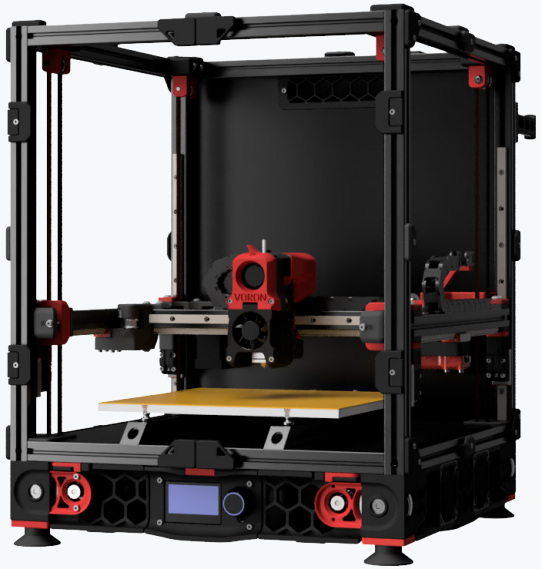
VORON



2.4 ASSEMBLY MANUAL

We build space shuttles with gardening tools
so anyone can have a space shuttle of their own

VERSION 2021.05.20

Before you begin on your journey, a word of caution.

In the comfort of your own home you are about to assemble a robot. This machine can maim, burn, and electrocute you if you are not careful. Please do not become the first VORON fatality. There is no special Reddit flair for that.

Please, read the entire manual before you start assembly. As you begin wrenching, please check our Discord channels for any tips and questions that may halt your progress.

Most of all, good luck!
The VORON Team

STL FILE KEY

By this time you should have already downloaded our STL files from the Voron GitHub. You might have noticed that we have used a unique naming convention for the files. This is how to use them.

PRIMARY COLOR

Example z_joint_lower_x4.stl

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

ACCENT COLOR

Example [a]_tensioner_left.stl

We have added "[a]" to the front of any STL file that is intended to be printed with accent color.

QUANTITY REQUIRED

Example [a]_z_belt_clip_lower_x4.stl

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

STL OPTIONS

You have some options on the STL's you print for your Voron.

DIN BRACKETS or LEGACY

VORON2.4\Electronics_Compartment

DIN brackets are used for the current printer specification. Use this if you're doing a new build.

Legacy brackets are used to mount electronics to the frame if you are not using DIN rail.

DIRECT FEED or BOWDEN

VORON2.4\Gantry\X_Axis\X Carriage

Direct feed is the standard setup for most new builds.

Bowden allows for an external extruder to be used. If in doubt, print the direct feed.

CABLE CHAIN or ZIP CHAIN

VORON2.4\ZipChain

We recommend using cable chain. You can check the sourcing guide for options.

If you prefer to print zip chain, you can find it in the folder listed above.

PRINT GUIDELINES

The Voron Team has provided the following print guidelines for you to follow in order to have the best chance at success with your parts. There are often questions about substituting materials or changing printing standards, but we recommend you follow these recommendations as closely as possible.

FDM MATERIAL
VORON printers are ABS capable machines that run at impressive print speeds. For that reason we recommend only using ABS to build your printer.

LAYER HEIGHT
Recommended: 0.2mm

EXTRUSION WIDTH
Recommended: Forced 0.4mm

INFILL PERCENTAGE
Recommended: 40%

INFILL TYPE
Grid, Gyroid, Honeycomb, Triangle or Cubic

WALL COUNT
Recommended: 4

SOLID TOP/BOTTOM LAYERS
Recommended: 5

SUPPORTS REQUIRED
None at all.

PRINT IT FORWARD

Often times our community members have issues printing ABS will bootstrap themselves into a VORON using our Print It Forward program. This is a service where approved members with VORON printers can make you a functional set of parts to get your own machine up and running. Check Discord if you have any interest in having someone help you out.

HOW TO GET HELP

If you need assistance with your build, we're here to help. Head on over to our Discord group and post your questions. This is our primary medium to help VORON Users and we have a great community that can help you out if you get stuck.

DISCORD https://discord.gg/xgXWctB

THIS IS JUST A REFERENCE

This manual is designed to be a simple reference manual. Building a Voron can be a complex endeavour and for that reason we recommend downloading the CAD files off our Github repository if there are sections you need clarification on. It can be sometimes be easier to follow along when you have the whole assembly in front of you.

https://github.com/vorondesign

GitHub

FINAL THOUGHTS

VORON printers are amazing machines that take care and attention to assemble. Take your time! Little issues in the assembly phase tend to stack up and cause you trouble later on. If at any point you get stuck or are just not sure about something, please ask on Discord. There are no stupid questions and we're more than happy to point you in the right direction.

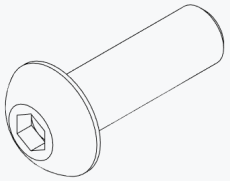
PRINTED PARTS

Not all prints come off the printer perfect and may require some finishing work. You may find that you need to do some light sanding to get some parts to sit flush with each other. Take your time to get the fitment right.

MAINS POWER

VORON printer builds require 110v/220v wiring work. It's important to understand what you're doing to avoid injury or death. Mains power can kill, and it will hurt the entire time you're dying from it. If in doubt we encourage you to ask questions. This is not something you want to guess your way through.

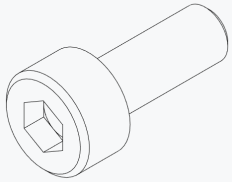
Best of luck on your build! The VORON Team looks forward to seeing your serial application soon!



BUTTON HEAD CAP SCREW (BHCS)

Metric fastener with a domed shape head and hex drive. Most commonly found in locations where M5 fasteners are used.

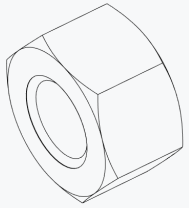
ISO 7380-1



SOCKET HEAD CAP SCREW (SHCS)

Metric fastener with a cylindrical head and hex drive. The Most common fastener used on the Voron.

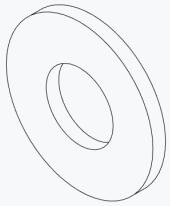
ISO 4762



HEX NUT

Hex nuts couple with bolts to create a tight, secure joint. You'll see these used in both M3 and M5 variants throughout this guide.

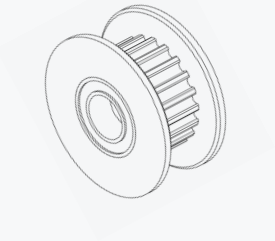
ISO 4032



SHIM

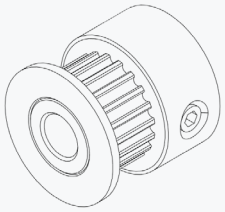
Not to be confused with stamped washers. These are used in all M5 callout locations in this manual.

DIN 988



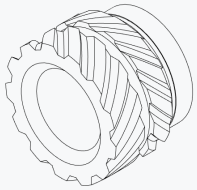
IDLER

GT2 idler used in the motion system of the Voron. Used in two sizes for both 6mm and 9mm belt locations.



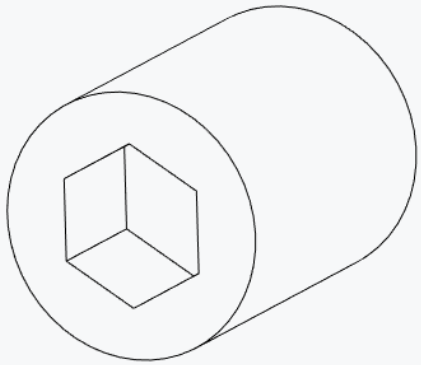
PULLEY

GT2 pulley used on the motion system of the Voron. Used in two sizes for both 6mm and 9mm belt locations.



HEAT SET INSERT

Heat inserts with a soldering tip 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.

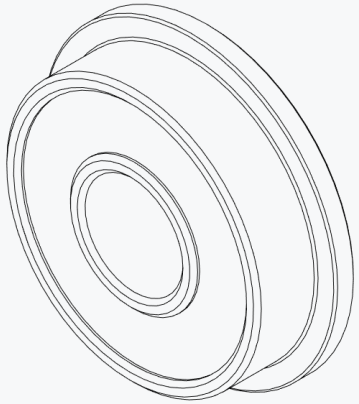


GRUB SCREW

Used to secure pulleys to stepper motor drive shafts. Take care to tighten these correctly and secure with thread lock compound.

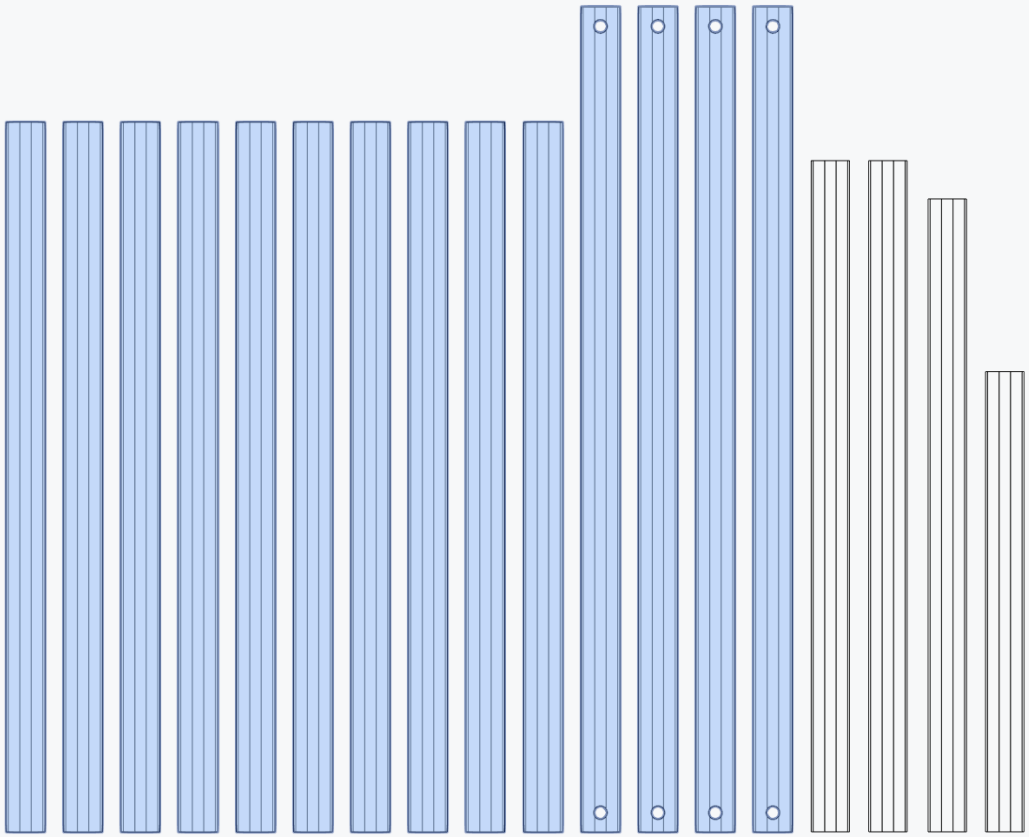
625 BEARING

A ball bearing used on the Voron Z drives.



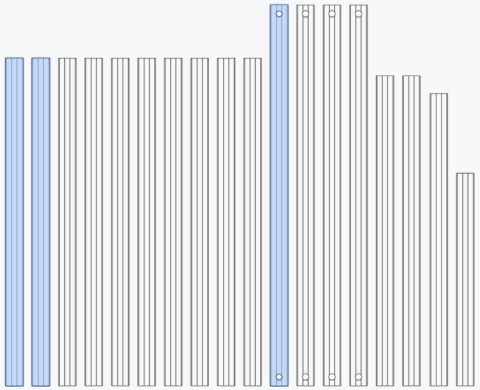
F695 BEARING

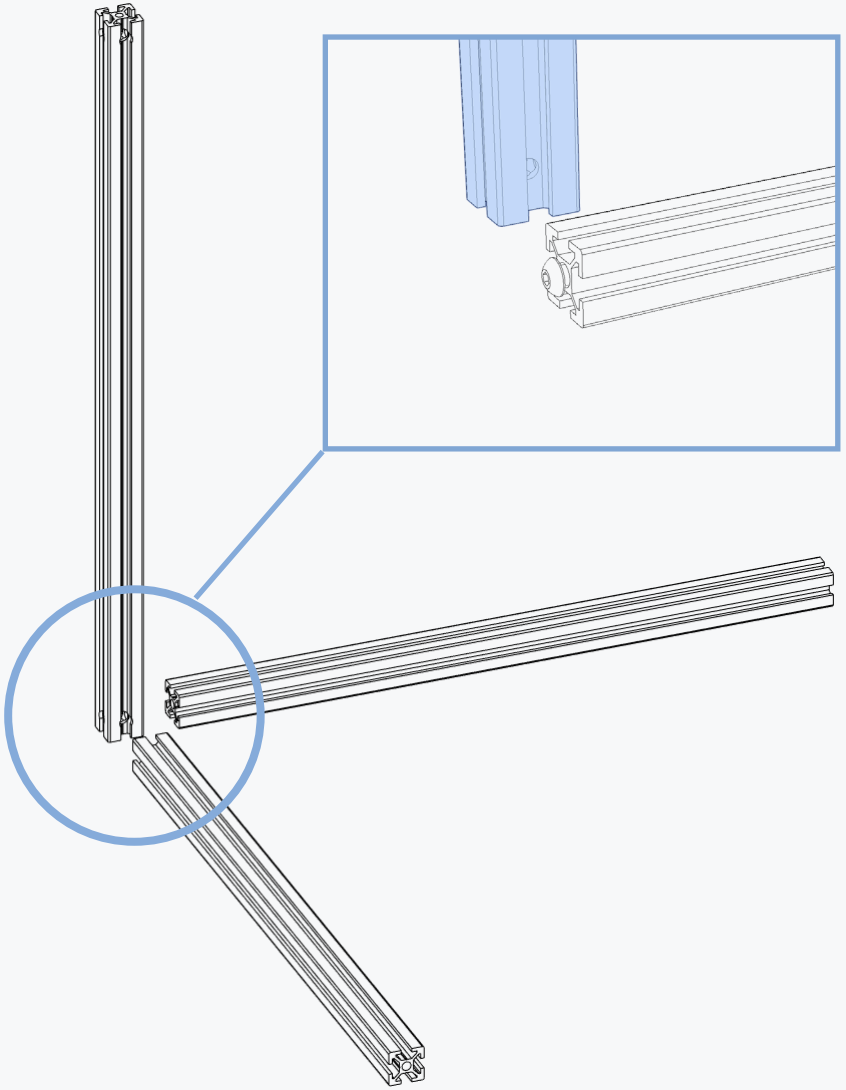
A thinner ball bearing with a flange used in various gantry locations.

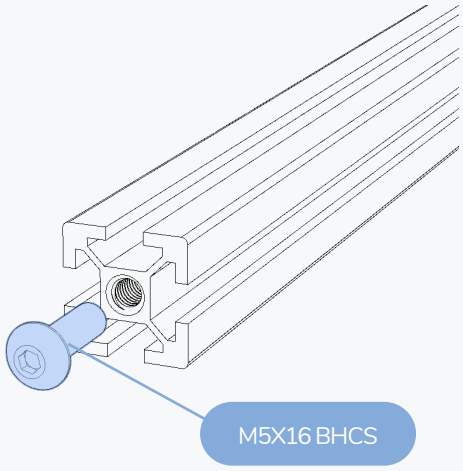


GETTING EXTRUSIONS TOGETHER

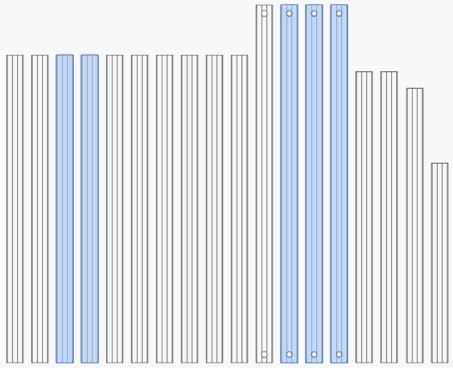
Separate the extrusions you're going to need for this section of the build. We've laid out all the parts you should have and highlighted the ones that will be used in the following sections.

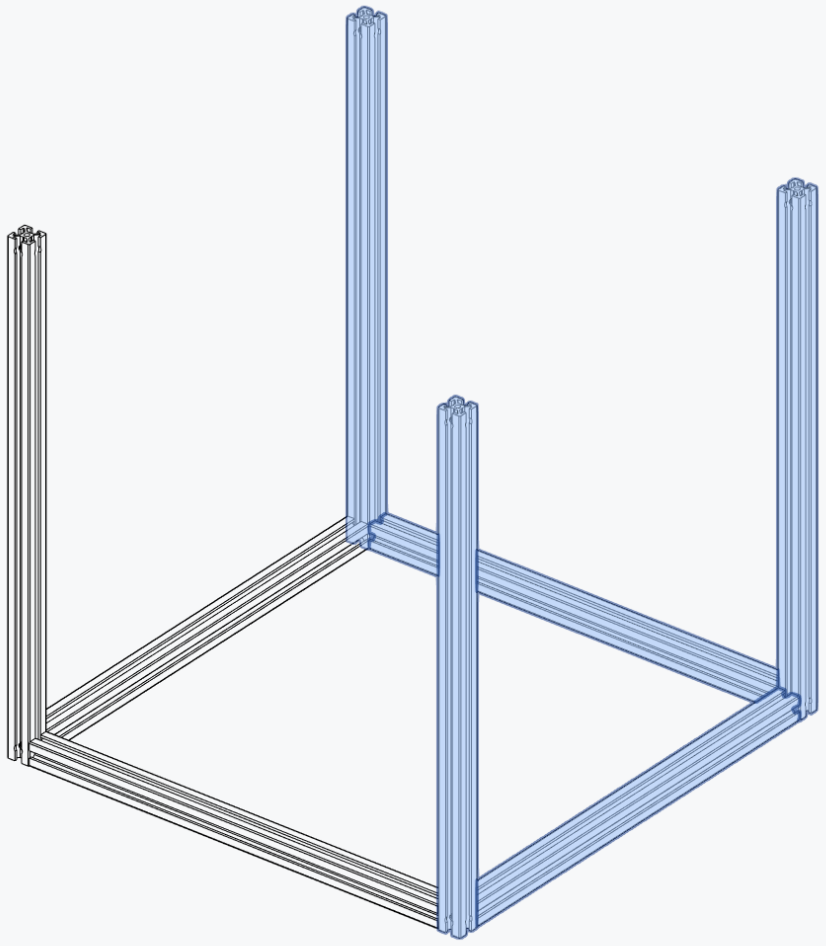






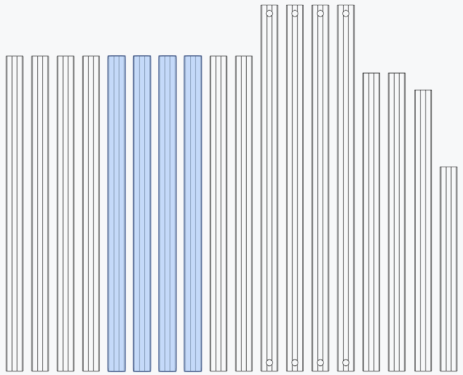
Use a low strength thread lock compound here.

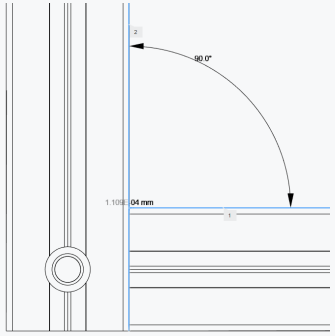




BUILDING SQUARE

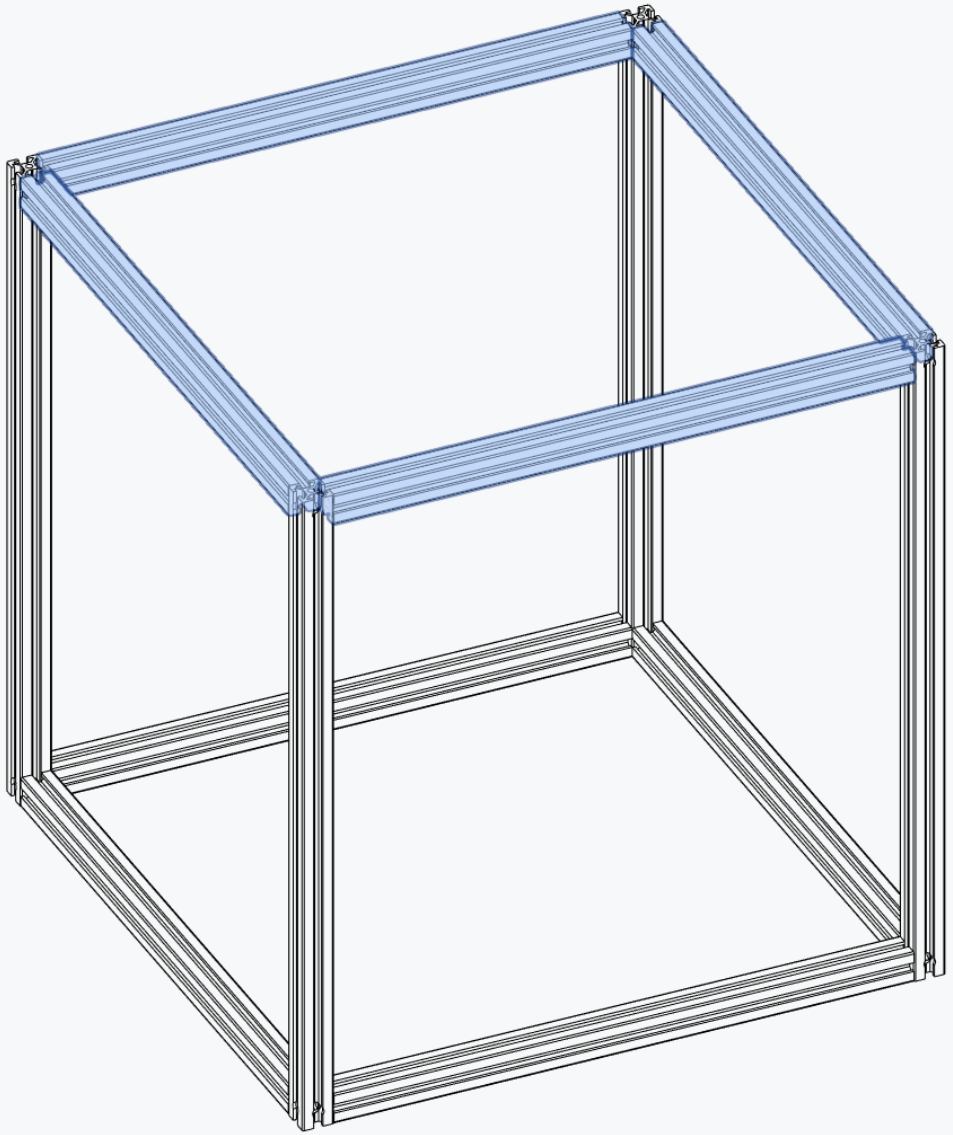
It' not a bad idea to build this frame on a glass surface to ensure you can get it as square as possible.

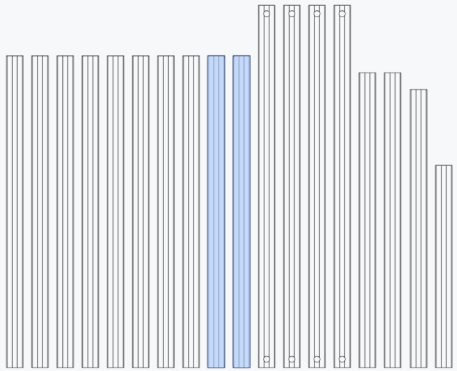


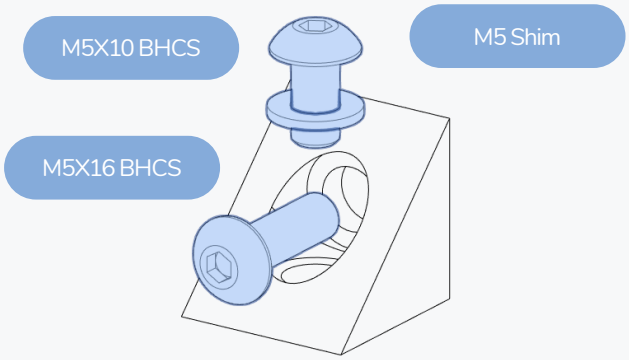


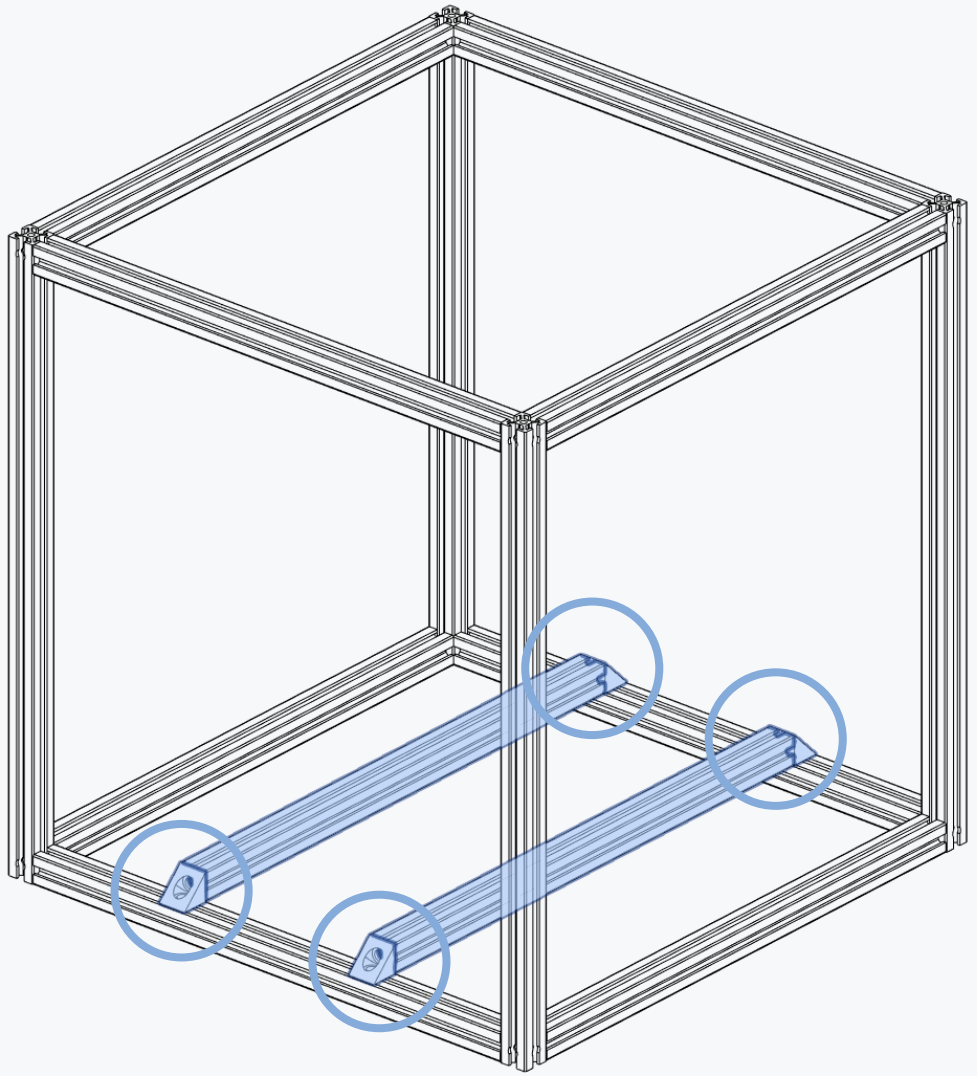
CHECK THE FRAME

Use a framing square and ensure all corners are as square as possible before moving on or you may have problems later on when you start printing.



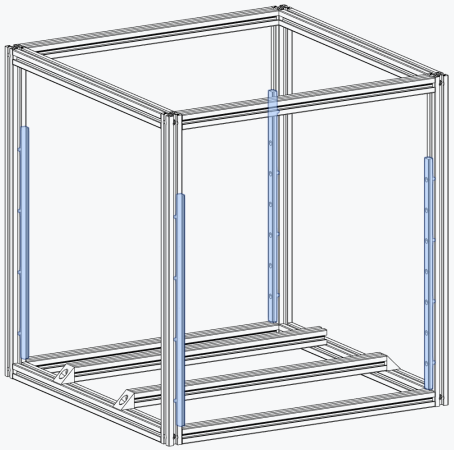


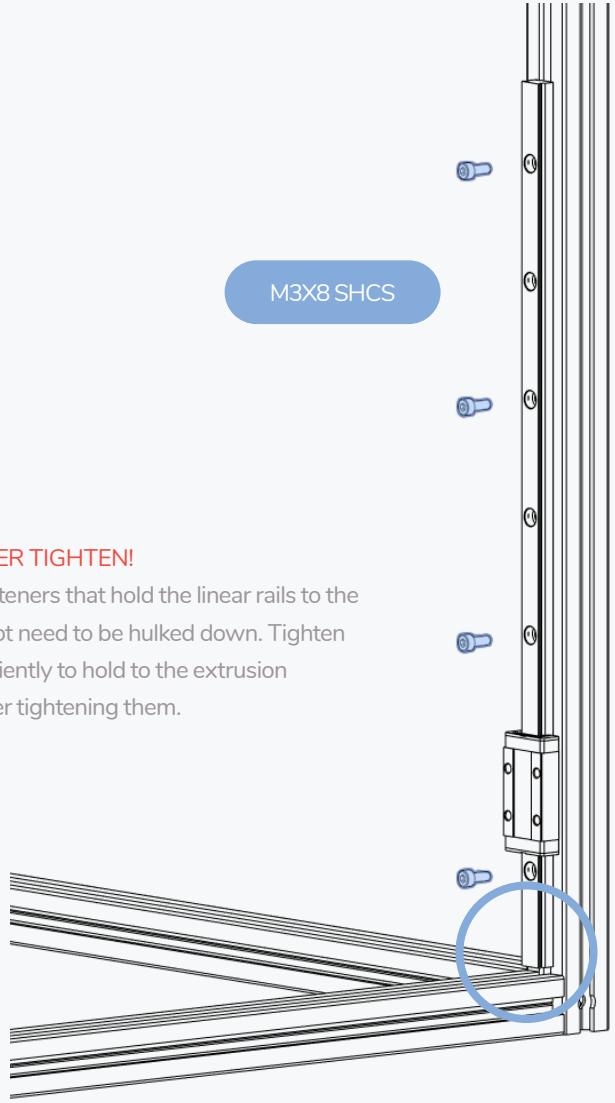




FASTENERS

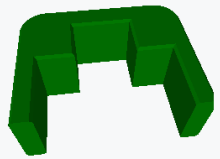
Insert fasteners before you start. It makes attaching the bed extrusions to the frame easier. Don't tighten these down too hard at this stage. We'll want them loose when we install the heated bed assembly!





DON'T OVER TIGHTEN!

The M3 fasteners that hold the linear rails to the frame do not need to be hulked down. Tighten them sufficiently to hold to the extrusion without over tightening them.



CENTERED RAIL INSTALLATION GUIDE

When tightening the fasteners to hold the linear rails in place, ensure that you have attached a centered rail installation guide to both the top and bottom. You should have two printed.

STAGGER FASTENERS

There's no need to use a fastener in every hole of the linear rail. We recommend staggering them the way the diagram shows. Fastener count will differ depending on your machine size.

RAIL SPACING

Make sure to space the rails 3mm off the bottom extrusions. This leaves room for the installation of belt covers later in the build.

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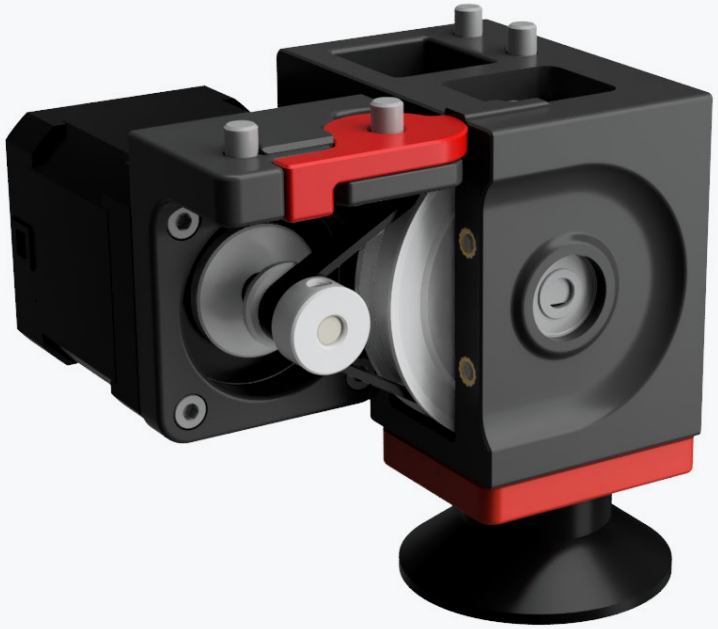
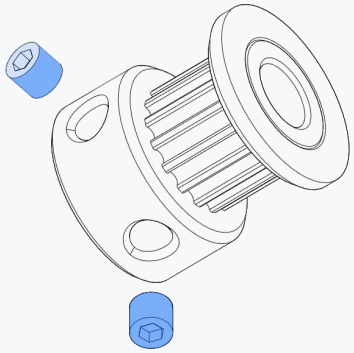
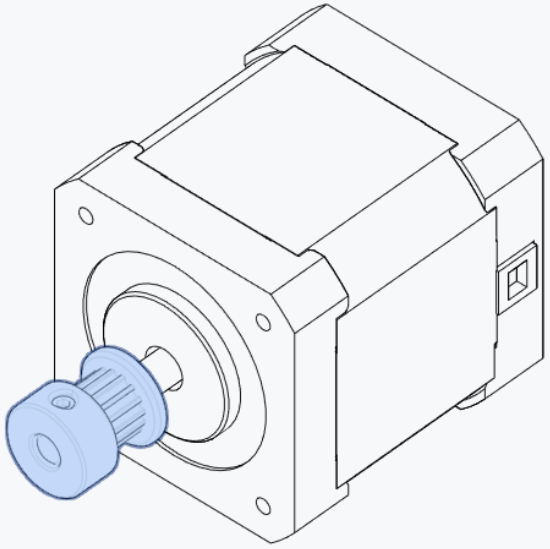


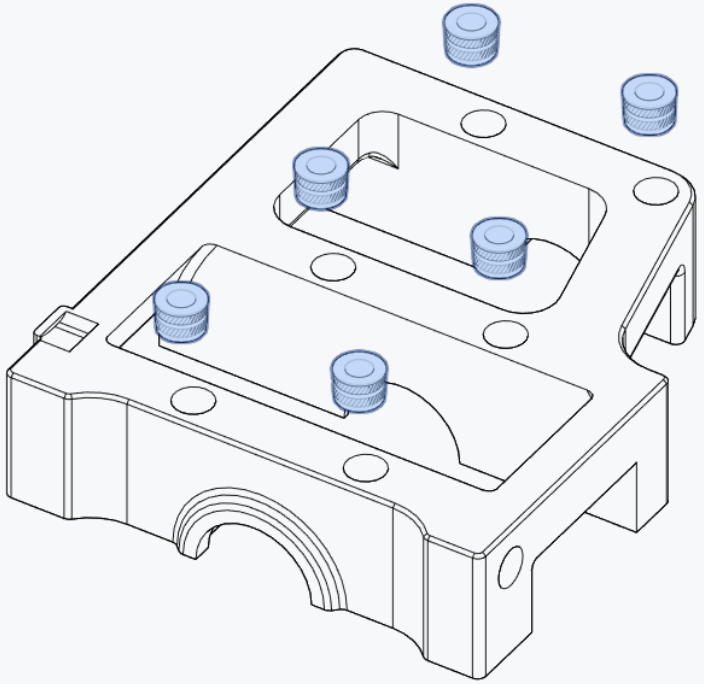


APPLY THREAD LOCK COMPOUND

Make sure to apply thread lock compound to the grub screws.

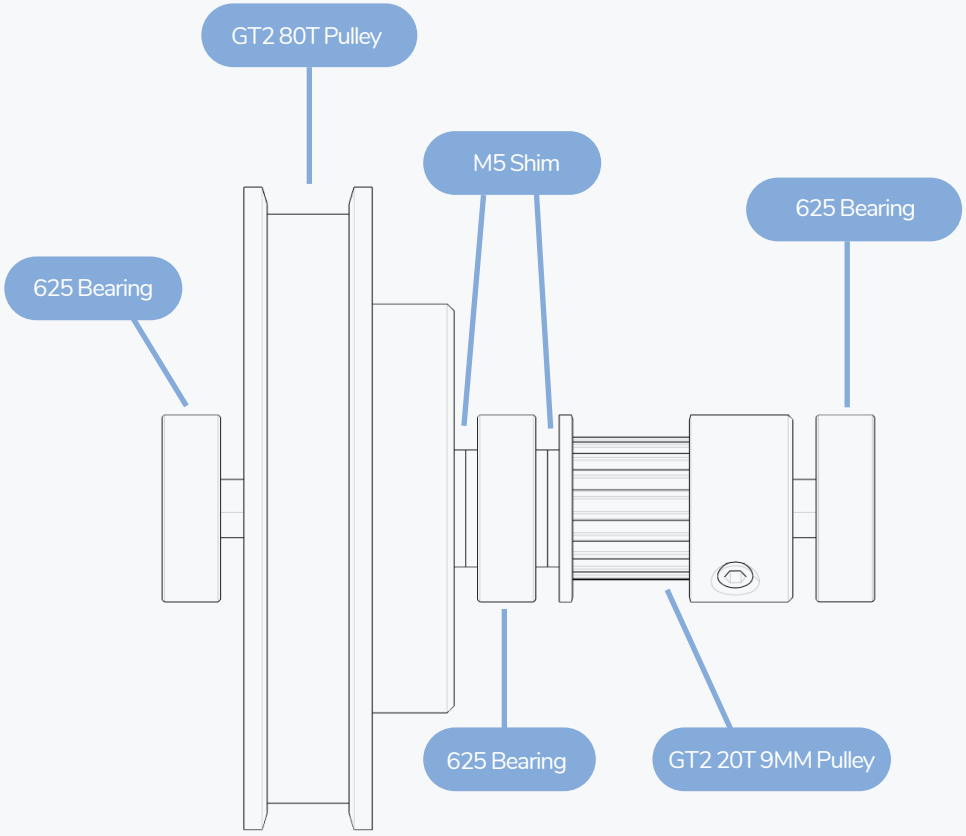


GT2 16T Pulley



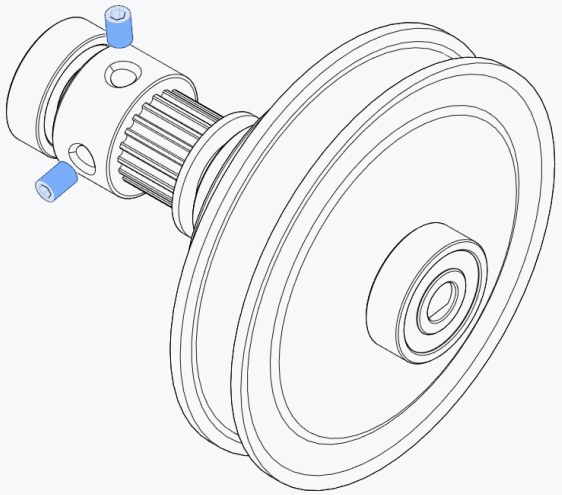
INSTALL HEAT SET INSERTS

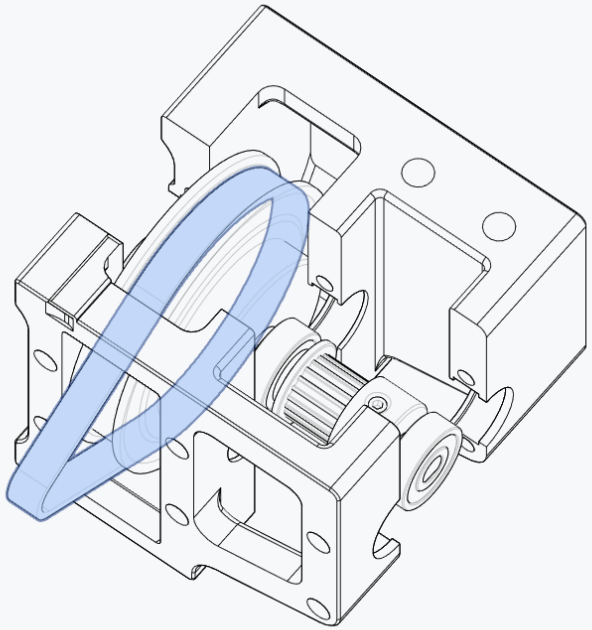
You will need to install heat set inserts into all four sets of Z drive housings. If you need help on the correct procedure, ask in Discord.



APPLY THREAD LOCK COMPOUND

Make sure to apply thread lock compound not only to the 9mm pulley grub screws, but also the 80T pulley!



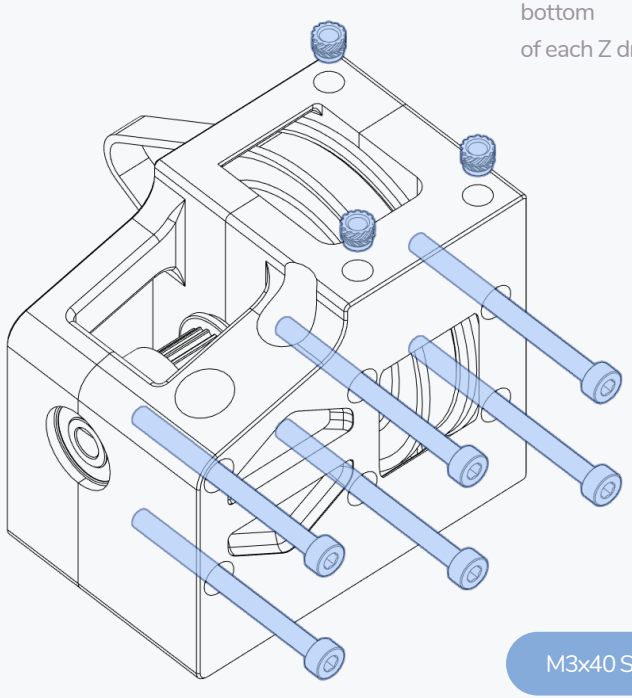


ASSEMBLE BELT DRIVE

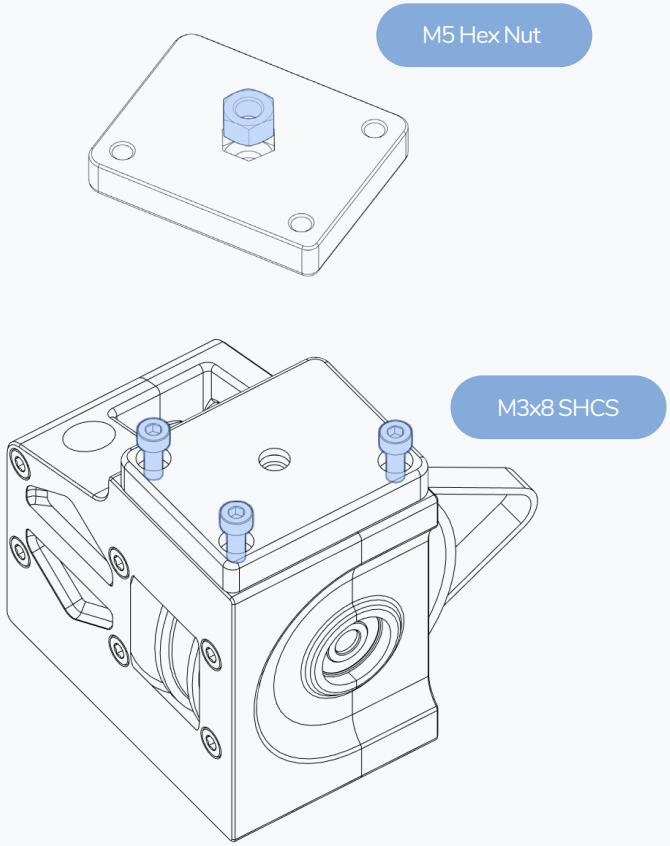
All four go together the same way. Don't forget to put the belt loop on!

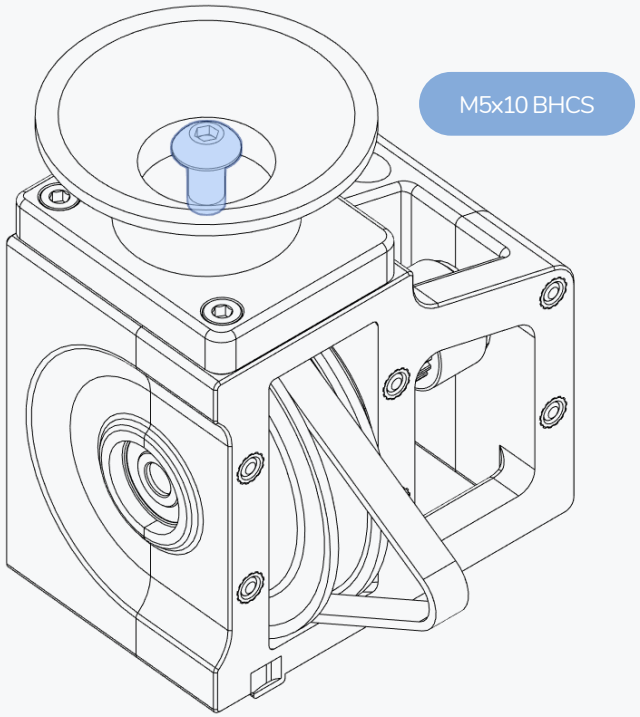
INSTALL HEAT SET INSERTS

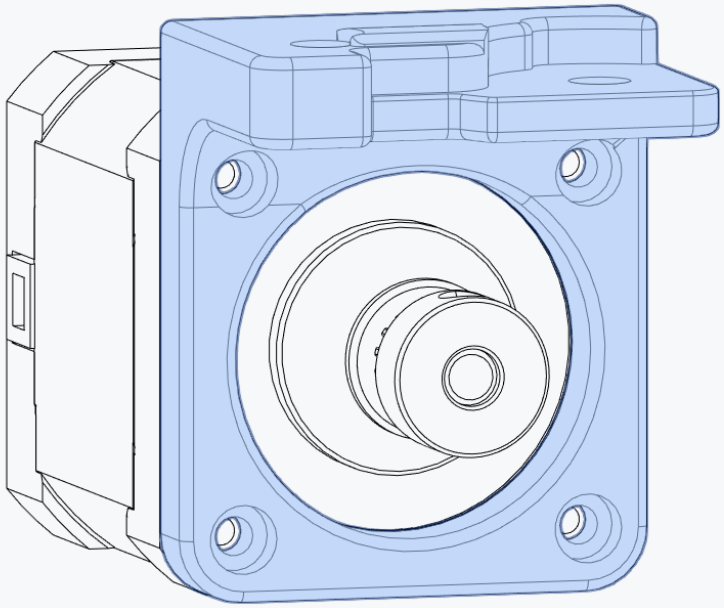
Don't forget these ones on the bottom
of each Z drive!

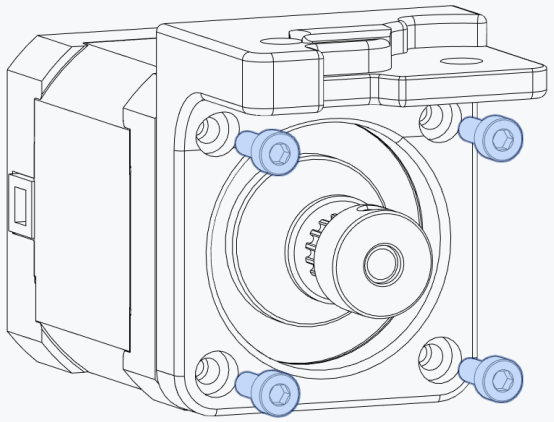


M3x40 SHCS


M5 Hex Nut
M3x8 SHCS


M5x10 BHCS





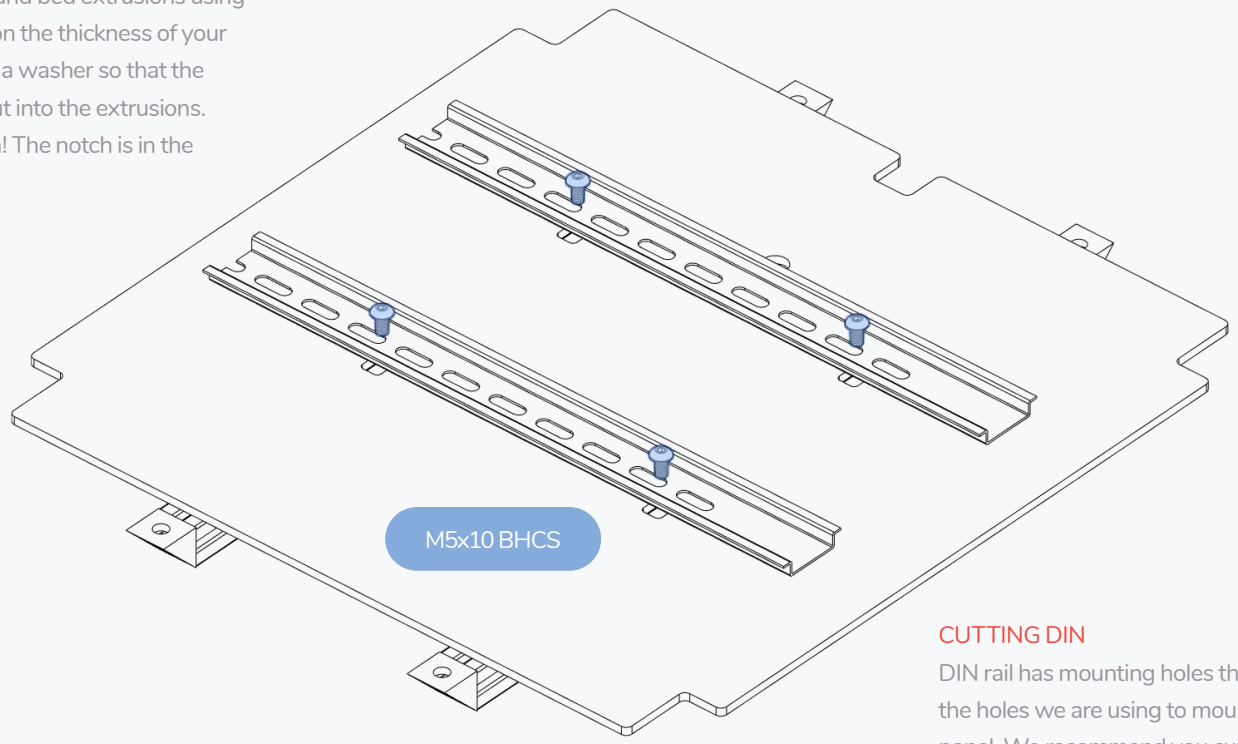
M3X8 SHCS

Attach Motor Mounts

Attach all 4 motor mounts to their stepper motors for your Z drive. You will need M3x8 SHCS for these.

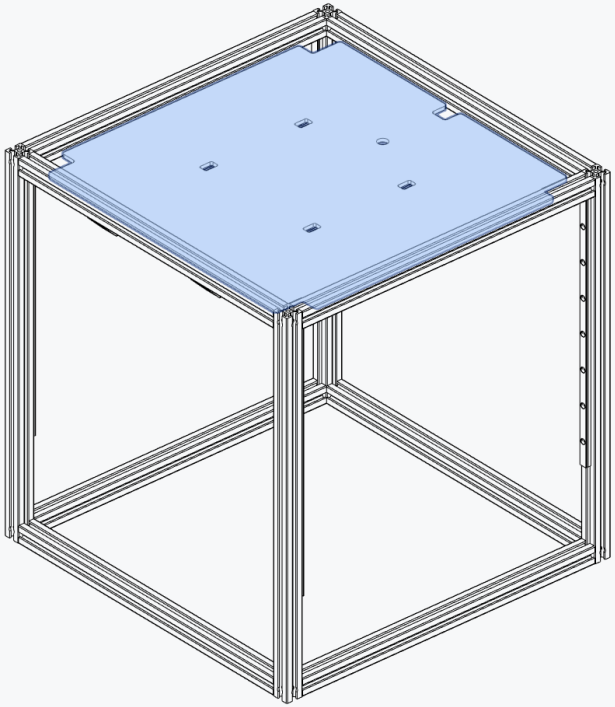
THE SANDWICH

The bottom deck panel is held in place by mounting it in between the DIN rails and bed extrusions using M5 fasteners. Depending on the thickness of your panel you may need to use a washer so that the fasteners do not bottom out into the extrusions. Also check your orientation! The notch is in the back.



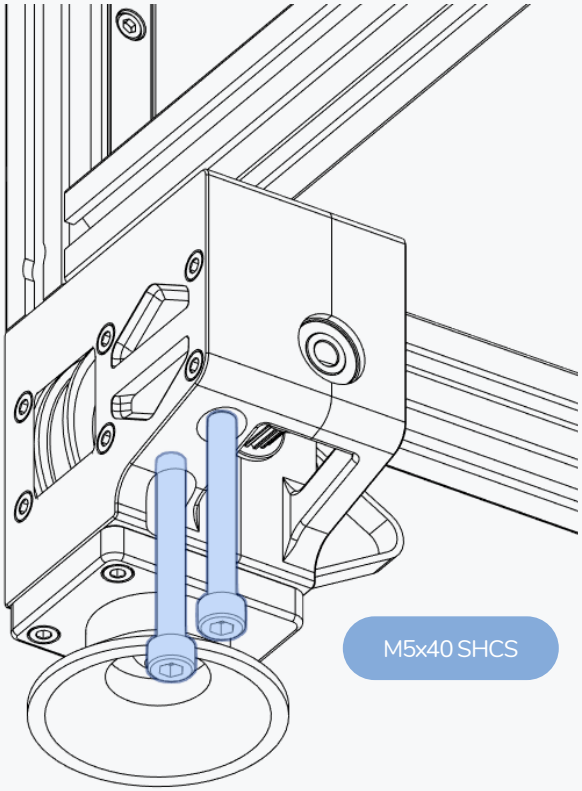
CUTTING DIN

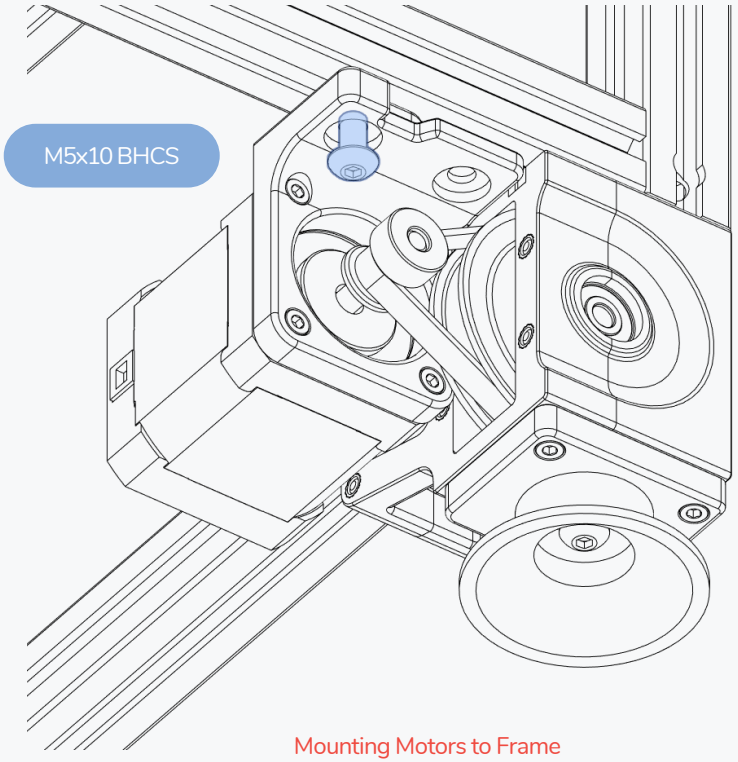
DIN rail has mounting holes that need to align with the holes we are using to mount through the deck panel. We recommend you cut the DIN rail smaller than the maximum width of the bottom frame so that you can align these properly.

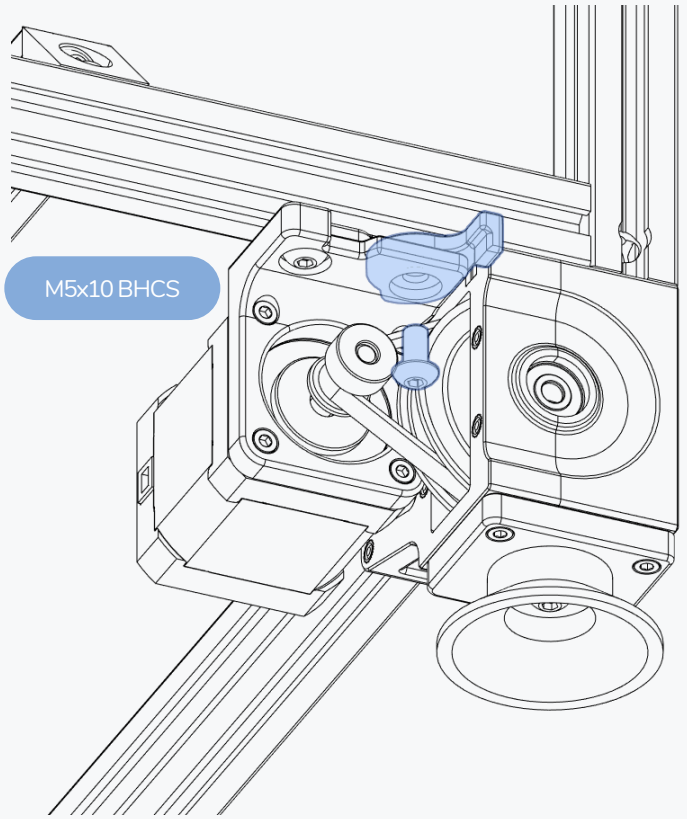


INSTALL BOTTOM DECK PANEL

Flip the frame over and install the deck panel. We're going to be working inverted for a little bit. You probably want to tape the carriages in place so they don't fall off the ends of the rails when you flip the machine!

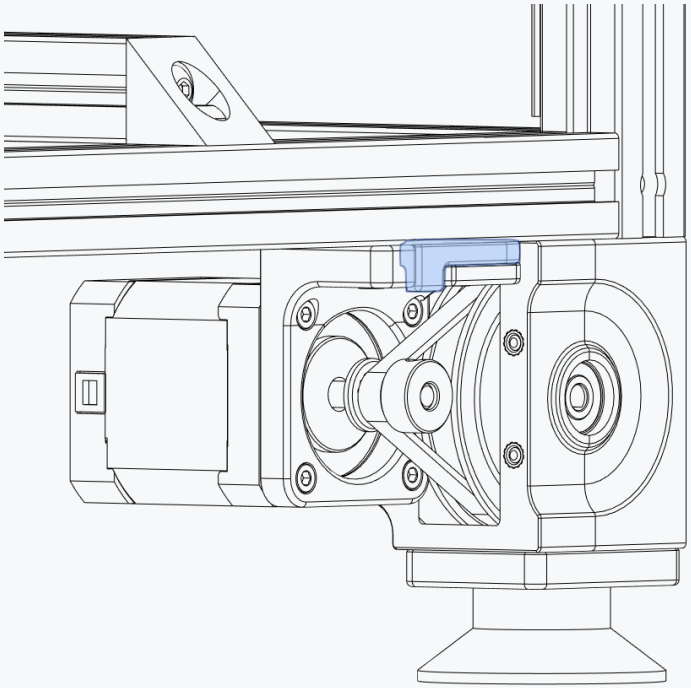






Mounting Motors to Frame

LIGHTLY secure the motor assemblies to the frame using the M5 fastener. We have more steps before we can fully tighten these.

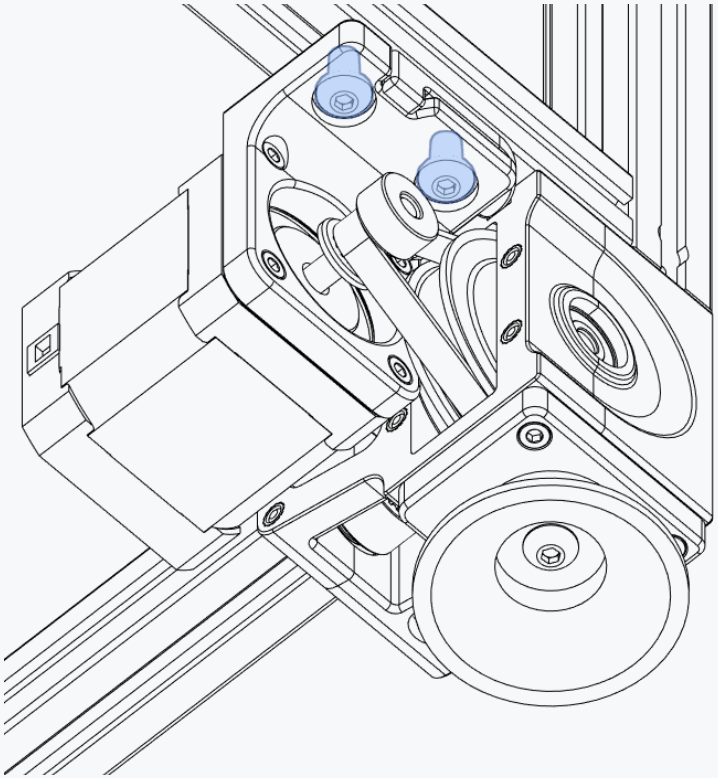


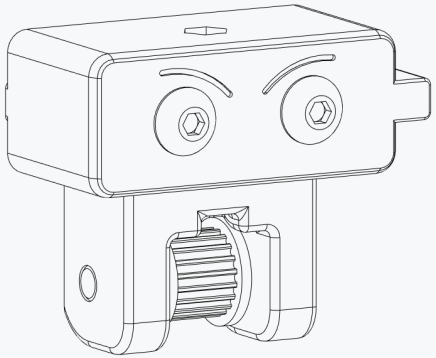
Close Belt Tensioner

Flip the belt tensioner latch closed. It should sit flush with the frame.

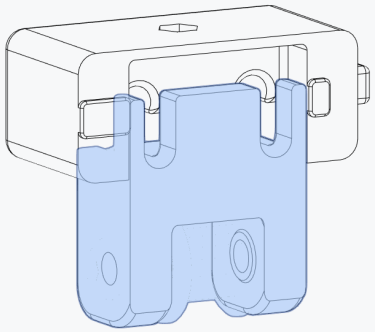
Tighten M5 Bolts

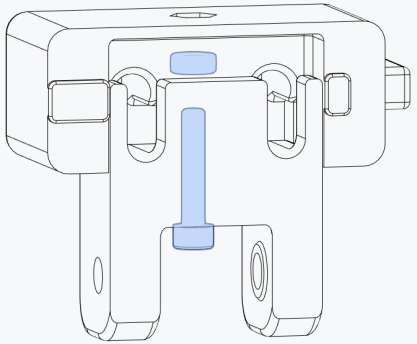
After closing the tensioner we can now tighten the M5 Bolts to secure the motor assembly.



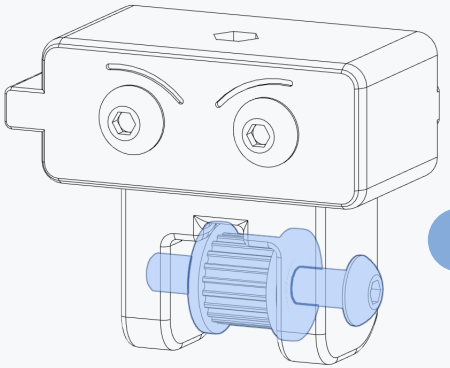


M3 Hex Nut



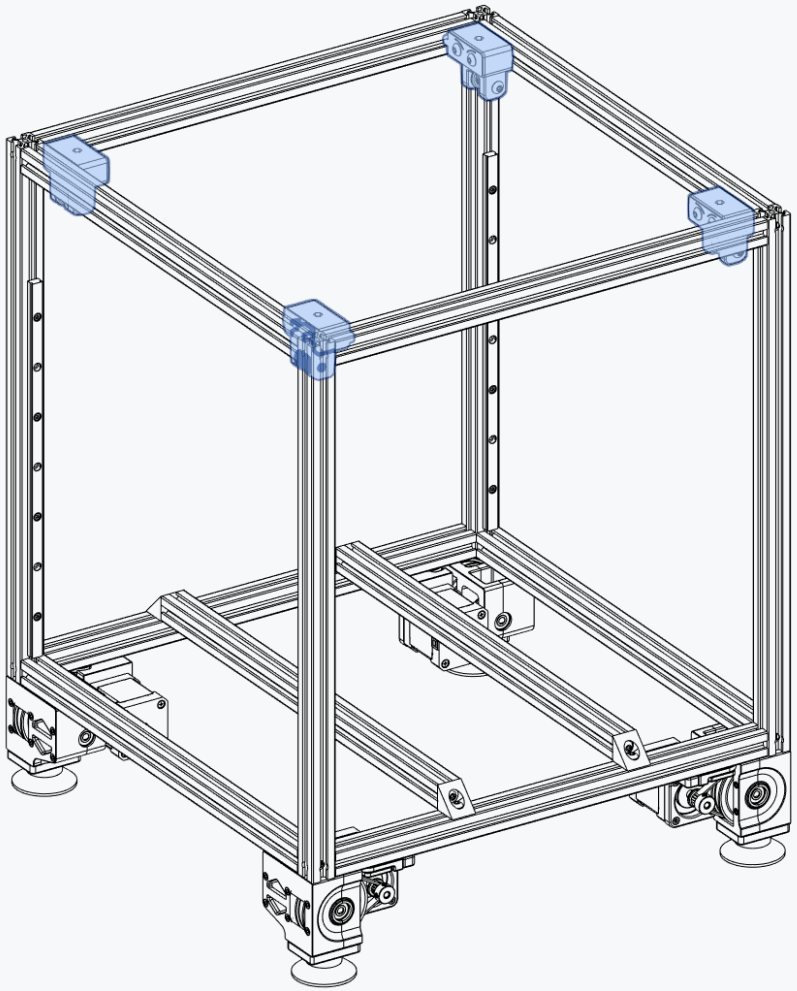


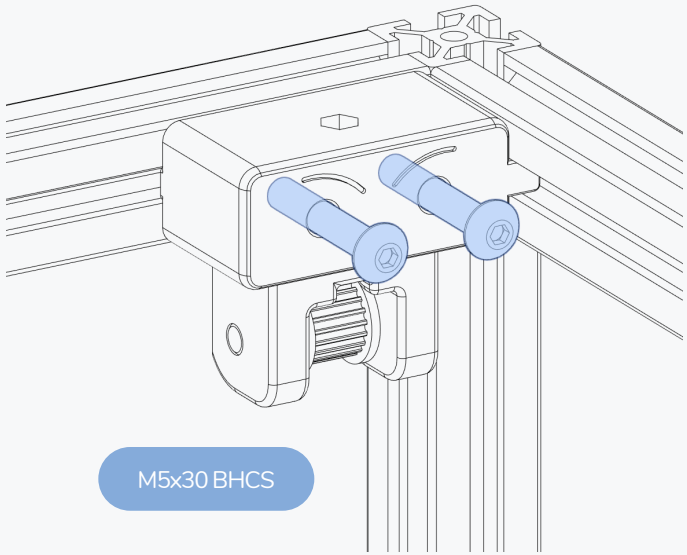
M3x16 SHCS

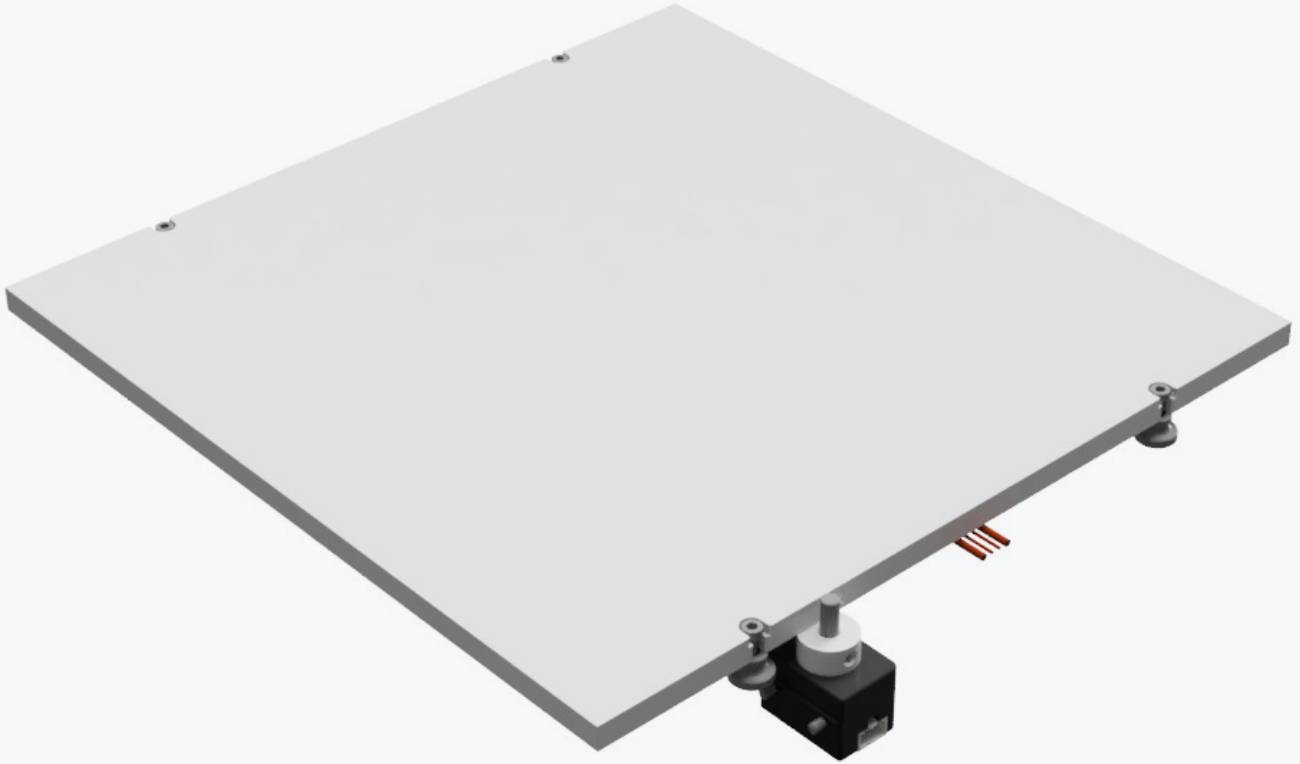


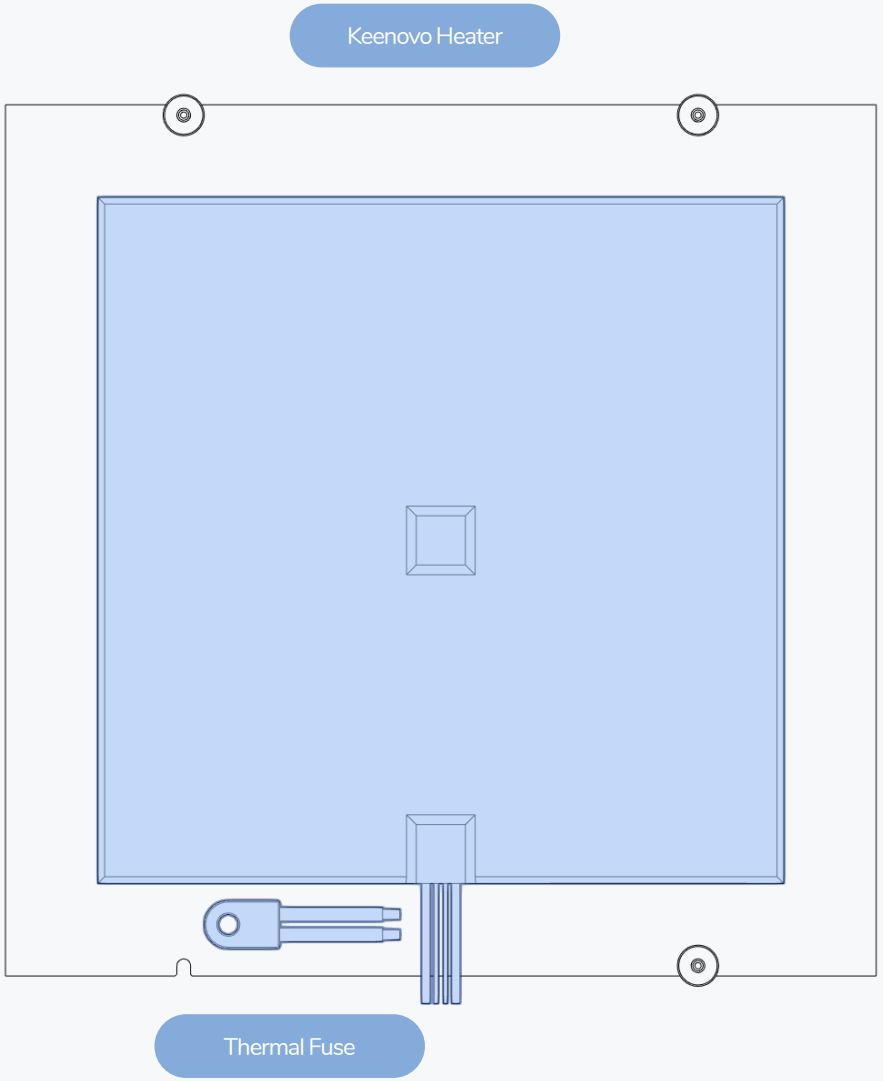
M5x30 BHCS

GT2 20T 9mm Idler



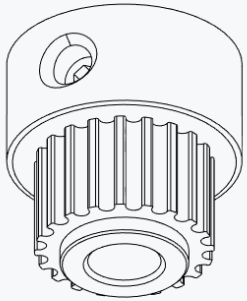

M5x30 BHCS

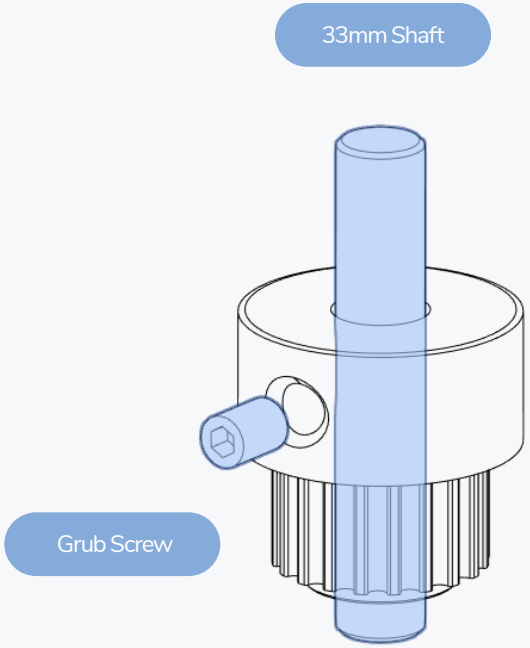



Keenovo Heater
Thermal Fuse

Deflange GT2 20T

Check our help videos in discord if you need help removing the flange for the 20T pulley.





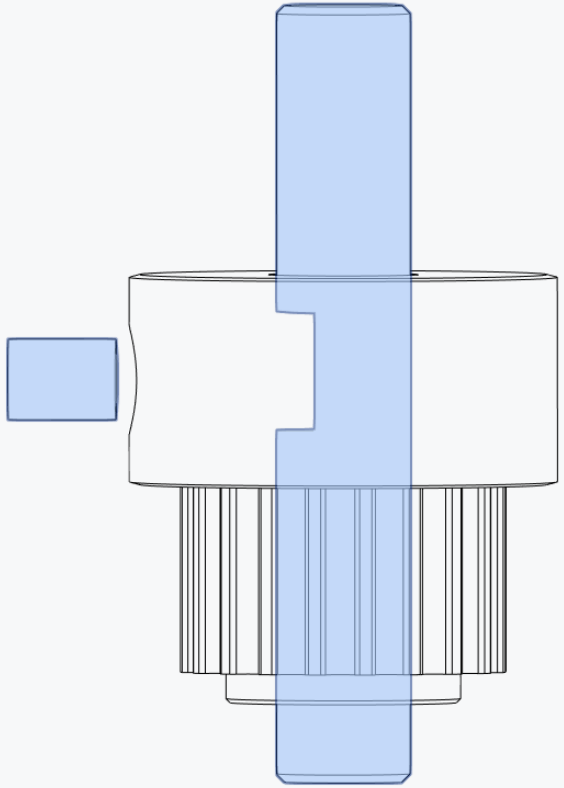
IMPORTANT NOTICE

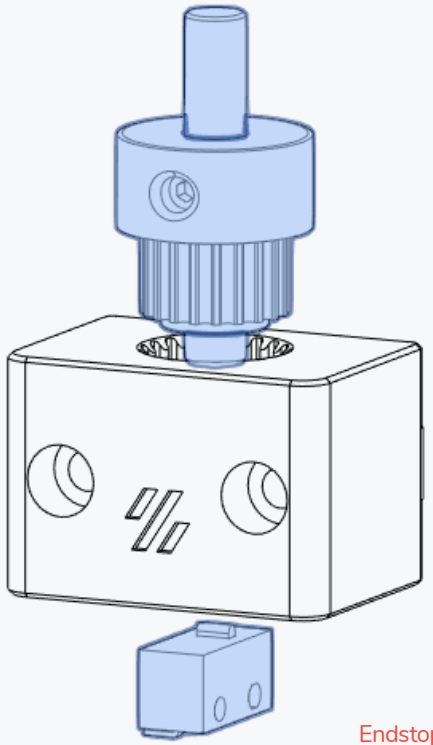
We have specified a notch to be cut into the Z endstop pin along with a grub screw. This is simply to prevent it from falling out if you tilt your machine to do work on it in the future. This does happen (even to the best of us) and can result in a nozzle strike with significant damage to the gantry.

It is recommended that you cut and size this pin as your last step in your build process. Build plate configurations are sometimes different based on removable build plates, PEI thickness etc. If the pin is too short you will strike the hot end housing on the build plate, but if it's too long you will hit it during prints.

When securing the grub screw, remember that the shaft has to move in order to hit the microswitch. It should not be tight to the shaft, but rather left loose to allow for movement. It is intended to installed backed out slightly and held in place with retaining compound.

If you have questions, please ask in our Discord. This is one of the most critical steps to your build so please take care in assembly of this component.





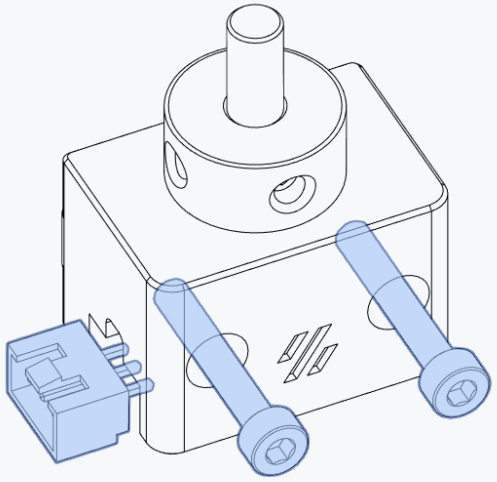
Microswitch

Endstop Microswitch

Secure the microswitch with two your M2 self tapping screws. Make sure to remove the lever from the microswitch as it will get in the way.

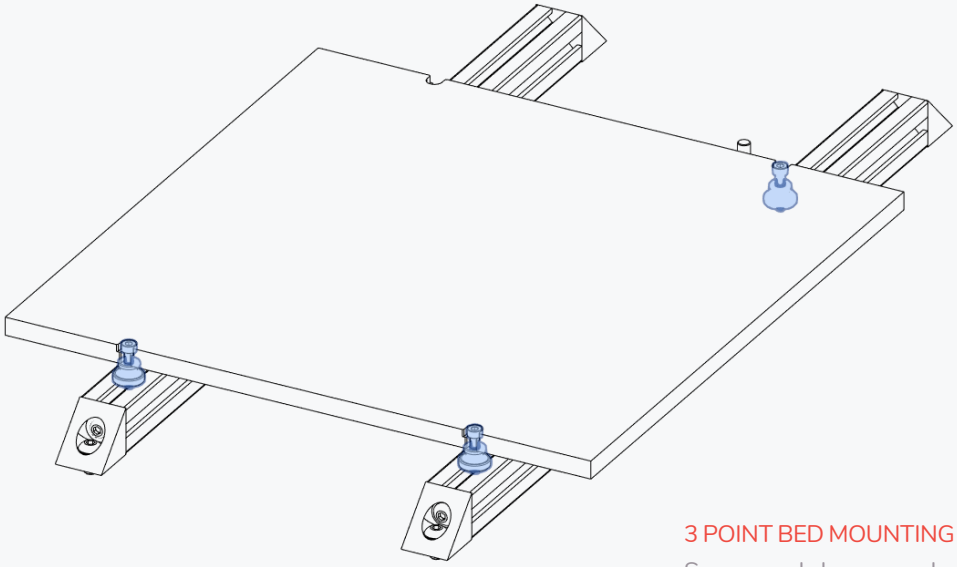
Solder Connector

It's possible to solder the JST connector directly to the microswitch if you wish.

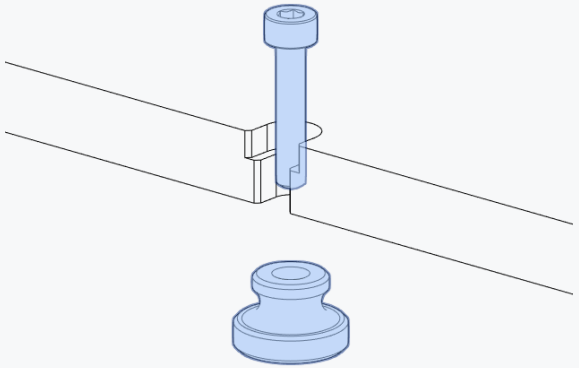


JST 3 Pin Connector

M3x20 SHCS



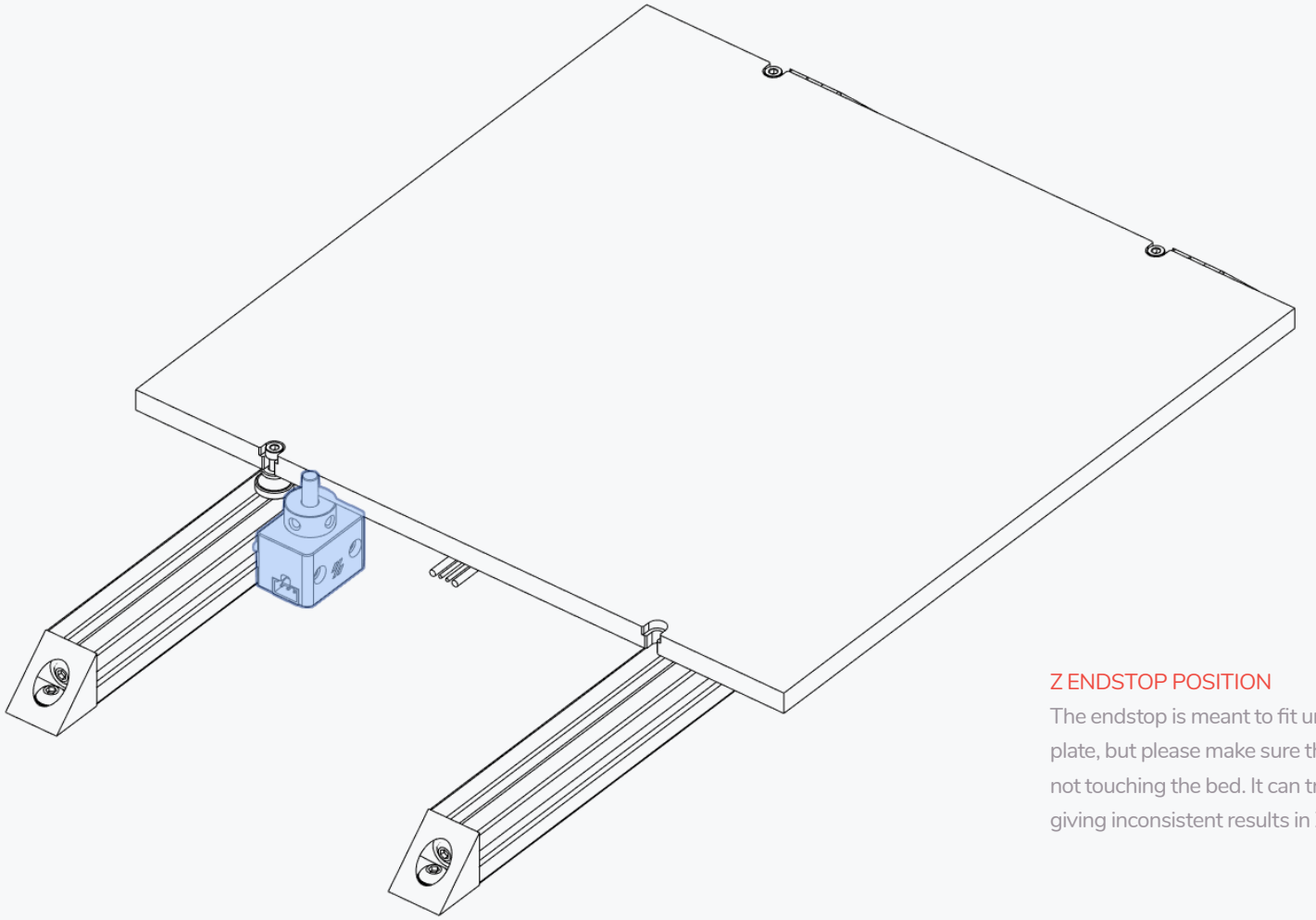
M3x16 SHCS



M4 Knurled Nut

3 POINT BED MOUNTING

Some people have more luck doing a 3 point bed mount. It can help prevent bed warping.



Z ENDSTOP POSITION

The endstop is meant to fit under the build plate, but please make sure that the pin is not touching the bed. It can transfer heat giving inconsistent results in Z probing.

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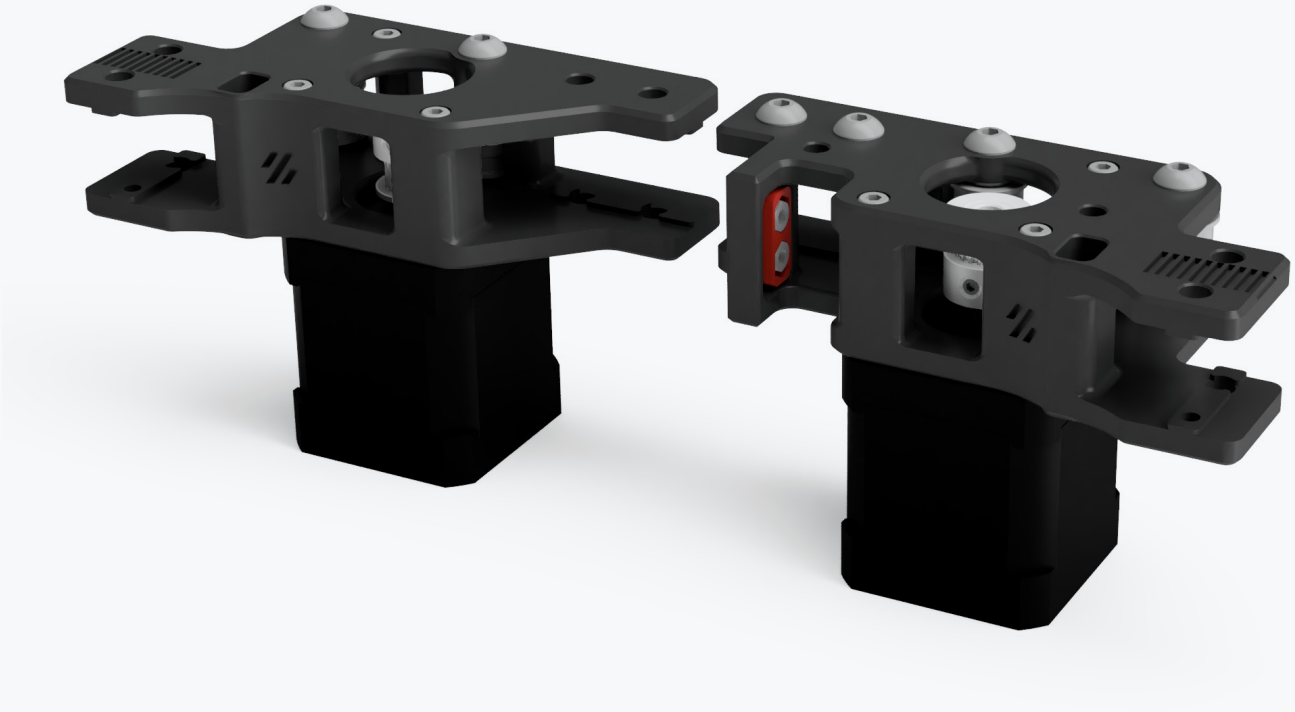
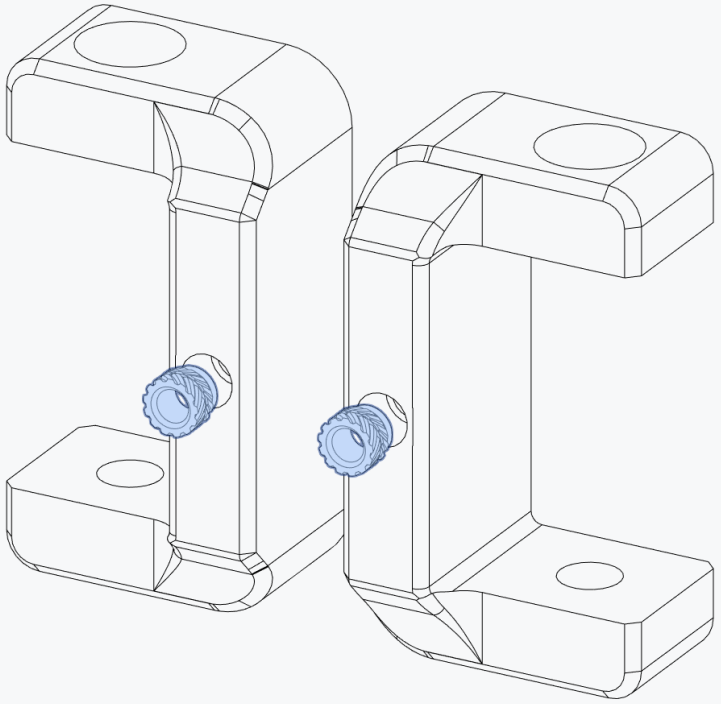
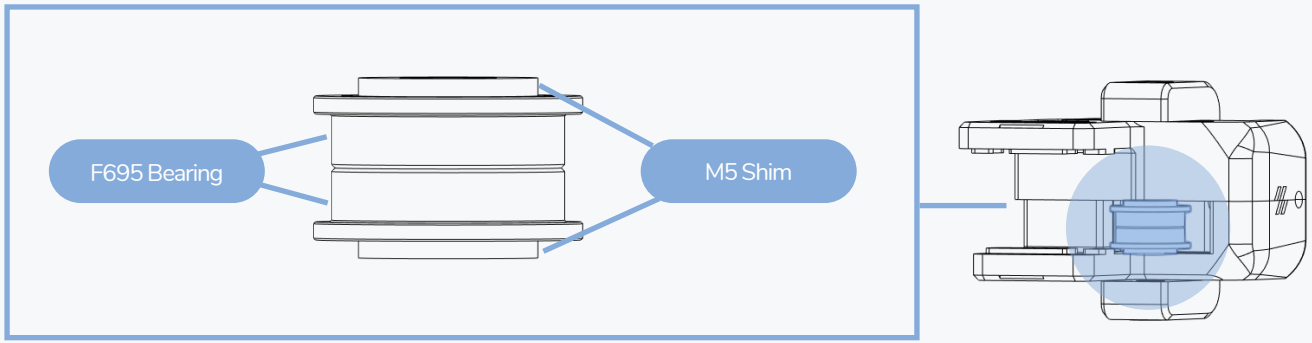


INSTALL HEAT SET INSERTS

You will need to install heat set inserts into both Front Idler Tensioners. If you need help on the correct procedure, ask in Discord.



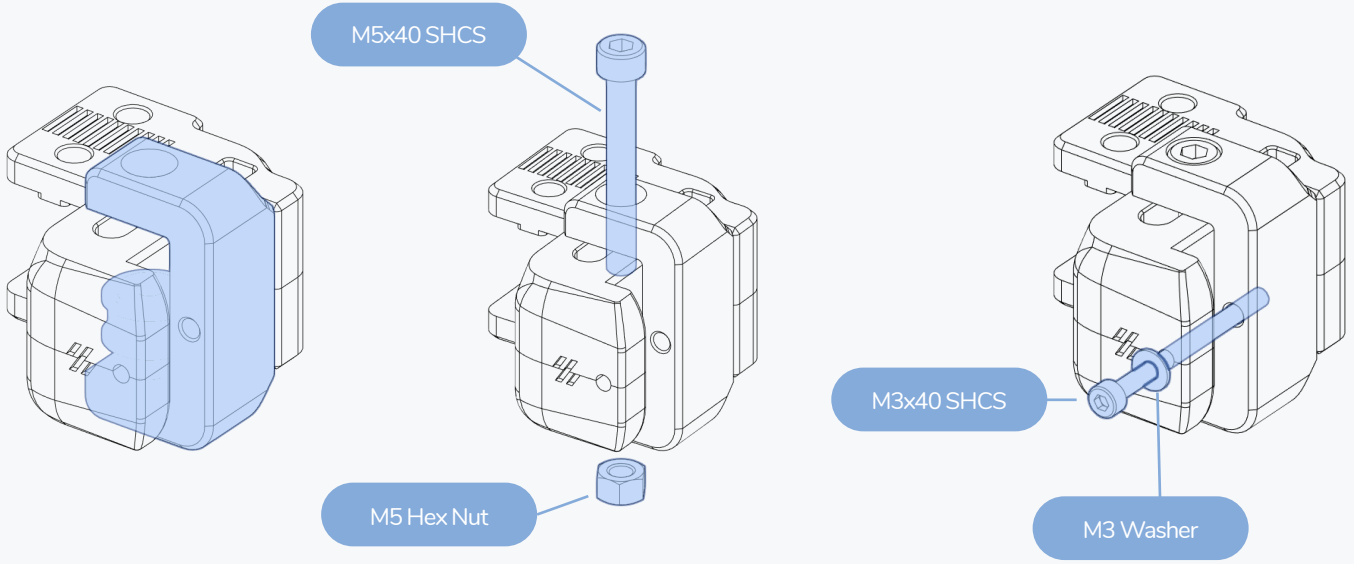


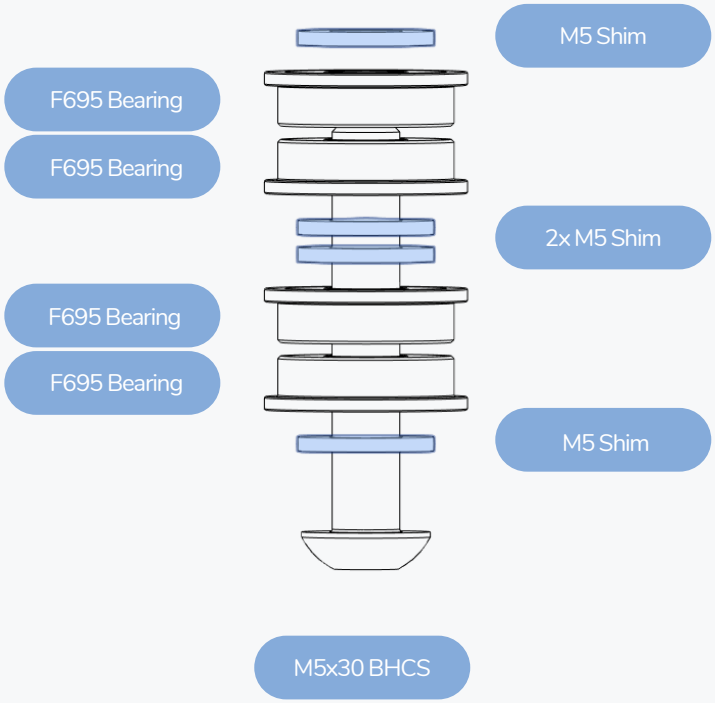
M3 HOLE

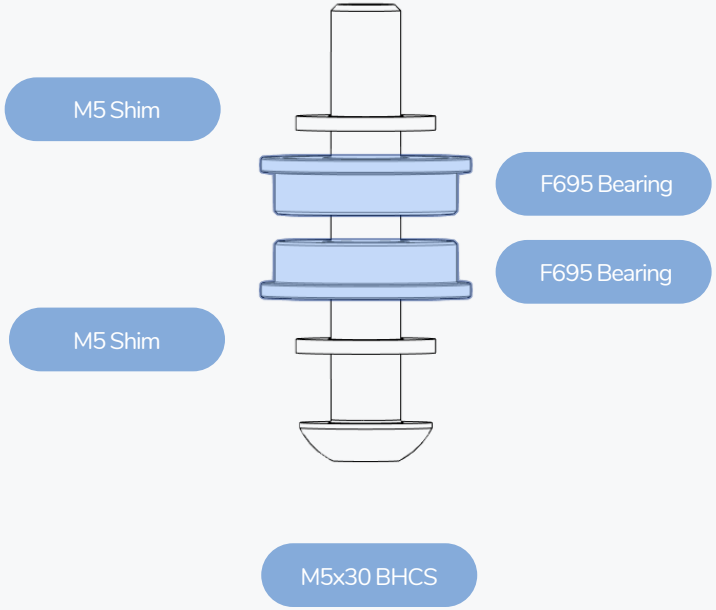
The bearing stack can be a little tricky to install. Sometimes it helps to use the M5x40 as a guide and feed the washers and bearings in one at a time.

BEARING STACK

The bearing stack can be a little tricky to install. Sometimes it helps to use the M5x40 as a guide and feed the washers and bearings in one at a time.

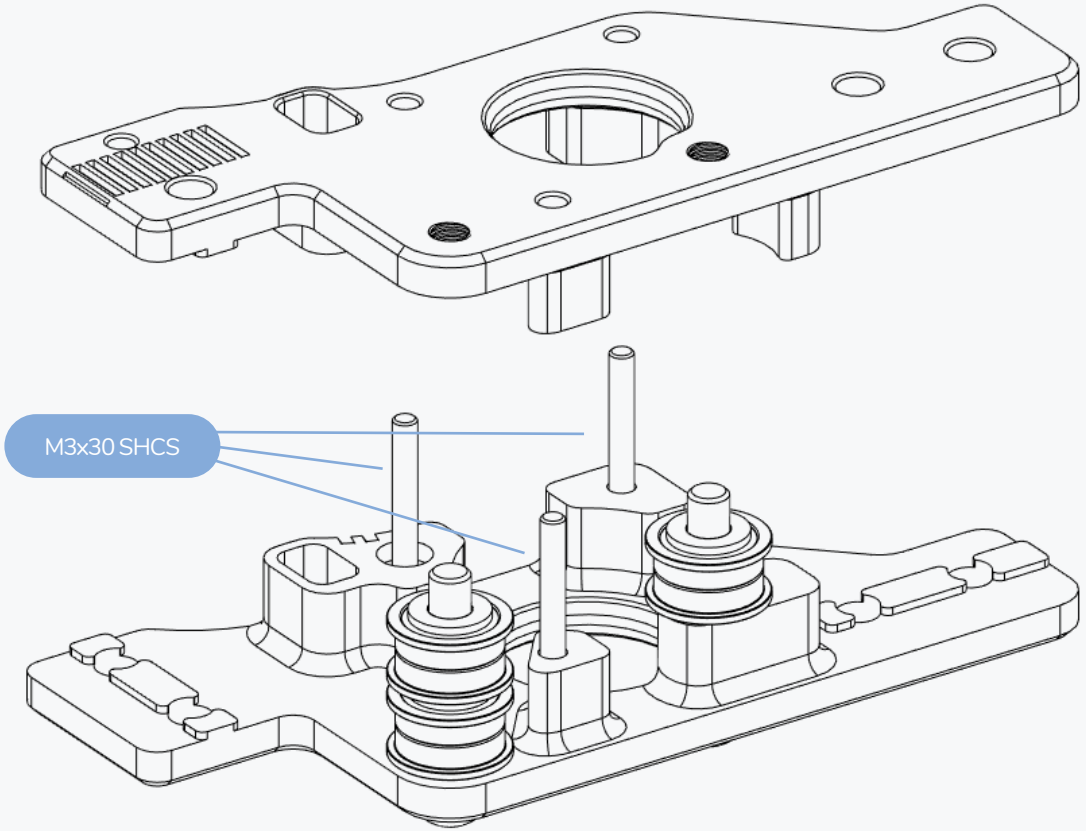


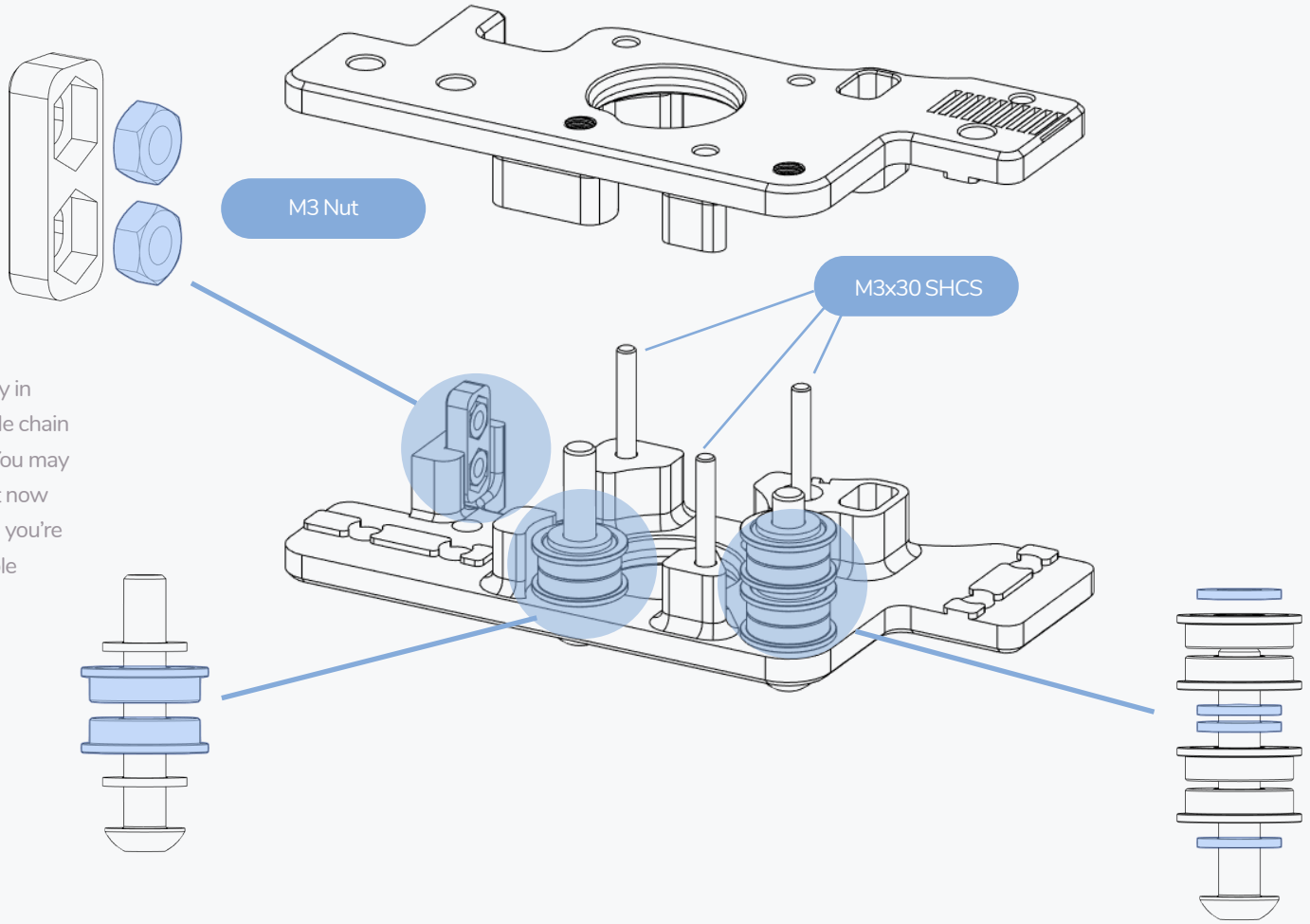

F695 Bearing
F695 Bearing
F695 Bearing
F695 Bearing
M5 Shim
2x M5 Shim
M5 Shim
M5x30 BHCS


M5 Shim
M5 Shim
F695 Bearing
F695 Bearing
M5x30 BHCS

UPSIDE DOWN

It's easier to build these upside down. Feed the M3 and M5 bolts through the top, flip it over and start building your bearing stacks.





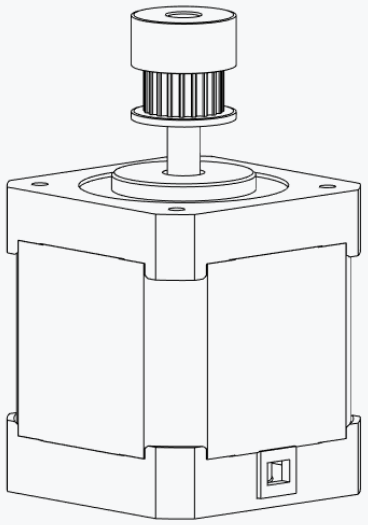
CHAIN MOUNT

This part will not stay in place unless the cable chain mount is attached. You may wish to add this part now or skip this step until you're ready to add the cable chains.

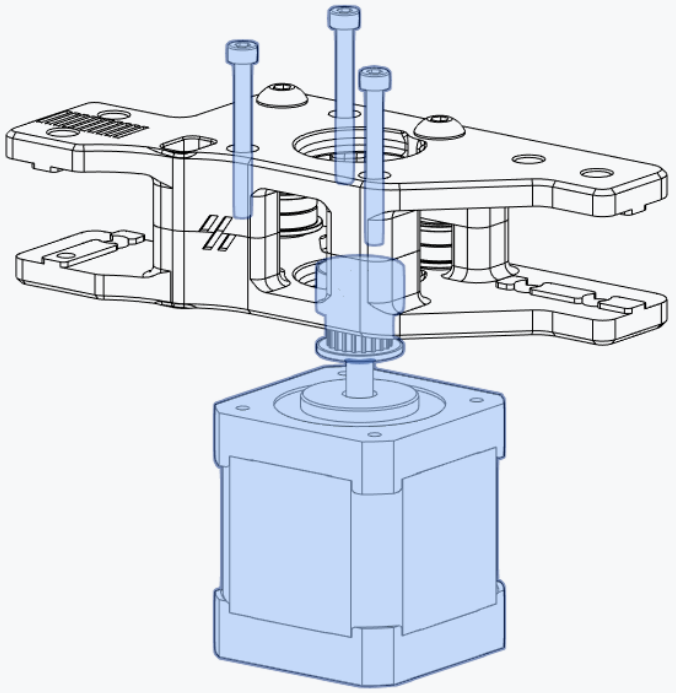
APPLY THREAD LOCK COMPOUND

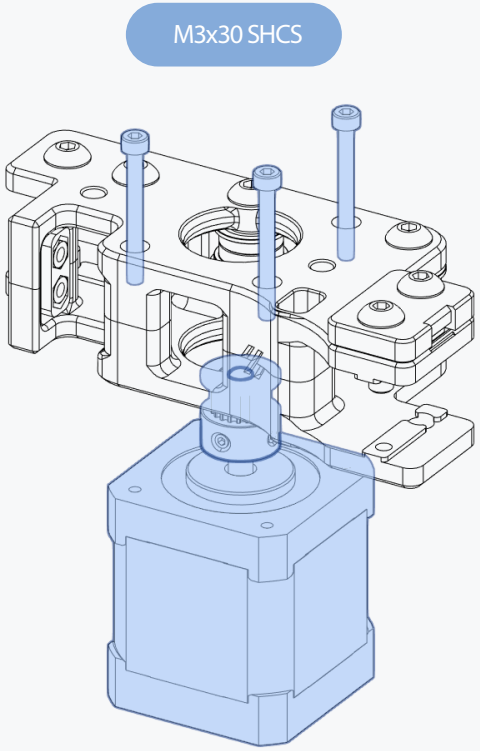
Make sure to apply thread lock compound to the pulley grub screws.

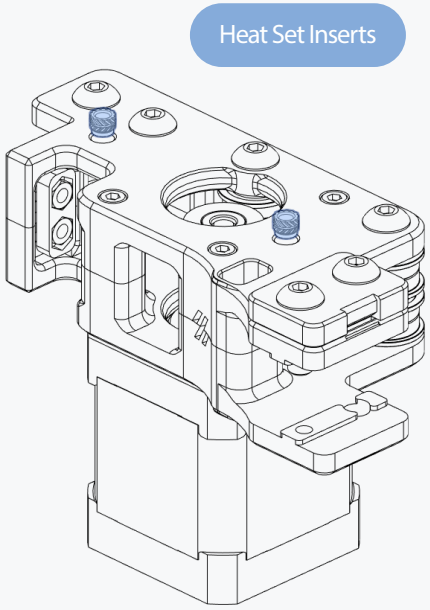
GT2 20T Pulley

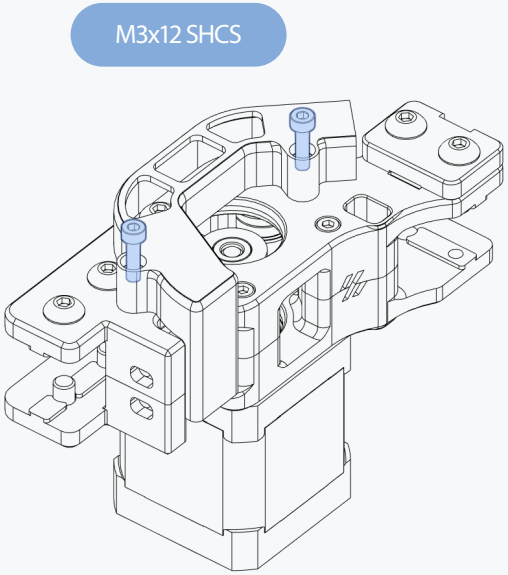


M3x30 SHCS





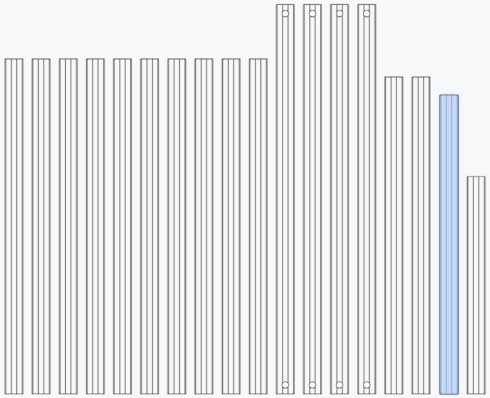


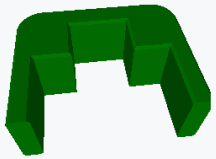


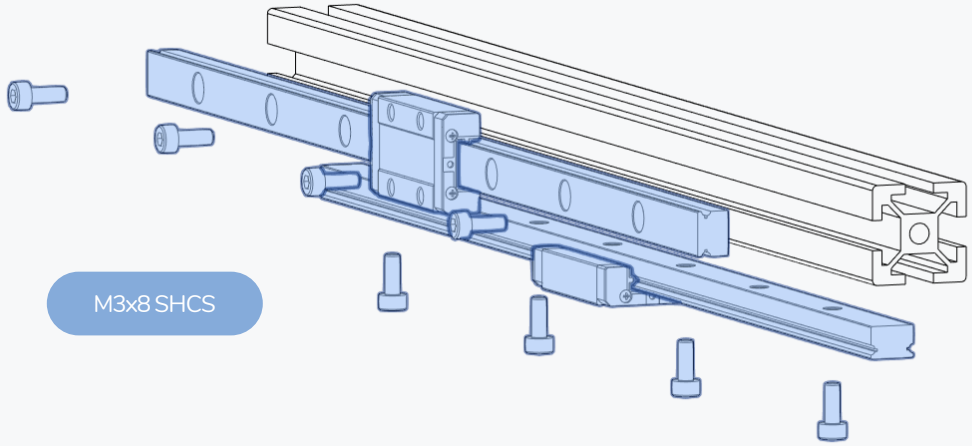
CHECK 20T PULLEY

Make sure you mounted your 20T pulley on your A drive (right side image) opposite to the way we did the B drive (left side image).


VORON

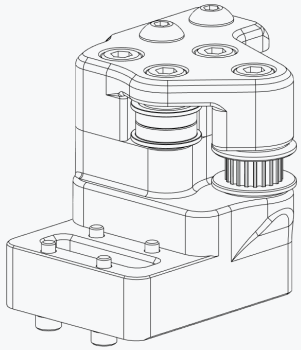


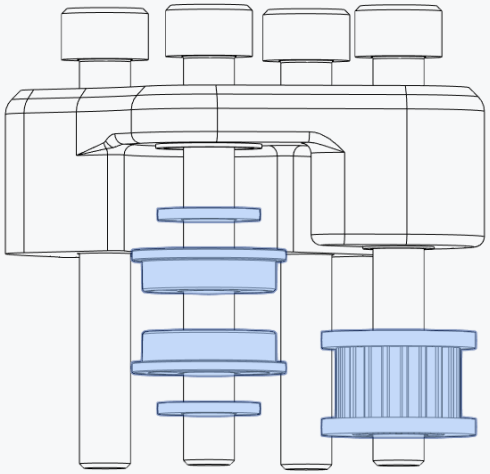




CENTERED RAIL INSTALLATION GUIDE

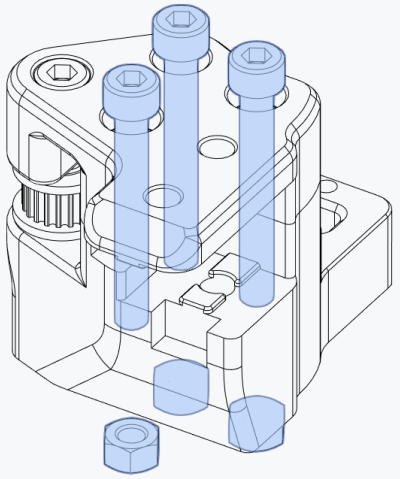
When tightening the fasteners to hold the linear rails in place, ensure that you have attached a centered rail installation guide to both the top and bottom. You should have two printed.



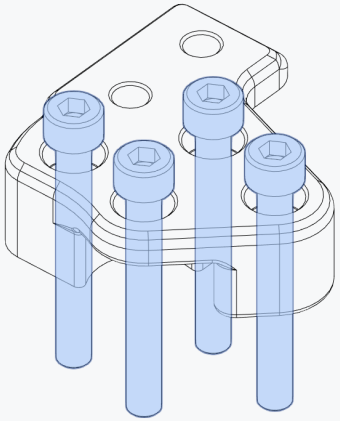


GT2 20T Idler

M5x40 SHCS



M5 Hex Nut

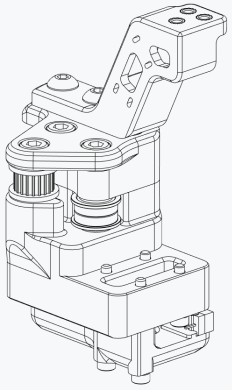


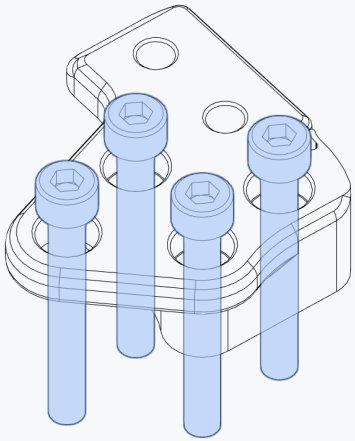
M5x40 SHCS

BEARING STACKS

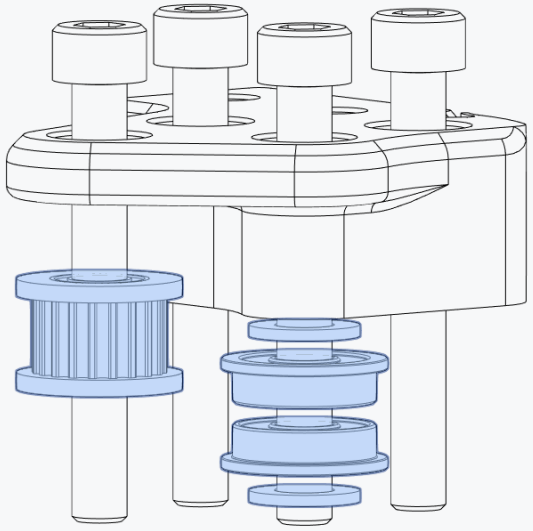
See previous examples for how to assemble these.

We use the same bearings and fasteners as used in other steps.





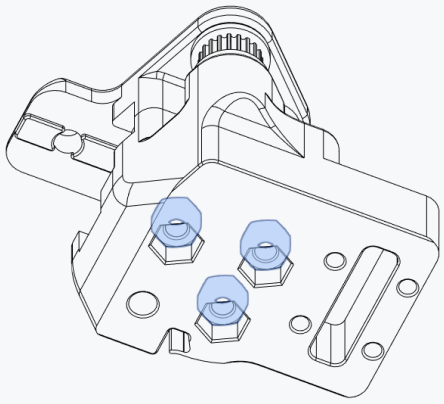
M5x40 SHCS



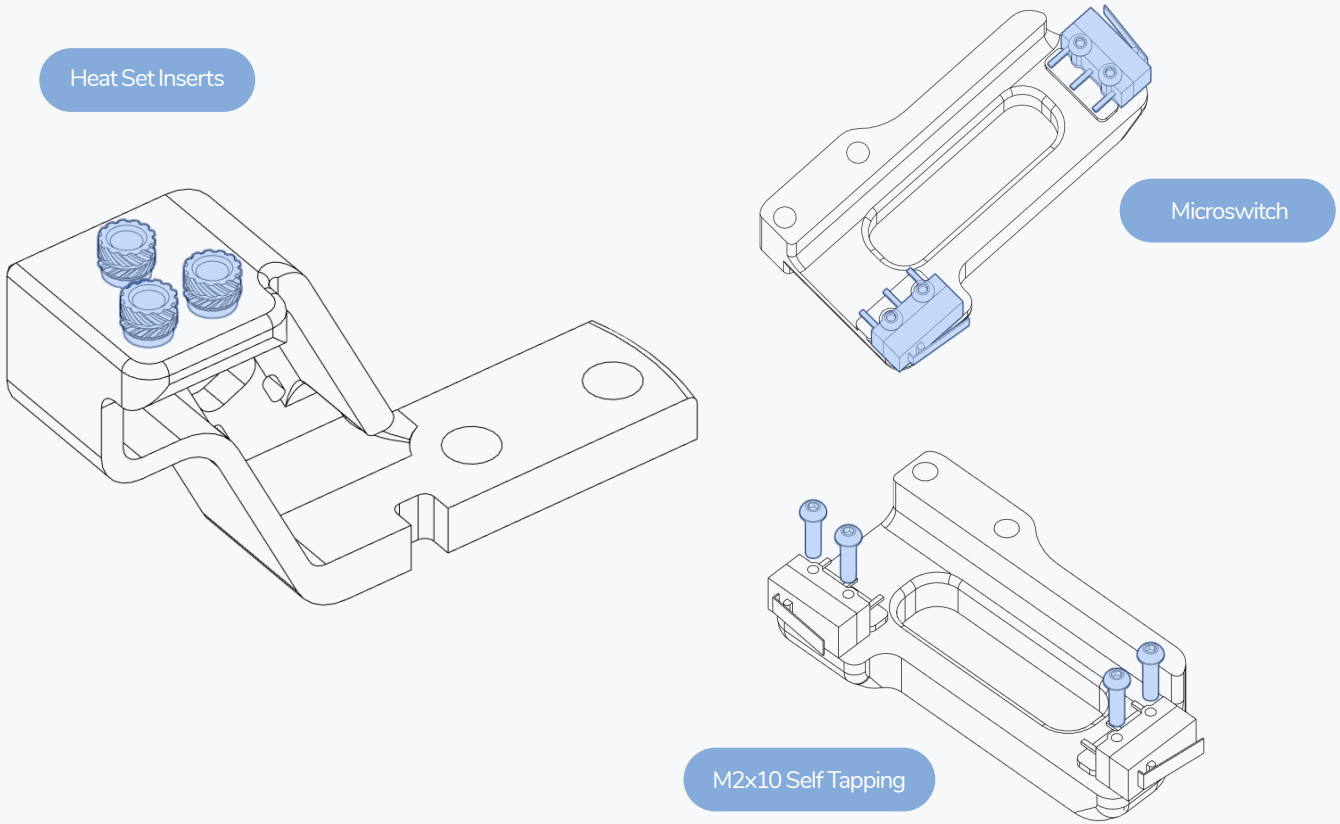
GT2 20T Idler

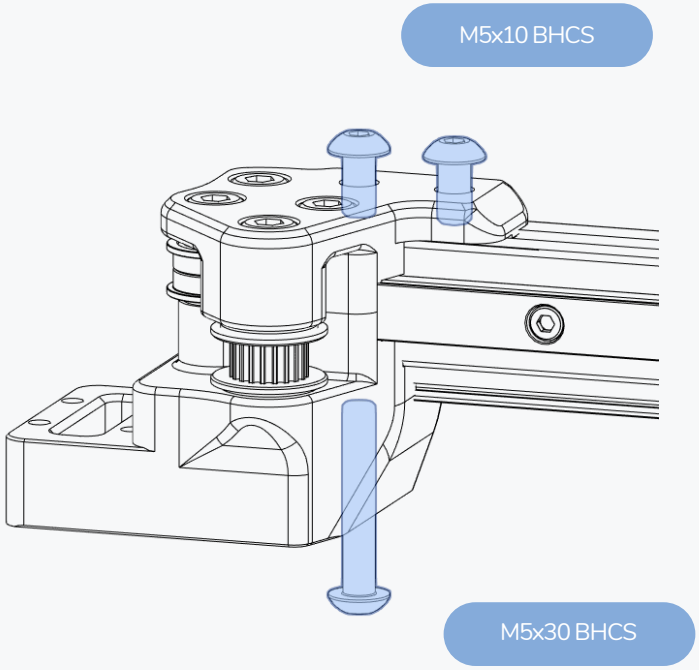
BEARING STACKS

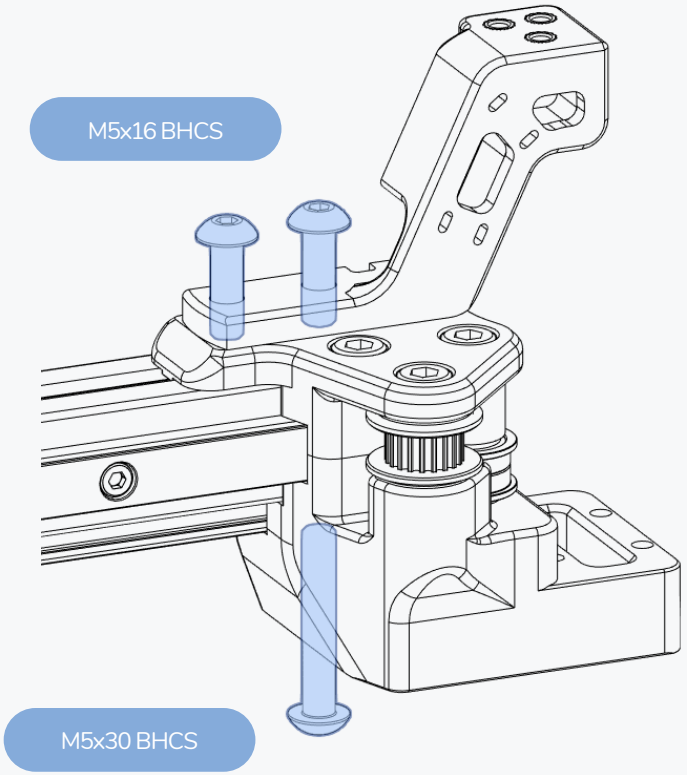
See previous examples for how to assemble these. We use the same bearings and fasteners as used in other steps.



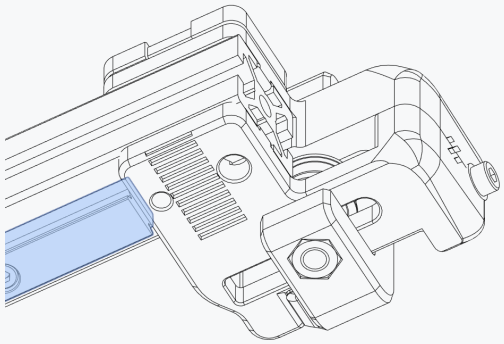
M5 Hex Nut


Heat Set Inserts
Microswitch
M2x10 Self Tapping


M5x10 BHCS
M5x30 BHCS


M5x16 BHCS
M5x30 BHCS

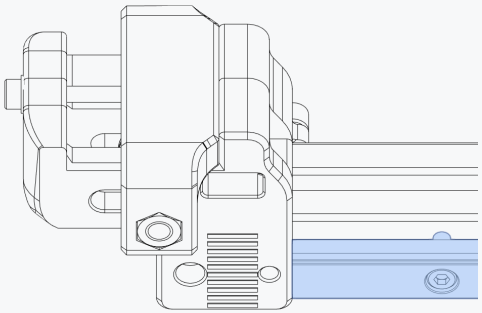
M3x8 SHCS



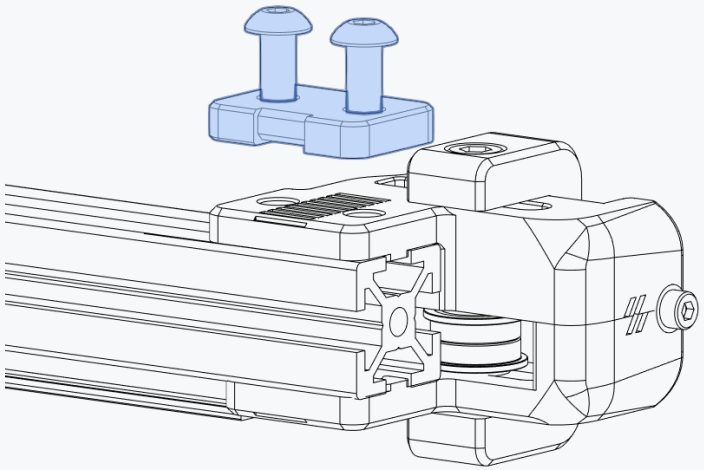
INSTALLING Y LINEAR RAILS

The front idlers are our index point for the Y rail installation. Confirm that both idlers are sitting flush with the end of the extrusion and then install the linear rails such that they are pressed firmly against the backs of the idlers.

Don't forget to use your rail center guide!



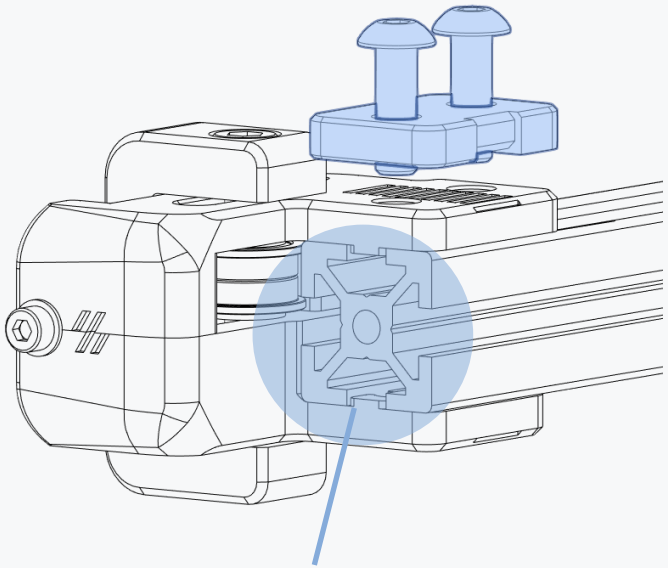
M5x16 BHCS



LEFT IDLER

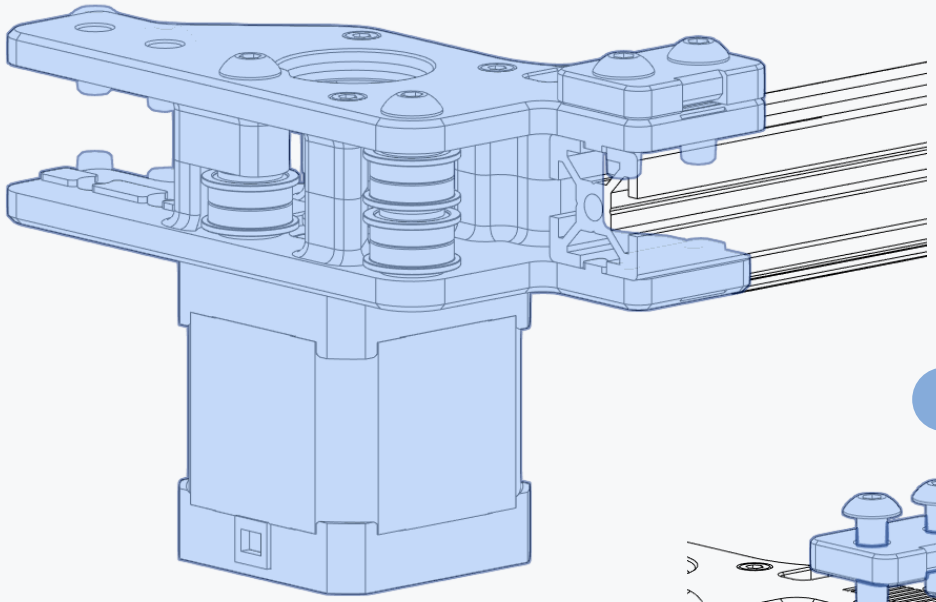
Make sure you mounted your 20T pulley on your A drive (right side image) opposite to the way we did the B drive (left side image).

M5x16 BHCS



FLUSH INSTALL

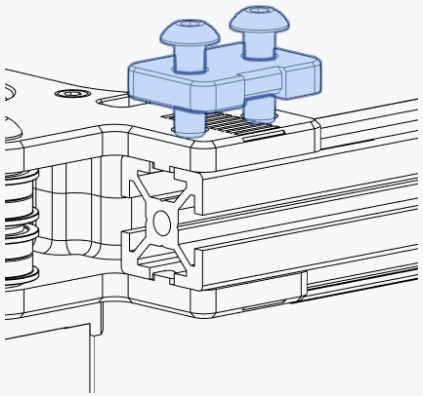
We are going to be indexing things off the front idlers moving forward. Take your time and ensure that both idlers are sitting flush to the end of both extrusions. Errors here can cause issues later on.

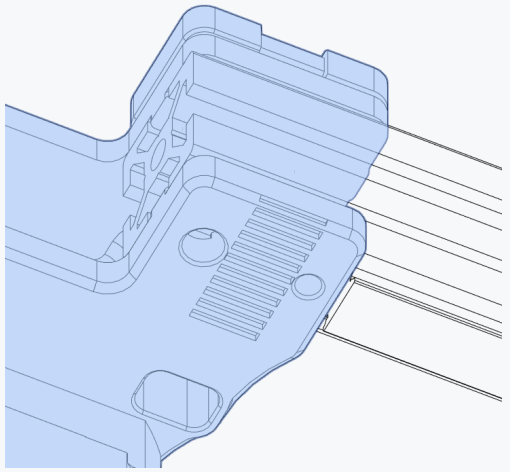


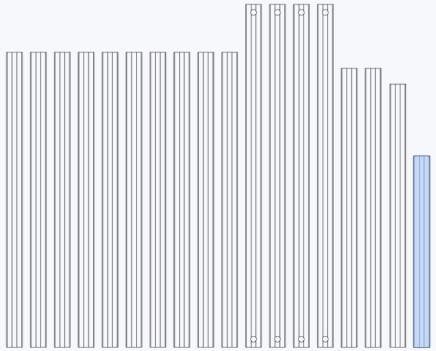
INSTALLING AB DRIVE UNITS

With your front idlers and linear rails on your Y extrusions, now we can install the AB Drive Units. Press these against the linear rail and secure from the top as per the diagram.

M5x16 BHCS

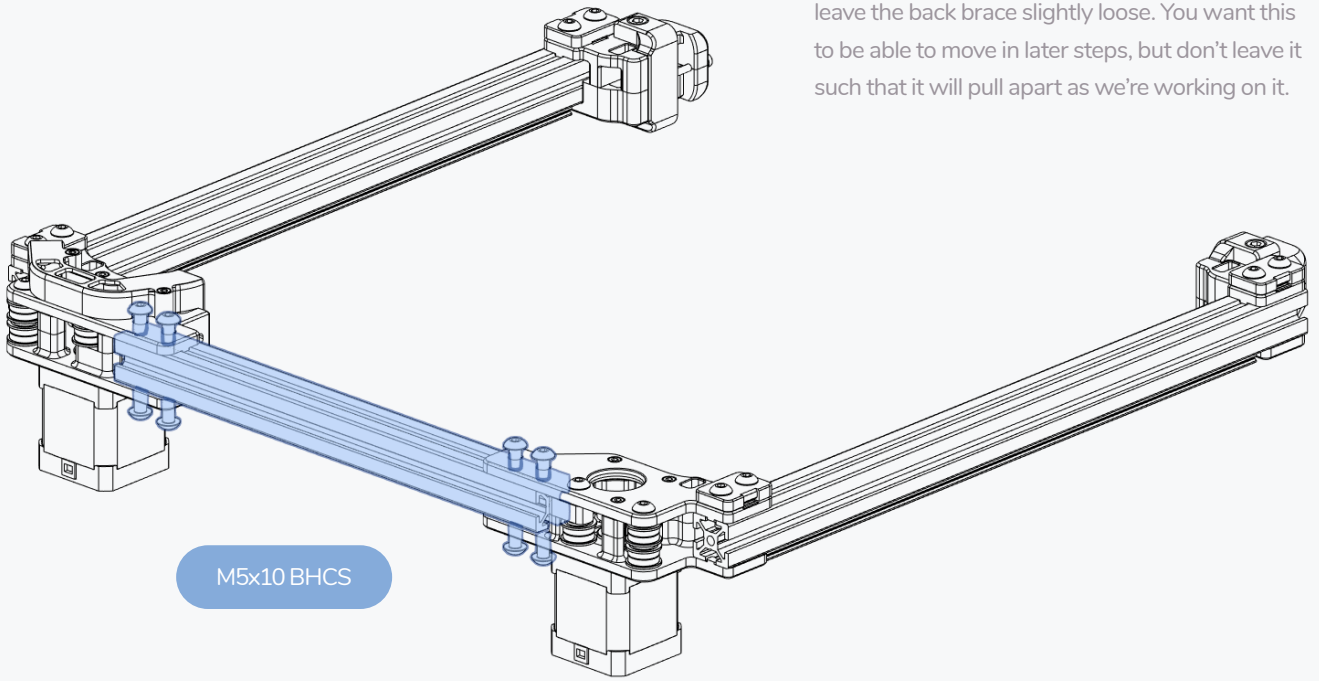


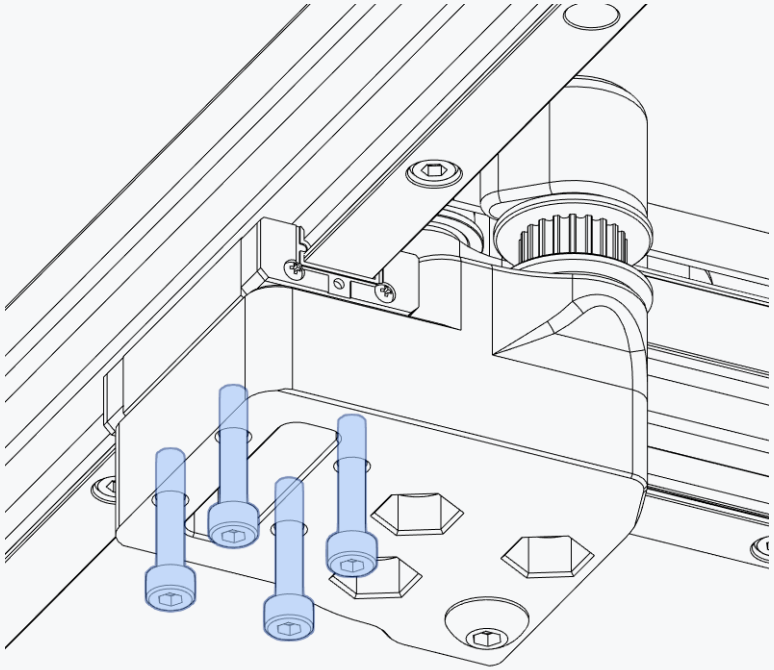


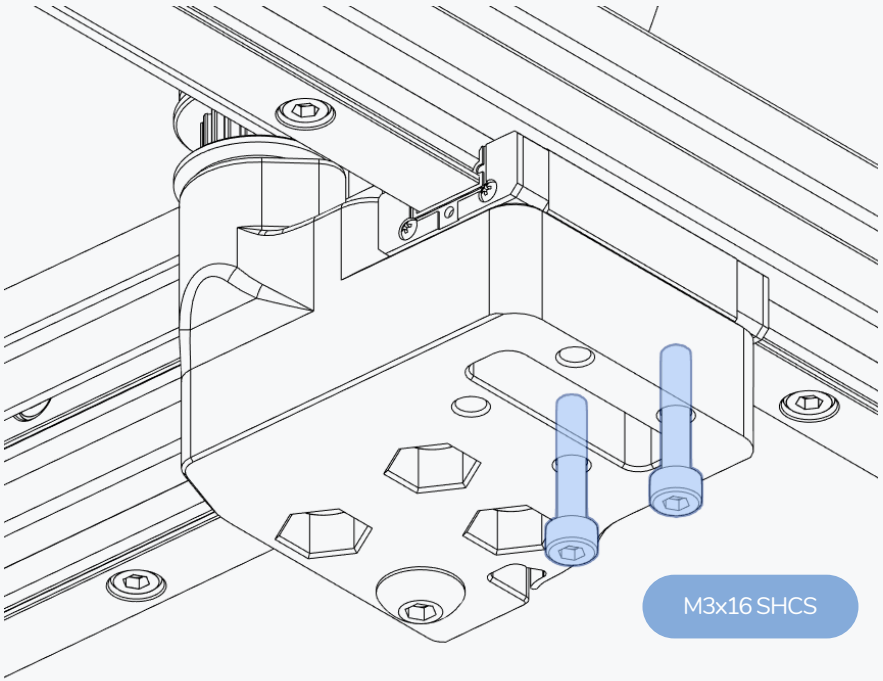


REAR BRACE EXTRUSION

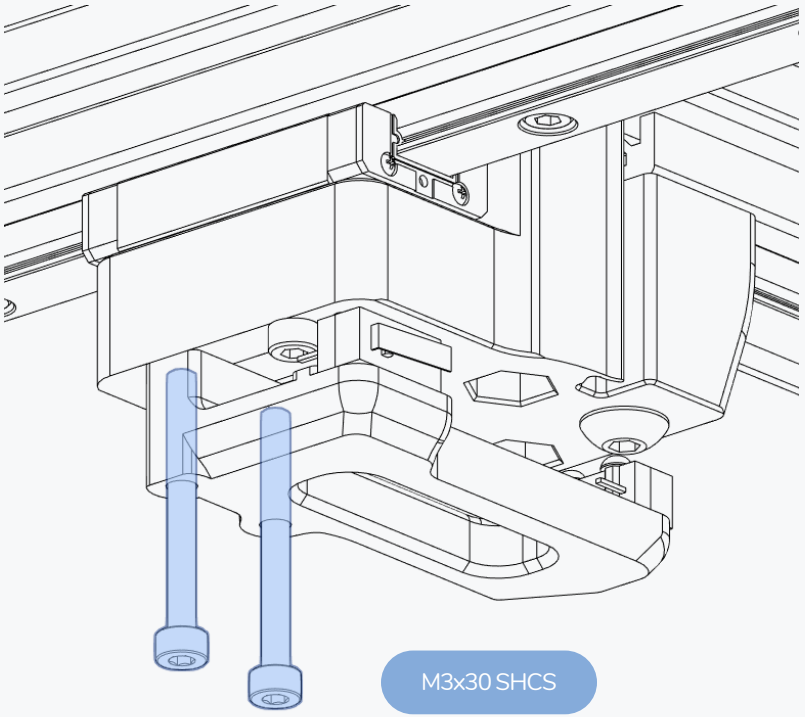
When you install your M5x10 BHCS fasteners, leave the back brace slightly loose. You want this to be able to move in later steps, but don't leave it such that it will pull apart as we're working on it.



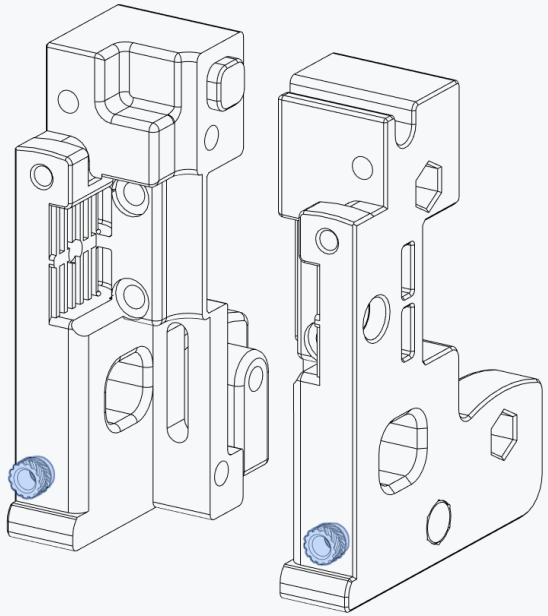

M3x16 SHCS


M3x16 SHCS


Microswitch Pod

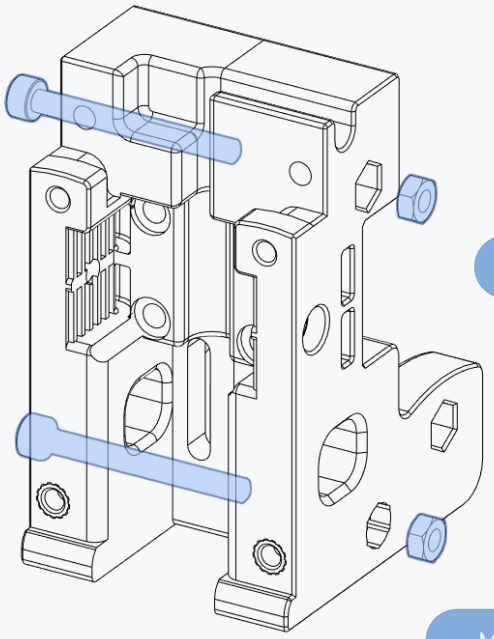

M3x30 SHCS


VORON



Heat Sets

M3x30 SHCS

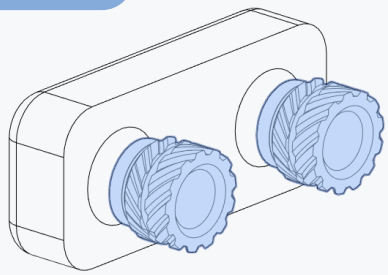


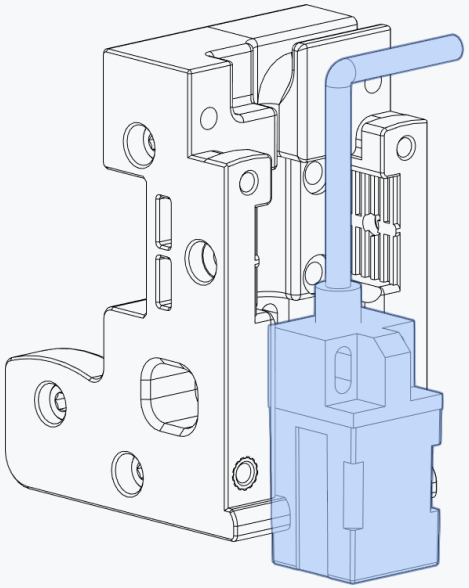
M3 Hex Nut

M3x30 SHCS

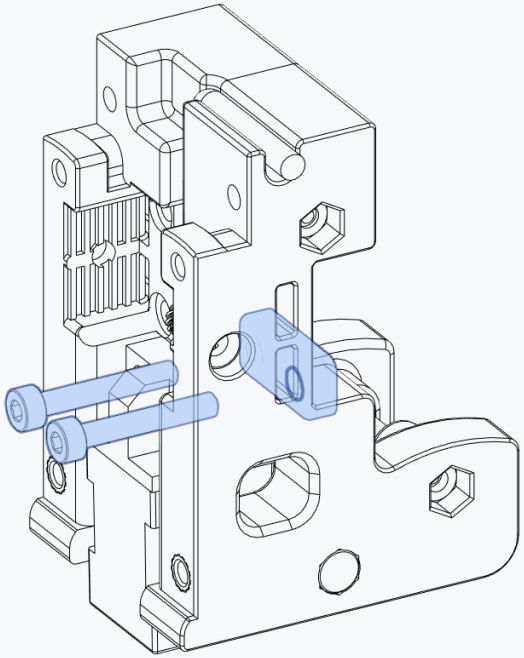
M3 Hex Nut

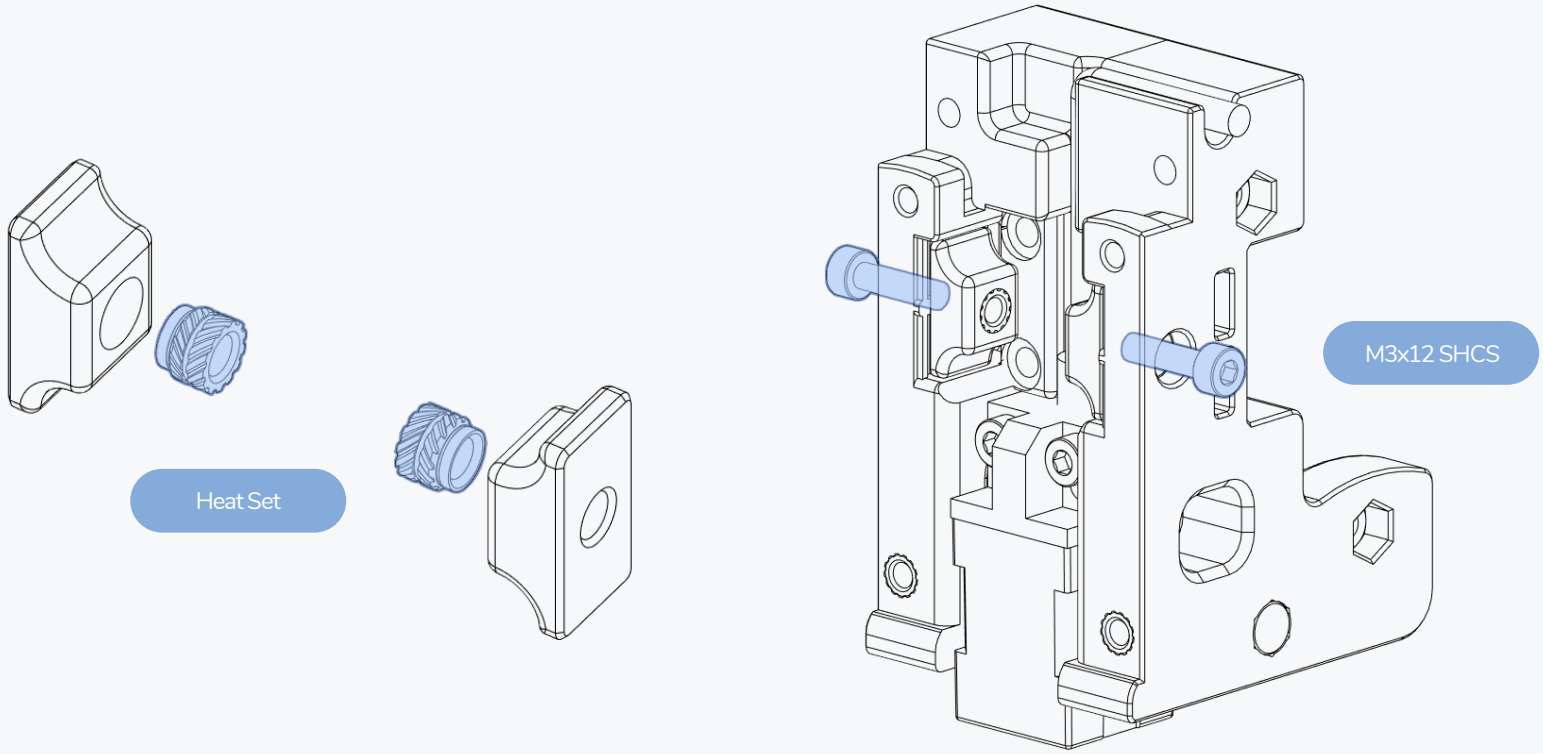
Heat Set

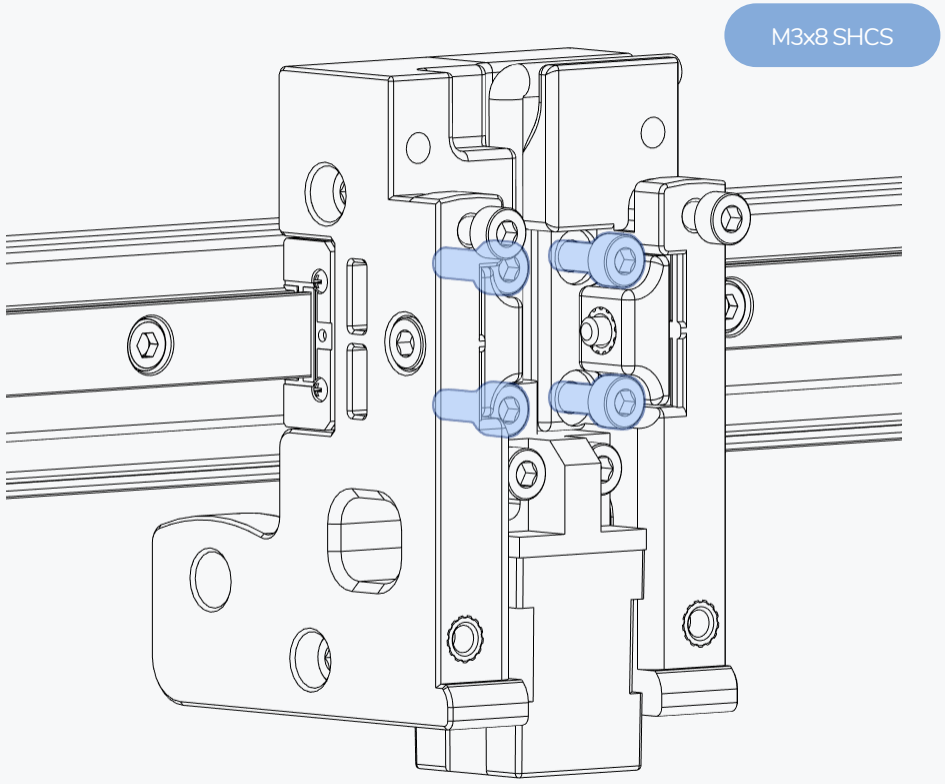




M3x20 SHCS

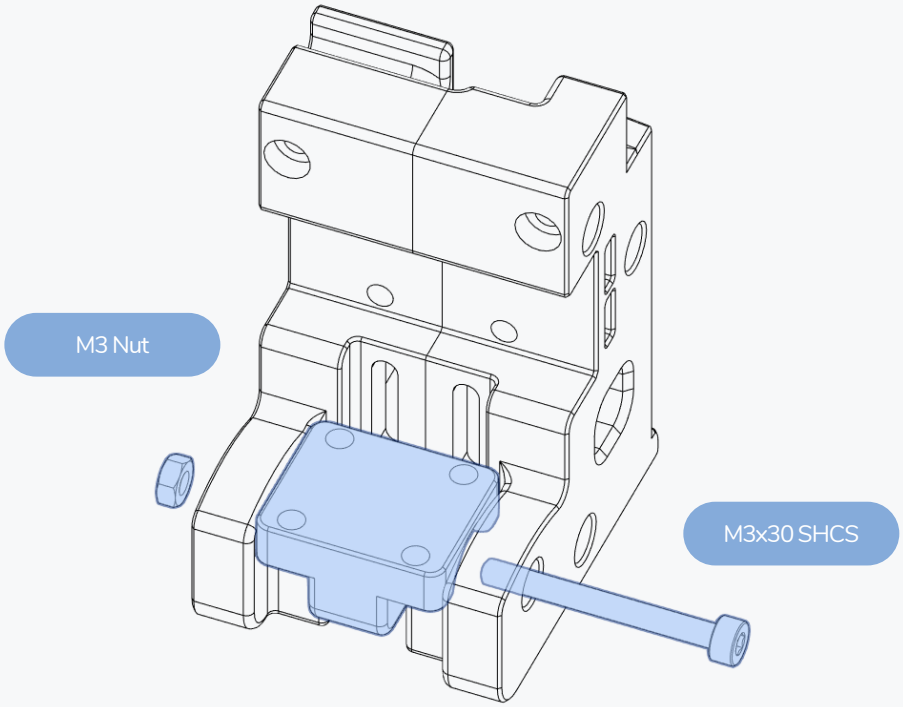


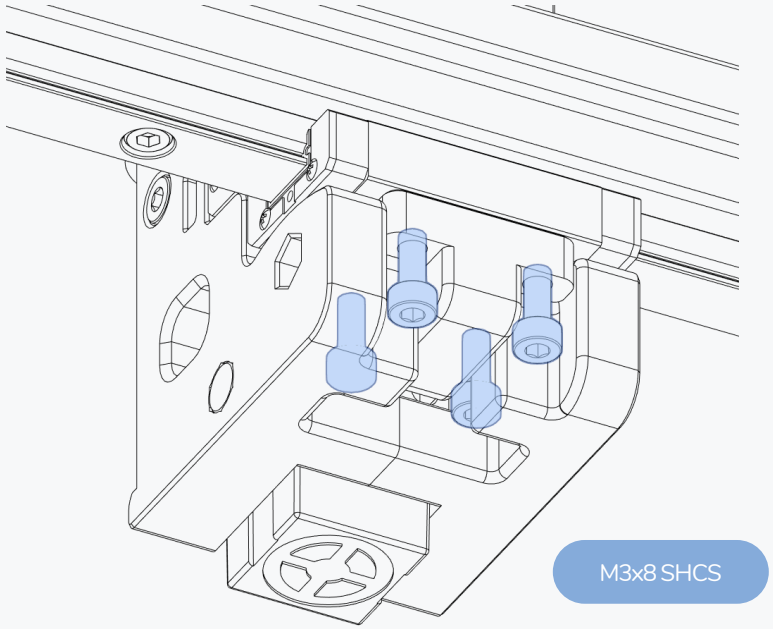

Heat Set
M3x12 SHCS



BUTTON HEAD OPTION

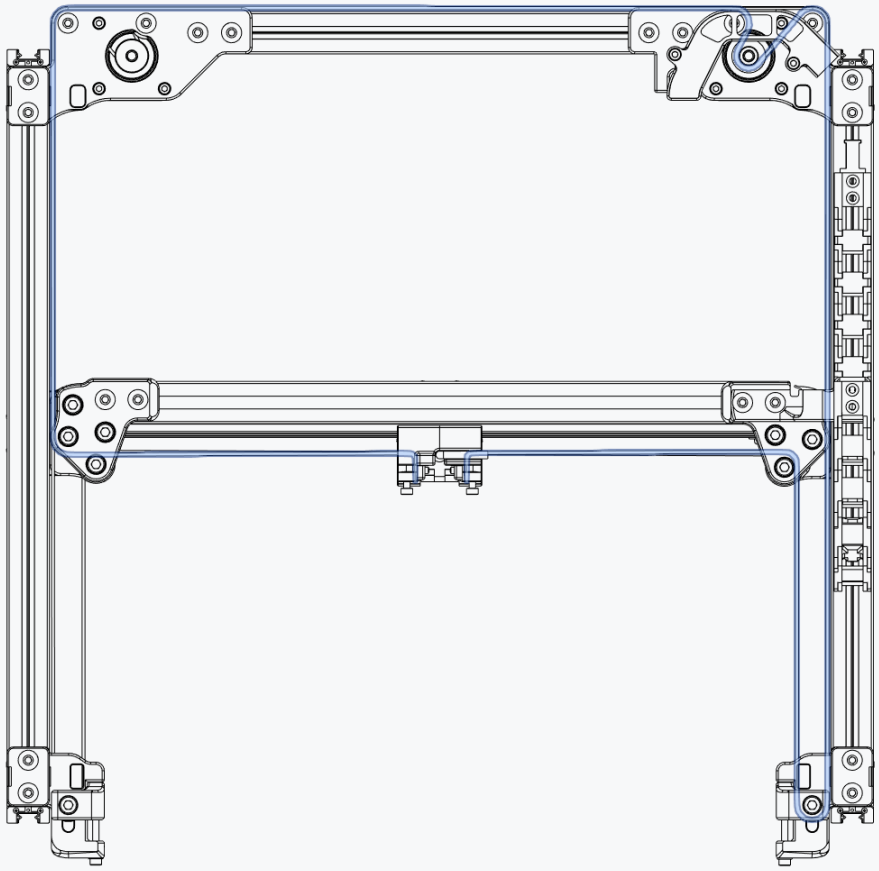
If you happen to have some M3x8 BHCS laying around you can use those here. It can make belting the gantry in later steps a little easier but it's not a big deal if you don't have them.





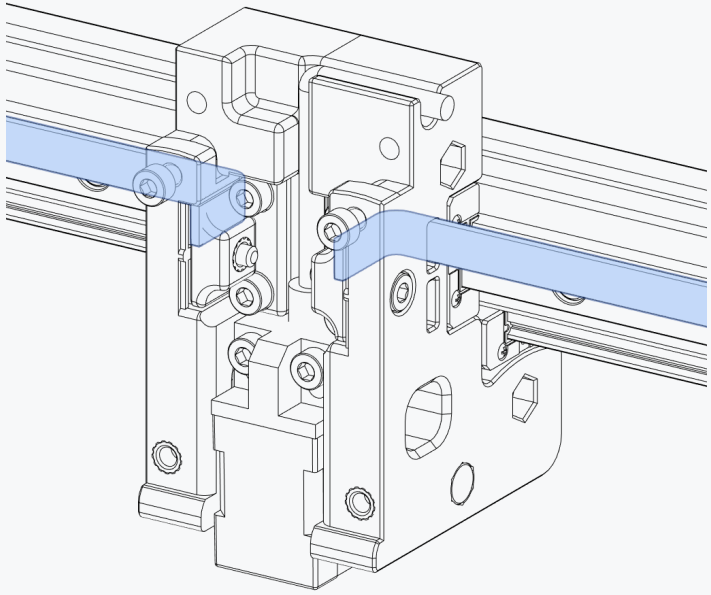
DO NOT TIGHTEN (YET)

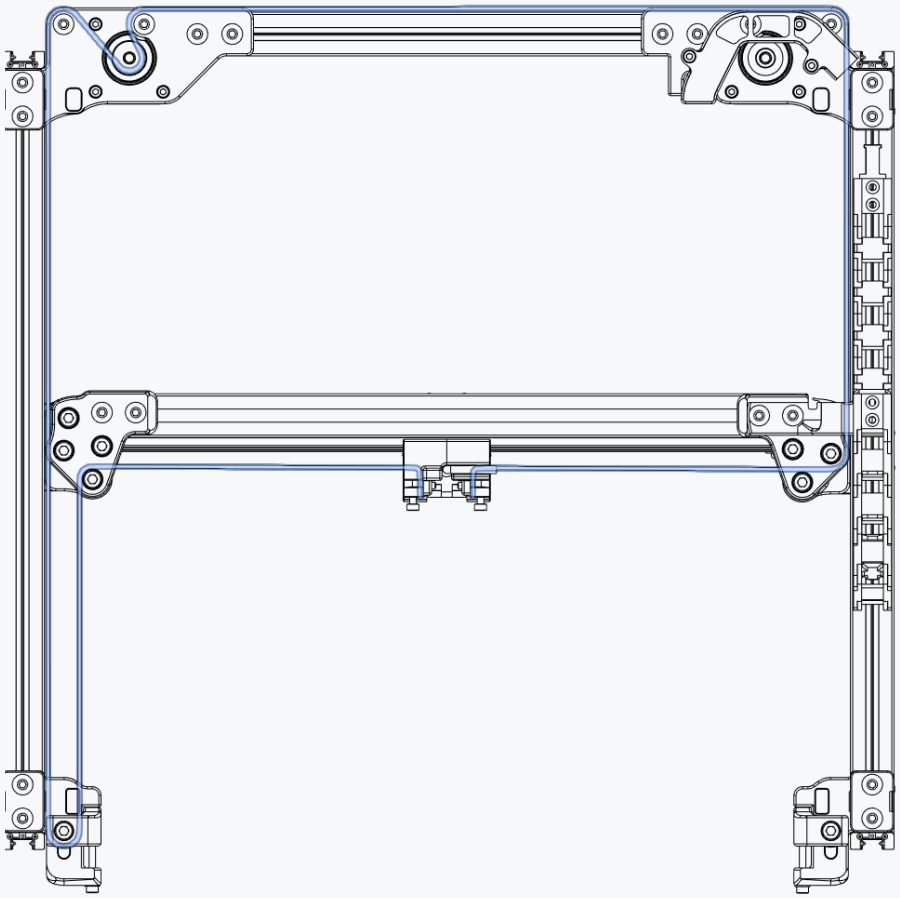
Leave these loose. You'll need to aslign the rail before tightening. See discord if you need help with the correct procedure.

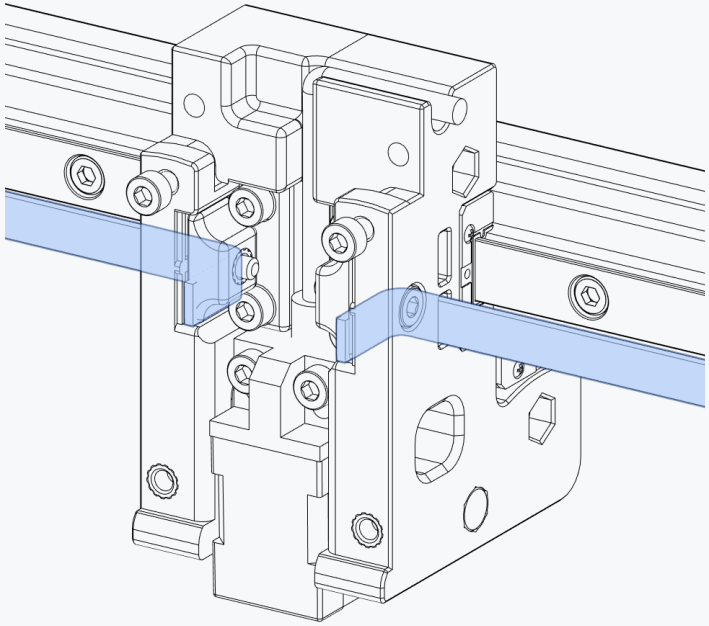


CUTTING BELTS

Best practice is to cut both XY belts the same length. You can pre-run one length and then cut the other using it as your guide.

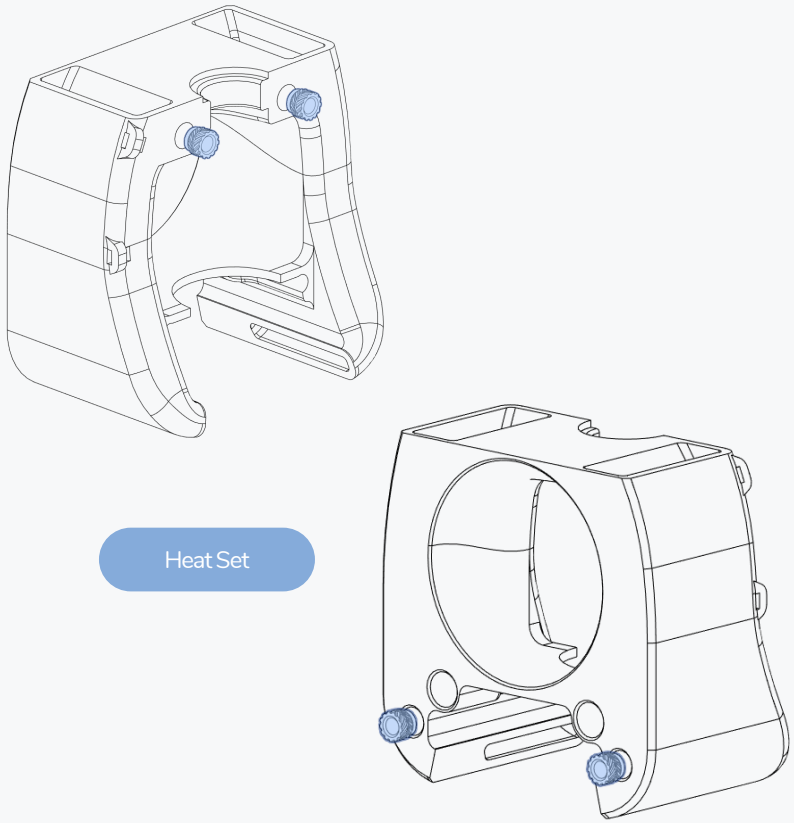




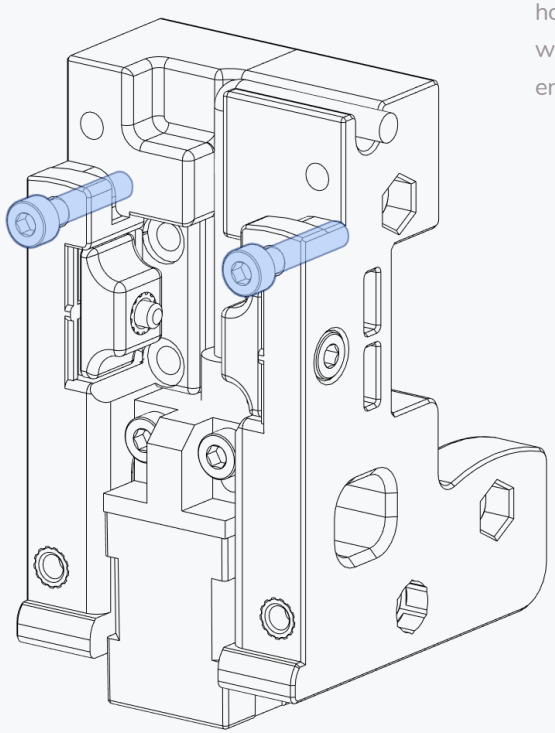


SECURING BELTS

Pick one side of the carriage and tighten the belts down flush with the front face. This allows you to pull the belts on the other side an equal length to help keep things square.

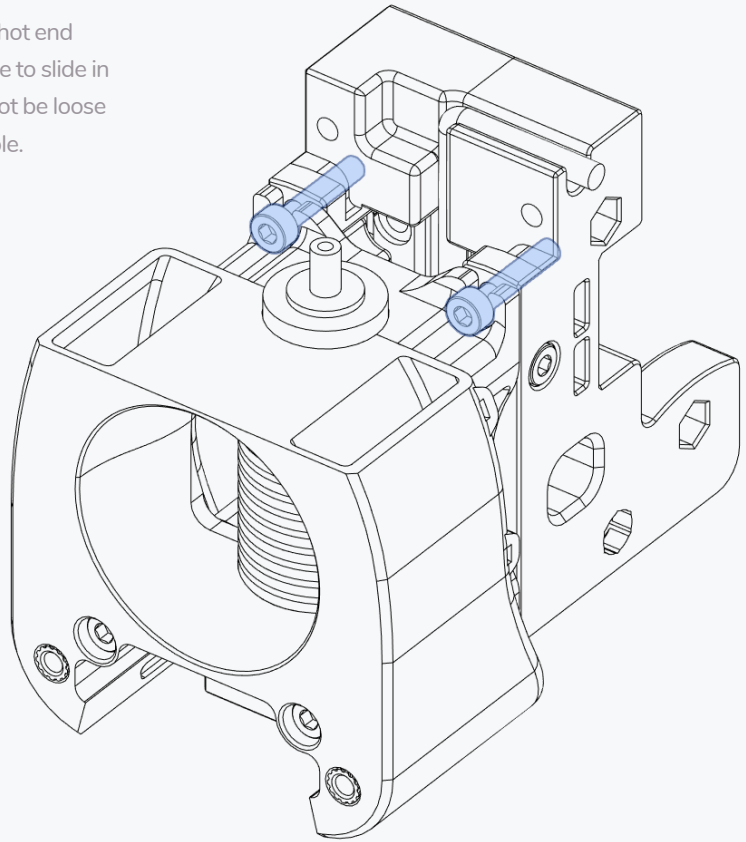

Heat Set
M3x16 SHCS
M3x40 SHCS

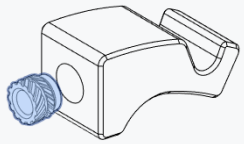
M3x16 SHCS



TEST FIT HOUSING

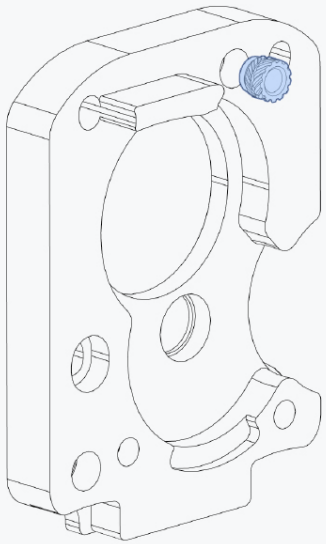
Make sure to test fit the hot end housing. It should be able to slide in with firm pressure but not be loose enough that it can wobble.

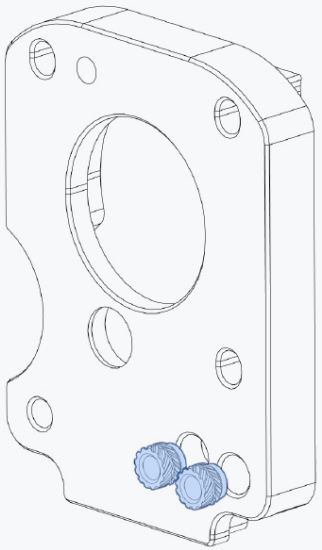


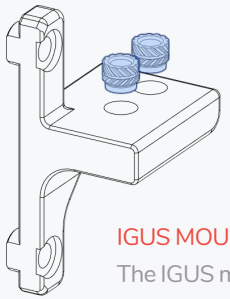


INSTALL HEAT SET INSERTS

You will need to install heat set inserts into the locations shown on this page. Take note of the different cable chain mounts and use the one that best fits your build.

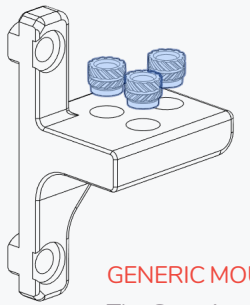






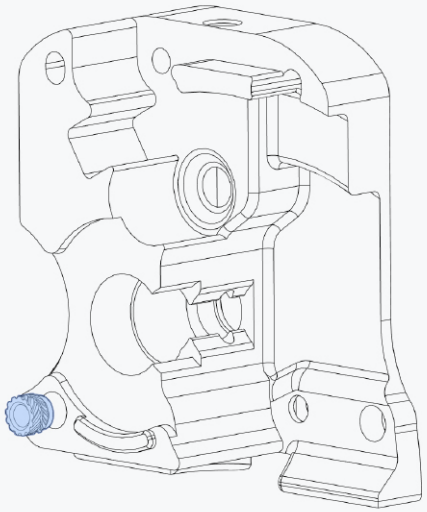
IGUS MOUNT

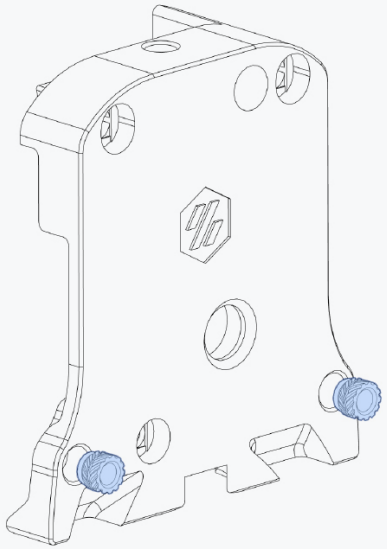
The IGUS mount is identifiable by its 2 mounting holes.

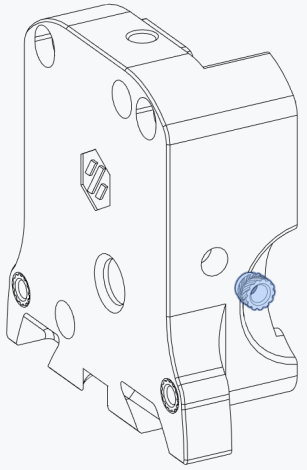


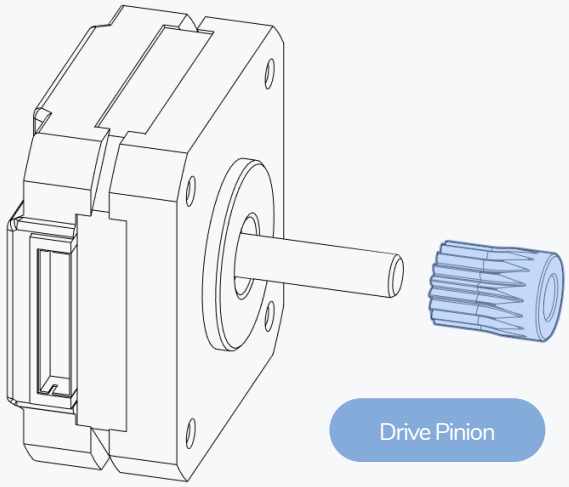
GENERIC MOUNT

The Generic mount is identifiable by its 3 mounting holes.



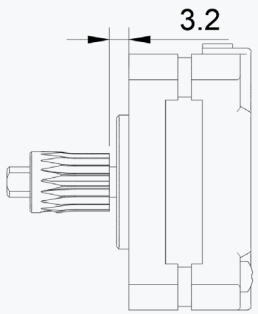






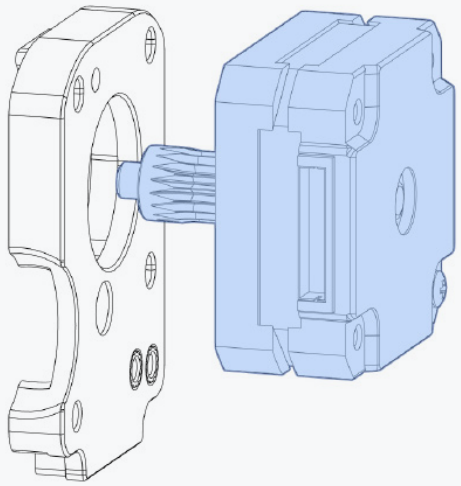
DRIVE PINION SPACING

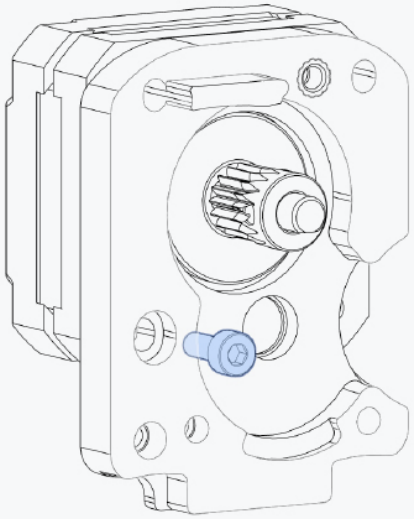
Take care when installing the drive pinion on the extruder motor. It should be spaced 3.2mm from the main body of the stepper motor.



STEPPER MOTOR ORIENTATION

Make sure to orient the motor on the drive plate so that the wires are on the left side. This will allow correct routing through the cable cover that will be installed later.

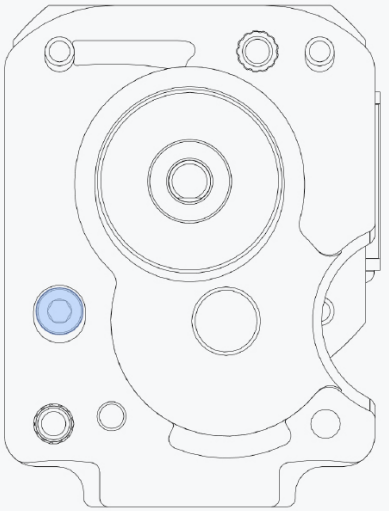


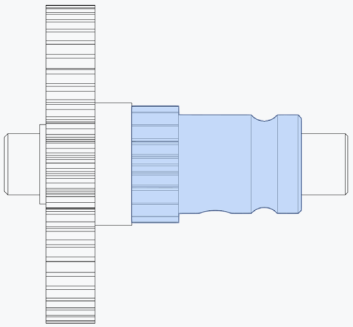


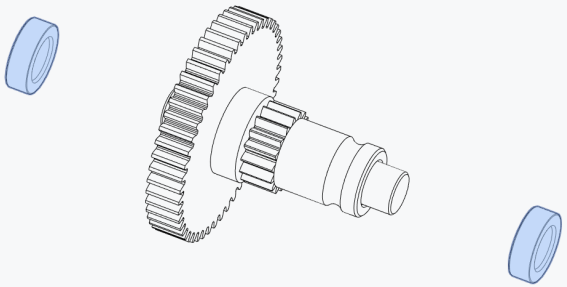
M3x8 SHCS

ADJUSTABLE MOTOR POSITION

The motor position is adjustable to allow for properly meshing of the drive gears. We recommend you start in the top most position of the slot, but check Discord if you have questions on how to properly adjust this.







MR85 Bearings

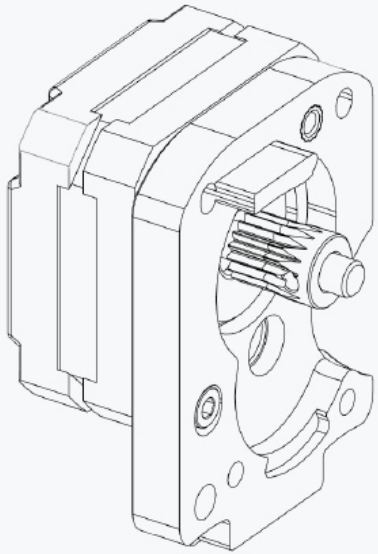
CHECK PLACEMENT

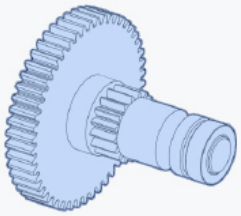
Ensure the filament drive gear is fully seated against the drive shaft gear.

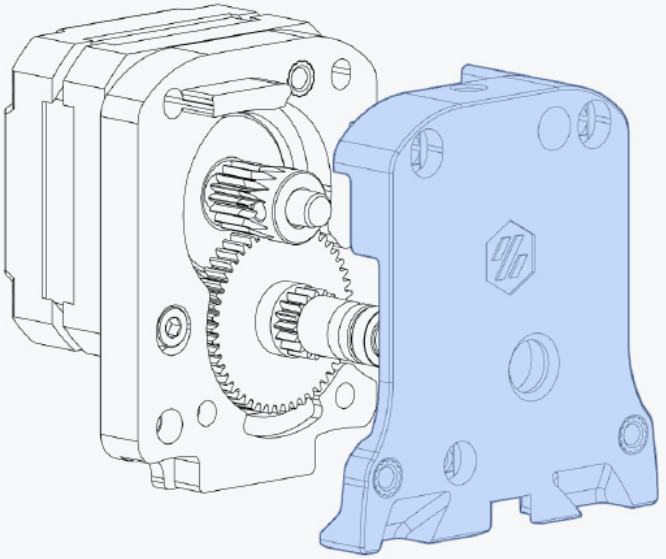
BEARING FIT

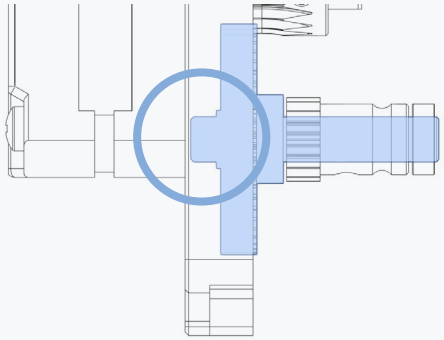
The MR85 bearings should slip on to the drive shaft easily allowing the assembly to self center itself in relation to the filament.

If you find that they are too tight, you can lighty sand the drive shaft.



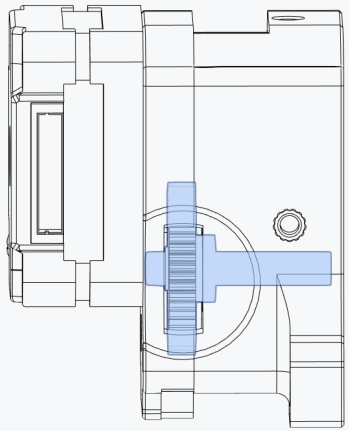






CHECK CLEARANCE

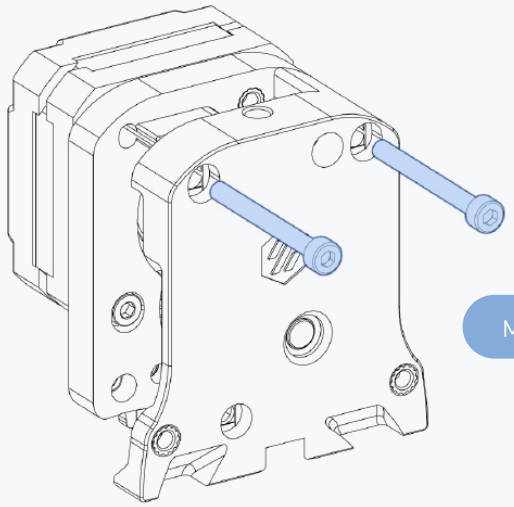
Make sure the drive shaft is not rubbing on the extruder motor. You can sand the face of the drive shaft if required.



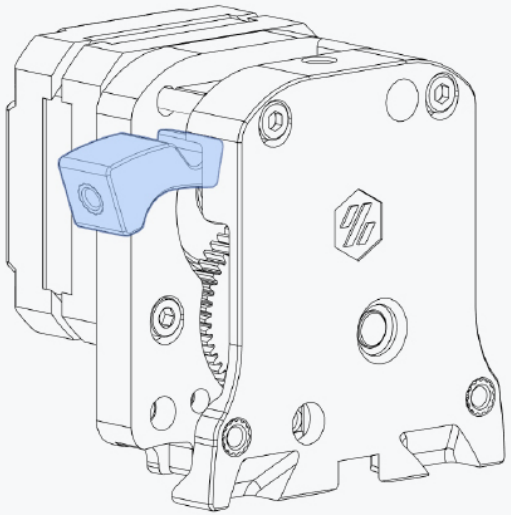
DRIVE SHAFT CHECK

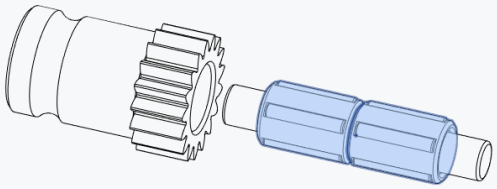
Now is a good time to check that the drive shaft assembly is moving as it should. The engagement of the gears should be smooth throughout the full rotation and the drive shaft should be able to move forward and back slightly to aid in filament alignment.

If required, adjust using the fastener on page 71.



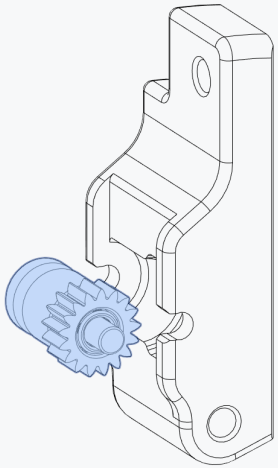
M3x30 SHCS

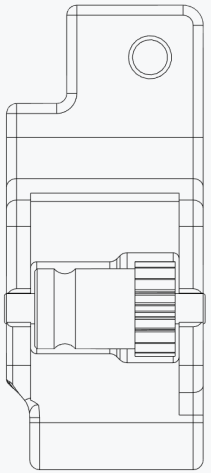


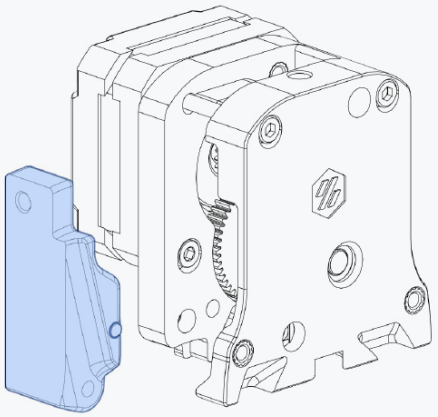


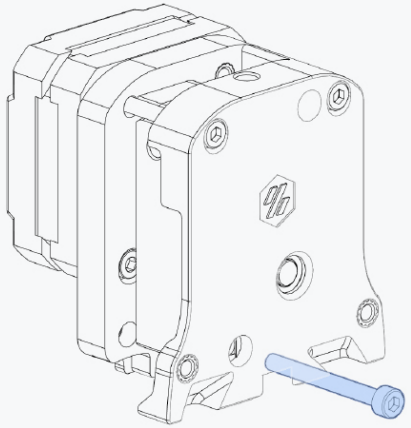
LUBRICATION

The idler assembly requires lubrication to ensure smooth operation and longevity. Refer to the BOM for lubricant options.

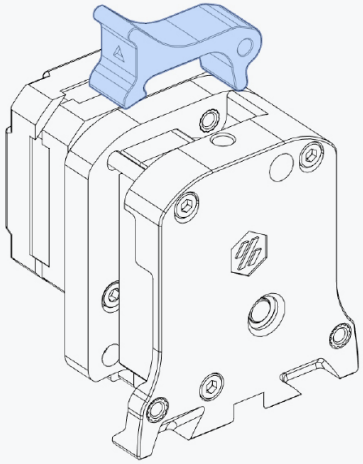


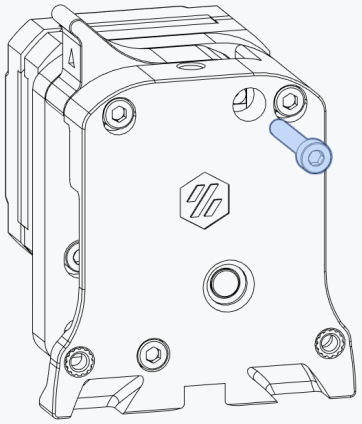




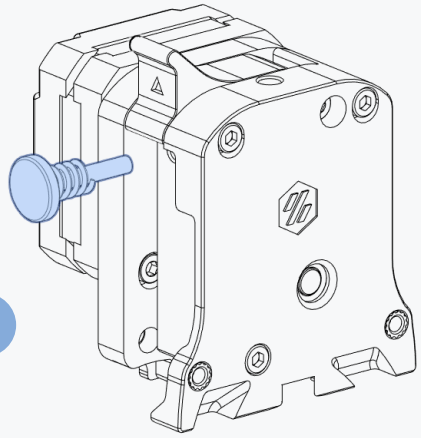


M3x30 SHCS

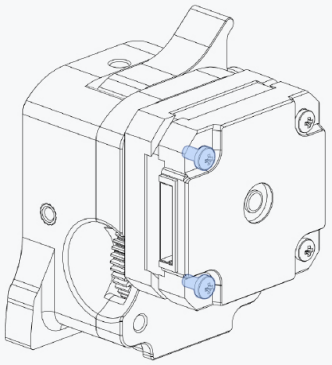




M3x20 SHCS

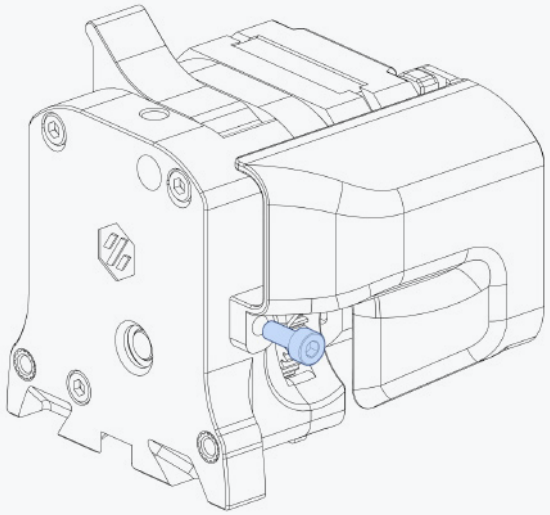


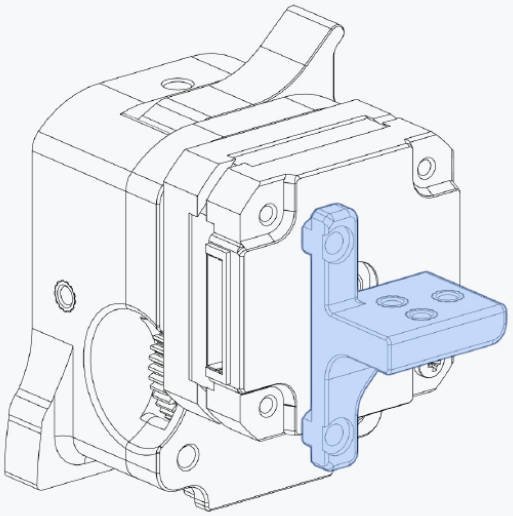
Tension Knob

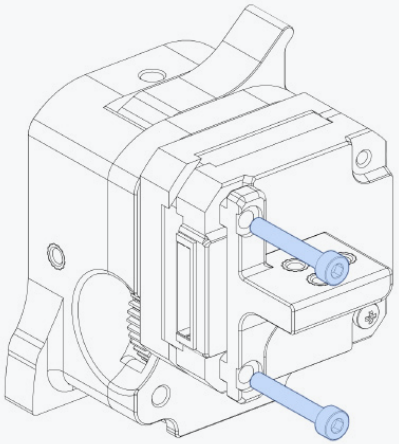


REMOVE SCREWS

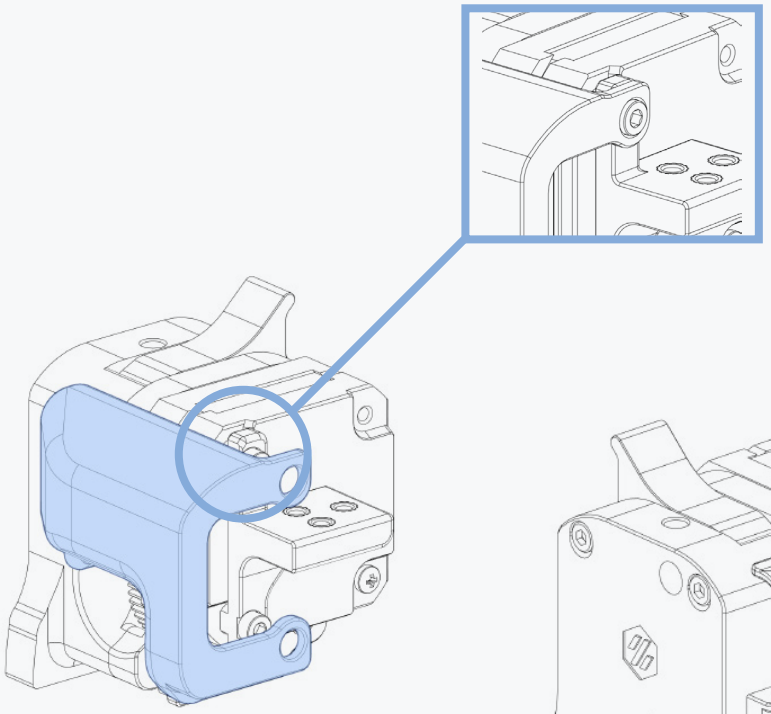
Carefully remove the two screws on the left side of the extruder motor. We are going to be replacing these in further steps.





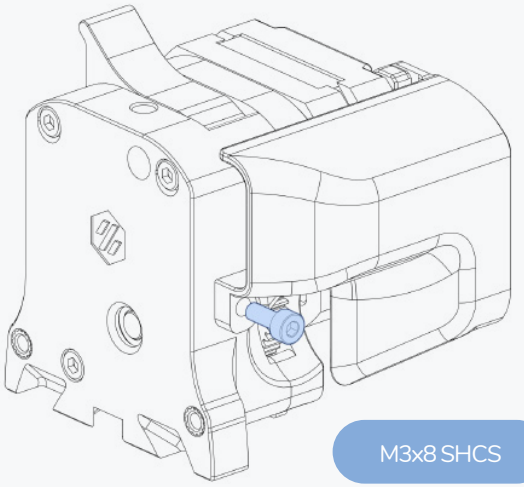


M3x20 SHCS

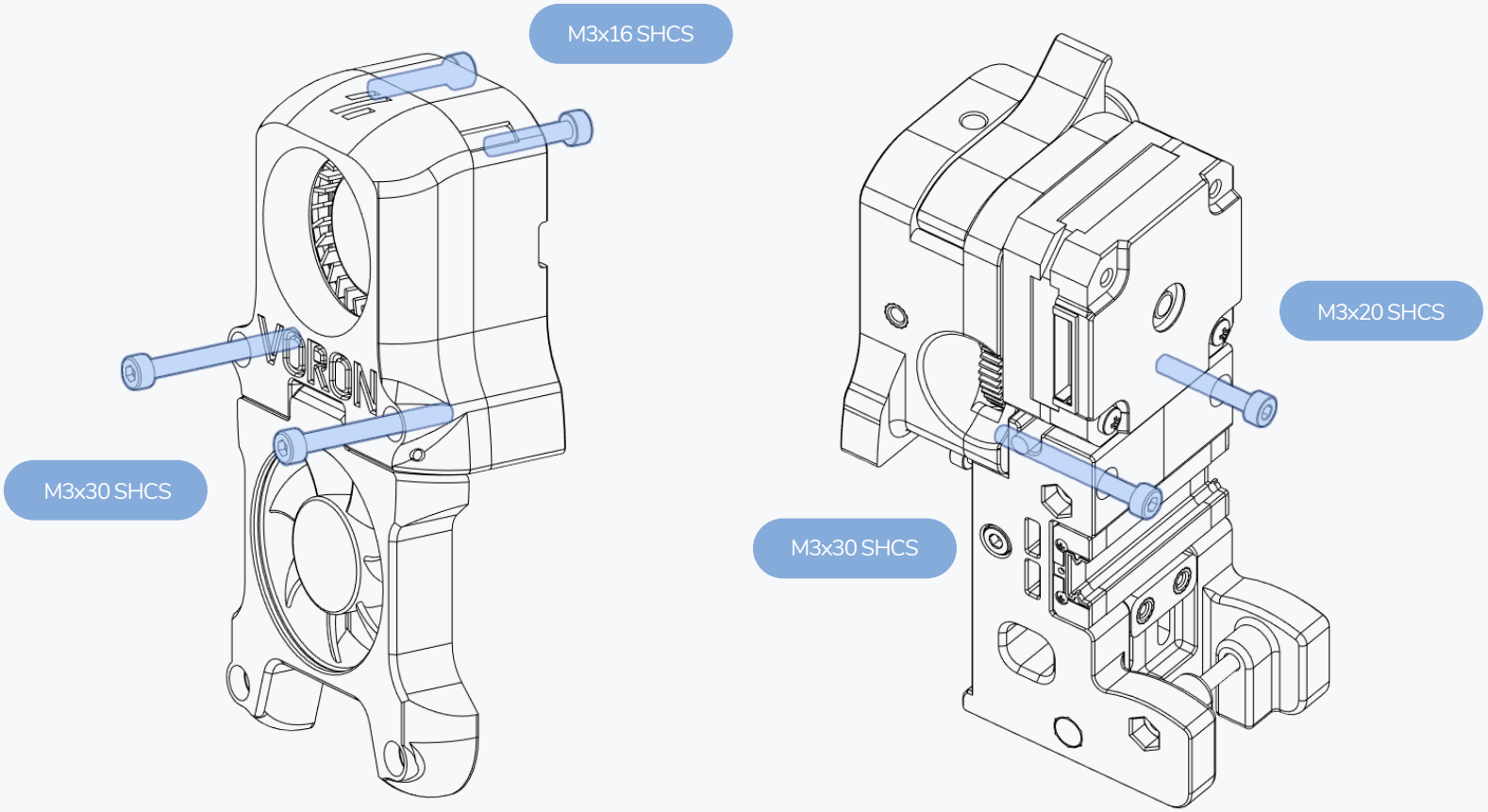


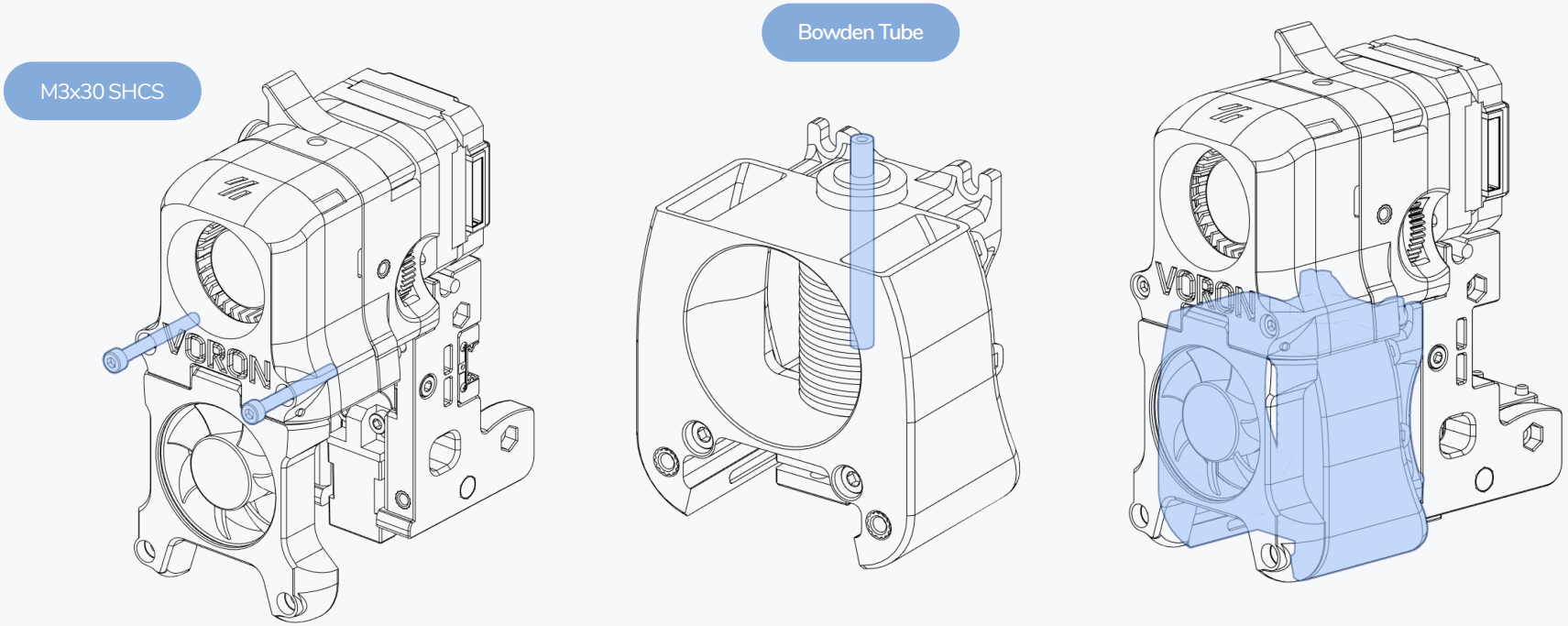
OVER NOT UNDER

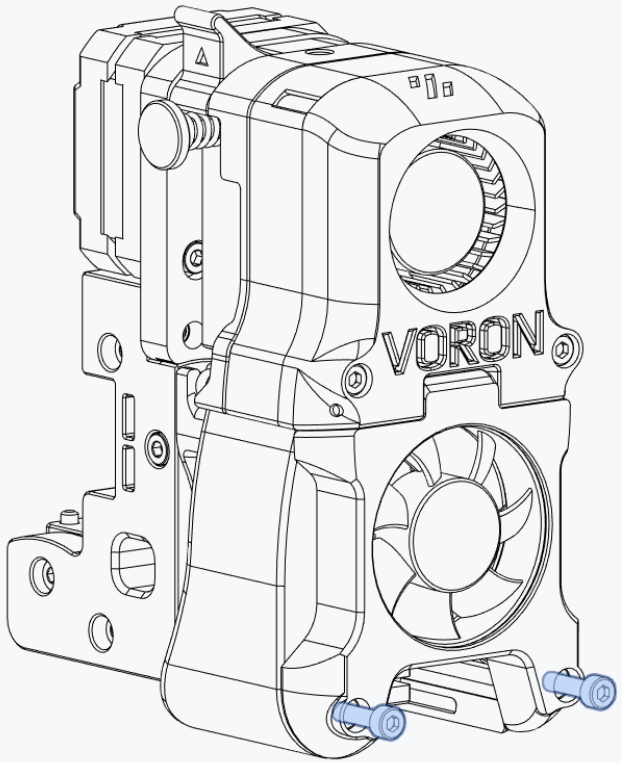
The cable cover simply hangs off the heads of the M3x20 fasteners so that it can be easily removed.



M3x8 SHCS


M3x16 SHCS
M3x30 SHCS
M3x20 SHCS
M3x30 SHCS


M3x30 SHCS
Bowden Tube
VORON
VORON



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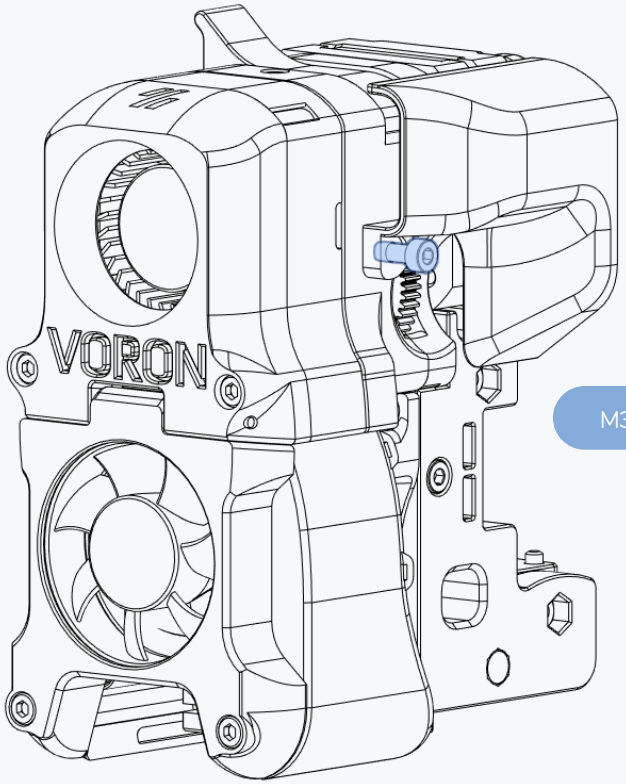
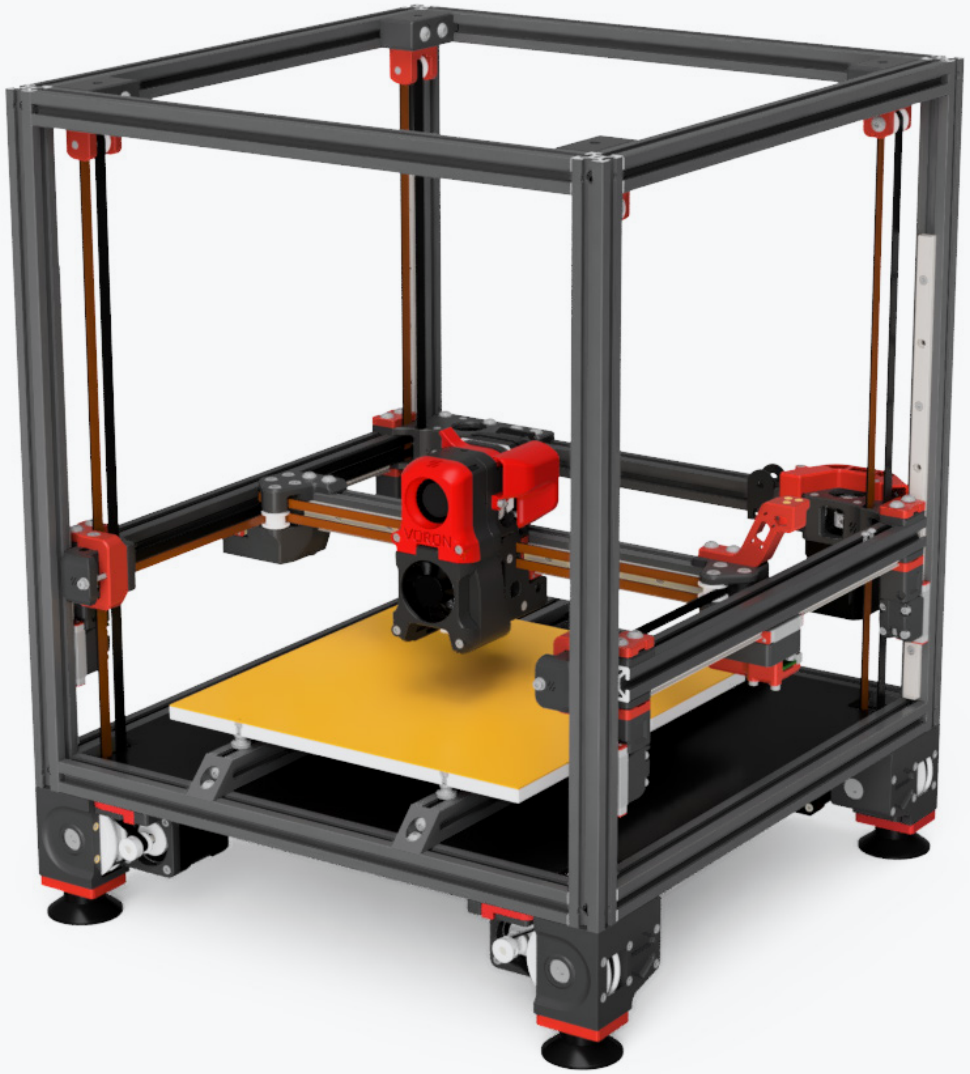
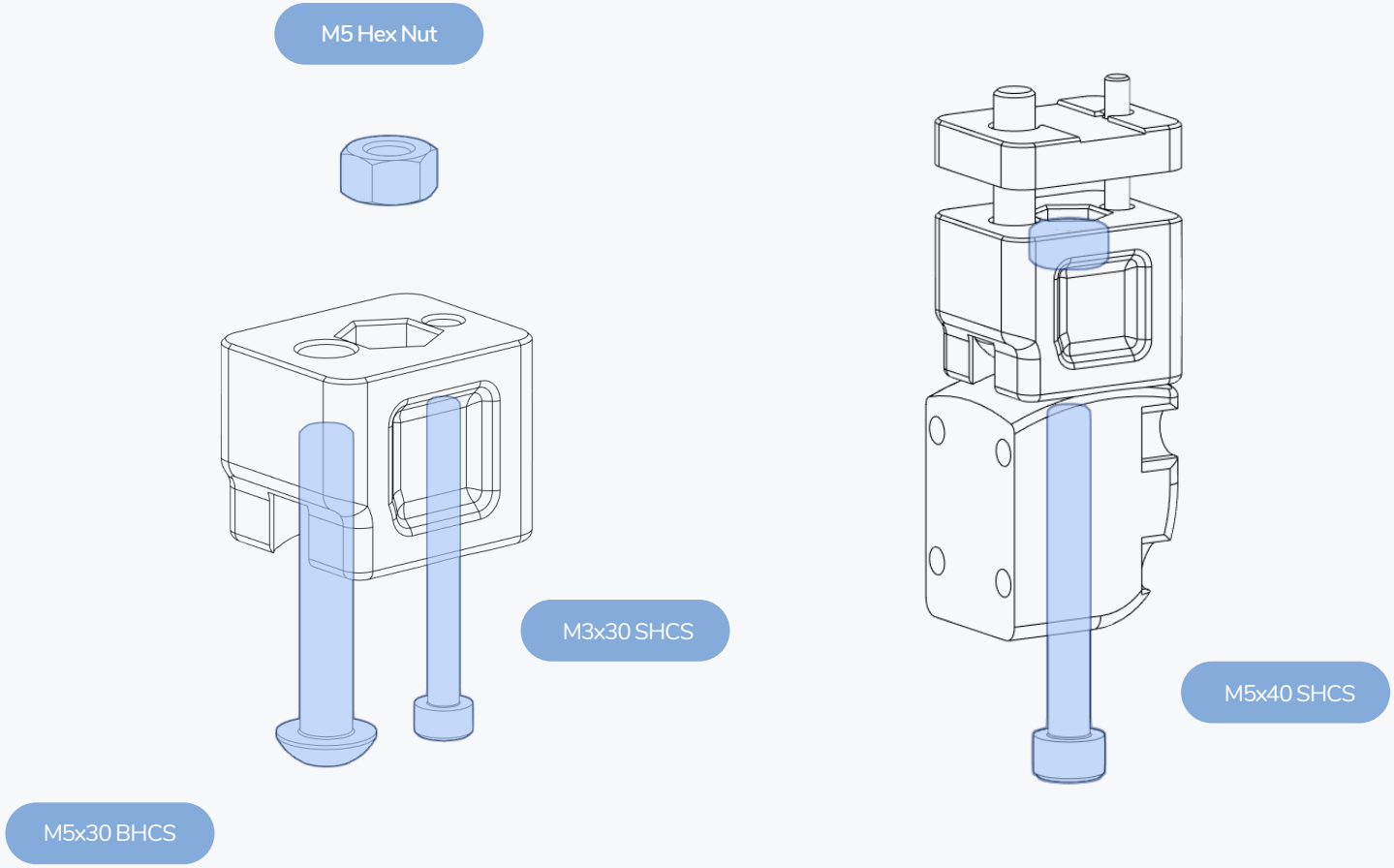
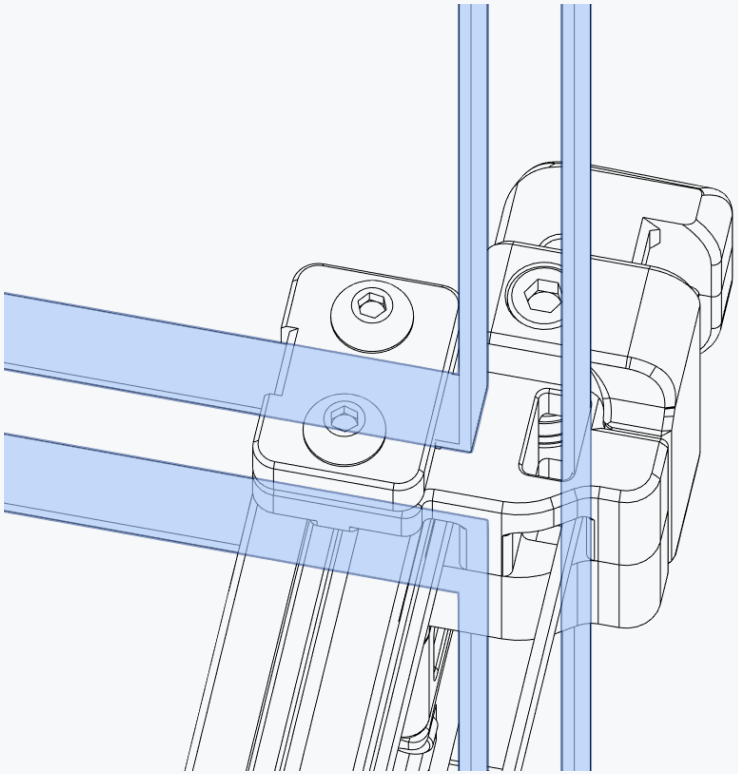
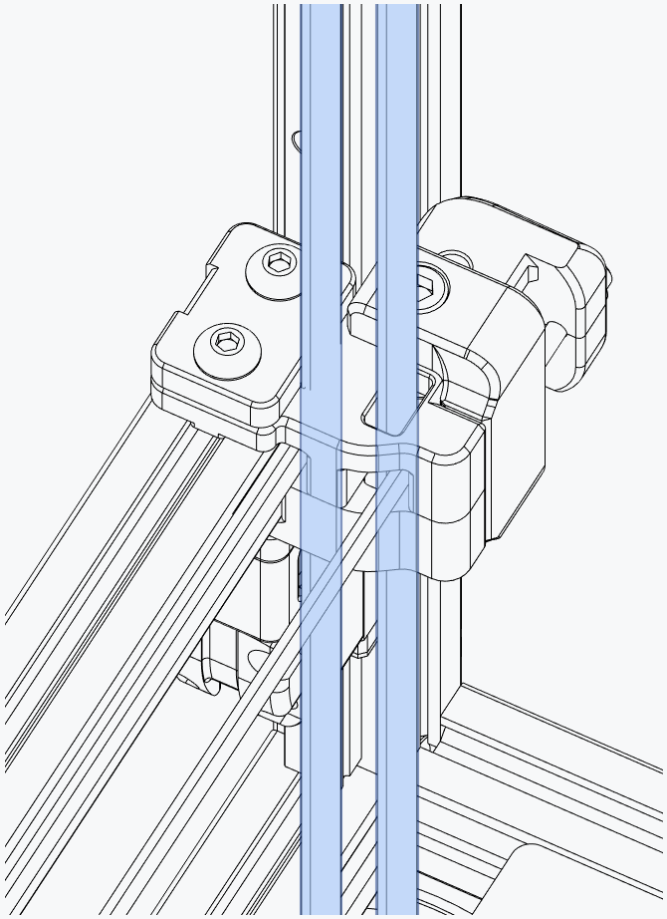


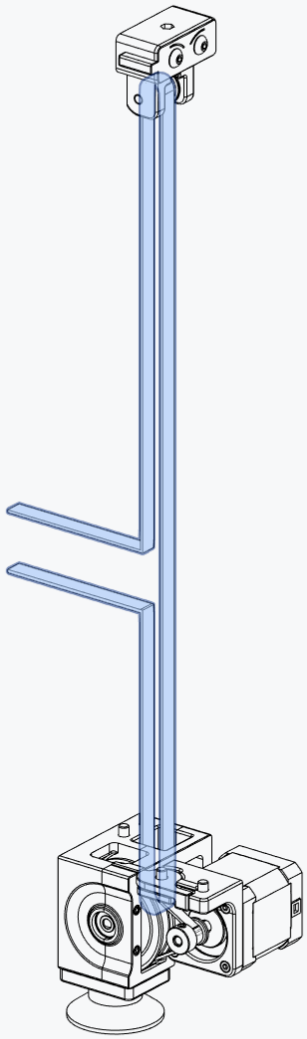
M3x8 SHCS

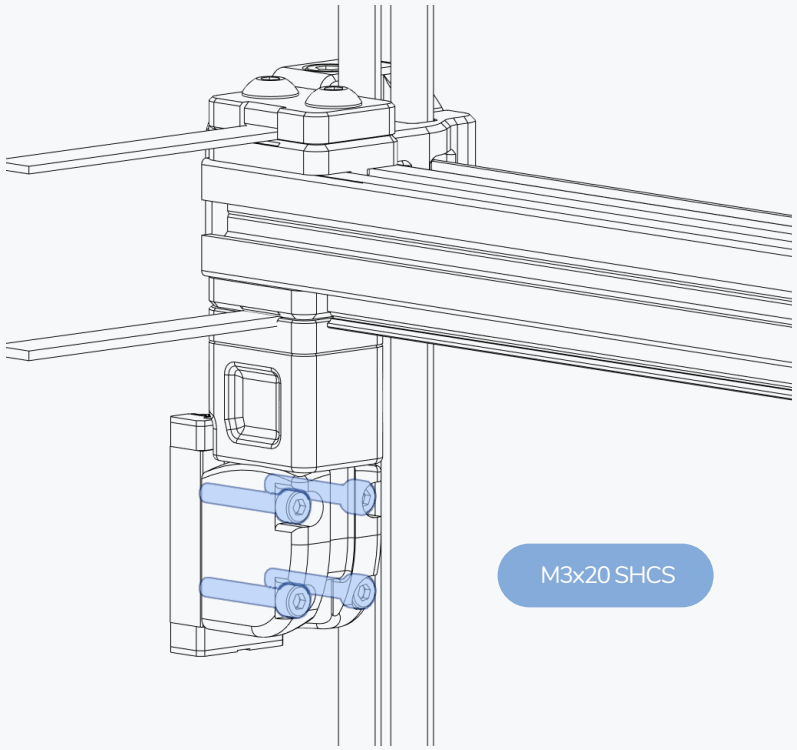


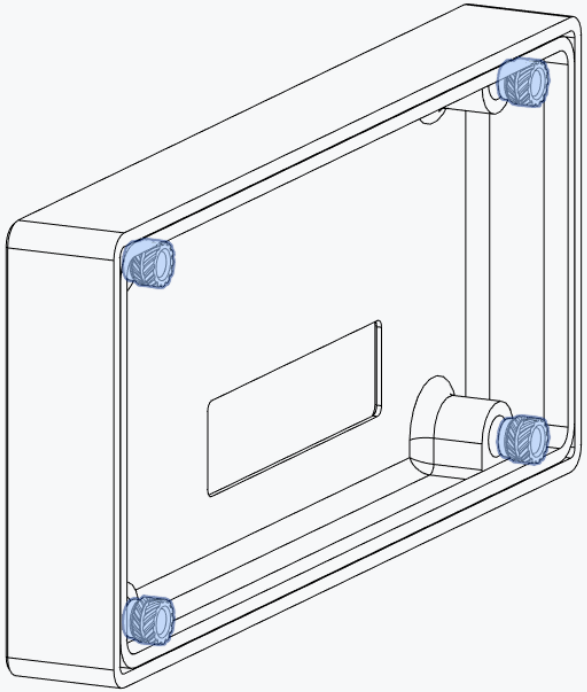

M5 Hex Nut
M3x30 SHCS
M5x30 BHCS
M5x40 SHCS



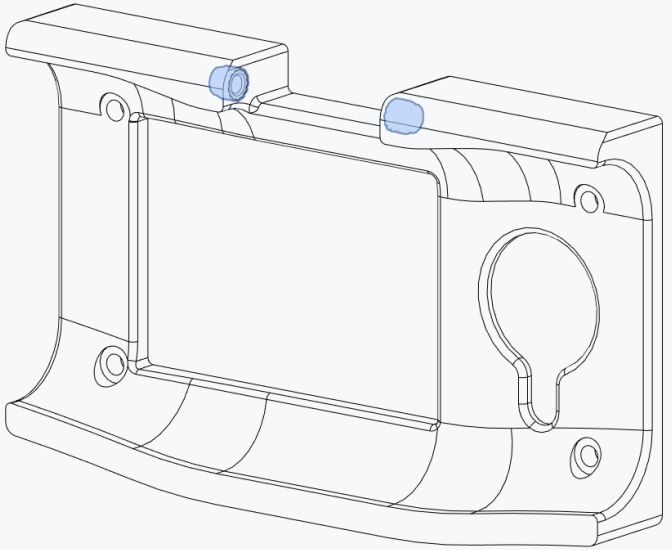


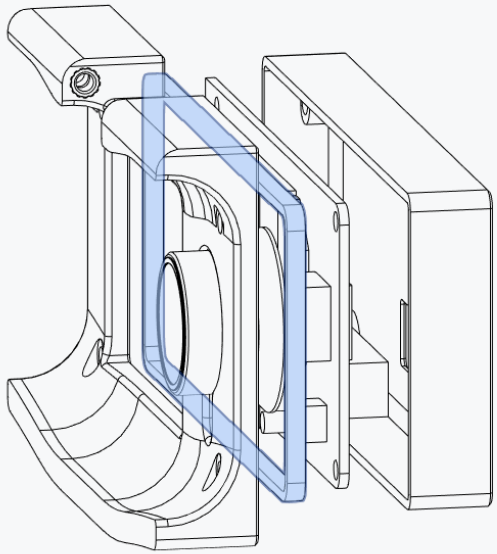


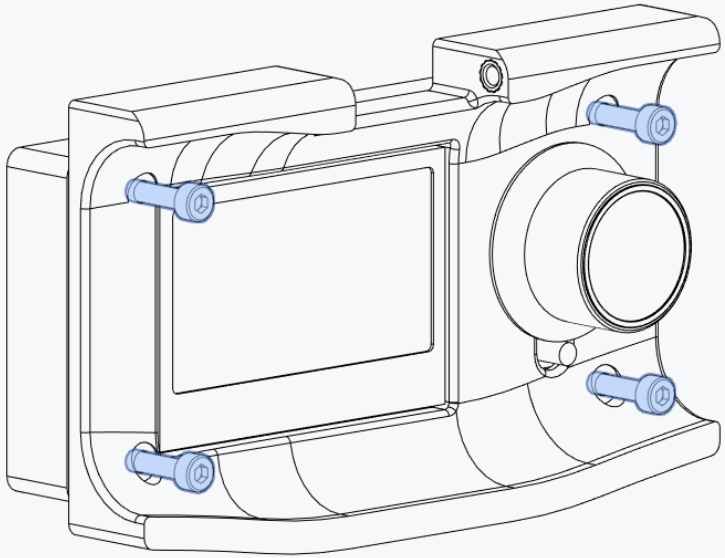

M3x20 SHCS



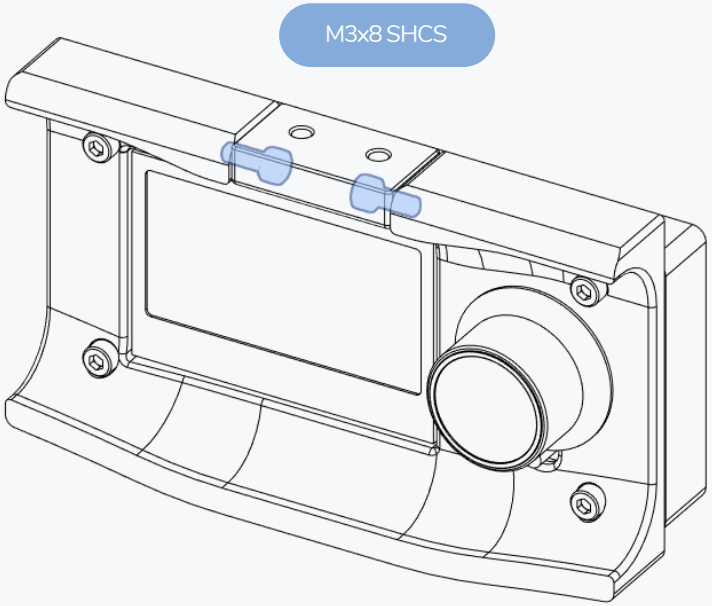
Heat Set Inserts

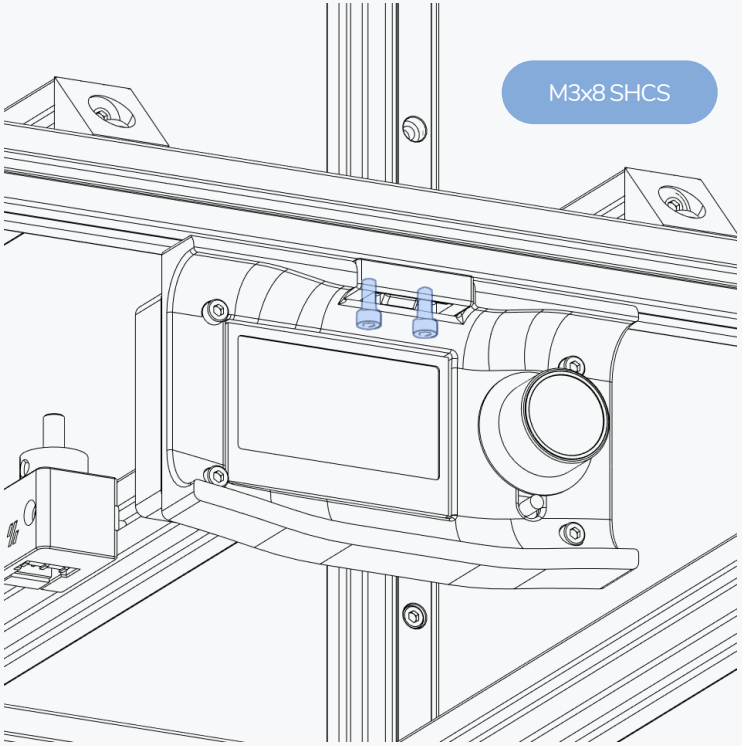


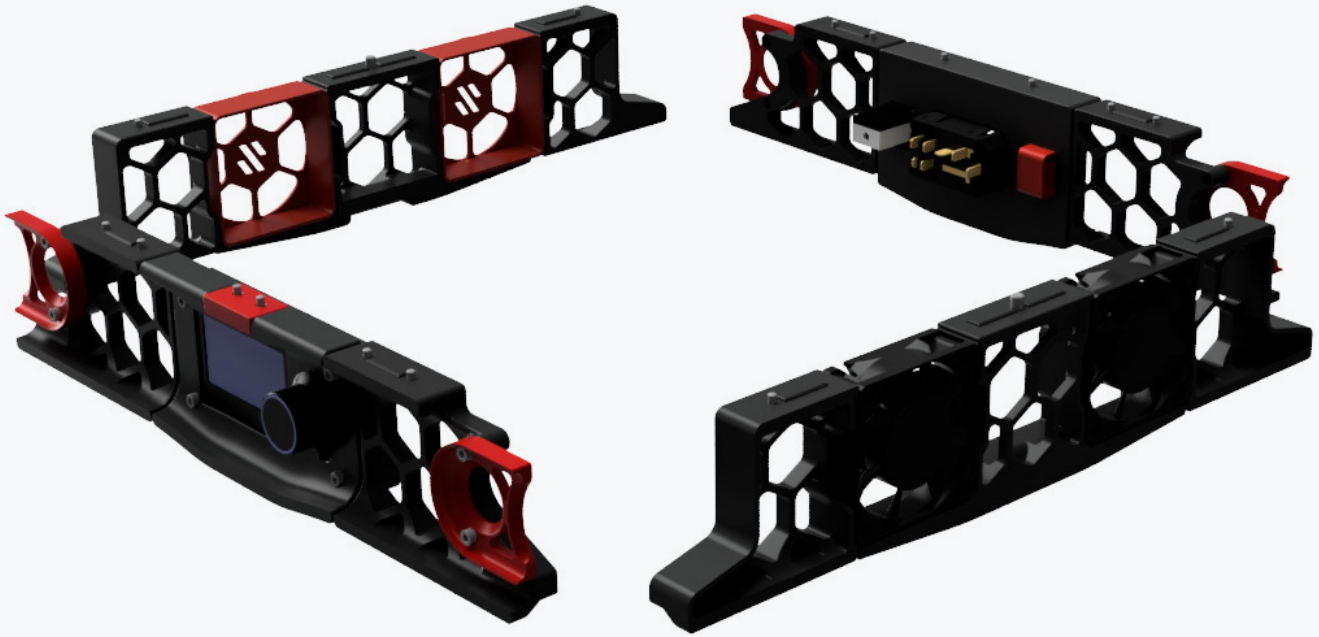


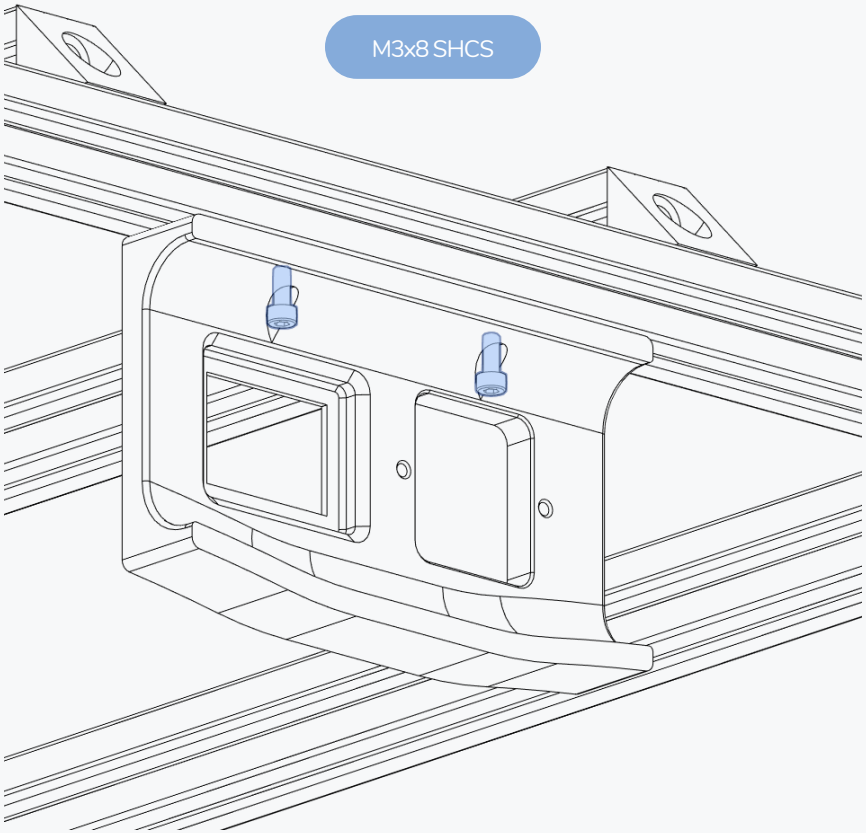


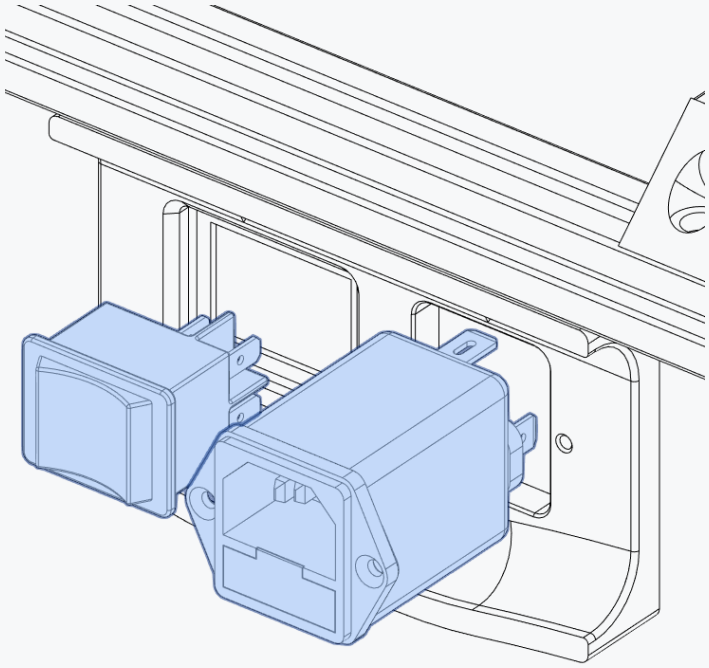
M3x12 SHCS

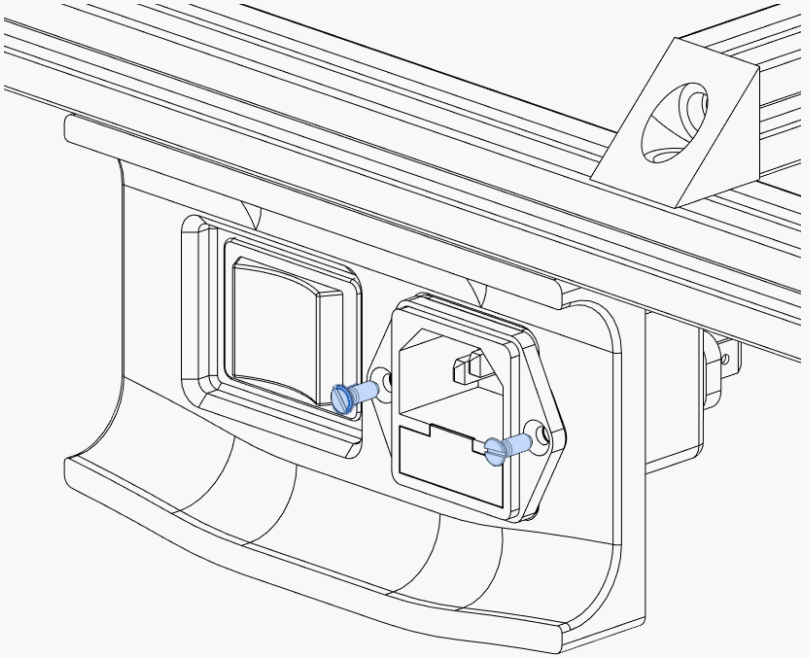

M3x8 SHCS


M3x8 SHCS




M3x8 SHCS





#4 X 3/8 FLAT HEAD SELF TAPPING

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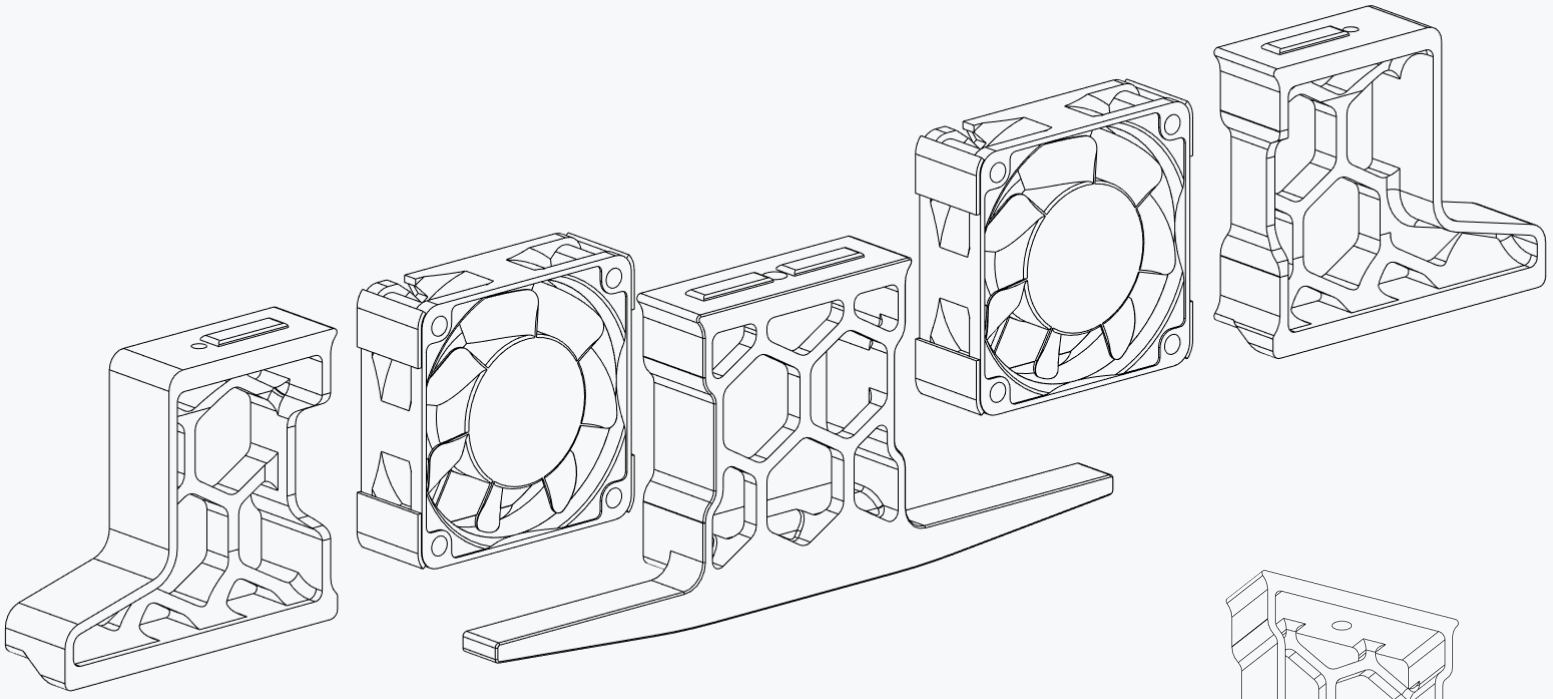
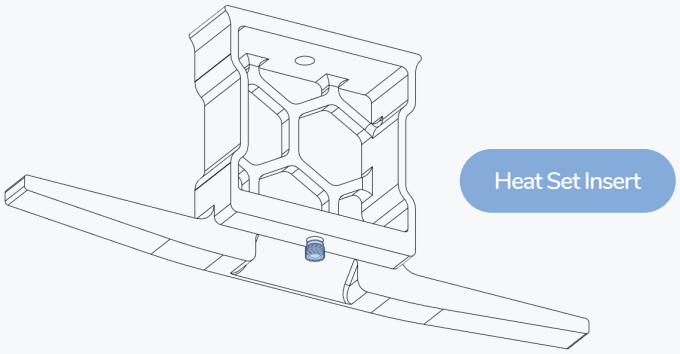
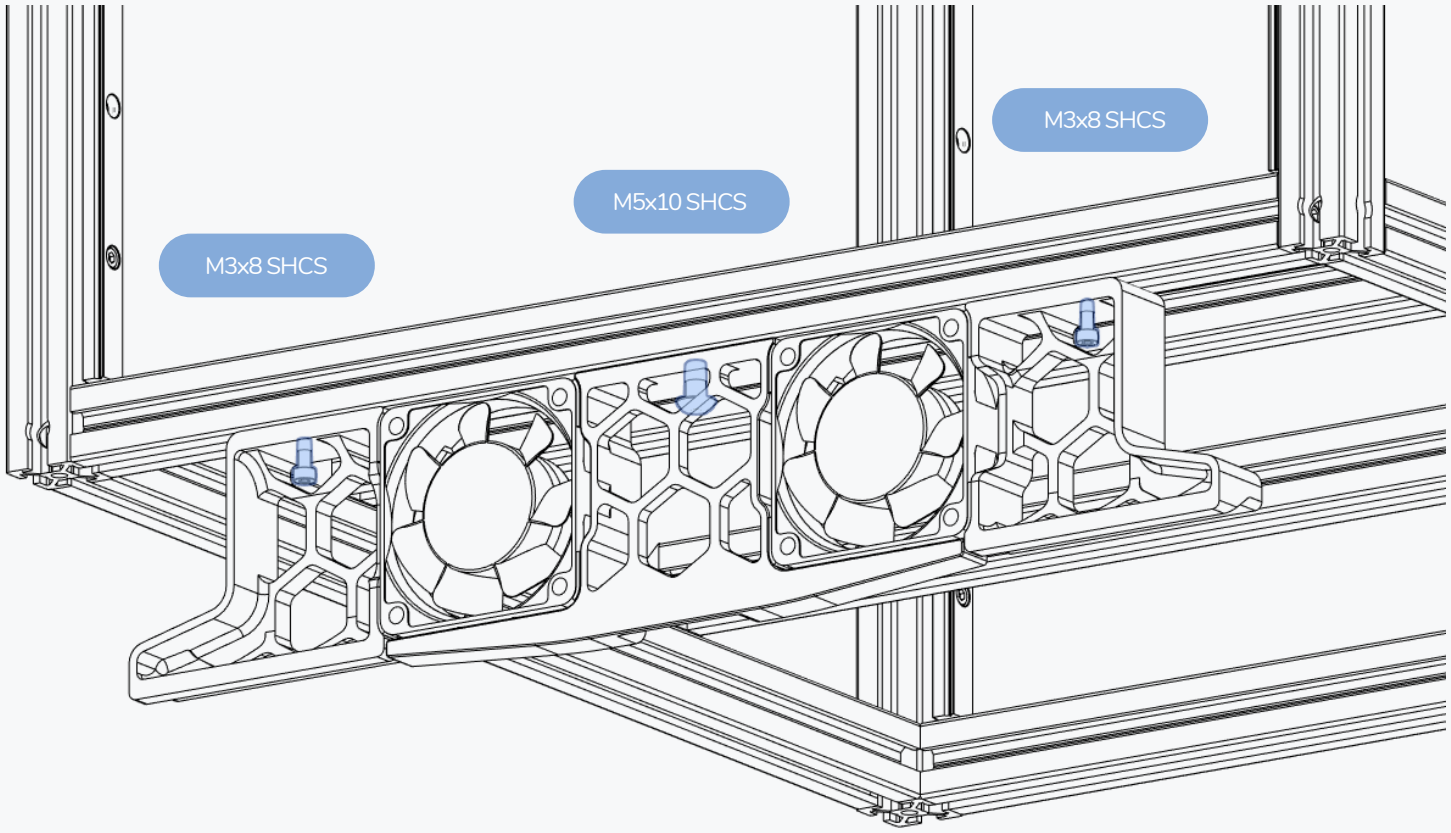
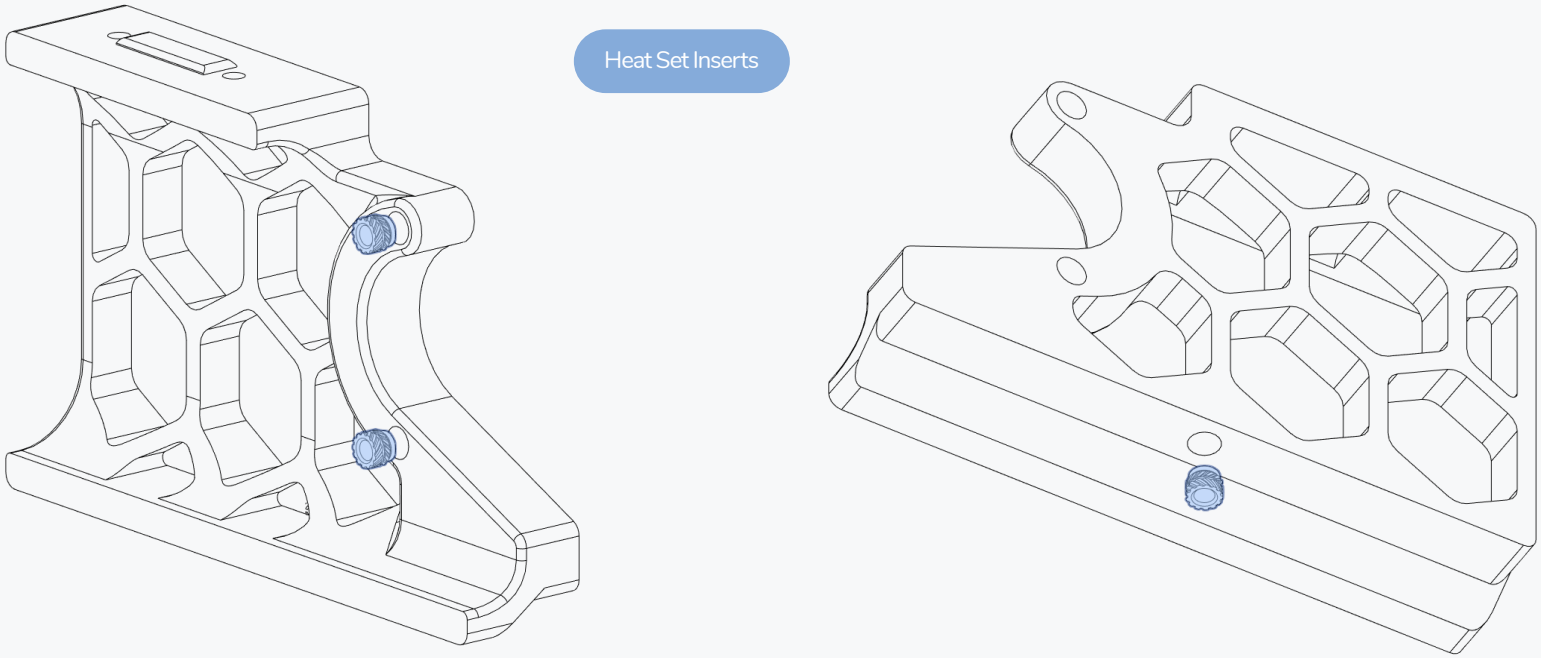


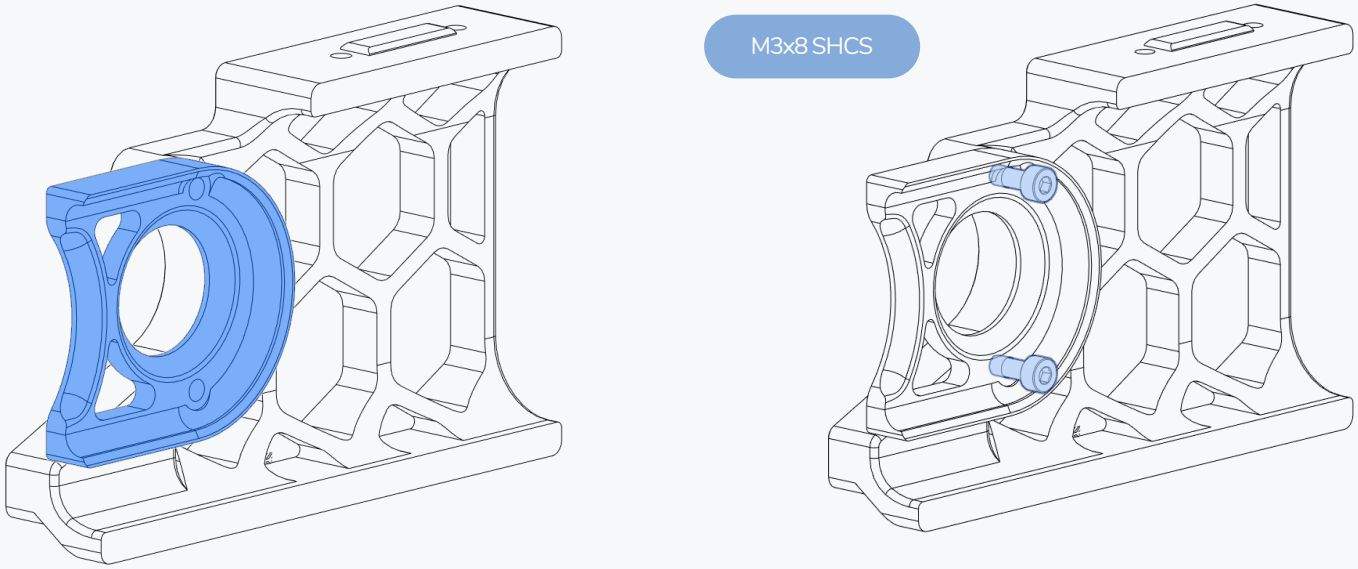


USE VHB TO SECURE FANS

You should have VHB tape as part of your bill of materials. Use it to secure the fans to the bracket.

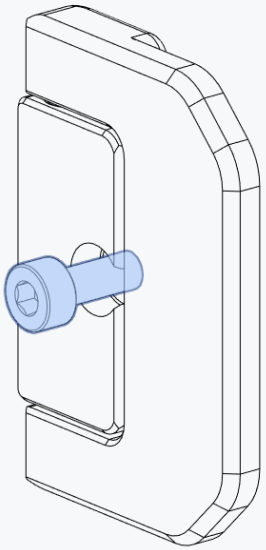

M3x8 SHCS
M5x10 SHCS
M3x8 SHCS


Heat Set Inserts

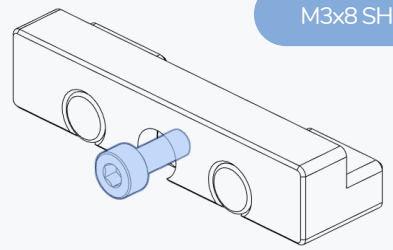

M3x8 SHCS

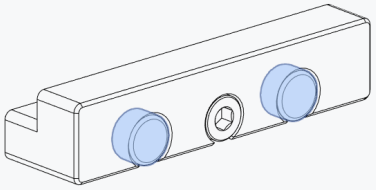

VORON

M3x8 SHCS

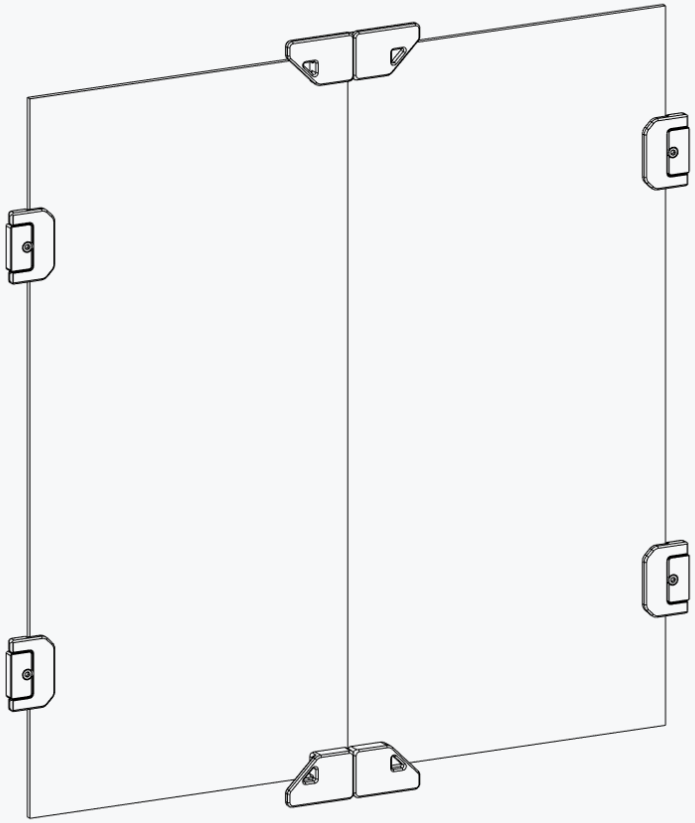


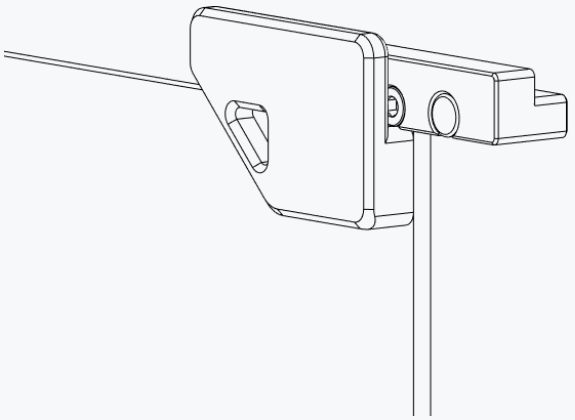
M3x8 SHCS





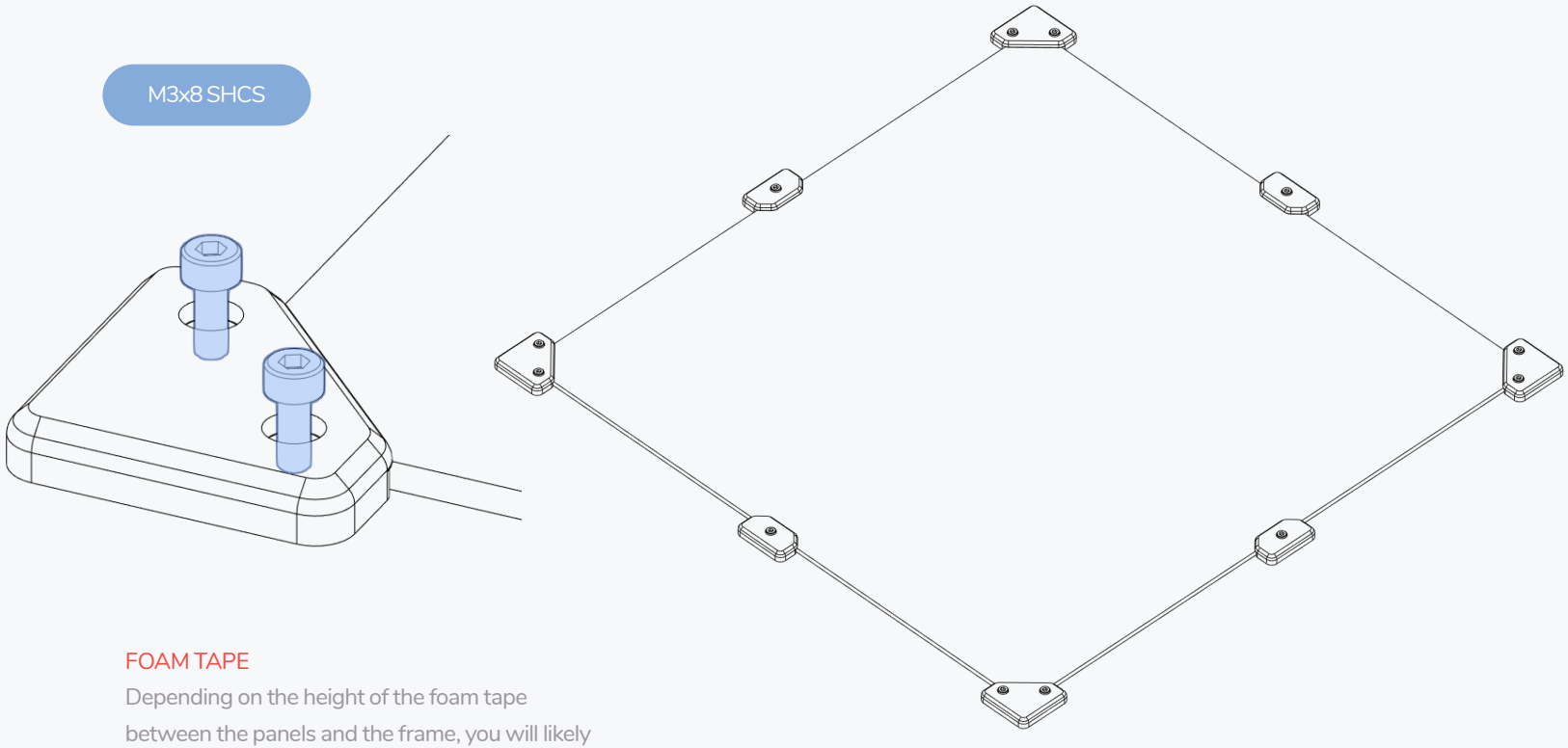
Magnets





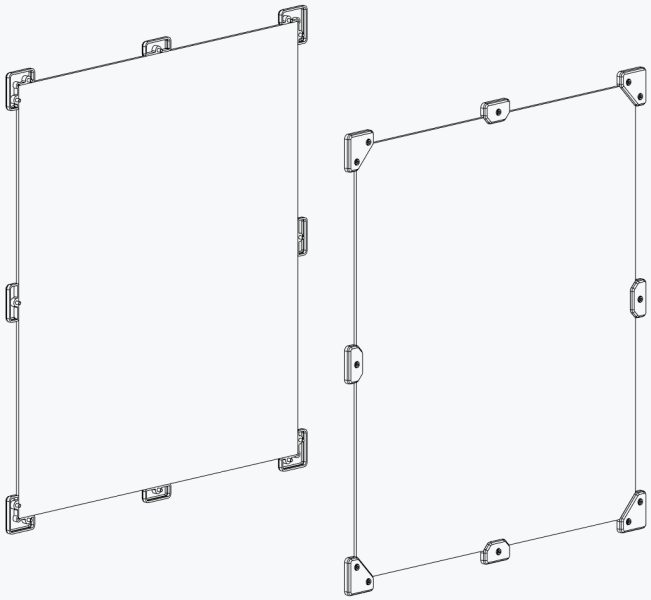
USE VHB TO ATTACH LATCHES

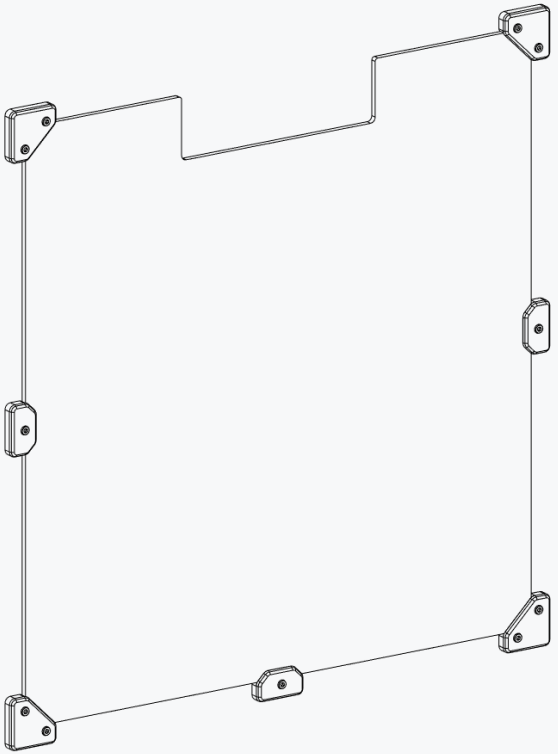
You should have VHB tape as part of your bill of materials. Use it to secure the panel latches to the polycarb panels.

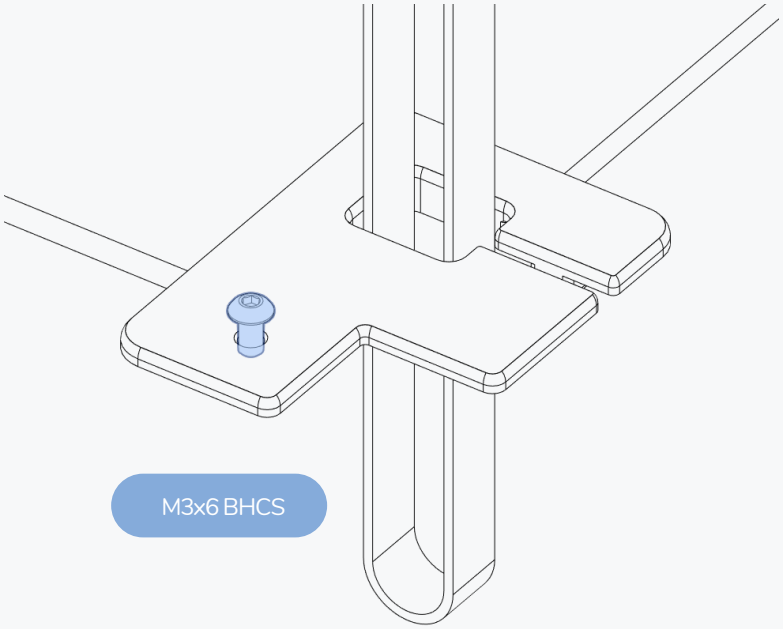


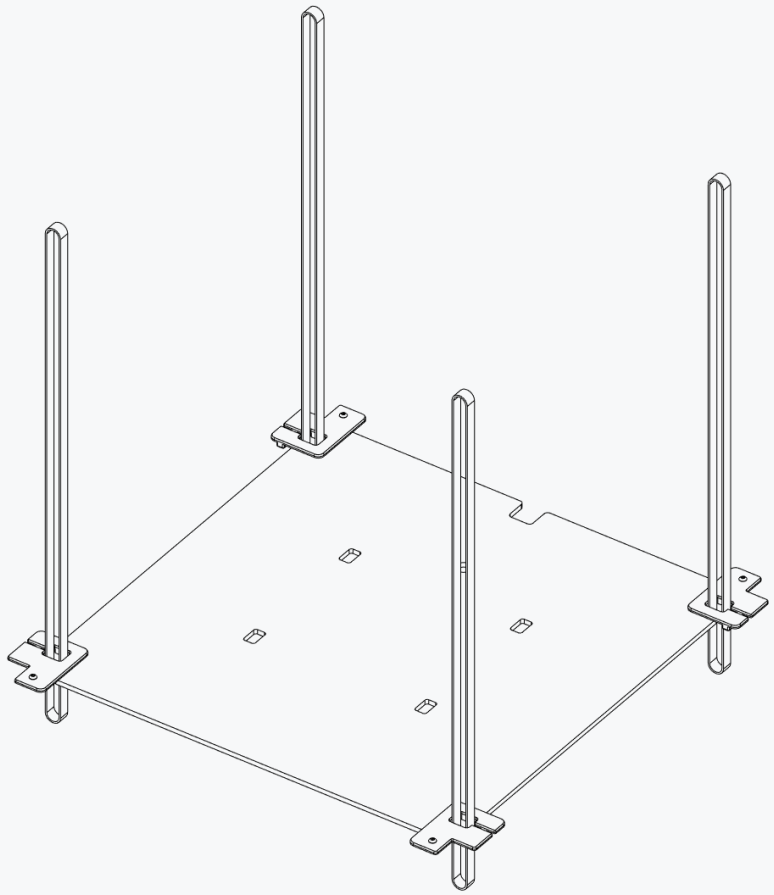
FOAM TAPE

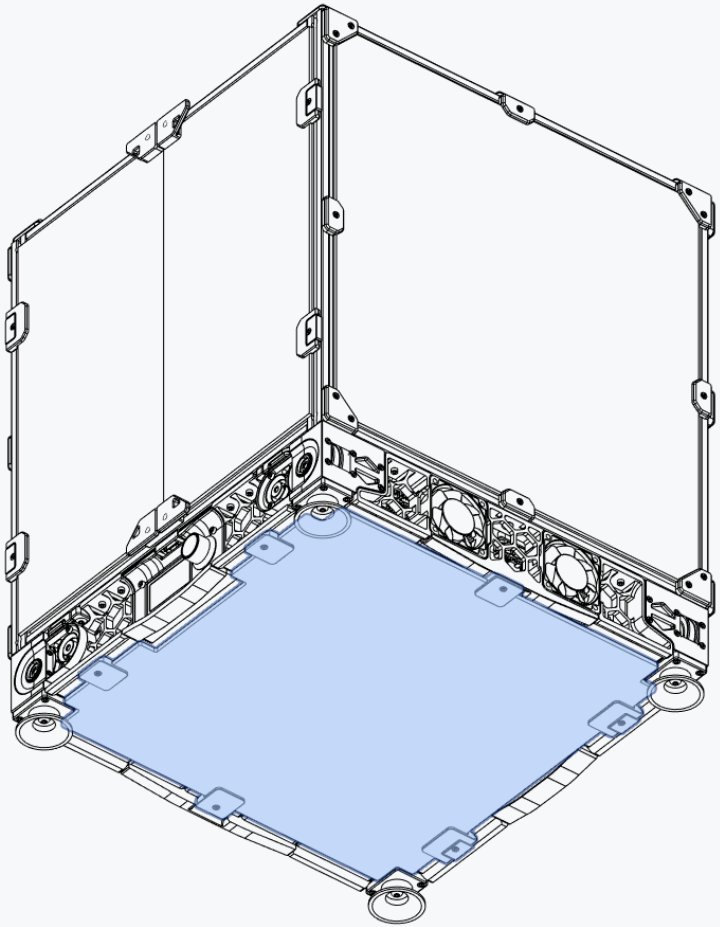
Depending on the height of the foam tape between the panels and the frame, you will likely have to use larger sized clips depending on it's thickness.

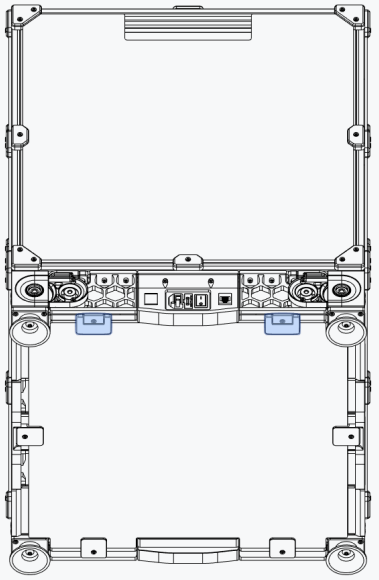





M3x6 BHCS







HINGES

Remember to place the hinges on the rear of the machine.

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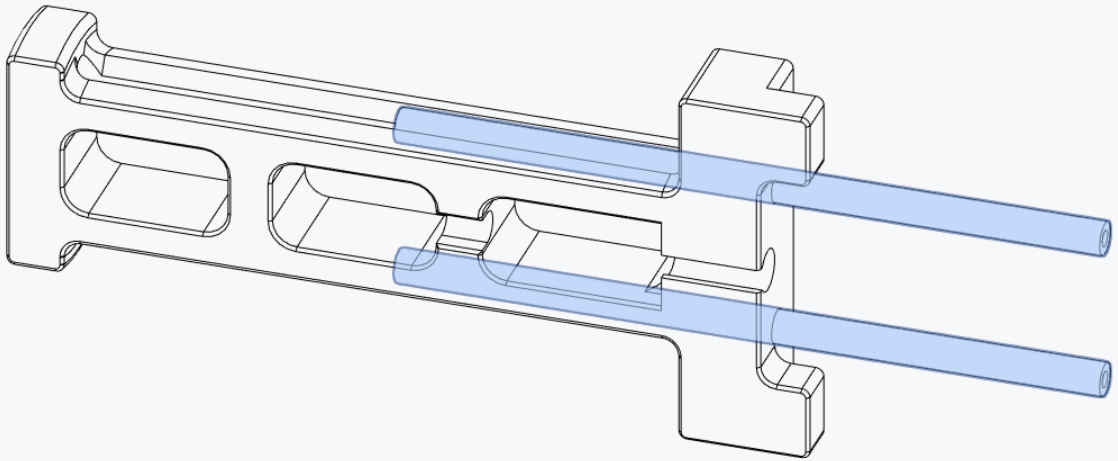
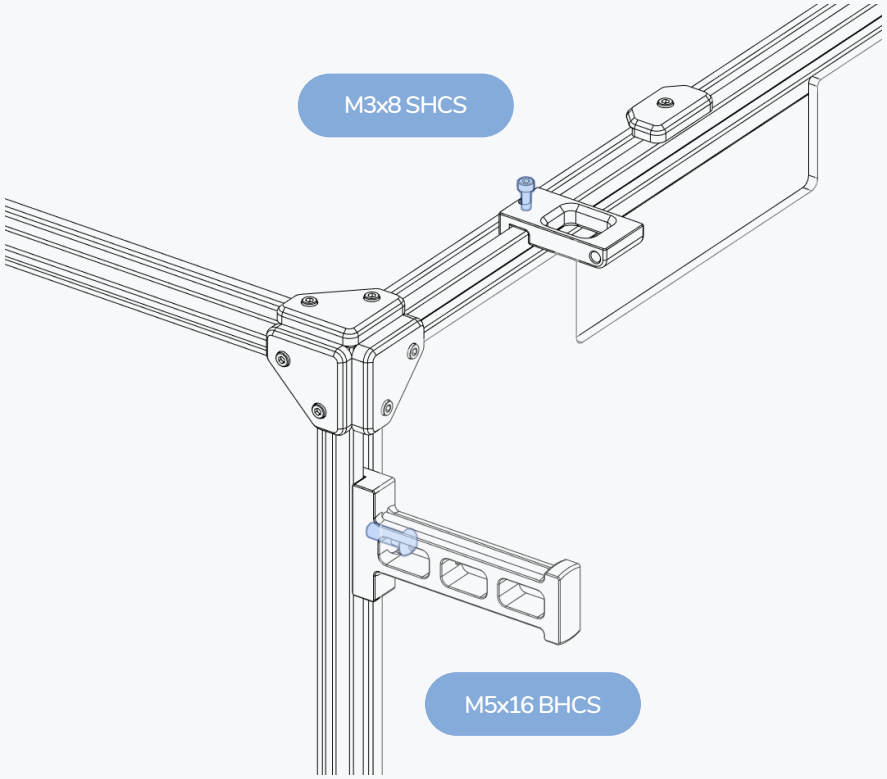
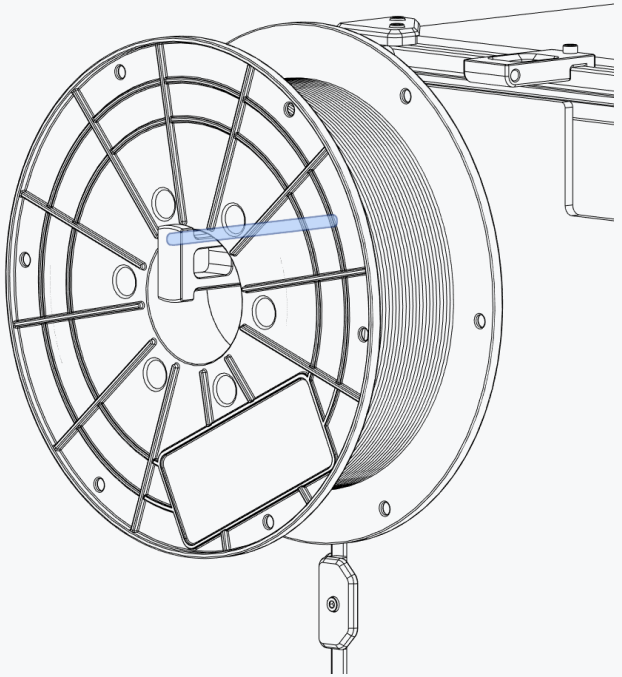


PTFE Insert


M3x8 SHCS
M5x16 BHCS



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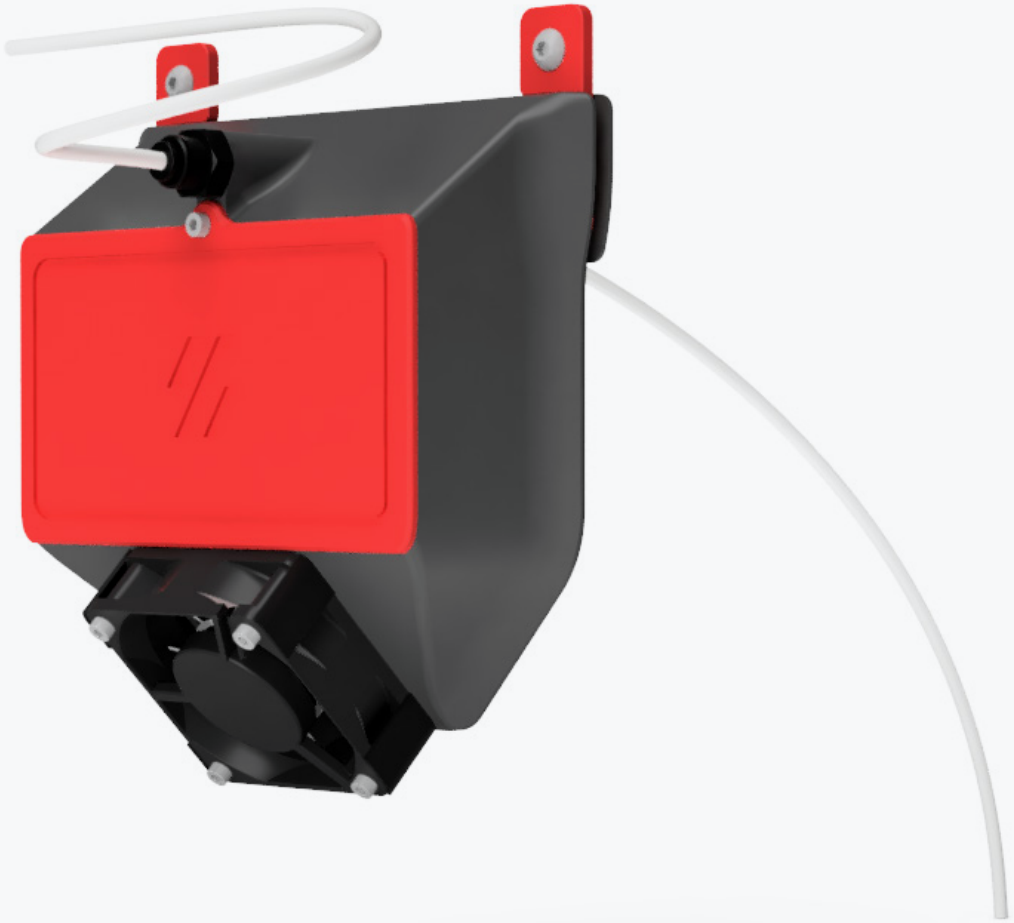
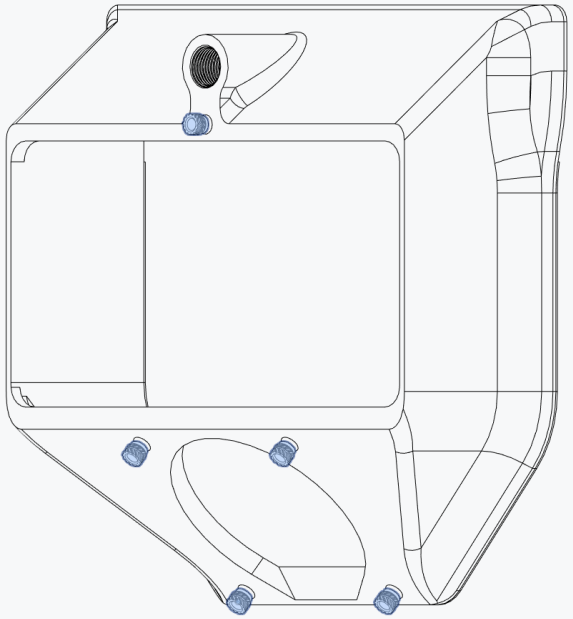
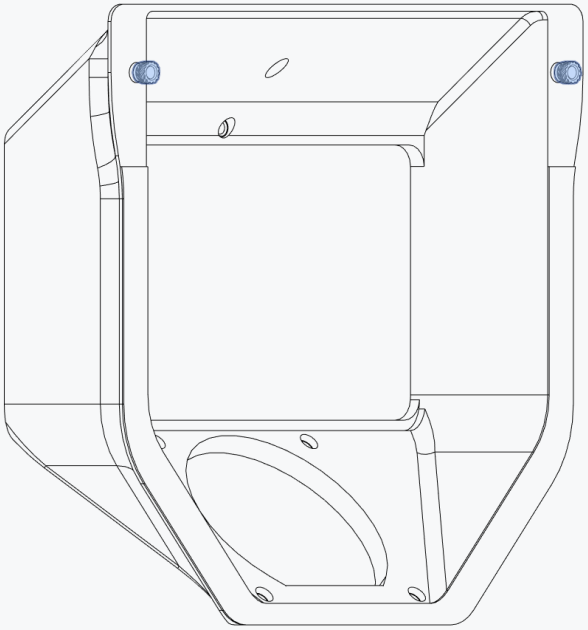
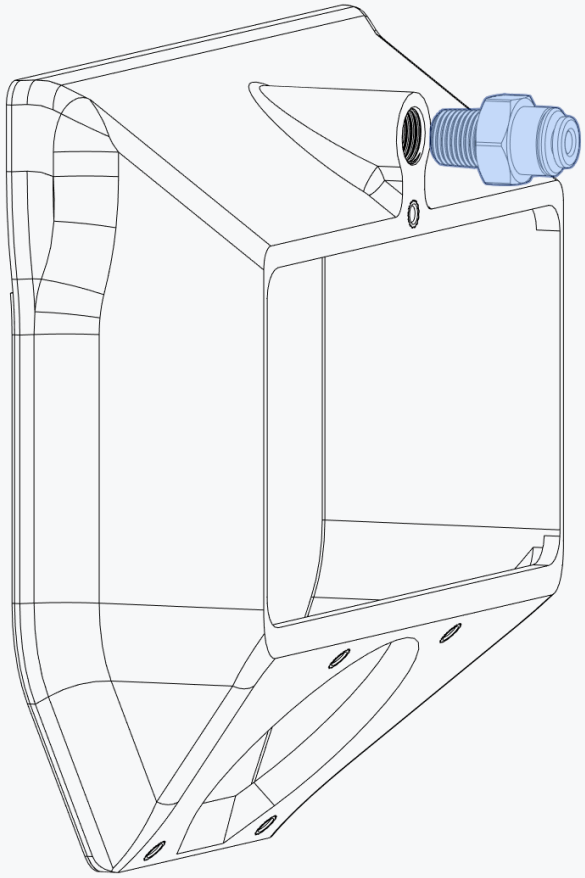




Heat Set Inserts

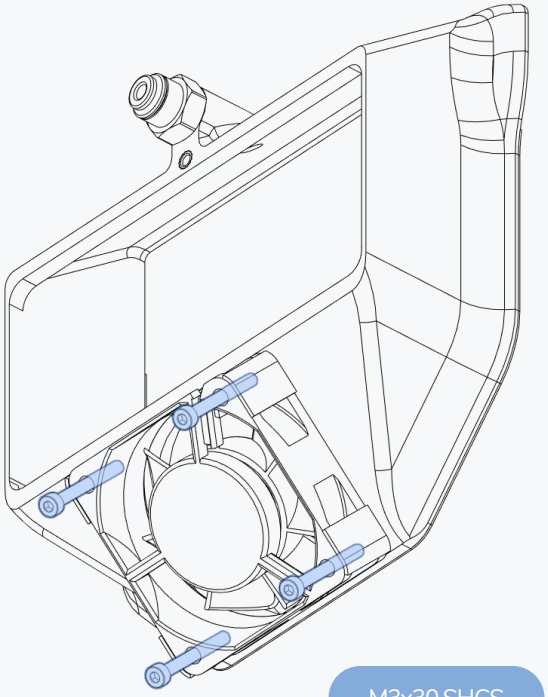




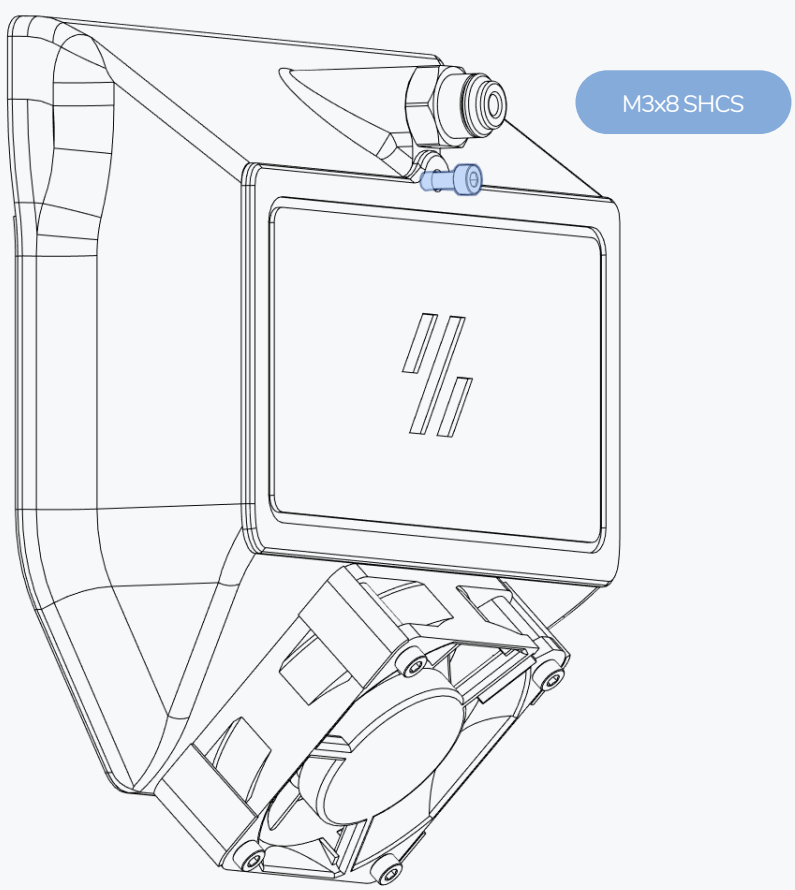
BSP Adapter

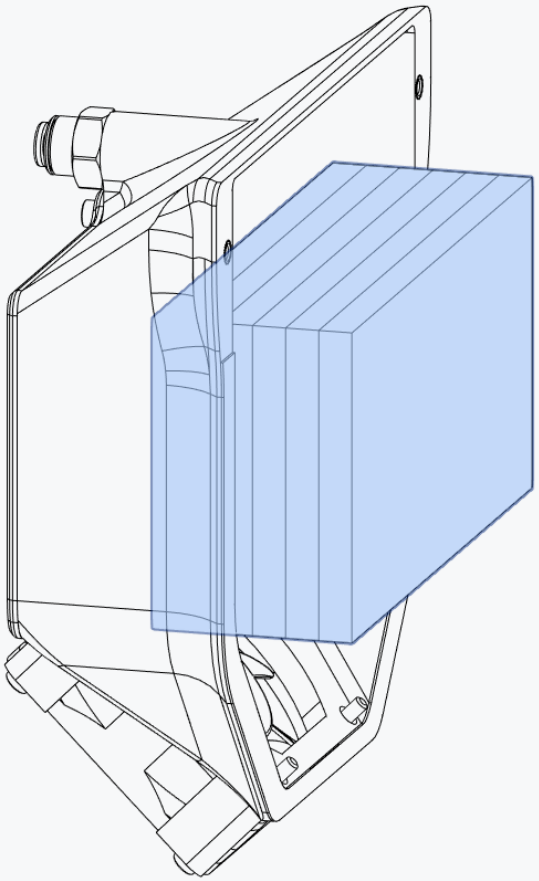
DRILL ADAPTER

Bowden tube won't fit though some BSP adapters depending on the source. You'll have to drill these out.

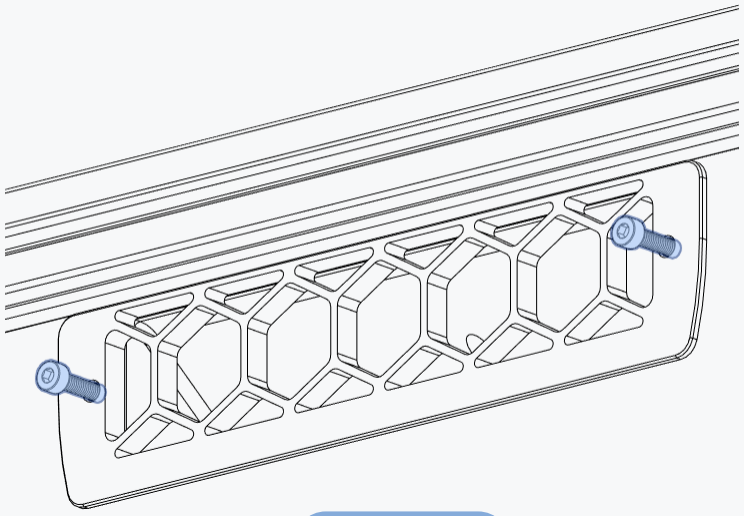


M3x30 SHCS


M3x8 SHCS

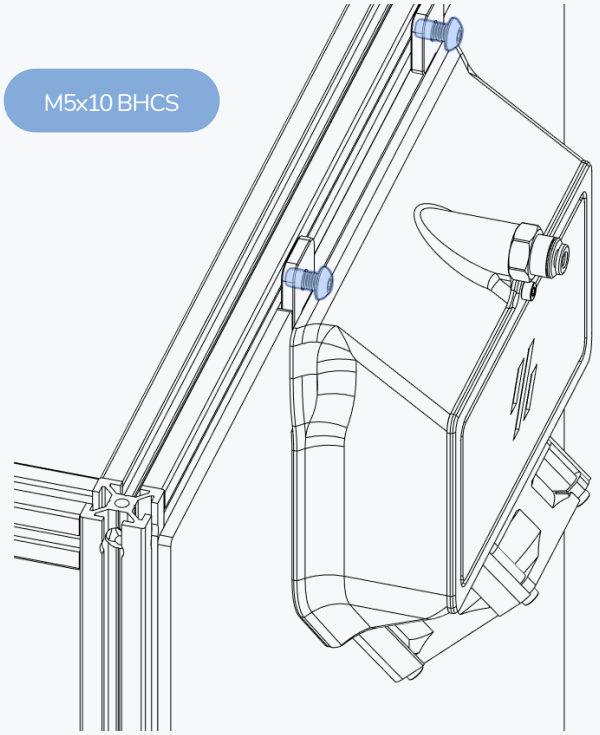


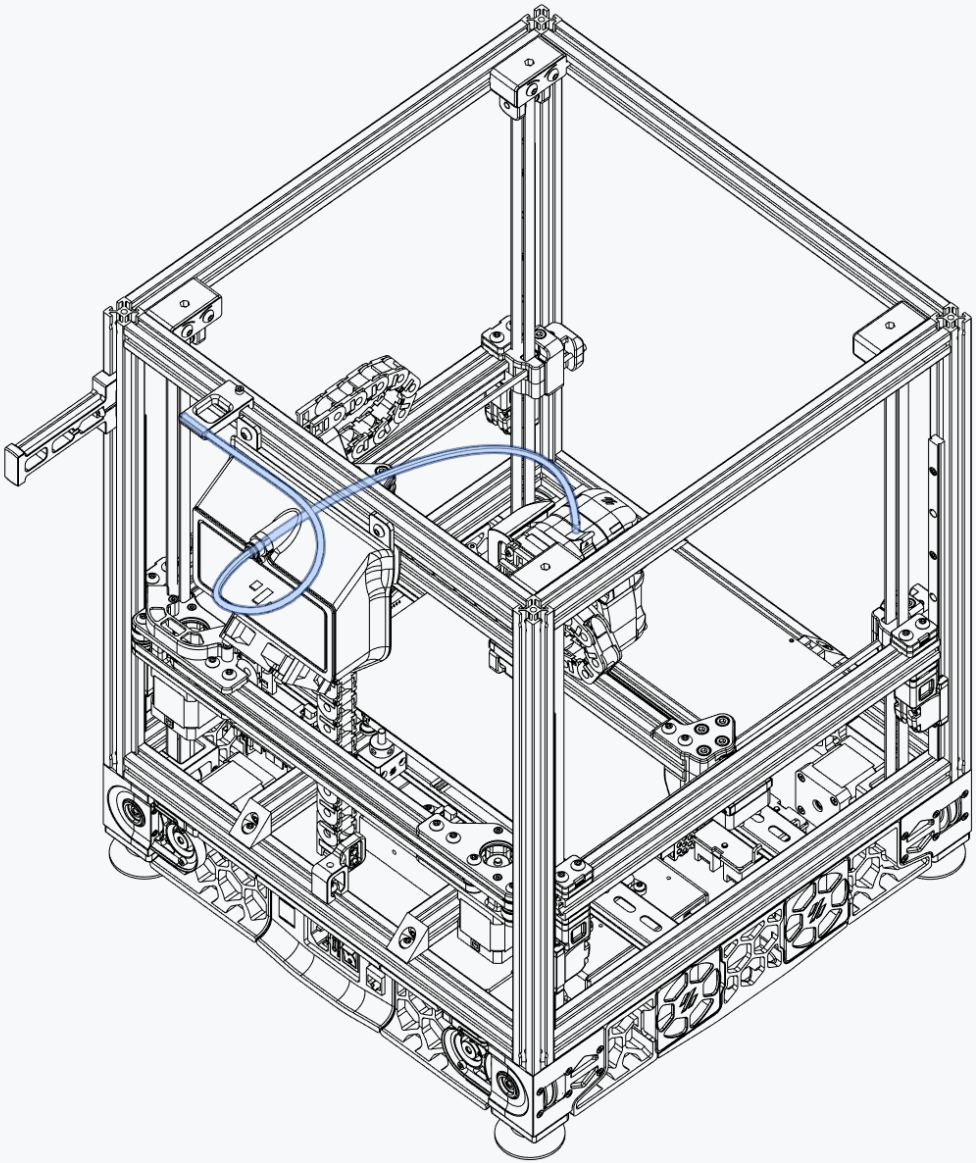
BSP Adapter

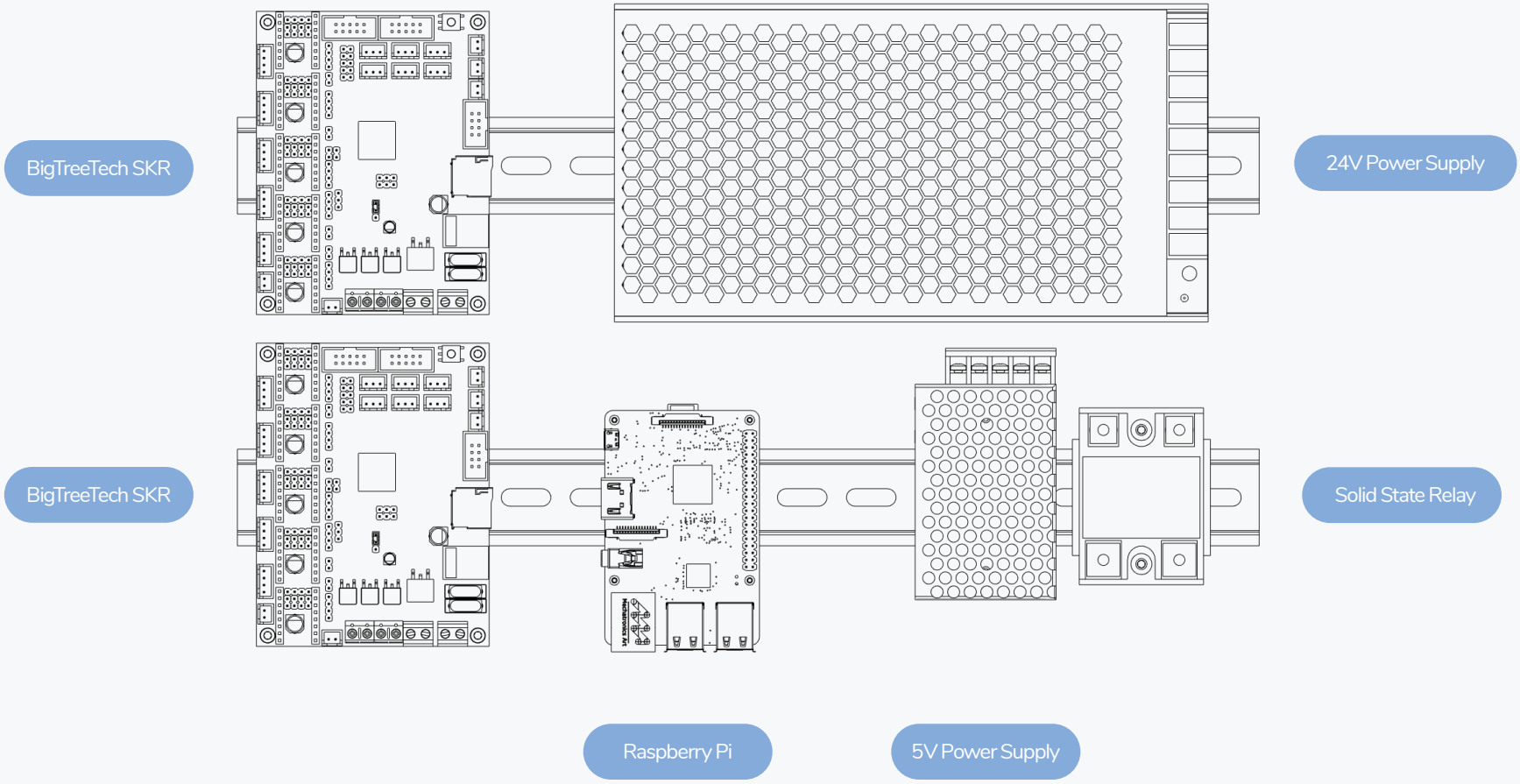


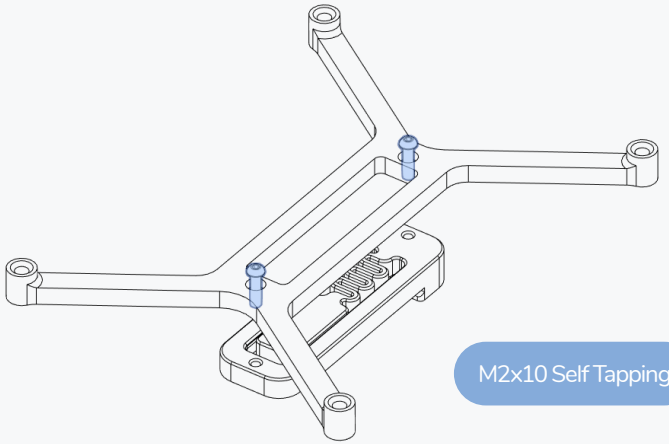
M3x12 SHCS

M5x10 BHCS

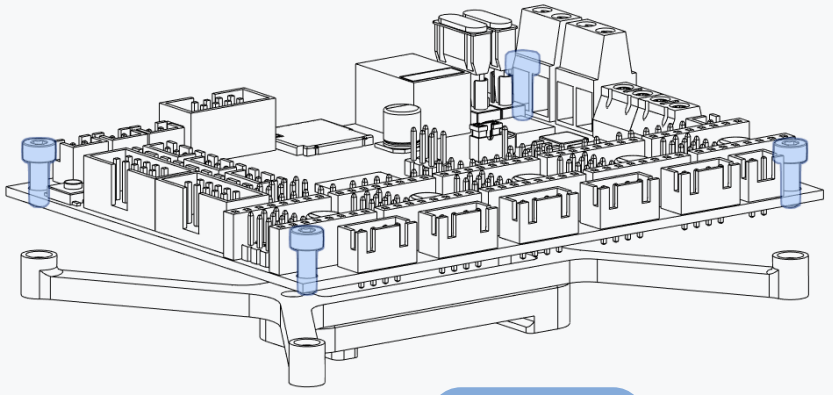




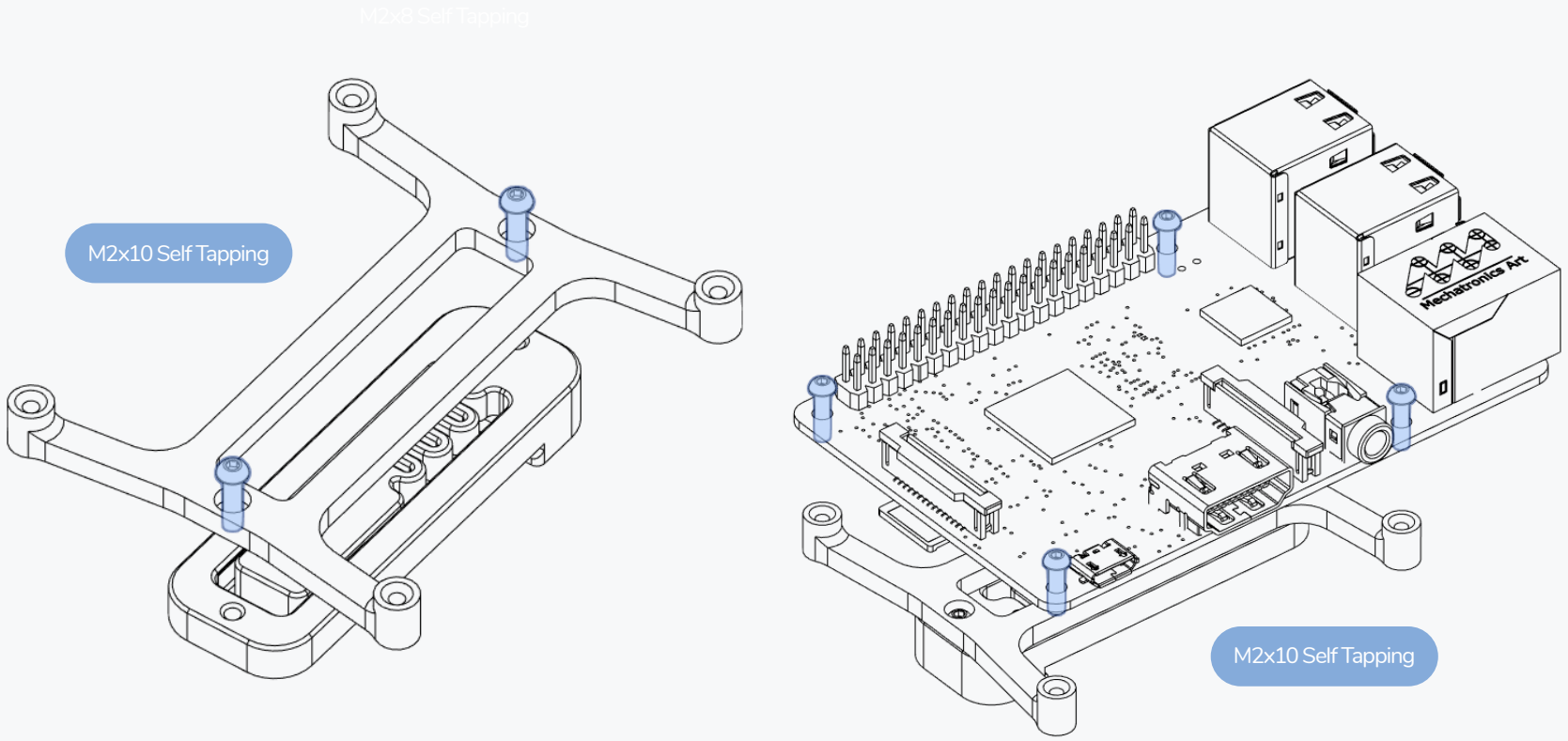

BigTreeTech SKR
24V Power Supply
BigTreeTech SKR
Solid State Relay
Raspberry Pi
5V Power Supply

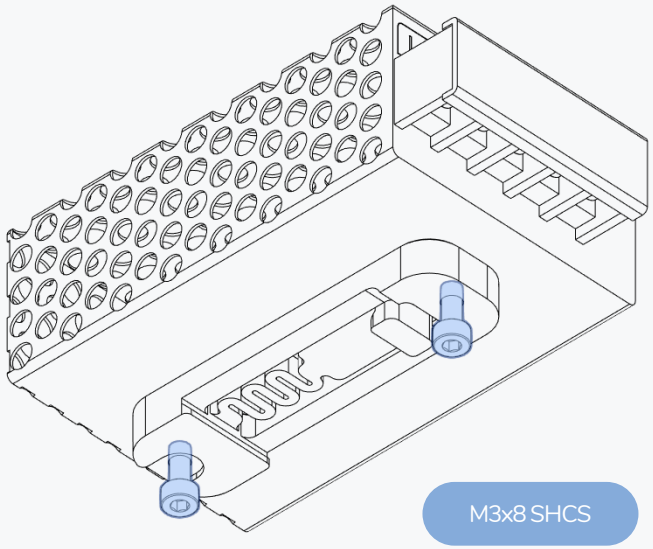


M2x10 Self Tapping

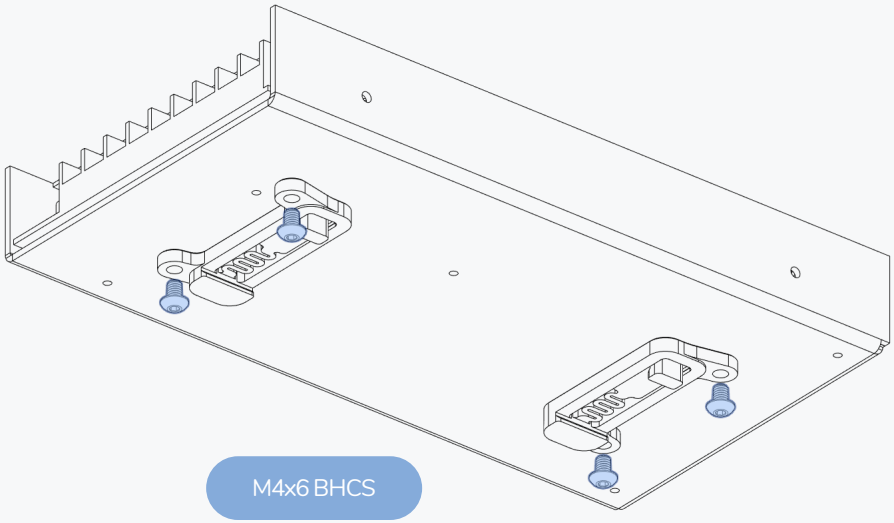


M3x8 SHCS

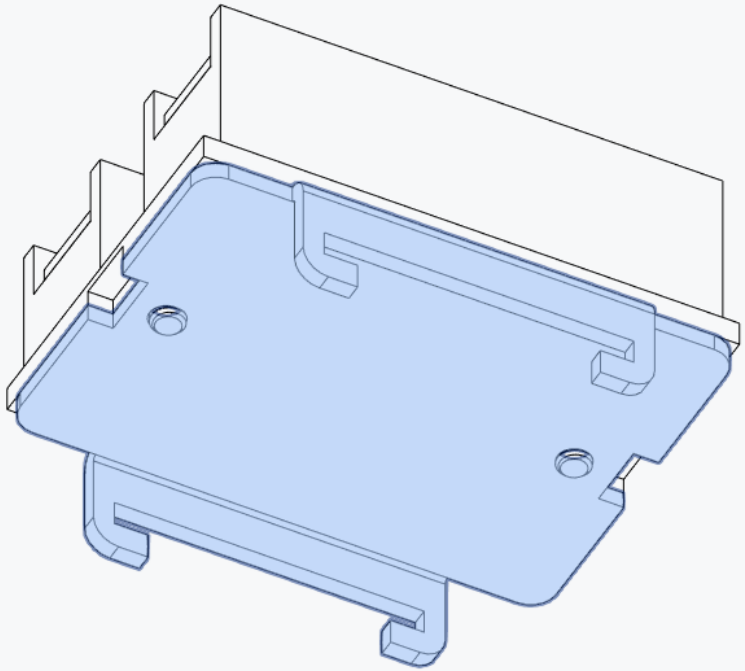

M2x8 Self Tapping
M2x10 Self Tapping
Mechatronics Art
M2x10 Self Tapping

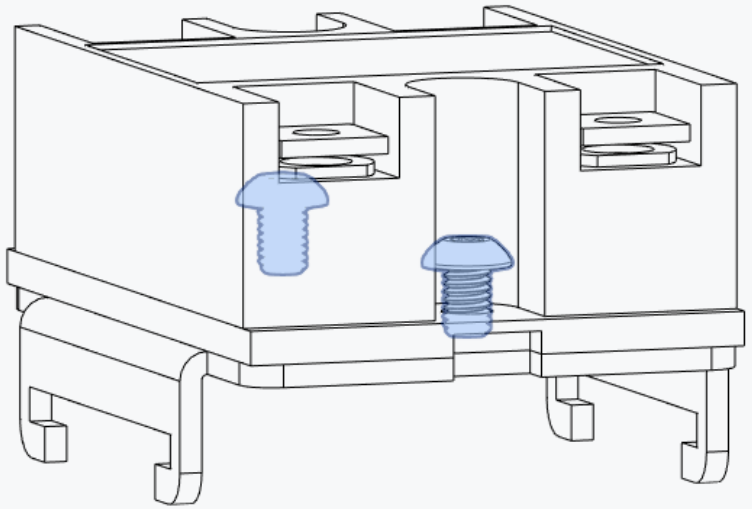


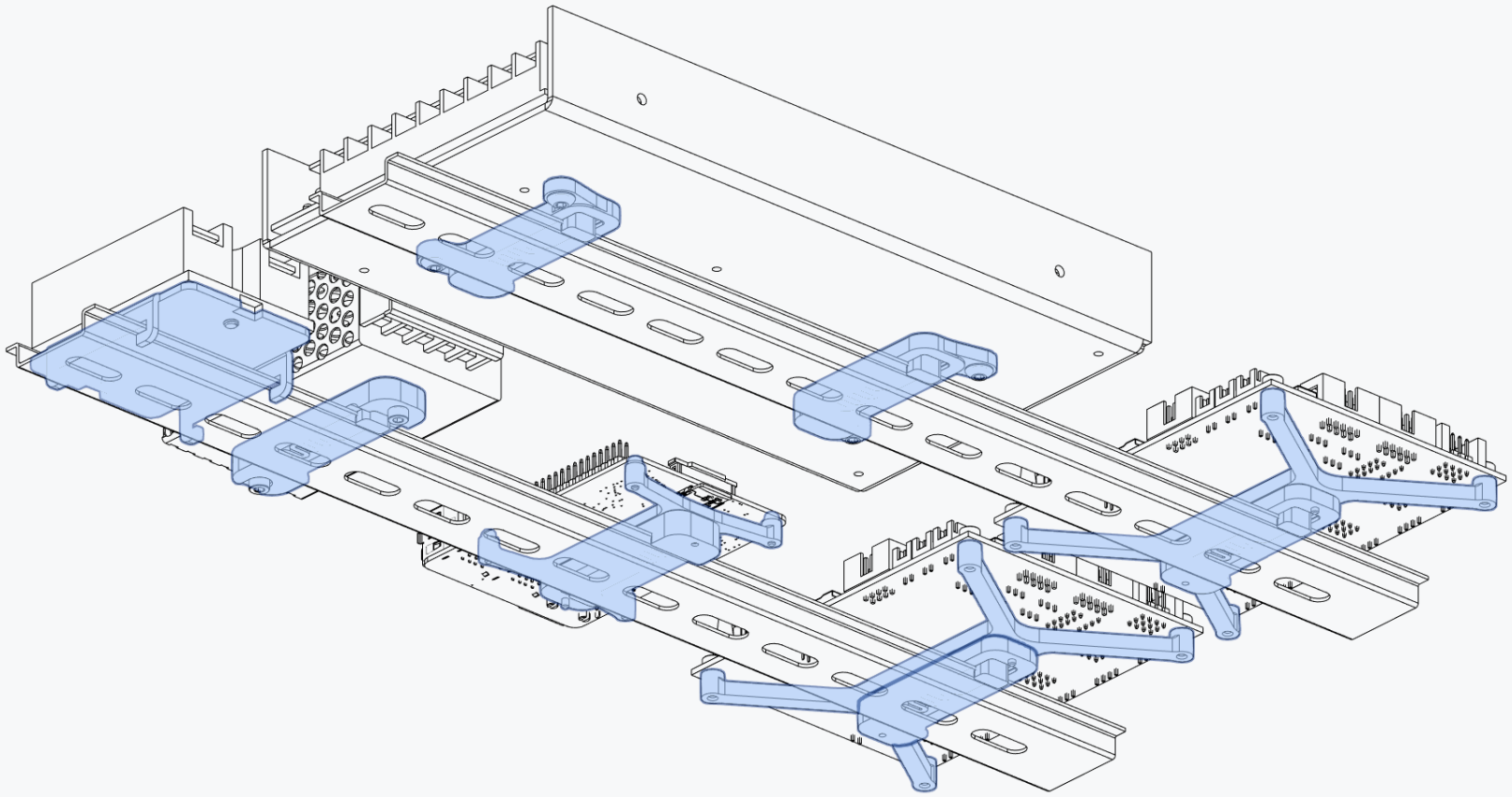
M3x8 SHCS



M4x6 BHCS



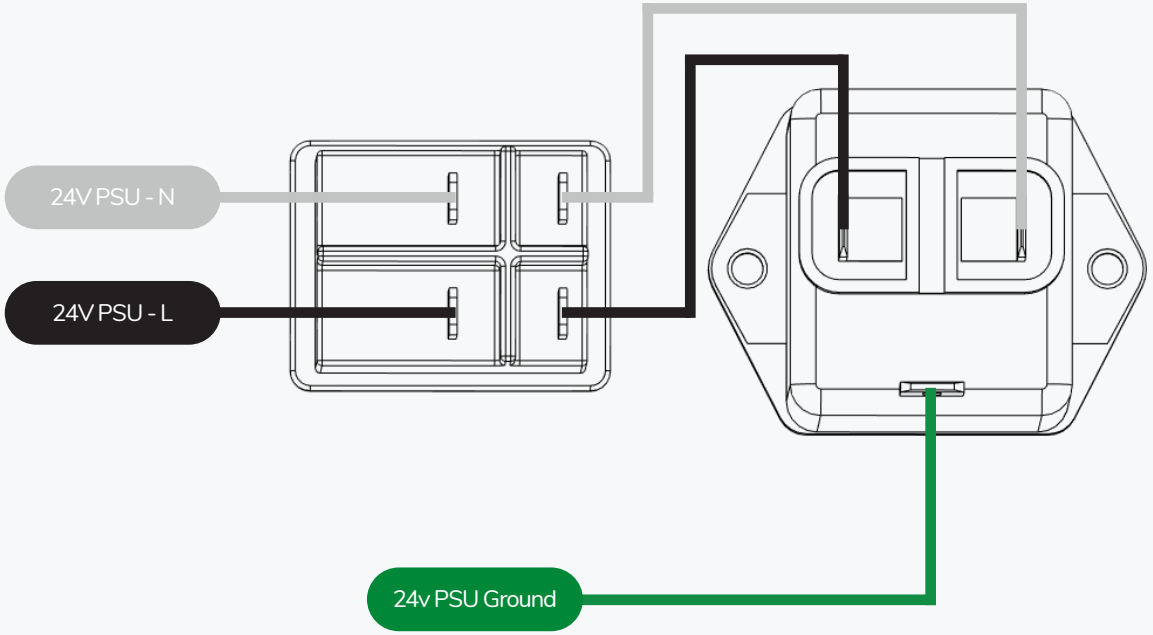

M4x6 BHCS



You are about to start working with electrical wiring that can cause serious injury or death.

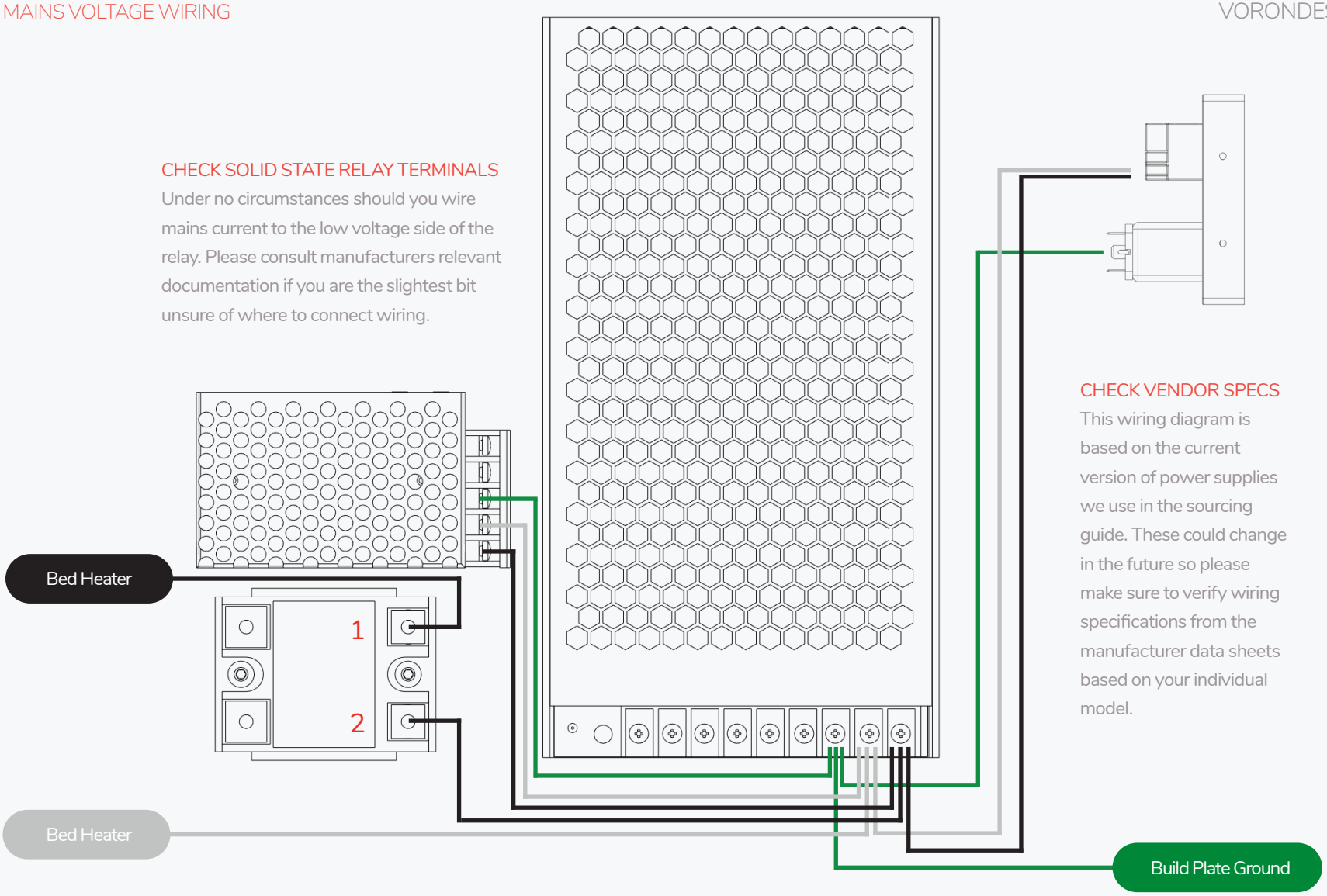
Mains power can kill, and it will hurt the entire time you're dying from it. If in doubt we encourage you to ask questions.

This is not something you want to guess your way through.



CHECK SOLID STATE RELAY TERMINALS

Under no circumstances should you wire mains current to the low voltage side of the relay. Please consult manufacturers relevant documentation if you are the slightest bit unsure of where to connect wiring.

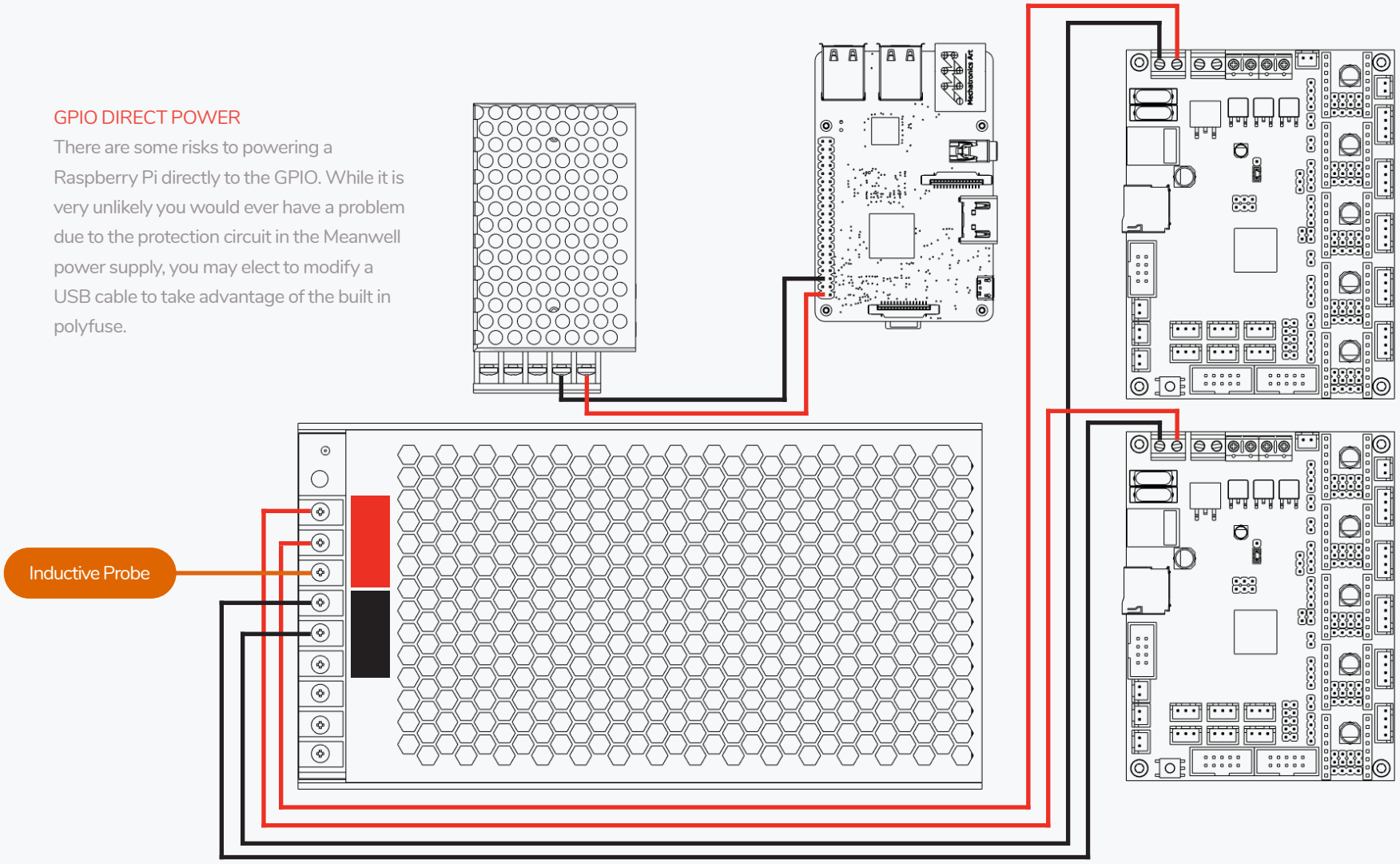


CHECK VENDOR SPECS

This wiring diagram is based on the current version of power supplies we use in the sourcing guide. These could change in the future so please make sure to verify wiring specifications from the manufacturer data sheets based on your individual model.

GPIO DIRECT POWER

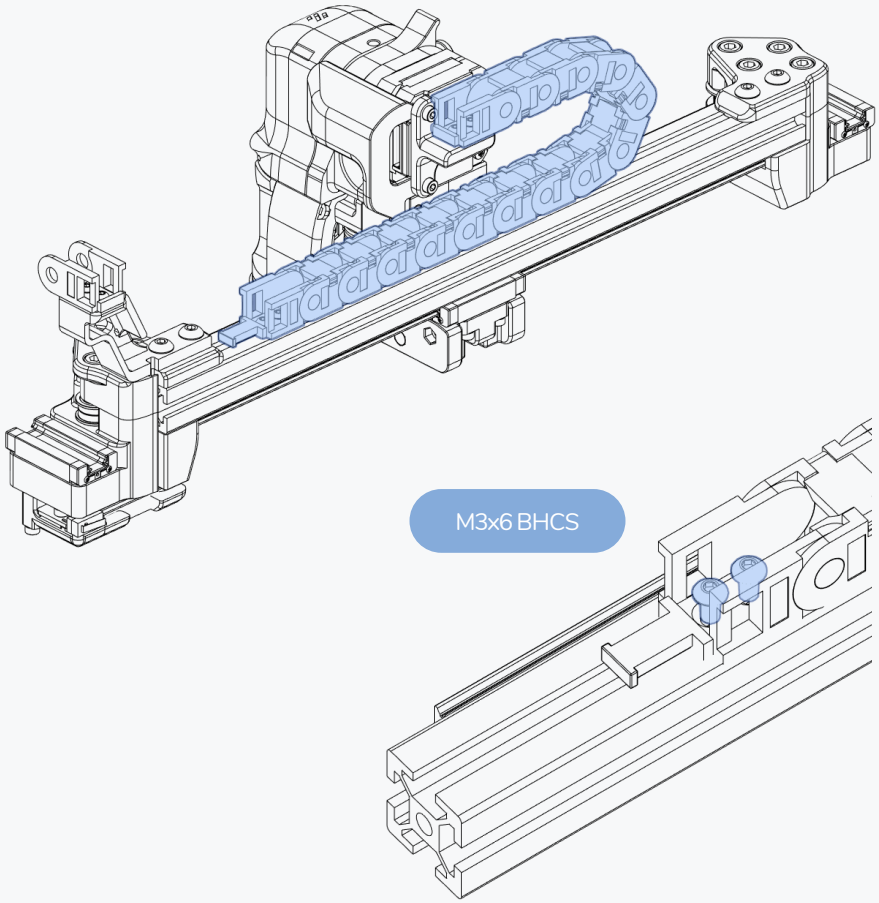
There are some risks to powering a Raspberry Pi directly to the GPIO. While it is very unlikely you would ever have a problem due to the protection circuit in the Meanwell power supply, you may elect to modify a USB cable to take advantage of the built in polyfuse.

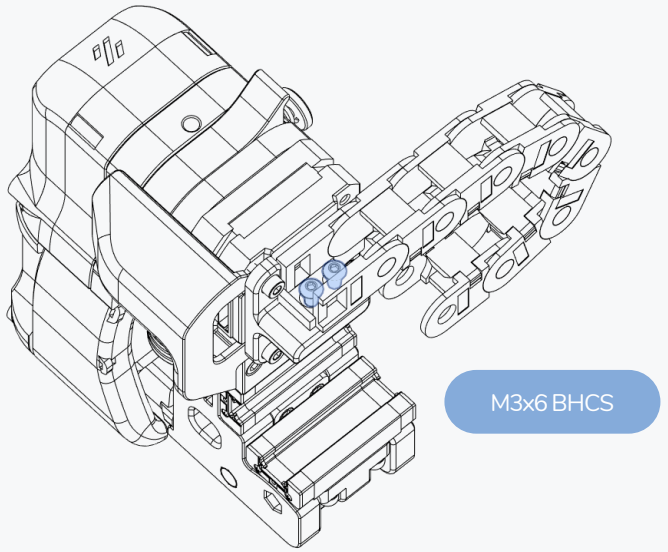


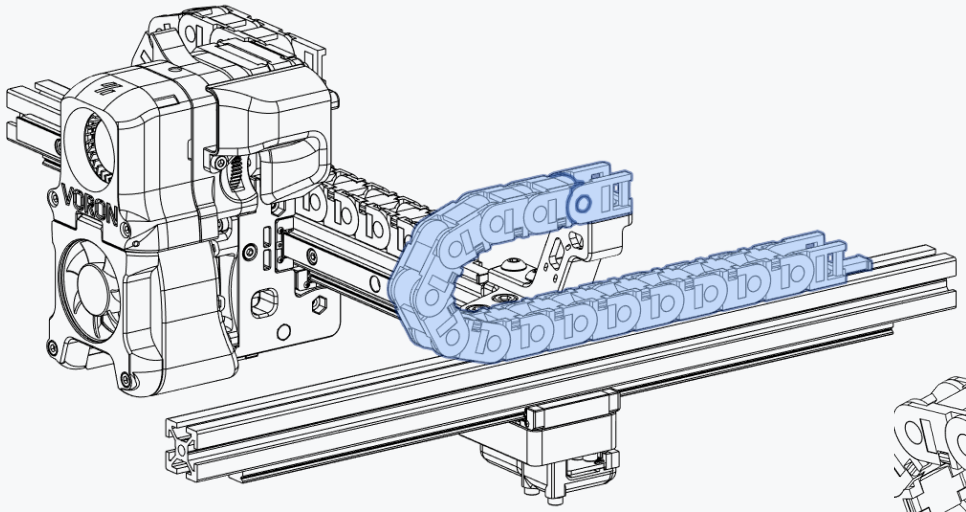
CONTROLLER WIRING

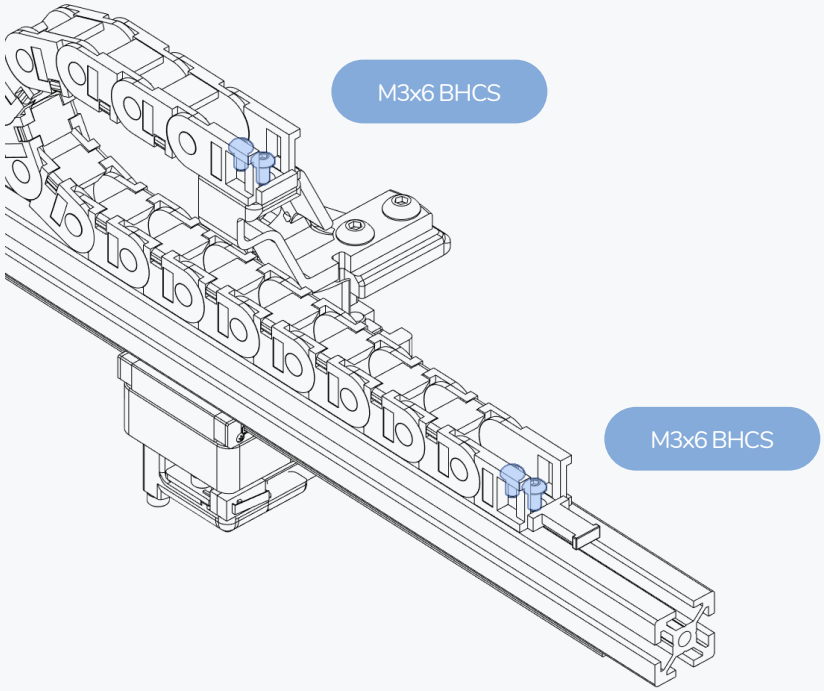
The Voron printer supports multiple controller configurations. Depending on your choice, there will be different wiring requirements to follow.

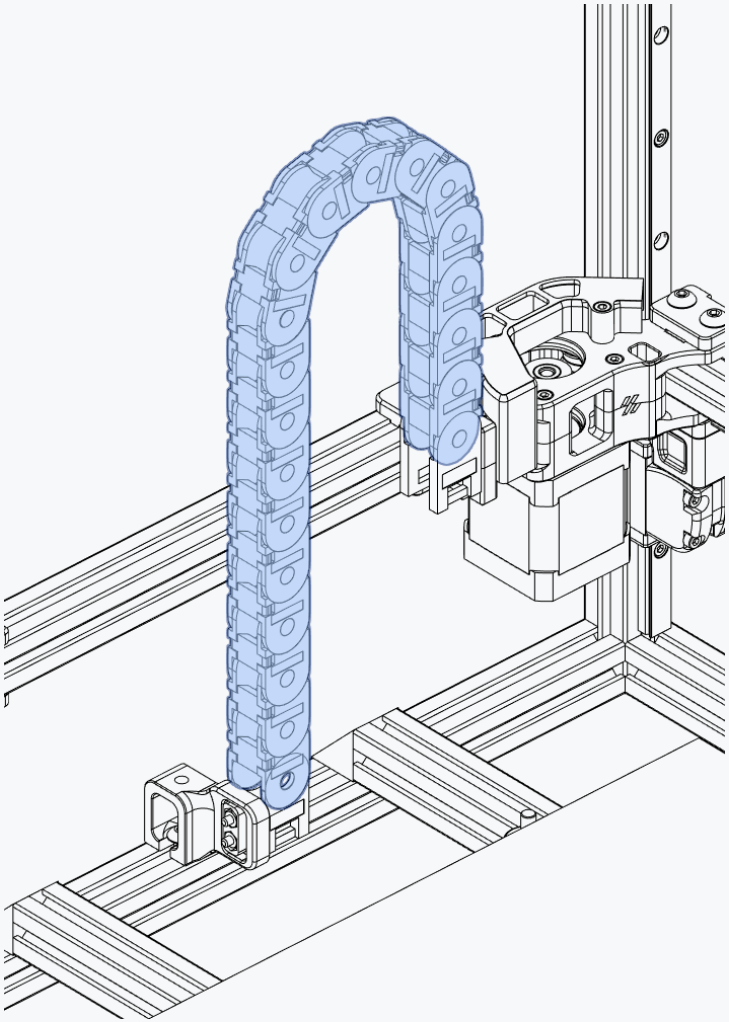
Please check our Discord for specific guides on the controller boards you have chosen.

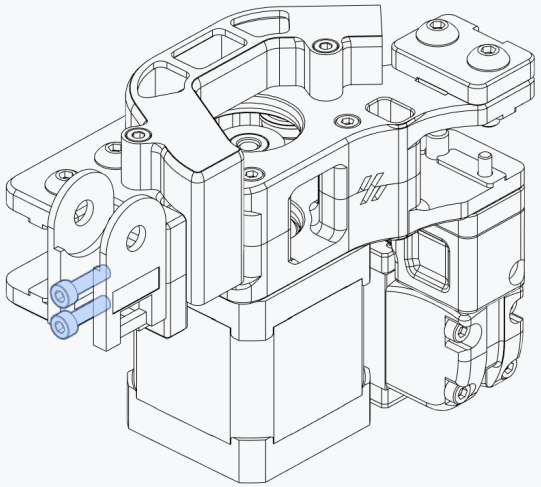

M3x6 BHCS

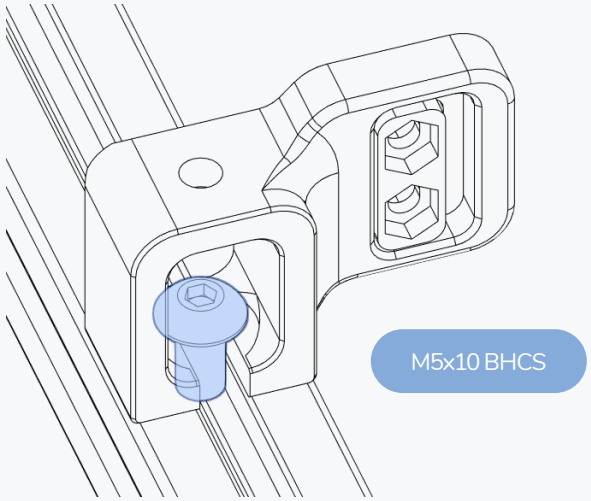

M3x6 BHCS

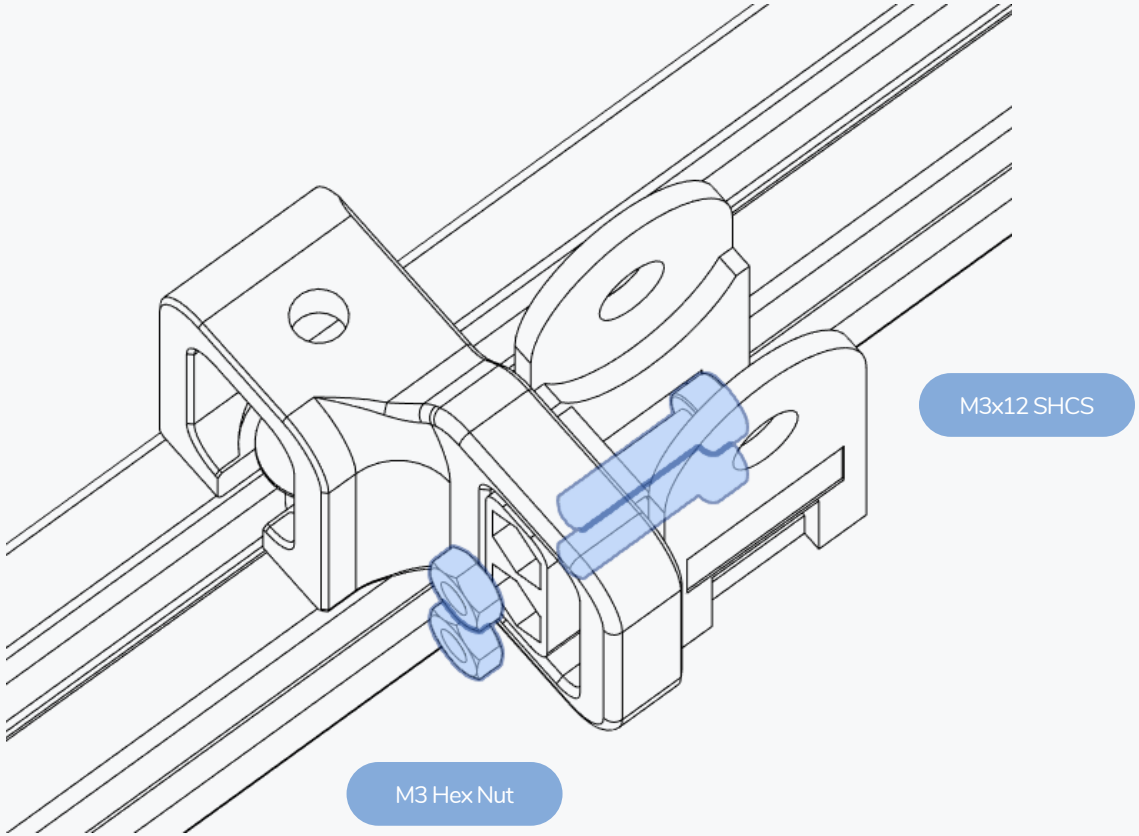


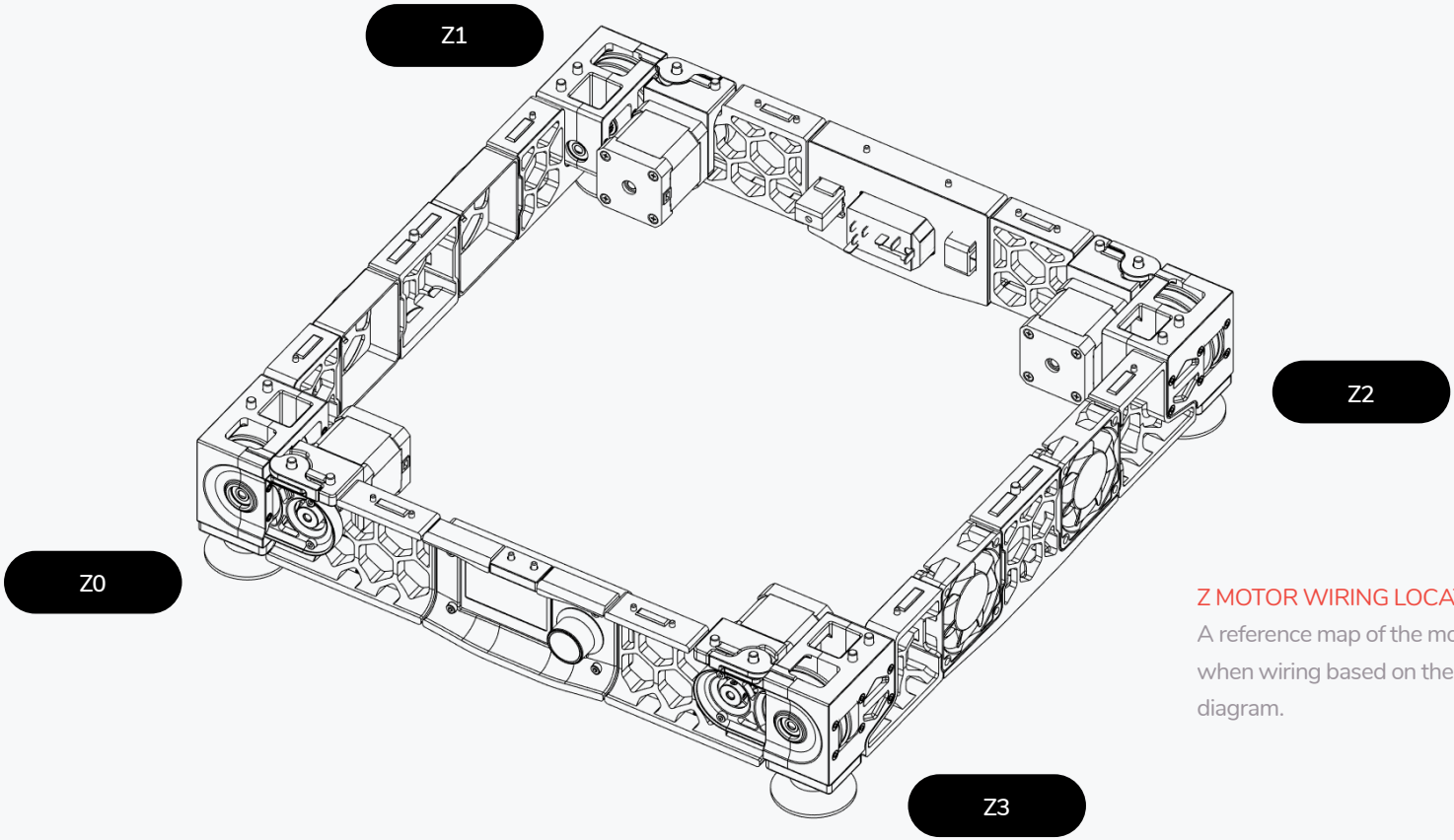

M3x6 BHCS
M3x6 BHCS






M5x10 BHCS


M3x12 SHCS
M3 Hex Nut

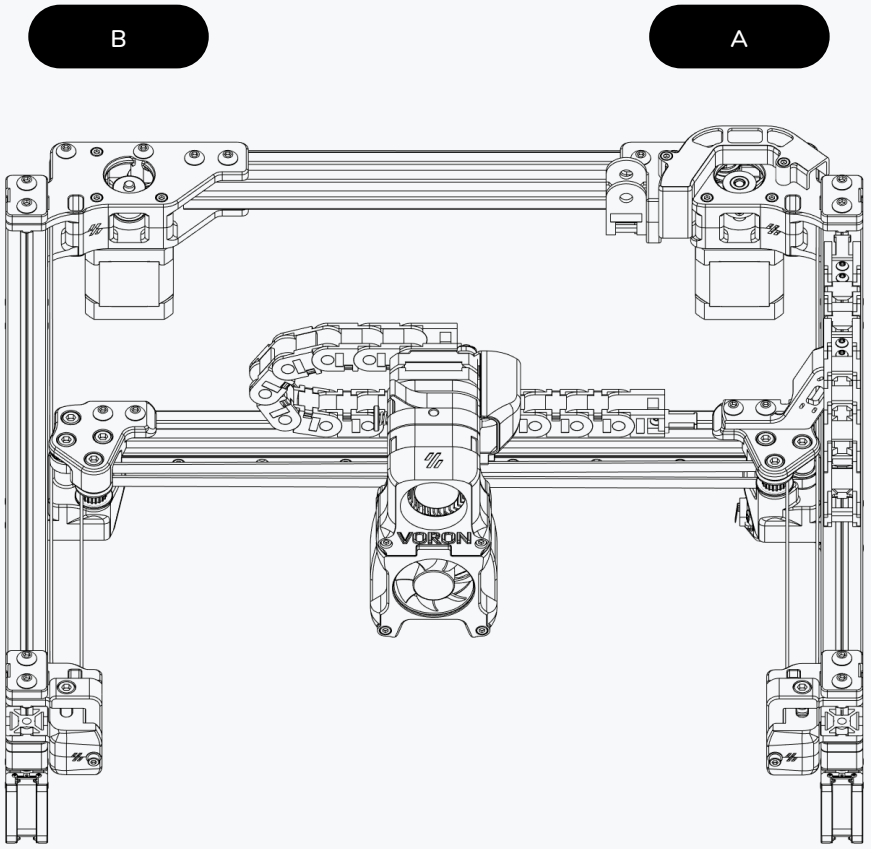


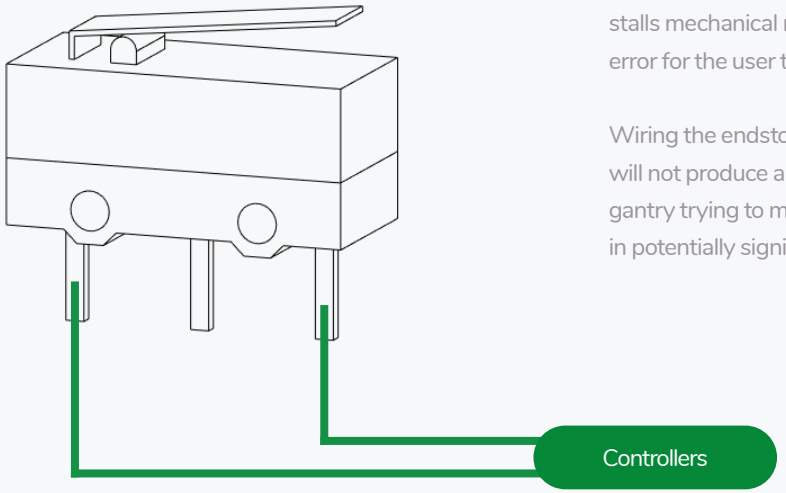
Z MOTOR WIRING LOCATIONS

A reference map of the motor locations when wiring based on the SKR MCU Z diagram.

XY MOTOR WIRING LOCATIONS

A reference map of the motor locations when wiring based on the SKR MCU diagram.





WIRING ENDSTOPS

For the purpose of endstops in the Voron - It is safer to wire in the NC configuration as a fault in the endstop or it's wiring stalls mechanical movement in the machine and produces an error for the user to investigate.

Wiring the endstop in NO configuration, a fault in the endstop will not produce an error and may result in the toolhead or gantry trying to move further than physically possible resulting in potentially significant damage to your machine.

MAINS WIRING

Now is a good time to go back and have a careful look at your mains wiring. Mistakes here can mean bad news so it's best to get some fresh eyes on things. Verify that your wiring conforms to the previous guide steps.

LOW VOLTAGE WIRING

Double check that your low voltage wiring has been completed correctly. It's not a bad idea to use a multimeter and spend some time tracing things to ensure that things are connected as they should be.

KLIPPER CONFIG

Verifying that things are connected in Klipper is very straightforward. Kevin has written a fantastic guide on what steps to perform. You can find his guide on the official Klipper Github, located at the link below.

https://github.com/KevinOConnor/klipper/blob/master/docs/Config_checks.md

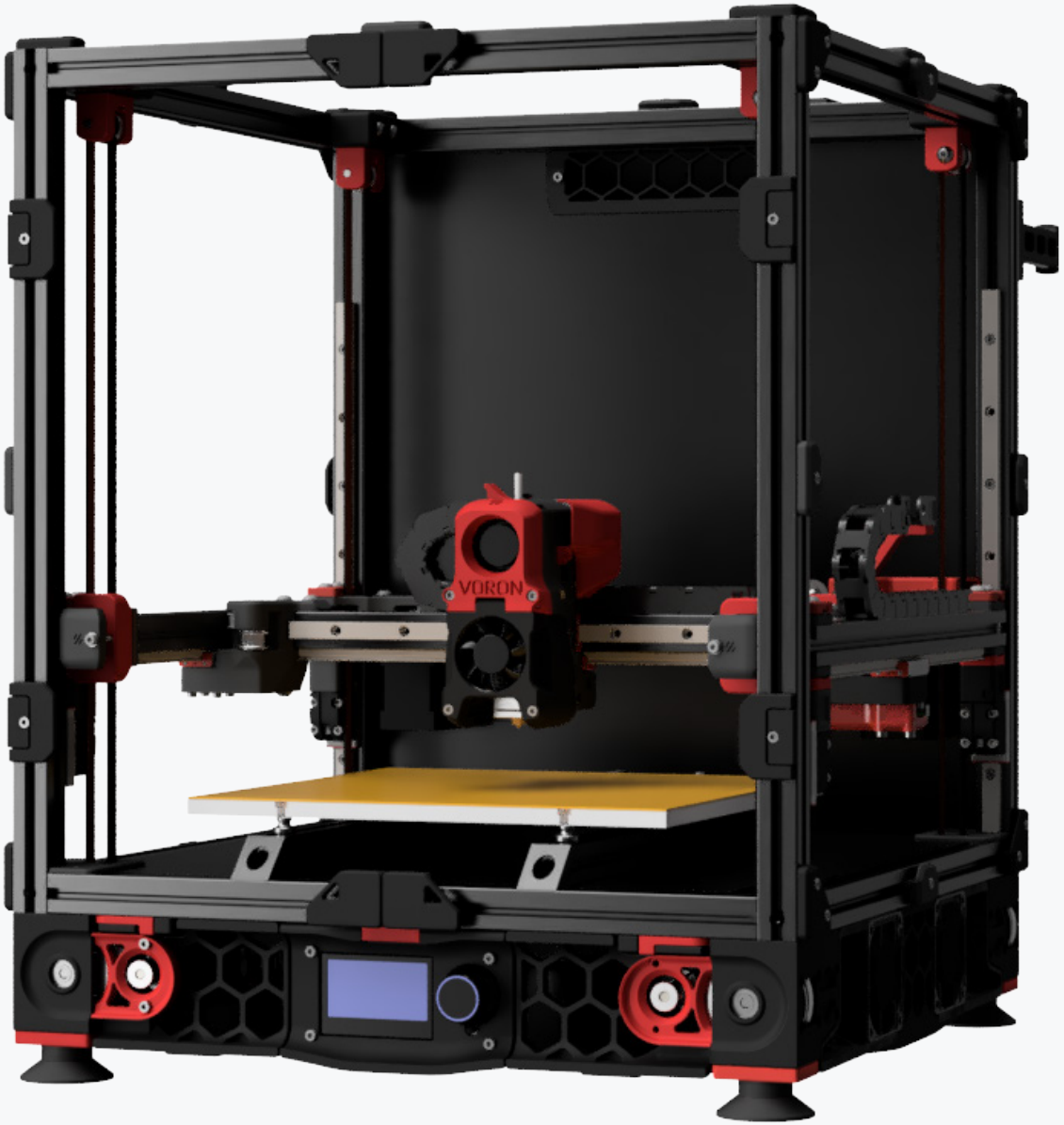
TEST PRINTS & SERIAL

Once you're ready to start printing you might want to have a look in STL folder for some prints we use to tune our machines. Once you're successfully printing we would be happy to see your serial request. Check our Discord for more information.

Website
www.vorondesign.com

Github
https://github.com/

Discord
https://discord.gg/xgXWctB


VORON