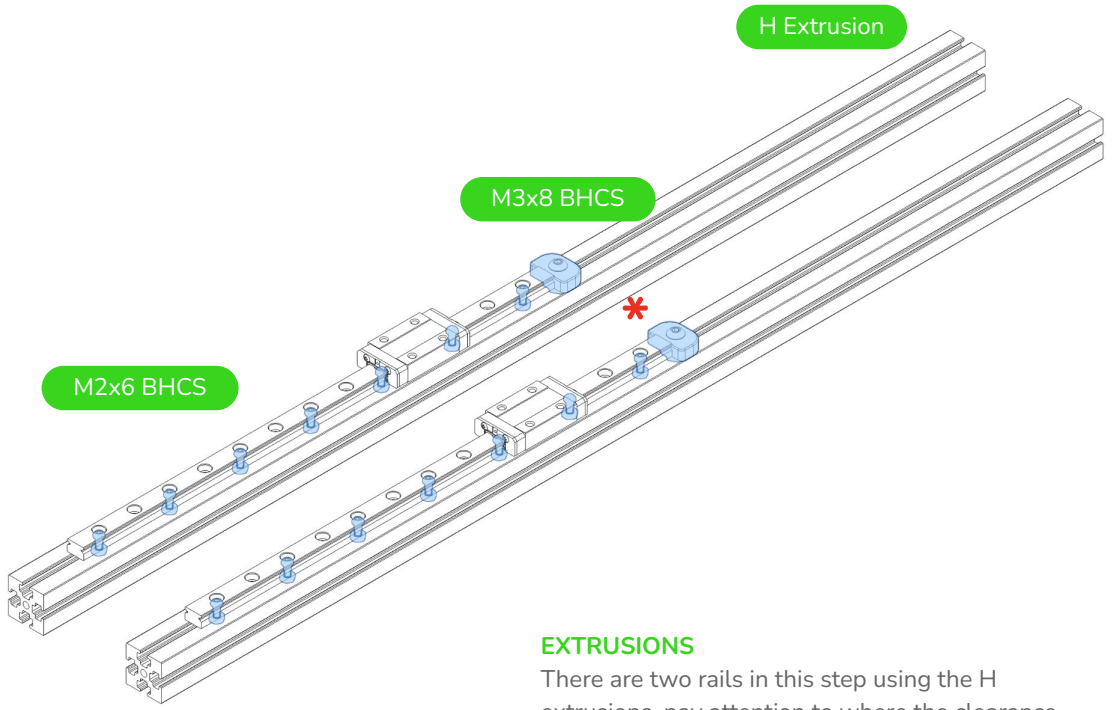
For the 5 MGN7 rails used on this printer, you will need to utilize some form of nut holder for the M2 hex nuts that hold the rails to the extrusion. There are printed versions for each size printer provided, or your kit may include a machined or PCB version instead.

Insert the nuts into the nut holder, and slide the nut holder into the extrusion prior to adding the rails in the next few steps.



WHICH RAILS TO USE?

120mm	MGN7H-200
160mm	MGN7H-200
180mm	MGN7H-200

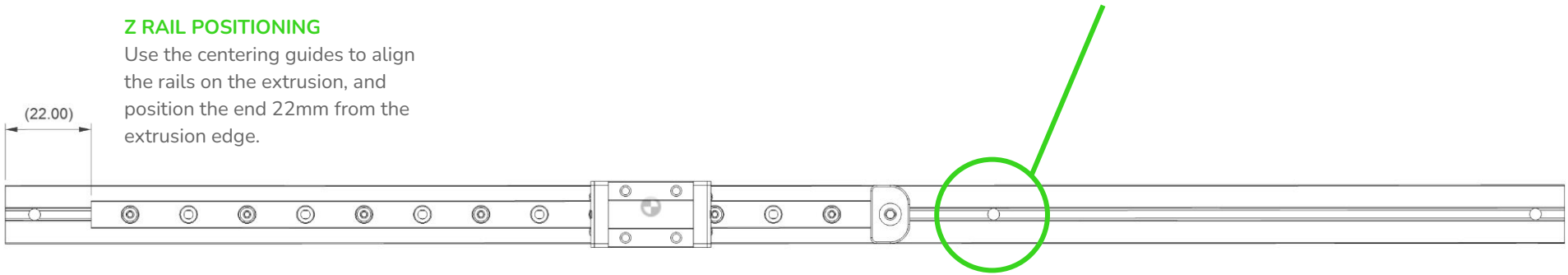


EXTRUSIONS

There are two rails in this step using the H extrusions, pay attention to where the clearance hole is.

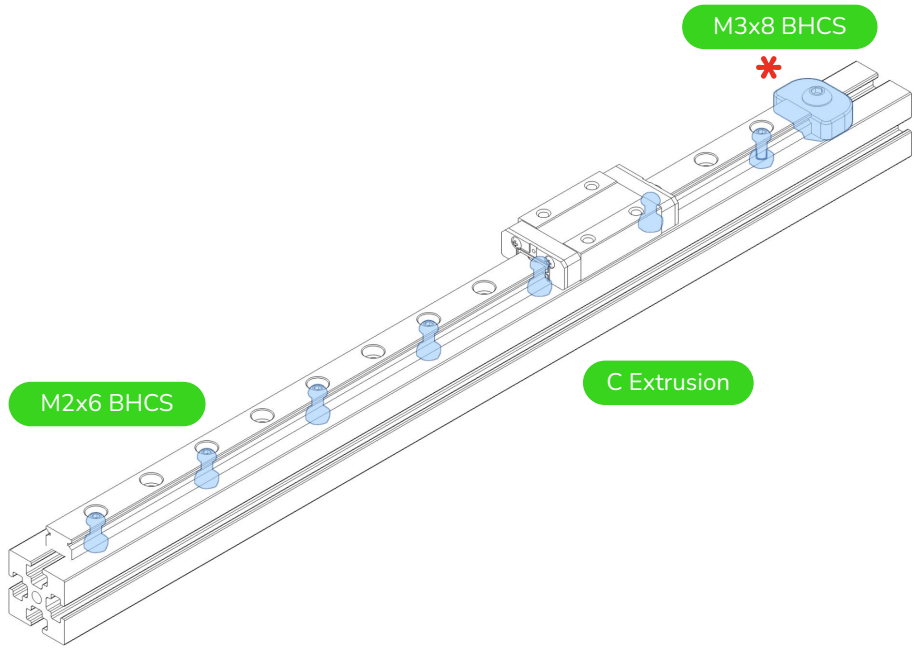
Z RAIL POSITIONING

Use the centering guides to align the rails on the extrusion, and position the end 22mm from the extrusion edge.



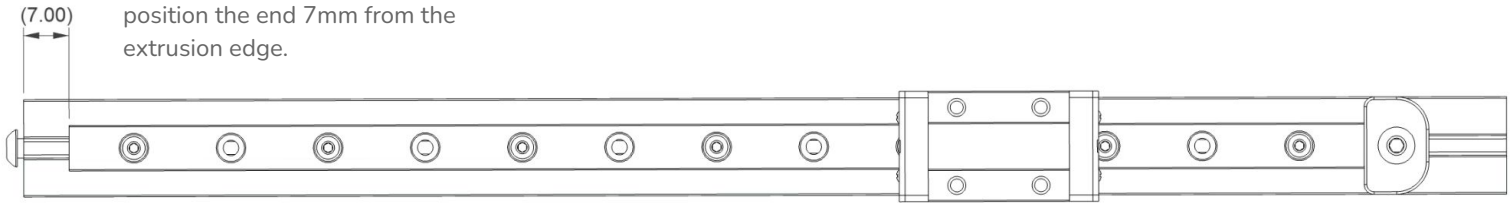
WHICH RAILS TO USE?

120mm	MGN7H-200
160mm	MGN7H-200
180mm	MGN7H-200



Z RAIL POSITIONING

Use the centering guides to align the rails on the extrusion, and position the end 7mm from the extrusion edge.

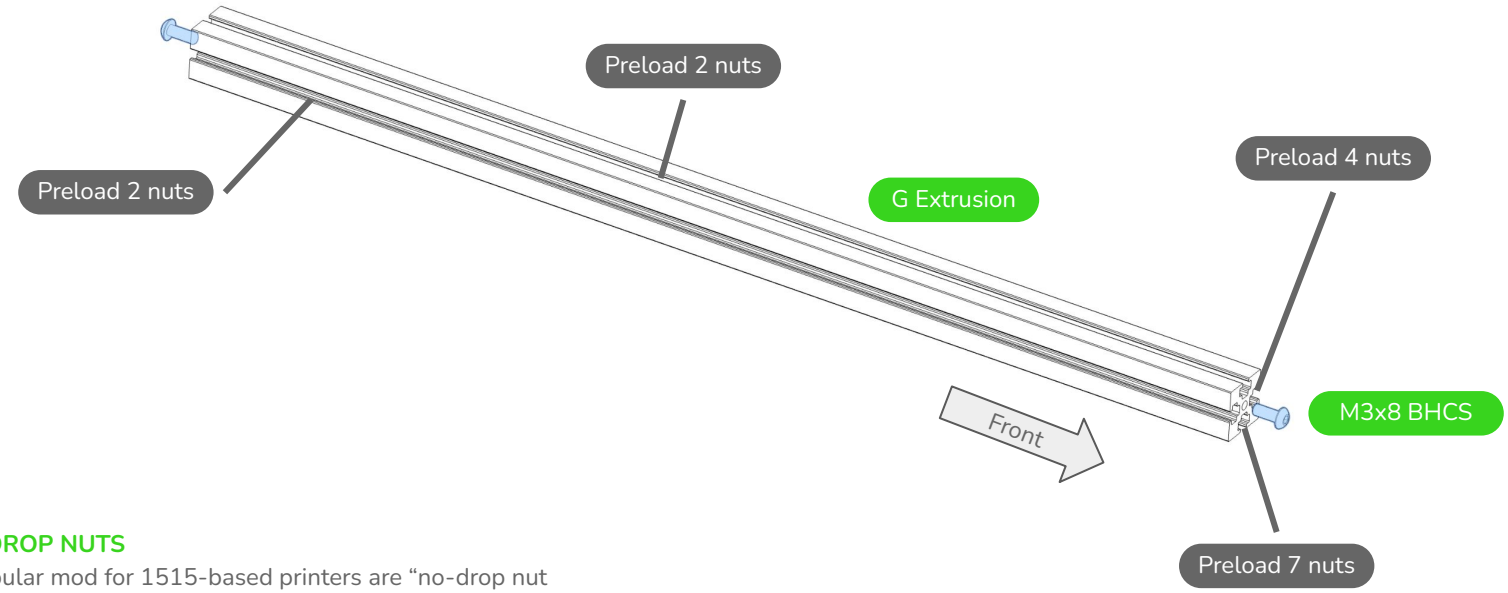


BLIND JOINT SCREWS

All of the blind joints in this build use M3x8 BHCS screws and for clarity won't be called out specifically in later steps.

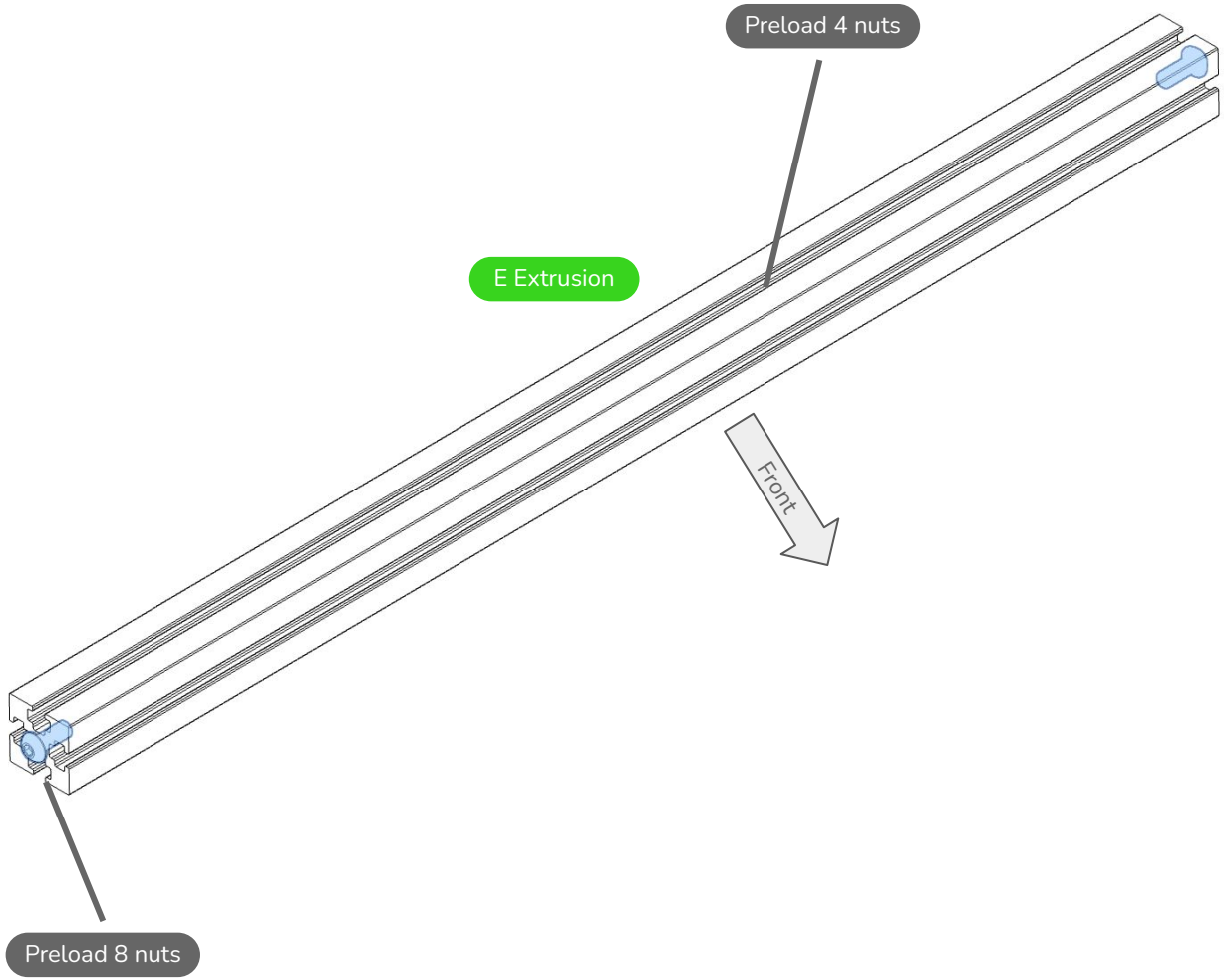
NUTS AND PRELOADS

For the rest of this guide, there will be callouts for additional nuts that need to be added to the extrusion channels. These are ***in addition*** to the nuts which anchor any screws called out in each step.



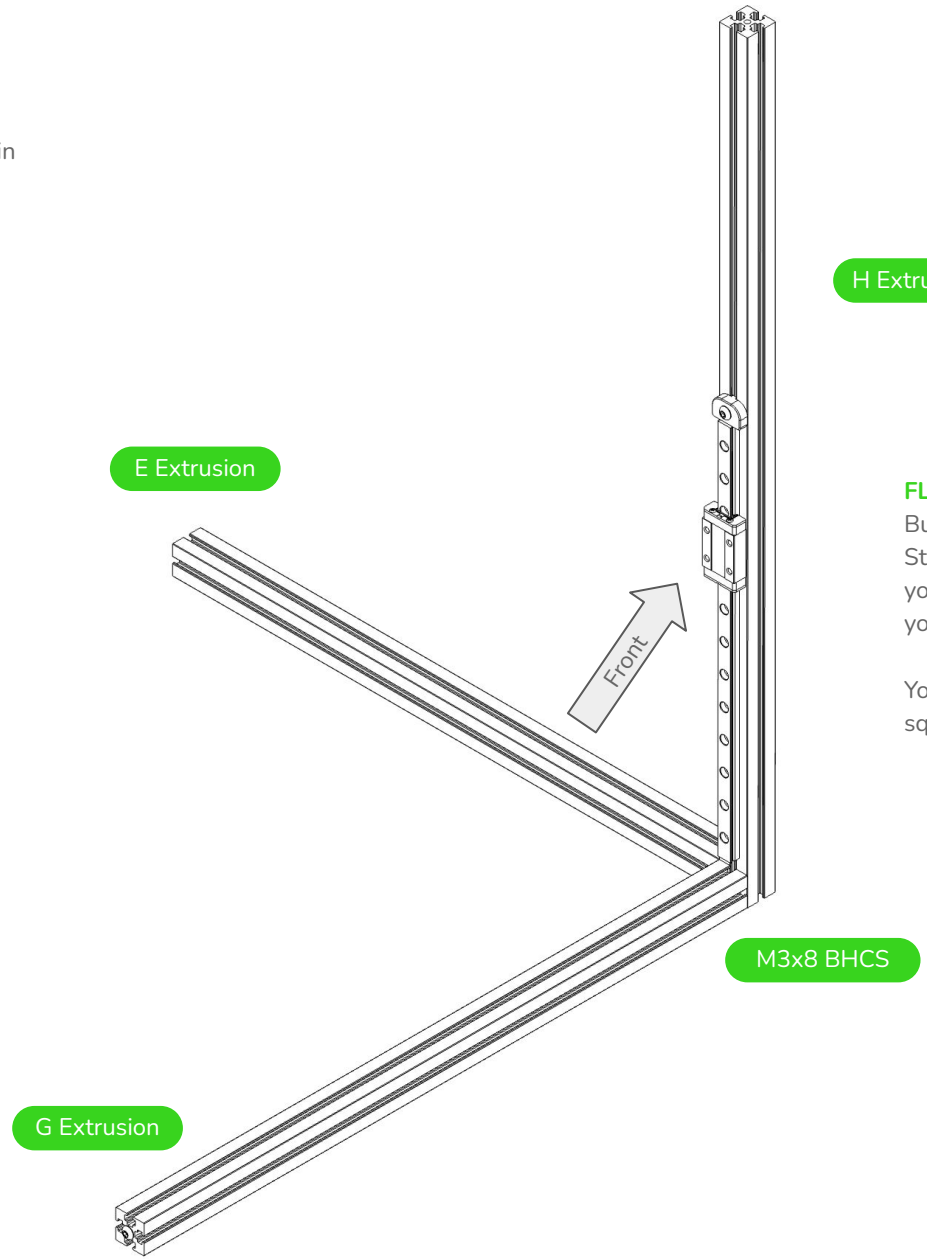
NO-DROP NUTS

A popular mod for 1515-based printers are "no-drop nut holders", which keep preloaded nuts from moving around in the extrusions during assembly.. These have to match the type of extrusion profile you have, so be sure to test them first if you want to use them for your build.


Preload 4 nuts
E Extrusion
Front
Preload 8 nuts

JOIN THE EXTRUSIONS

As shown in the Blind Joint Basics section earlier in this guide, attach the 3 extrusions that you just prepared together like this.



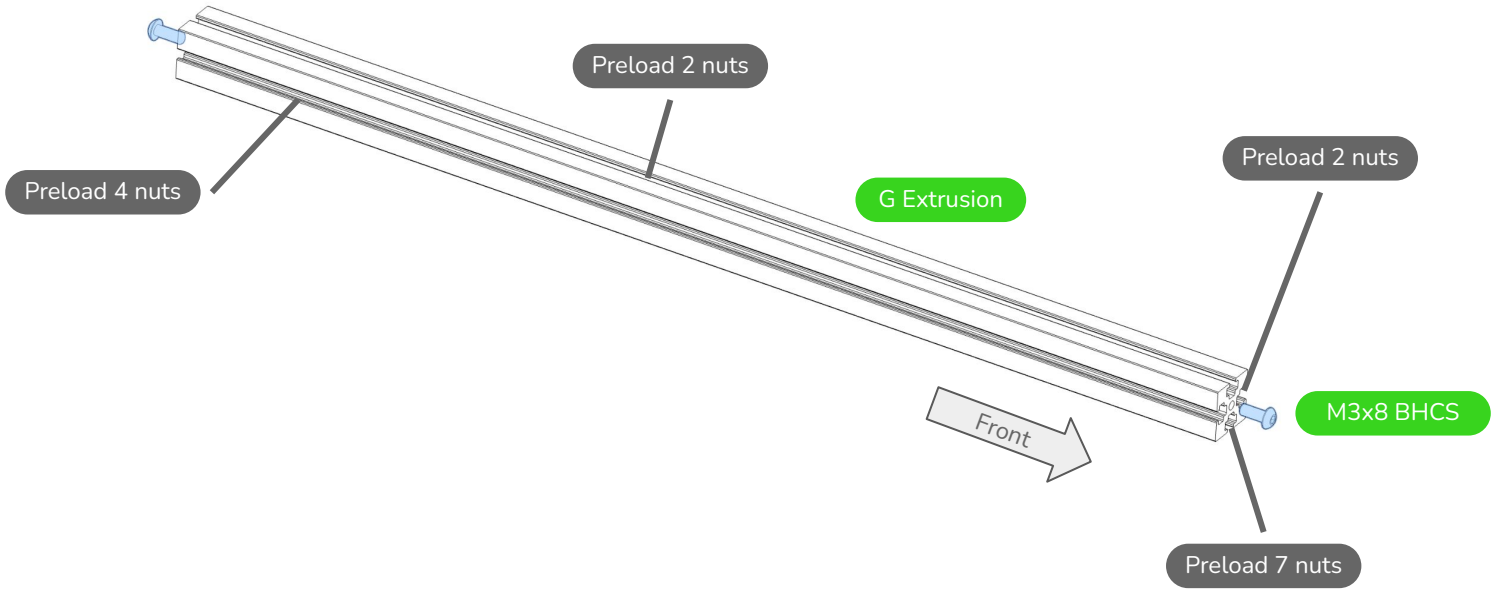
FLAT BUILD SURFACE

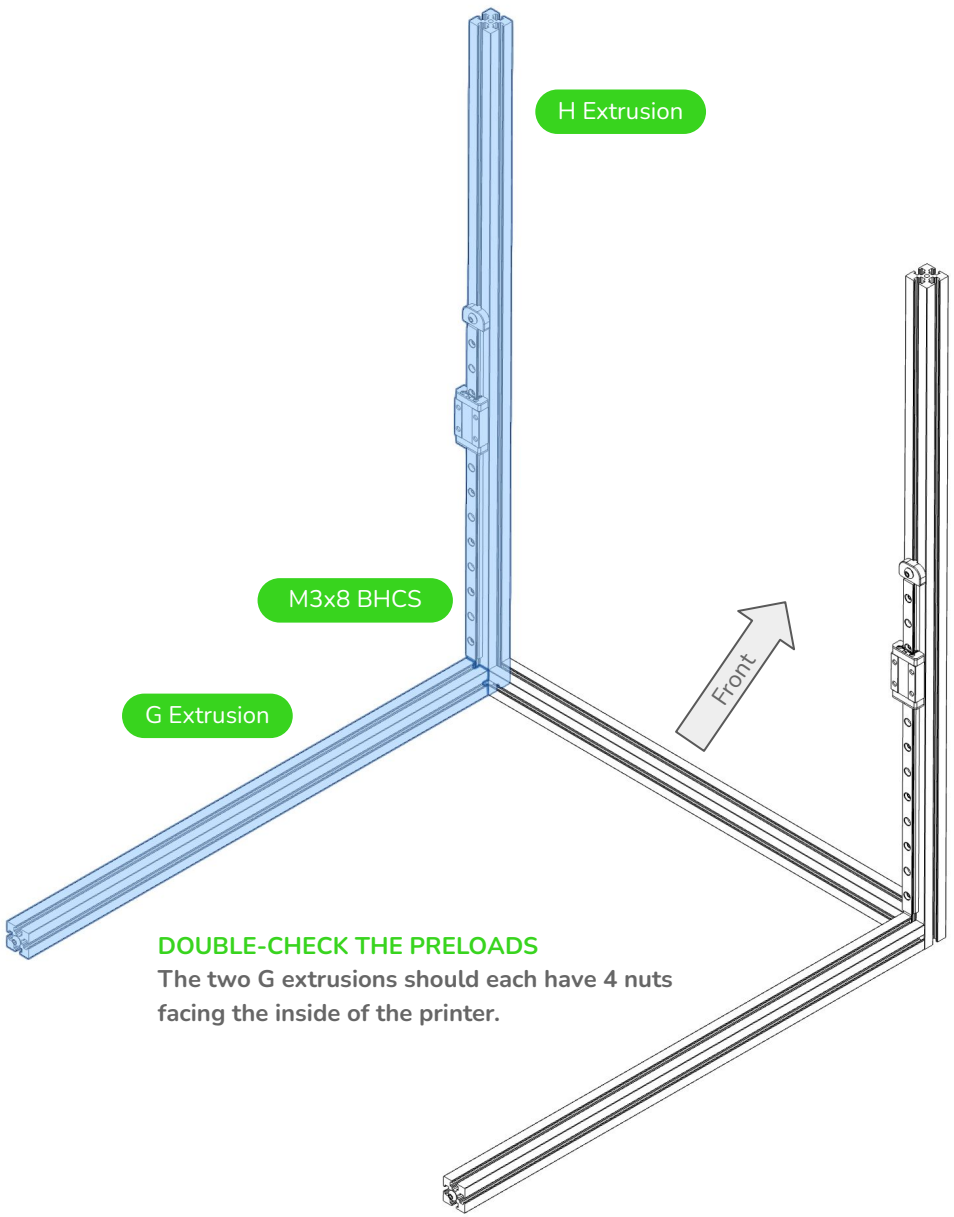
Build these on the flattest build surface you have. Stone countertops are a great surface for this, but if you don't have one then try to find the flattest area you can to do this assembly on.

You want the ends of the extrusions to be flush and square to each other. Accuracy matters!

PART ORIENTATION

Be careful with the orientation on the G extrusions here, this extrusion has some opposite preload counts to the earlier one.



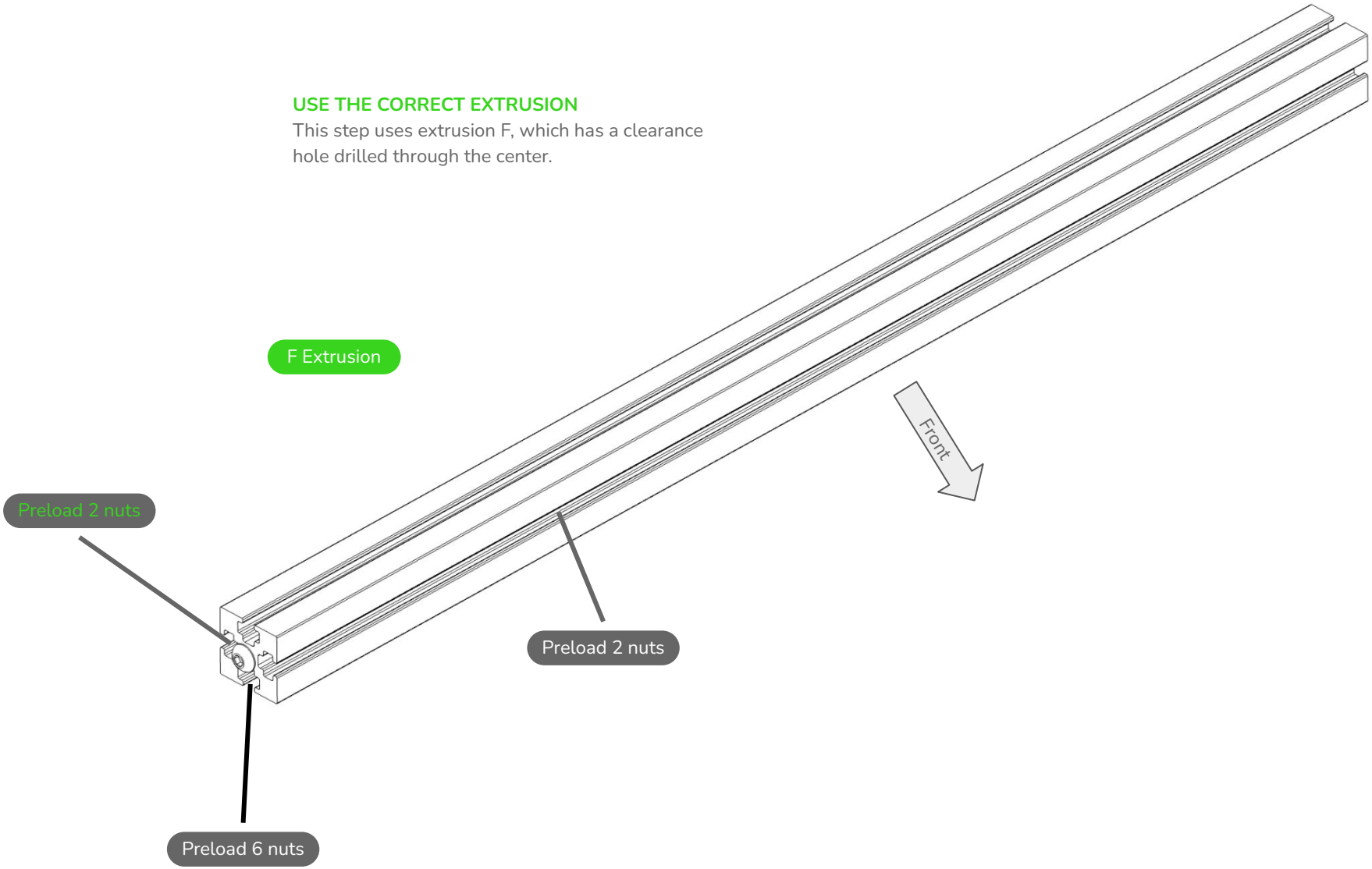


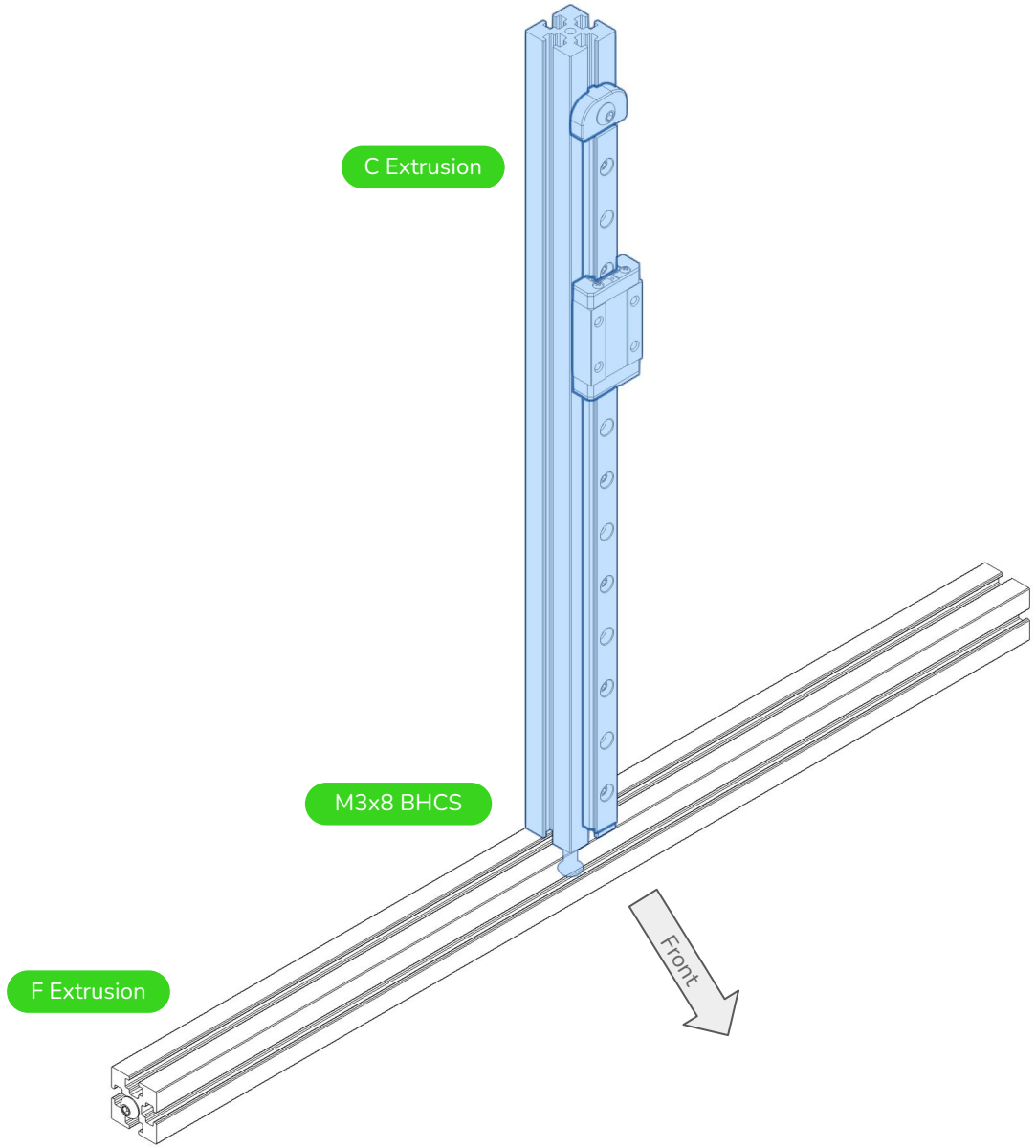
DOUBLE-CHECK THE PRELOADS

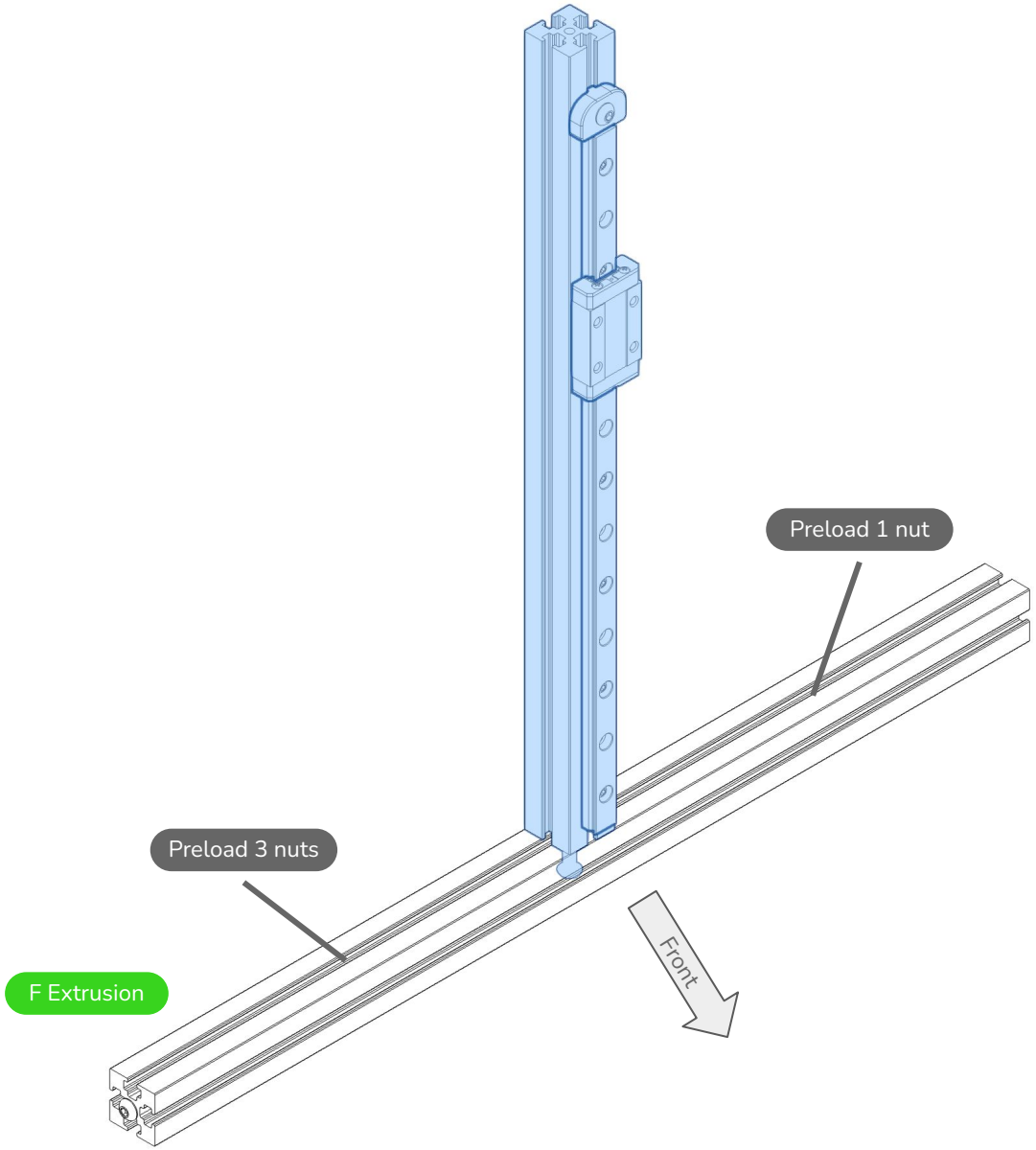
The two G extrusions should each have 4 nuts facing the inside of the printer.

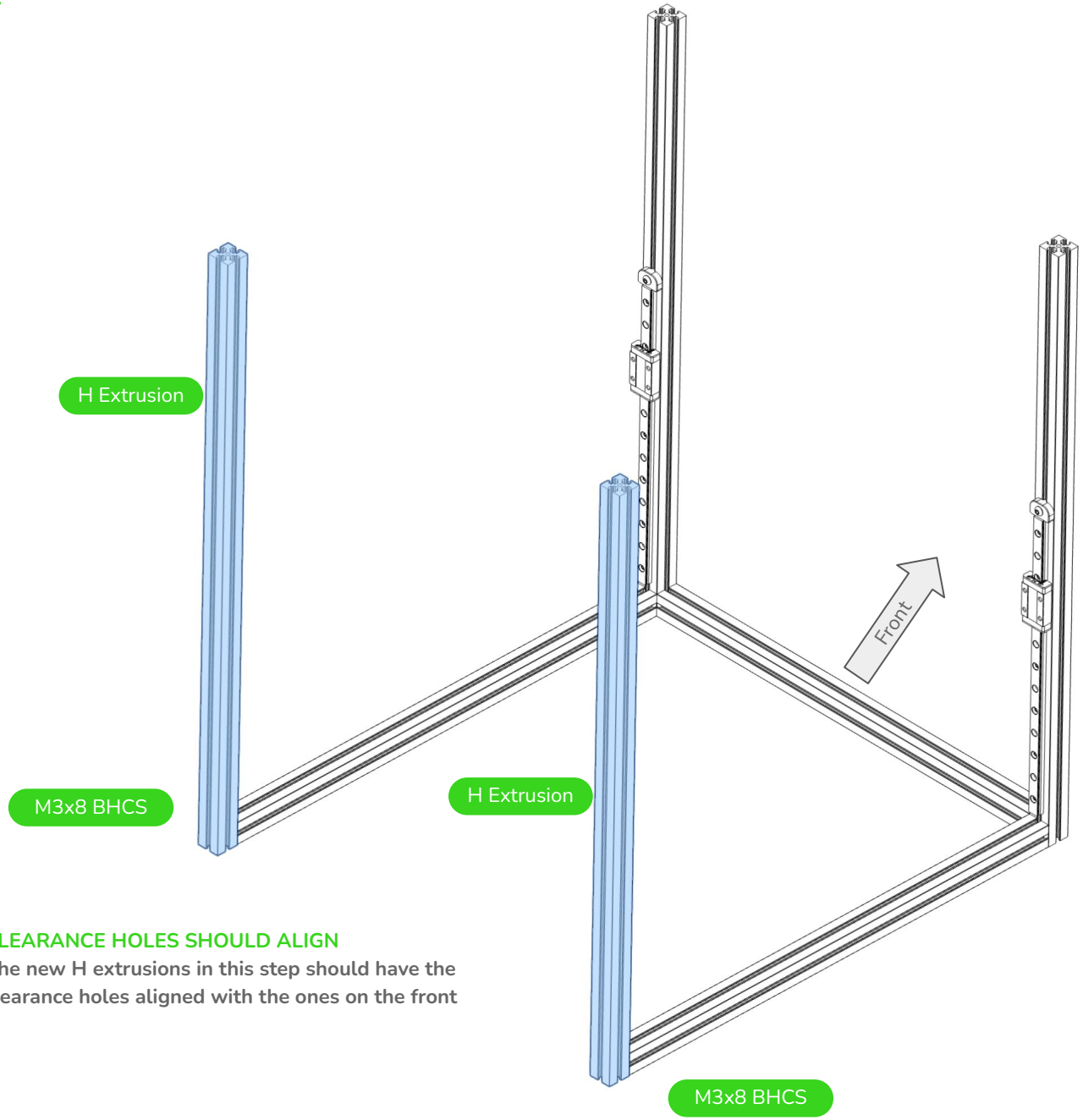
USE THE CORRECT EXTRUSION

This step uses extrusion F, which has a clearance hole drilled through the center.



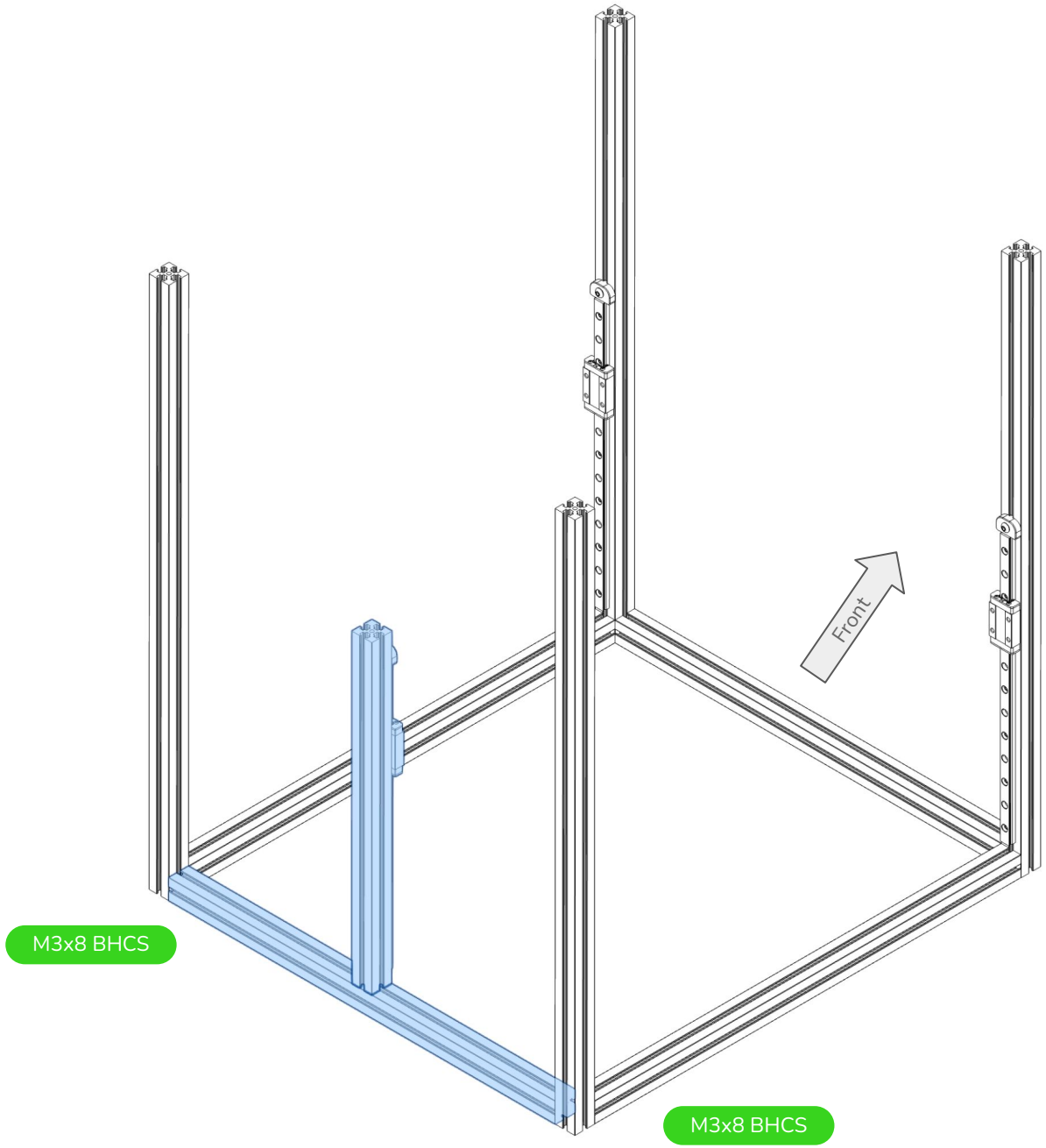

C Extrusion
M3x8 BHCS
F Extrusion
Front

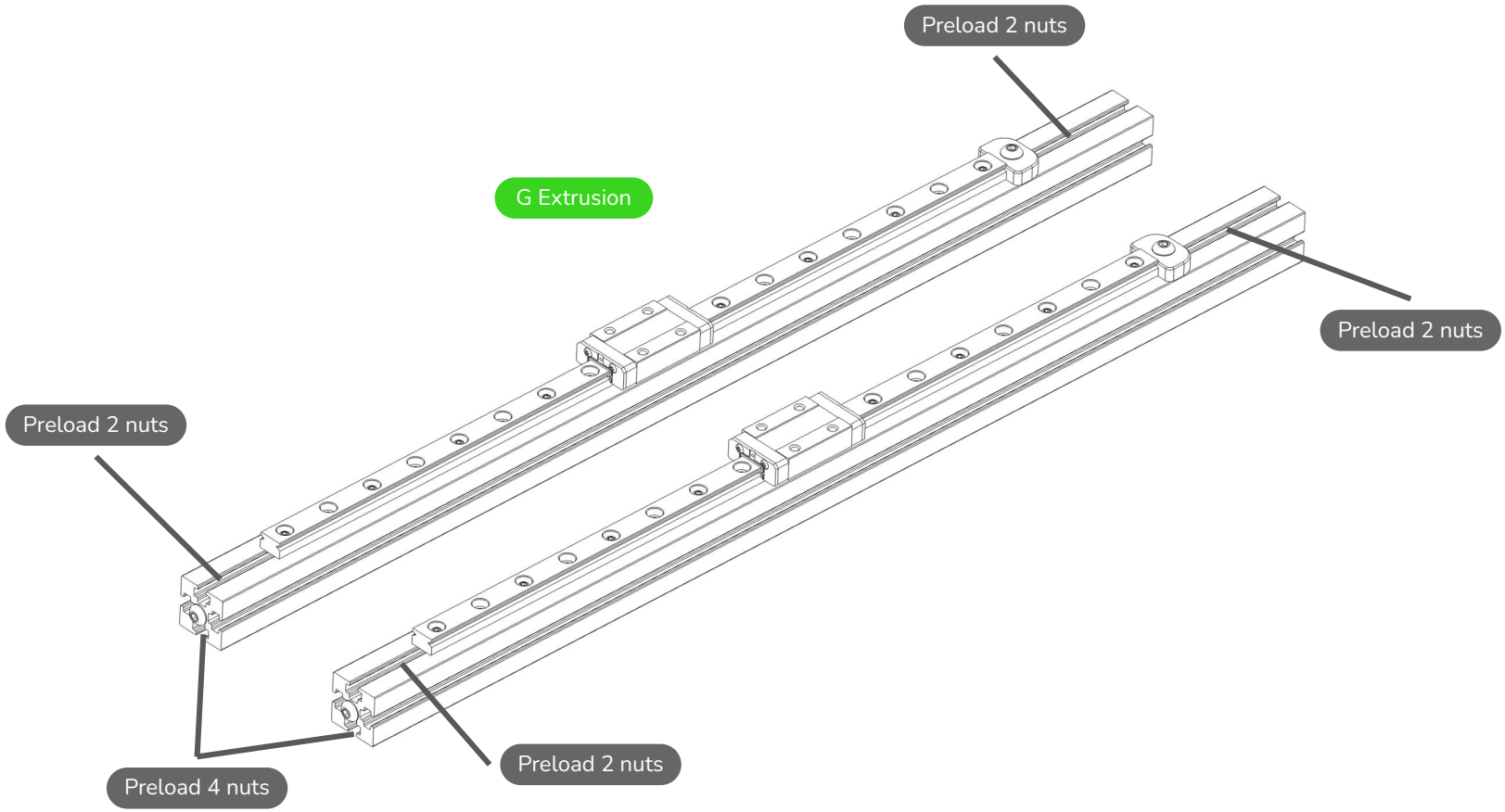

Preload 1 nut
Preload 3 nuts
F Extrusion
Front



CLEARANCE HOLES SHOULD ALIGN

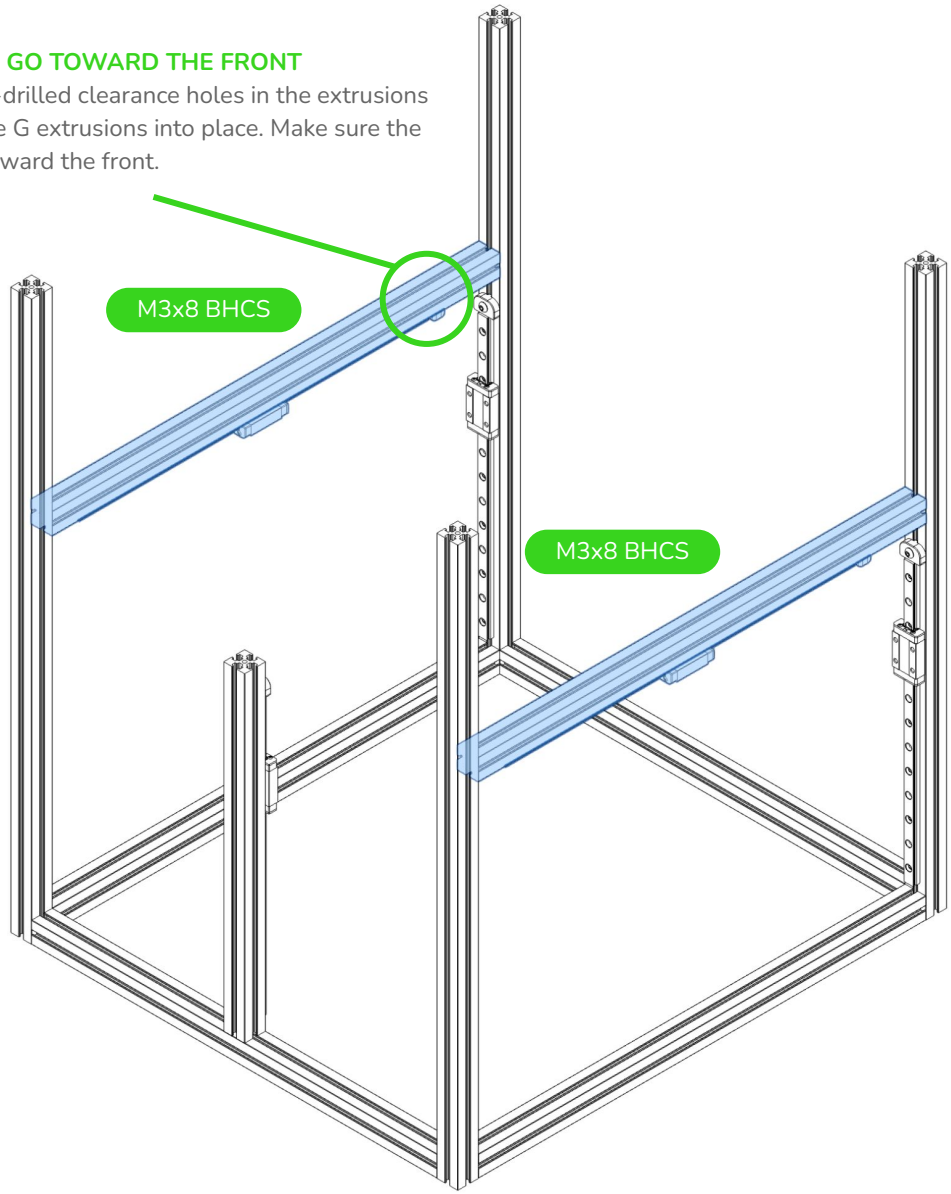
The new H extrusions in this step should have the clearance holes aligned with the ones on the front

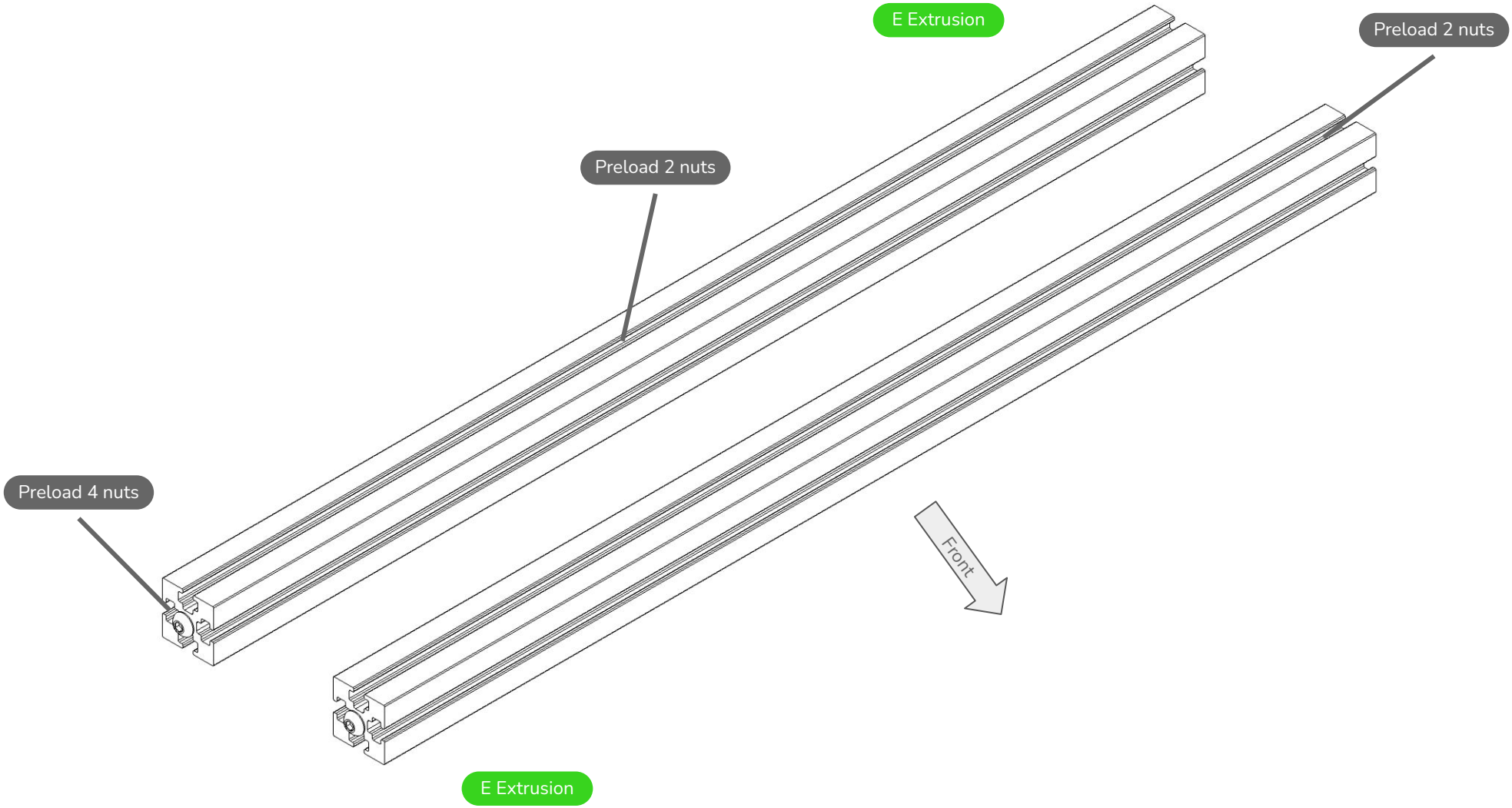

Front
M3x8 BHCS
M3x8 BHCS

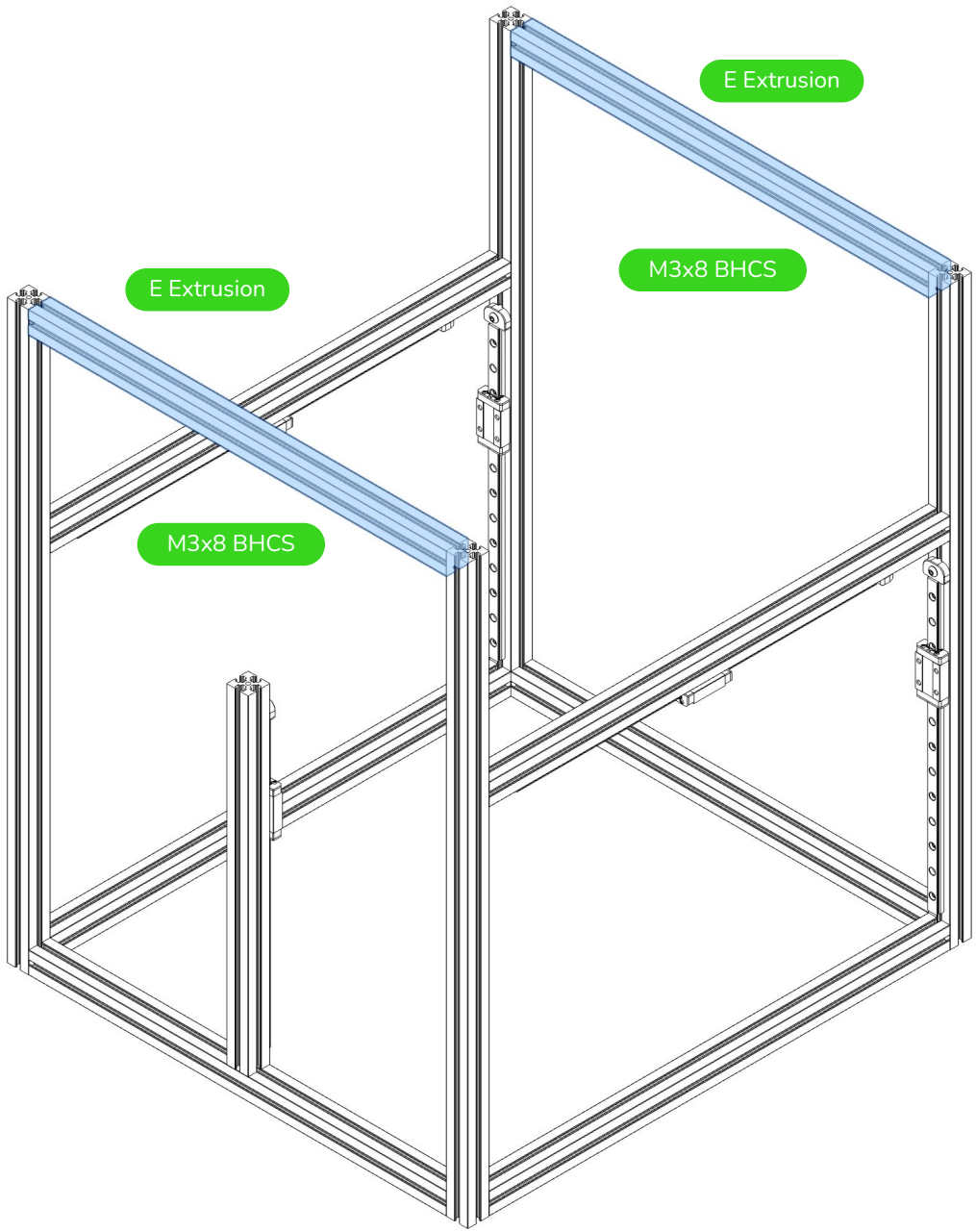

Preload 2 nuts
G Extrusion
Preload 2 nuts
Preload 2 nuts
Preload 4 nuts
Preload 2 nuts

RAILSTOPS GO TOWARD THE FRONT

Use the pre-drilled clearance holes in the extrusions to secure the G extrusions into place. Make sure the railstop is toward the front.

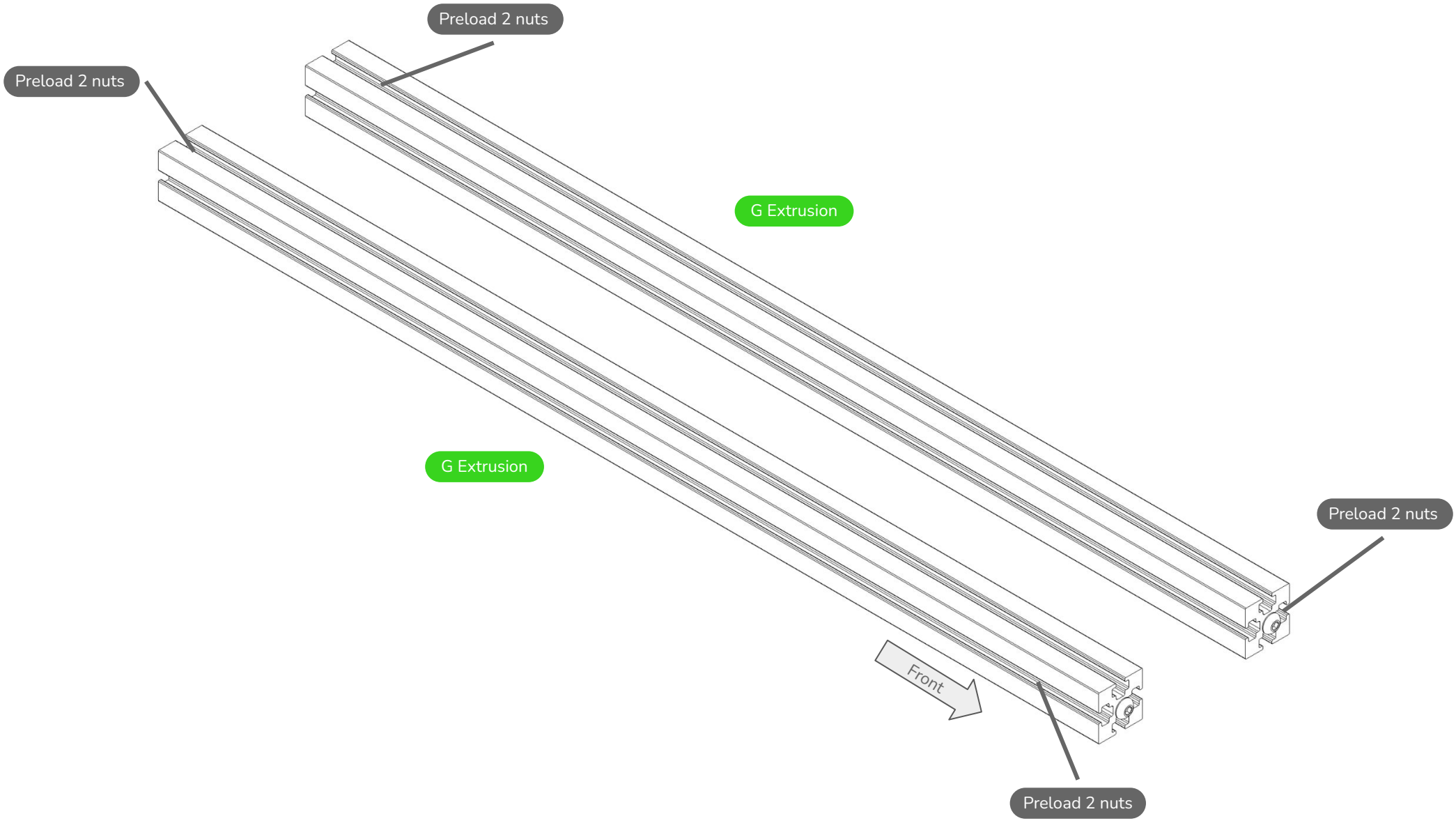


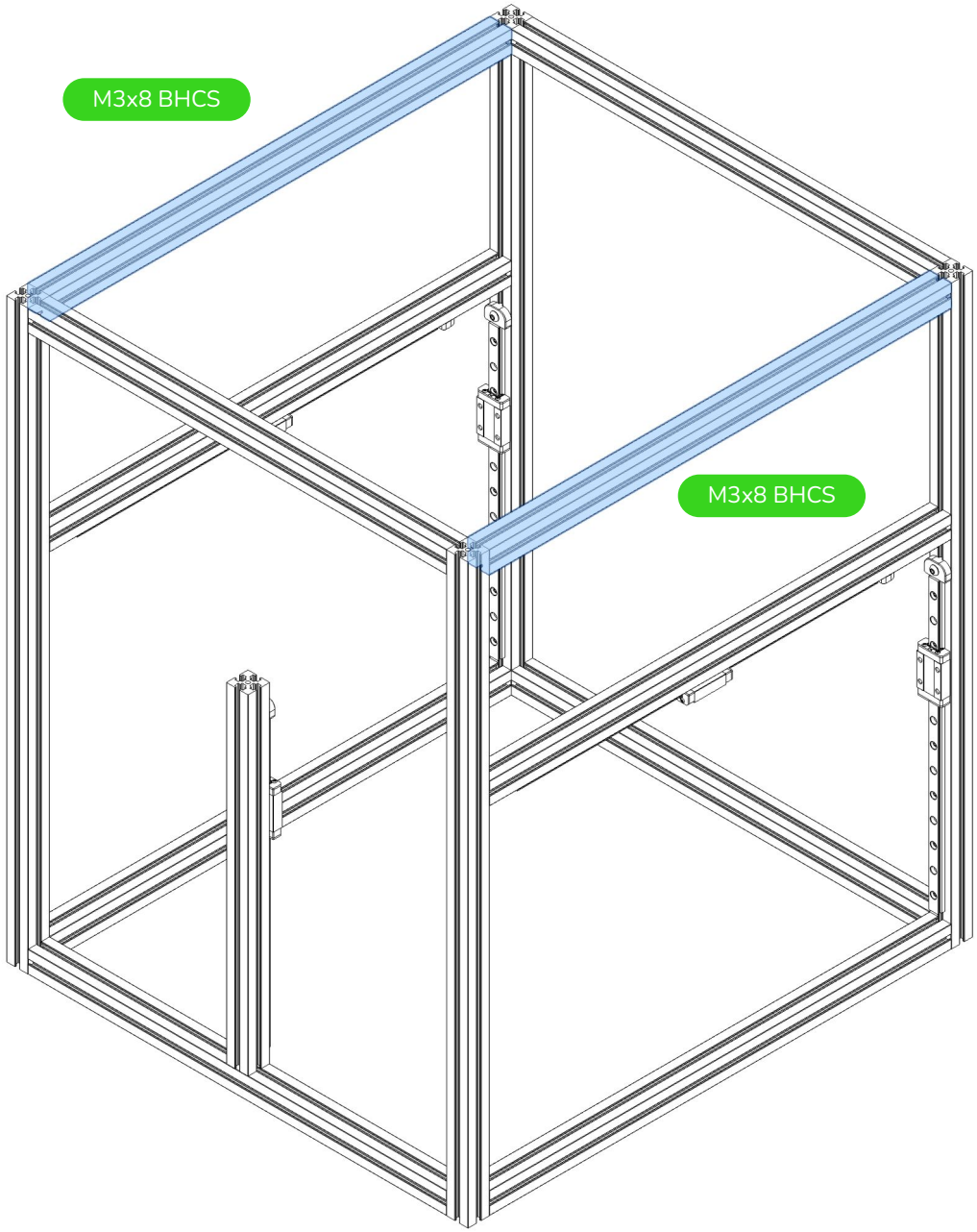

E Extrusion
Preload 2 nuts
Preload 2 nuts
Preload 4 nuts
Front
E Extrusion



4 NUTS IN THE REAR

Make sure that the E extrusion with 4 nuts is in the back, and that the 4 nuts are facing the back of the printer.


Preload 2 nuts
Preload 2 nuts
G Extrusion
G Extrusion
Preload 2 nuts
Front
Preload 2 nuts

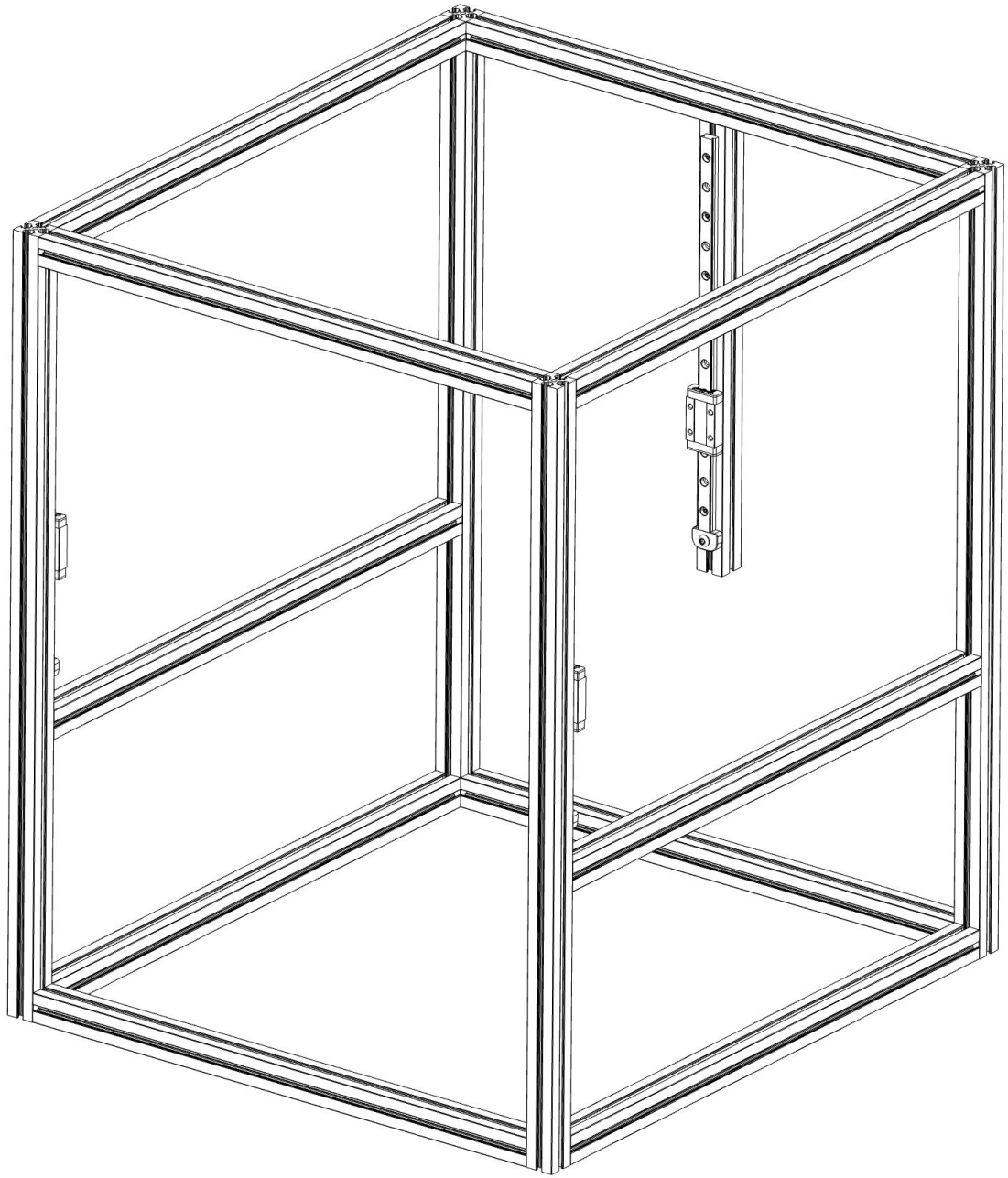

M3x8 BHCS
M3x8 BHCS

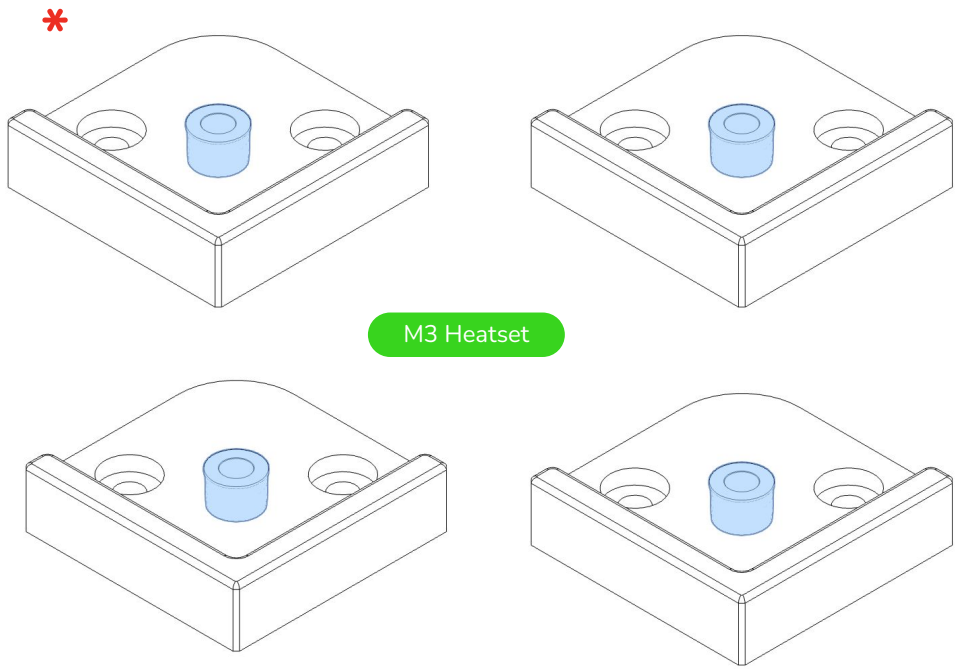
LEVEL THE Y RAIL EXTRUSIONS

Use the printed extrusion guide tool (or other precision tool if you have them) to make sure the extrusions are level and equal distance from the top. Suggested range is between 124-125mm. Both extrusions must be the same distance, and the front and back of each extrusion must also be the same distance

INVERT THE PRINTER

For the next few pages as the feet are attached, invert the printer carefully





HEATSETS

This step adds heatset inserts into the foot riser pieces. Use a soldering iron, preferably with a special tip for heatsets to install. Refer to the internet for demonstration videos if needed.

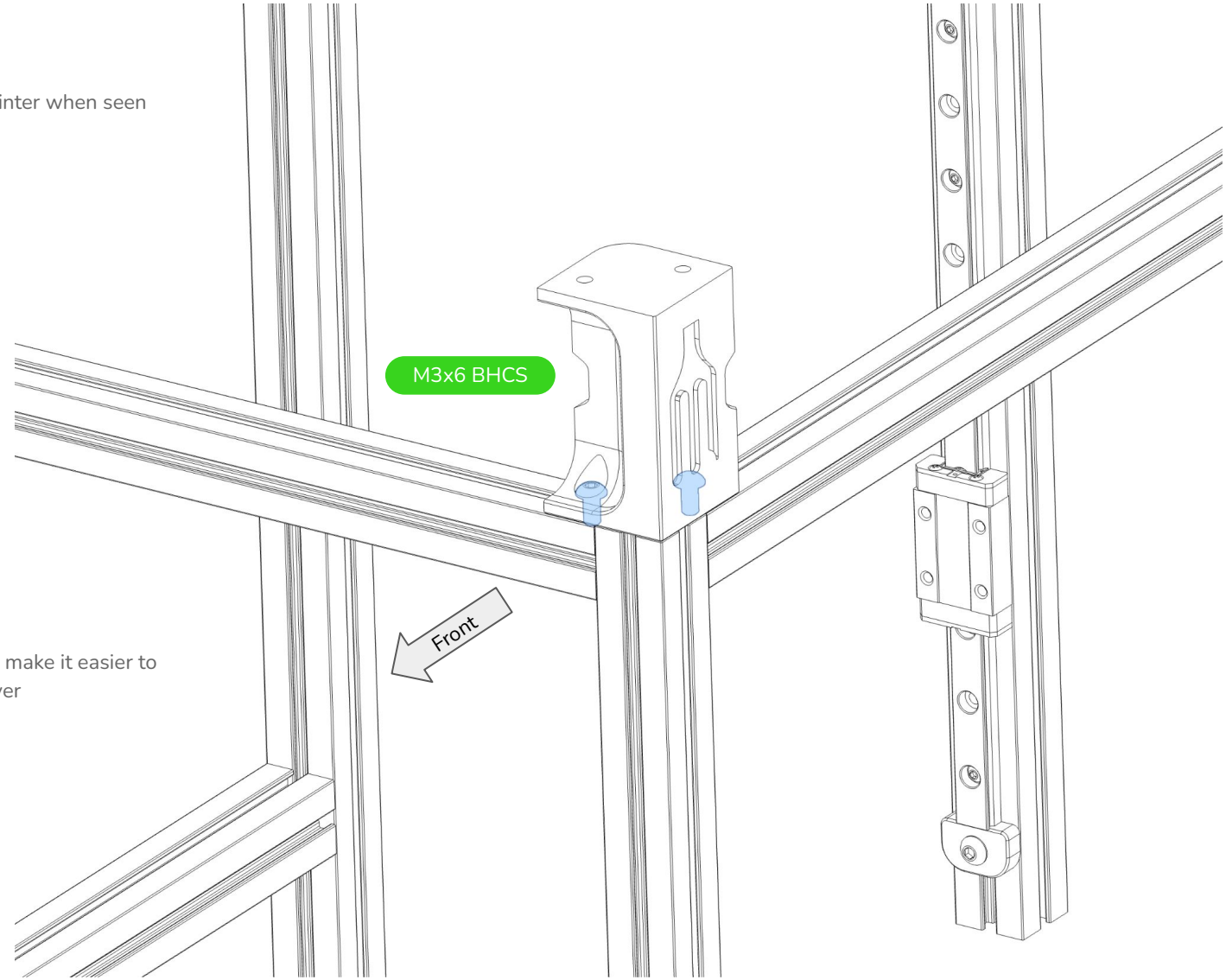
Make sure that the top of the heatset is flush with the surface of the part when finished.

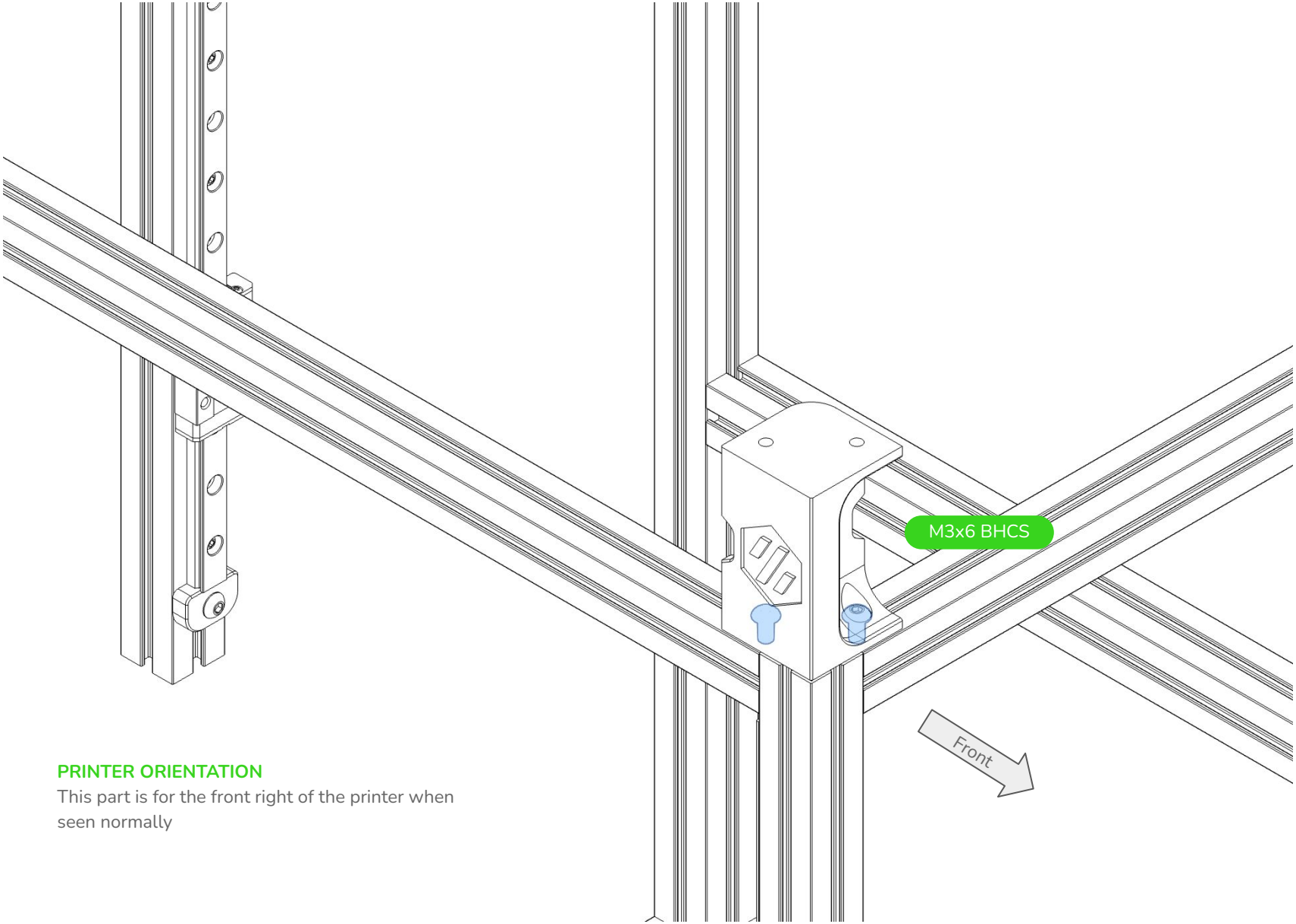
PRINTER ORIENTATION

This part is for the front left of the printer when seen normally

ACCESS HOLES IN PART

These parts have small holes to make it easier to access the screw with a hex driver





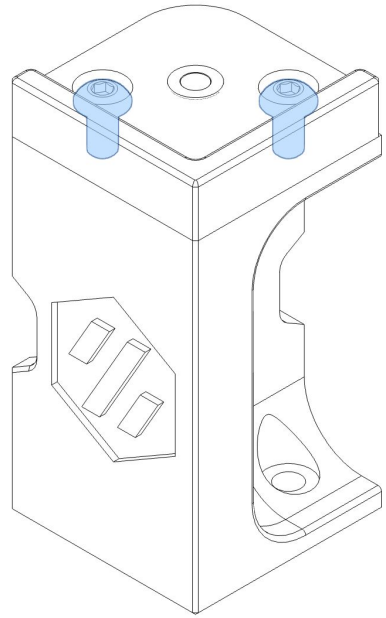
PRINTER ORIENTATION

This part is for the front right of the printer when seen normally

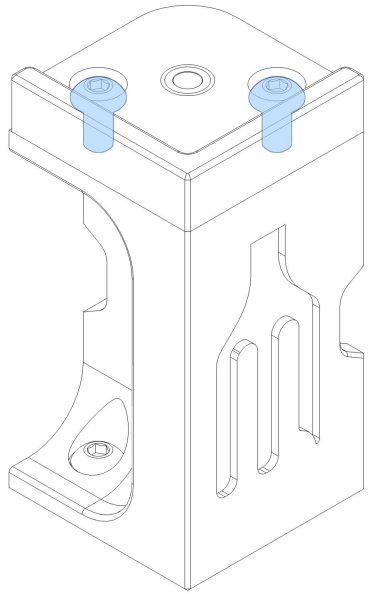
ATTACH FOOT RISERS

Attach the foot risers to both front feet at this time

M3x6 BHCS

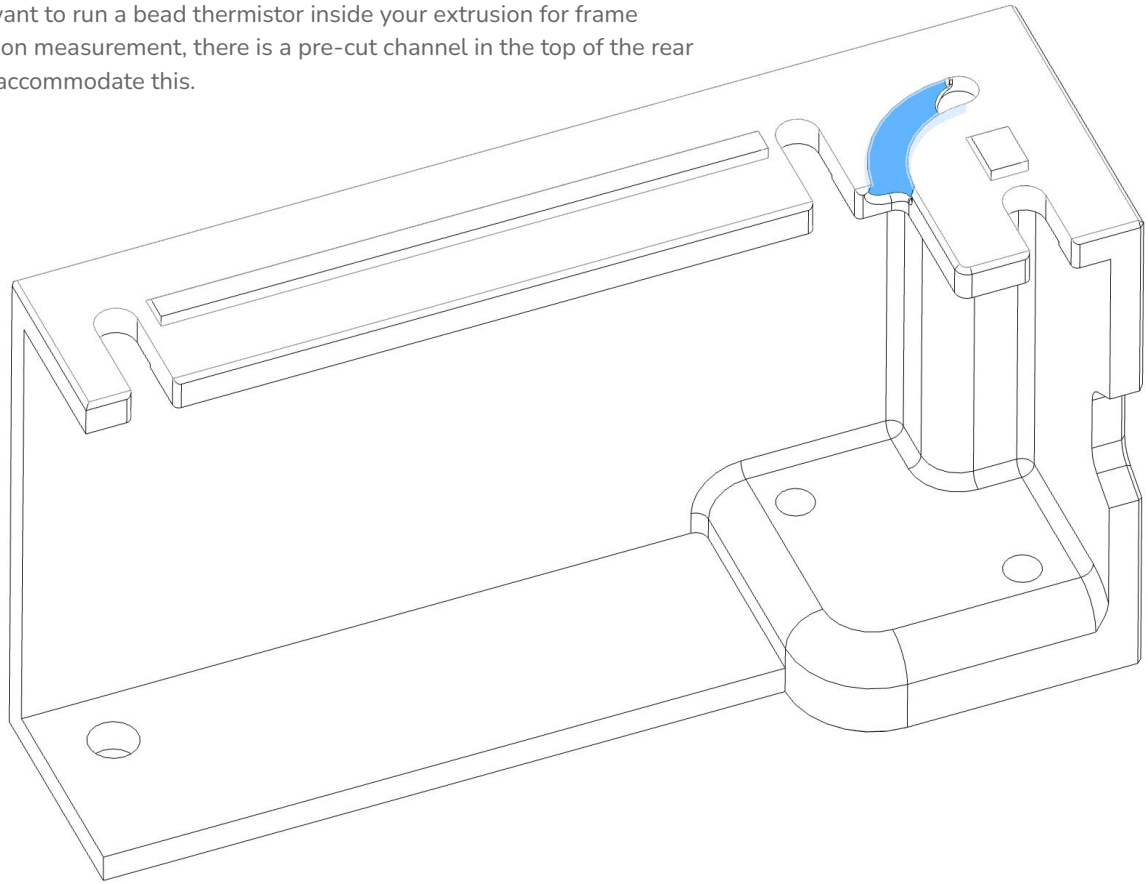


M3x6 BHCS



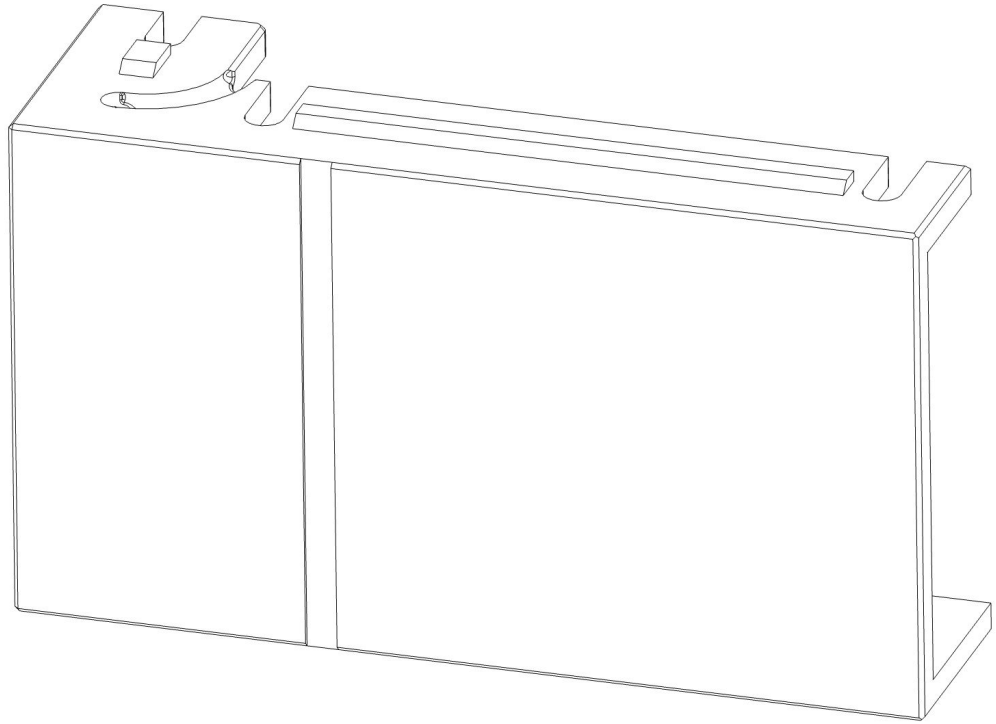
CHANNEL FOR THERMISTOR

If you want to run a bead thermistor inside your extrusion for frame expansion measurement, there is a pre-cut channel in the top of the rear foot to accommodate this.



OPEN FOR MODIFICATIONS

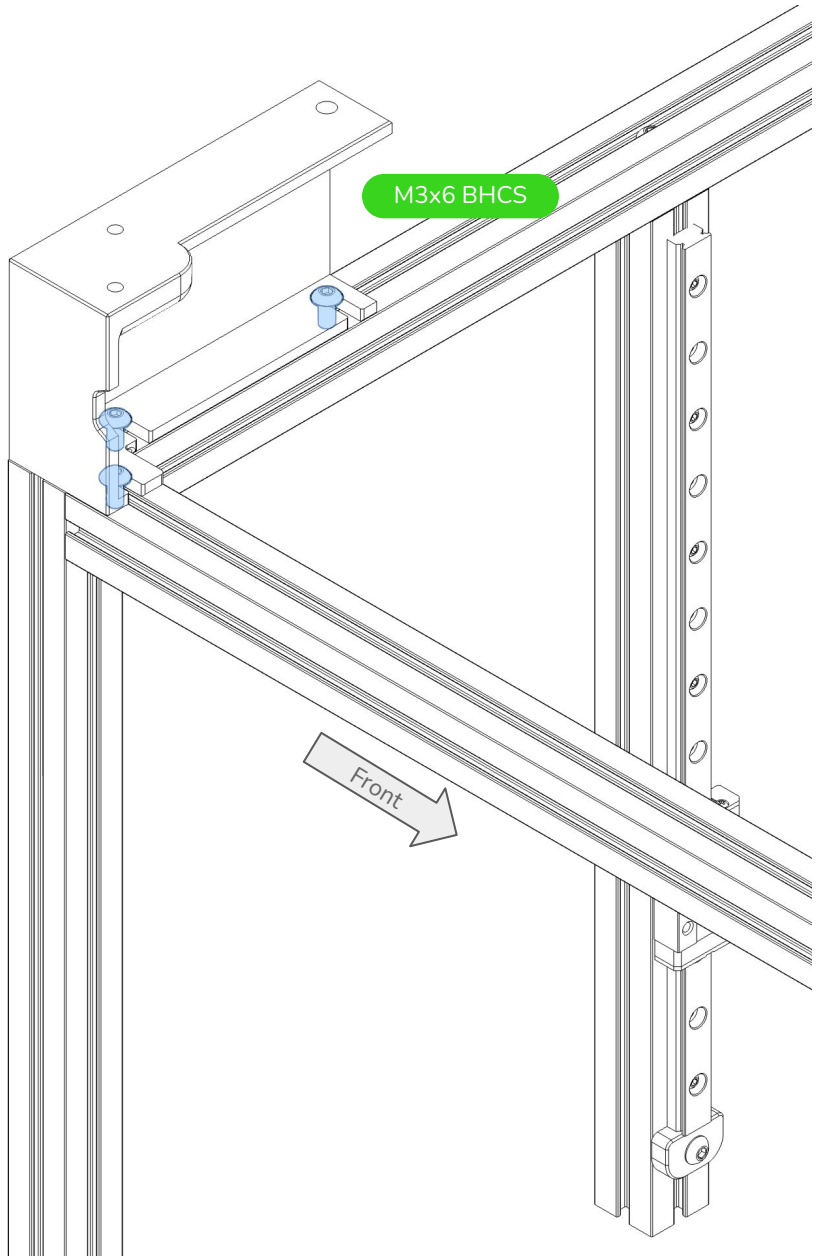
The large flat area of this part is a perfect place to add things like keystone jacks, extra switches, or anything else you might want. Have fun modding!



Z MOTION - ATTACH FEET

SLOTS FOR SCREWS

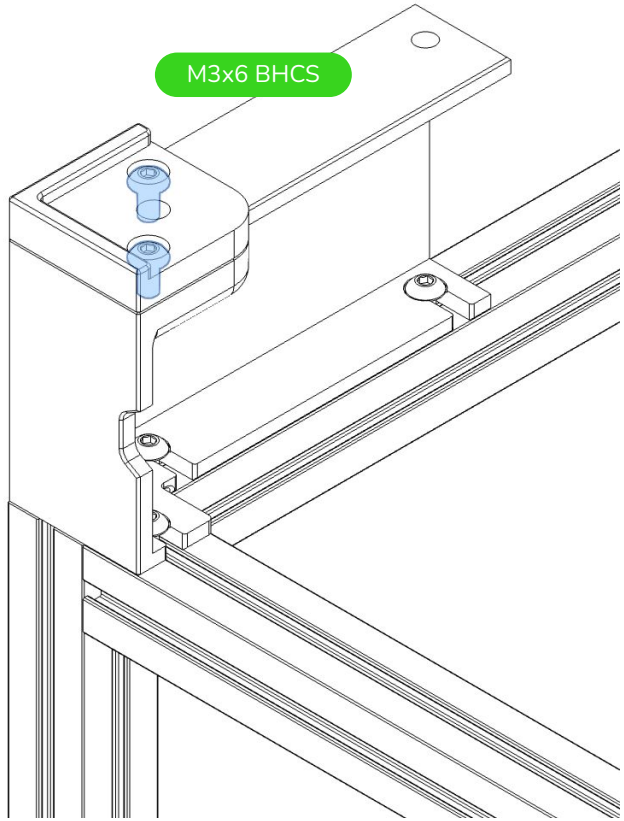
Parts which have slots for the screws are to make assembly easier, you can partially thread the screw onto the preloaded nut in the channel, slide the part onto the screws and then tighten the screws down.

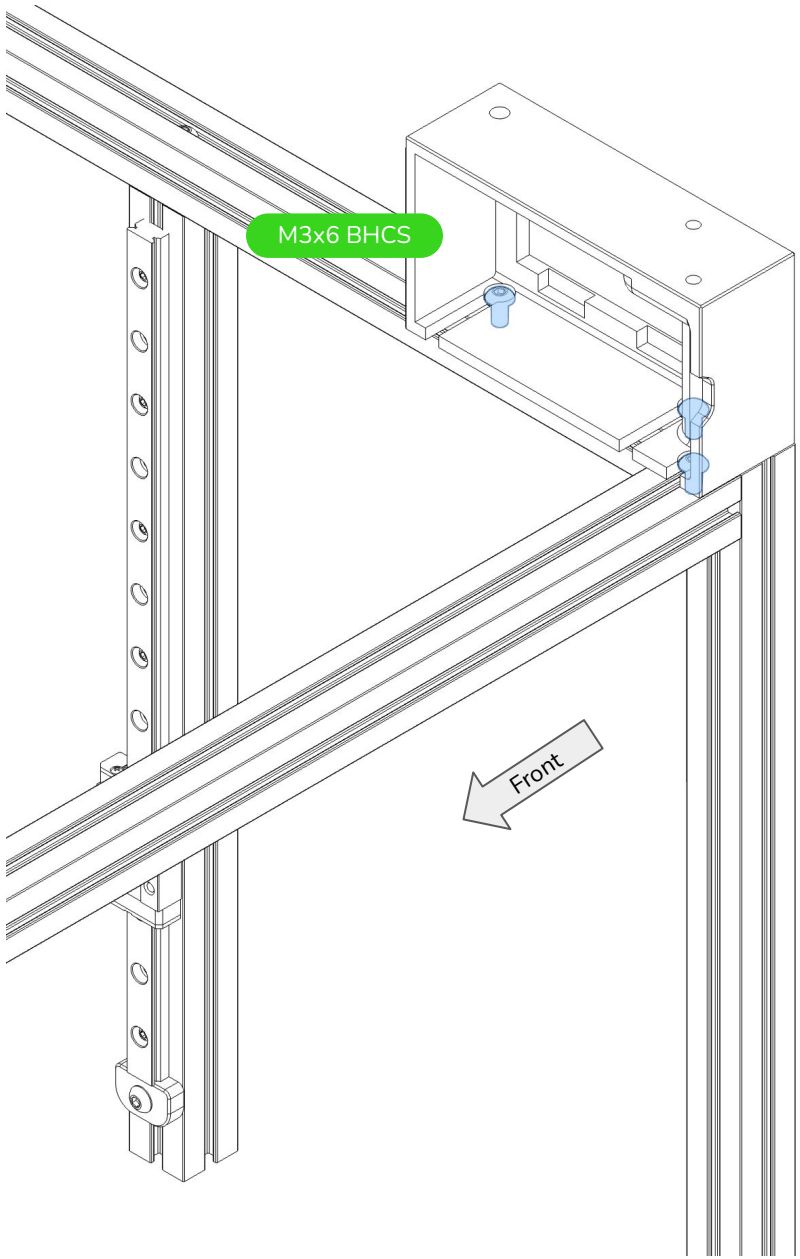


PRINTER ORIENTATION

This part is for the rear right of the printer when seen normally

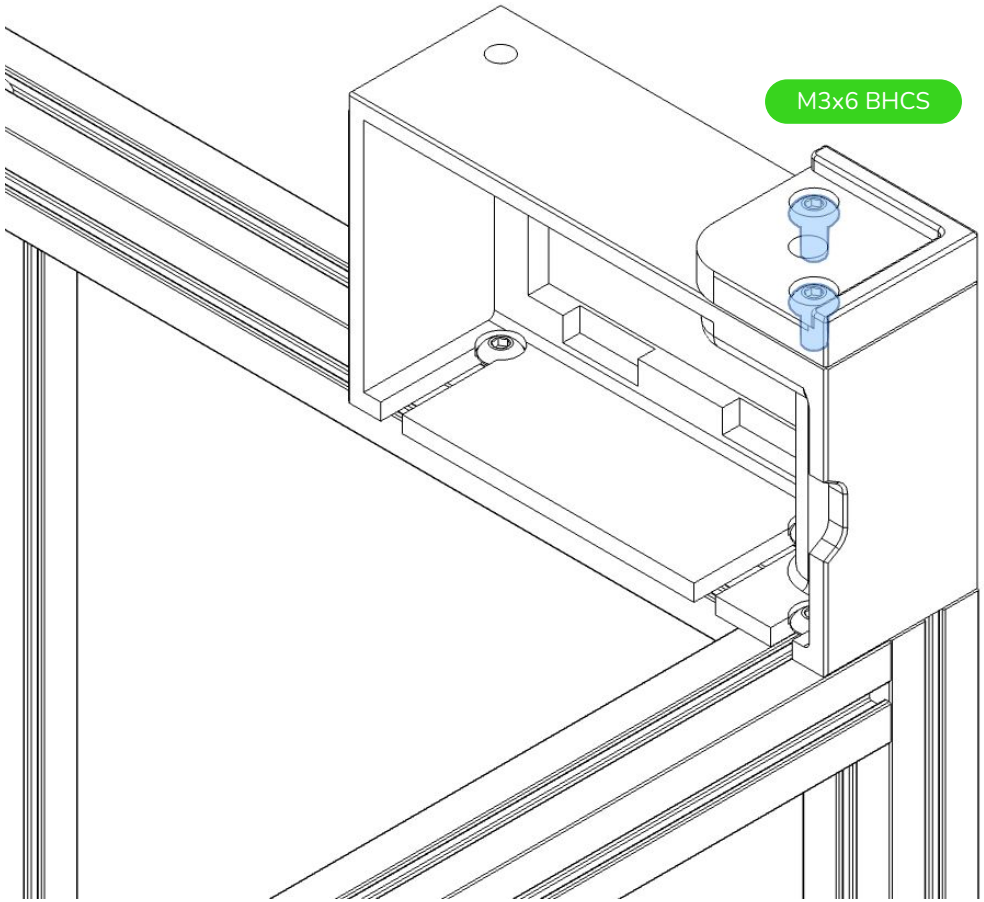
44


M3x6 BHCS



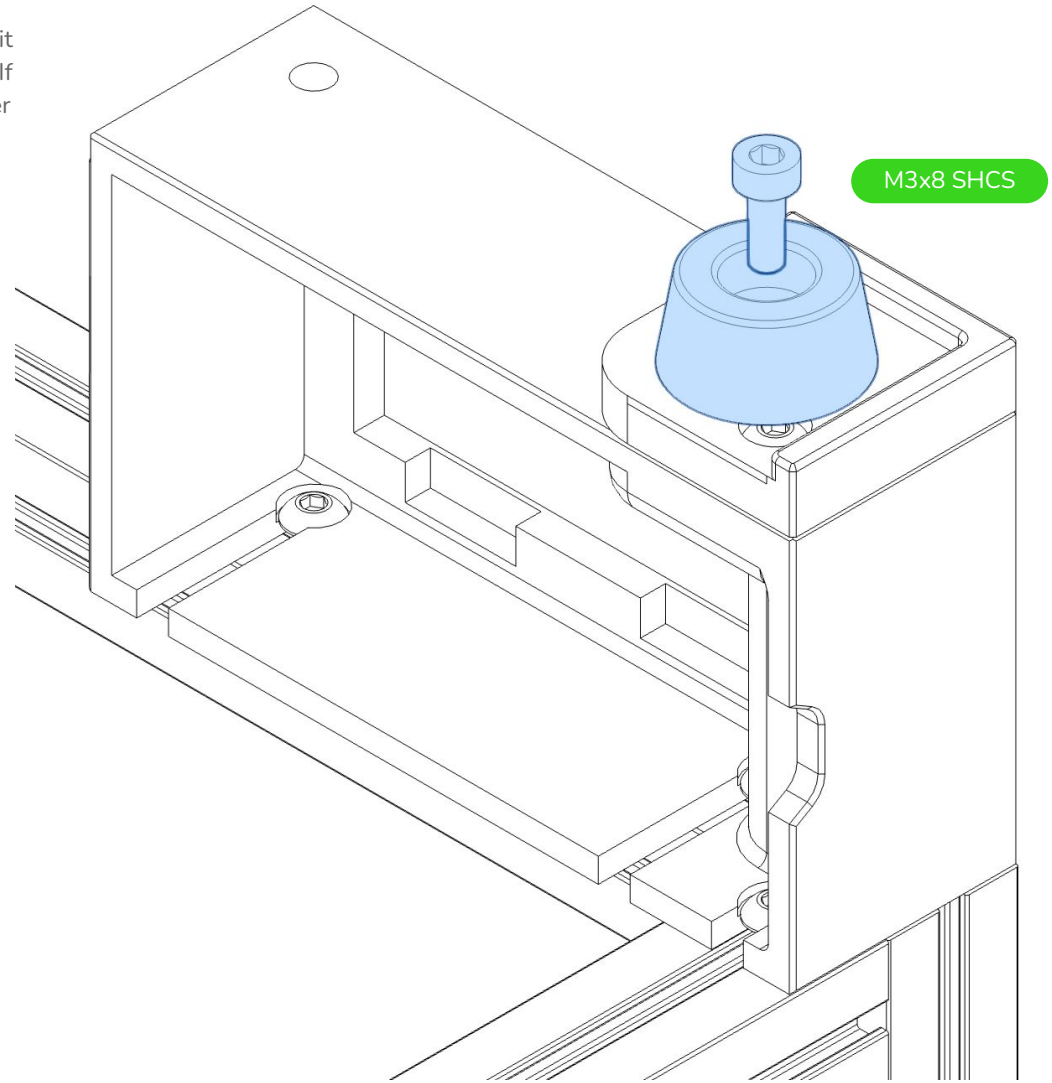
PRINTER ORIENTATION

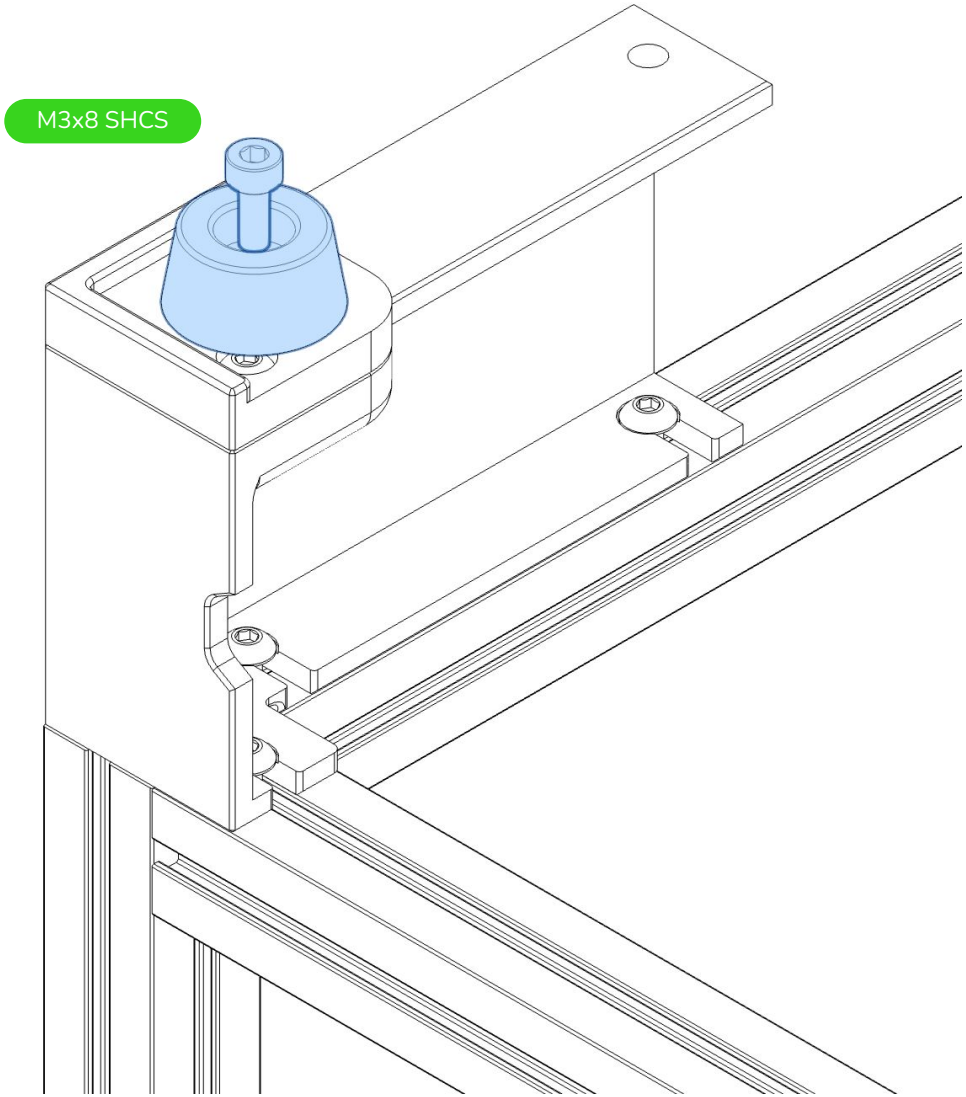
This part is for the left right of the printer when seen normally

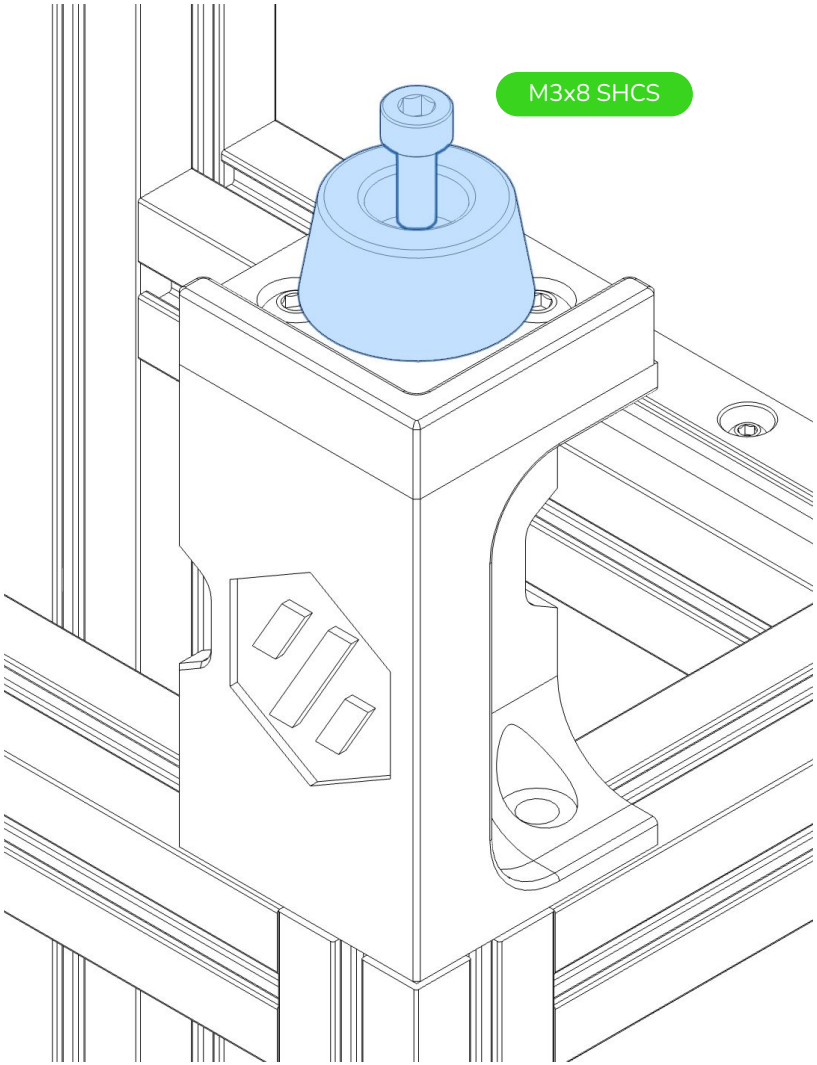

M3x6 BHCS

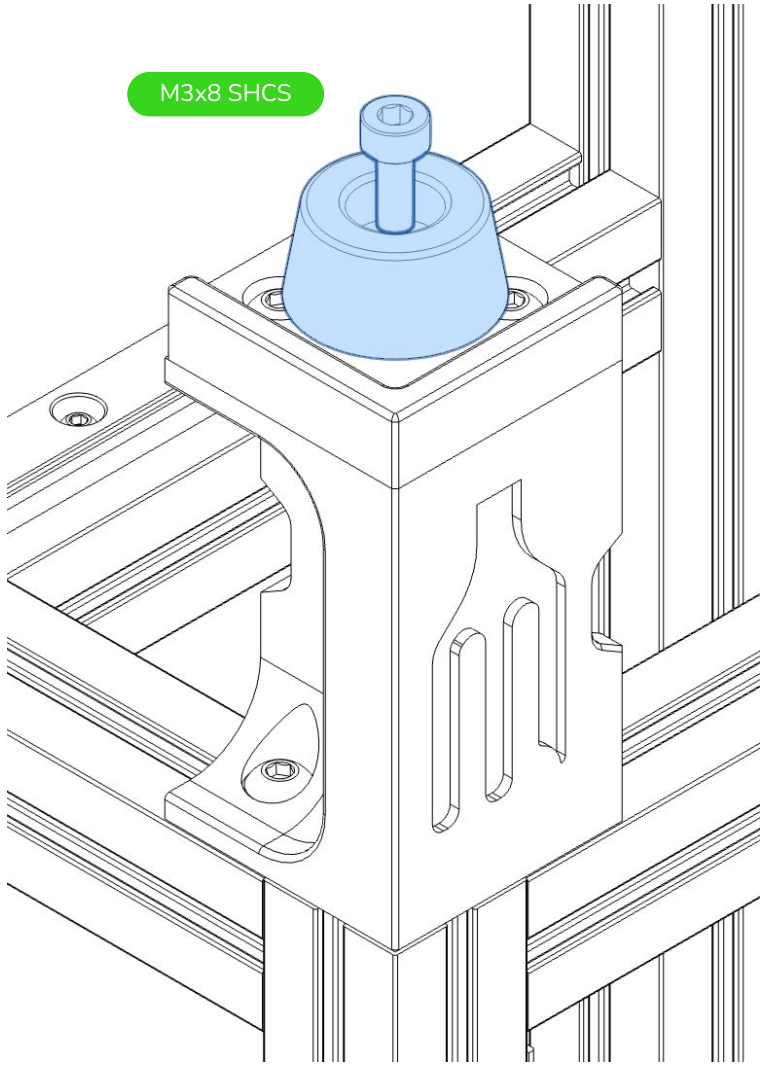
M3-SIZED RUBBER FEET

The default rubber foot for Salad Fork uses a 3mm screw to hold it in place, however your kit may have different hardware provided. If that's the case, check for a user-made modification of the foot riser to find one that's sized for your specific feet



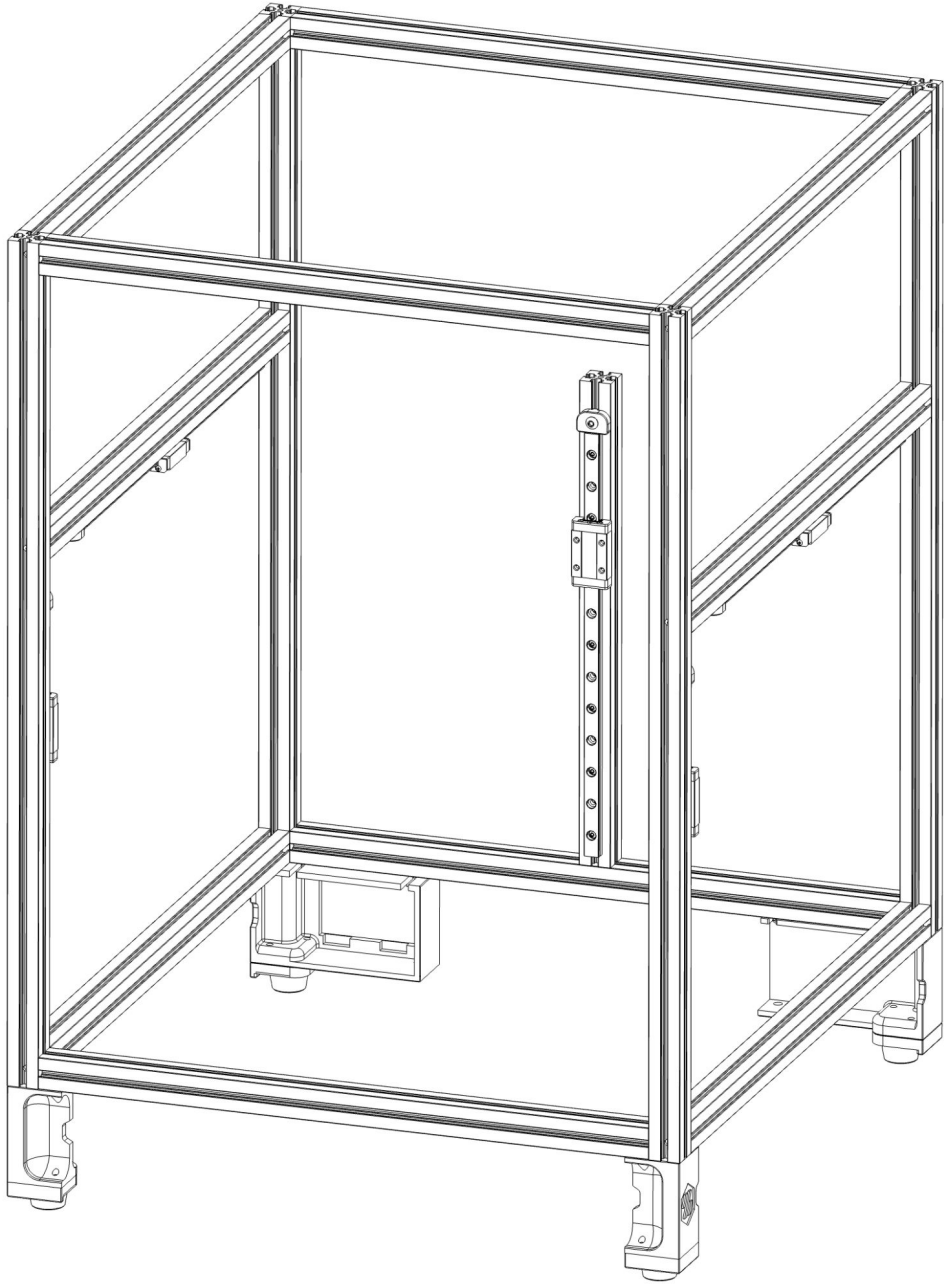

M3x8 SHCS

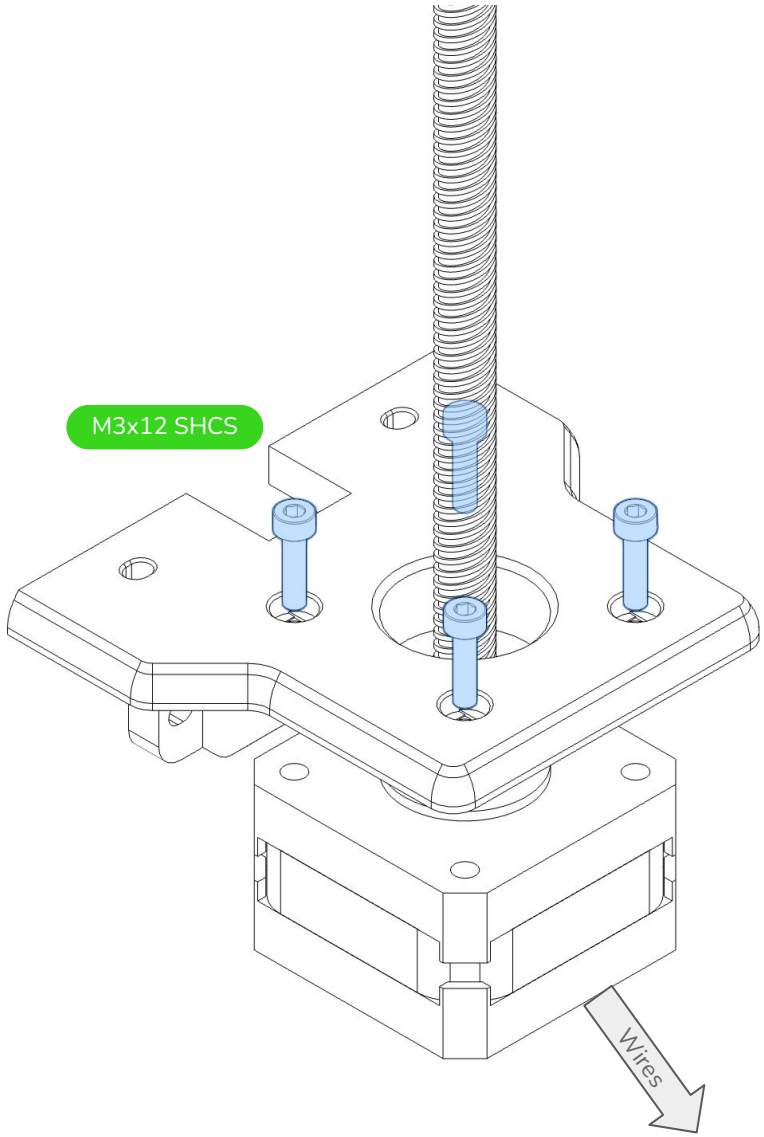

M3x8 SHCS

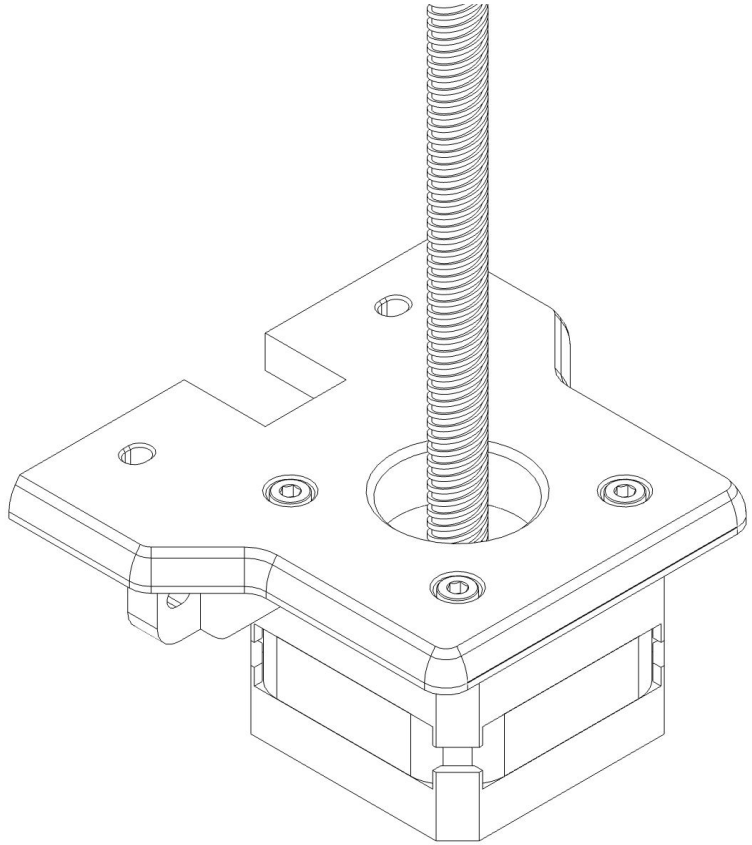

M3x8 SHCS

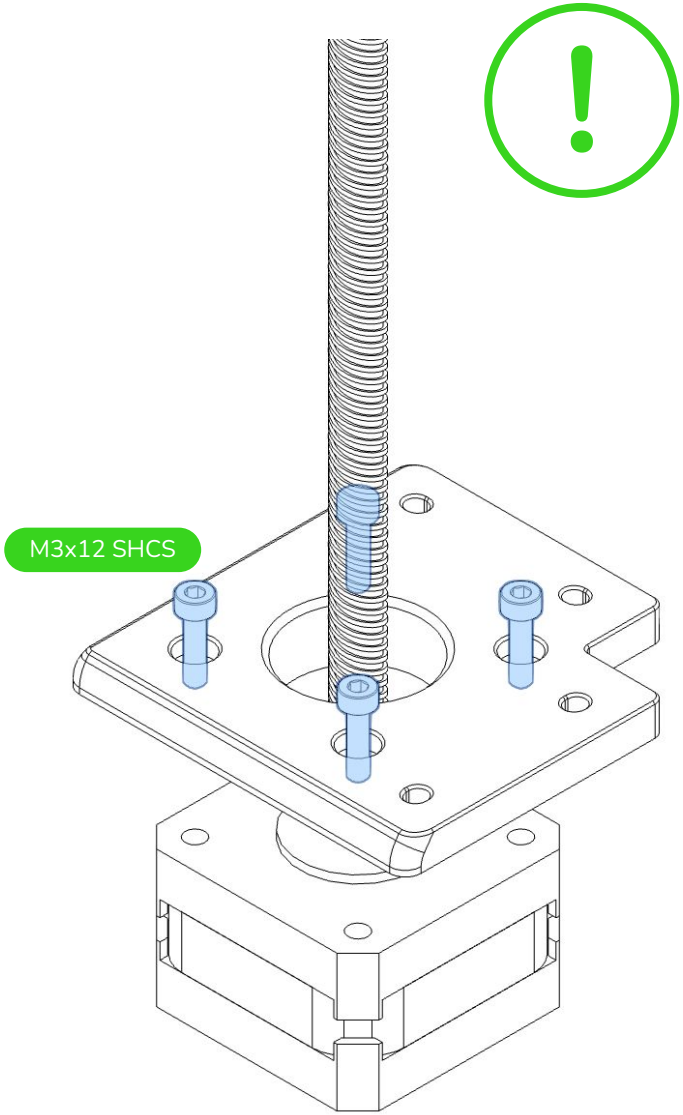
BACK TO NORMAL

Now that the feet are attached, return the printer to normal orientation,



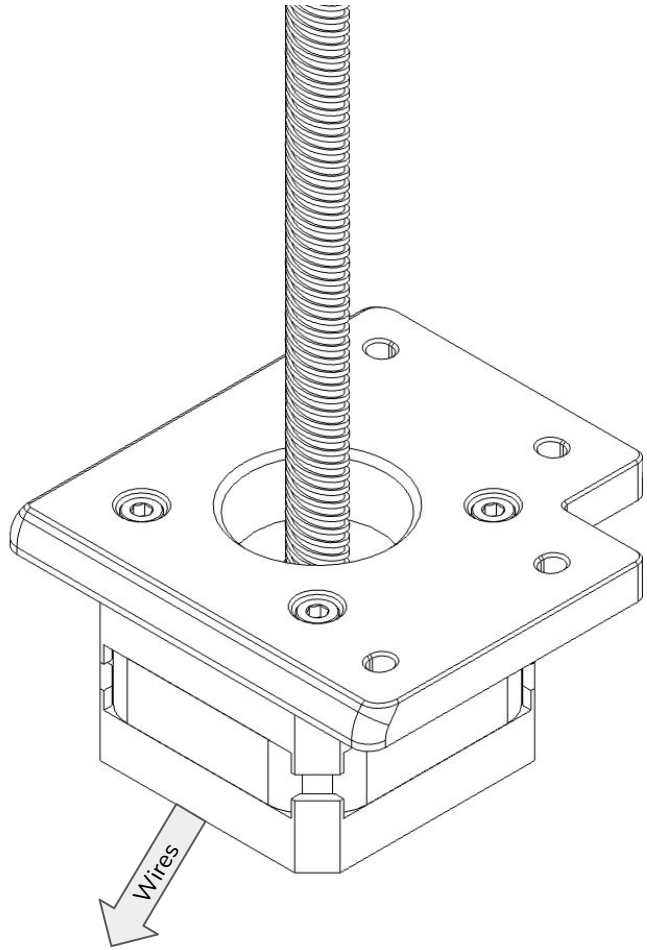

M3x12 SHCS
Wires





USING SALAD FORK 1.0 DECK PLATE?

If you are using a deck plate from a 1.0 version of the Salad Fork, you will want to print the alternate version of the front motor mounts, the file names end with “for_sf10_decks”



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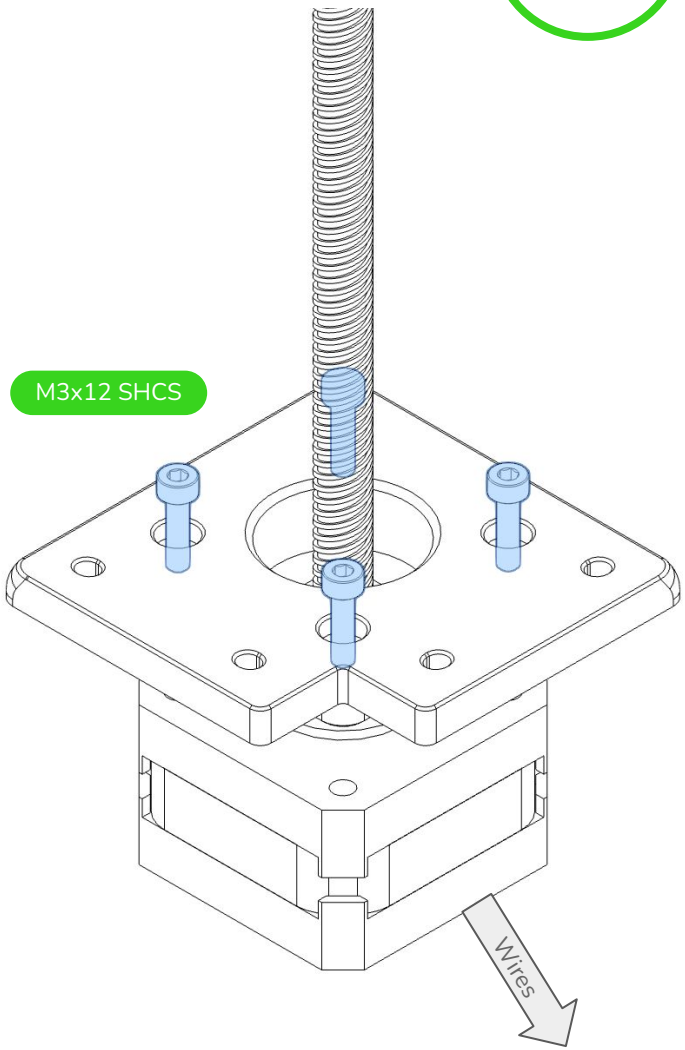
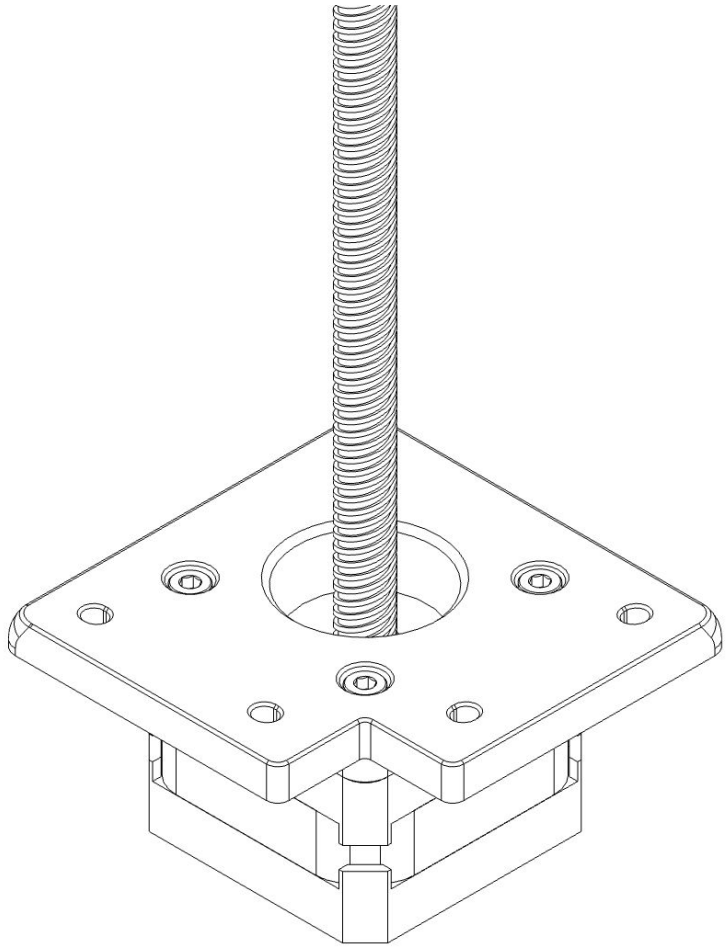
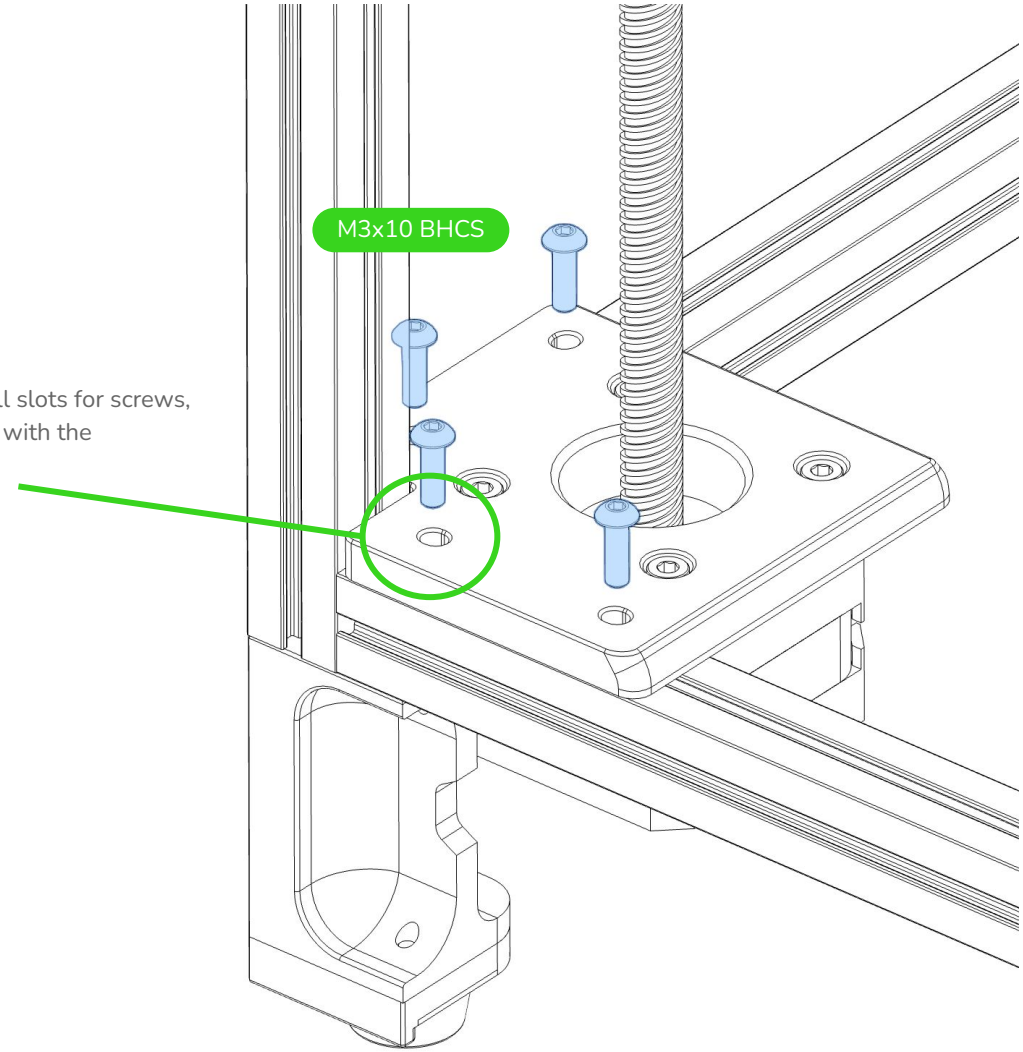
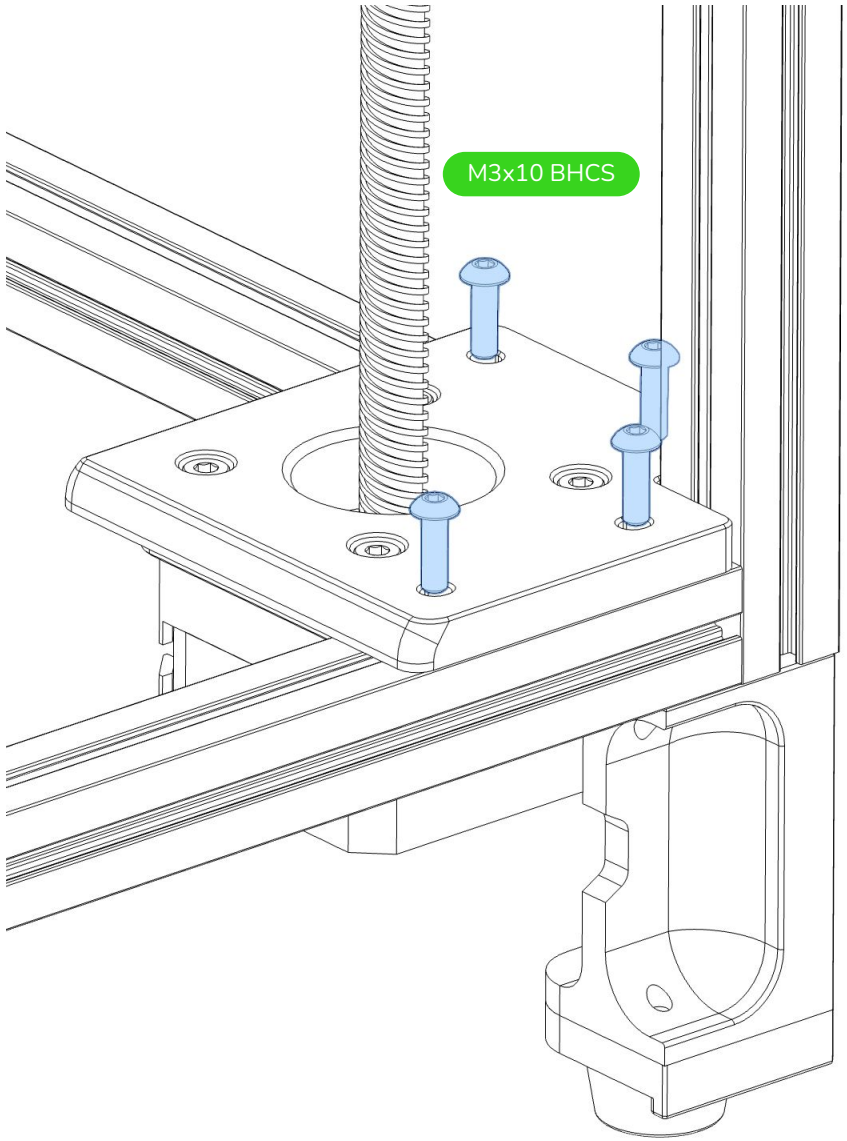




SLOTS FOR EASY ASSEMBLY

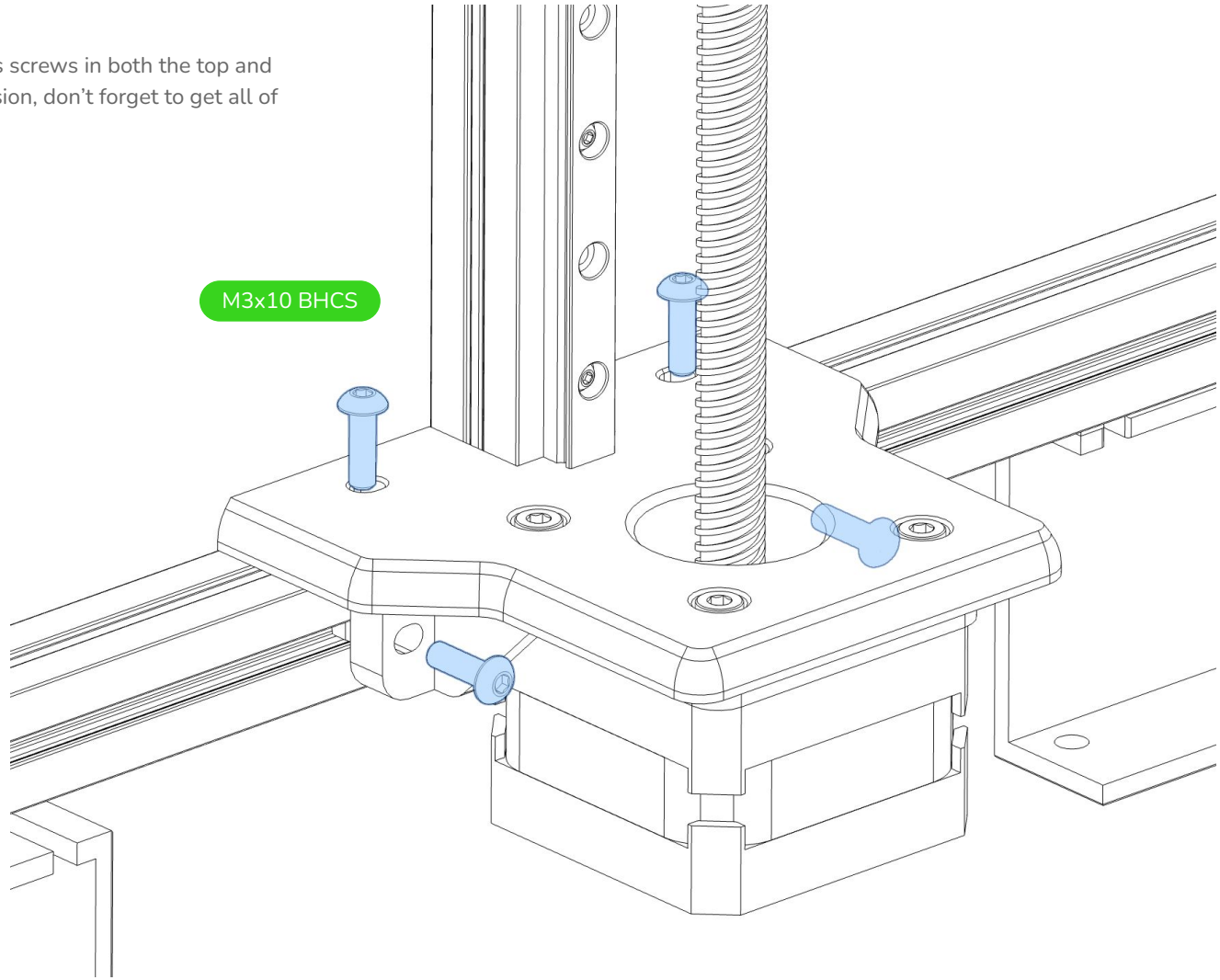
Wherever possible, parts use small slots for screws, making it easier to align the screw with the preloaded m3 hex nut.




M3x10 BHCS

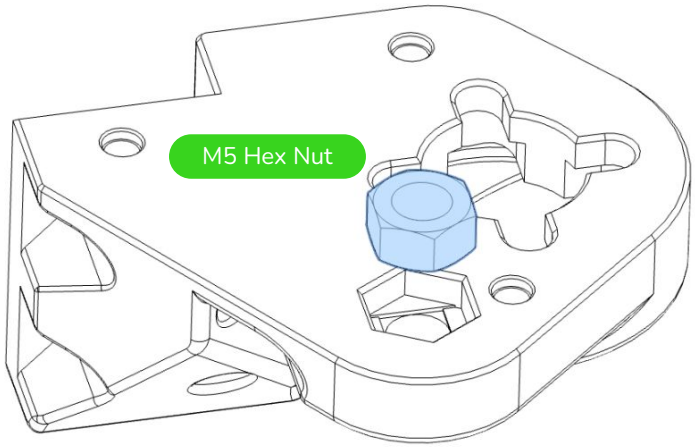
TOP AND SIDE

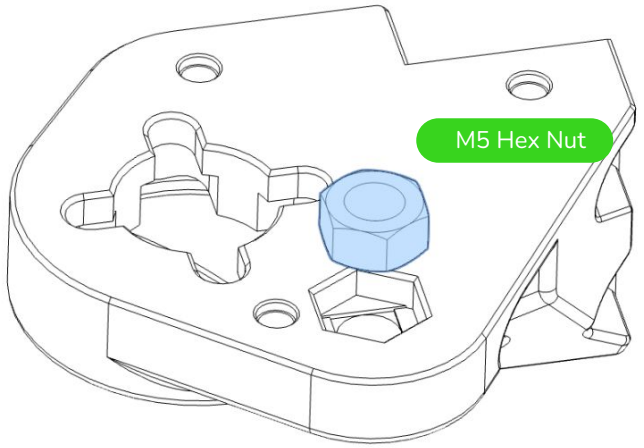
This motor mount has screws in both the top and side of the rear extrusion, don't forget to get all of them.



BUILDING BOTH SIDES AT ONCE

These two parts are symmetrical, so we will be building them at the same time

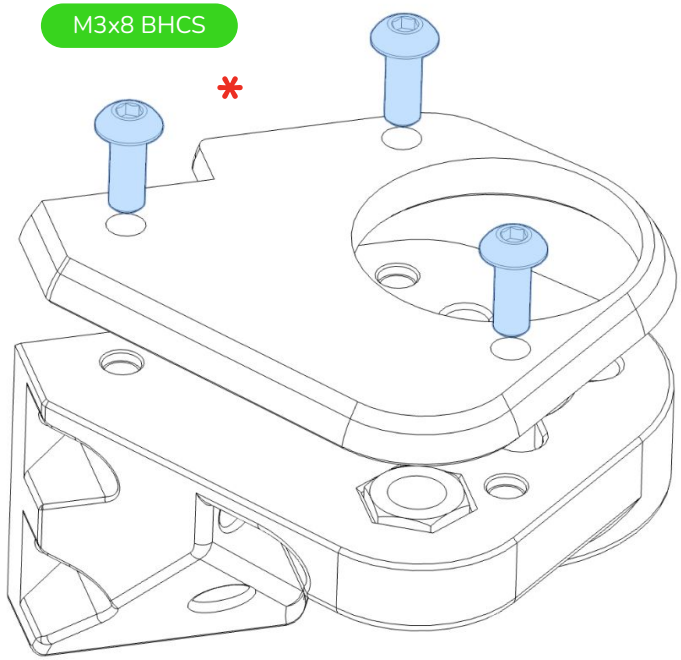




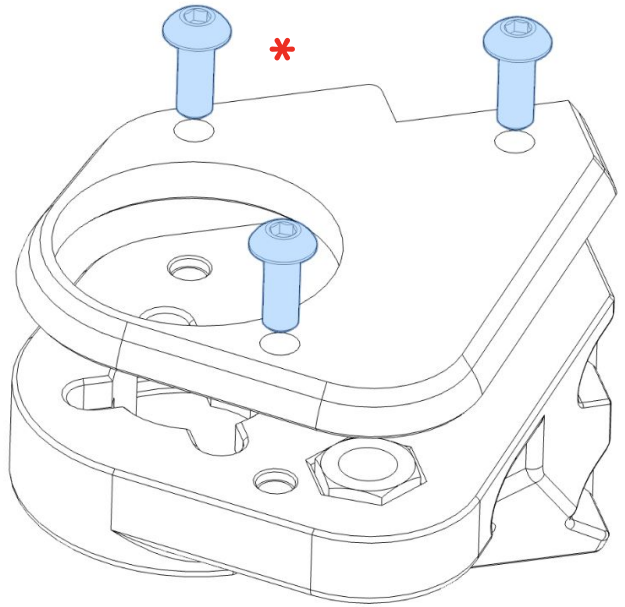
DON'T OVER-TIGHTEN

These screws thread into plastic, not a heatset or a nut, so if you tighten them too much the plastic will not hold the screws any more. Just tighten until lightly snug

M3x8 BHCS

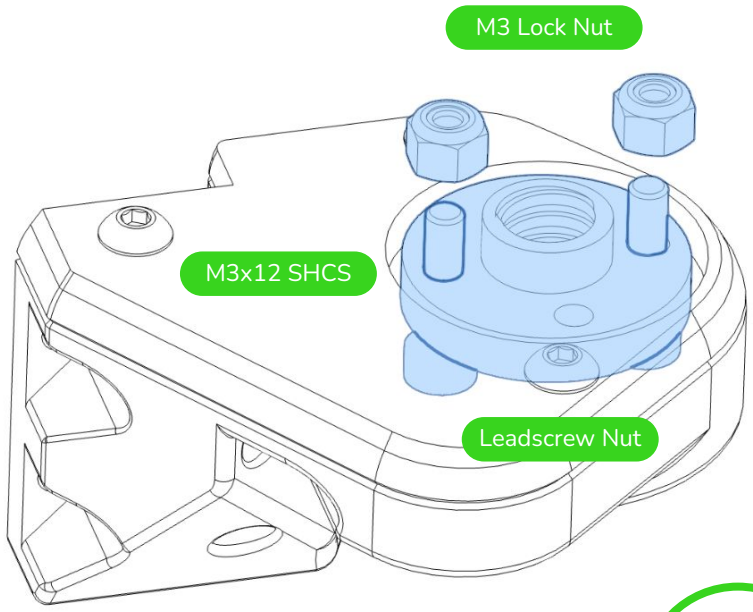


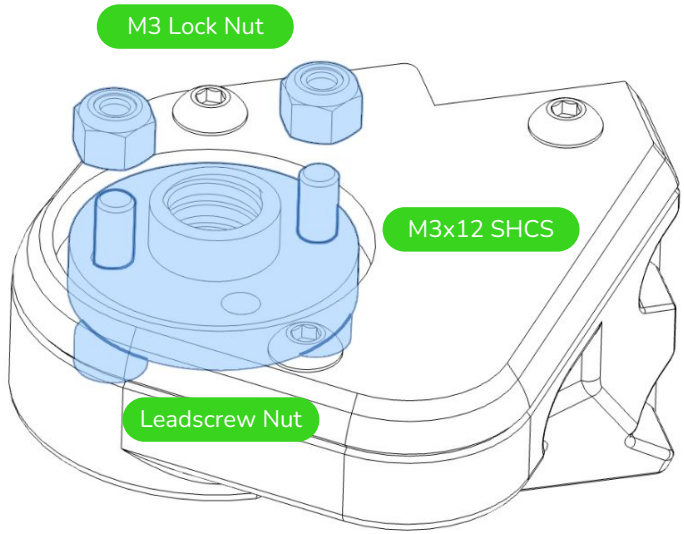
M3x8 BHCS



CAPTIVE NUT

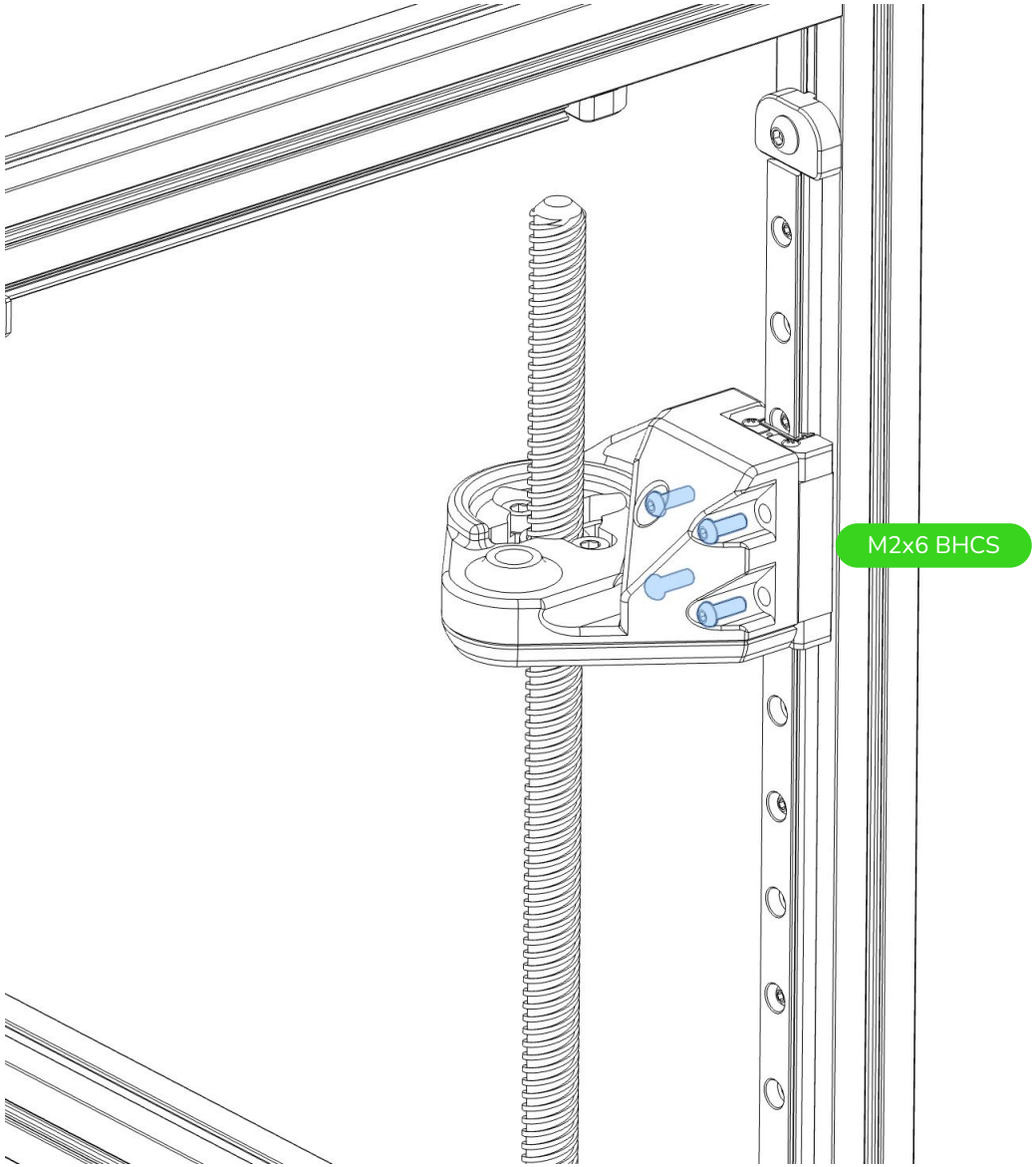
The M5 nut is held captive by the accent piece for ease of assembly later





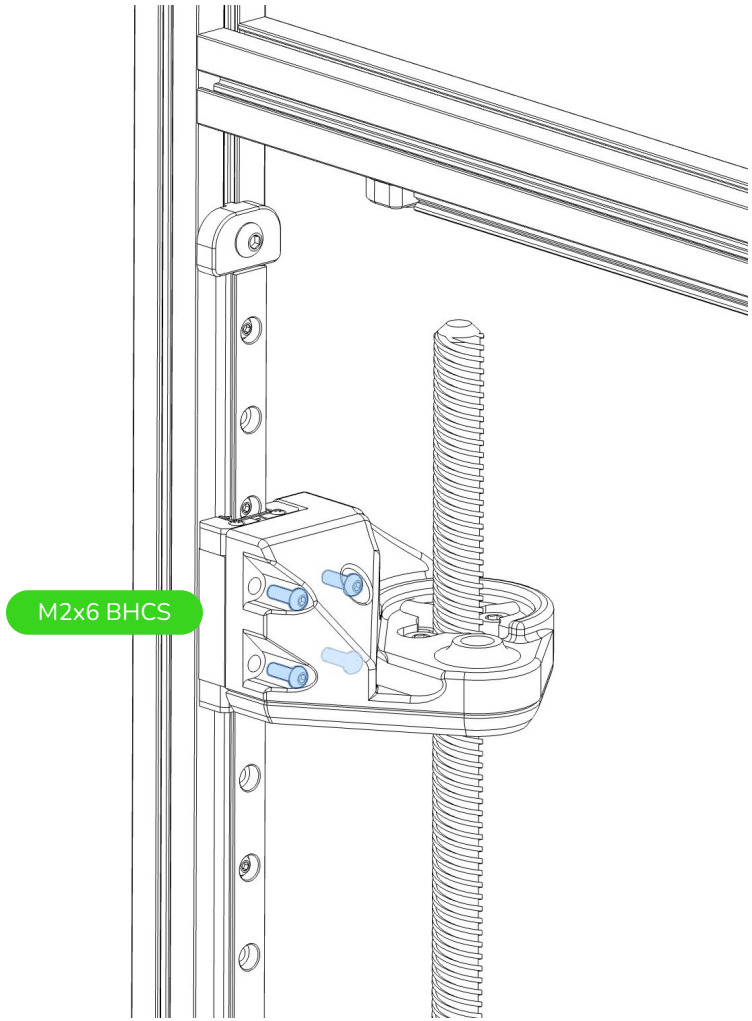
LEADSCREW NUT

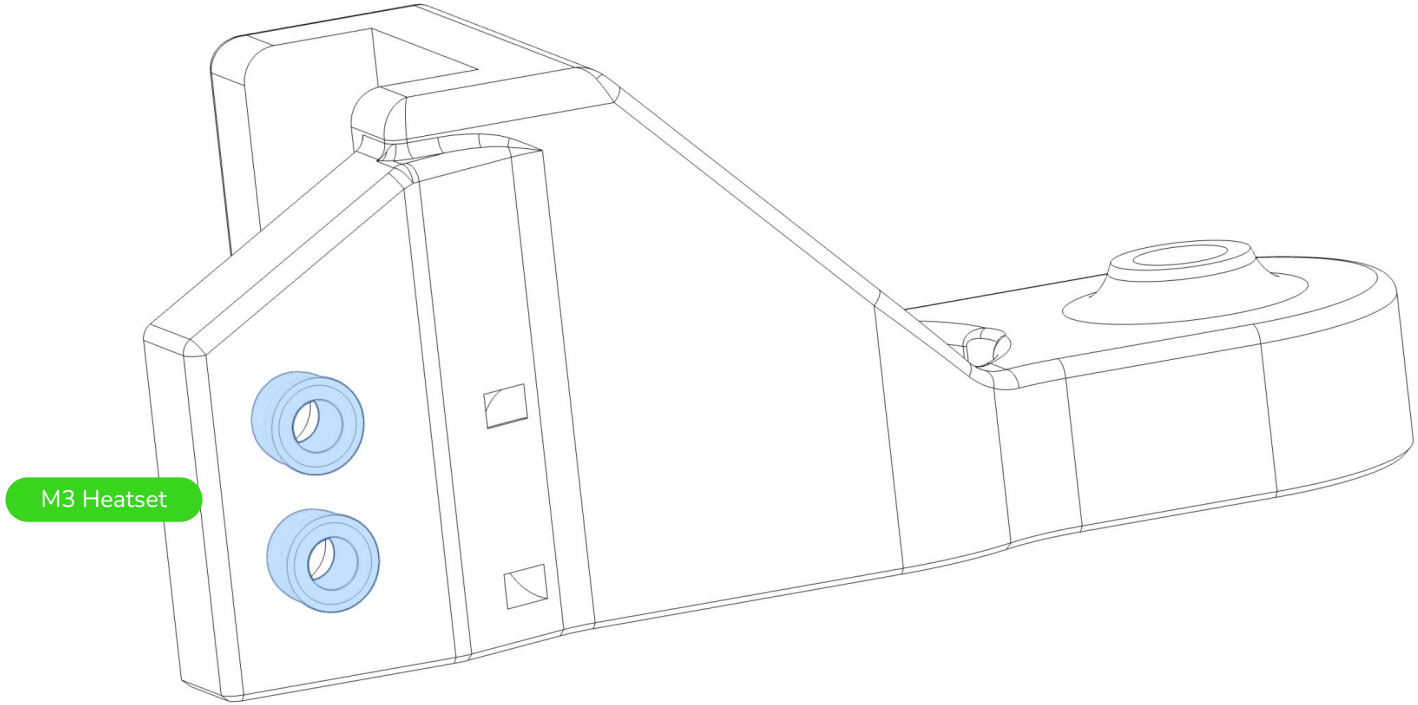
It's important to not over-tighten the M3 hardware holding the leadscrew nut in place. The nut should be able to slide around horizontally, but should not be able to move vertically.

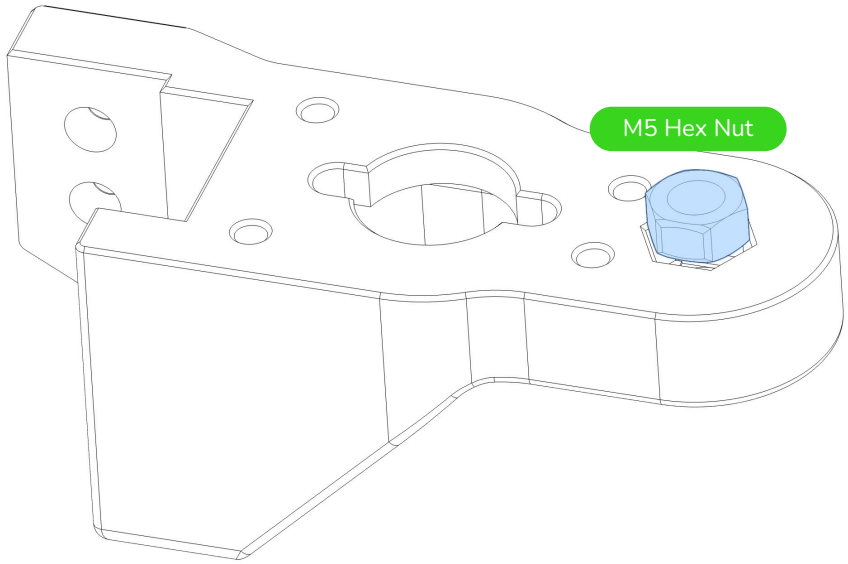


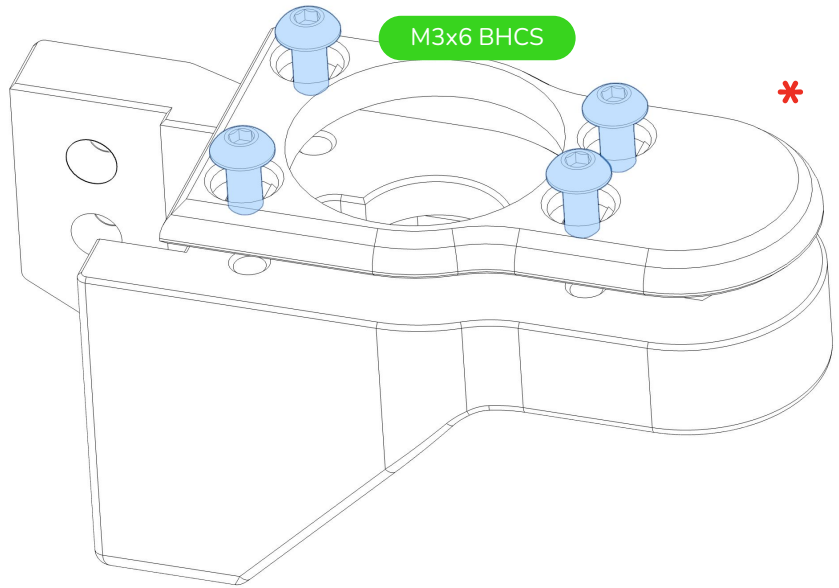
INSTALLATION

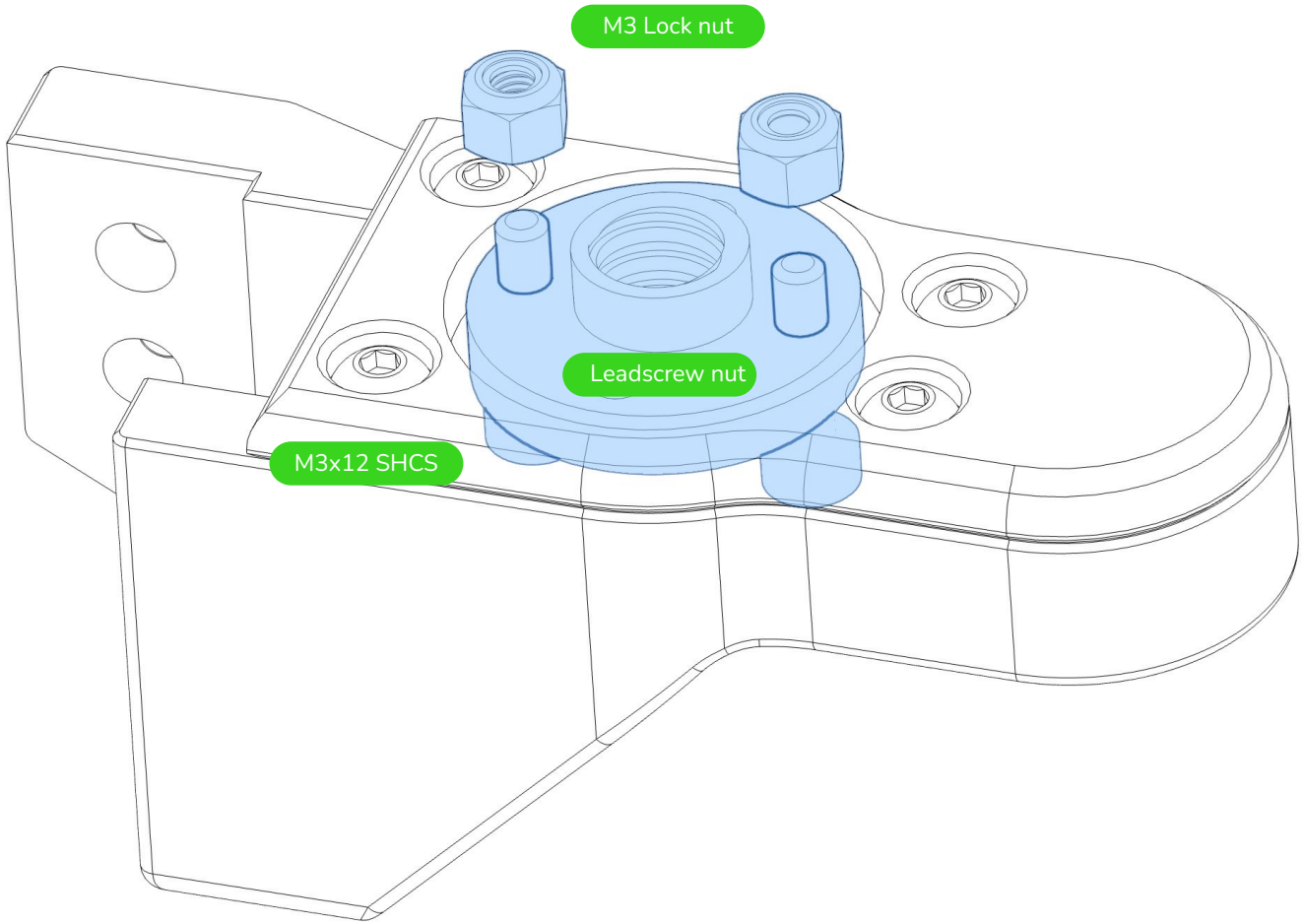
Thread the leadscrew nut onto the leadscrew, and turn the leadscrew as needed to align the printed part with the rail carriage, then add the screws and attach the parts.

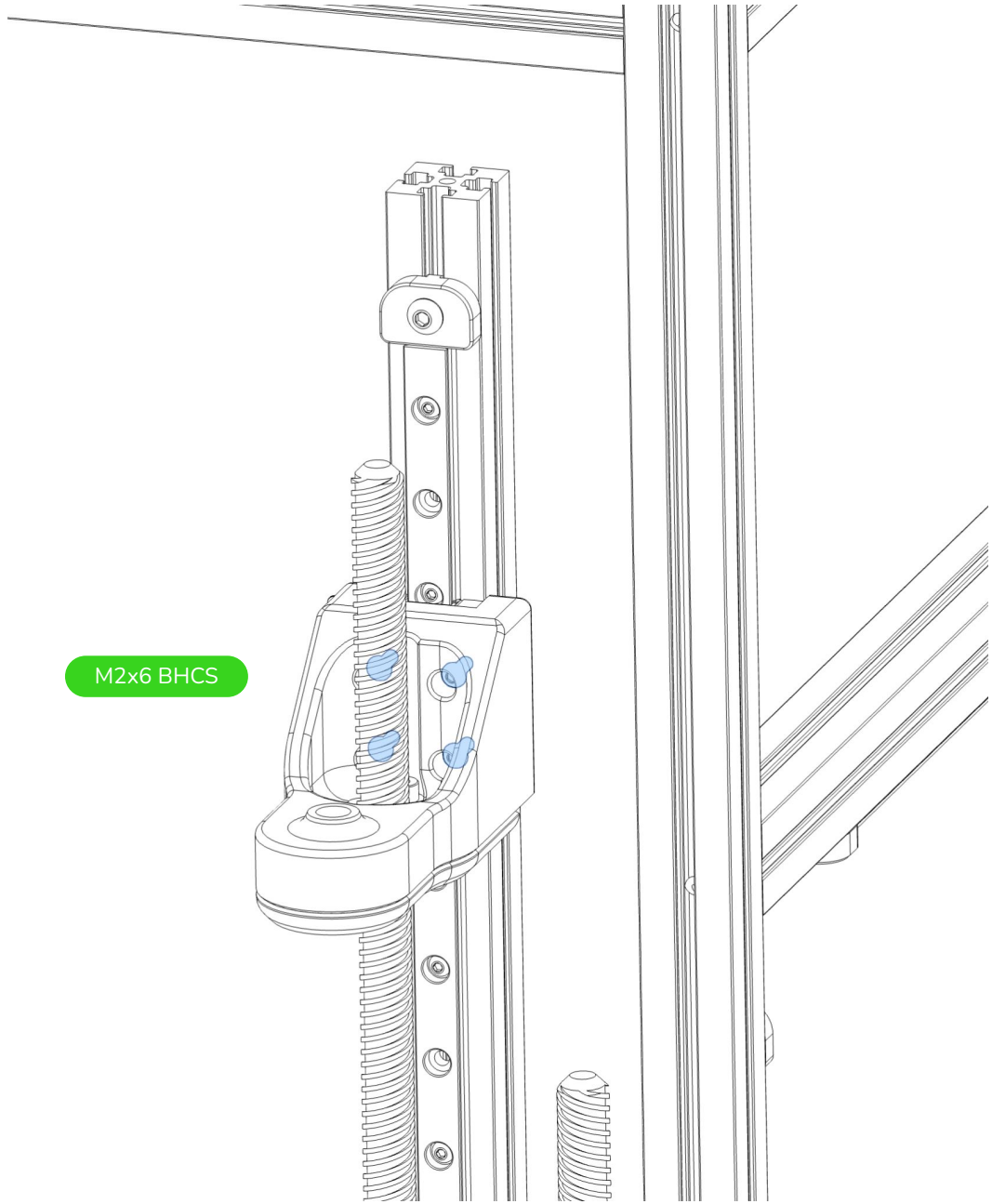

M2x6 BHCS


M3 Heatset


M5 Hex Nut

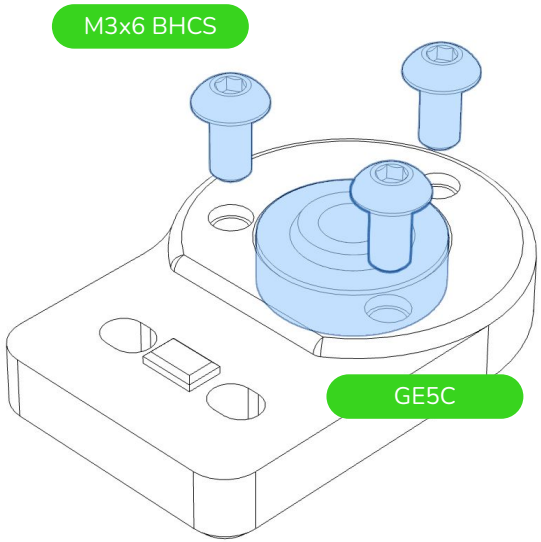

M3x6 BHCS
*

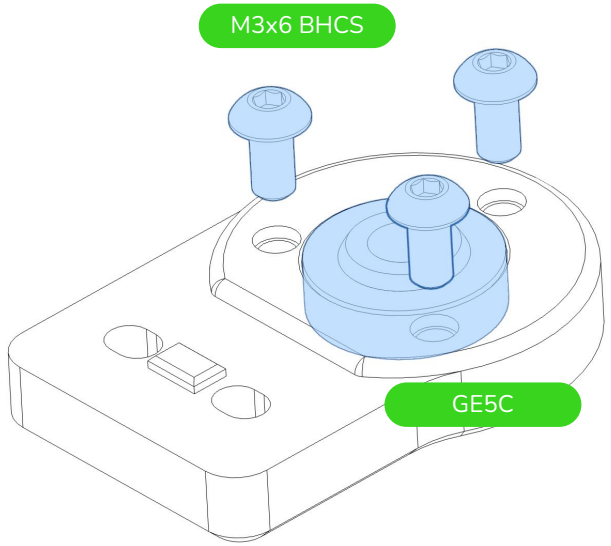

M3 Lock nut
Leadscrew nut
M3x12 SHCS

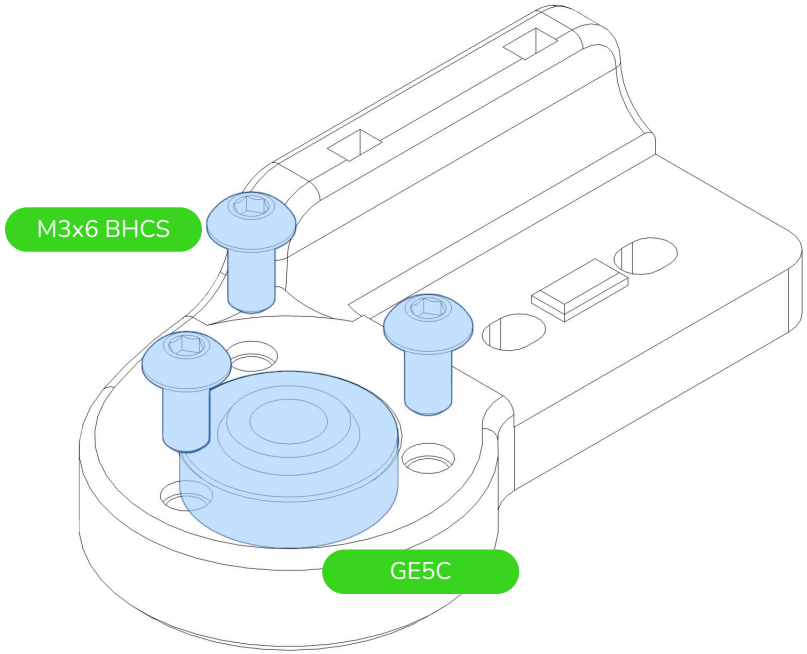

M2x6 BHCS

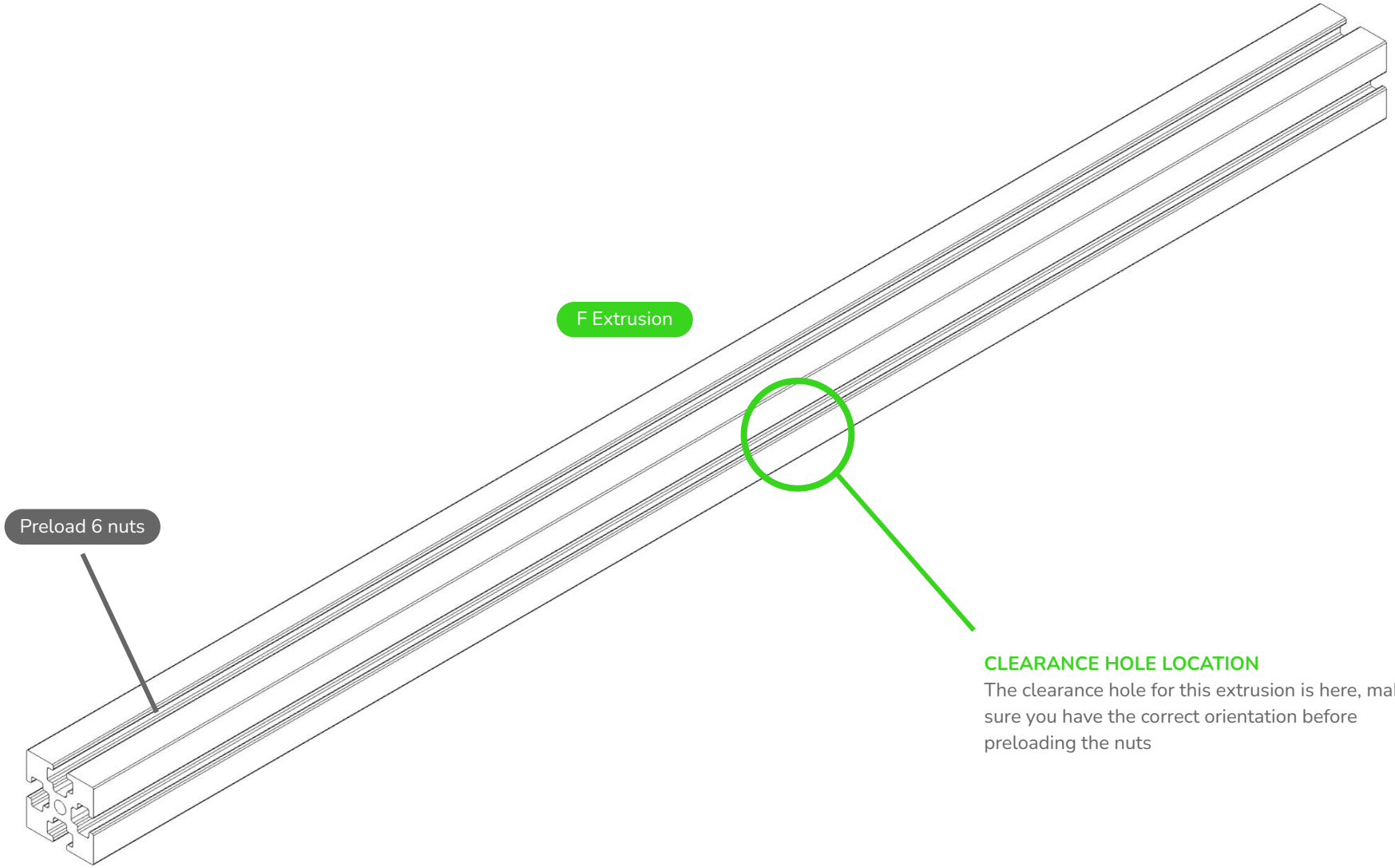
GE5C BEARING

The GE5C bearing used in these parts is inserted into the printed part and then retained with the BHCS screws. The screw heads will slightly overlap the bearing, that is all that is needed for a secure installation.



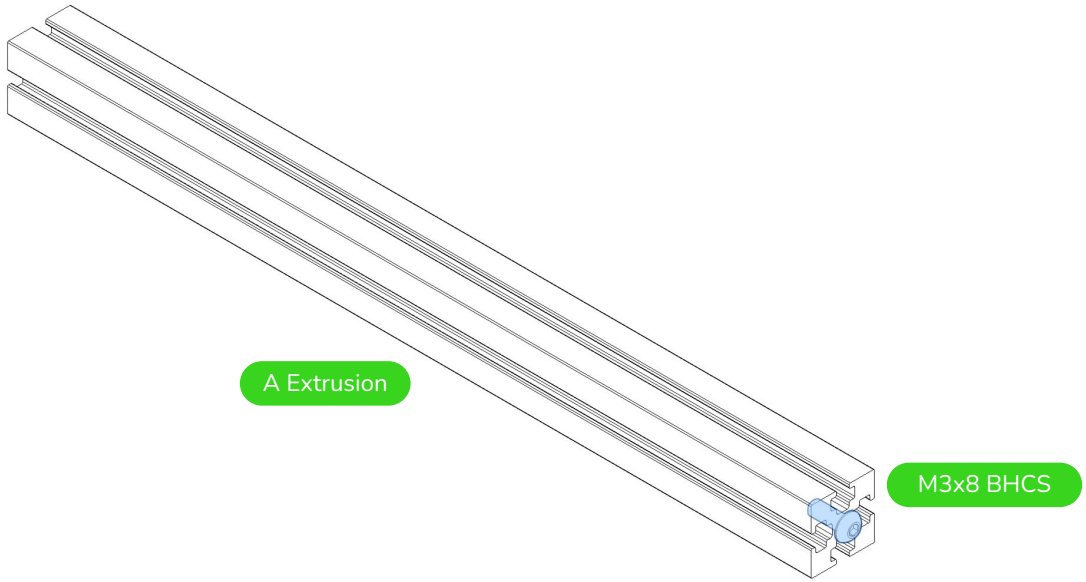



M3x6 BHCS
GE5C



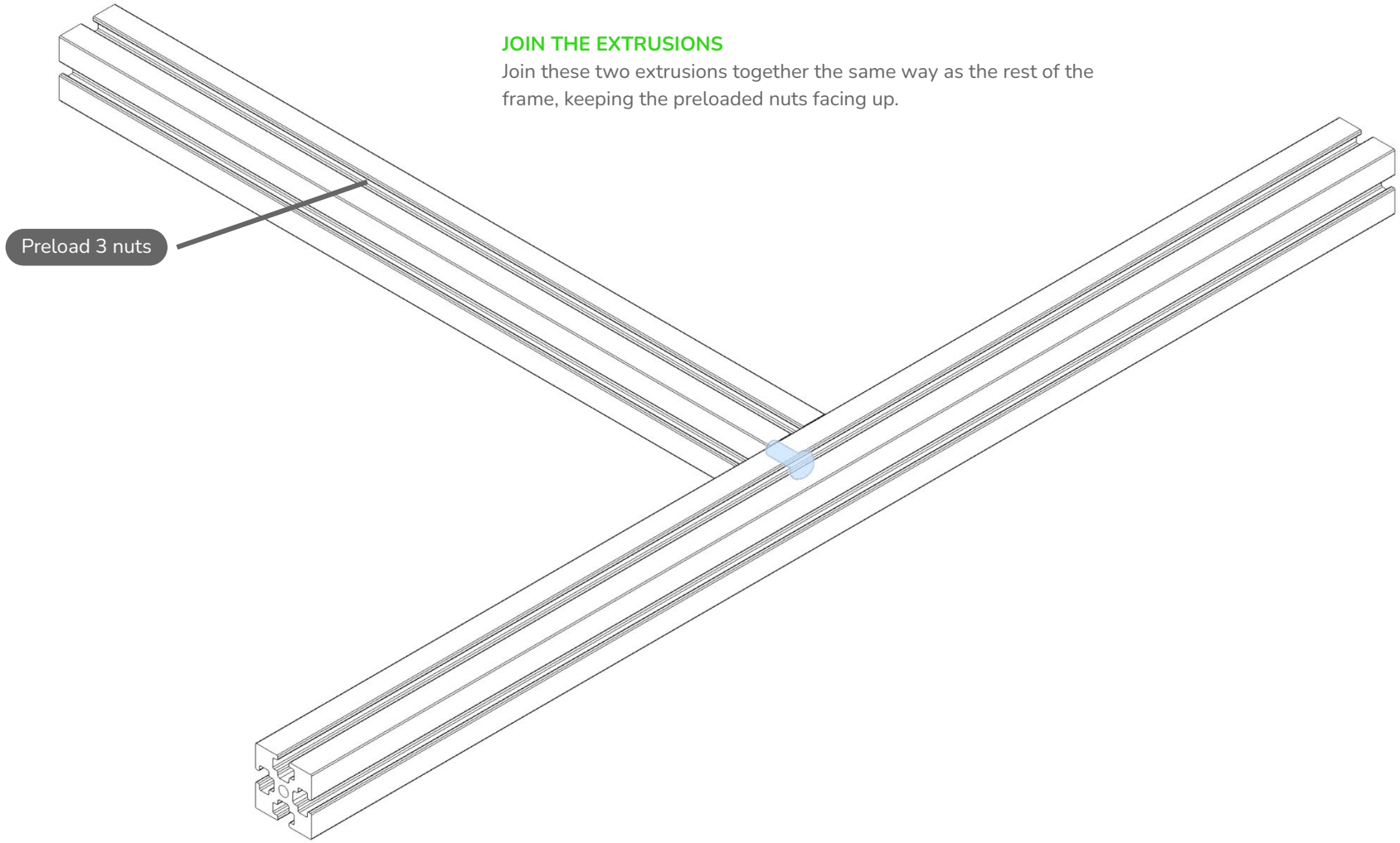
CLEARANCE HOLE LOCATION

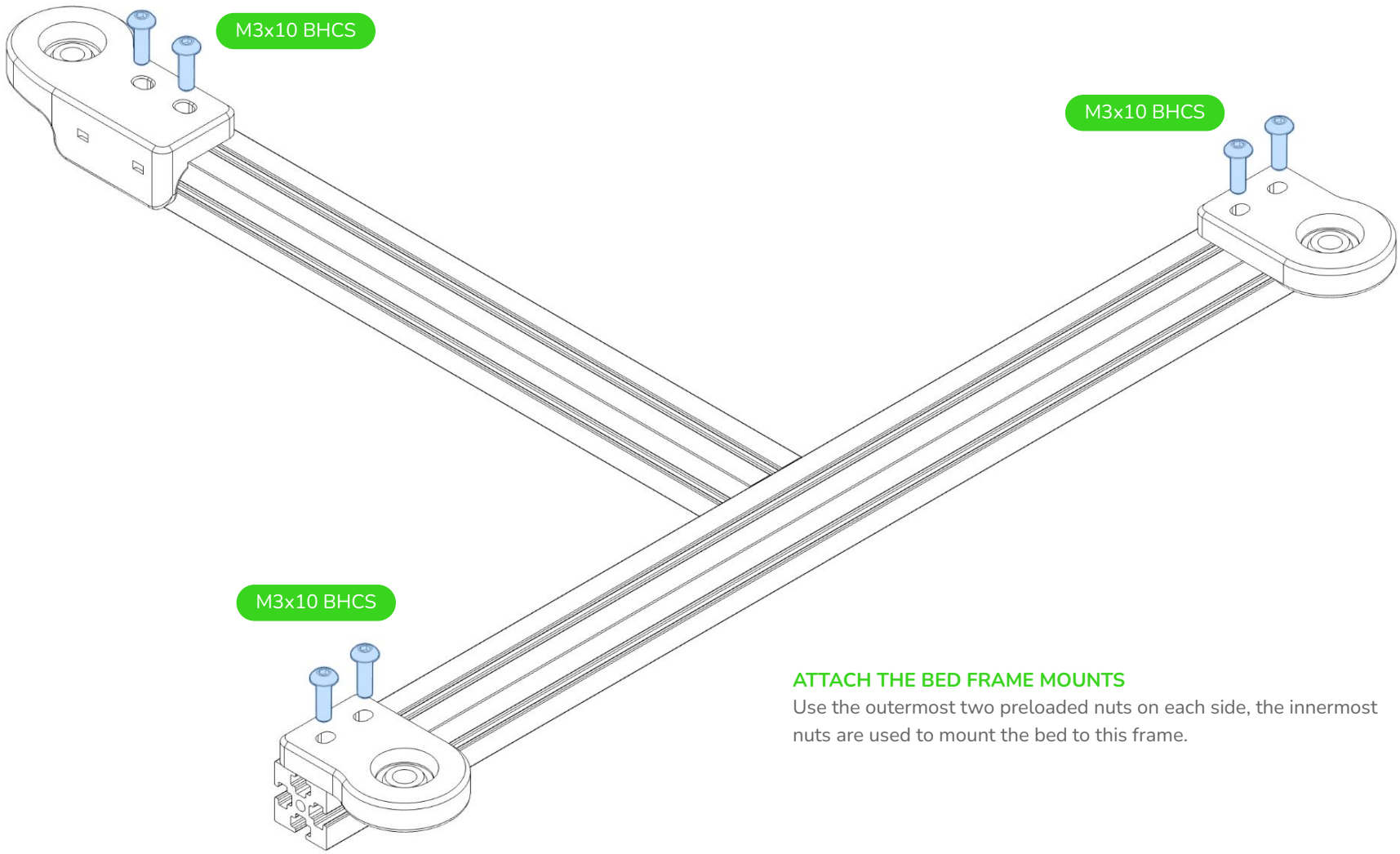
The clearance hole for this extrusion is here, make sure you have the correct orientation before preloading the nuts


A Extrusion
M3x8 BHCS

JOIN THE EXTRUSIONS

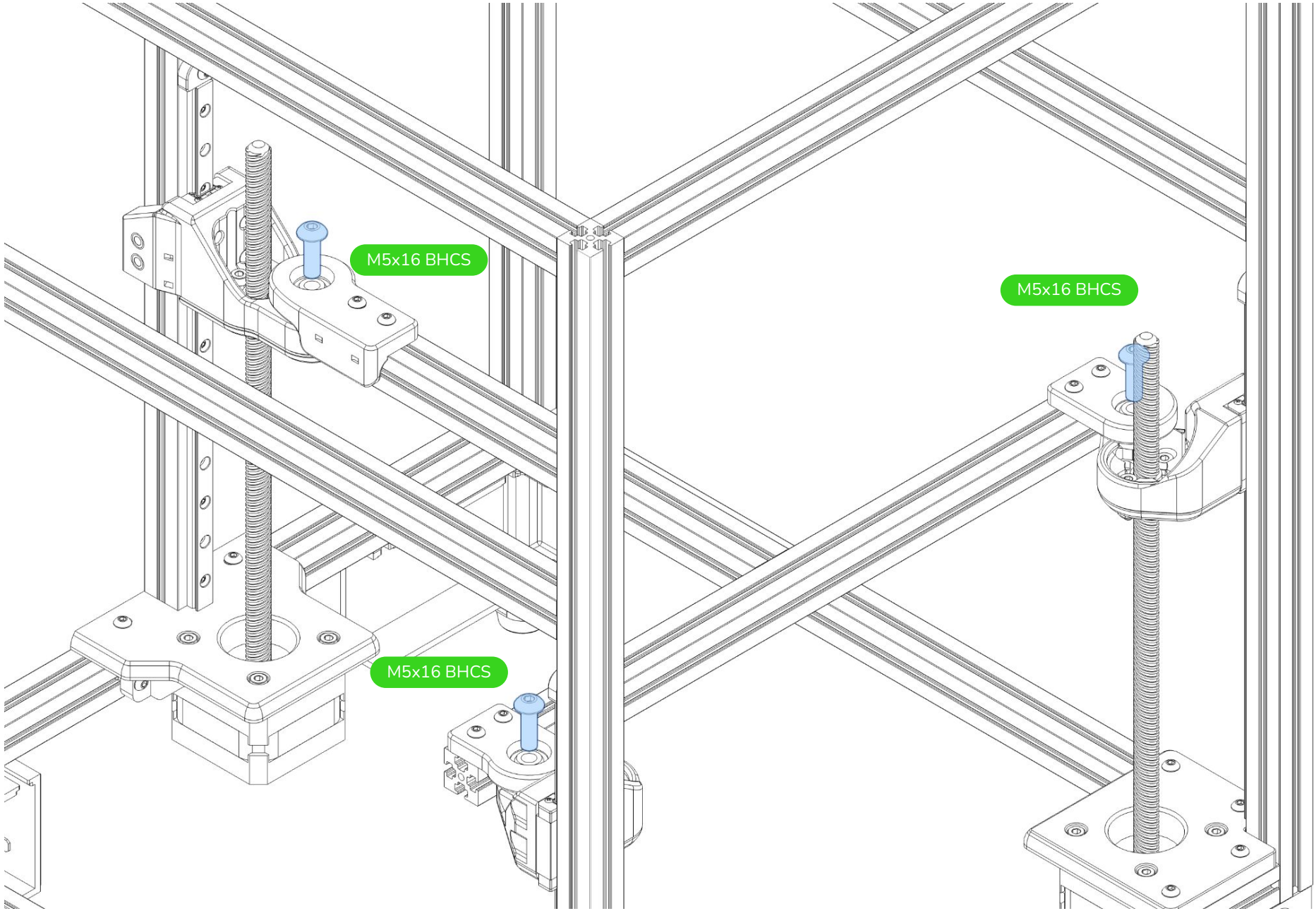
Join these two extrusions together the same way as the rest of the frame, keeping the preloaded nuts facing up.





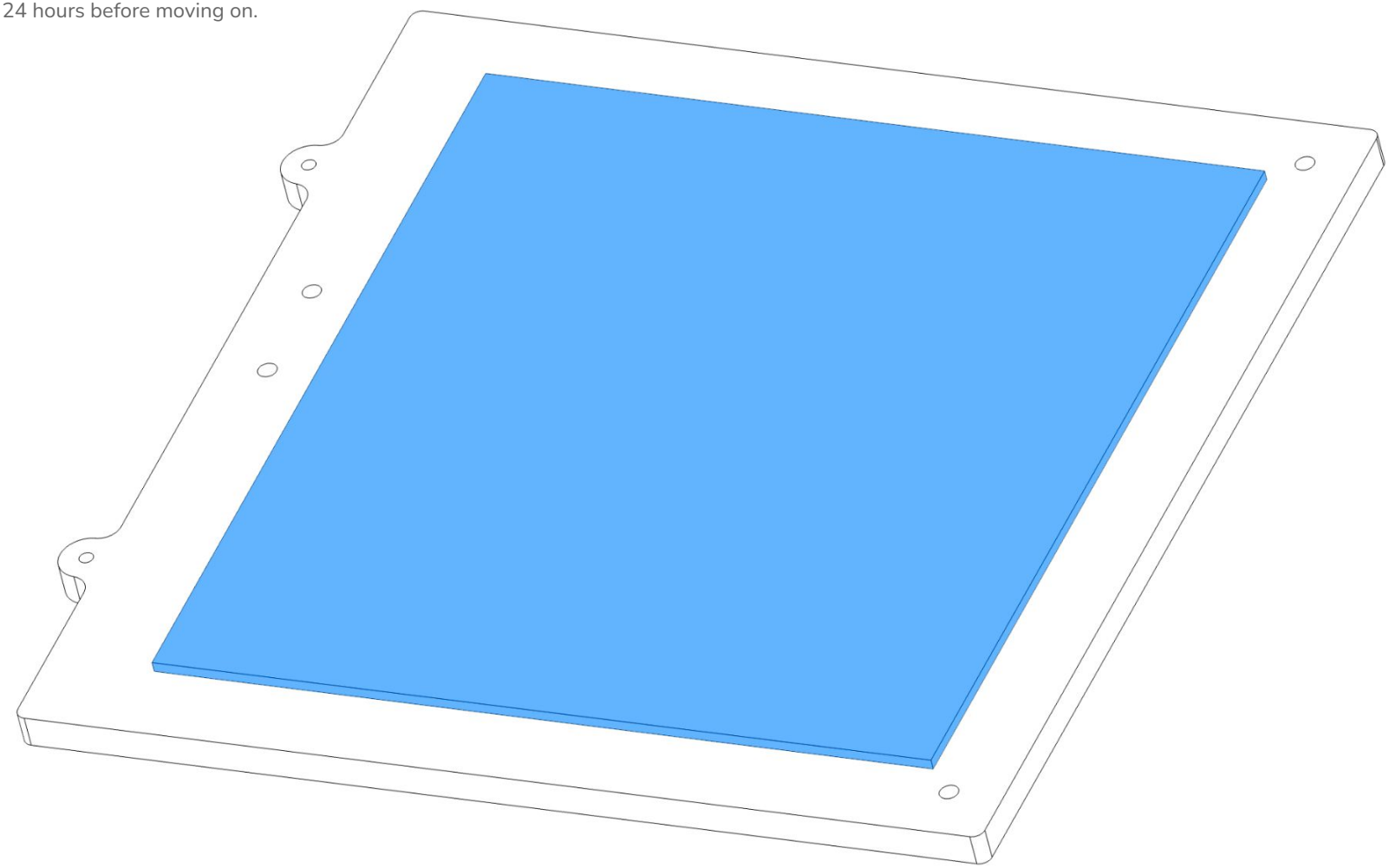
ATTACH THE BED FRAME MOUNTS

Use the outermost two preloaded nuts on each side, the innermost nuts are used to mount the bed to this frame.


M5x16 BHCS
M5x16 BHCS
M5x16 BHCS

ATTACH THE BED HEATER

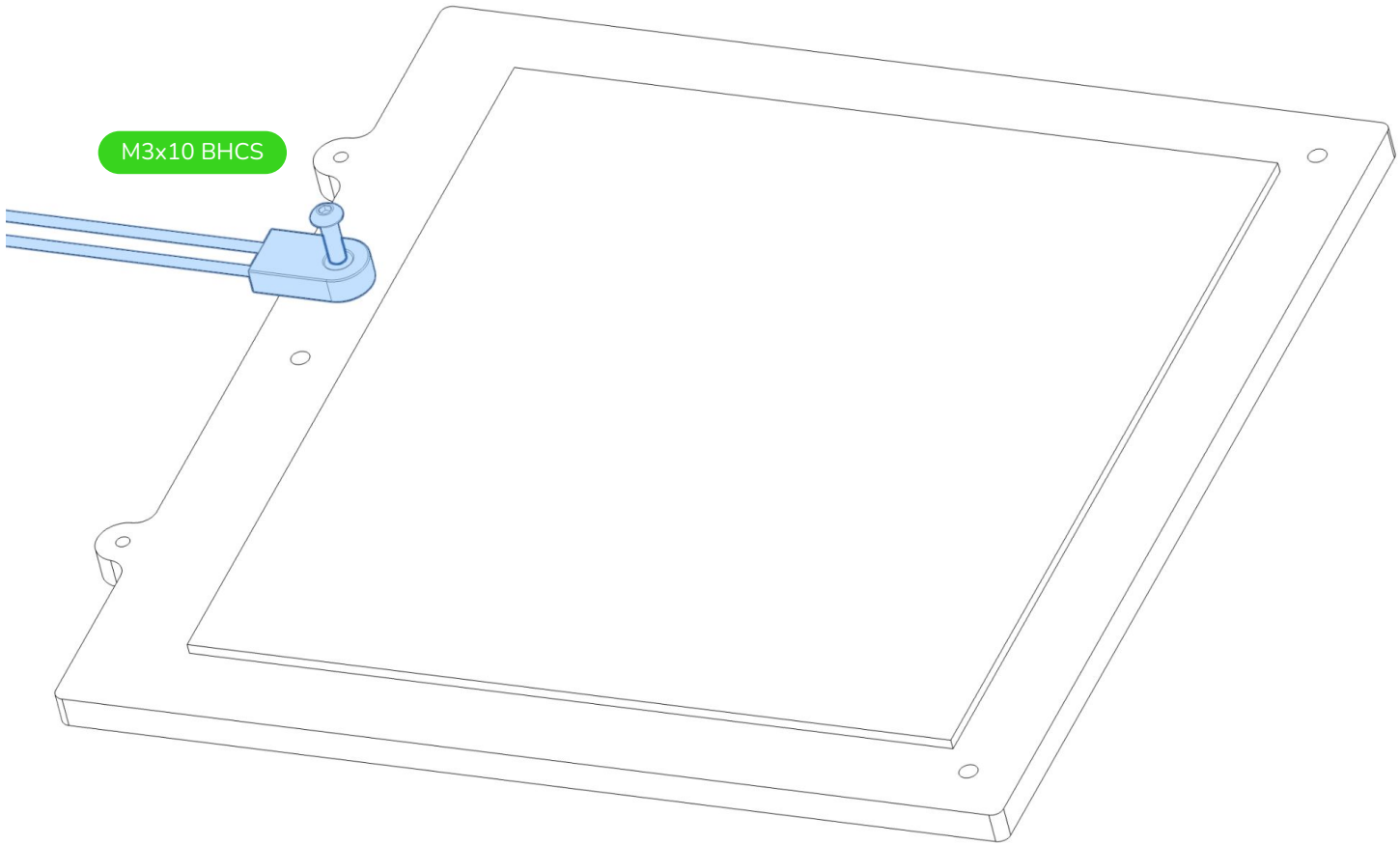
Attach the bed heater to the bottom of the bed. Apply the heater evenly to the bed starting on one side to avoid bubbles being trapped underneath it. Place a flat, weighted object on top of it and let cure for 24 hours before moving on.



ATTACH THE GROUND WIRE AND THERMAL FUSE

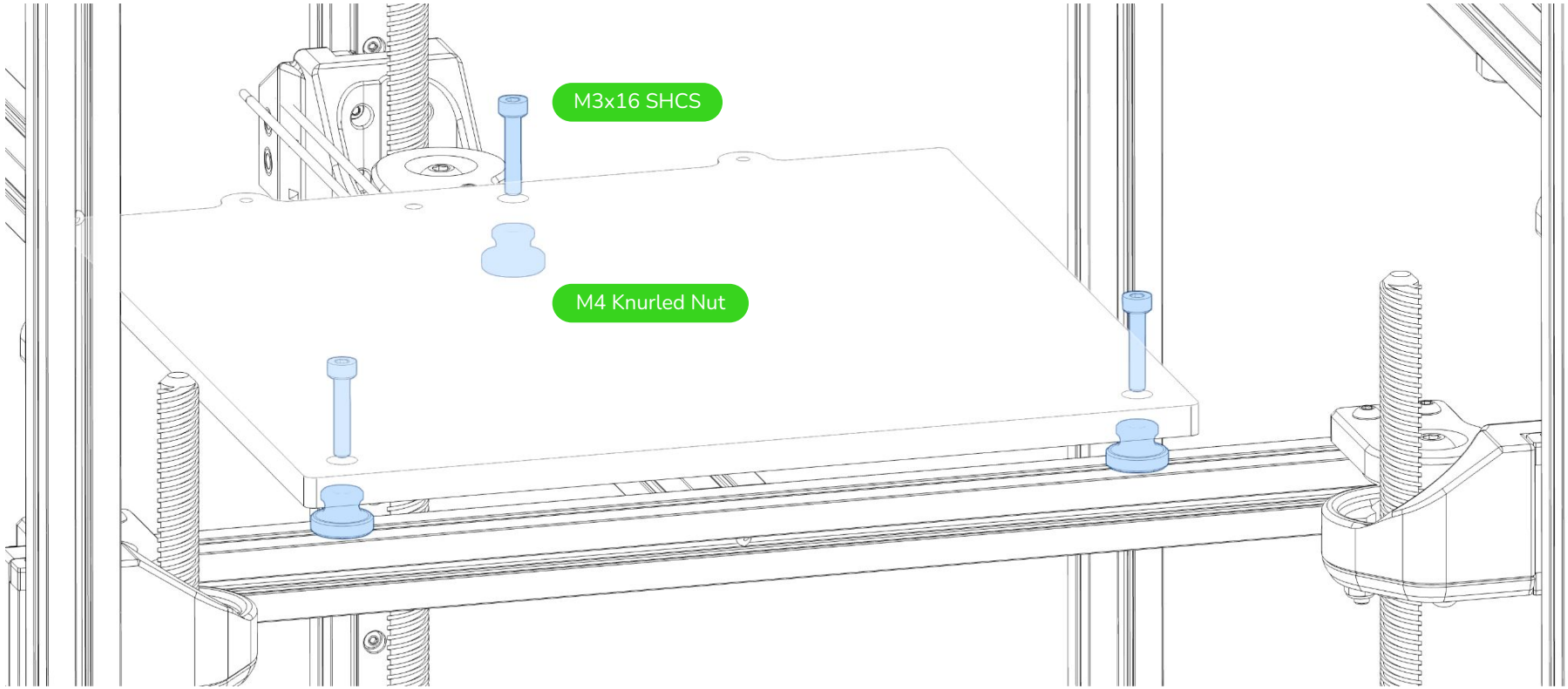
Important! If you are using an AC-powered bed heater, you **must** attach a ground wire to the bed directly. If your bed only has one hole, use that for the ground wire, and use a small amount of RTV to attach the fuse directly to the bed heater pad instead.

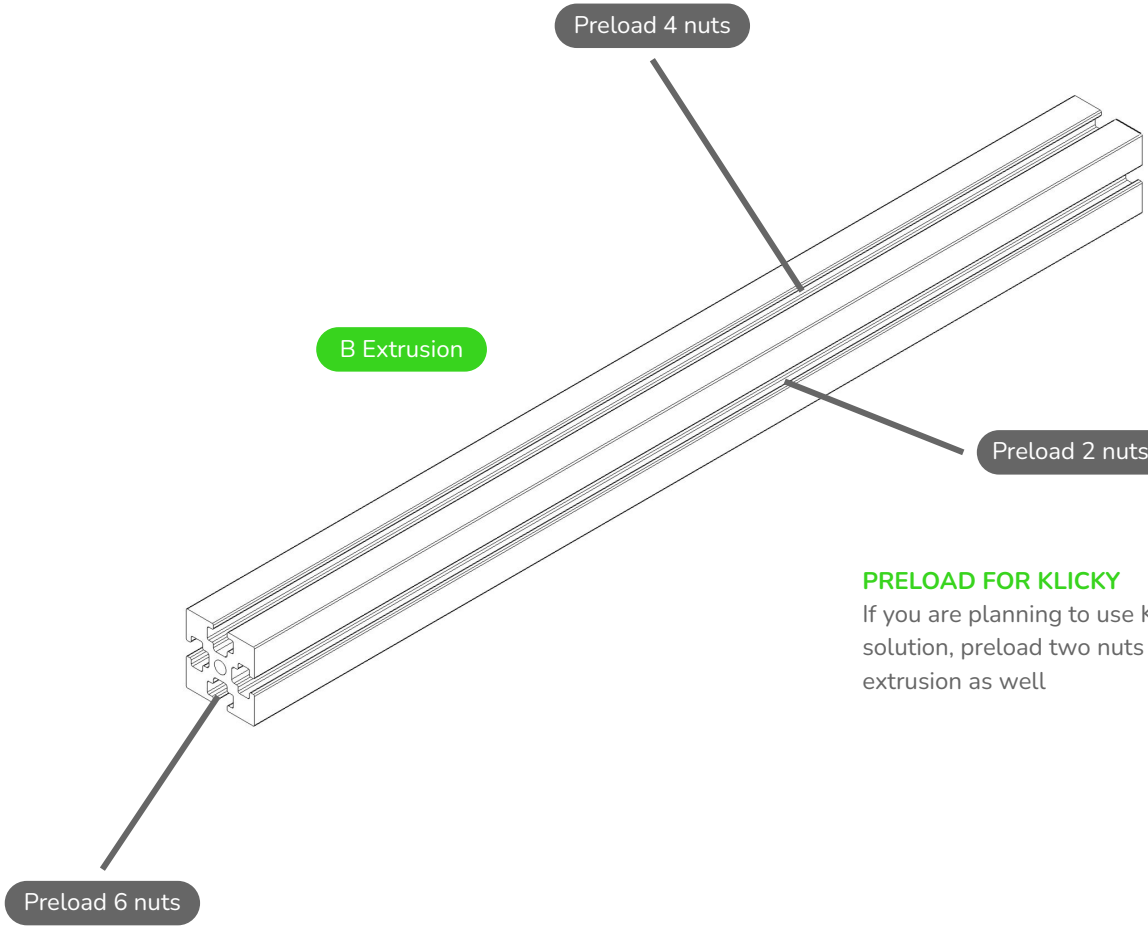
Depending on the specifics of your bed, you may need a different screw than what is shown here.



M4 KNURLED NUTS

The M4 nuts are used as a spacer, the M3 SHCS will not engage with the threads in these.





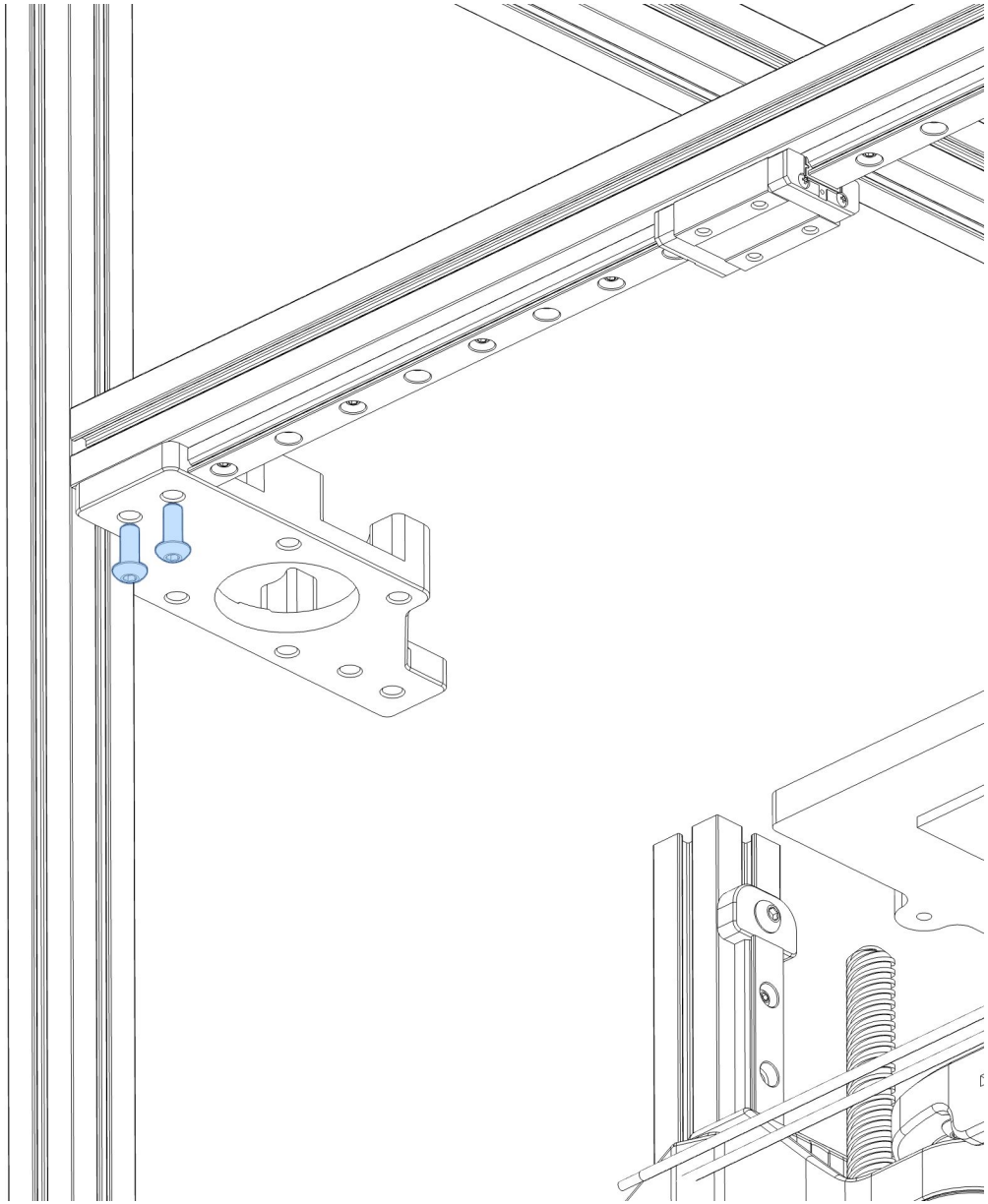
PRELOAD FOR KLICKY

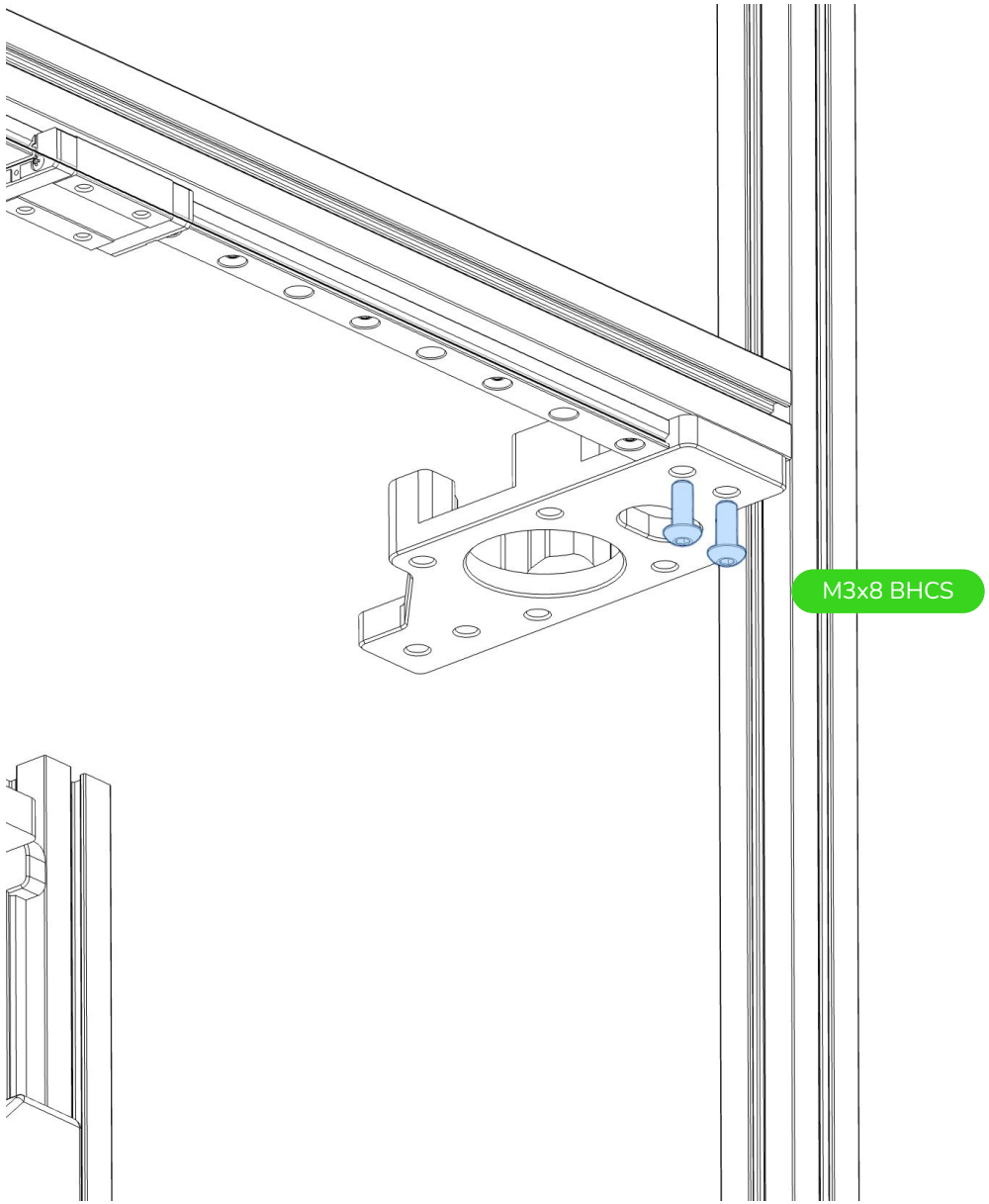
If you are planning to use Klicky as a z-homing solution, preload two nuts on the front of this extrusion as well

PRINTER GOES BAAAAAA

CoreXY printers have a “A” side and a “B” side. This printer follows the convention that the “B” side is on the left, so an easy way to remember the sides is to remember a sheep!

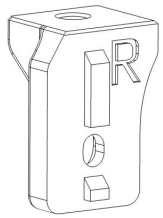
M3x8 BHCS

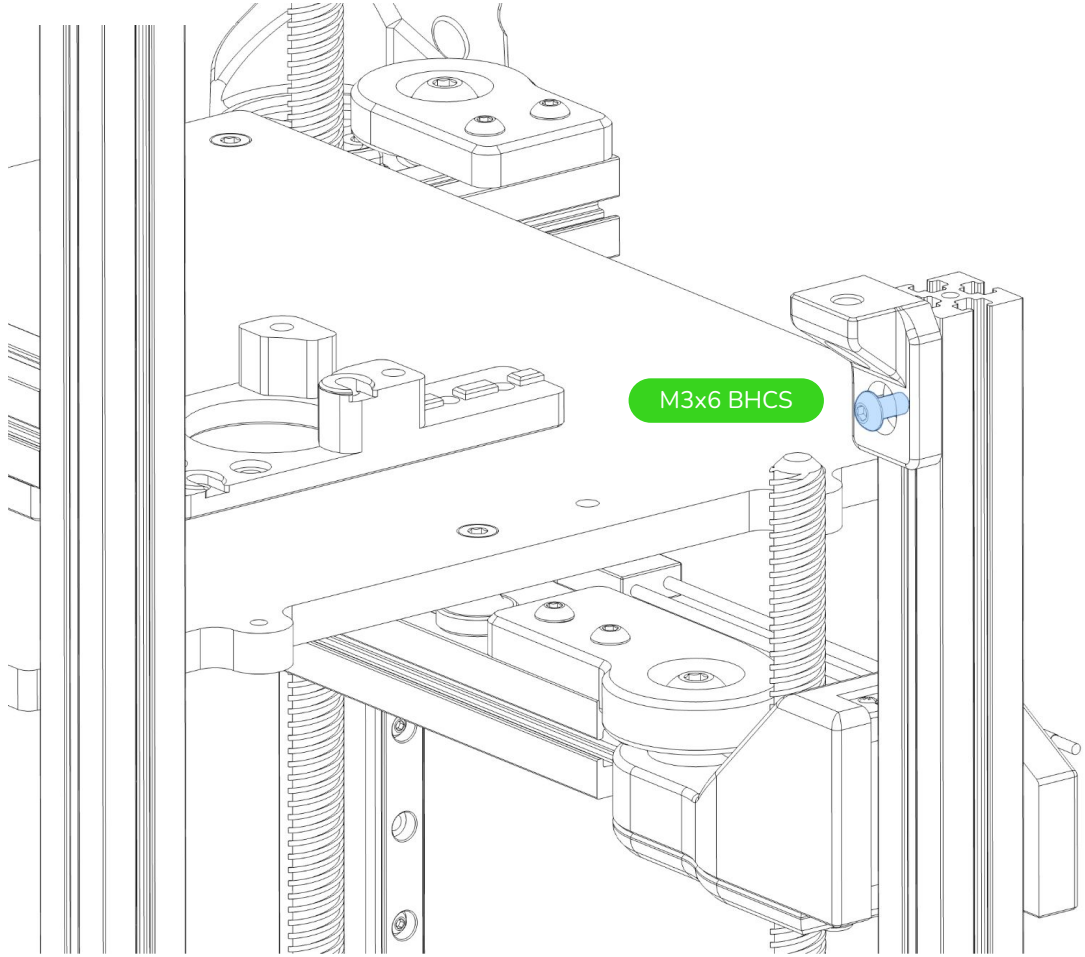


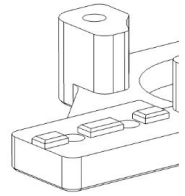

M3x8 BHCS

THESE PARTS ARE LABELED

There are 2 Z brackets, in this step we use the one stamped “R”

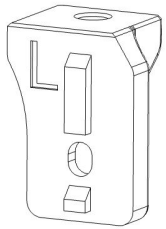


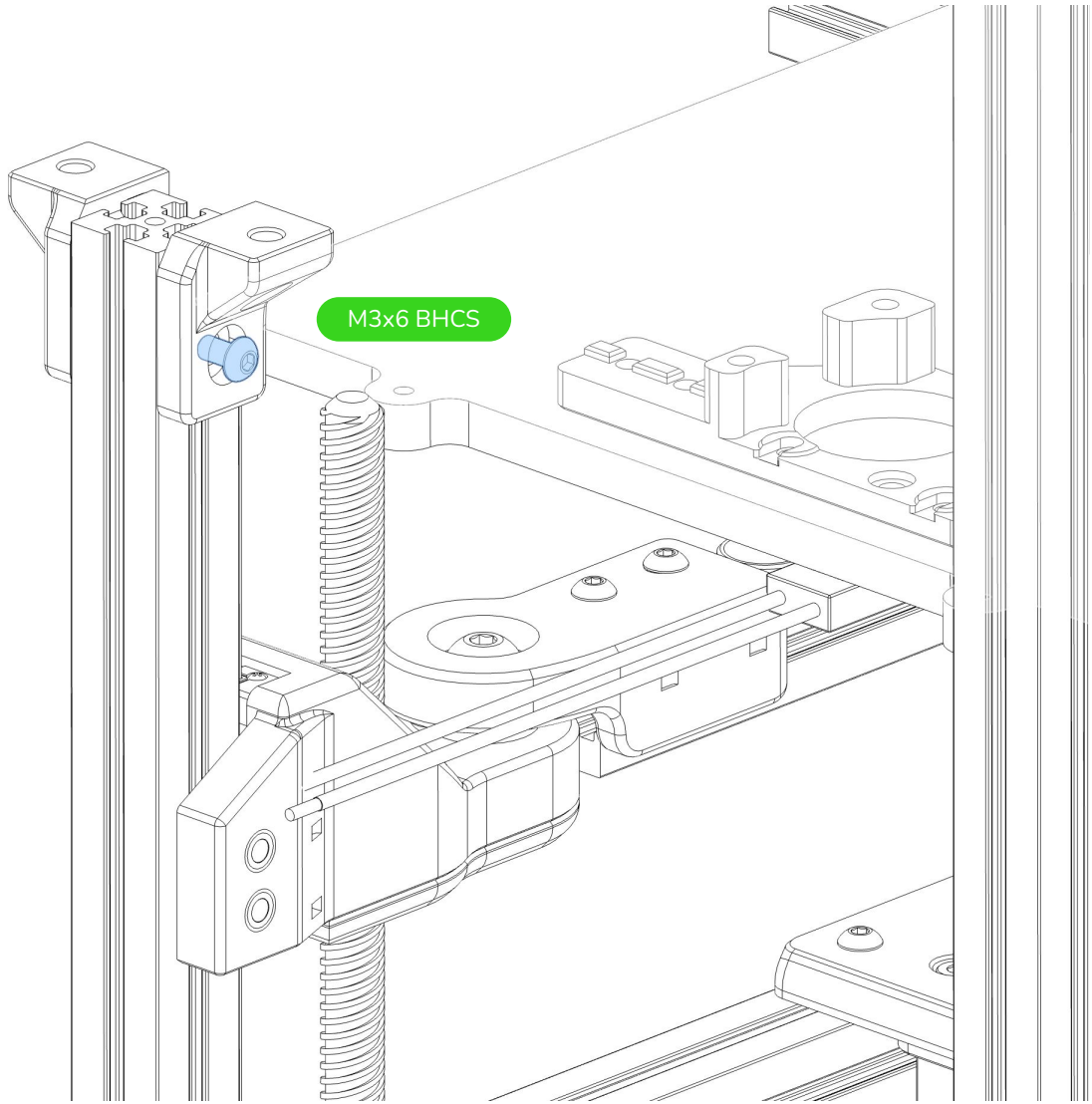


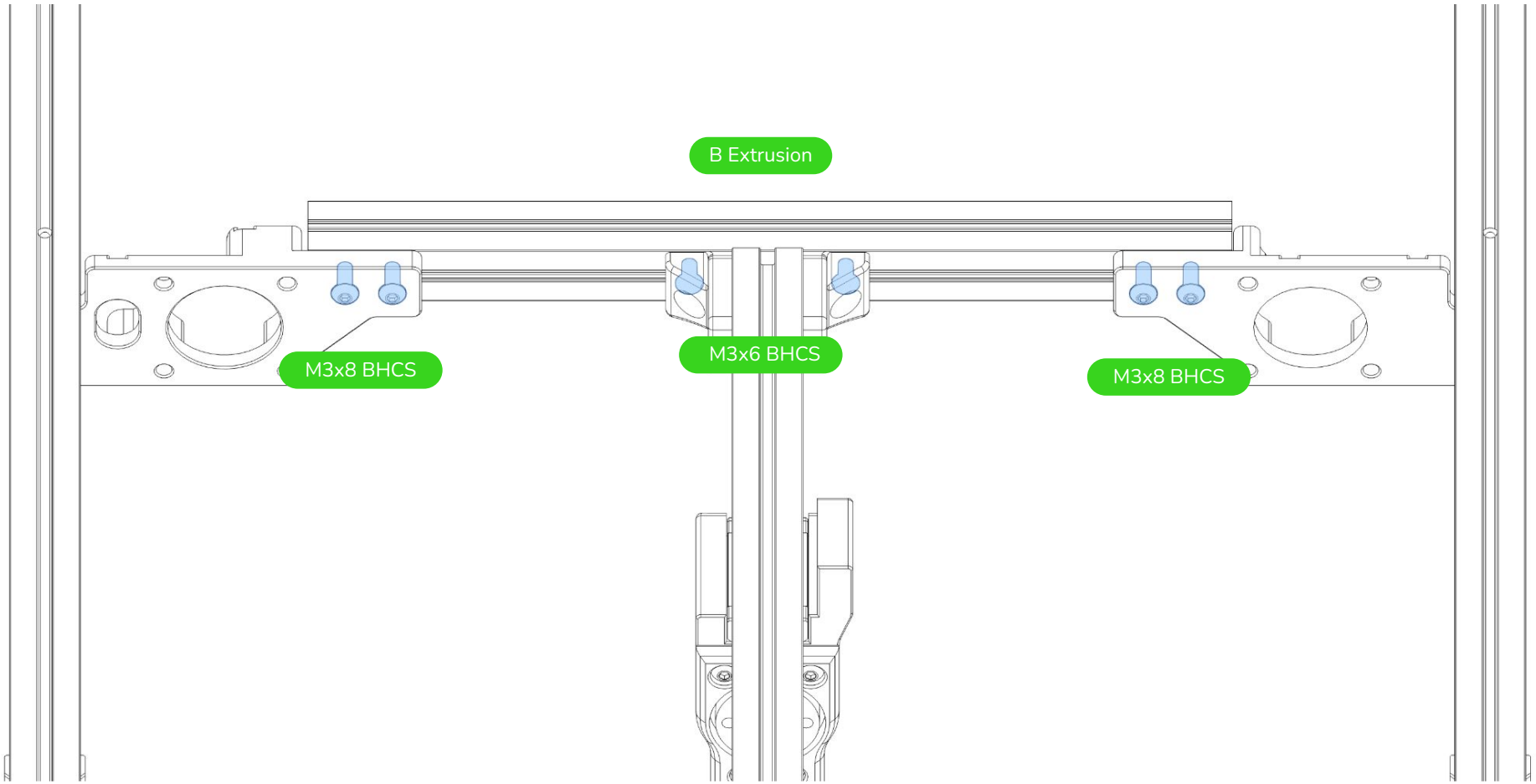


THESE PARTS ARE LABELED

There are 2 Z brackets, in this step we use the one stamped “L”

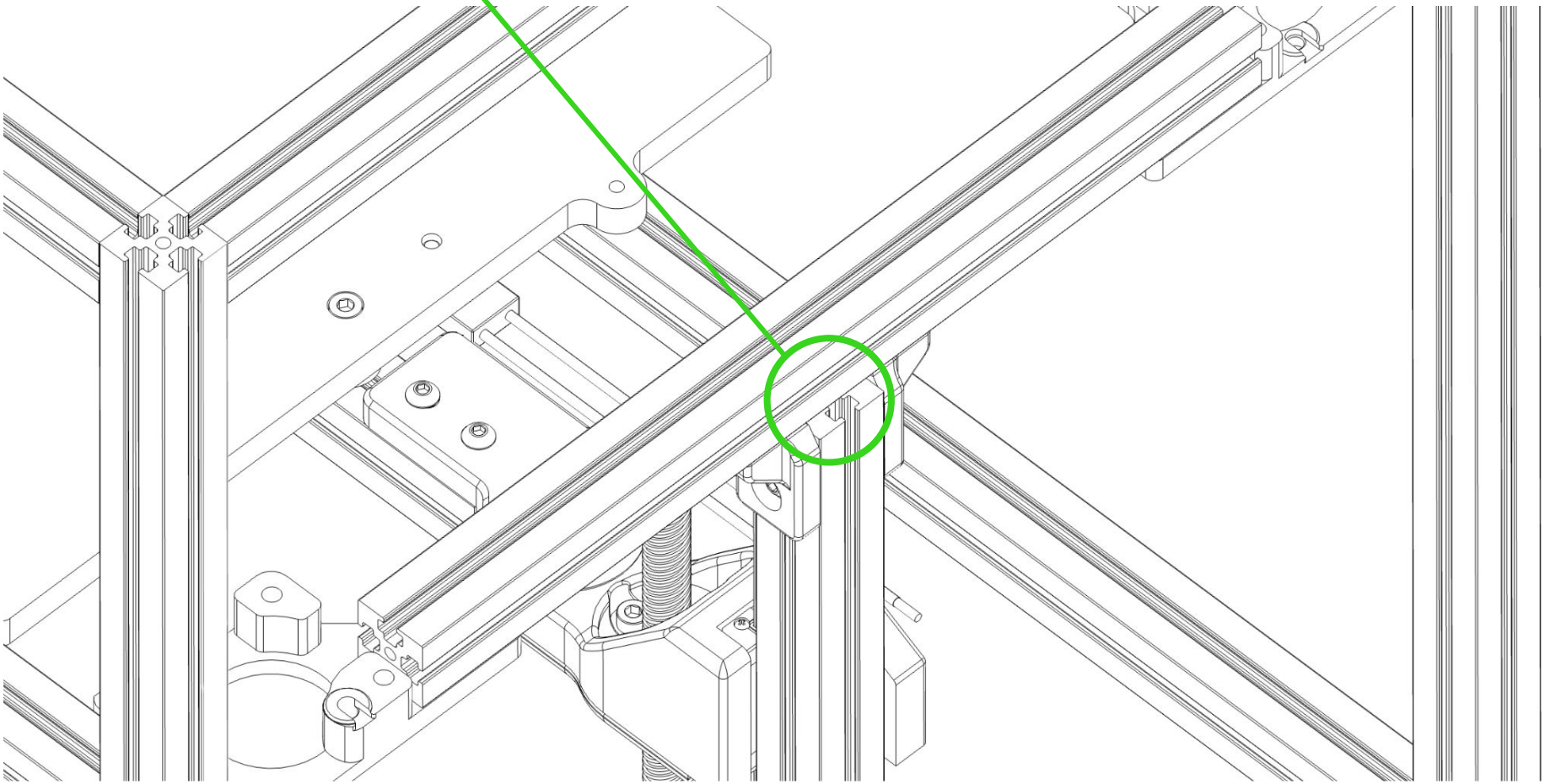





B Extrusion
M3x8 BHCS
M3x6 BHCS
M3x8 BHCS

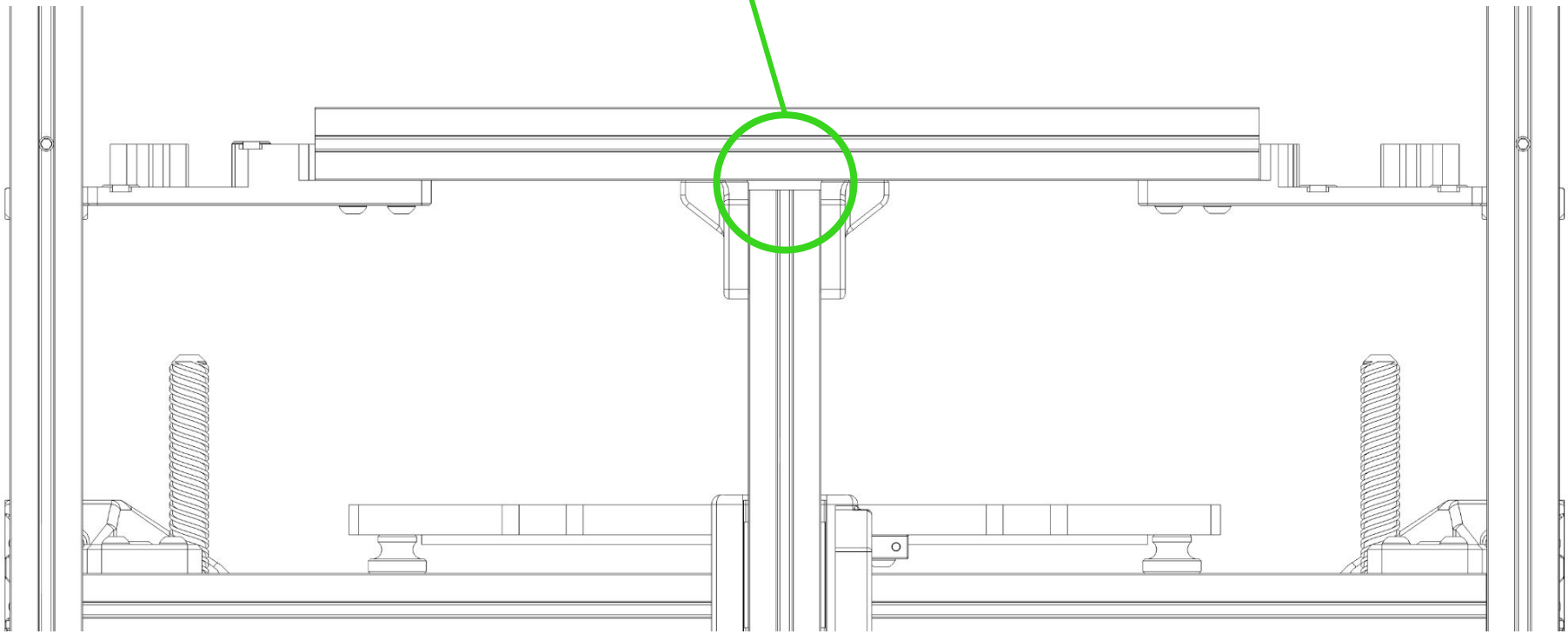
NOT FLUSH

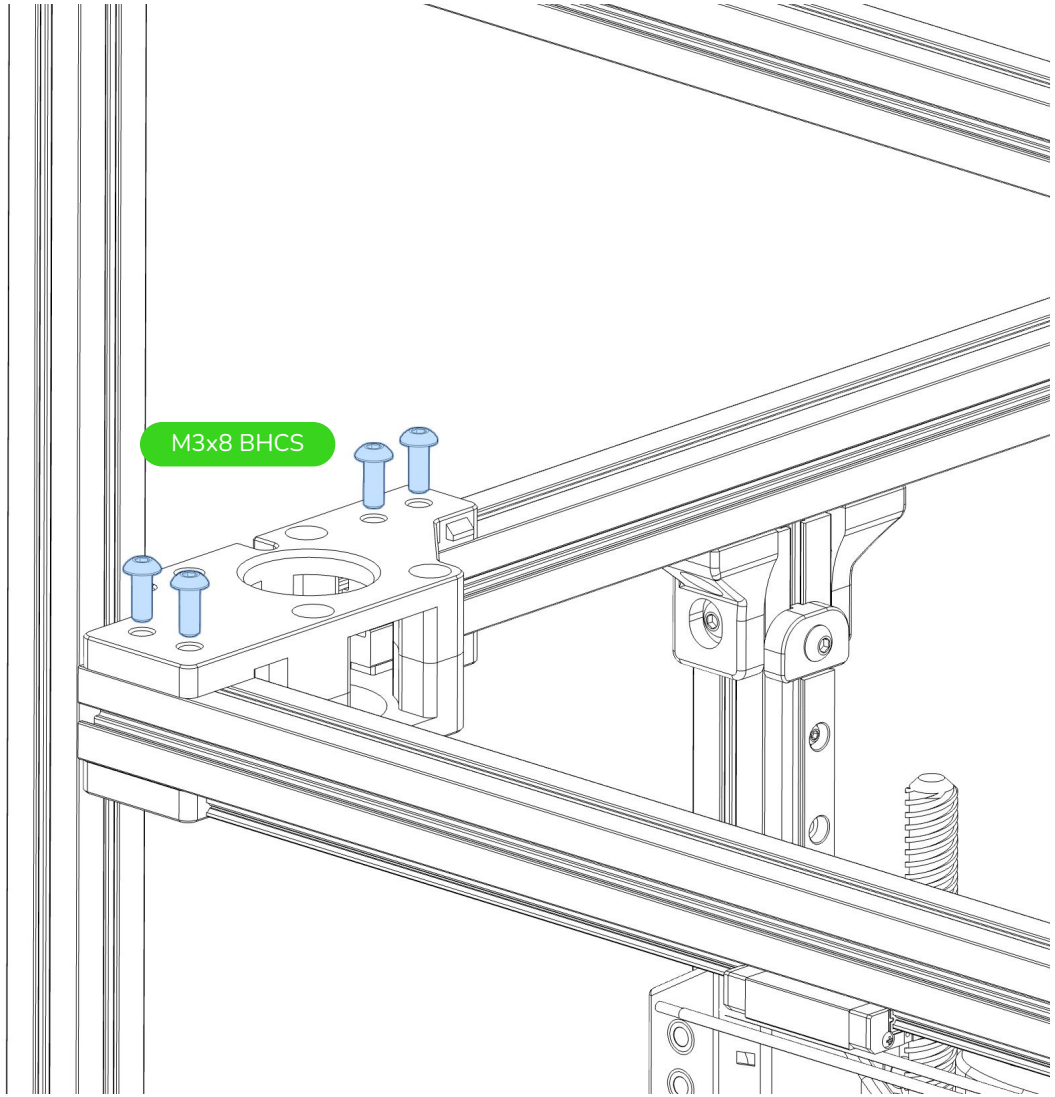
These extrusions intentionally do not align, the brackets will put the extrusion with the proper offset.



MIND THE GAP

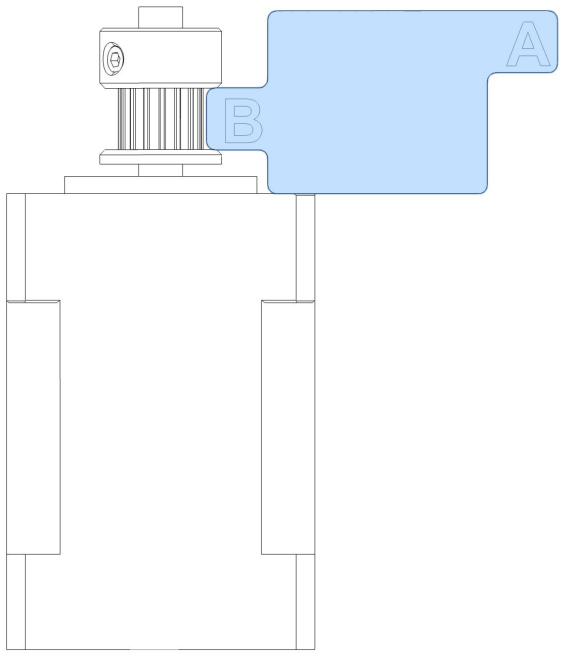
There should be a small gap between the vertical and horizontal extrusions, they should not be directly touching. If they are, adjust the Y rail extrusions as needed.




M3x8 BHCS

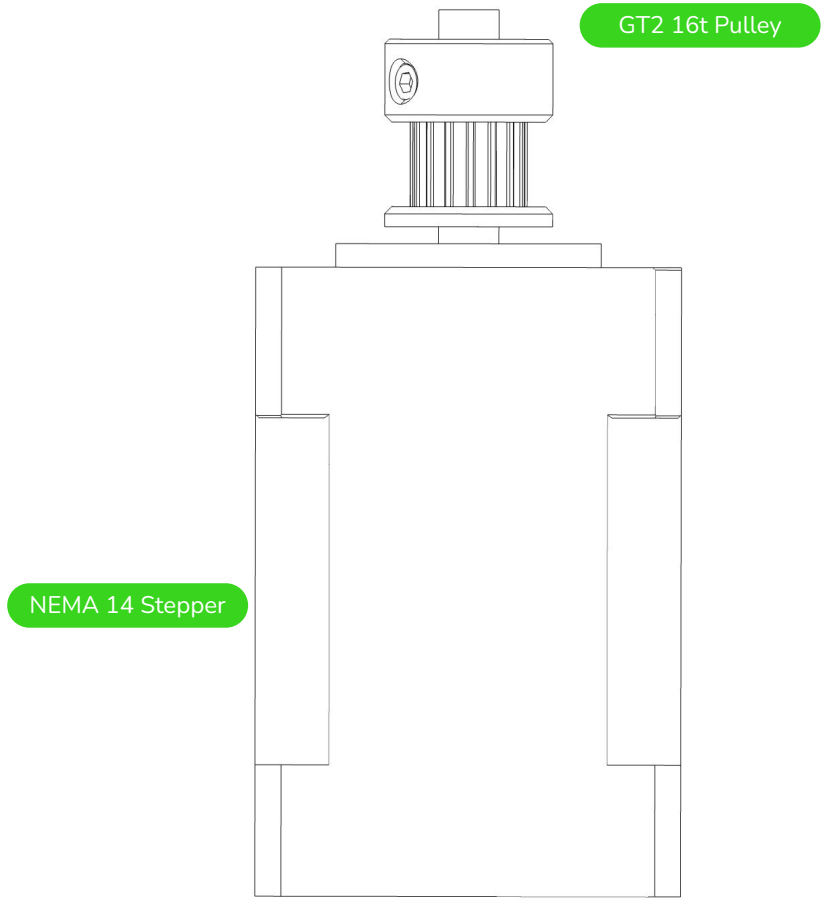
PULLEY OFFSET

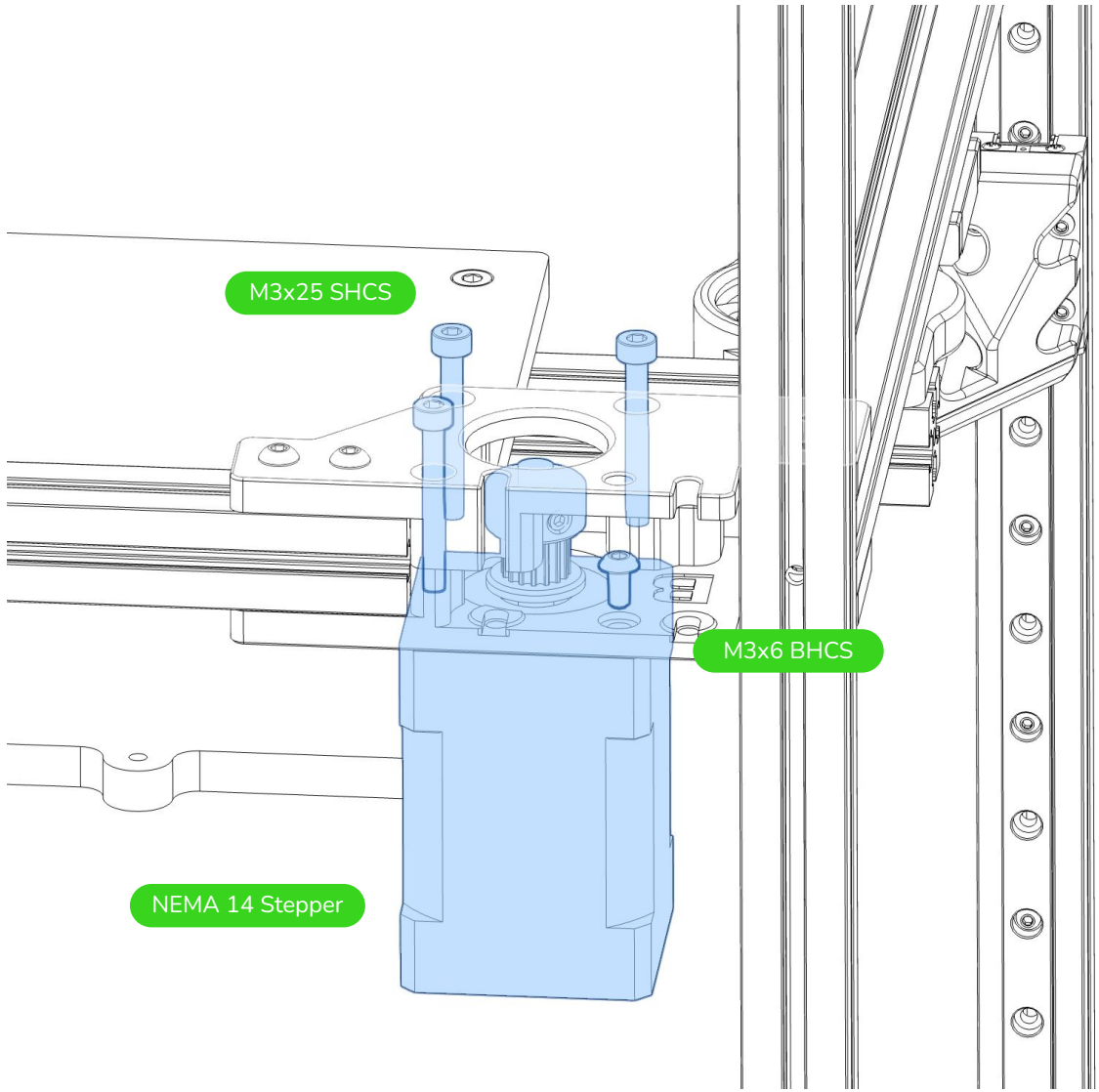
Use the supplied pulley offset tool to set the initial height of the pulley on the stepper shaft. After the belts are mounted this height can be fine-tuned to make sure the belt rides in the center of the pulley

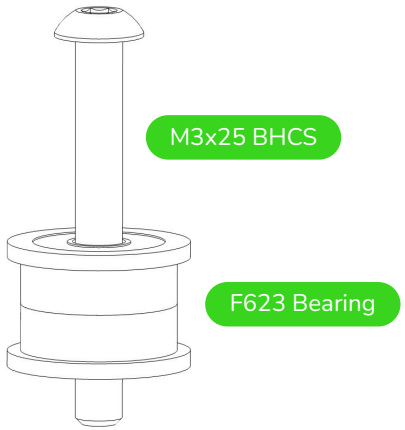


GRUB SCREWS

After setting the height of the pulley, don't forget to apply a light threadlocker to the grub screws. If you forget this step, you may encounter print issues over time as they work loose.

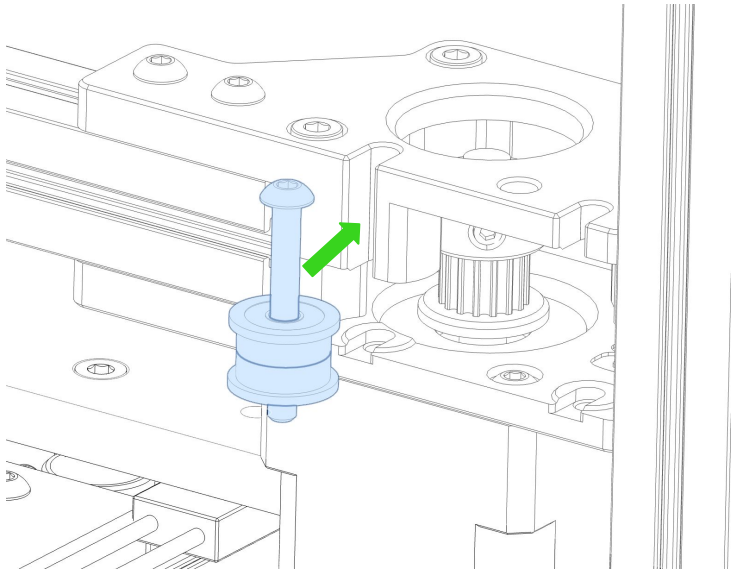


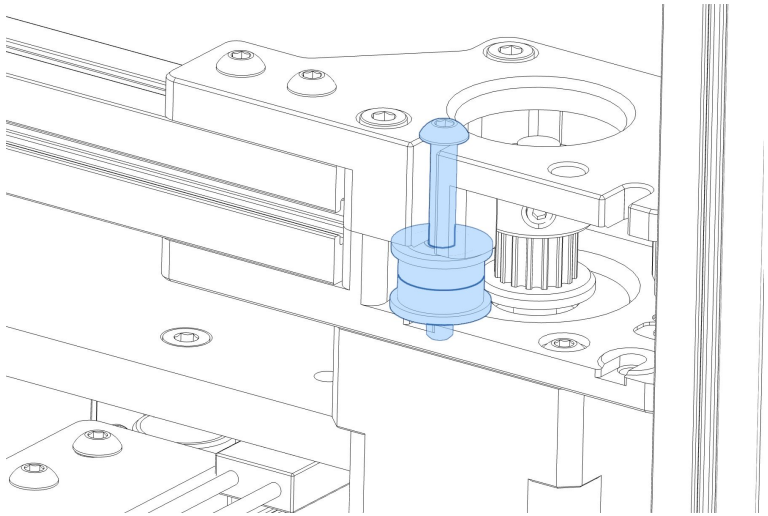

M3x25 SHCS
M3x6 BHCS
NEMA 14 Stepper

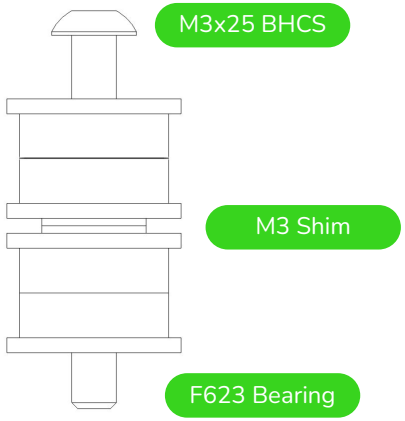


BEARING STACK

We use stacked bearings on a M3 screw as belt guides. Begin by adding two bearings as shown to the M3 screw, slide the screw into the slot on the motor mount, and snug gently. Do not over-tighten, the bearings must spin freely.

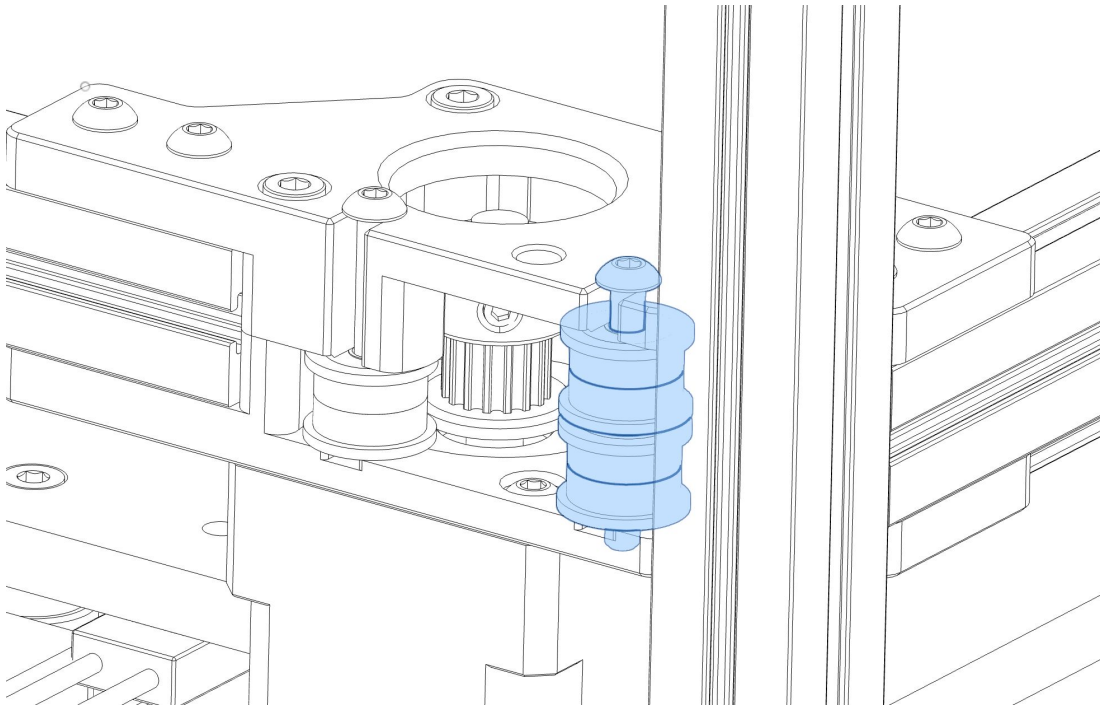






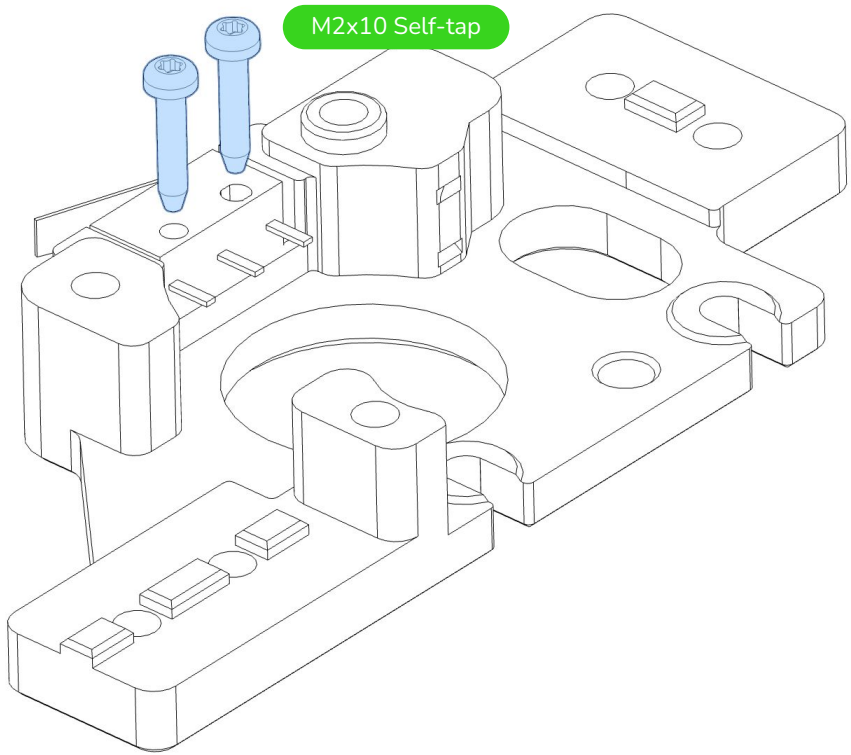
DOUBLE BEARING STACK

Just like the single bearing stack, except this time we add 2 M3 shims between the bearings to ensure proper alignment for the belts. Don't forget them!



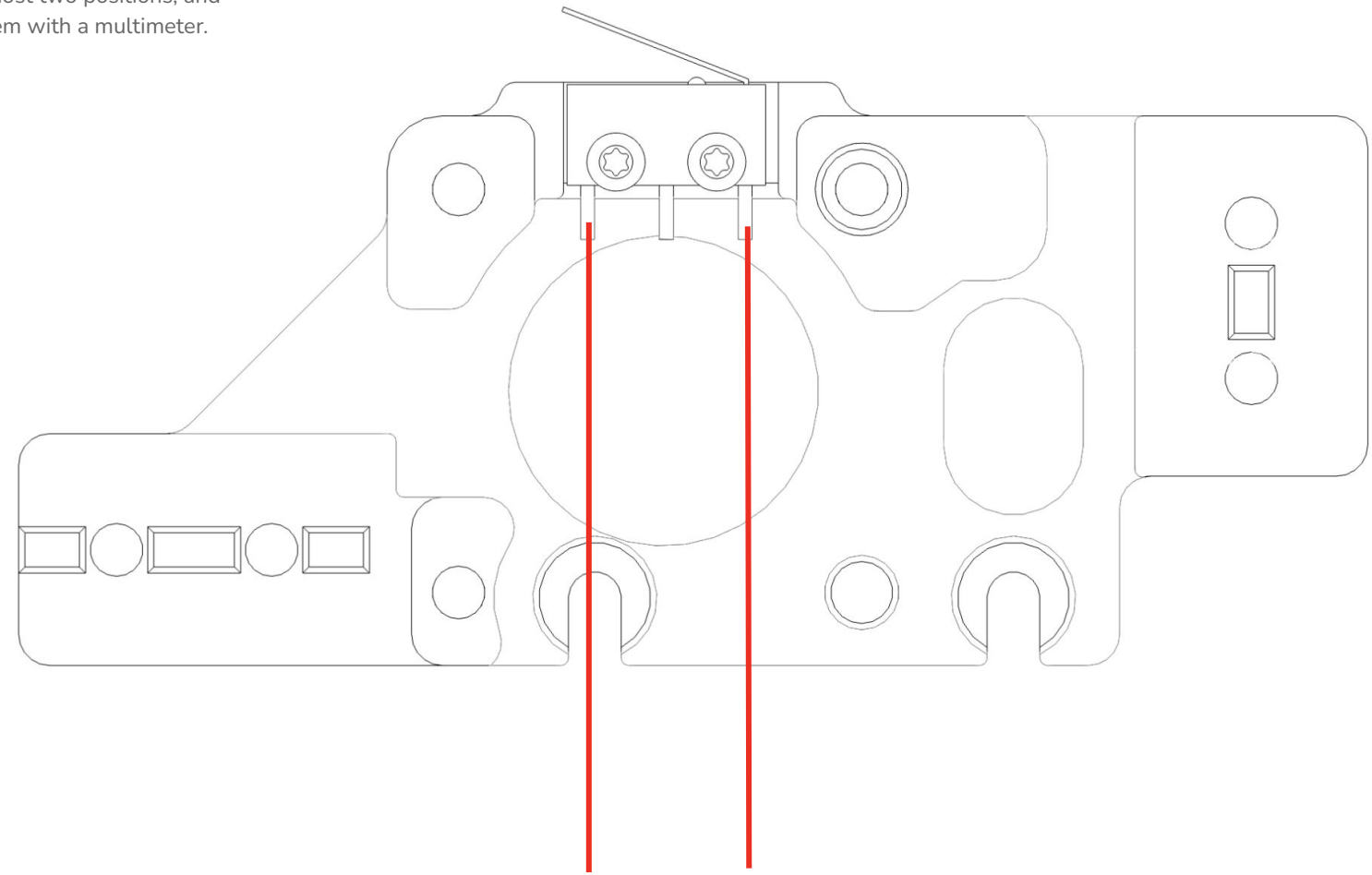
GOING SENSORLESS?

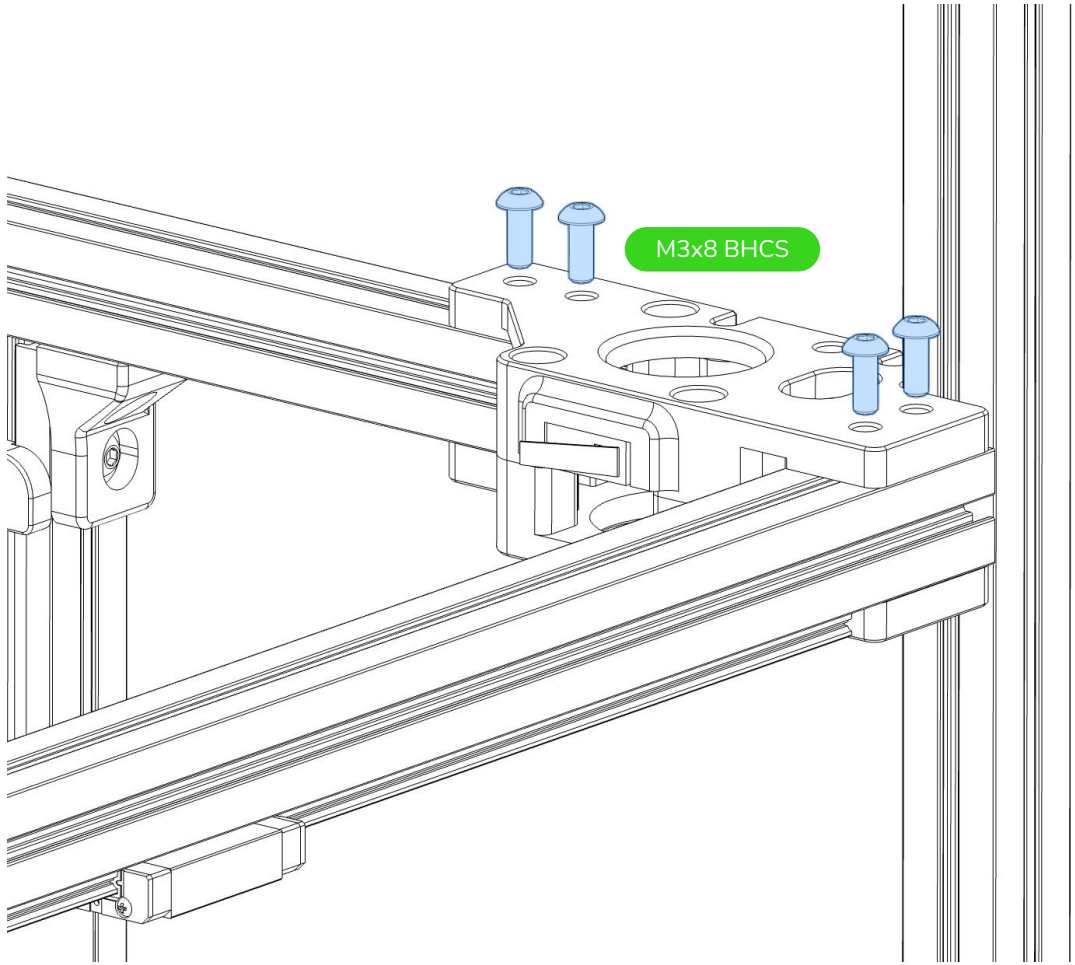
If you are going to utilize sensorless homing, you will need to use the A_Drive_Upper_Sensorless part instead of this part, and skip the instructions for wiring the endstop on the next page.



SOLDER THE ENDSTOP

Solder two lengths of wire about 60cm long to the switch poles. Use the outermost two positions, and verify continuity between them with a multimeter.




M3x8 BHCS

PULLEY OFFSET

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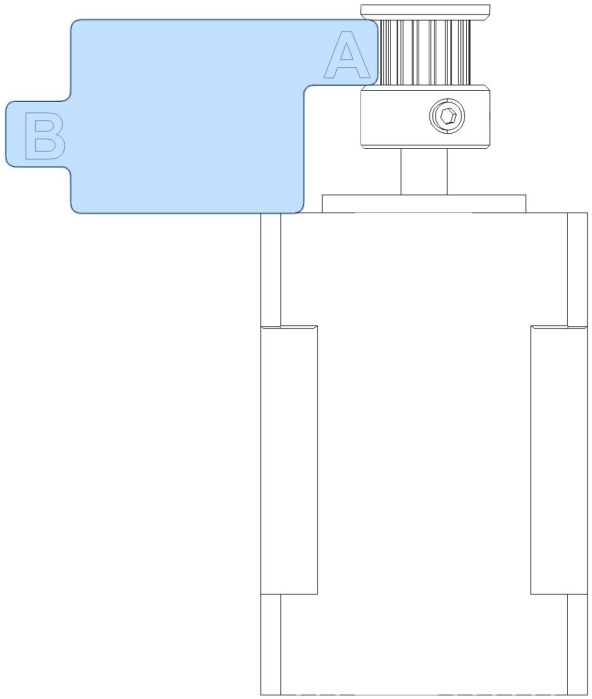

GRUB SCREWS HERE TOO

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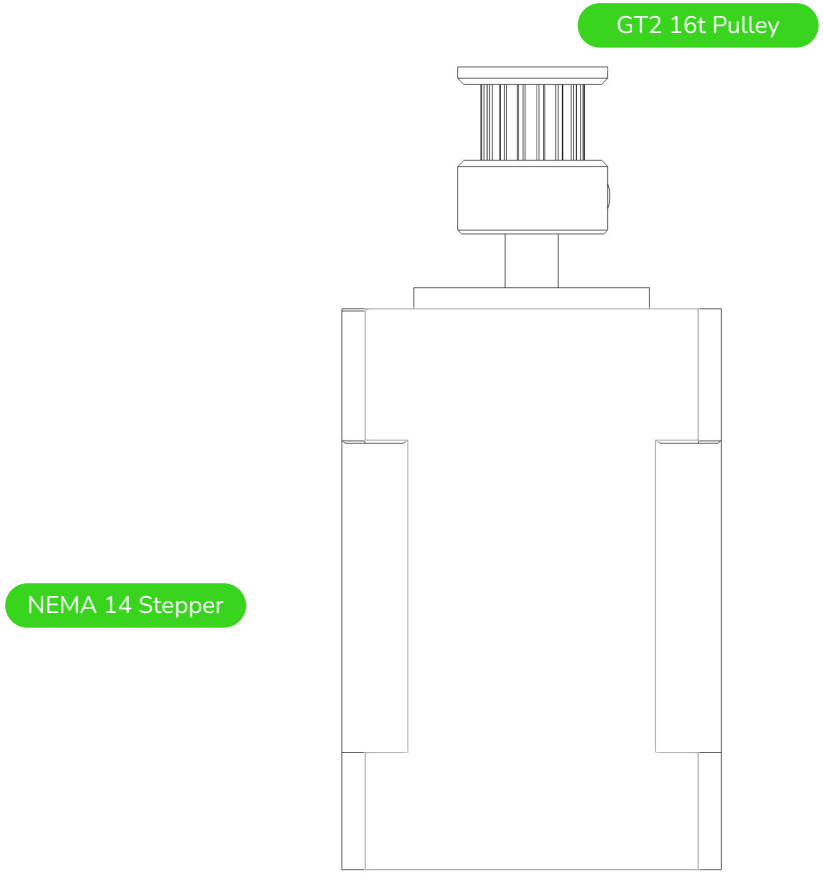
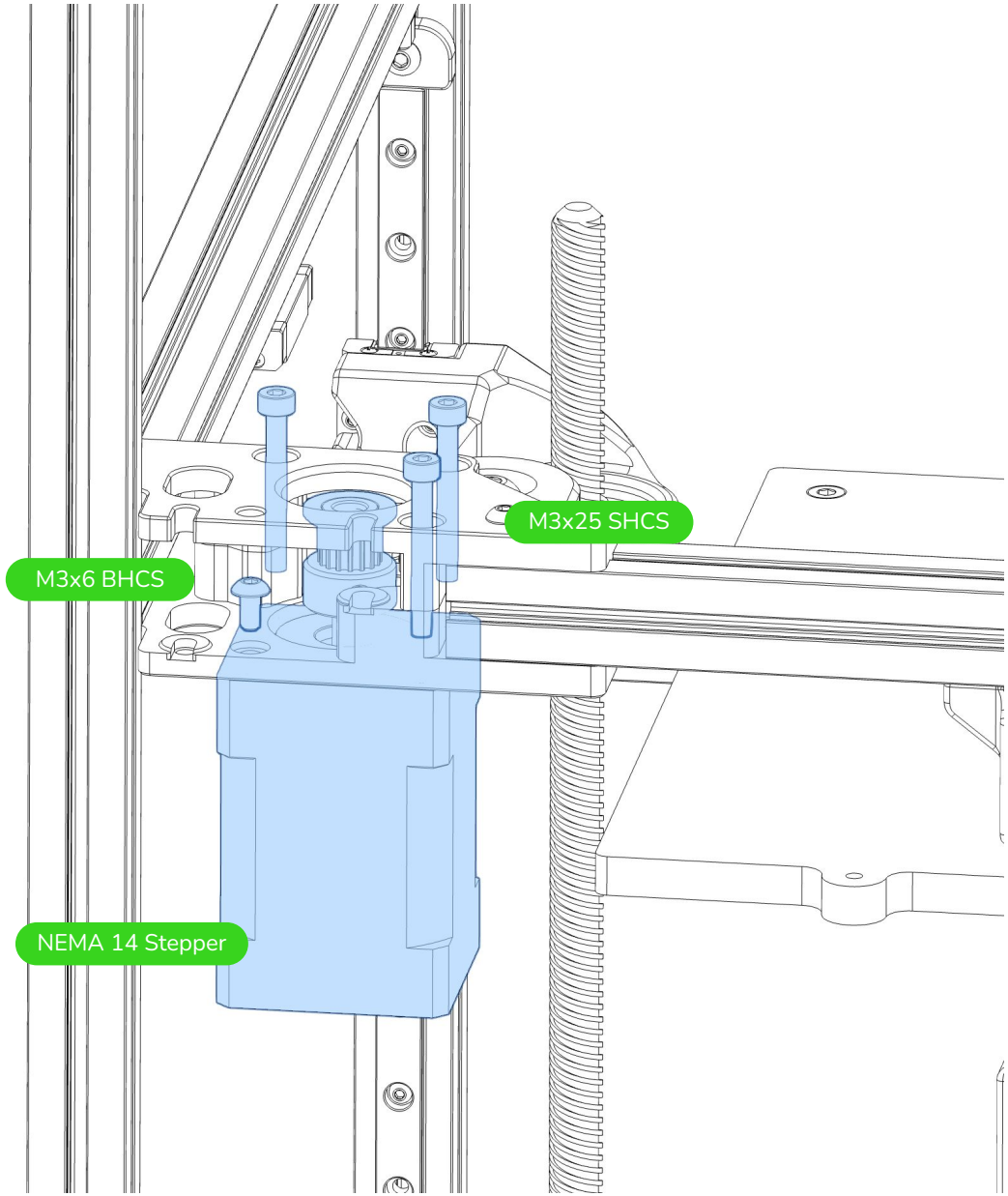
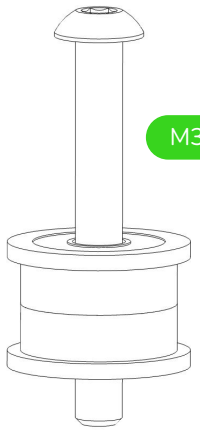
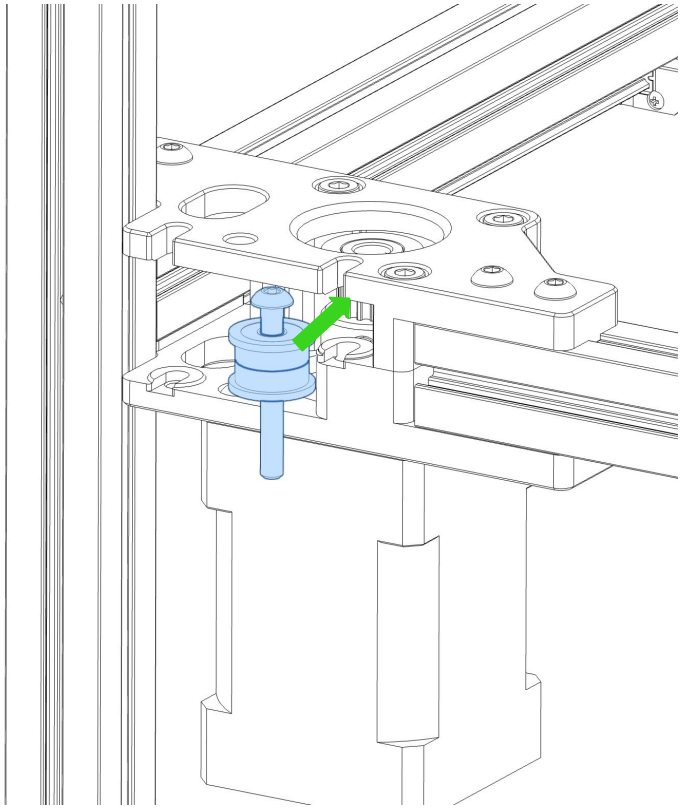
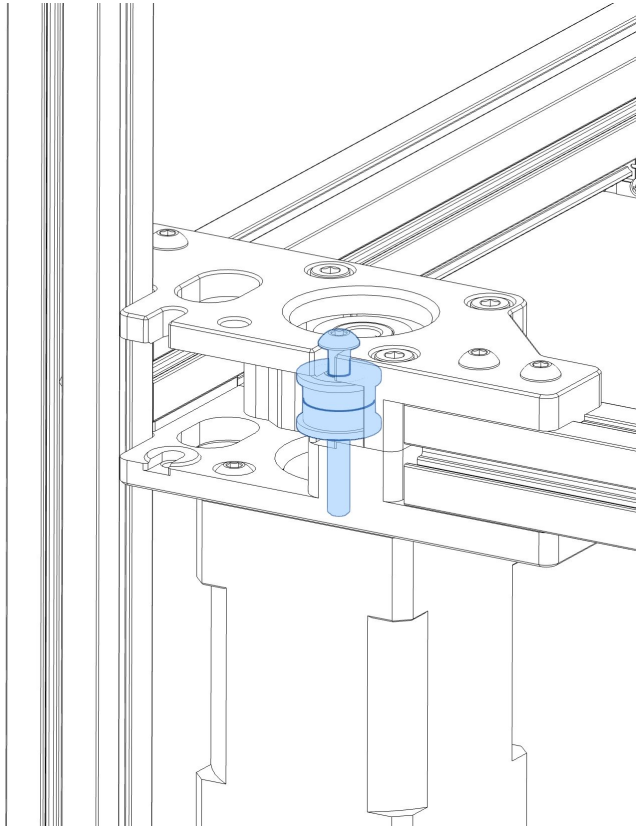
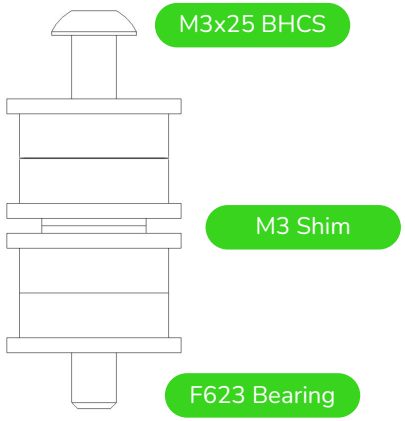



M3x25 SHCS
M3x6 BHCS
NEMA 14 Stepper


M3x25 BHCS
F623 Bearing

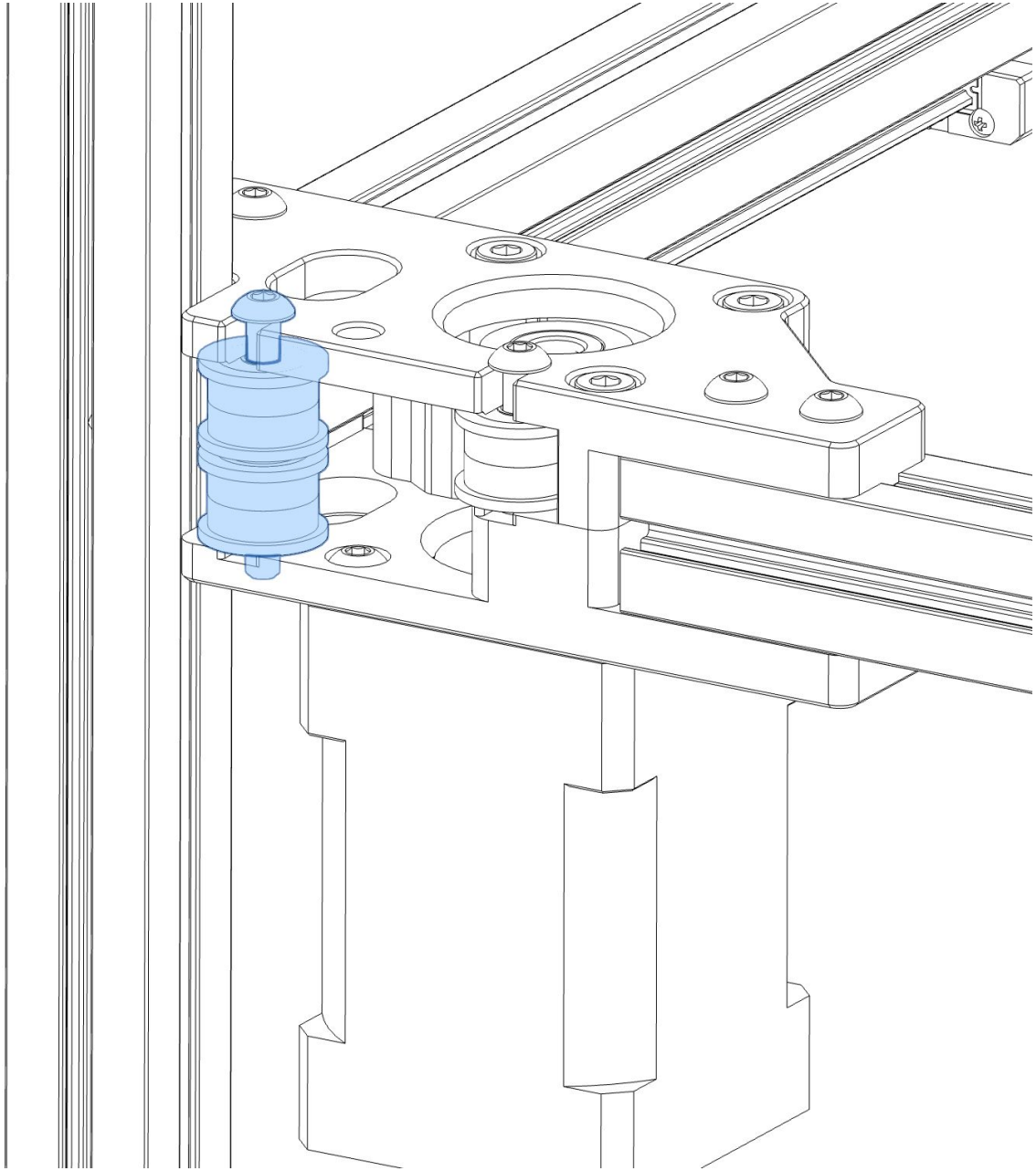


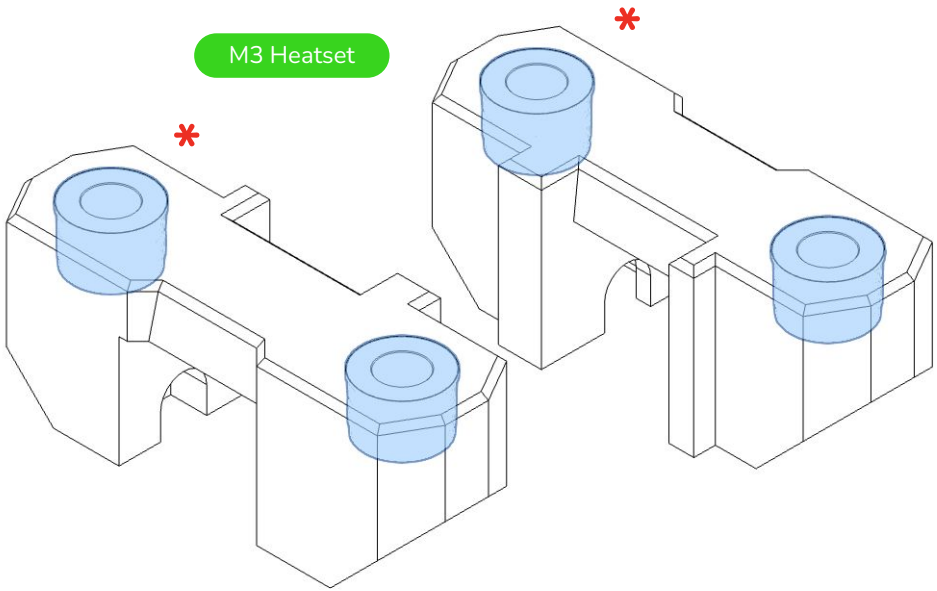


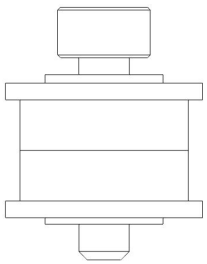


DOUBLE BEARING STACK

Just like the single bearing stack, except this time we add 2 M3 shims between the bearings to ensure proper alignment for the belts. Don't forget them!




M3 Heatset
*
*



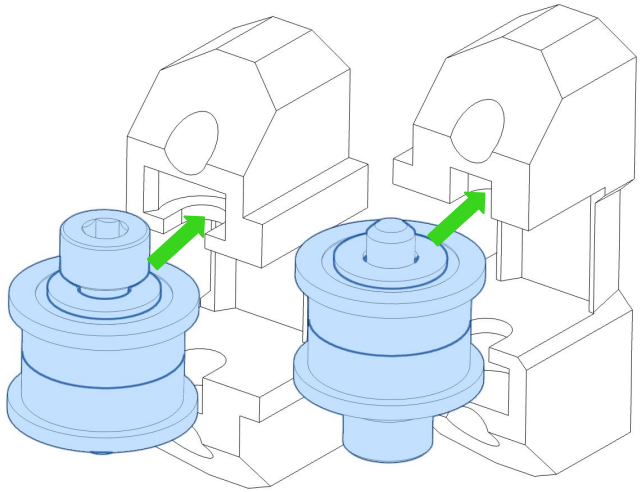
M3x12 SHCS

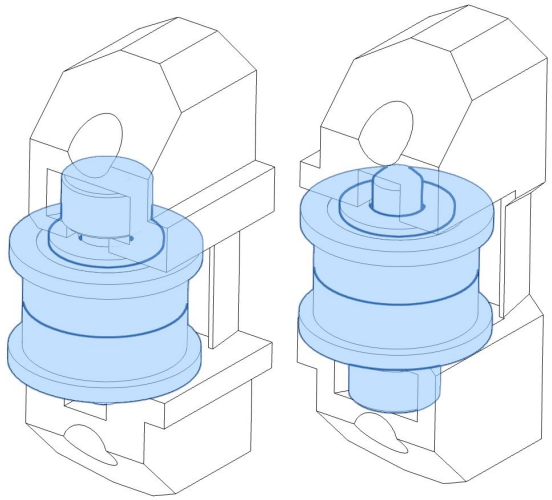
M3 Shim

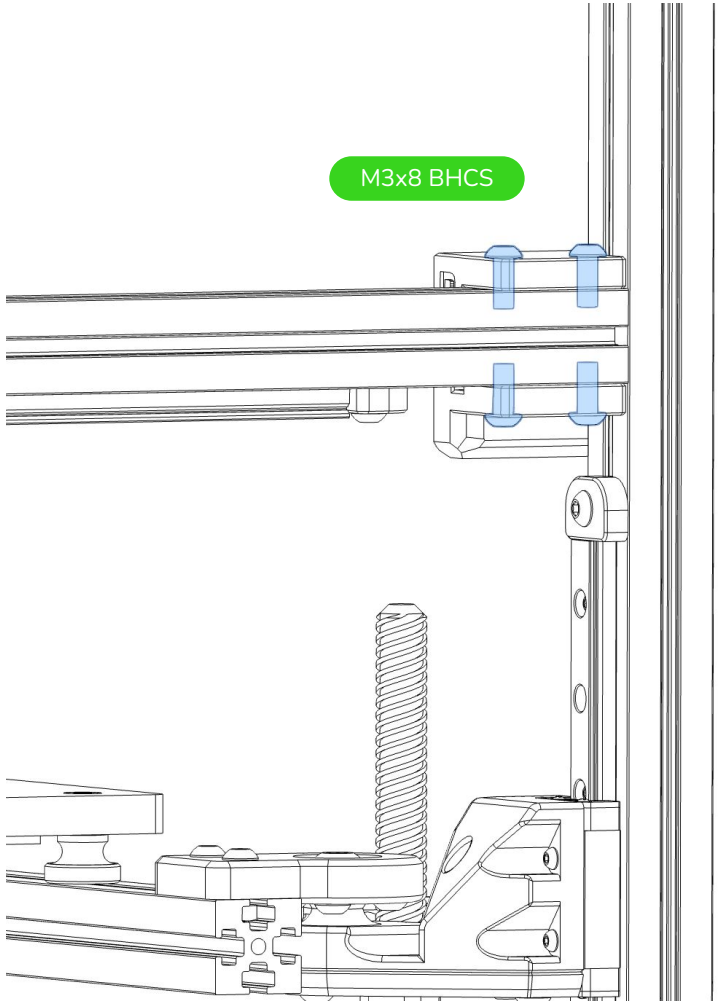
F623 Bearing

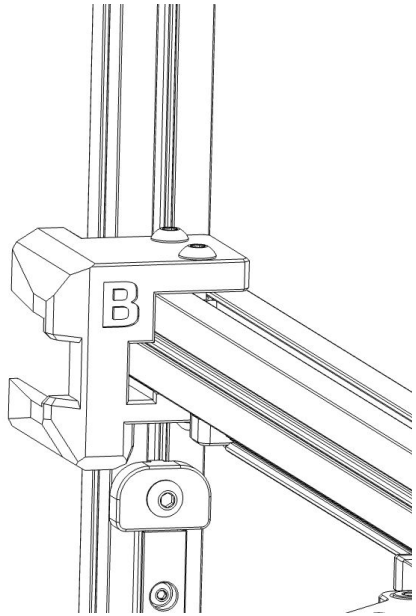
THE SAME, BUT DIFFERENT

Another set of bearing stacks, these have a M3 shim on either side of the bearings, and use a shorter M3 SHCS than the earlier bearing stacks.



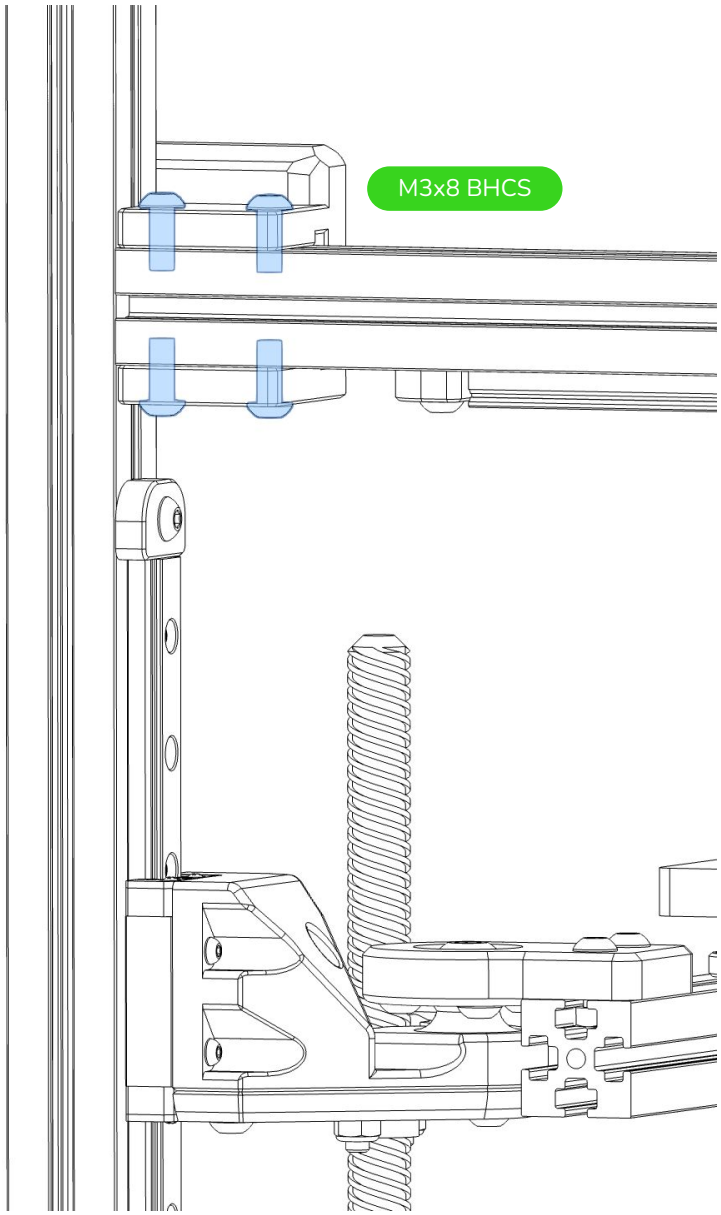


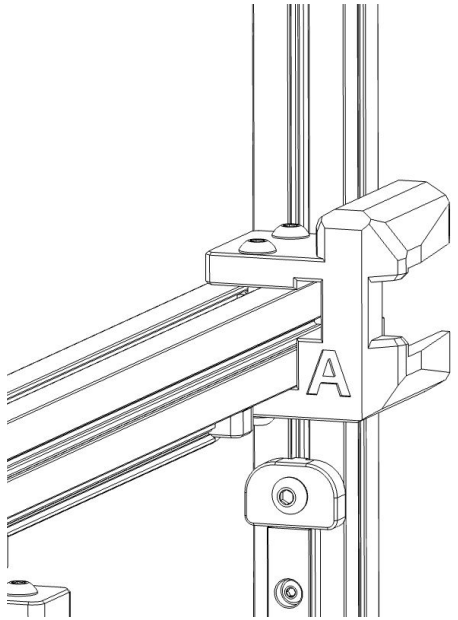




PARTS ARE LABELED

These parts have a label on the back, in this step we are using the B part.



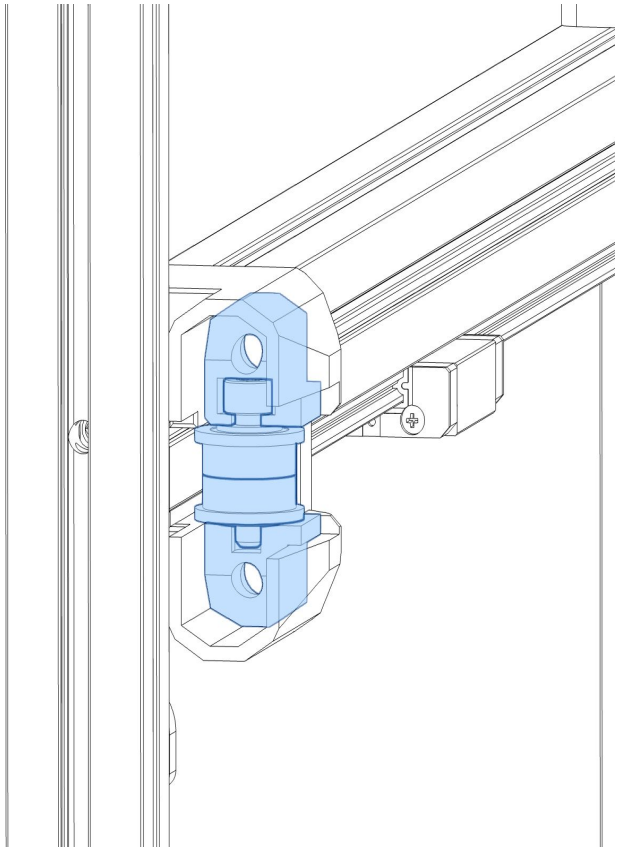


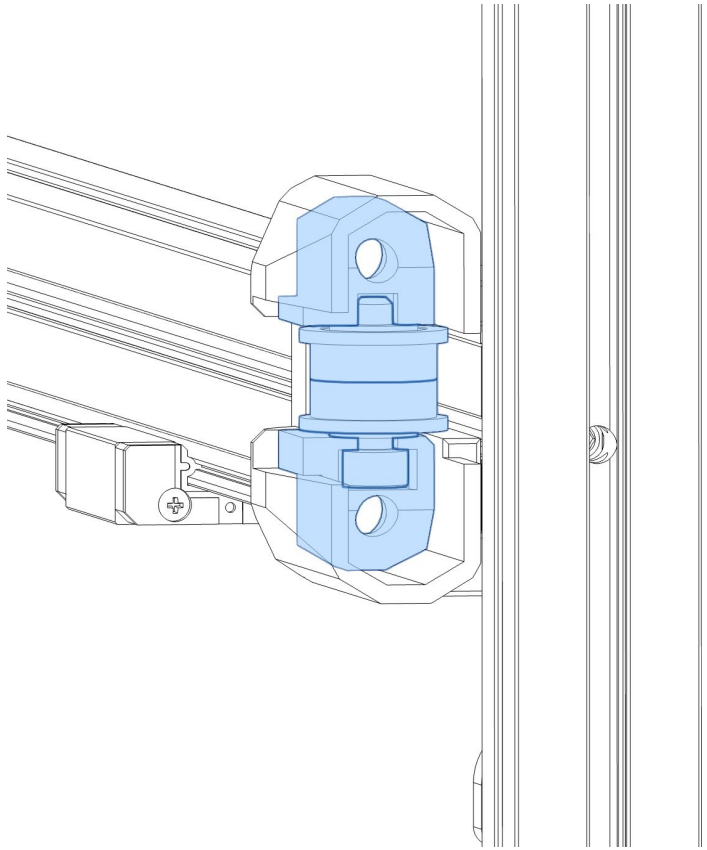
PARTS ARE LABELED

These parts have a label on the back, in this step we are using the A part.

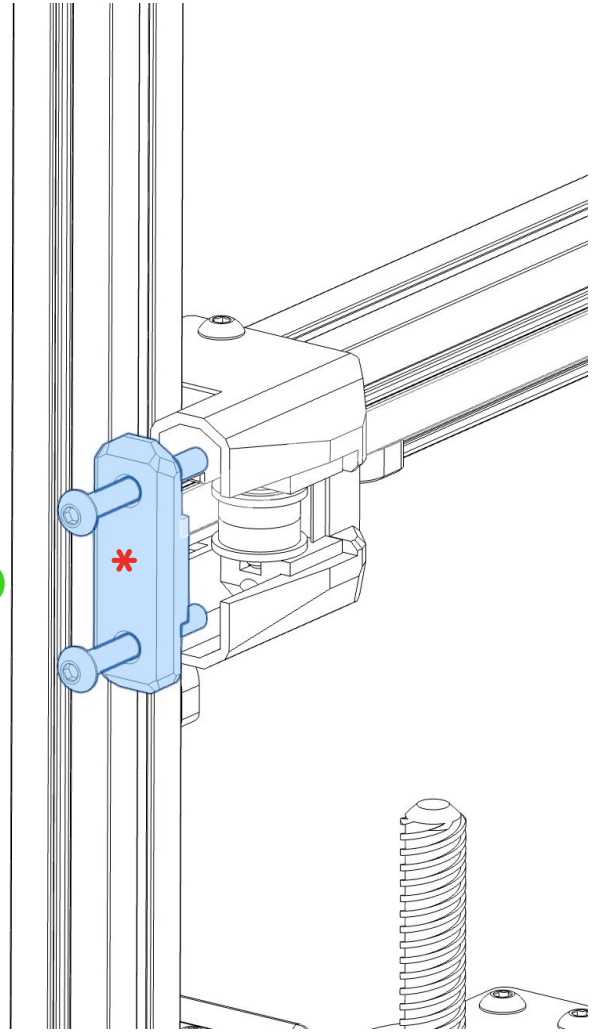
SLIDE IN THE PARTS

No screws yet, just slide in the idler carriers we assembled a few steps ago into here.



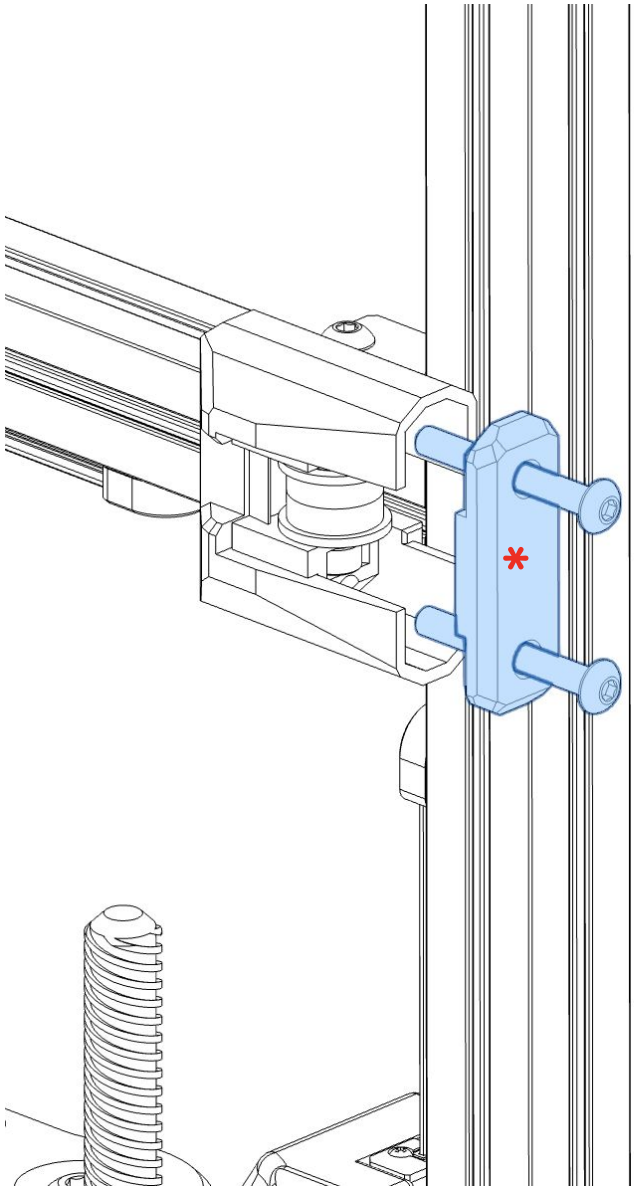


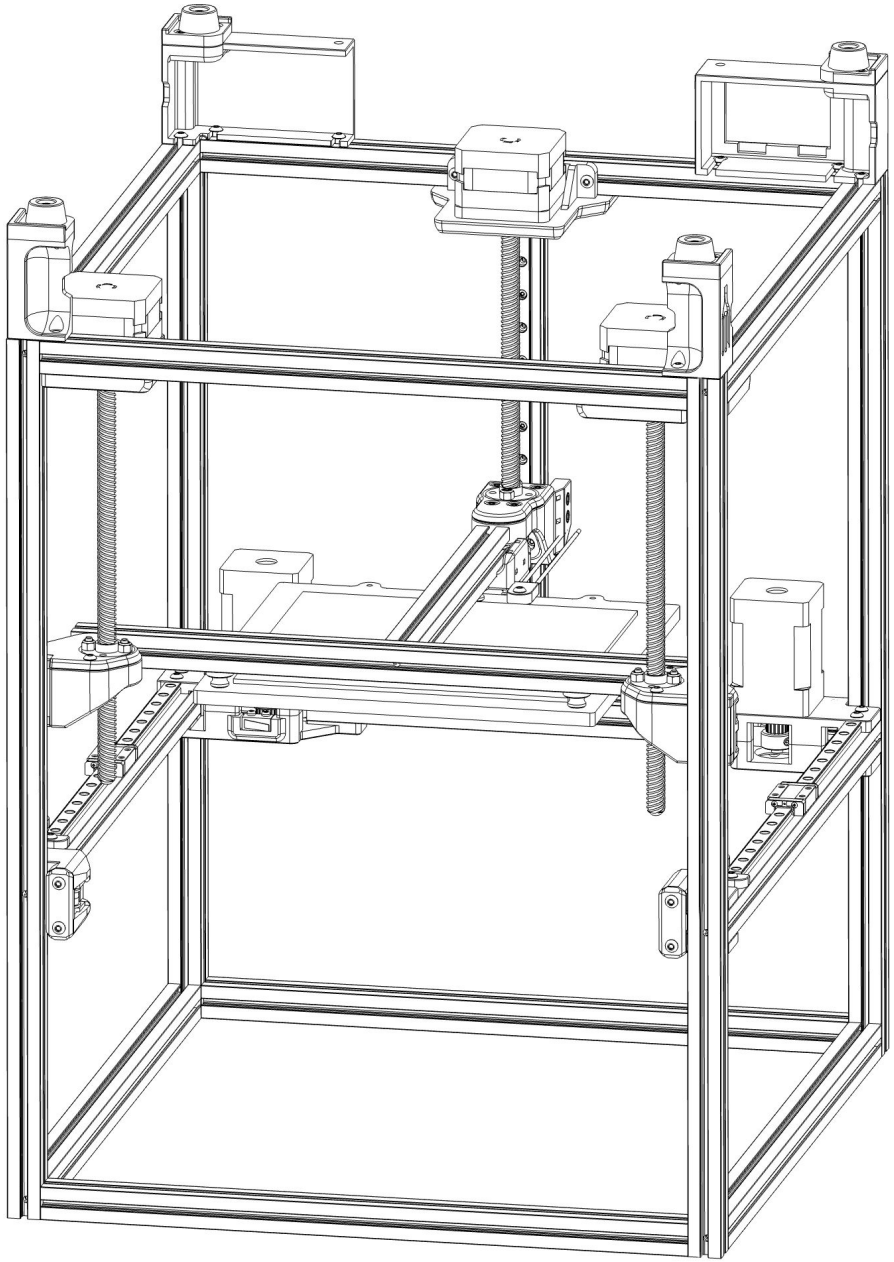
M3x25 BHCS



DON'T TIGHTEN YET

Just thread the screws in enough to engage with the heatsets. We will add tension later after running the belts.

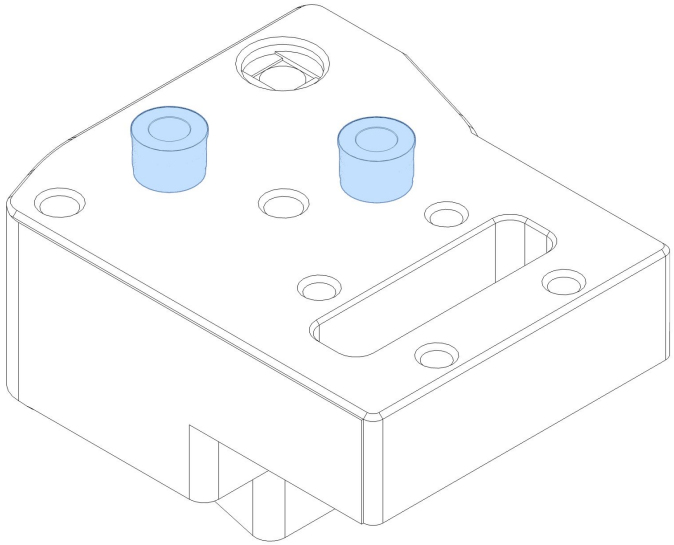

*
M3x25 BHCS



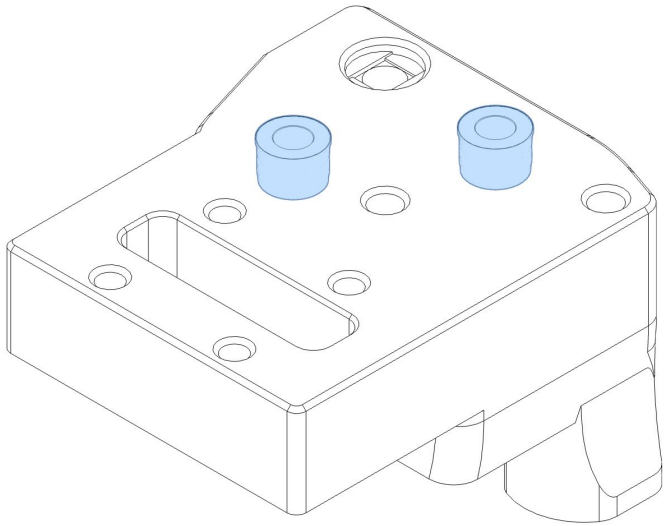
INVERT THE PRINTER

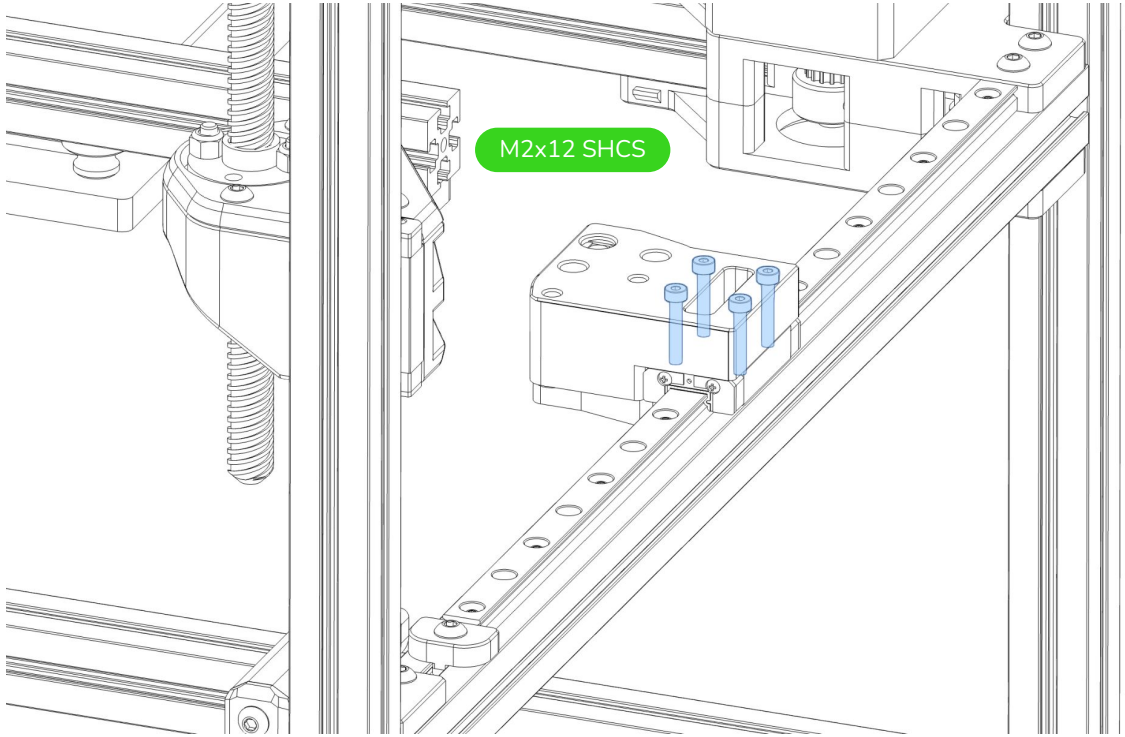
The XY joints are easier to put together when the printer is inverted. You can use a towel or other soft material to help prevent scratching the extrusions.

M3 Heatset

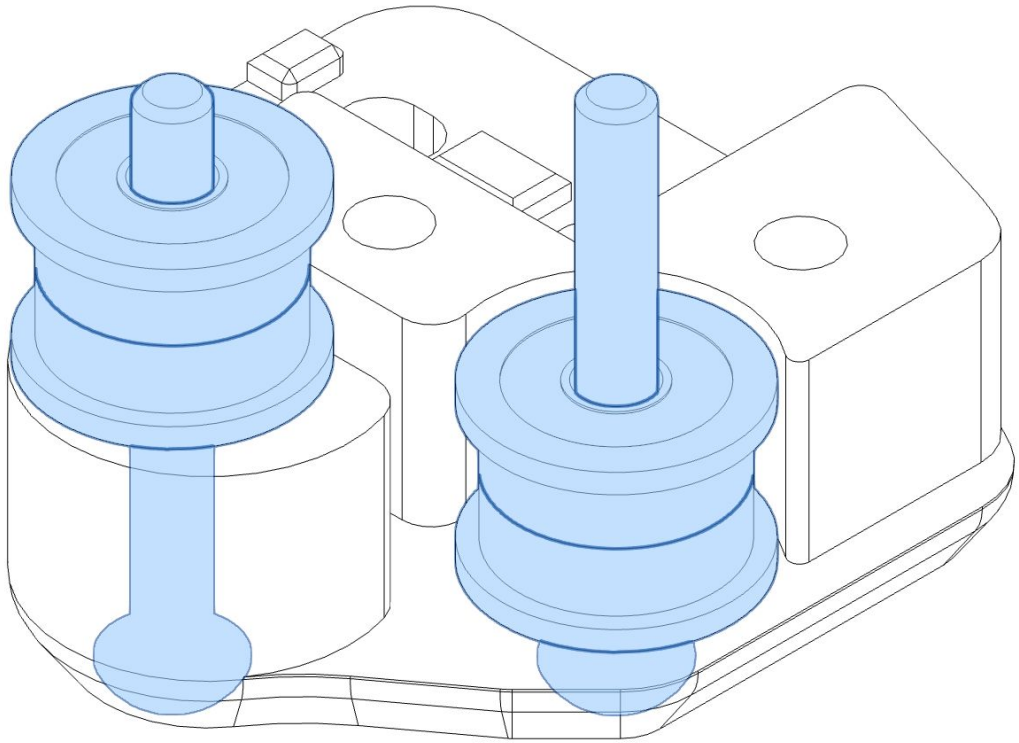


M3 Heatset




M2x12 SHCS

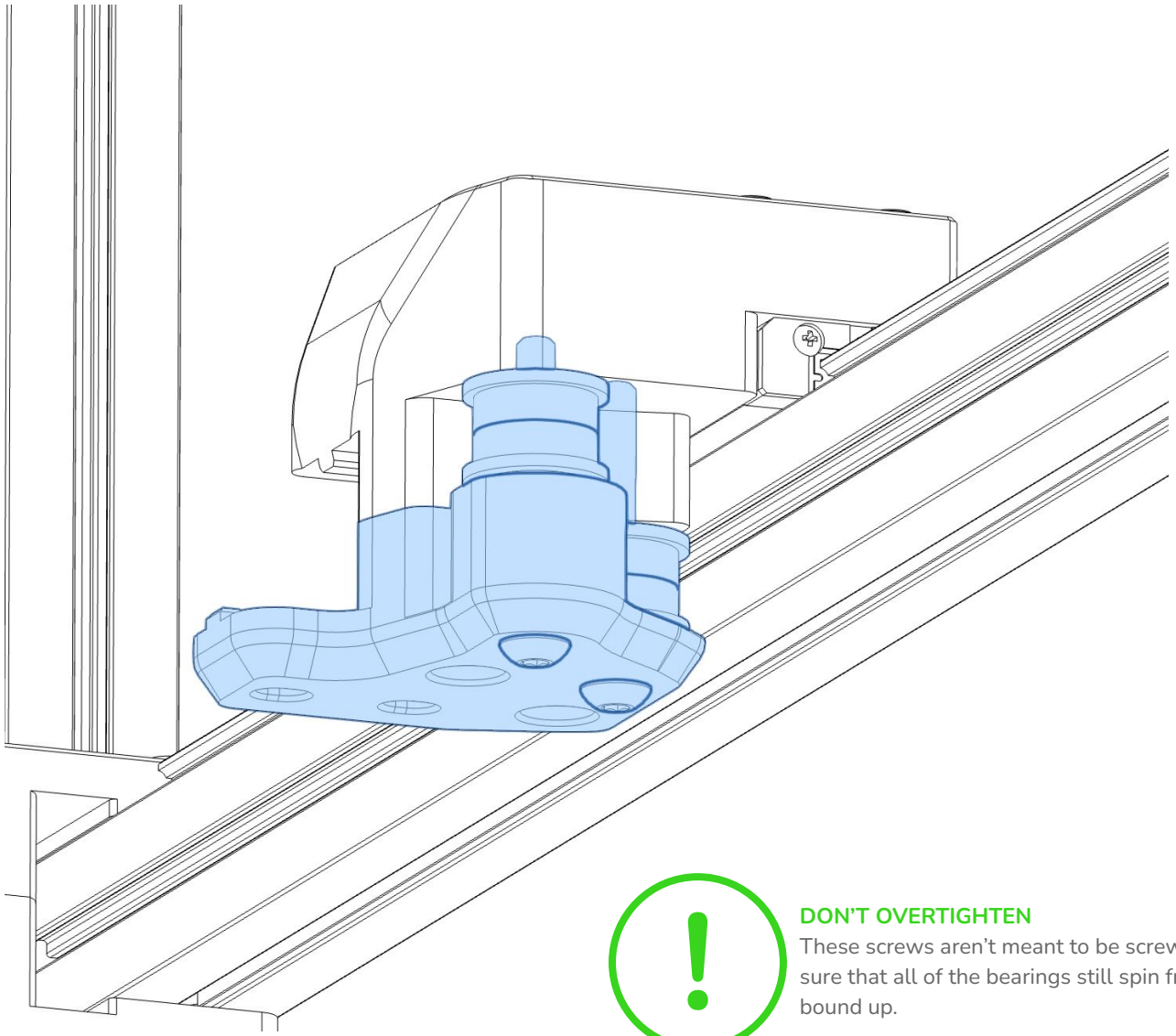
F623 Bearing



M3x25 BHCS

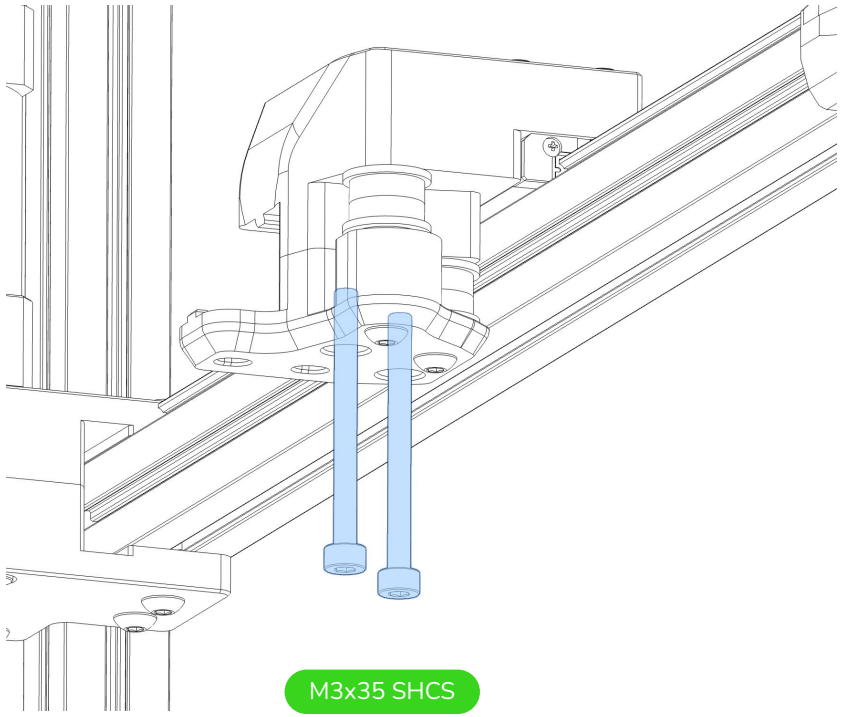
TAPE HELPS

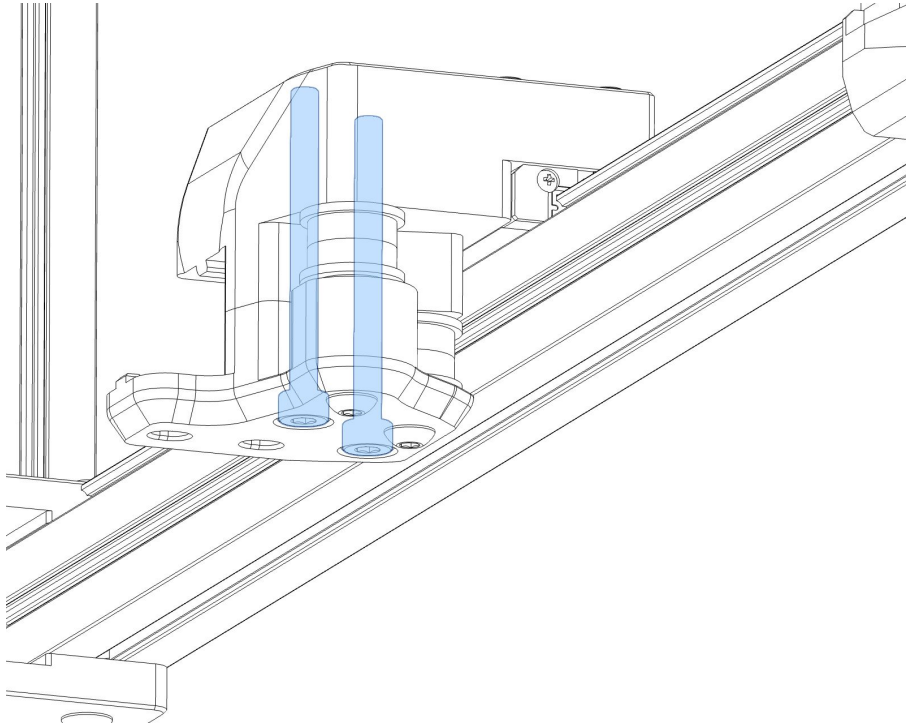
A small piece of tape can help hold the screws in place while the bearings are assembled and this piece is added to the printer

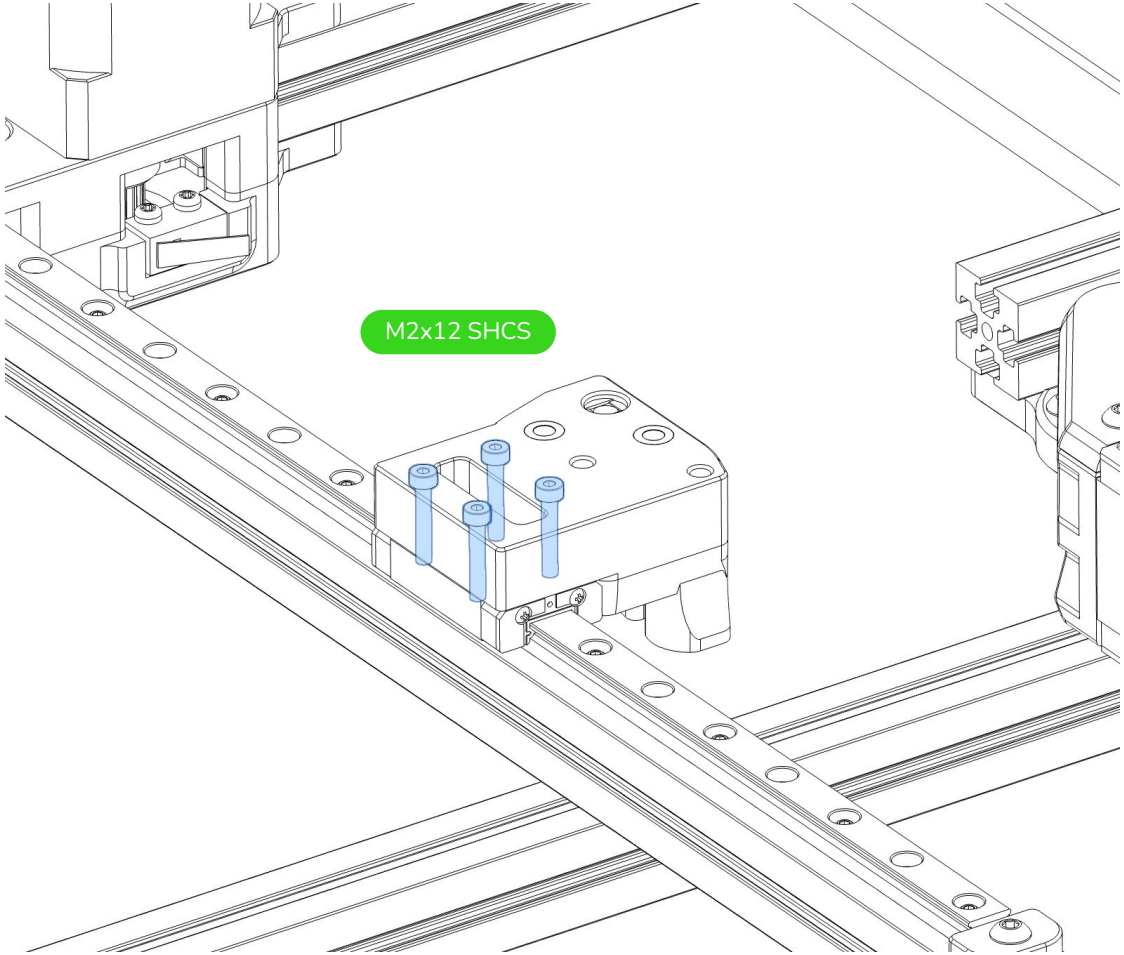


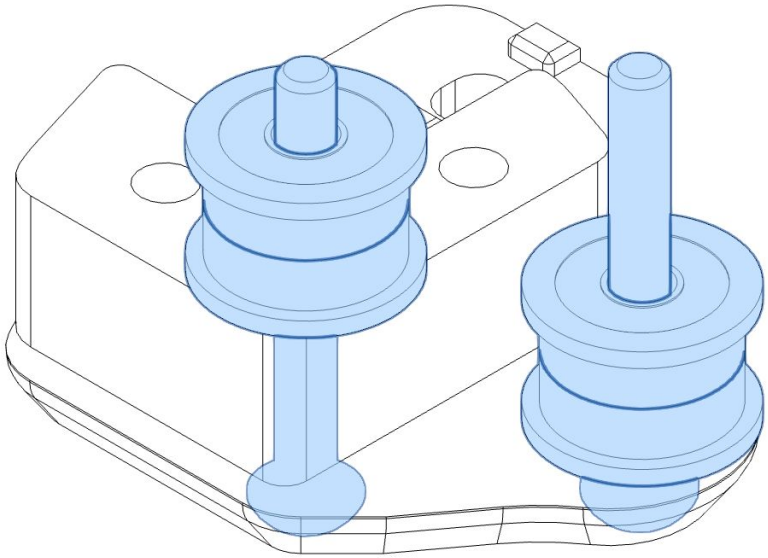
DON'T OVERTIGHTEN

These screws aren't meant to be screwed in tightly, be sure that all of the bearings still spin freely and aren't bound up.


M3x35 SHCS

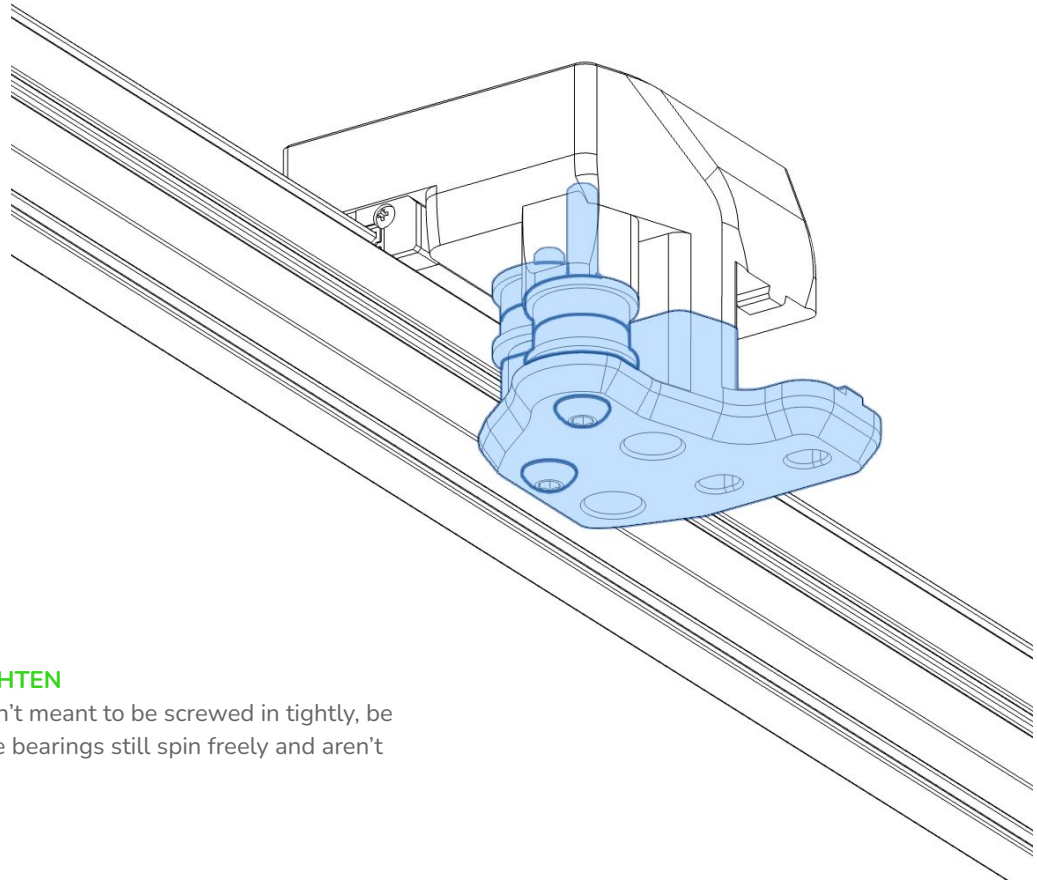



M2x12 SHCS



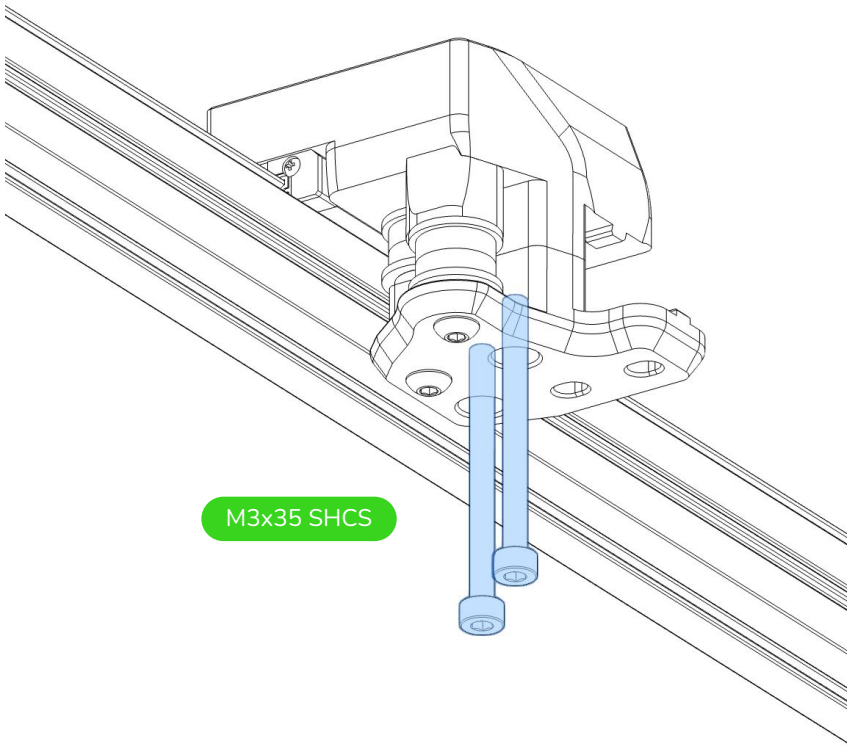
F623 Bearing

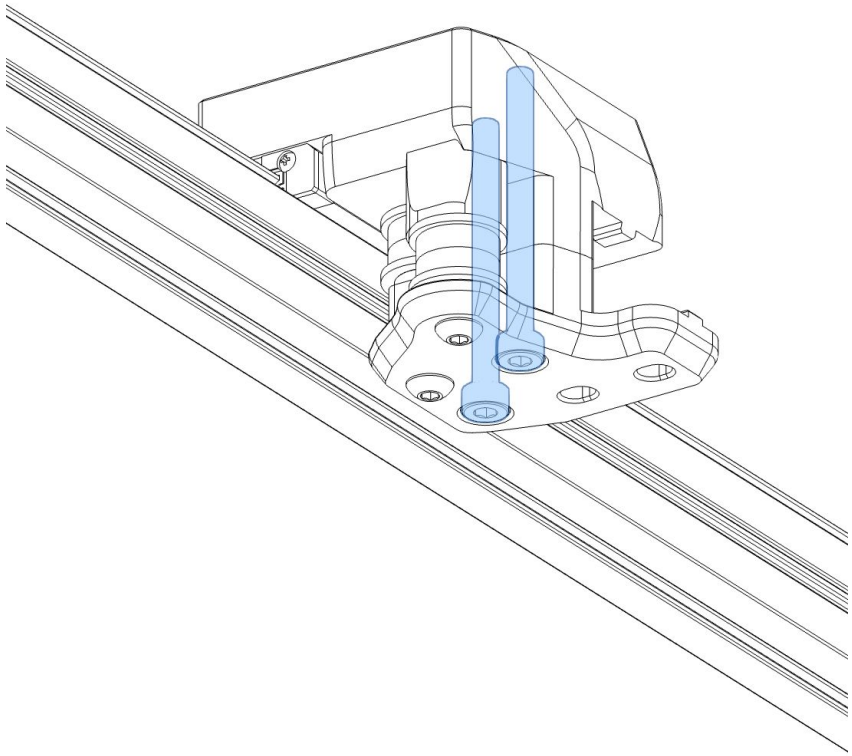
M3x25 BHCS



DON’T OVERTIGHTEN

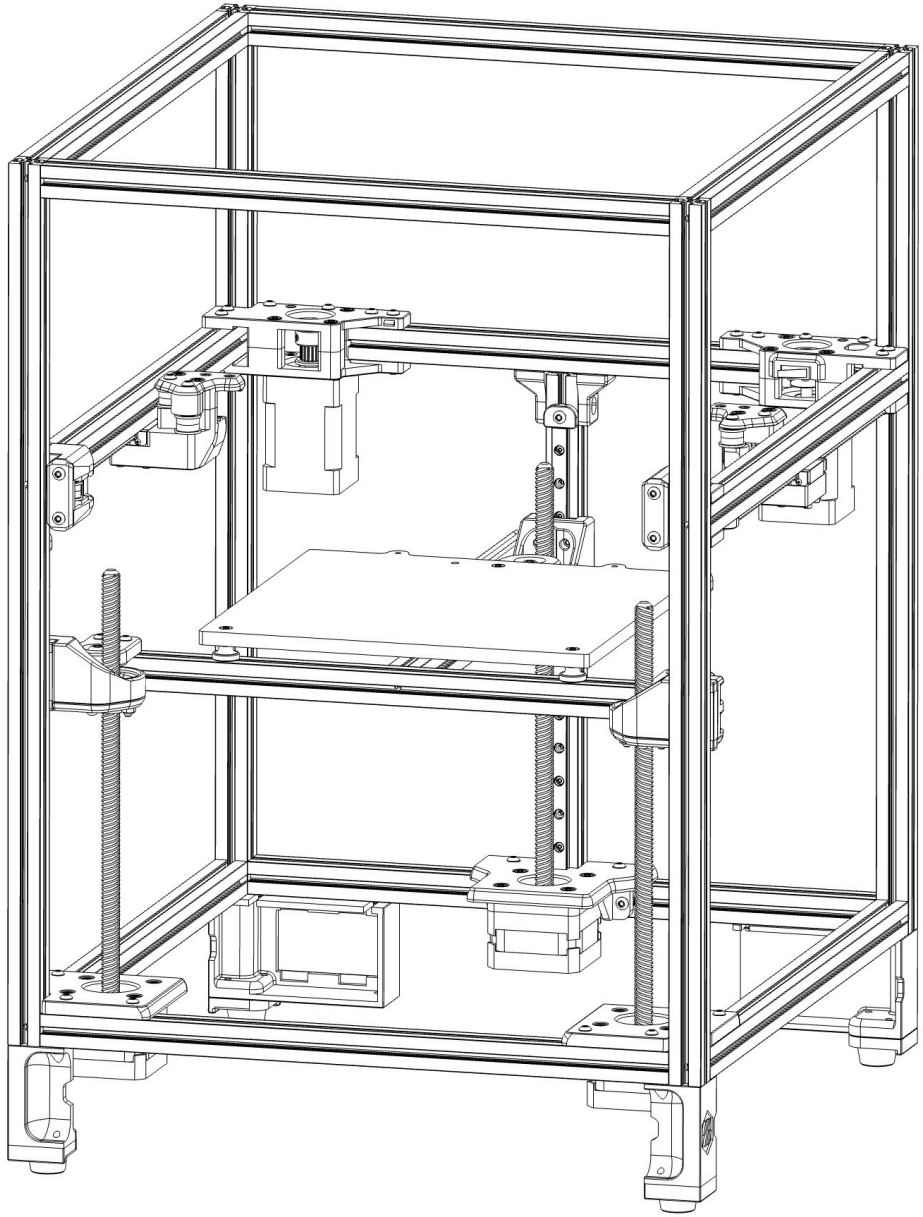
These screws aren’t meant to be screwed in tightly, be sure that all of the bearings still spin freely and aren’t bound up.

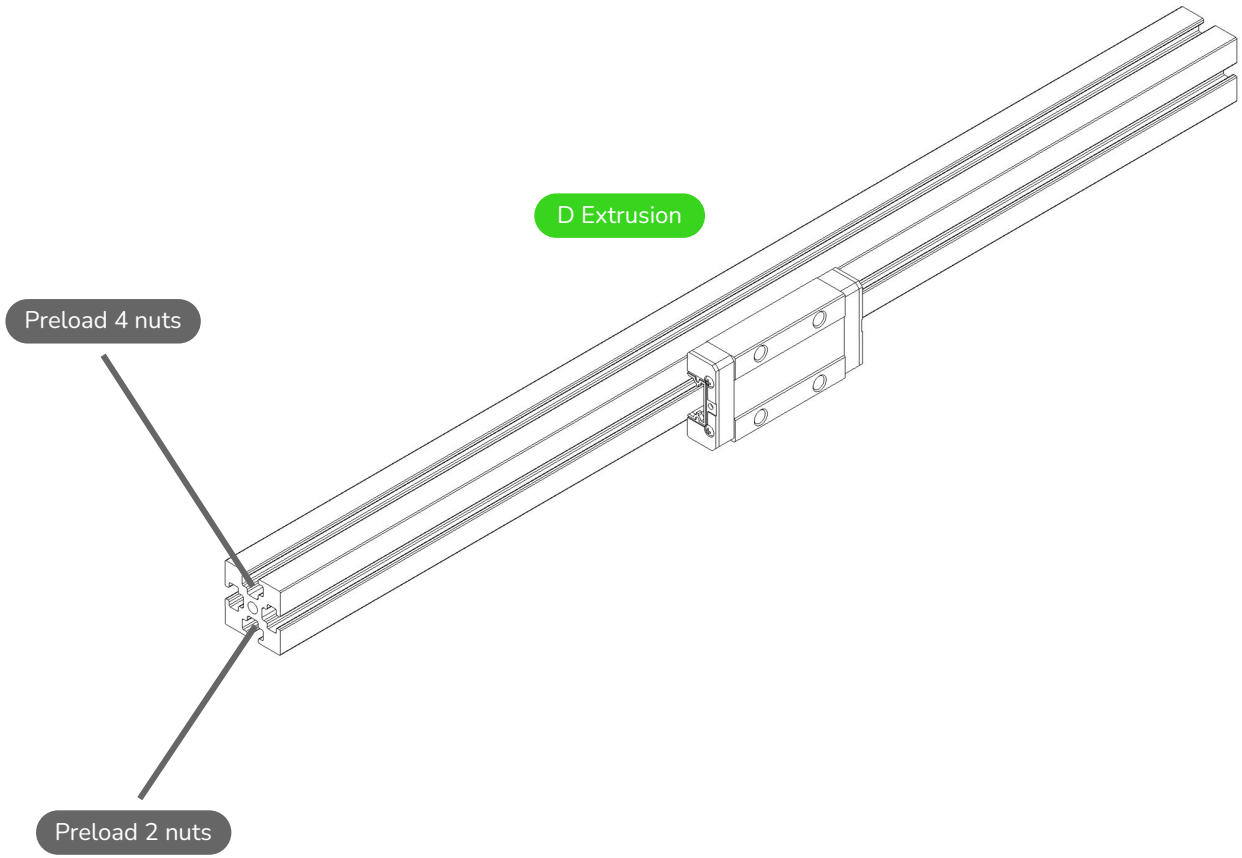

M3x35 SHCS

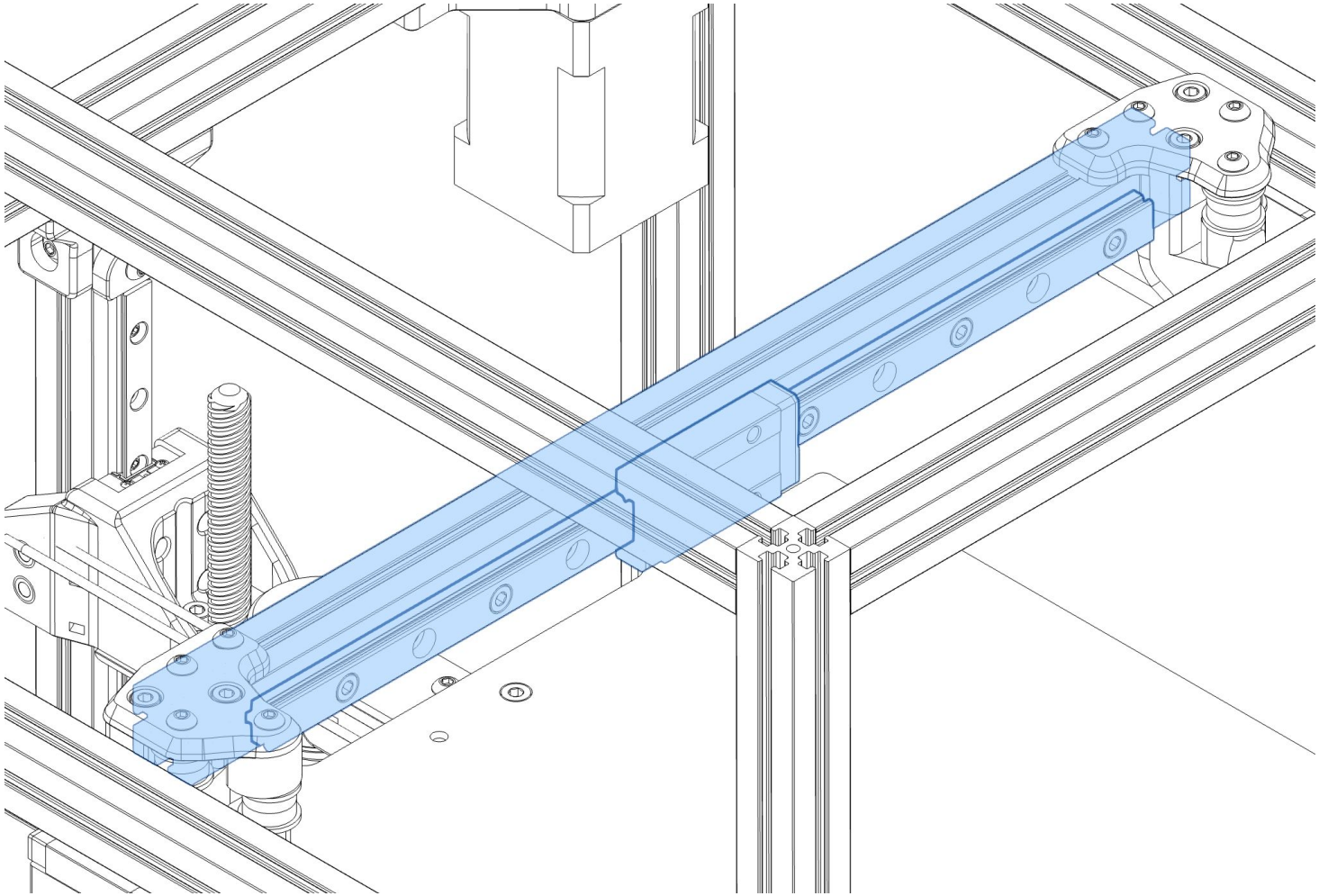


BACK UPRIGHT

Set the printer back on its feet to continue the build.

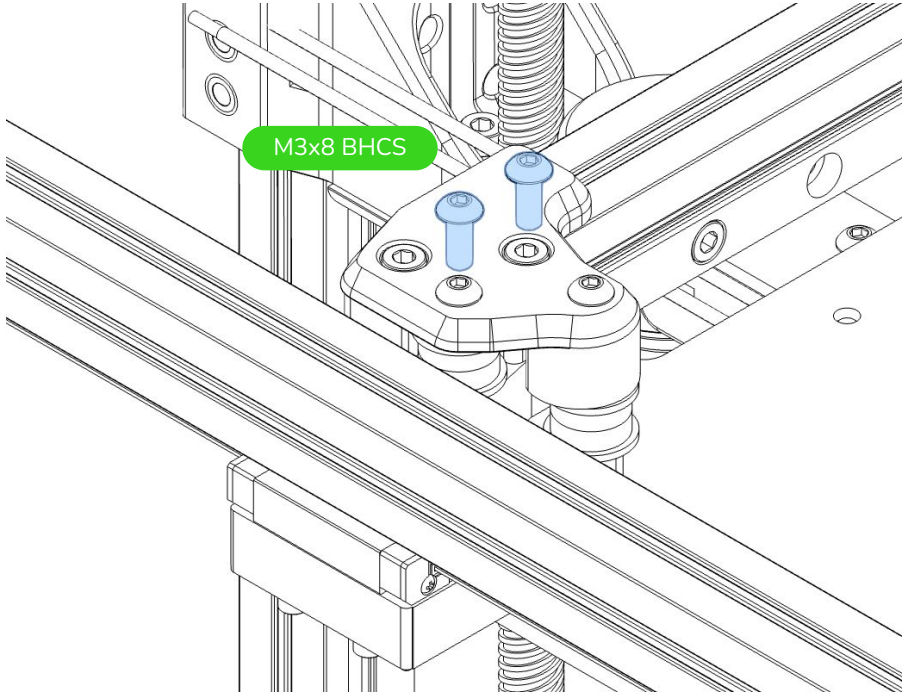


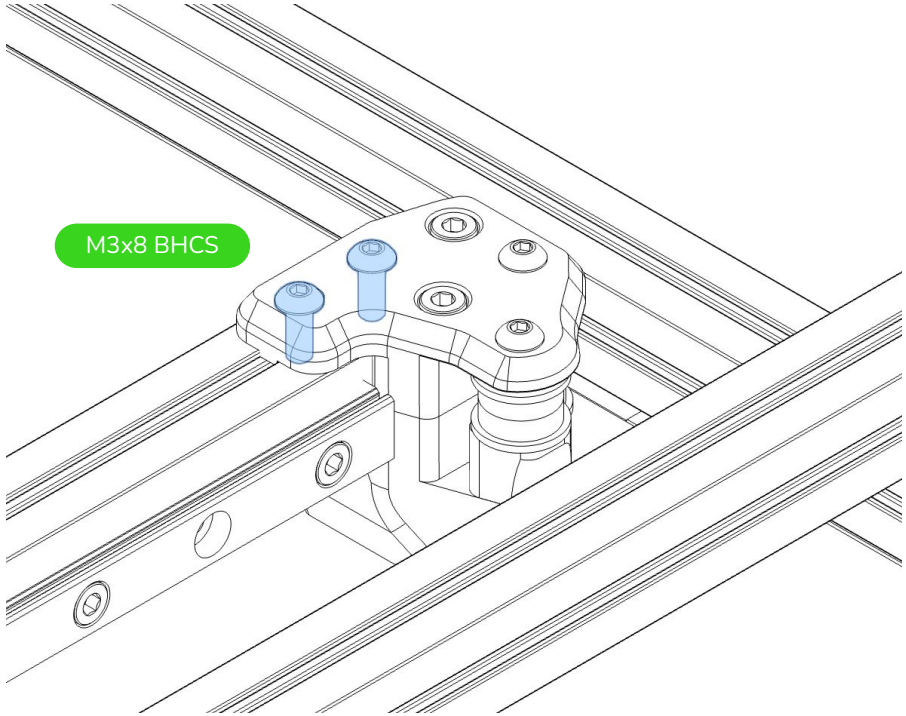

D Extrusion
Preload 4 nuts
Preload 2 nuts

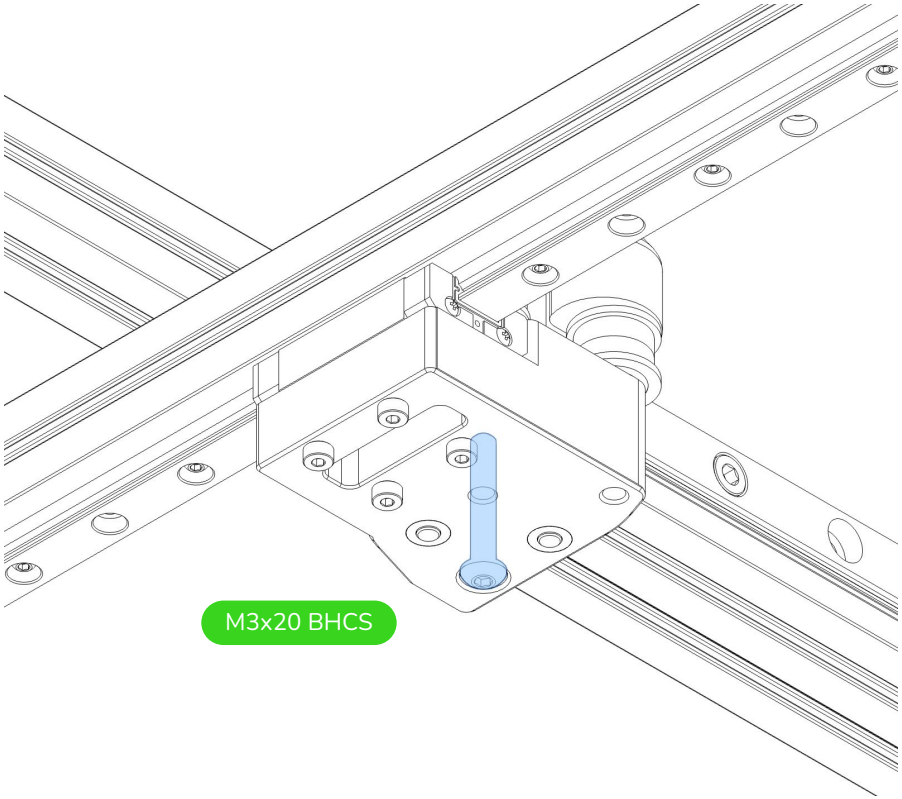


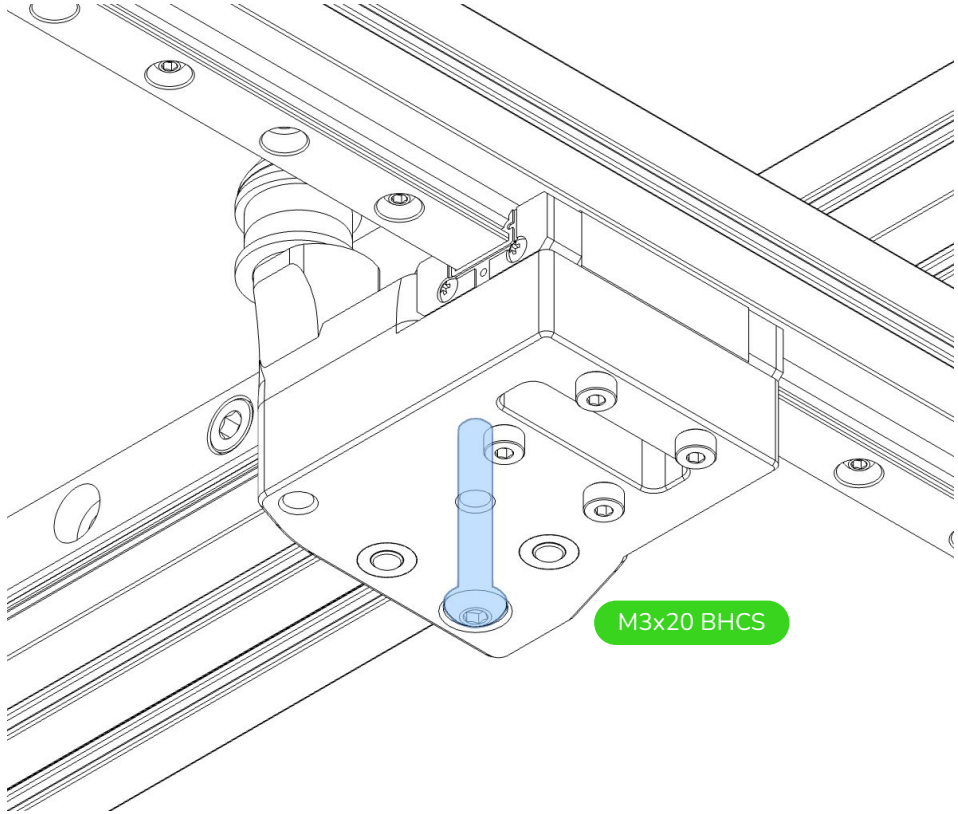
SLIDE IN THE EXTRUSION

If you are having troubles getting this installed, you can loosen the screws holding the top and bottom of the XY joints temporarily.


M3x8 BHCS

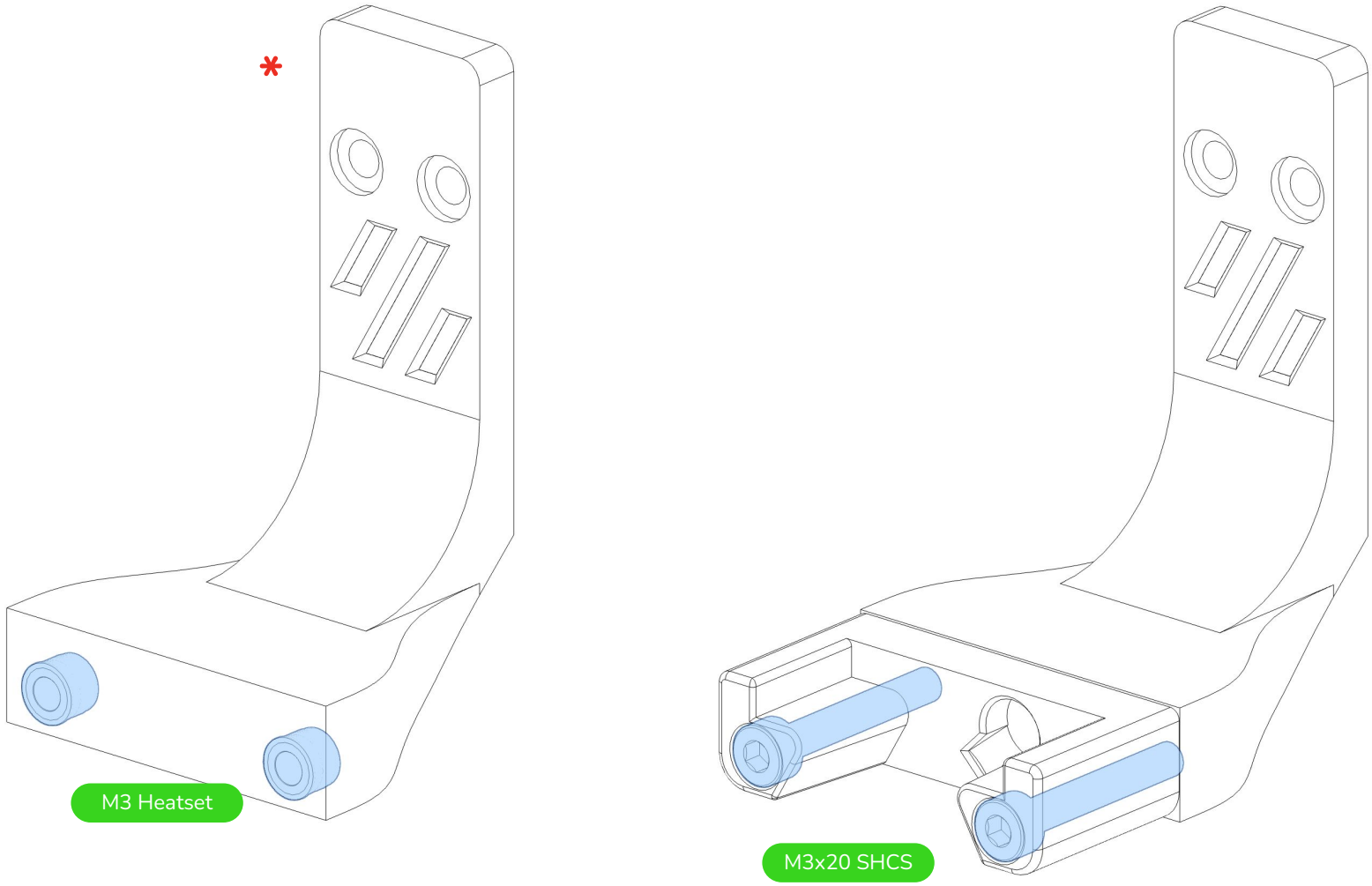

M3x8 BHCS

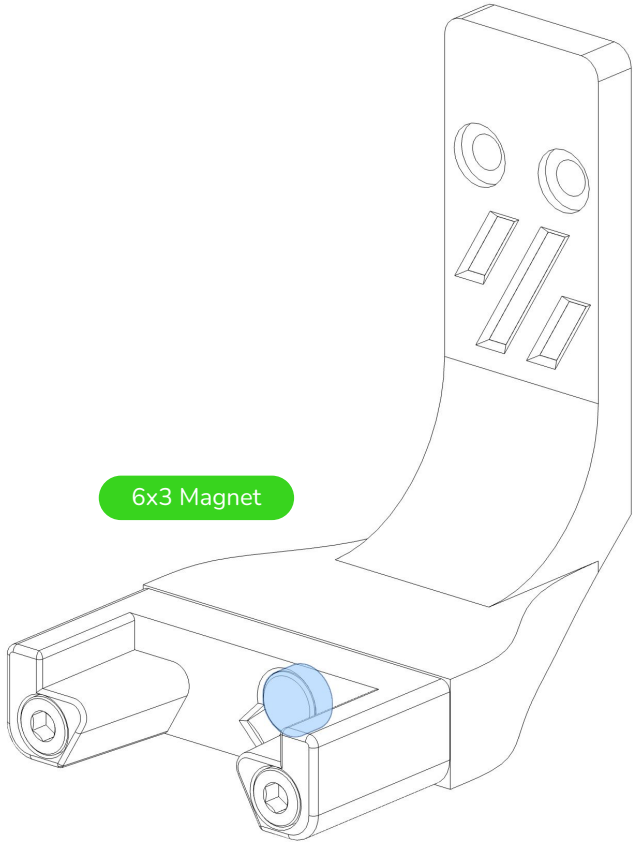

M3x20 BHCS


M3x20 BHCS

NOT USING KLICKY?

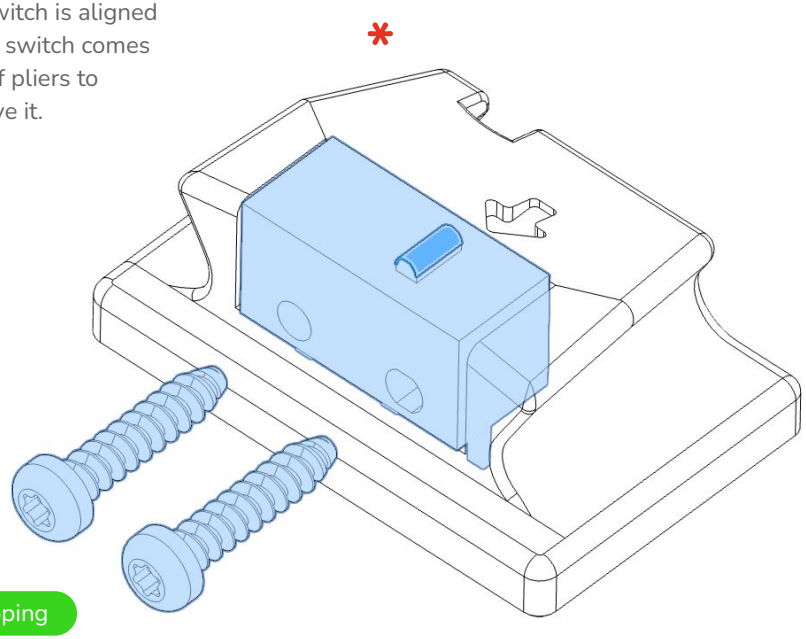
This section deals with the installation of the Klicky dock. If you aren't using Klicky, and are going with Boop or any other z-homing setup, go ahead and skip this section completely.


*
M3 Heatset
M3x20 SHCS


6x3 Magnet

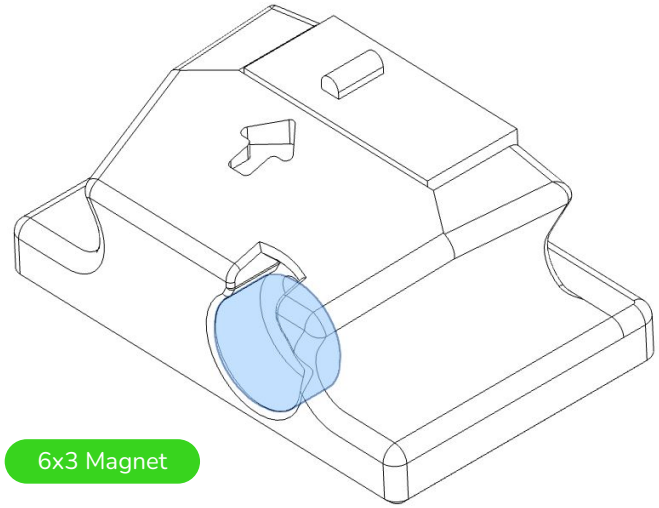
ALIGN THE BUTTON

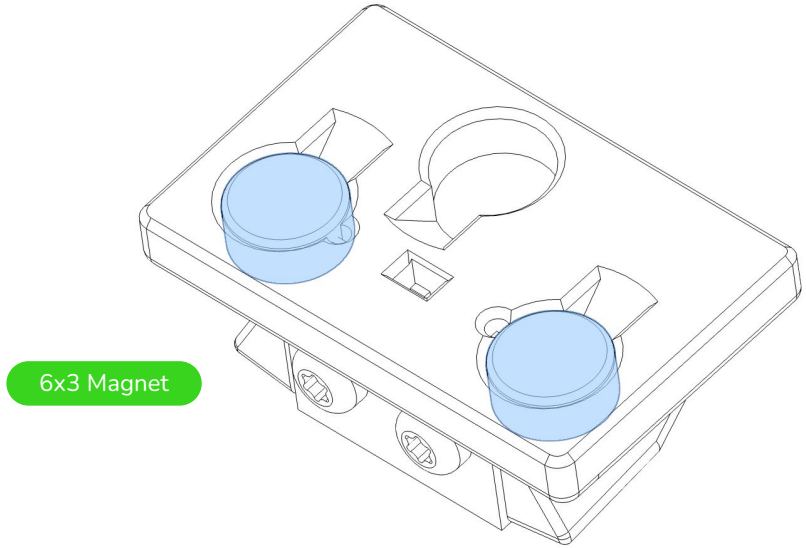
Make sure that the button on the D2F switch is aligned with the arrow in the probe dock. If your switch comes with a metal lever attached, use a pair of pliers to squeeze the hinge end gently and remove it.



MAGNET POLARITY

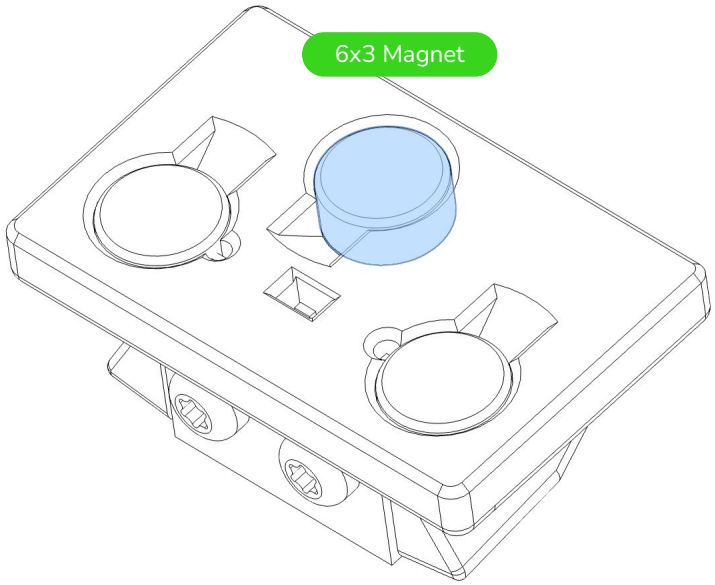
This magnet must be aligned so that it attracts to the magnet in the dock that we assembled a few steps ago. Once it's in place, use a drop of superglue to make sure it stays.





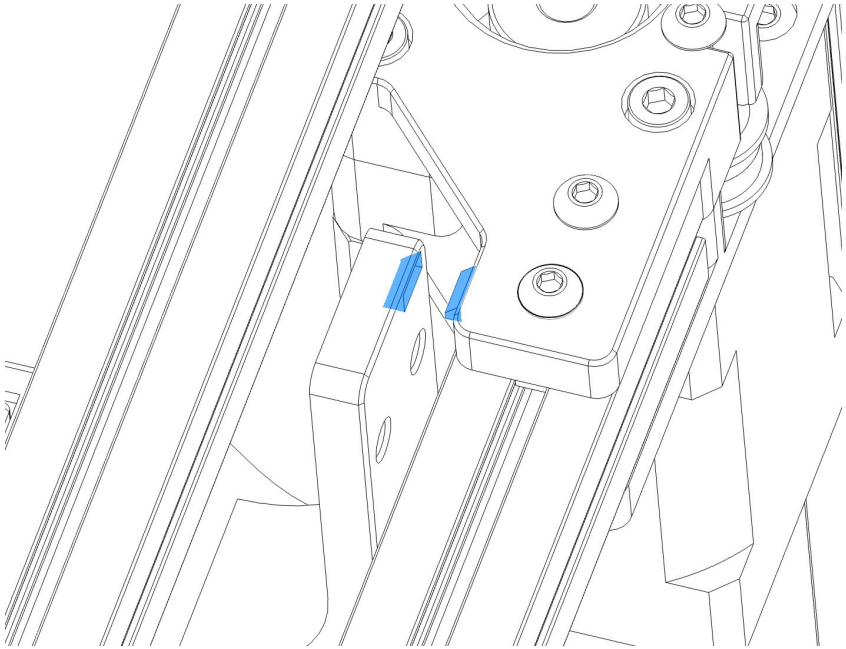
MAGNET POLARITY (AGAIN)

These magnets must be aligned with the same polarity, use superglue to hold them once ready.



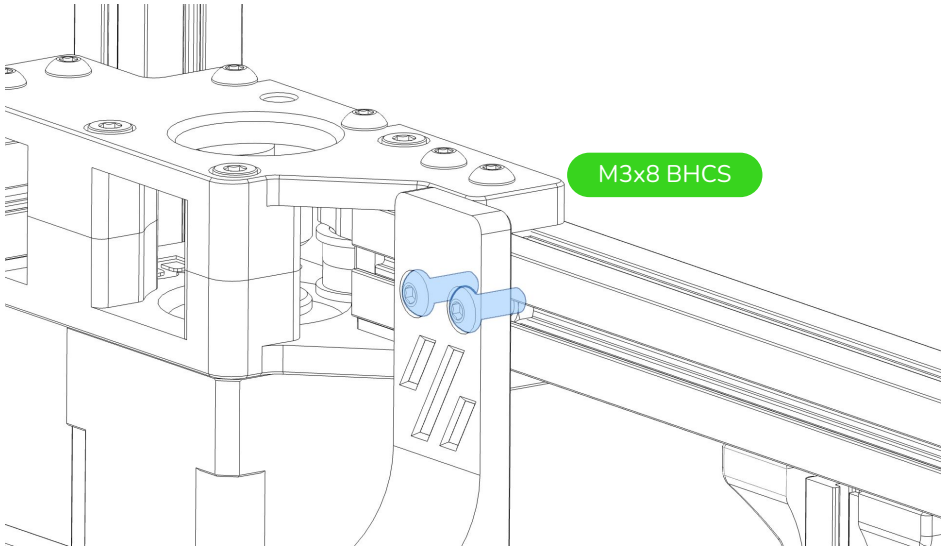
MAGNET POLARITY (AGAIN PART 2)

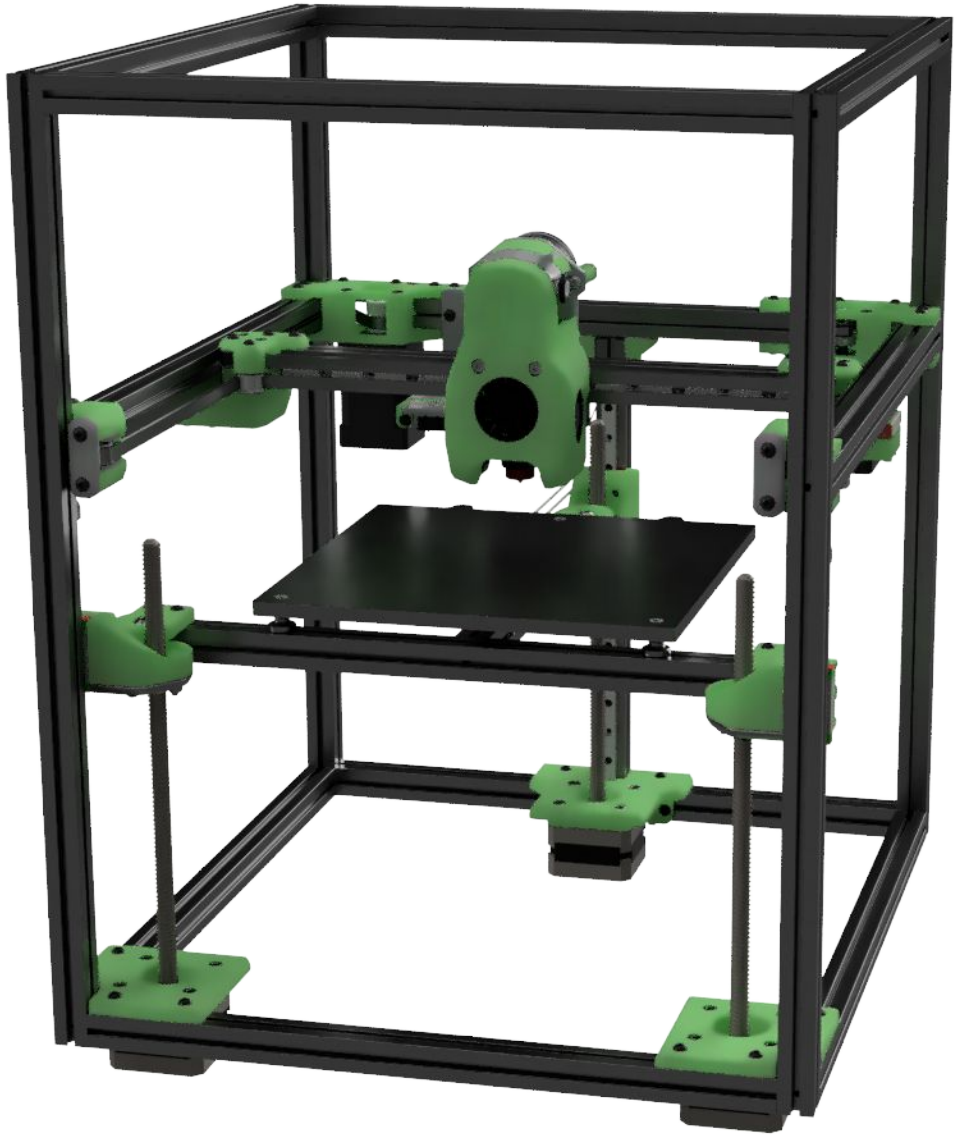
Set this magnet with ***opposite*** polarity to the ones in the previous step and superglue in place.

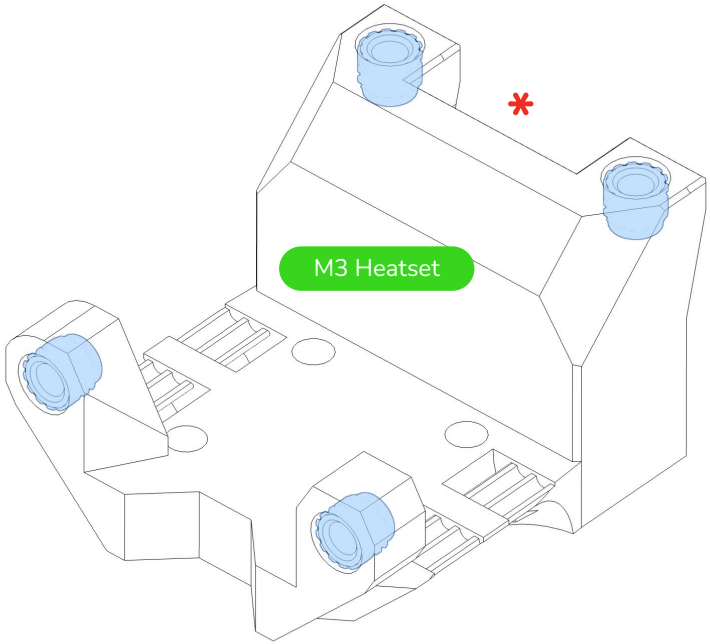


ALIGNMENT NOTCH

There is a notch in the klicky dock that matches with a tab on the motor mount for alignment.

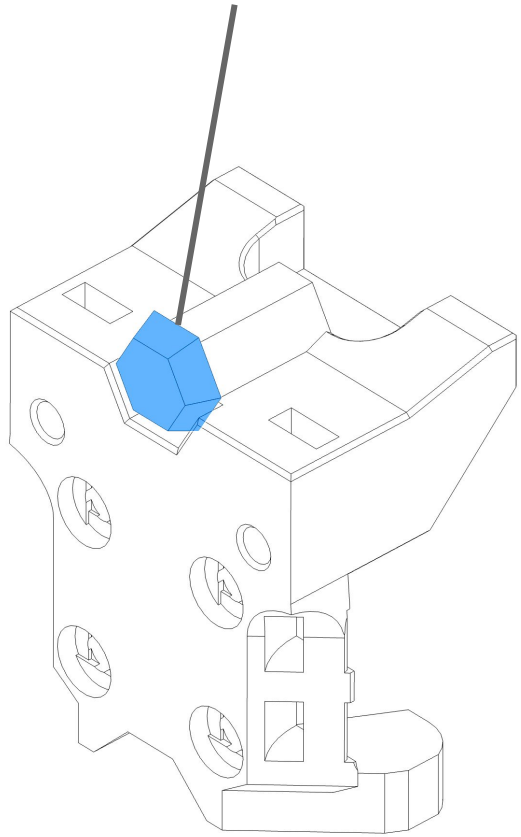


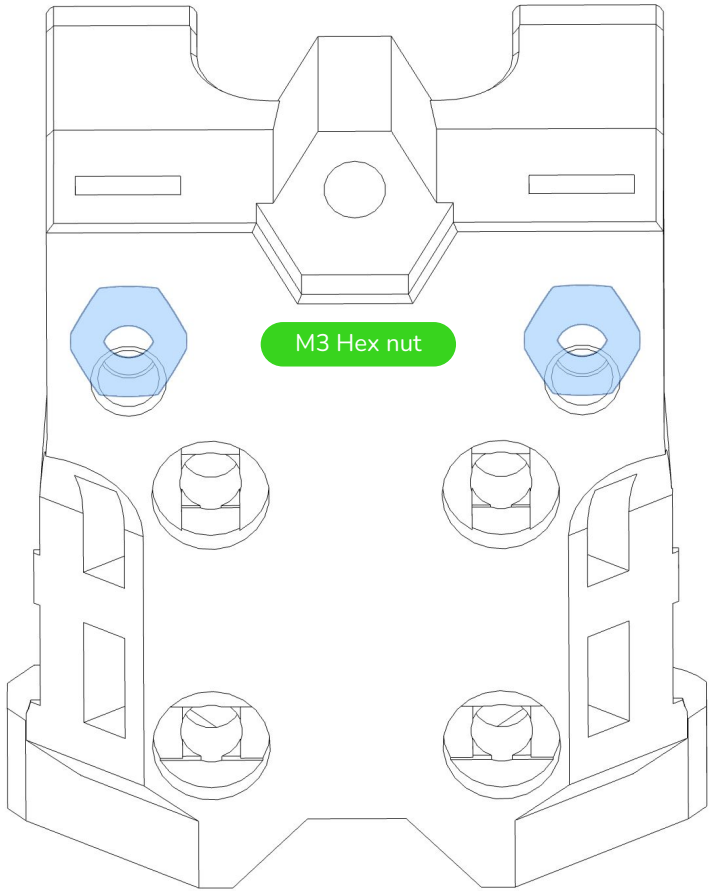




REMOVE THE SUPPORT

Remove this pre-printed support from this piece.





PRELOAD NUTS

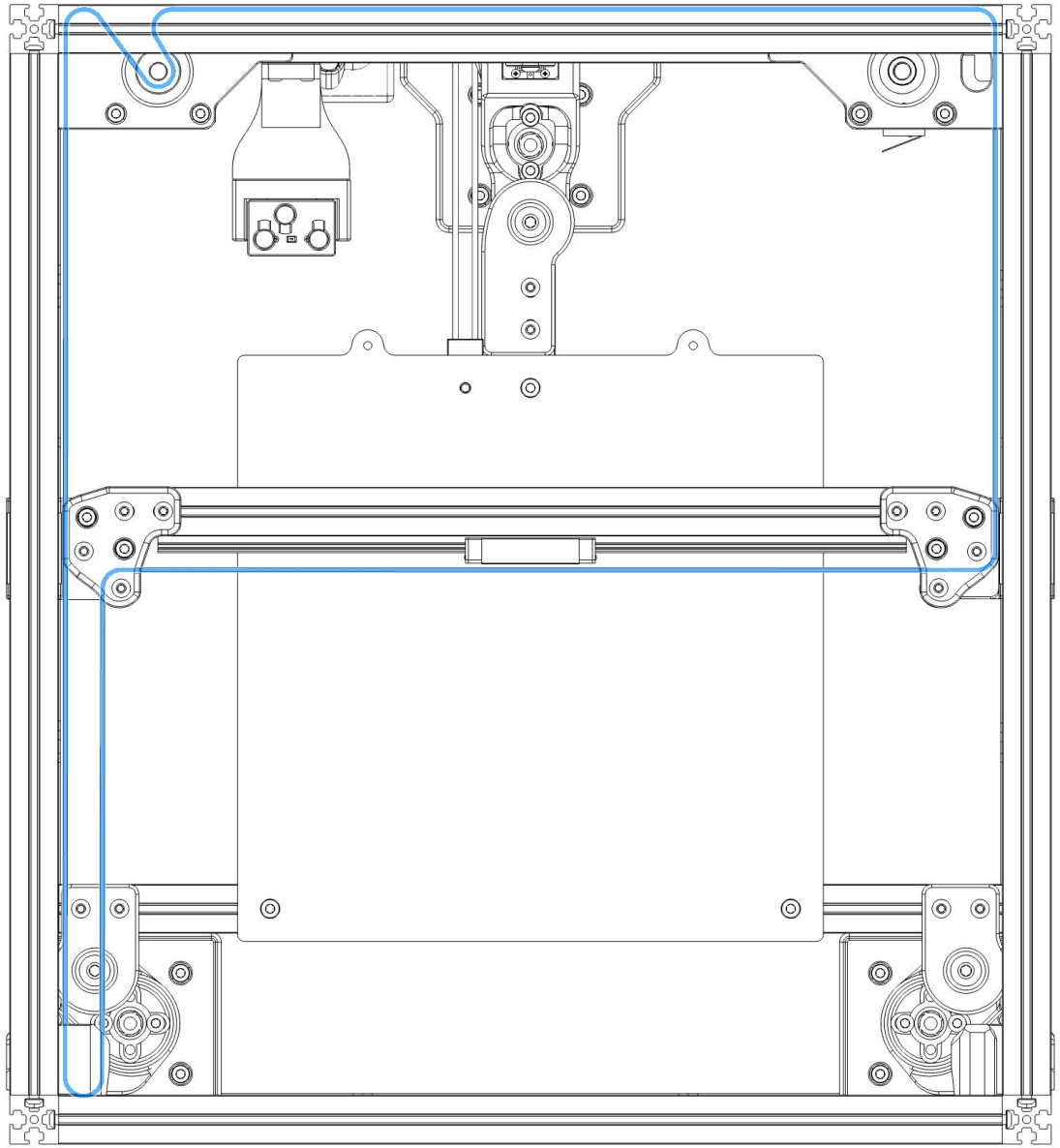
Insert M3 nuts into the two channels on this part and push them into position with a thin tool.

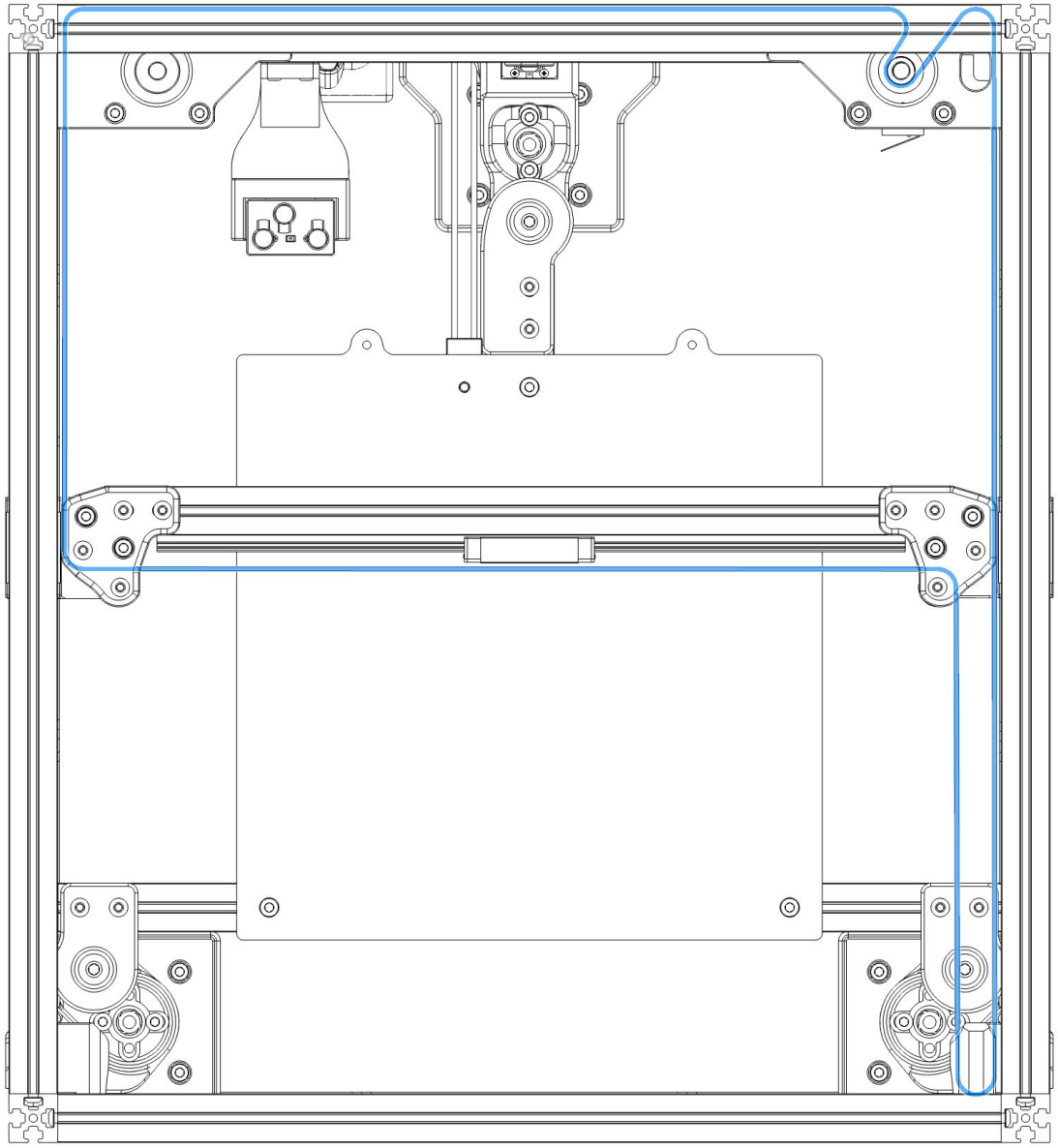
COREXY BELT PATH

Run the belt as shown, and be certain to leave about 2cm of extra belt on each side for later.

Remove the belt, and cut a second belt to the *exact same length*. This is crucial to getting a proper motion system without skew.

Then re-install this belt and continue to the next step.



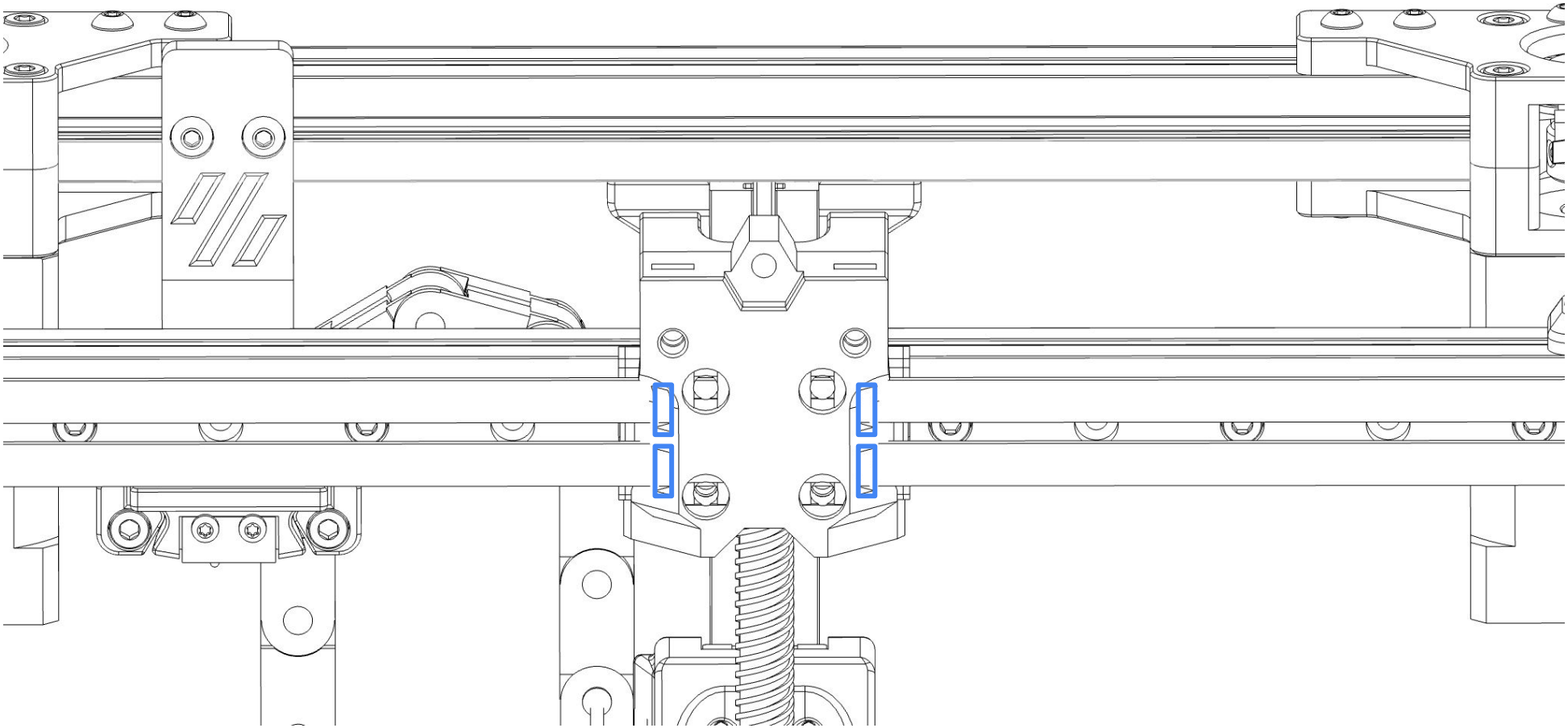


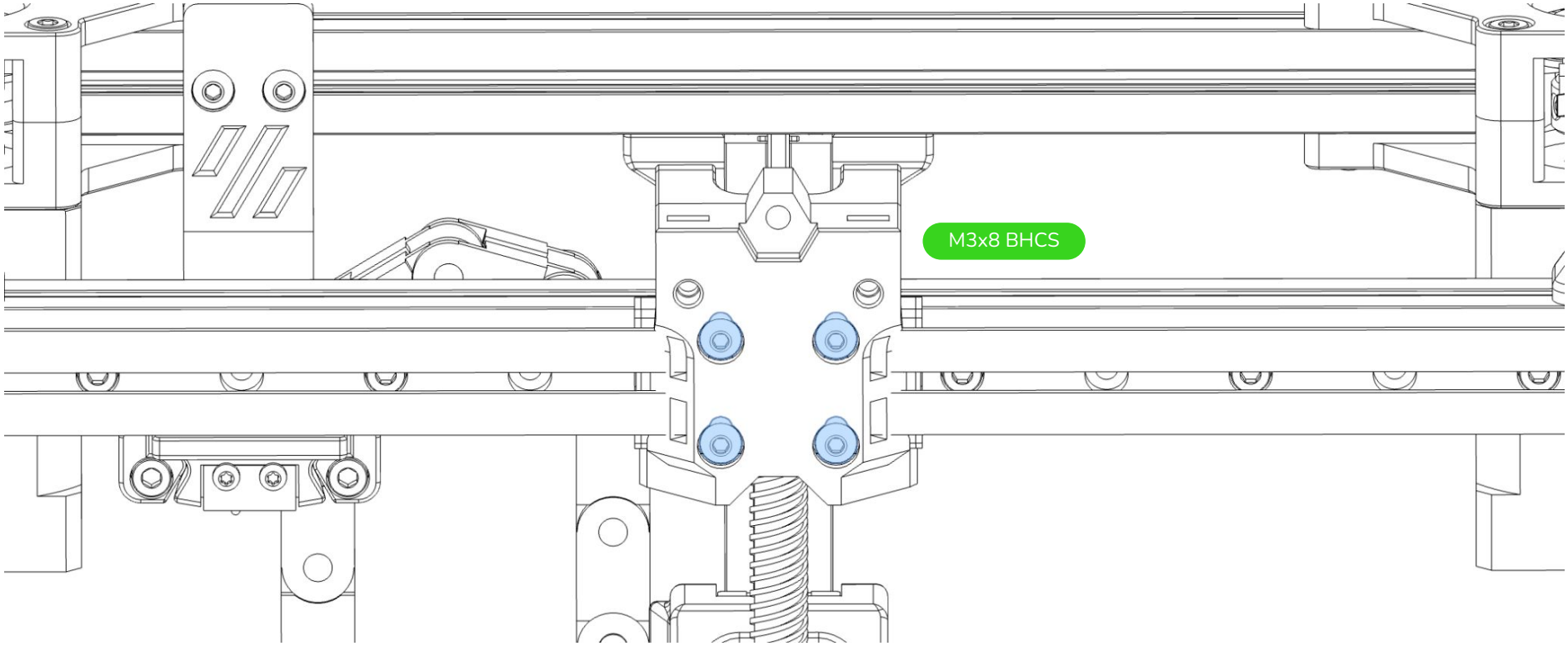
SECOND BELT

Run the second belt as shown here.

ROUTE THE BELTS

Route the belts through the highlighted holes in the carriage, and be certain to have an equal length on all sides after going through the holes.

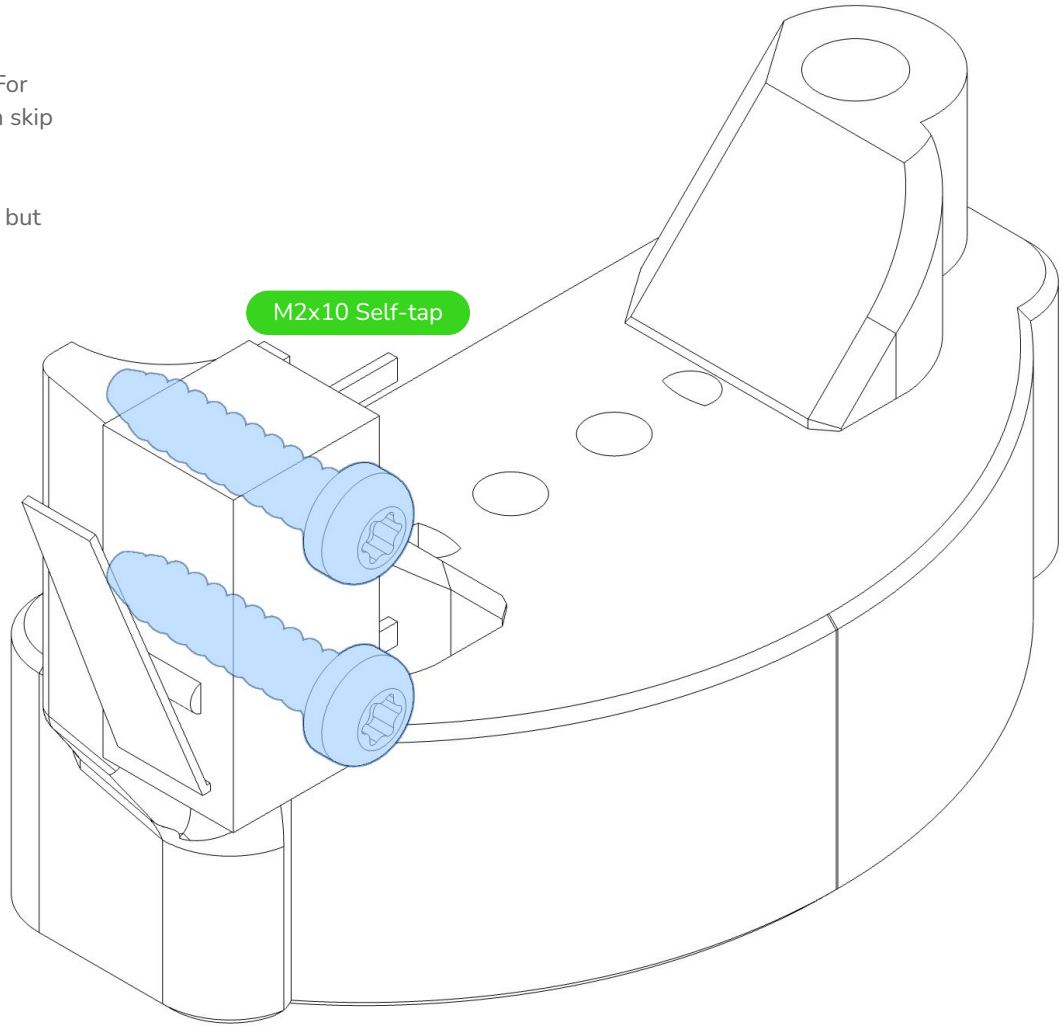



M3x8 BHCS

DO I NEED THIS PART?

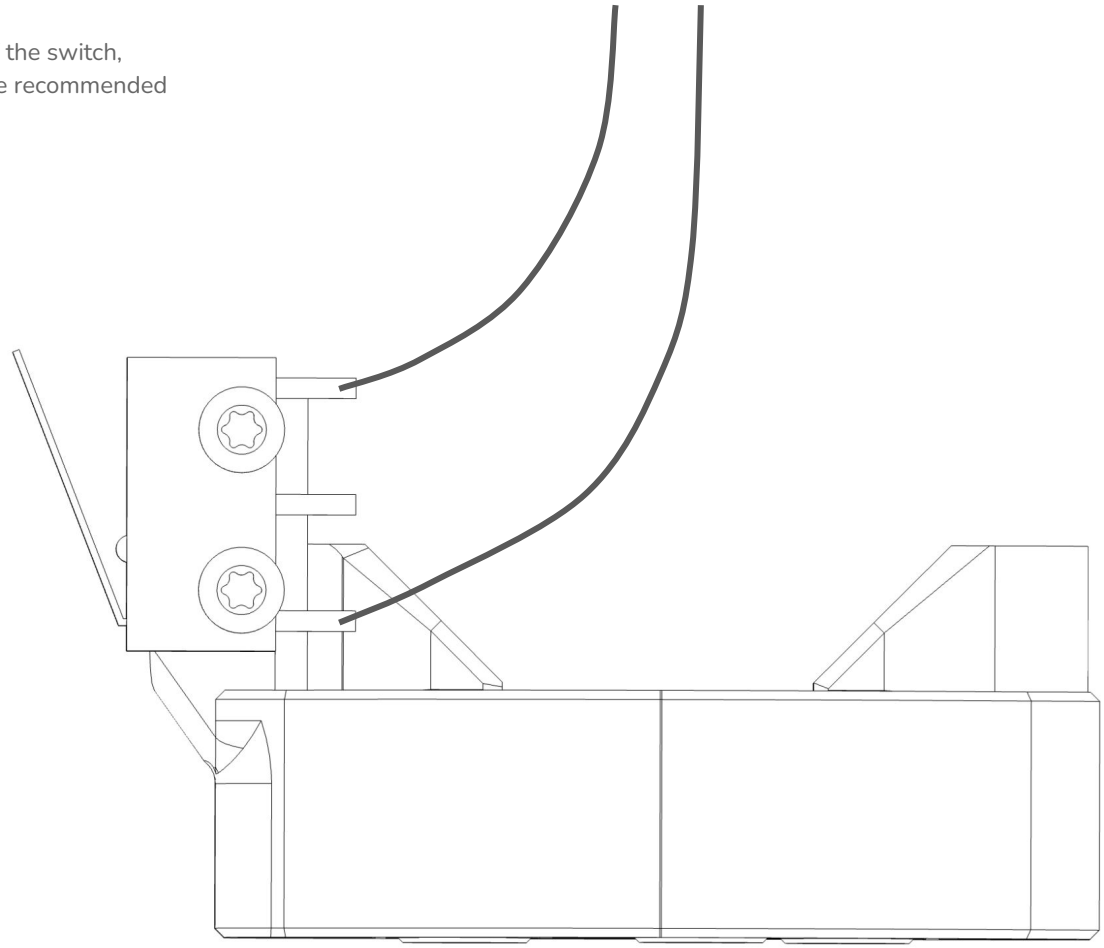
This part is only used if you are using Klicky and / or physical endstops. For Boop or other z-probing solutions as well as sensorless homing, you can skip ahead to the next part.

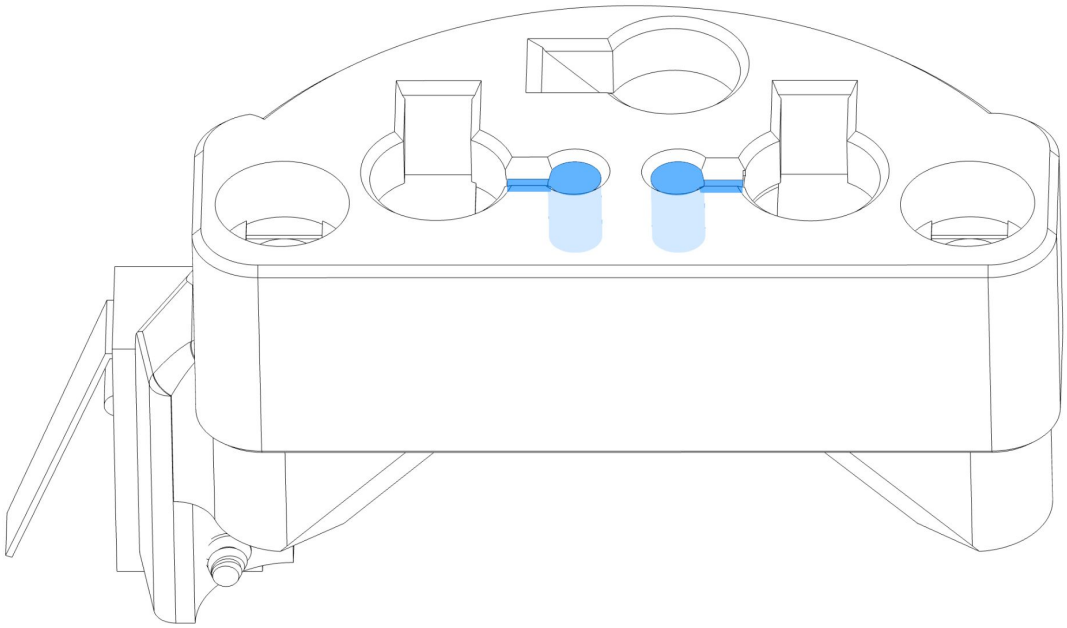
If you are using Klicky but running sensorless homing, ignore this switch but follow the rest of the steps to get this part assembled and mounted.



SOLDER WIRES

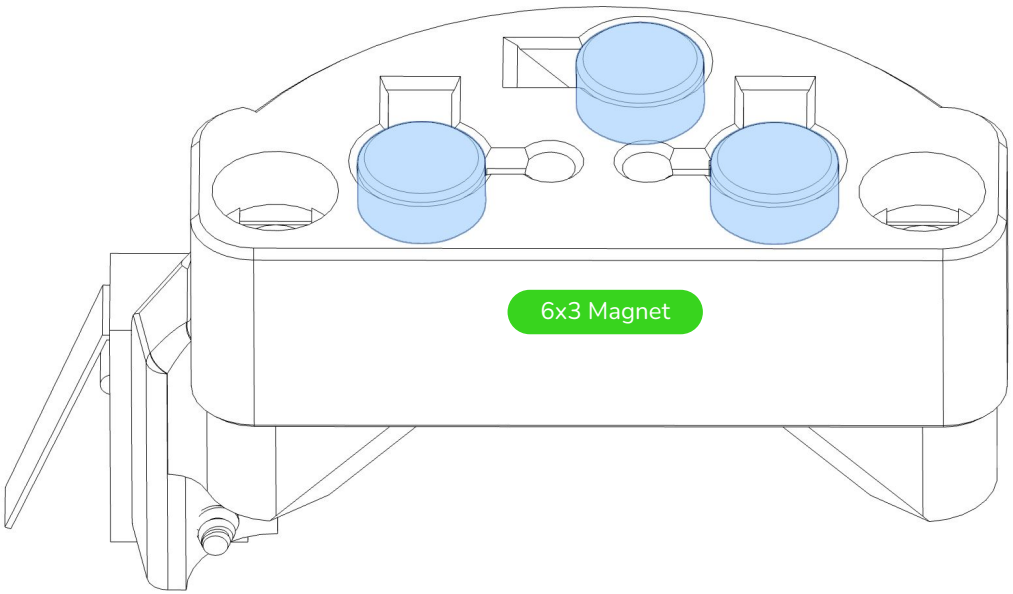
Solder some wires to the normally-closed (NC) positions of the switch, which are the outermost two connectors if you are using the recommended switch from the BOM.





WIRING

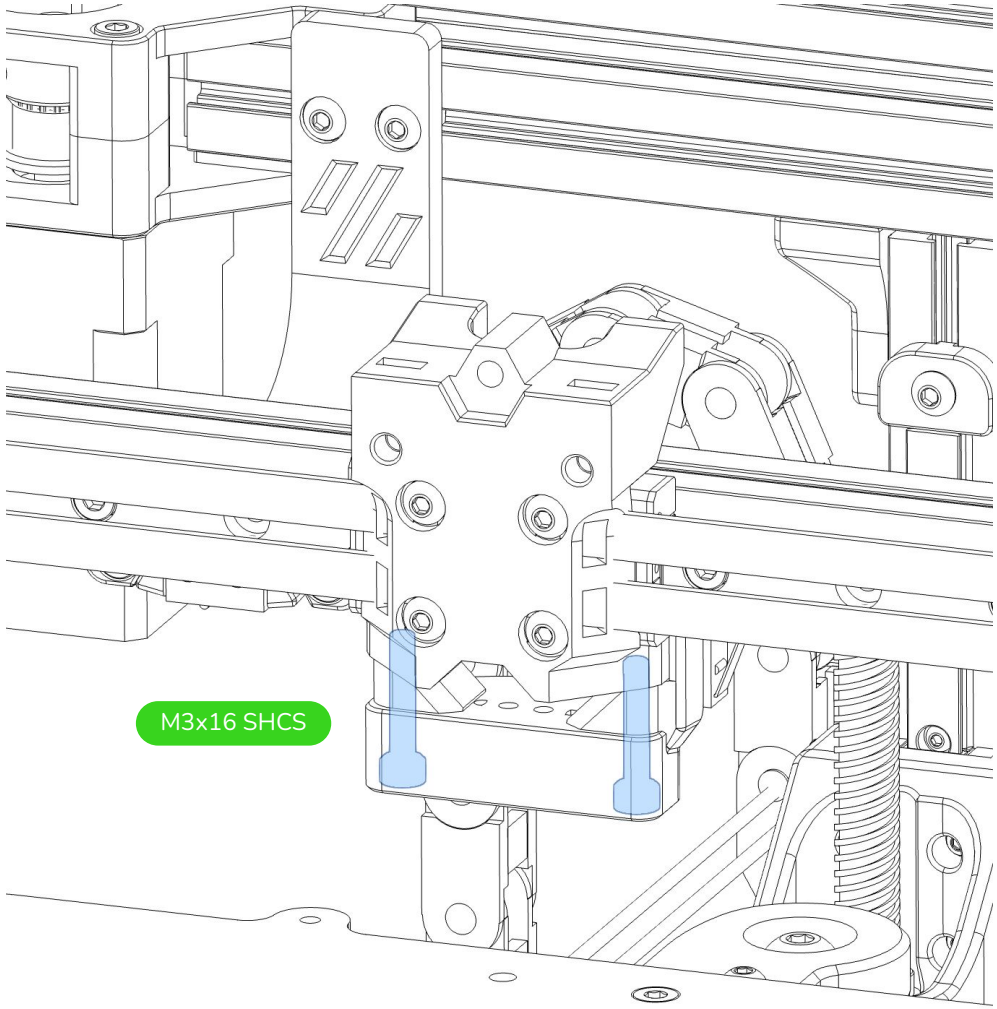
Run some wire through the highlighted holes and channels, bending the wire down to fit in the bottom of the pockets. The wire will be held in place by magnets in the next step.



MAGNET POLARITY

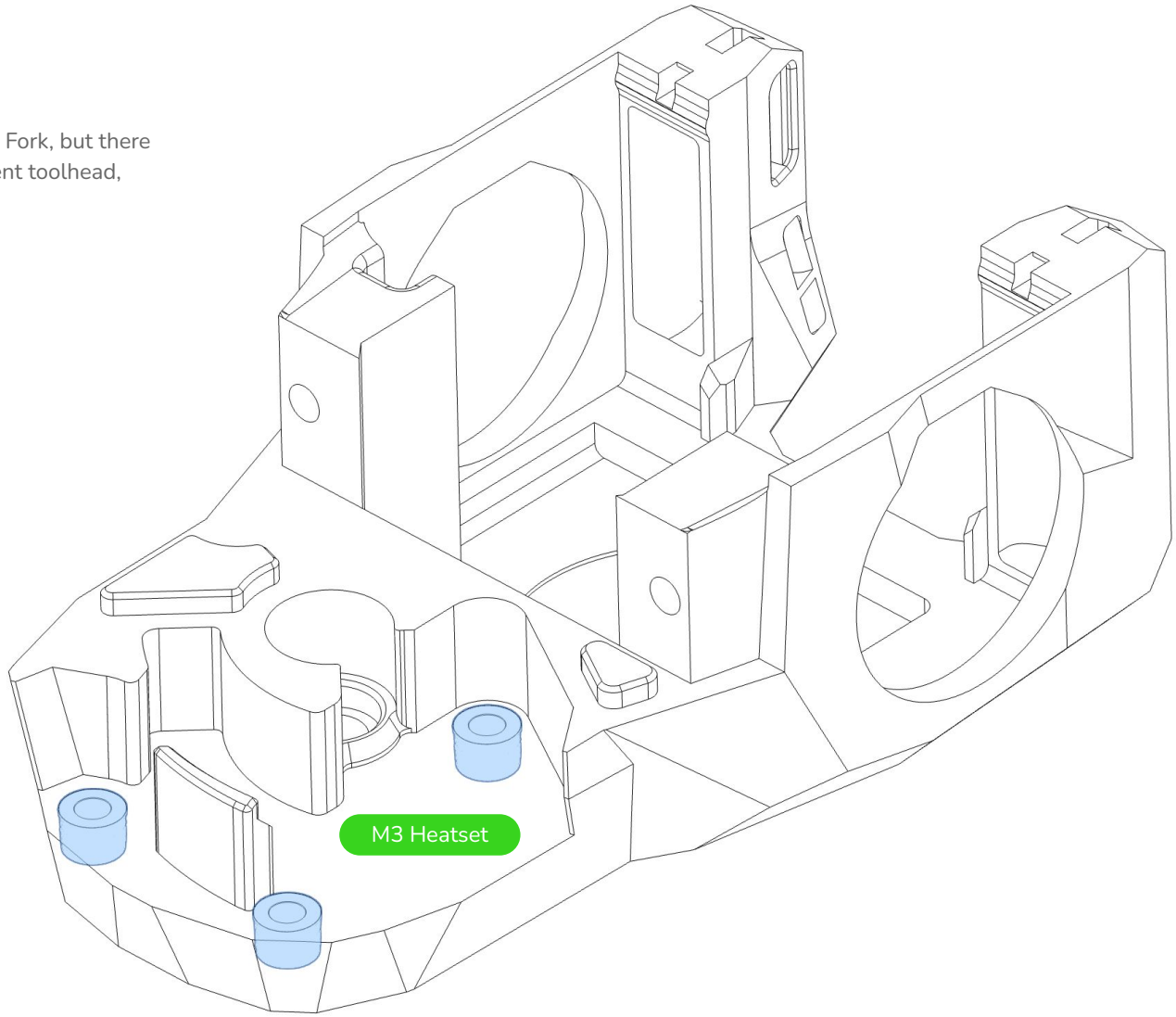
Add these magnets as usual, with the polarity set to attract the magnets in the Klicky probe from earlier. Remember that the magnet in the rear has opposite polarity from those in the front.

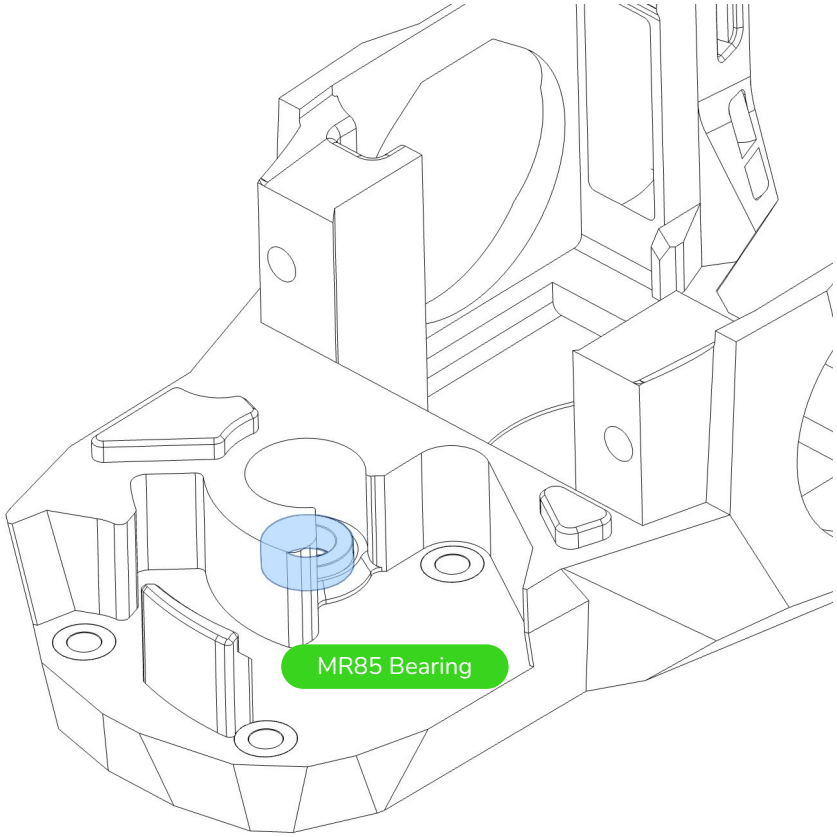
After the magnets have been secured, use a continuity tester to verify that the magnet and the wire have conductivity, then use a bit of superglue to lock them in place.

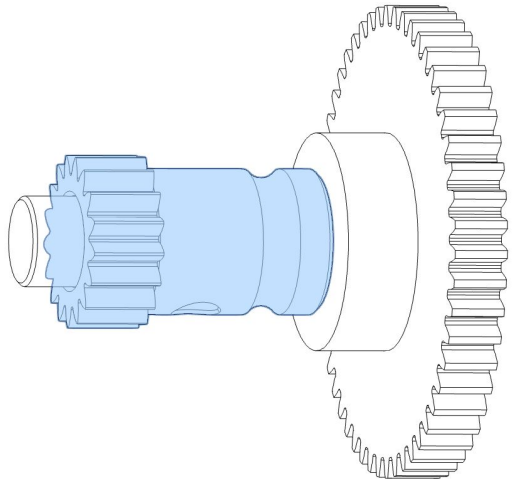

M3x16 SHCS

MINI-STEALTHBURNER

The Mini-StealthBurner is the default toolhead used in Salad Fork, but there are many alternatives also available. If you are using a different toolhead, feel free to skip ahead to the end of this section.

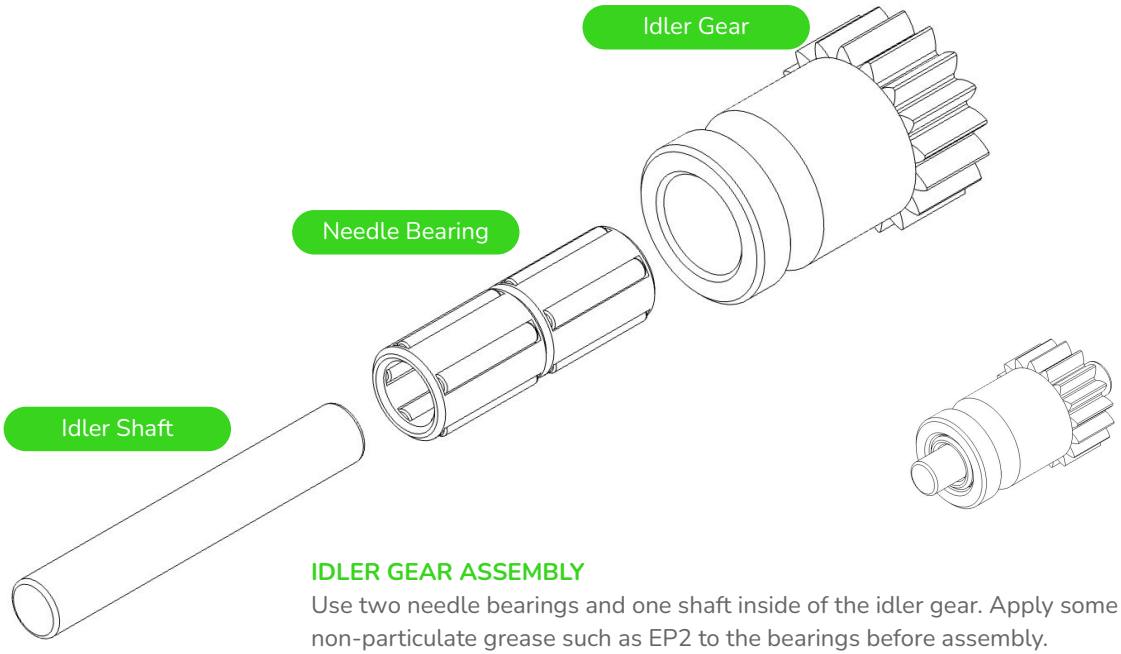






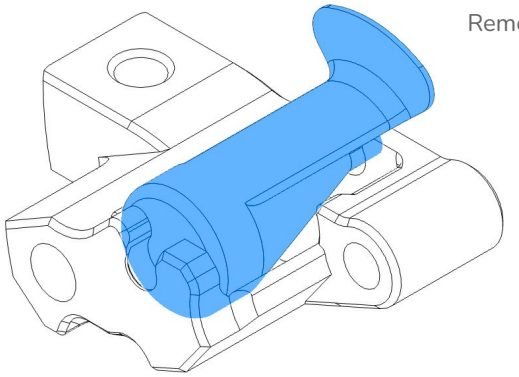
DRIVE GEAR ASSEMBLY

Add the BMG drive gear to the shaft of the large 50-tooth gear. Snug up the grub screw but don't tighten completely, as this will be fine-tuned later. Apply some light threadlocker to the grub screw to prevent it loosening and causing printing problems in the future.



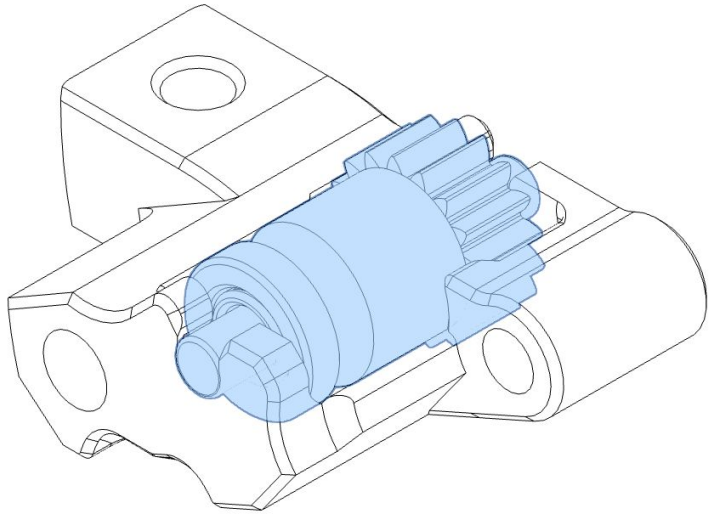
IDLER GEAR ASSEMBLY

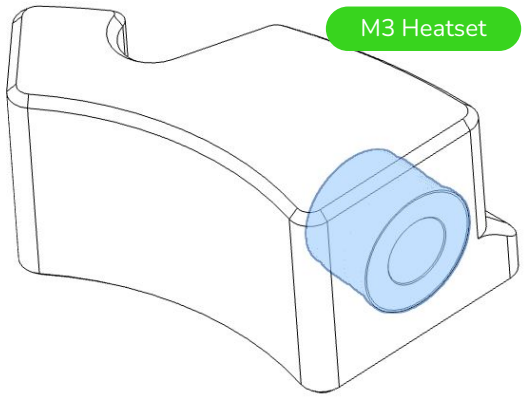
Use two needle bearings and one shaft inside of the idler gear. Apply some non-particulate grease such as EP2 to the bearings before assembly.

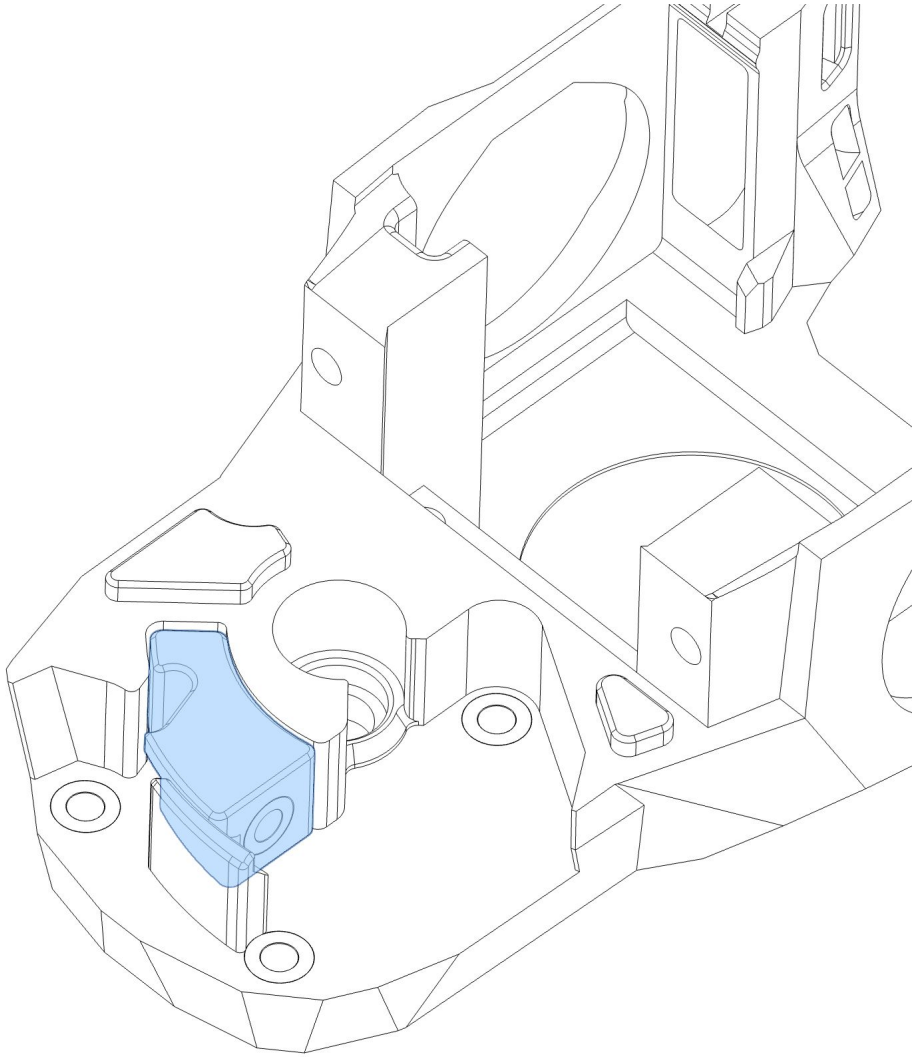


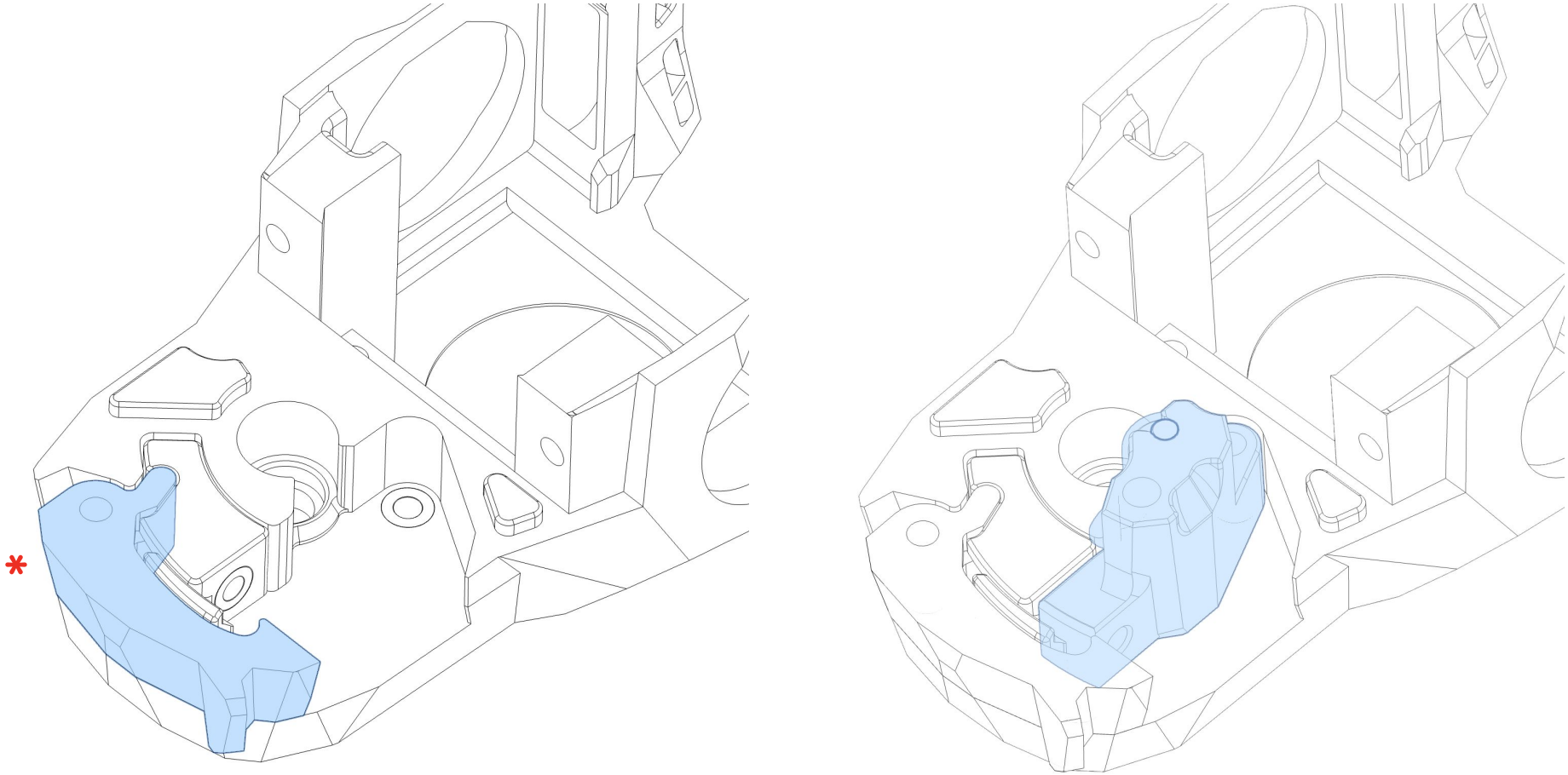
PRINTED SUPPORT

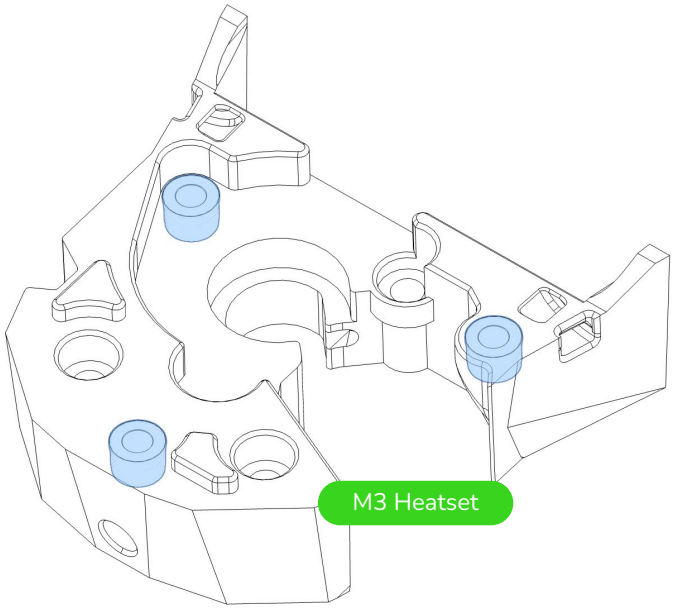
Remove the printed support from this part




M3 Heatset

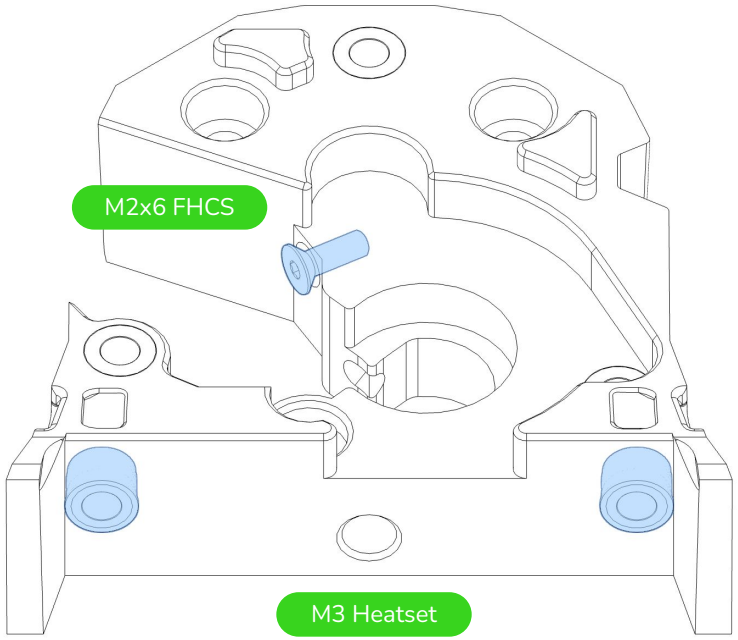


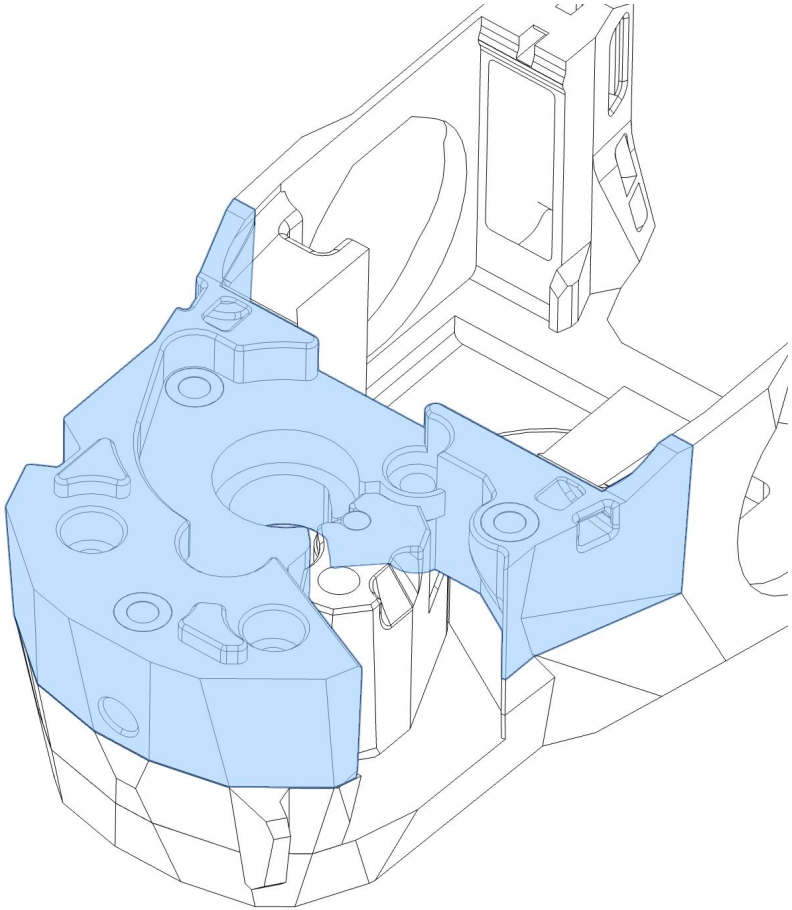


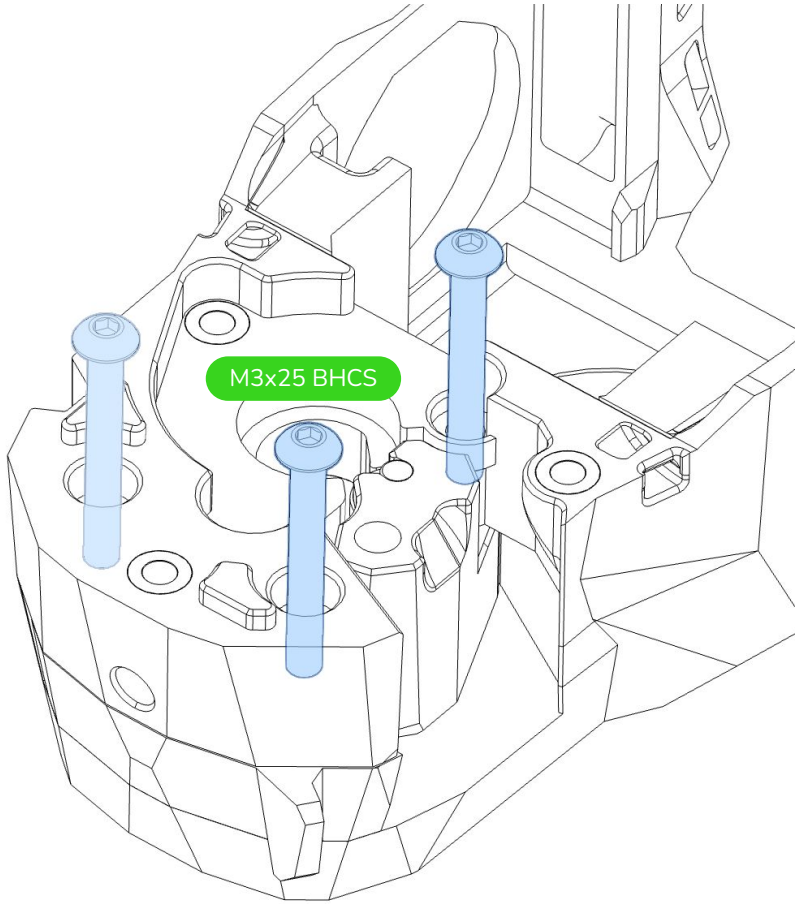


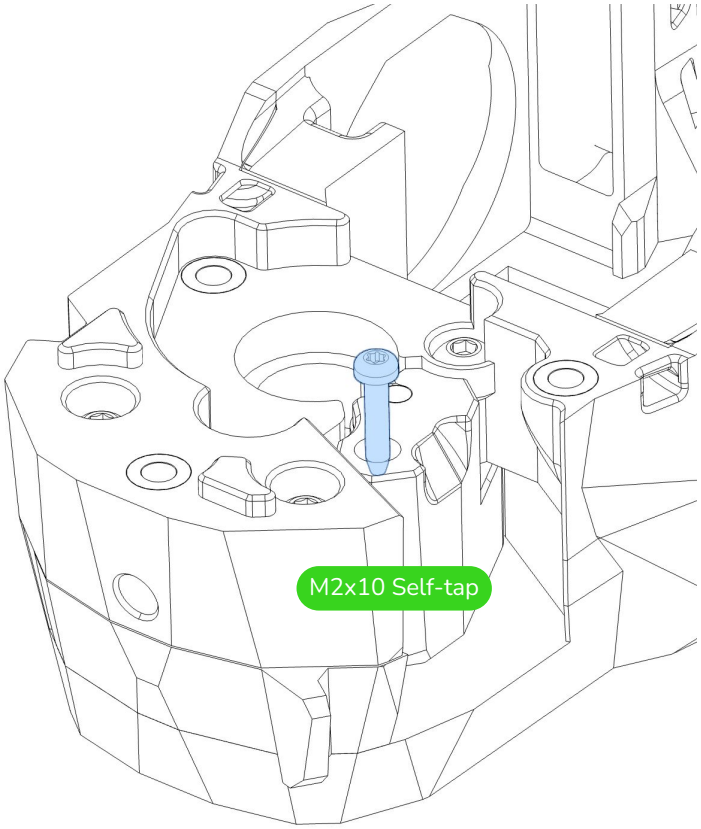
TENSION LIMITER

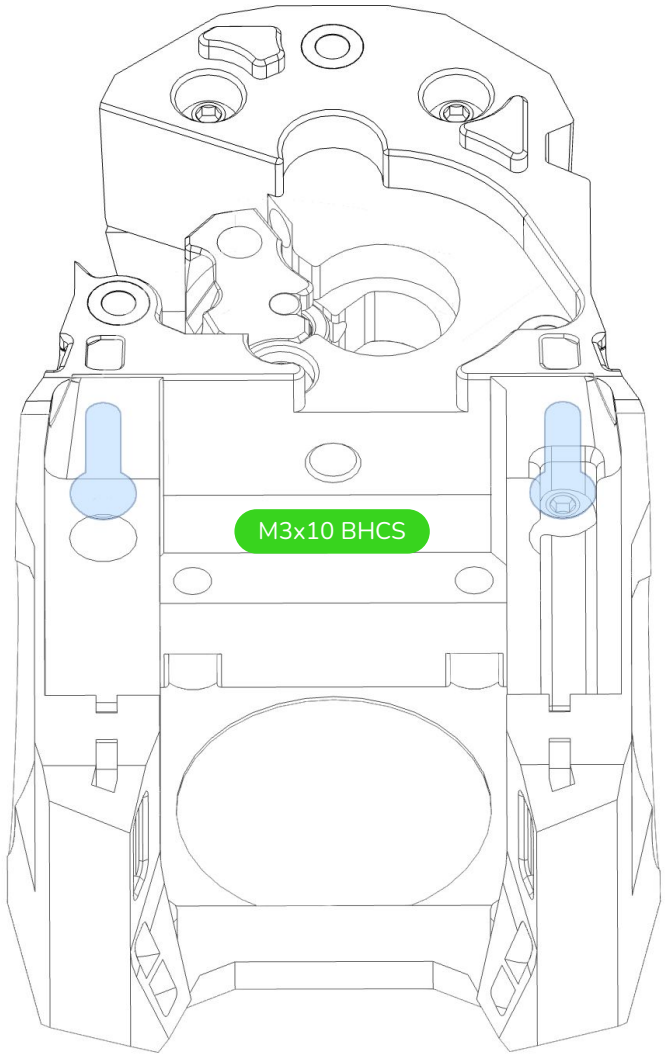
The FHCS screw here is used to limit the maximum tension the extruder can put on the filament. This is primarily useful for flexible filaments such as TPU. You can screw this all the way in or omit it if you don't need it.

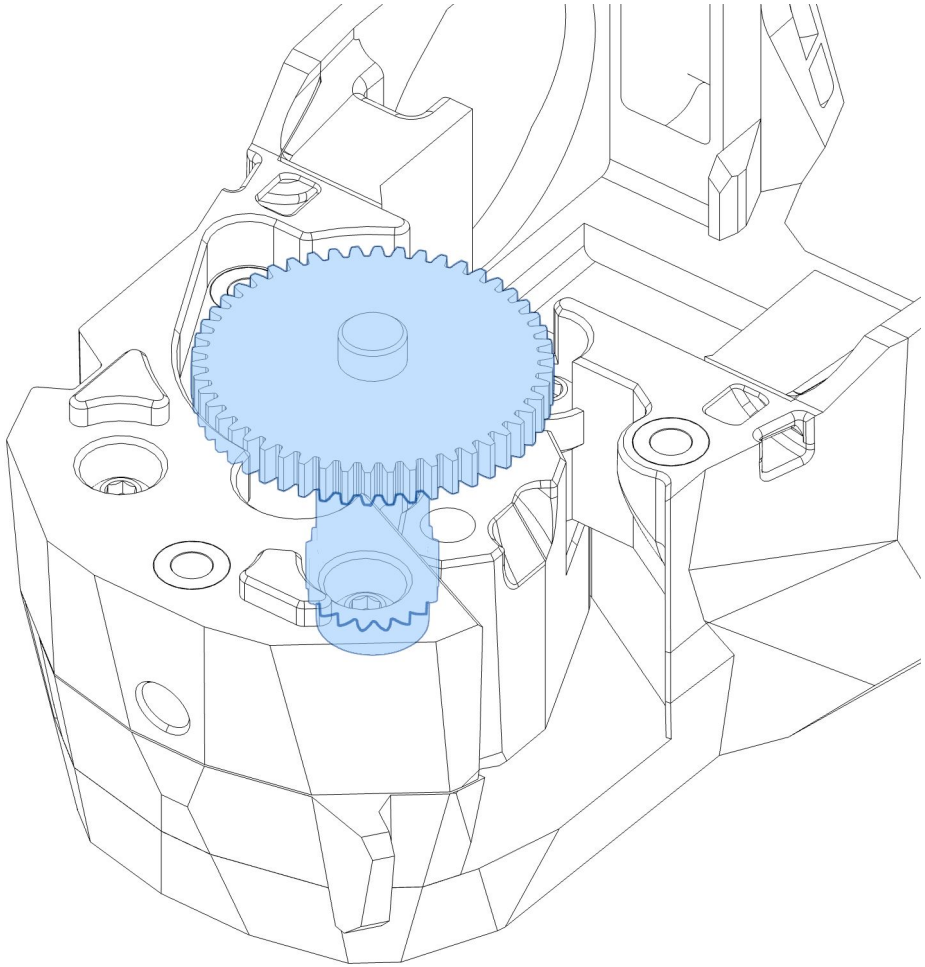





M3x25 BHCS

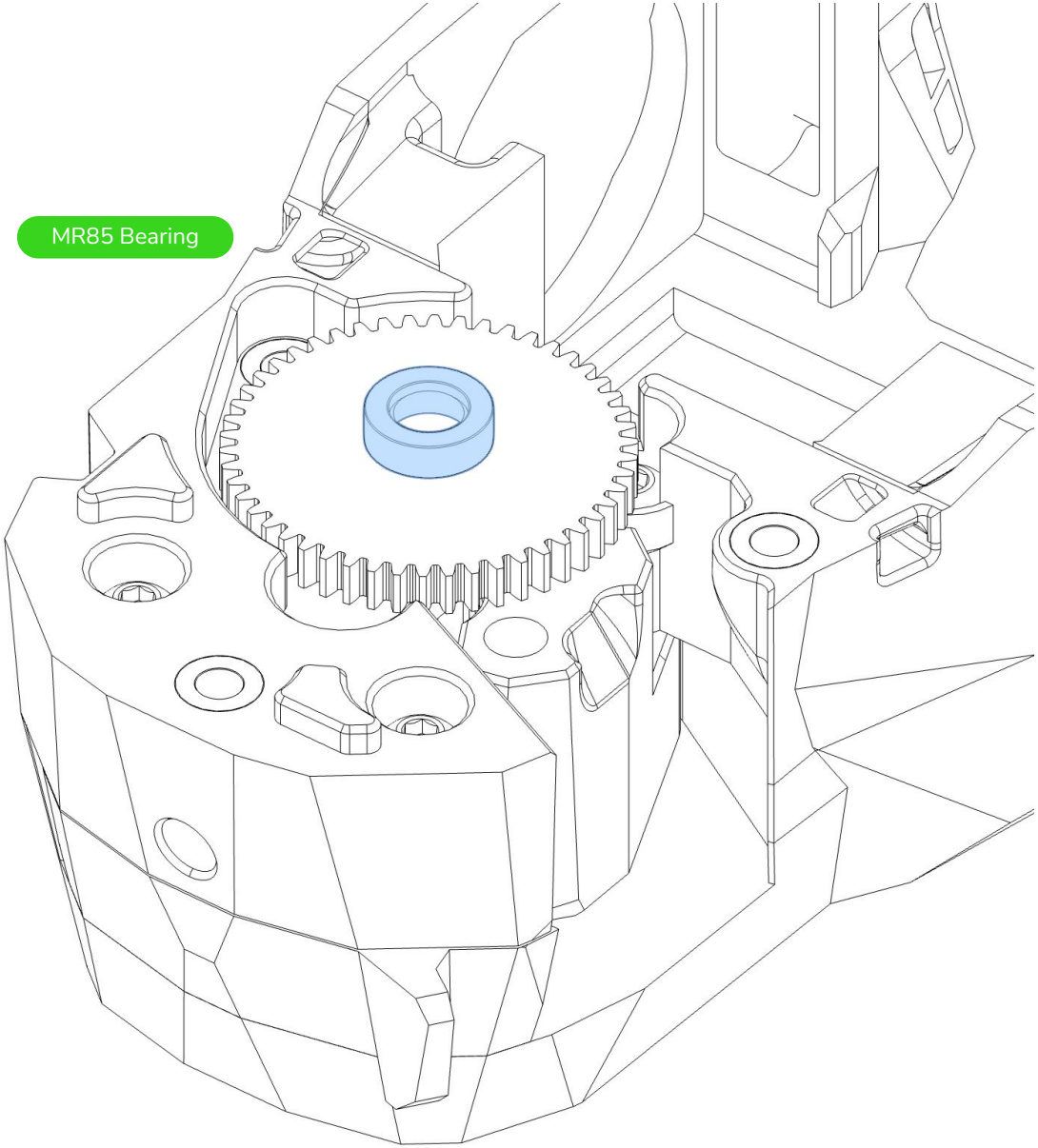

M2x10 Self-tap


M3x10 BHCS



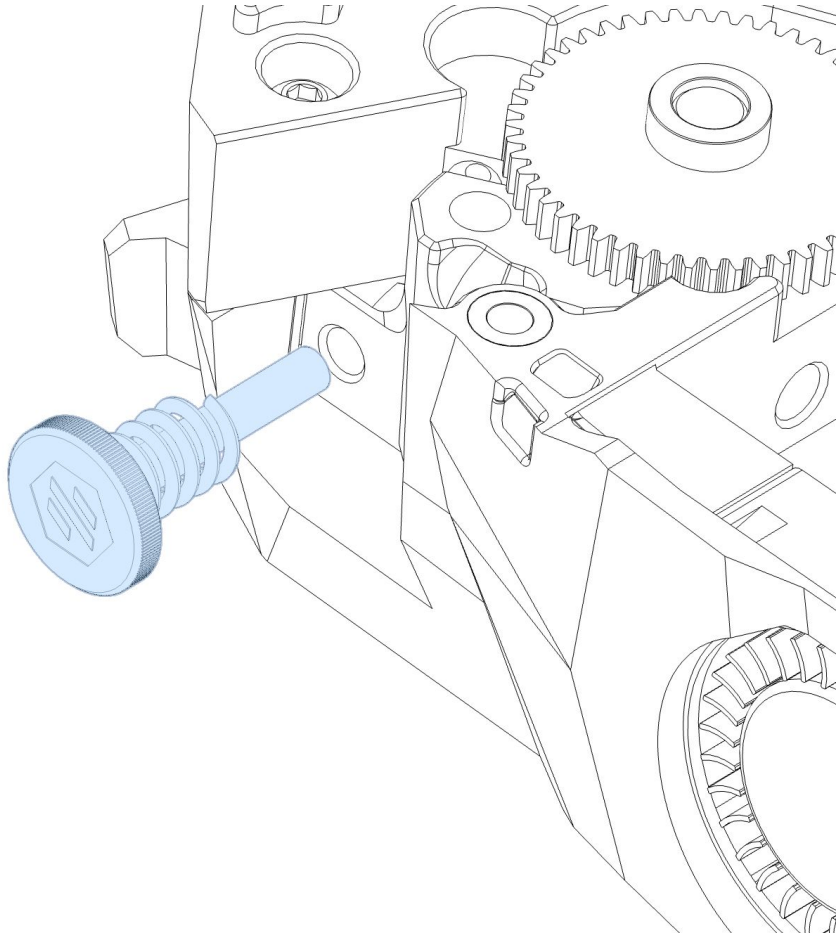
TIGHT FIT

This may be a tight fit to insert, but be patient and work with this to ensure the 50-tooth gear assembly sits fully down into the bearing at the bottom.


MR85 Bearing

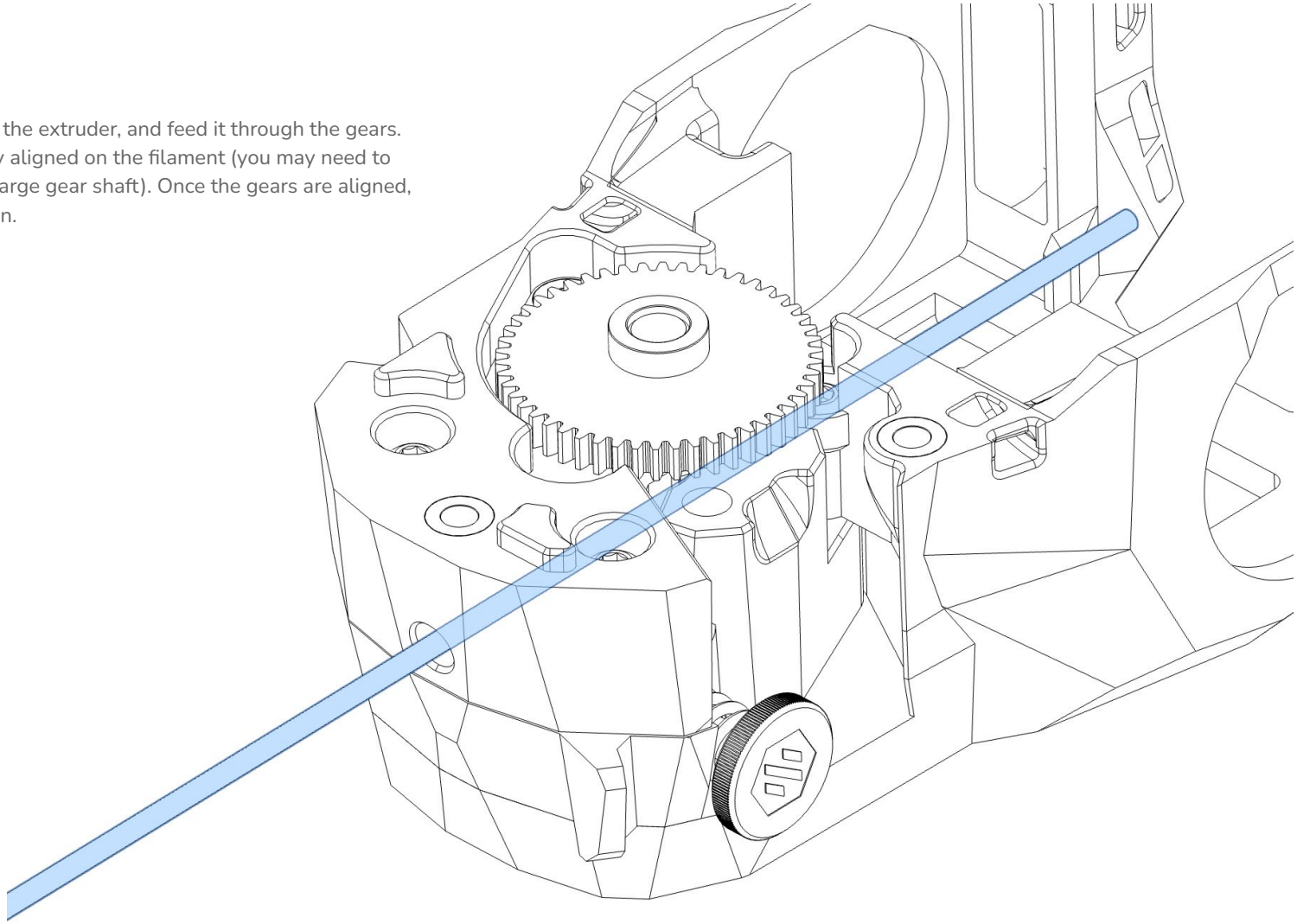
TENSIONER

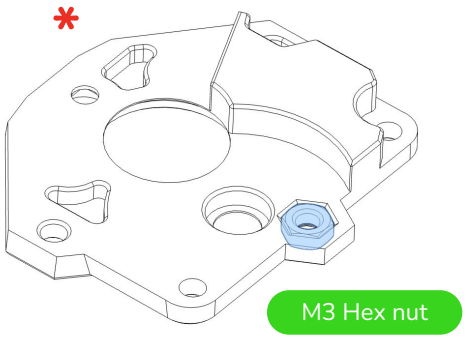
This screw controls the amount of tension placed on the filament by the extruder, you can adjust it as needed to suit the filaments you are printing.

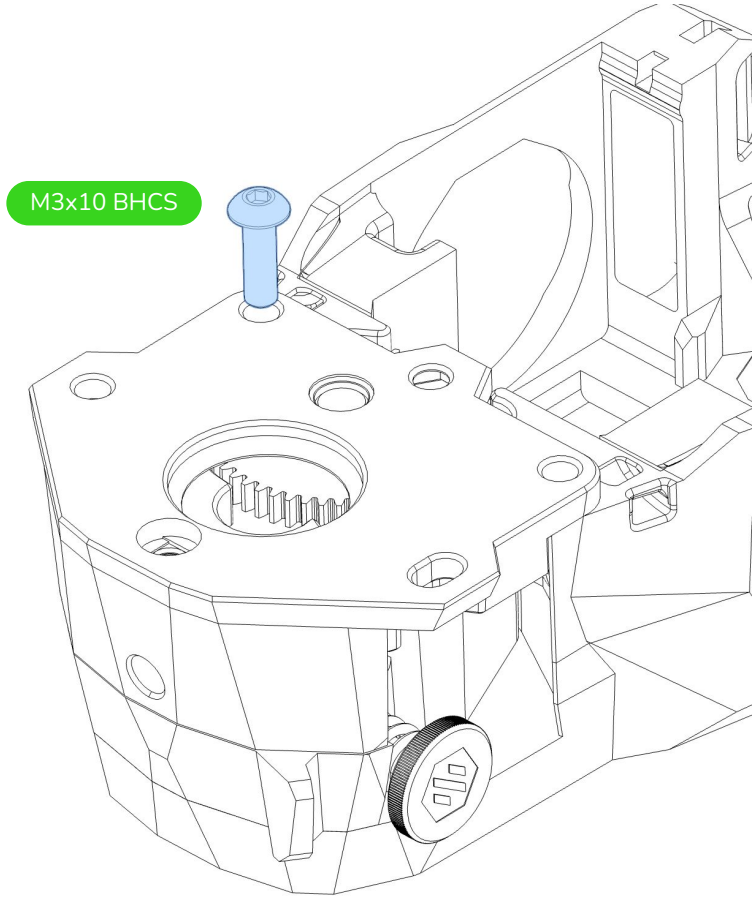


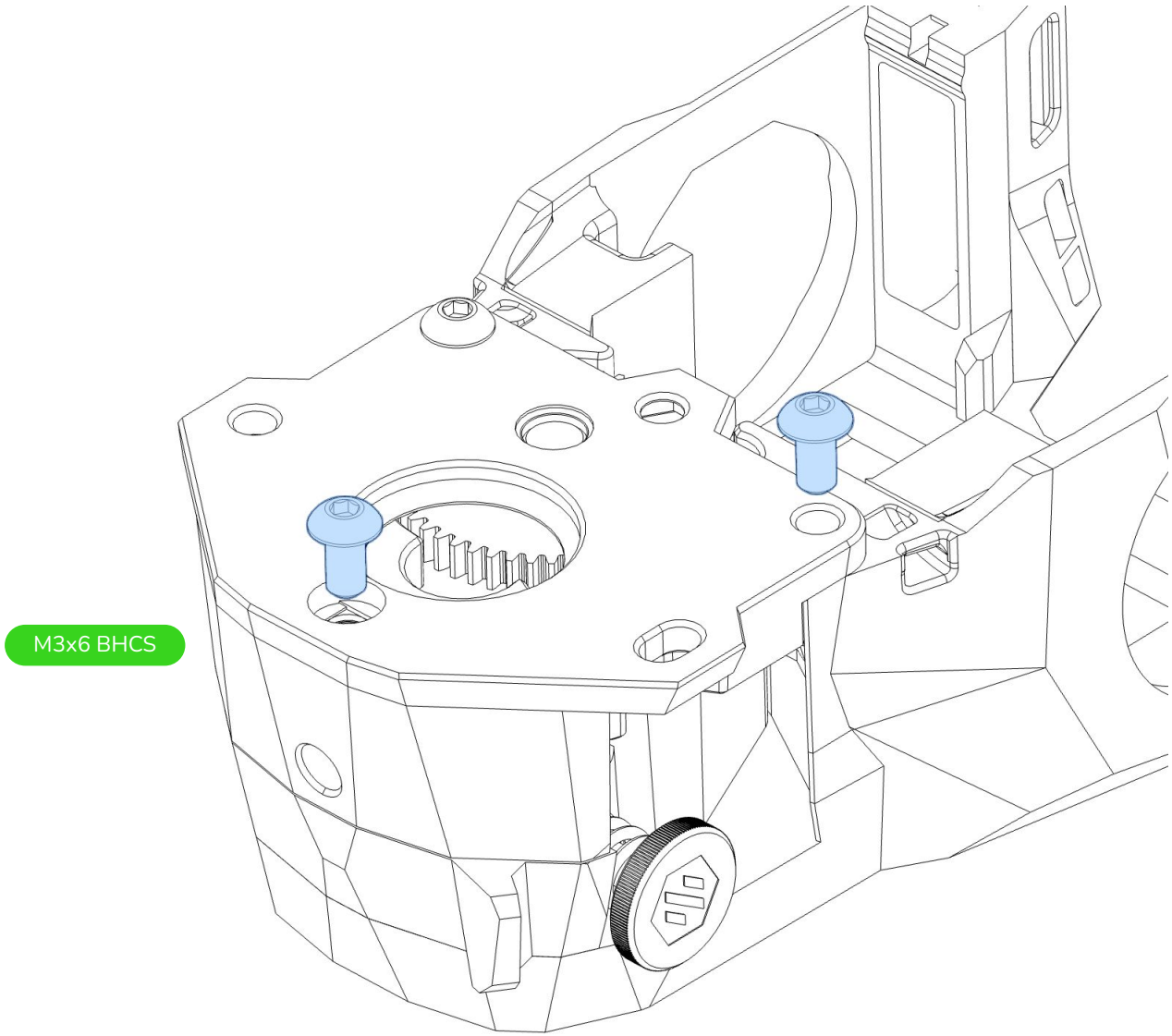
ALIGN EXTRUDER GEARS

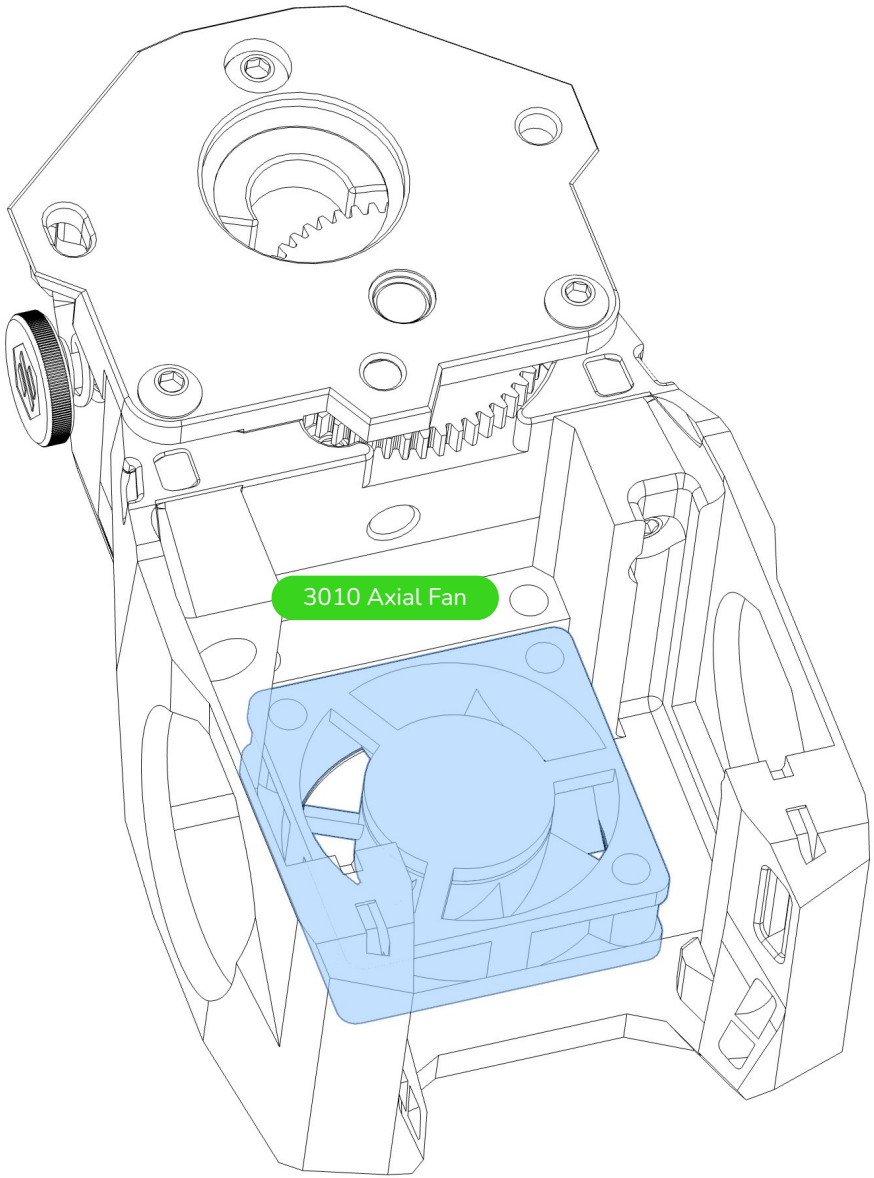
Insert a length of filament into the extruder, and feed it through the gears. Make sure the gears are evenly aligned on the filament (you may need to loosen the grub screw on the large gear shaft). Once the gears are aligned, tighten up the grub screw again.

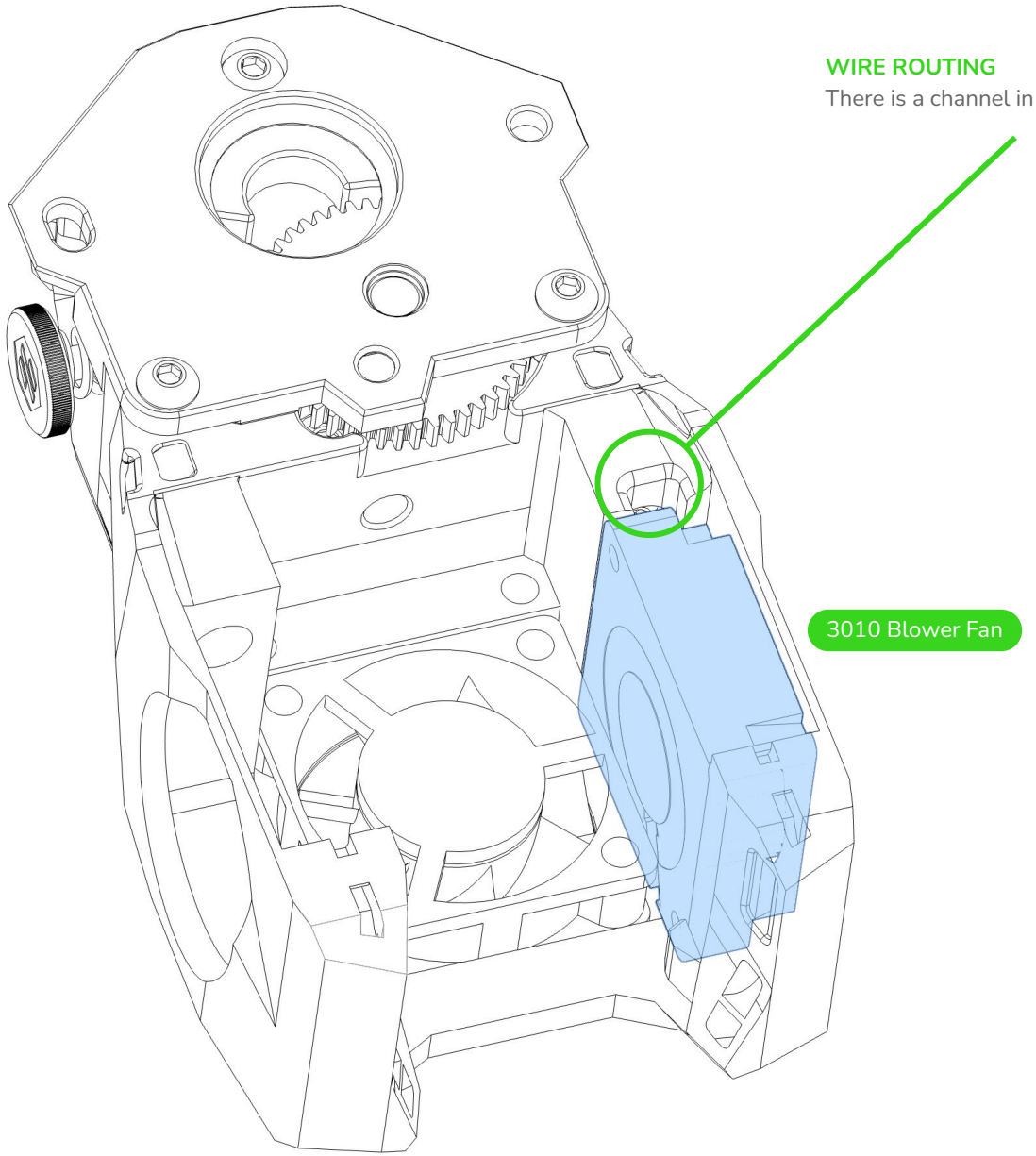



*
M3 Hex nut


M3x10 BHCS

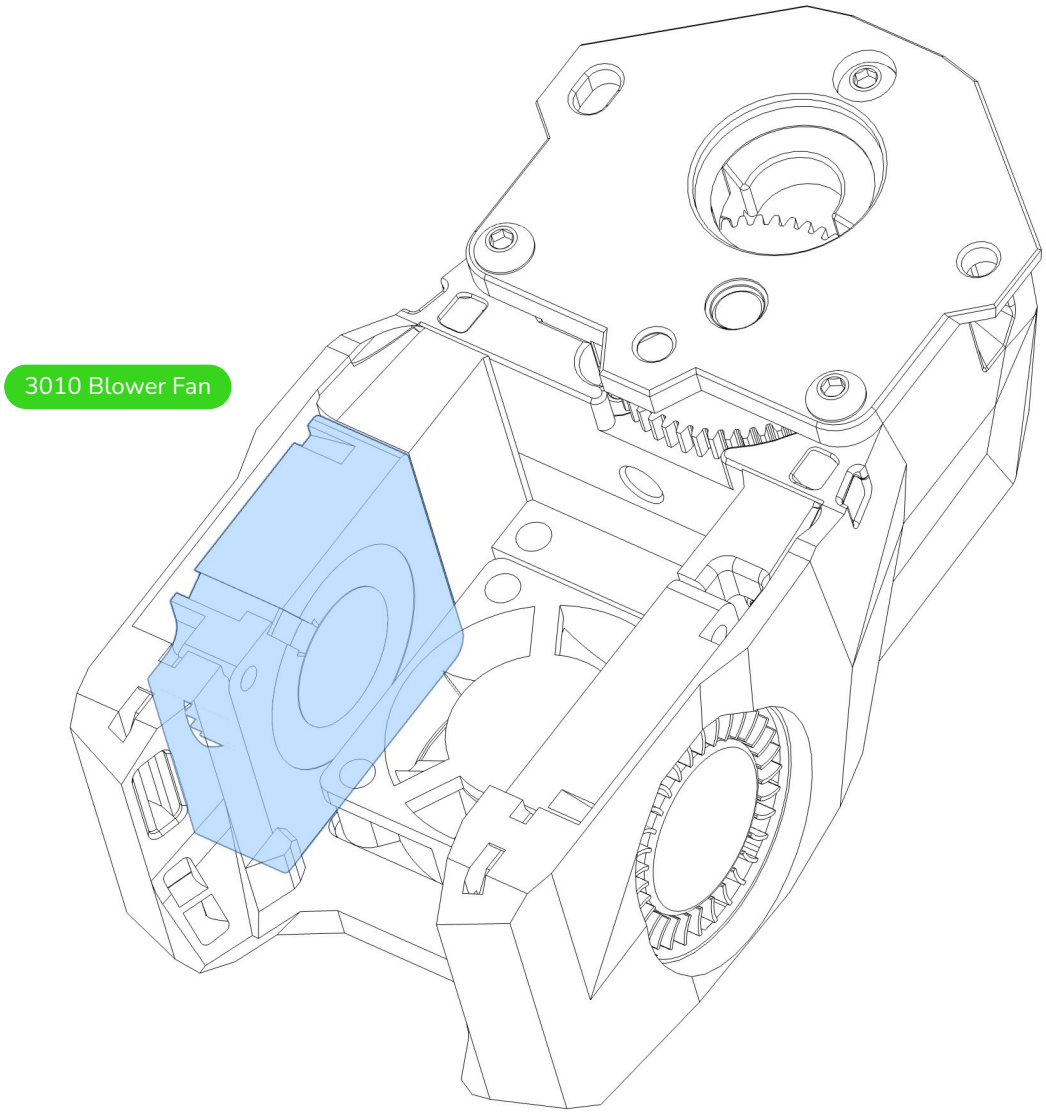

M3x6 BHCS

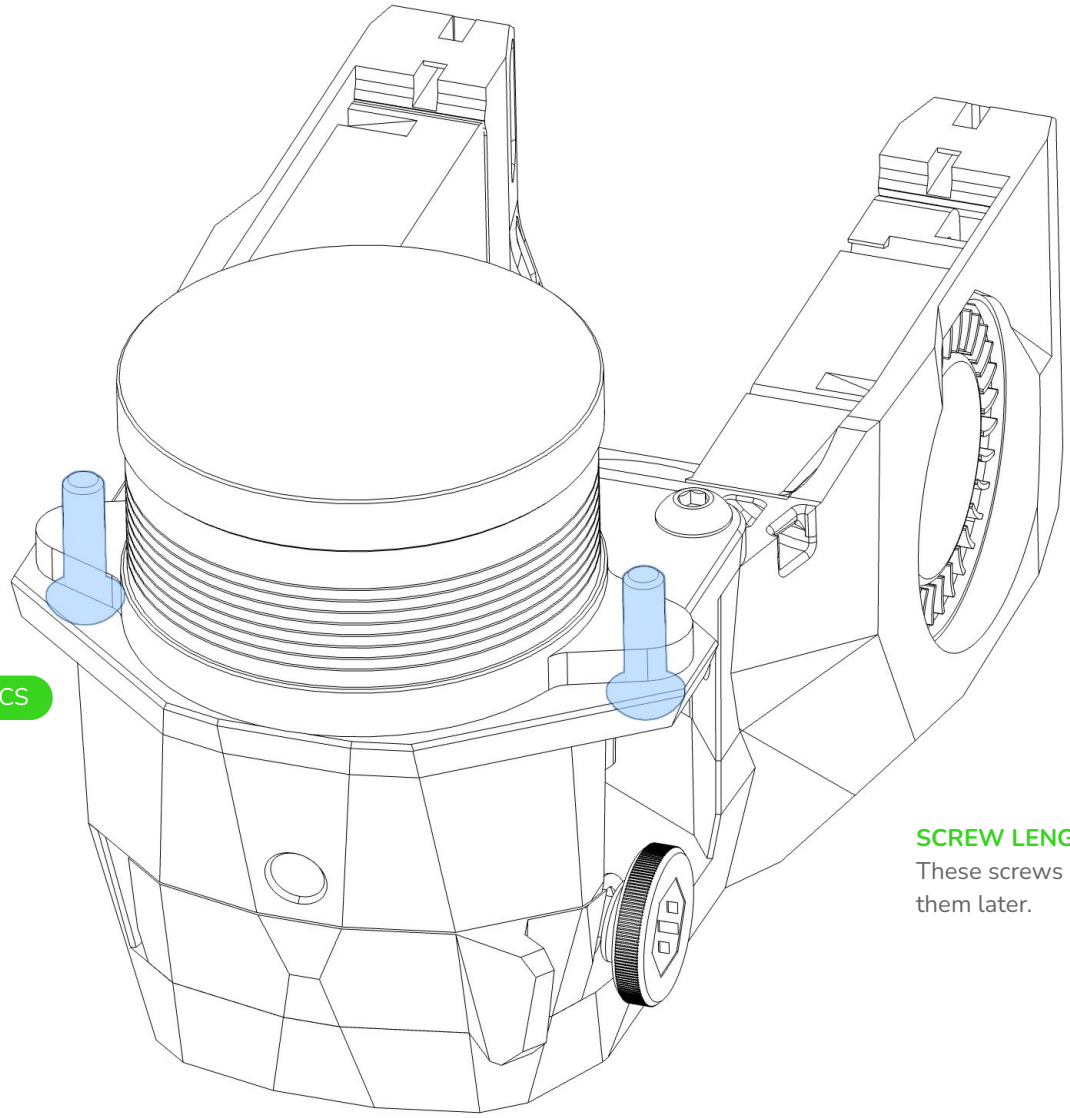

3010 Axial Fan



WIRE ROUTING

There is a channel in the toolhead to route the wires from this fan here

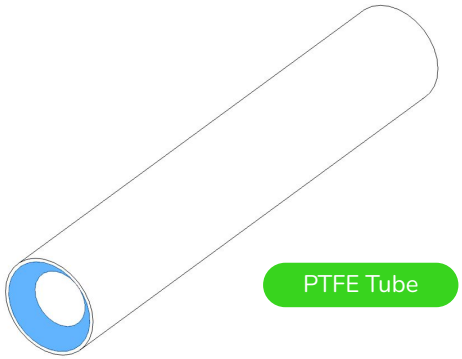

3010 Blower Fan



M3x10 BHCS

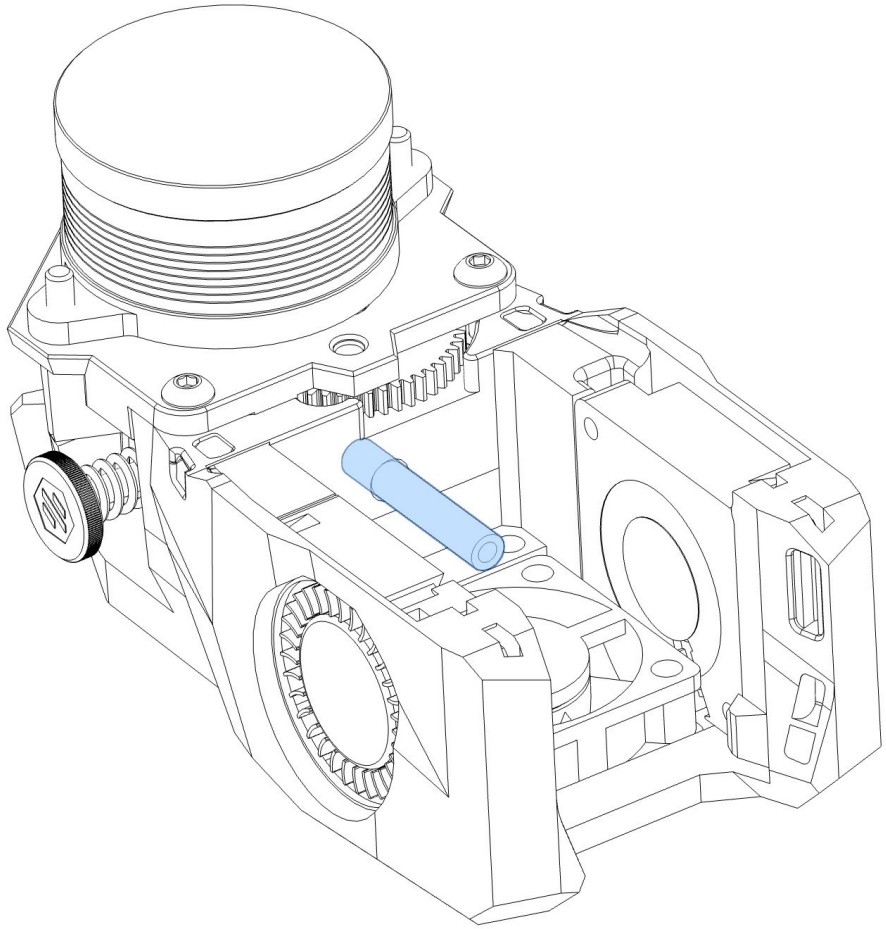
SCREW LENGTH

These screws are longer than needed at this step, more parts will go on them later.



PTFE CHAMFER

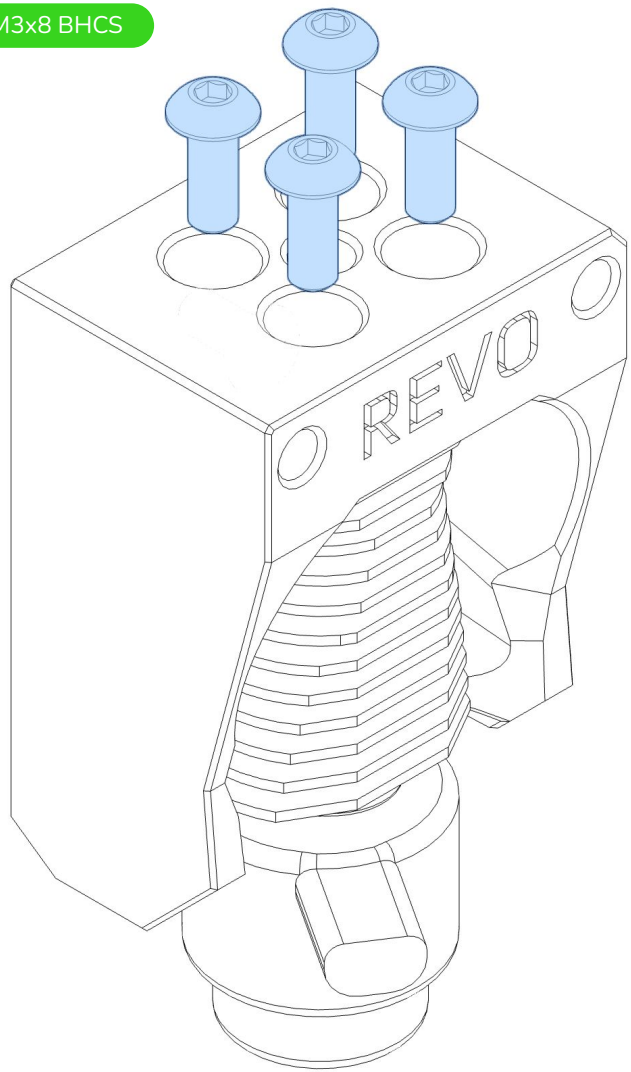
Cut a short length of PTFE tube at least 30mm long, and cut a small chamfer in one end, this will make filament loading much easier when the toolhead is assembled.



PTFE CHAMFER

The chamfered end of the PTFE tube goes inside the extruder. The total length will be adjusted later.

M3x8 BHCS



NOT USING REVO?

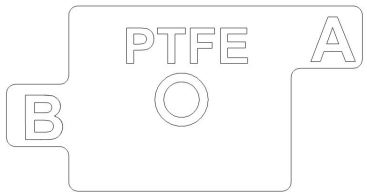
If you are using one of the other supported hotends other than Revo, just substitute the appropriate printed part and fasteners to match your hotend.

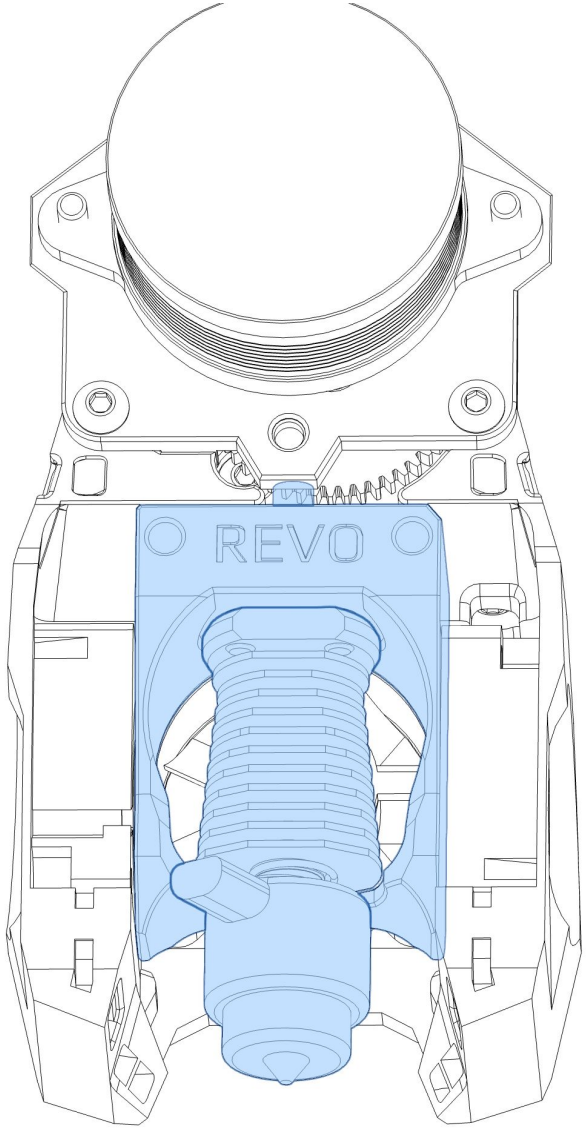
TRIM PTFE TO LENGTH

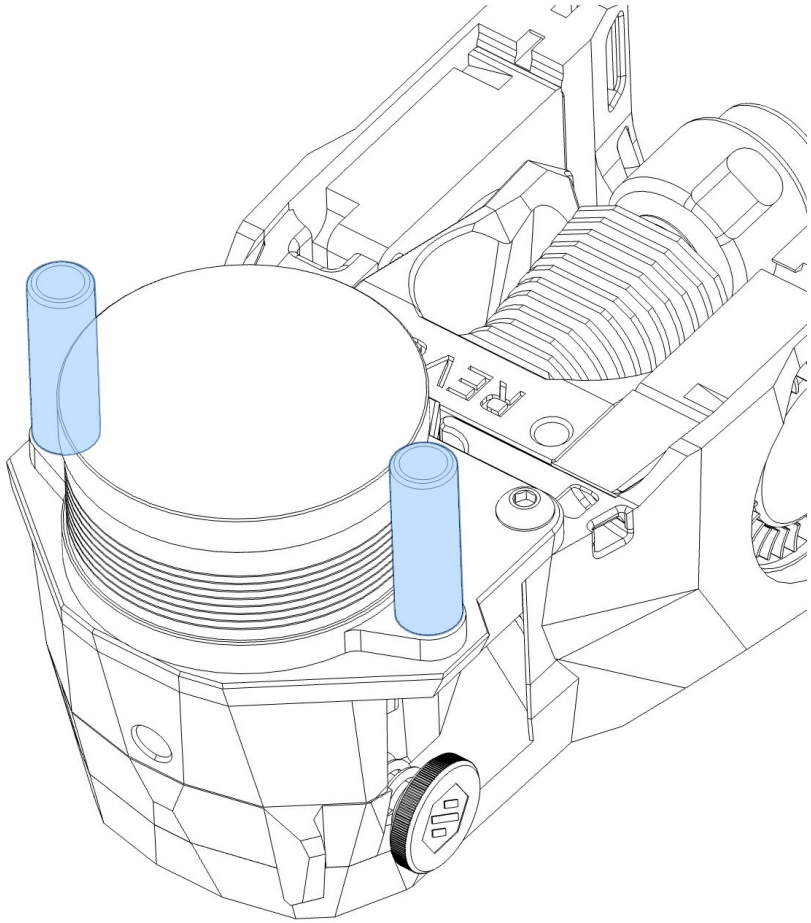
Fit your hotend into the toolhead, and cut the PTFE so that it fits into the hotend mount. For a Revo, the total length will be 22-23mm.

No matter which toolhead you use, the PTFE should stick out 6mm from the top of the mounting piece.

You can use the Belt Pulley Tool to trim your PTFE to the correct length, the tool is 6mm thick and has a hole in the middle for the PTFE to pass through for trimming.







STRAIN RELIEF SPACERS

There are printed strain relief spacers in the repository, but if your kit comes with metal spacers those are a much better option to use.

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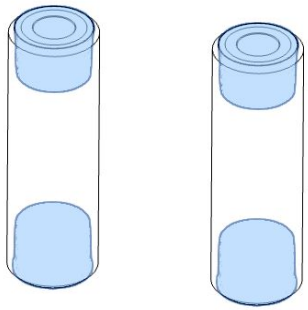
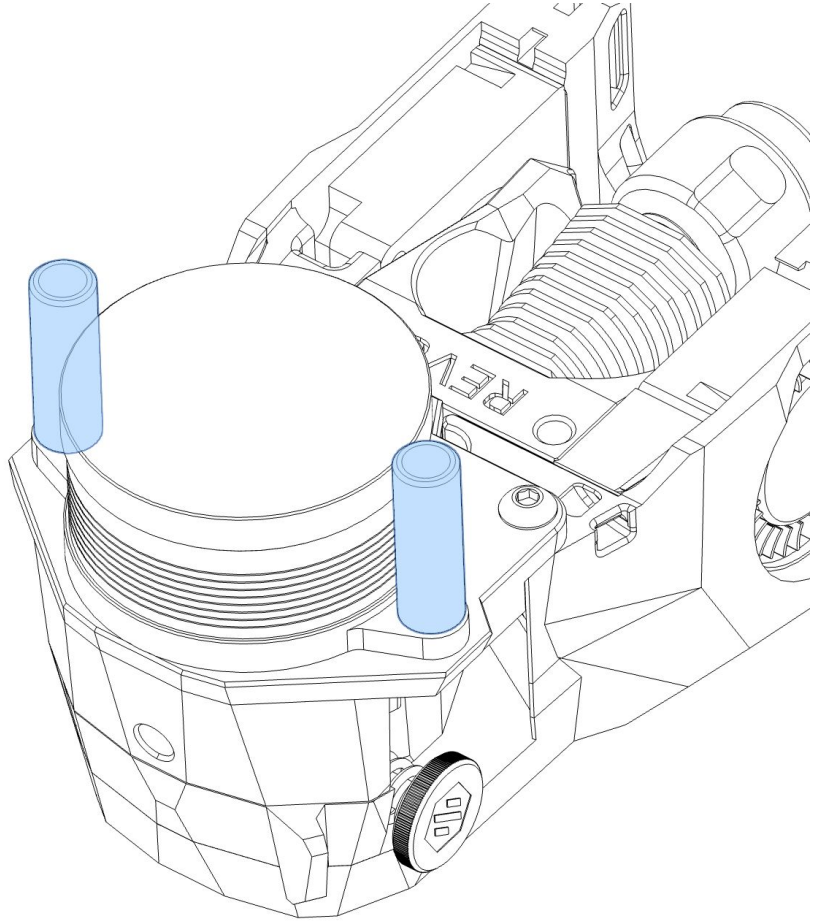
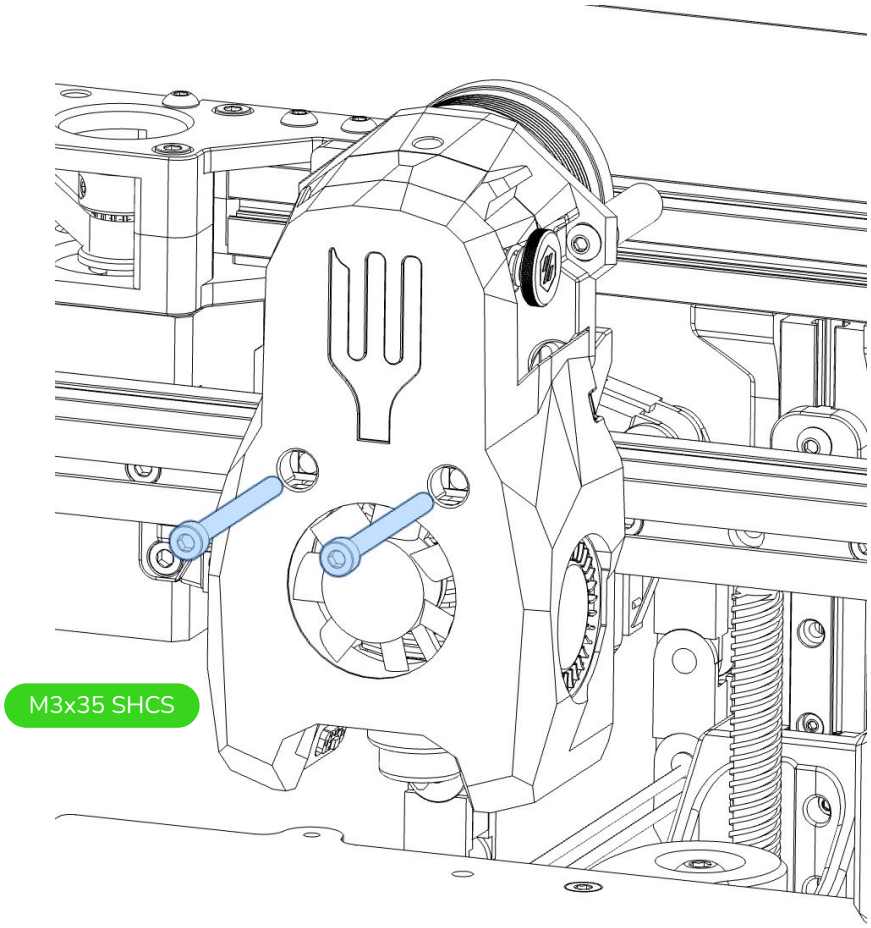
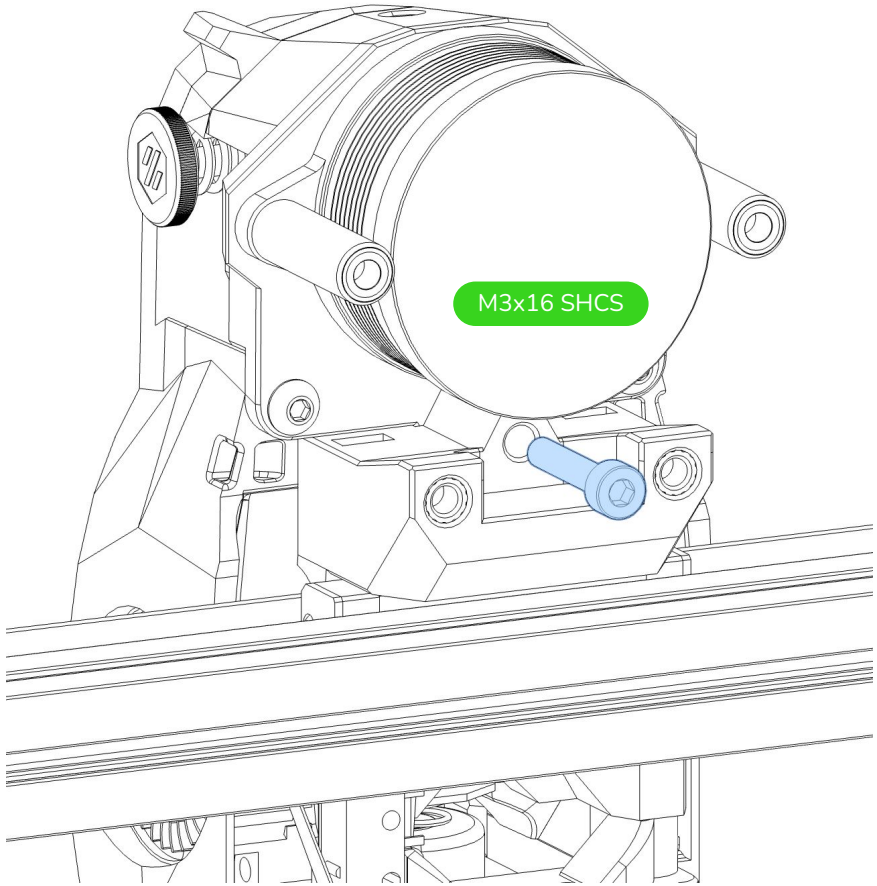
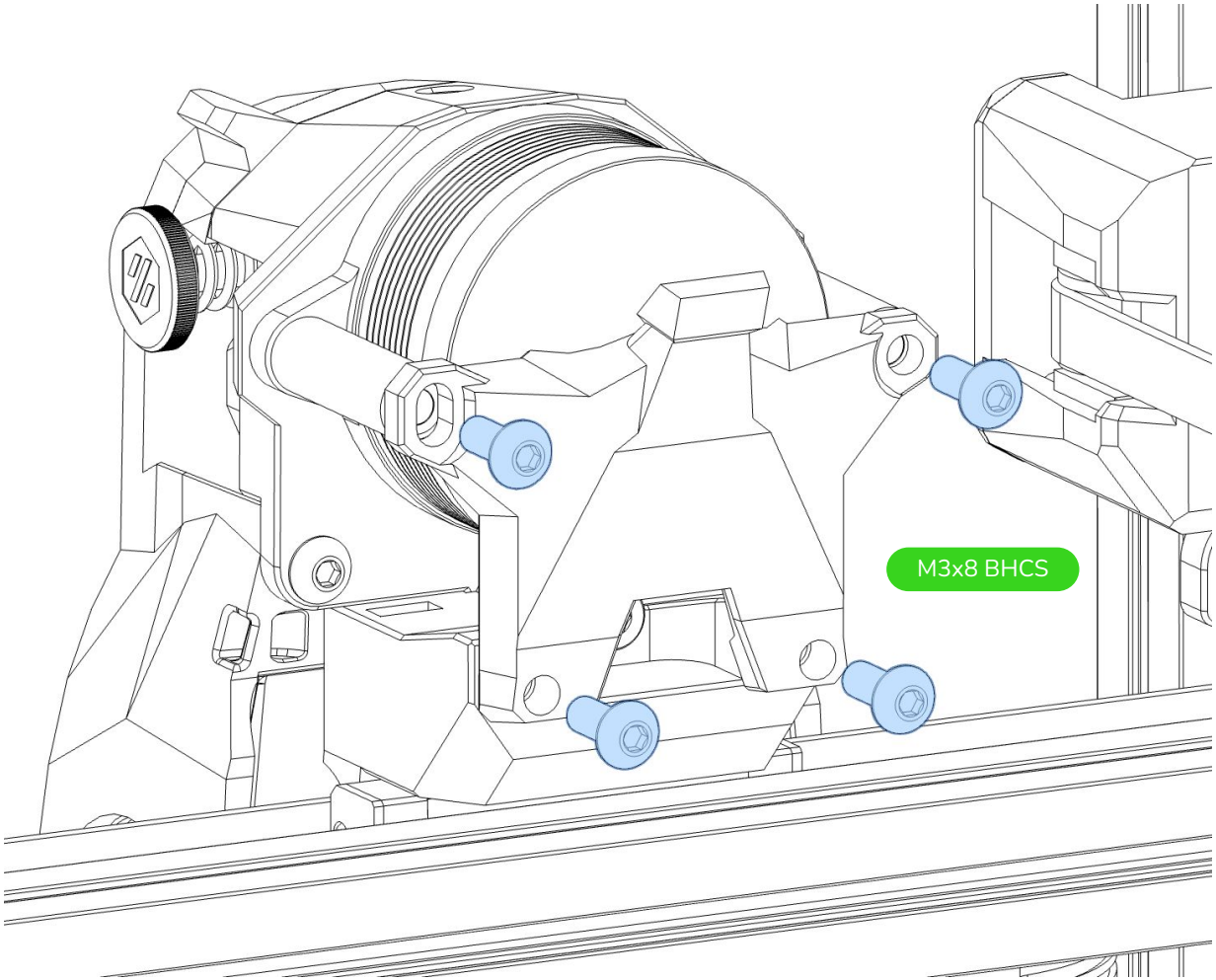
M3 Heatset





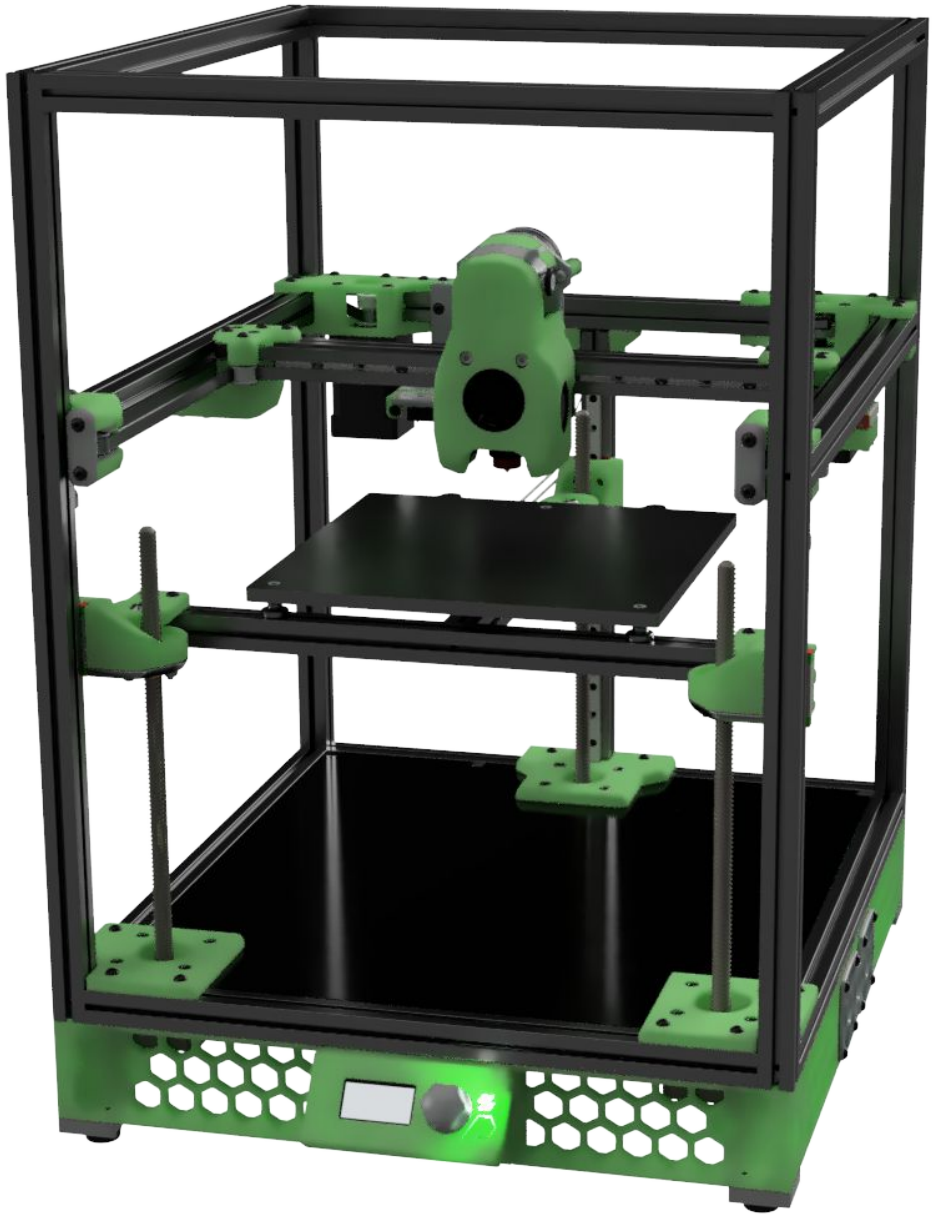

M3x35 SHCS

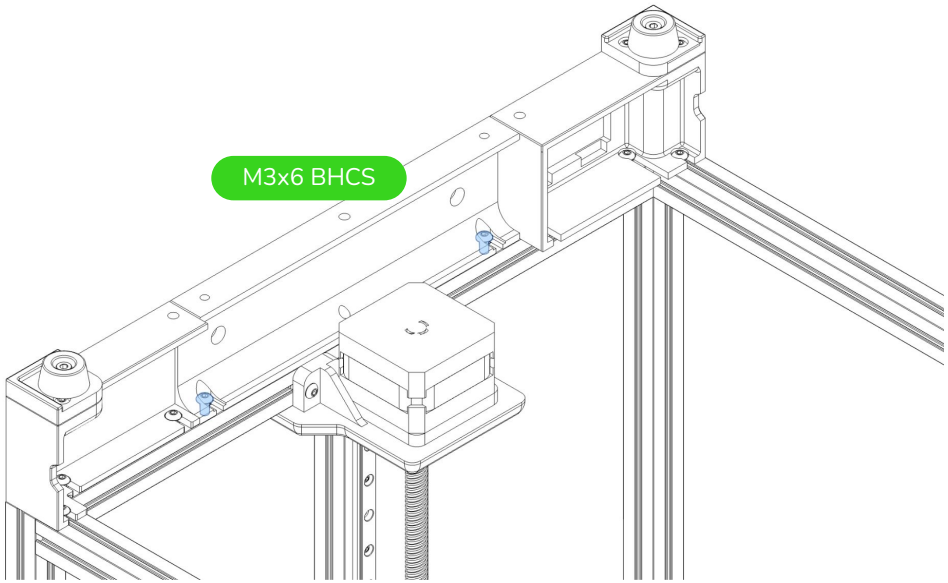

M3x16 SHCS



STRAIN RELIEF MOUNT

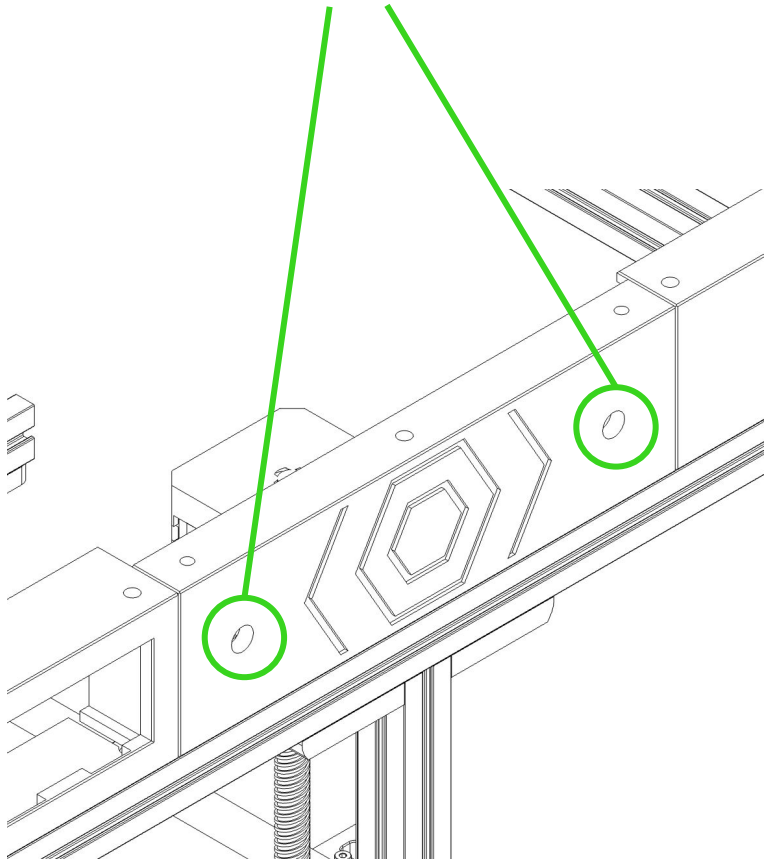
This strain relief pictured is for an wiring setup which does not use a breakout pcb or toolhead MCU (either CANbus or USB). If you are using some form of toolhead PCB, use the appropriate mount for your specific board instead.

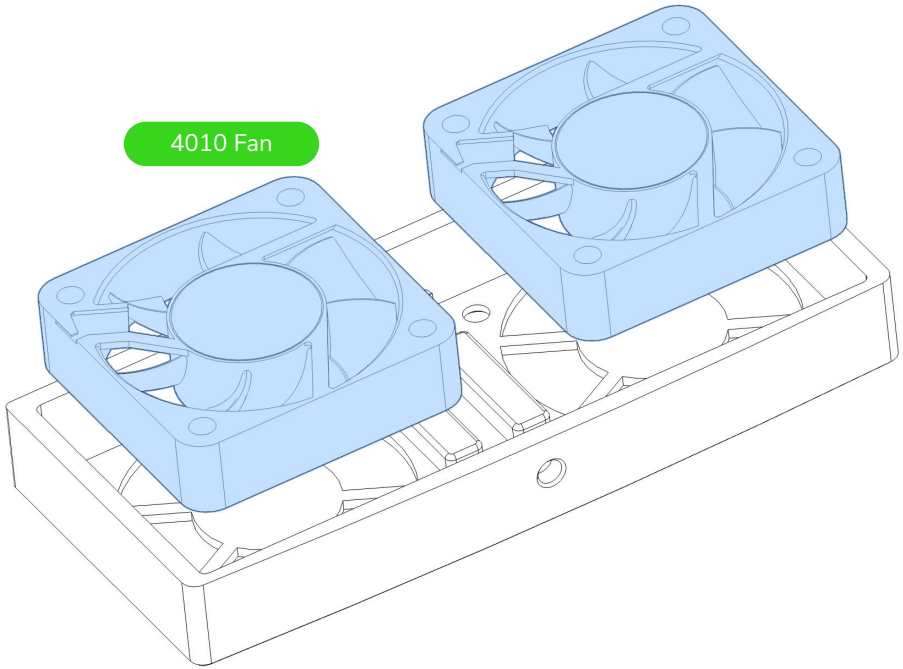


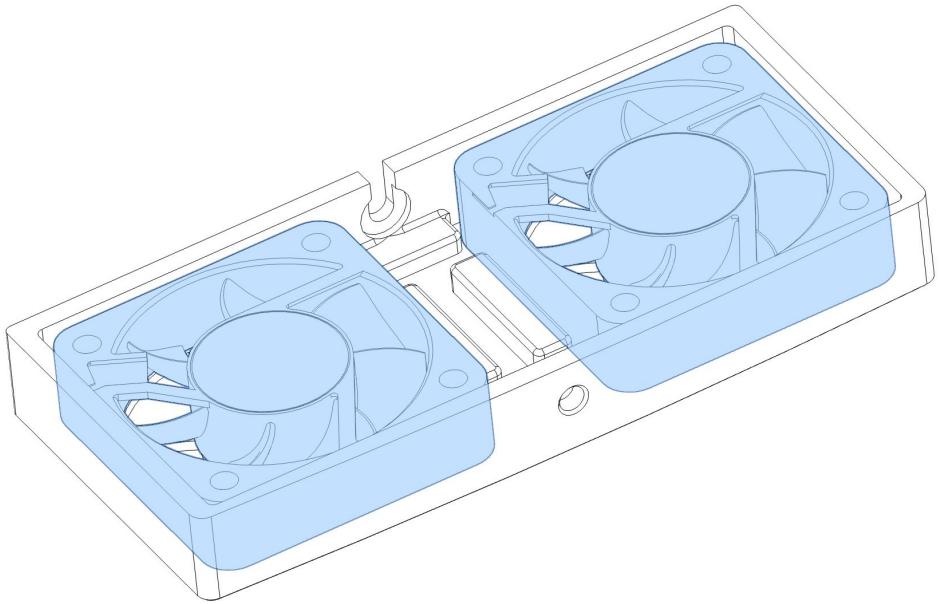


WIFI HOLES

These holes are provided to allow you to mount an external WiFi antenna if you wish for improved reception.

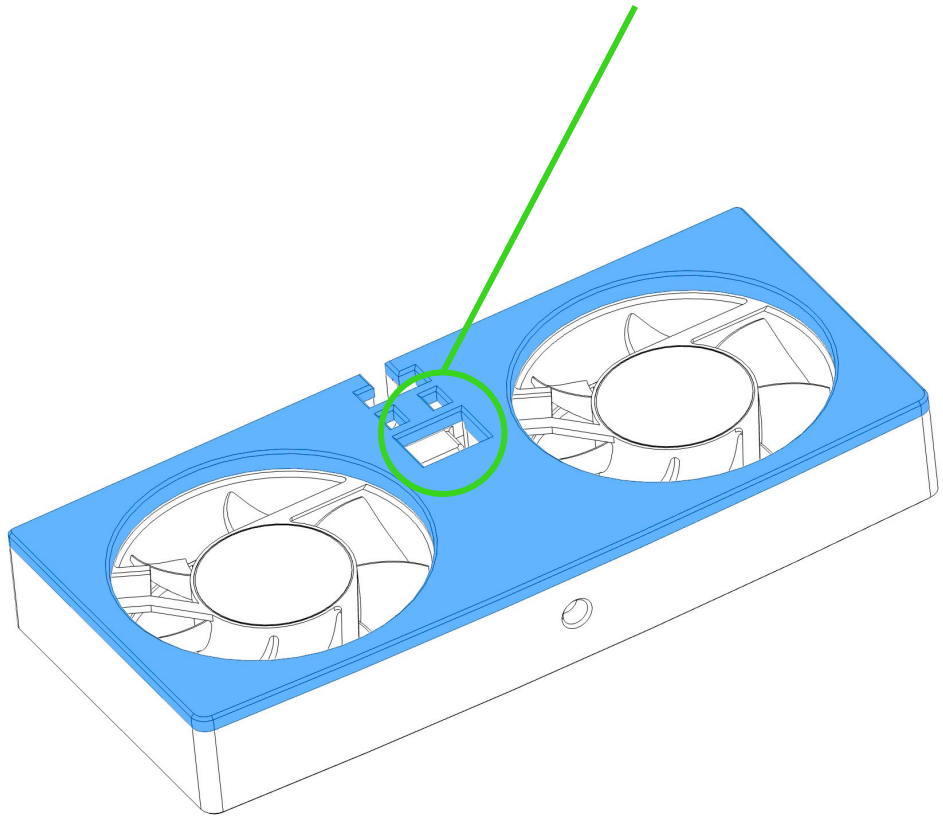


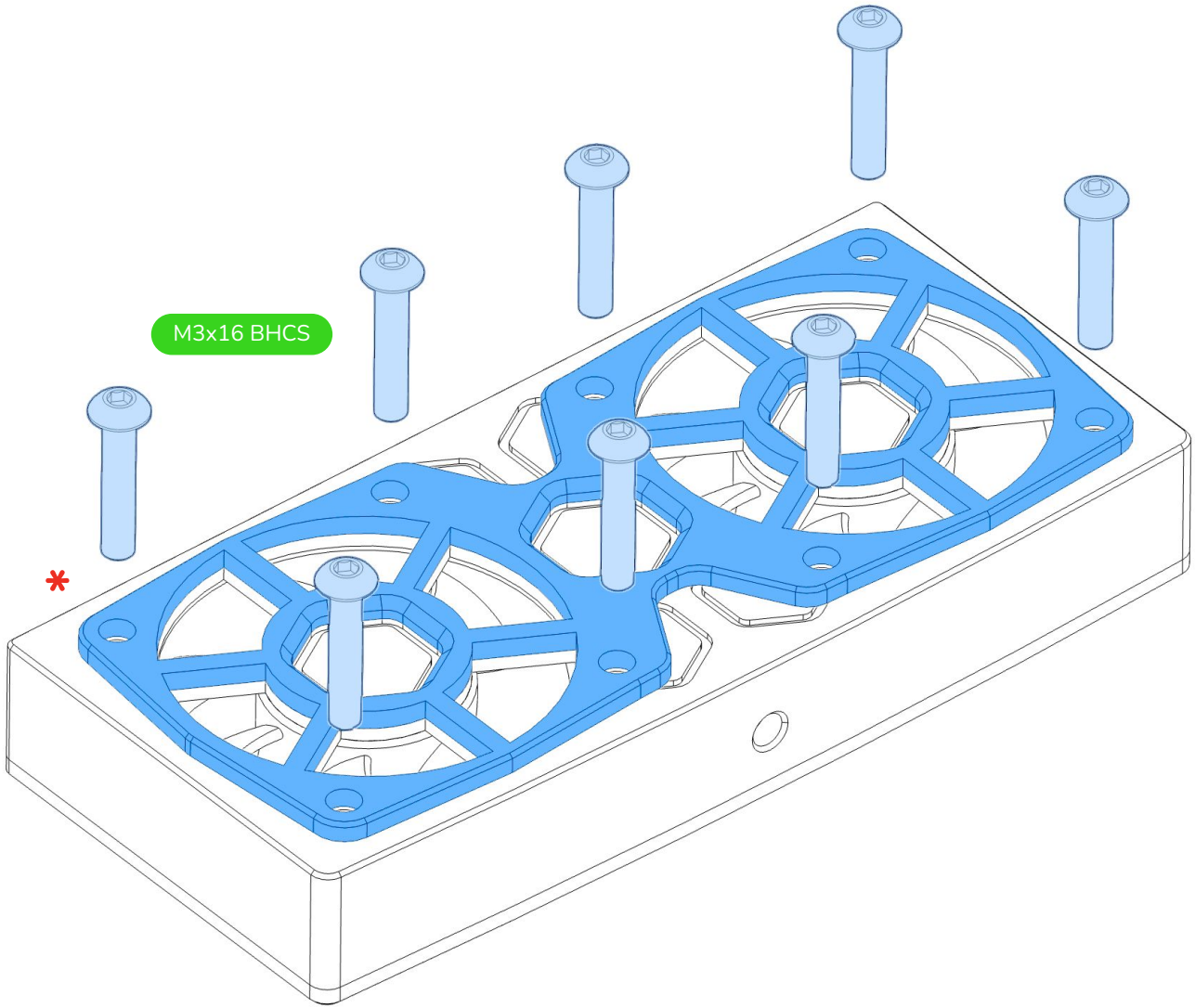

4010 Fan

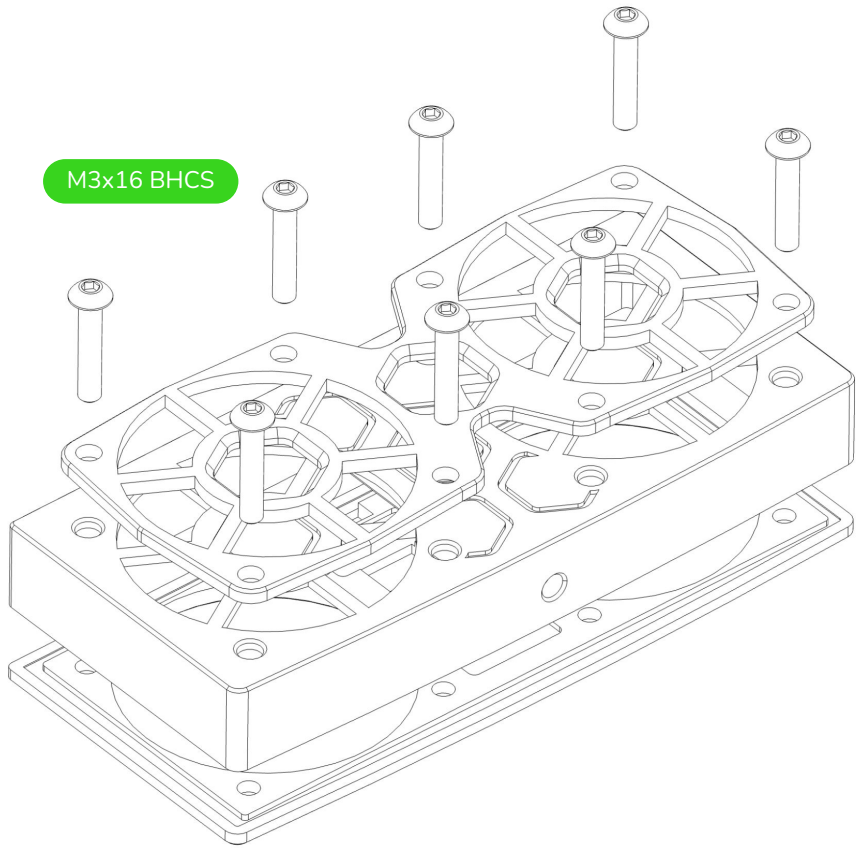


HOLE FOR FAN WIRES

Use this hole to route the wires from the fans out, and the small cutouts above it for a zip tie to hold the wires in place as a strain relief.




M3x16 BHCS
*

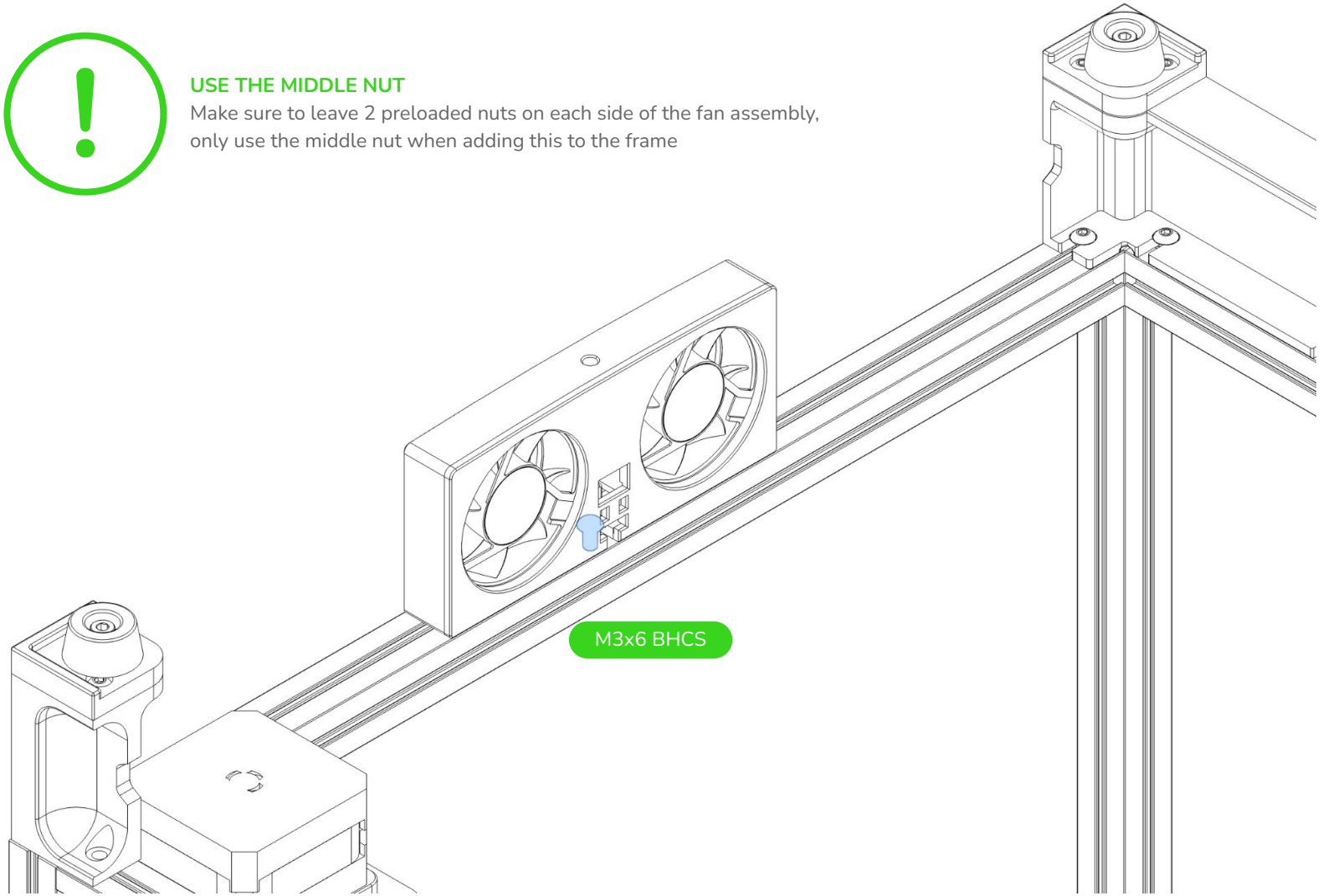


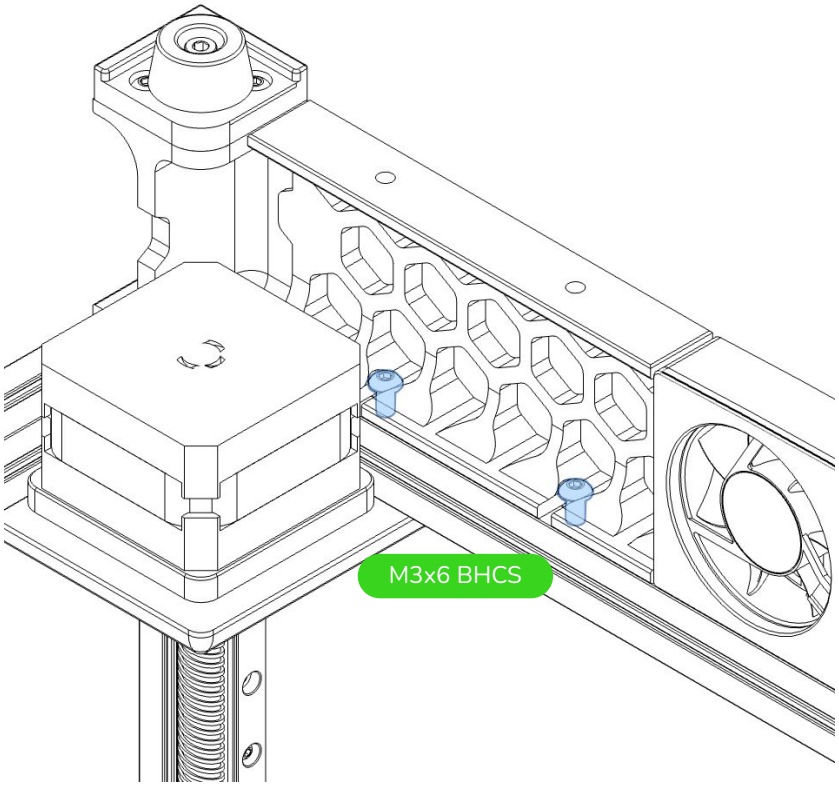
ONCE OR TWICE?

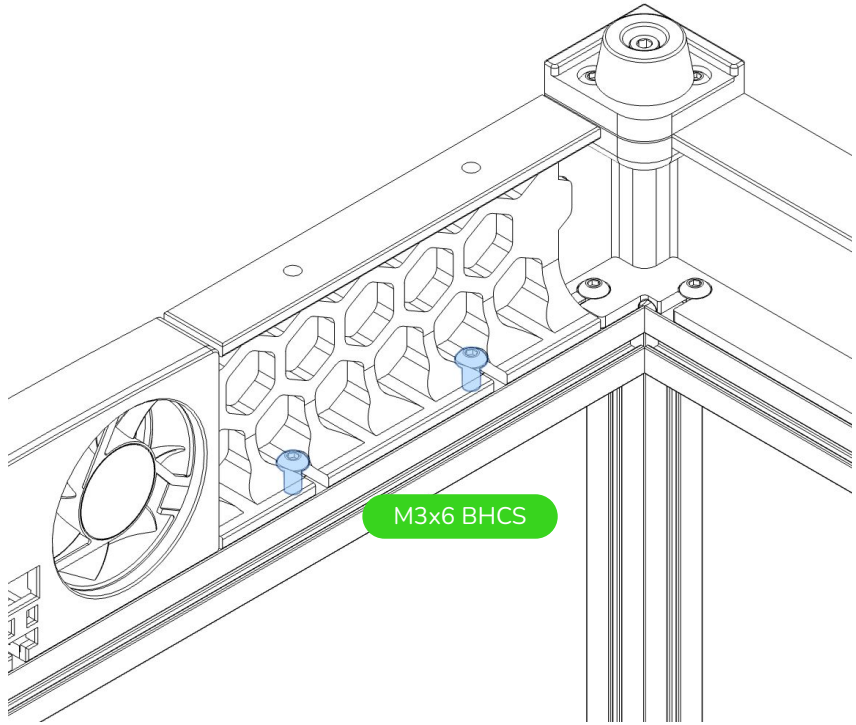
The standard design for the printer only requires fans on one side, but you can add extra fans to the opposite side if you wish. If you only want to use the standard 2 fans, just assemble the second fan holder without the fans as shown here.

USE THE MIDDLE NUT

Make sure to leave 2 preloaded nuts on each side of the fan assembly, only use the middle nut when adding this to the frame




M3x6 BHCS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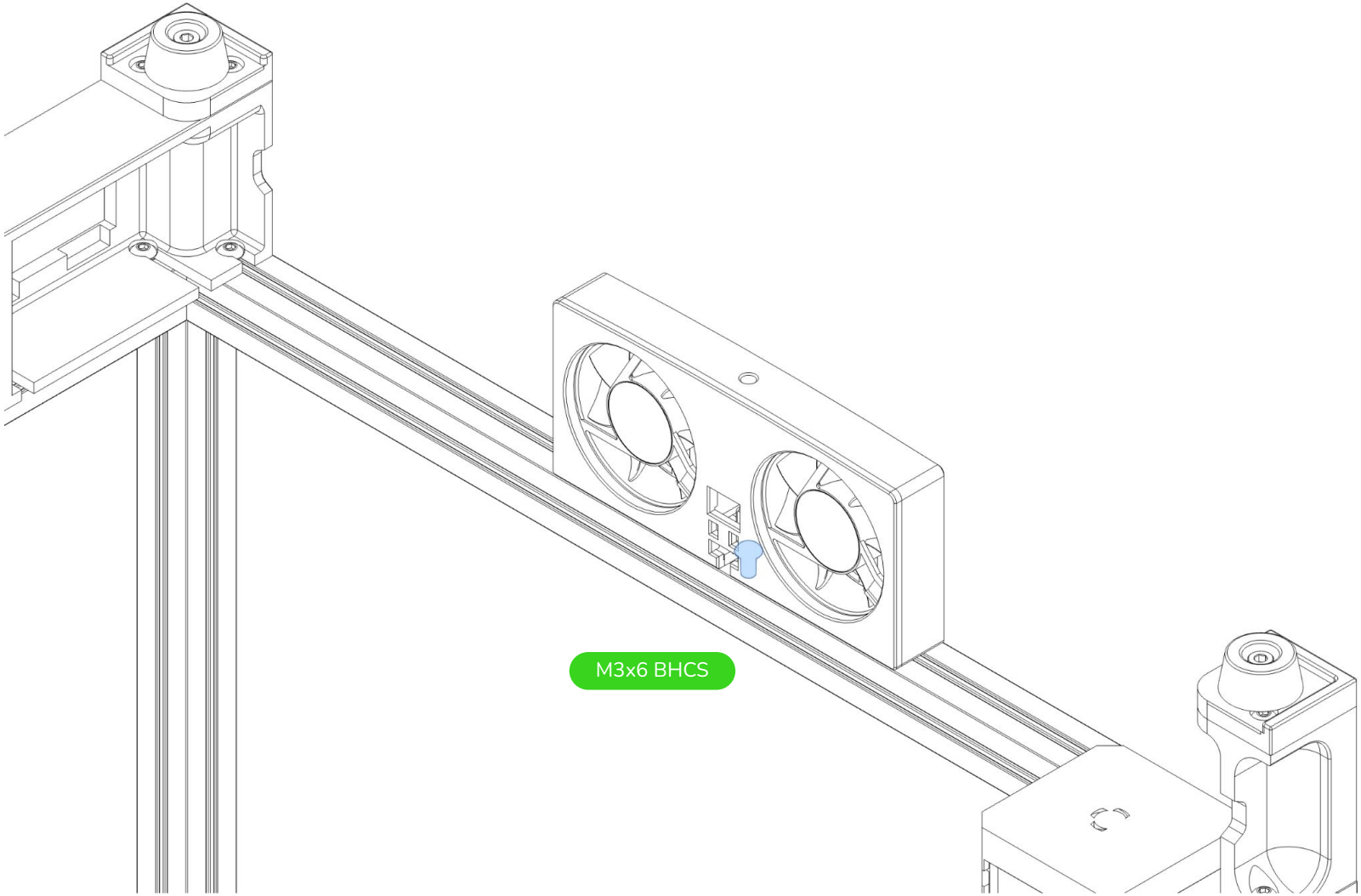
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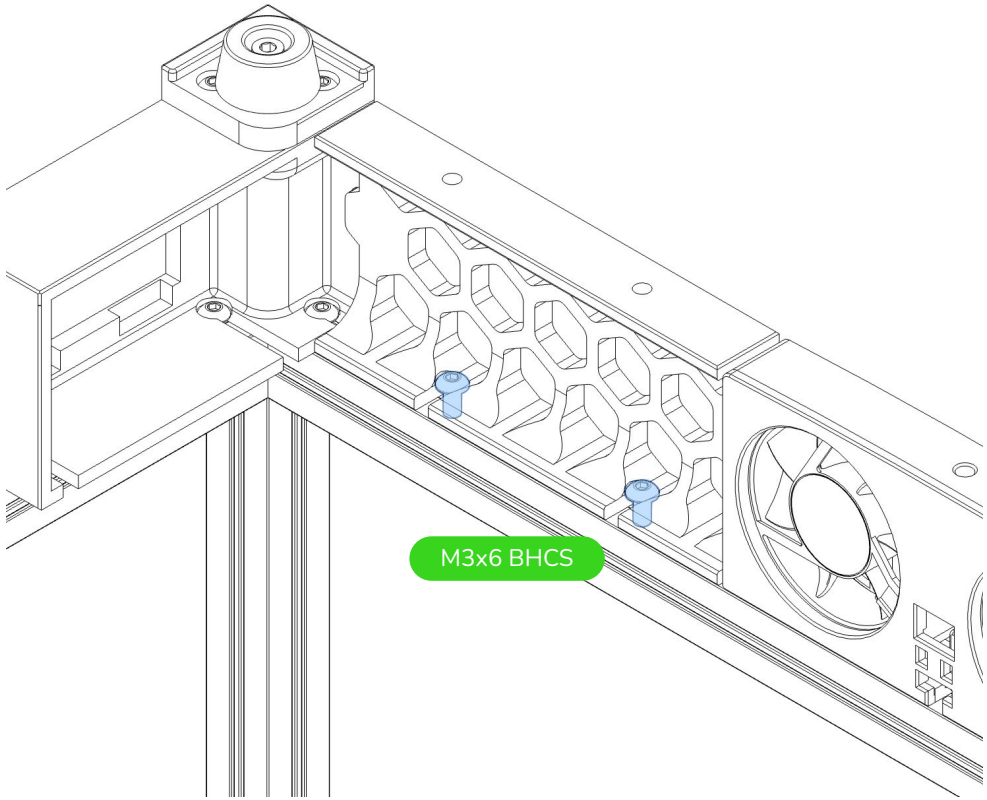
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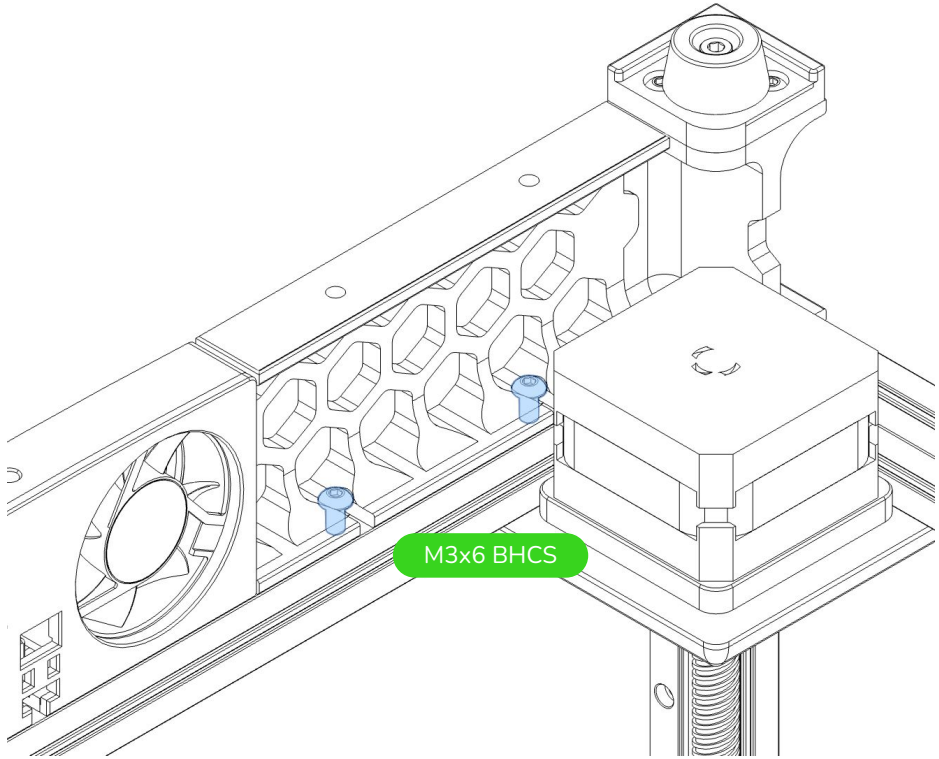
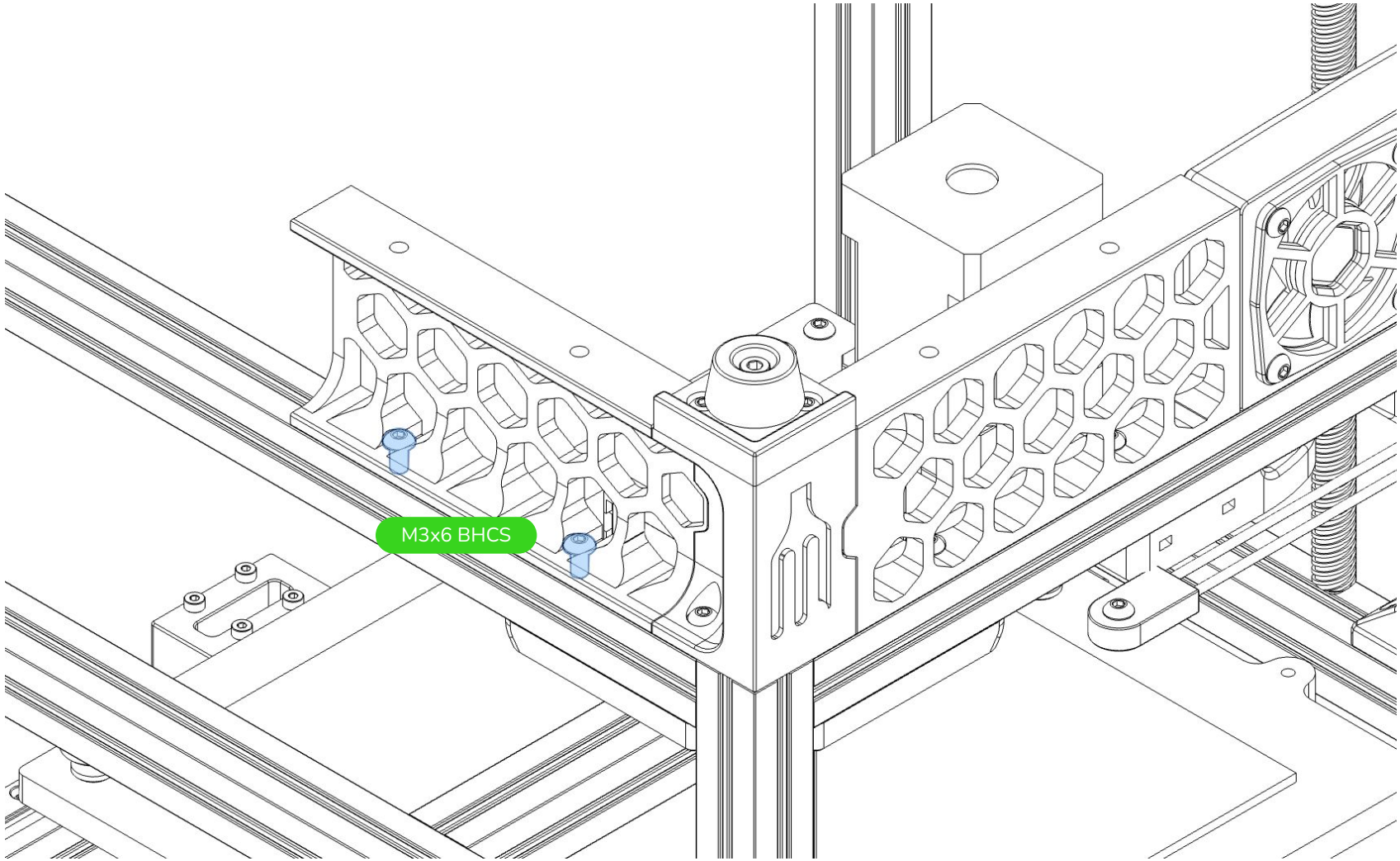
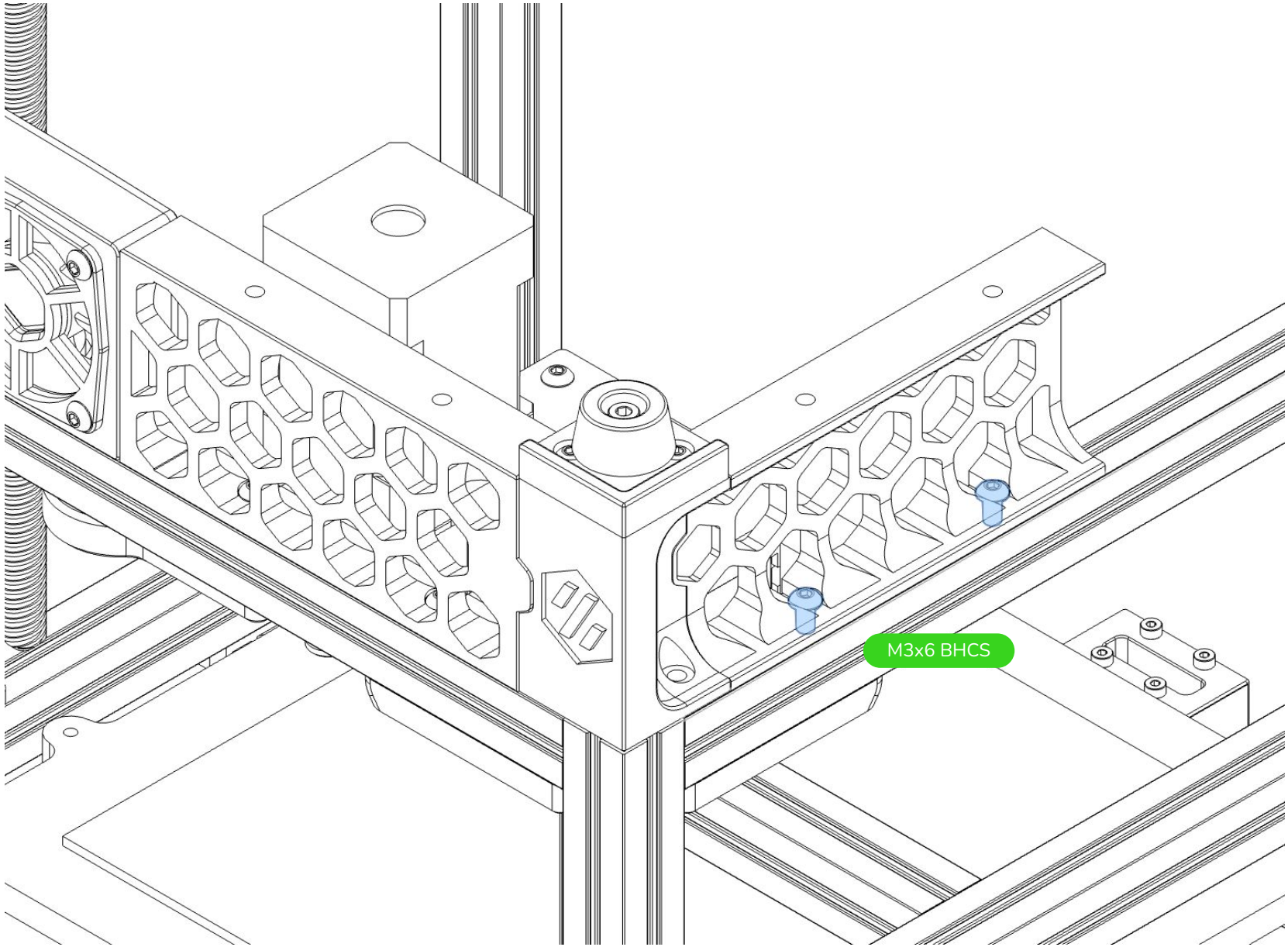
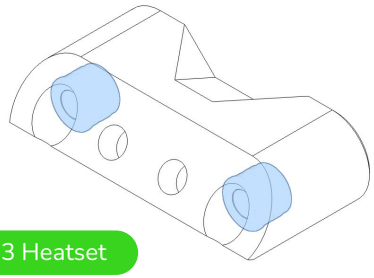
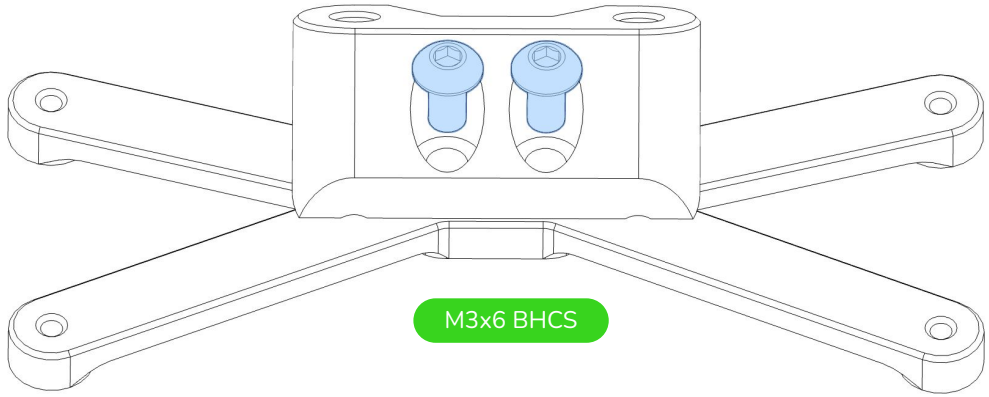

M3x6 BHCS


M3x6 BHCS


M3x6 BHCS



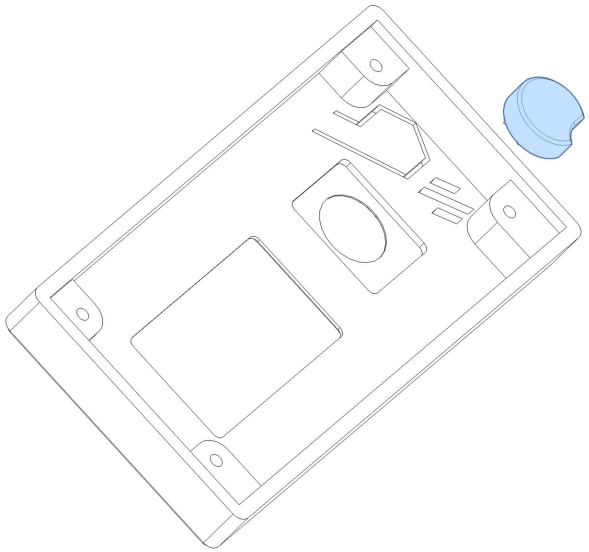
M3 Heatset



M3x6 BHCS

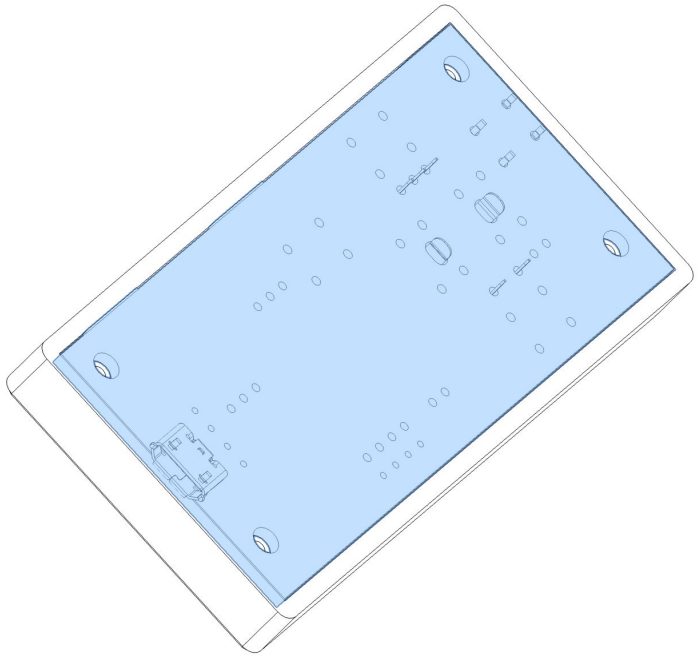
USING A DIFFERENT DISPLAY?

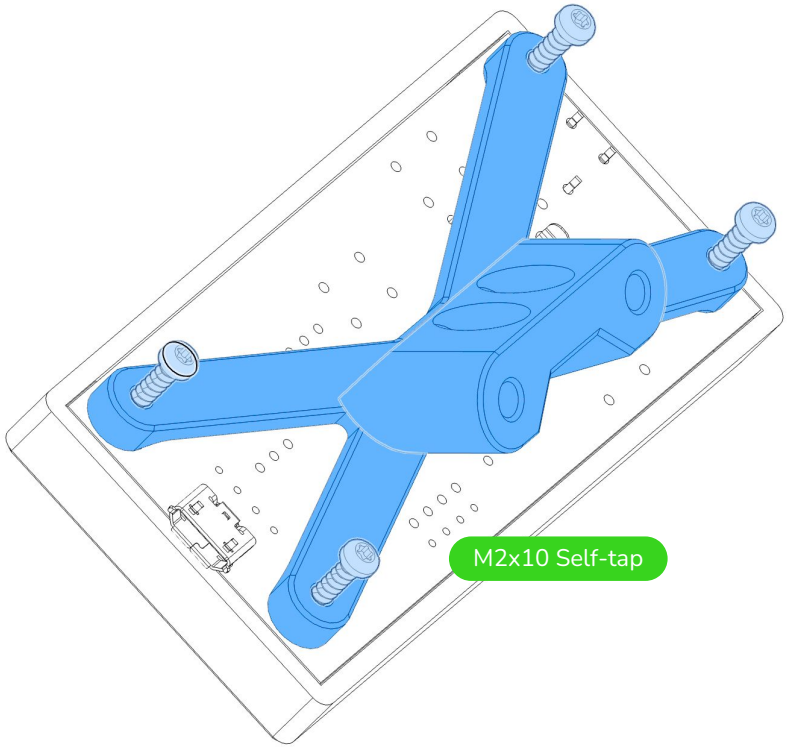
These instructions are for the stock mini-display, but the mounting setup was designed to be modular. Just swap out these parts with ones suited for the display you are using, check the mods sites for ones the community has created!



THE DIFFUSER

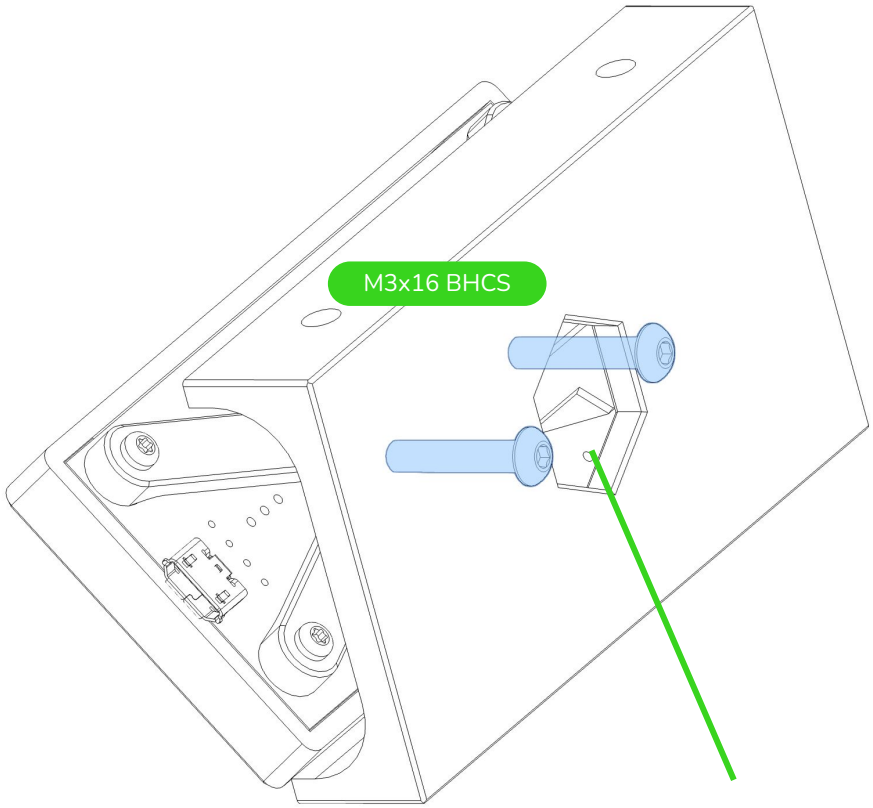
Just set the diffuser piece in place for this step, there are no screws or fasteners to retain it. It will be held in place by the display circuit board in the next steps.

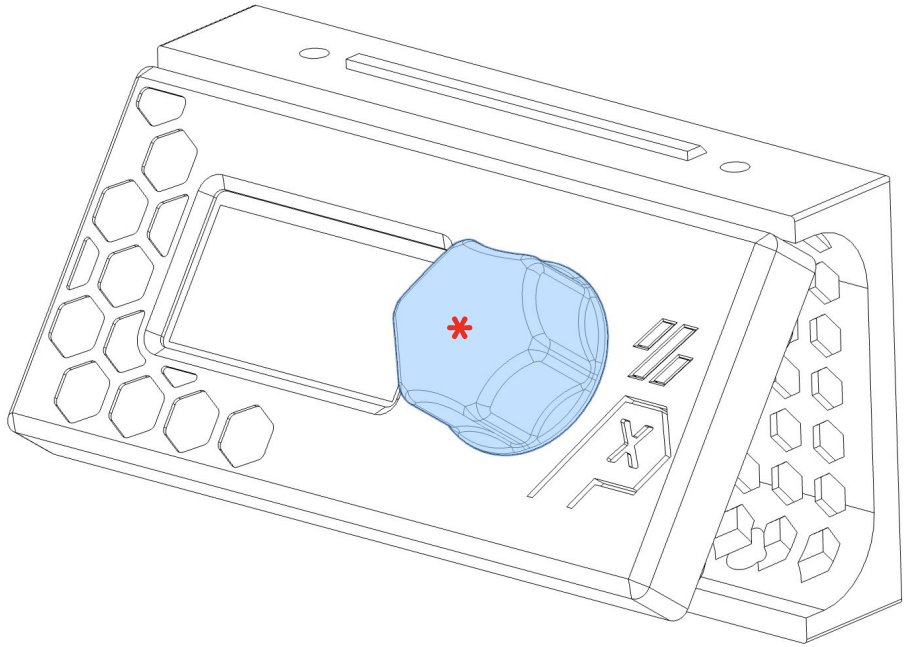




SELF-TAP SCREWS

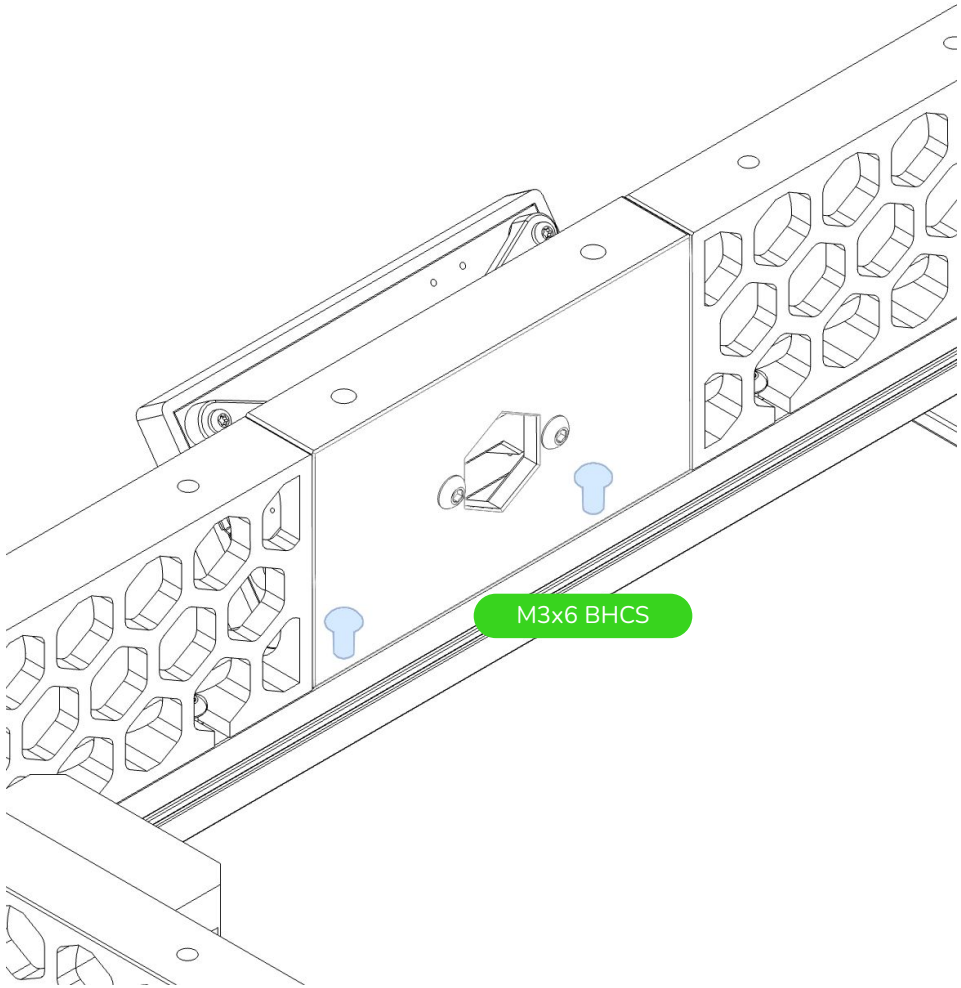
Don’t over-tighten these as they can crack the plastic parts. Just enough to snug everything together will be perfect.





WIRE ACCESS

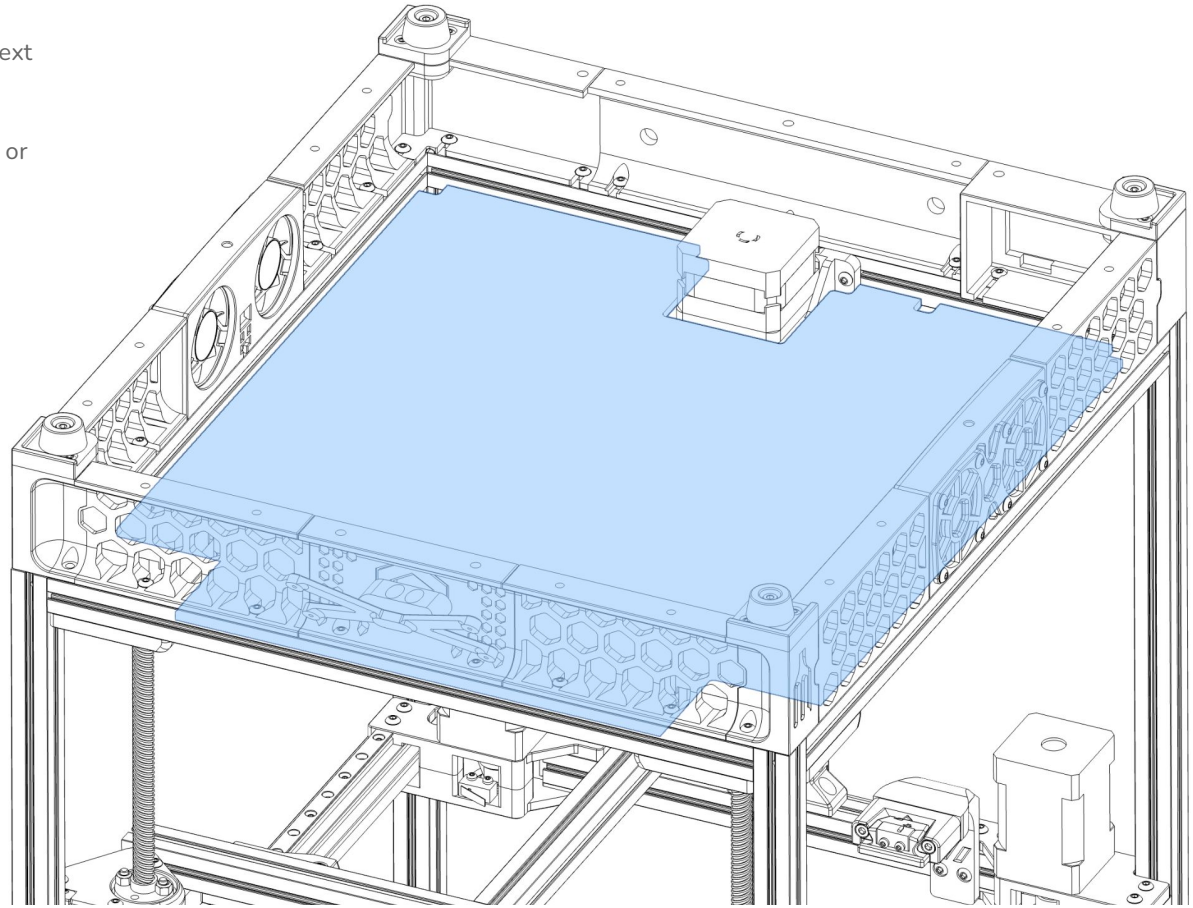
There is a hole in this skirt piece for you to run the display wires through.


M3x6 BHCS

INVERT THE PRINTER

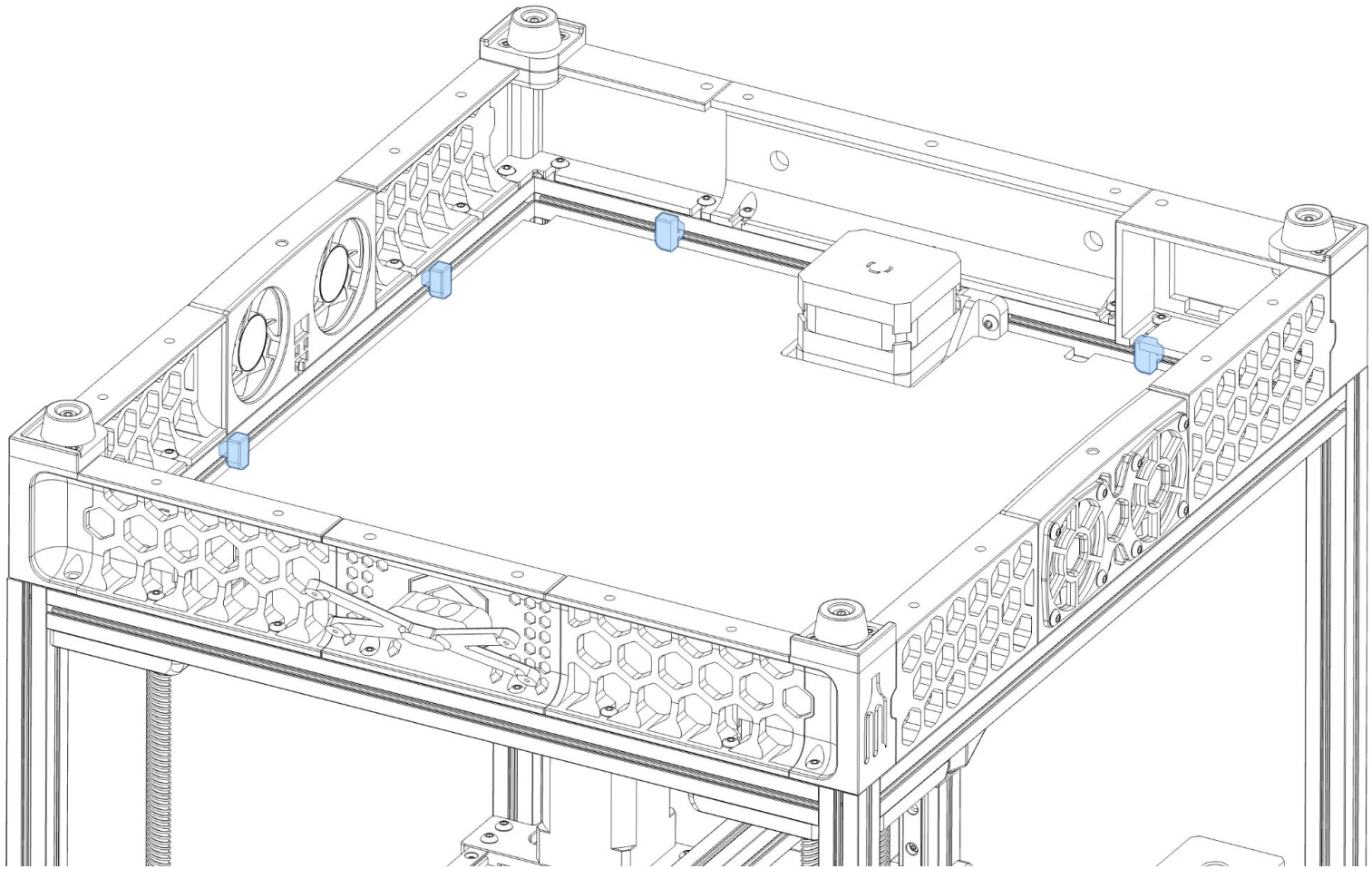
Invert the printer again, and set the deck plate in place. It will rest against the Z motor mounts and we'll anchor it in place over the next few steps.

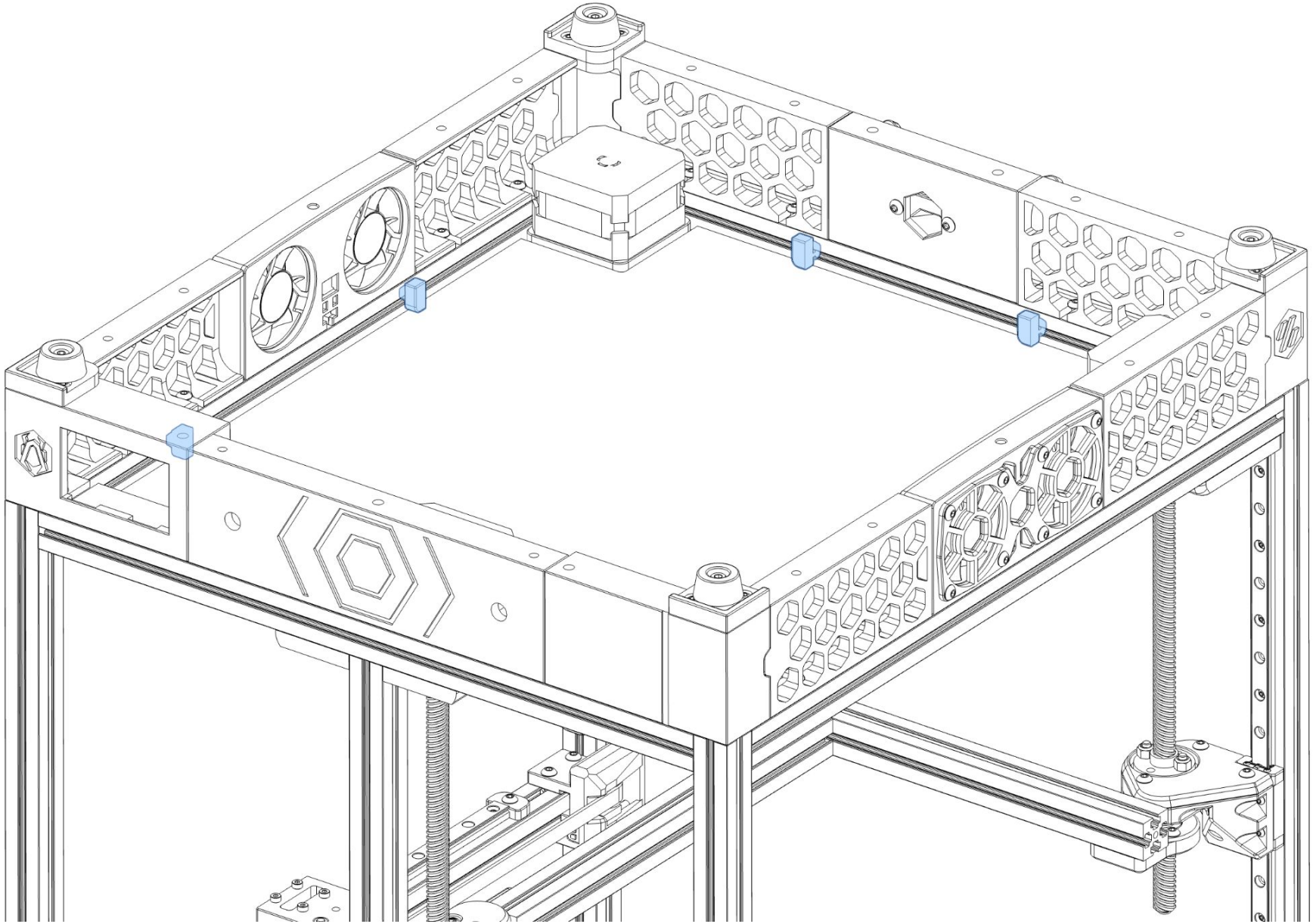
Depending on your z stepper motors, you may need to loosen one or more of them temporarily to fit the deck plate into position.

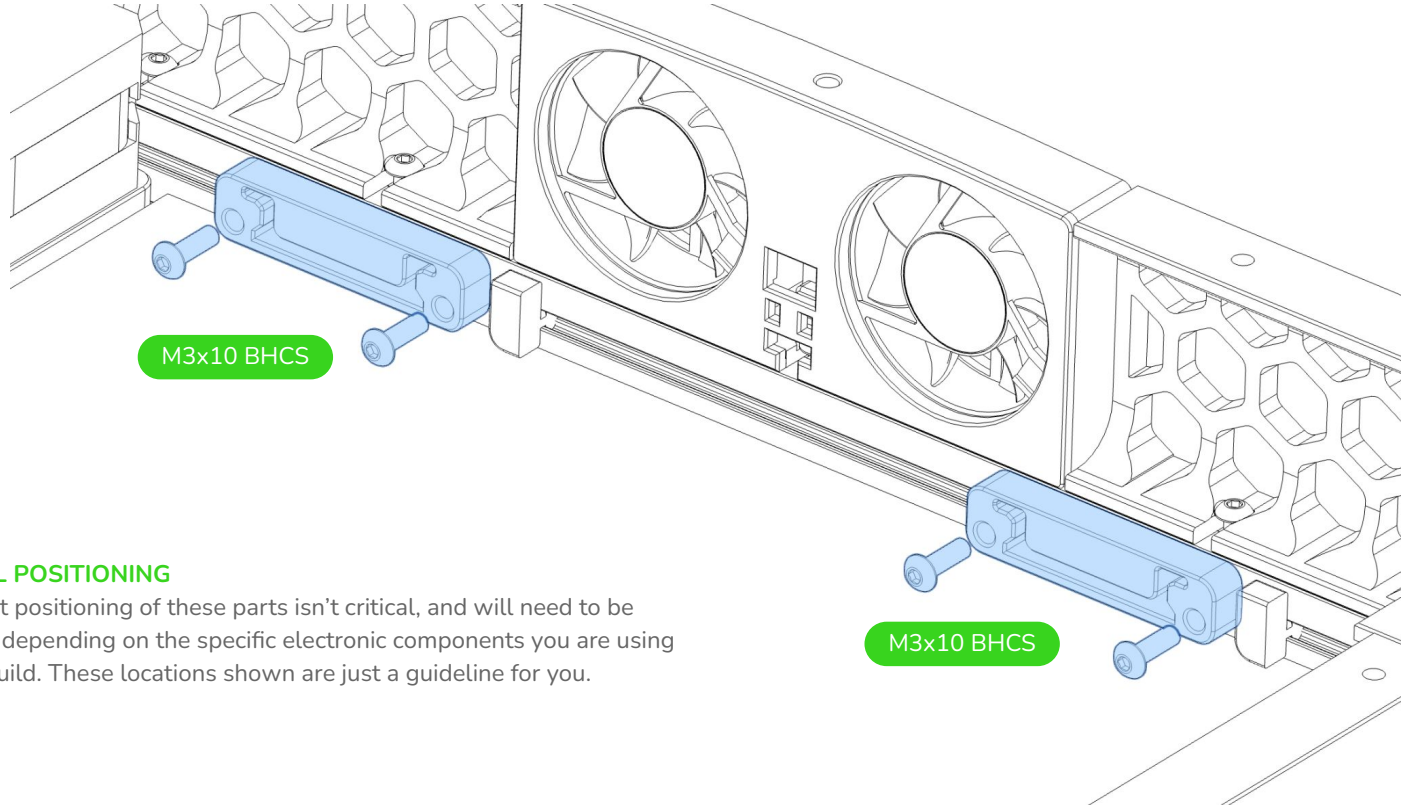


INVERT THE PRINTER

Use the printed deck supports to anchor the deck in place. Add them to the extrusion and twist them clockwise to lock them in place.

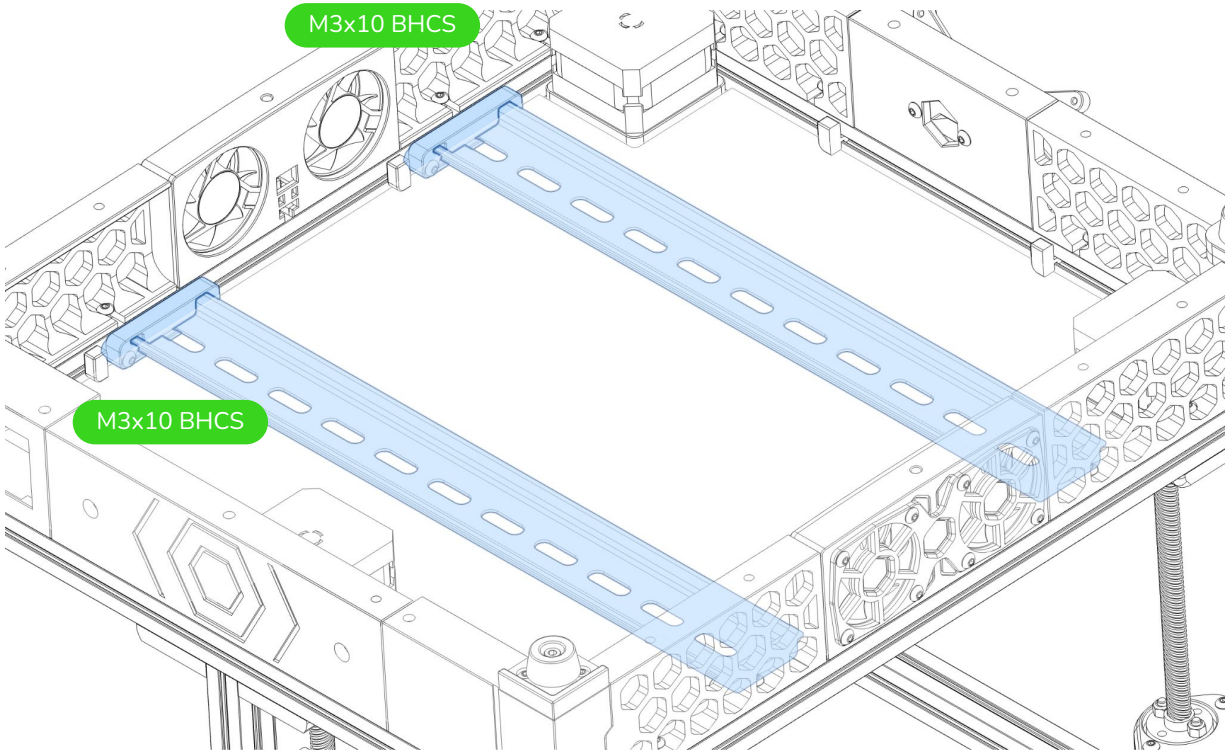






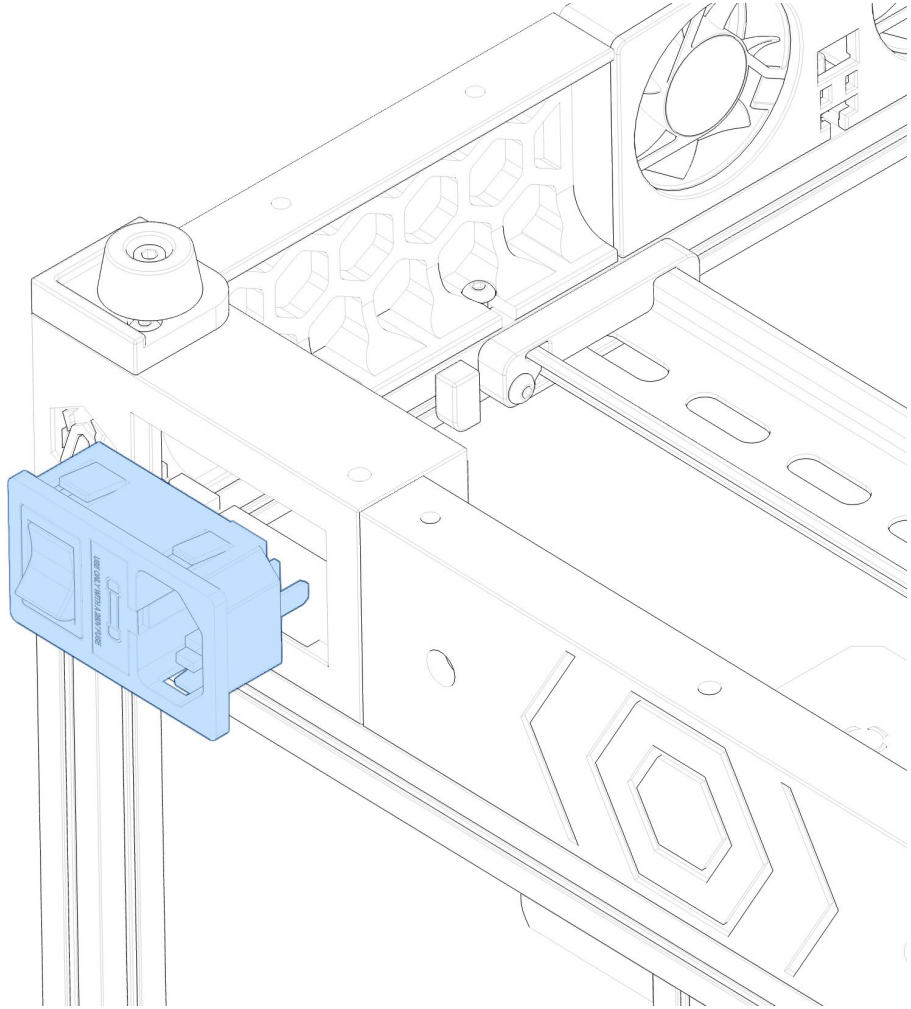
DIN RAIL POSITIONING

The exact positioning of these parts isn't critical, and will need to be adjusted depending on the specific electronic components you are using in your build. These locations shown are just a guideline for you.



DIN RAIL INSTALLATION

Slide the DIN rails into the second set of mounting pieces before screwing everything down.



POWER INLET

The inlet mounts with integrated clips, no additional hardware is needed here. Just slide the inlet in until it clicks into place.

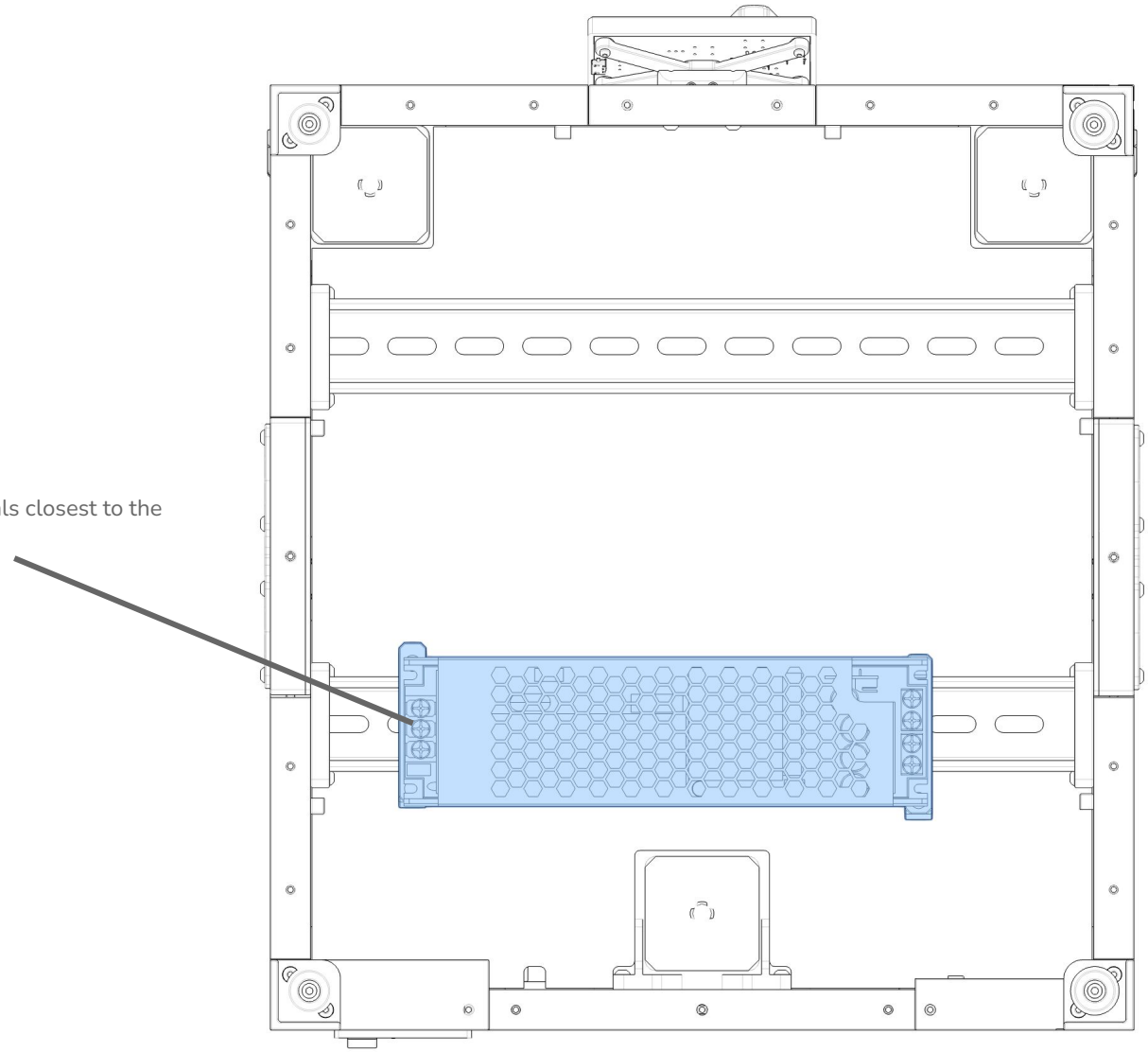
ELECTRONICS INSTALLATION

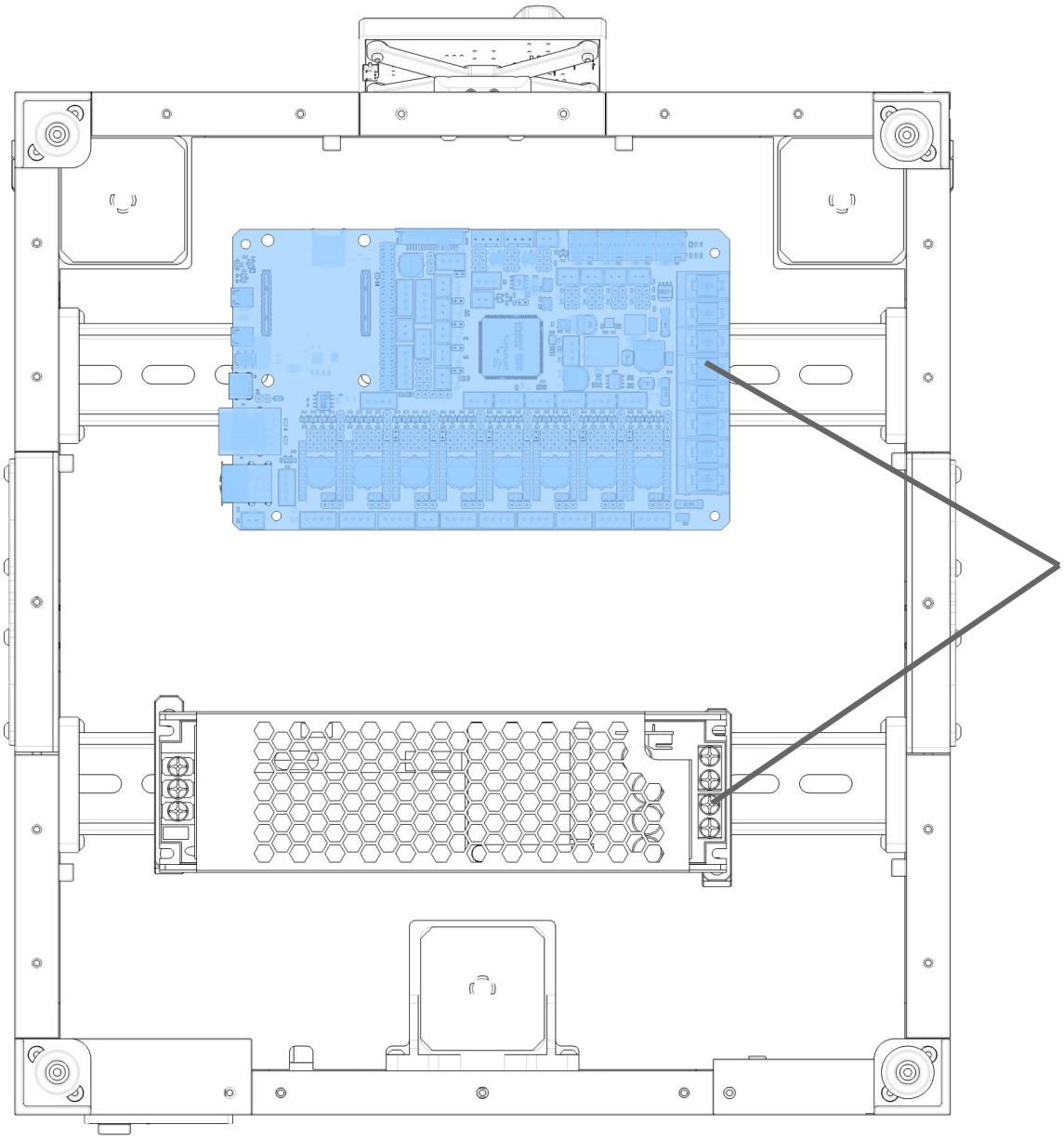
The next few steps show a *sample* installation of the electronics, using a UHP-200 power supply and a Manta M8P MCU. These are for example only, and different components will require different positioning and mounting hardware.

For that reason, there is no mounting hardware called out in the next steps, that will depend on the specific hardware and DIN mounting components you use on your build.

AC/DC SIDES

Mount your power supply with the AC input terminals closest to the power inlet



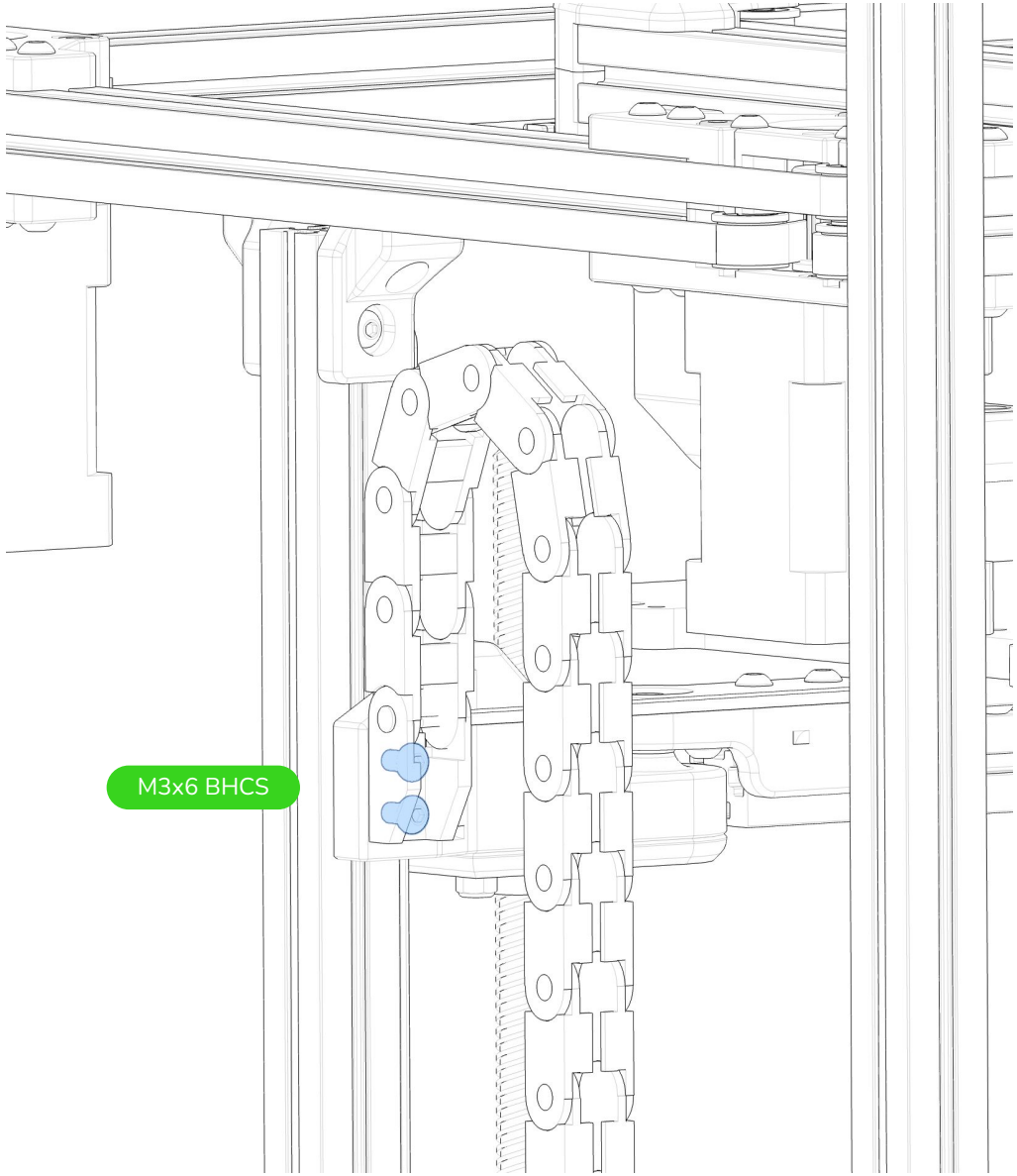


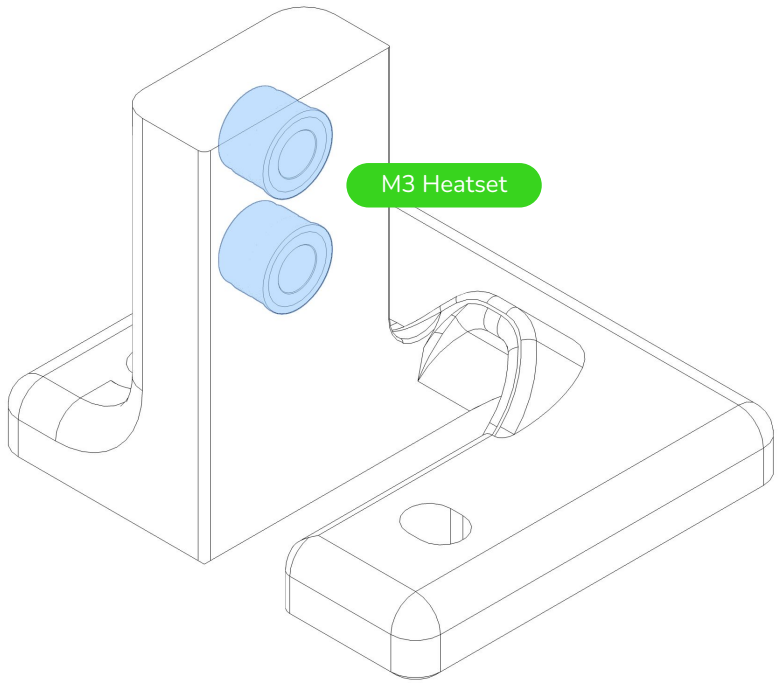
POWER INPUTS

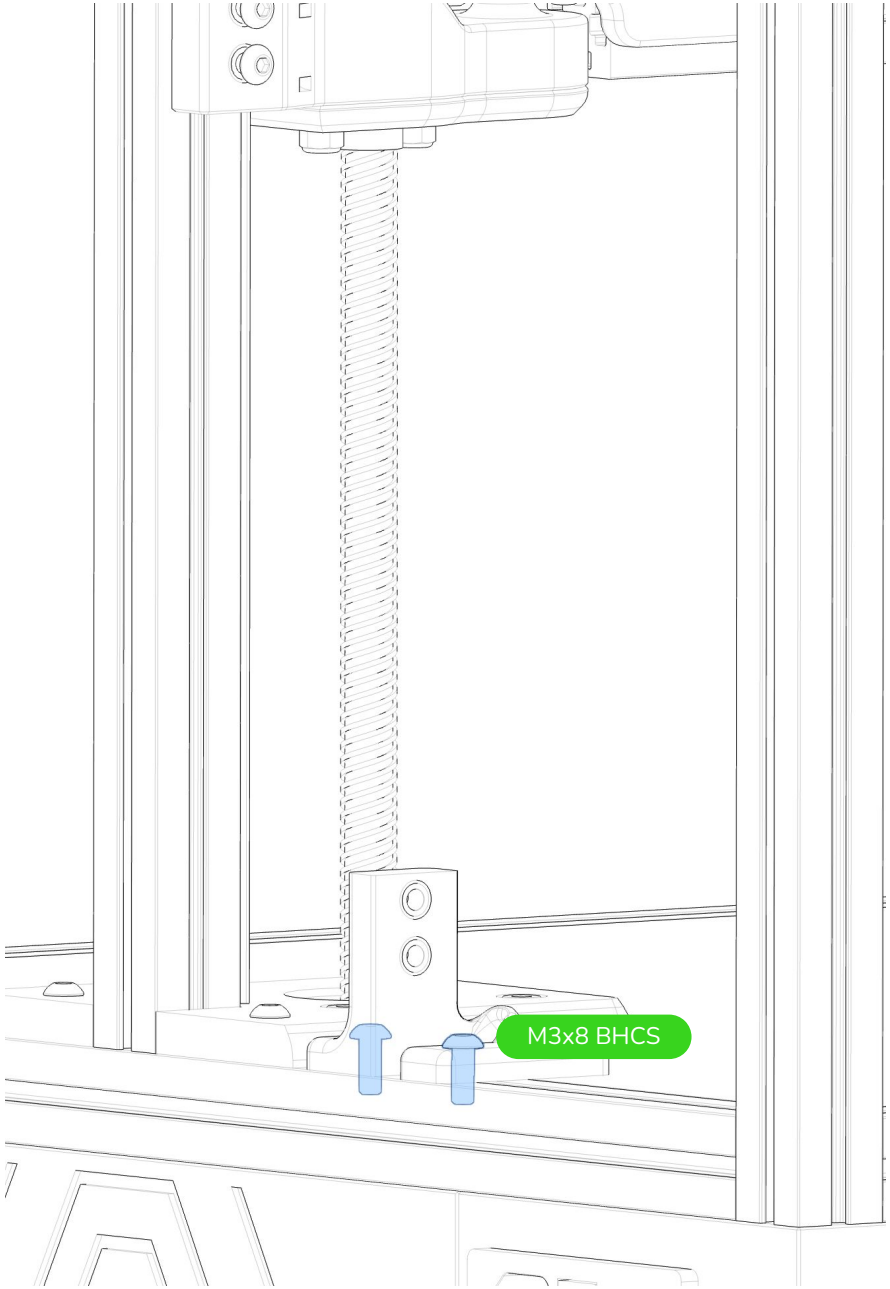
If the design of your MCU board allows, it's easier to do the wiring if the DC inputs of the MCU are on the same side of the printer as the DC outputs of your power supply.

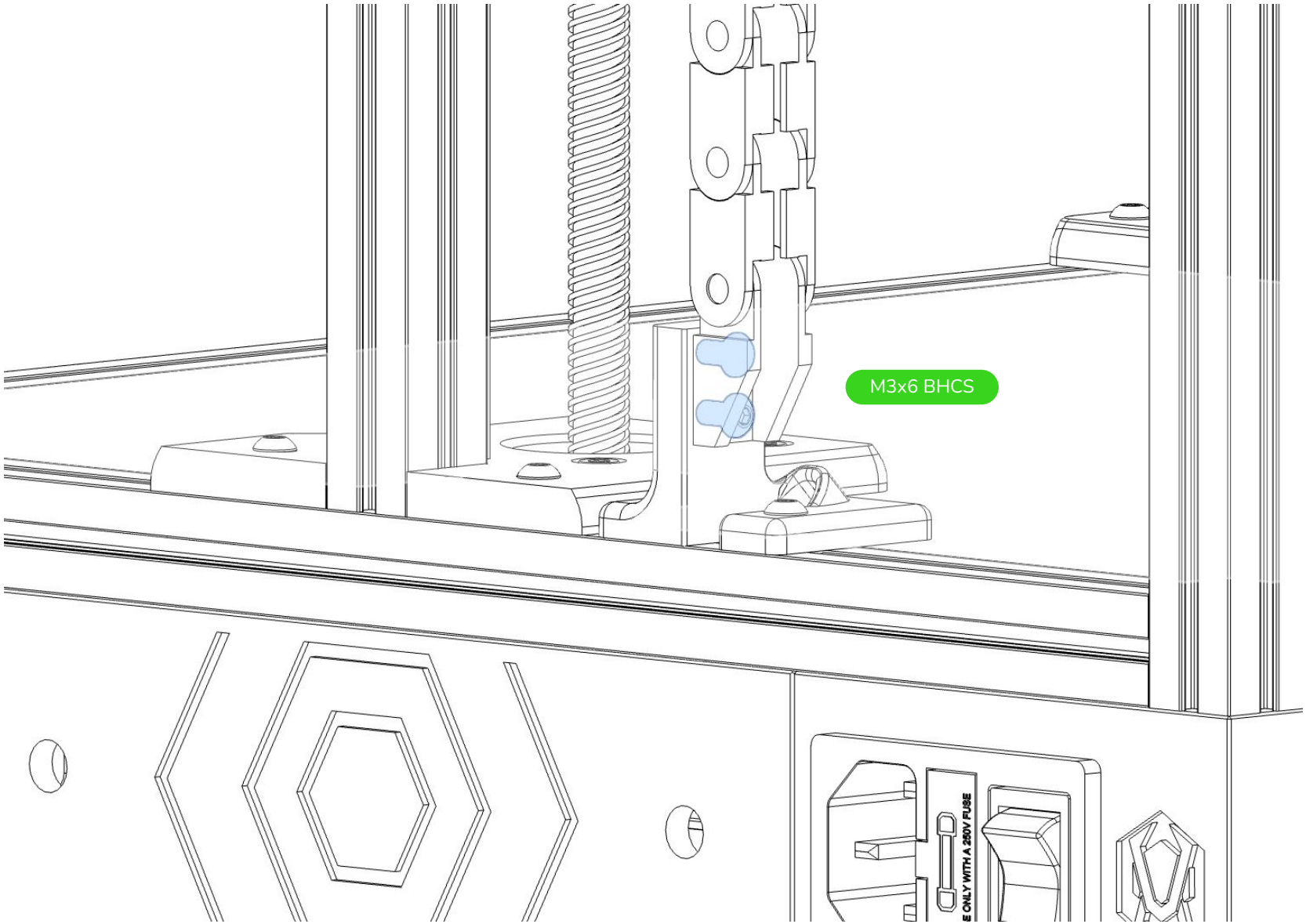
BED WIRING

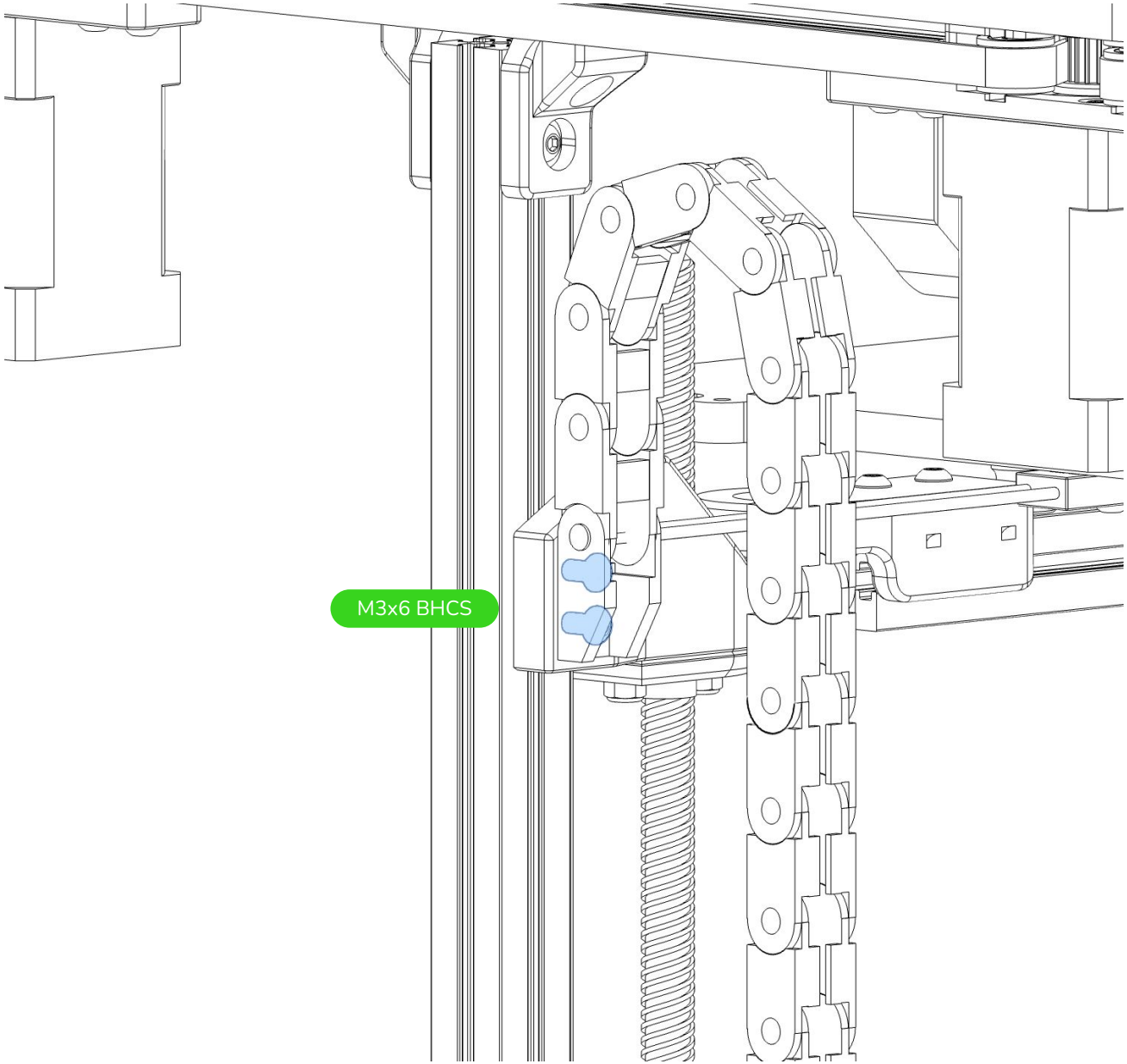
Run the wiring for the bed heater and bed thermistor through the cable chain here, then attach the chain to the rear Z carriage with screws.




M3 Heatset


M3x8 BHCS


M3x6 BHCS
E ONLY WITH A 250V FUSE


M3x6 BHCS

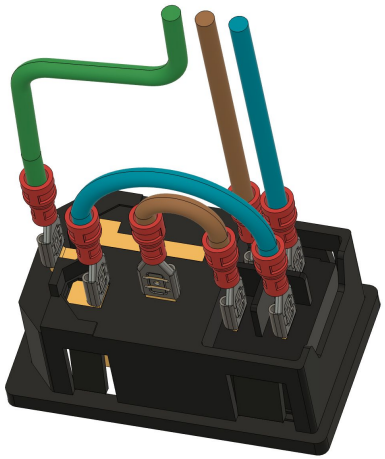
OTHER ELECTRONICS?

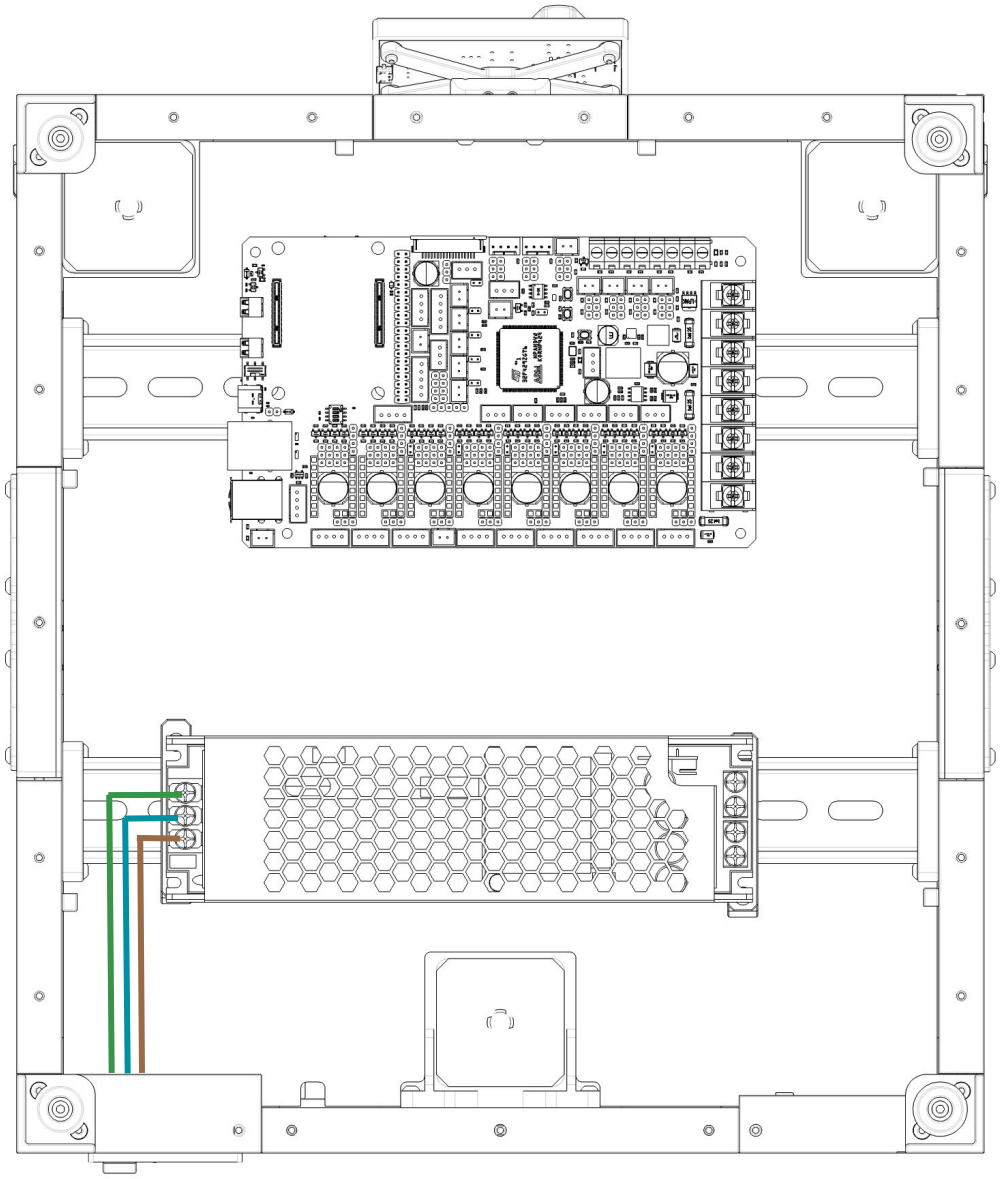
You may have other electronics components, such as a standalone Pi or a USB-to-CAN module. These can all be added to the electronics bay as needed.

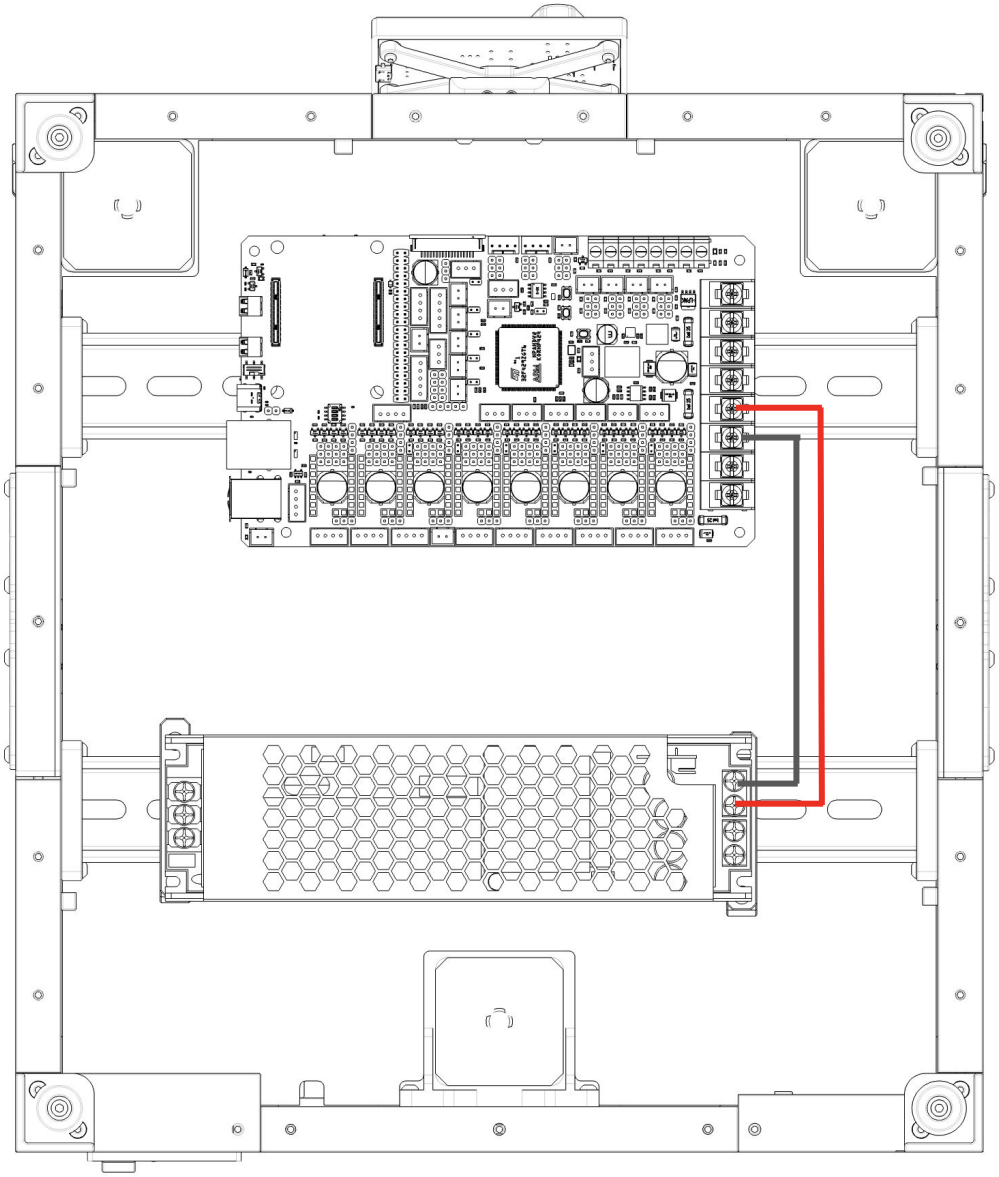
WIRING

AC is dangerous! Be sure to check your wiring and use proper wire gauge and coloring for your region.

This manual can't anticipate all scenarios, and you should always check with a local expert if you have any questions.



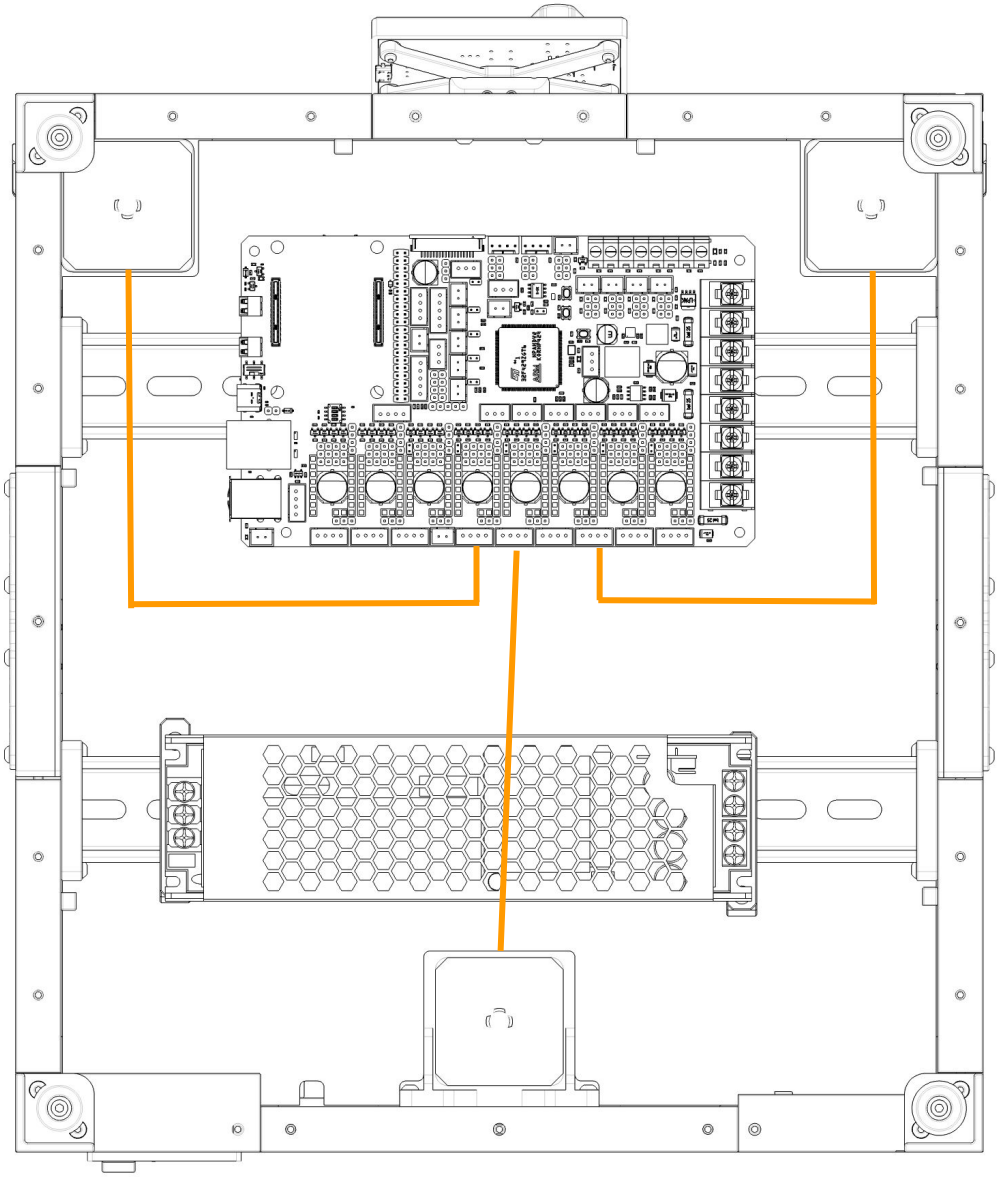




MORE WIRES?

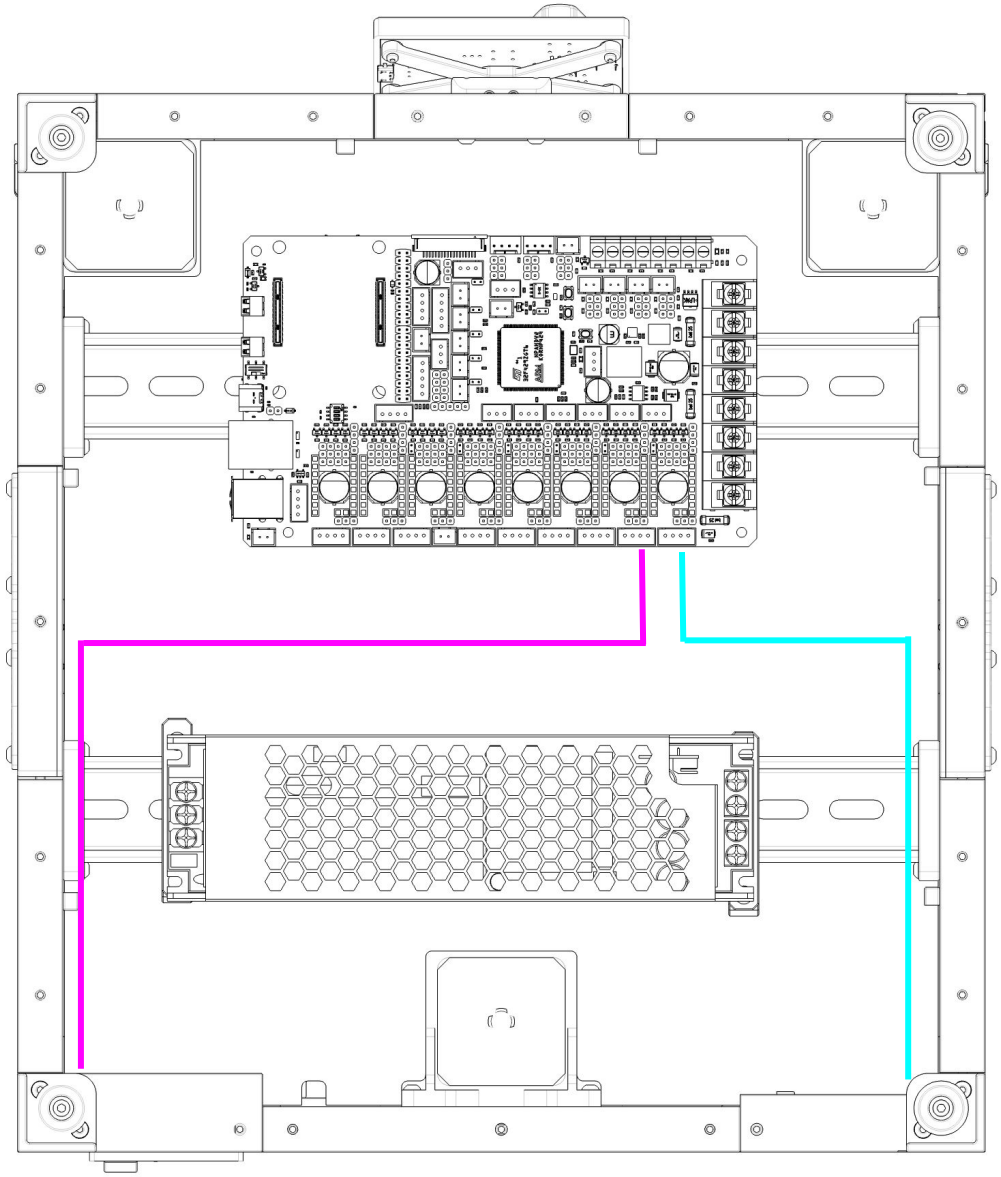
Wire additional pairs of wires to your MCU as required, only one pair of wires is shown here for clarity. If your MCU has separate bed power or hotend heater power input terminals, you should run wires to those as well.

Also verify the polarity of each connection, some MCU boards reverse the polarity of some of the input terminals.



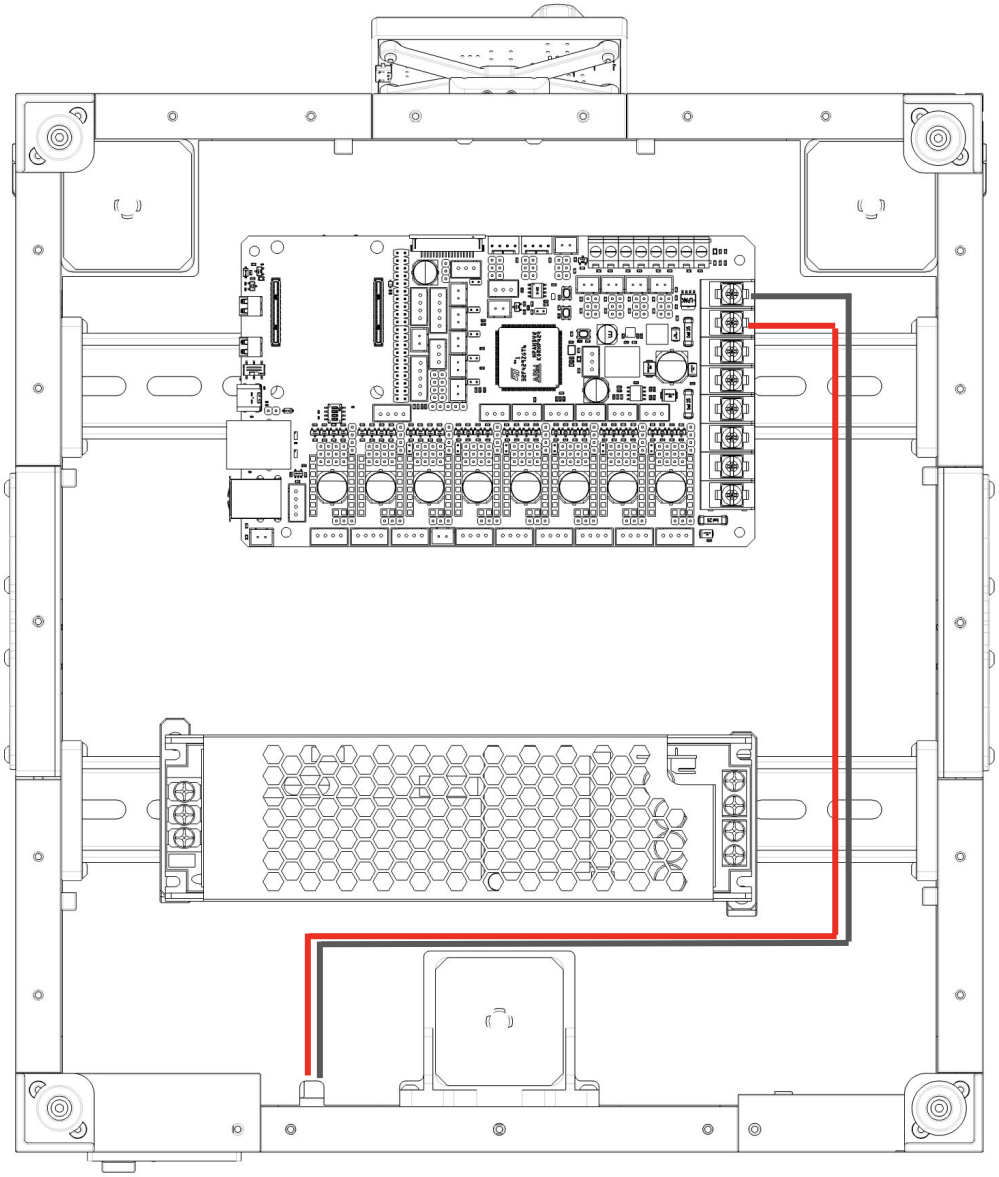
DOUBLE Z CONNECTION

Check your MCU documentation, some of them wire two outputs to a single Z stepper driver (for use in printers with 2 Z steppers that are linked to a single driver). If your board has that design, skip the extra output and shift the wiring over as appropriate.



GANTRY STEPPER WIRES

Route the wires from your gantry steppers down through the cutouts in the deck plate, and then run them to the board in the first two stepper slots.

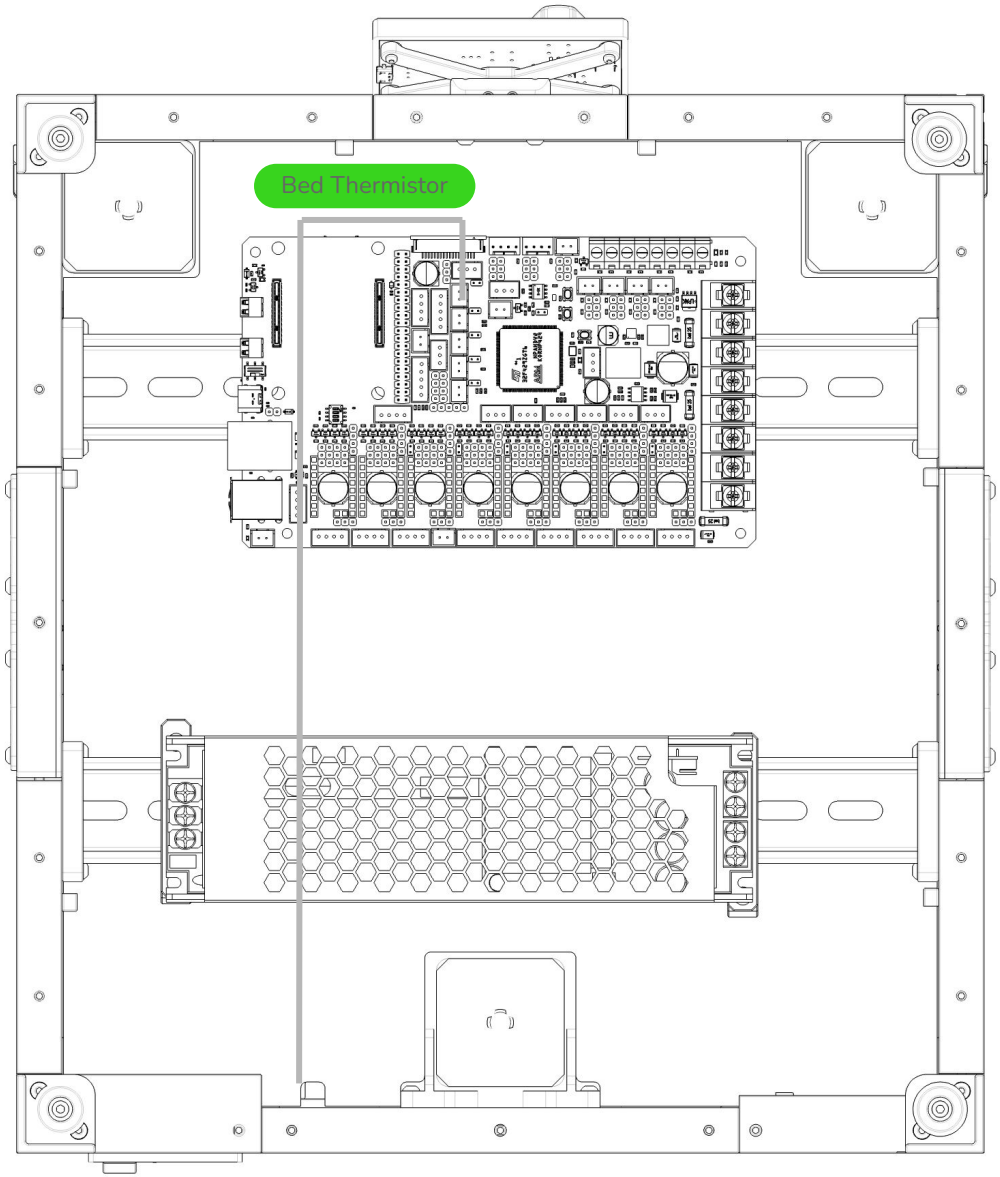


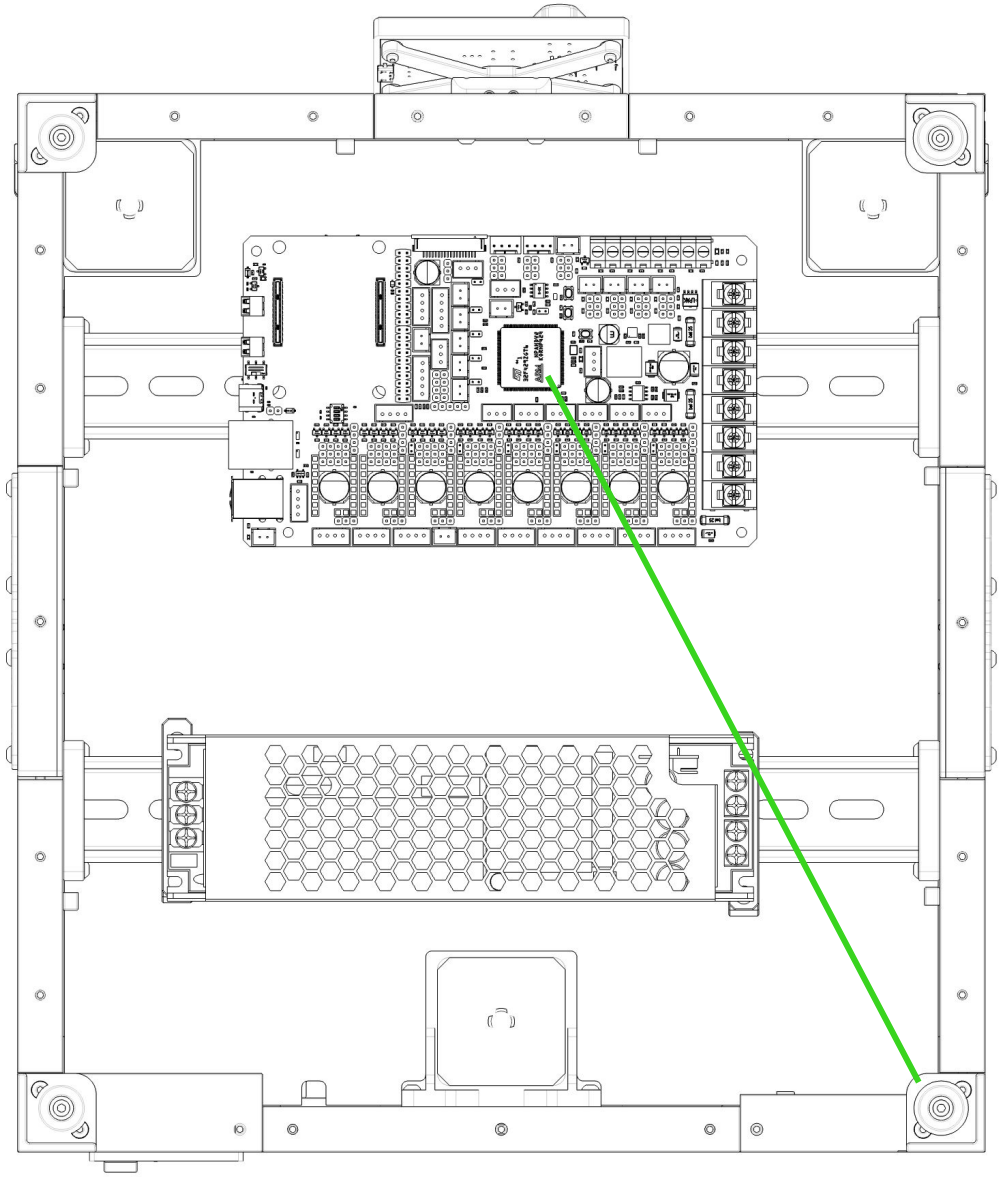
BED WIRES

If you are using a DC bed, run the bed wires to the BED_OUT (or equivalent) terminals on your MCU. These terminals have more powerful components designed to handle the power requirements of the bed heater.

If your MCU has a set of BED_IN (or equivalent) terminals, you need to run an additional set of wires from the power supply to those terminals, since that forms an isolated circuit on your MCU.

If you are using an AC bed, instead run the wires to the SSR and appropriate AC power junction (not covered in this manual).

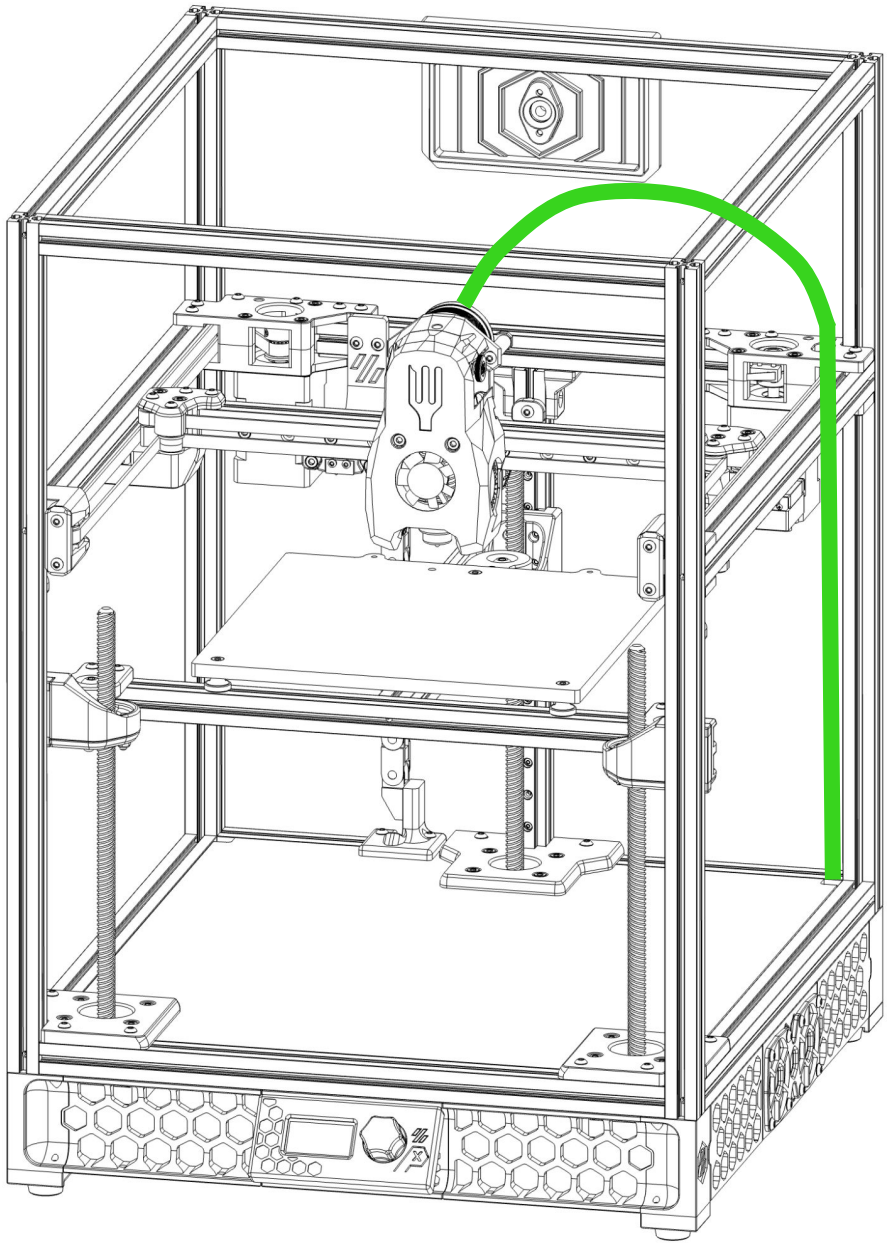

Bed Thermistor



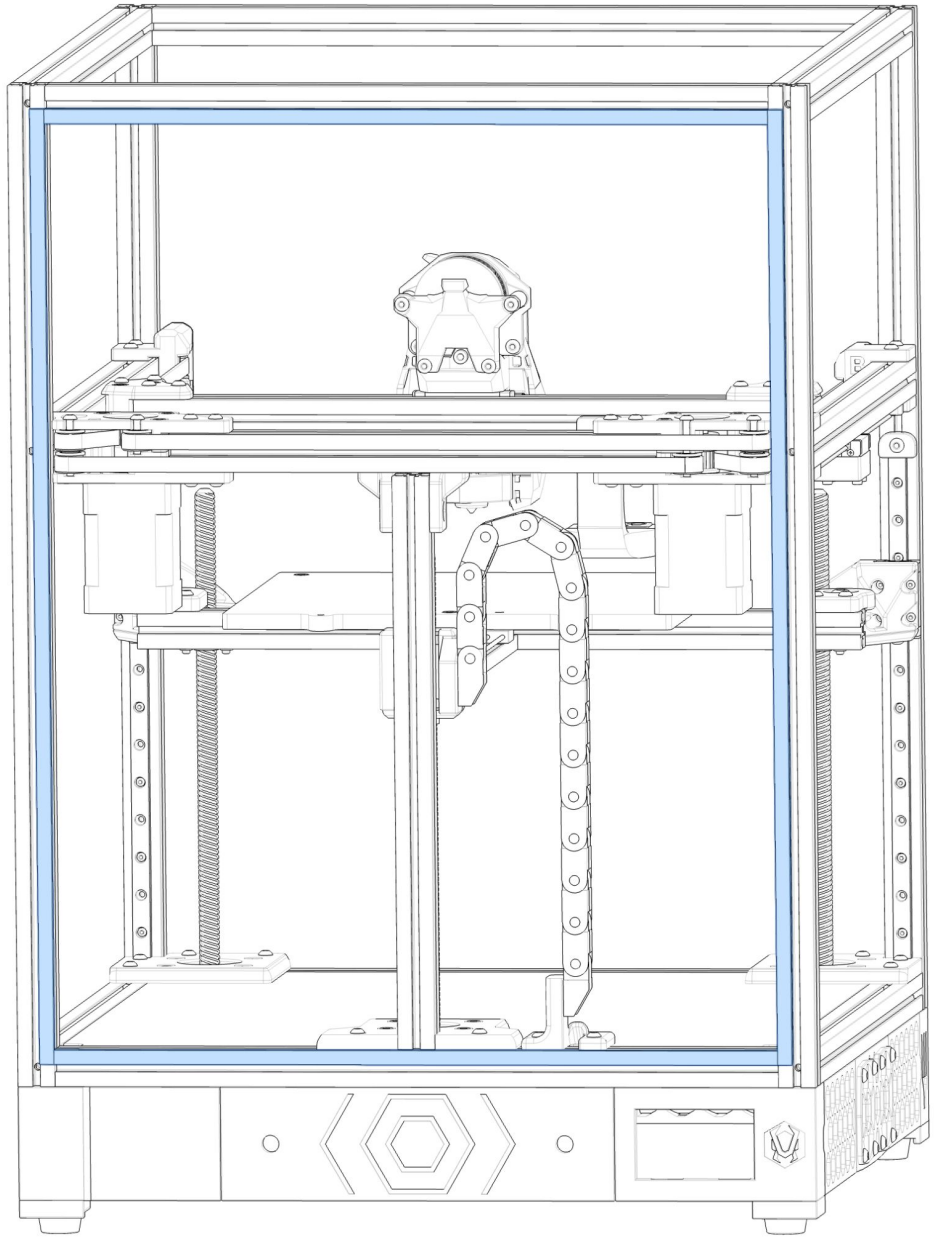
TOOLHEAD WIRES

Depending on your toolhead setup, you will either run a bundle of wires (for a toolhead breakout pcb) or a 4-wire CANBus or USB solution. In either case, the wiring will run through the deck in the corner pictured and up to the toolhead.

All of the existing wires previous to this step have been removed from this diagram for simplicity.



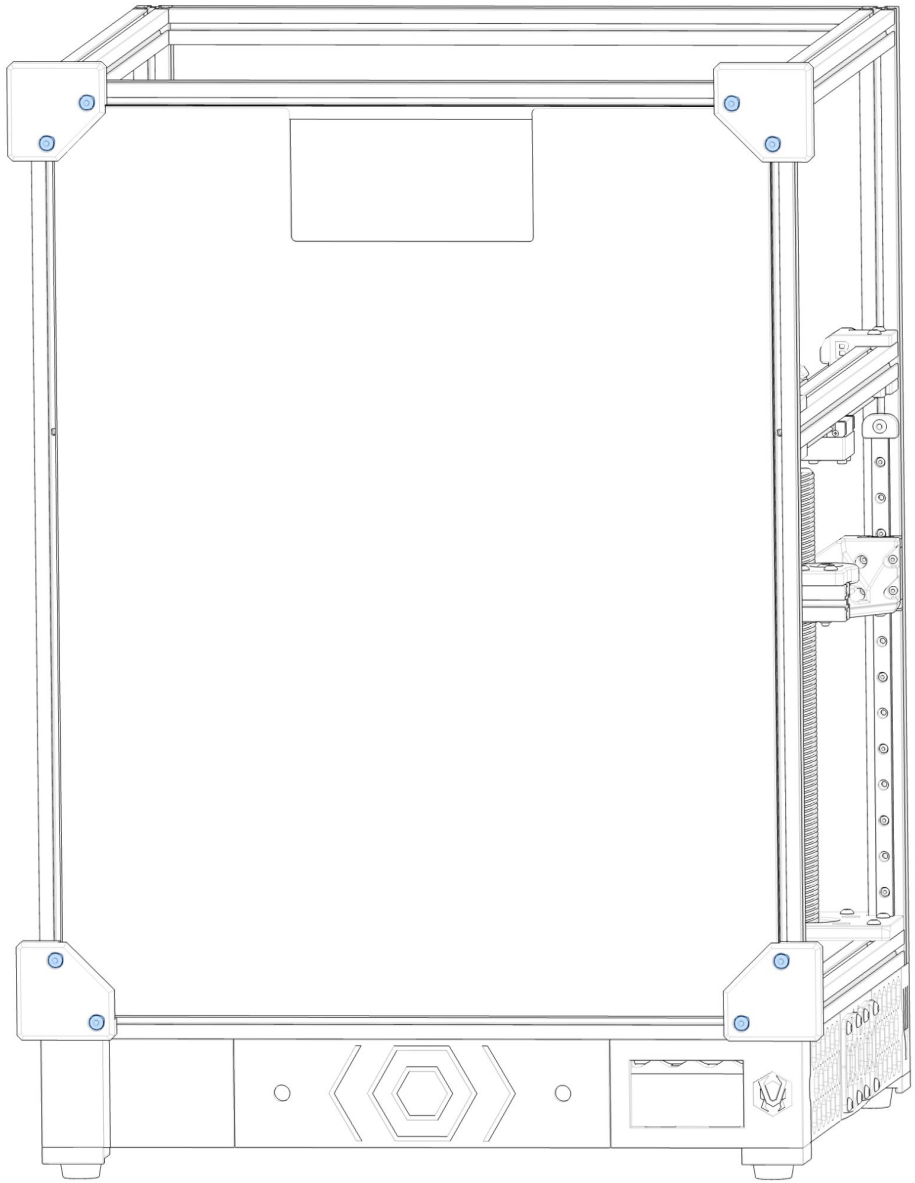
3mm x 6mm Foam Tape



FRAME OR PANEL?

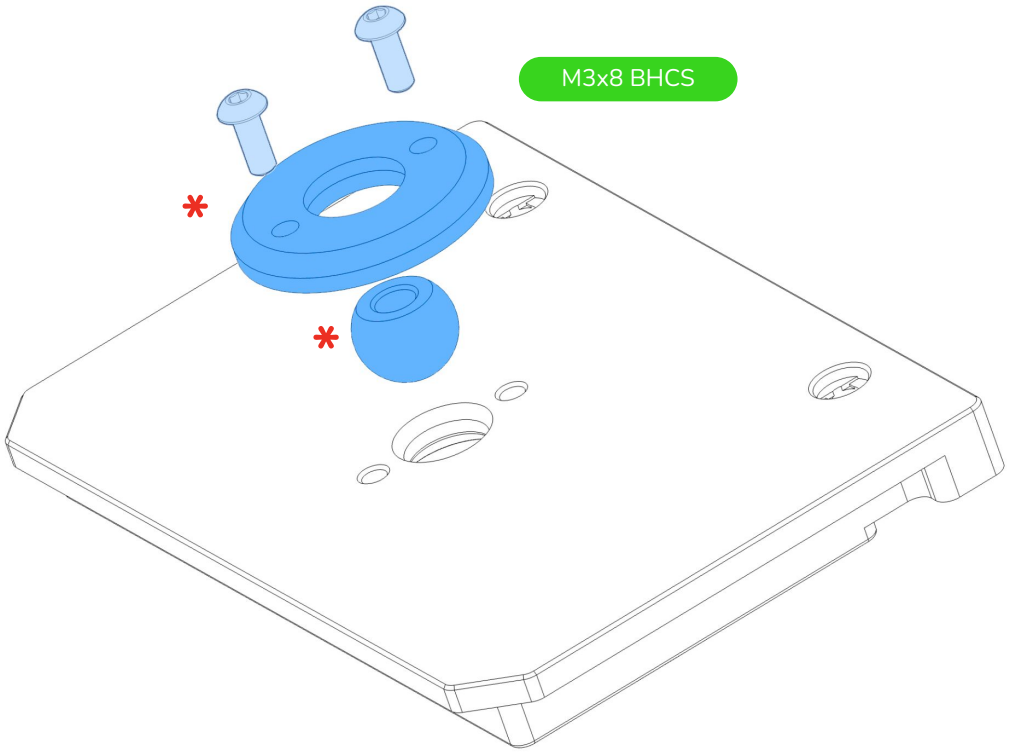
You can apply the foam tape to the printer's frame or to the panels, whichever you prefer. There are advantages and disadvantages to each approach, but either way is valid.

M3x12 BHCS



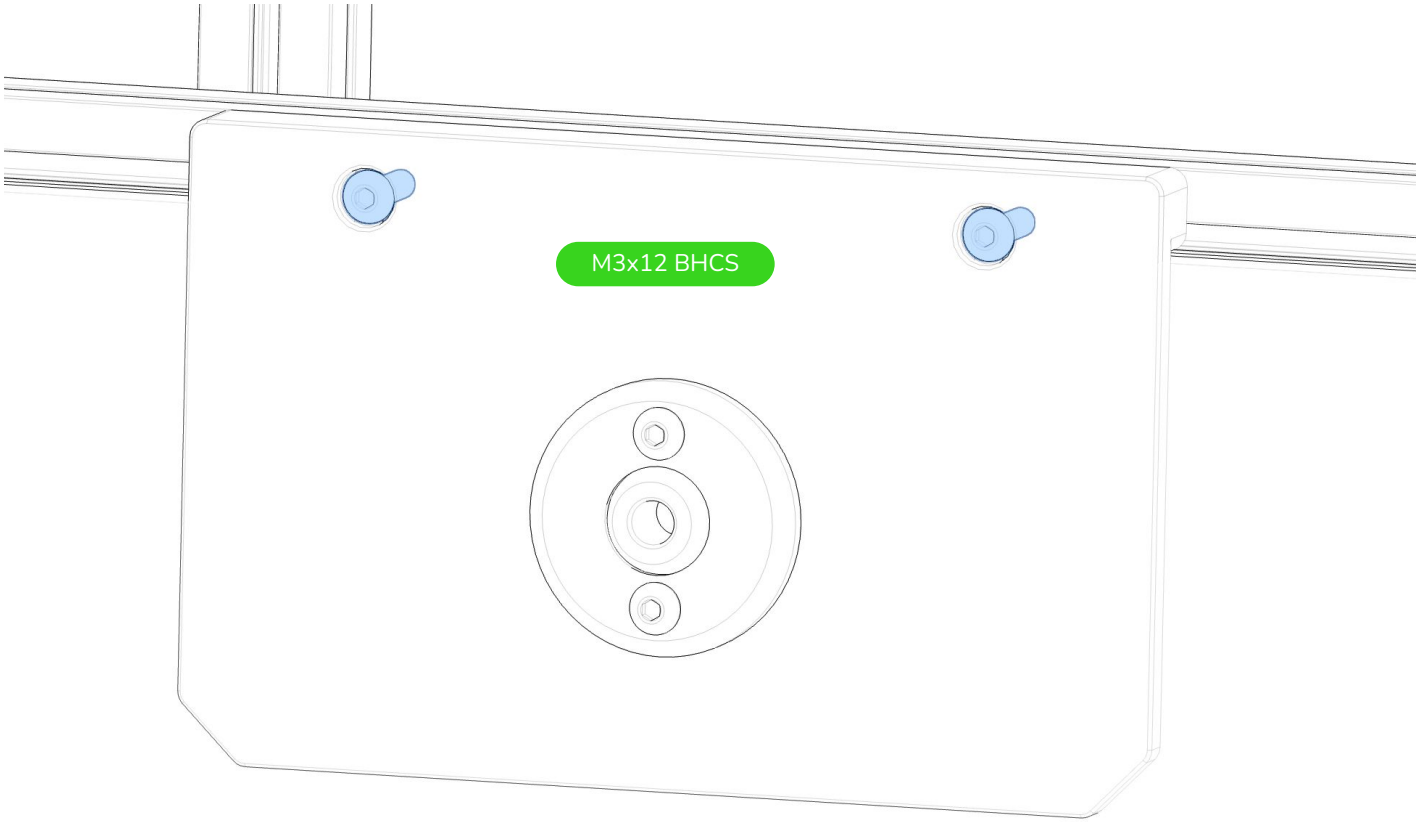
ADD EXTRA NUTS

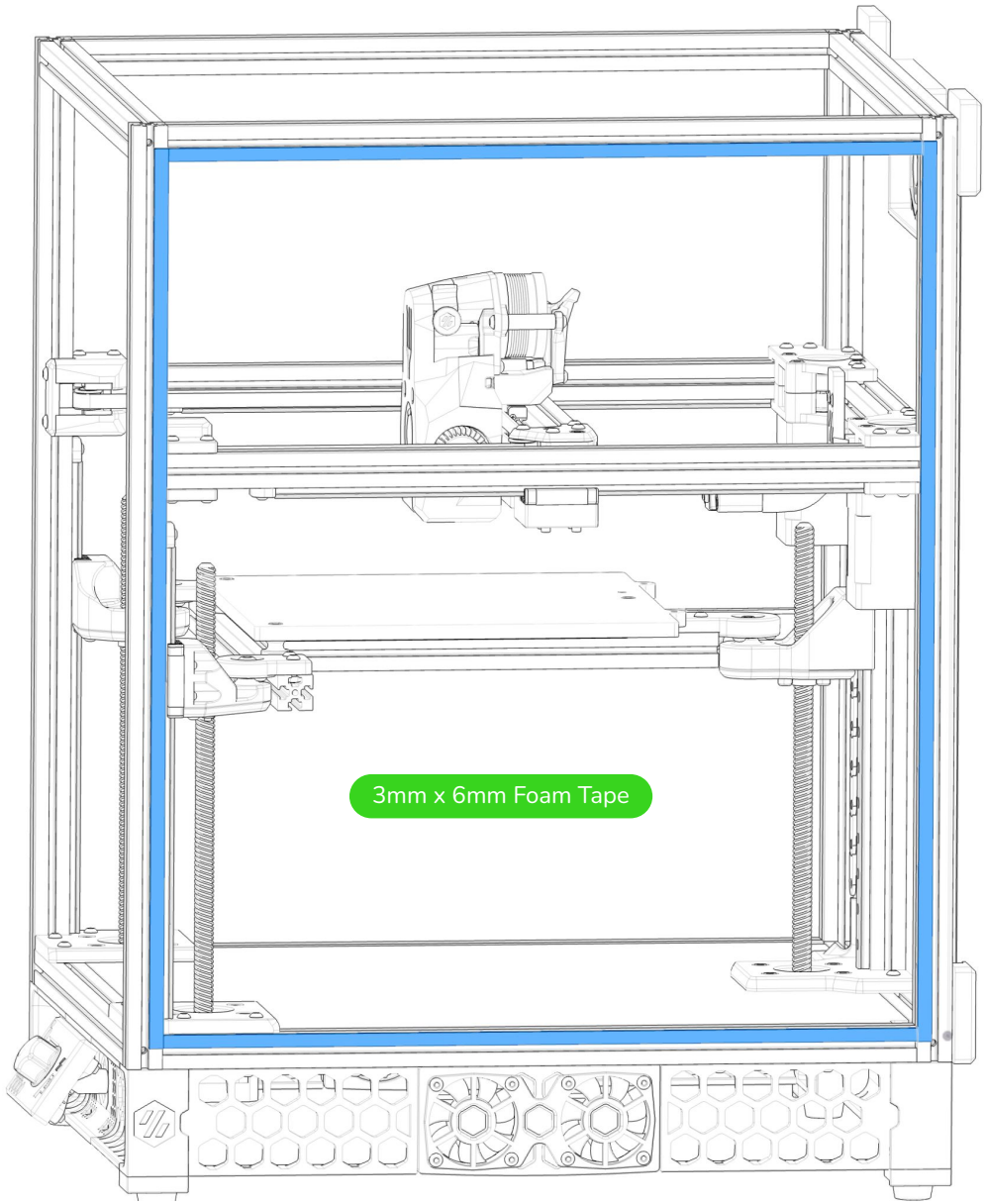
We did not preload nuts into the vertical extrusions, since they are easy to add at this step and don't require preloading.

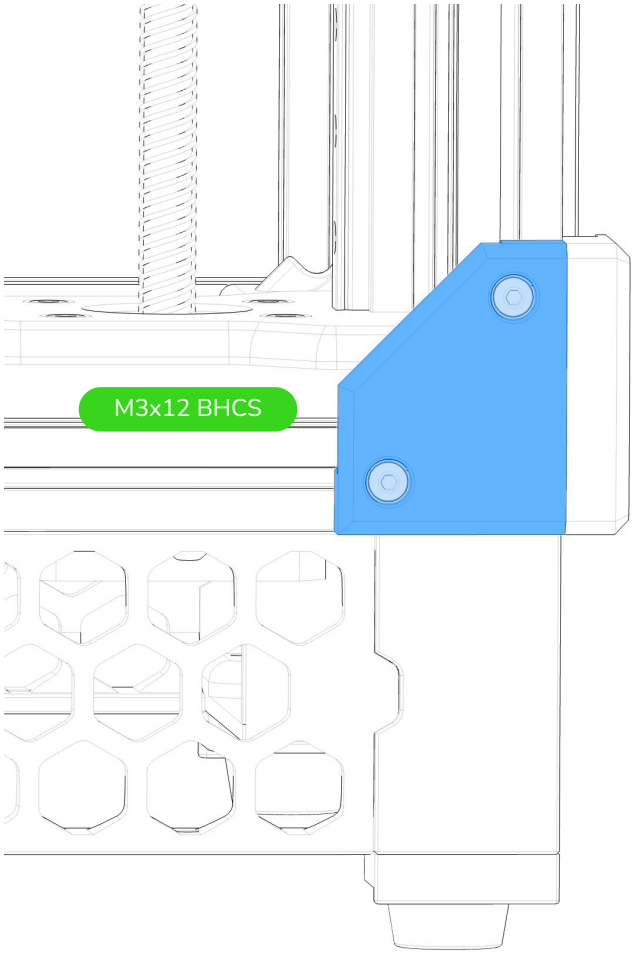


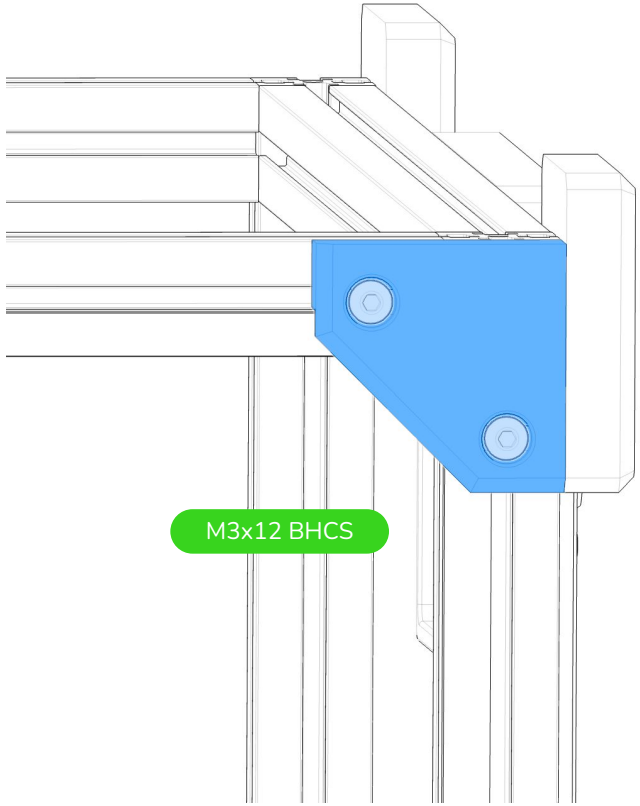
BOWDEN TUBE RETAINER

This assembly will hold your reverse bowden tube, and it utilizes a ball joint to allow the tube to move naturally without binding during printing. You may need to widen the hole slightly with a drill or a file to fit your specific tube based on how your printed parts came out.


M3x12 BHCS


3mm x 6mm Foam Tape



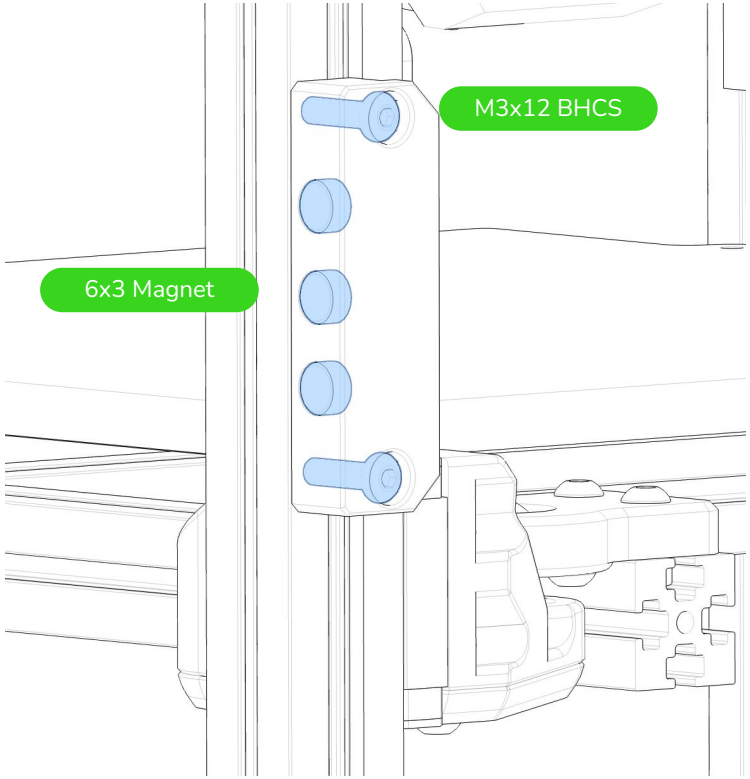


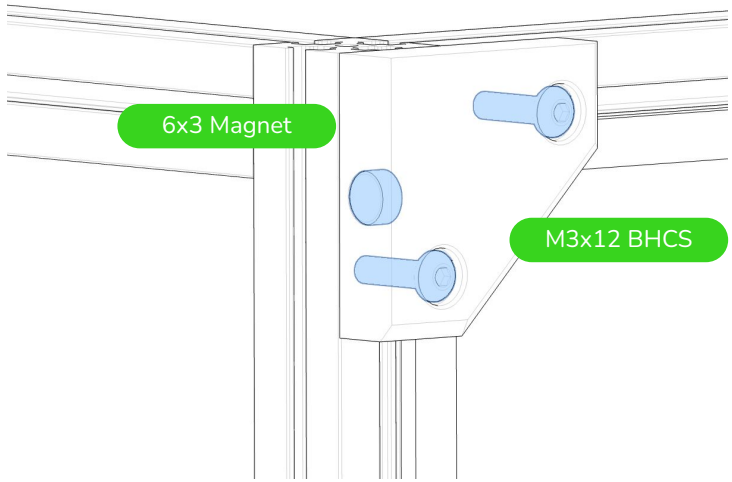
JUST THESE TWO FOR THIS STEP

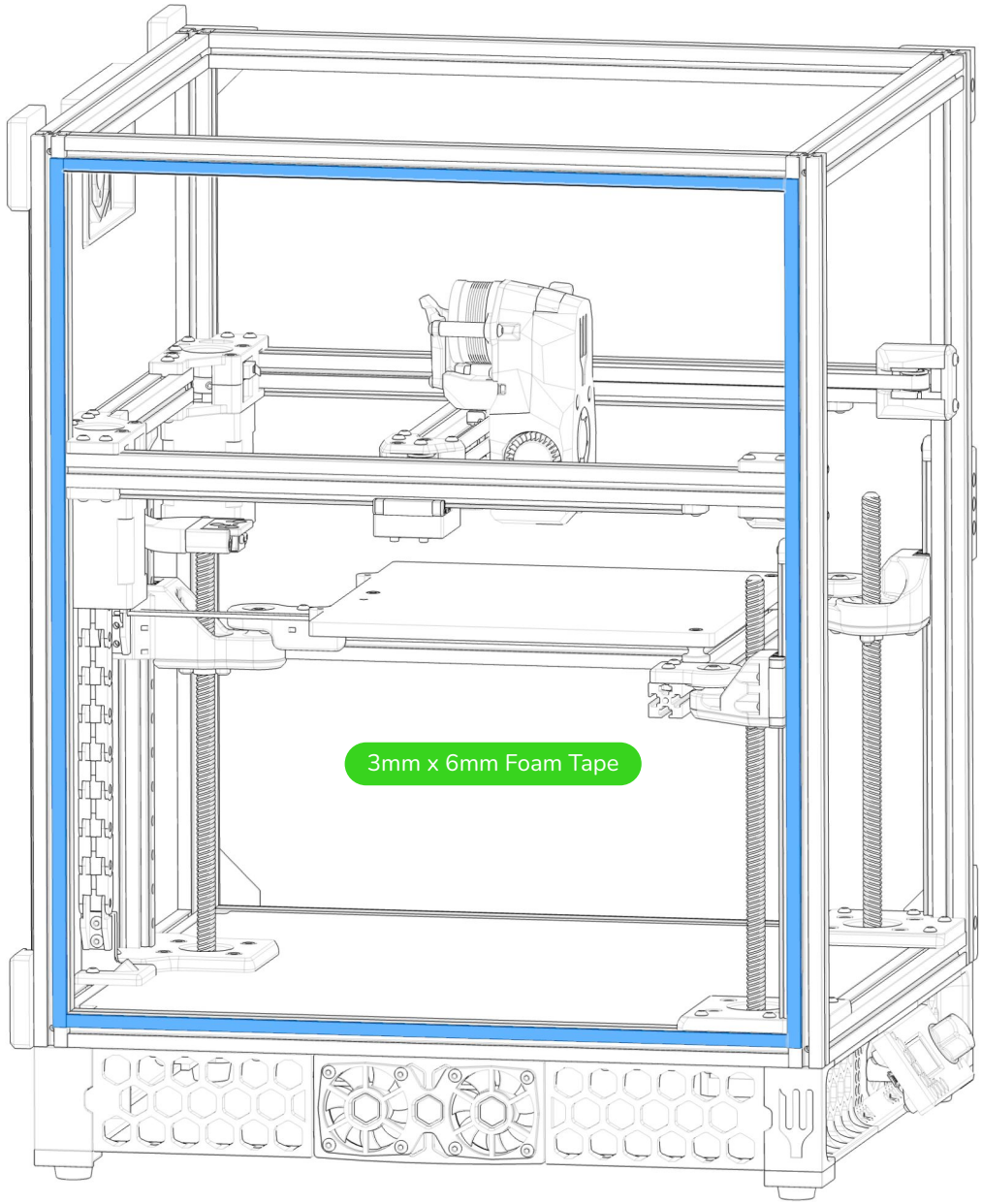
The front corner clips require a little more work, so we'll do those next.

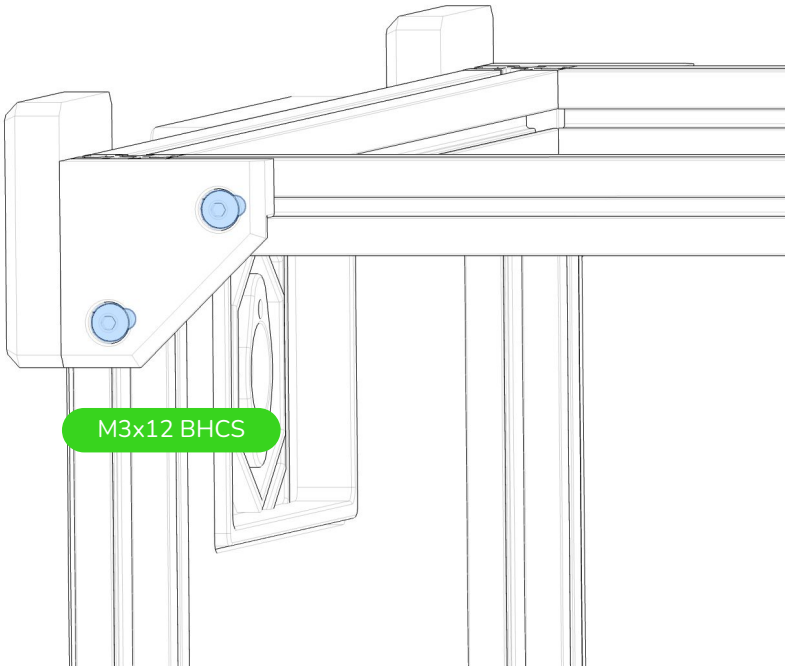
MAGNETS

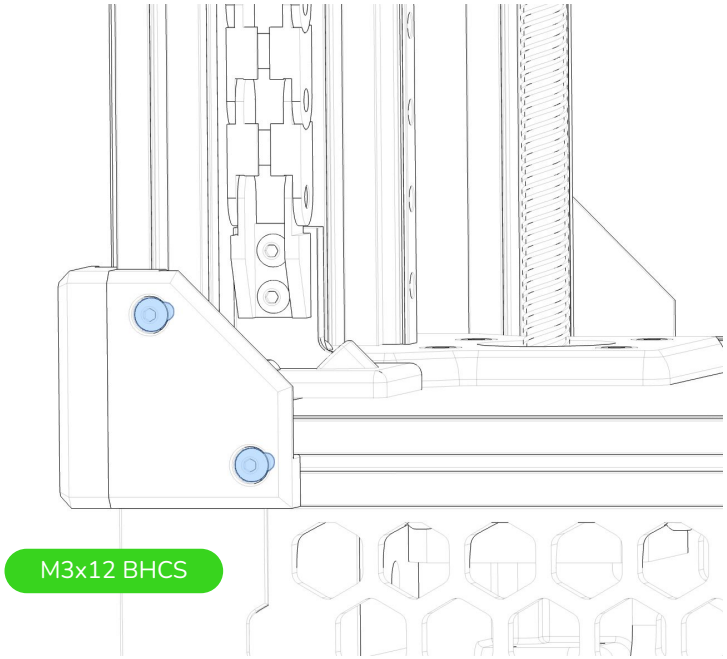
We use magnets to hold the front door closed, and the next few parts all have magnets in them. A drop of superglue will help hold the magnets in place. When adding the door later, be careful with the magnet polarity so that the door closes properly.


M3x12 BHCS
6x3 Magnet


6x3 Magnet
M3x12 BHCS

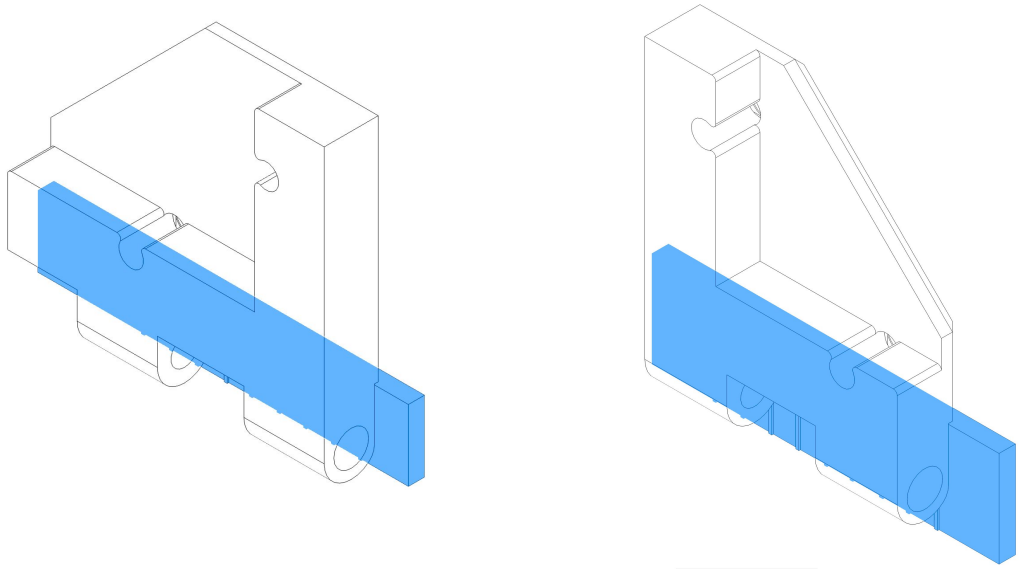

3mm x 6mm Foam Tape





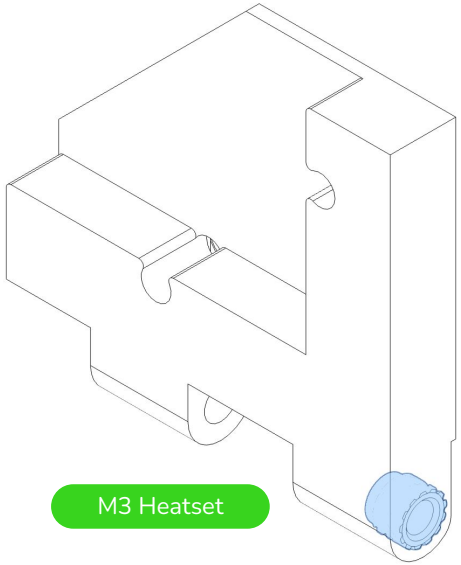
REAR FIRST AGAIN

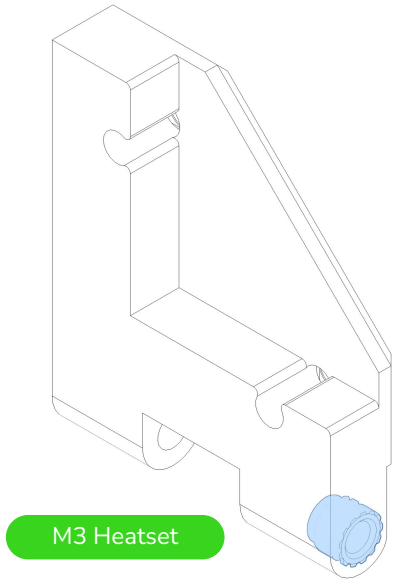
Just like on the right side, the left side of the printer needs additional detail for the front panel clips, so start with the two easy ones in the rear.

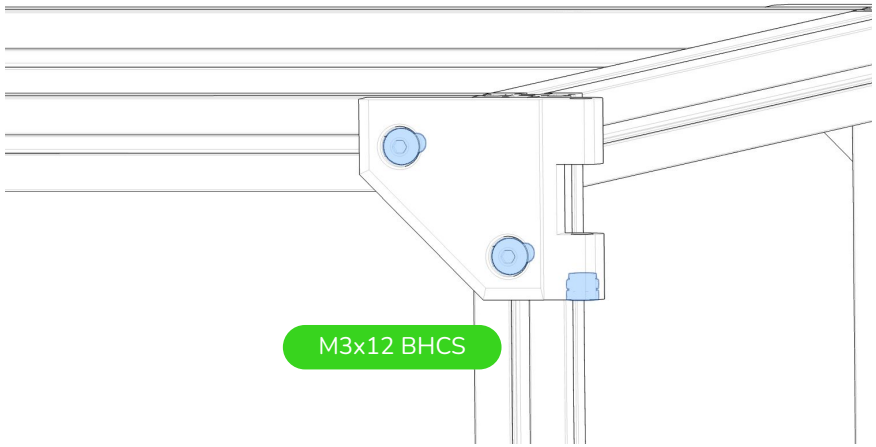


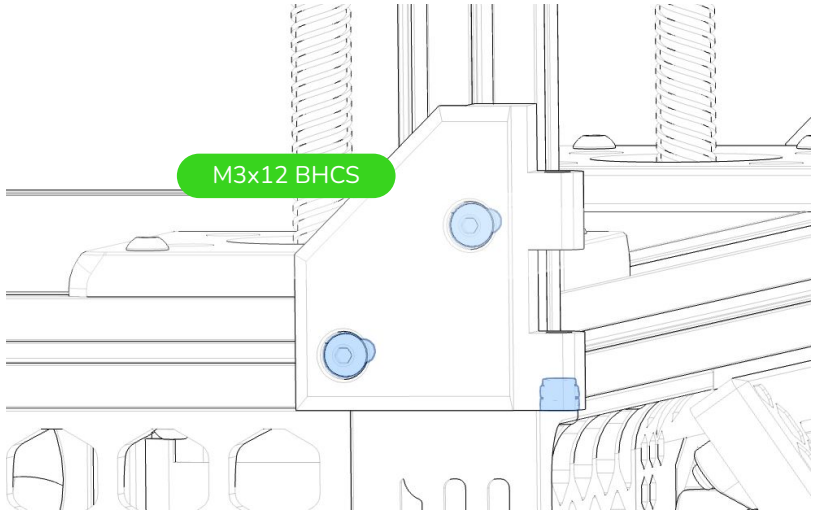
BREAKAWAY SUPPORT

These two parts have a printed support on them which you will need to break away. A little bit of sandpaper or a file will clean up any leftover irregularities in the surface.


M3 Heatset

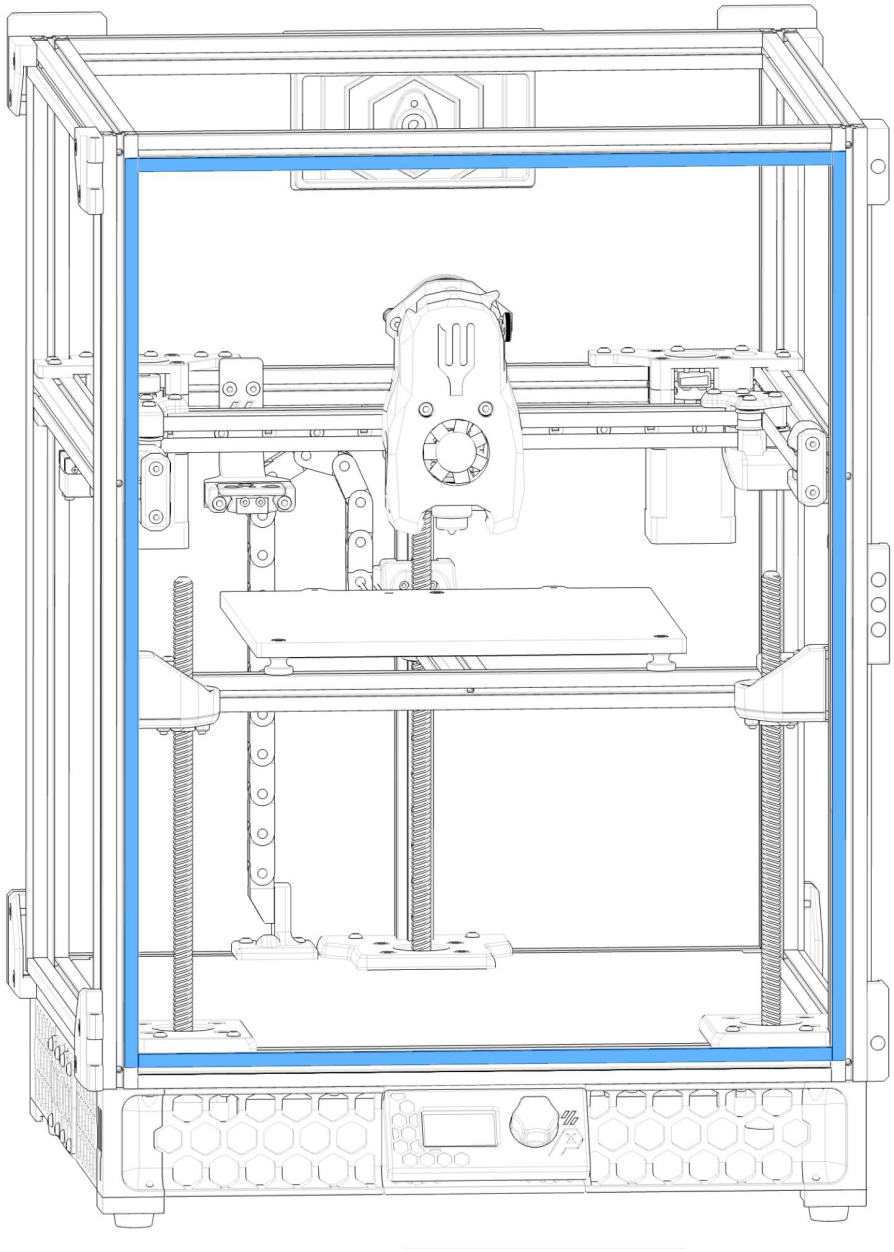

M3 Heatset



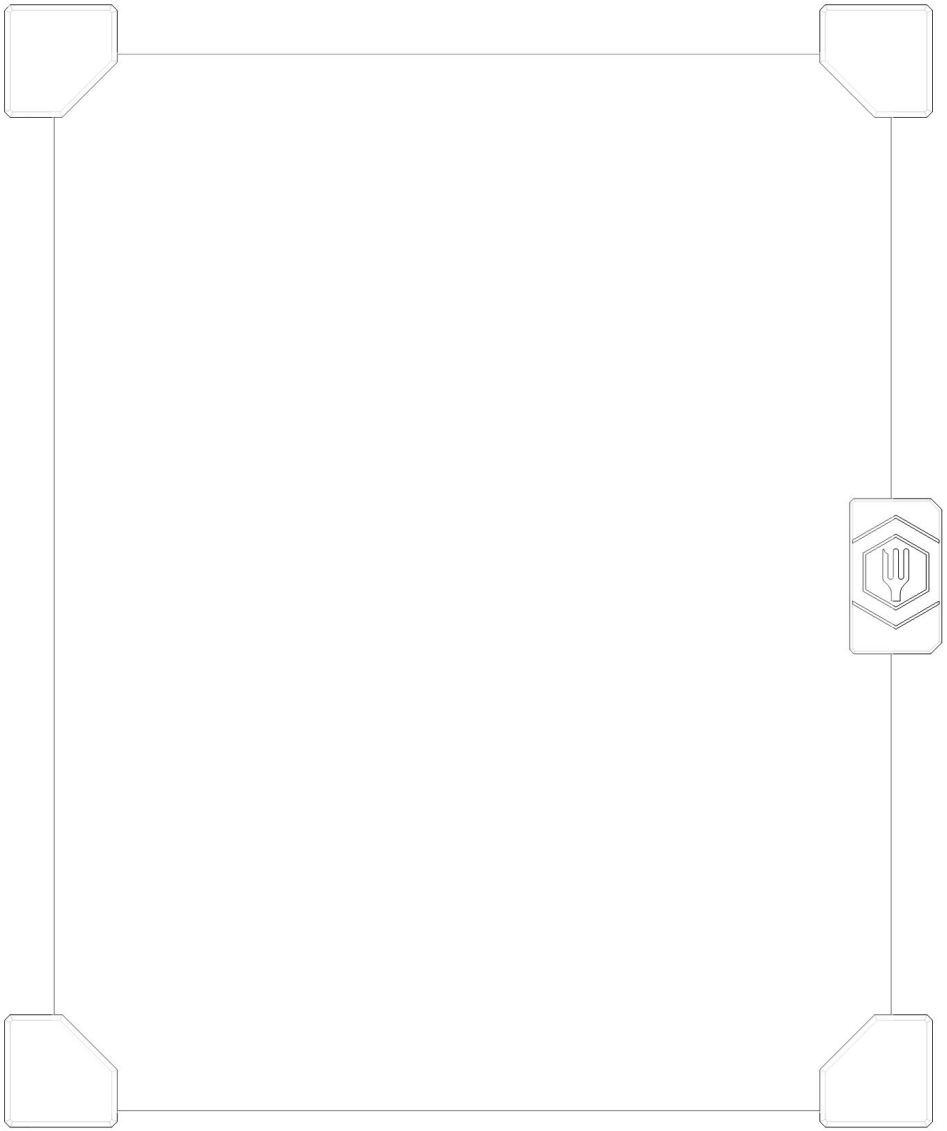


HEATSETS SHOWN FOR CLARITY

These heatsets were already inserted into the part, they are highlighted here to help you orientate the parts correctly.



3mm x 6mm Foam Tape



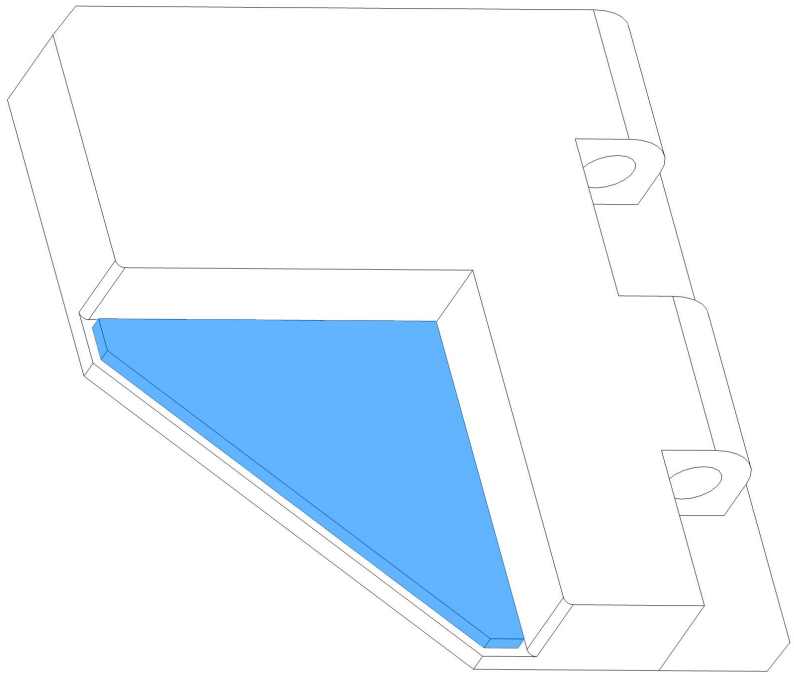
FOR REFERENCE

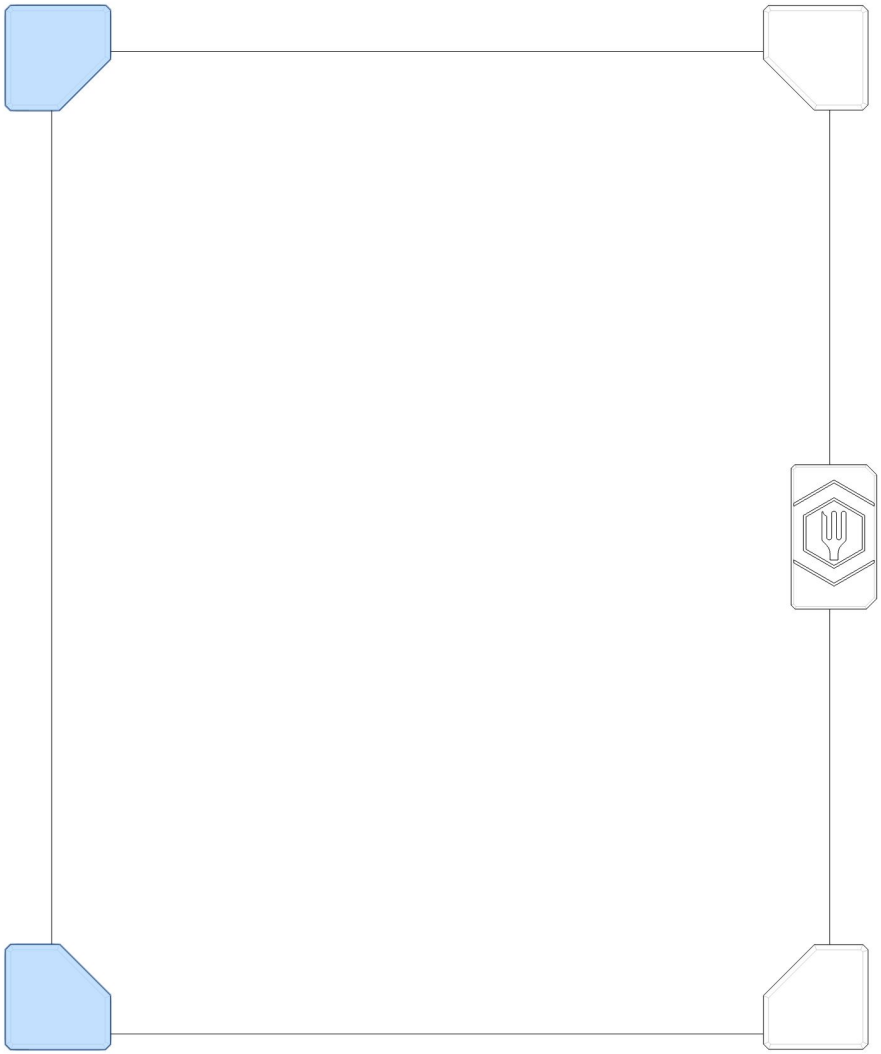
This is what the front door will look like when completed, this picture is for reference for the next few steps.

APPLY VHB

VHB tape is used for holding the acrylic panels to the plastic hinges. Add some tape to the printed parts (upper-left corner shown here as an example), and then mount the part to the acrylic panel.

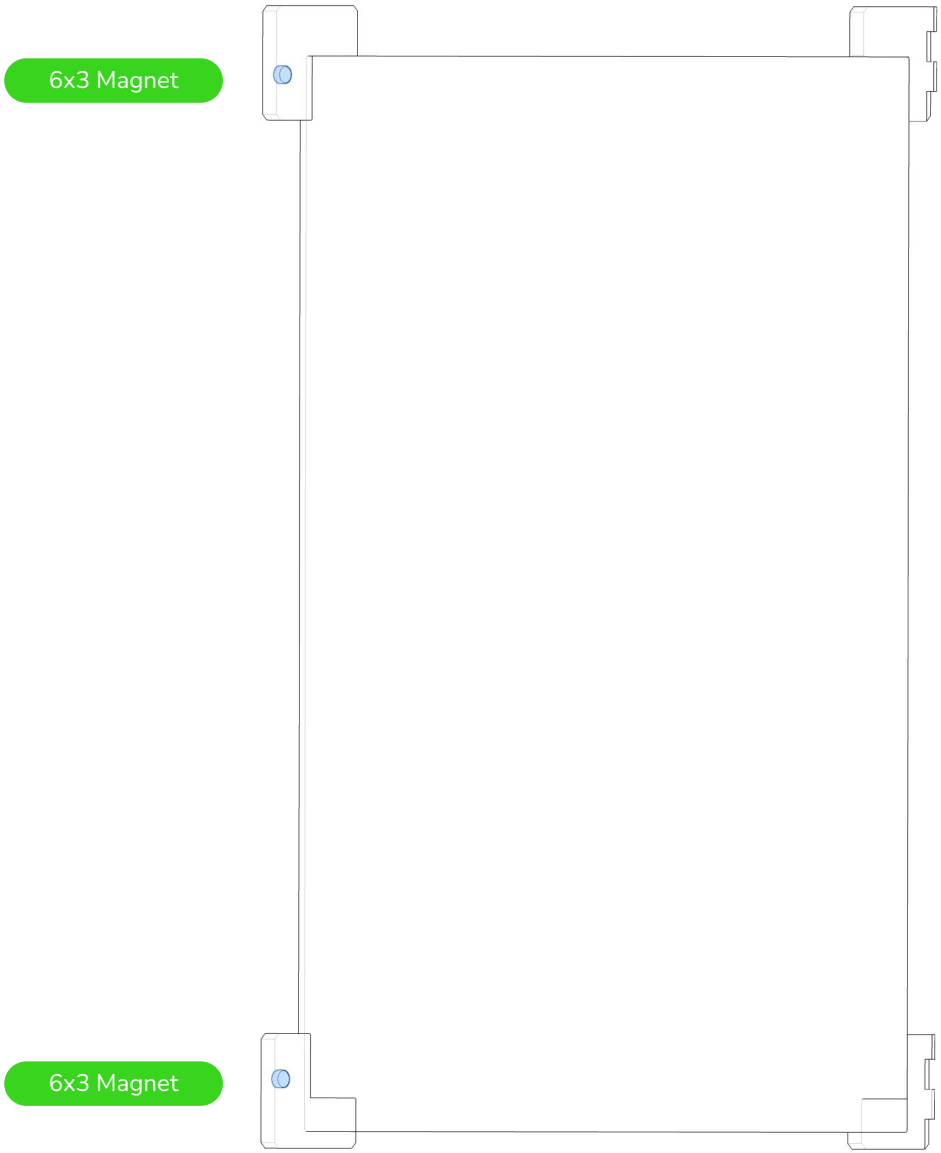
It is important to apply firm pressure to the parts for at least 60 seconds in order to allow the adhesive to fully activate and bond the parts together. Not doing this may cause the tape to fail.





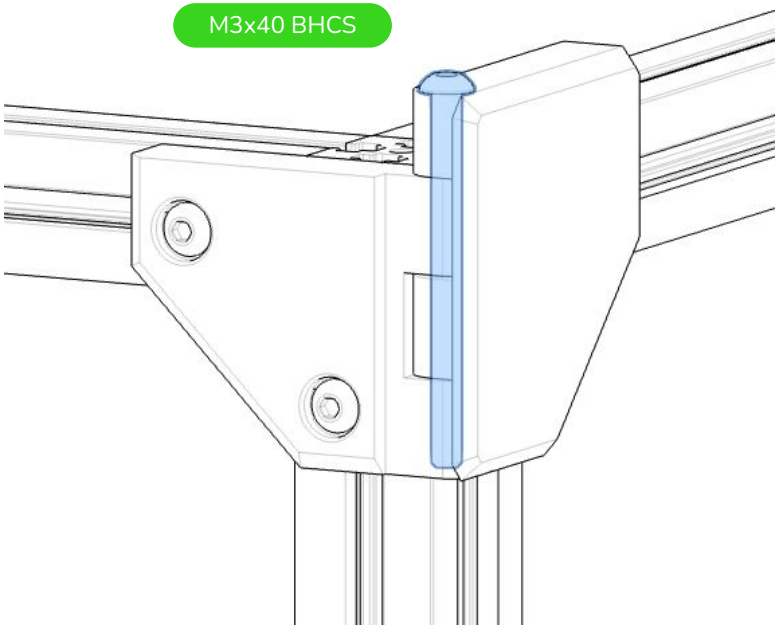
THESE CORNERS FIRST

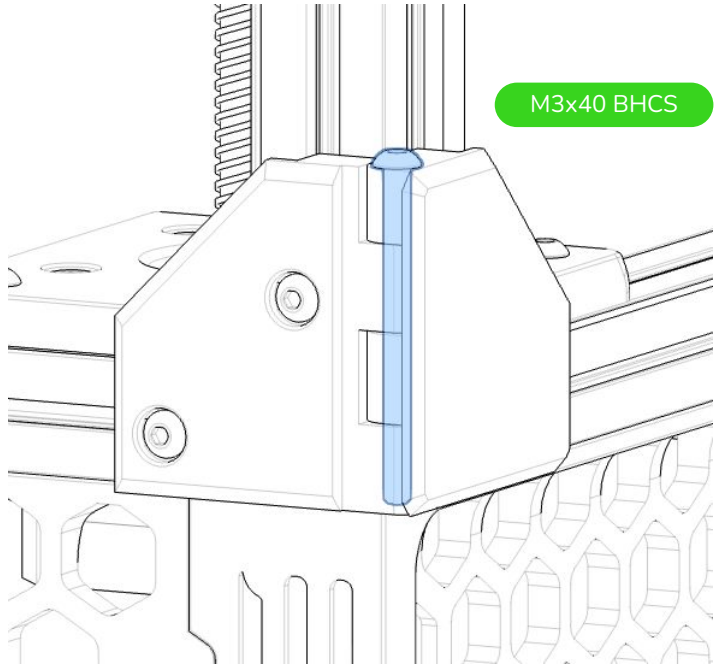
These corners are the easiest to do, so apply VHB tape and attach them to the acrylic.



MAGNETS

After attaching the corners to the acrylic panel with VHB tape, insert 6x3 magnets into them, and be careful of the polarity. These should be attracted to the magnets already mounted in the frame.



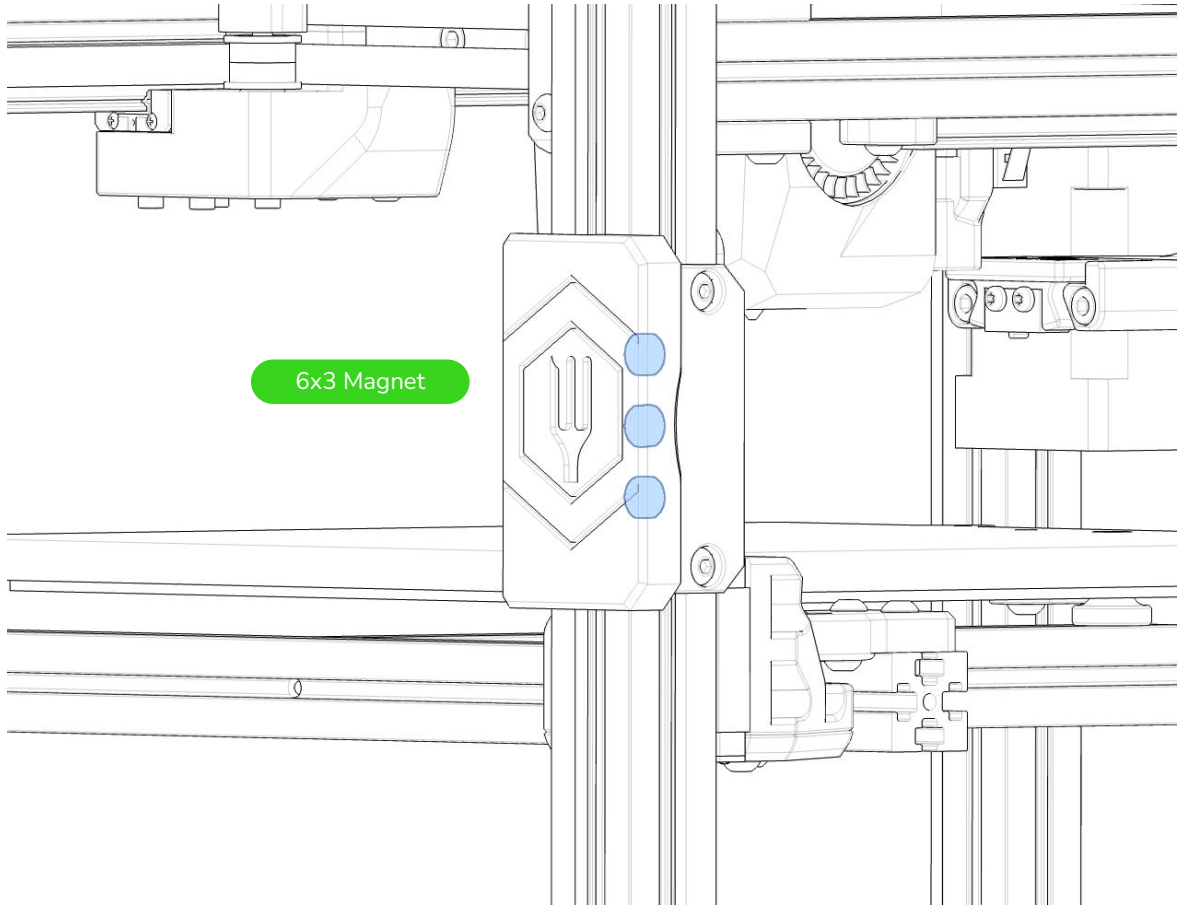


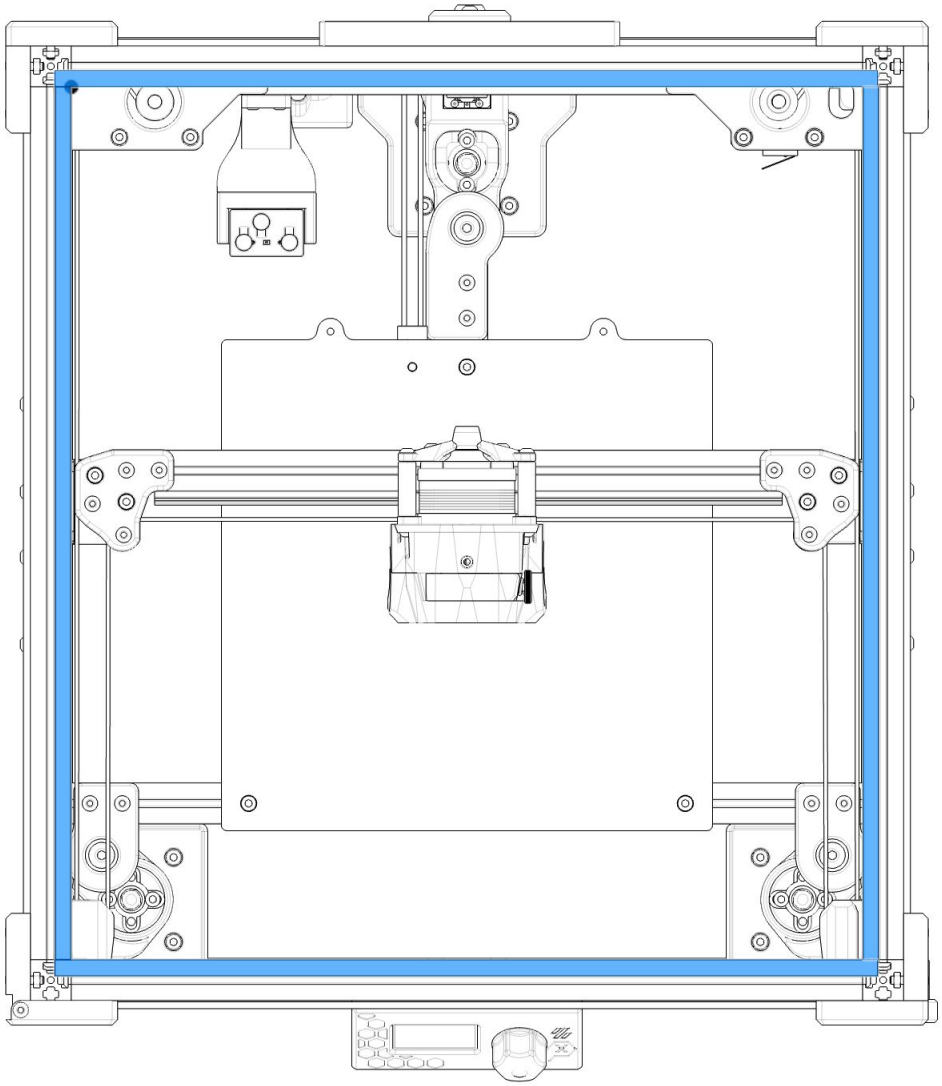
ATTACH THE DOOR

Attach the door to the frame using the specified screws which will act as the hinges for the door to open and close.

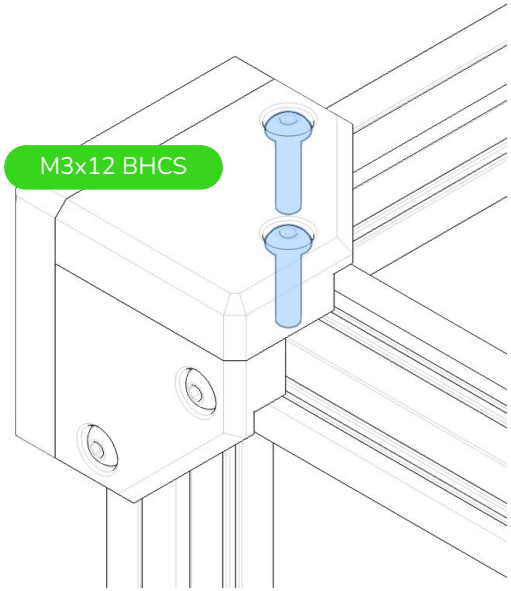
DOOR HANDLE

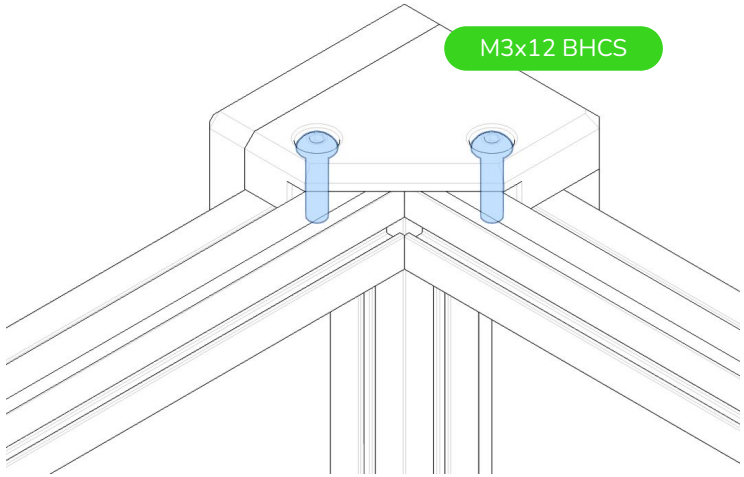
Now that the door is on the frame, you can align the door handle with the other part of the mechanism. Remember to add magnets and make sure the polarity is correct! Once it's aligned, apply VHB tape and apply pressure for at least 60 seconds.





3mm x 6mm Foam Tape


M3x12 BHCS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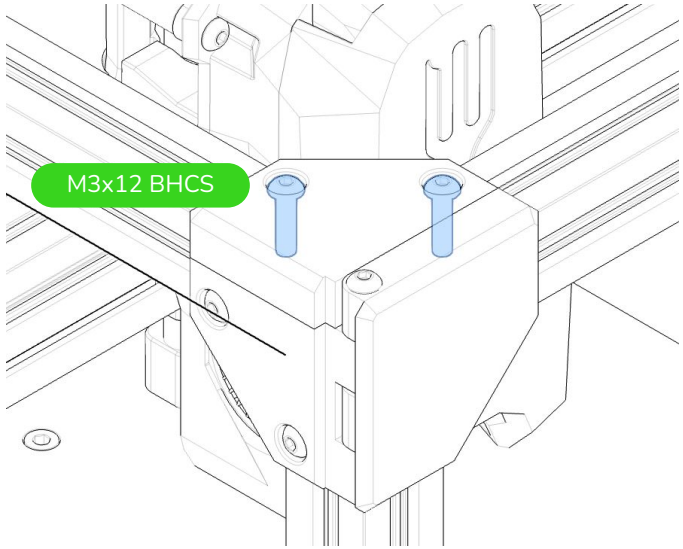
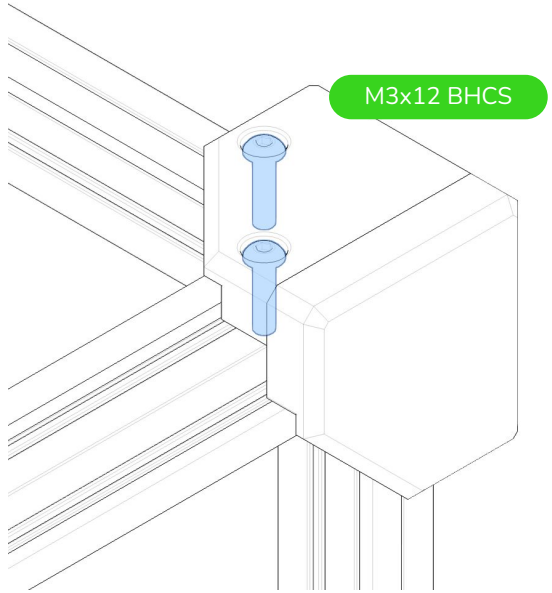

M3x12 BHCS


M3x12 BHCS