



1.8 ASSEMBLY MANUAL

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

VERSION 2020-09-05



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

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PART PRINTING 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.

3D PRINTING PROCESS

Fused Deposition Modeling (FDM)

MATERIAL

ABS

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

PRINT IT FORWARD (PIF)

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.



<https://discord.gg/voron>

THIS IS JUST A REFERENCE

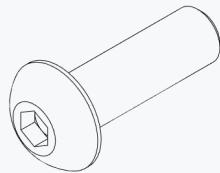
This manual is designed to be a simple reference manual. Building a Voron can be a complex endeavour and for that reason we recommend downloading the CAD files off our Github repository if there are sections you need clarification on. It can be sometimes be easier to follow along when you have the whole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



<https://github.com/vorondesign>

HARDWARE

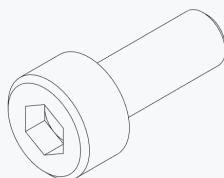
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BUTTON HEAD CAP SCREW (BHCS)

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

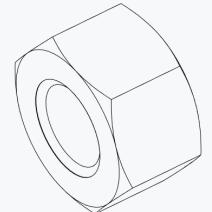
ISO 7380-1



SOCKET HEAD CAP SCREW (SHCS)

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

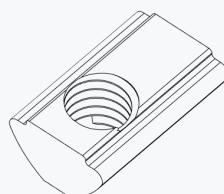
ISO 4762



HEX NUT

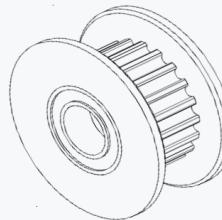
Hex nuts couple with bolts to create a tight, secure joint. You'll see these used in both M3 and M5 variants throughout this guide.

ISO 4032



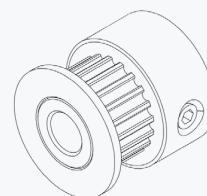
POST INSTALL T-SLOT NUT

Nut that can be inserted into the slot of an aluminium profile. Used in both M3 and M5 variants throughout this guide.



IDLER

GT2 idler used in the motion system of the Voron.



PULLEY

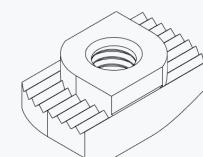
GT2 pulley used on the motion system of the Voron.



SHIM

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

DIN 988

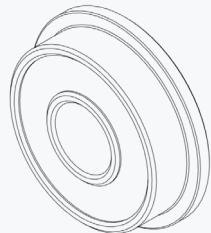


HAMMER HEAD NUT

Nut that can be inserted into the slot of an aluminium profile. Used exclusively for panel mounting, all other components use T-Slot nuts.

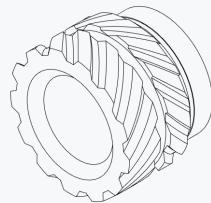
HARDWARE

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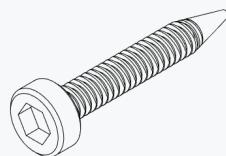
F695 BEARING

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



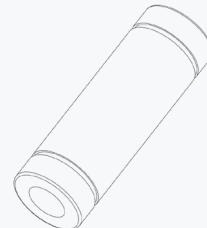
HEAT SET INSERT

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.



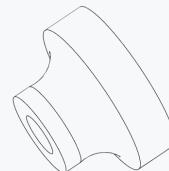
SELF TAPPING SCREW

Fastener with a pronounced thread profile that is screwed directly into plastic.



LM8LUU BEARING

A long linear ball bearing used in the Z axis.



THUMB NUT

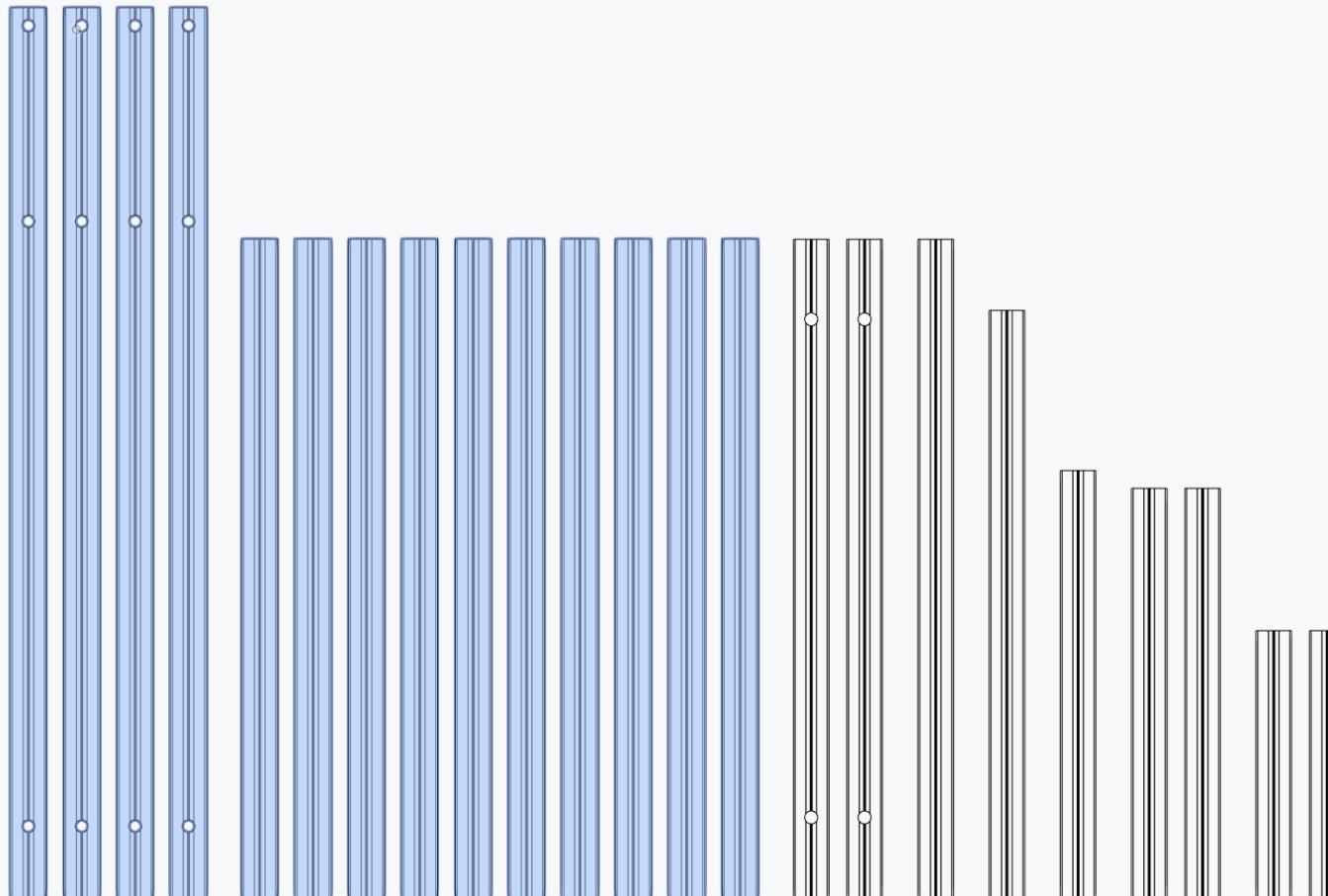
Used in the print bed both for manual tramping and as a spacer.

DIN 466-B

FRAME

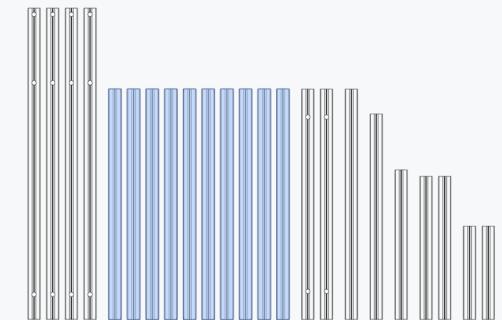
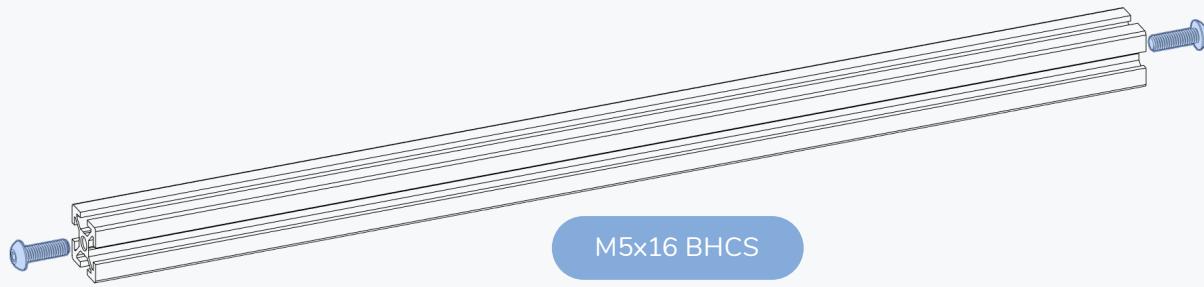
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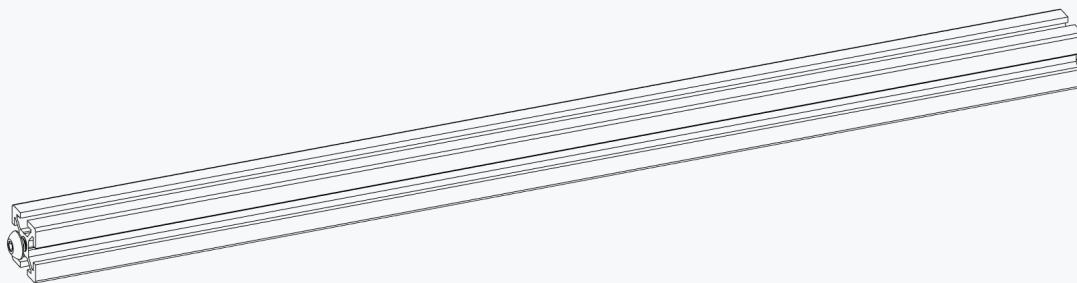
GETTING EXTRUSIONS TOGETHER

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.

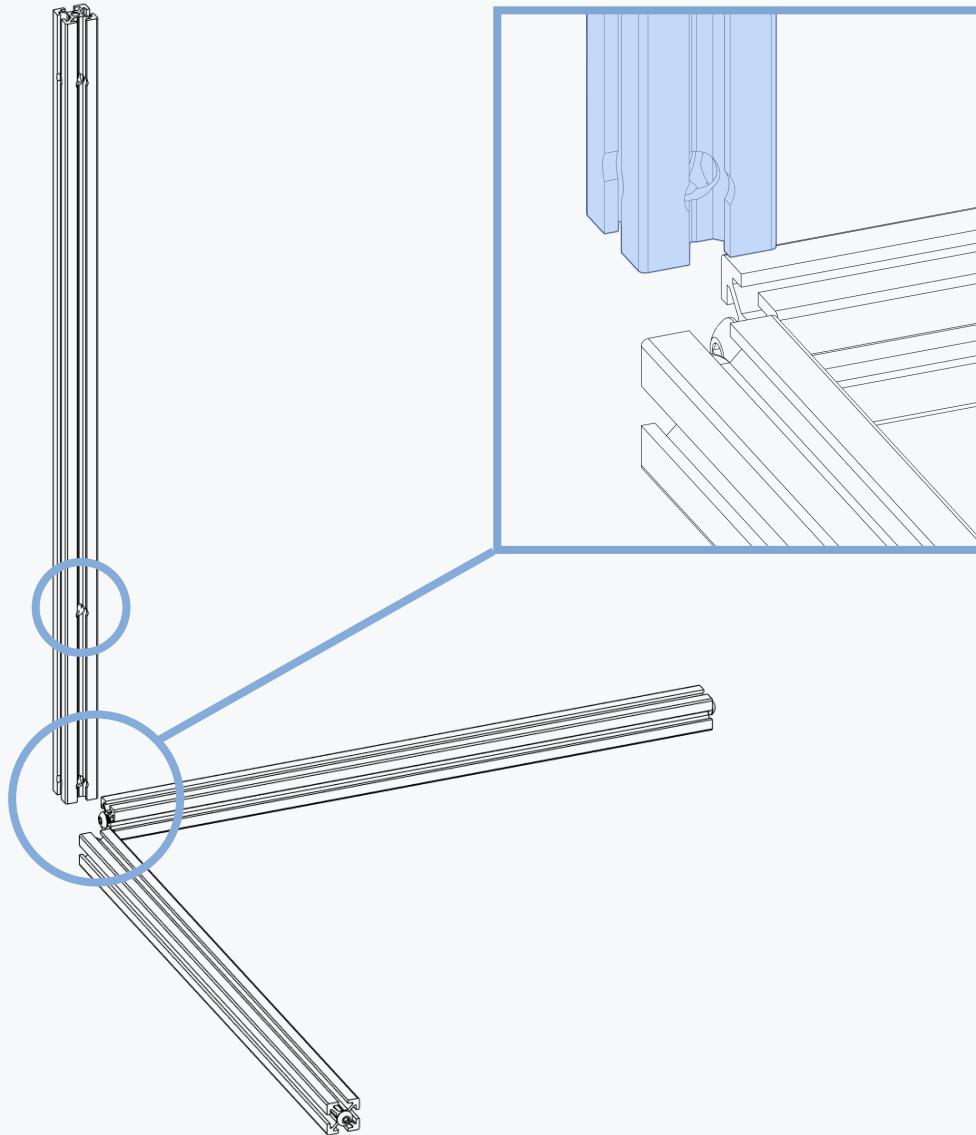


PREPARE 10 EXTRUSIONS

All 10 extrusions are going to be used in this section. Prepare them as shown to the left.



FIRST BLIND JOINT



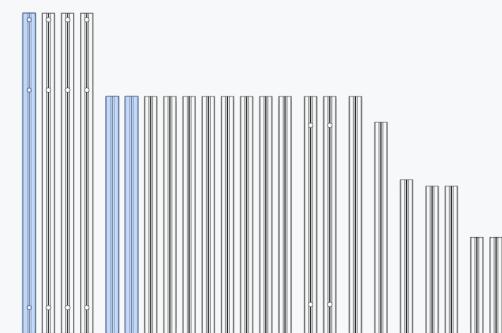
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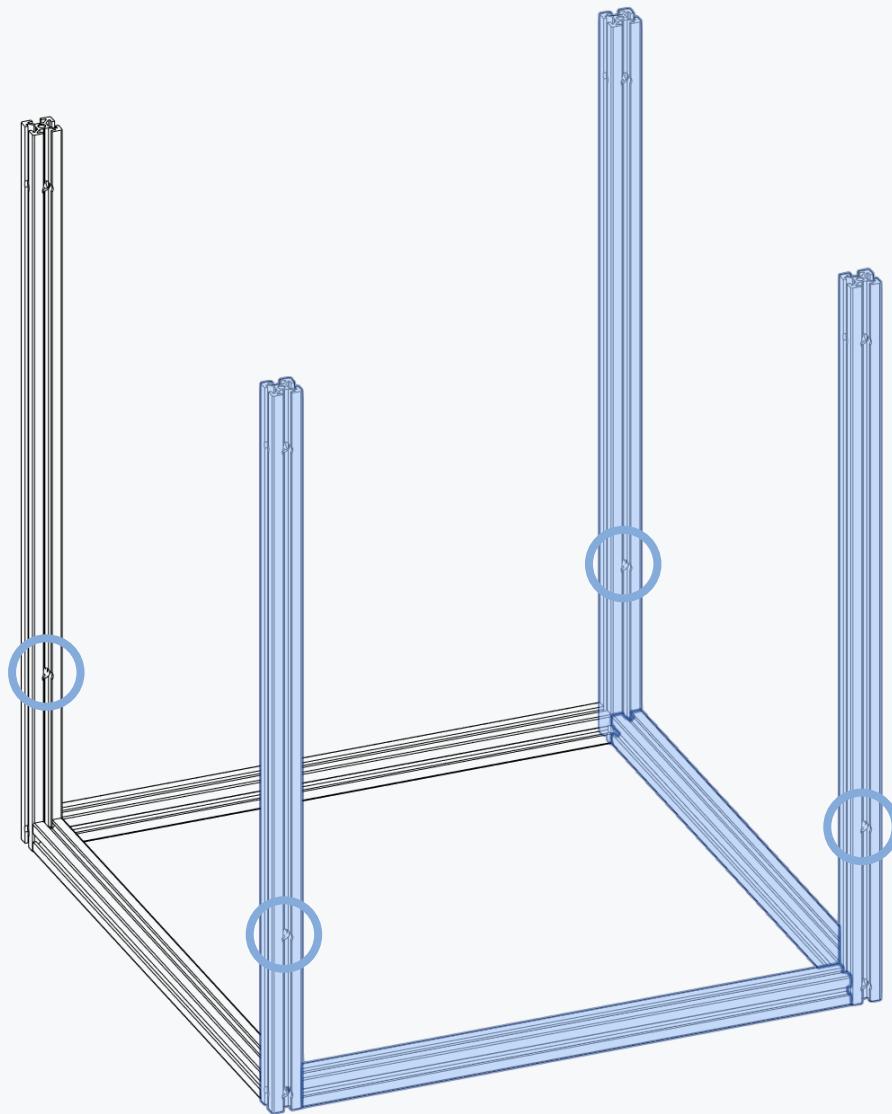
BUILD ON A FLAT SURFACE

Build the frame on a glass or granite surface to ensure you can get it as square as possible.

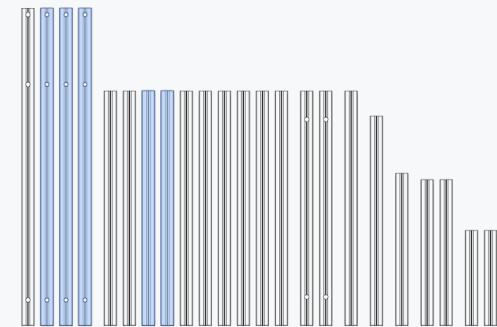
UPSIDE DOWN ASSEMBLY

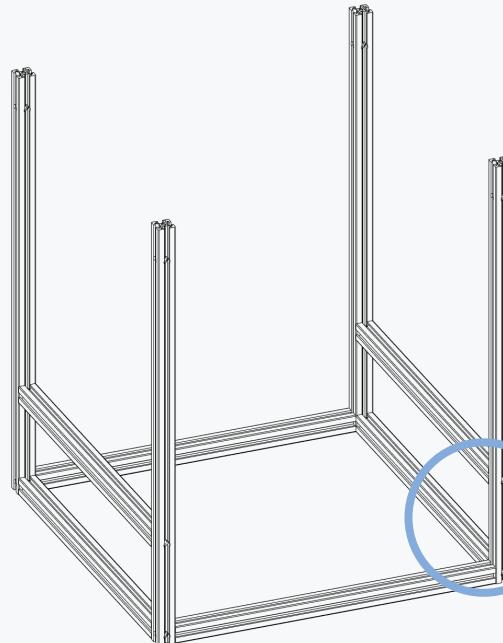
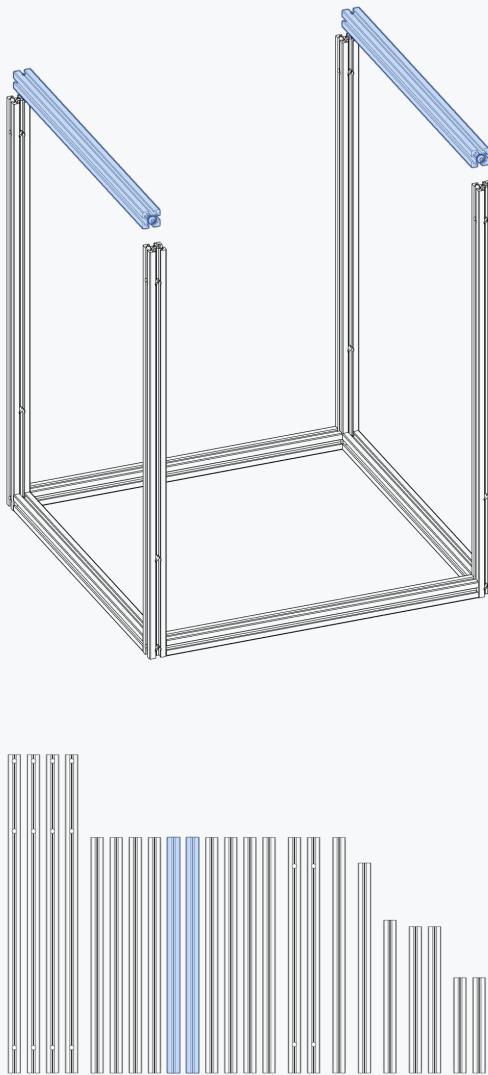
For ease of assembly we recommend to assemble the frame upside down.
Mind the position and orientation of the access hole on the vertical extrusions.



**MIND ACCESS HOLE POSITION**

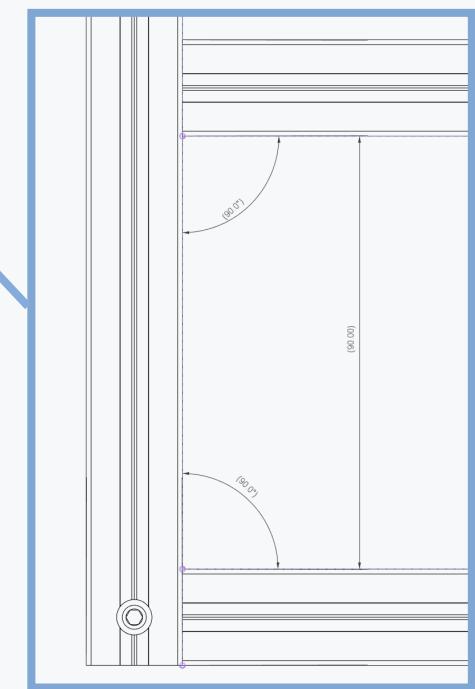
We do our best to call out things that may bite you later in the assembly process but may skip things that seem obvious to us. If in doubt please refer to the CAD model, it might save you some considerable time down the road.

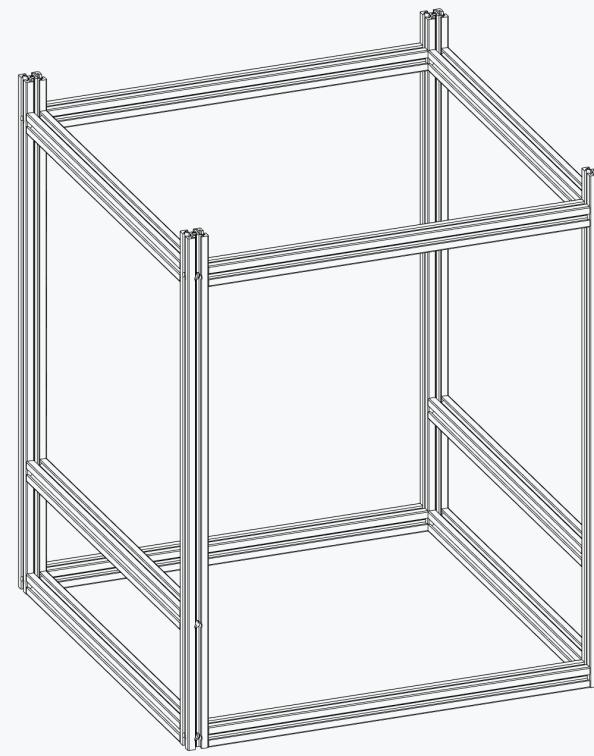


**ADJUST TO 90MM DISTANCE**

The extrusions that will later hold the Y-Rails are spaced 90mm from the top extrusions (110mm from the work surface).

Make sure that they sit flush with the vertical extrusions and aren't twisted/rotated. A small machinist square will help with this task.





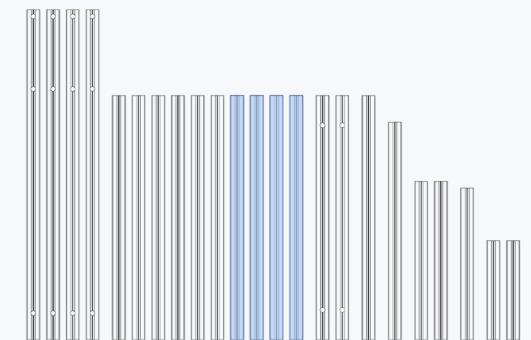
FINDING THE RIGHT POSITION

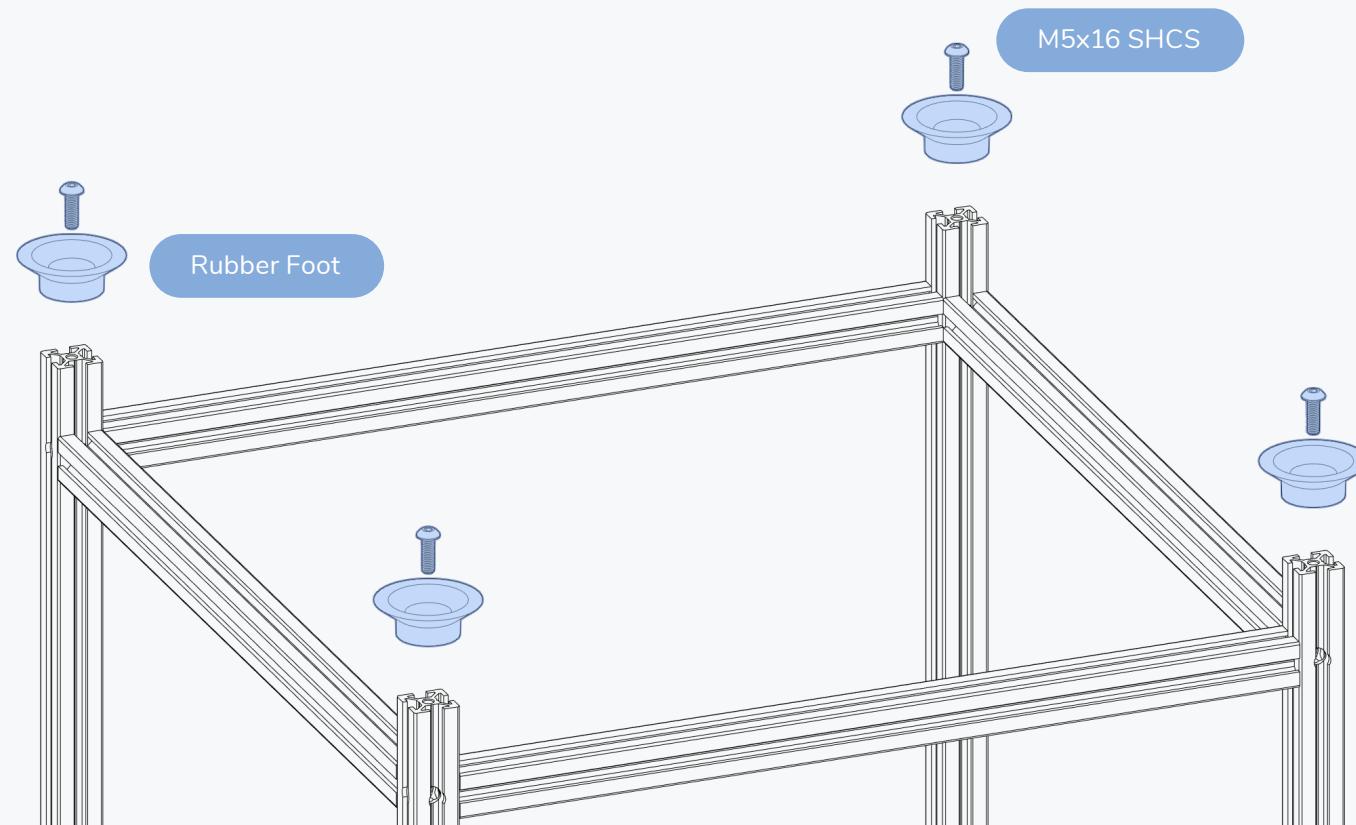
The bottom extrusions are spaced 320mm from the Y extrusions.

Use the linear rods of the Z drive as a guide. Make sure that you are able to slide them in from the side.

Make sure that the extrusions sit at an 90° angle and are free of any rotation/twist. The outsides of the extrusions should be flush.

The position of the front/back facing extrusion is not critical.

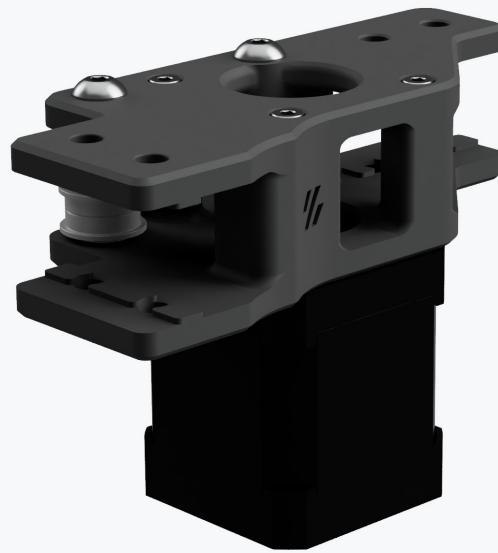


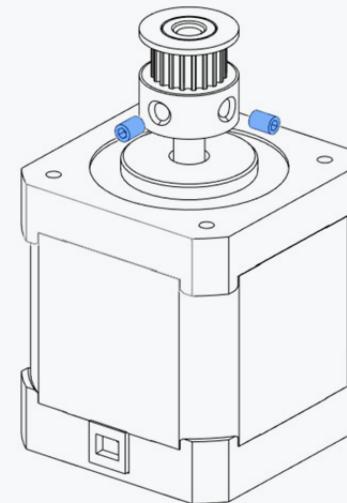
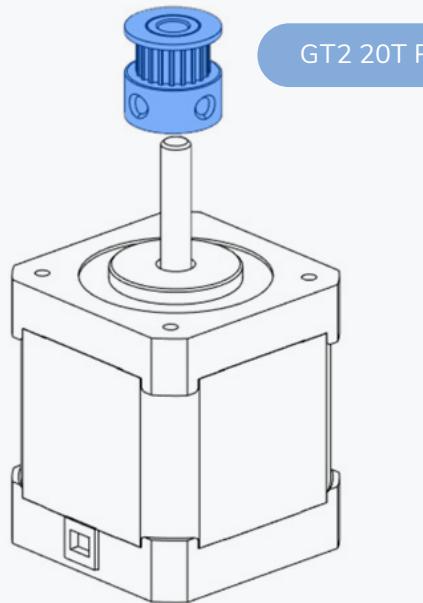
**FLIP RIGHT-SIDE UP**

This concludes the first section of the assembly. Time to put the printer on it's own feet.
Don't forget to take a photo of your success.

A/B DRIVE

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A/B DRIVE MOTORS

The picture shows the A Drive motor (left hand side of the printer). B Drive motor is assembled in the same fashion with the pulley orientation flipped.

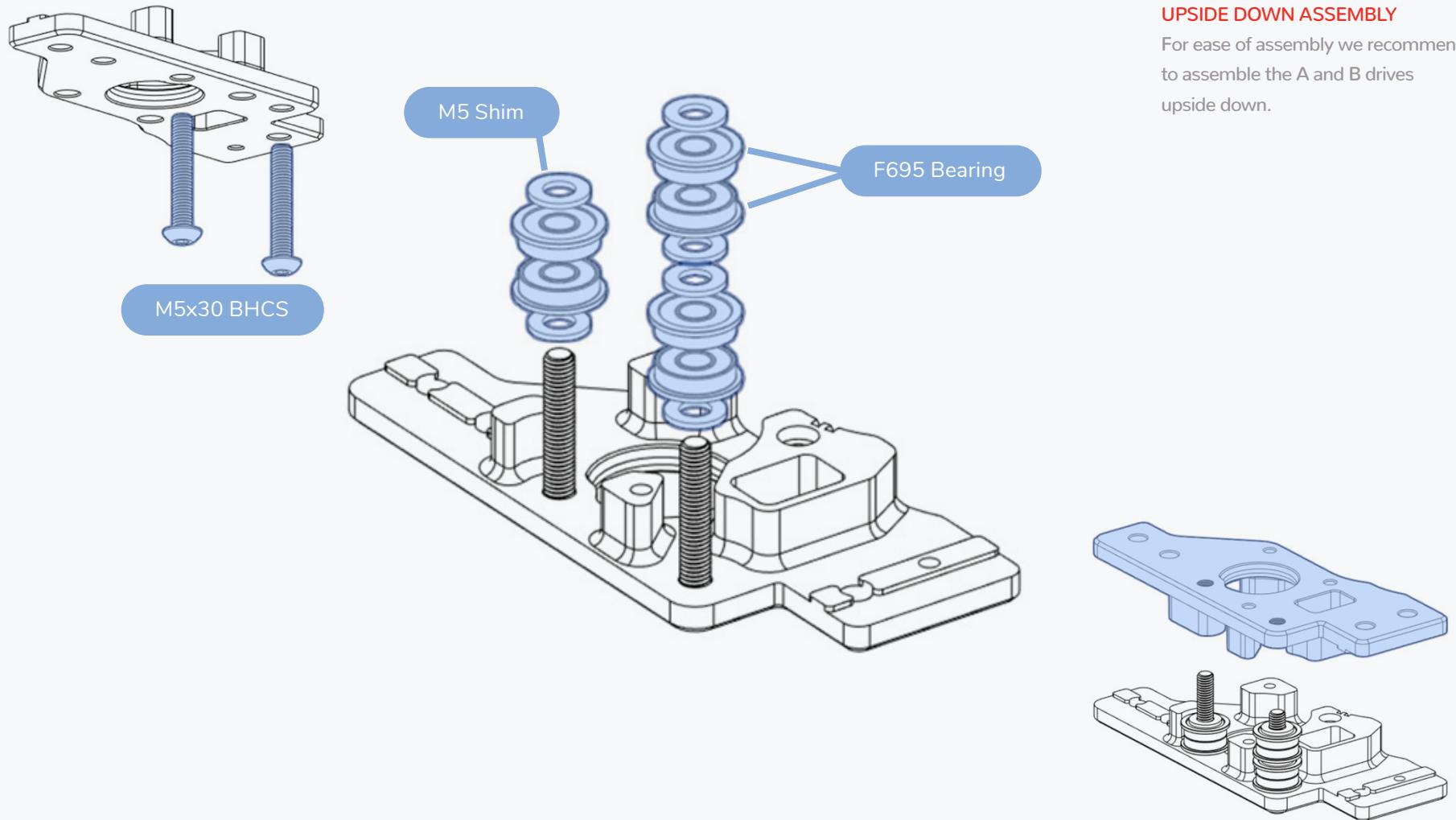
GRUB SCREWS

AKA THE ROOT OF ALL ISSUES

Use thread locker on all grub screws.

Loose grub screws account for the majority of issues that our users report. Save yourself hours of troubleshooting and apply thread locker to all grub screws during the build.

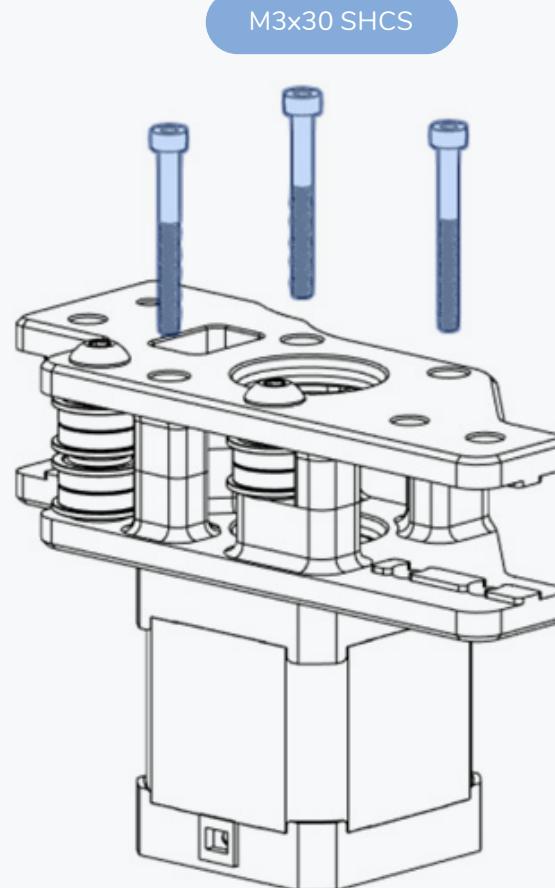
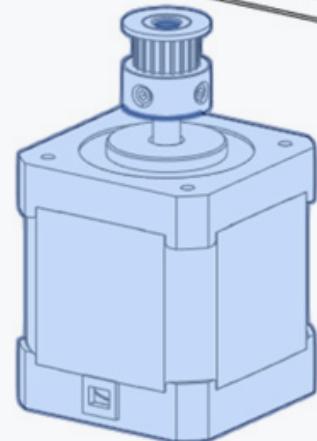
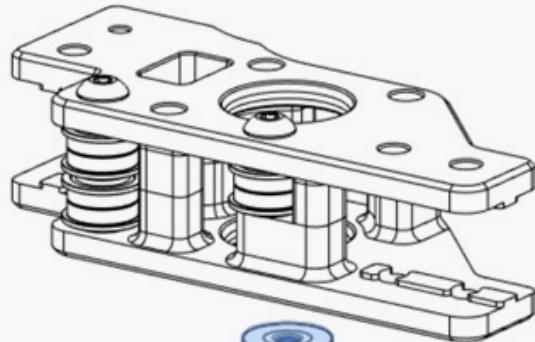
See the products application notes for instructions.

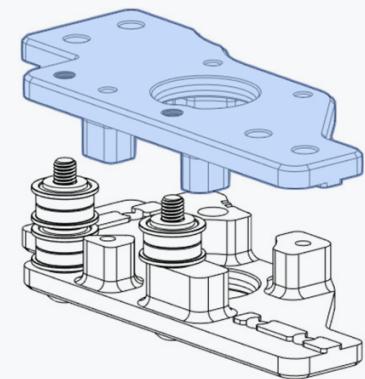
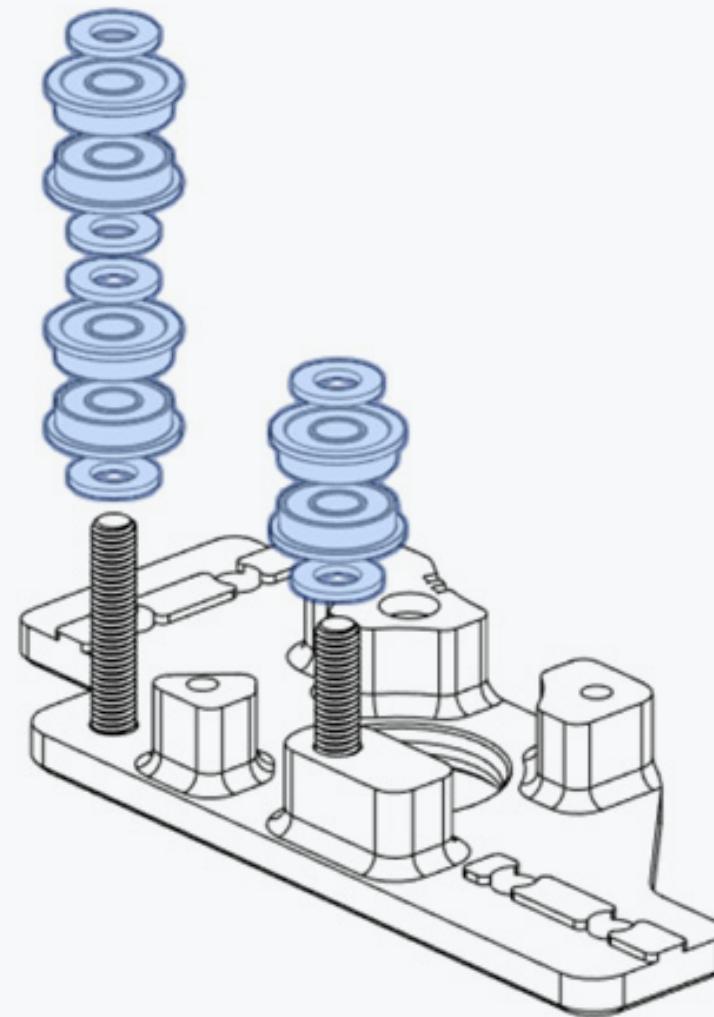
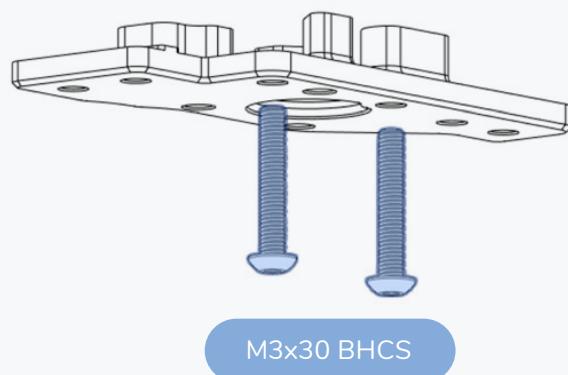
**UPSIDE DOWN ASSEMBLY**

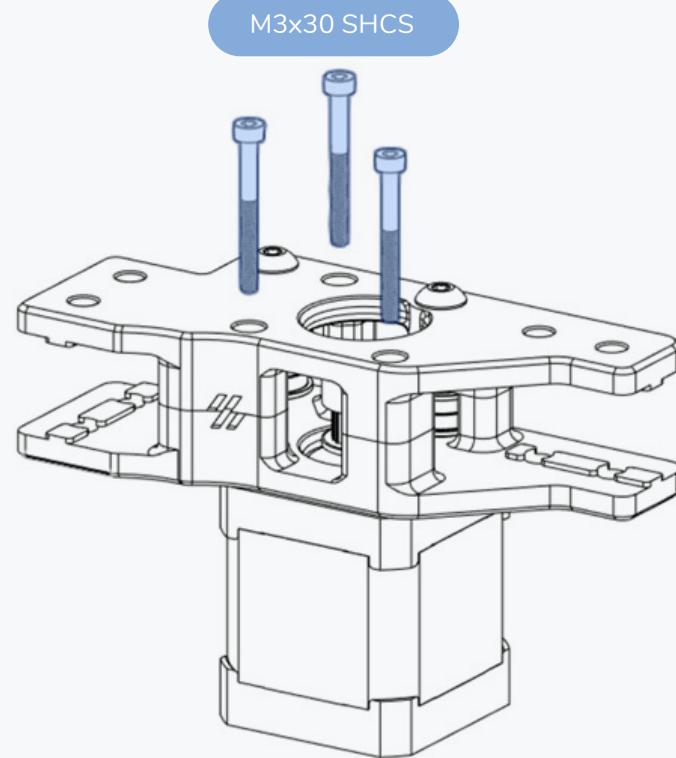
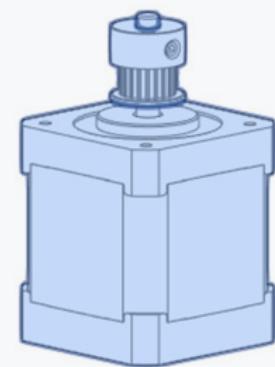
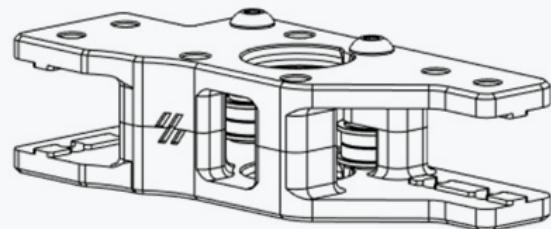
For ease of assembly we recommend to assemble the A and B drives upside down.

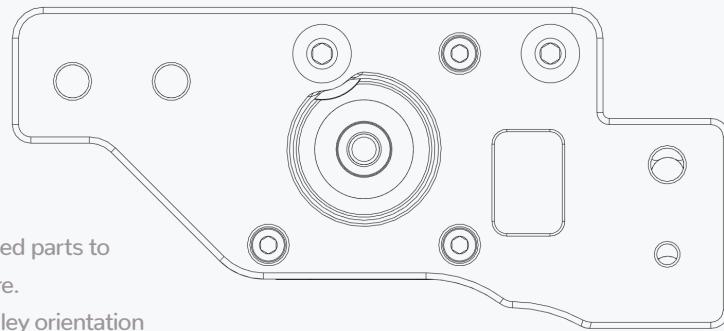
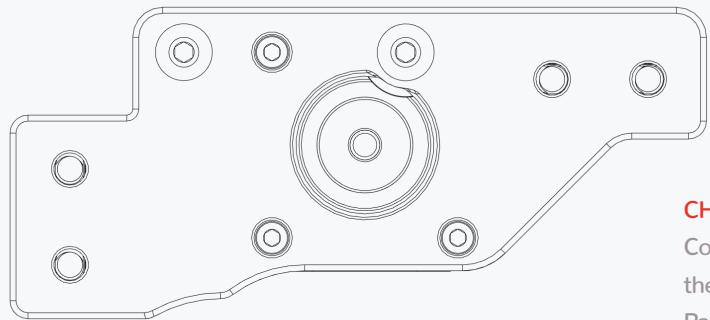
FLIPPED RIGHT SIDE UP

Turn the part over



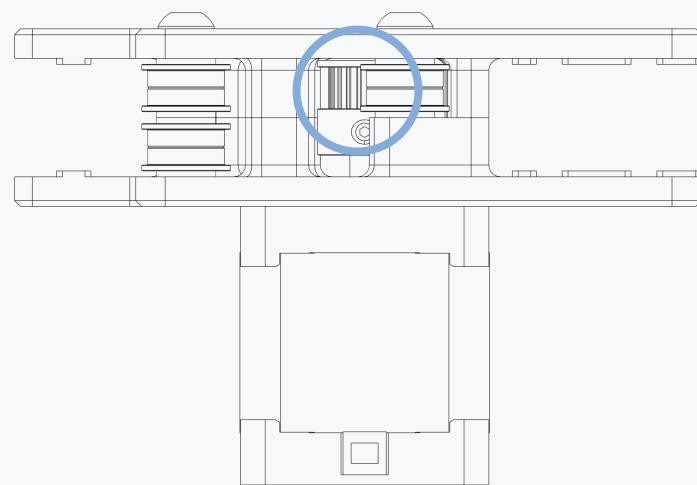
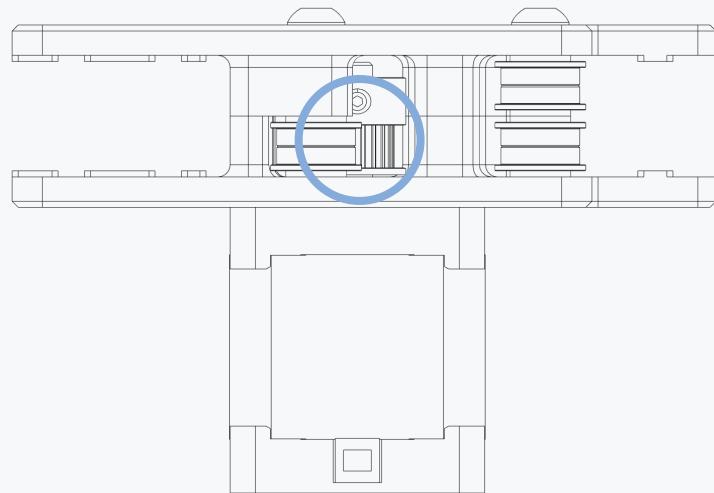




**CHECK YOUR WORK**

Compare your assembled parts to
the graphics shown here.

Pay attention to the pulley orientation
and alignment with the bearing stack
ups.

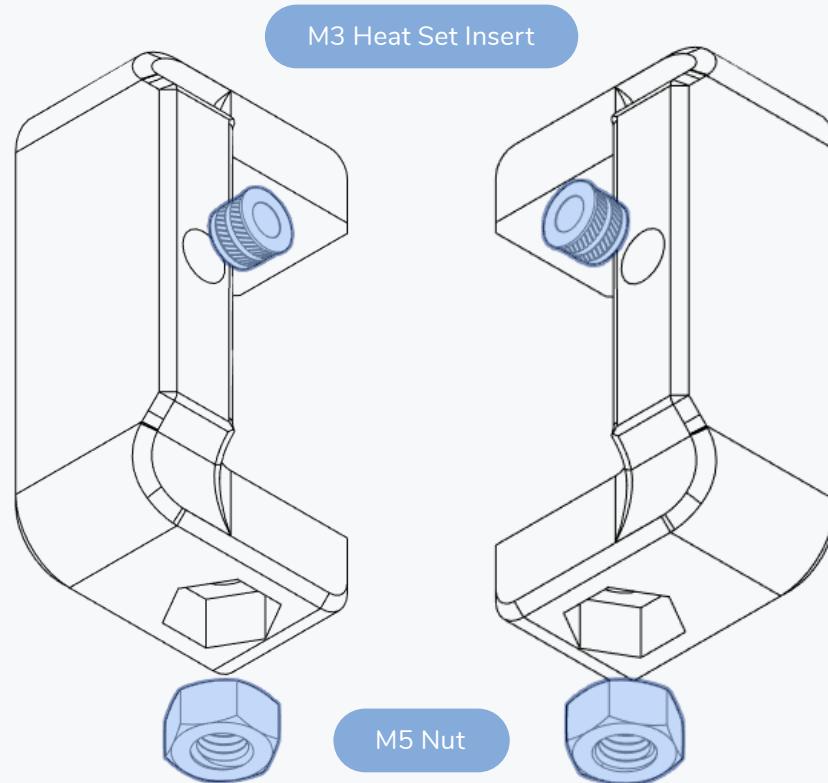


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FRONT IDLERS

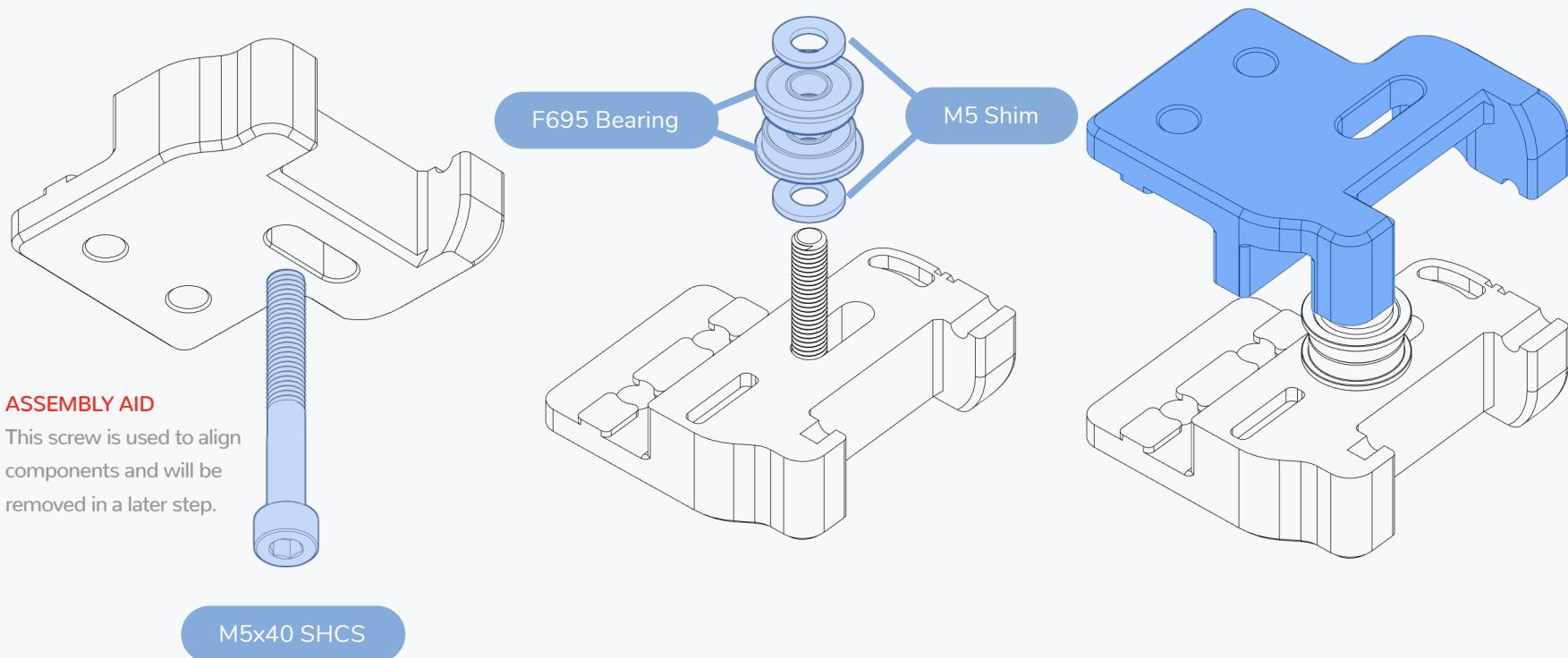
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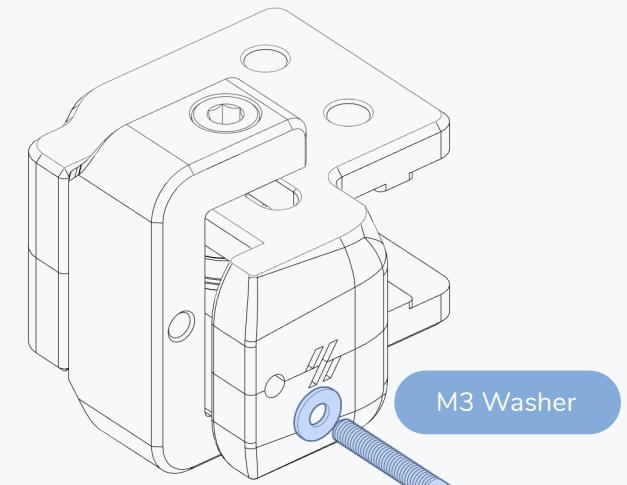
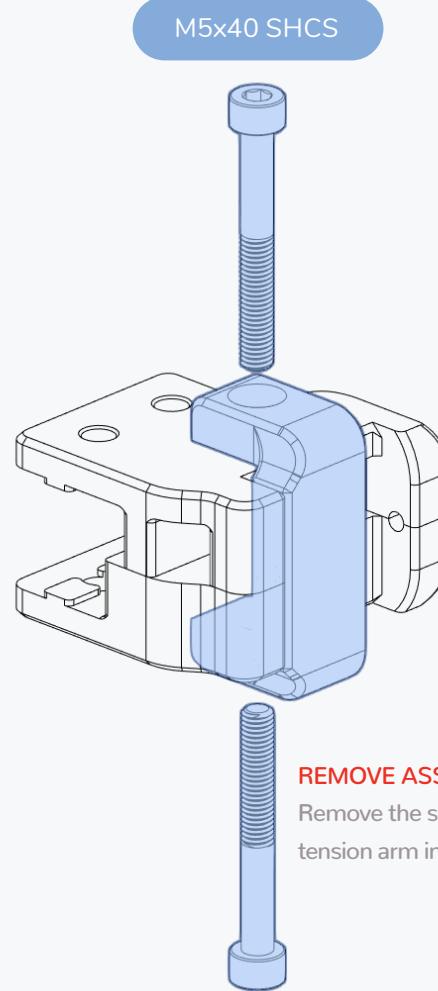
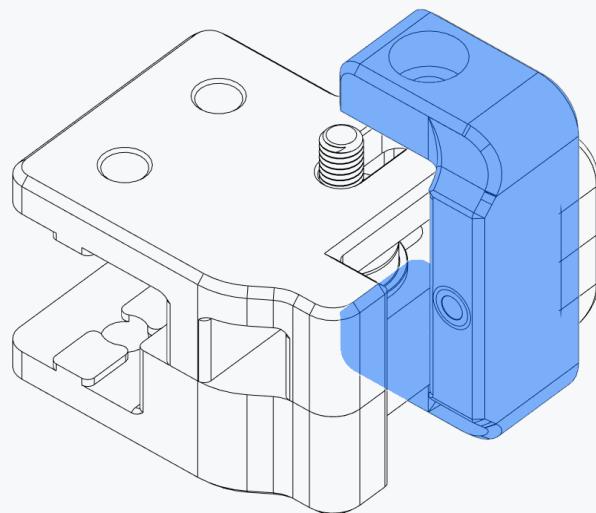




HEAT SET INSERTS

You will need to install heat set inserts into the tension arms. If you need help on the correct procedure, ask in Discord.

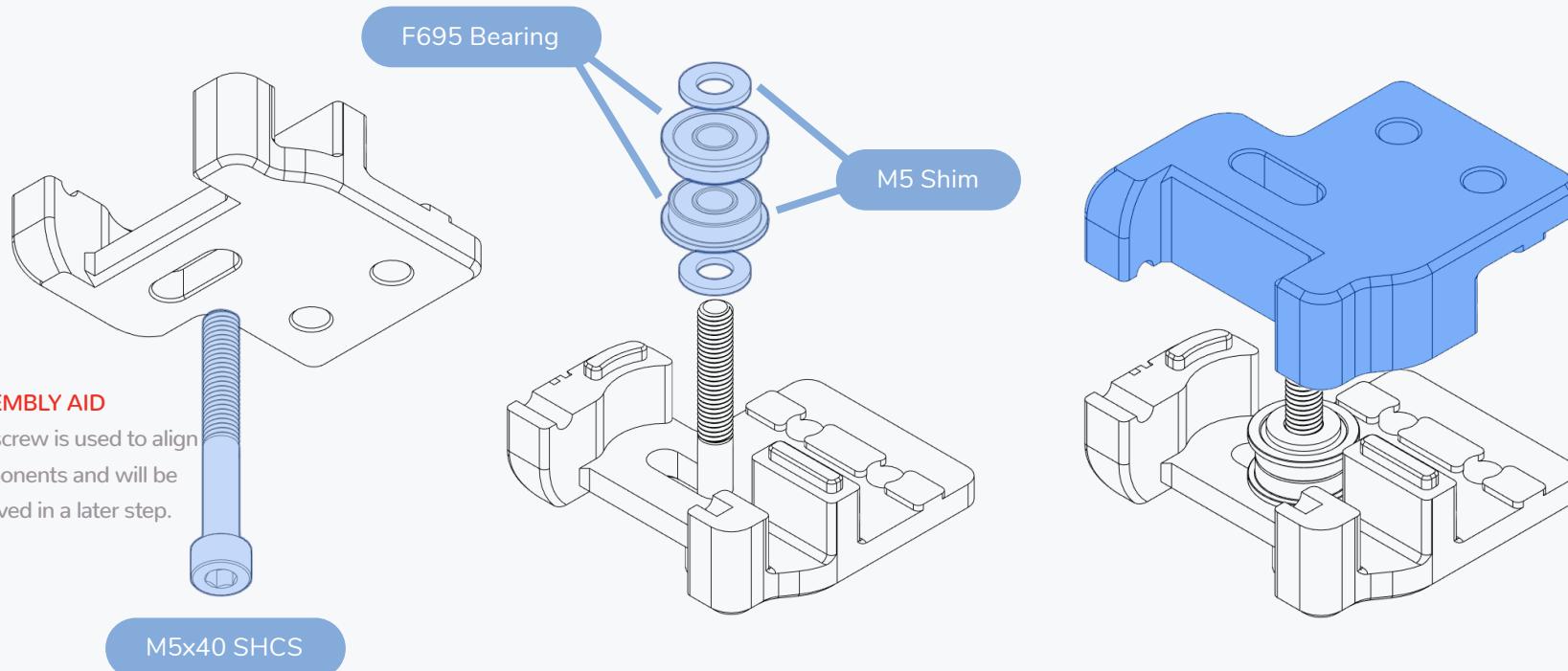


**REMOVE ASSEMBLY AID**

Remove the screw and slide the tension arm into place.

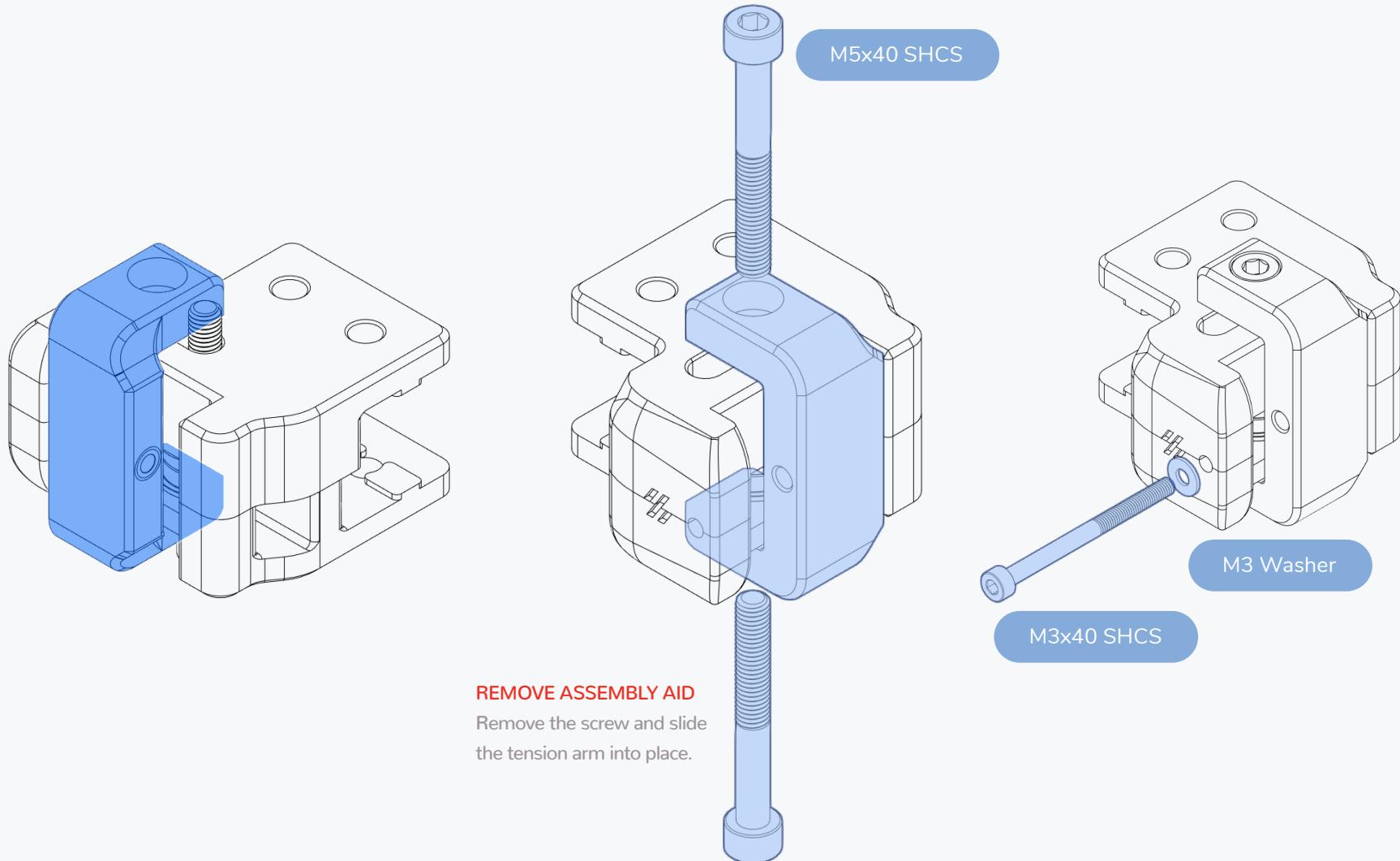
M3x40 SHCS

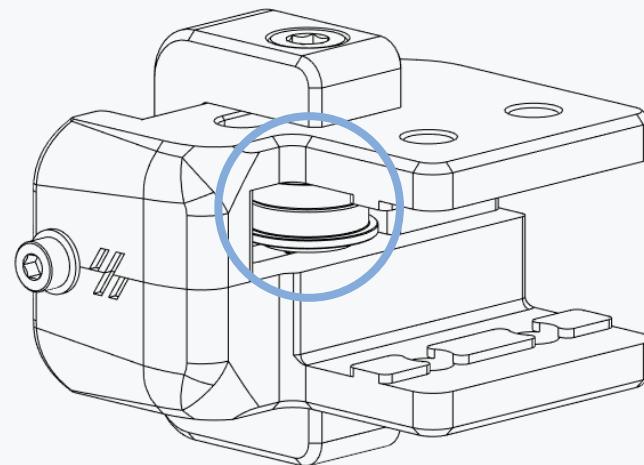
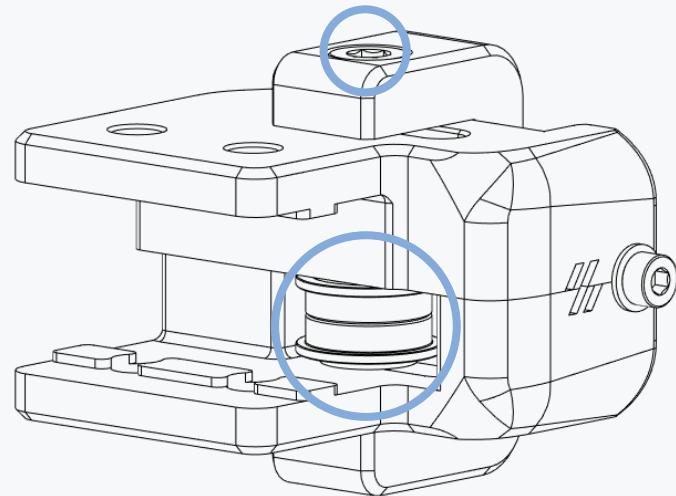
M3 Washer



B IDLER

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CHECK YOUR WORK

Compare your assembled parts to
the graphics shown here.

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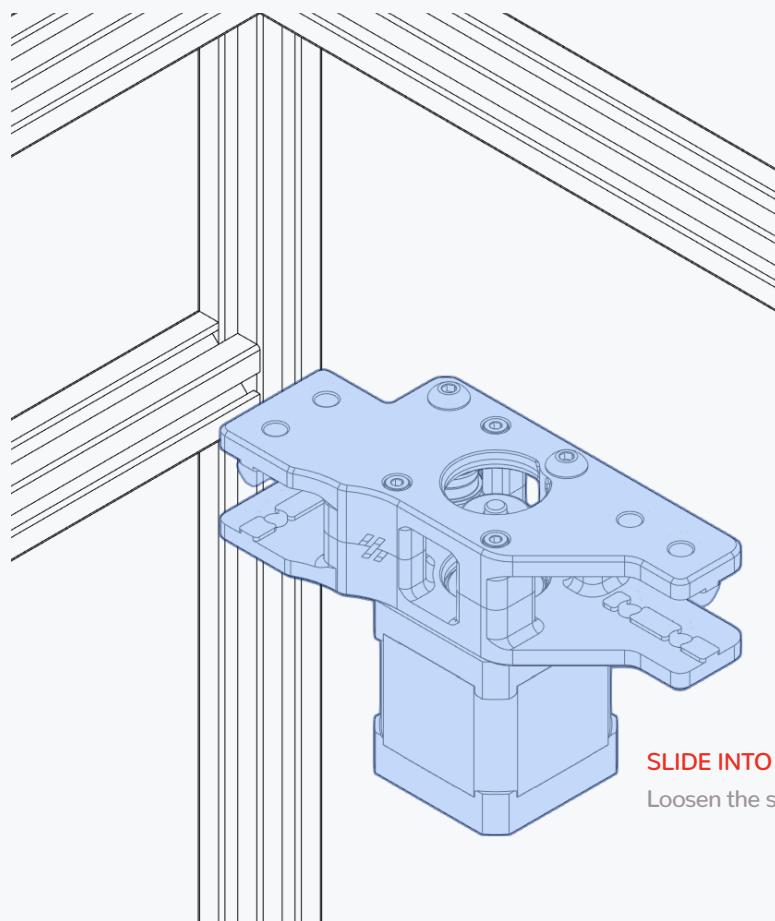
GRANTY

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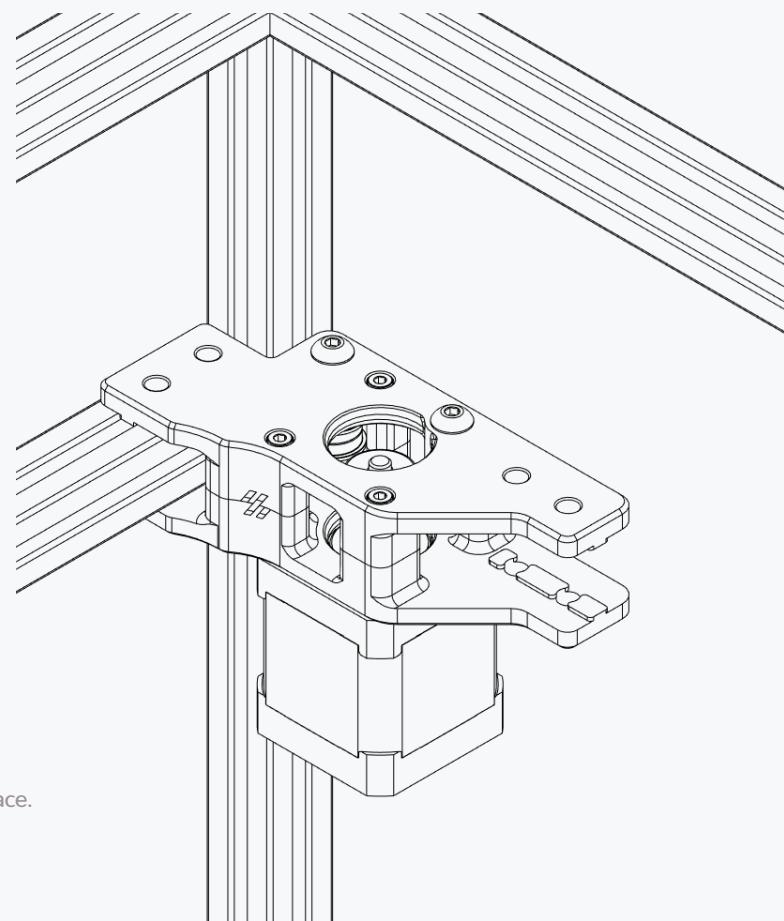
B MOTOR MOUNTING

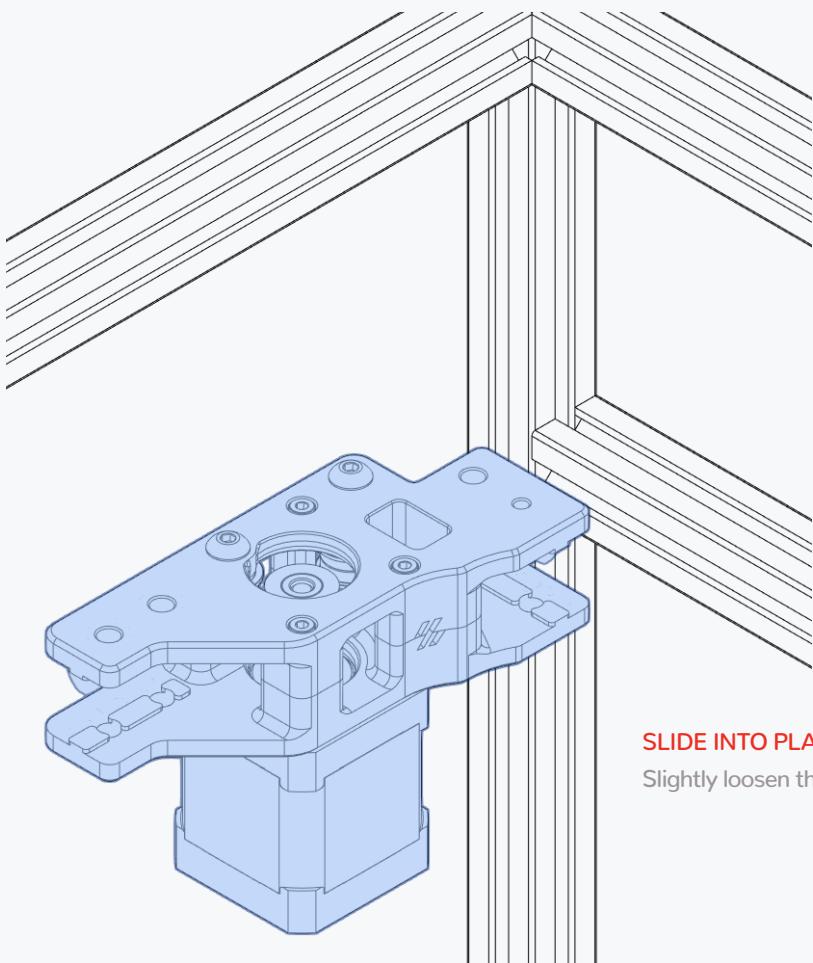
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SLIDE INTO PLACE

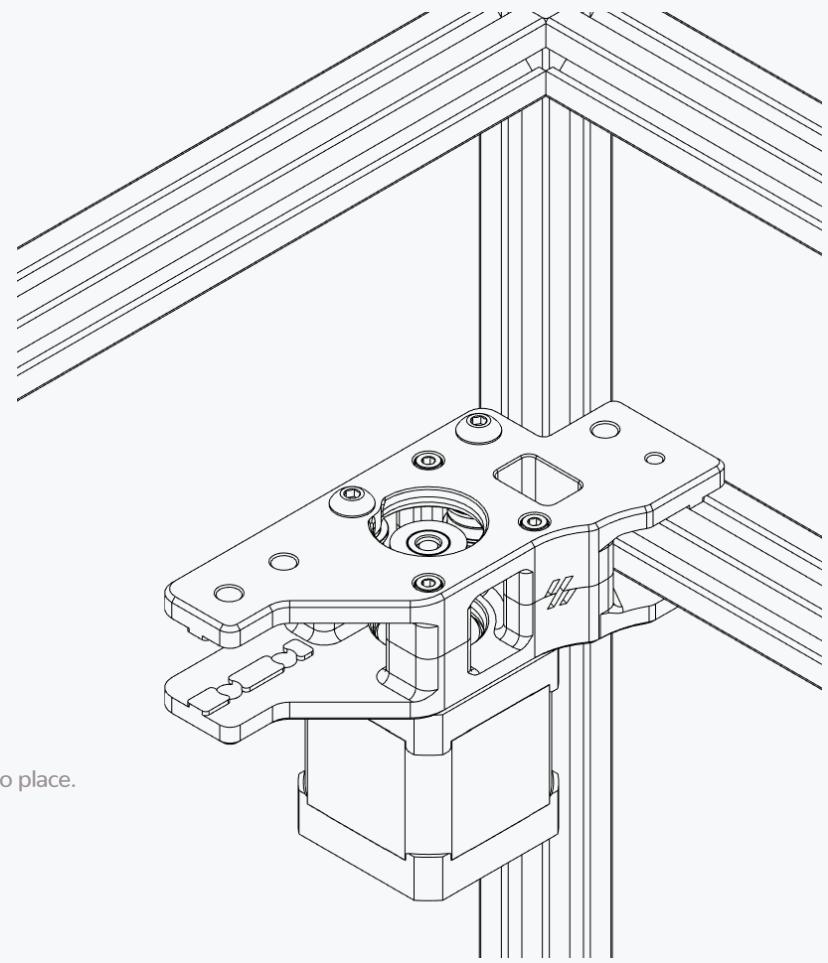
Loosen the screws and slide into place.





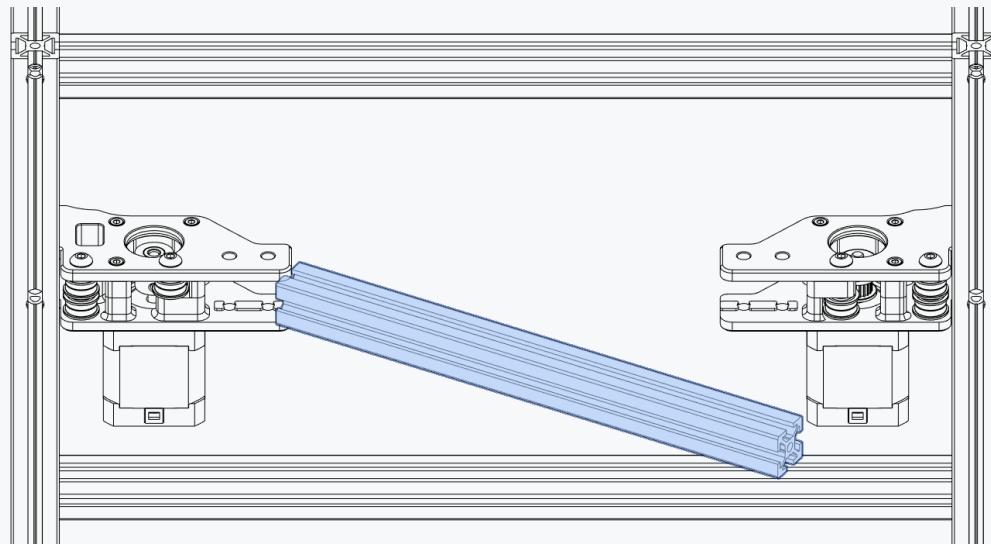
SLIDE INTO PLACE

Slightly loosen the M5 screw and slide into place.



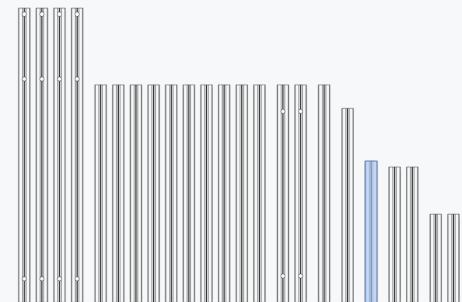
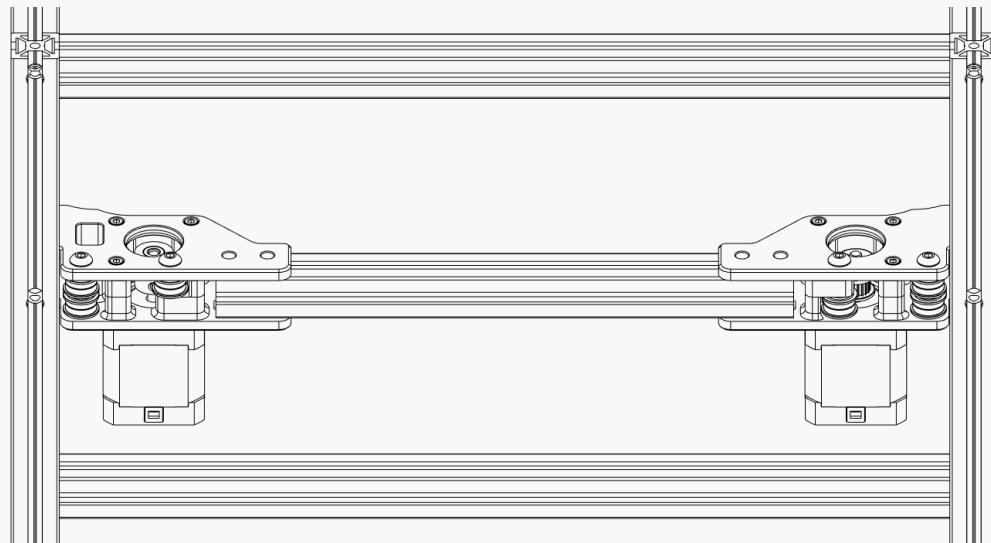
REAR CROSSBAR

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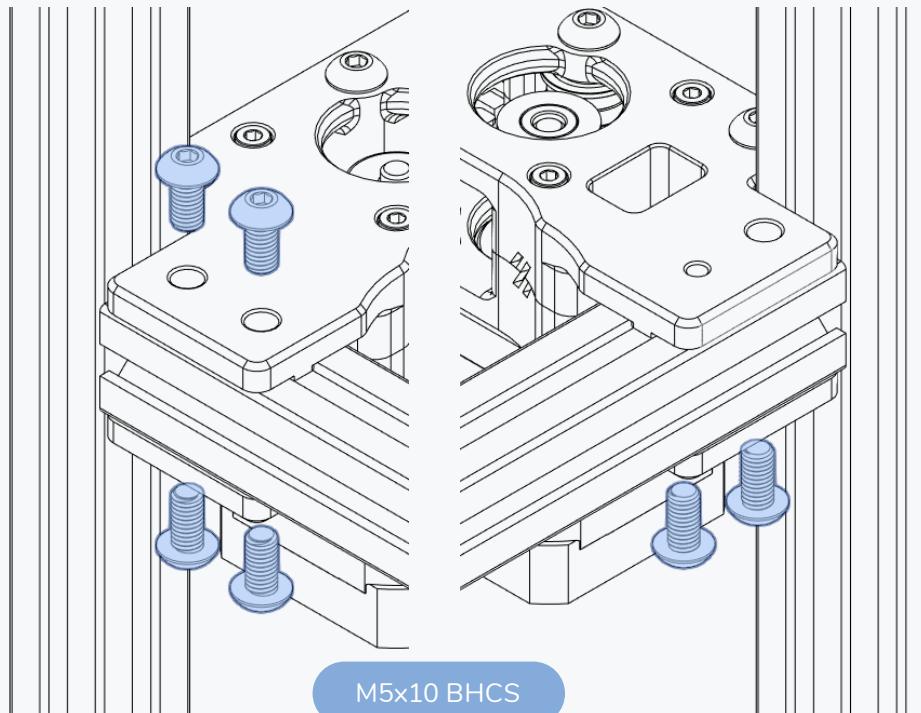
SLIDE INTO PLACE

The rear crossbar can be slid into place. You may need to loosen the M5 screws.

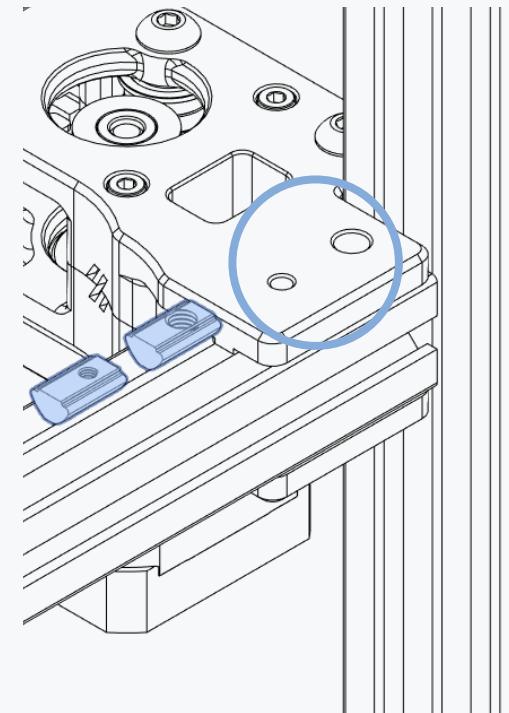


REAR CROSSBAR & A/B DRIVE MOUNTING

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M5x10 BHCS



PRELOAD T NUTS

You won't be able to access this spot after the rails are installed. Preinstall and align 1 M5 T Nut and 1 M3 T Nut now.

M5 T-Nut

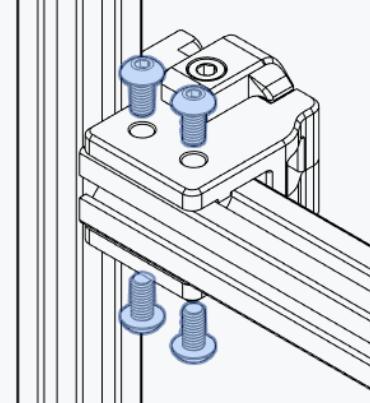
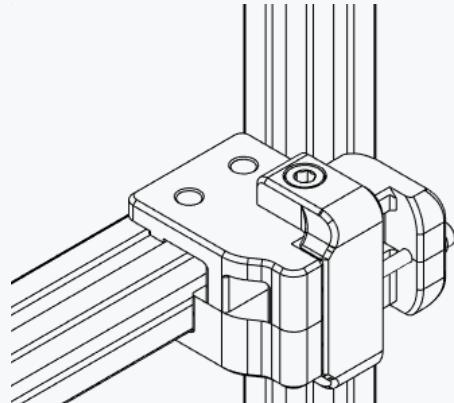
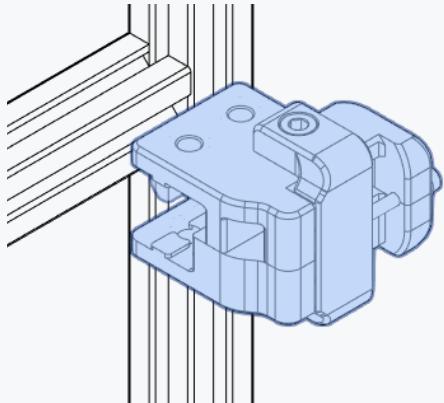
M3 T-Nut



M5x10 BHCS

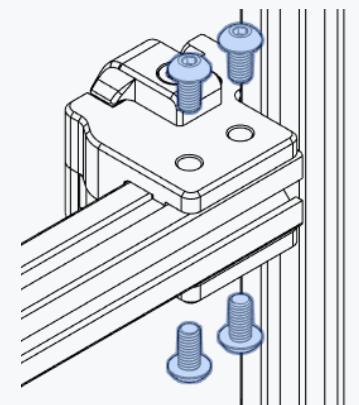
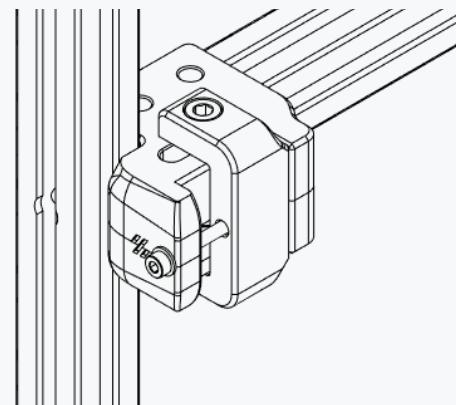
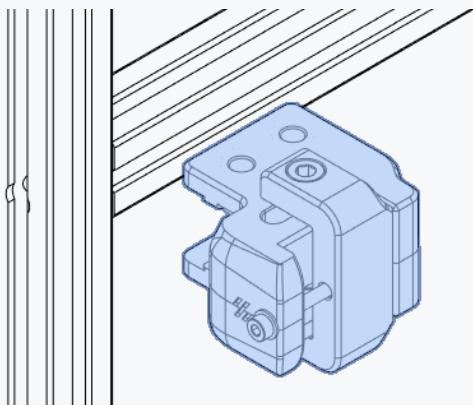
FRONT IDLER MOUNTING

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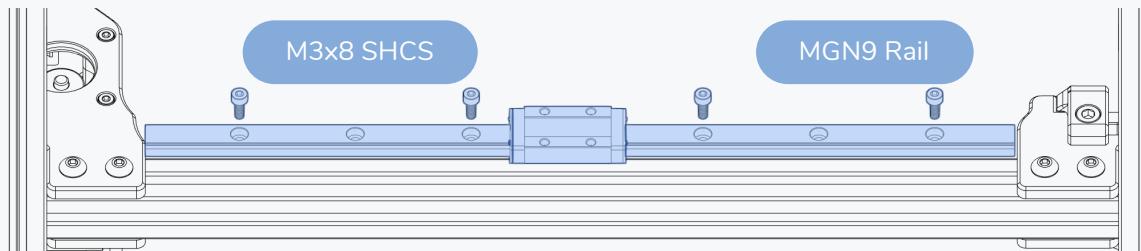


SLIDE INTO PLACE

Slightly loosen the M5 screw and slide into place.

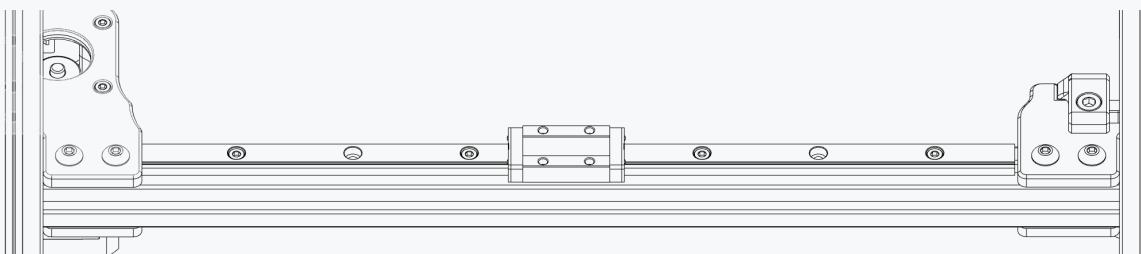


M5x10 BHCS

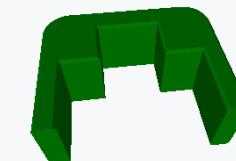
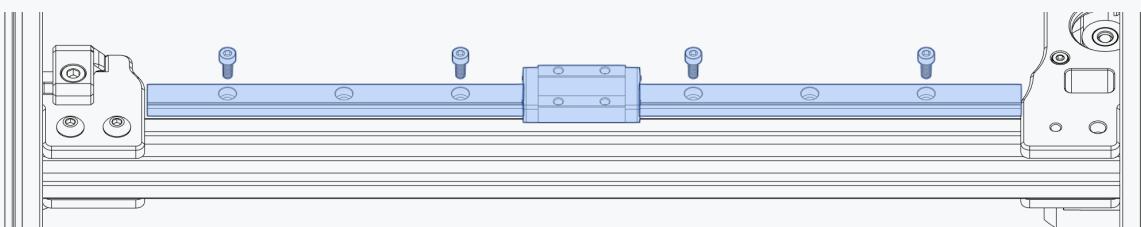
**MIND THE CARRIAGE**

The carriages are designed to slide along the rail easily. This unfortunately also includes sliding off the rails.

Dropping the carriage likely irreparably damages it.

**USE A BALL END DRIVER**

The top extrusion will block access for a regular straight driver.

**CENTERED RAIL INSTALLATION GUIDE**

Use the guides to position the rail in the center of the extrusion prior to fastening the screws.

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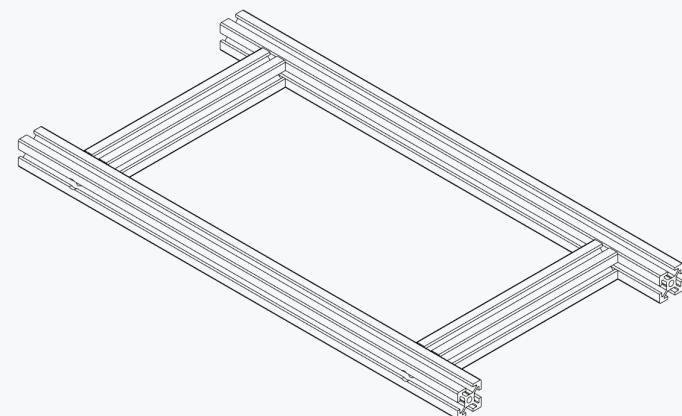
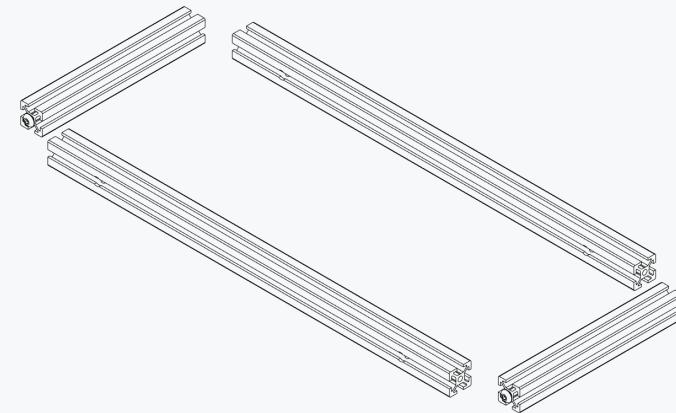
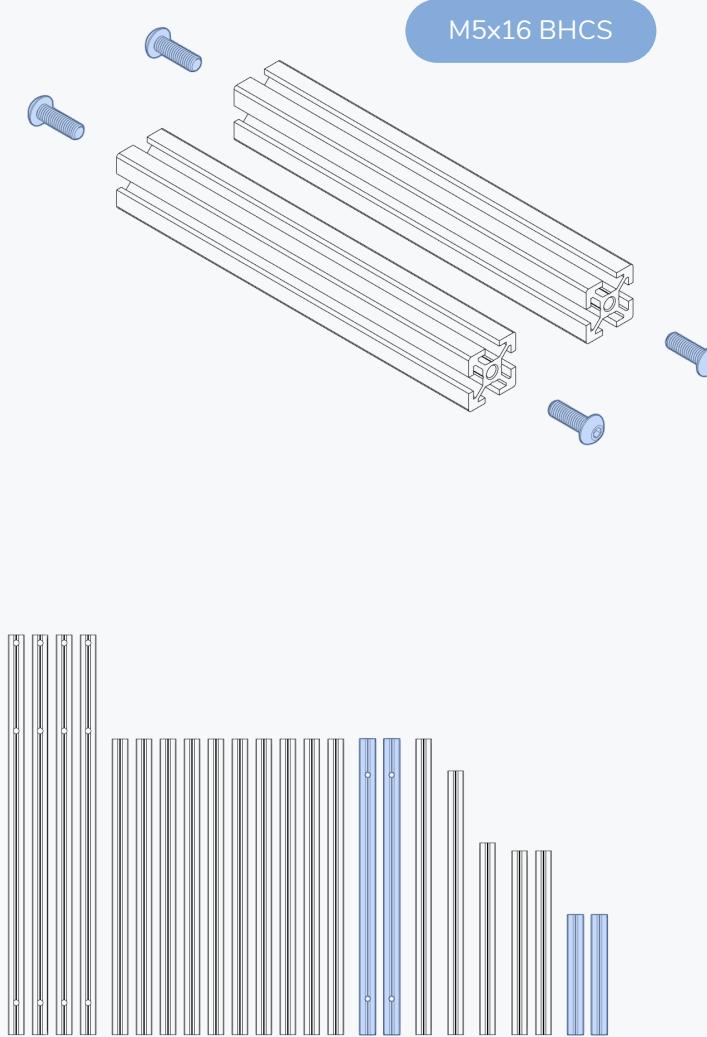
BED FRAME

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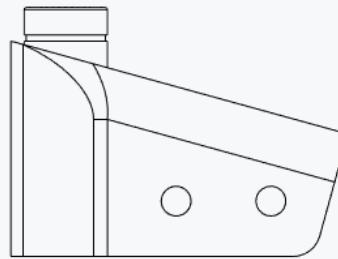
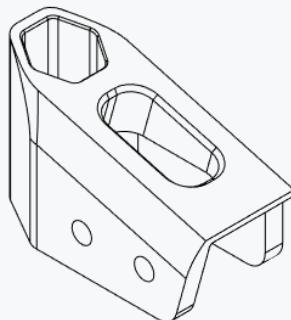
BED FRAME

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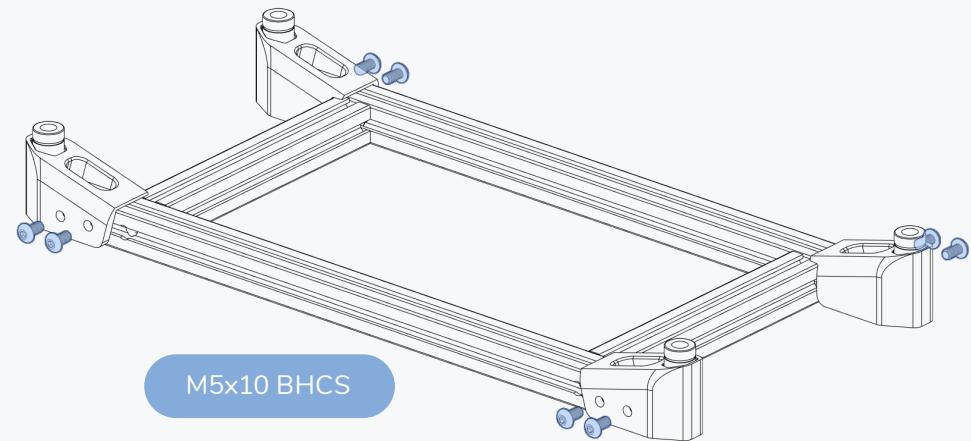
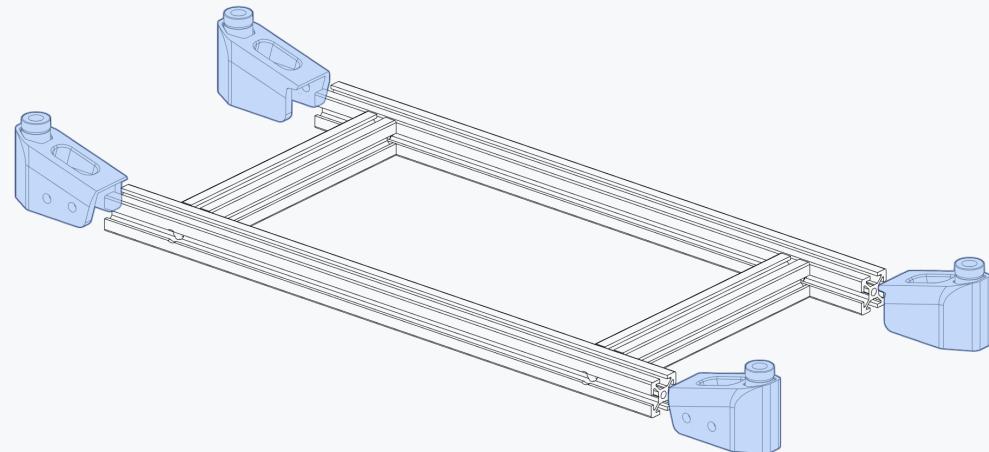
LM8LUU Bearing

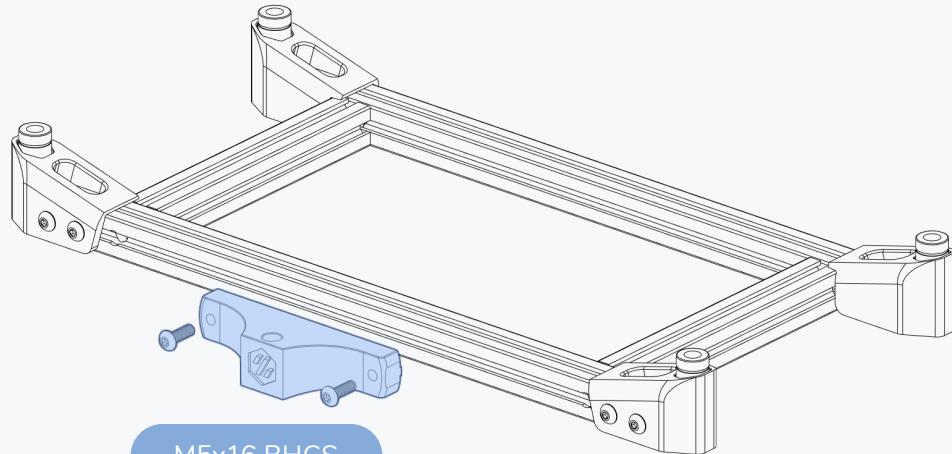
**BEARING LUBRICATION**

Bearings are usually shipped in a rust prevention oil . Clean and properly lubricate prior to installation.

FLUSH WITH BOTTOM

Insert the bearing all the way until it sits flush with the bottom of the part.

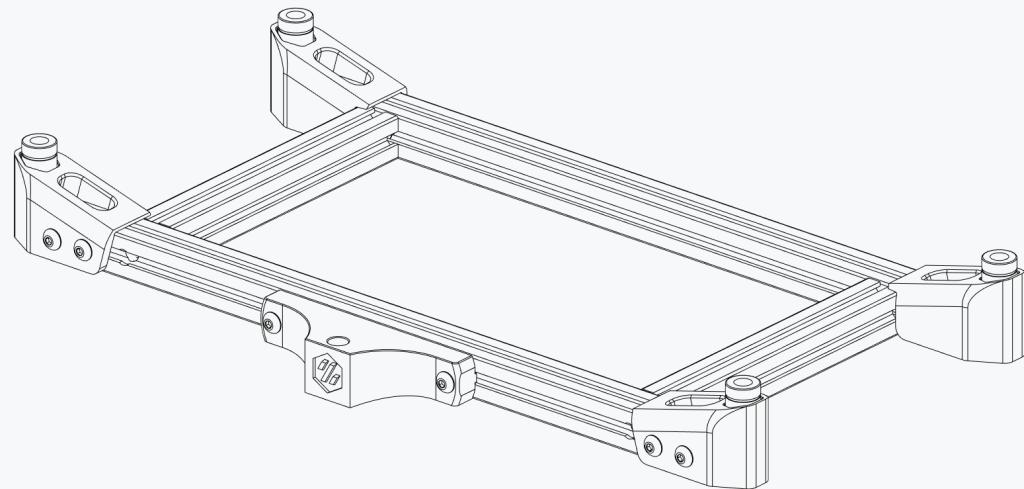




M5x16 BHCS

CHECK YOUR WORK

Compare your assembled parts to
the graphics shown here.



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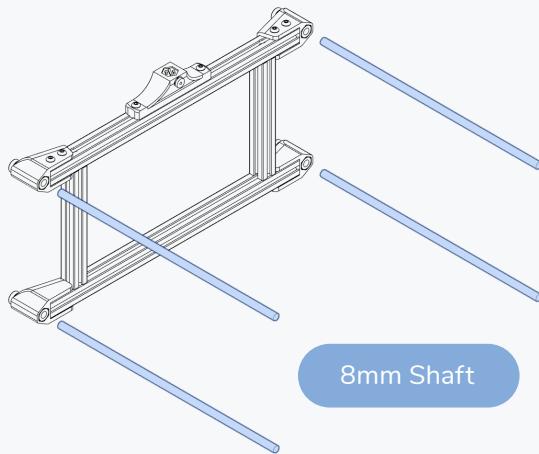
Z AXIS

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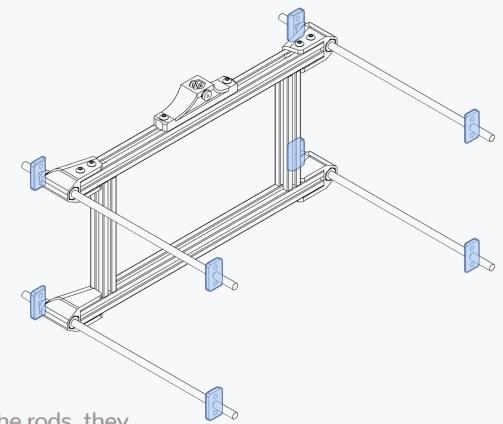
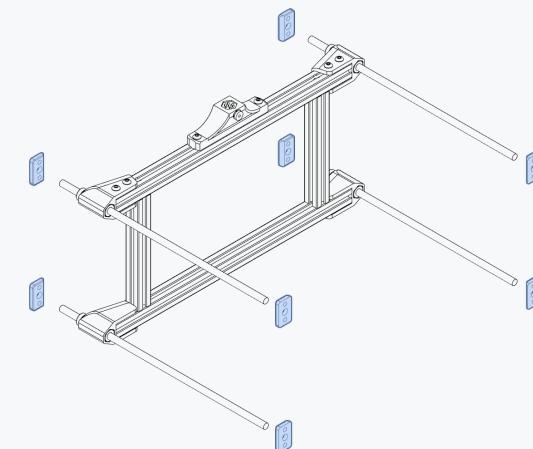
Z AXIS RODS

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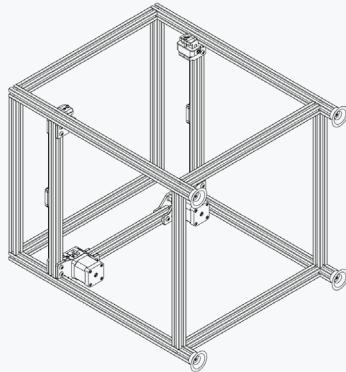
APPLY LUBRICATION

A thin layer of lubrication will prevent rust.

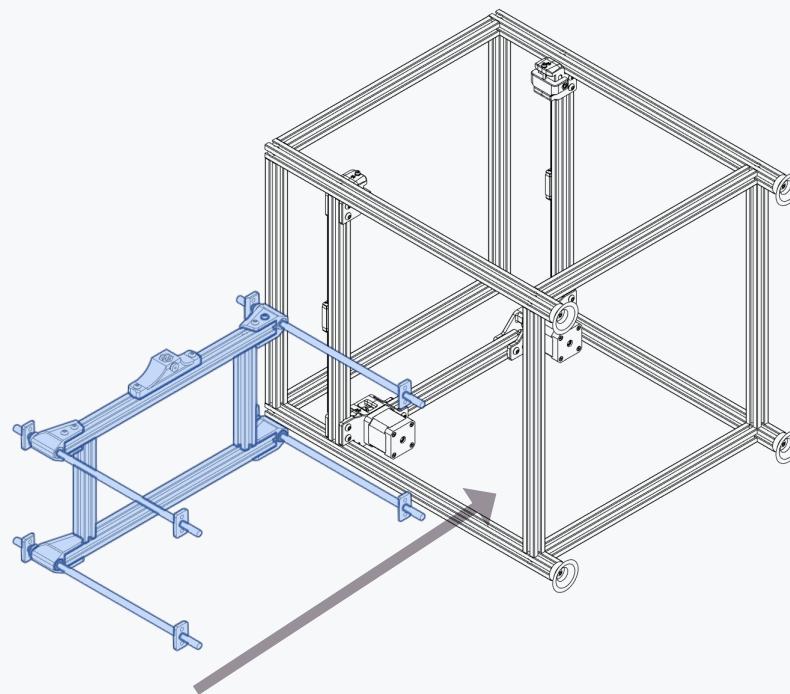


IMPROVISED STOPS

Push the brackets onto the rods, they will prevent the rods from slipping out.

**FLIP PRINTER BACKWARDS**

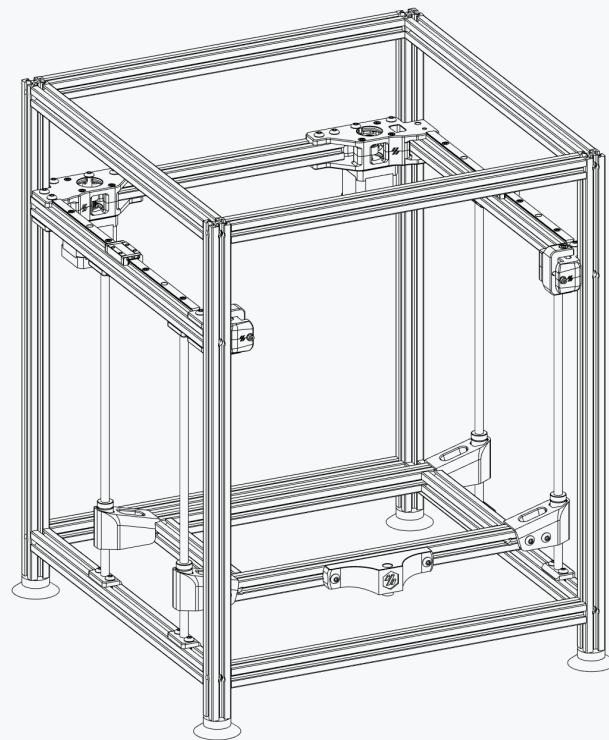
Flip the printer on it's back if you're having trouble installing the Z stage installed

**INSERT FROM THE SIDE**

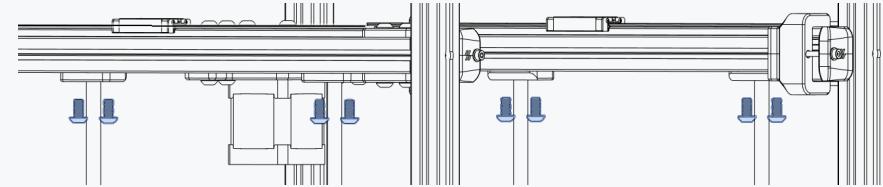
Insert the Z stage at an angle to position all rods close to their final place.

If required loosen the bottom extrusion.

Do not loosen the middle or top extrusions.



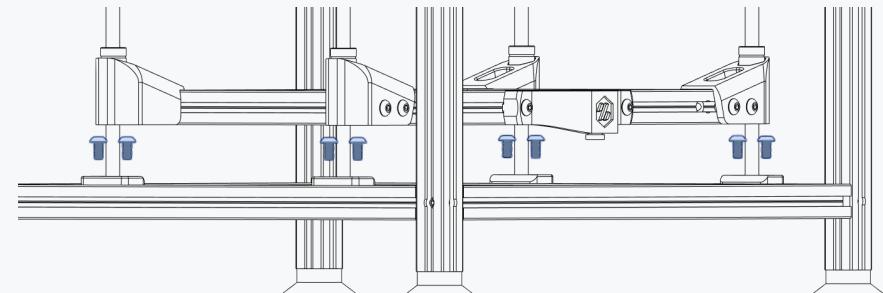
FLIP PRINTER UPRIGHT

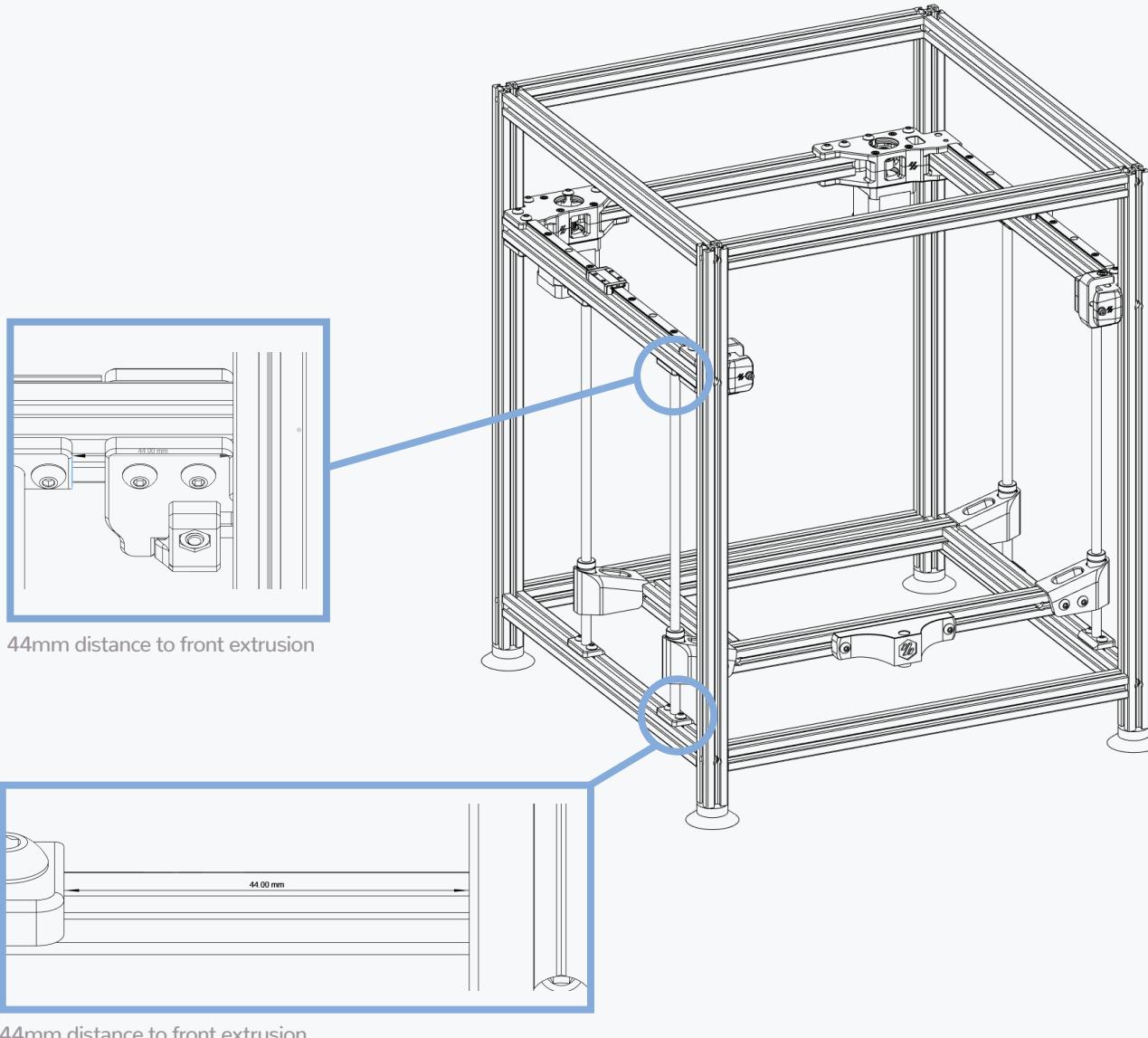


M5x10 BHCS

DON'T TIGHTEN

Leave the screws slightly loose
for the next step.





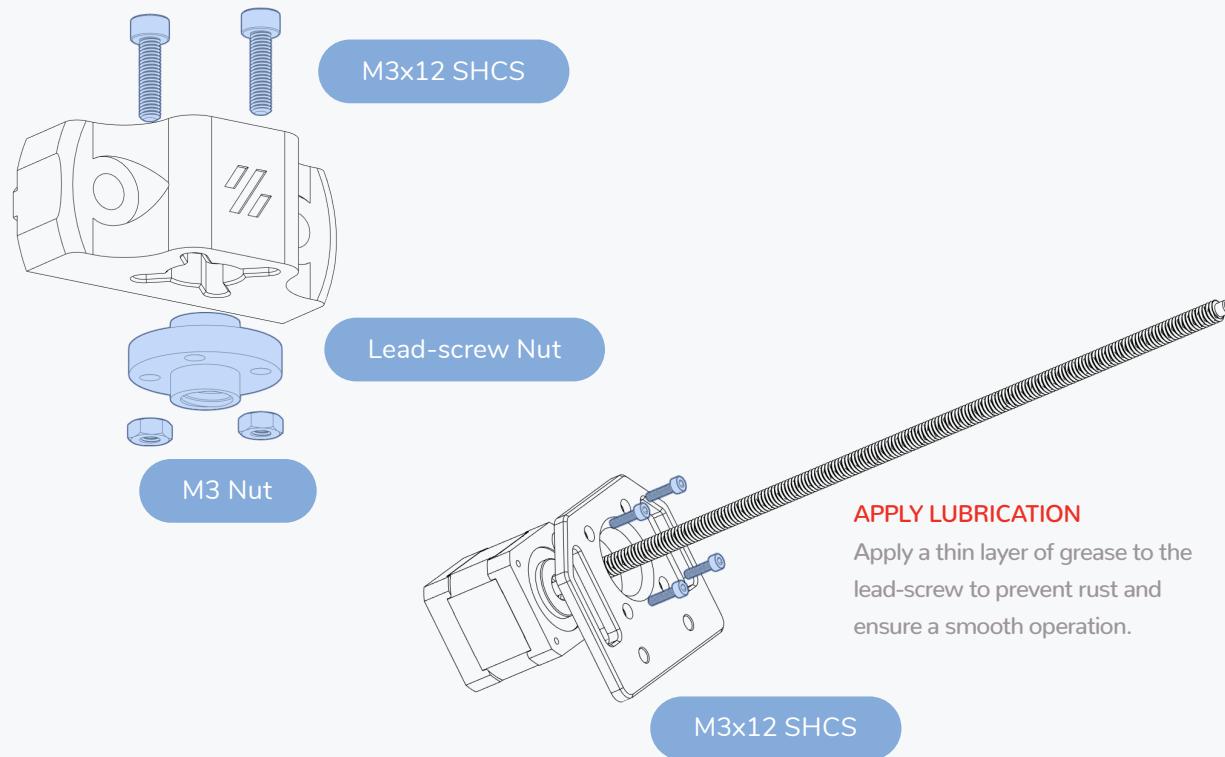
ALIGNING THE Z RODS

Position the plastic brackets as shown on the left (44mm from the front extrusion) and fasten the screws for that rod.

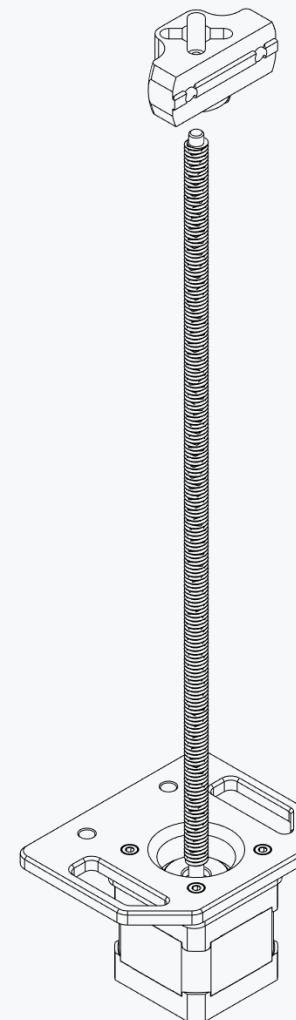
Repeat for the front right rod.

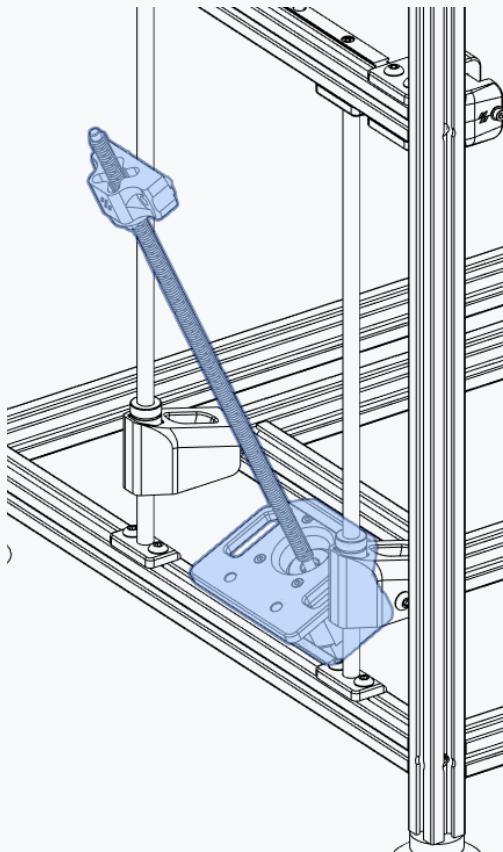
Move the bed carrier up and down to bring the other rods into position. Fasten their screws.

Tweak the position of the rods until the axis moves freely without any binding.

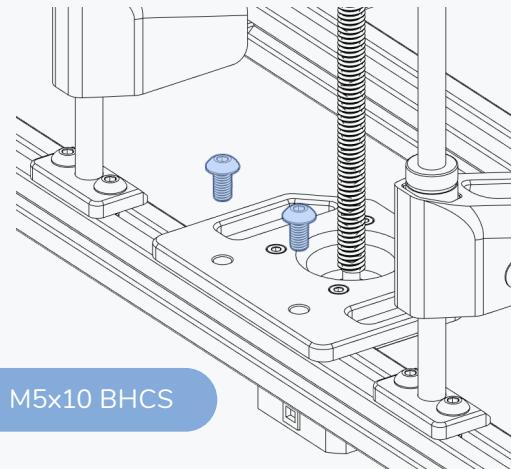
**APPLY LUBRICATION**

Apply a thin layer of grease to the lead-screw to prevent rust and ensure a smooth operation.



**SWING INTO PLACE**

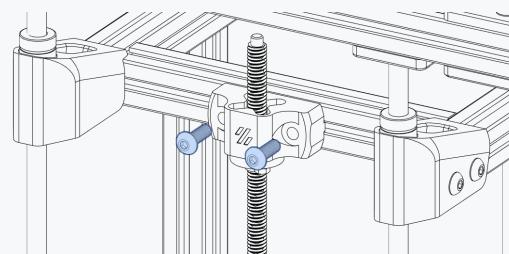
Insert one of the Z motors on an angle and secure it to the extrusions.



M5x10 BHCS

LEAD-SCREW BLOCK

Lift the bed carrier and fasten the lead-screw block to it.



M5x16 BHCS

REPEAT FOR SECOND MOTOR

Repeat the install steps for the second Z motor.

ALIGNMENT

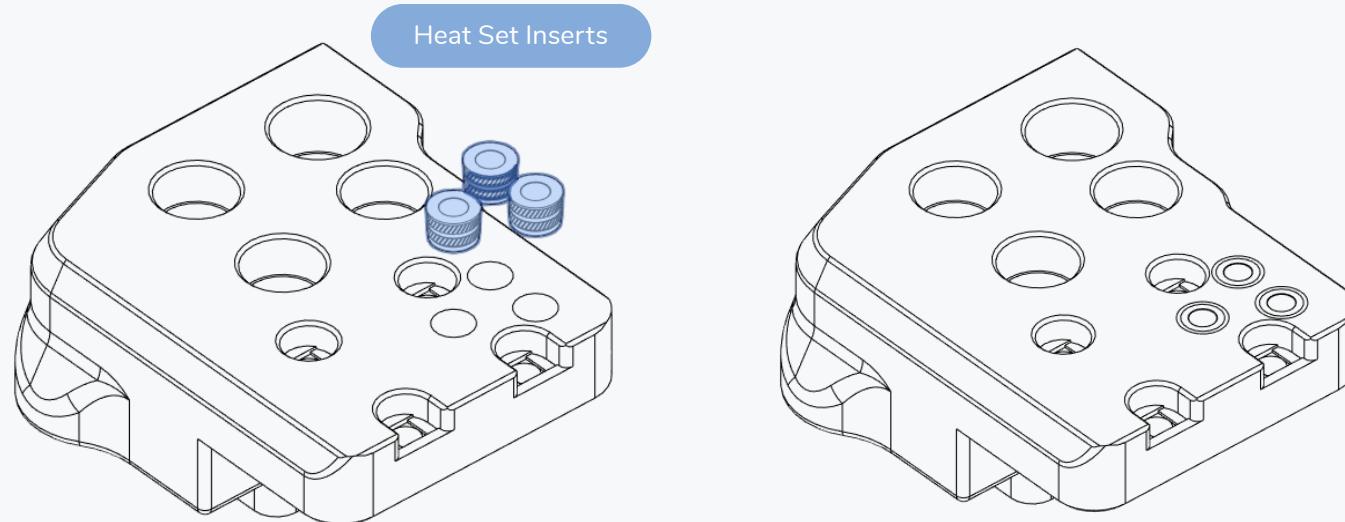
Position the lead-screw block in the center of the extrusion. Adjust the position of the motor mount until the lead-screw is perpendicular.

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X AXIS

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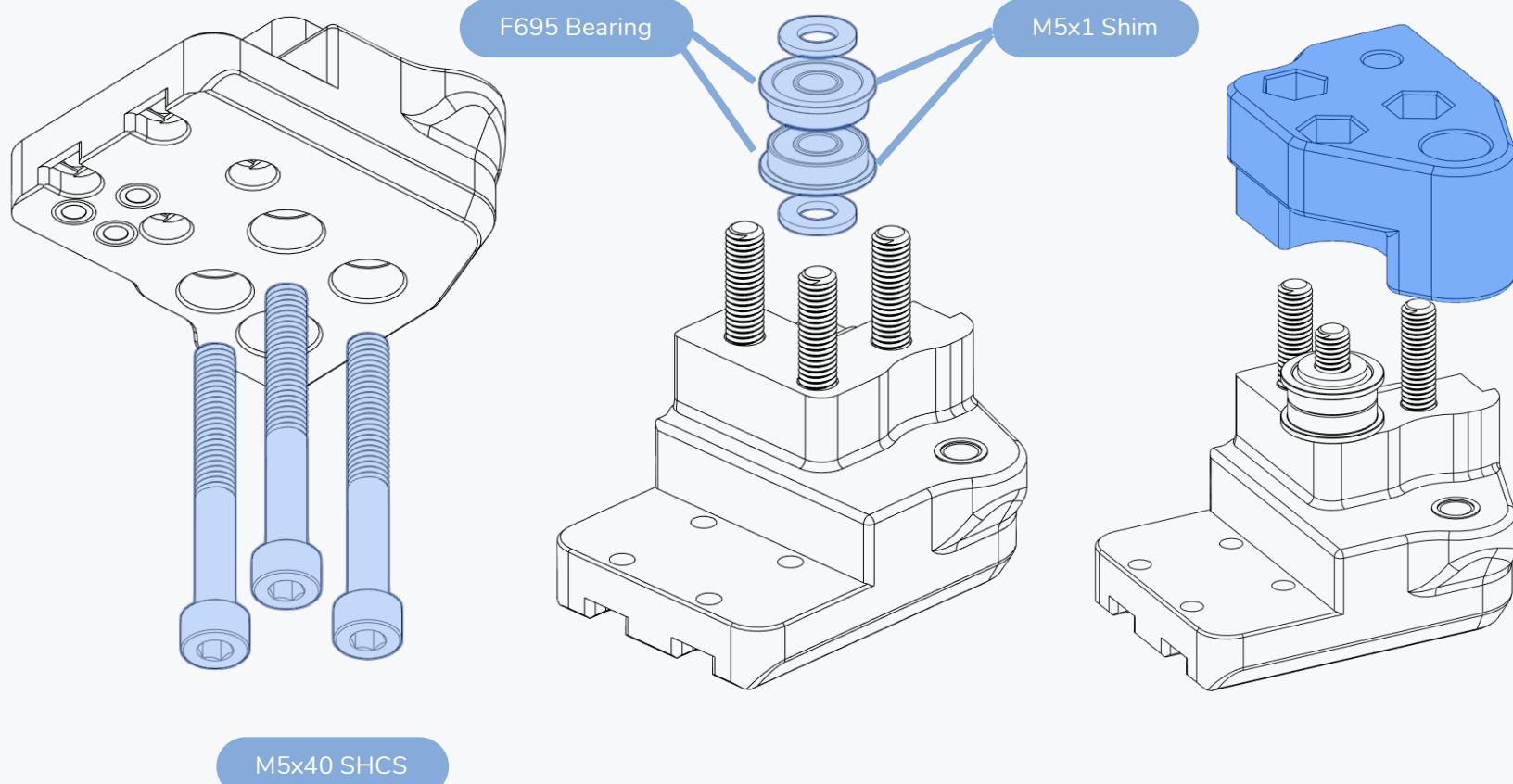


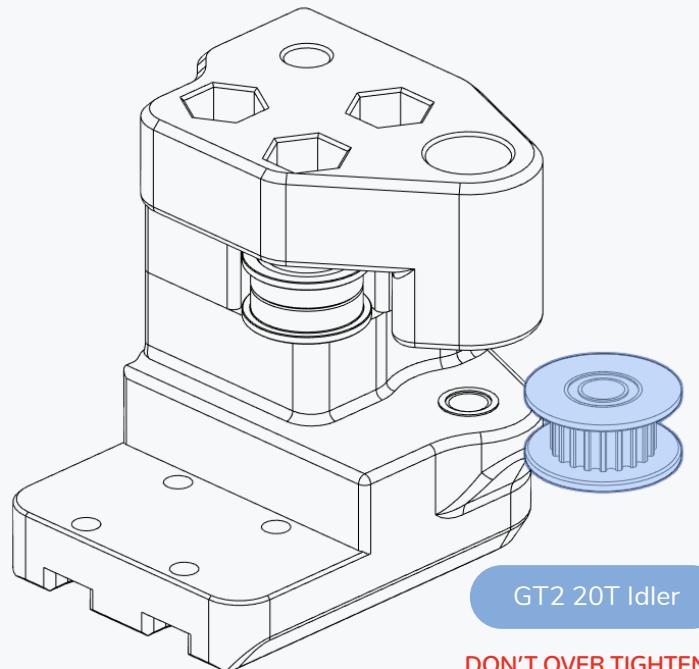


HEAT SET INSERTS

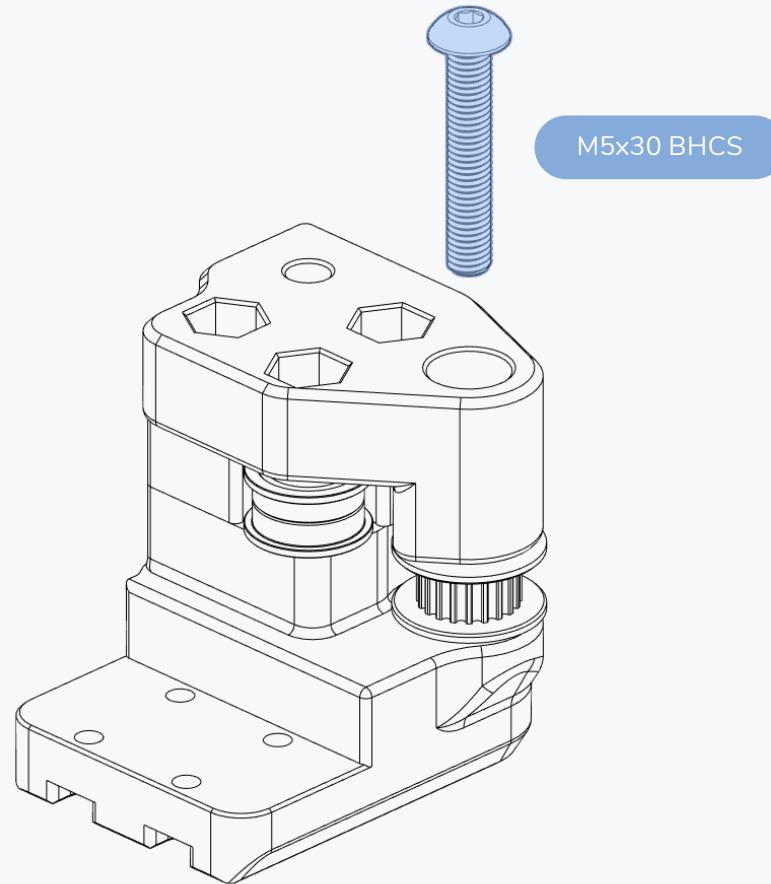
You will need to install heat set inserts into the XY joint.

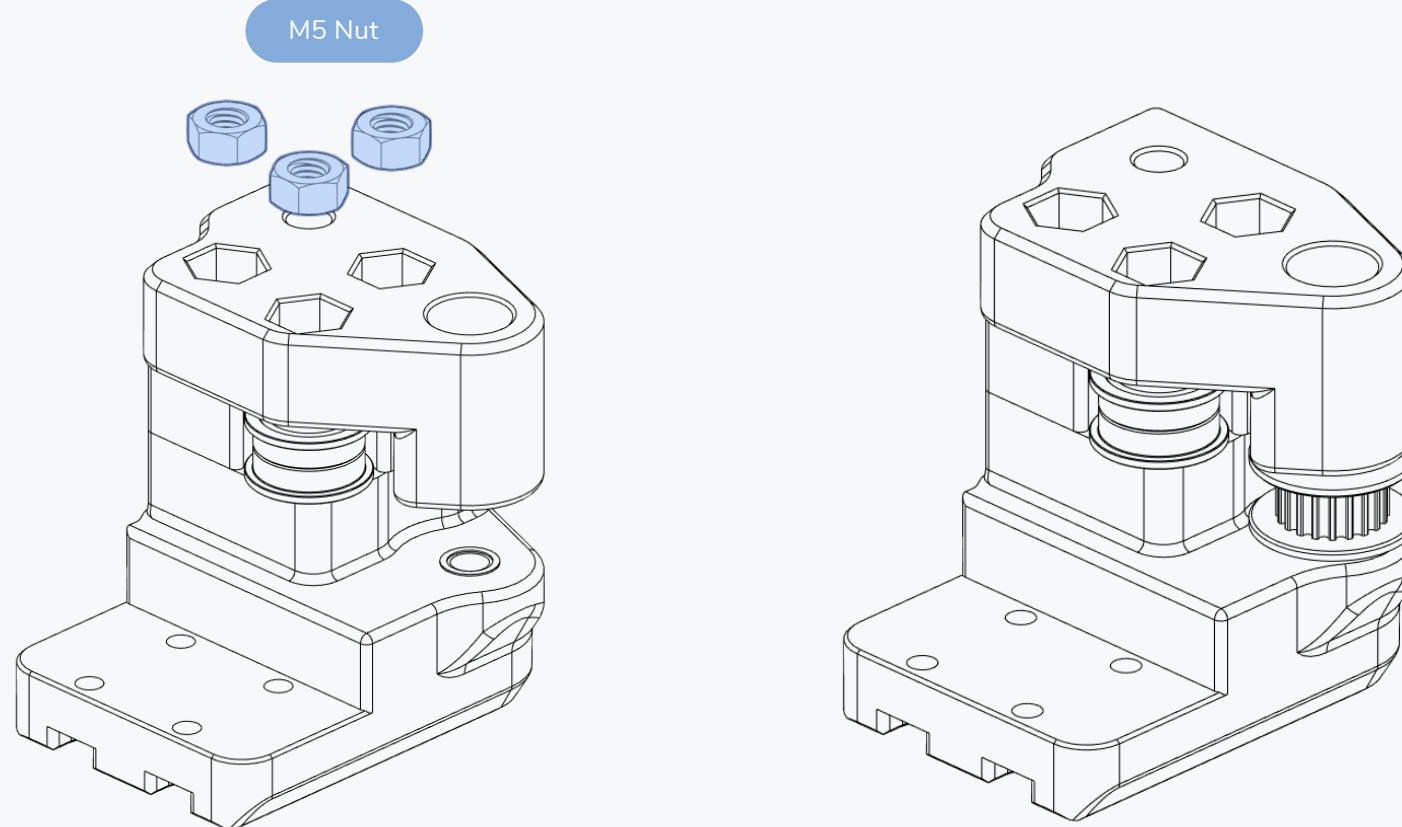
If you need help on the correct procedure, ask in Discord.

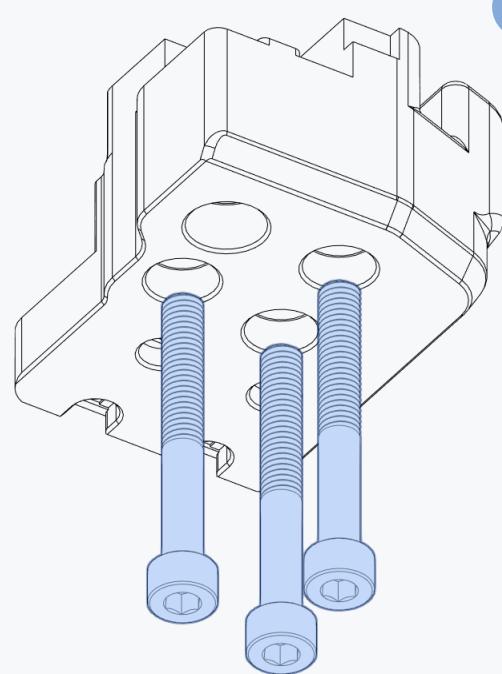




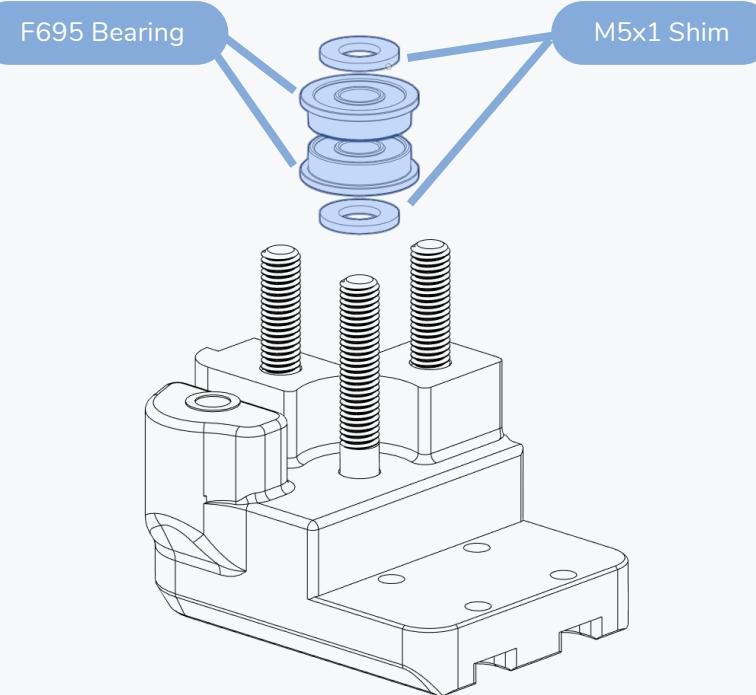
DON'T OVER TIGHTEN
The screw is used to position the idler and is screwed directly into plastic.
The idler must spin freely.





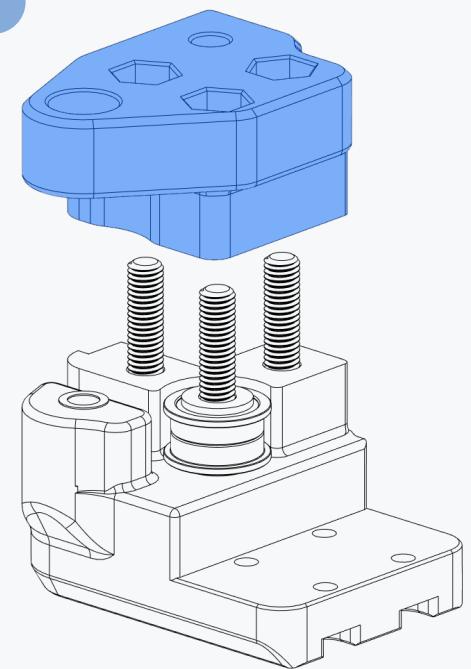


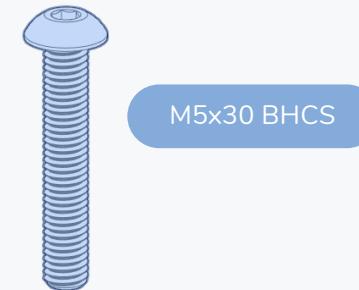
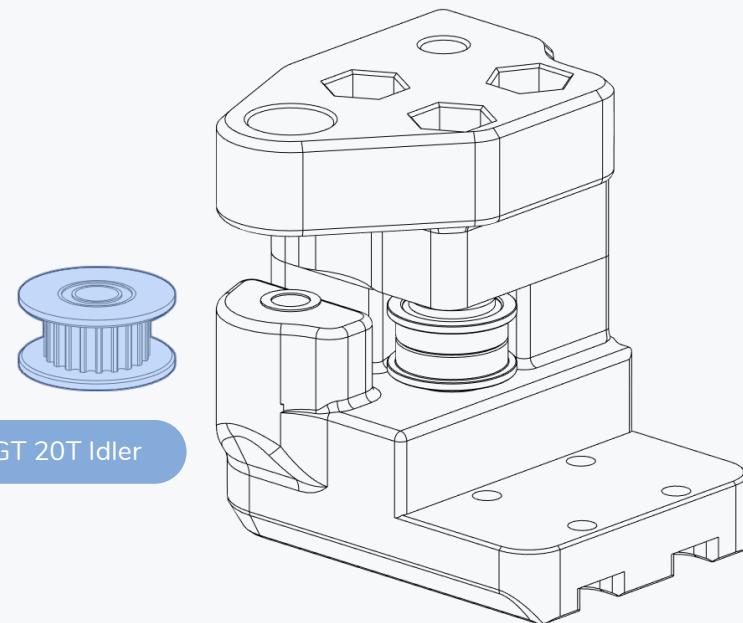
M5x40 SHCS



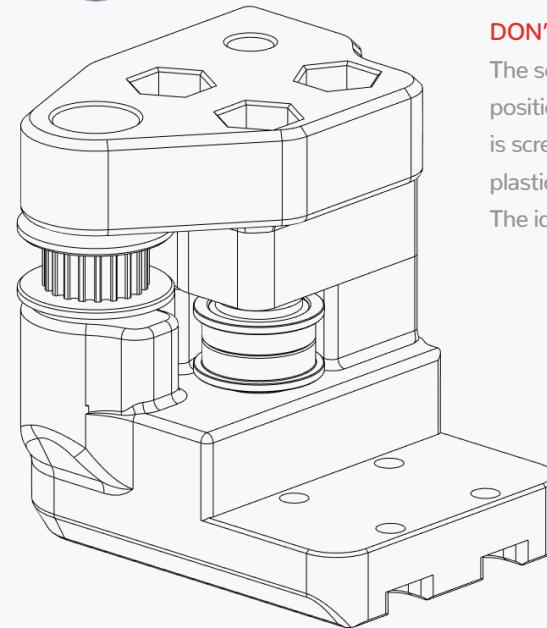
F695 Bearing

M5x1 Shim





M5x30 BHCS



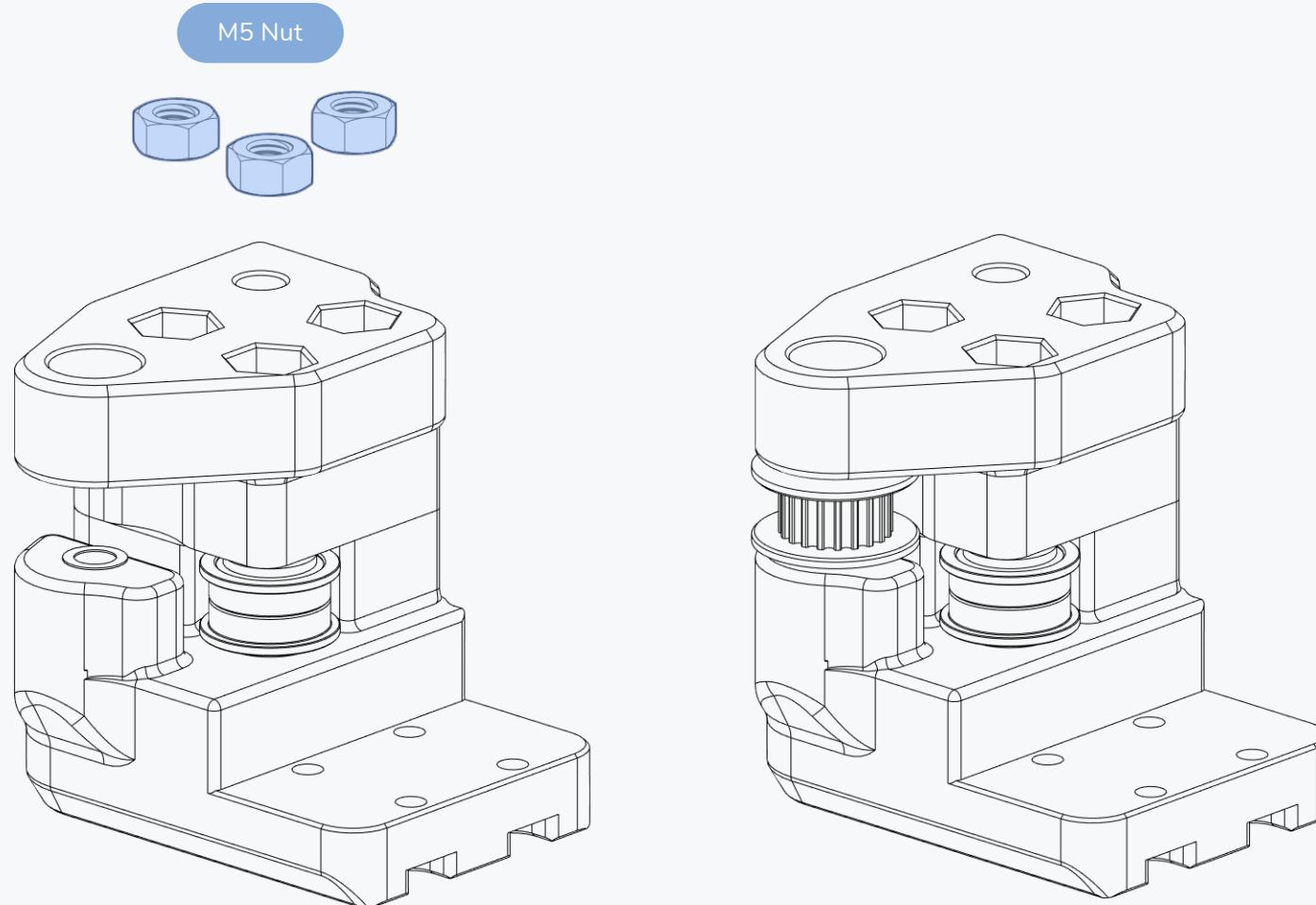
DON'T OVER TIGHTEN

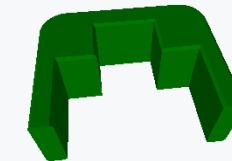
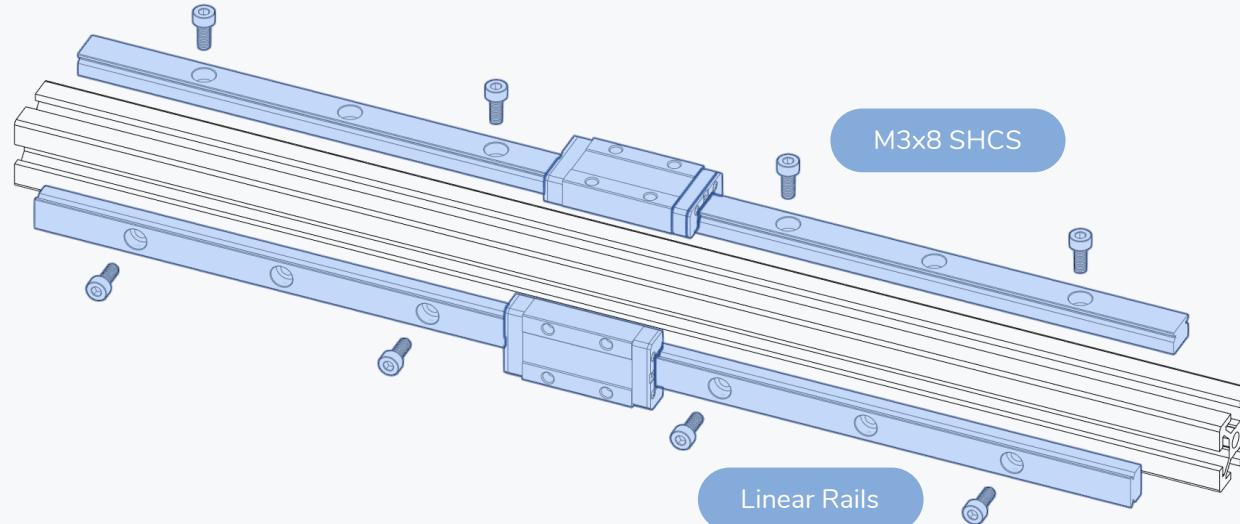
The screw is used to position the idler and is screwed directly into plastic.

The idler must spin freely.

LEFT XY JOINT

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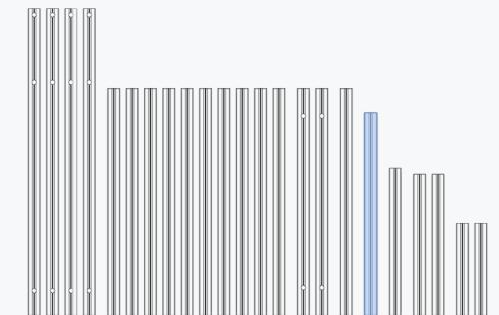
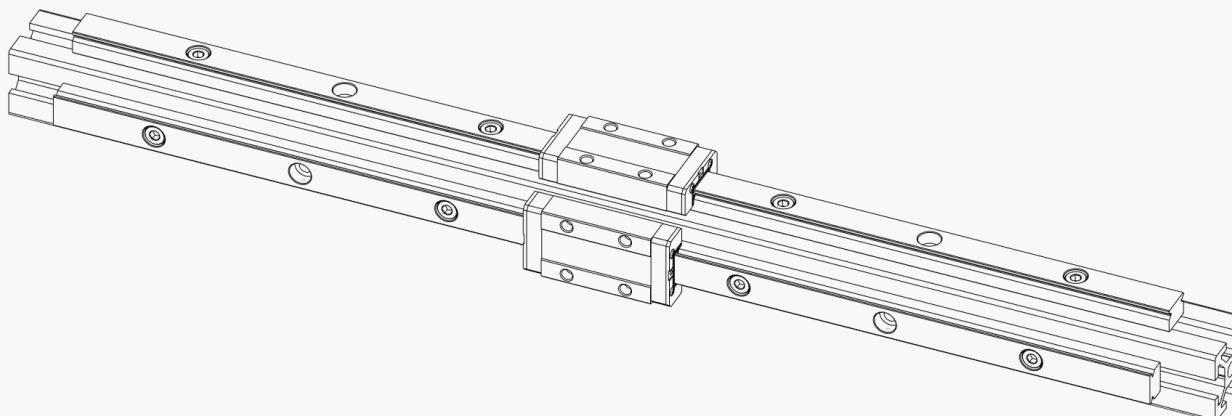


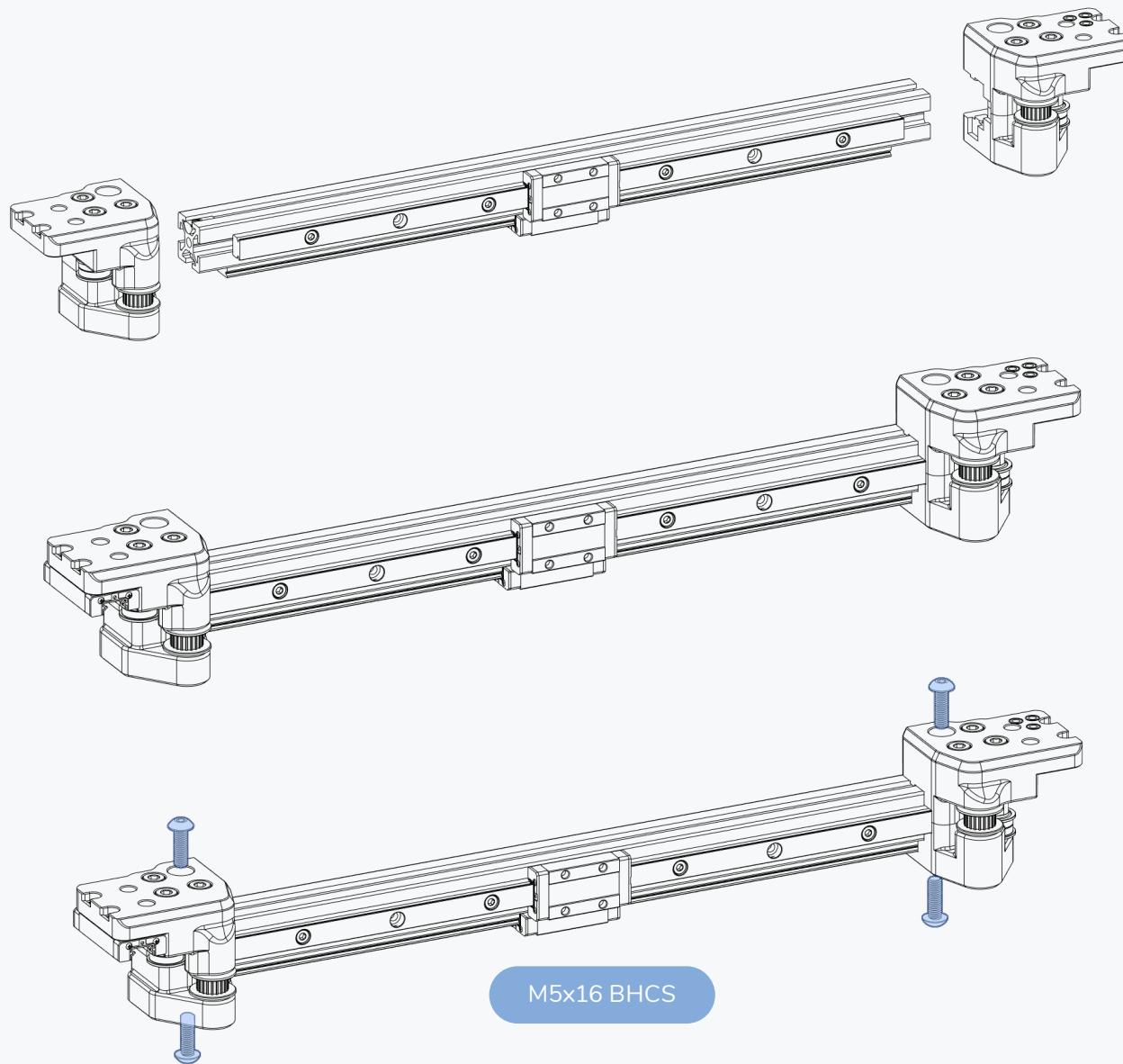
CENTERED RAIL INSTALLATION GUIDE

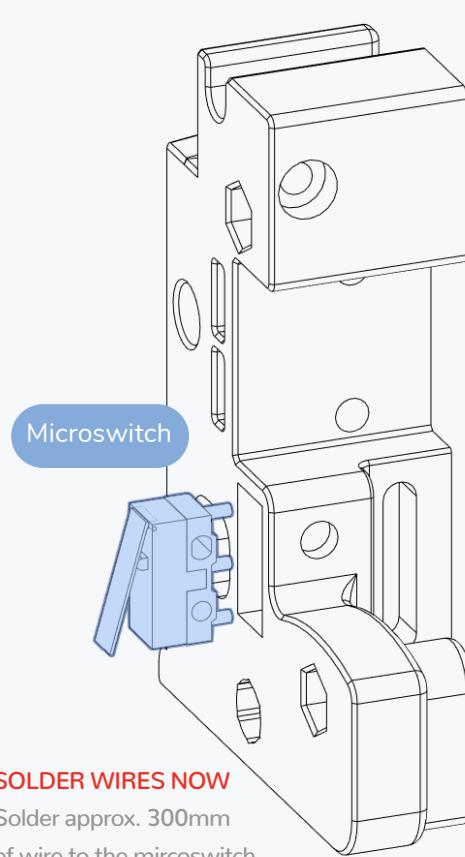
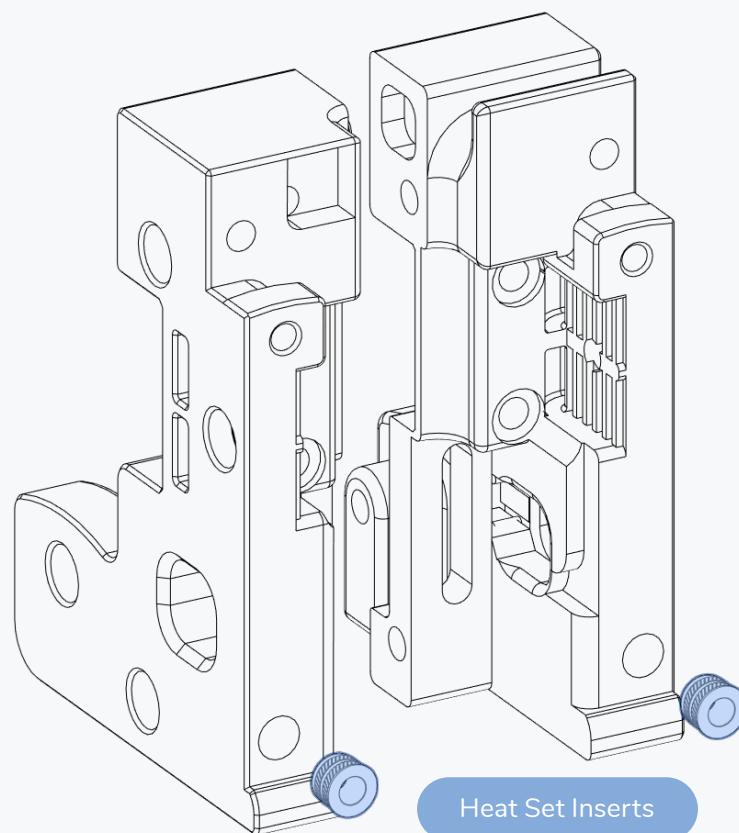
Use the guides to position the top rail in the center of the extrusion prior to lightly fastening the screws. This rail will become the forward facing rail.

Loosely position the other rail and lightly fasten the screws.

Rails will be aligned in a later step.

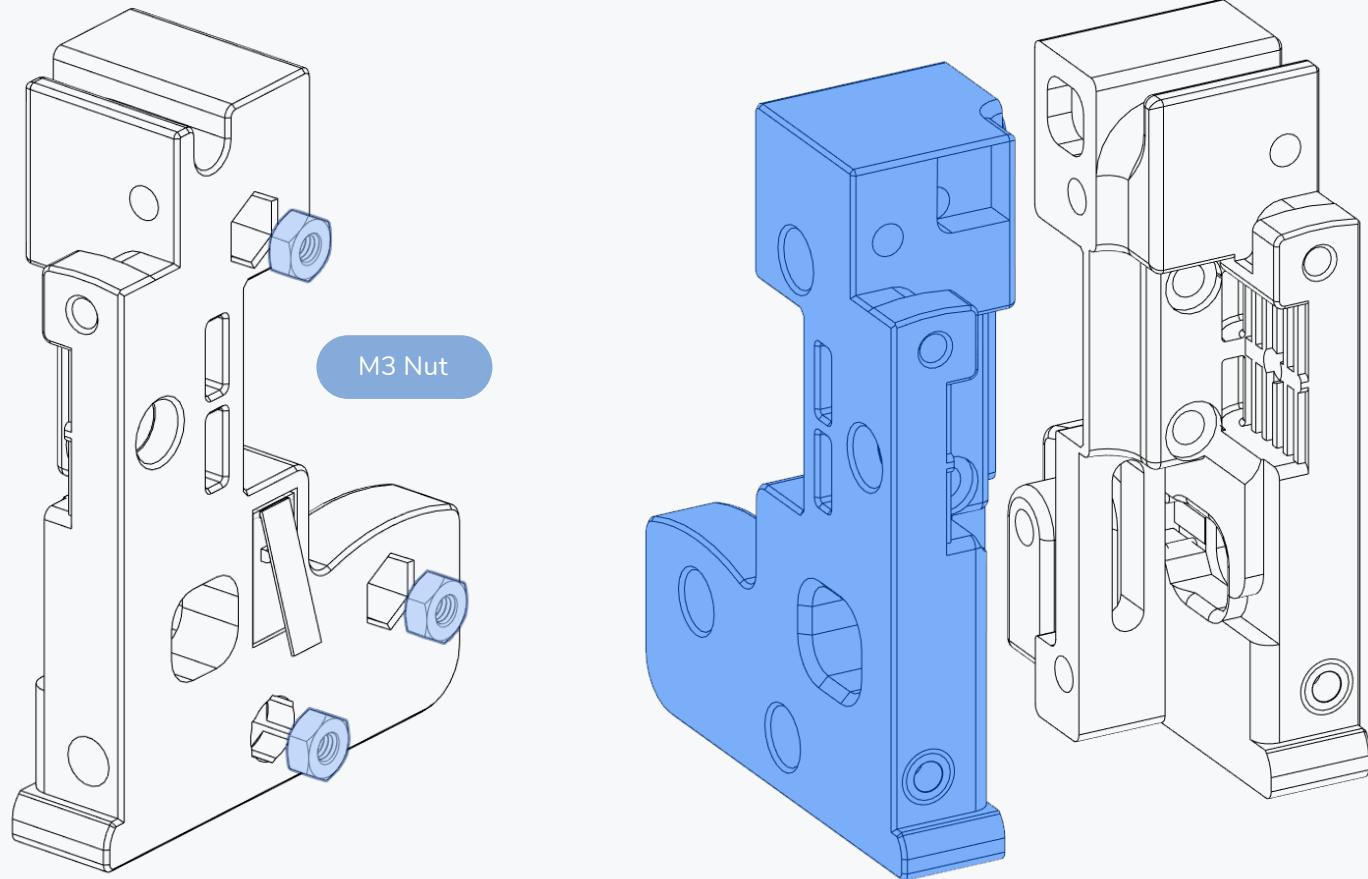


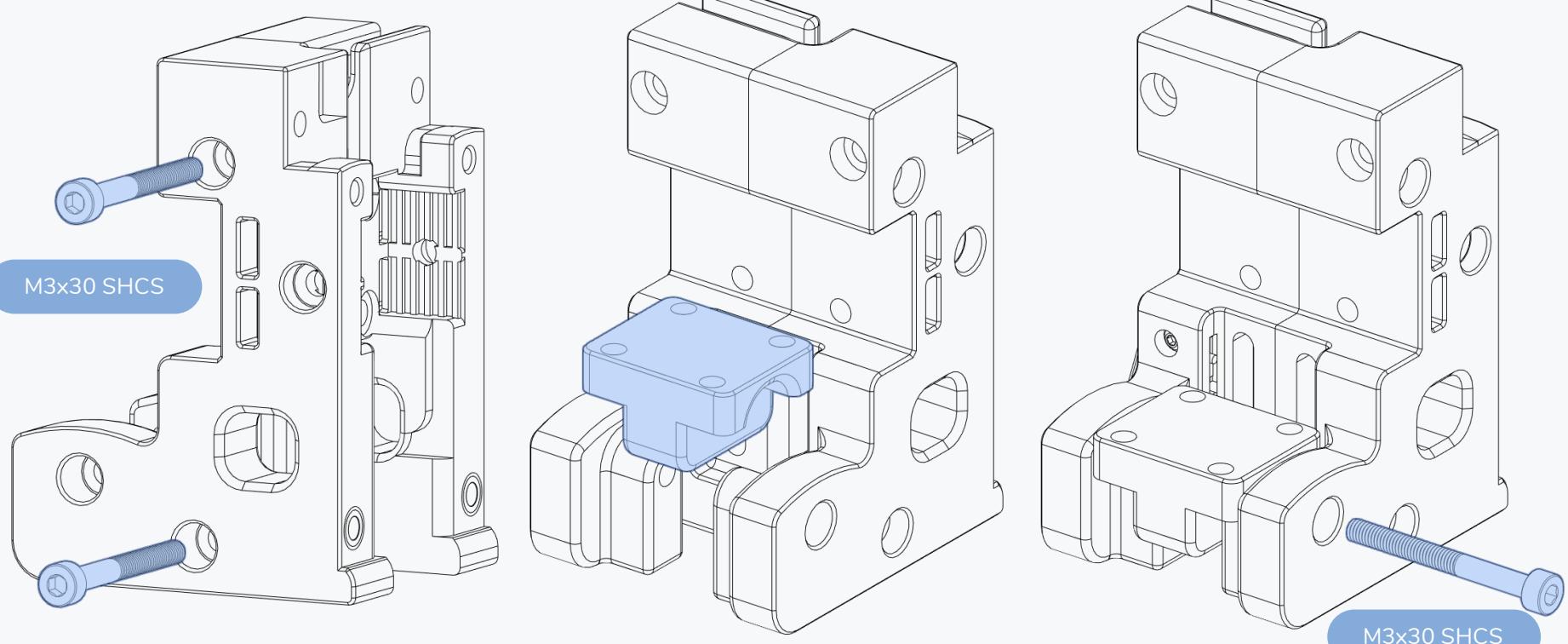


**SOLDER WIRES NOW**

Solder approx. 300mm
of wire to the mircoswitch
before installing it.
See setup guide for details.

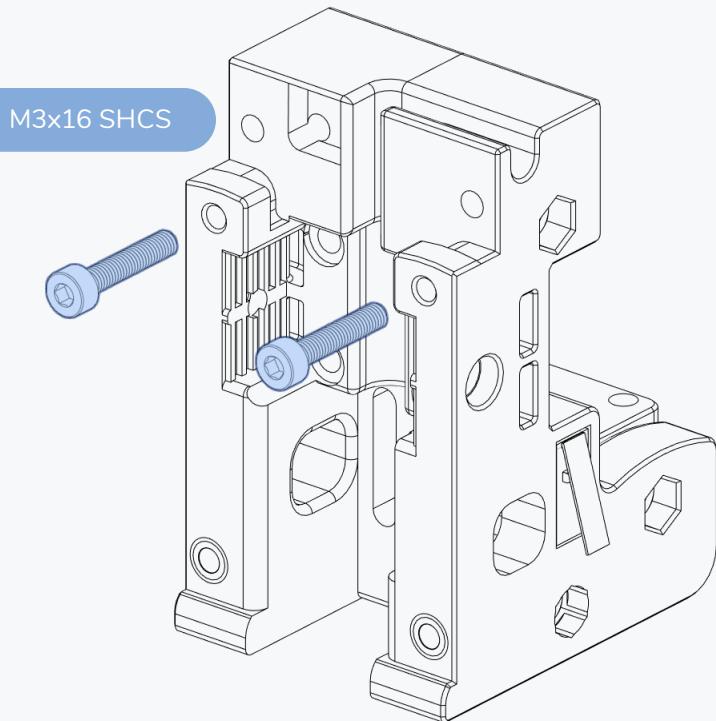




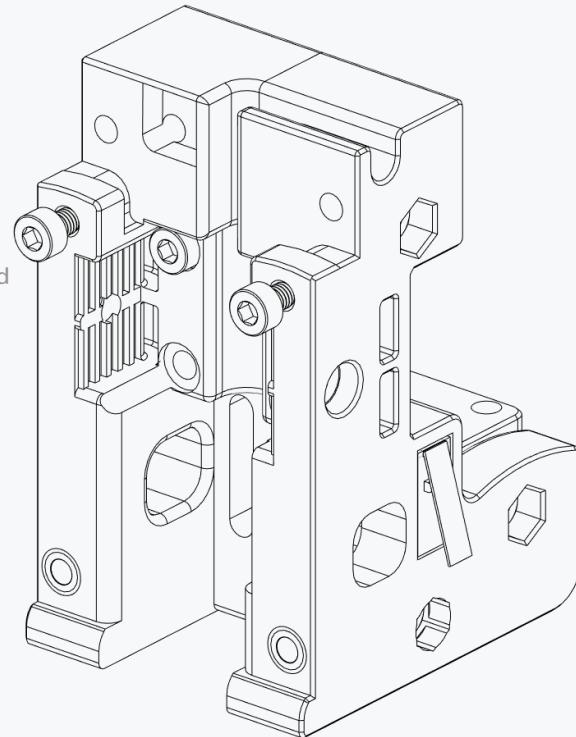


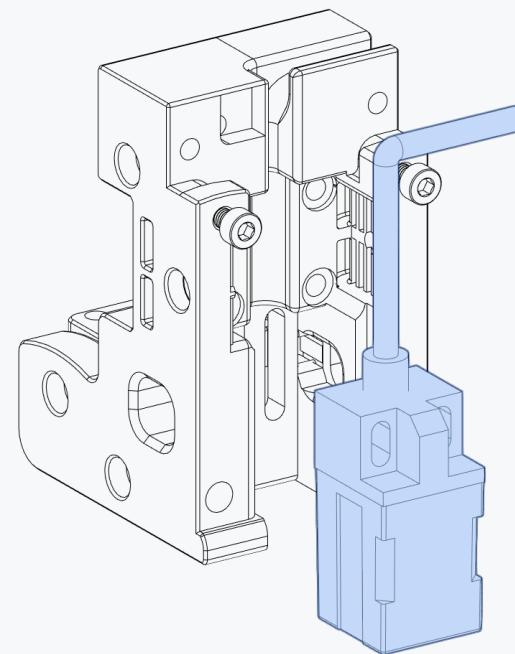
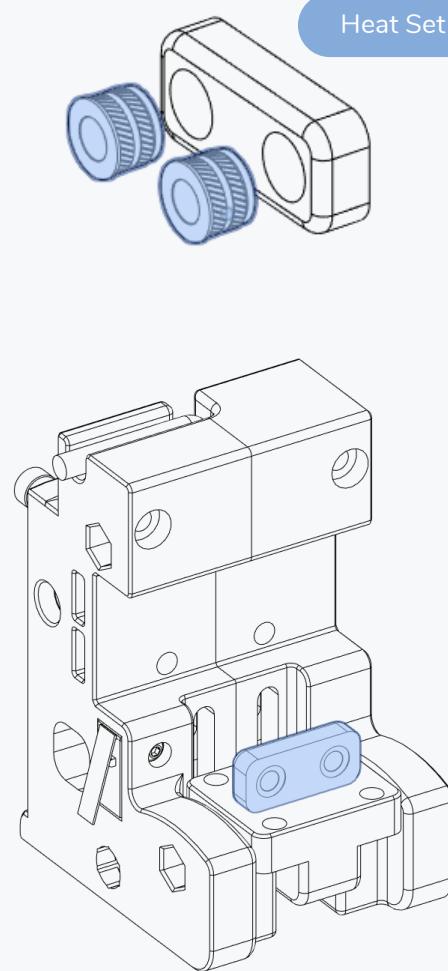
LEAVE LOOSE

Lightly tighten the screw.

**3MM DISTANCE**

Fasten the screw until there is 3mm space between the screw head and the printed part.

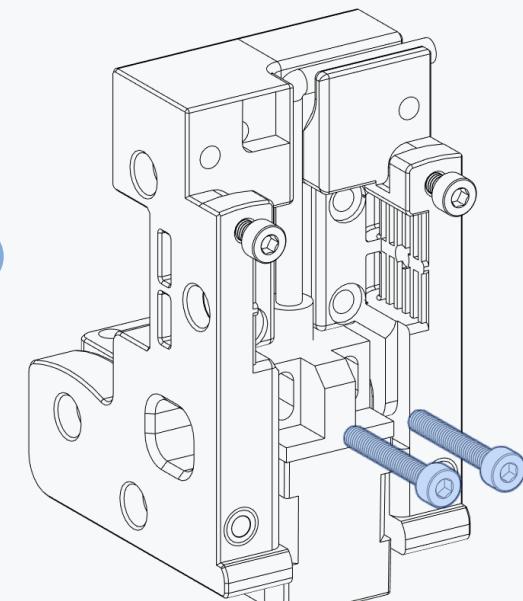


**PROBE WIRES**

Cut the probes wires to about 15cm.

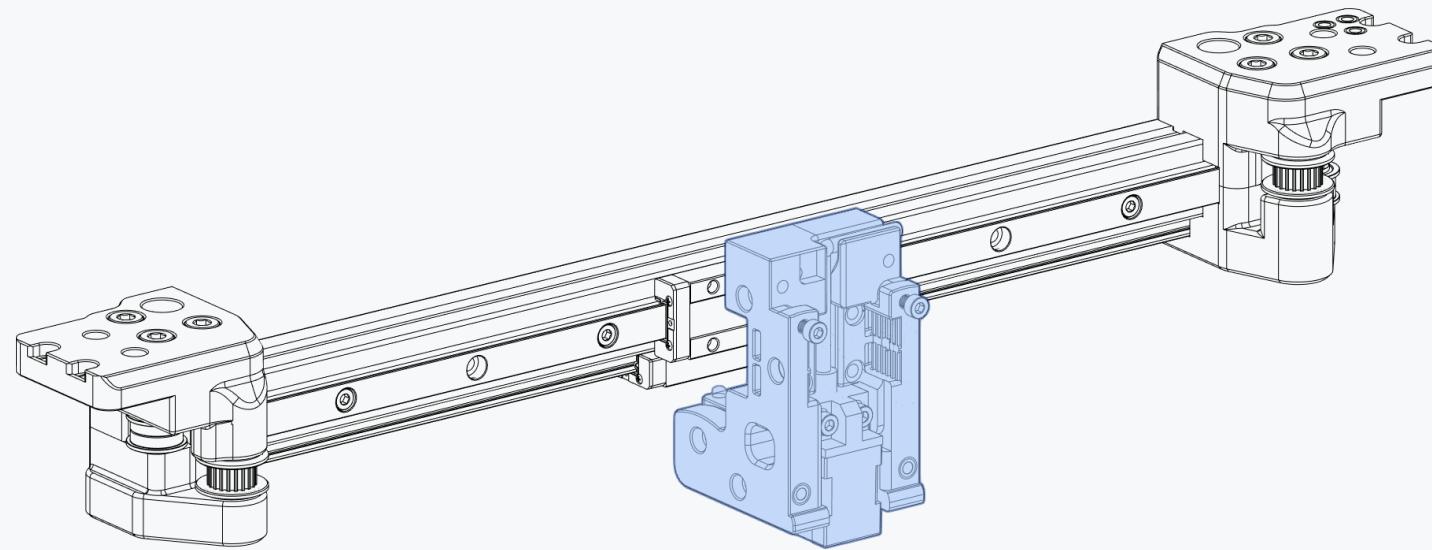
ENDSTOP WIRES

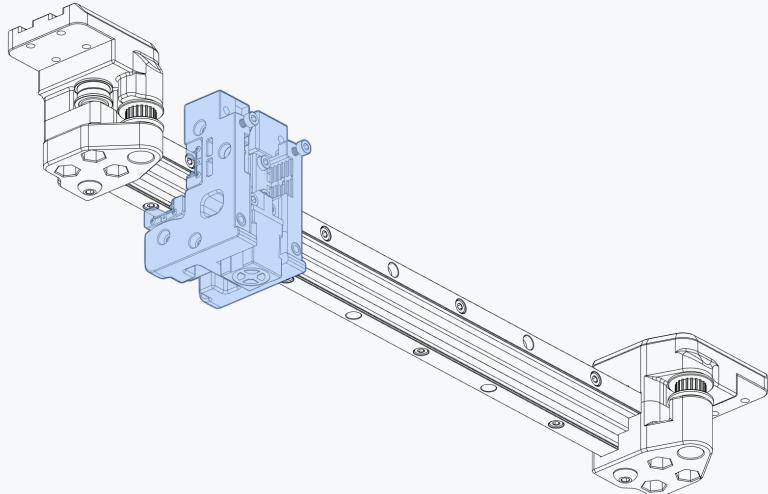
Place the endstop wires into the same channel.



X CARRIAGE MOUNTING

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RAIL ALIGNMENT

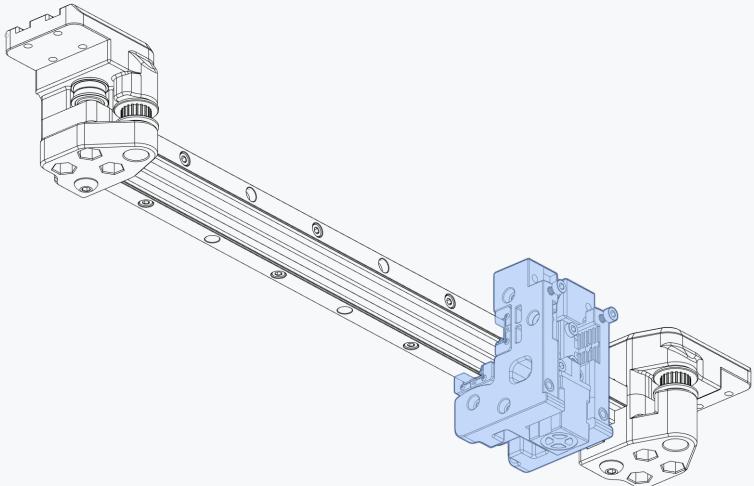
Move X Carriage over the full range to initially align the bottom rail.

Slightly tighten the screws of the front rail, the screws of the bottom rail and the pivot block screw on the underside of the carriage.

Move the X Carriage to check for any binding.

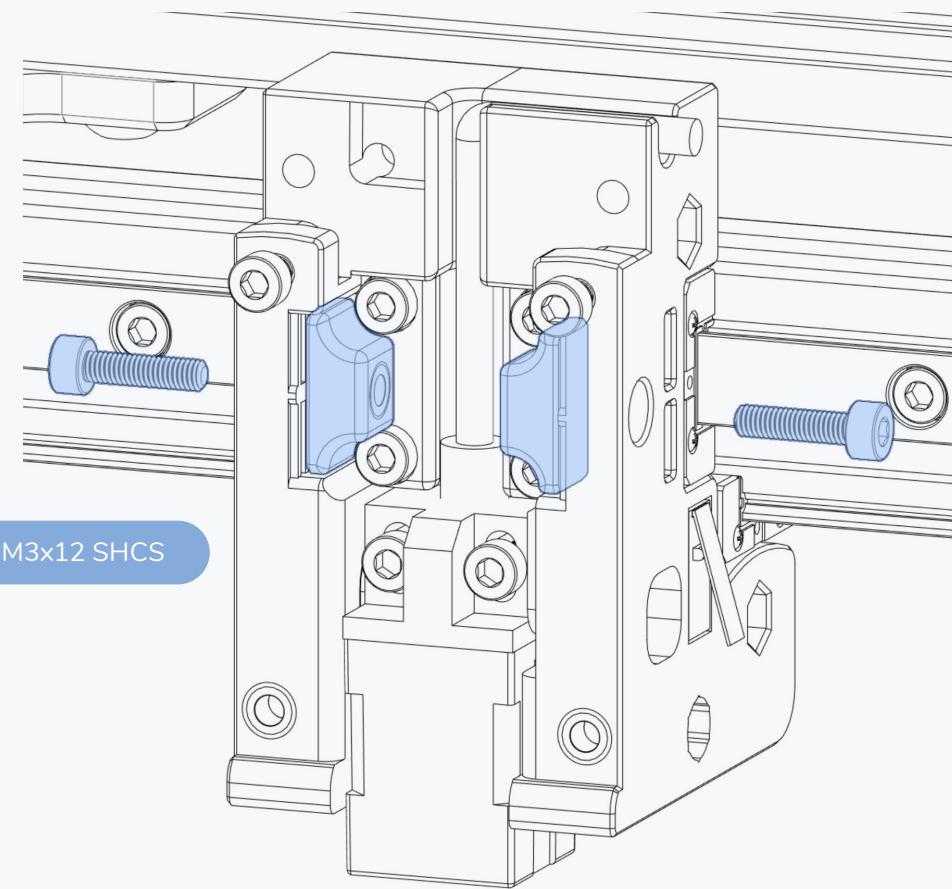
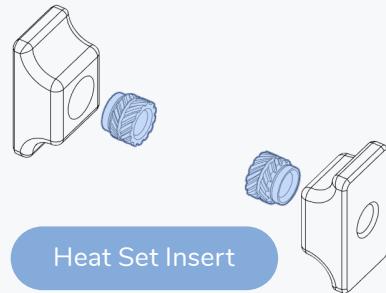
Repeat until all screws are fully tight. If you get binding at any point slightly loosen the screws and retry.

Refer to Discord if you are having issues with the alignment.



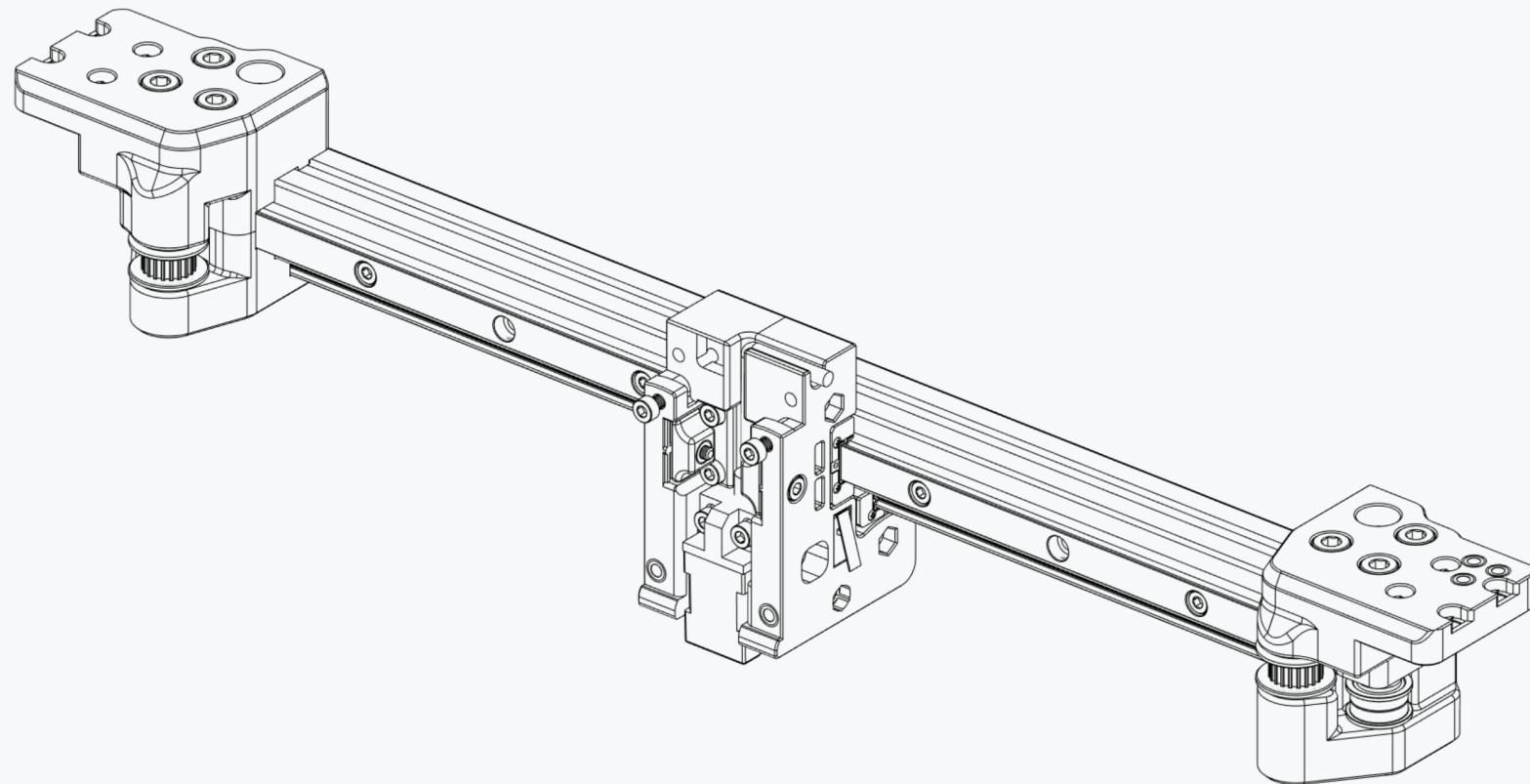
BELT CLAMPS

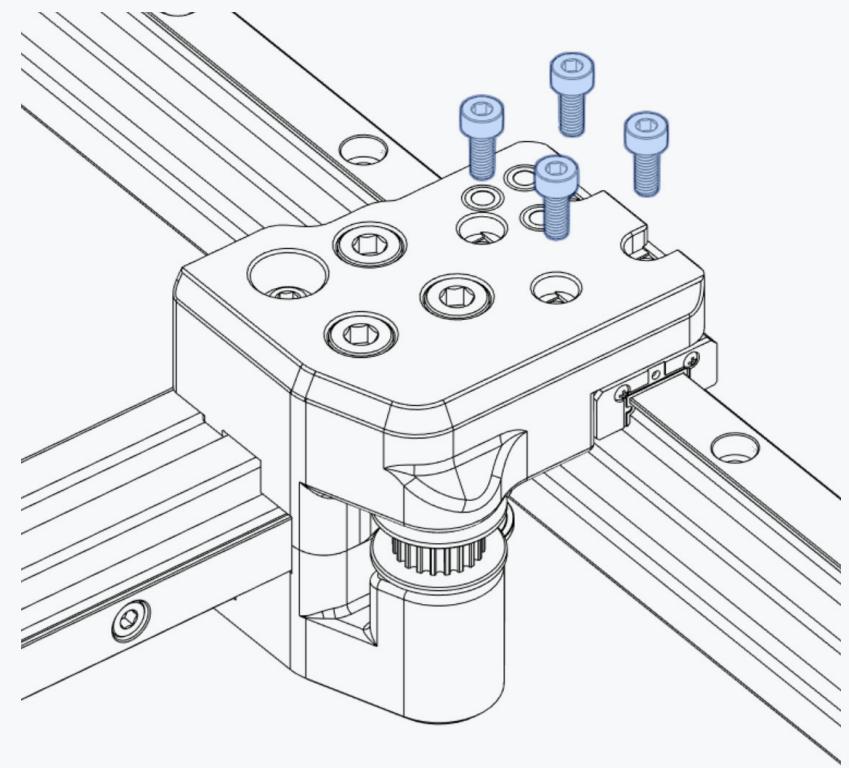
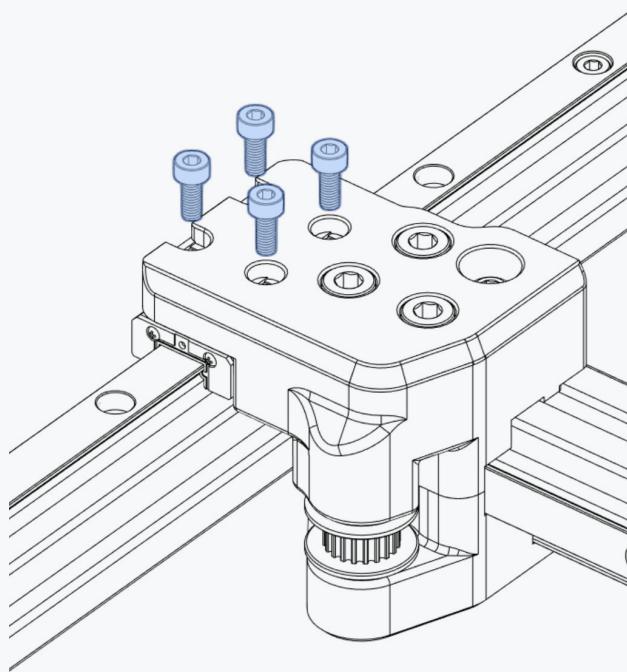
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X AXIS

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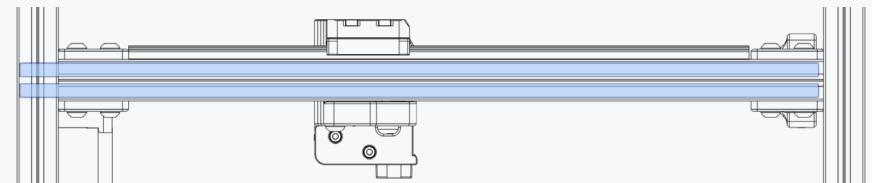
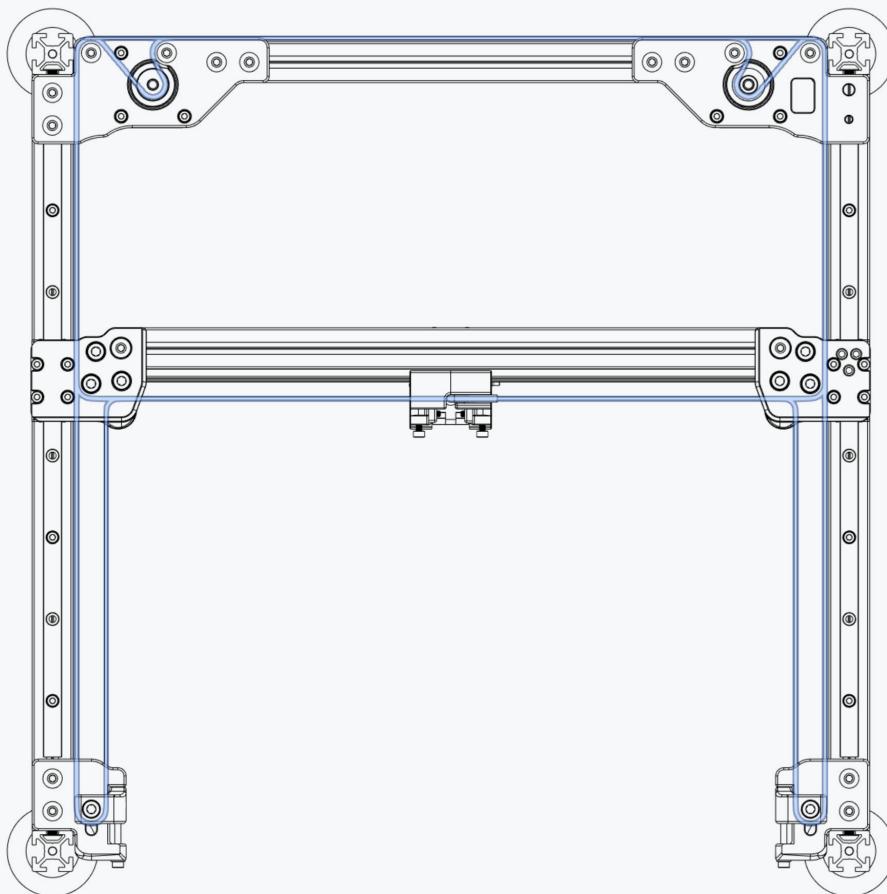




BELT PATH

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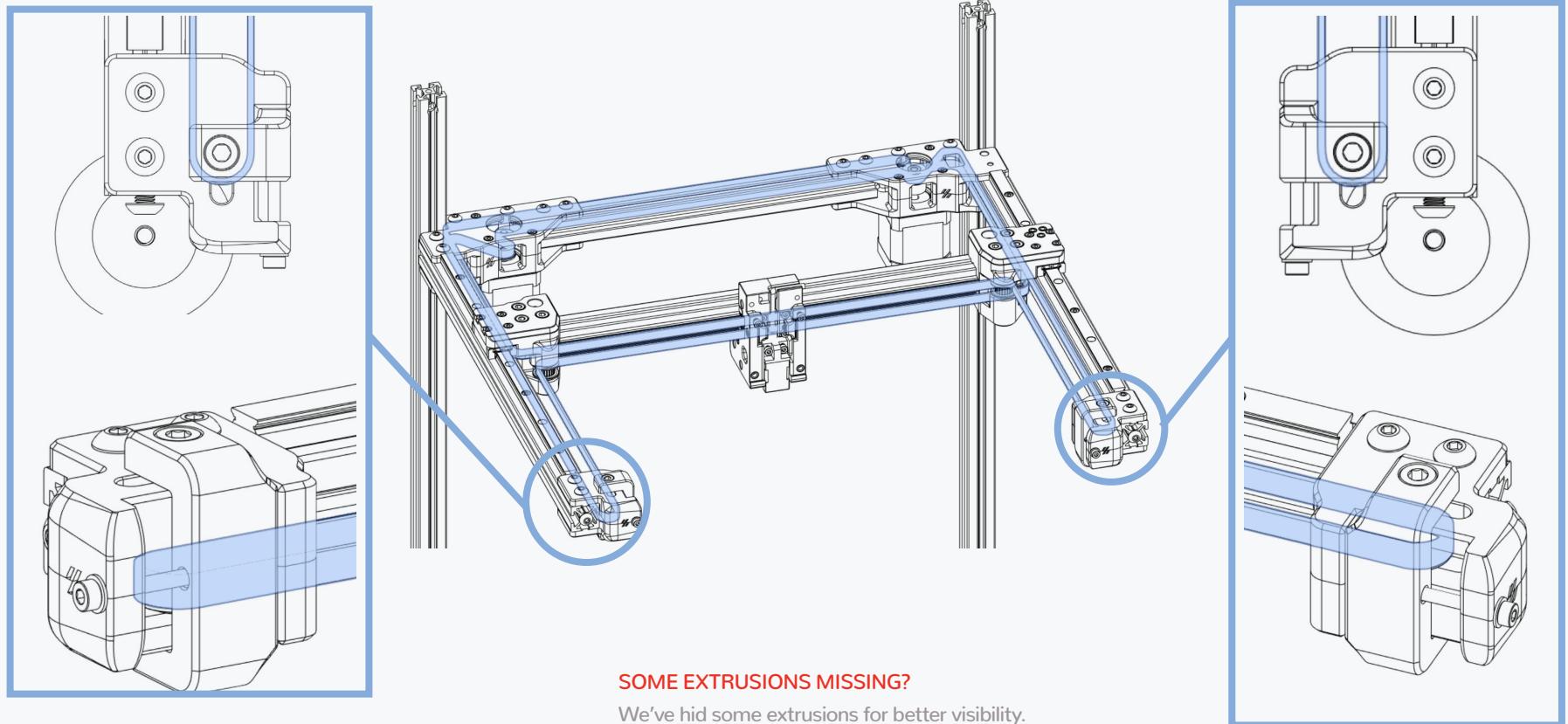


THE VORON BELT PATH

Voron printers use a belt path based on the popular CoreXY pattern.

The individual belt paths are stacked on top of each and the crossing often found in CoreXY designs is omitted.

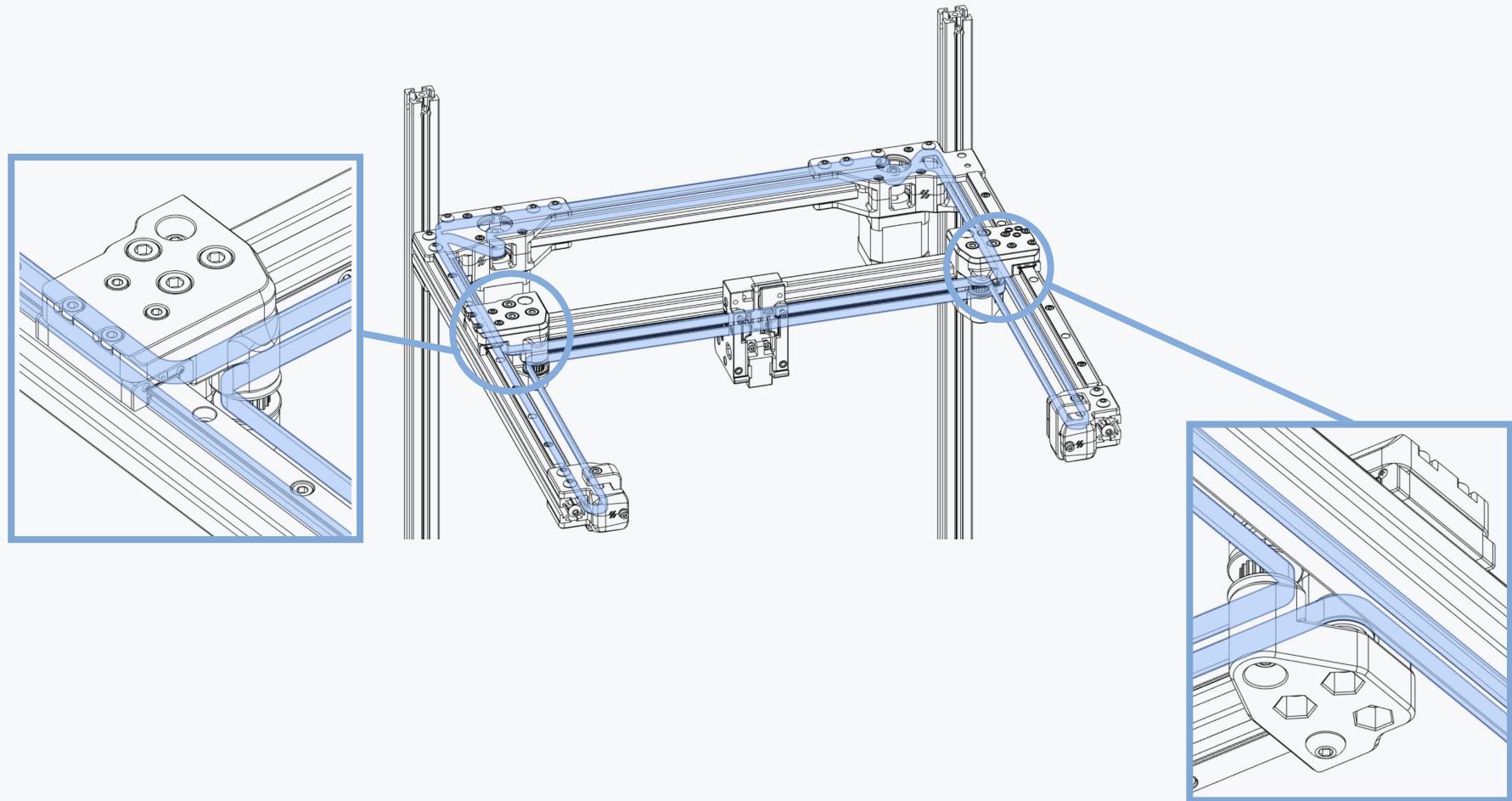
Compared to many other implementations the motors are moved to a less intrusive position.

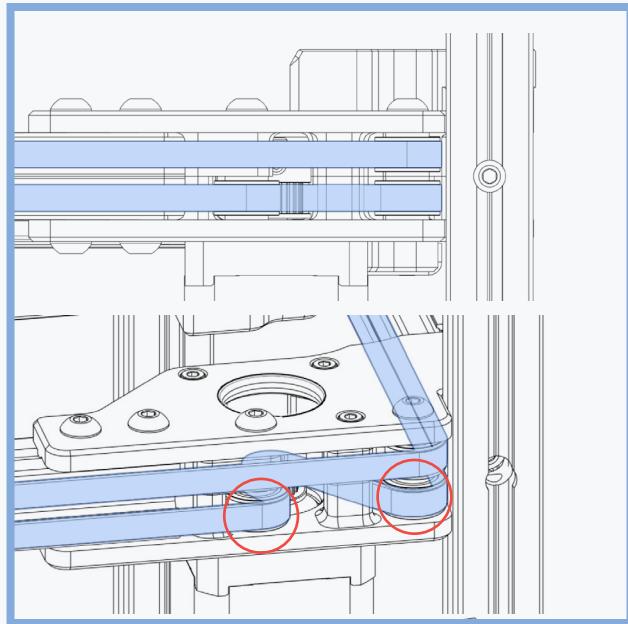
**SOME EXTRUSIONS MISSING?**

We've hid some extrusions for better visibility.
No need to disassemble anything.

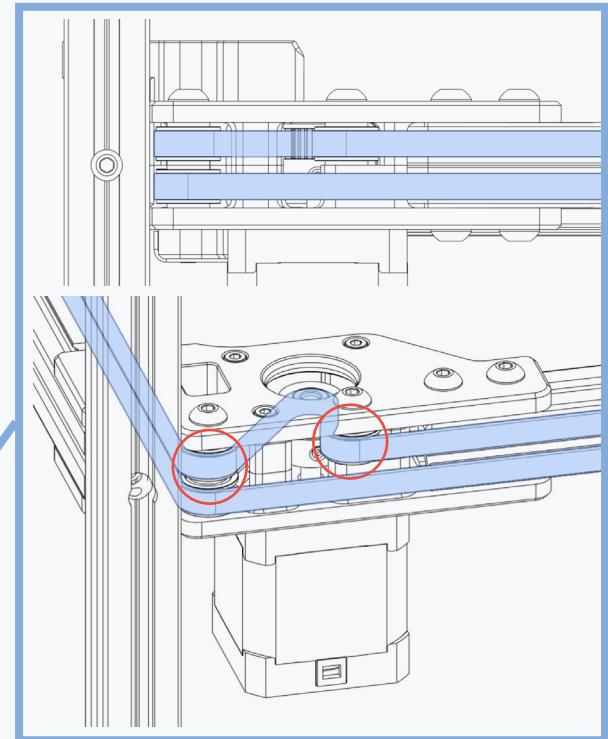
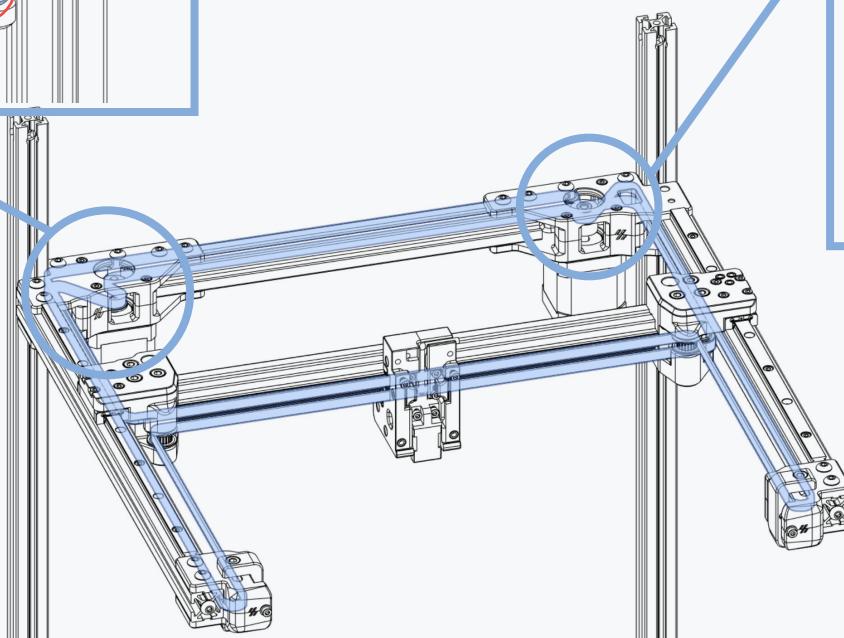
BELT ROUTING

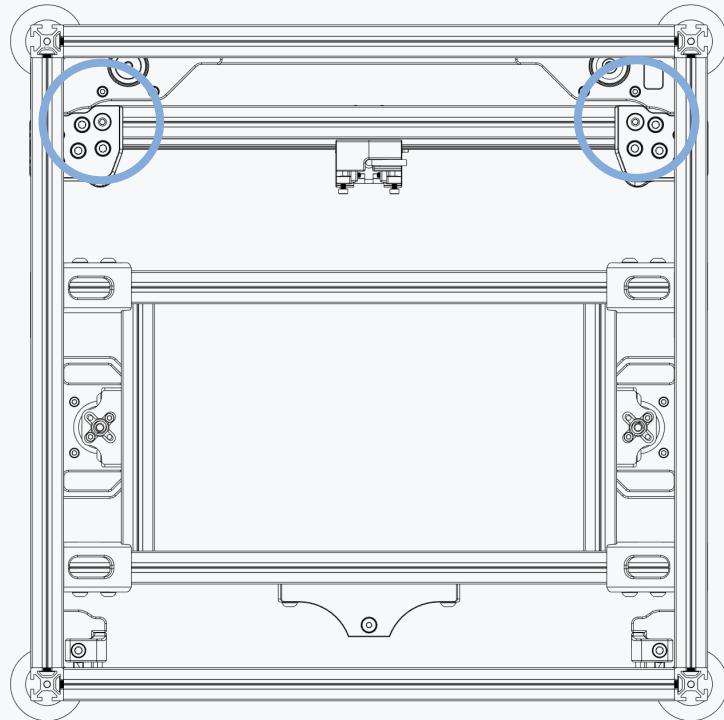
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**MIND THE BELT PATH**

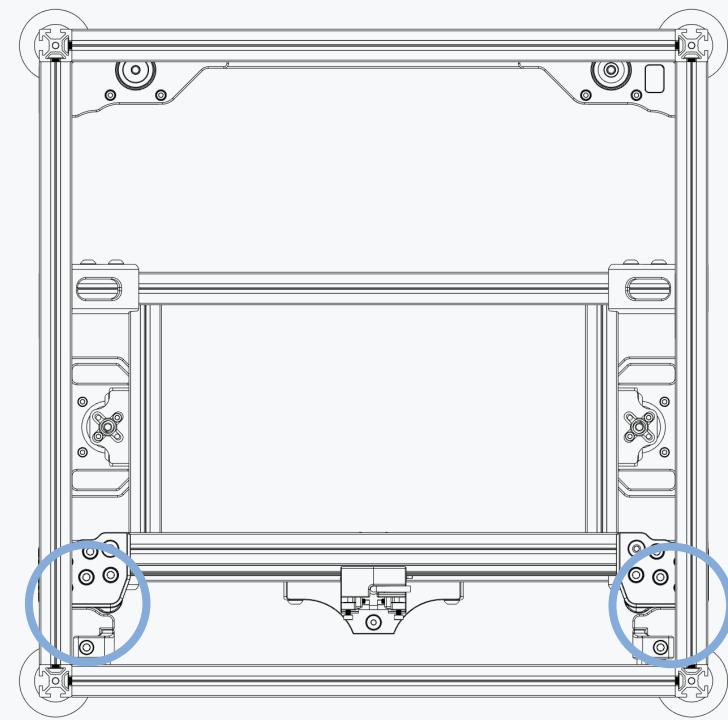
Make sure that the belts are sitting on the bearing stacks.
This may seem obvious but is easy to miss.



**MOVE X AXIS BACK**

Loosen the X Beam screws.

Move the axis all the way back. Both XY Joints must touch the motor mounts.

**MOVE X AXIS FORWARD**

Move the axis all the way forward until both XY Joints touch the idlers.

Tighten the screws on the xy joints.

AFTERBURNER

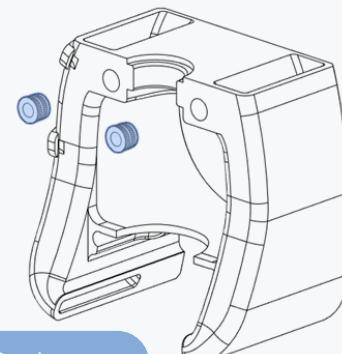
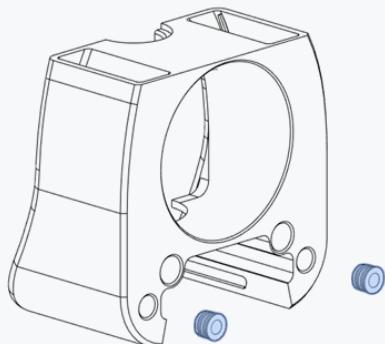
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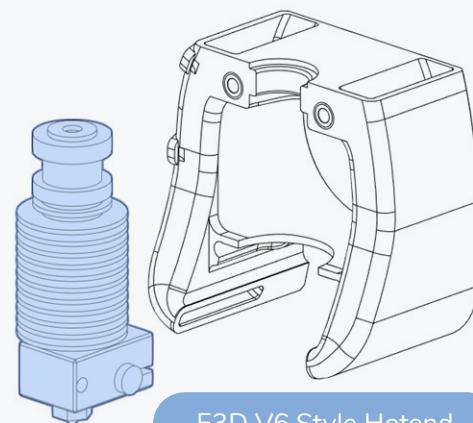
AVAILABLE MOUNTS

We also provide mounts for the Slice Engineering Mosquito and TriangleLab/Phaetus Dragon Hotend.

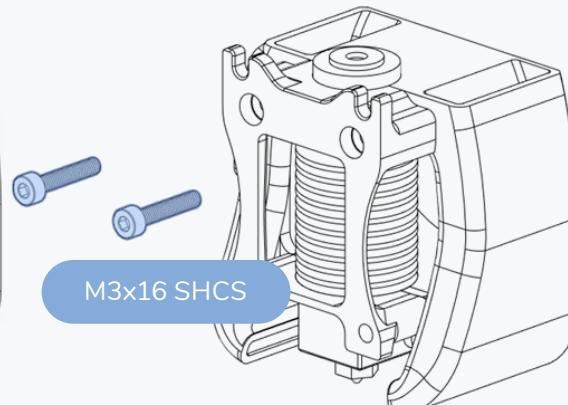
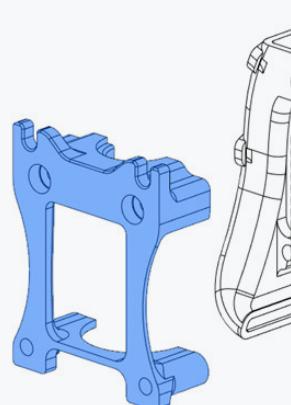
They are assembled in a similar manner.



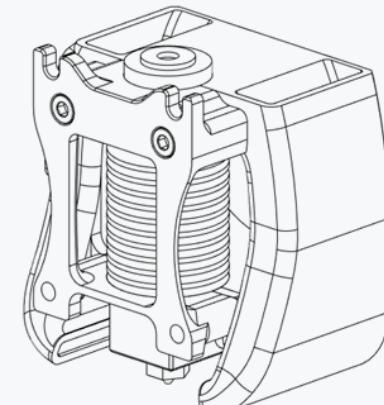
Heat Set Insert

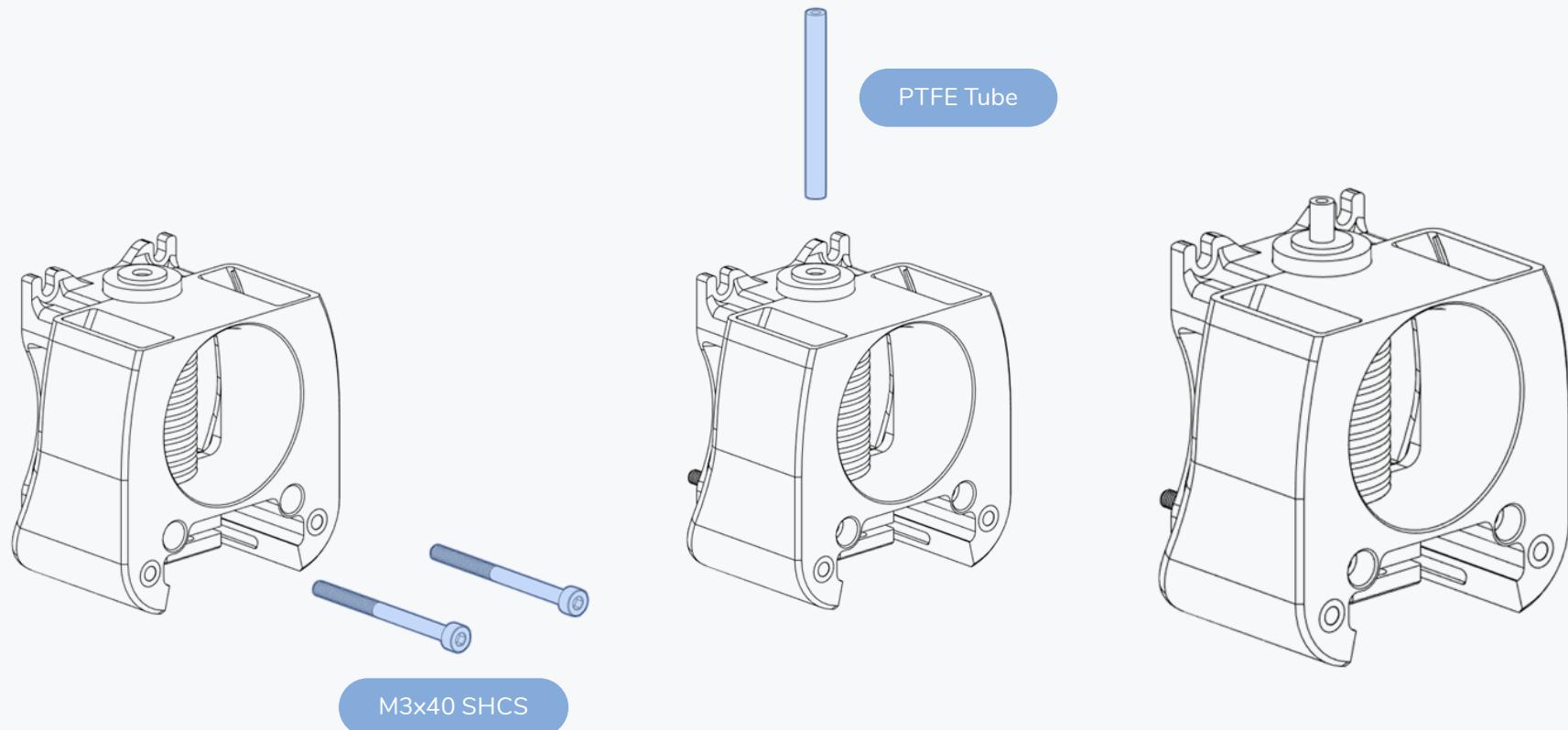


E3D V6 Style Hotend



M3x16 SHCS

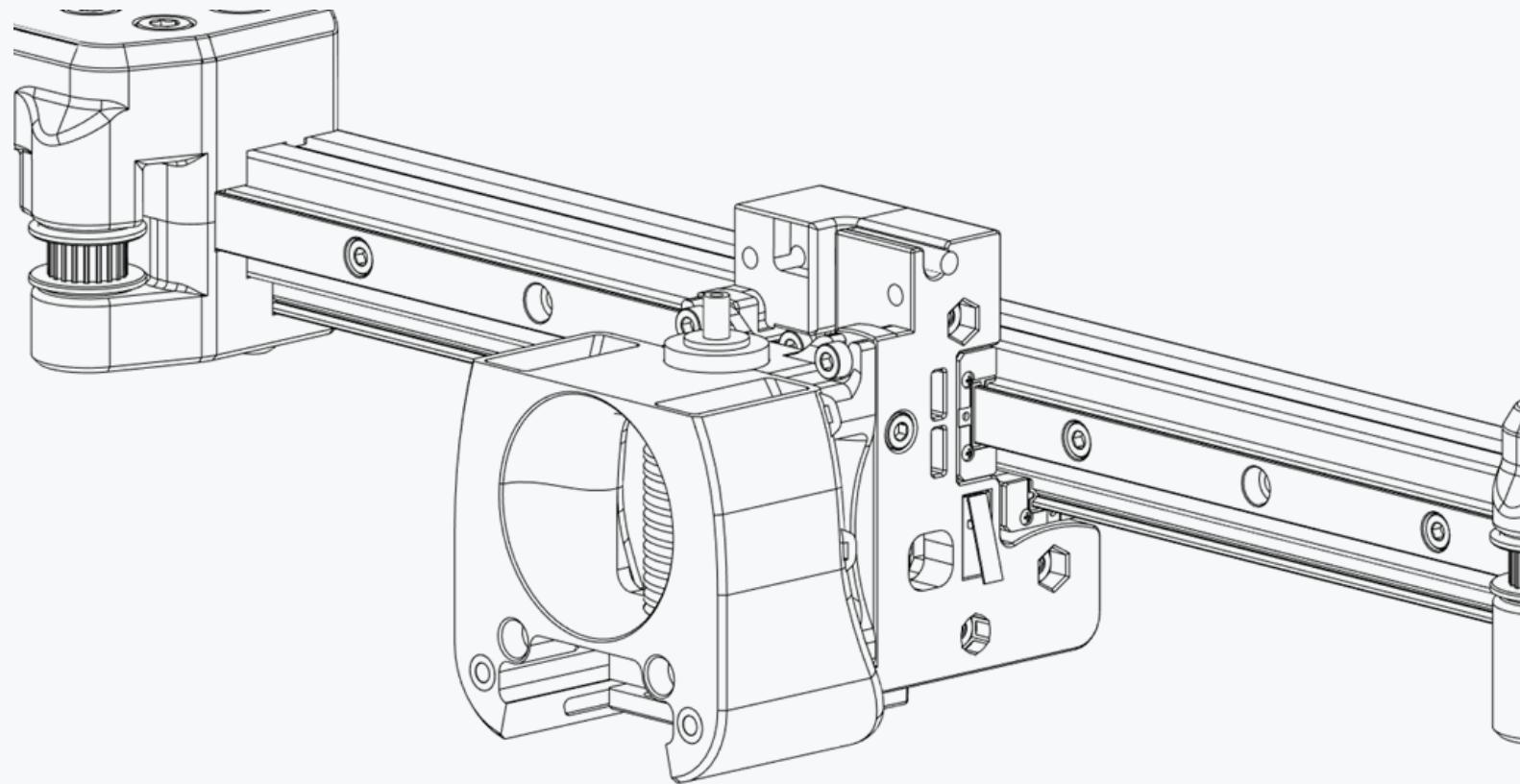


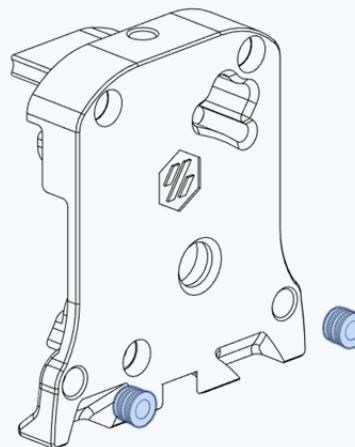
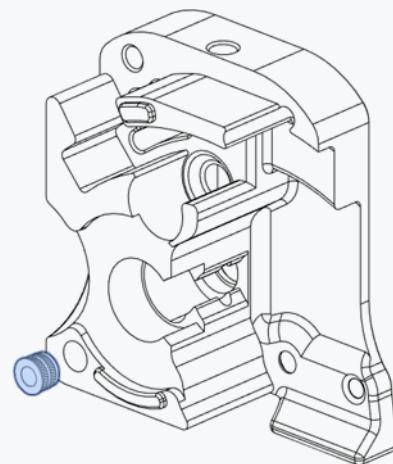
**PTFE STICKOUT**

The PTFE tube should end 10mm above the surface of the printed part.

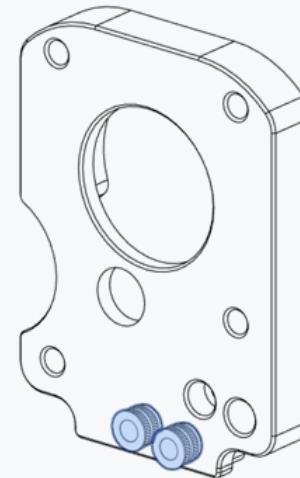
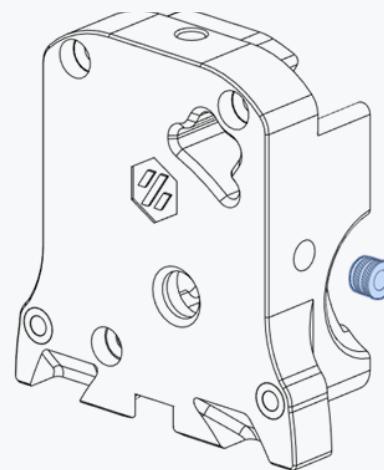
TOOL CARTRIDGE

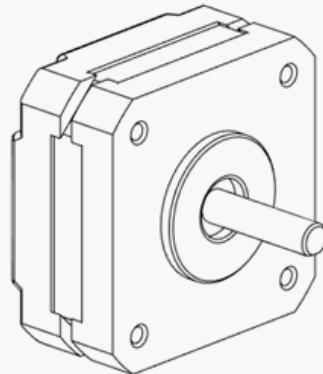
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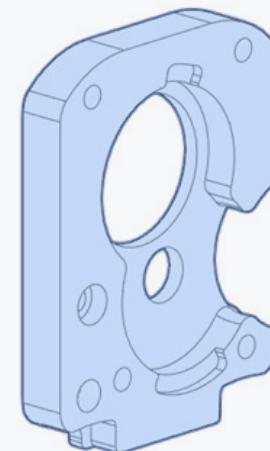
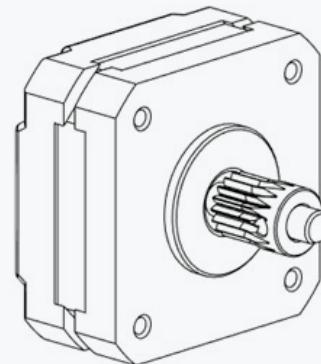
Heat Set Insert





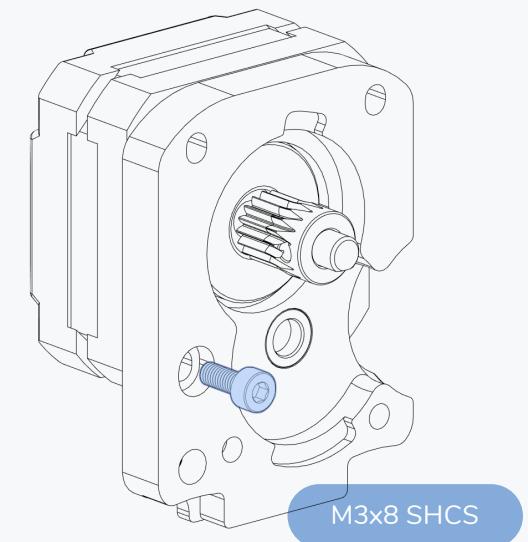
Stepper Motor

BMG Drive Pinion

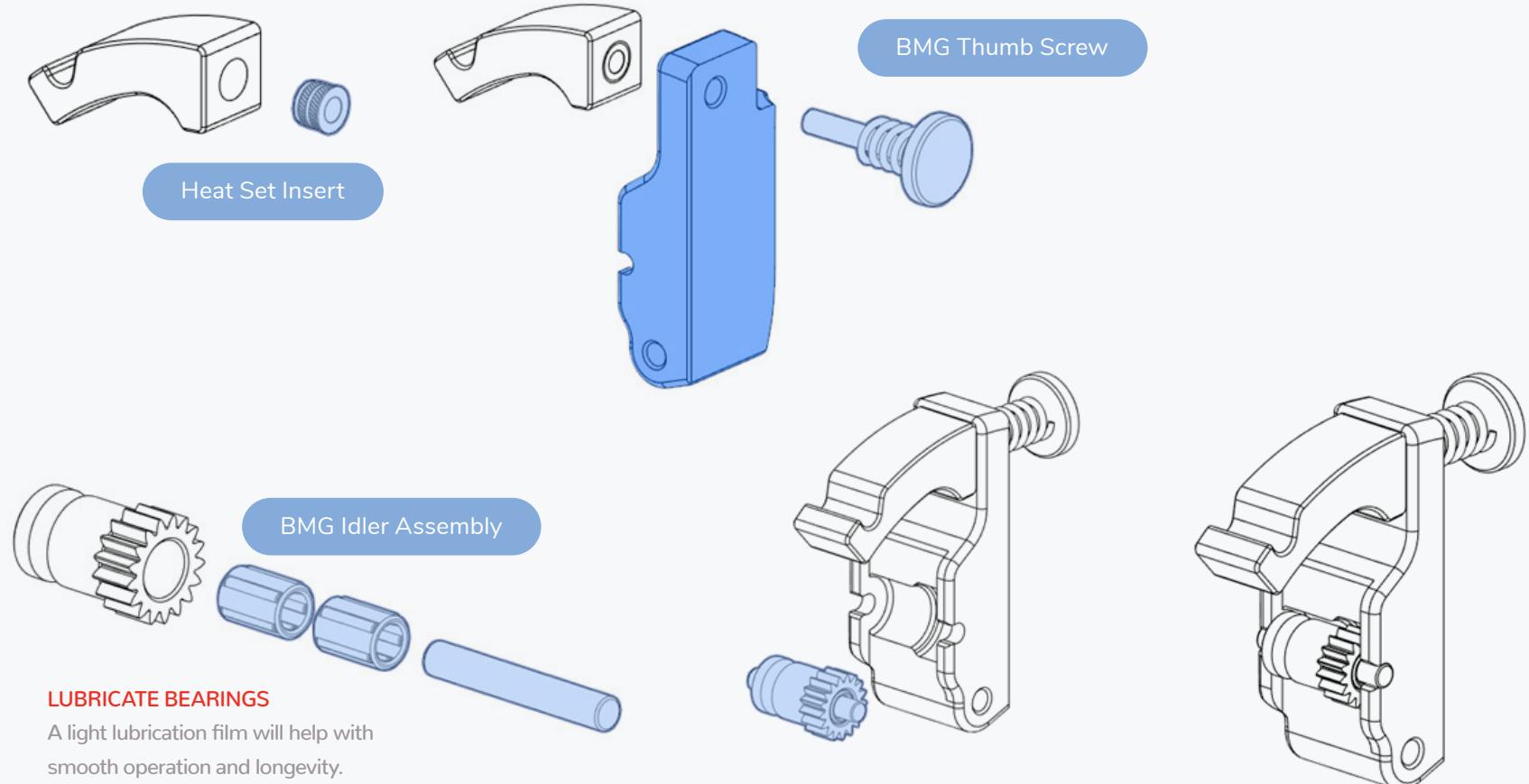
**STEPPER WIRES**

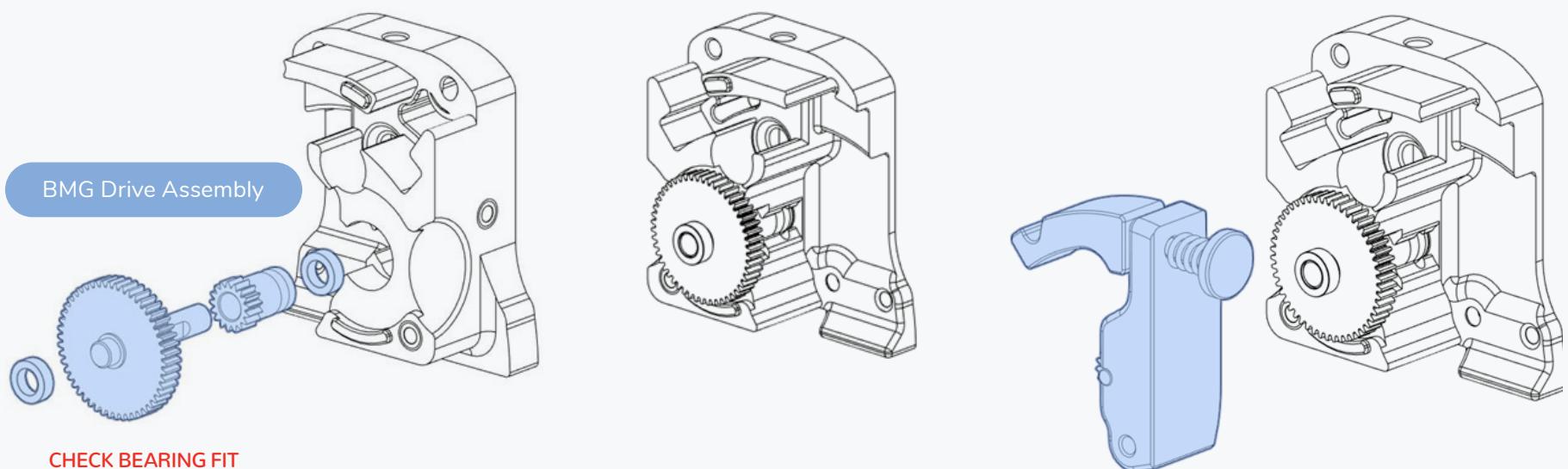
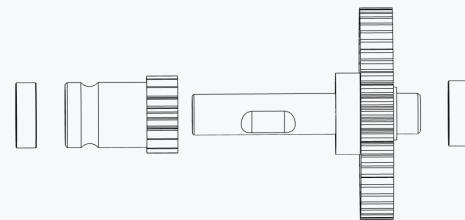
If the steppers has wires cut them to approximately 150mm.

Wires/connector to the right hand side.



M3x8 SHCS

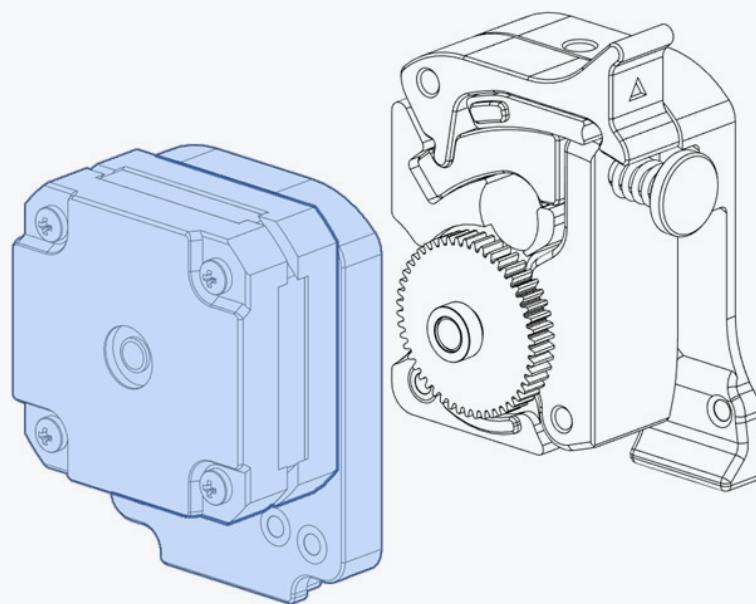
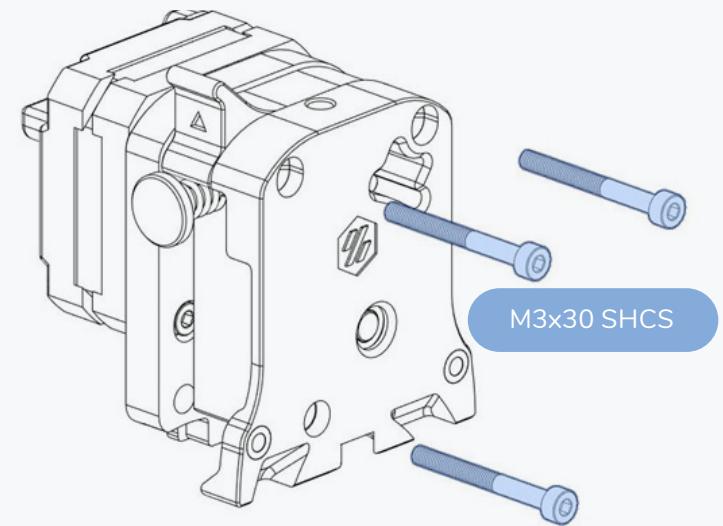
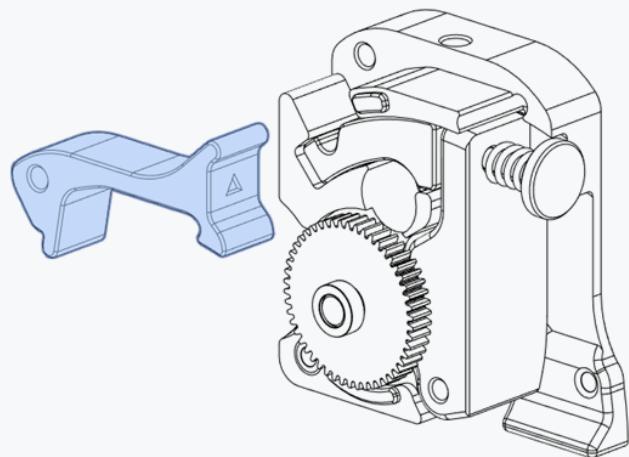


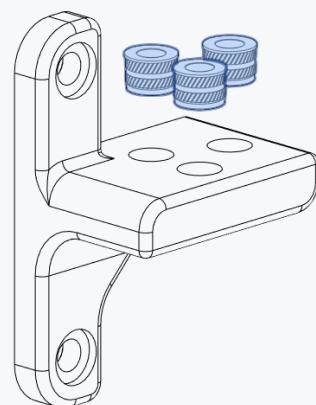
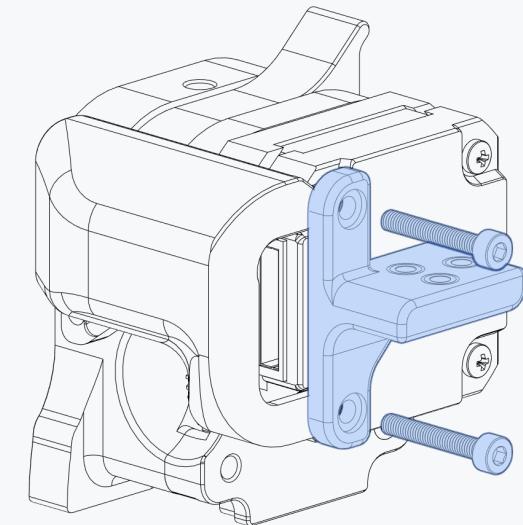
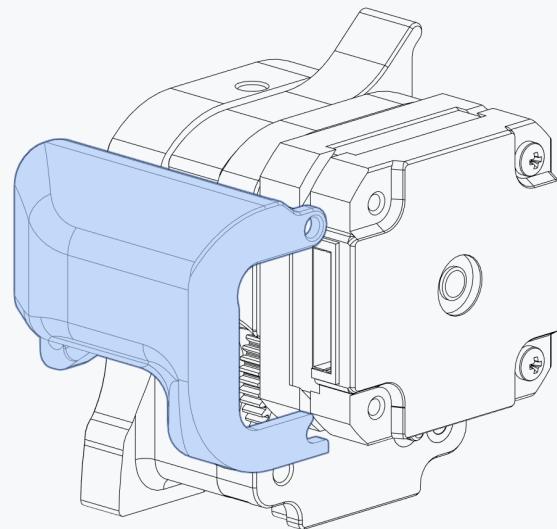
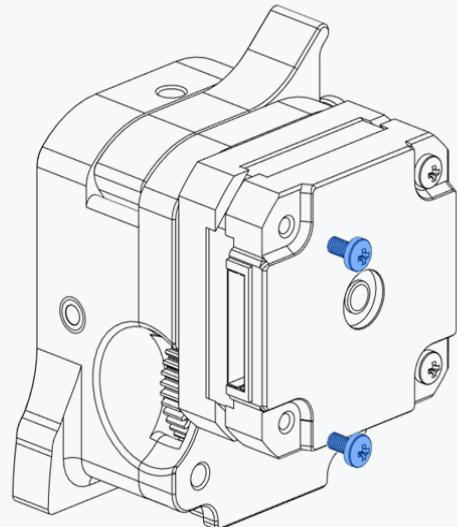
**CHECK BEARING FIT**

The bearings must slip on and off the shaft easily. Pressing the bearings on the shaft will damage them. Lightly sand the shaft if required.

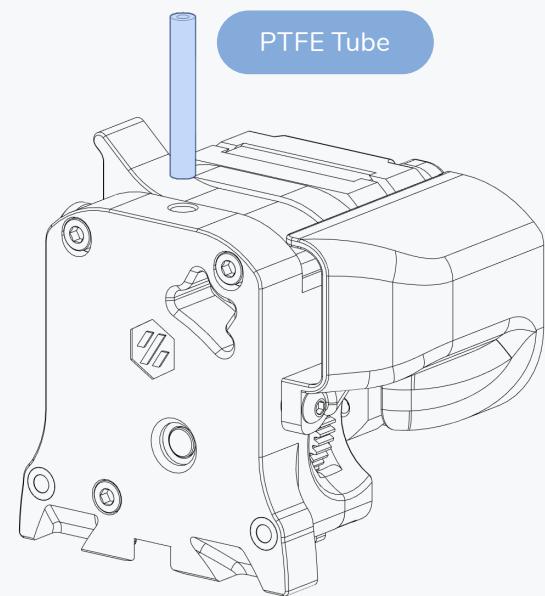
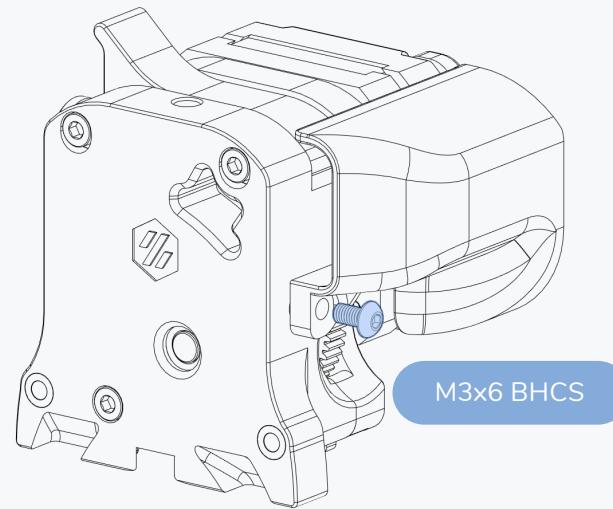
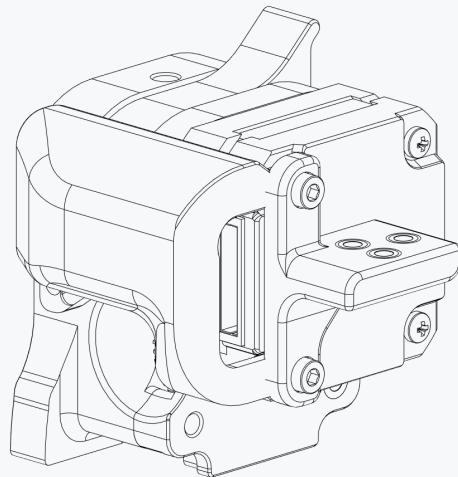
CLOCKWORK

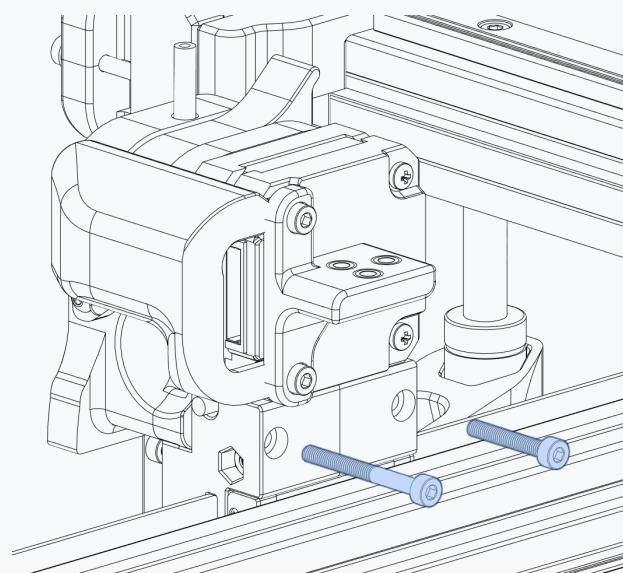
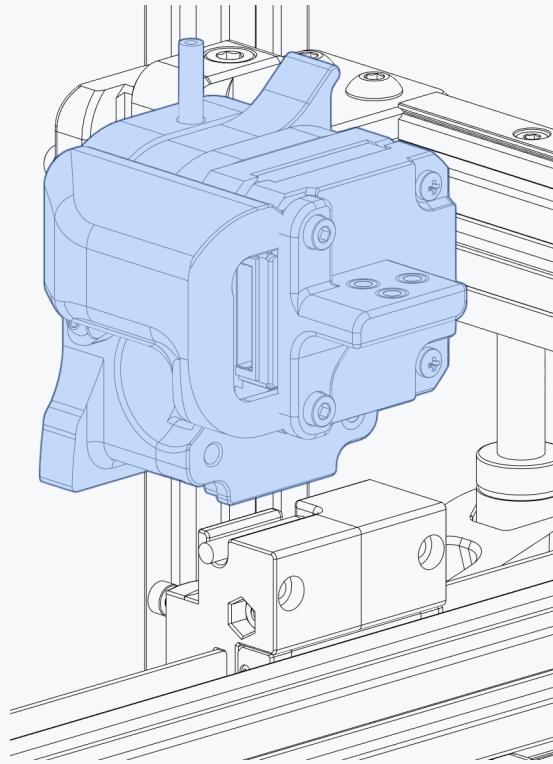
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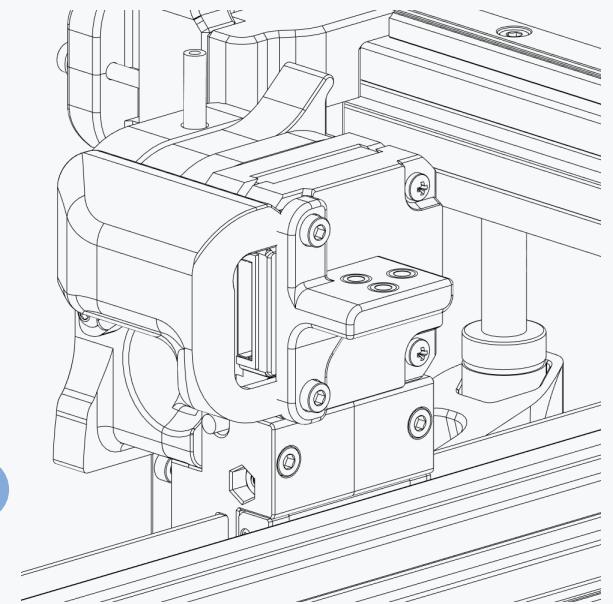
M3x20 SHCS

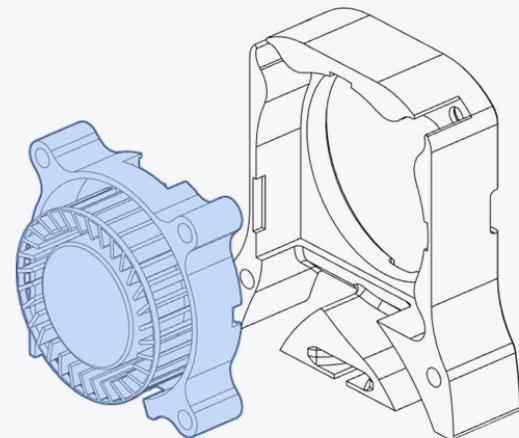




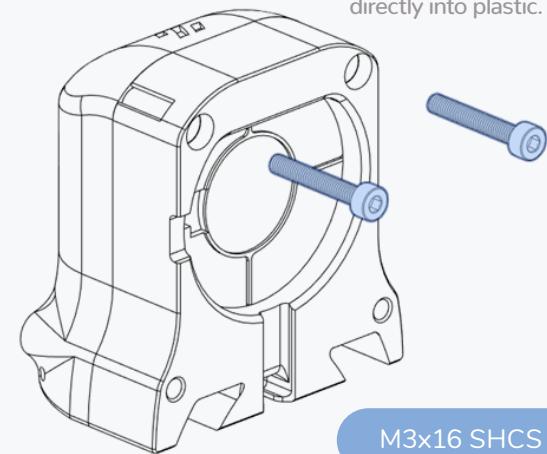
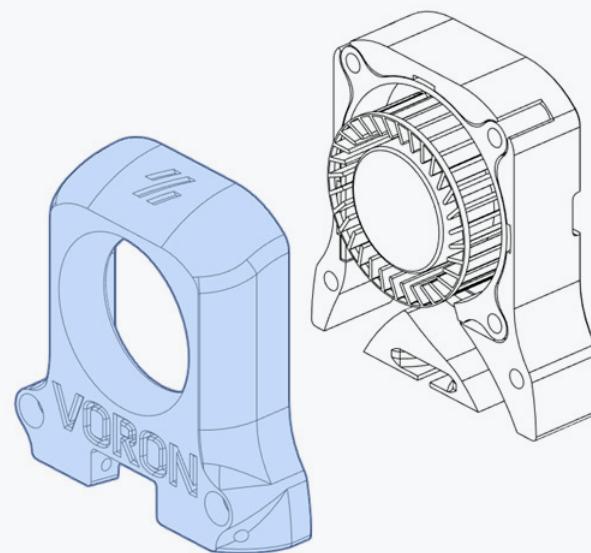
M3x30 SHCS

M3x20 SHCS



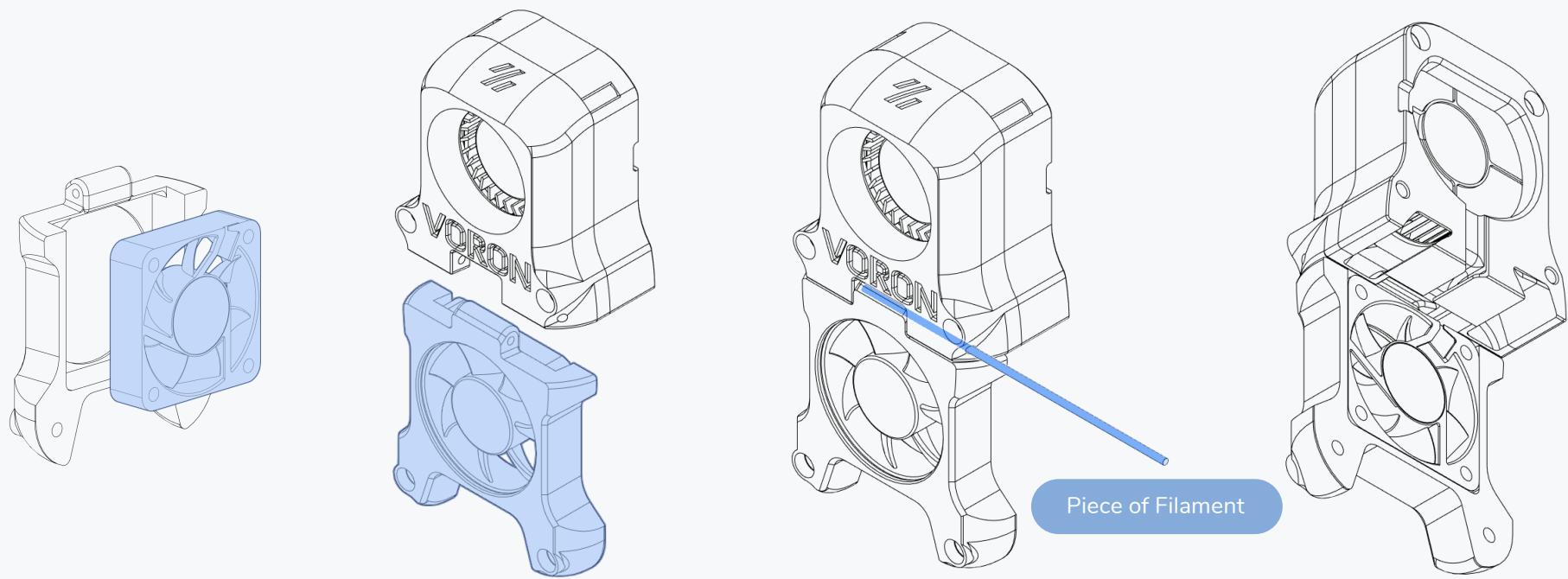
**REMOVE TOP COVER**

Split the fan open by bending the tabs on the side.

**M3x16 SHCS****DON'T OVER TIGHTEN**
The screws are screwed directly into plastic.

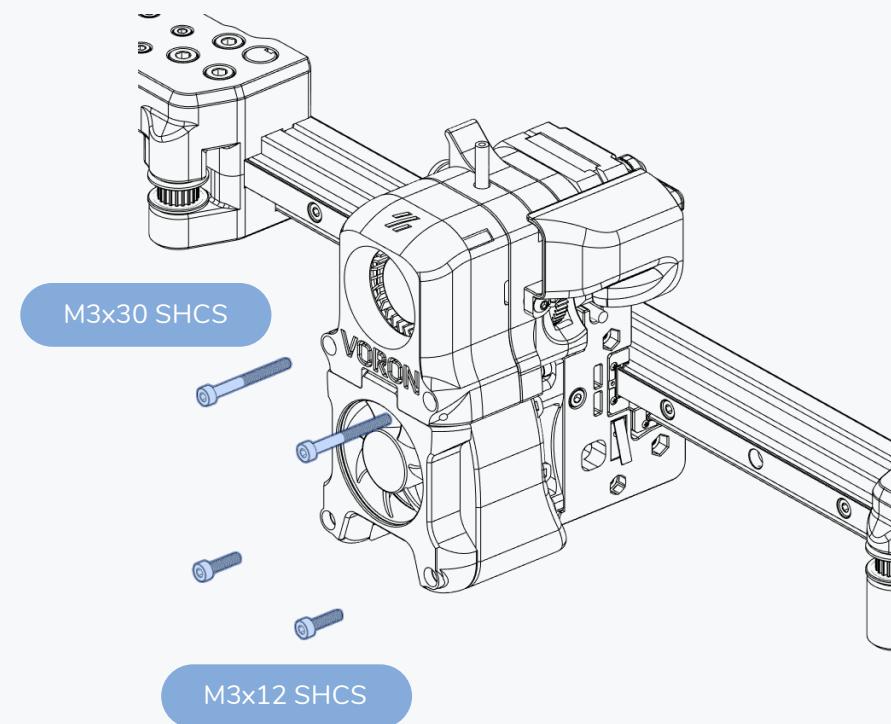
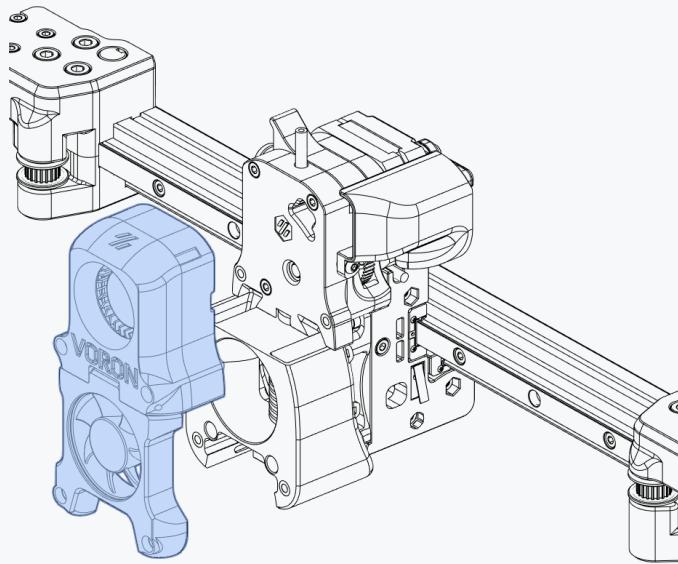
FAN ASSEMBLY

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FAN ASSEMBLY

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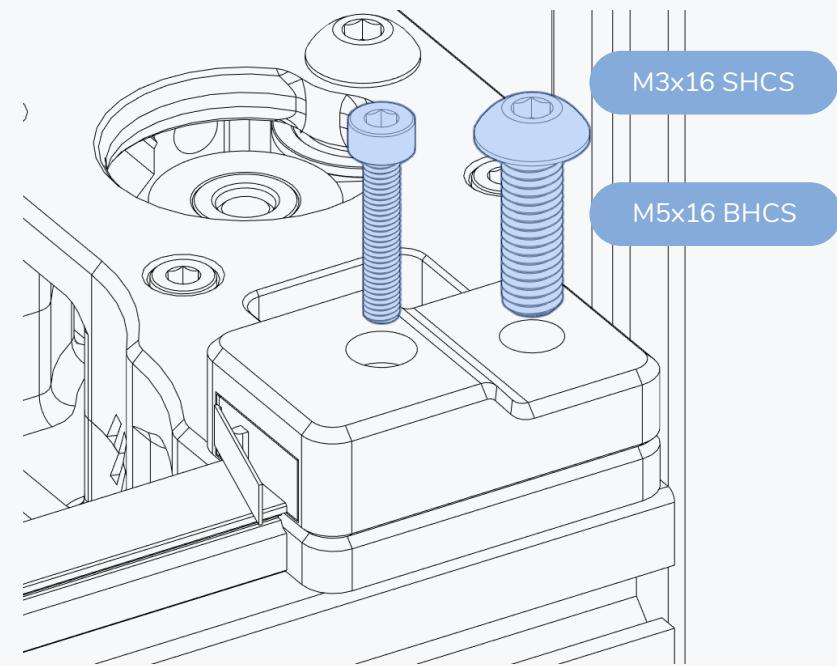
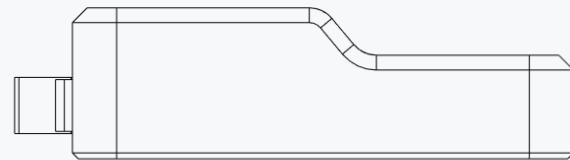
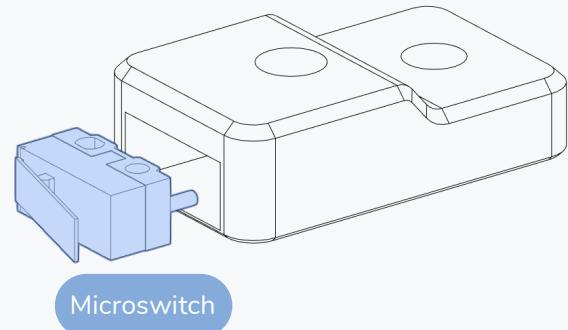
PRINT BED & WIRE PATH

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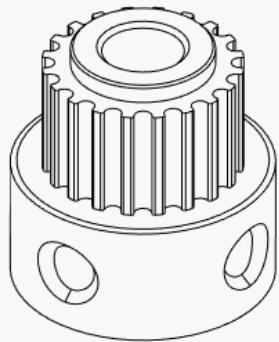
SOLDER WIRES

Solder 500mm of wire to the microswitch before inserting it flush into the housing.

**PRELOADED NUTS**

The nuts have been installed several chapters before.

GT2 Pulley

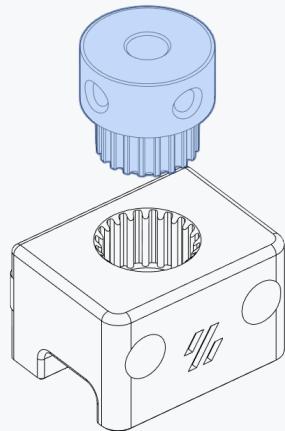
**REMOVE FLANGE & GRUB SCREWS**

Use a bottle opener or some pliers to remove the top flange.

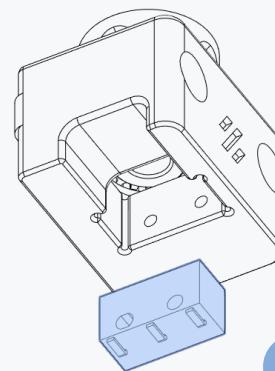
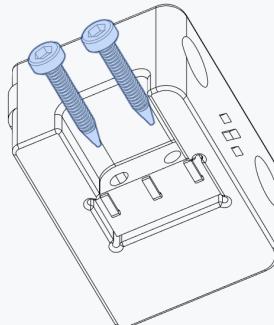
Remove the grub screws from the pulley.

PRESS FIT

Apply the required force to fully seat the pulley in the printed part.

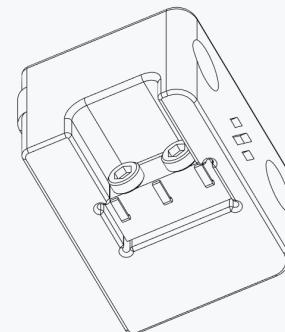


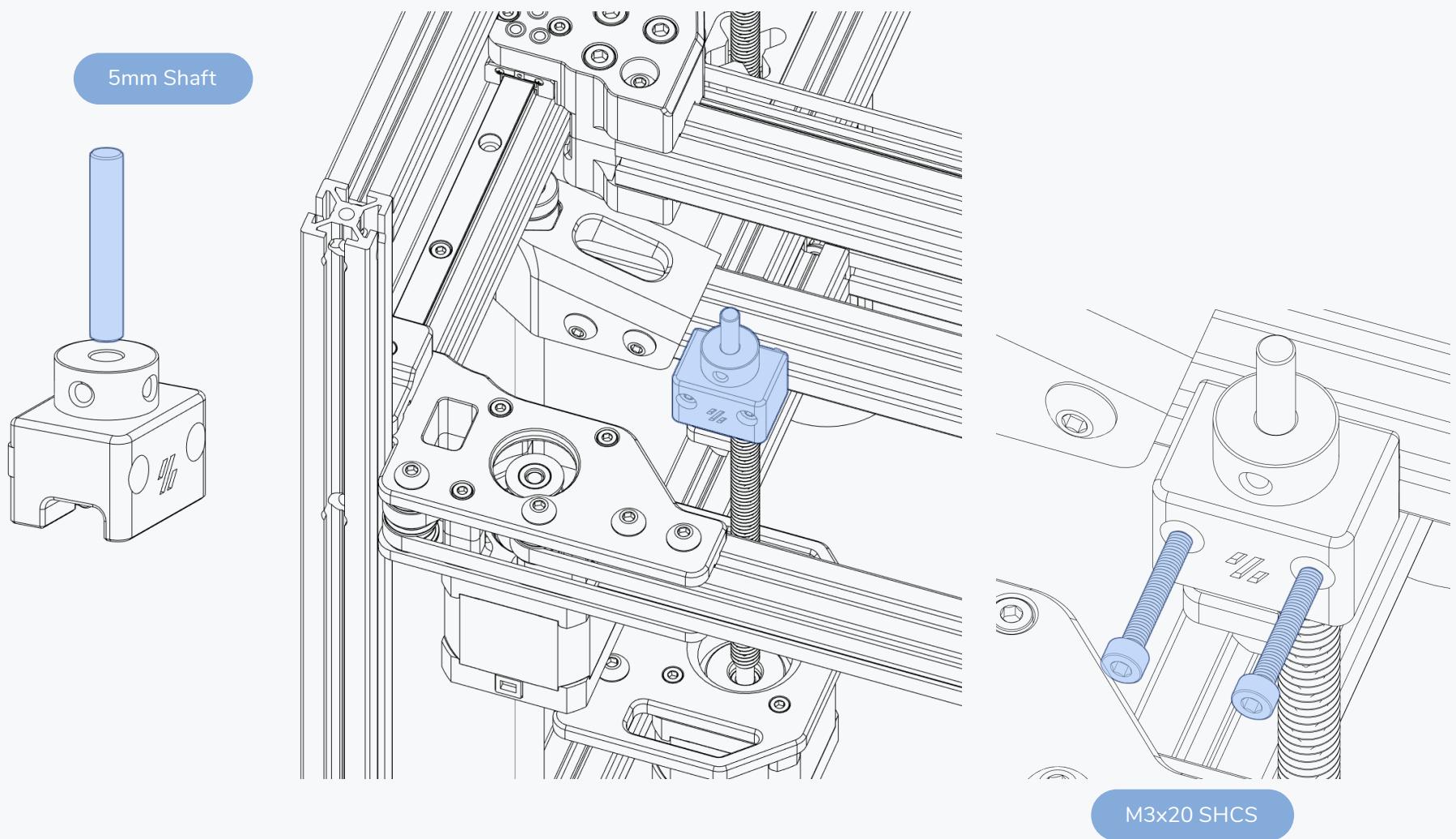
M2x10 Self Tapping

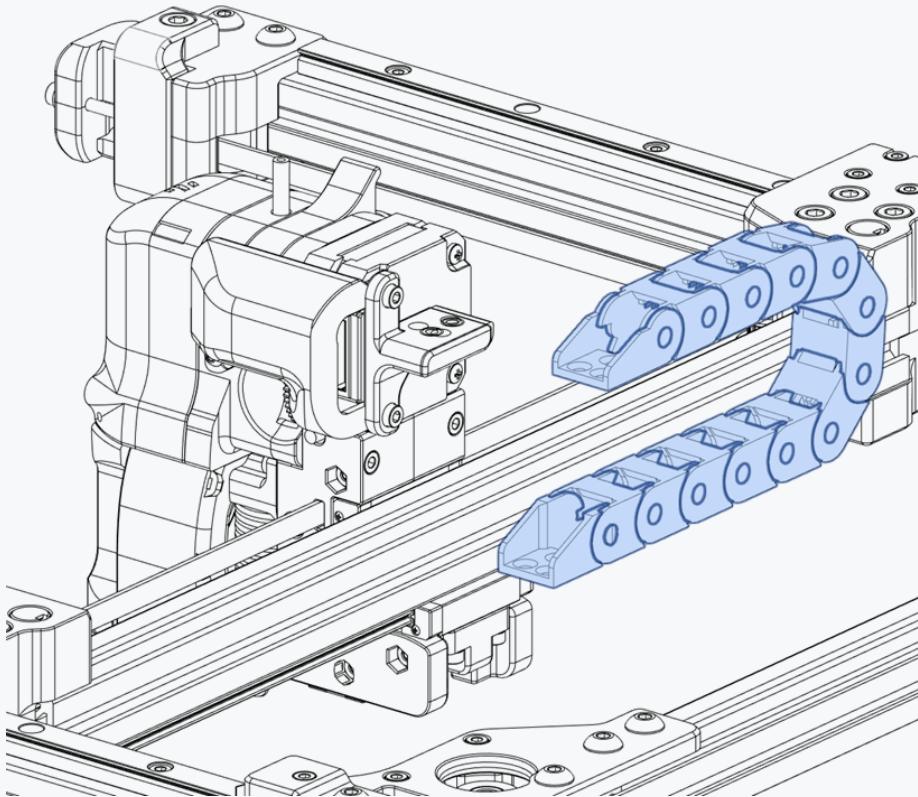
**SOLDER WIRES**

Solder 100mm of wire to the microswitch before inserting it into the housing.

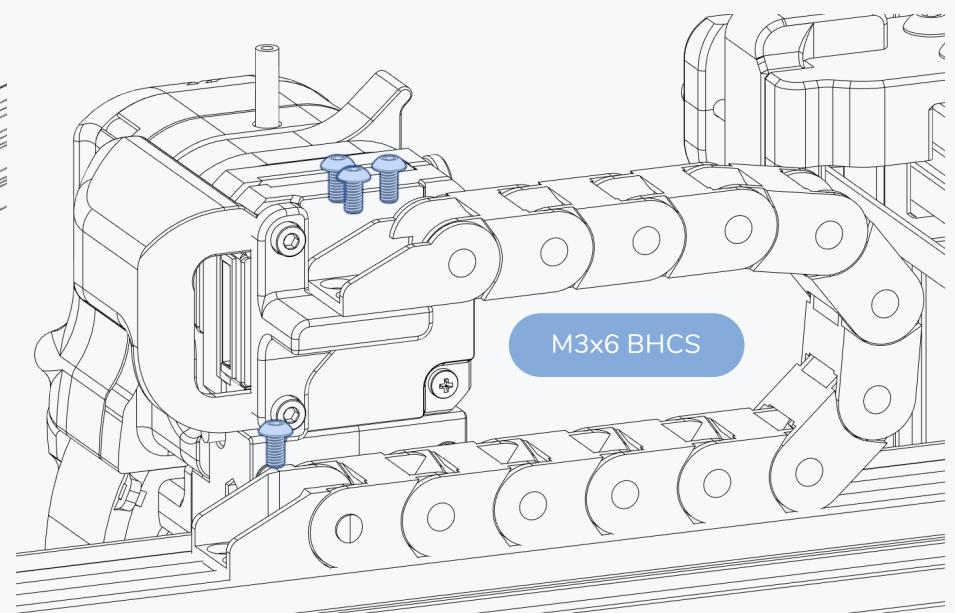
Microswitch





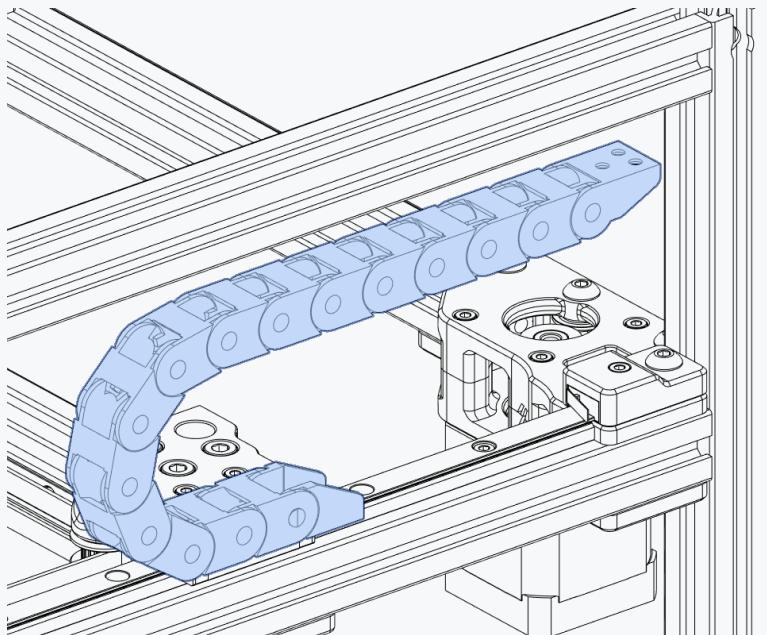
**FIXED END VS. FREE END**

Some cable chains only have one end that is able to swing freely. Use this end on the back of the Afterburner.



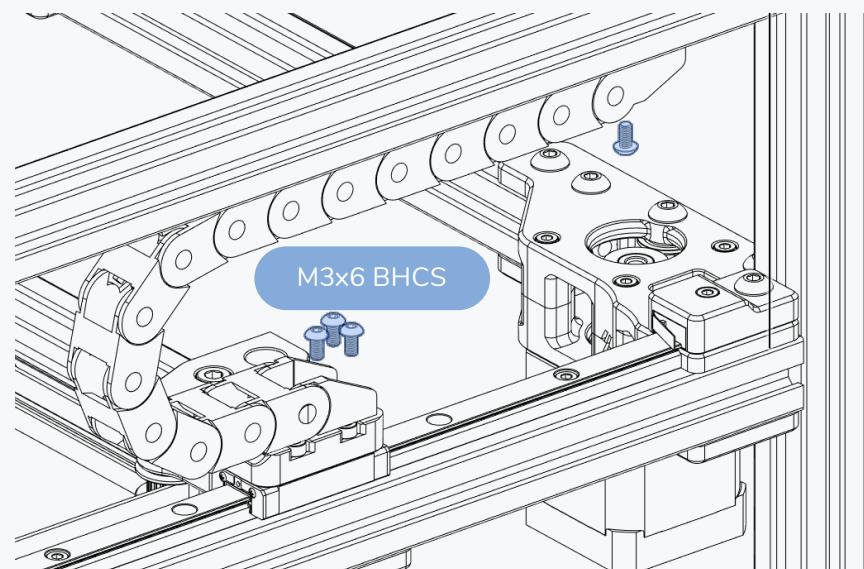
CABLE CHAIN

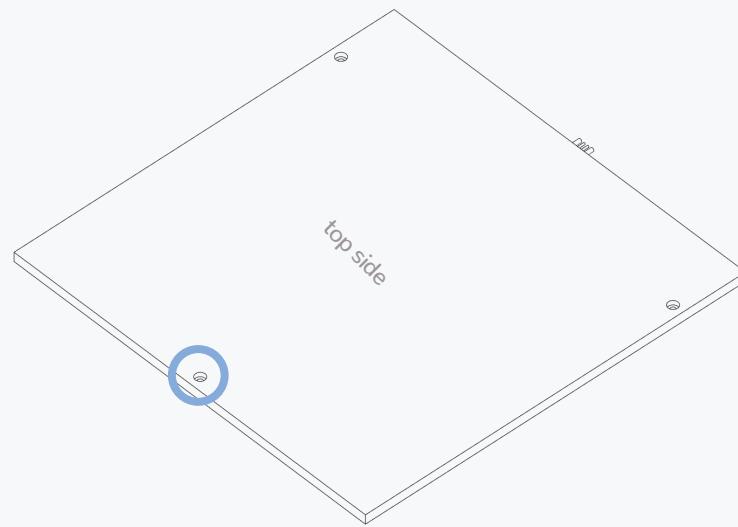
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FIXED END VS. FREE END

If you cable chain as a fixed and use this end
on the XY joint.





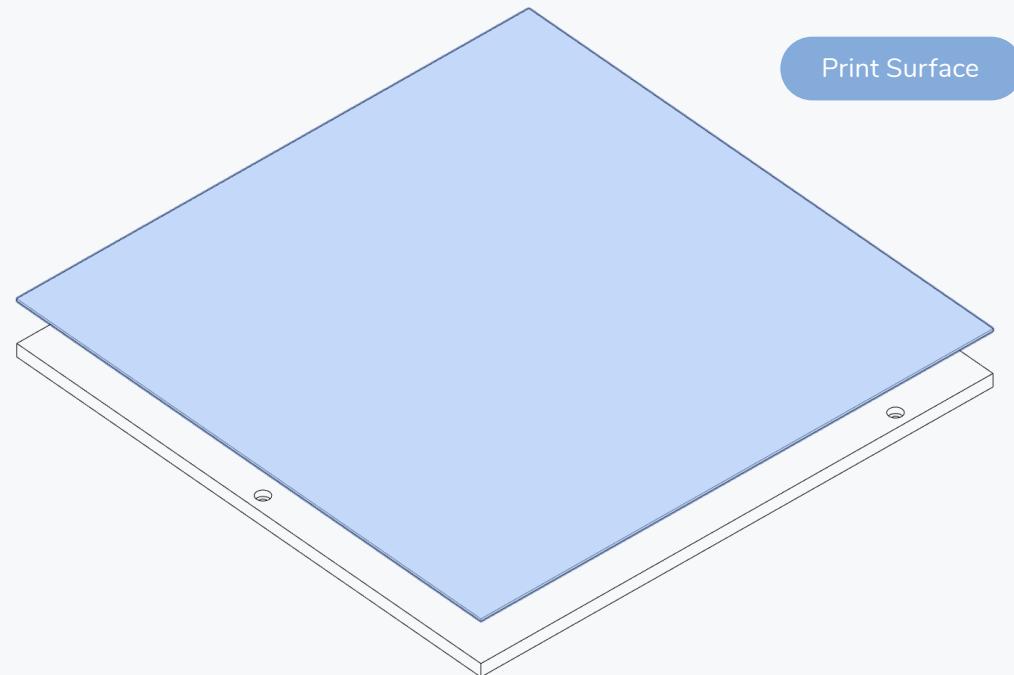
PRINT SURFACE

The print surface can be applied directly to the print bed or alternatively a magnet based removable system can be used.

A removable surface is recommended.

Preinstalling the screws is possible but not recommended as those will interfere with the heater application.

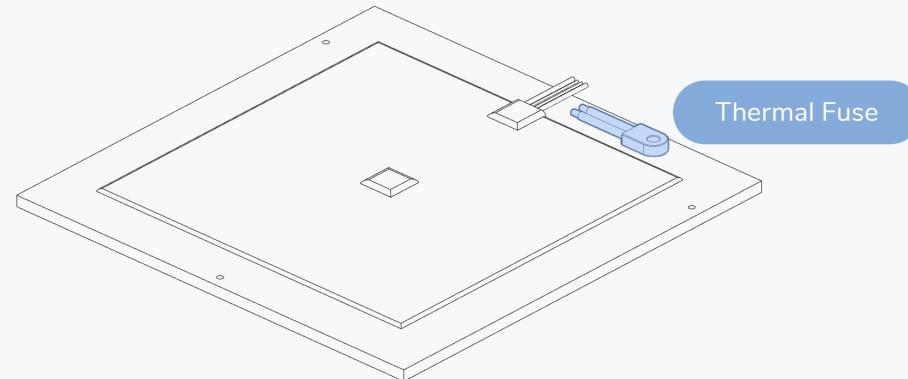
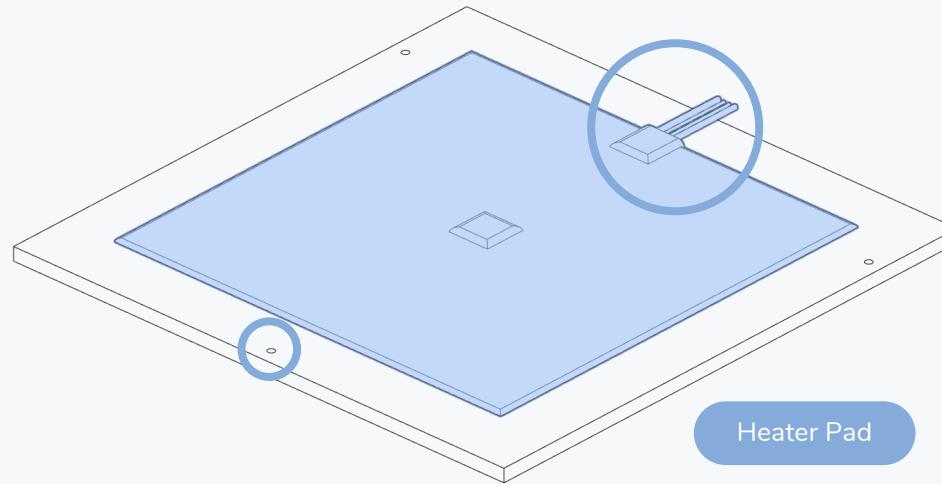
Read/watch a guide about the proper application if you are unsure.

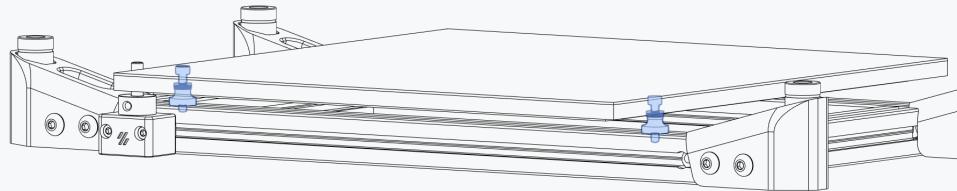


HEATER APPLICATION

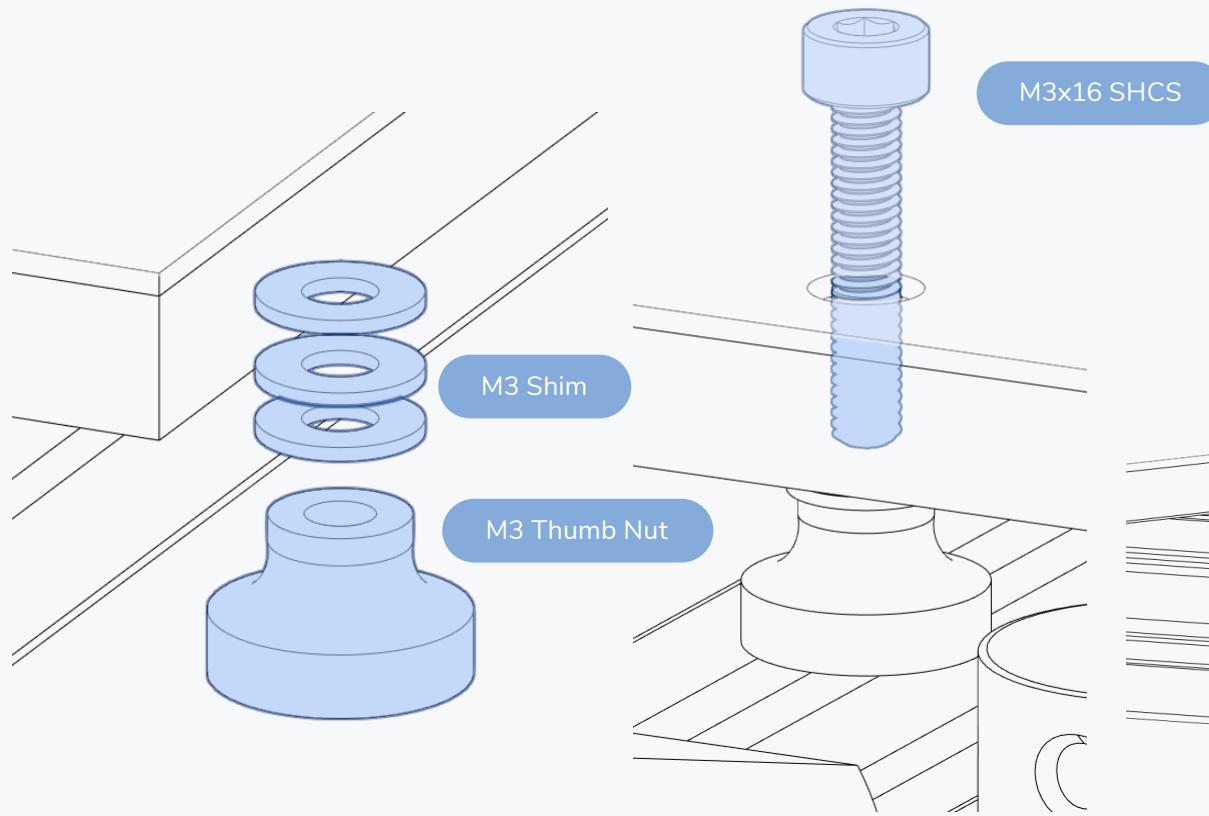
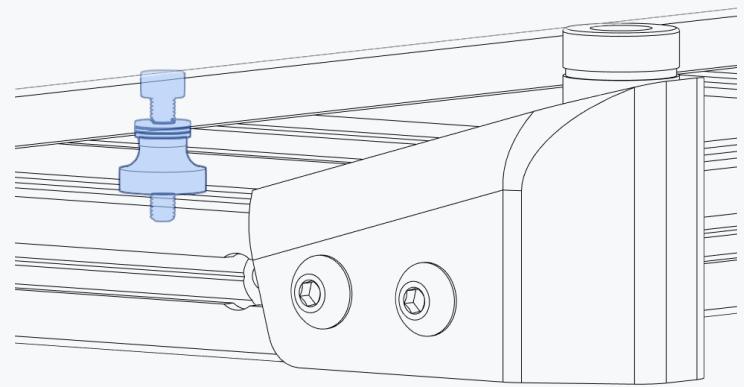
Attach the heater to the bottom of the plate with wires facing away from the center hole.

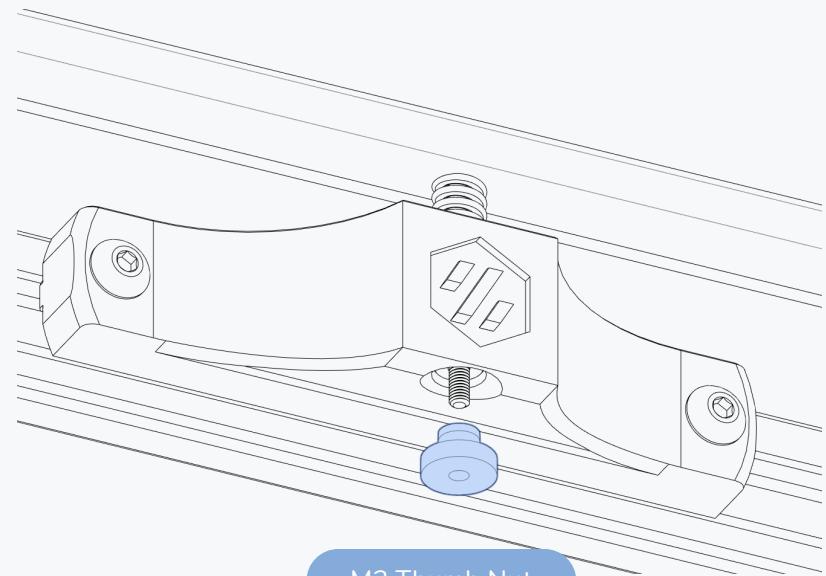
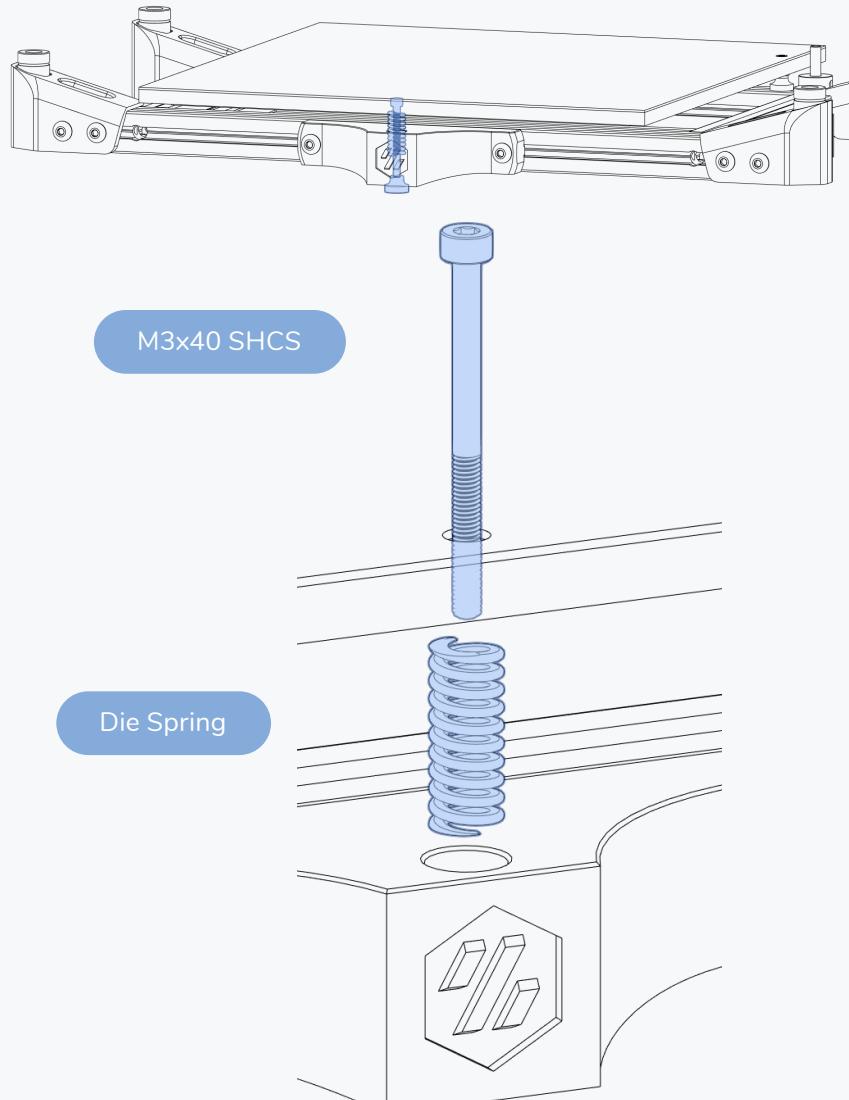
Read/watch a guide on heater installation if you are unsure about the procedure.

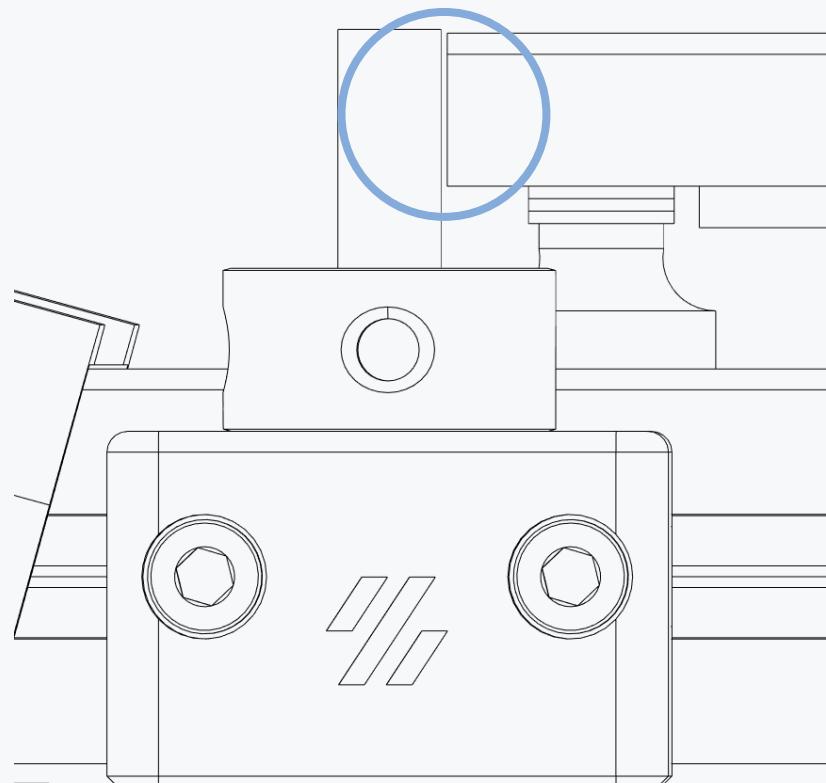


**SCREW ACCESS HOLES**

Cut holes for the screws.

**REPEAT FOR SECOND MOUNT**





ADJUST Z ENDSTOP POSITION

The shaft of the Z Endstop must not touch the print bed.
Adjust the position if required.

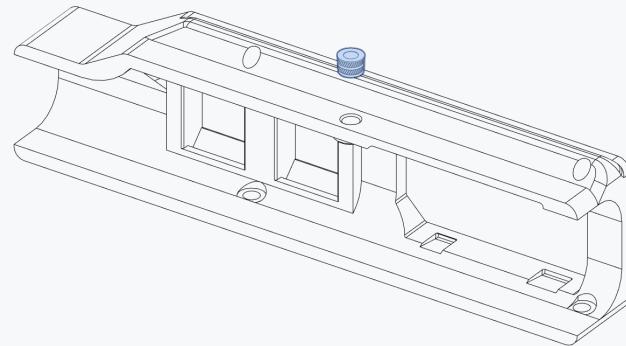
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SKIRTS & BOTTOM COMPARTMENT

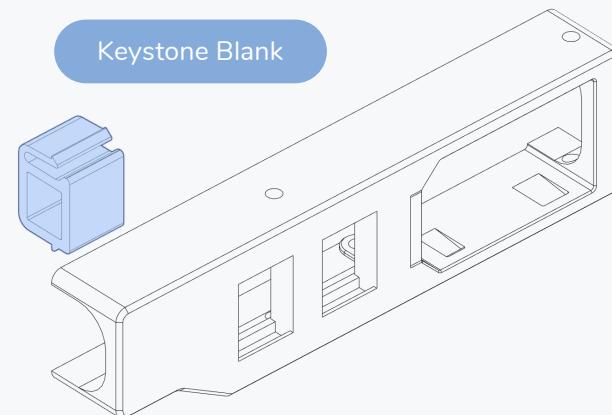
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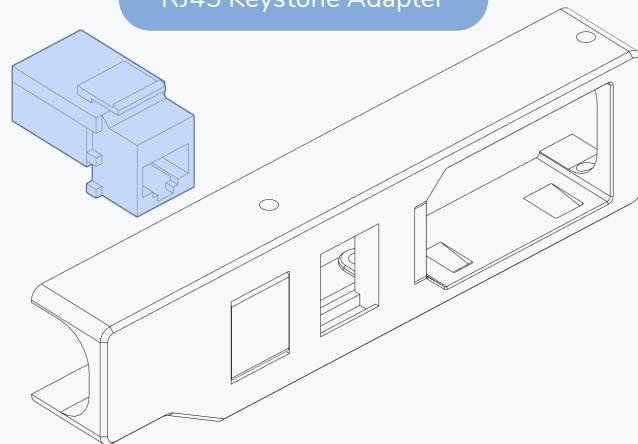
Heat Set Insert



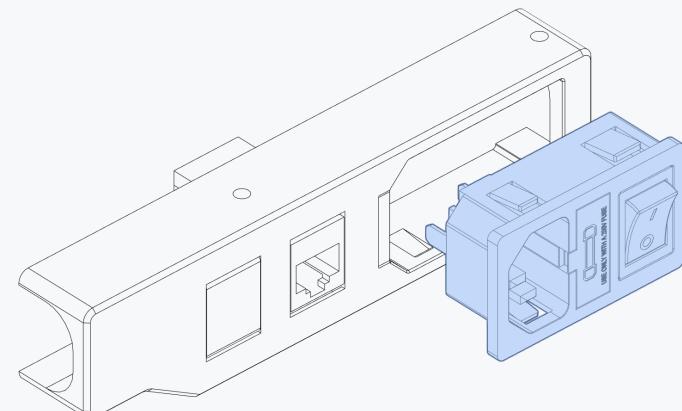
Keystone Blank

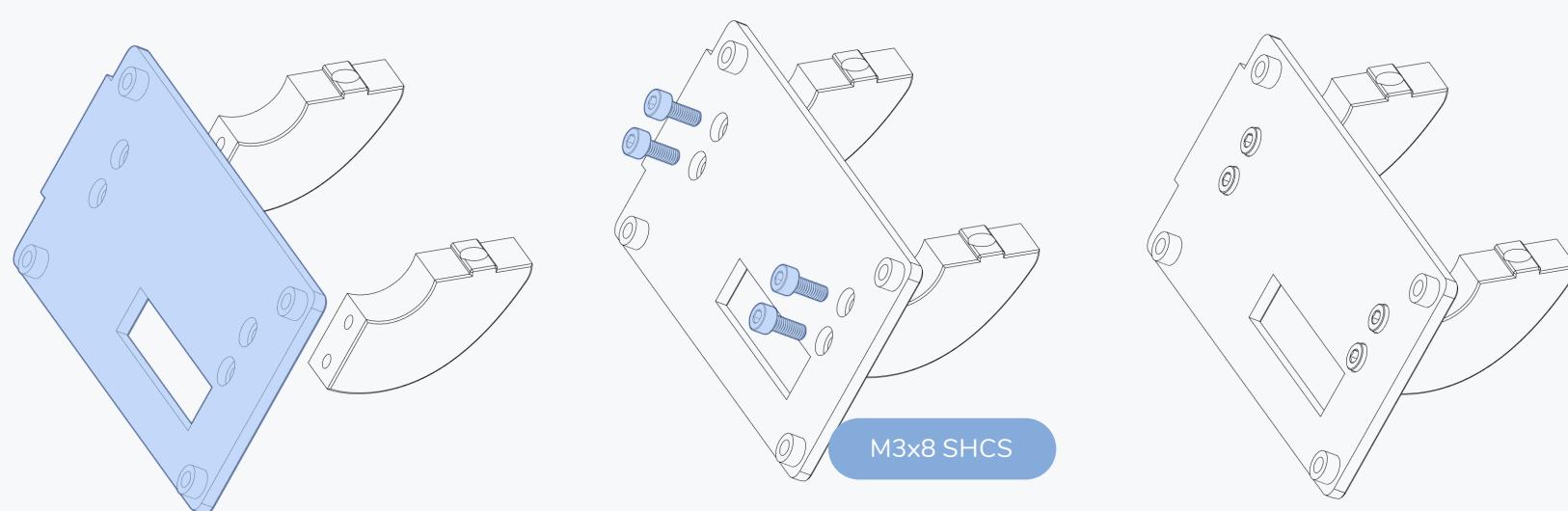
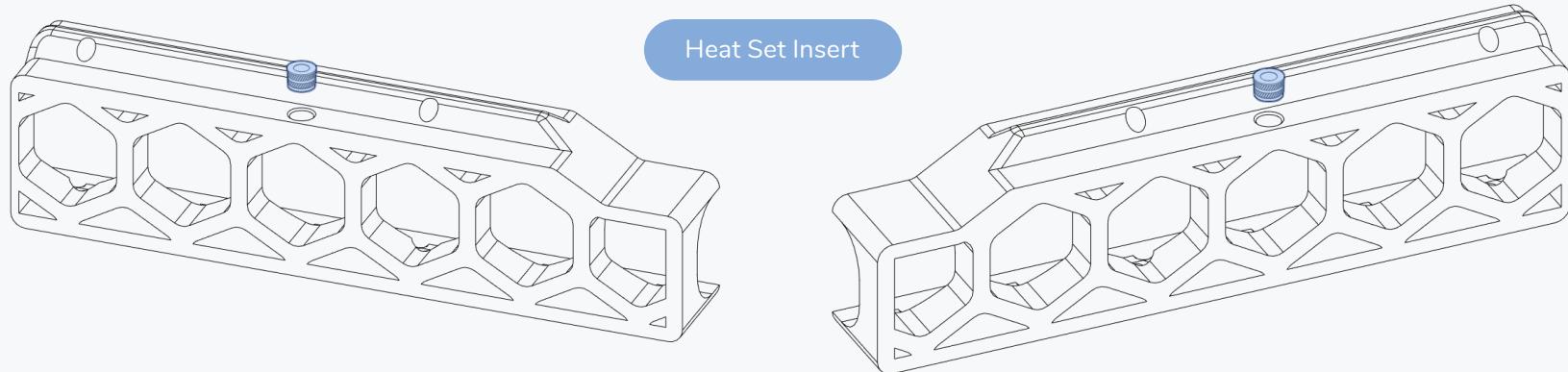


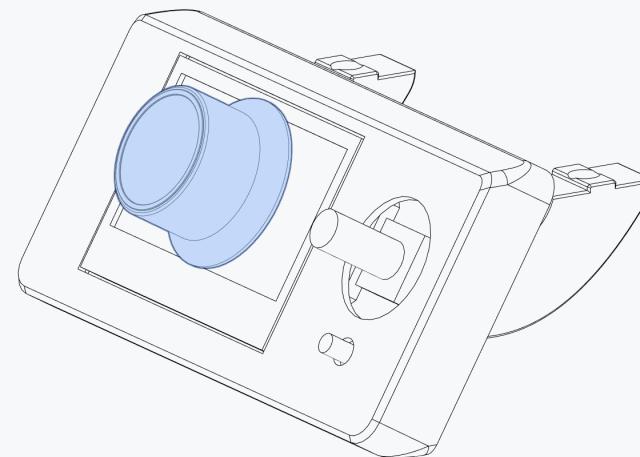
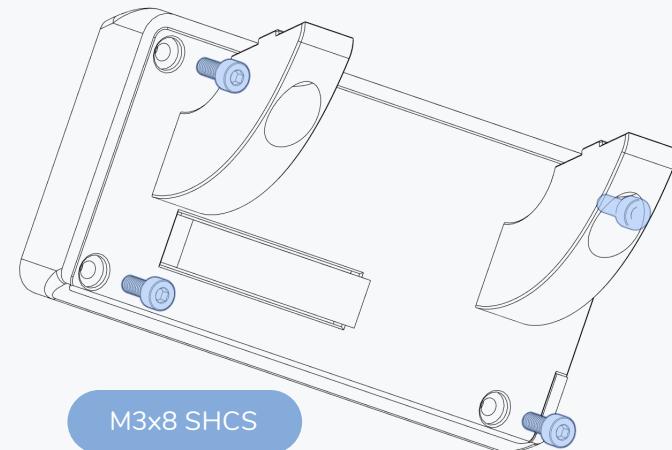
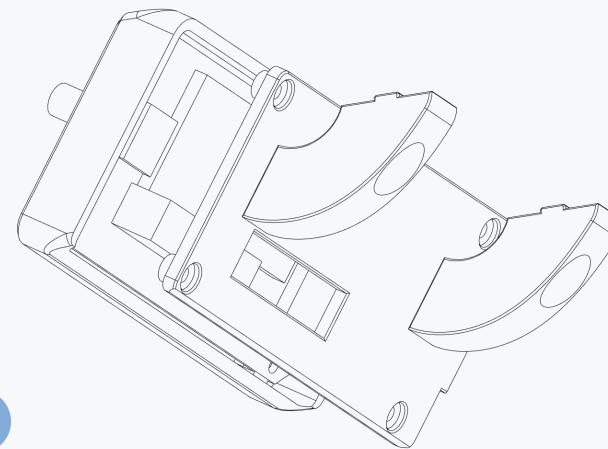
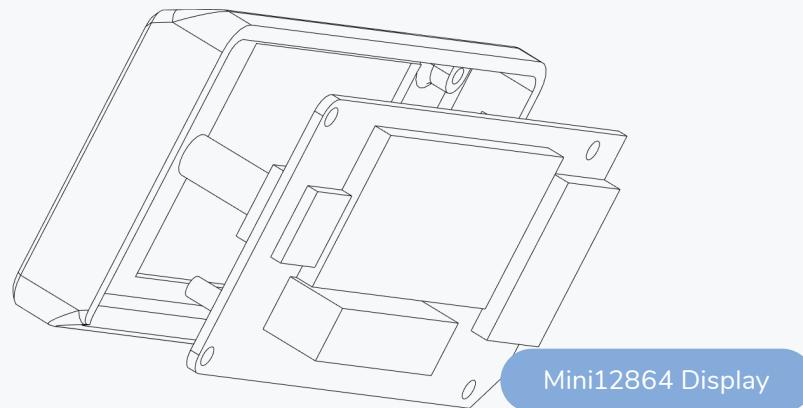
RJ45 Keystone Adapter

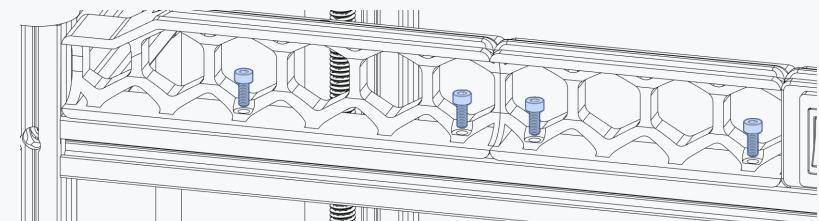
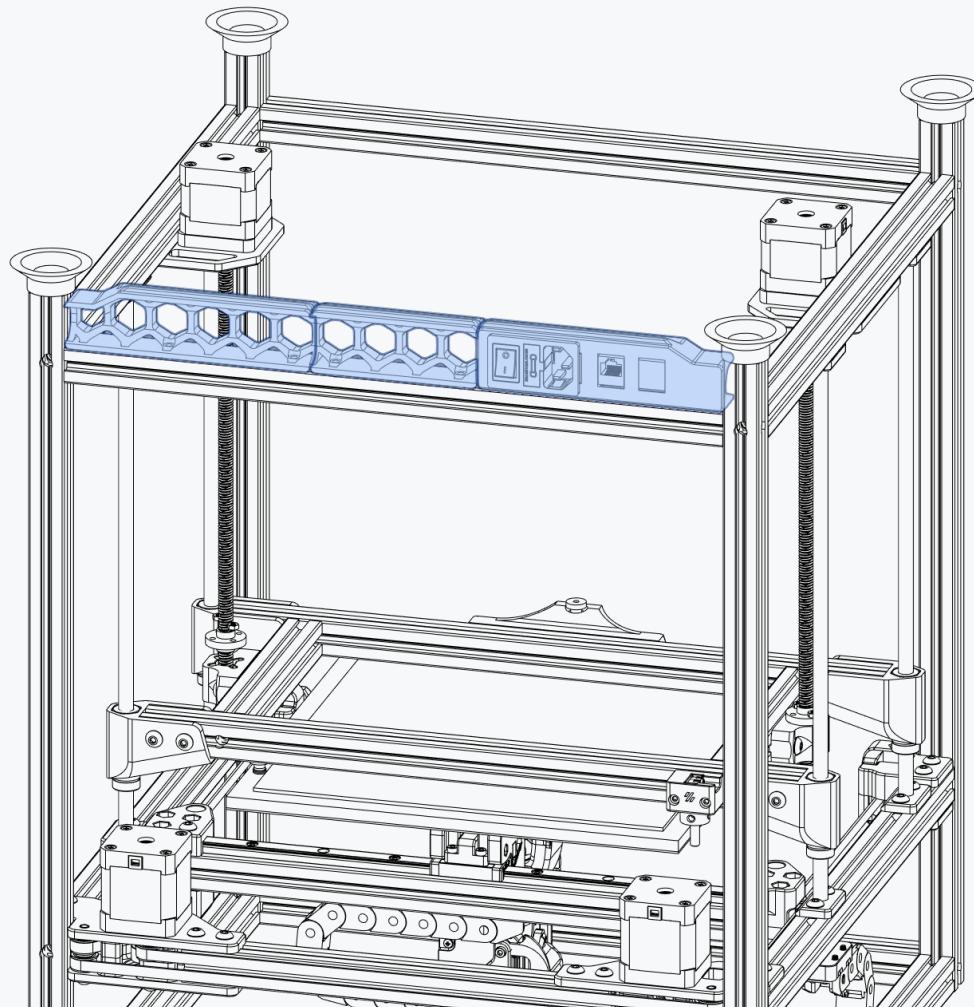


Power Inlet

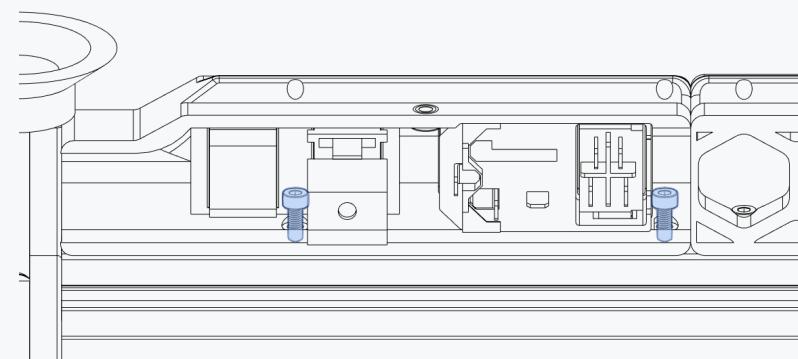


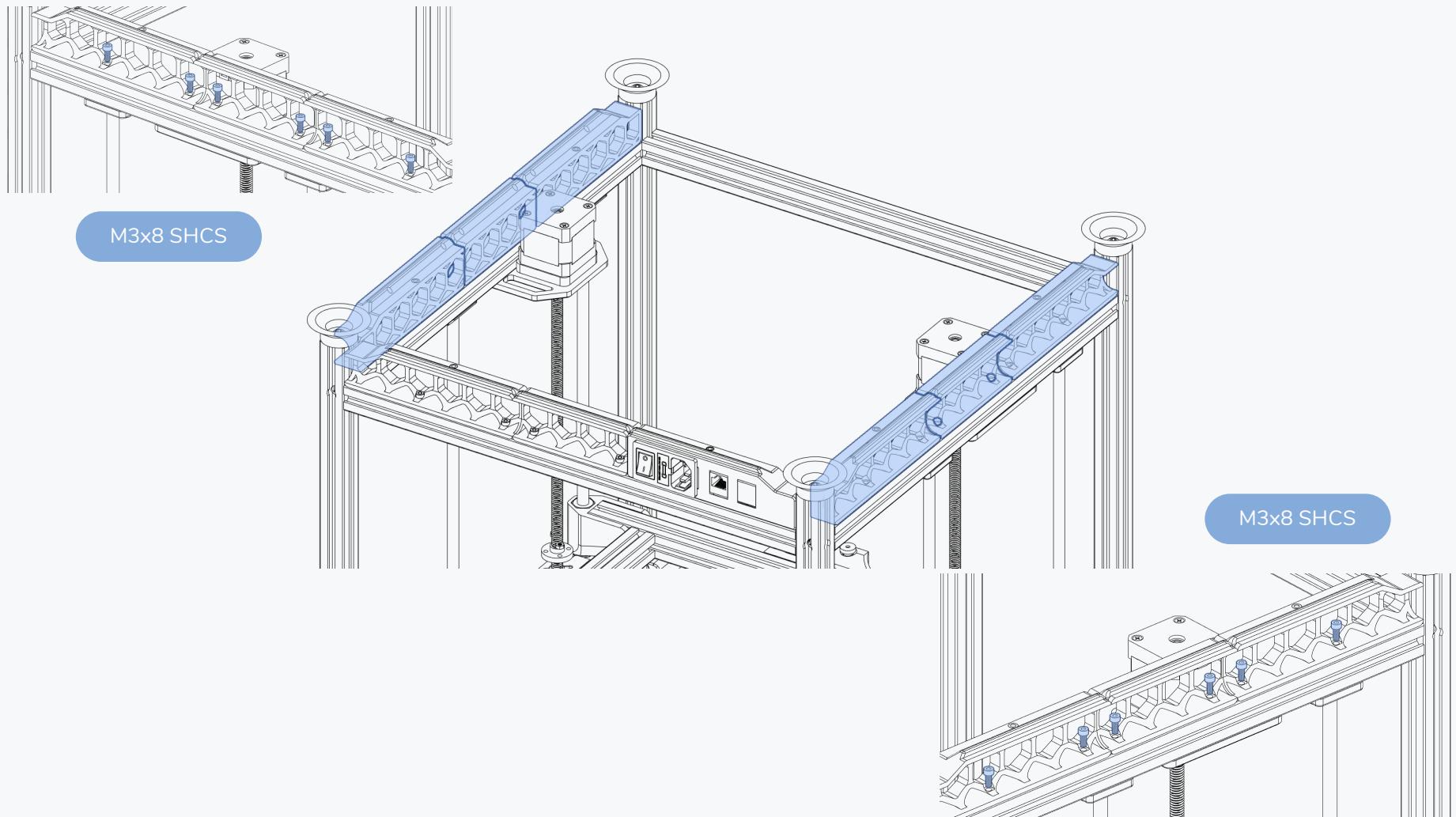


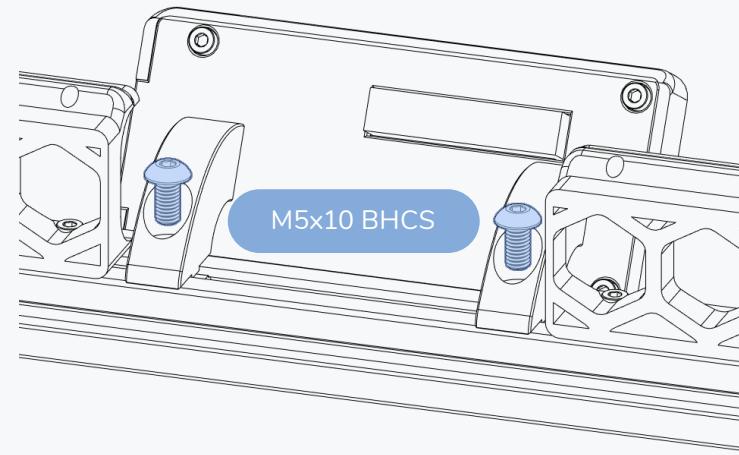
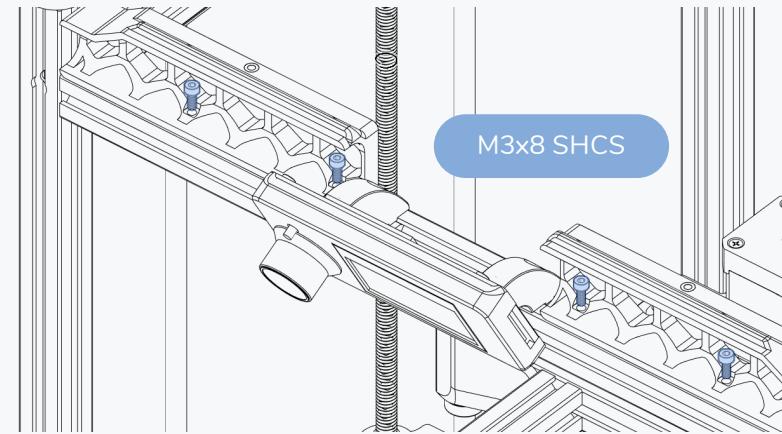
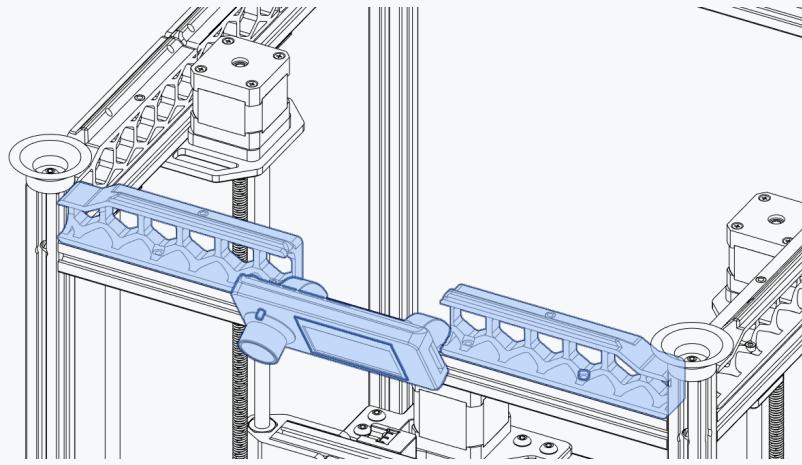


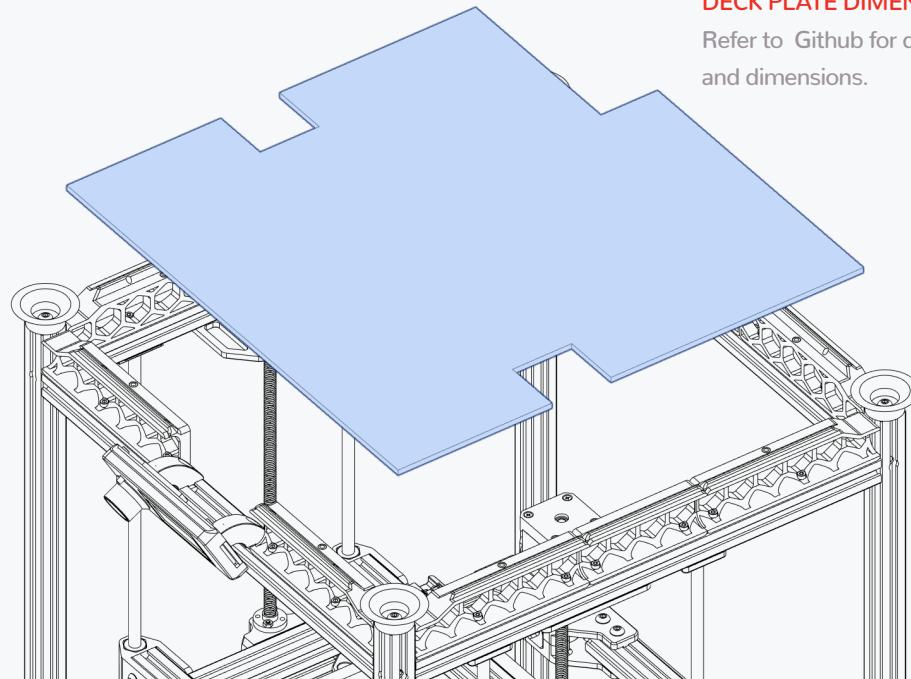


M3x8 SHCS

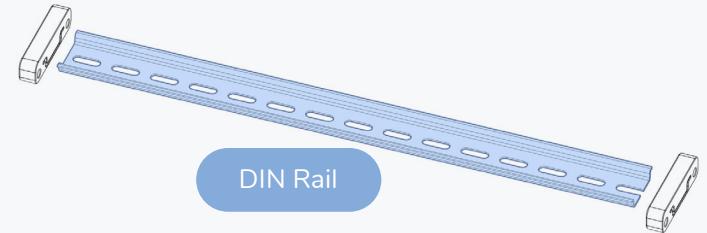
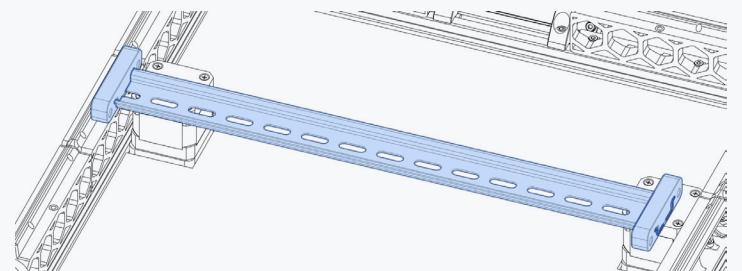






**DECK PLATE DIMENSIONS**

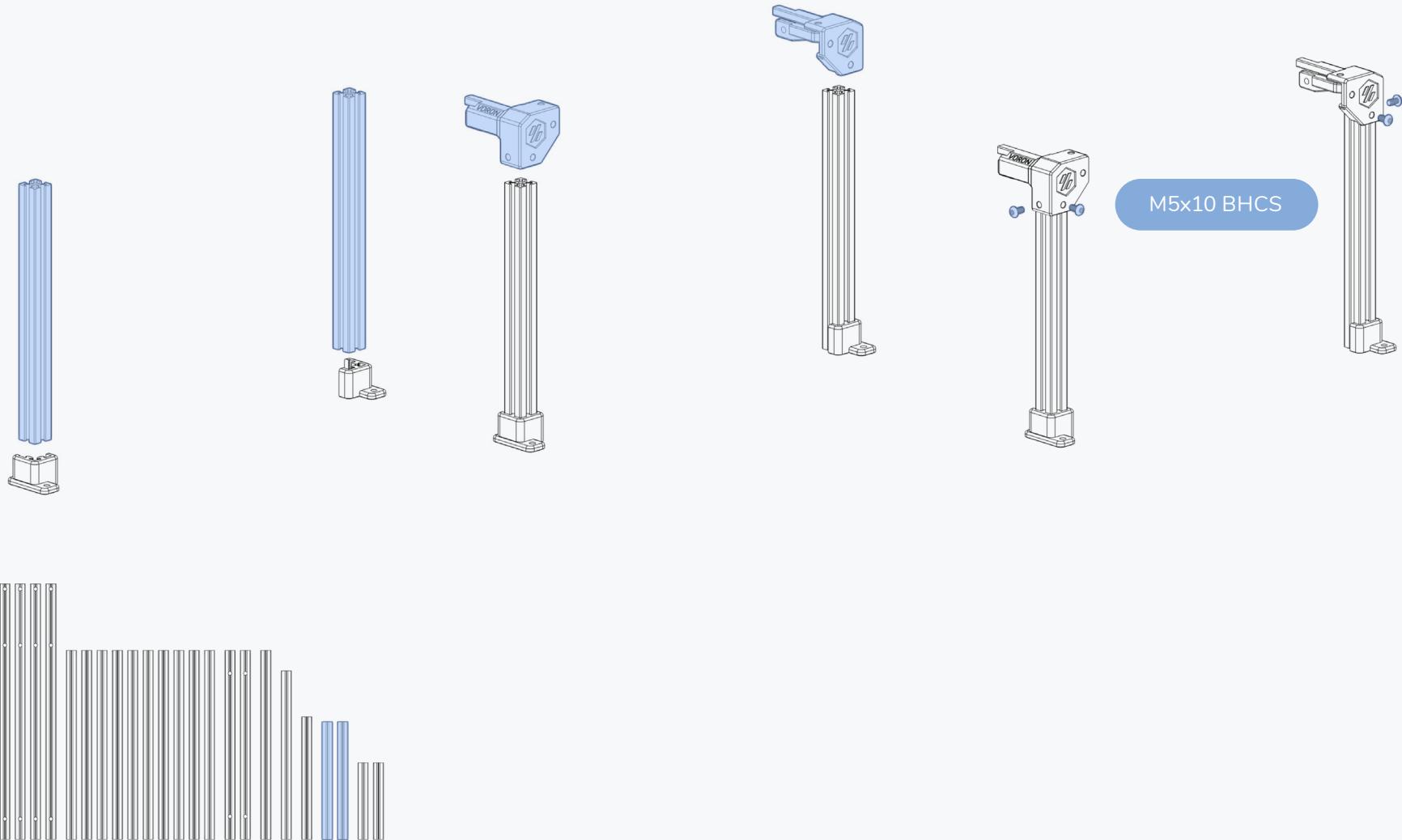
Refer to Github for drawings and dimensions.

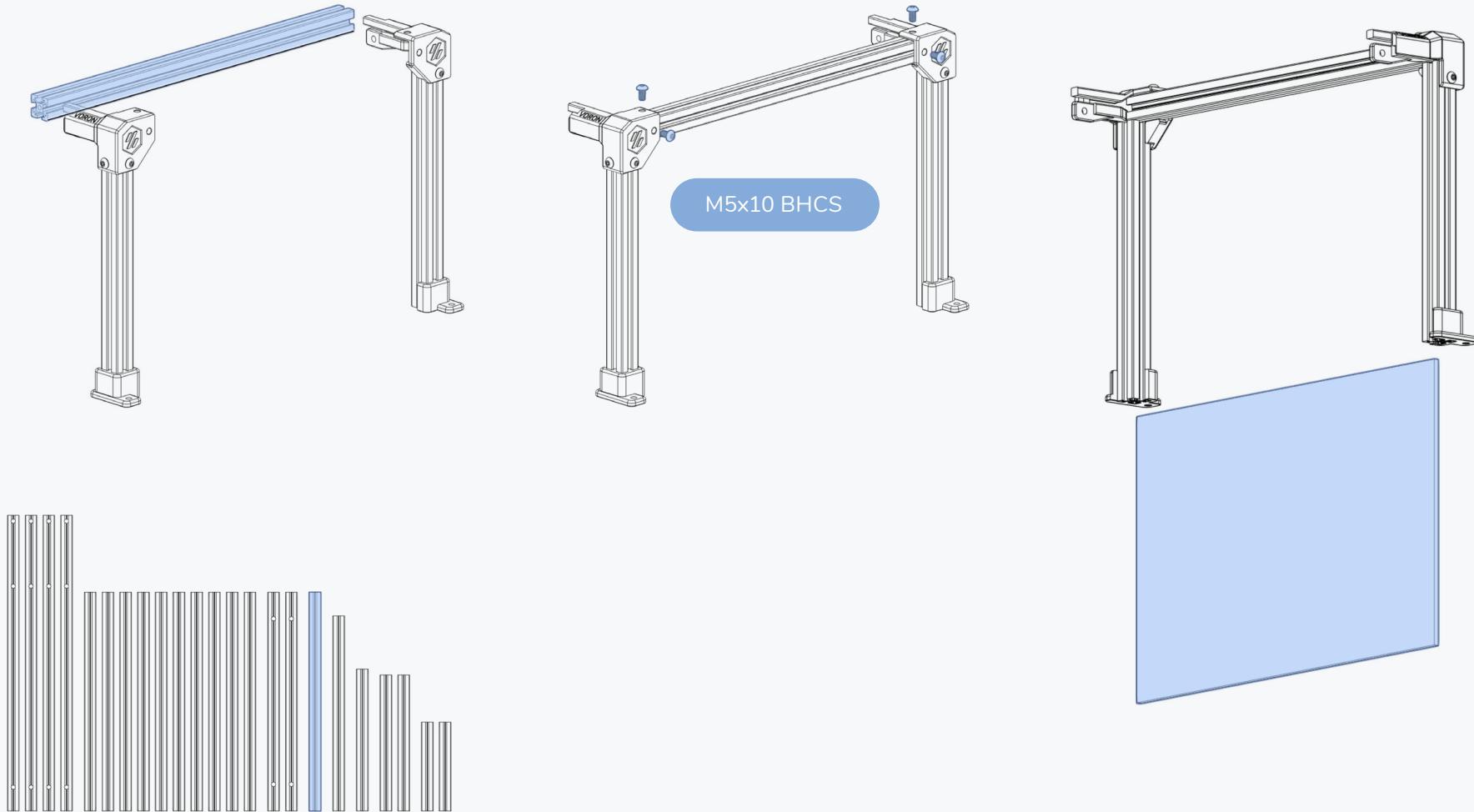
**DIN Rail****M5x16 BHCS**

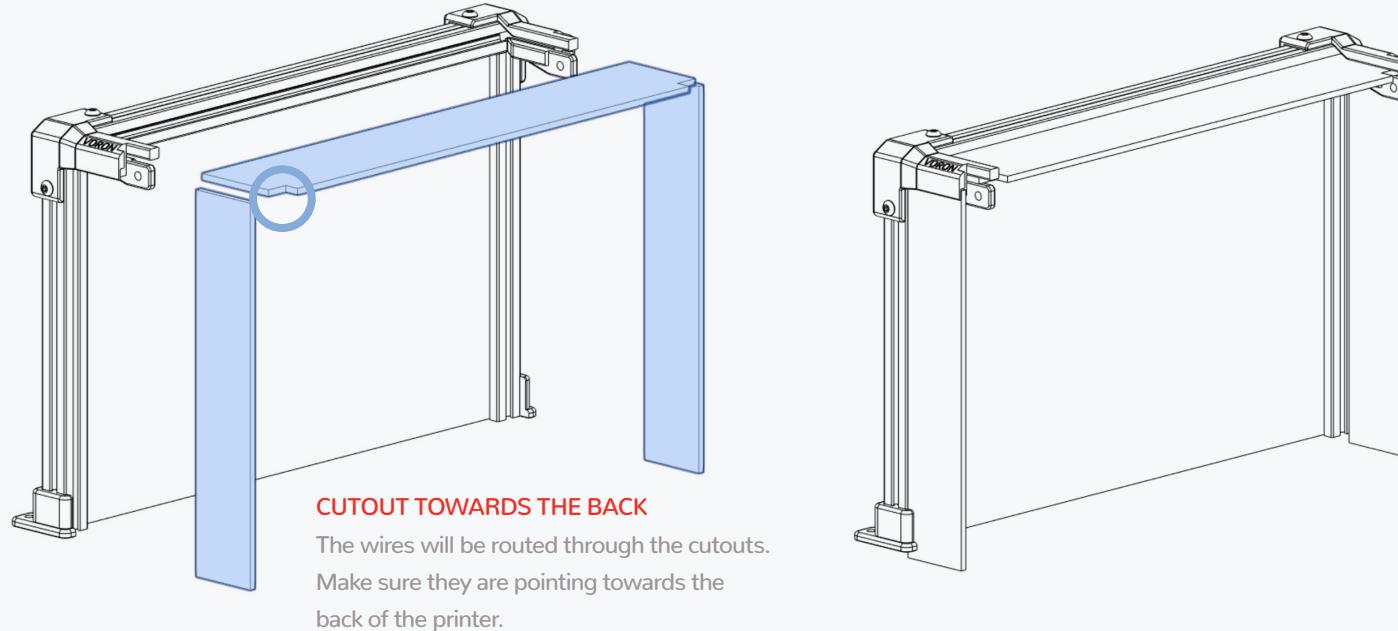
ELECTRONICS COMPARTMENT

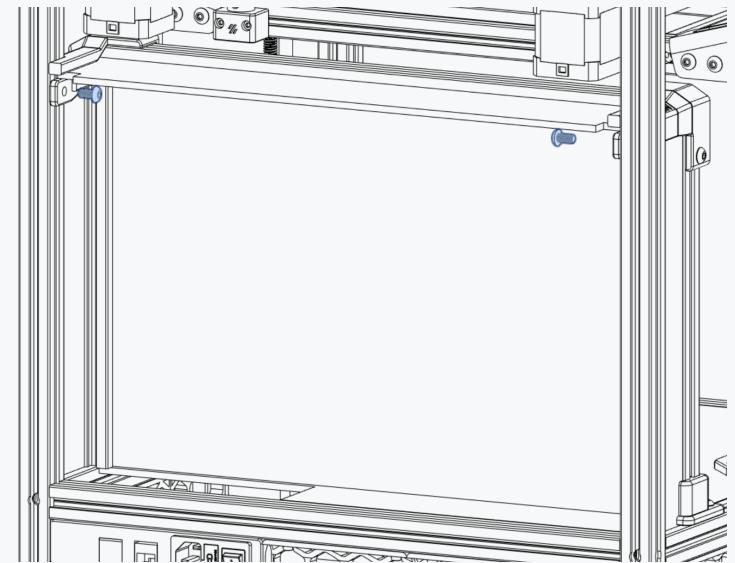
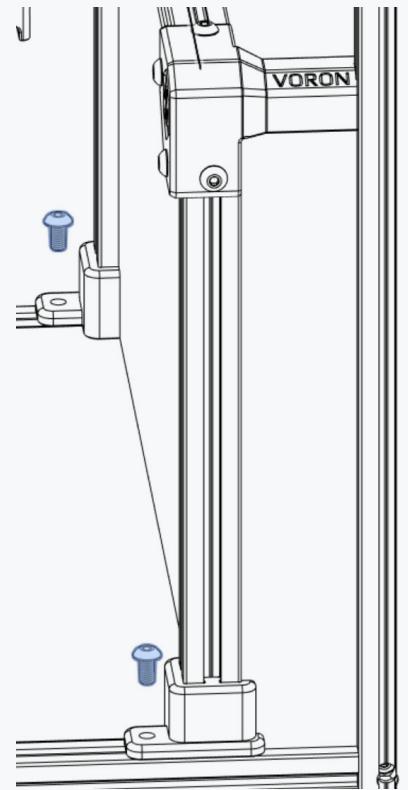
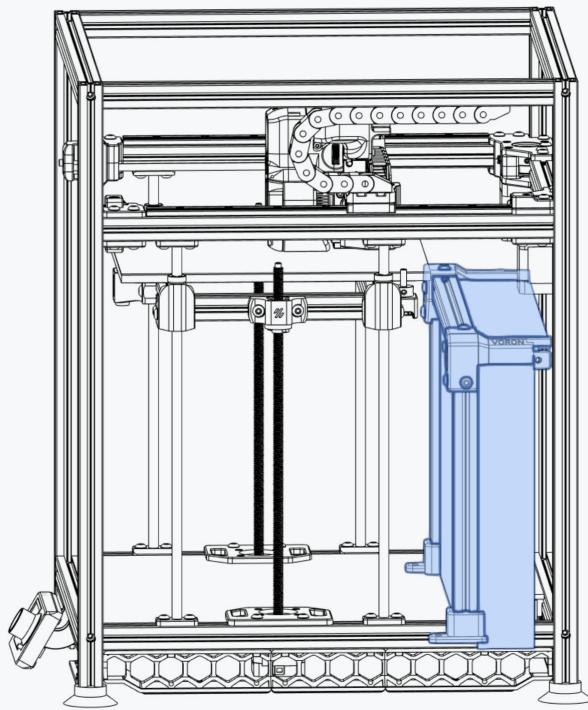
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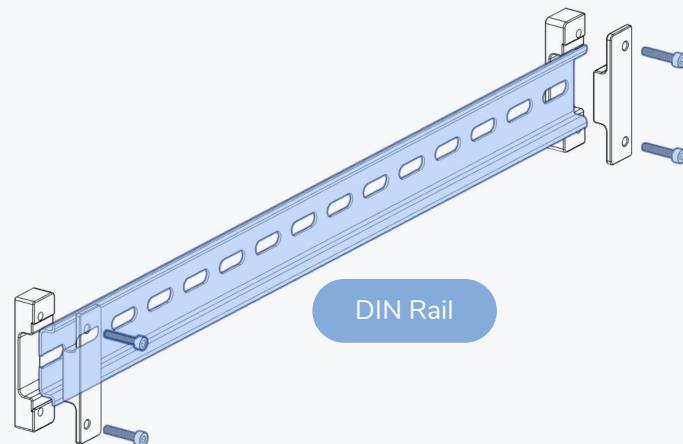




M5x10 BHCS

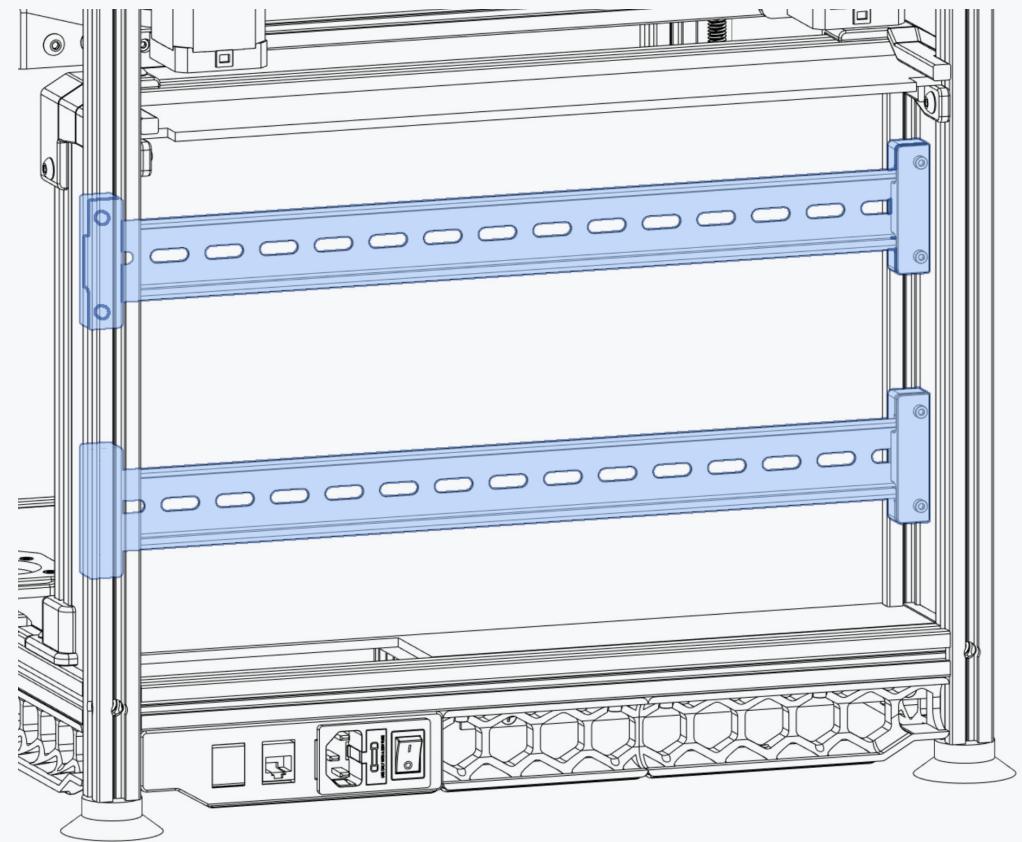
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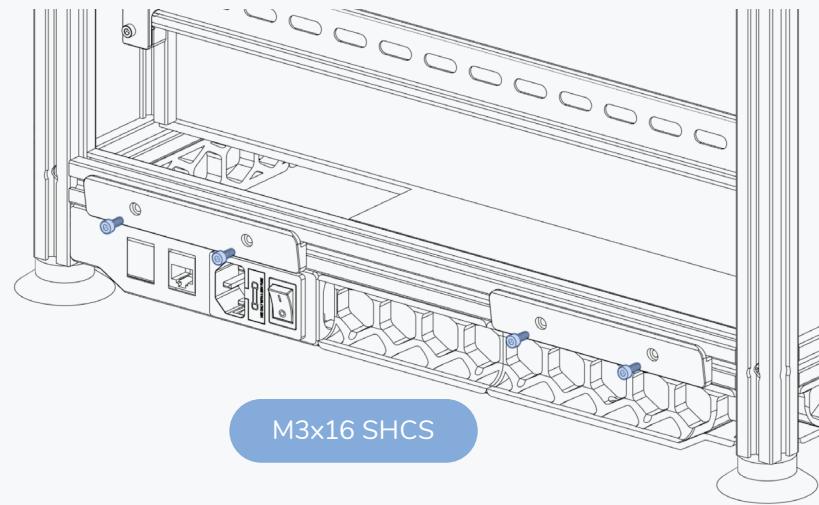
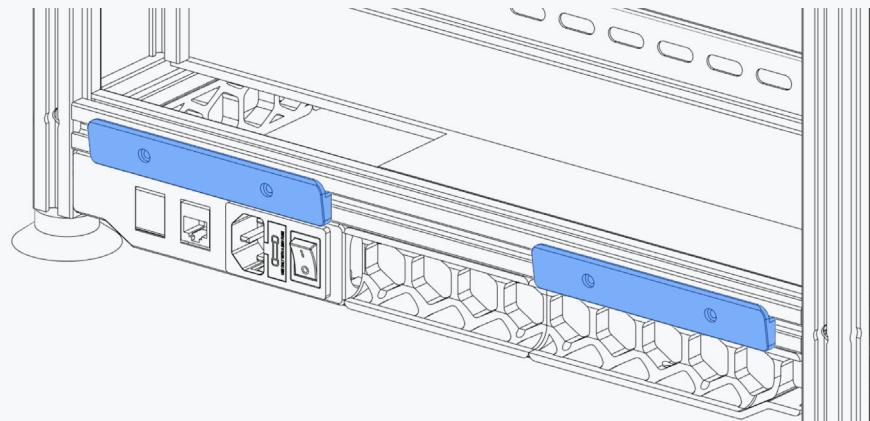
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DIN Rail

M3x16 SHCS

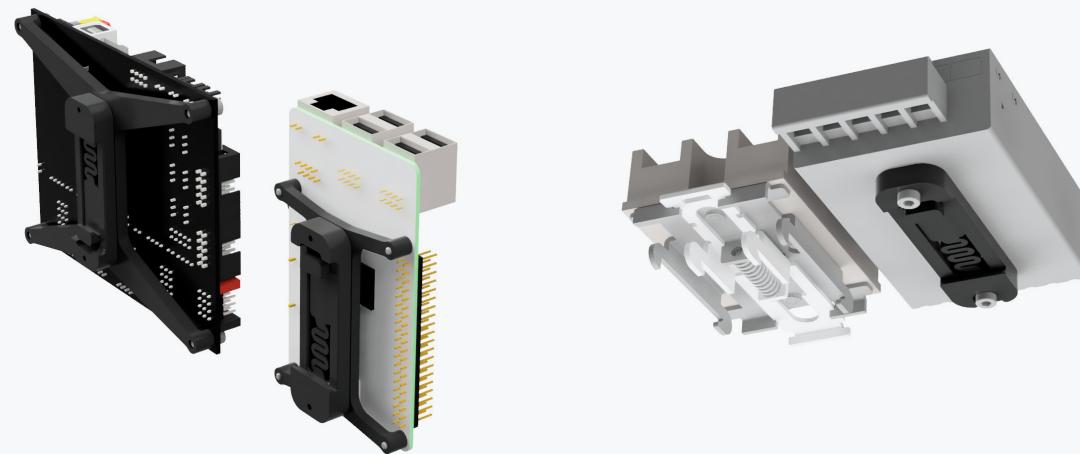




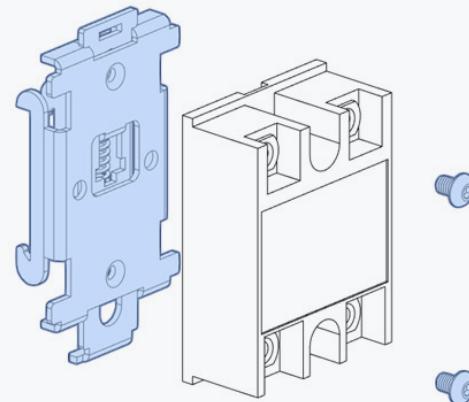
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ELECTRONICS

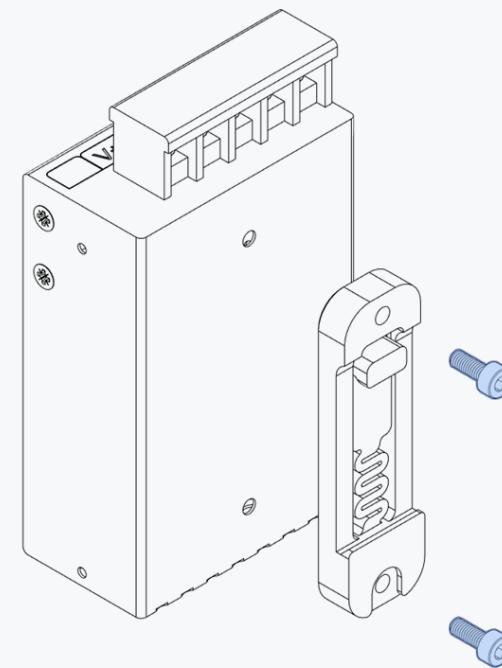
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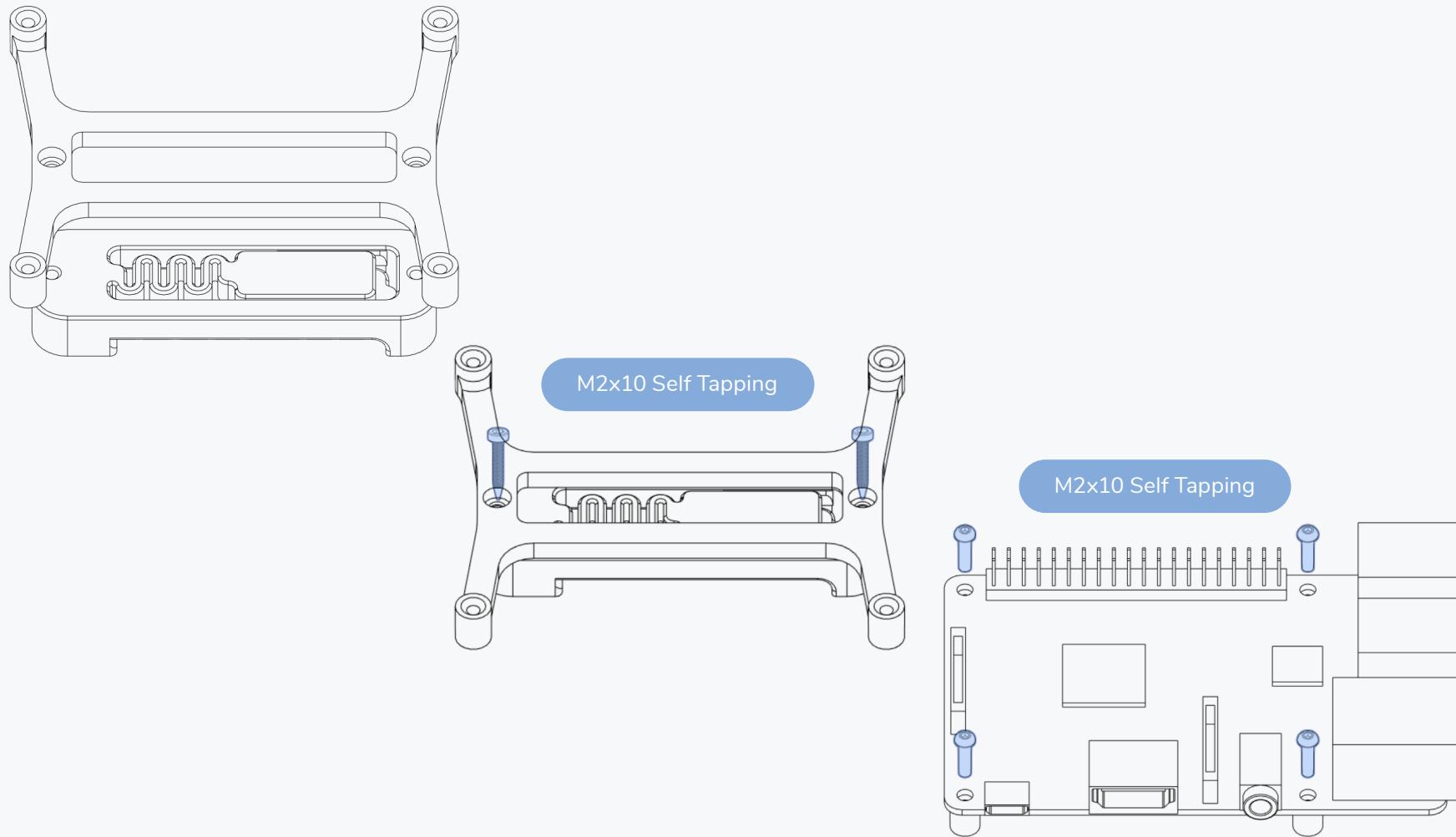
SSR Din Mount

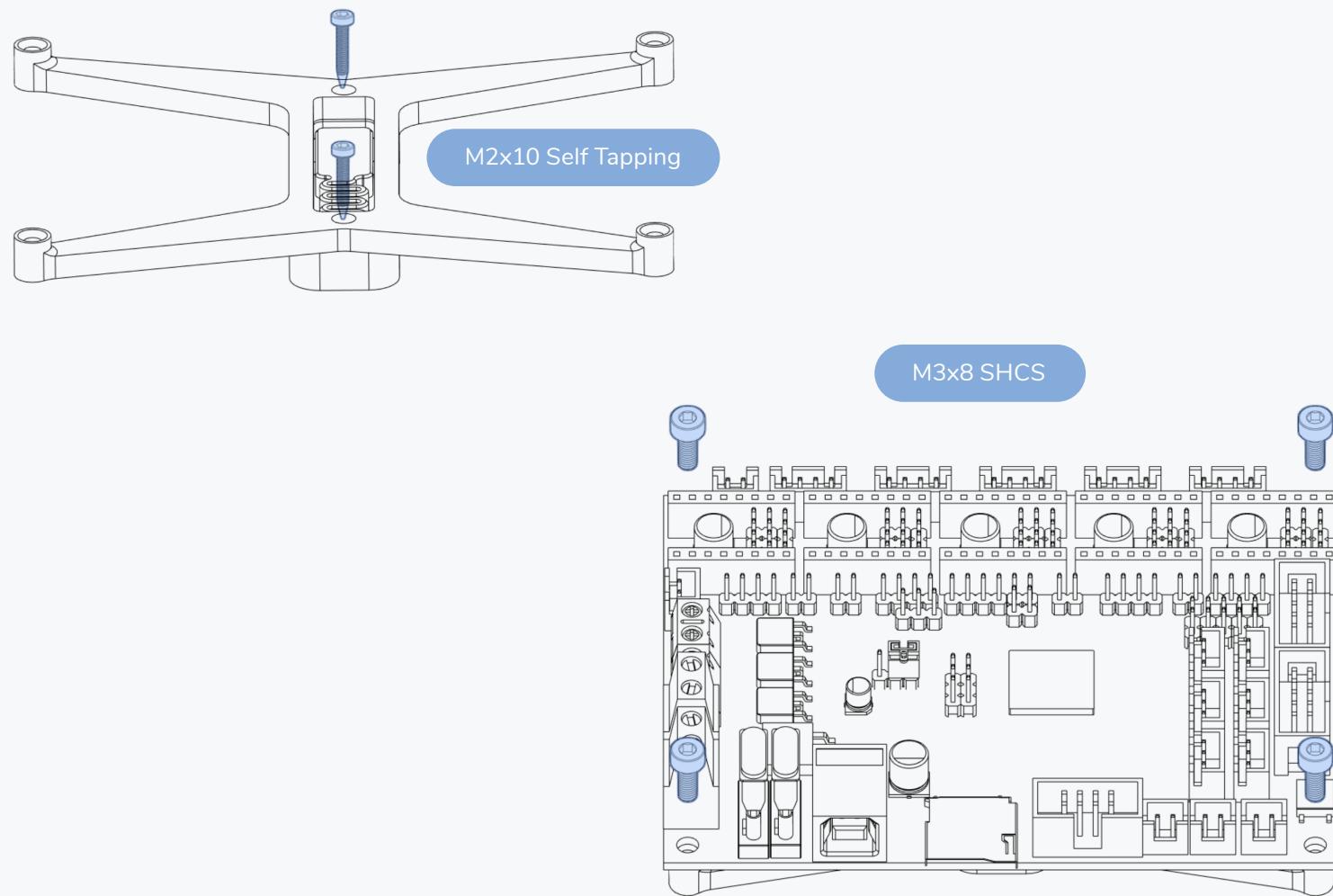


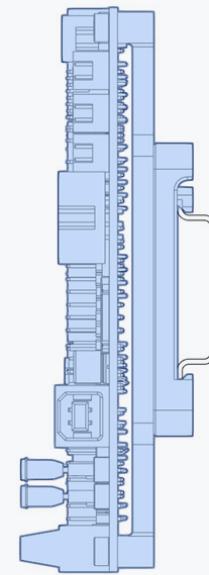
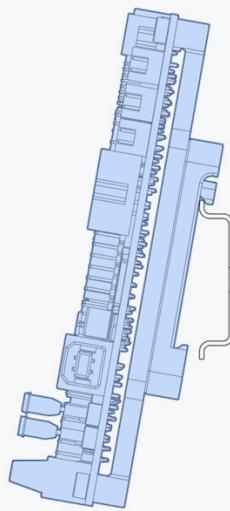
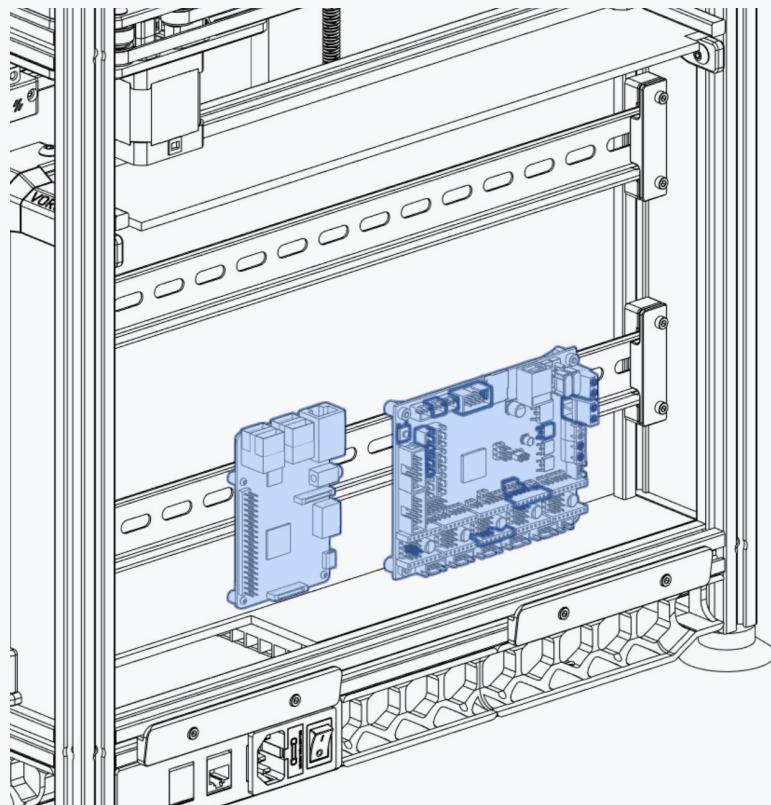
M4x6 BHCS

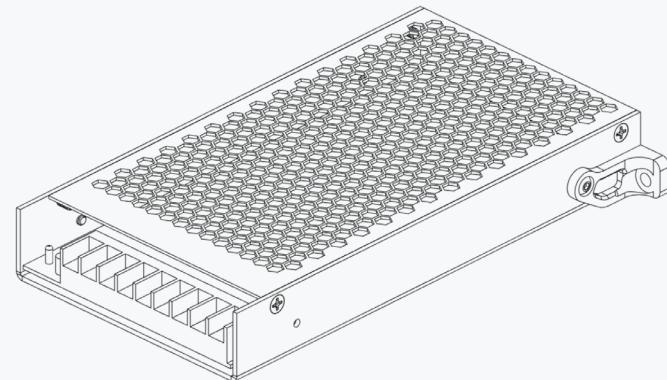
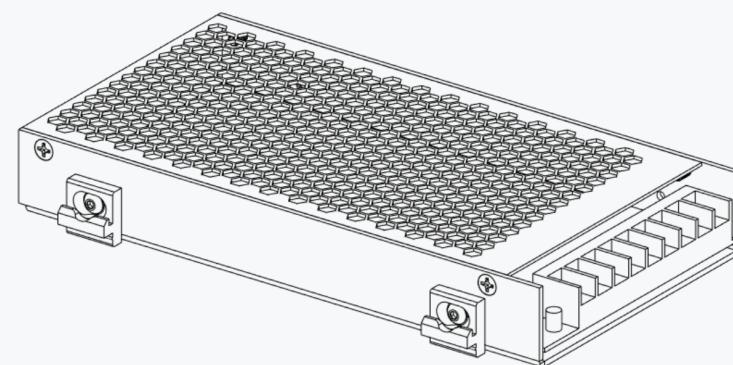
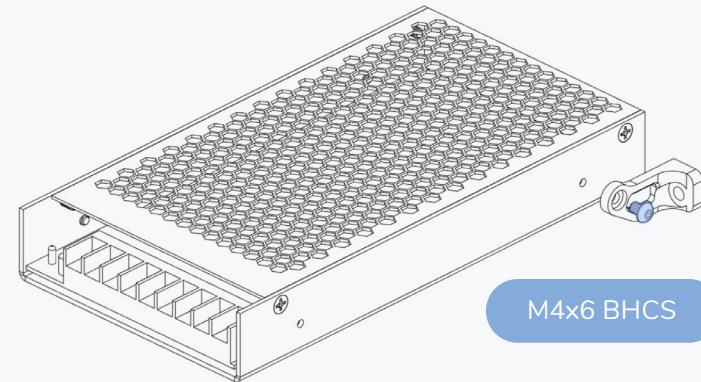
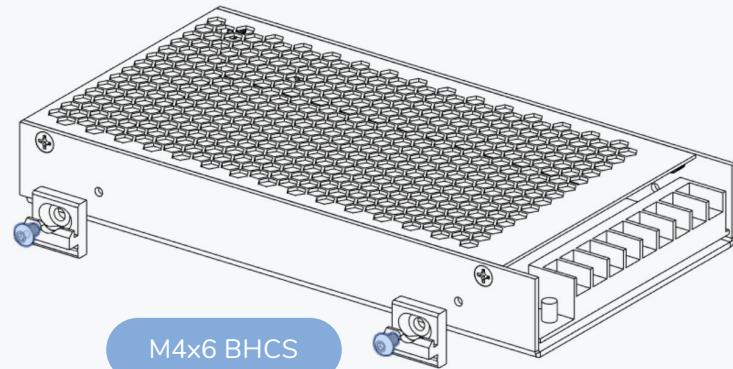


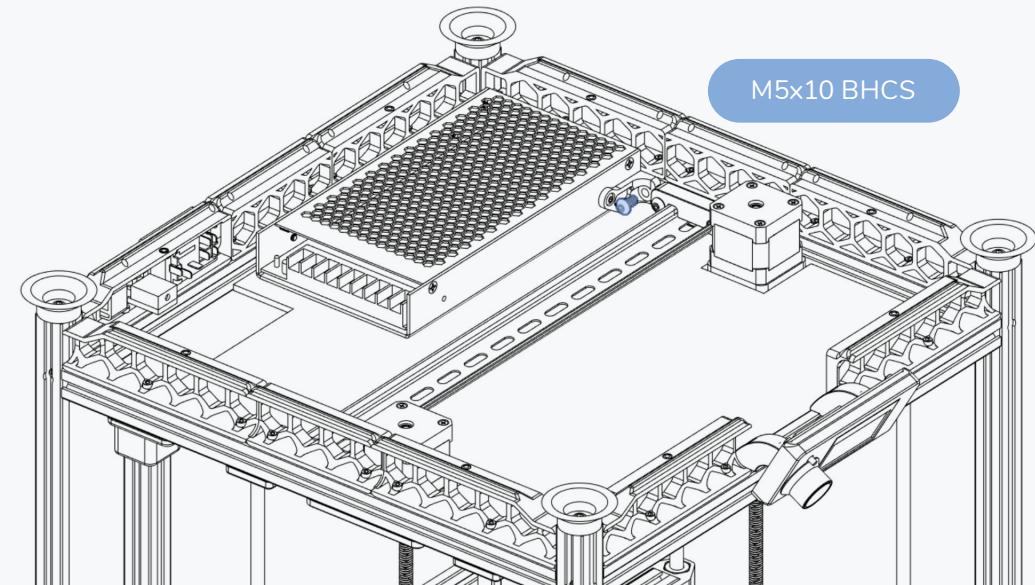
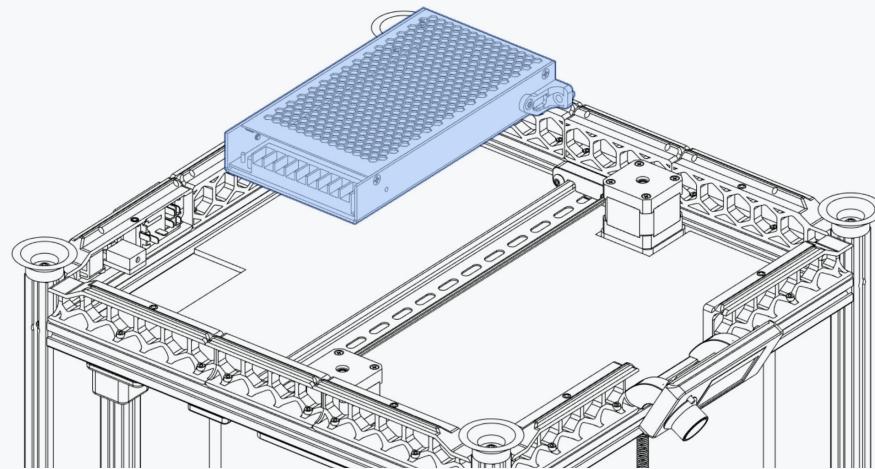
M3x8 SHCS

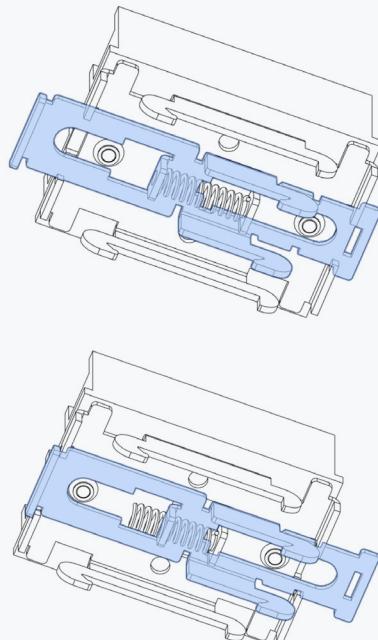






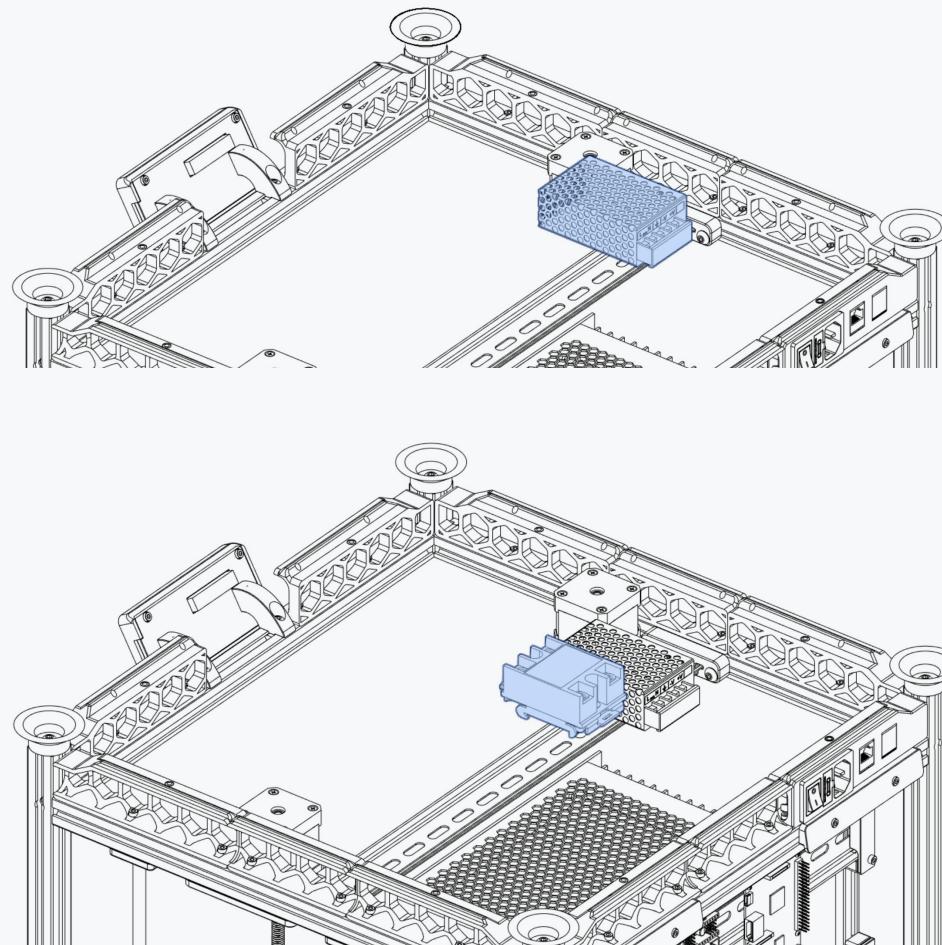


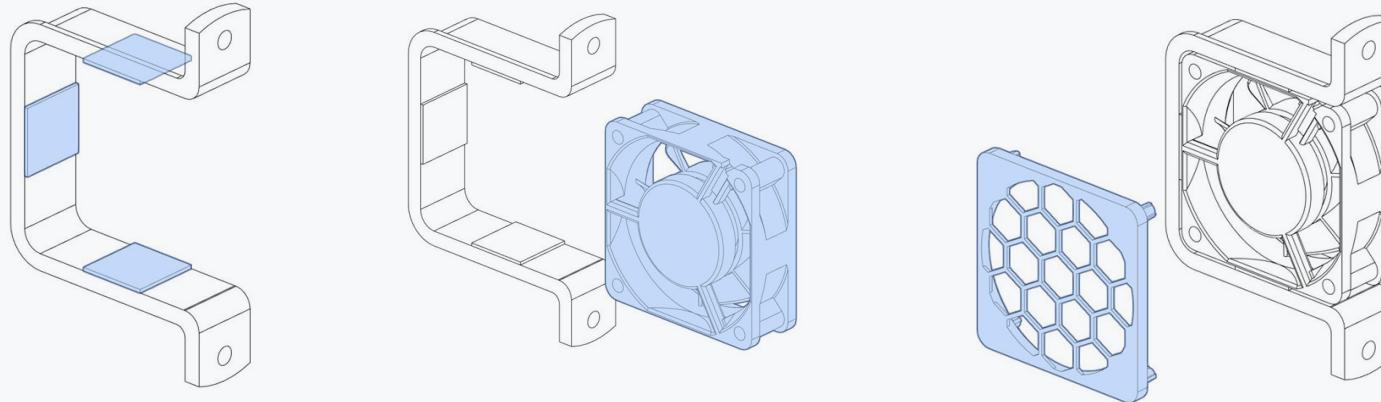


**SPRING LOADED**

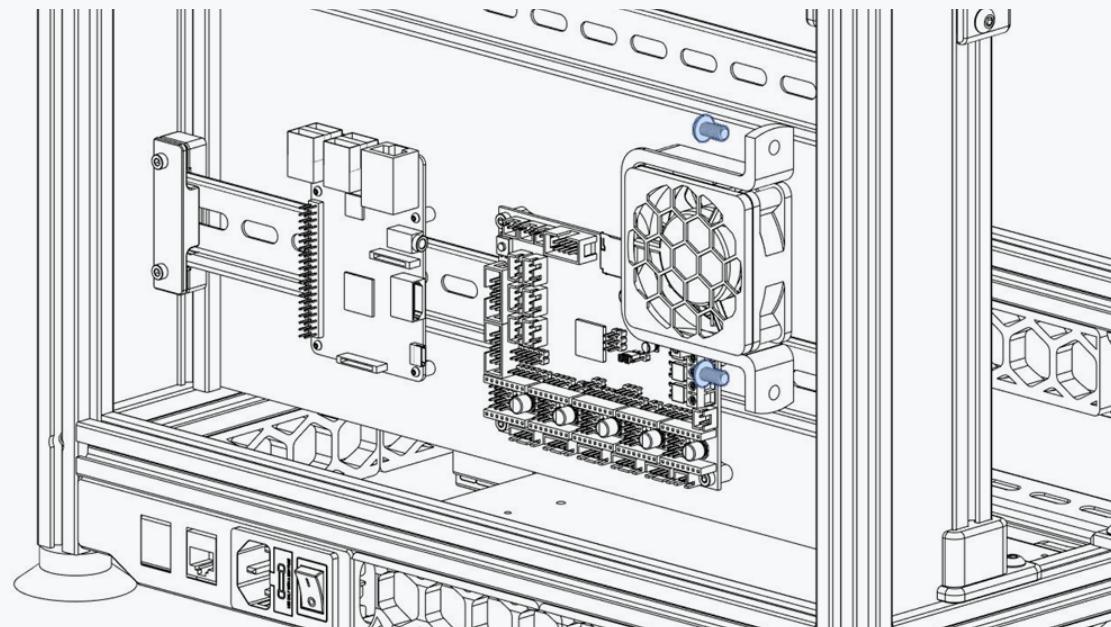
Use a flat head screw driver to pull the latch open. It will lock open.

Be careful when releasing the latch, it will snap back into place. Mind your fingers.



**APPLY VHB TAPE**

3M VHB tape is a double sided adhesive tape. Other vendors have similar products that you can use as a substitute.



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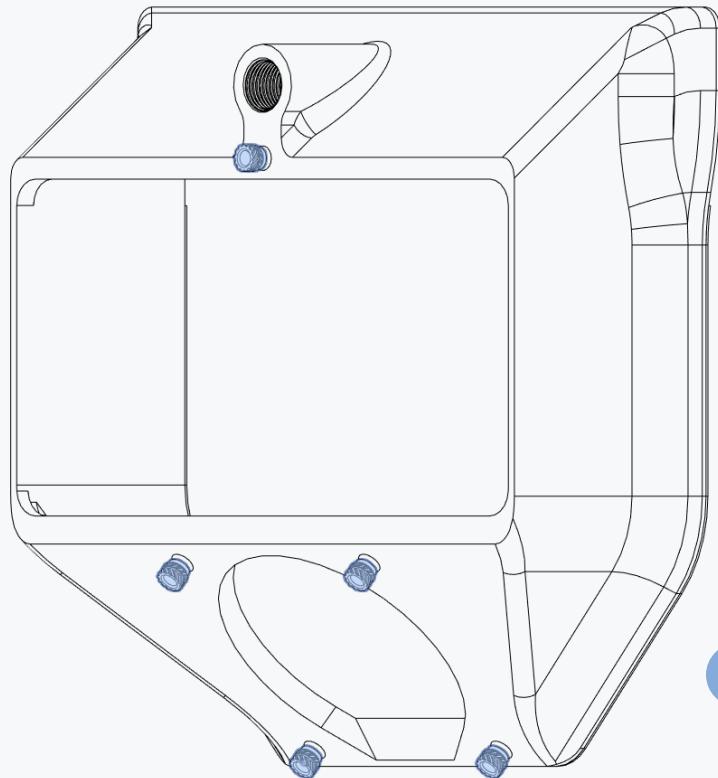
REAR PANEL & EXHAUST

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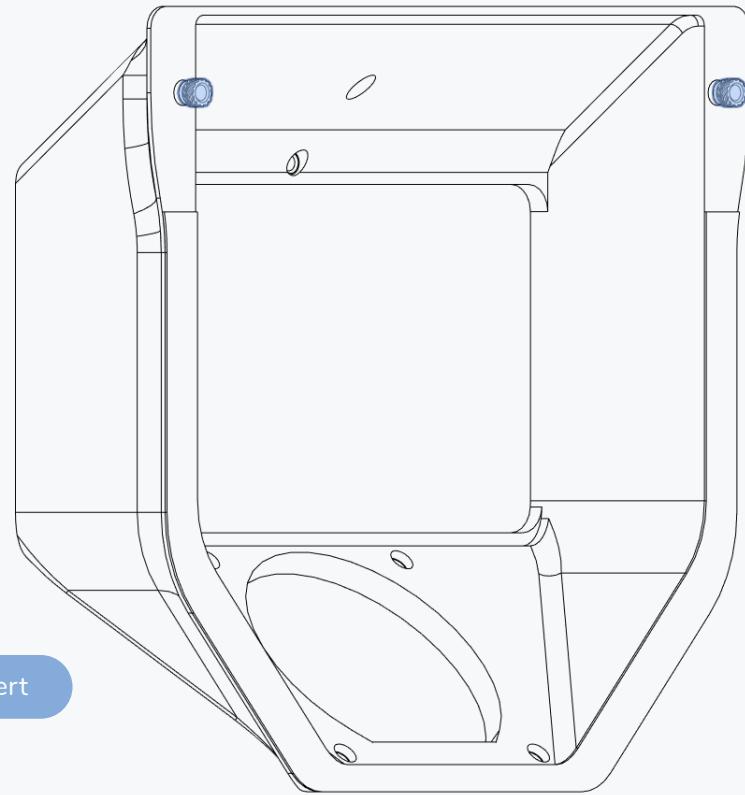


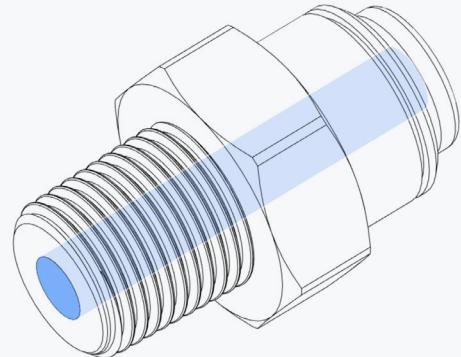
EXHAUST

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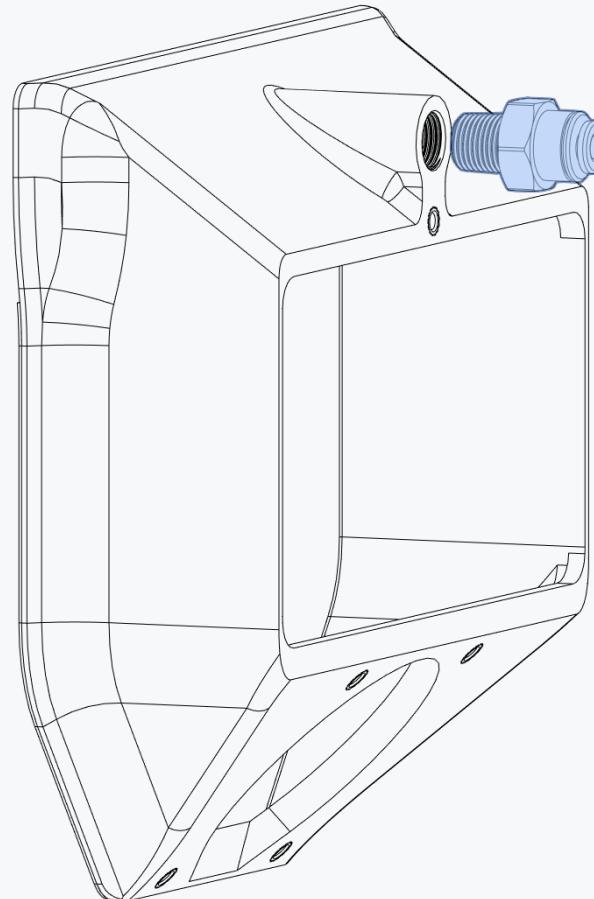
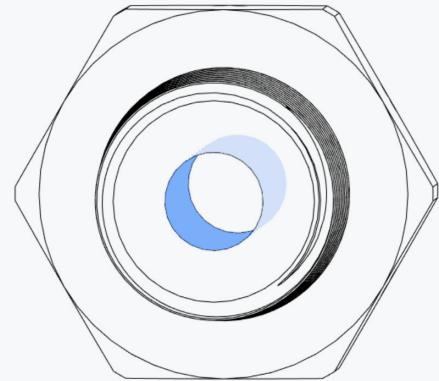
Heat Set Insert



**BSPP ADAPTER**

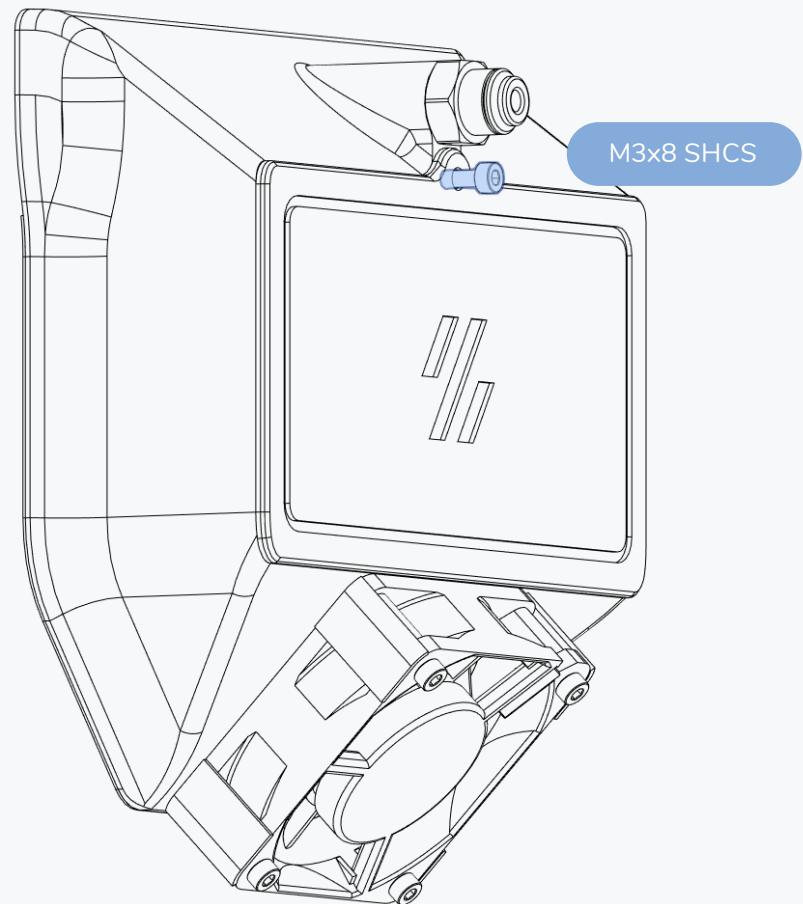
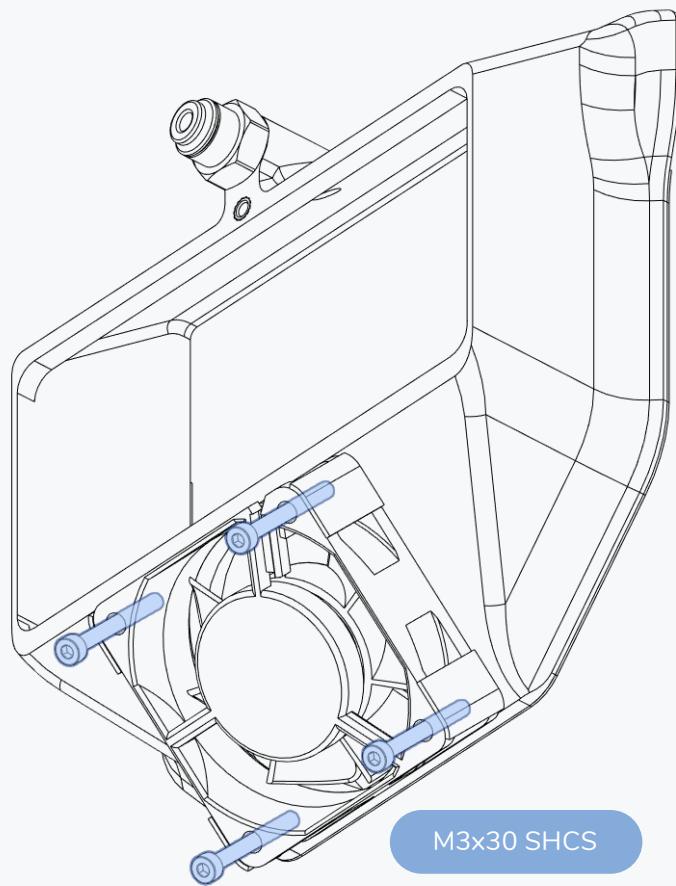
Some adapters have a small lip that prevents the PTFE tube from passing through.

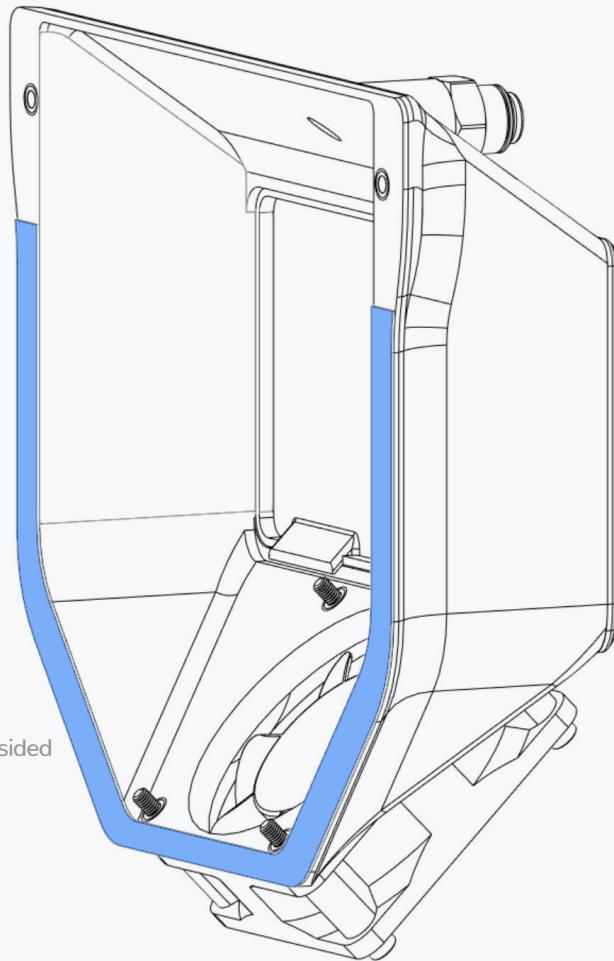
Inspect the adapter and if necessary use a drill to carefully remove the lip.



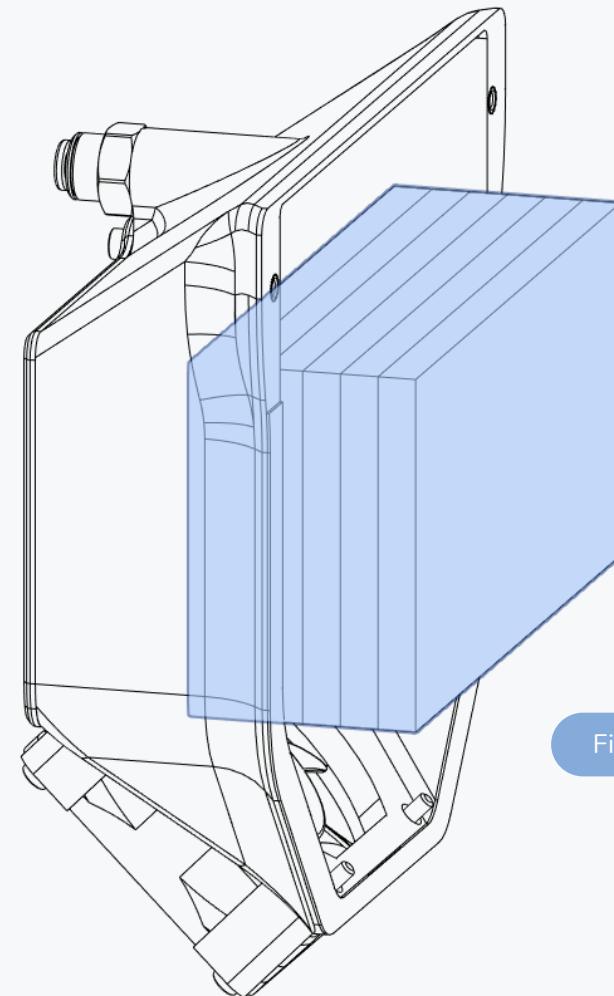
EXHAUST

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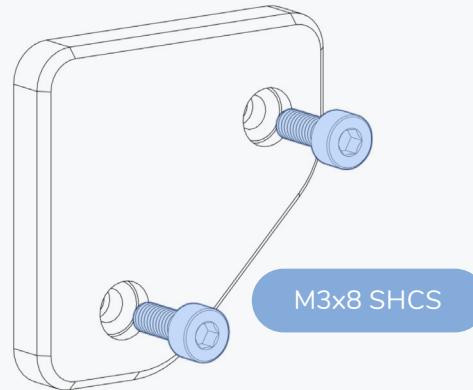


**APPLY VHB TAPE**

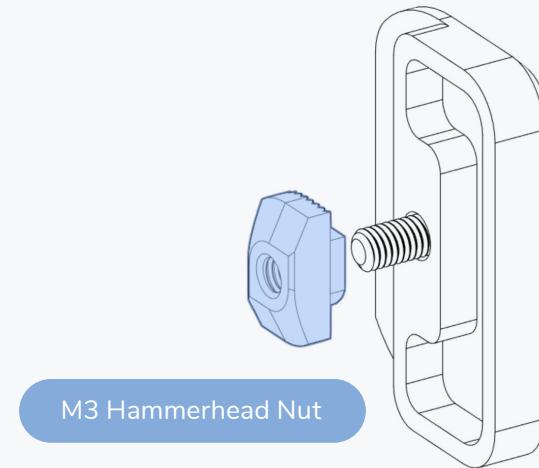
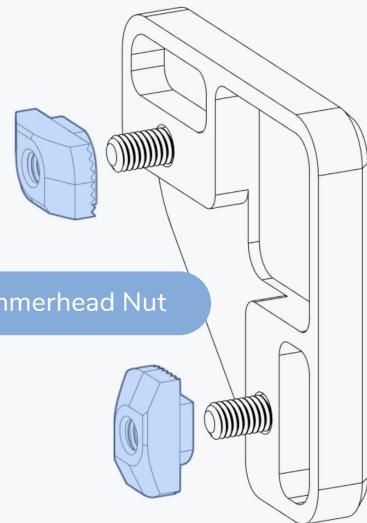
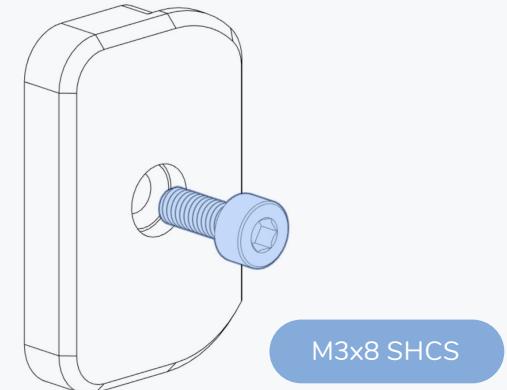
VHB Tape is a double sided adhesive tape.

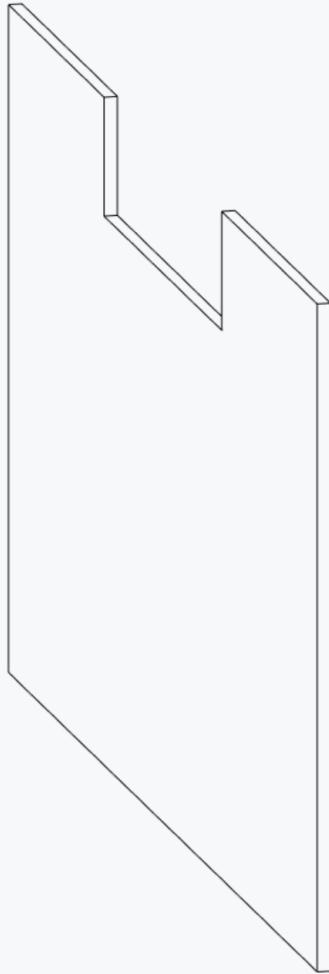


Filter Material

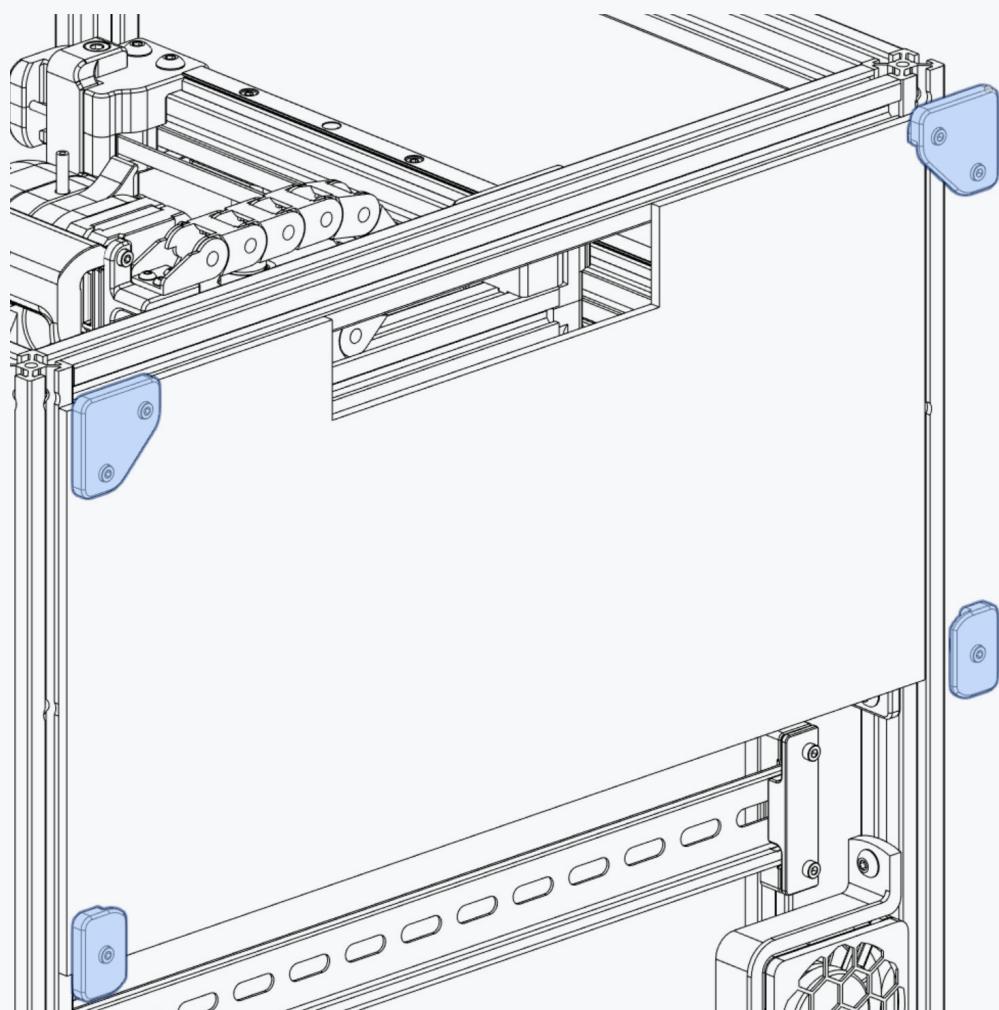
**HAMMERHEAD NUTS?**

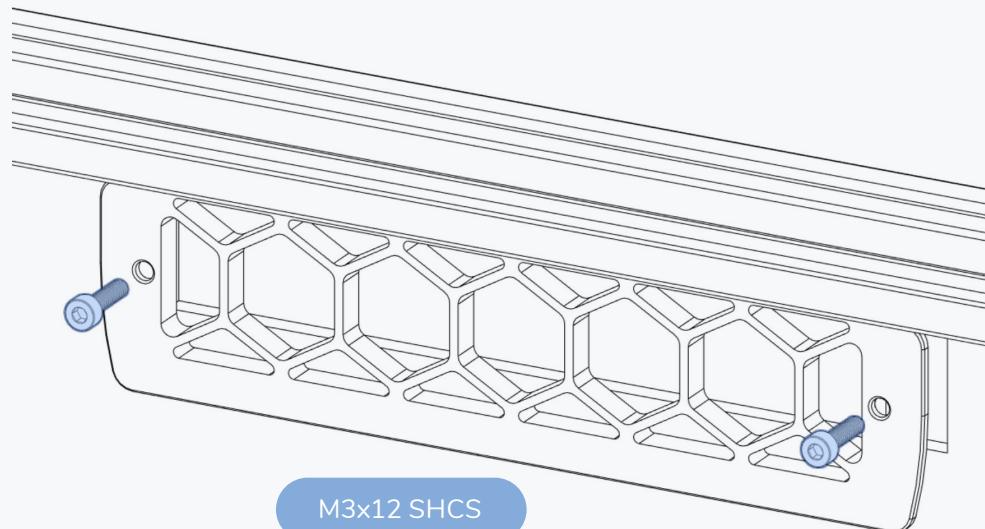
A drop of thread locker will turn the hammerhead nuts into a 1/4 turn quick release for the panels. Best done once the assembly is finished.



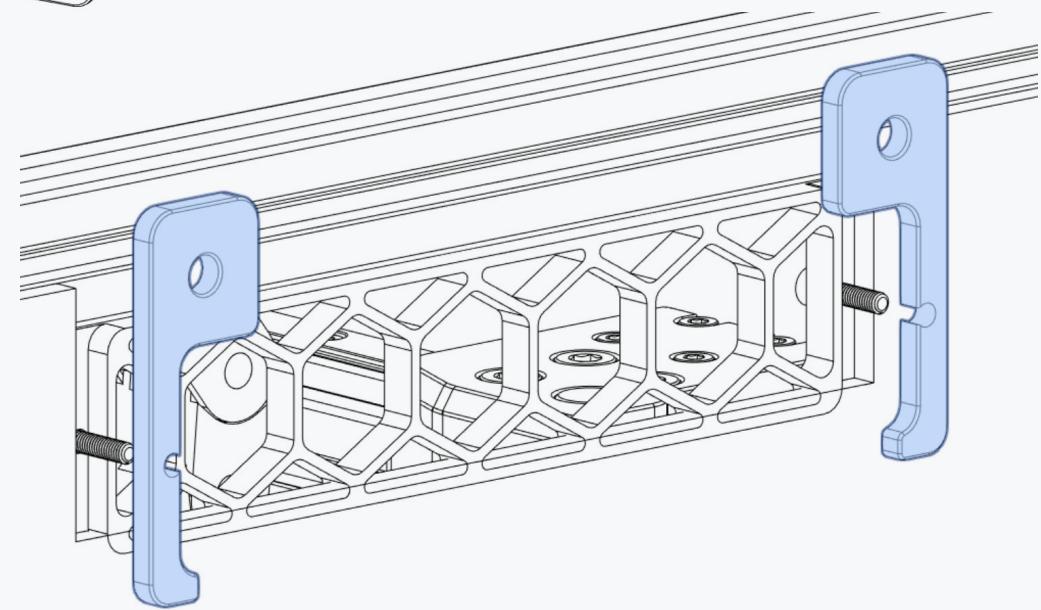
**APPLY FOAM TAPE**

Use foam tape on the contact areas between the panels and the frame to mitigate noise from vibrations.



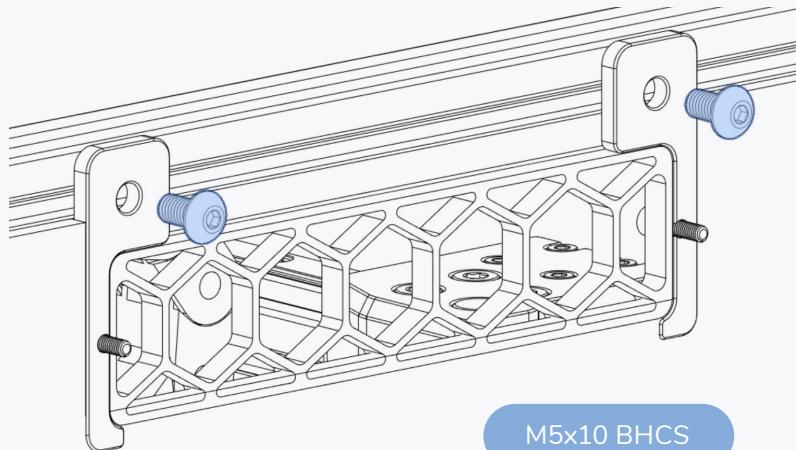


M3x12 SHCS



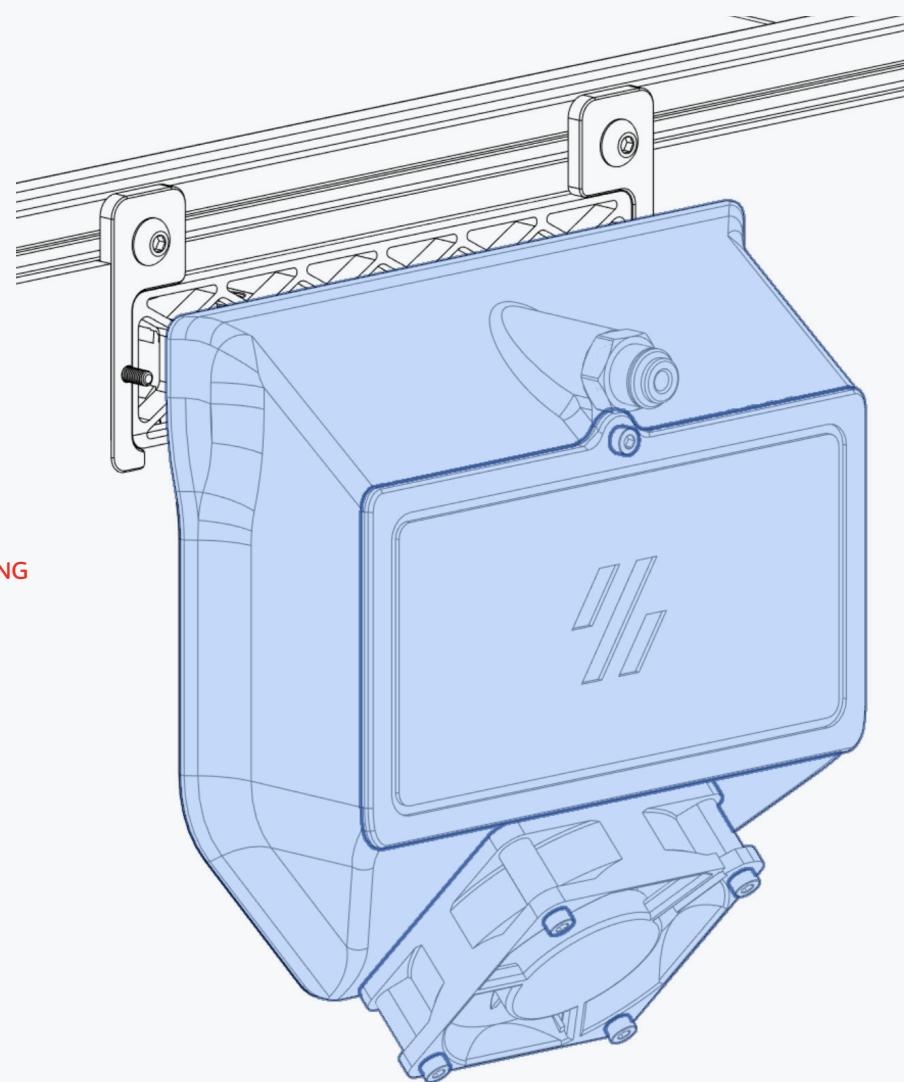
REAR PANEL

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M5x10 BHCS

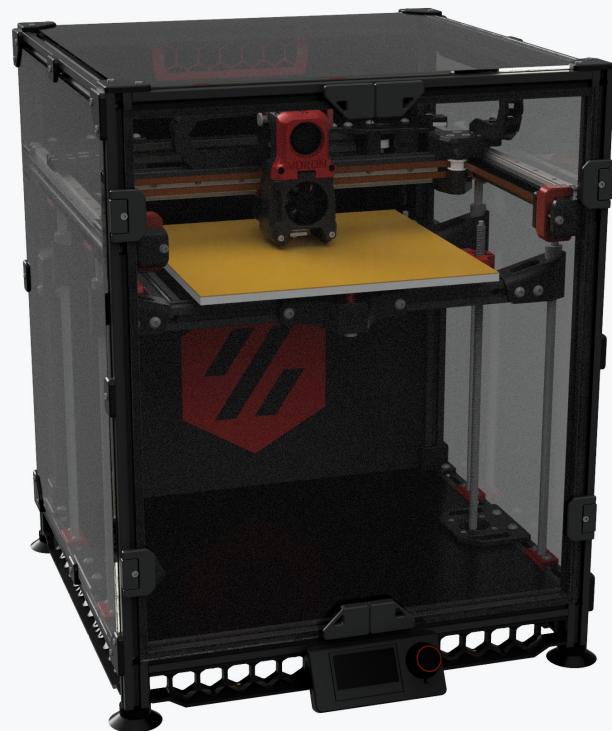
REMOVE TAPE BACKING



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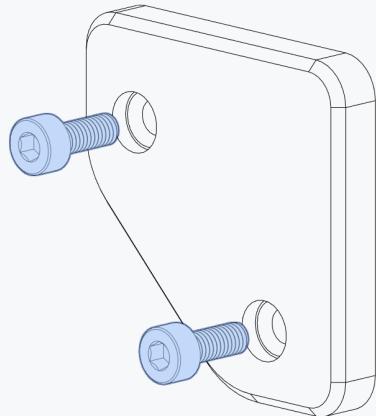
PANELS

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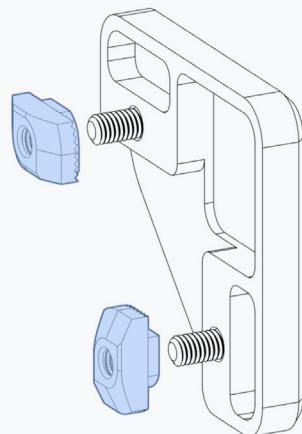


PANEL MOUNTS

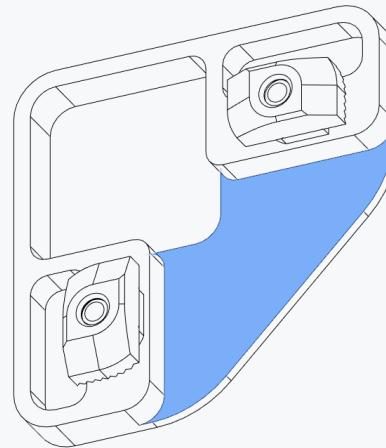
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M3x8 SHCS

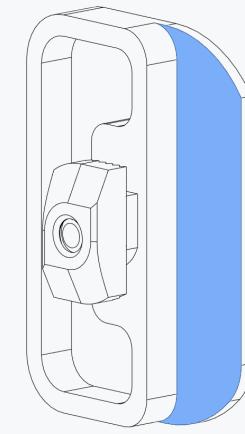
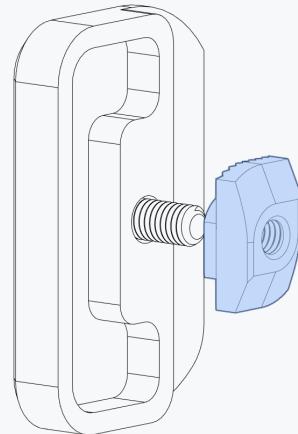
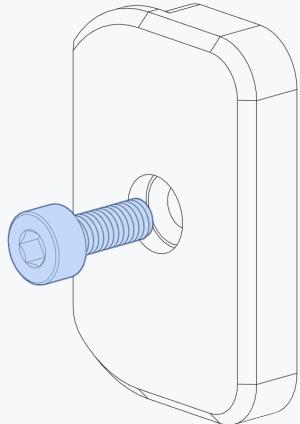


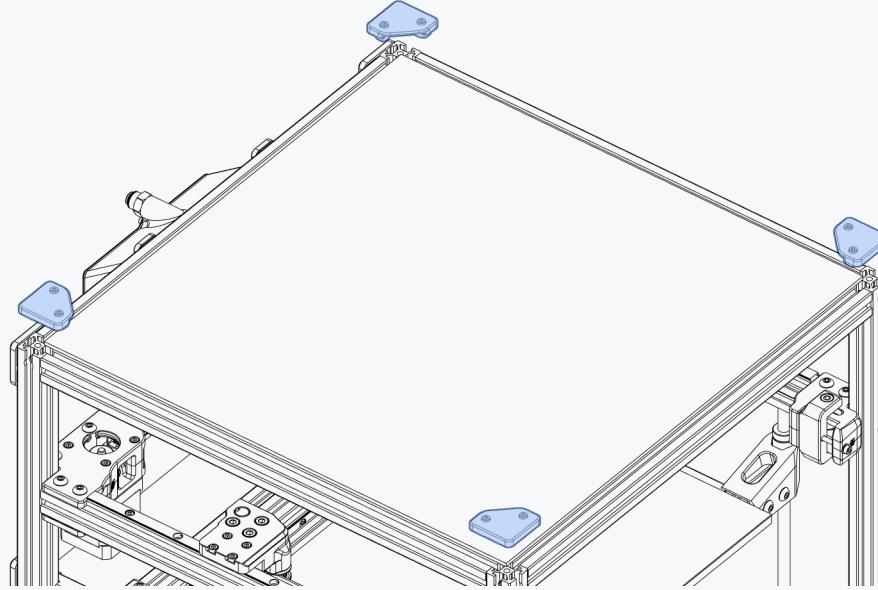
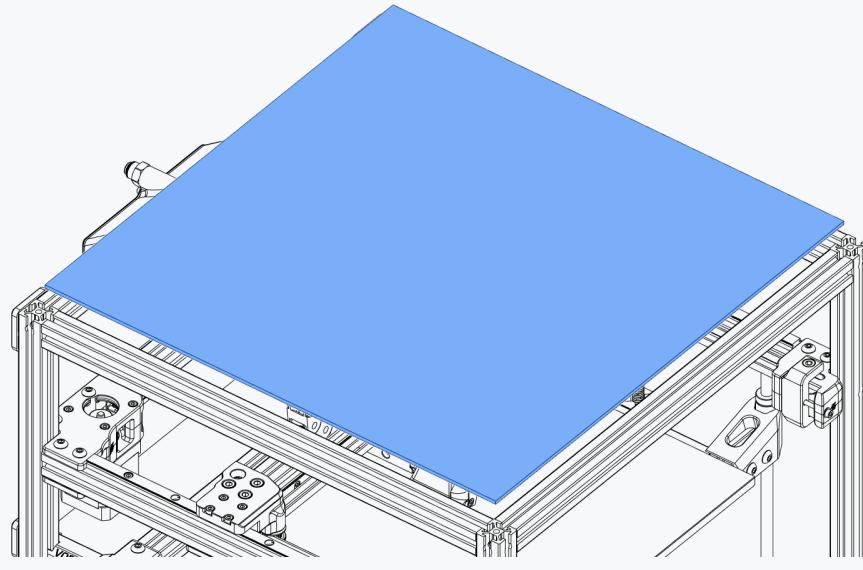
M3 Hammerhead Nut



APPLY FOAM TAPE

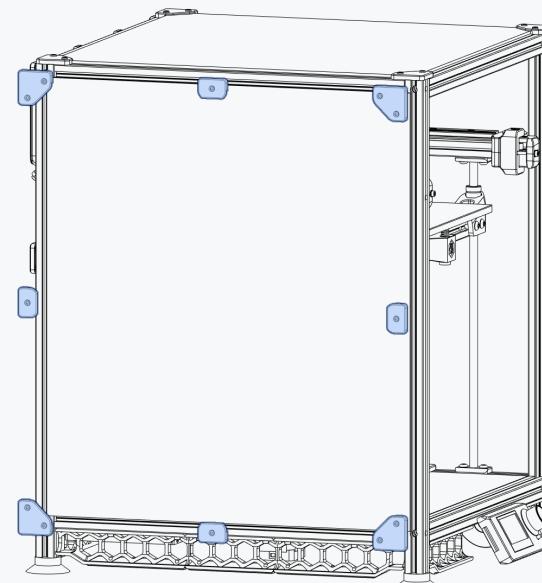
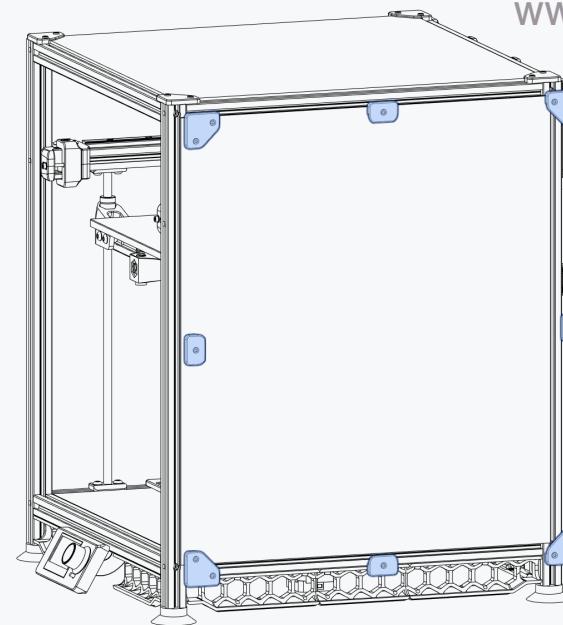
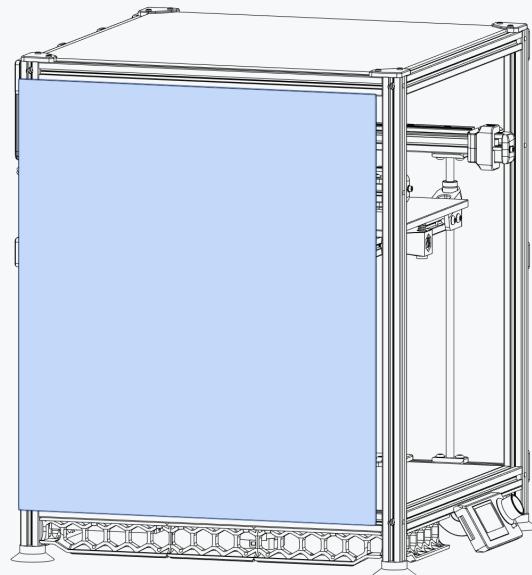
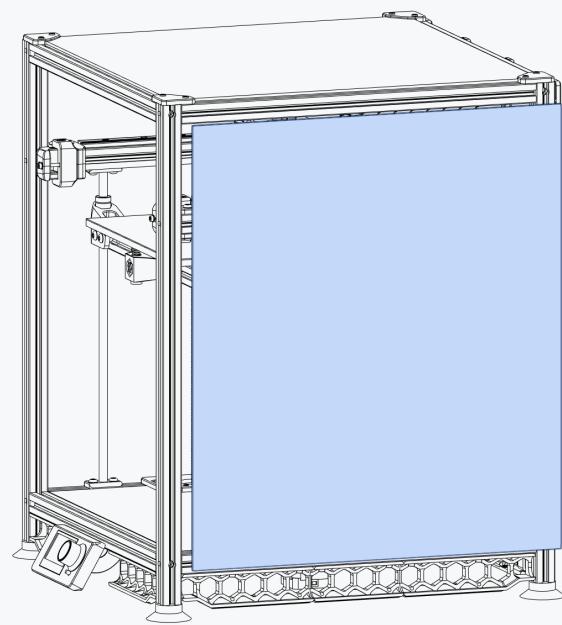
Use foam tape on the highlighted areas to mitigate noise from vibrations.



**APPLY FOAM TAPE**

Use foam tape on the contact areas between the panels and the frame to mitigate noise from vibrations.

SIDE PANEL



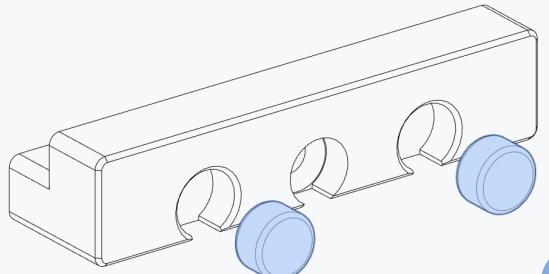
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APPLY FOAM TAPE

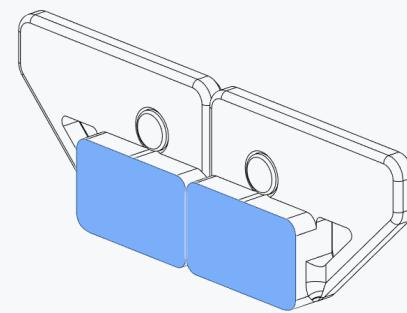
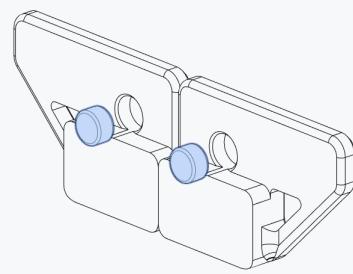
Use foam tape on the contact areas between the panels and the frame to mitigate noise from vibrations.

GLUE INTO PLACE

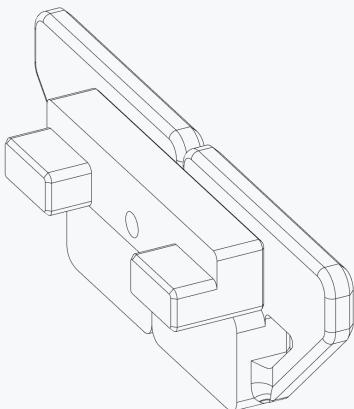
Use a fast acting glue like super-glue.



Magnets

**APPLY VHB TAPE**

The parts will be bonded to the panels using double-sided adhesive tape.

**MIND THE MAGNET POLARITY**

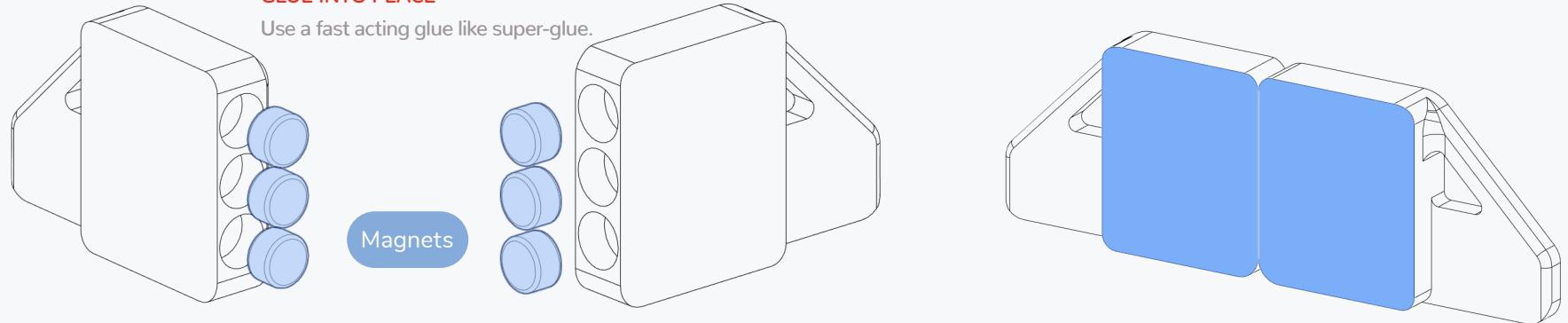
Ensure that the magnets are facing in the right direction prior to glueing them into place.



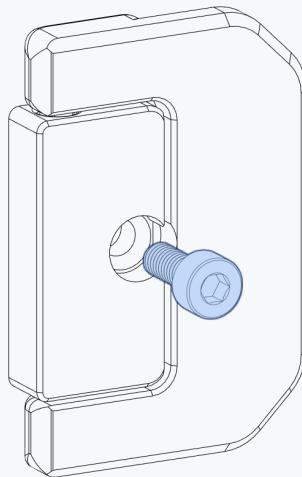
M3x8 SHCS

GLUE INTO PLACE

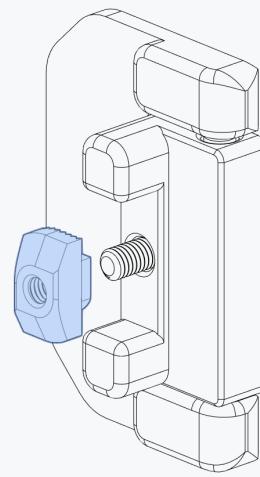
Use a fast acting glue like super-glue.

**MIND THE MAGNET POLARITY**

Ensure that the magnets are facing in the right direction prior to glueing them into place.



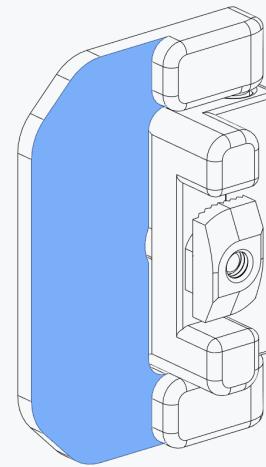
M3x8 SHCS

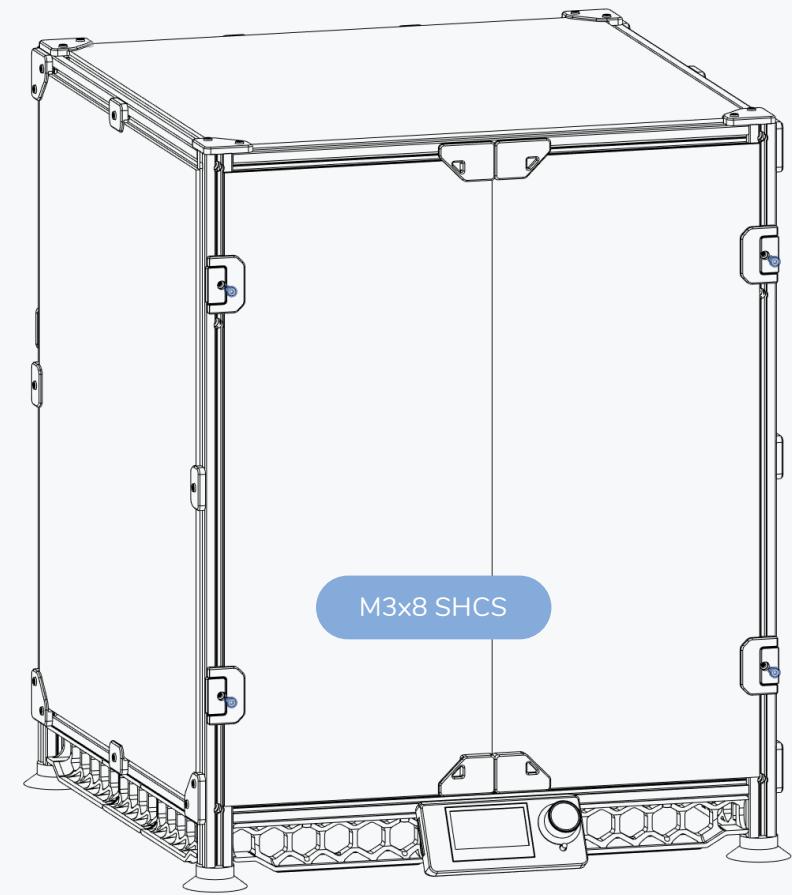
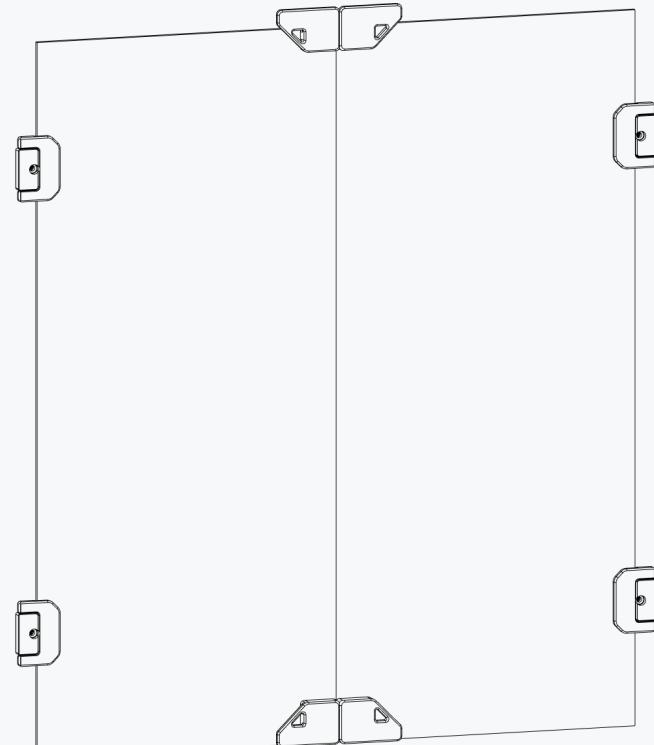


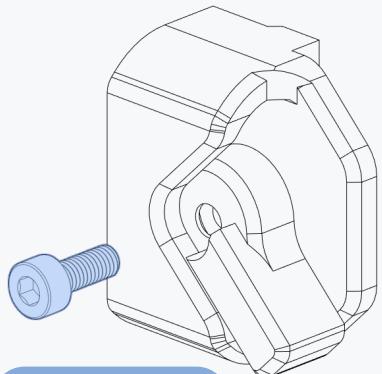
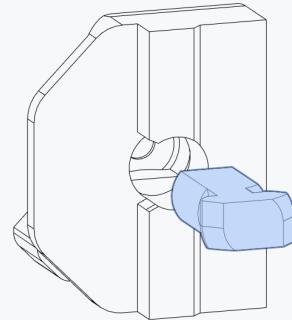
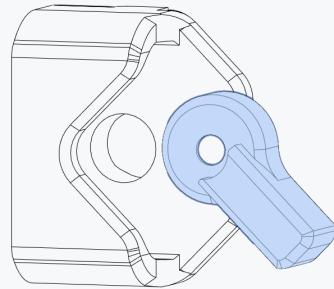
M3 Hammerhead Nut

APPLY VHB TAPE

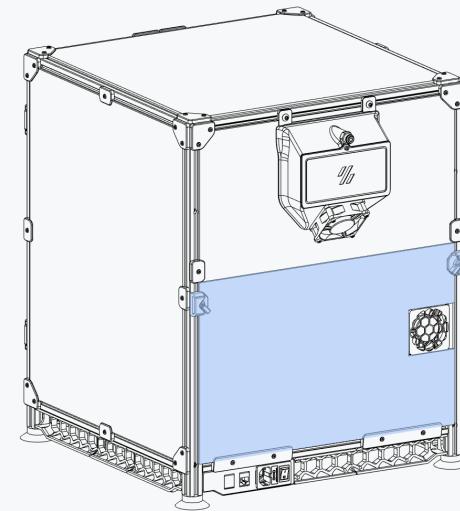
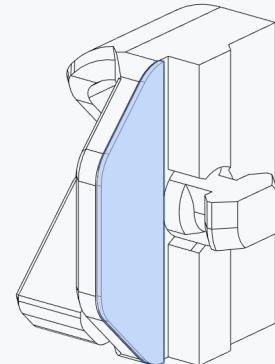
The parts will be bonded to the panels using double-sided adhesive tape.



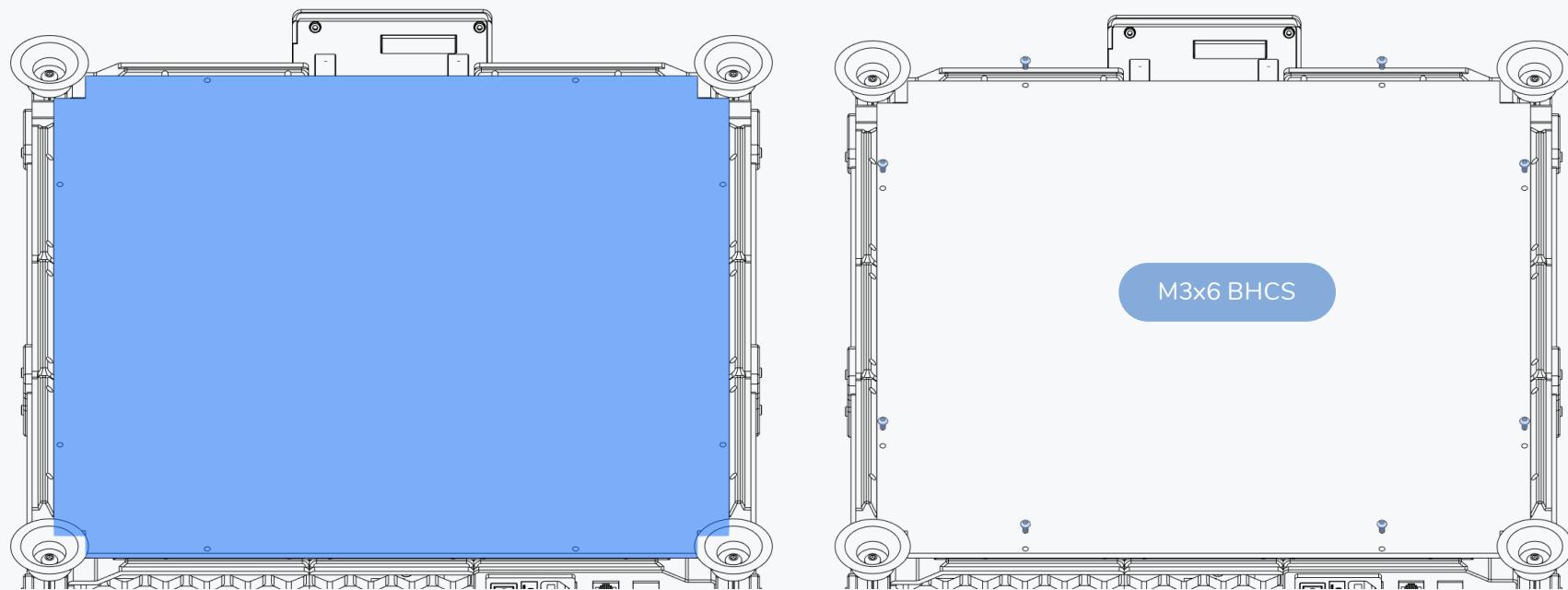




M3x8 SHCS

**ROTATE LEVERS TO LOCK**

Use the levers to lock and unlock
the panel for the electronics

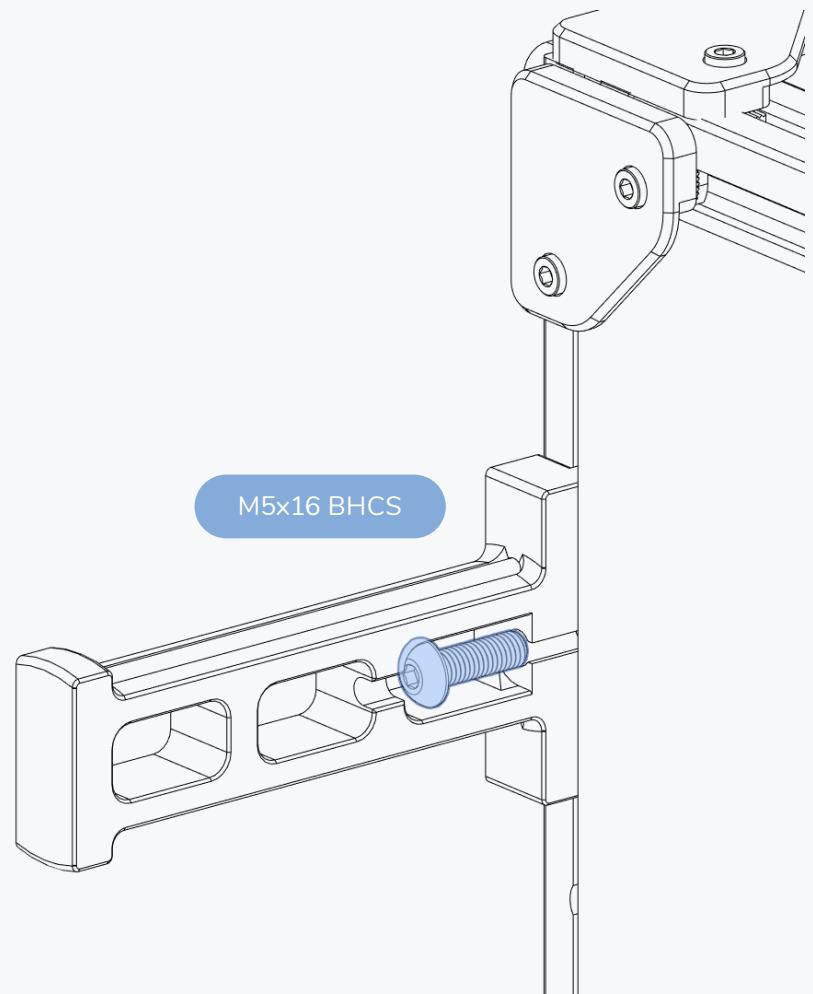
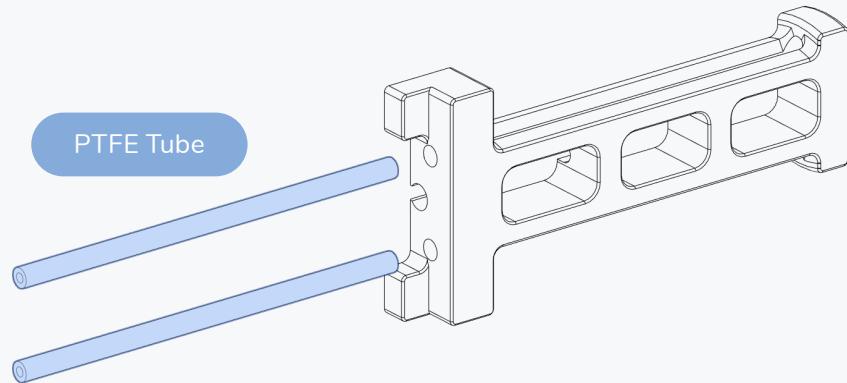


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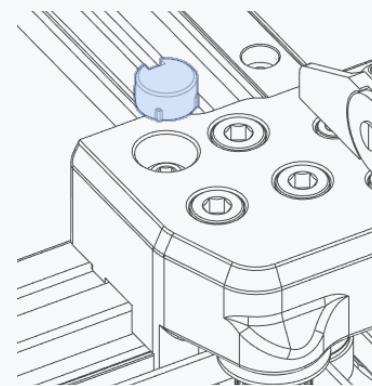
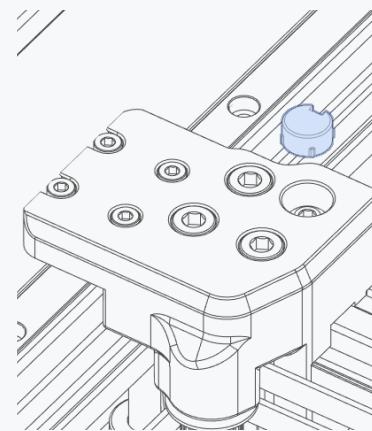
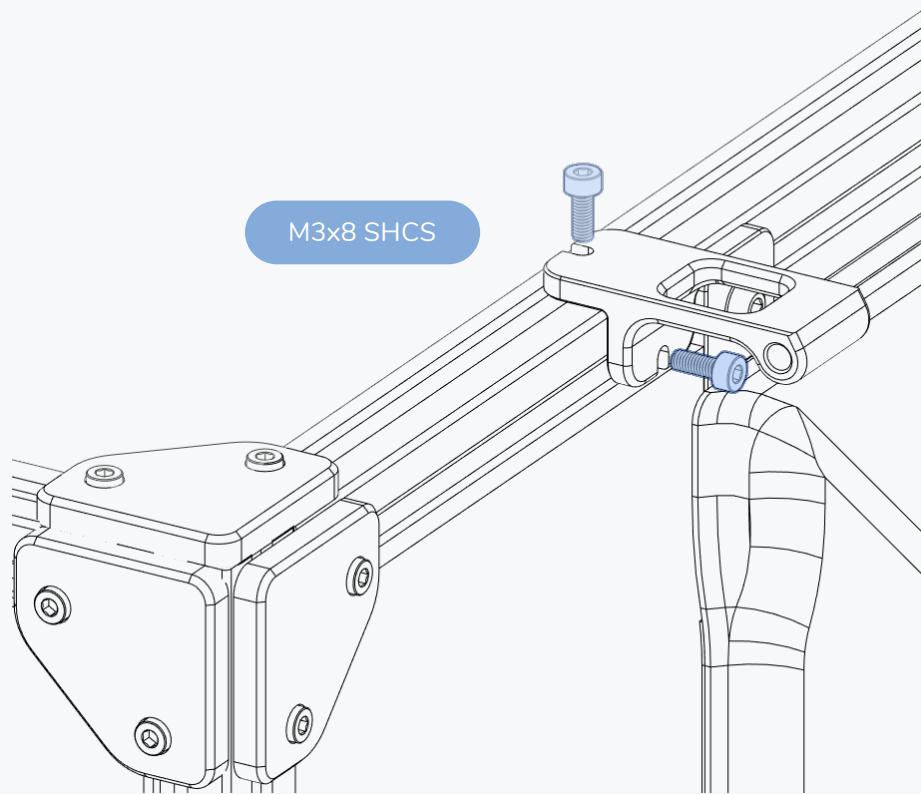
SPOOL HOLDER

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BOWDEN HOLDER & XY CAPS

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MECHANICAL ASSEMBLY COMPLETED ... NEXT STEP WIRING & ELECTRICAL

This manual is designed to be a simple reference manual for the build process. Wiring and the initial setup of your printer is not included.

For details on wiring, setup of the electronics and other initial steps of your new printer please visit our documentation available on github.



<https://github.com/vorondesign/voron-1>

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.



<https://discord.gg/voron>

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Website
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Github
<https://github.com/vorondesign>

Discord
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