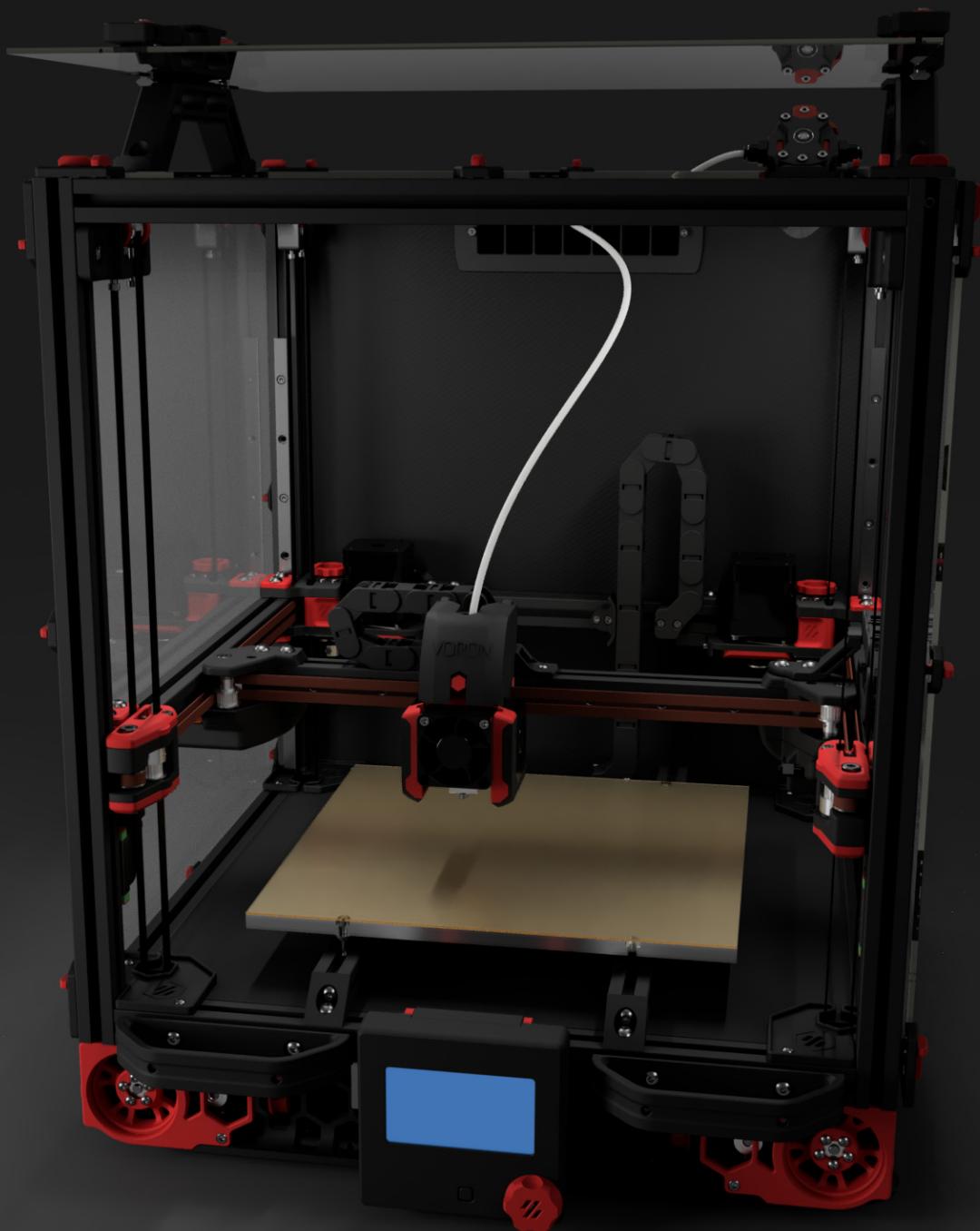




VORON2  
v2.2

Assembly Manual





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 channel (#voron\_v2\_build\_help) for any tips and questions that may halt your progress.

Most of all, good luck!

- The VORON Development Team

## File Key / Part Printing Guidelines and Standards

File Key	
<b>Primary Color</b>	nothing at start of file name
<b>Accent Color</b>	[a]_ at start of file name
<b>Quantity Required</b>	_x# near end of file name
<b>File Revision</b>	_Rev# at end of file name

Part Printing Guidelines and Standards	
<b>Approved FDM Materials</b>	ABS or ABS+ Only
<b>Layer Height</b>	0.2mm
<b>Extrusion Width</b>	Forced 0.4mm
<b>Infill Percentage</b>	40% minimum
<b>Infill Type</b>	Grid, Gyroid, Honeycomb, Triangle or Cubic
<b>Wall Count</b>	4 minimum
<b>Solid Top/Bottom Layers</b>	5 minimum

Very Important Steps

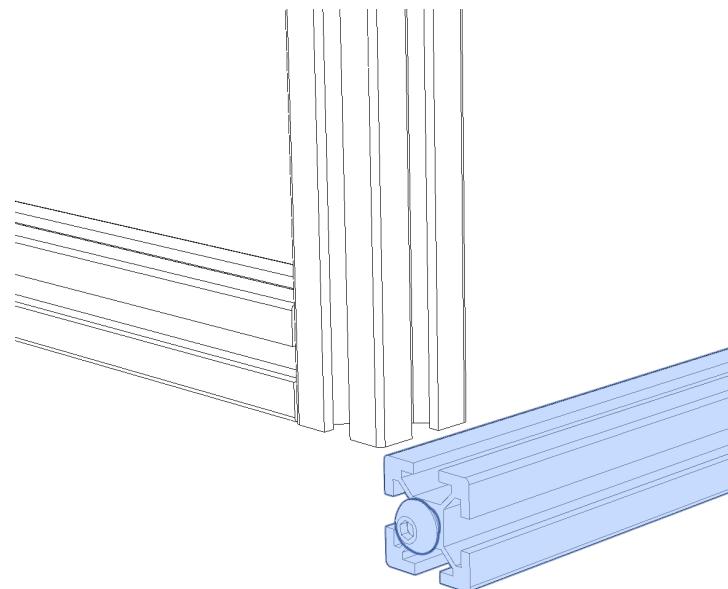
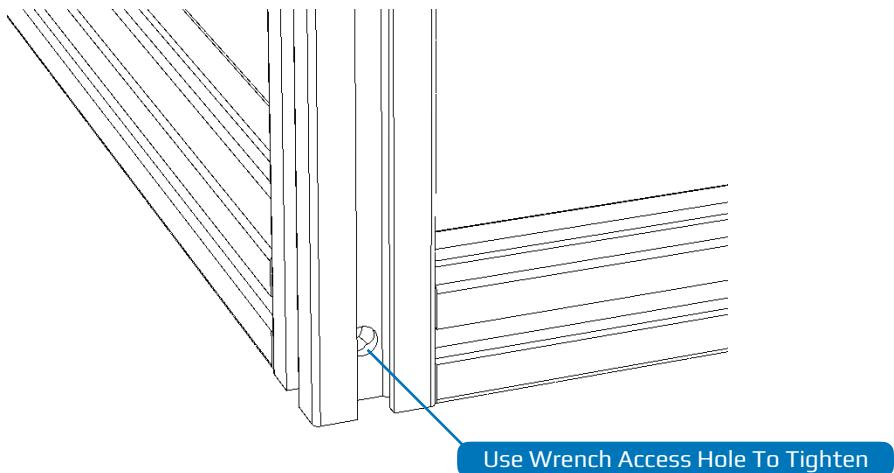
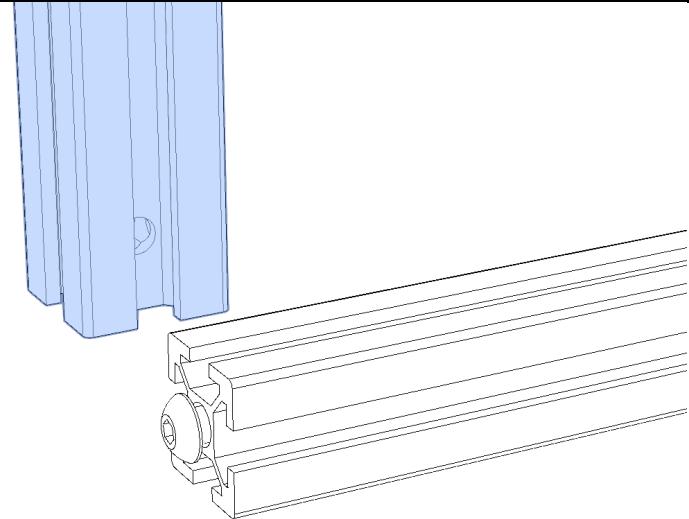
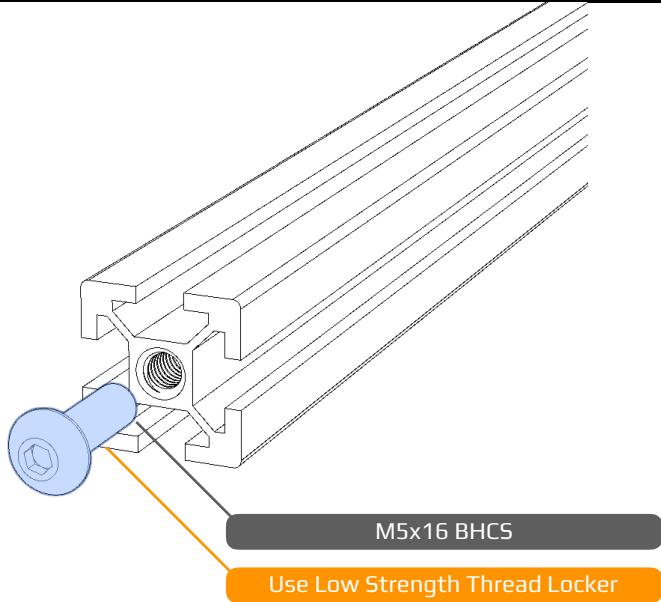
Fastener Size/Type Part

Notes and Tips

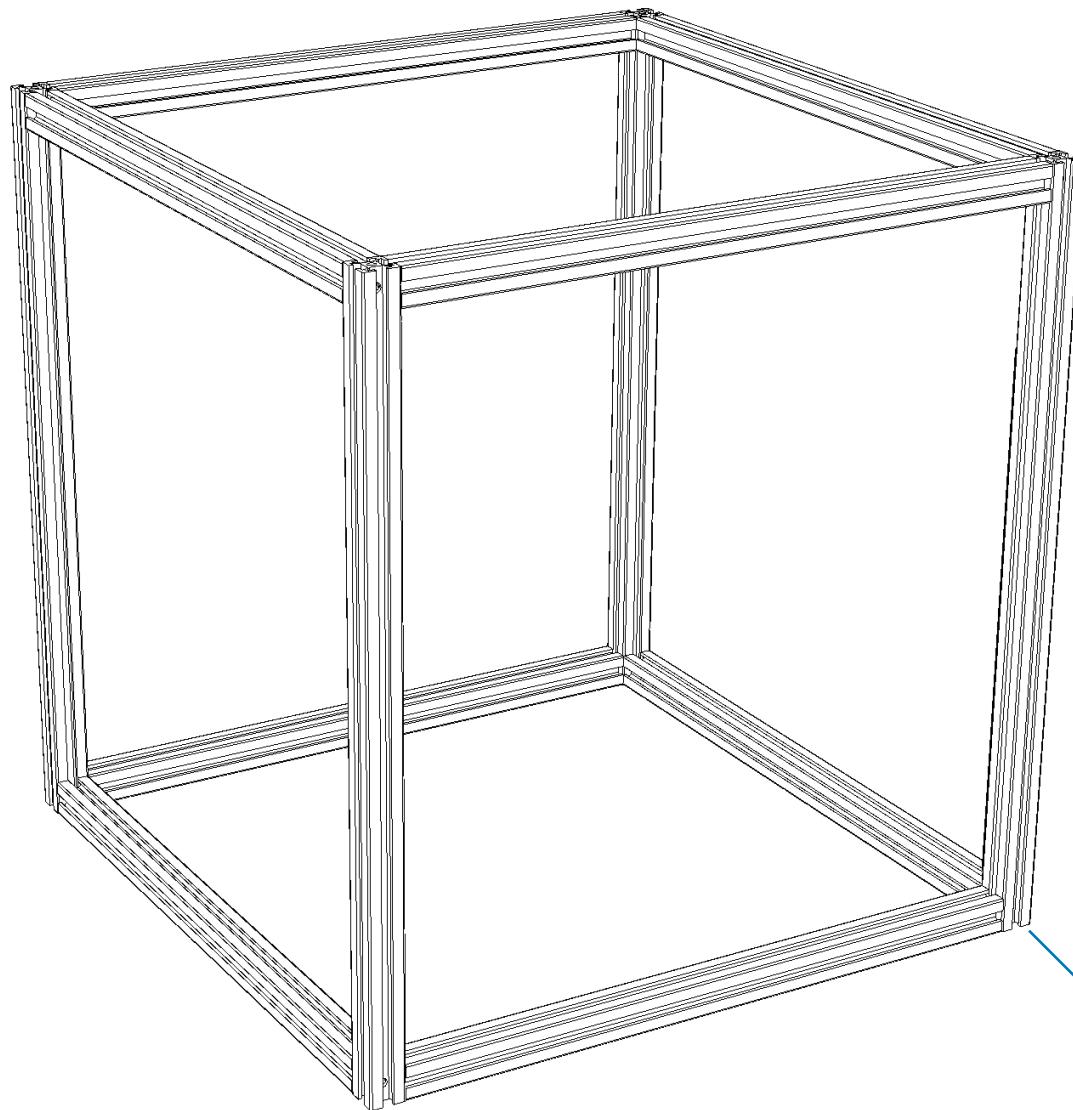
## Important Definitions and Adhesives List

Callout	Definition
BHCS	Button Head Cap Screw (ISO 7380-1)
SHCS	Socket Head Cap Screw (ISO 4762/DIN 912)
Plastite	Self-Tapping Screw for Plastics
Low Strength Thread Locker	Loctite 222 (aka "Purple")
Shaft Retaining Compound	Loctite 641 (aka "Yellow Retaining Compound")

# Frame

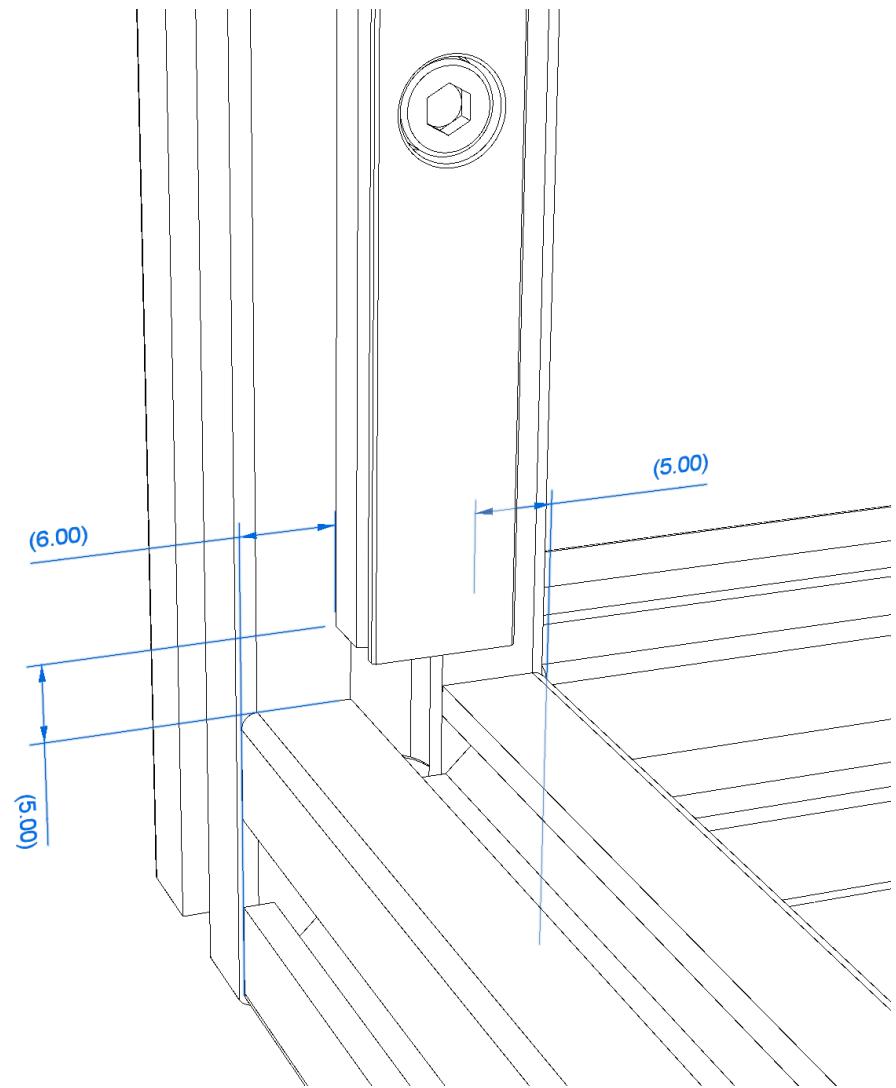
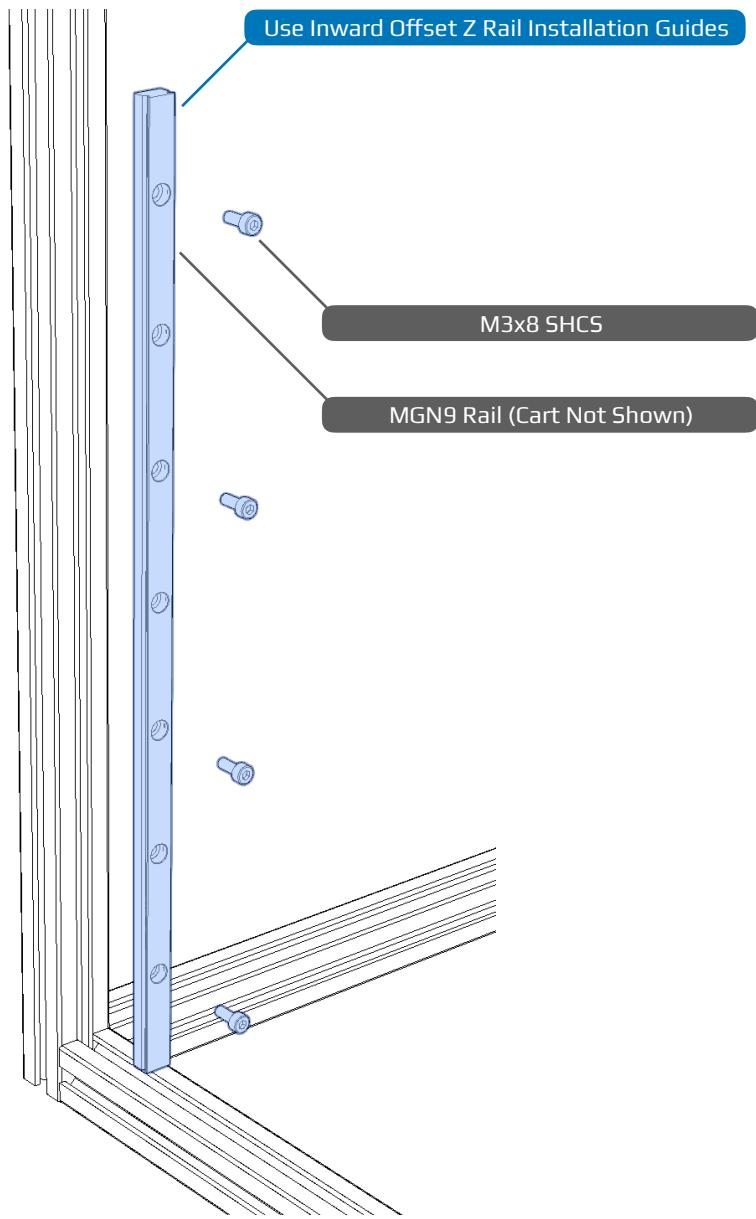


# Frame

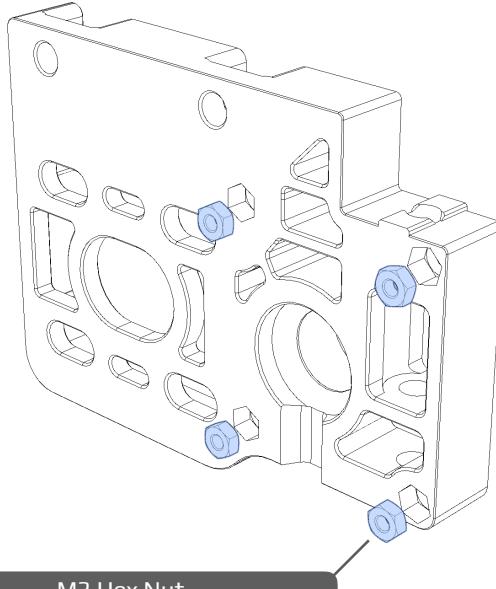


Ensure Squareness Of All Corners

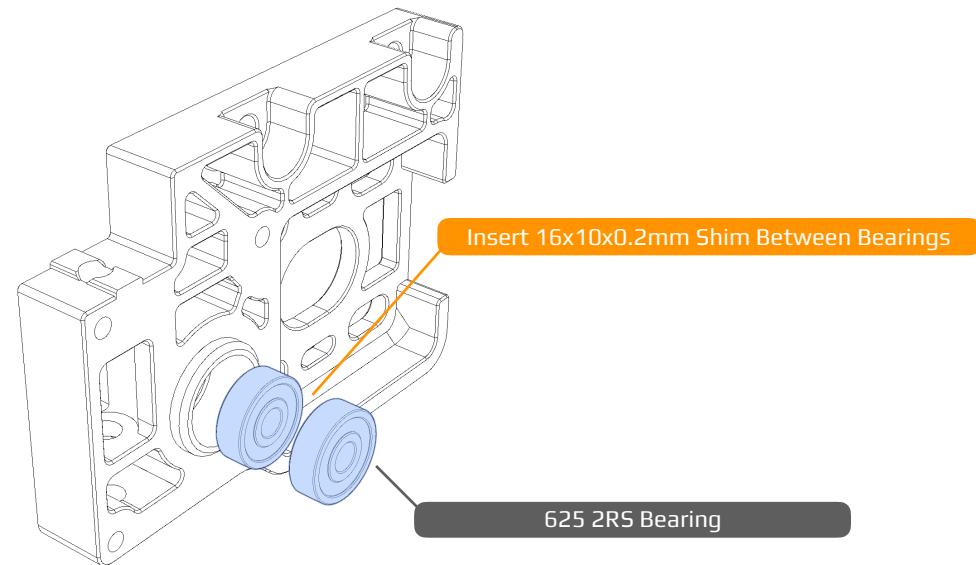
# Z Rails



# Z Drive

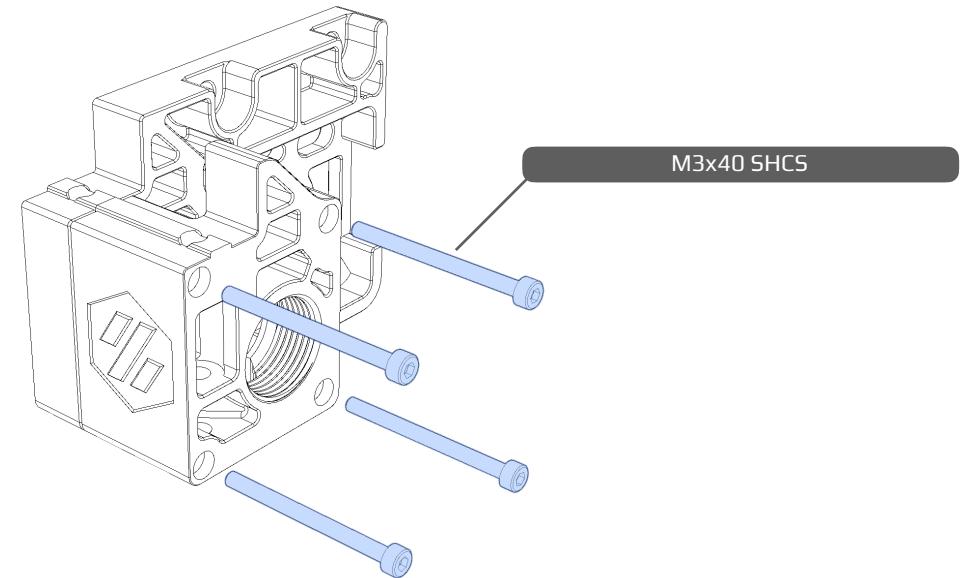
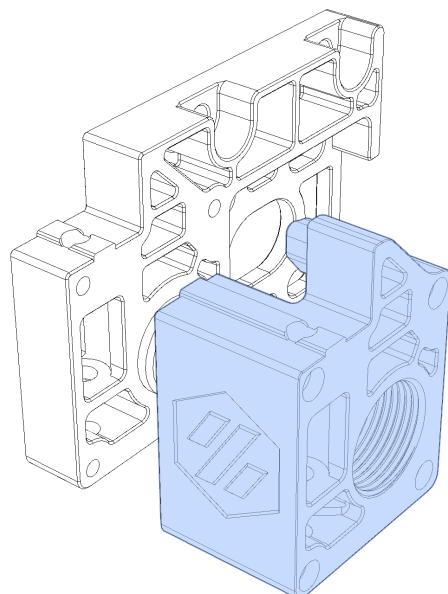


M3 Hex Nut



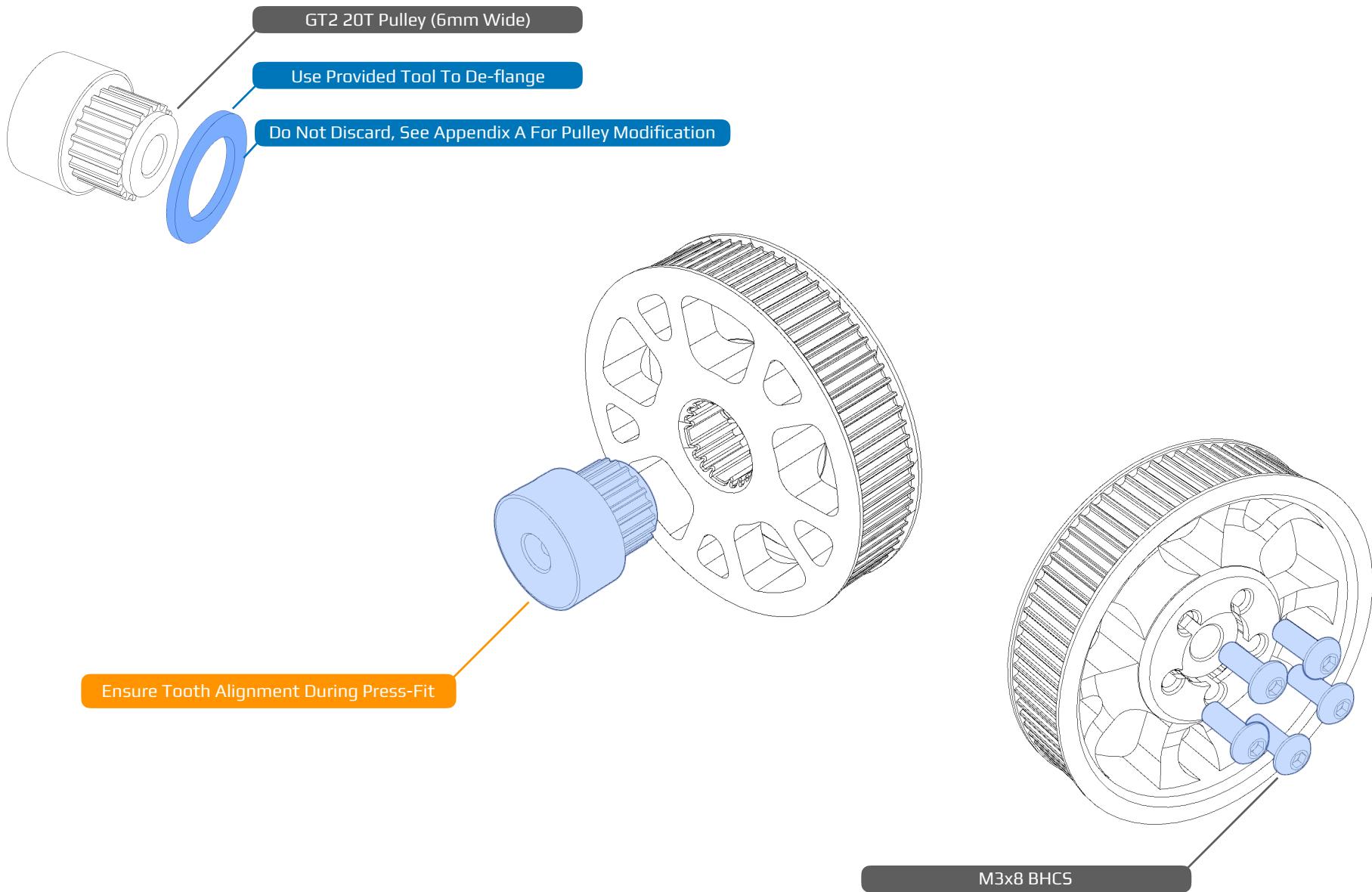
Insert 16x10x0.2mm Shim Between Bearings

625 2RS Bearing

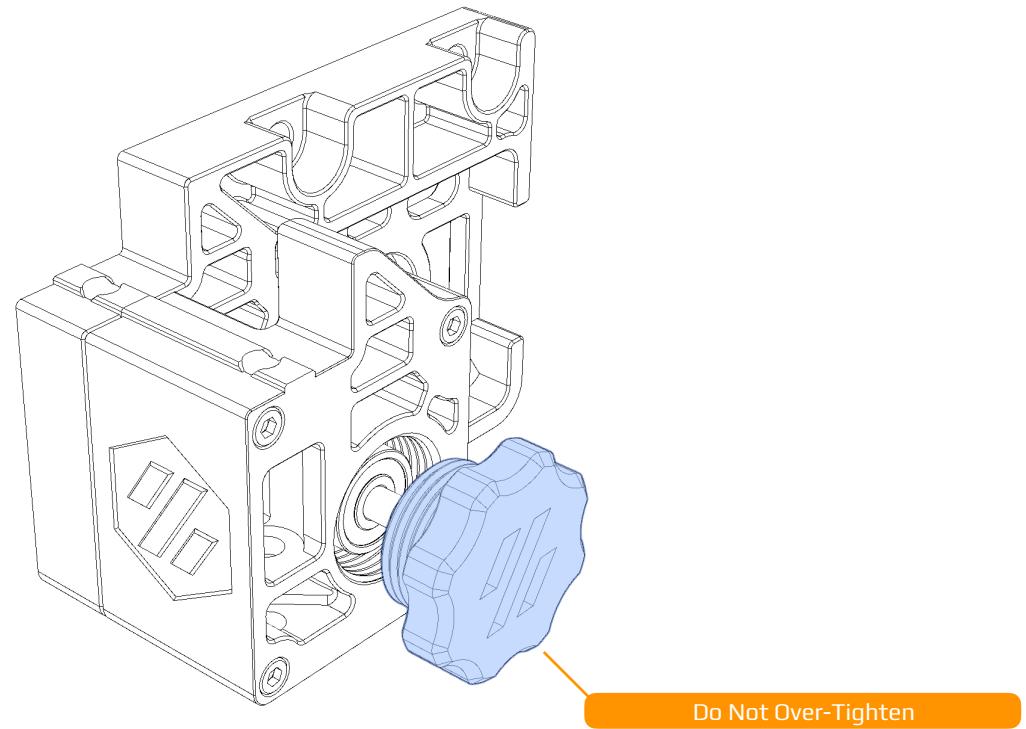
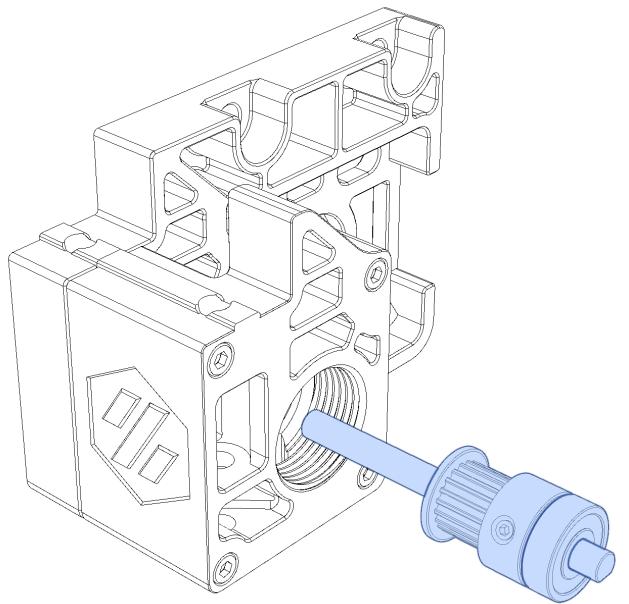
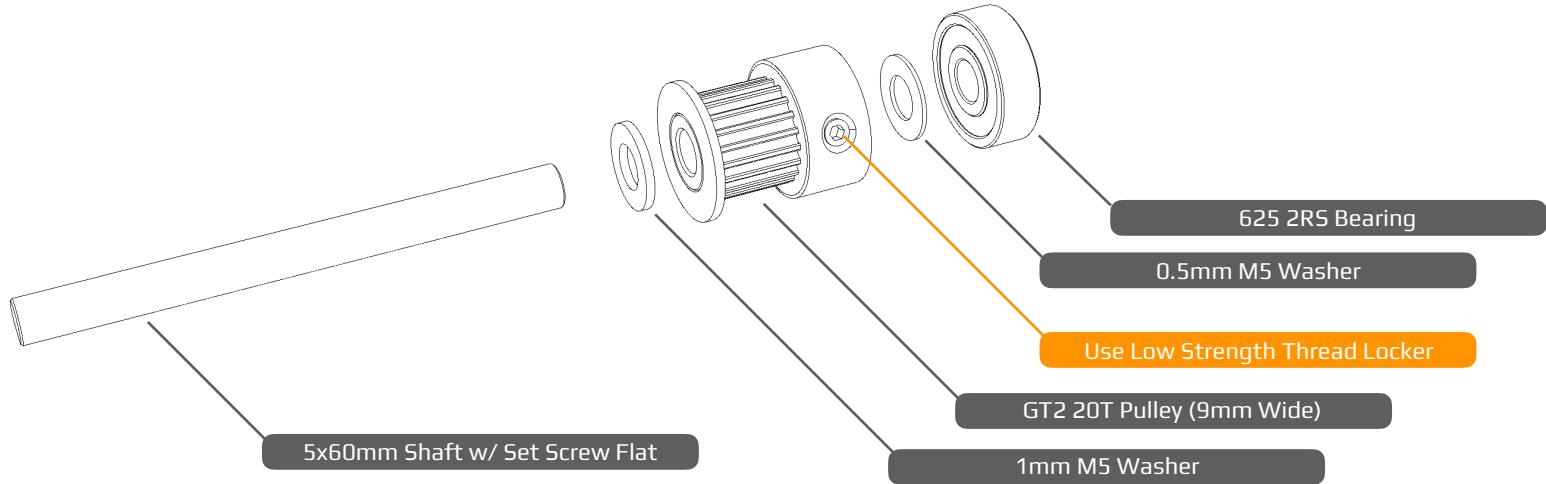


M3x40 SHCS

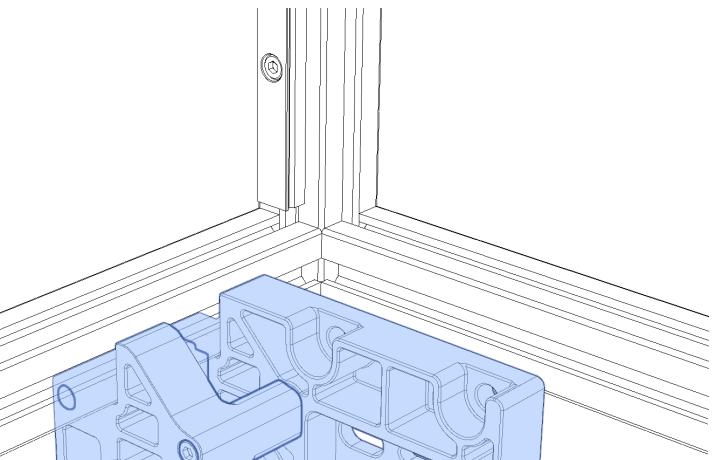
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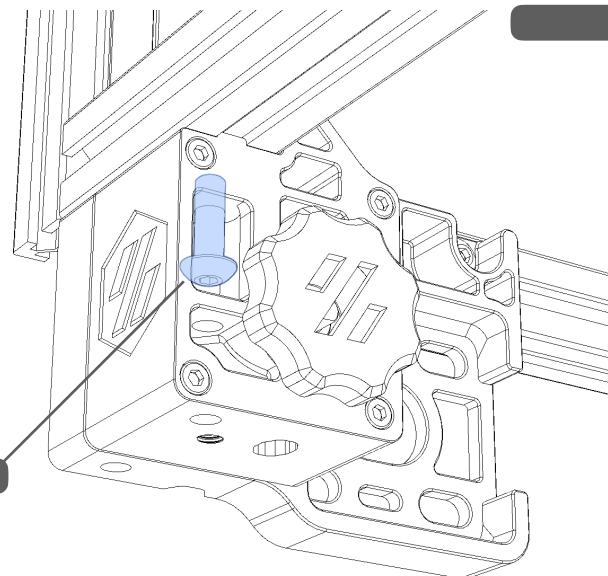
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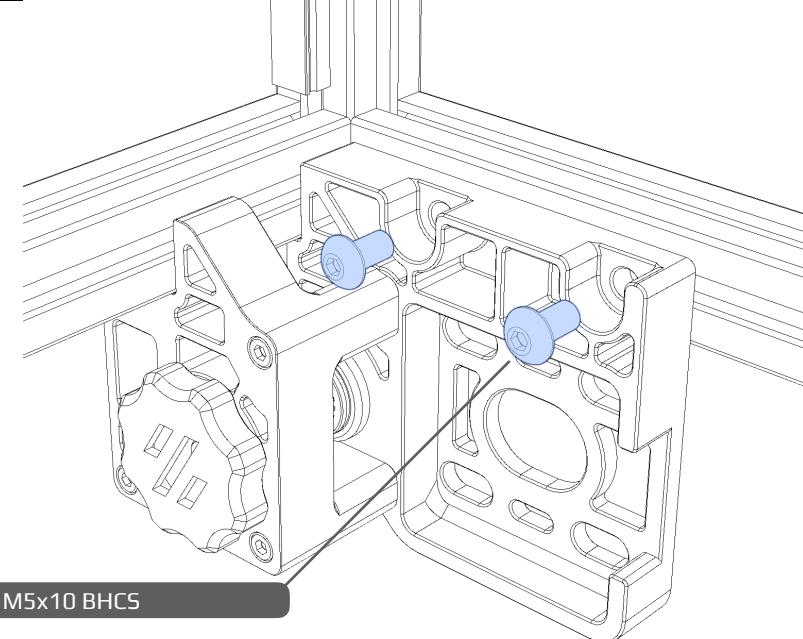
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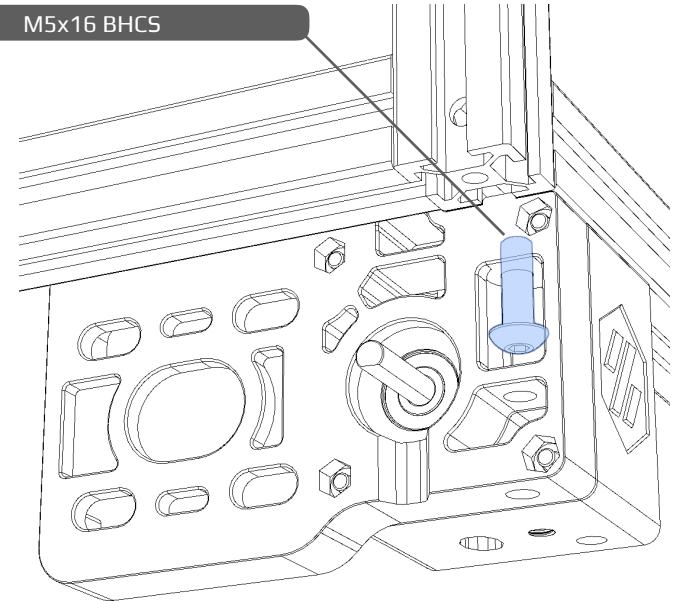
M5x16 BHCS



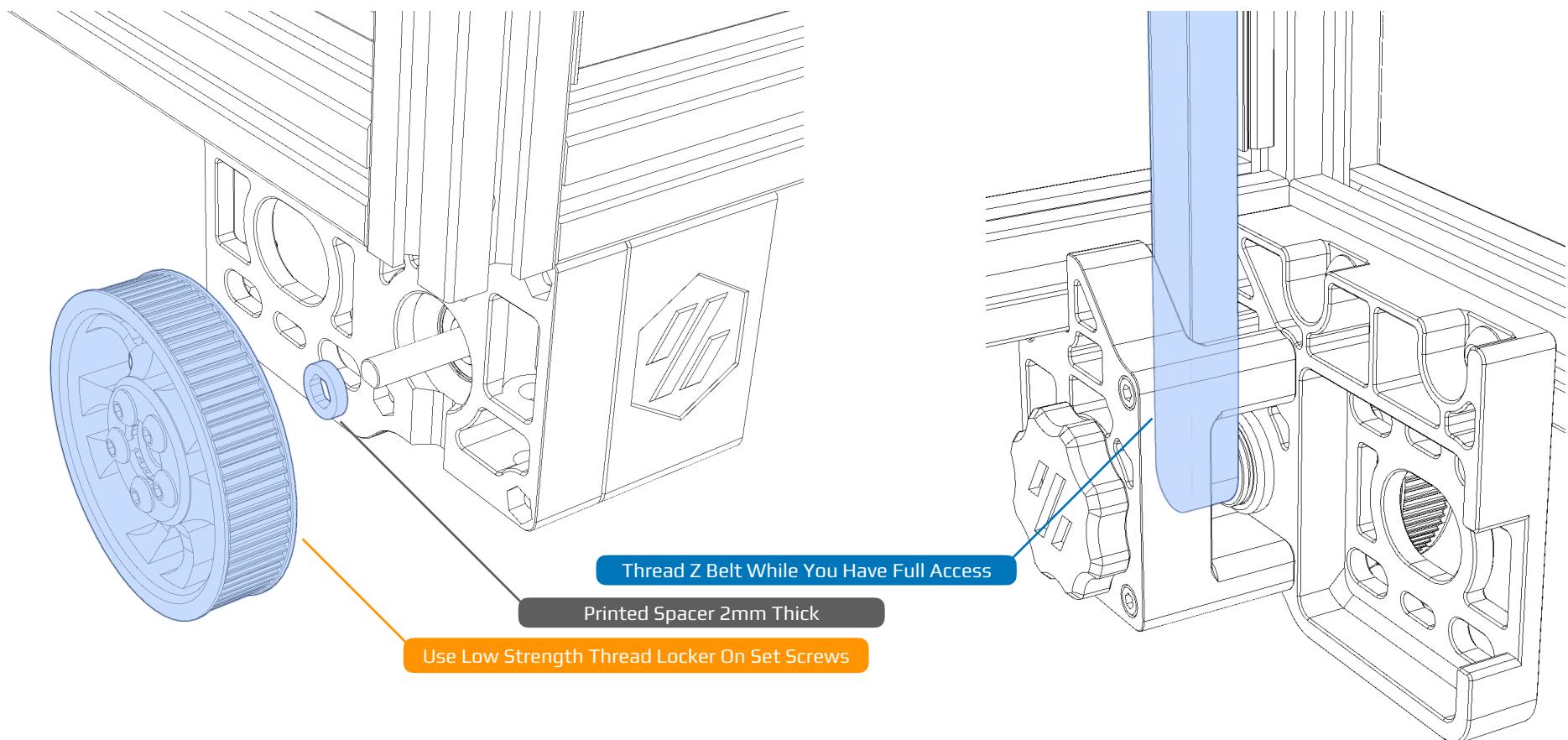
M5x16 BHCS



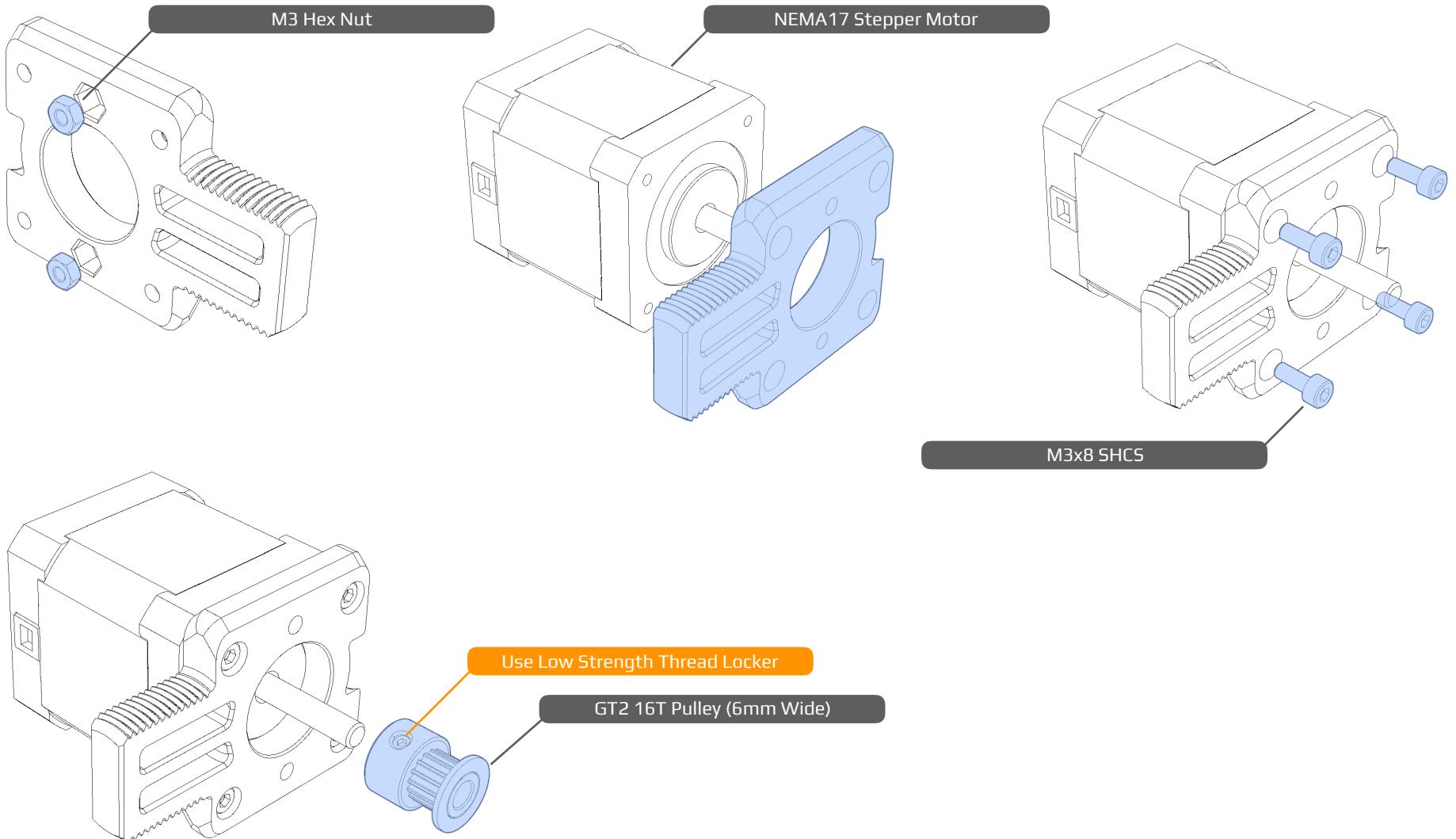
M5x10 BHCS



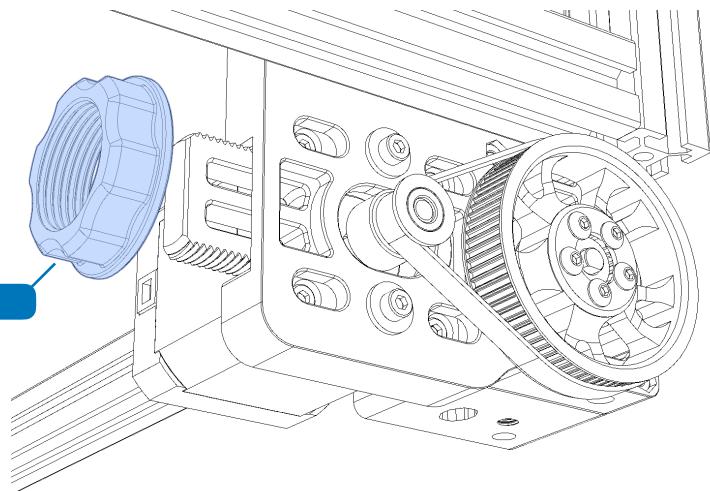
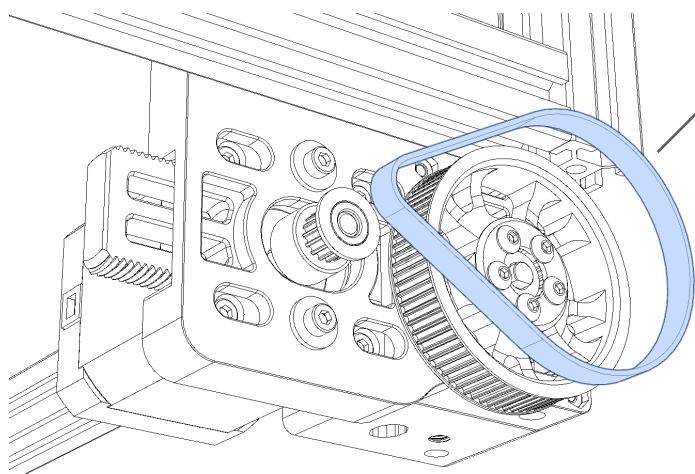
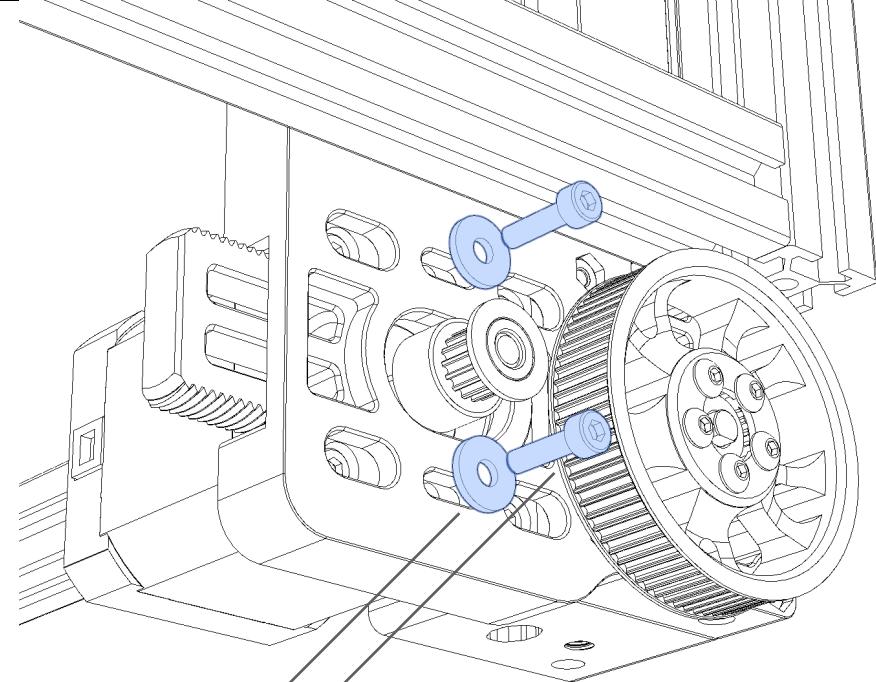
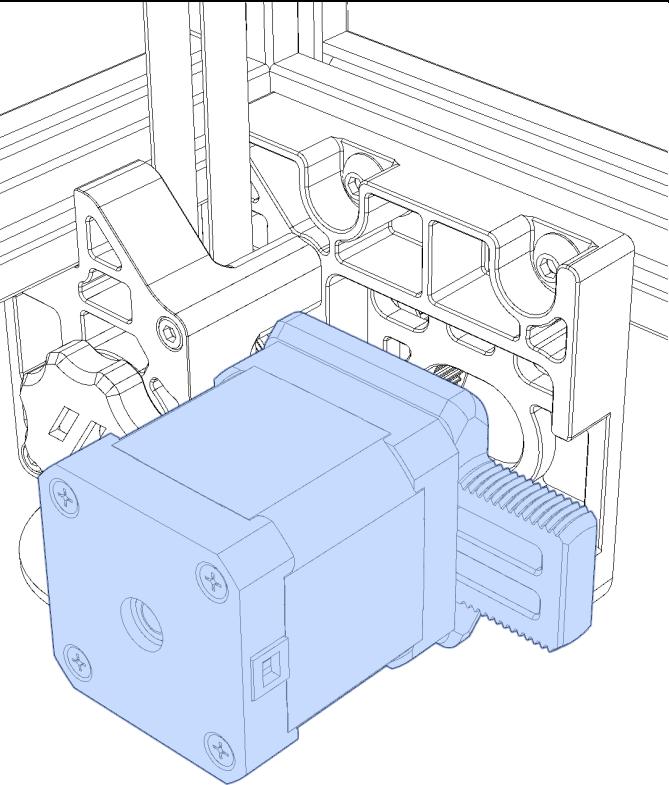
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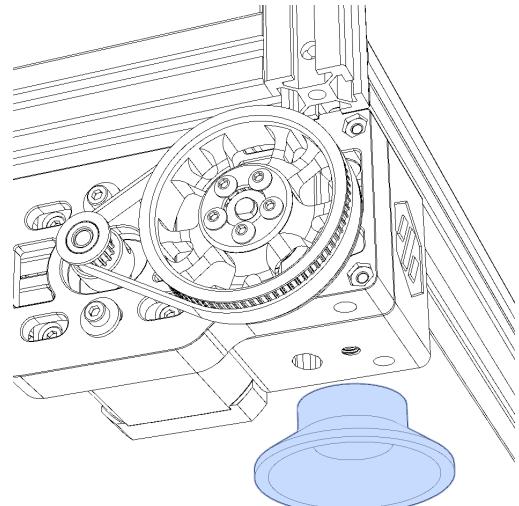
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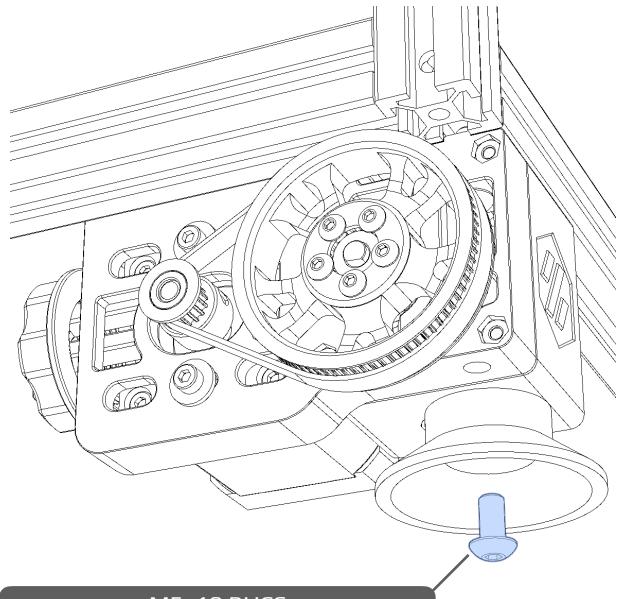
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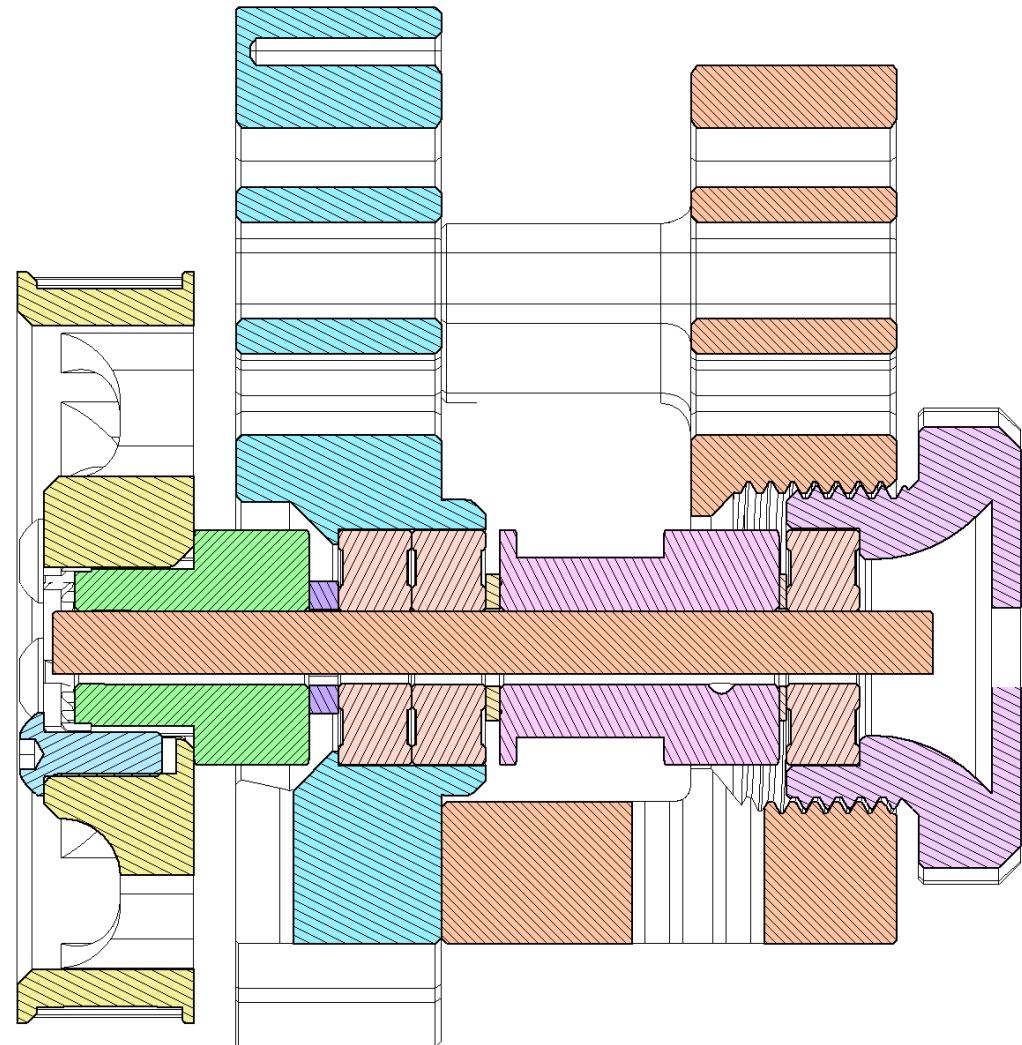
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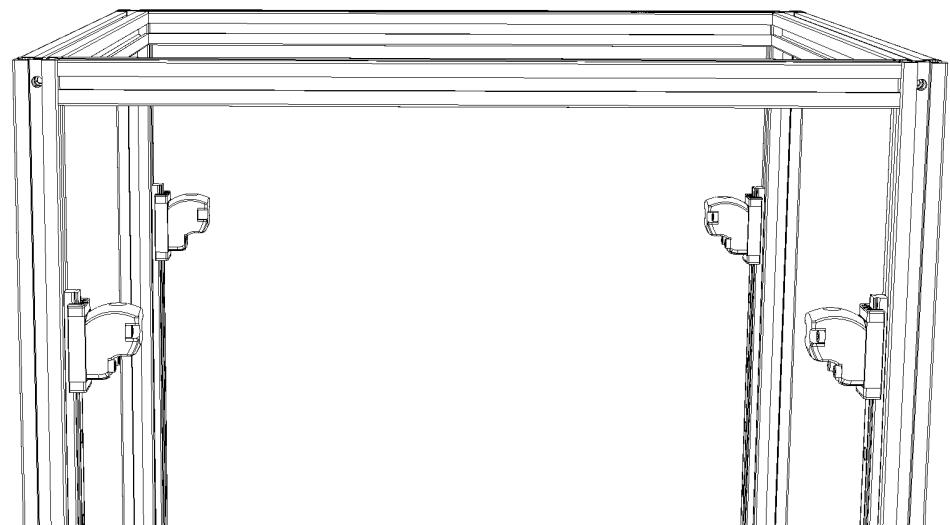
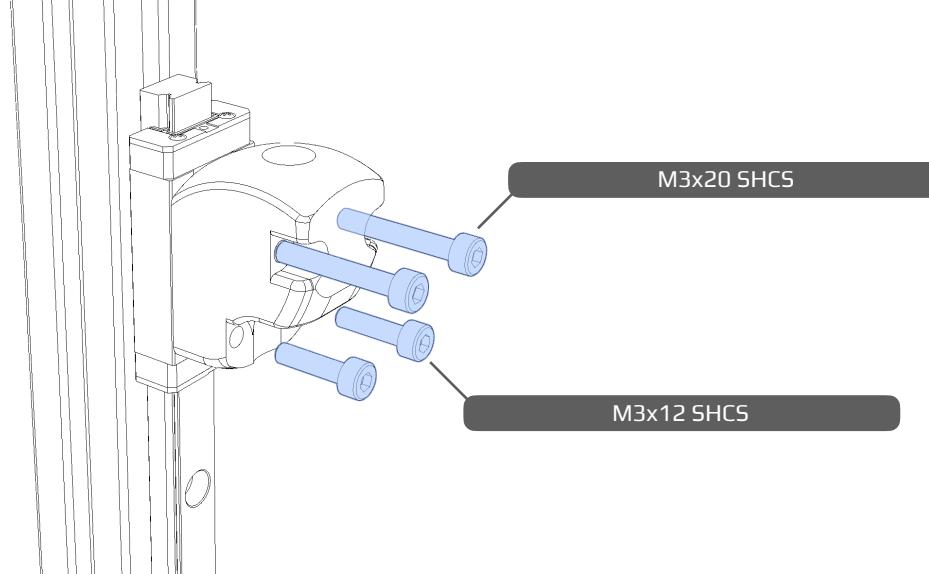
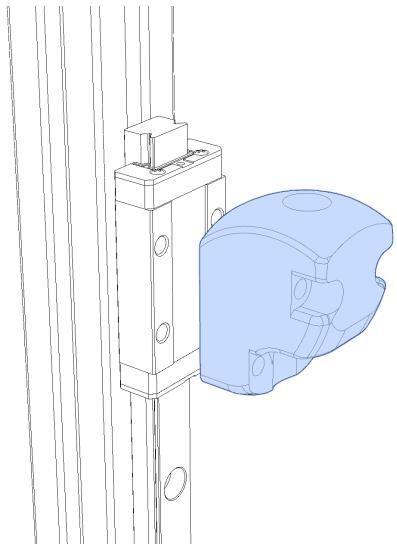
Rubber Compressor Foot



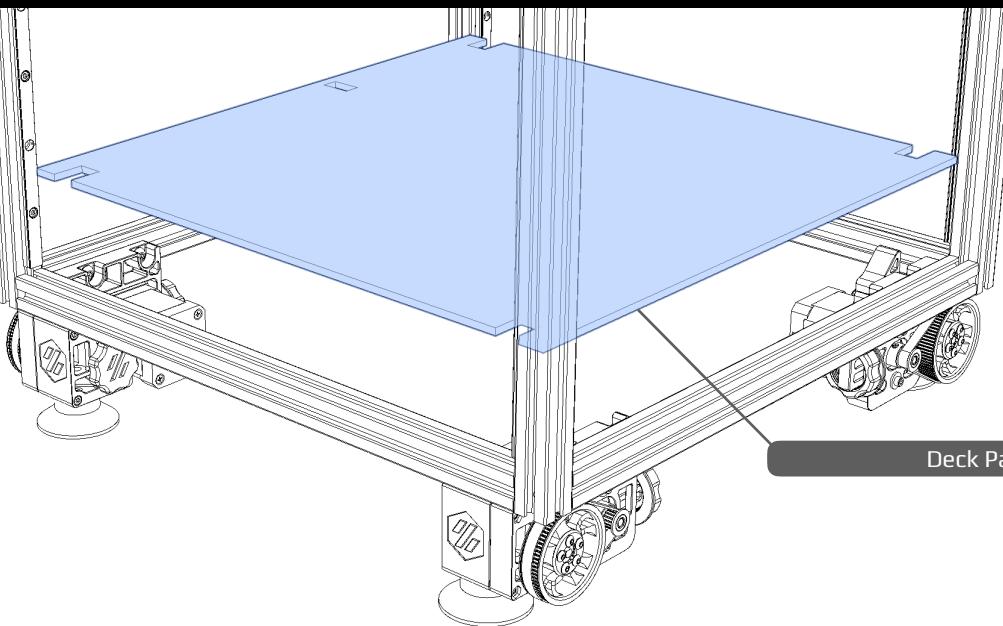
M5x10 BHCS



# Z Rails



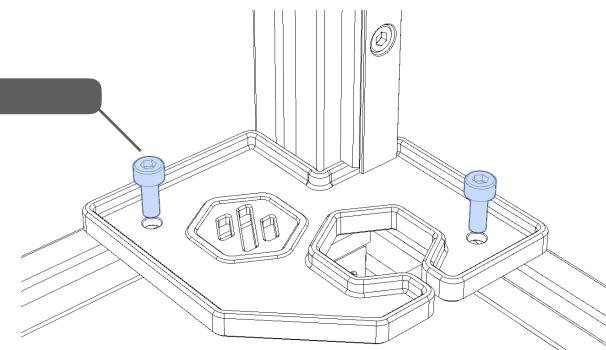
# Deck



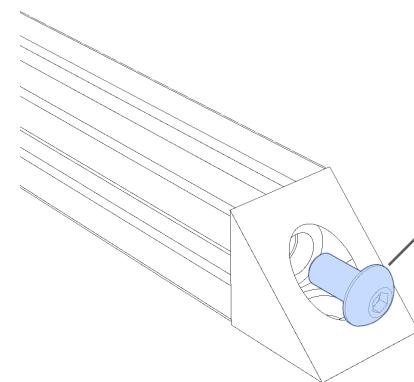
Pull Belt Through Opening Before Securing

Deck Panel

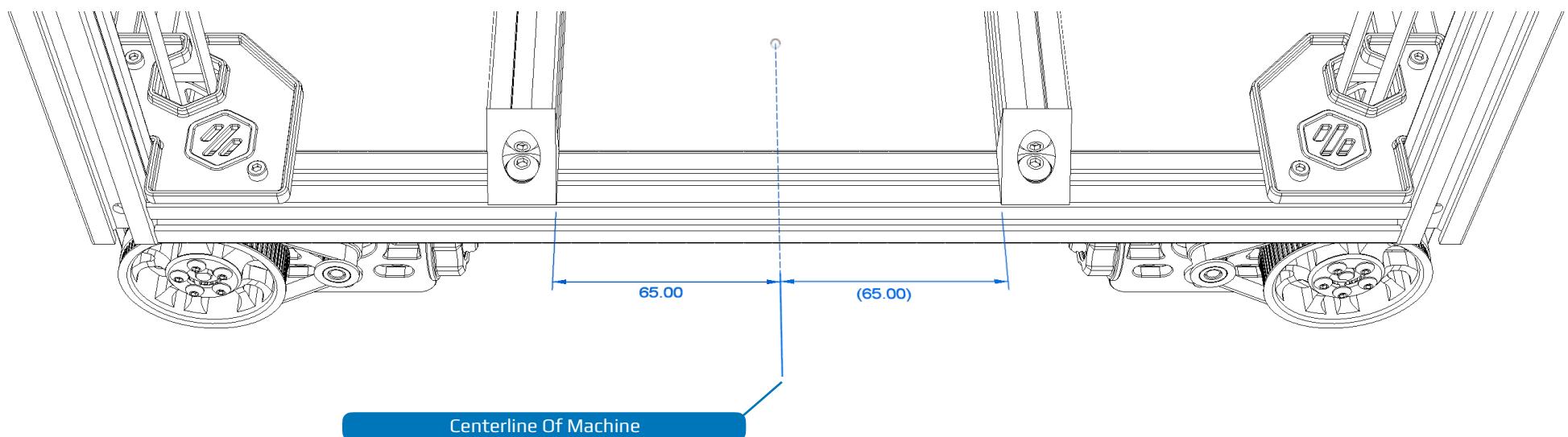
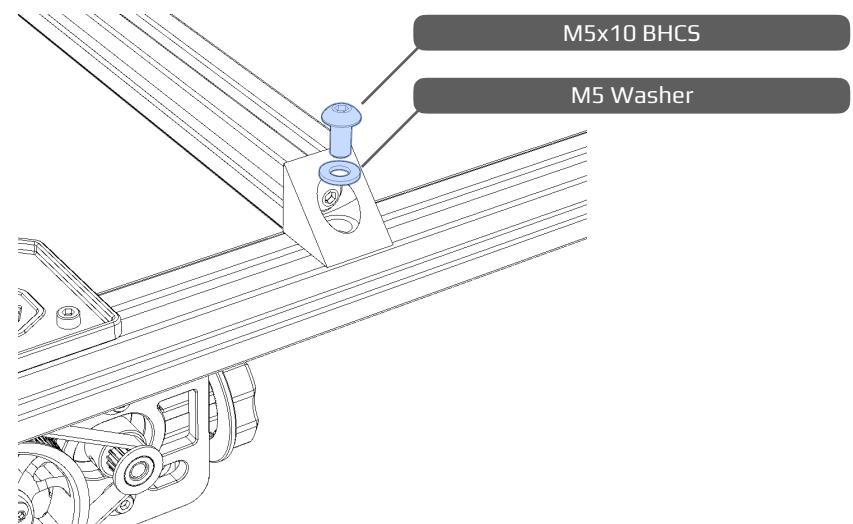
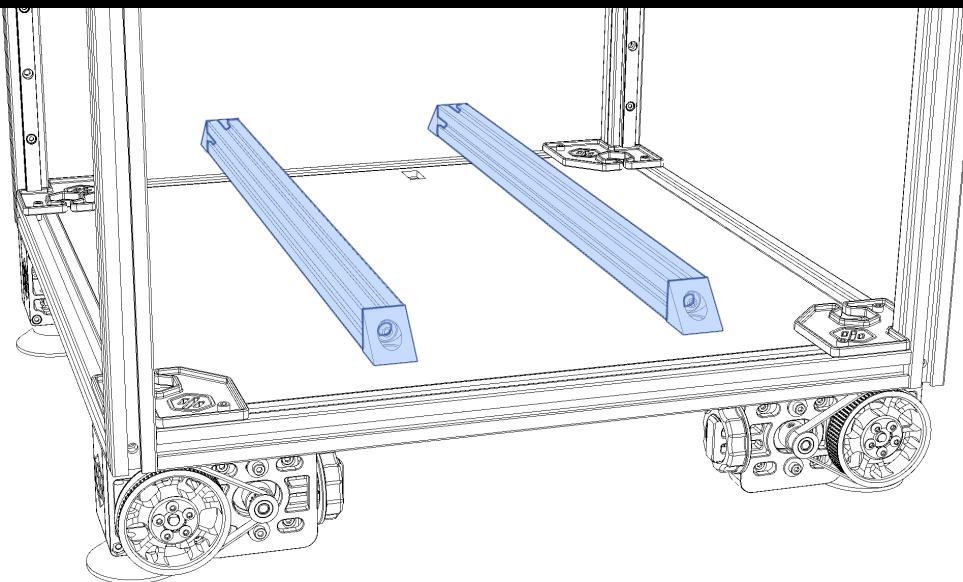
M3x8 SHCS



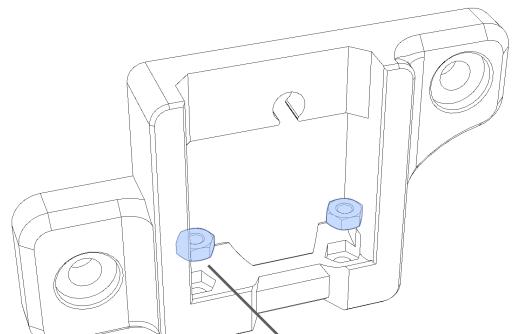
M5x10 BHCS



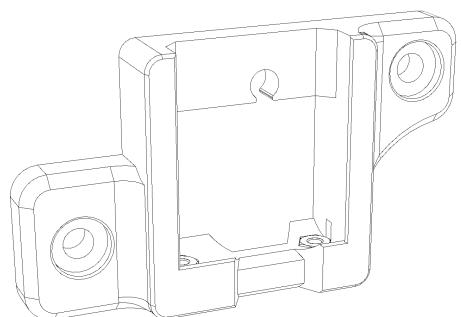
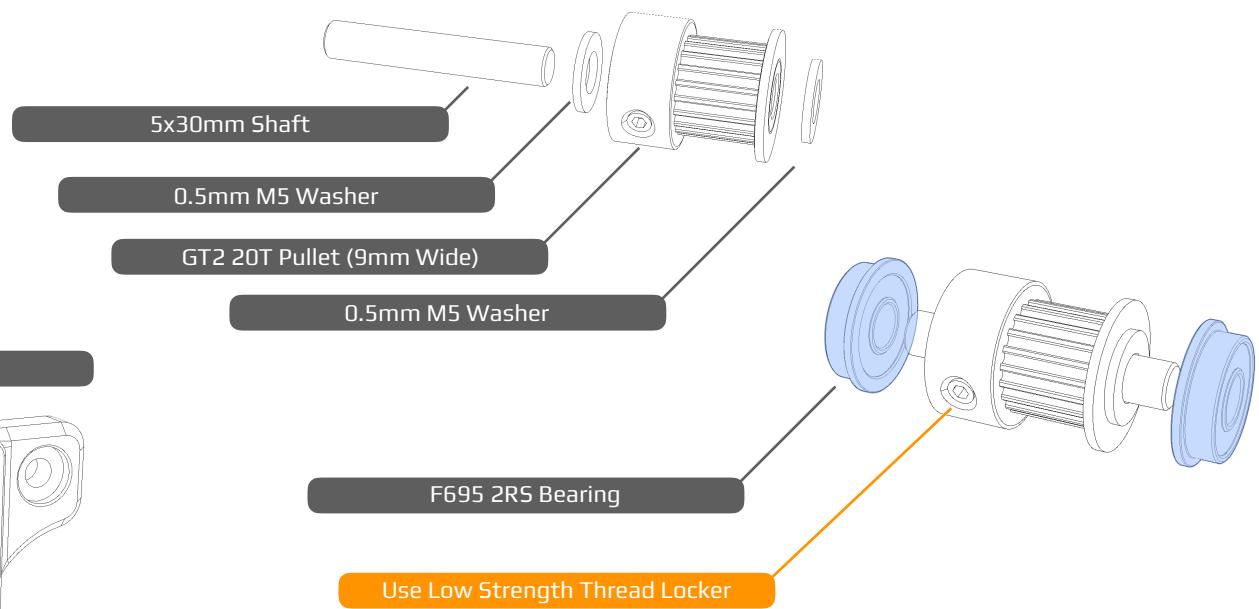
# Deck



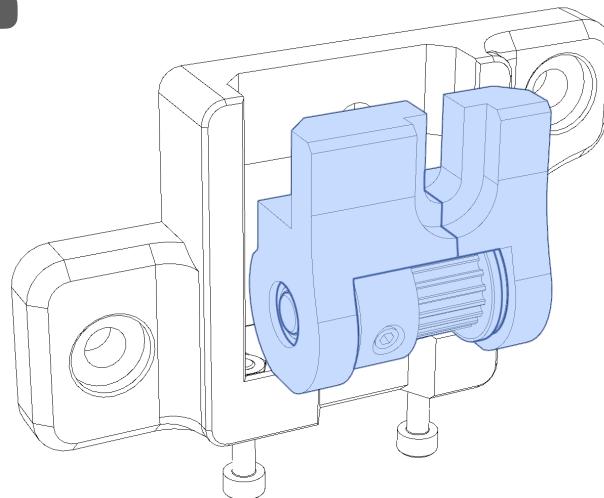
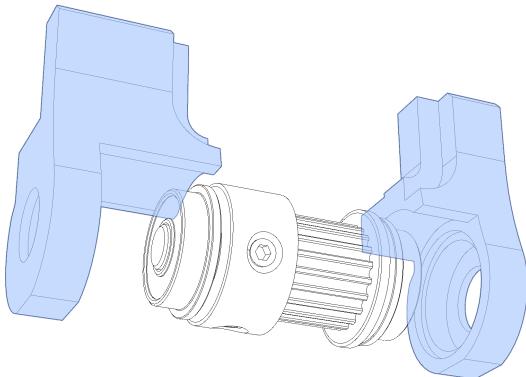
## Z Idlers



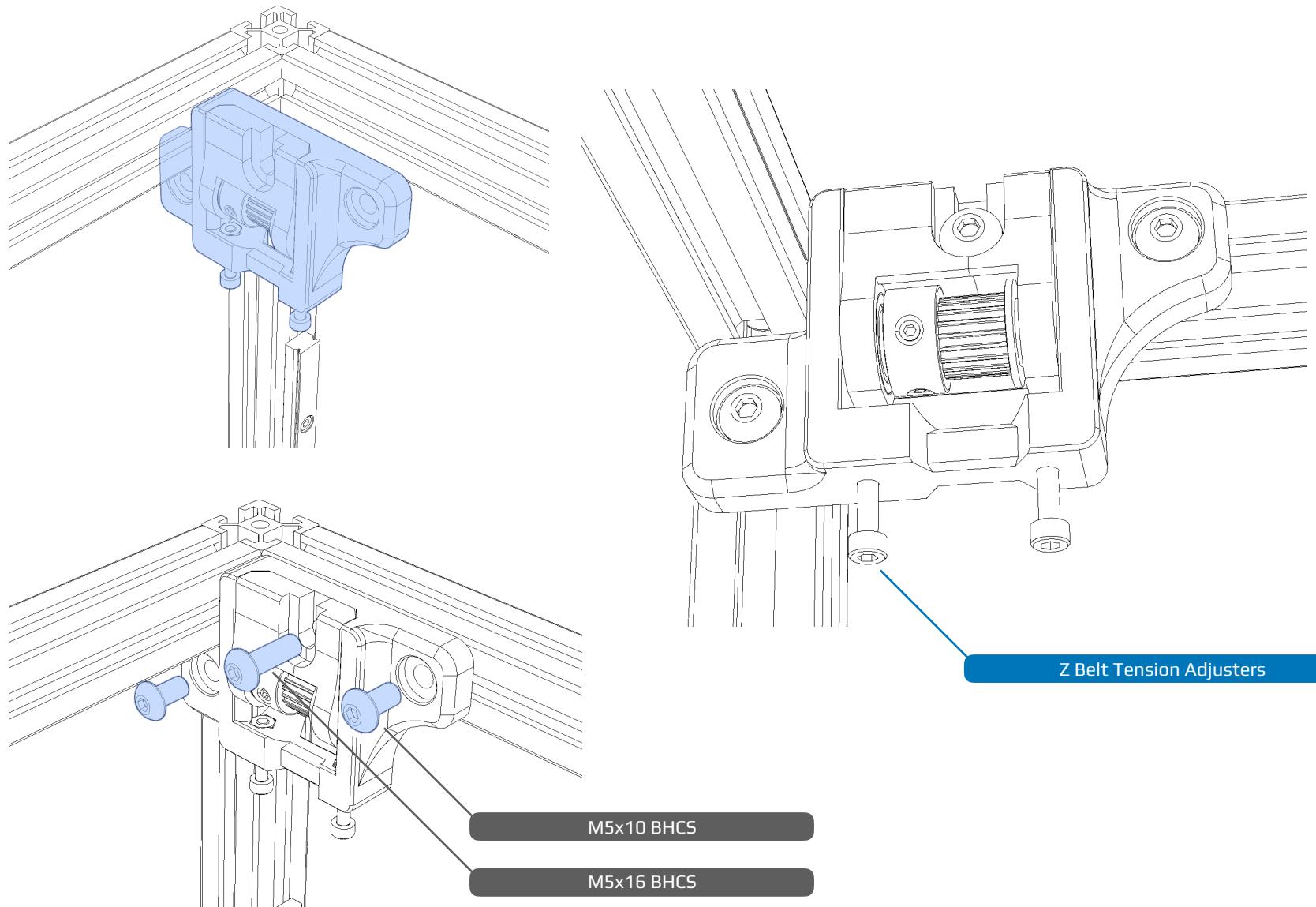
M3 Hex Nut

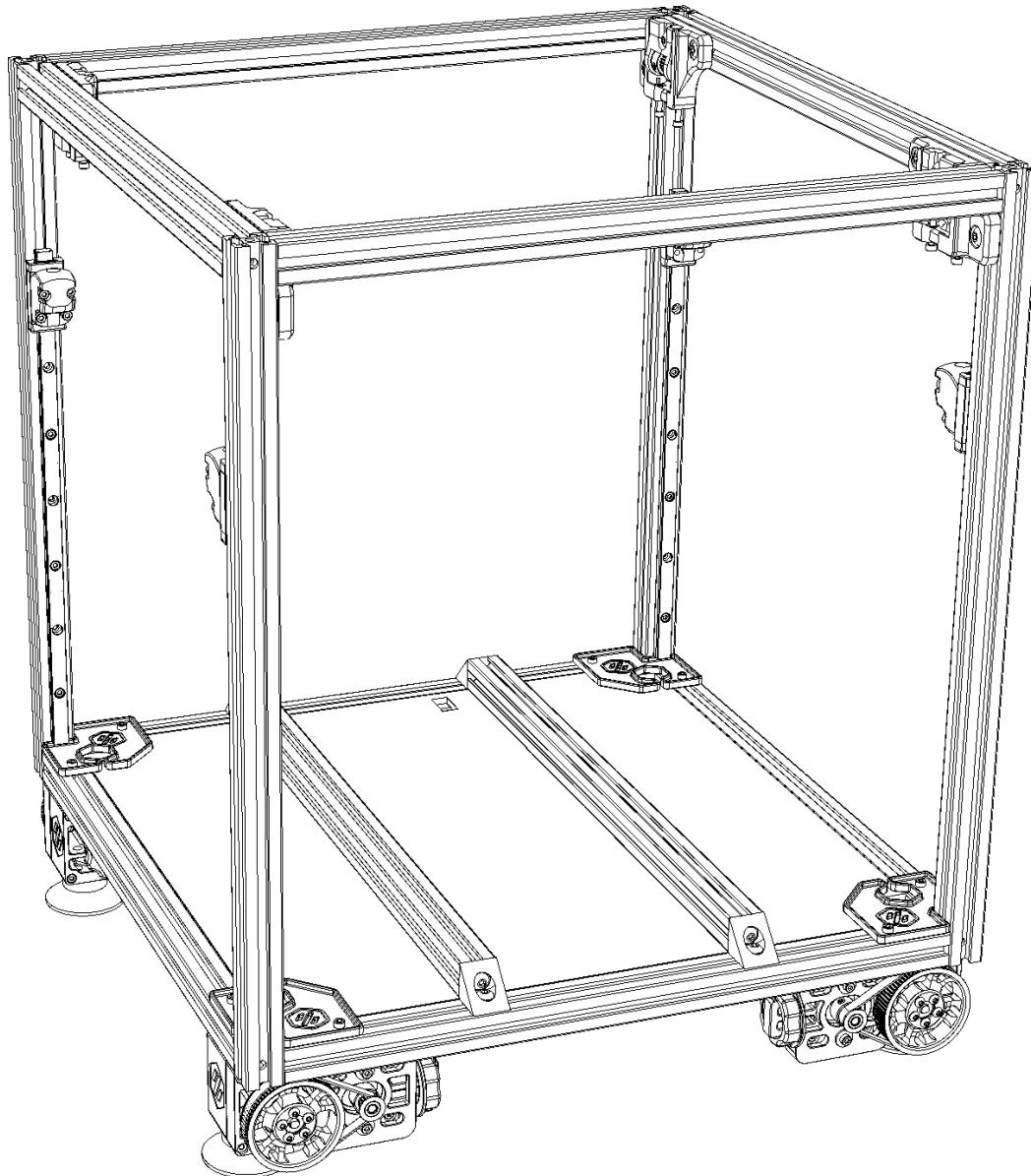


M3x16 SHCS

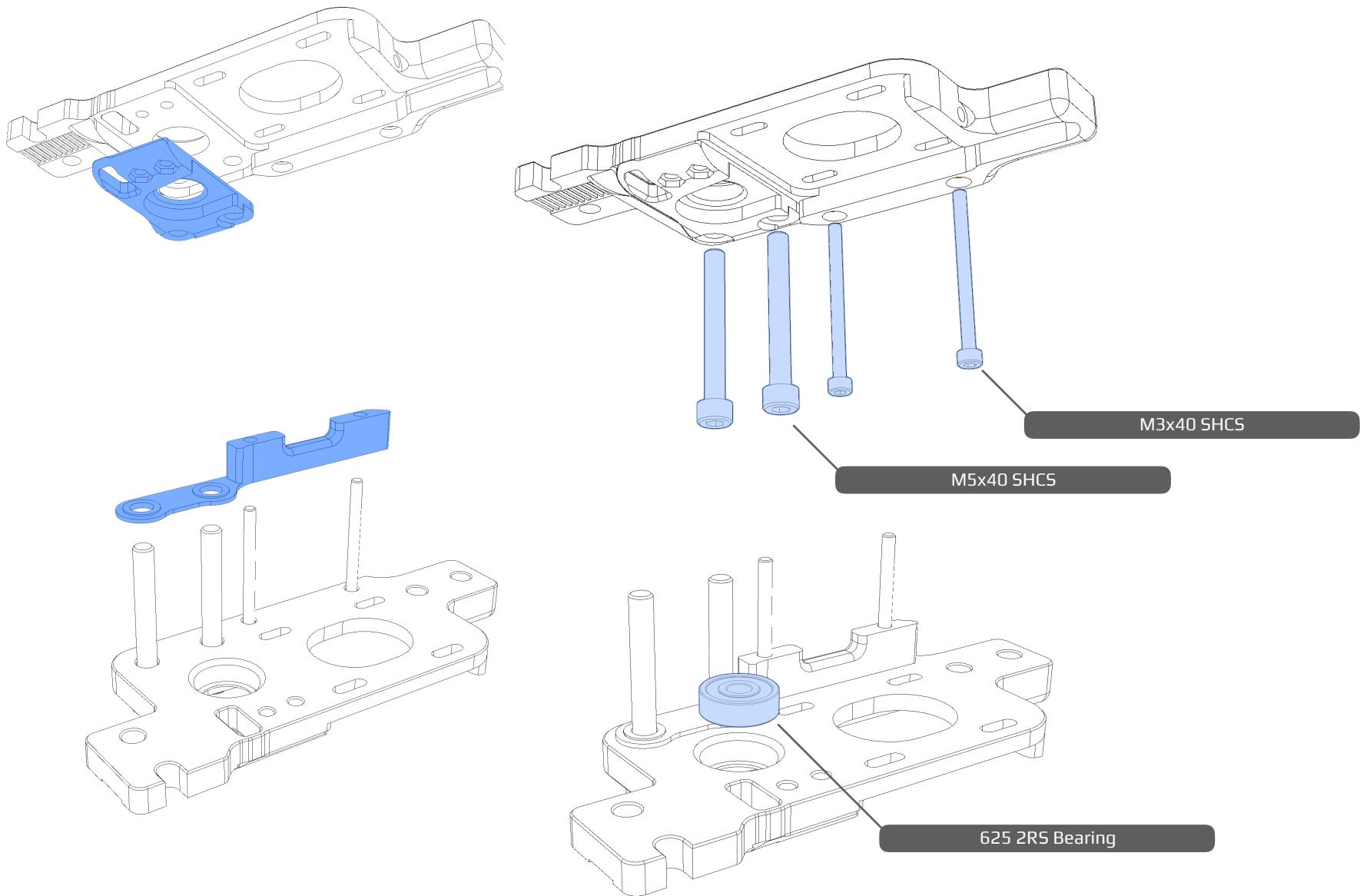


## Z Idlers

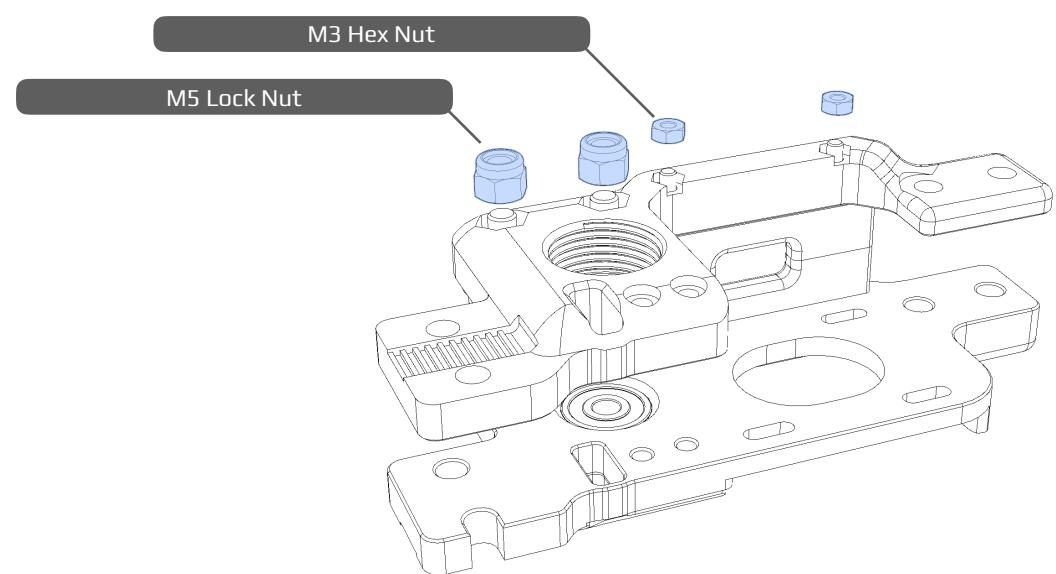
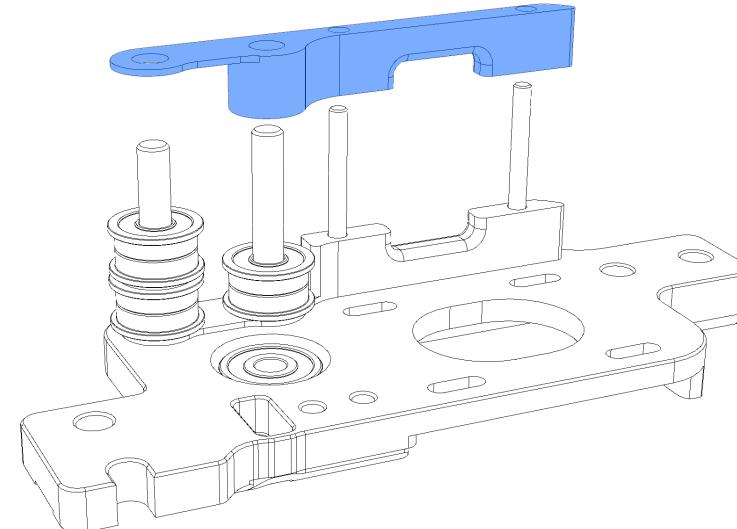
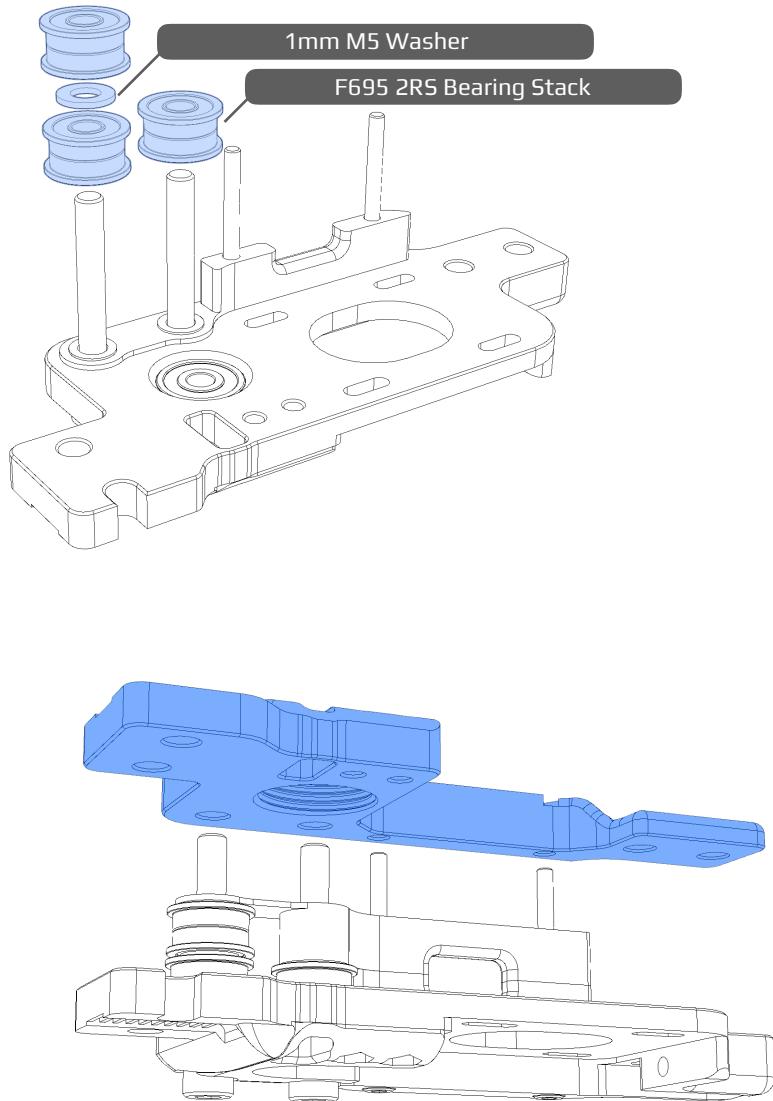




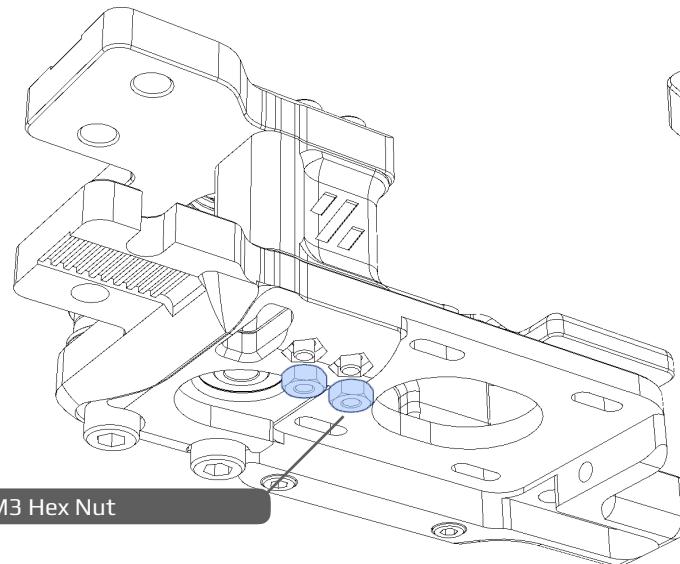
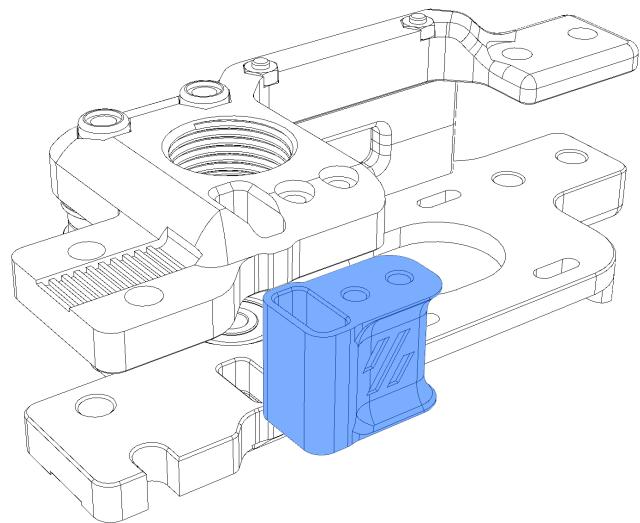
## B Drive Unit



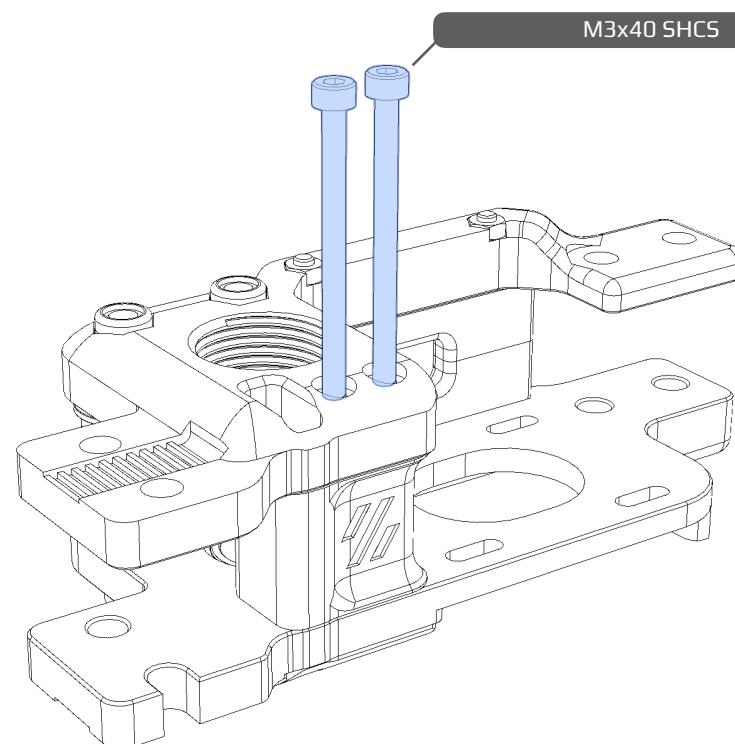
## B Drive Unit



## B Drive Unit



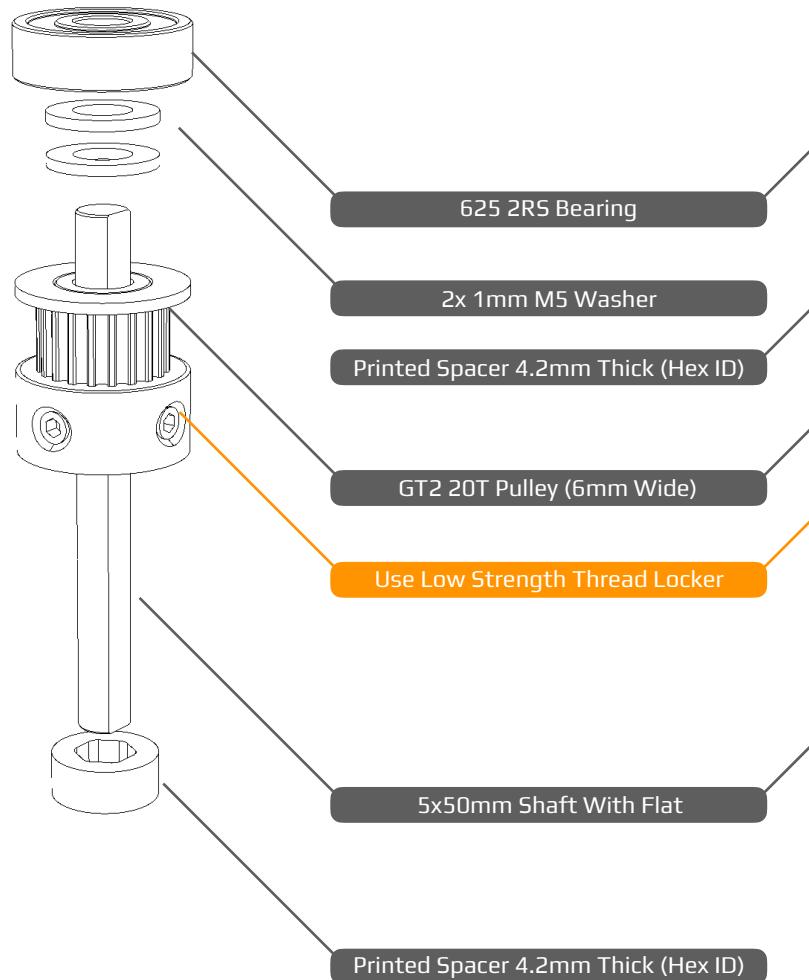
M3 Hex Nut



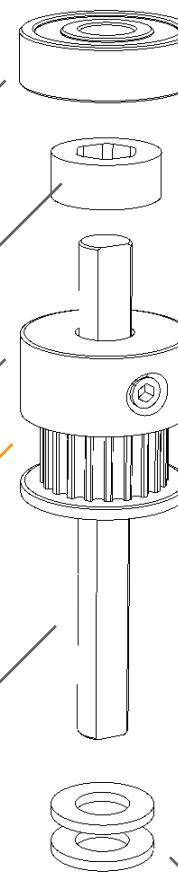
M3x40 SHCS

# A/B Drive Shafts

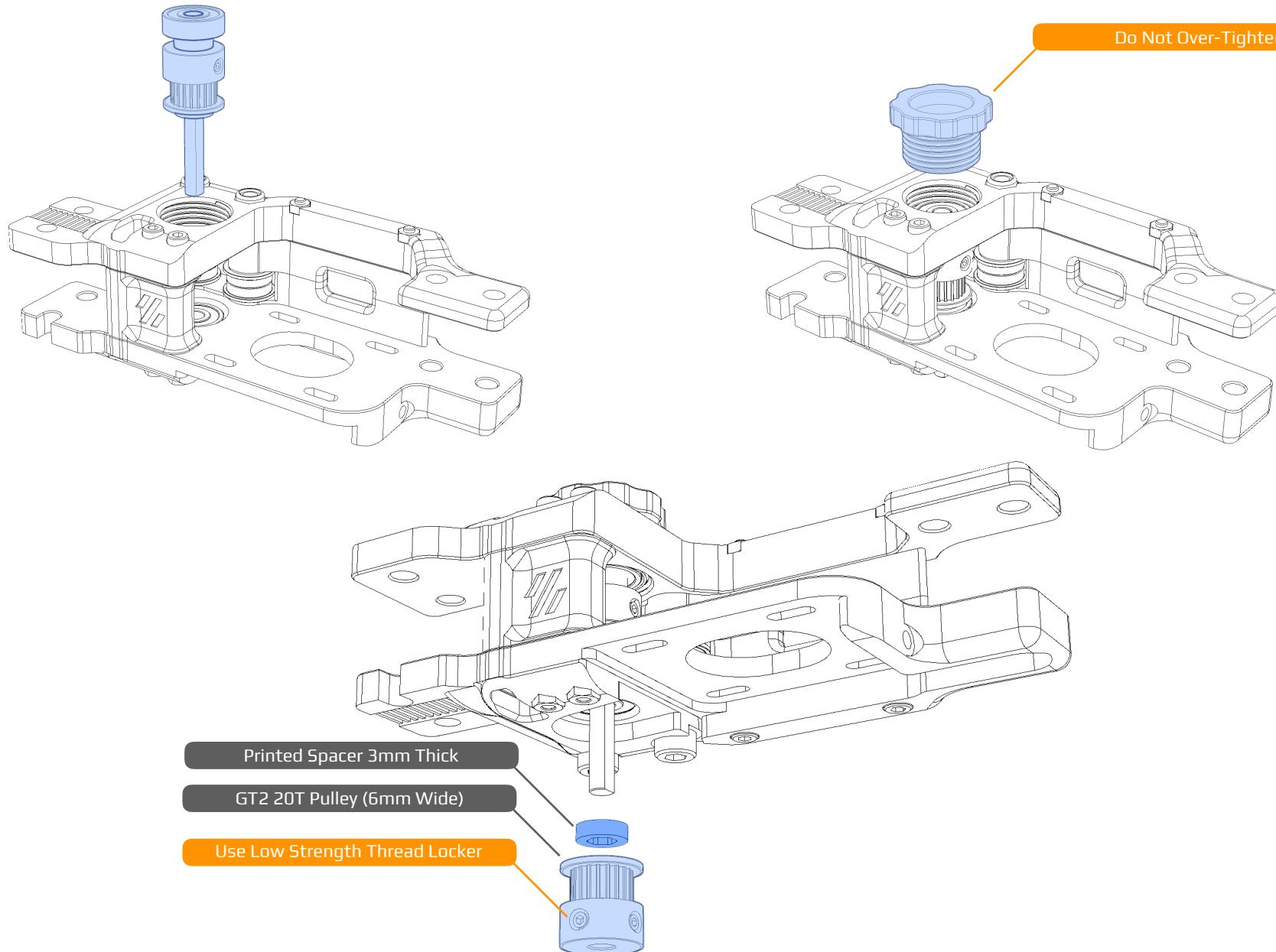
A Driveshaft



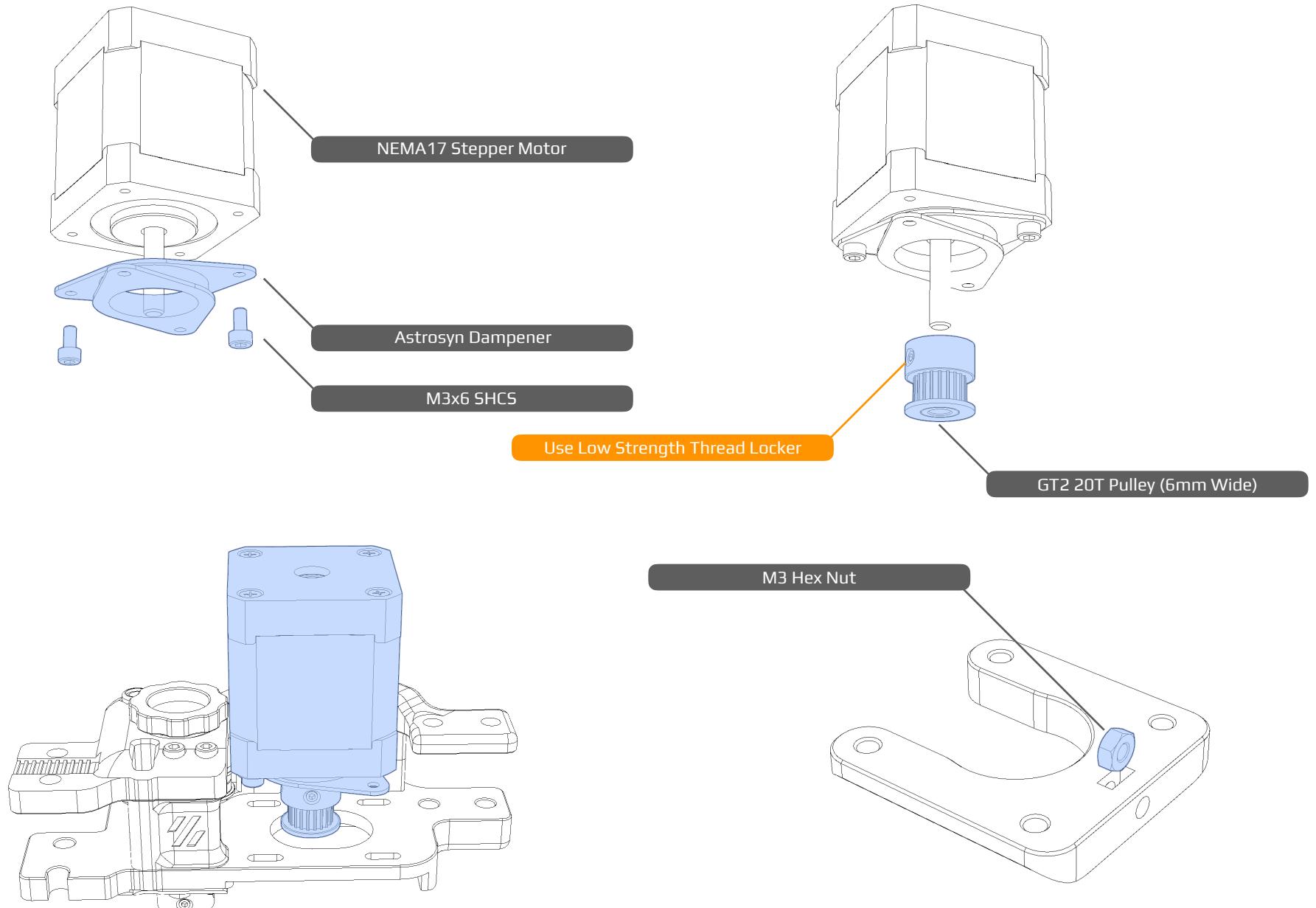
B Driveshaft



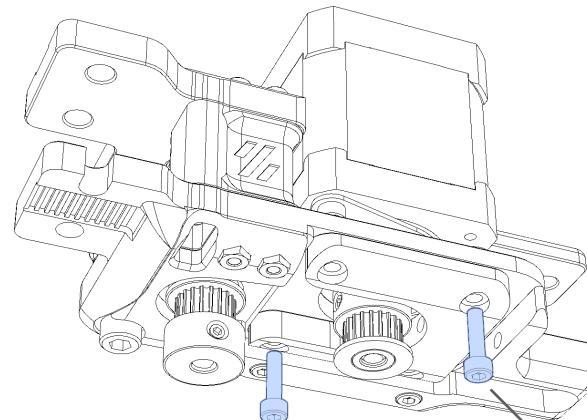
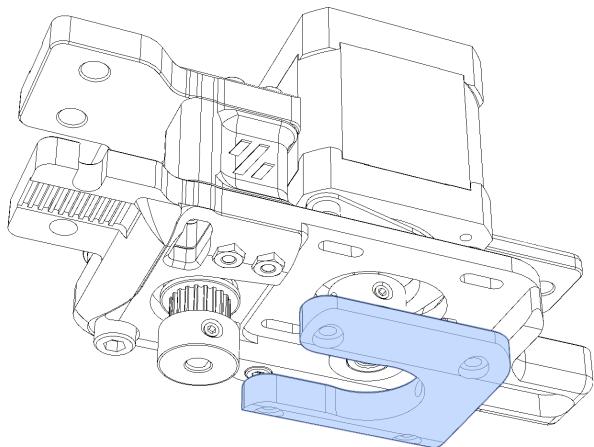
## B Drive Unit



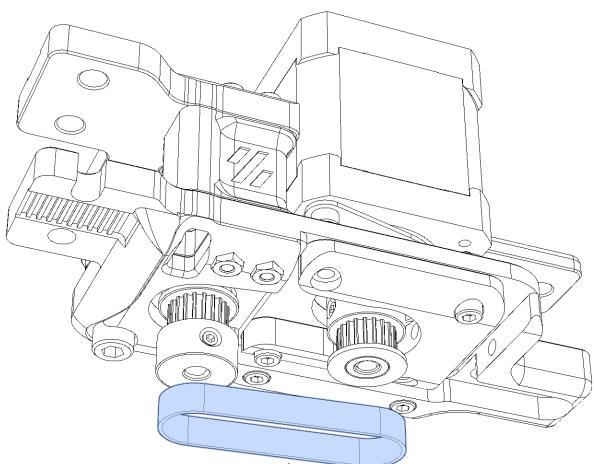
## B Drive Unit



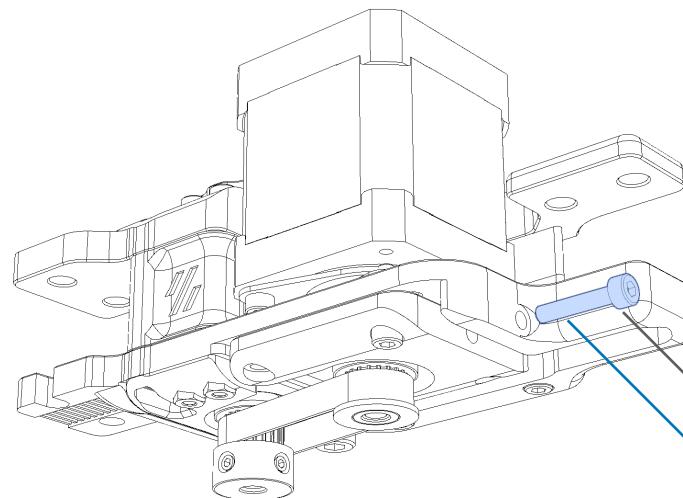
## B Drive Unit



M3x12 SHCS



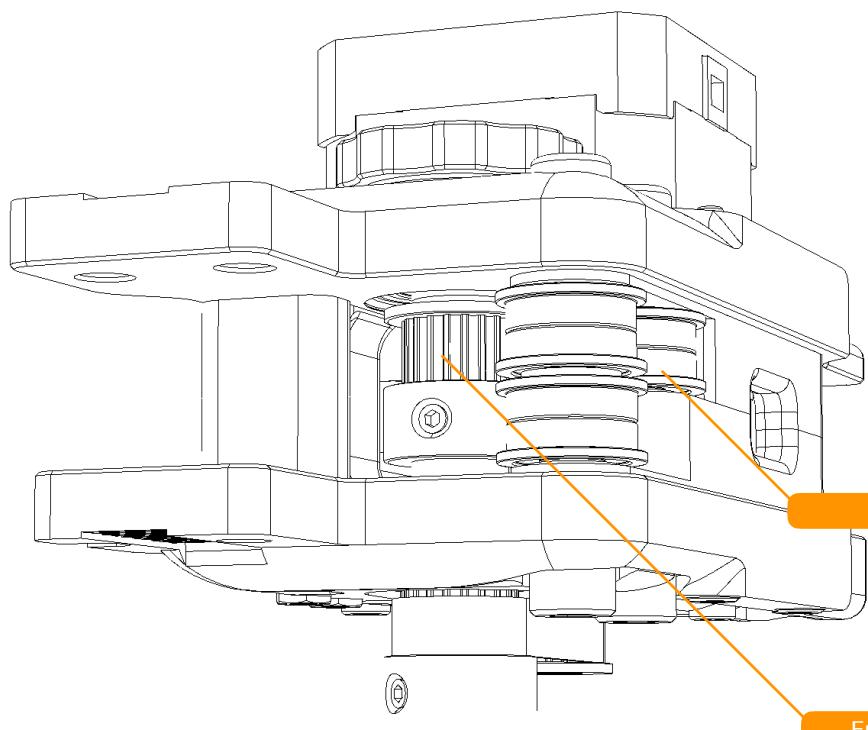
GT2 Belt Loop (110mm)



M3x16 SHCS  
Belt Loop Tension Adjustment

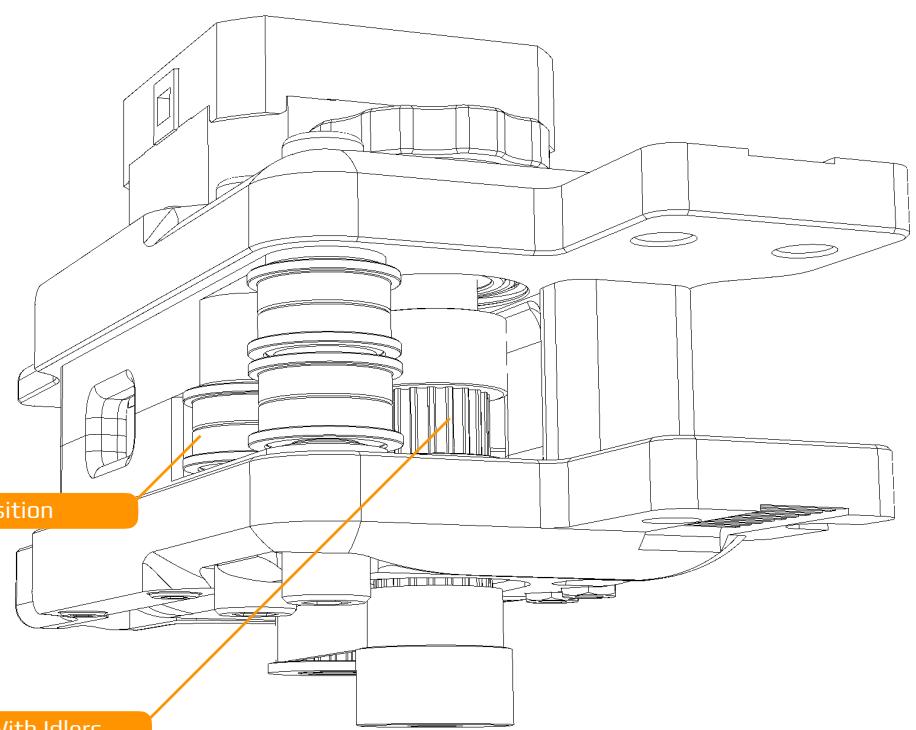
# A/B Drive Units

A Drive Unit



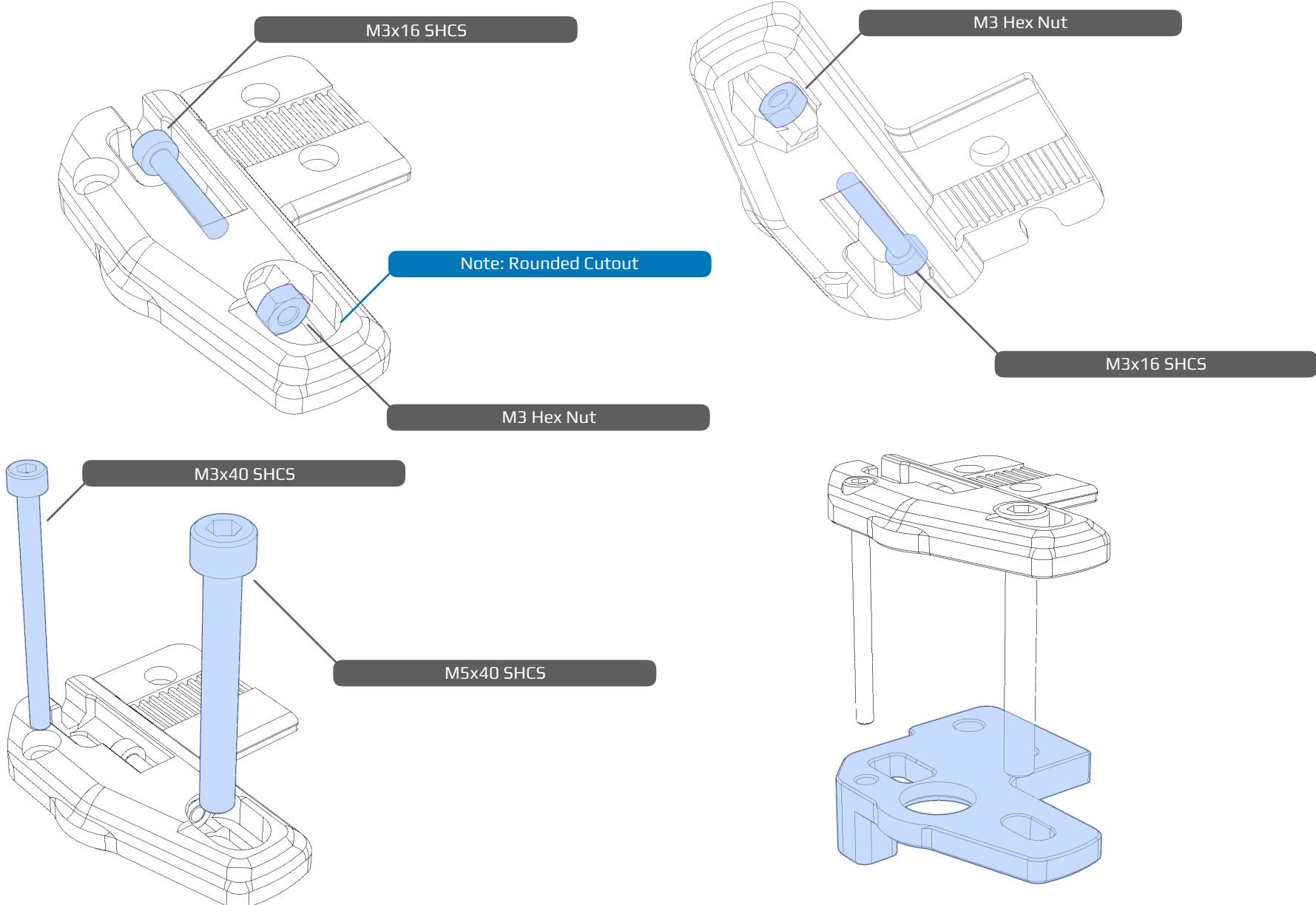
Note Single Idler Position

B Drive Unit

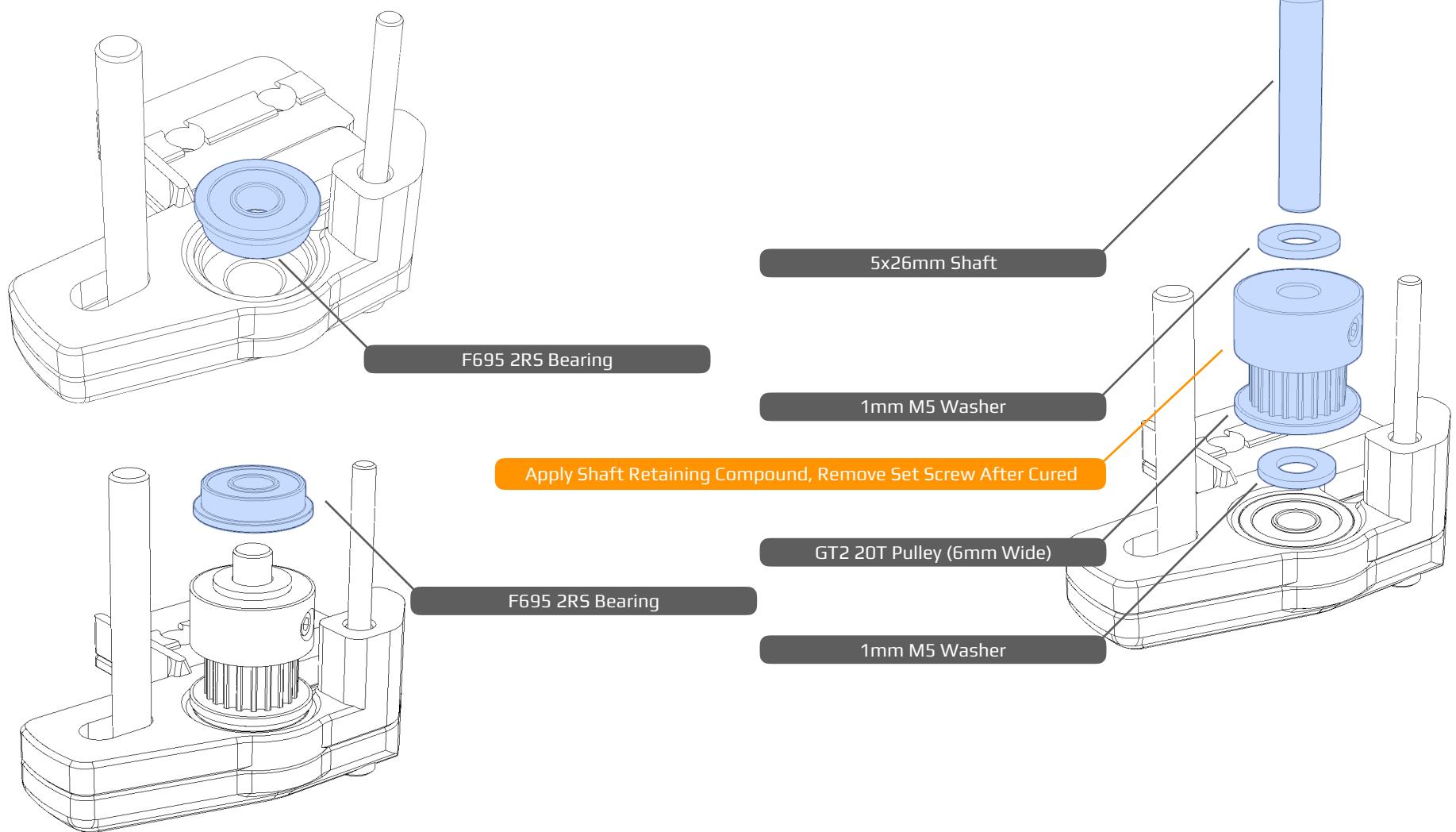


Ensure Pulley Aligns With Idlers

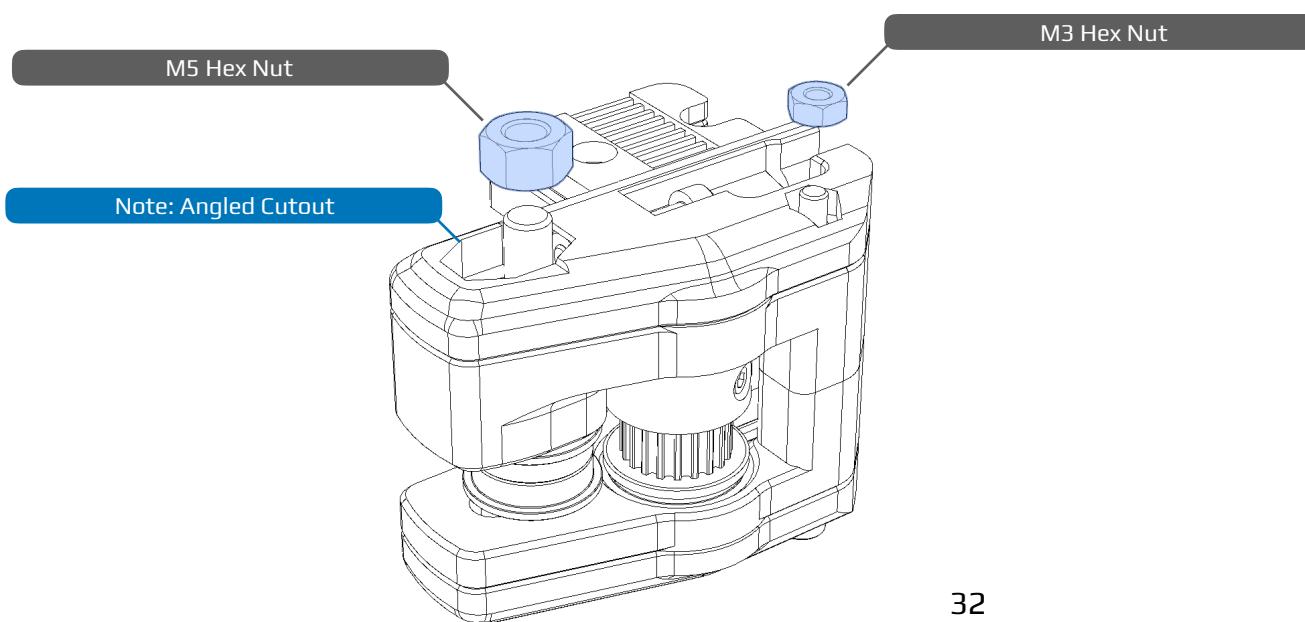
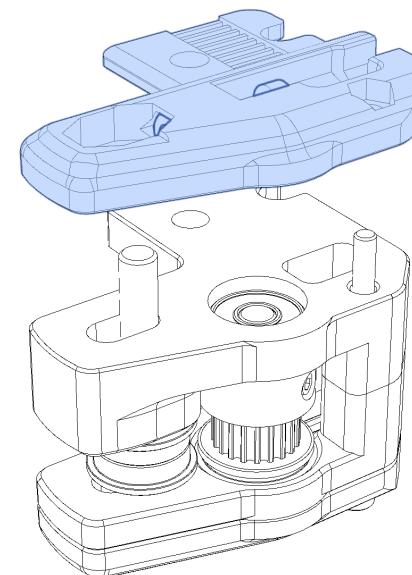
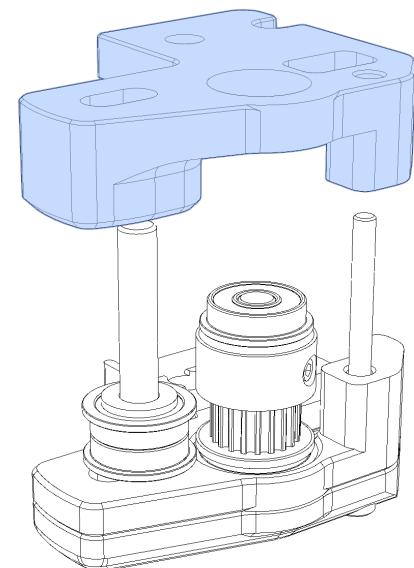
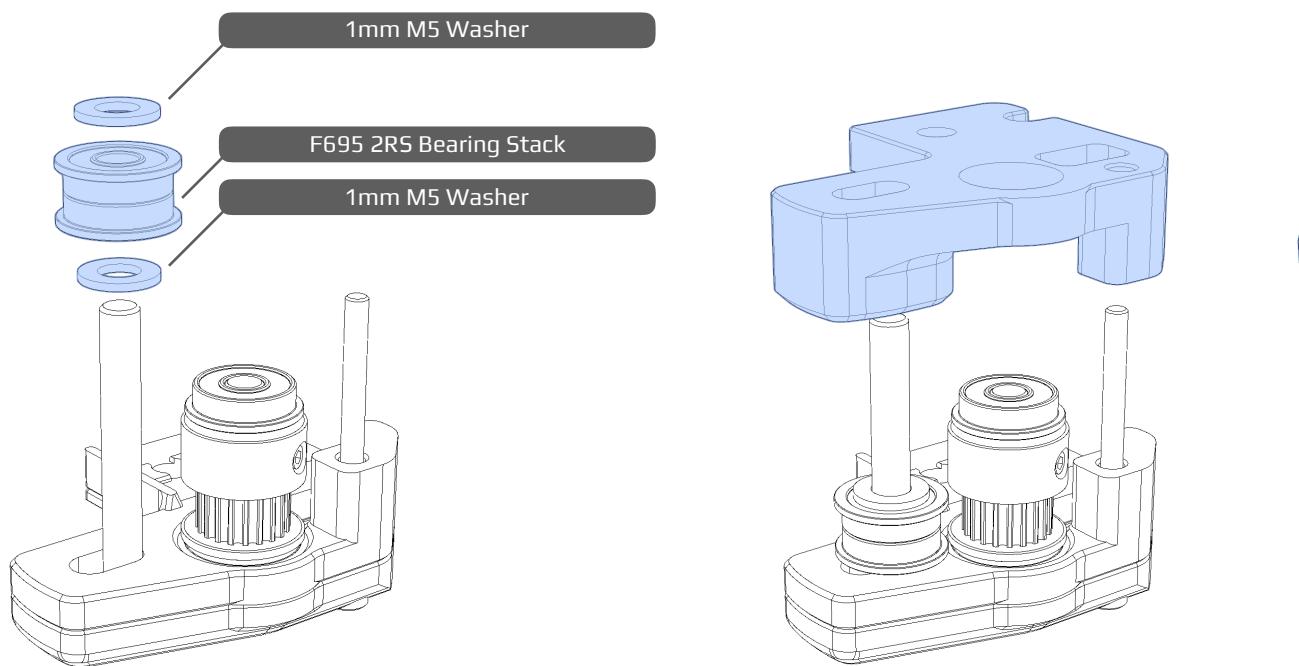
# Front Idler/Tensioners



# Front Idler/Tensioners

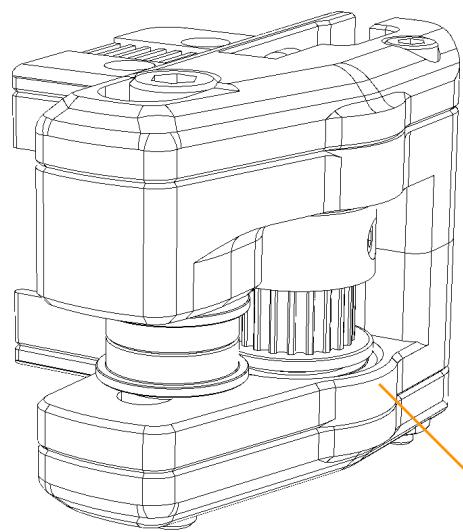


# Front Idler/Tensioners

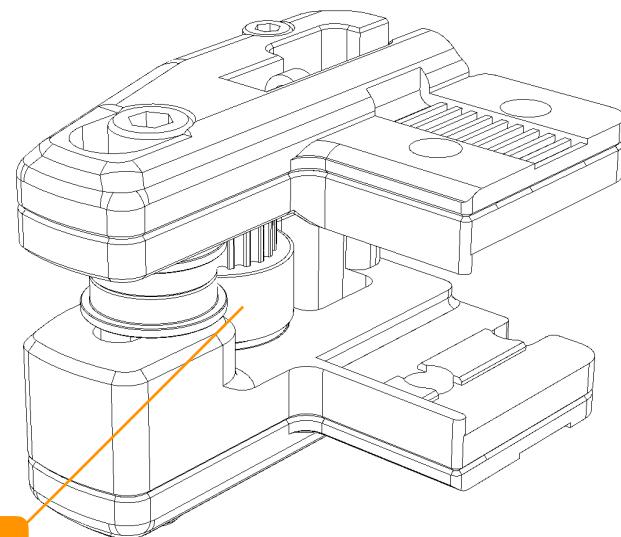


# Front Idler/Tensioners

Left Front Idler

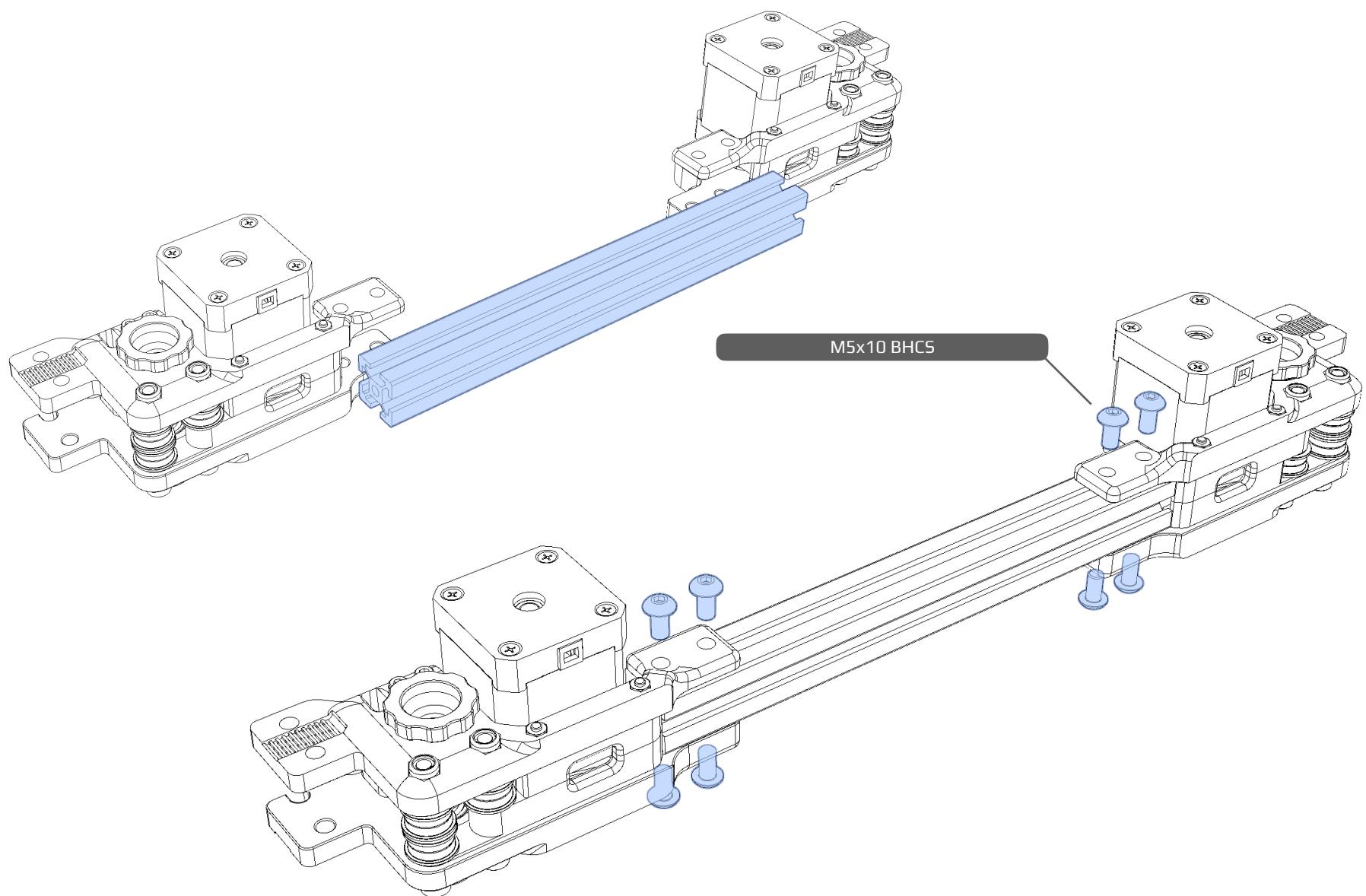


Right Front Idler

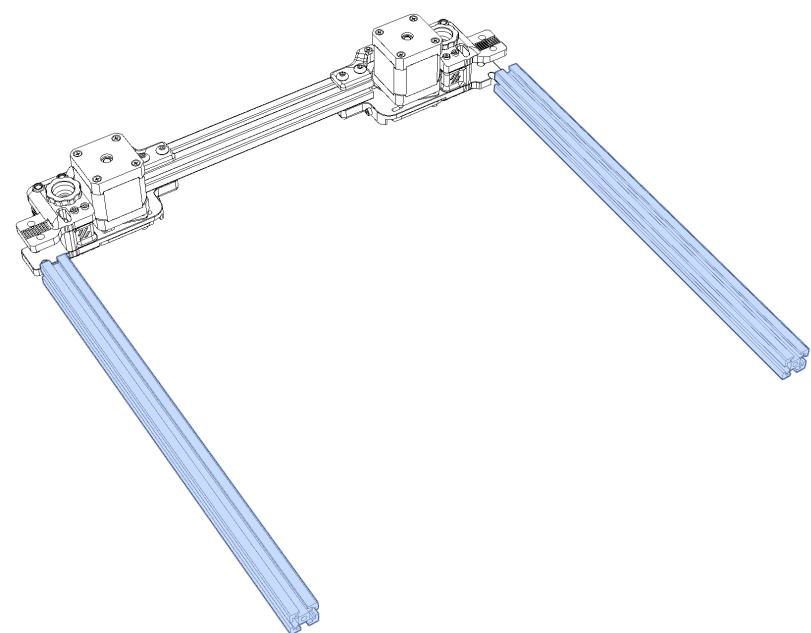
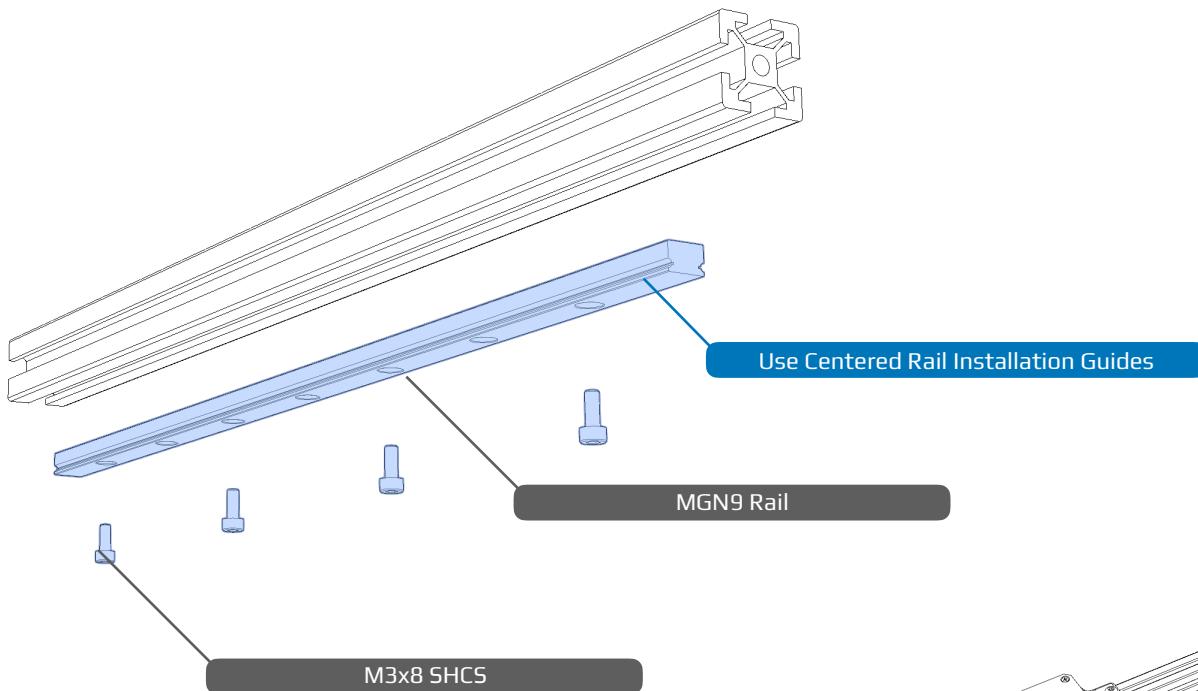


Note Idler Position

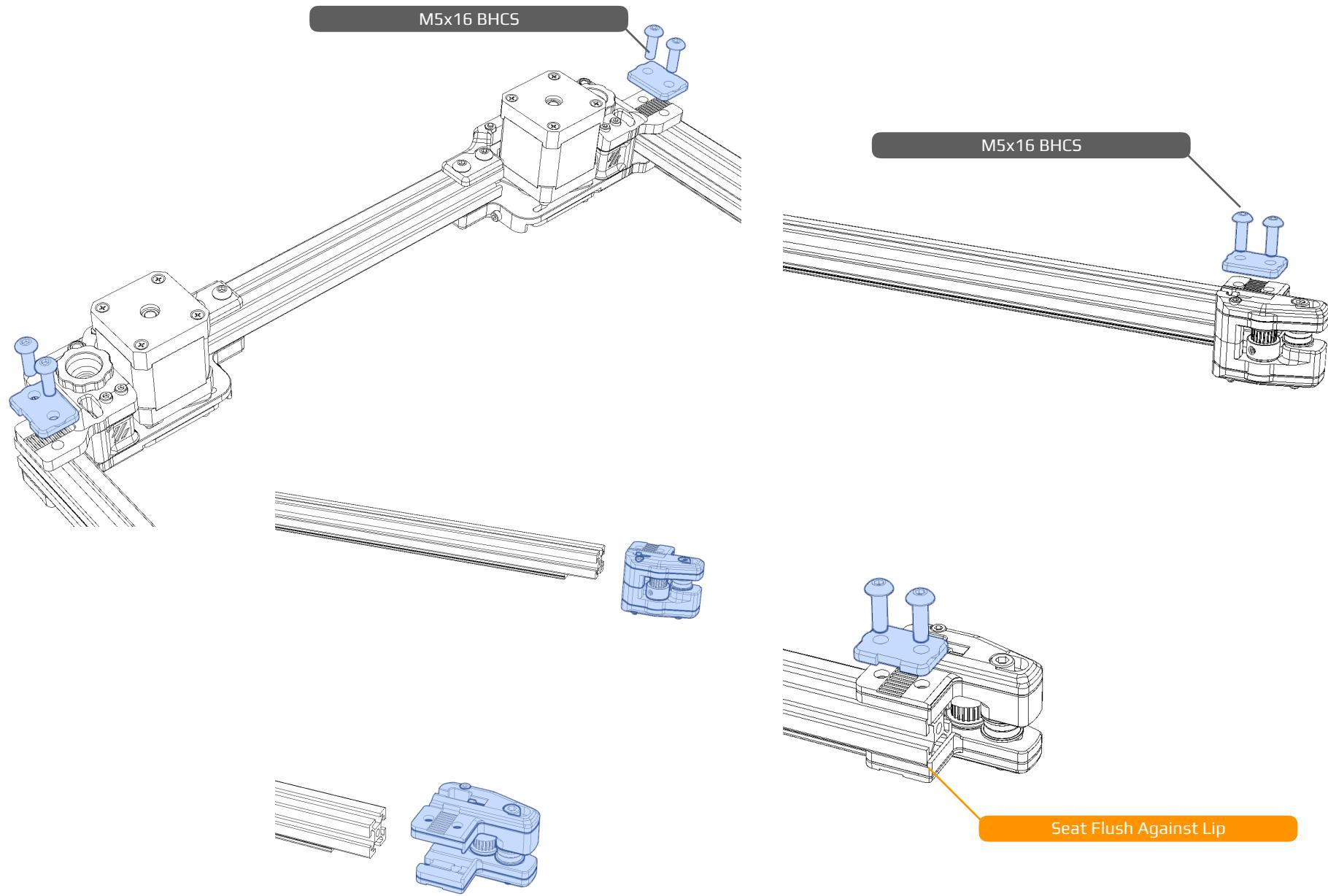
# Gantry

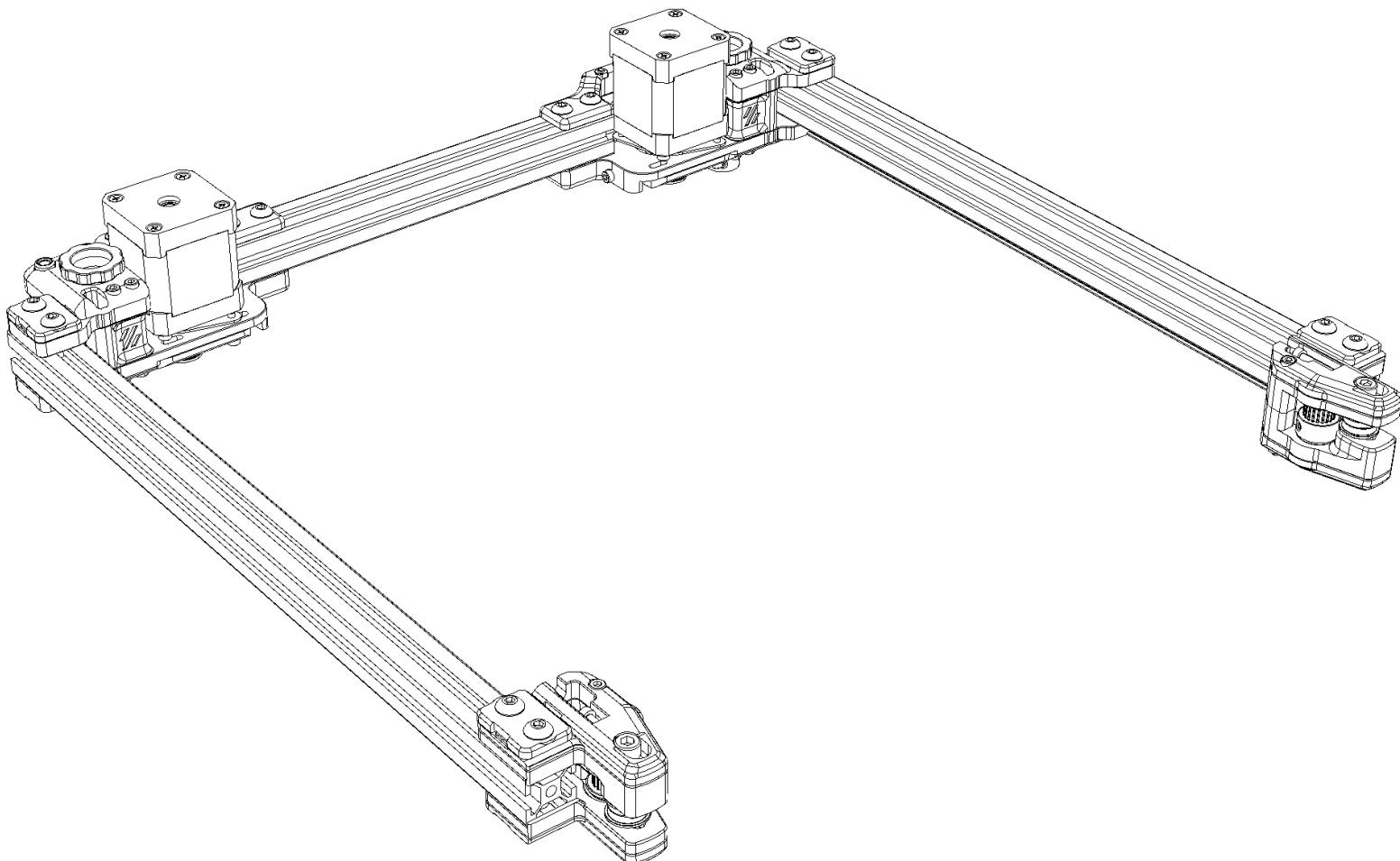


# Gantry

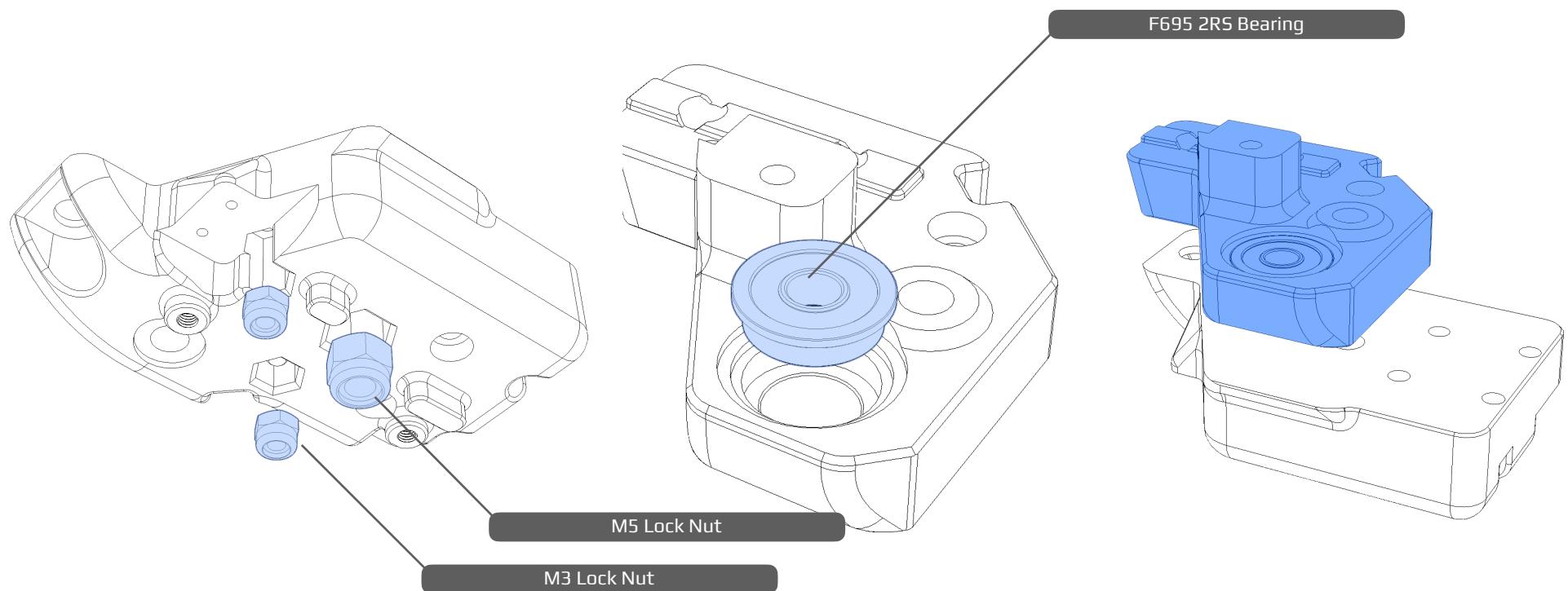


# Gantry

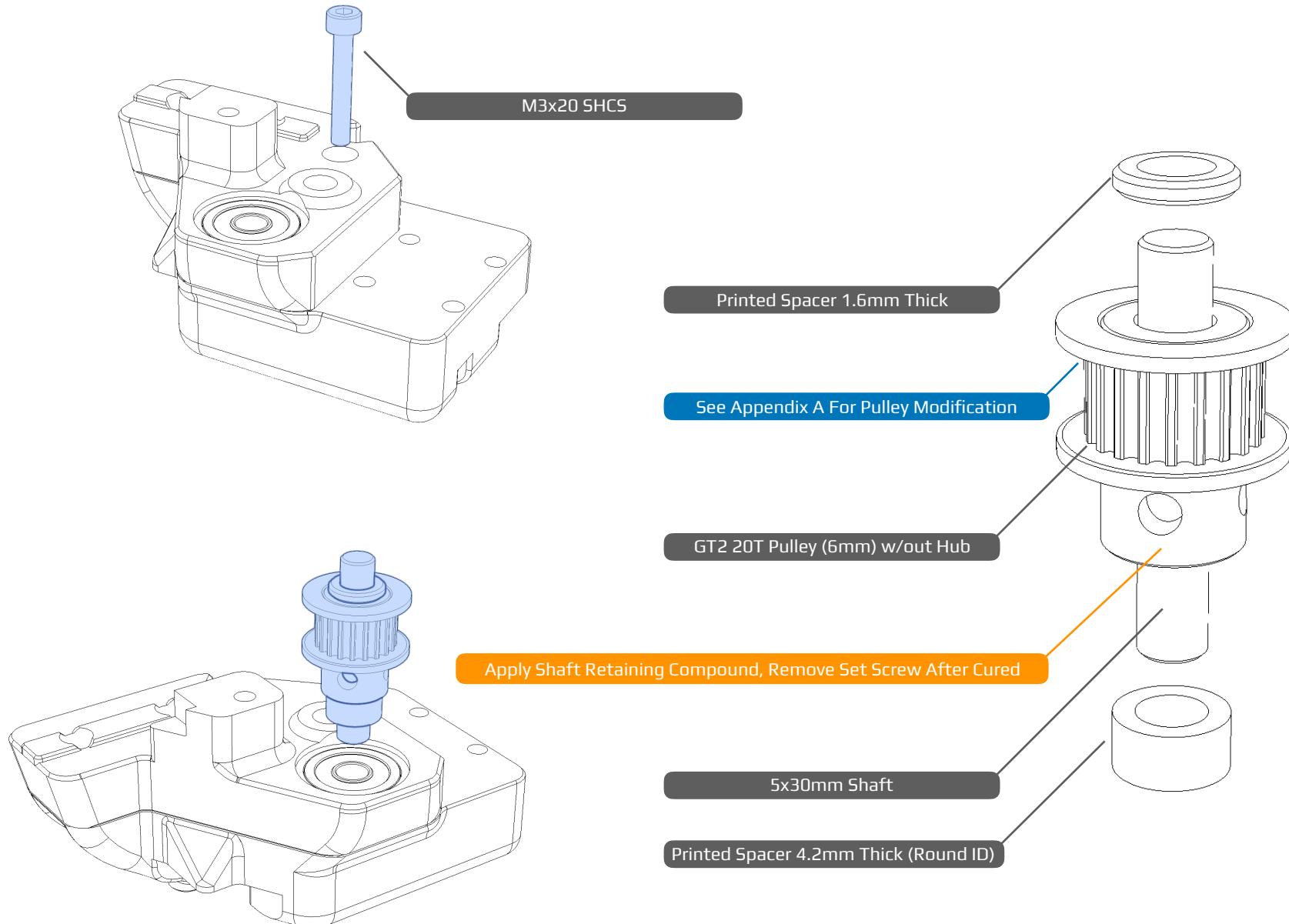




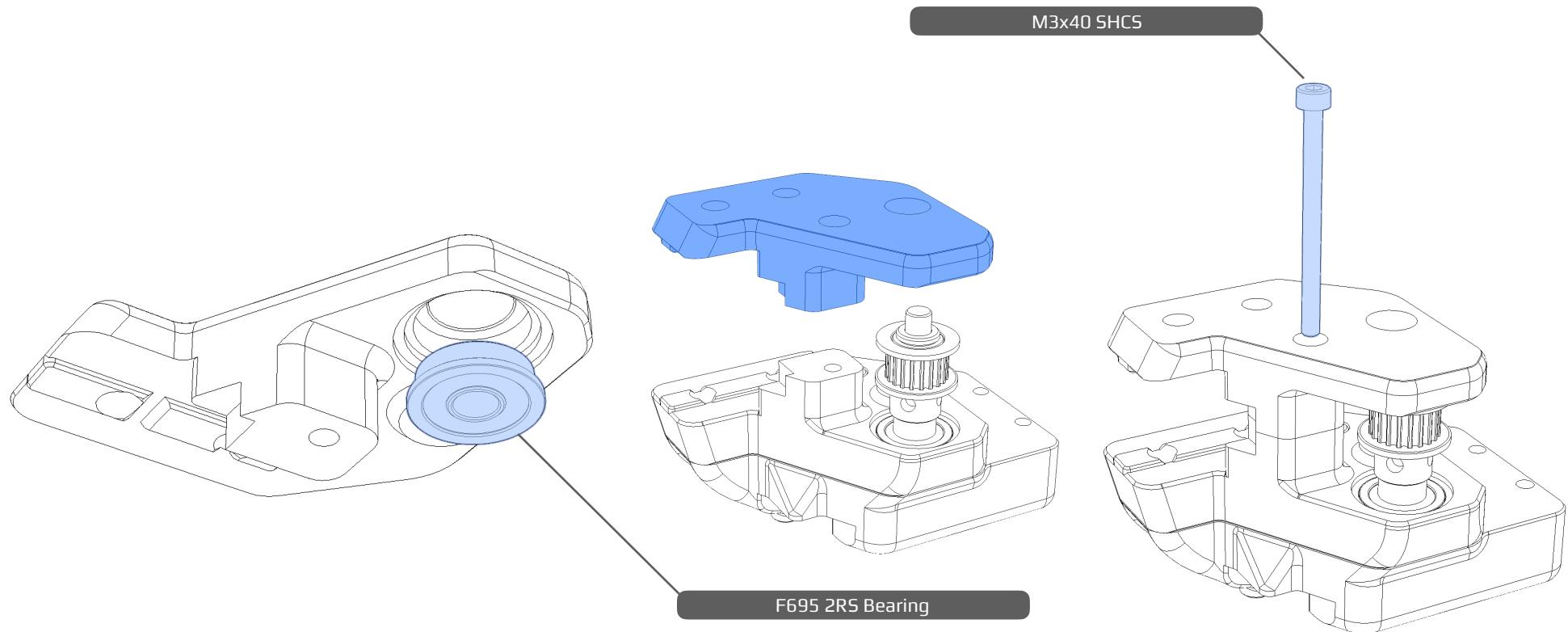
## X/Y Joints - Right Joint



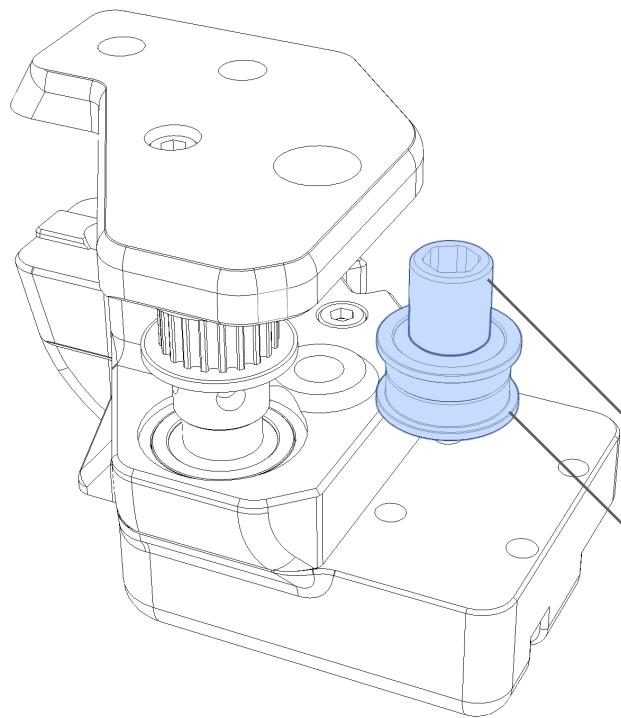
## X/Y Joints - Right Joint



## X/Y Joints - Right Joint

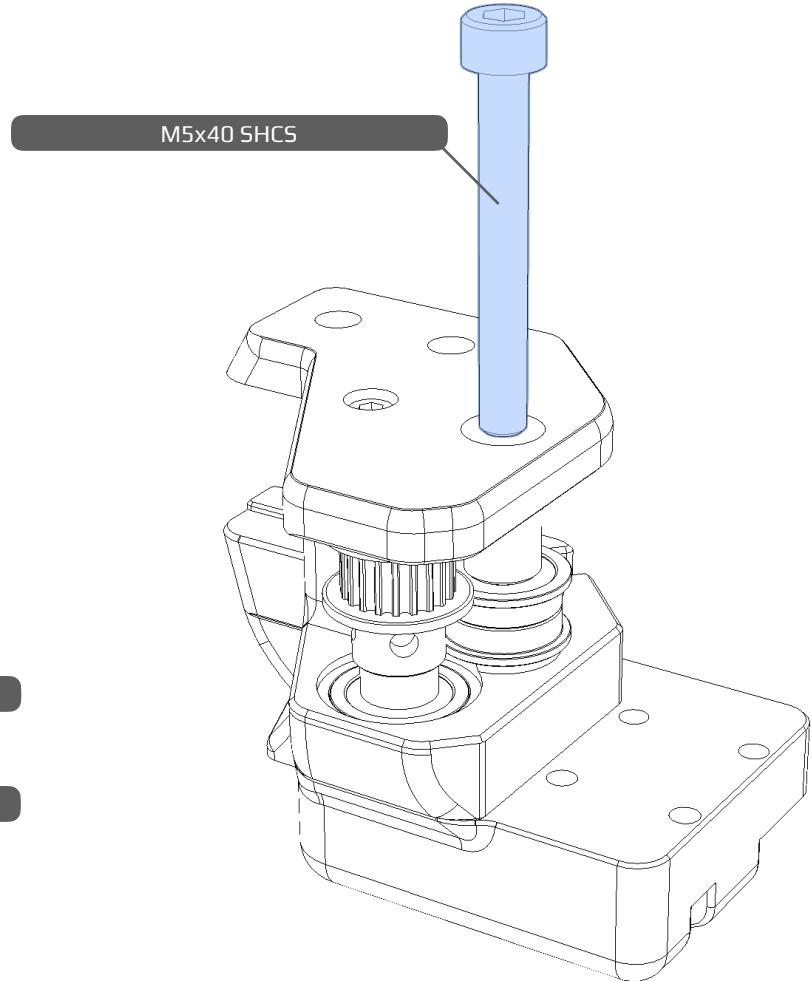


## X/Y Joints - Right Joint



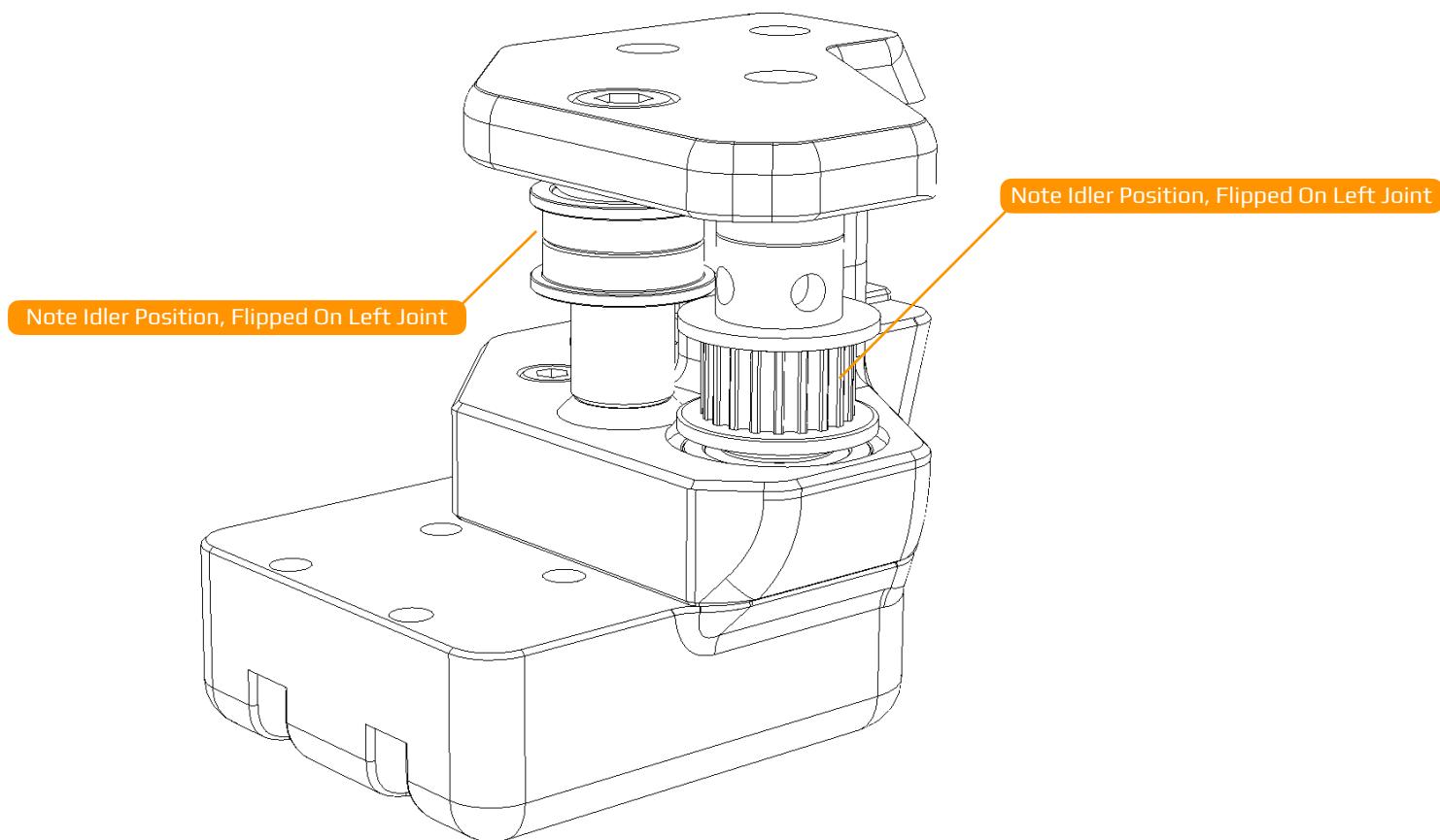
Printed Spacer 9.2mm Thick

F695 2RS Bearing

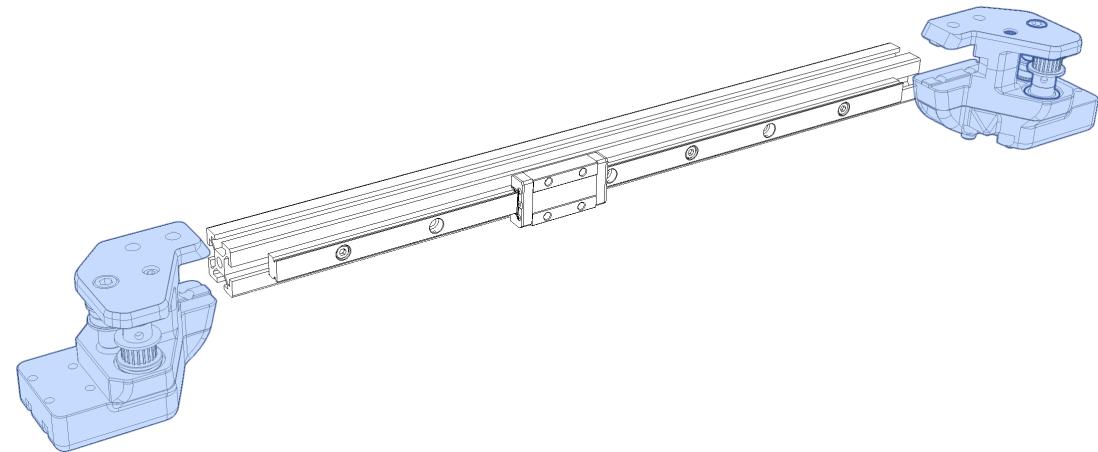
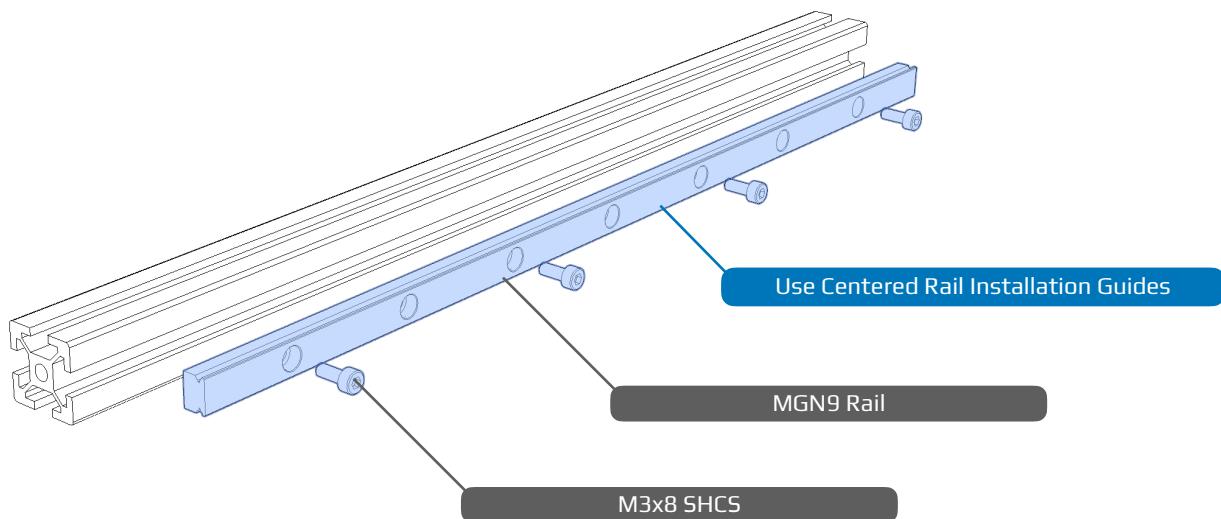


M5x40 SHCS

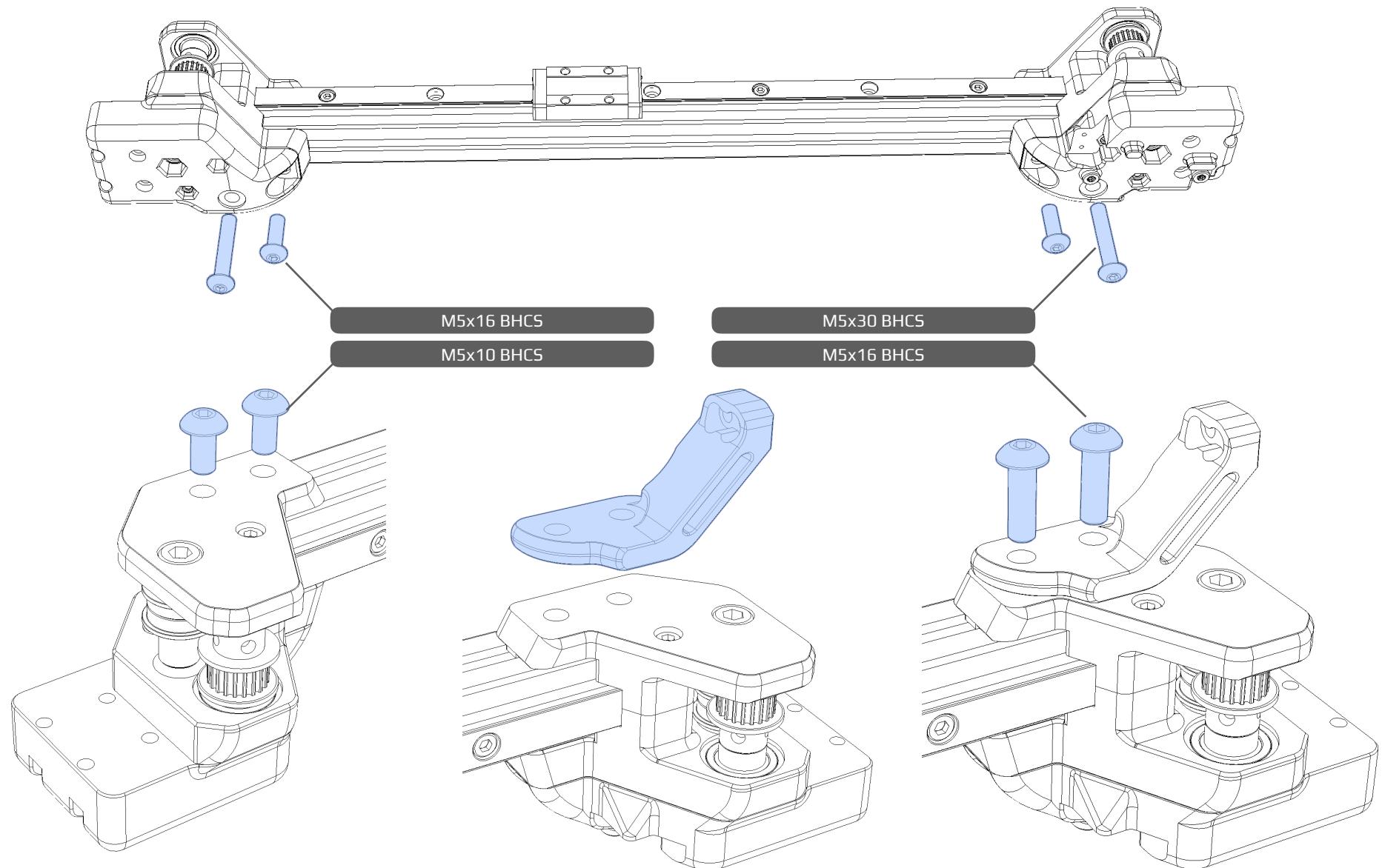
## X/Y Joints - Left Joint



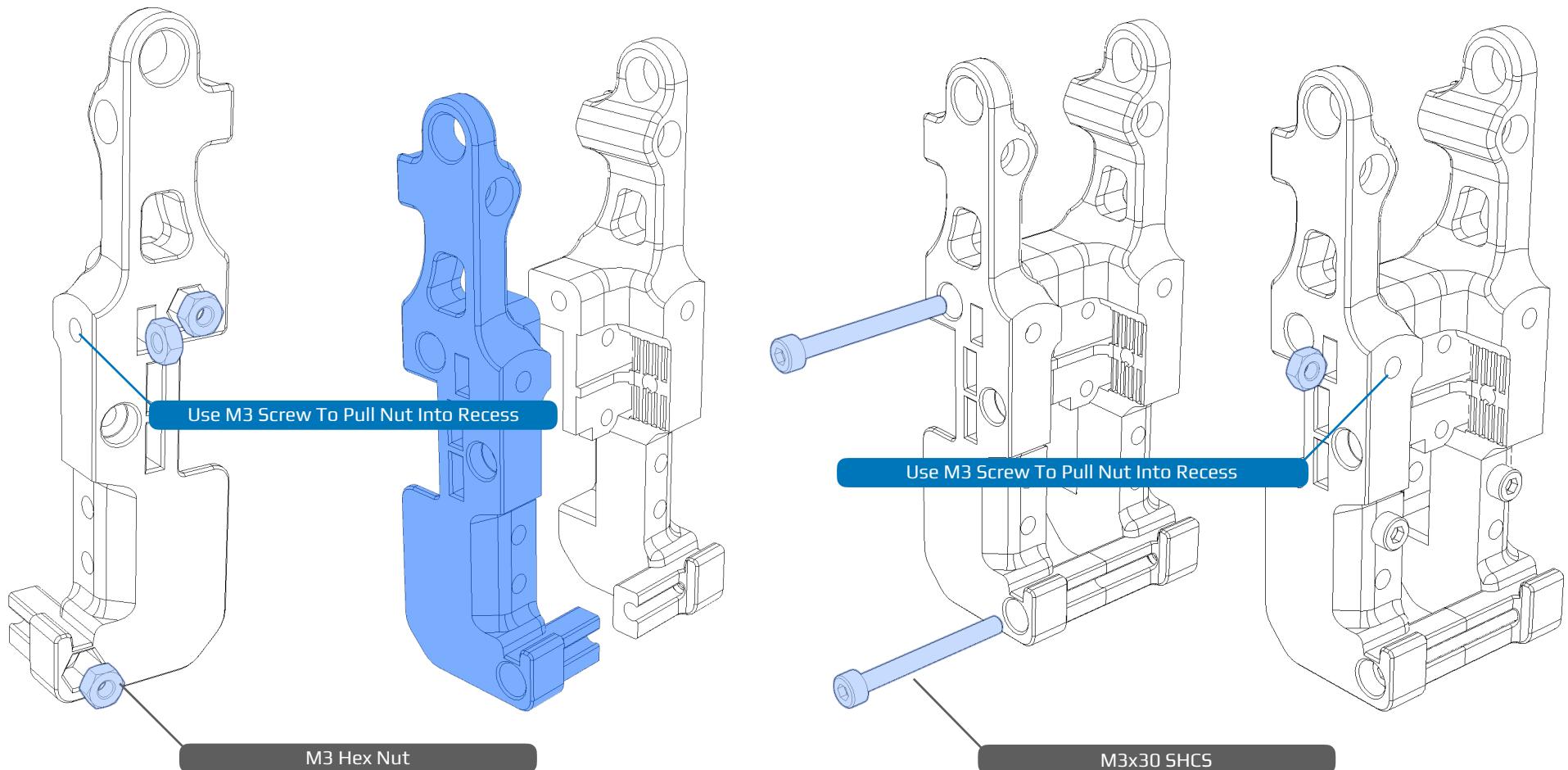
# X Beam



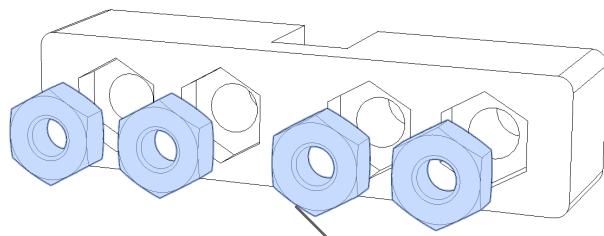
# X Beam



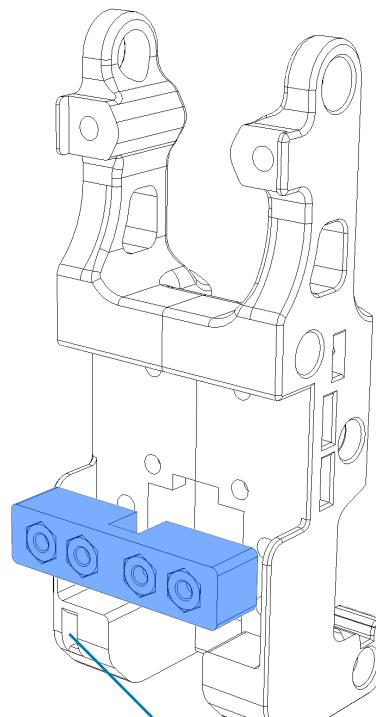
# X Carriage



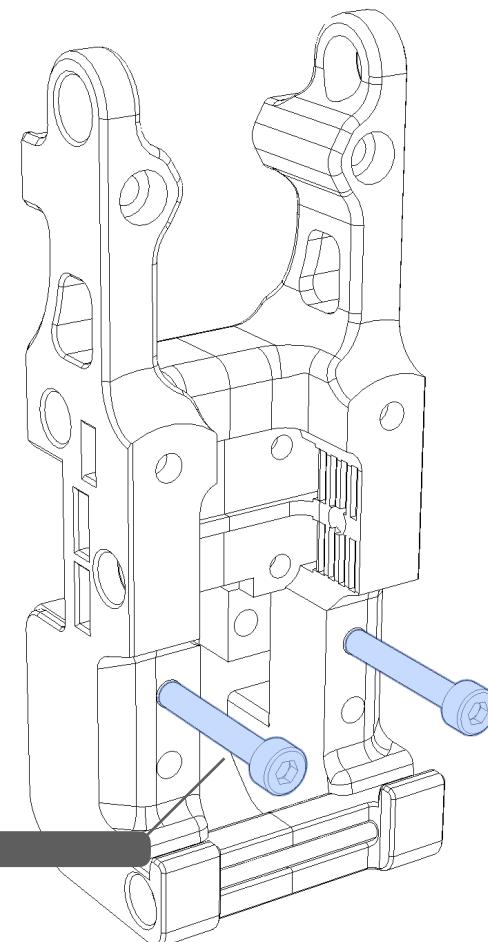
## X Carriage



M3 Hex Nut

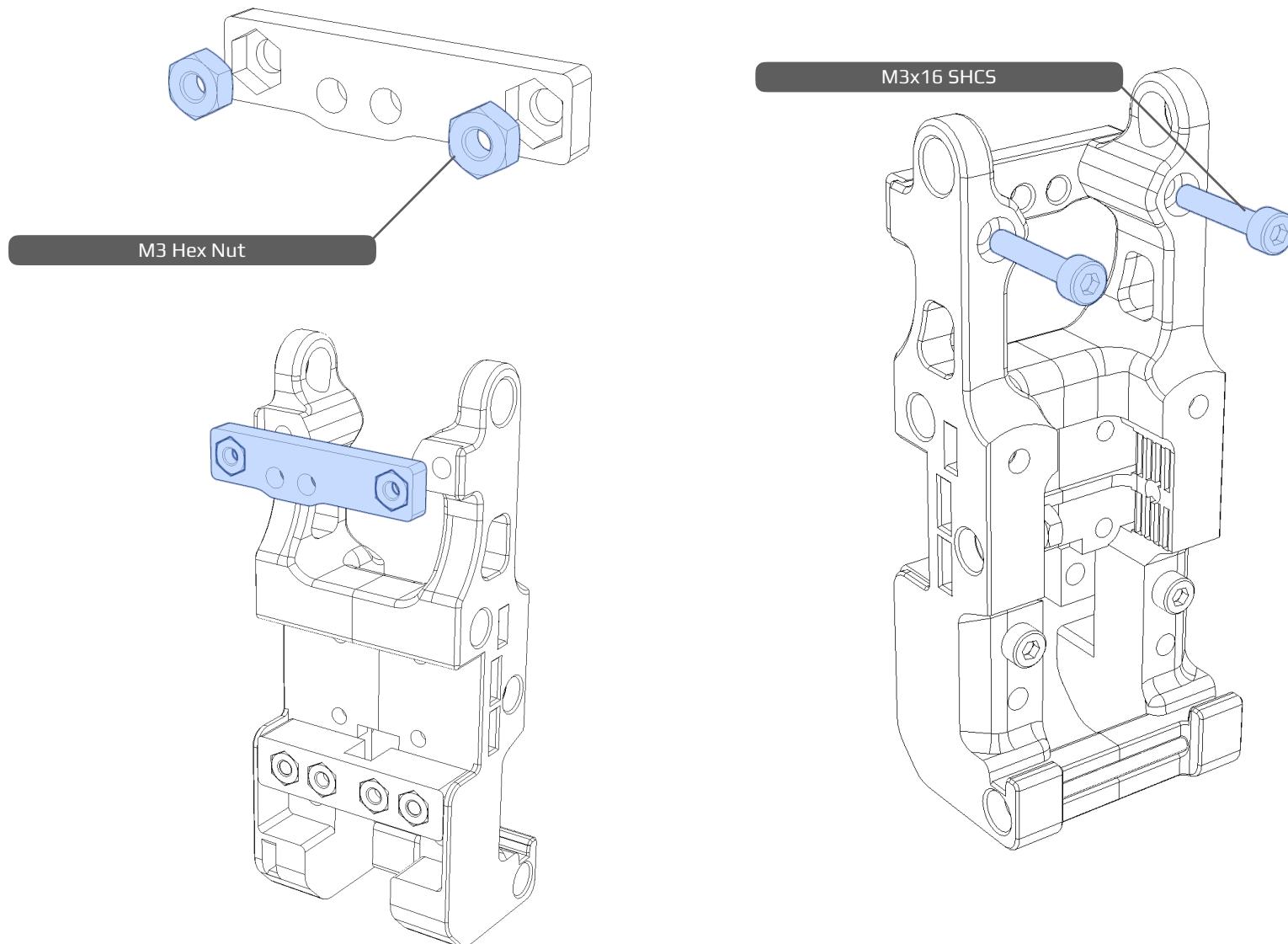


Optional: Magnet Location For Hall Effect Endstop

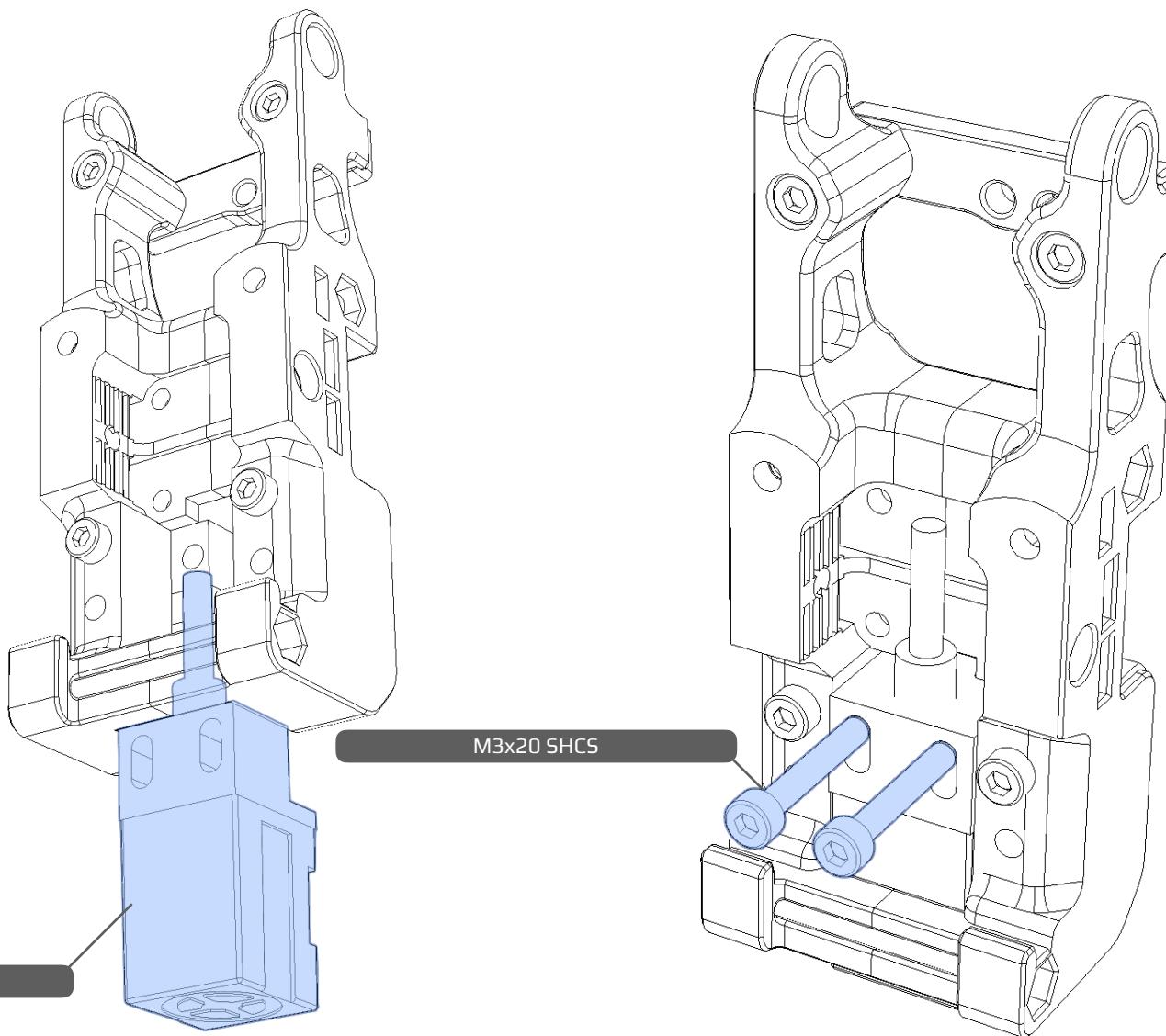


M3x20 SHCS

## X Carriage



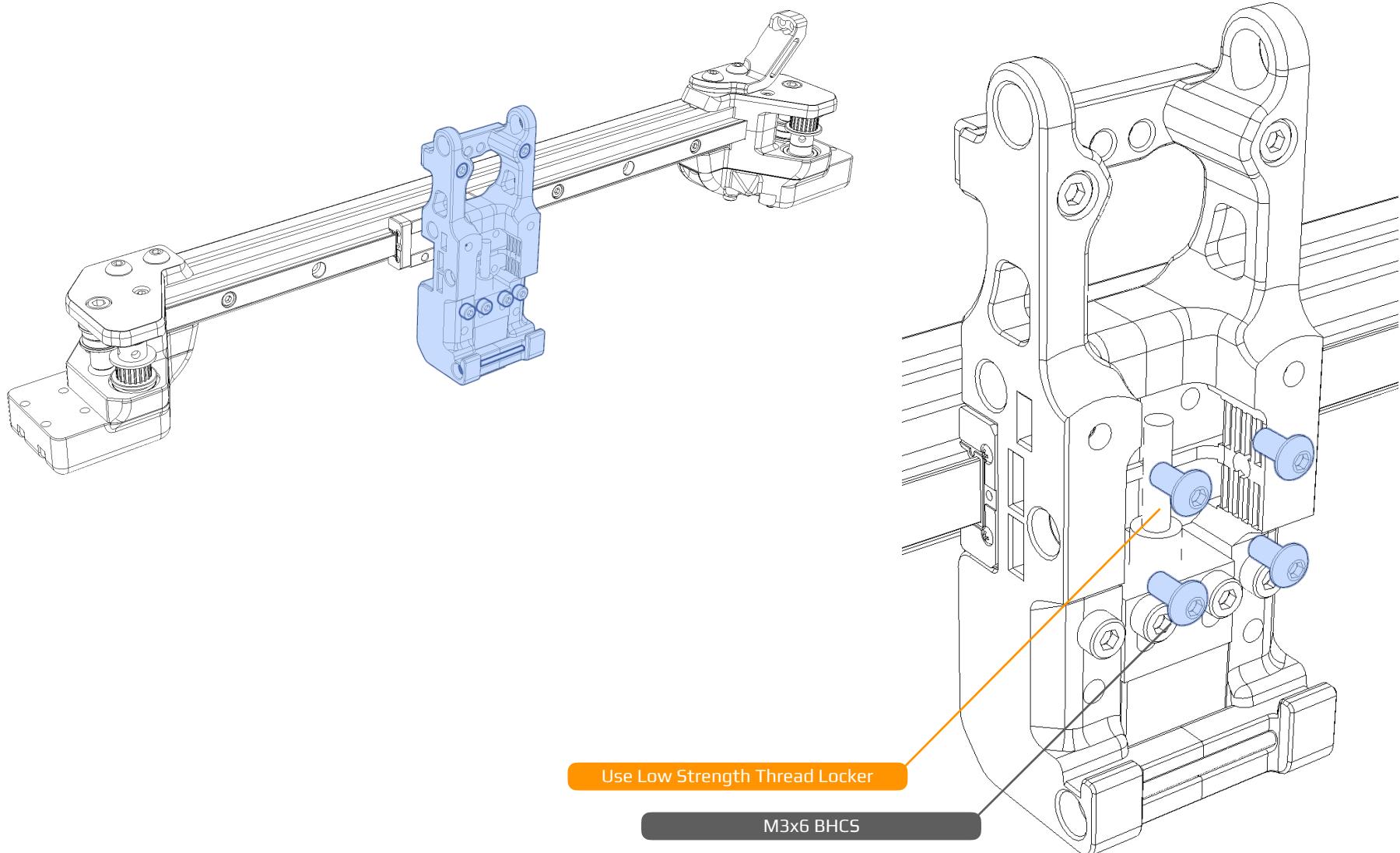
## X Carriage



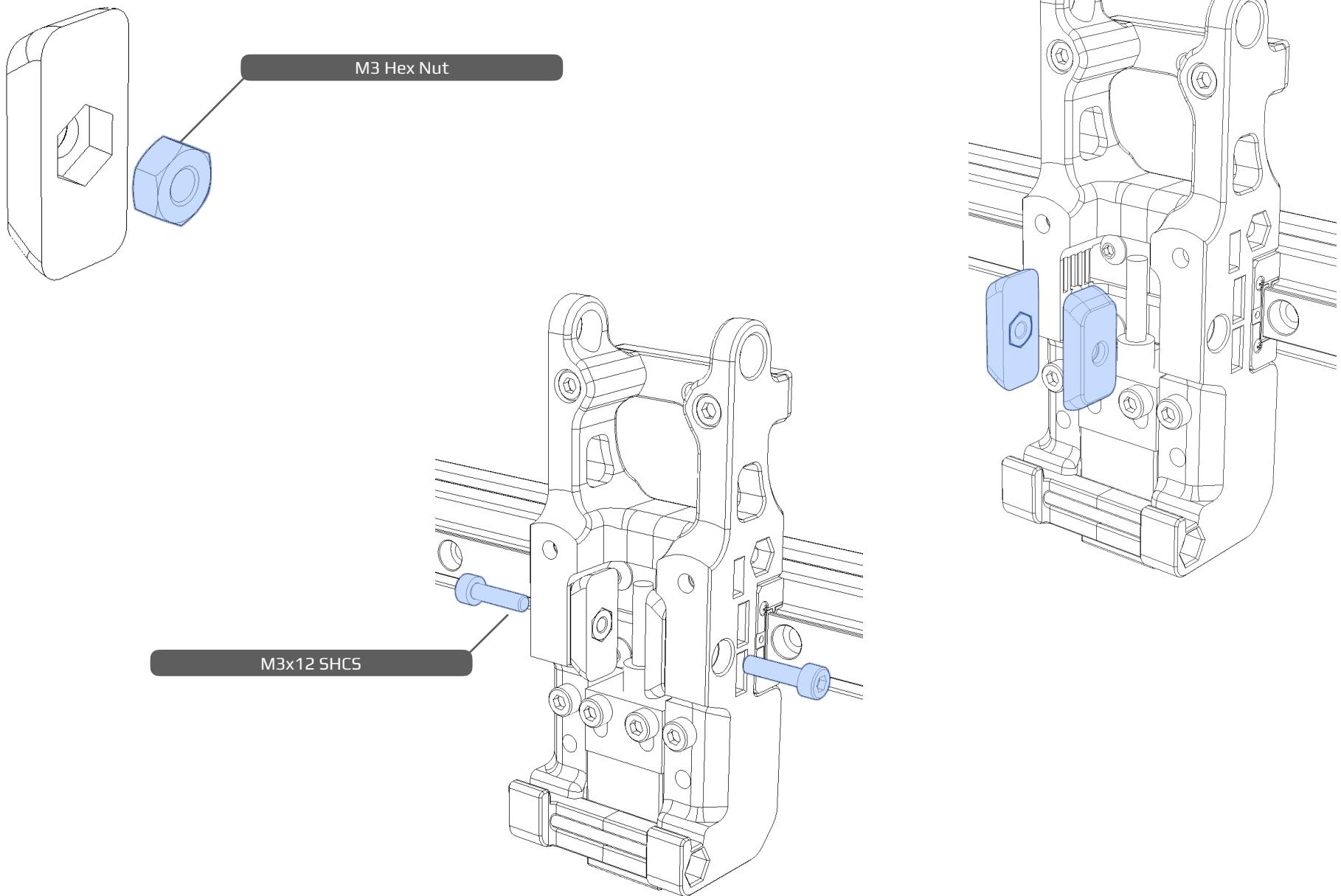
Inductive Proximity Probe

M3x20 SHCS

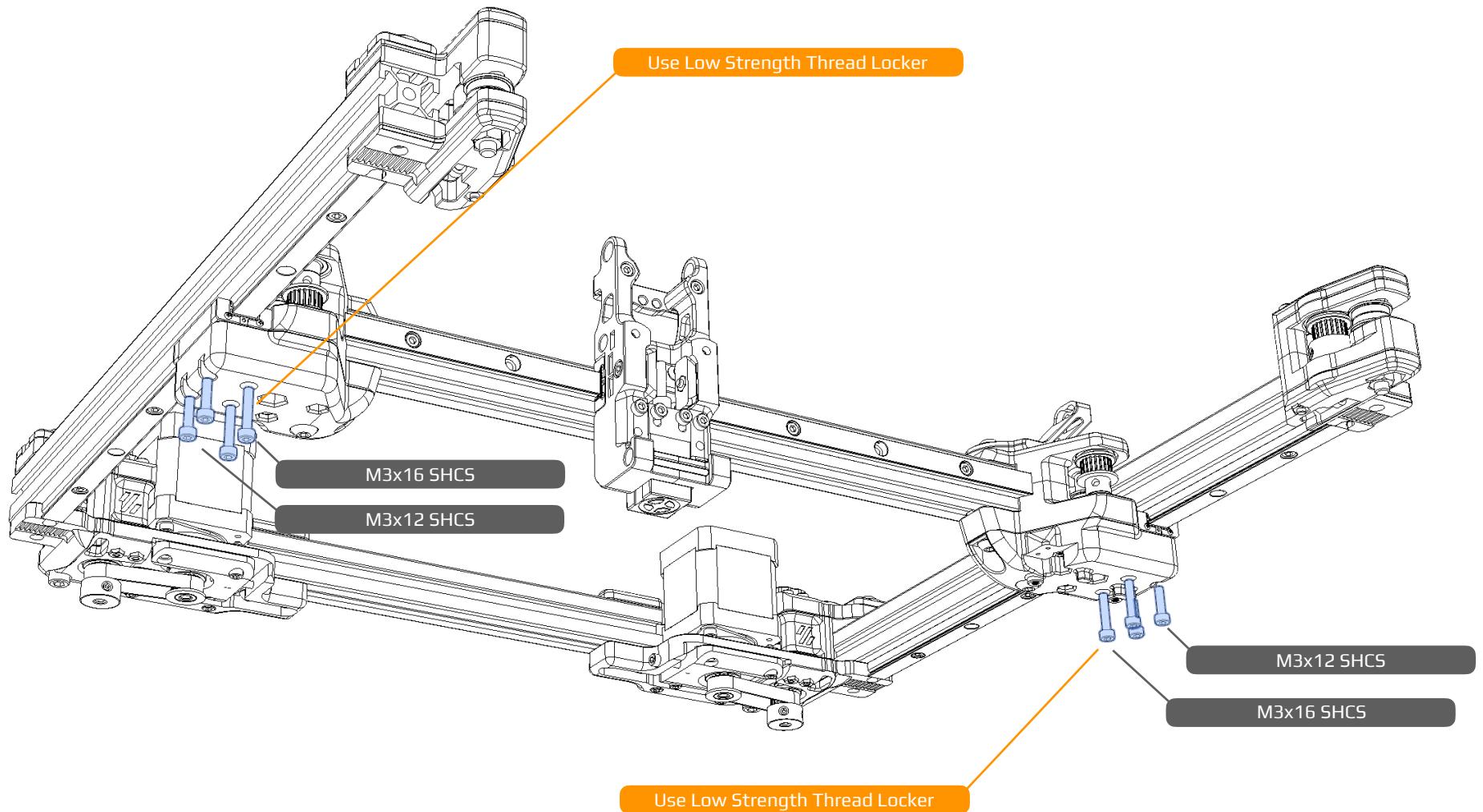
## X Carriage



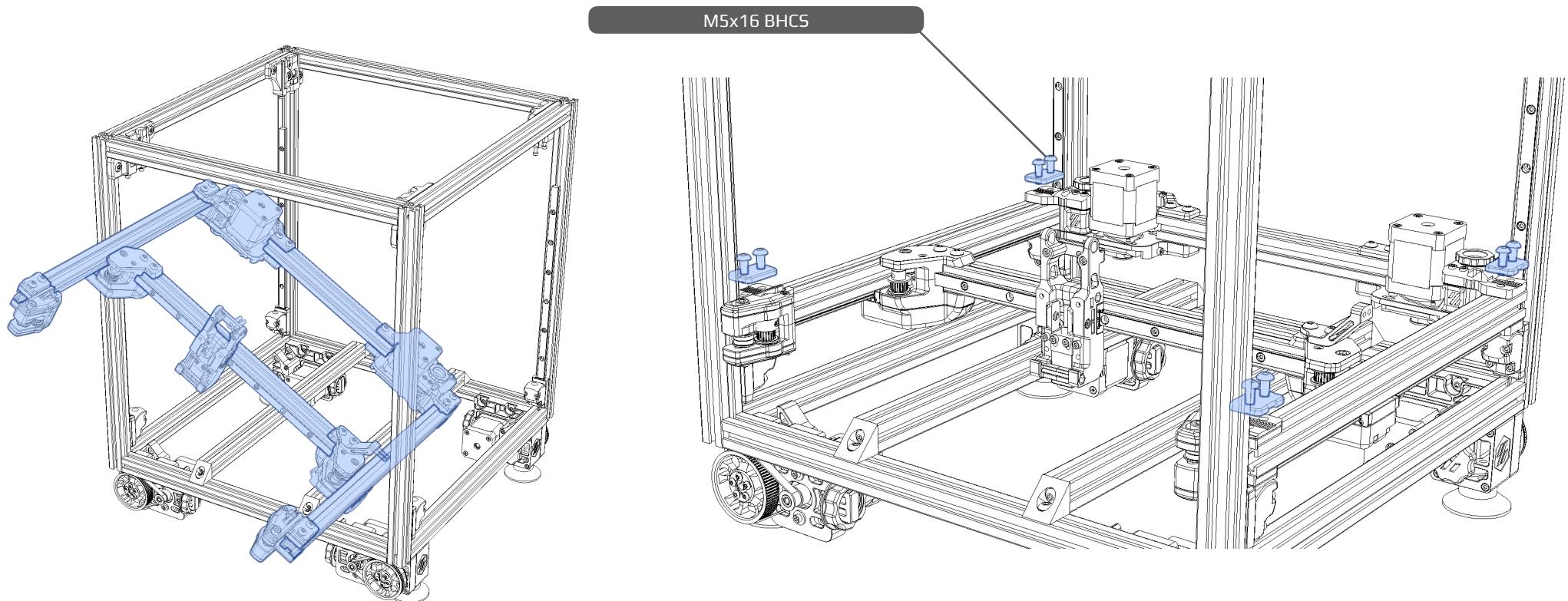
# X Carriage



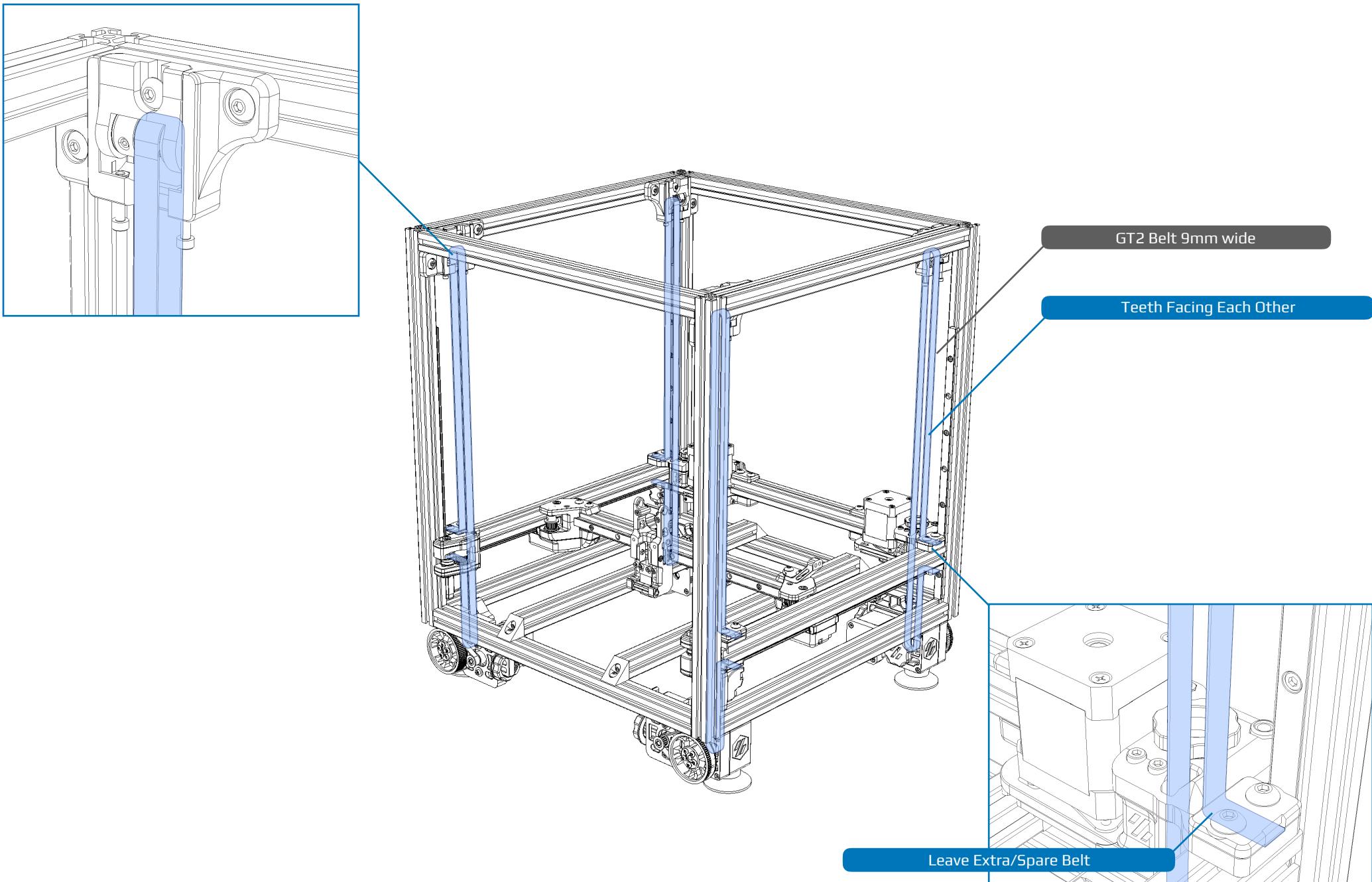
# Gantry



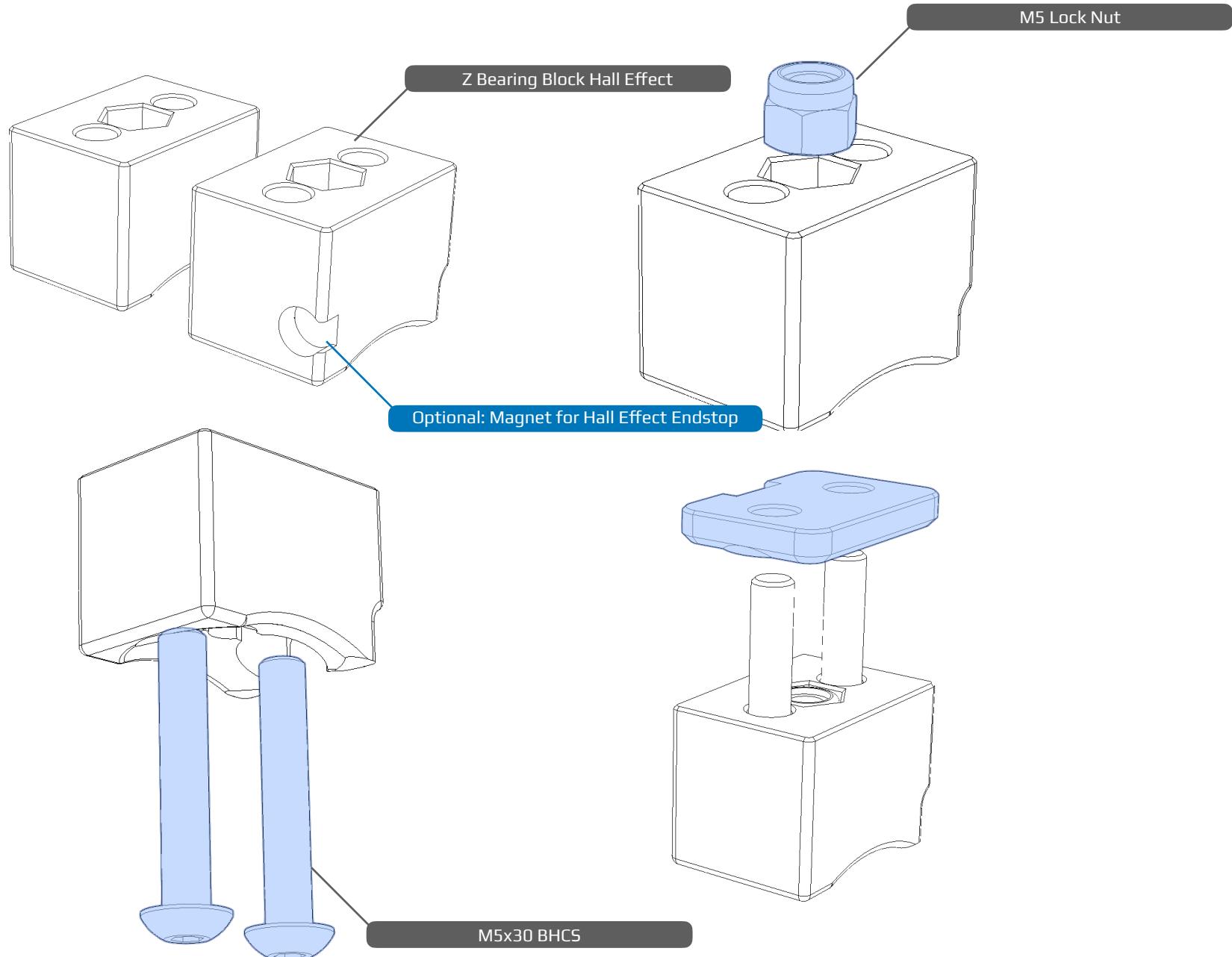
# Gantry



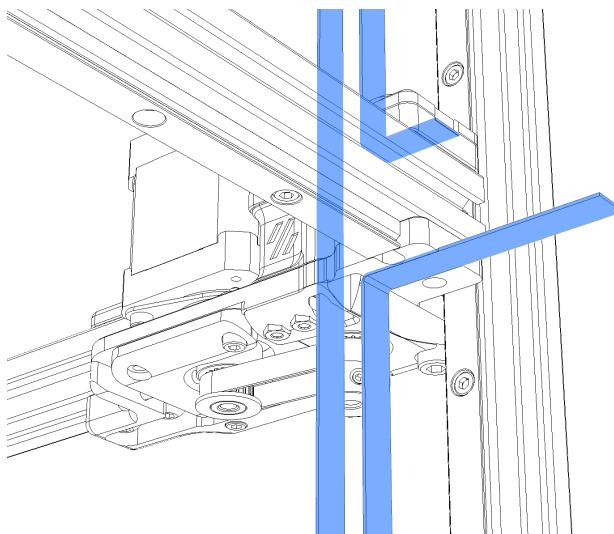
## Z Belts



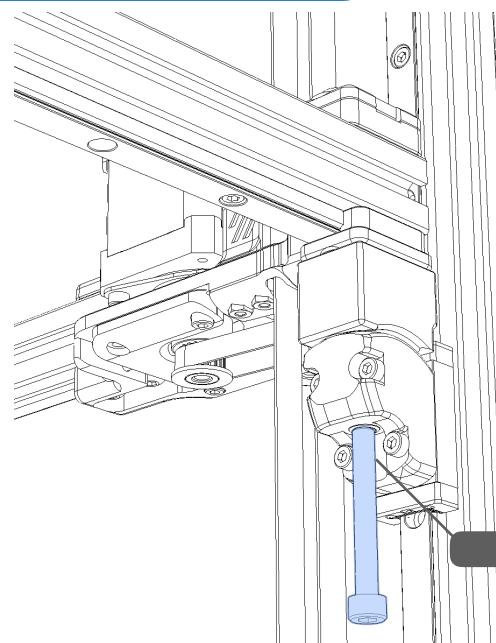
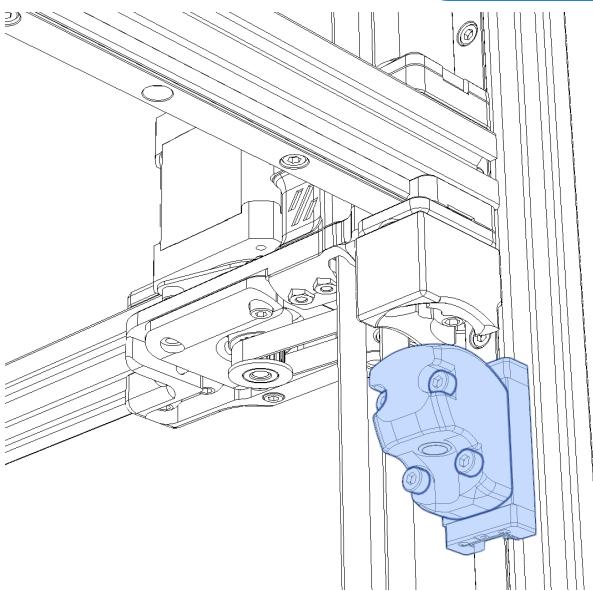
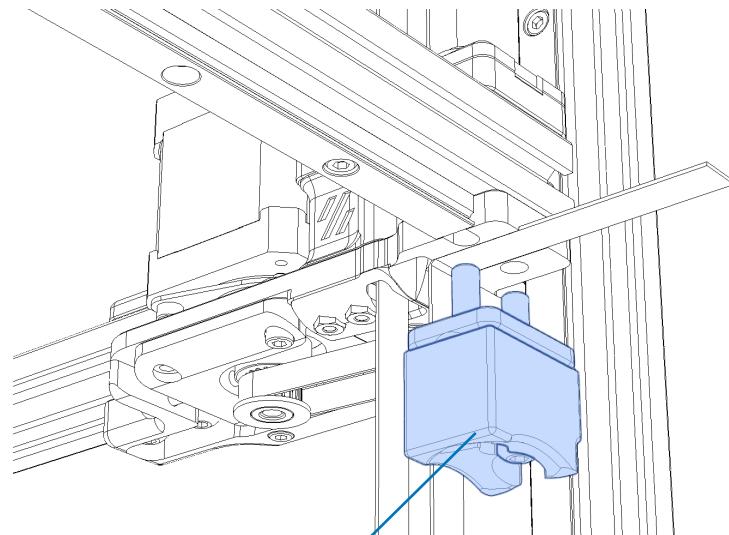
# Z Belts



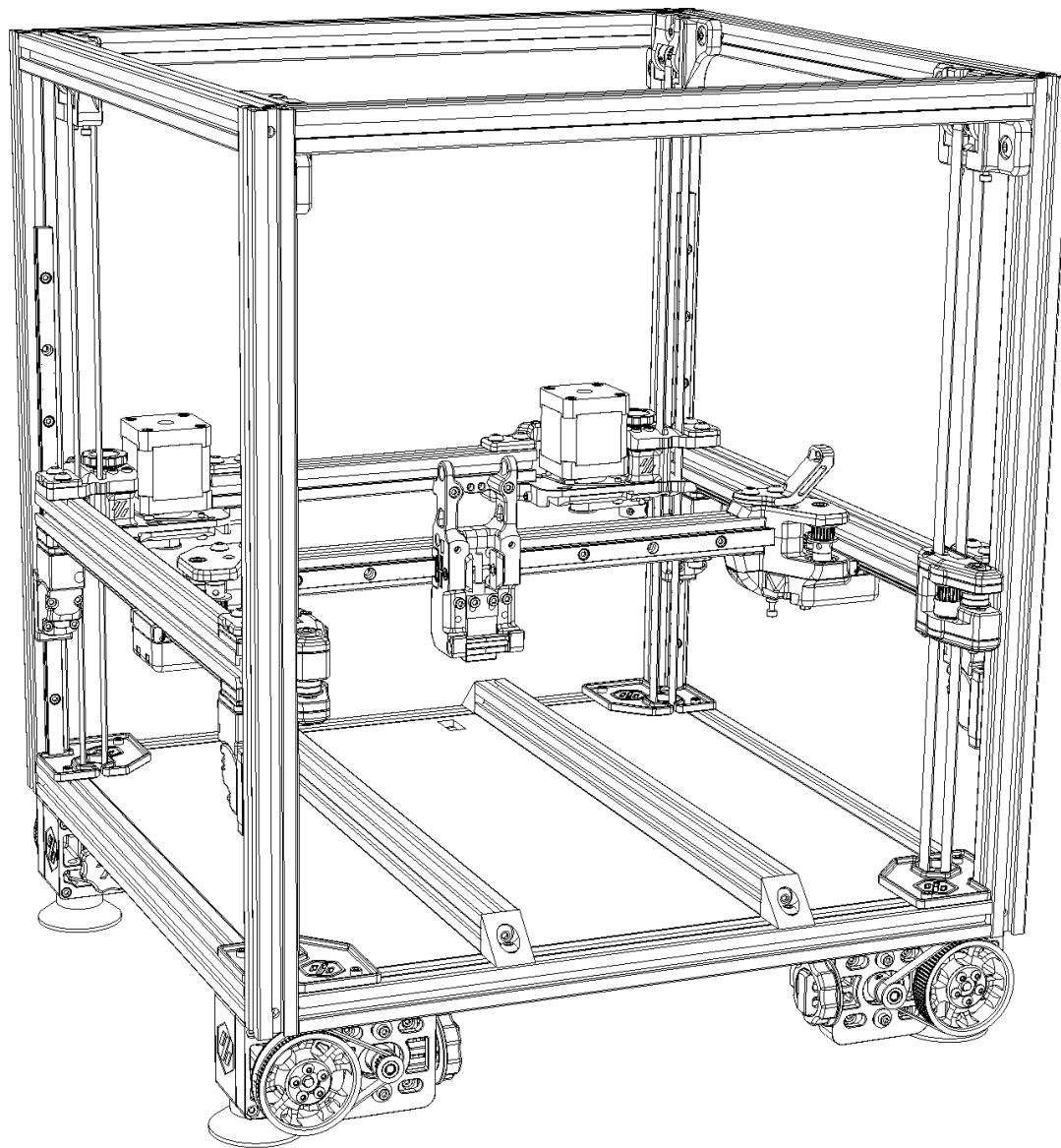
## Z Belts



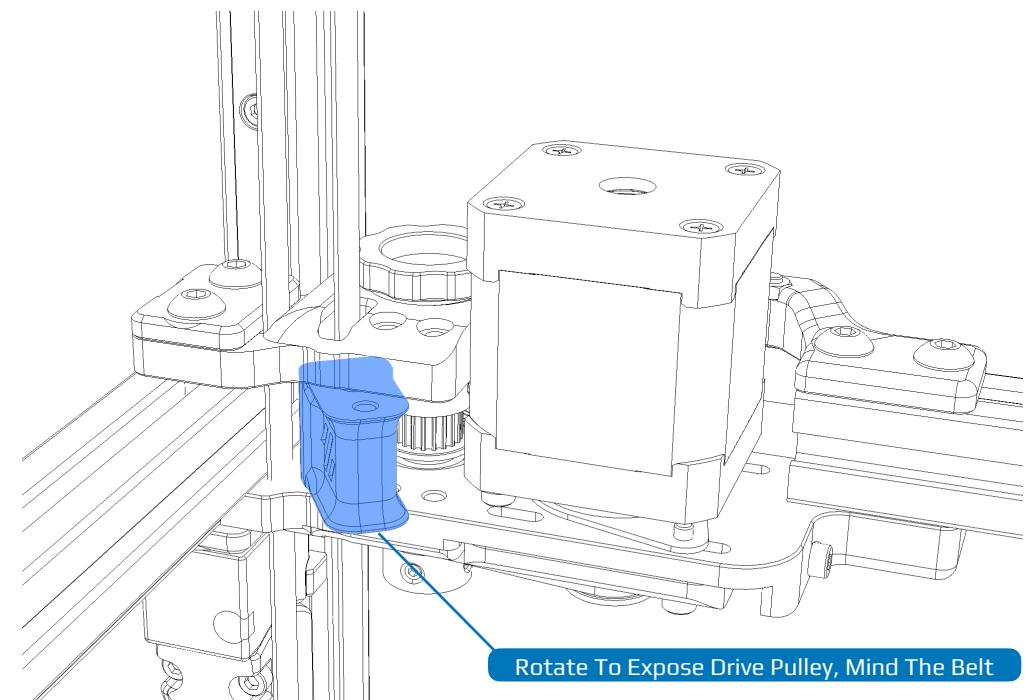
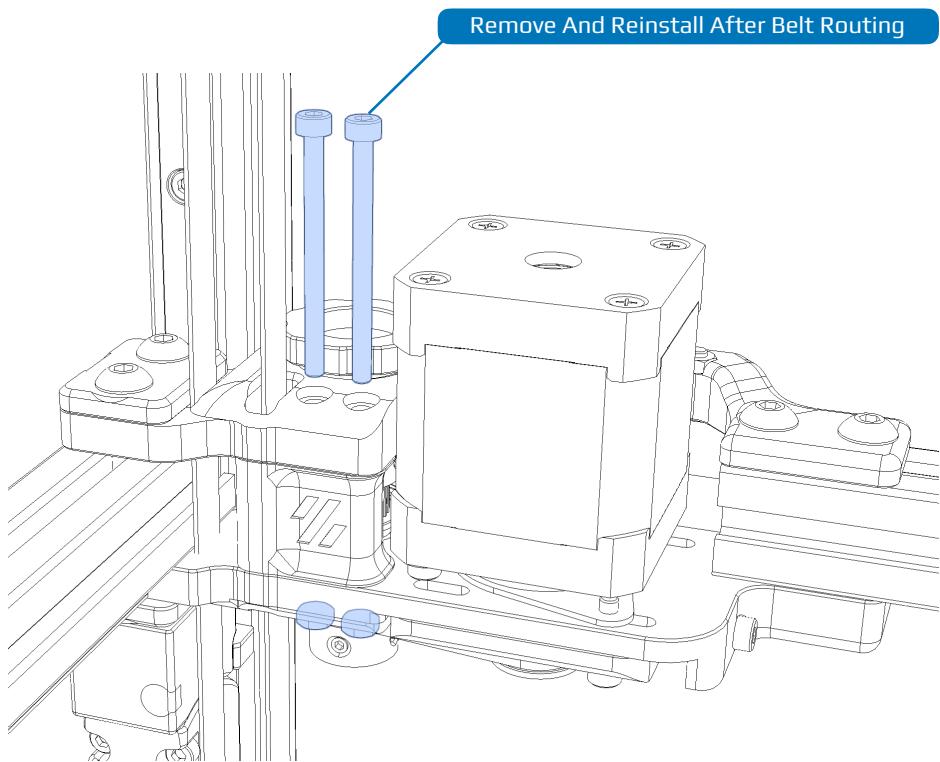
Optional: Block With Magnet For Hall Effect Endstop In Back Right Corner



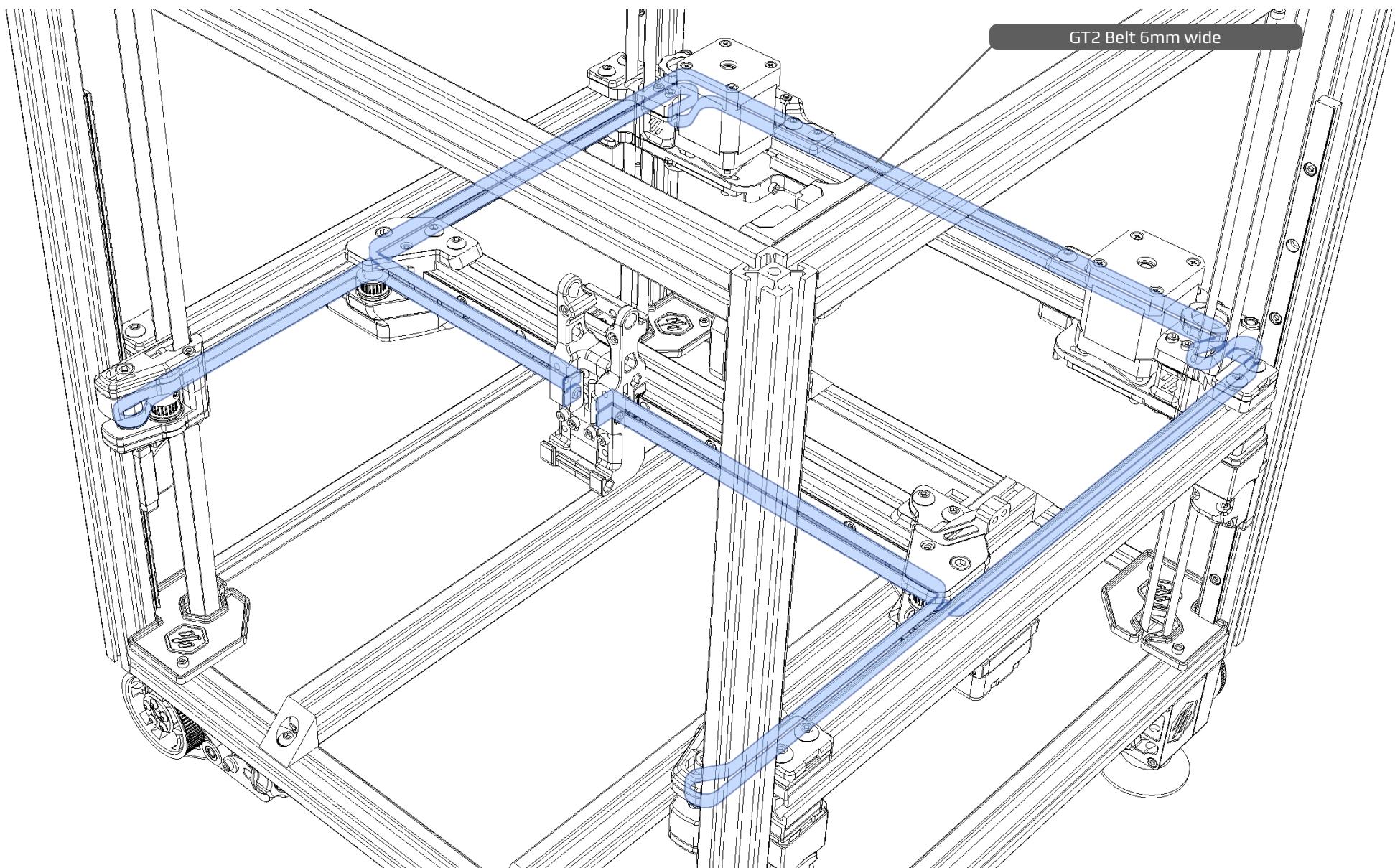
M5x40 SHCS



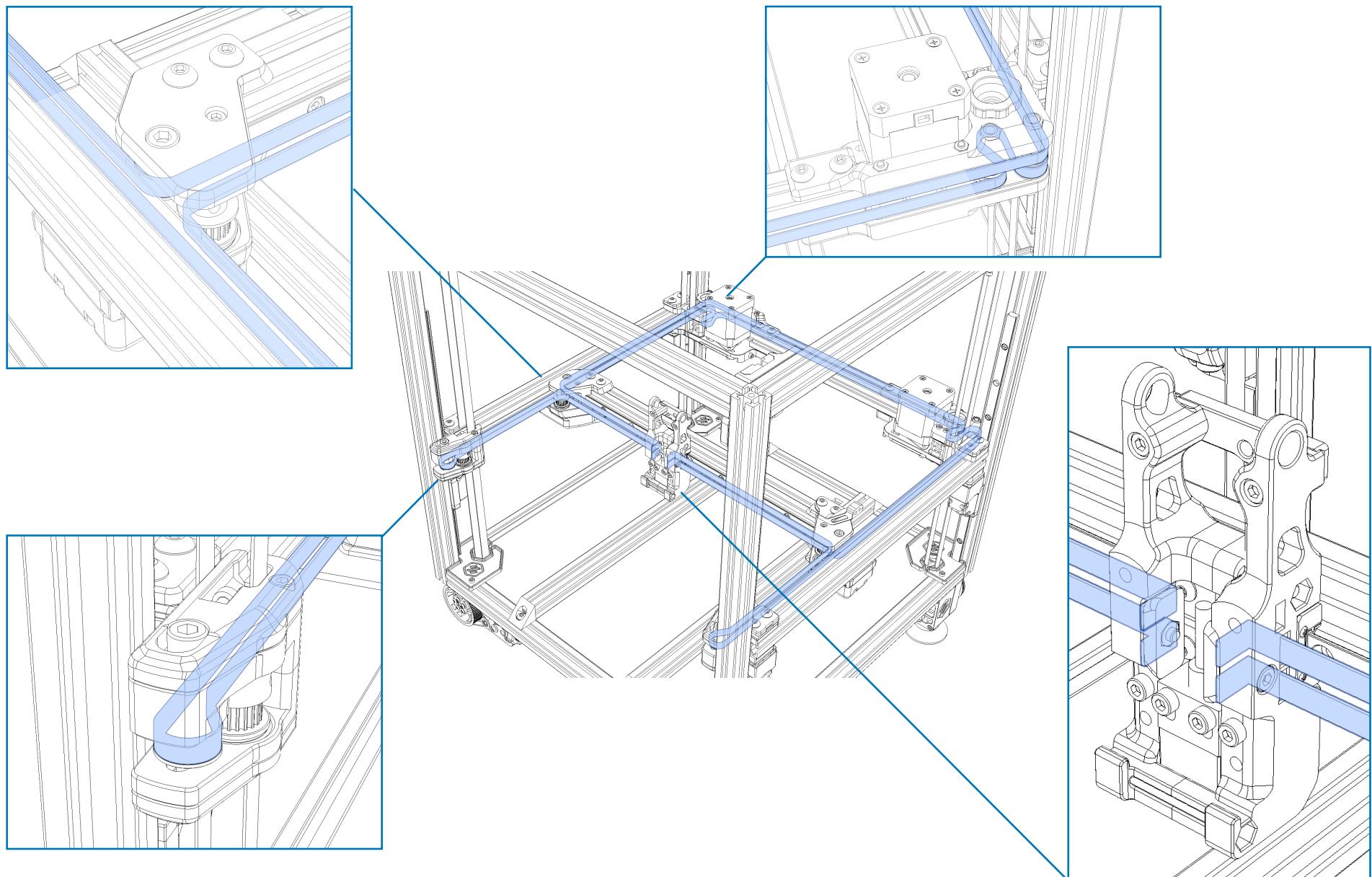
## A/B Belts



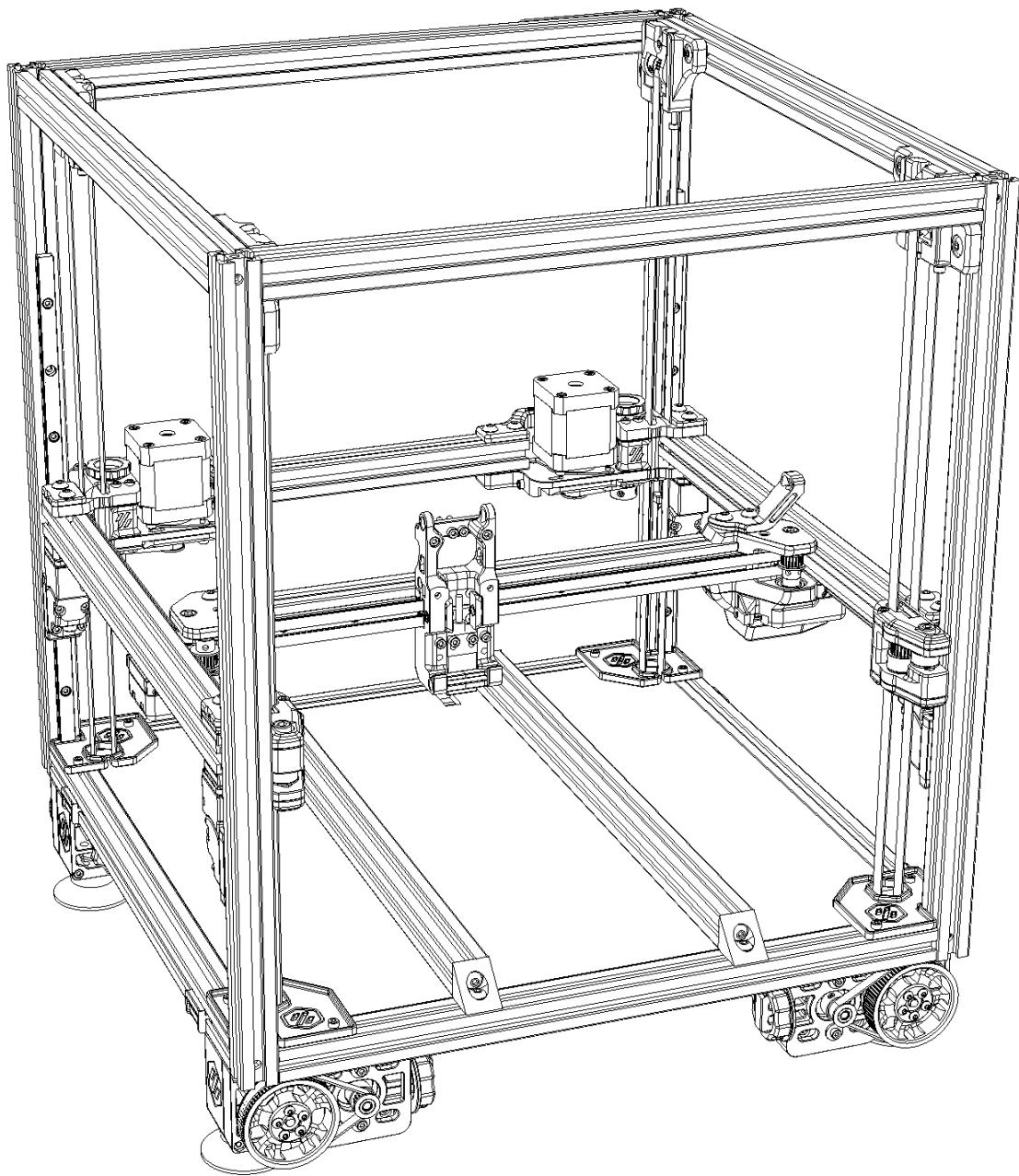
## A/B Belts



## A/B Belts



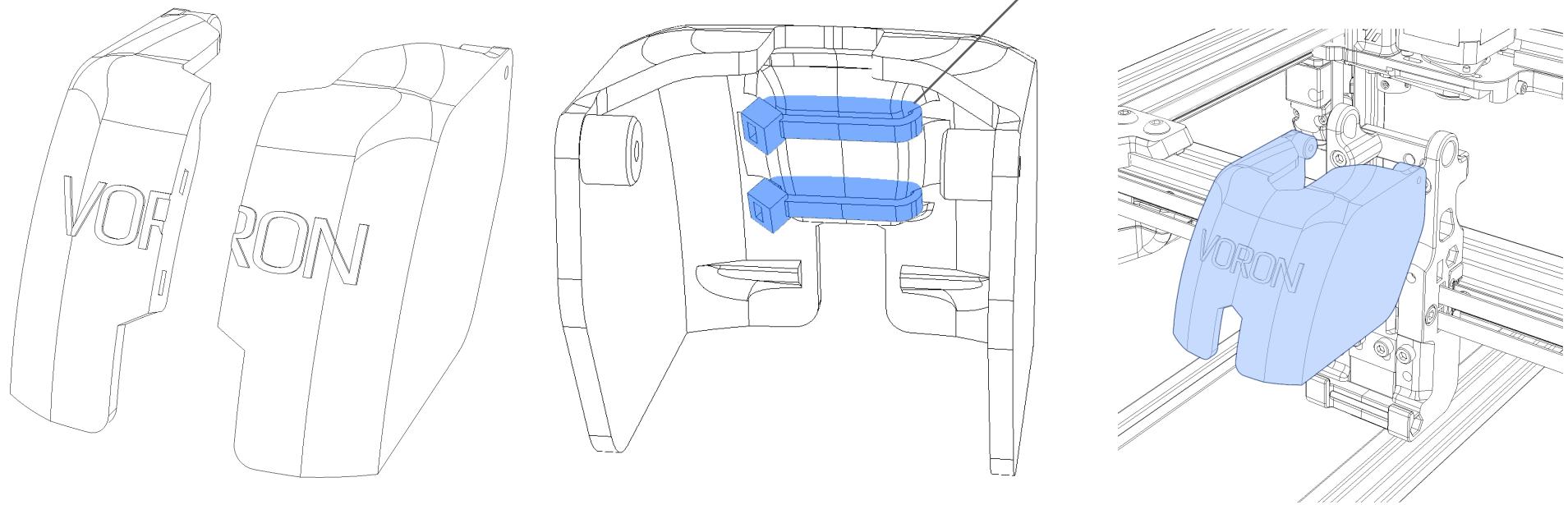
## A/B Belts Completed



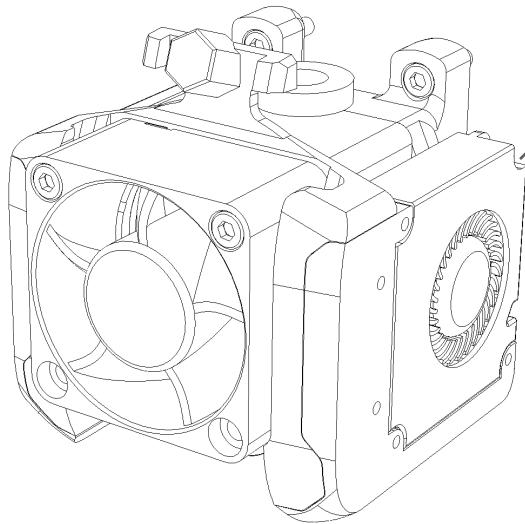
This is a good point to take a break.  
Get some rest and enjoy a nice cup of  
tea or cold brew.

- The VORON Development Team

## X Carriage Cable Covers

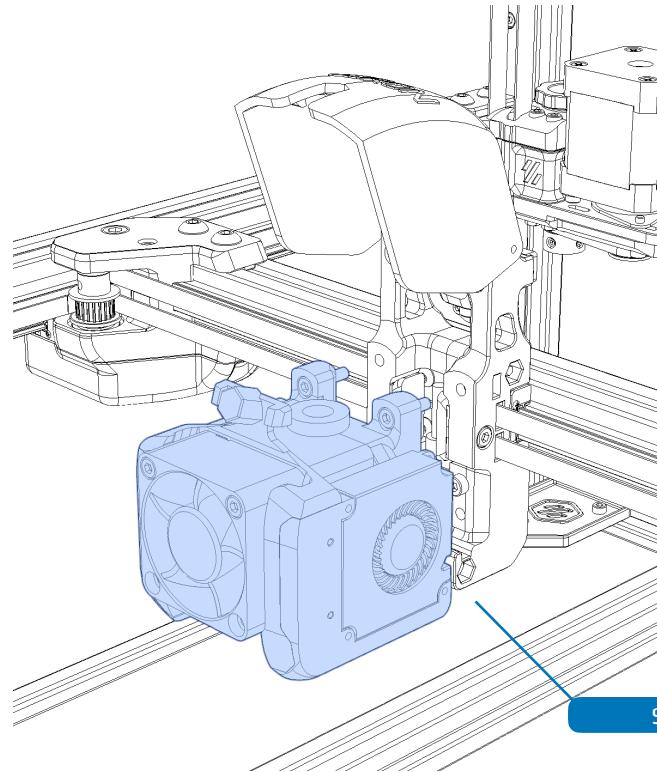
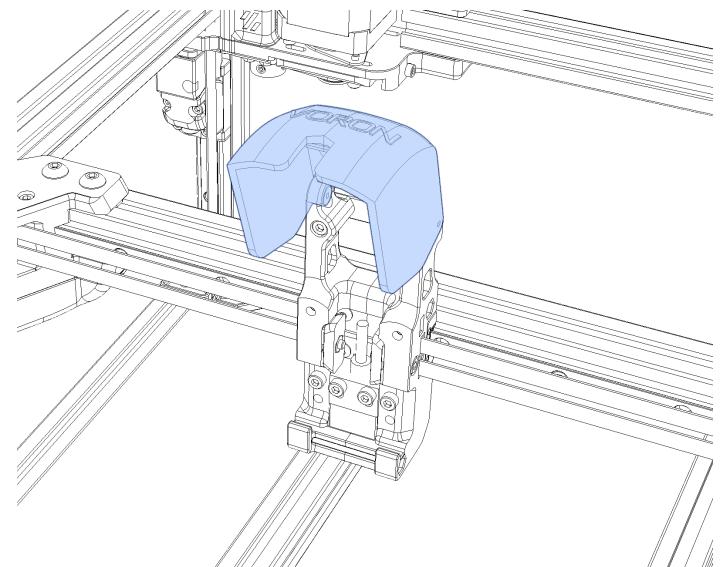


## X Carriage

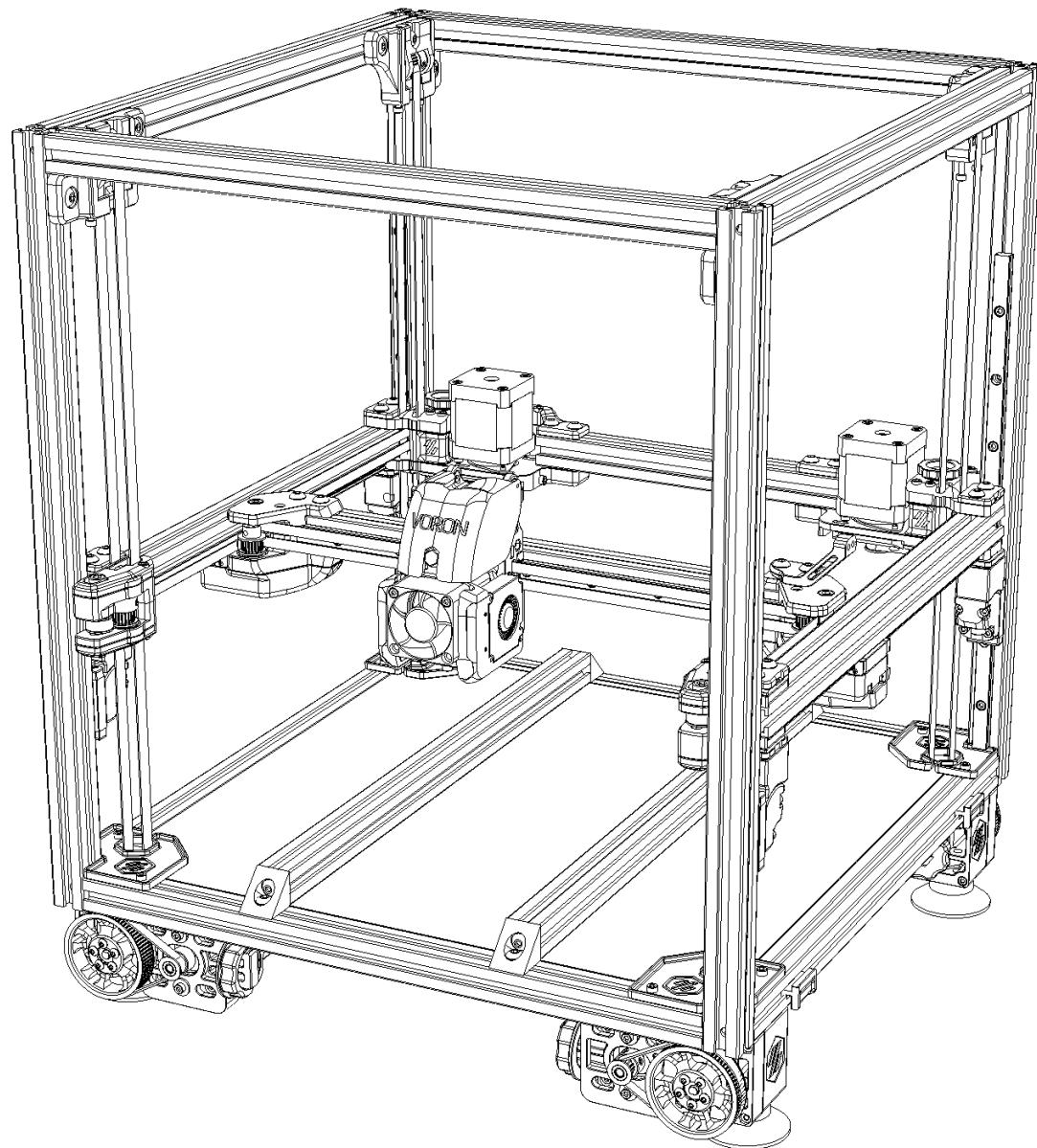


VORON Design Quick Change Toolhead

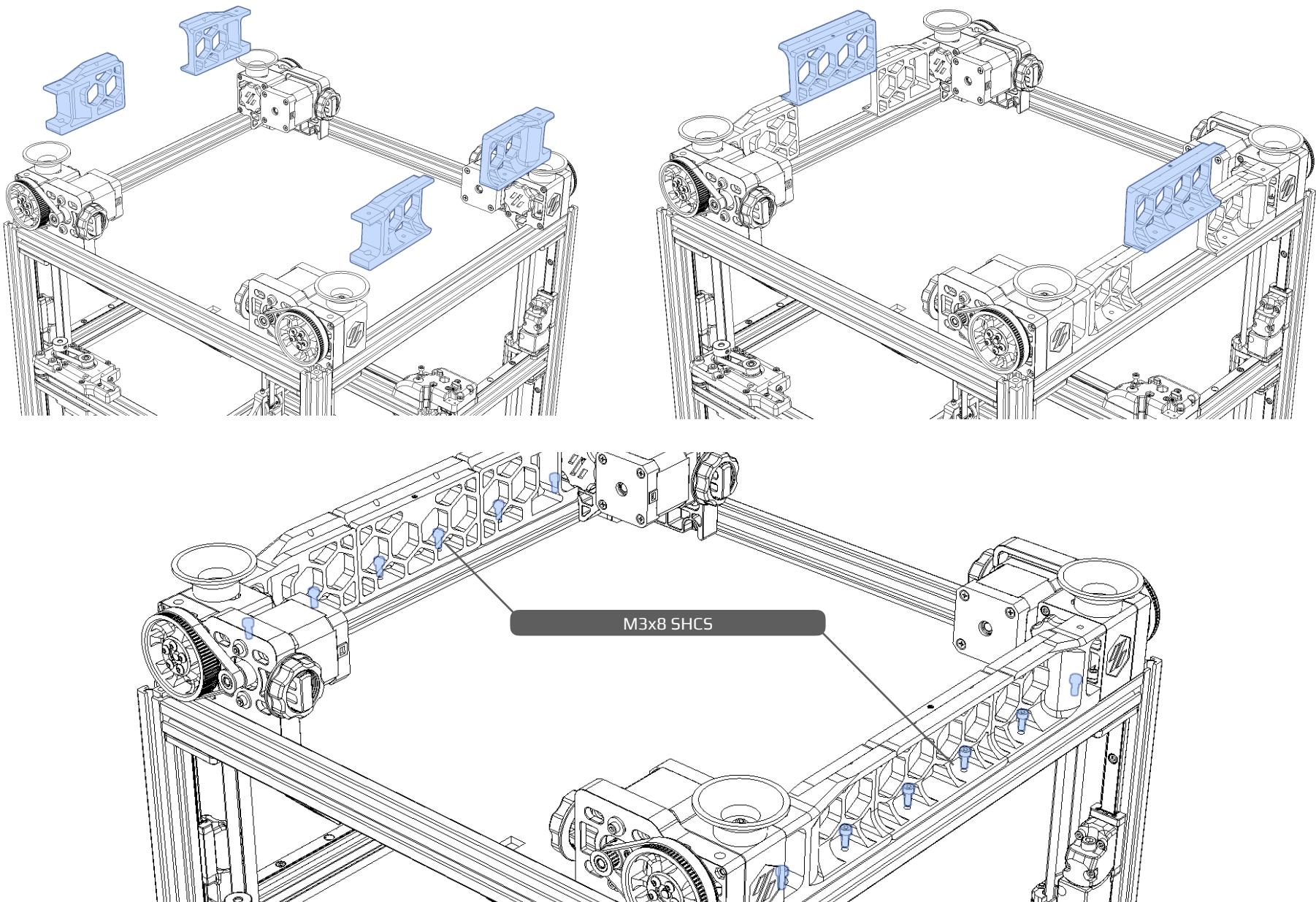
See Appendix B



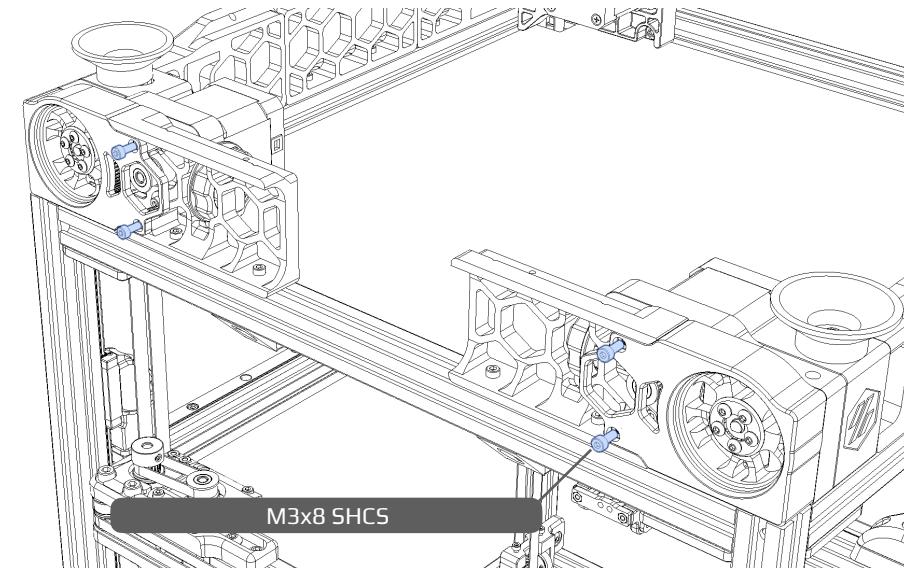
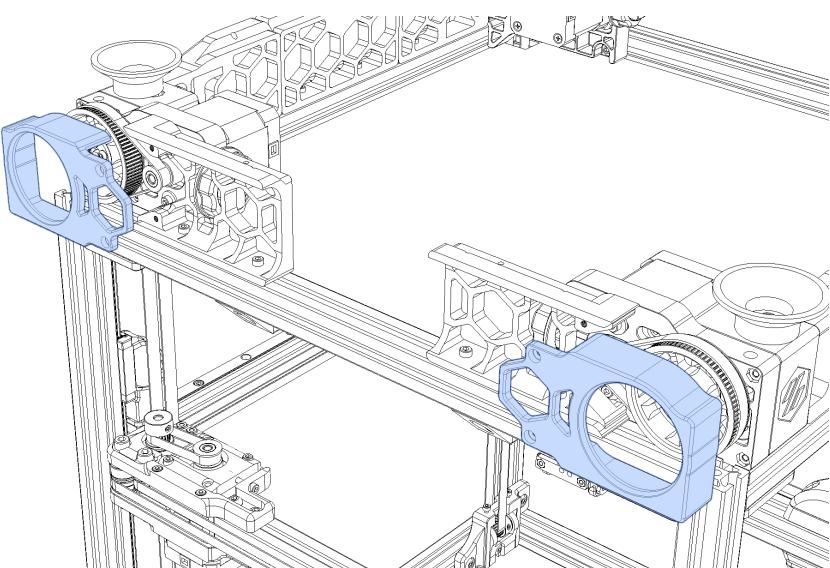
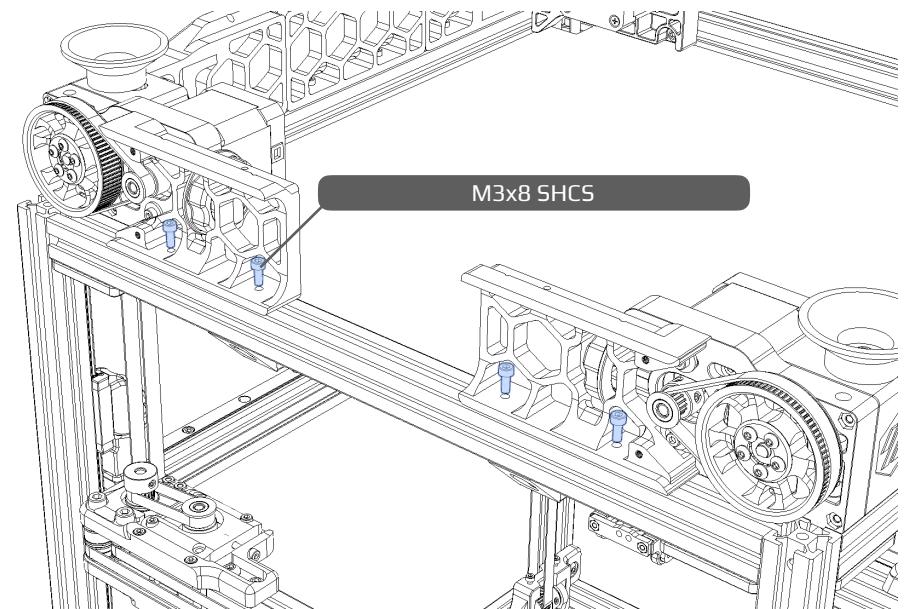
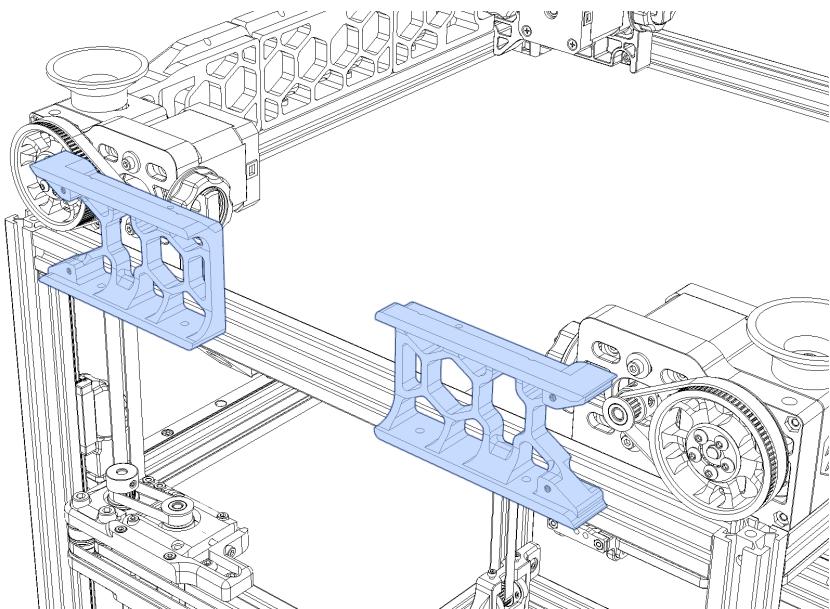
Seat The Toolhead In The Paws



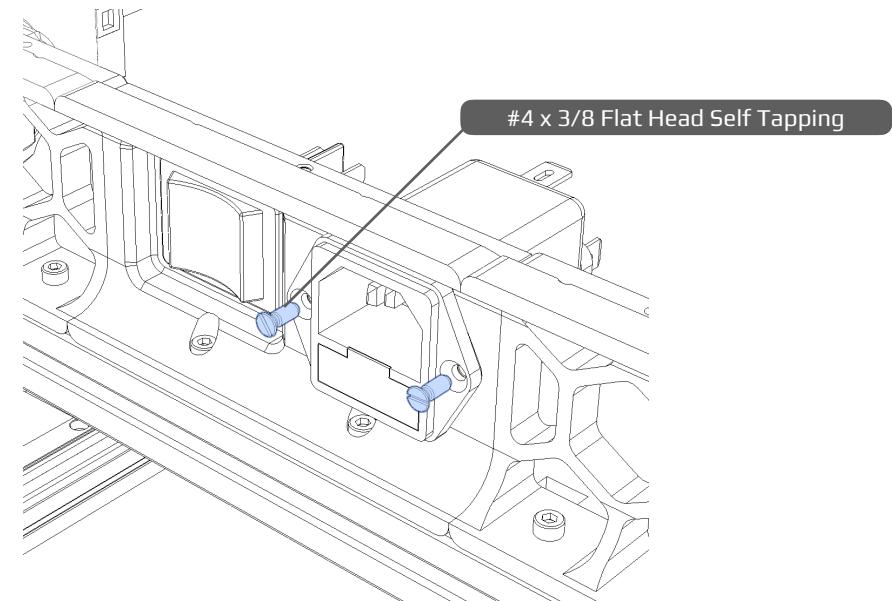
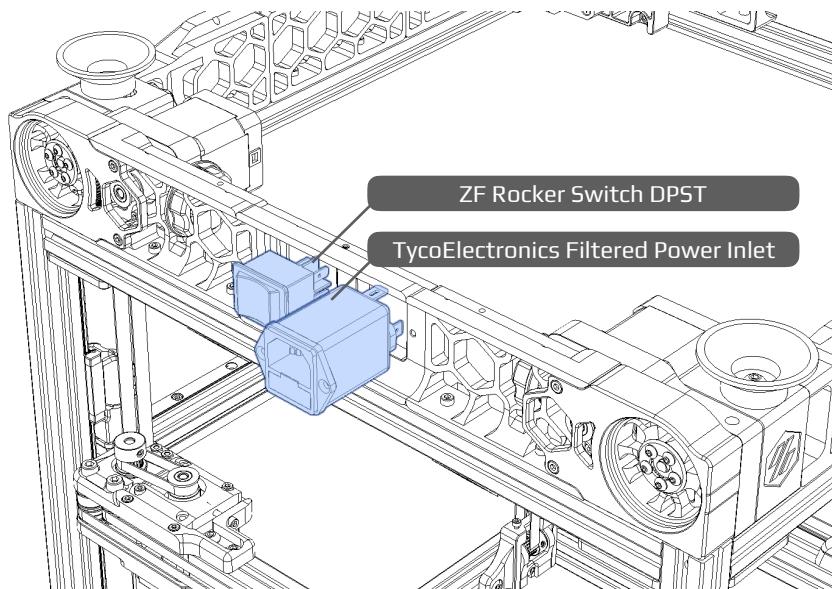
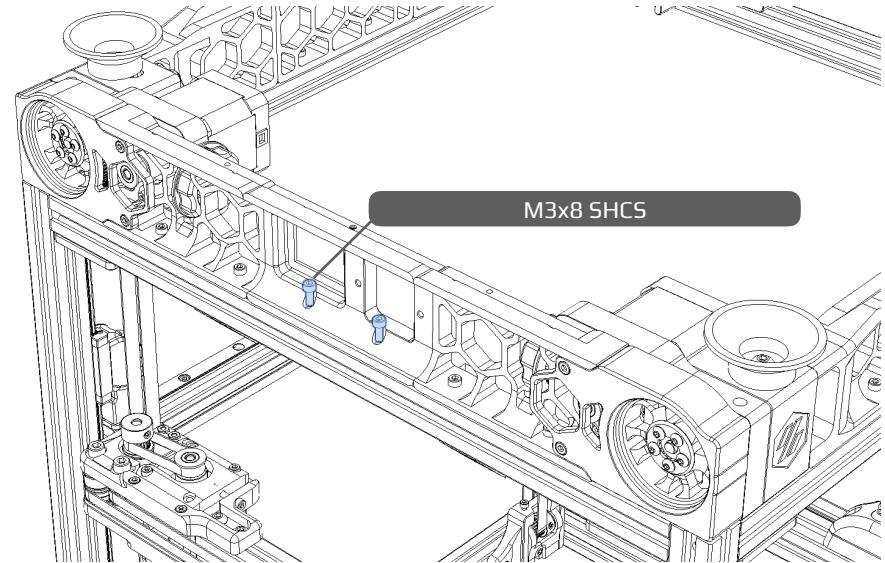
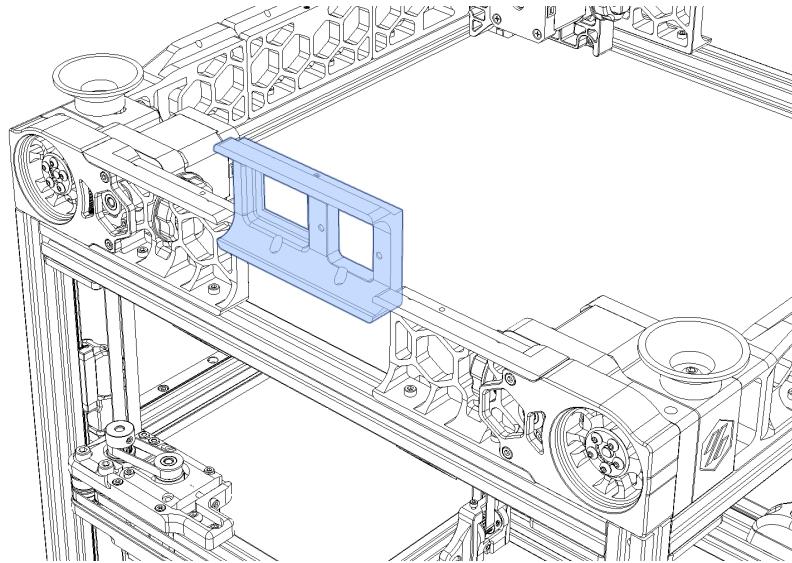
## Bottom Skirts



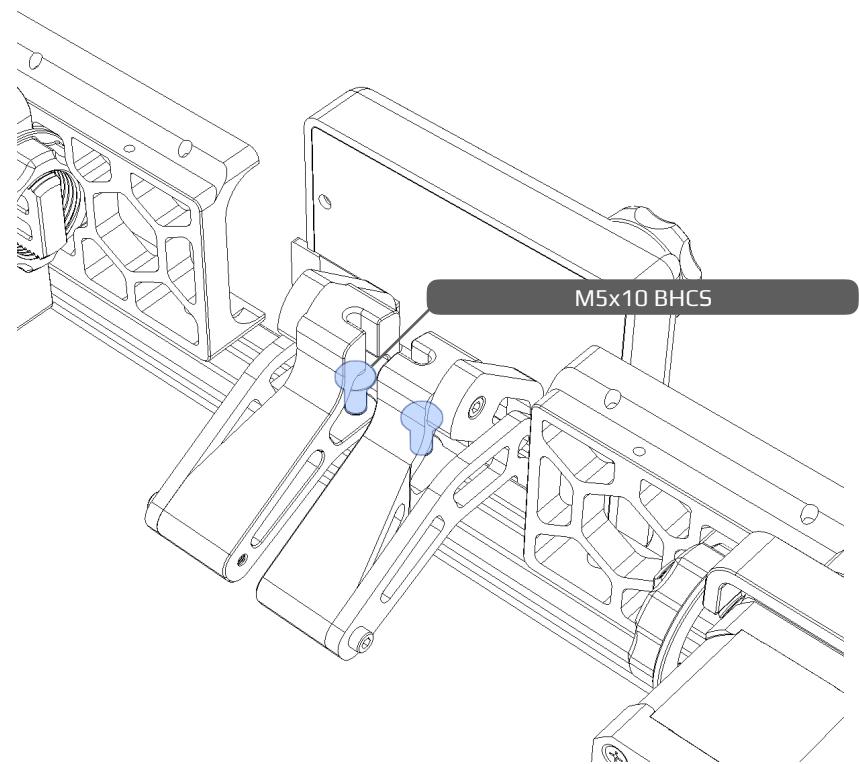
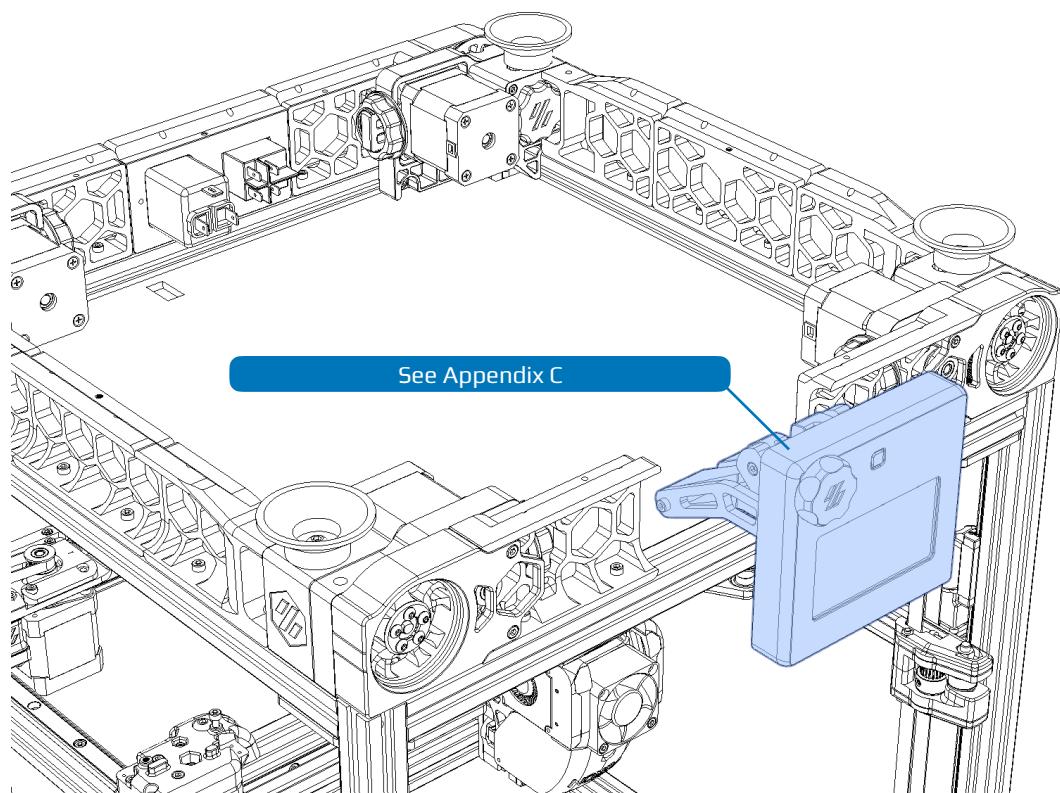
## Bottom Skirts



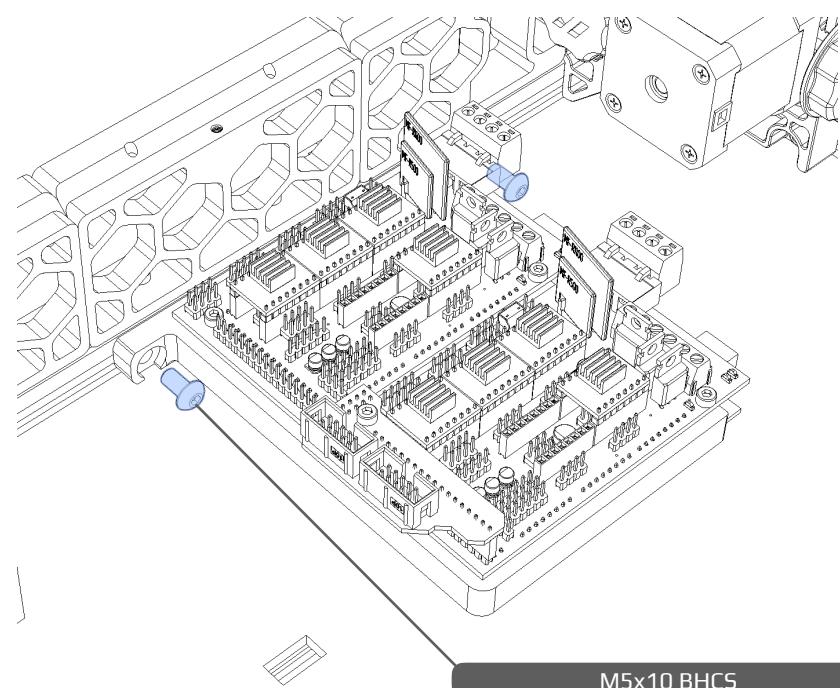
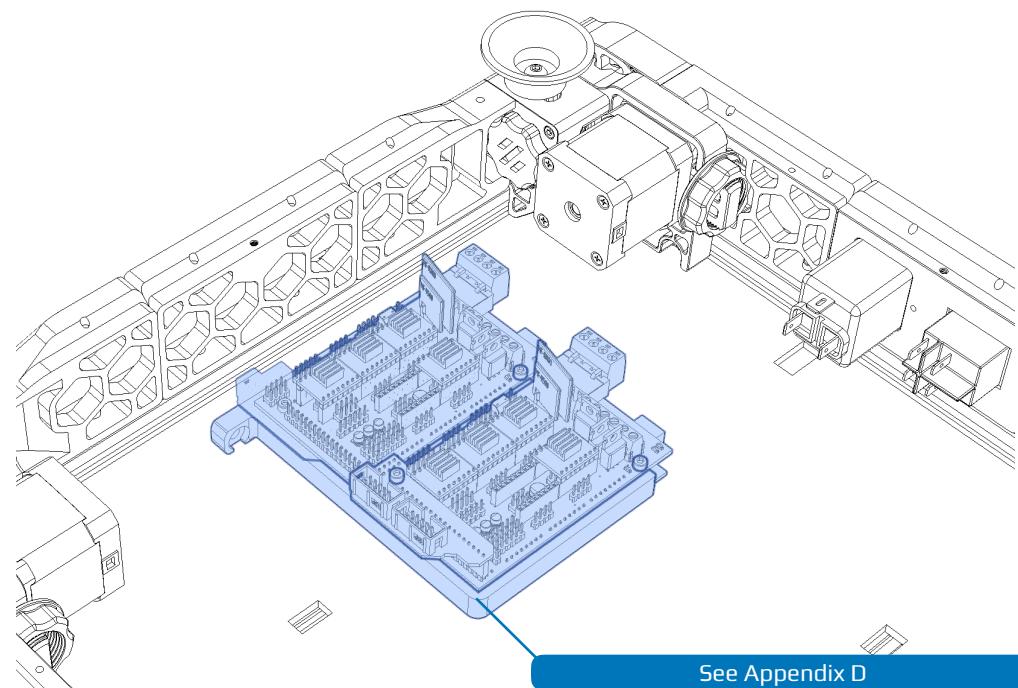
## Bottom Skirts



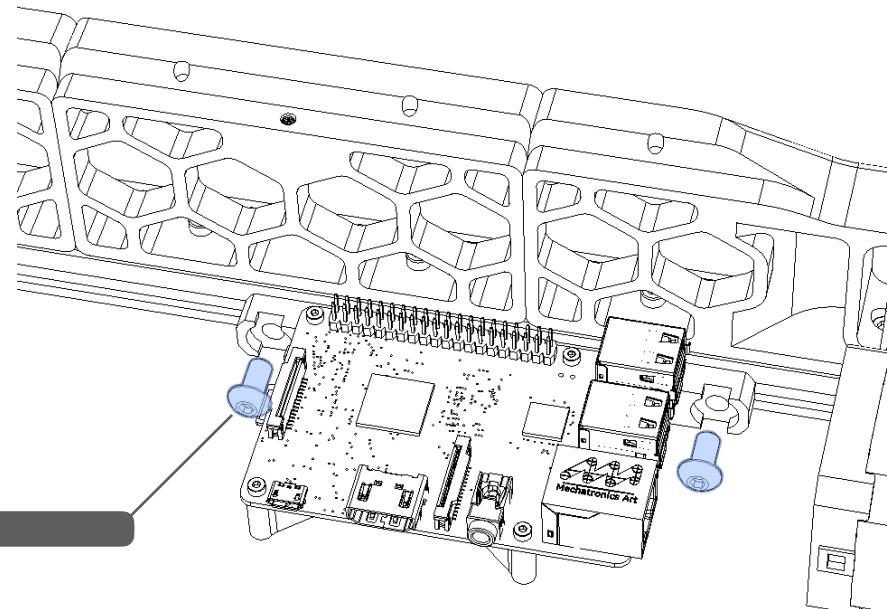
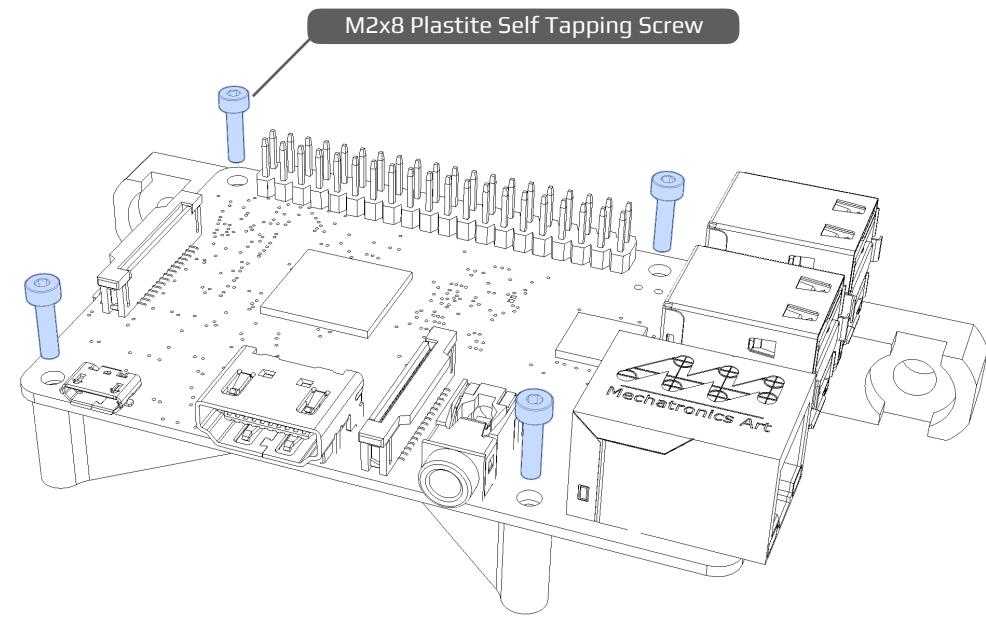
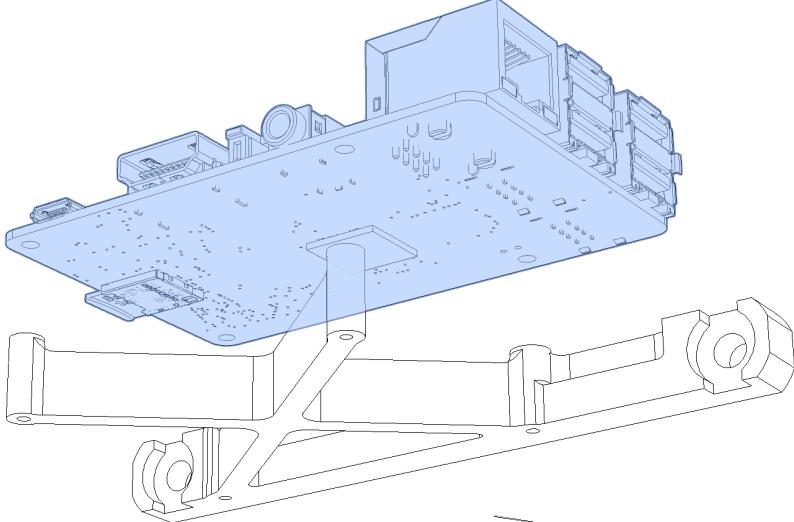
## Bottom Skirts



## Electronics Compartment

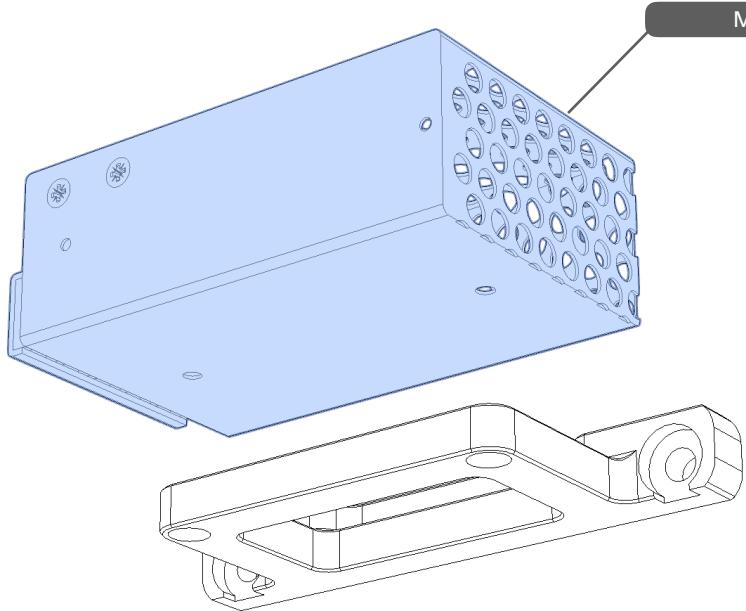


# Electronics Compartment

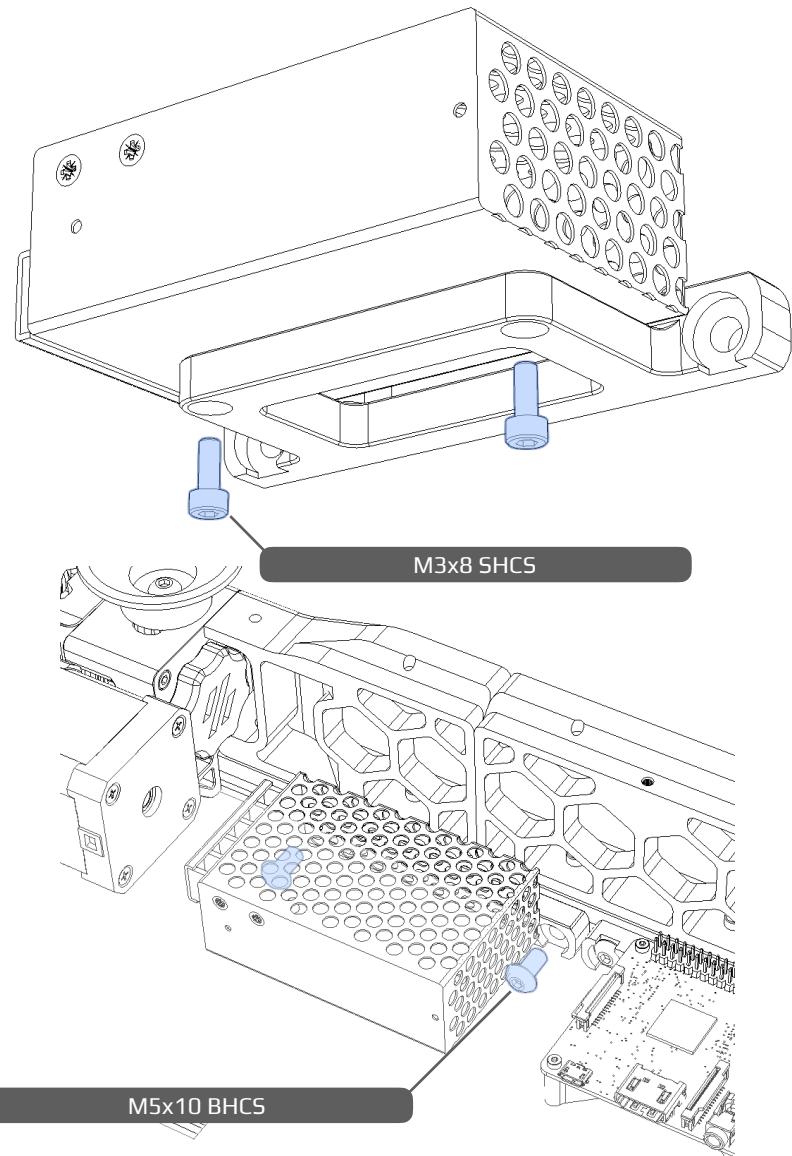


M5x10 BHCS

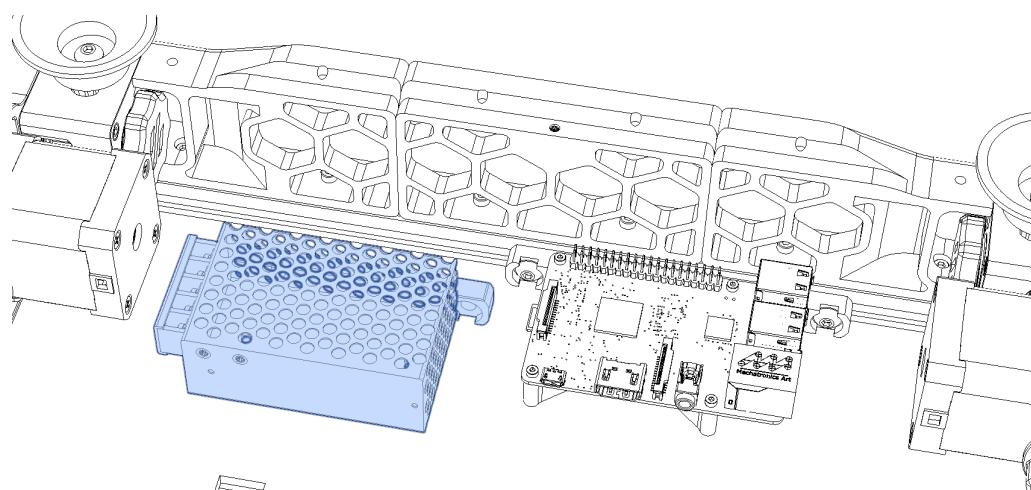
## Electronics Compartment



Mean Well RS-25-5 PSU

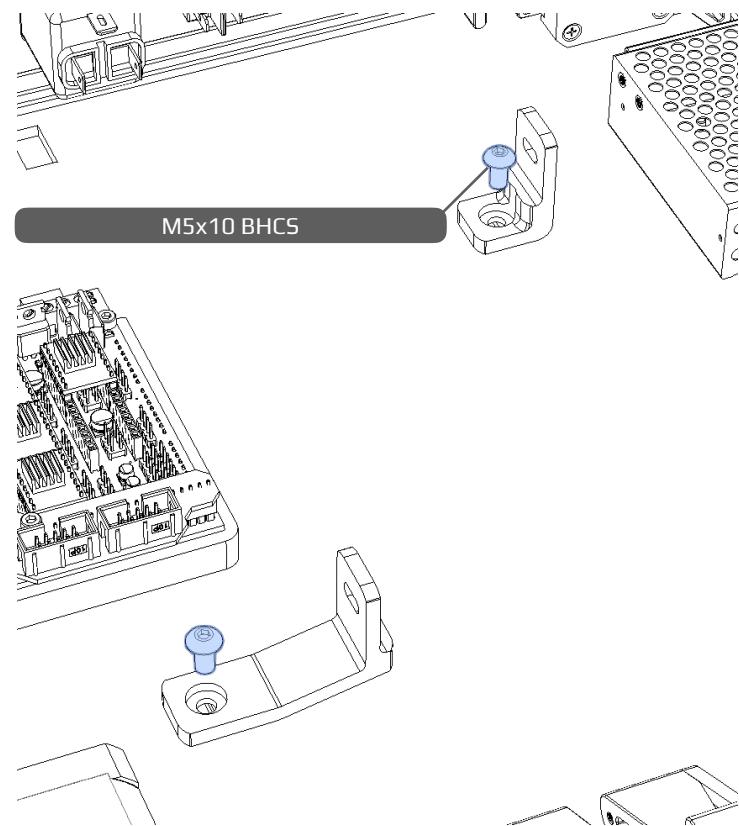
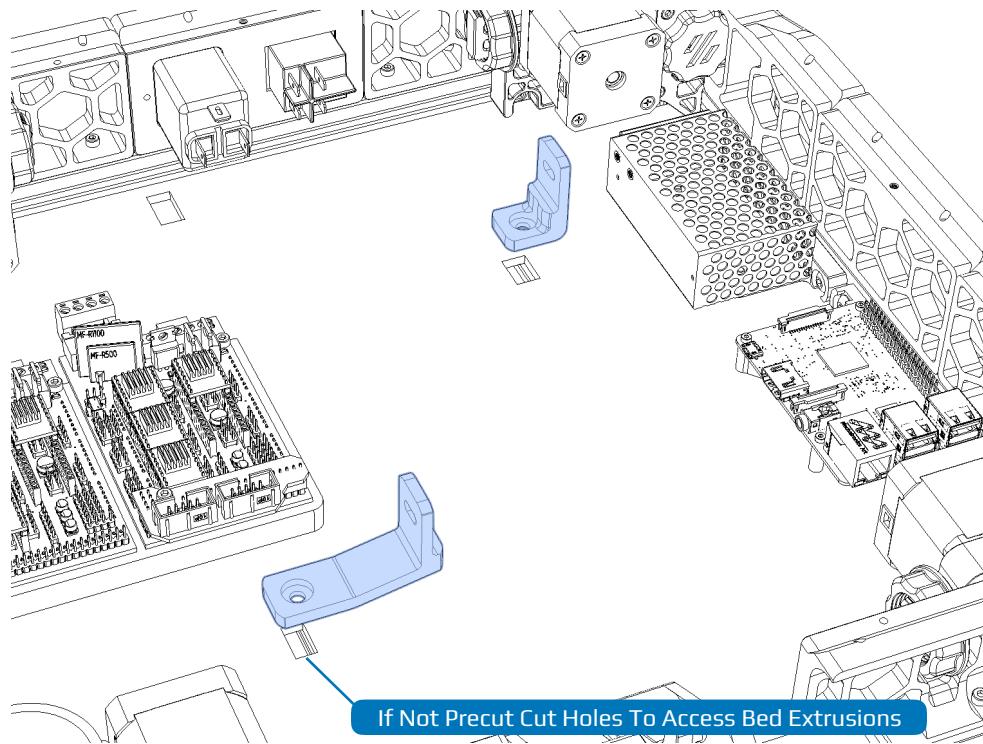


M3x8 SHCS

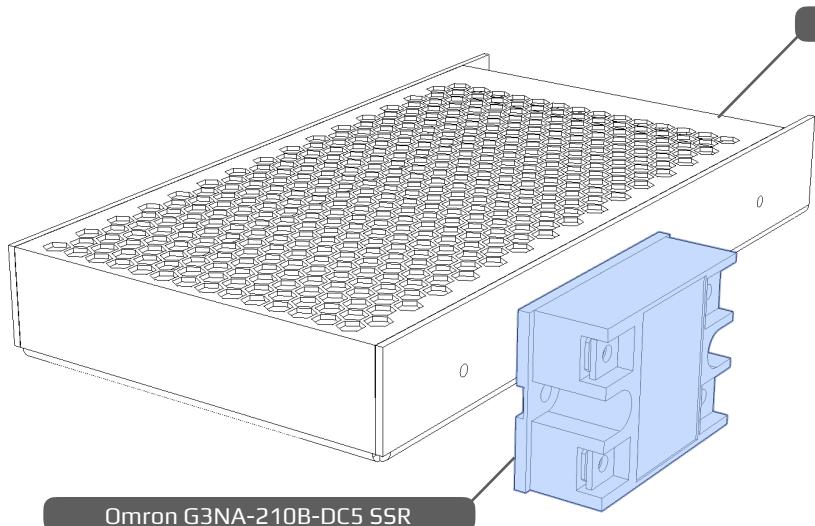


M5x10 BHCS

# Electronics Compartment

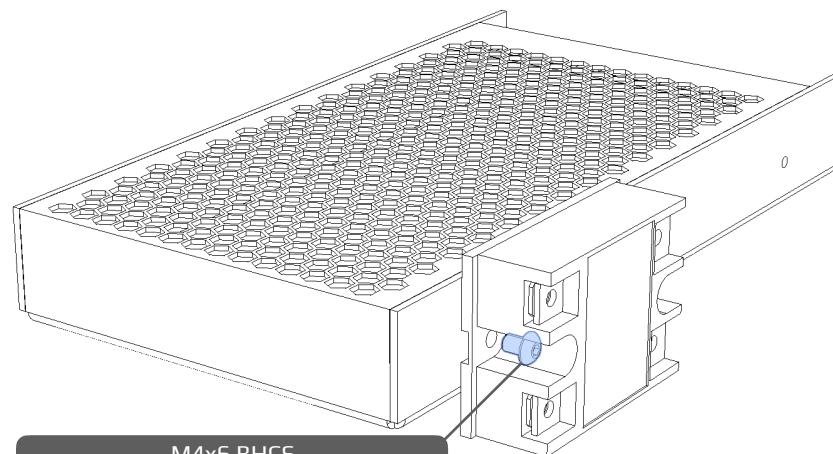


# Electronics Compartment

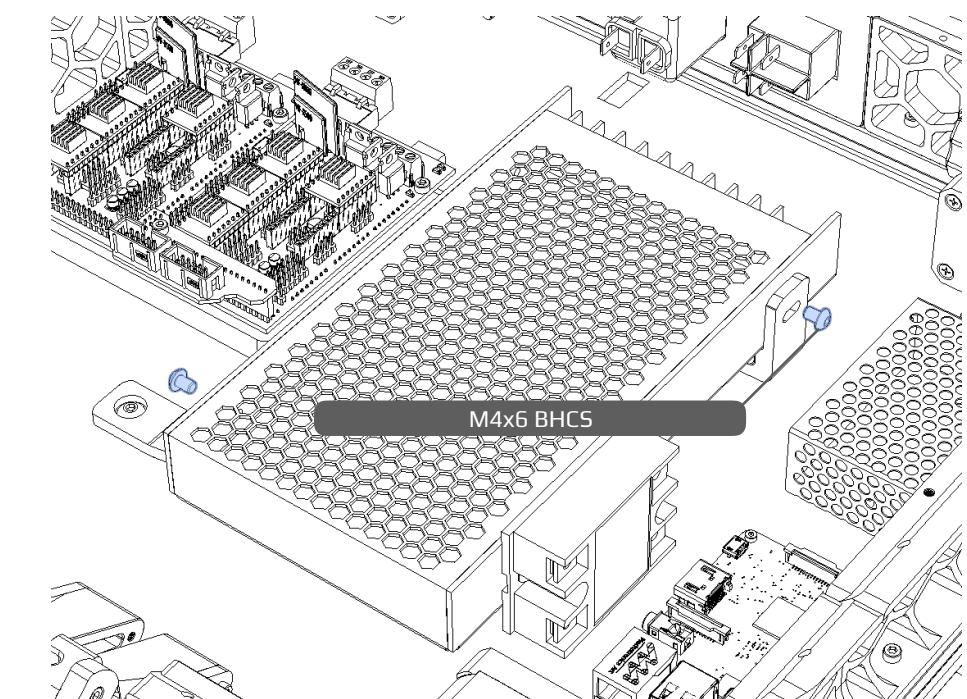
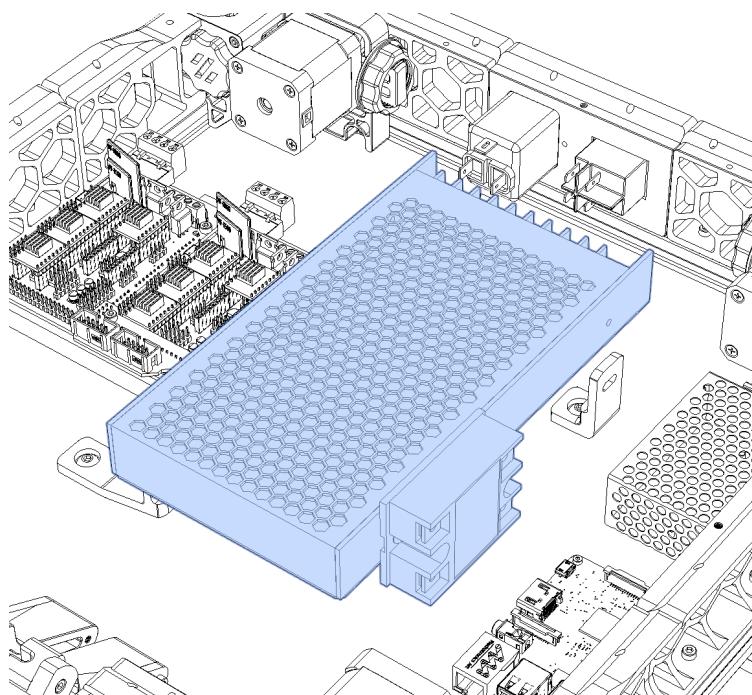


Mean Well LRS-200-12 PSU

Omron G3NA-210B-DC5 SSR

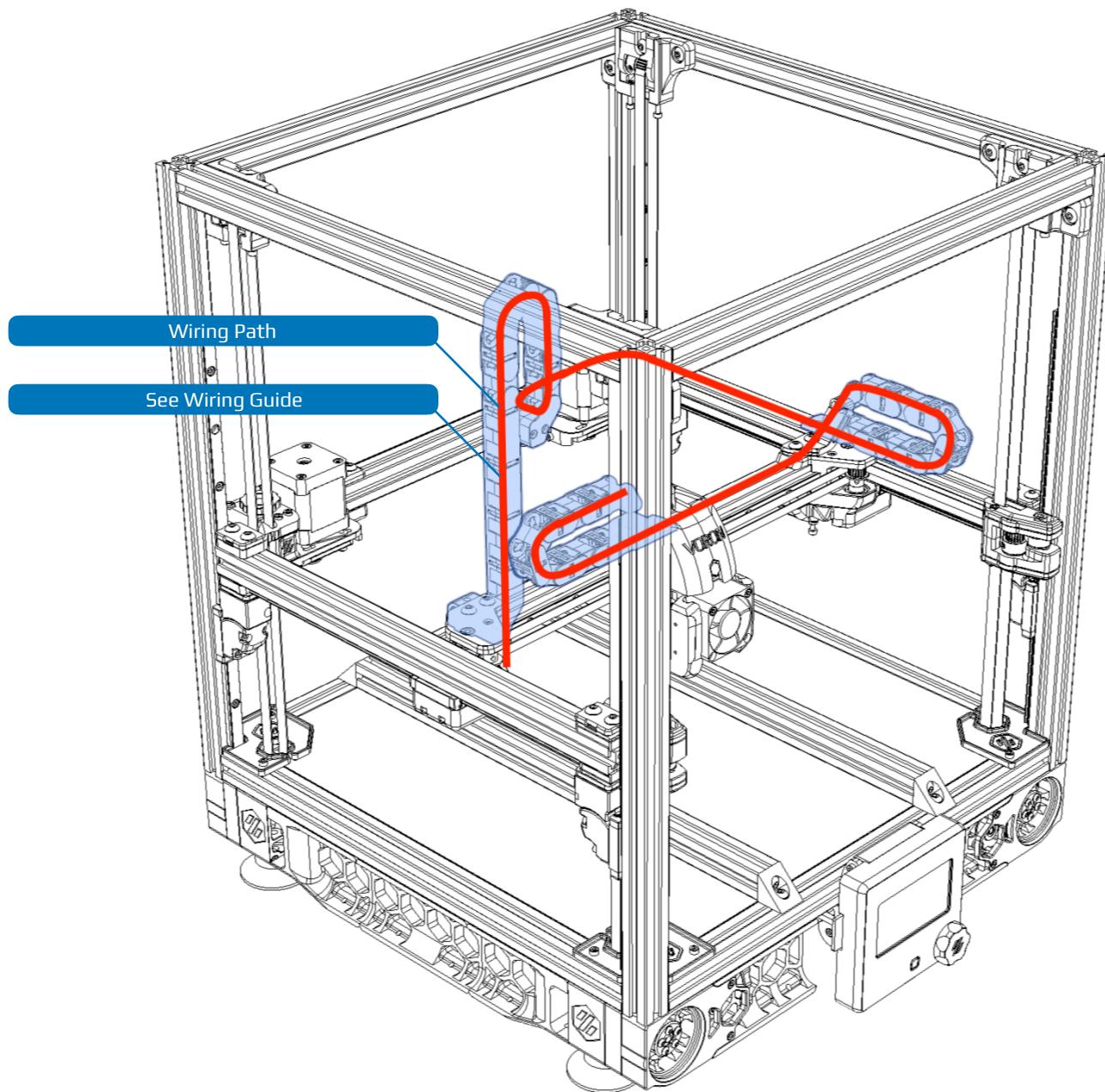


M4x6 BHCS

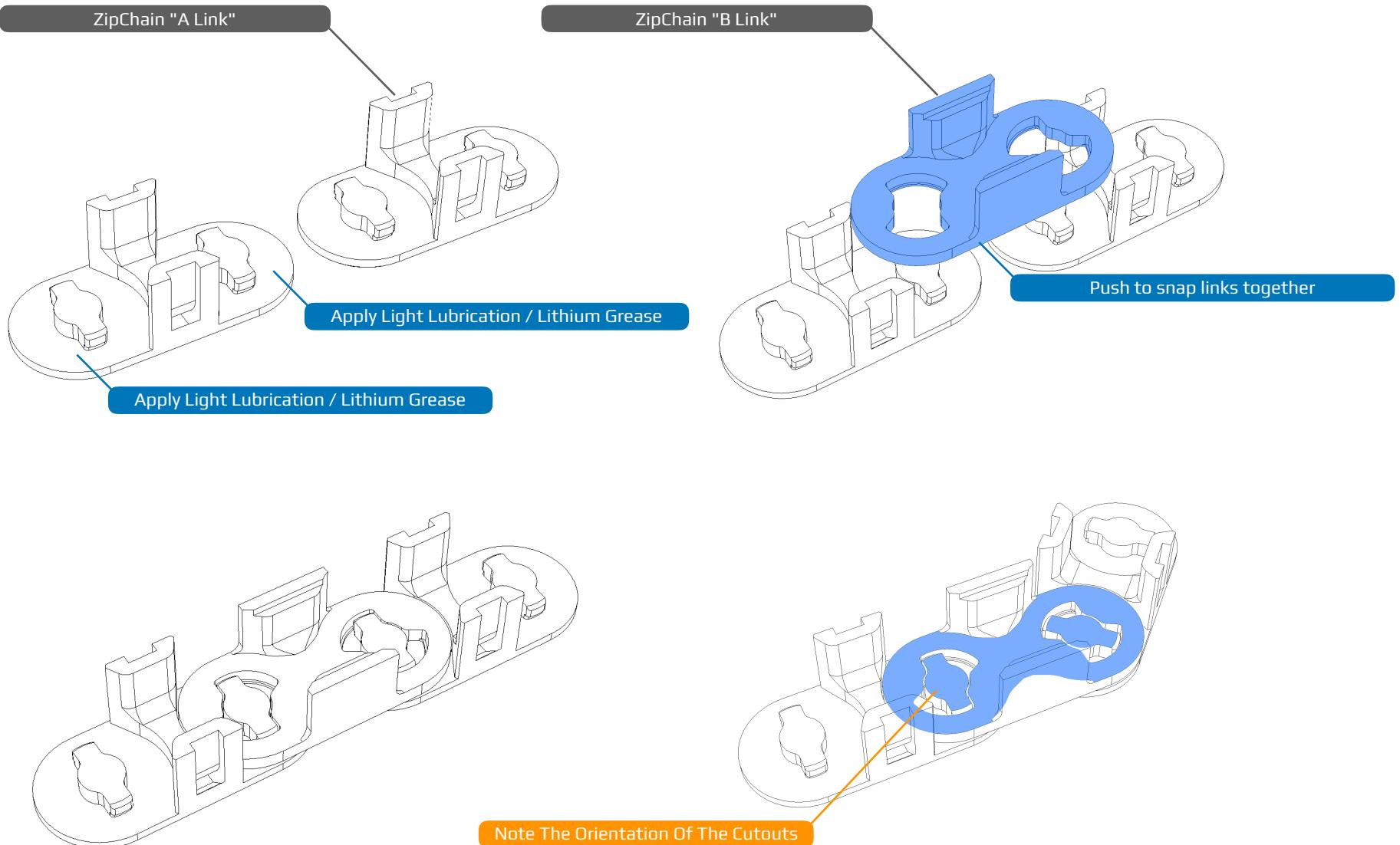


M4x6 BHCS

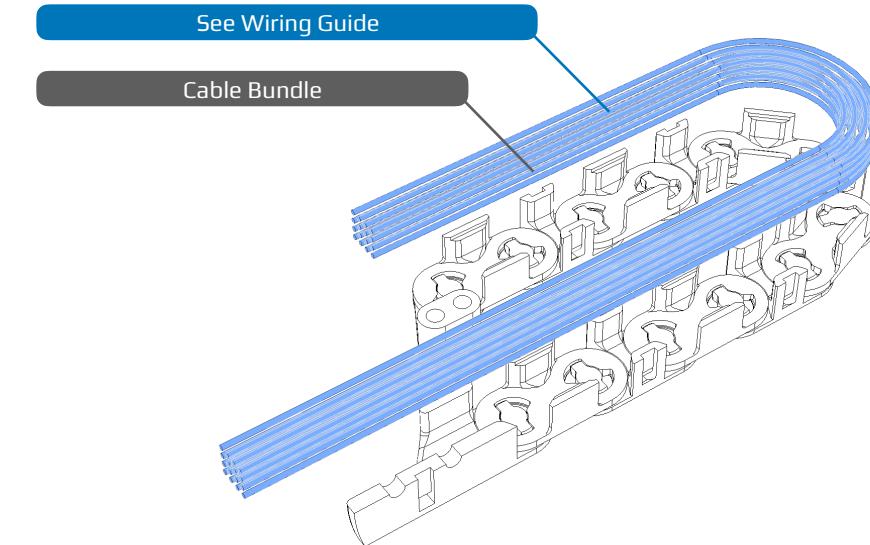
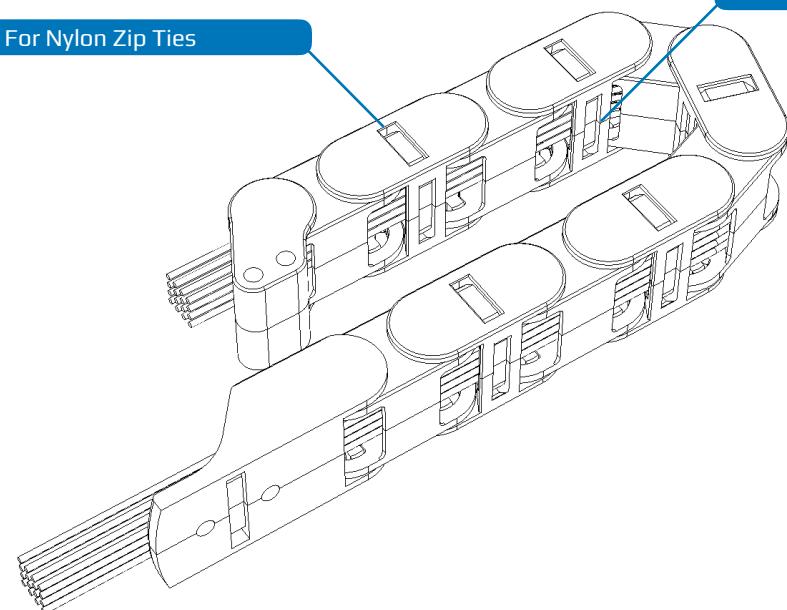
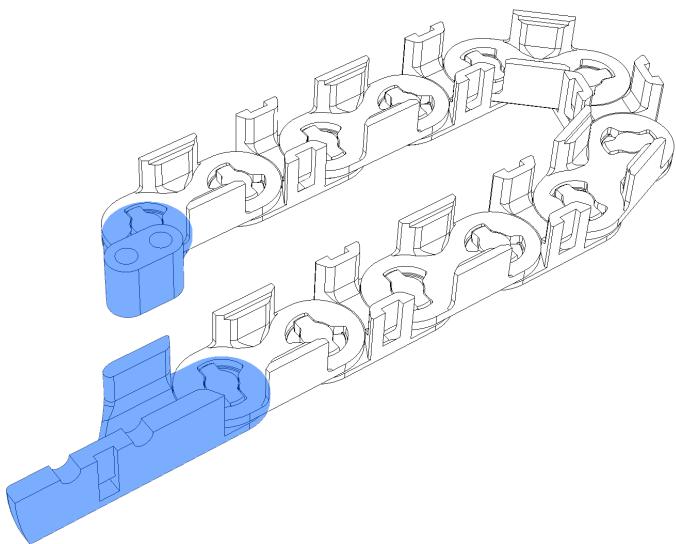
## Cable Chain



# Cable Chain



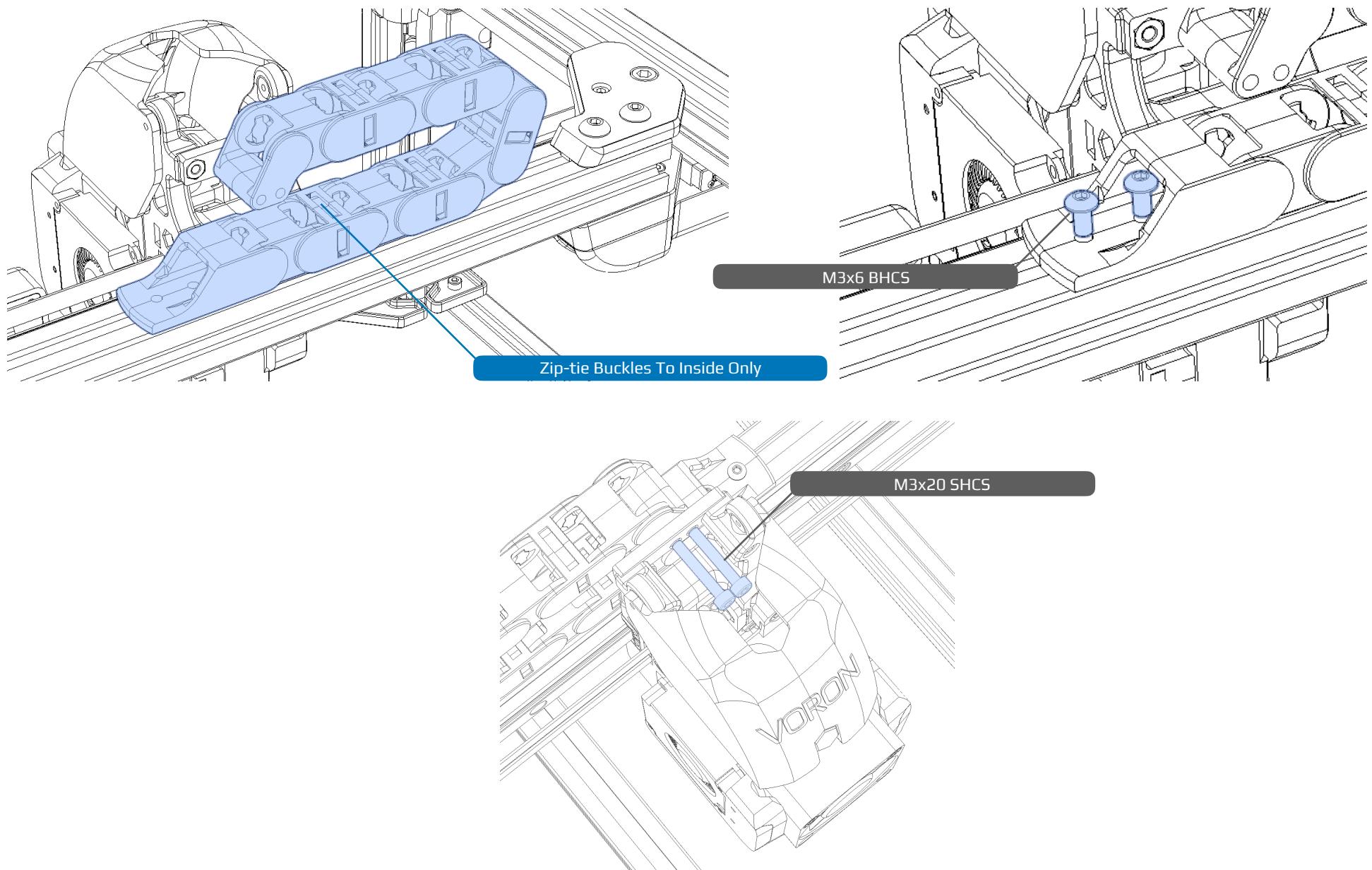
# Cable Chain



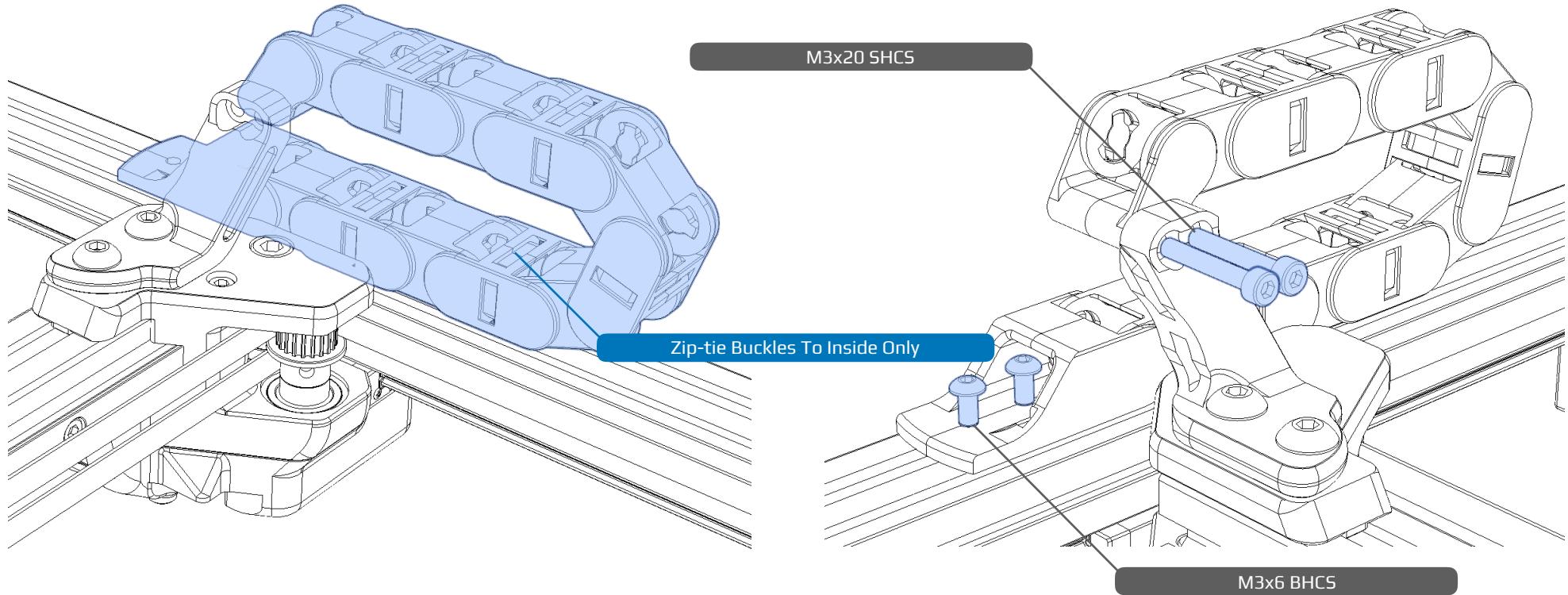
Chain Links used	X	Y	Z
<b>250</b>	5xA, 6xB	5xA, 6xB	5xA, 6xB + 250 Solid Vertical
<b>300</b>	6xA, 7xB	6xA, 7xB	5xA, 6xB + 300 Solid Vertical
<b>350</b>	7xA, 8xB	7xA, 8xB	6xA, 7xB + 350 Solid Vertical

Note: Plain links can also be used on the Z

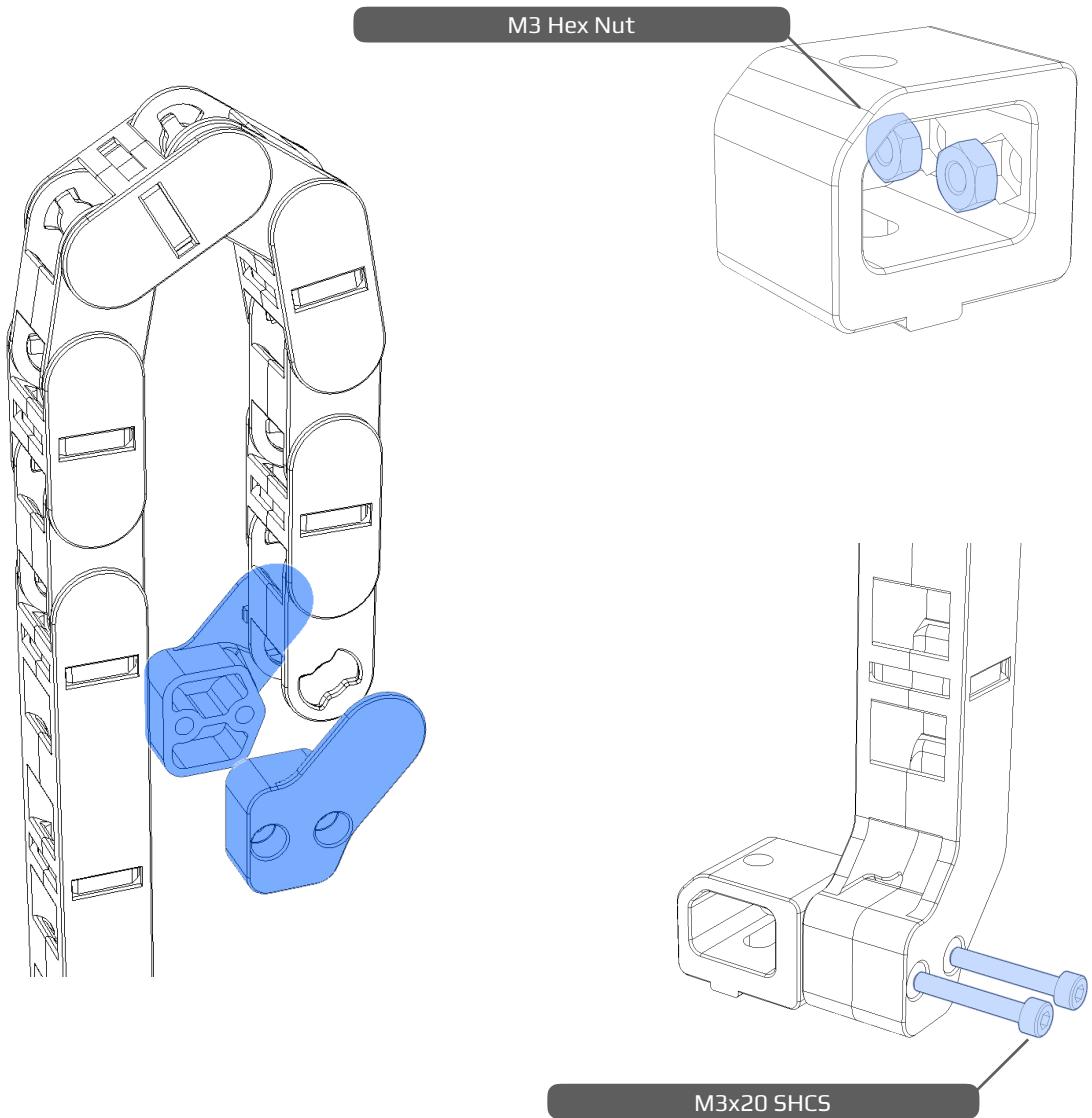
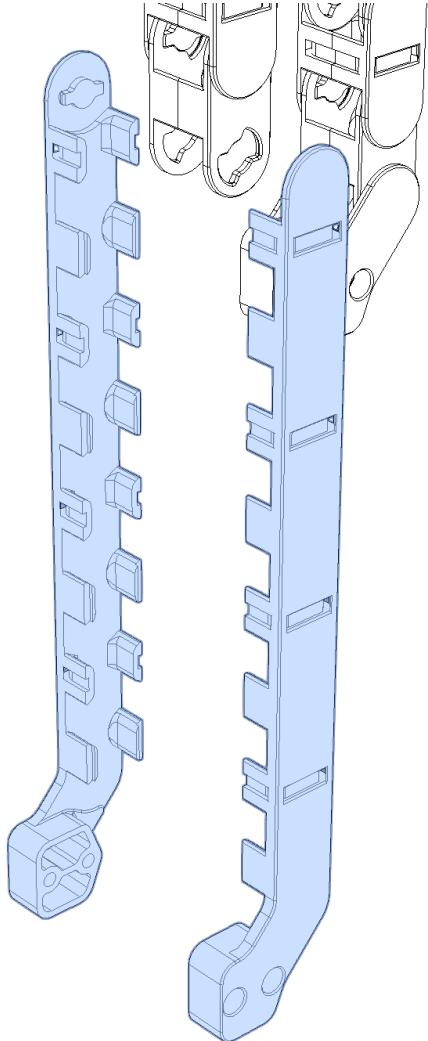
# X Cable Chain



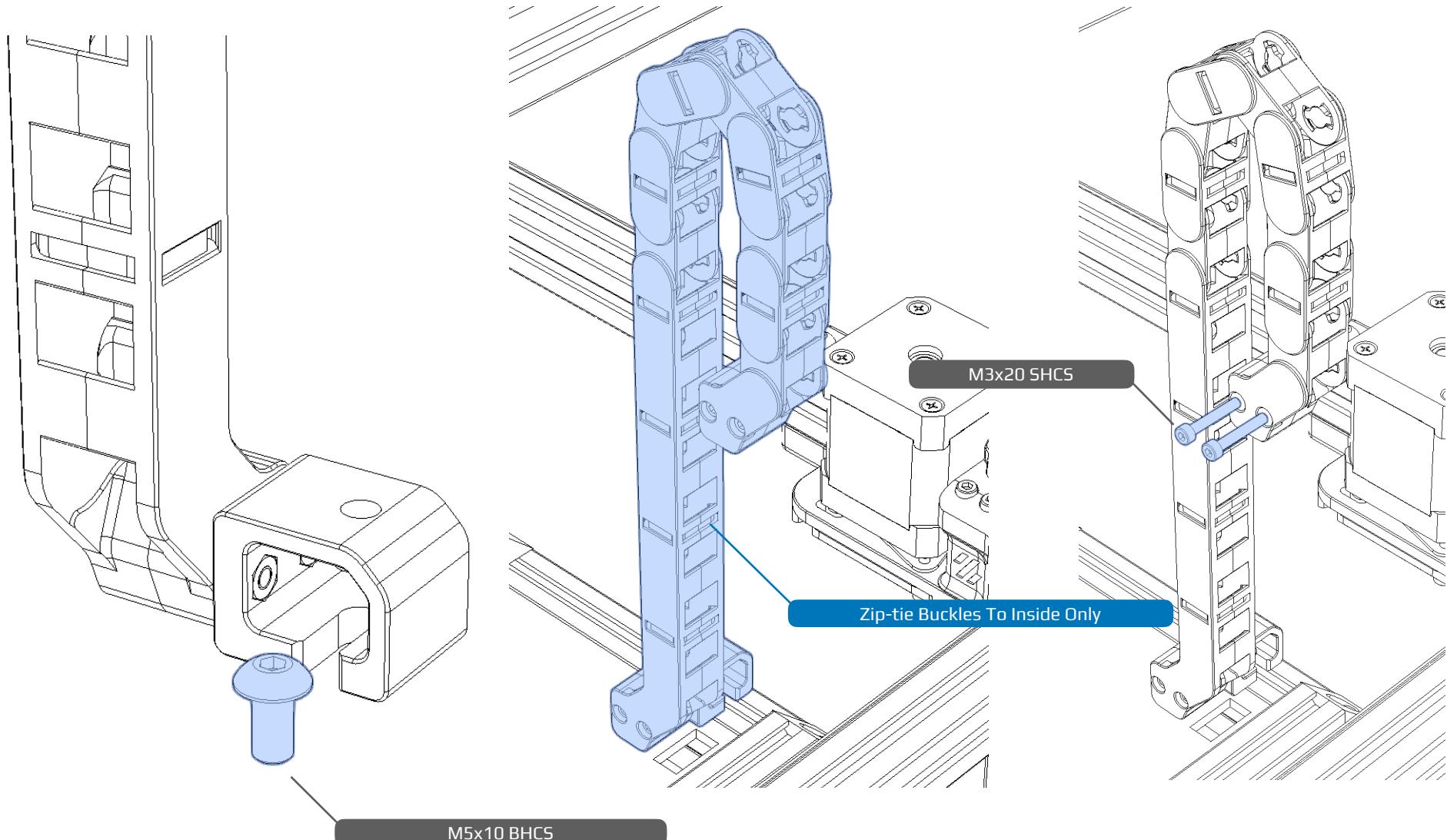
# Y Cable Chain



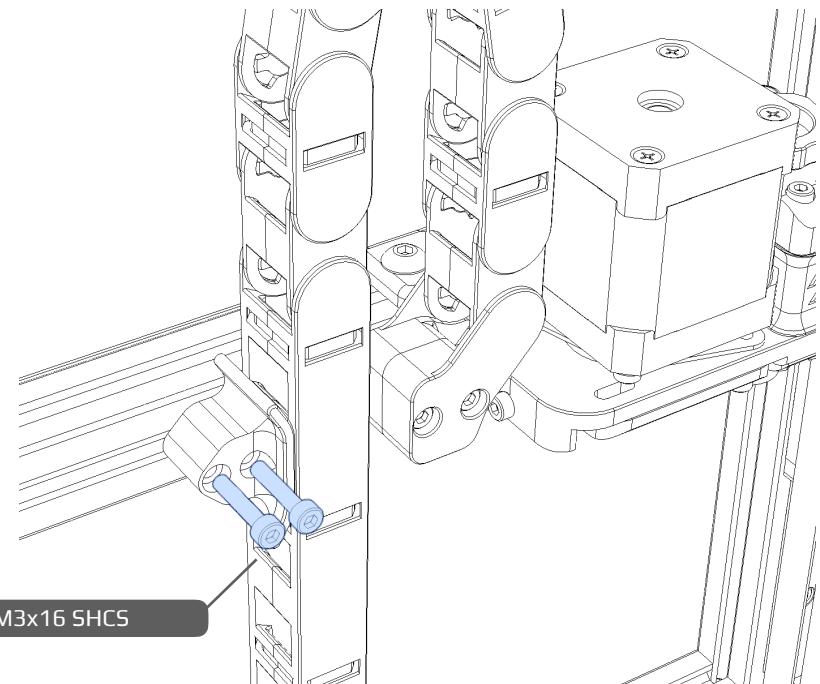
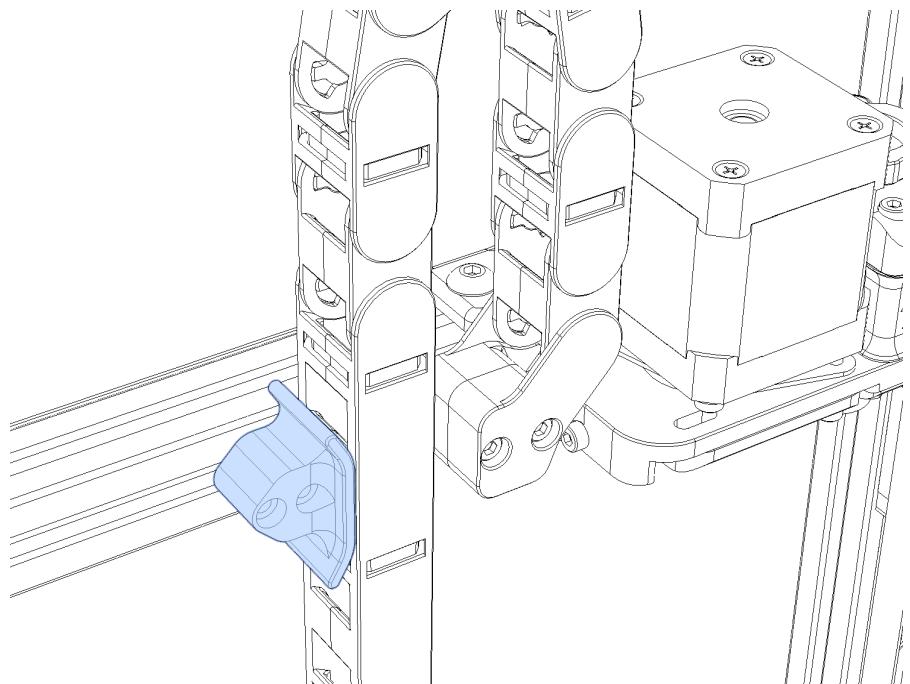
## Z Cable Chain



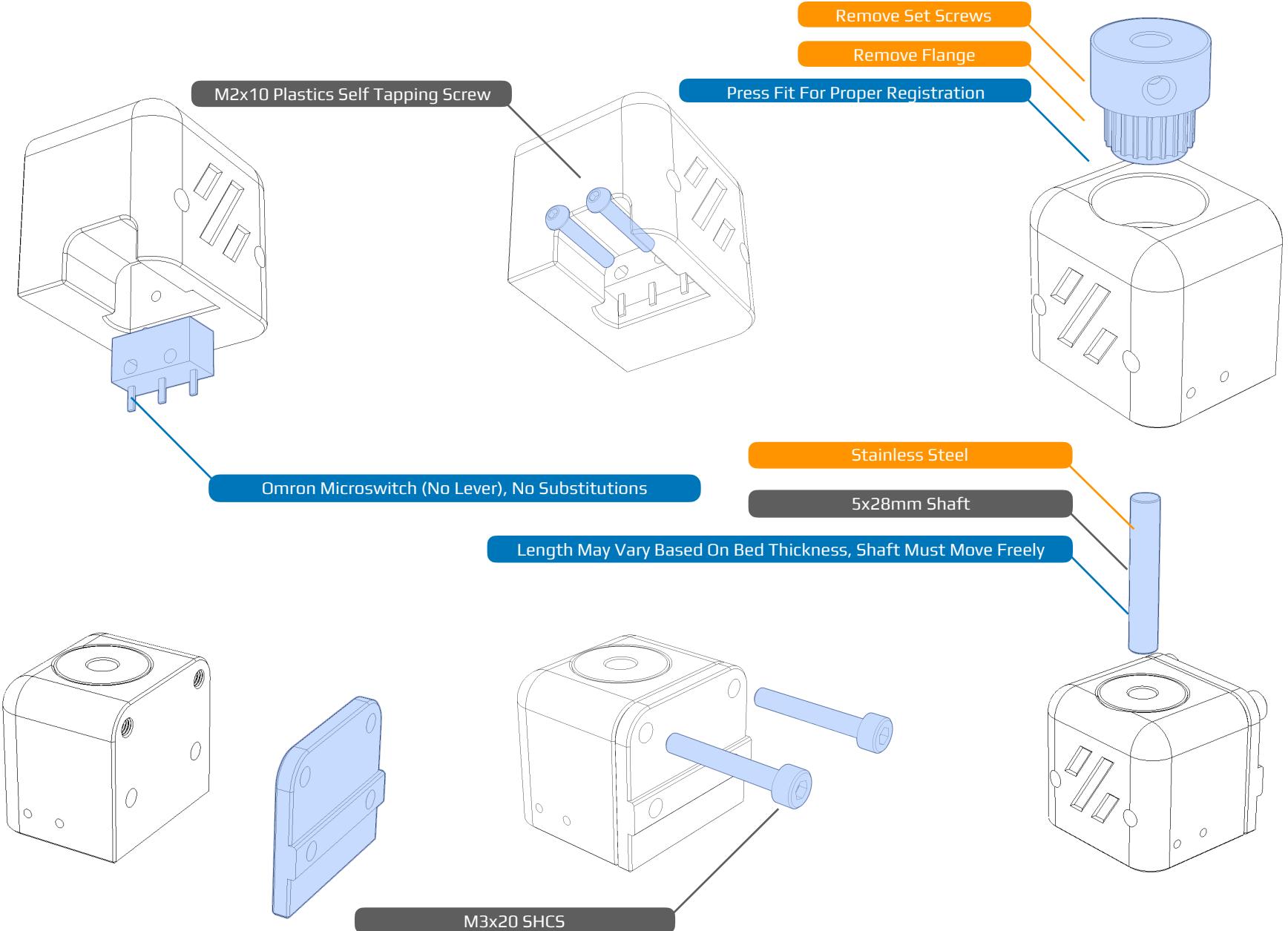
# Z Cable Chain



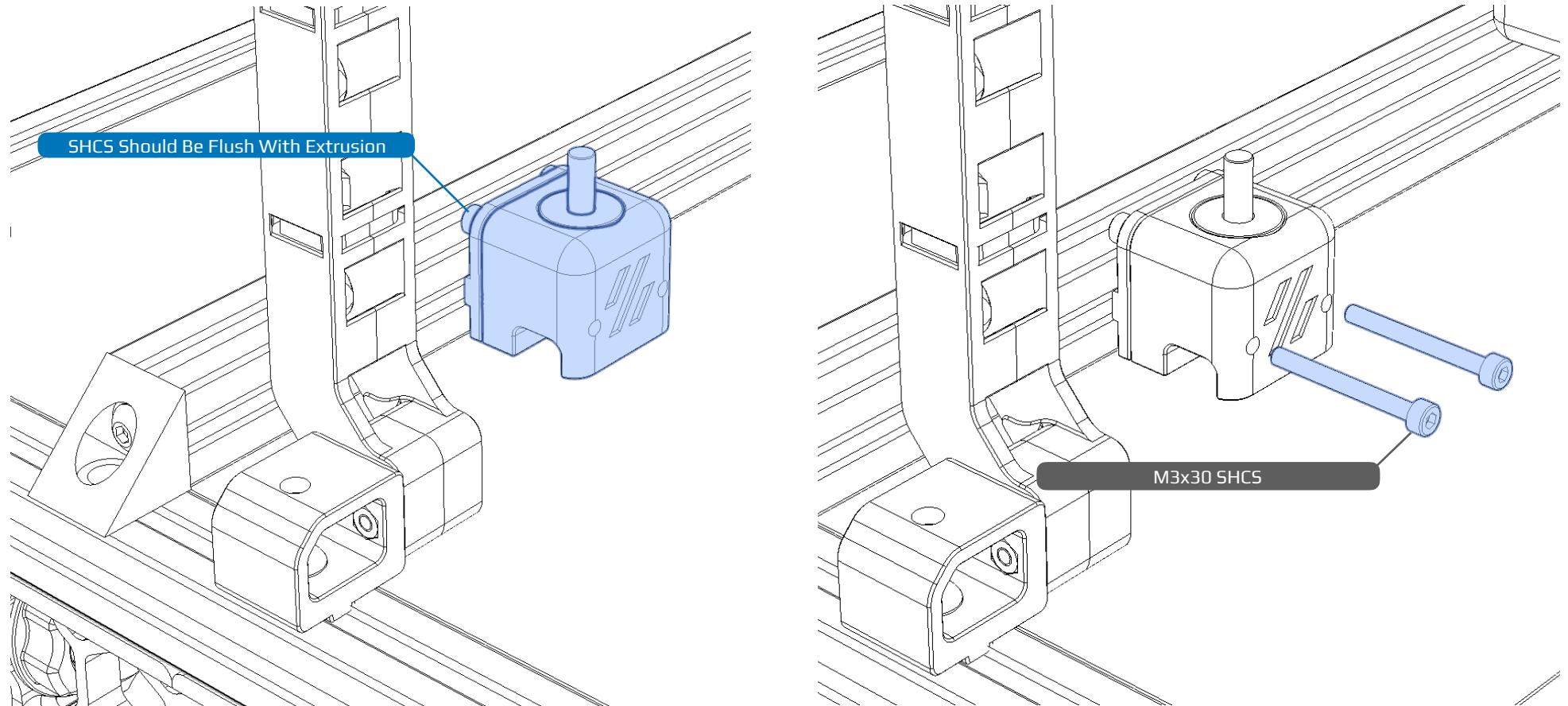
## Z Cable Chain



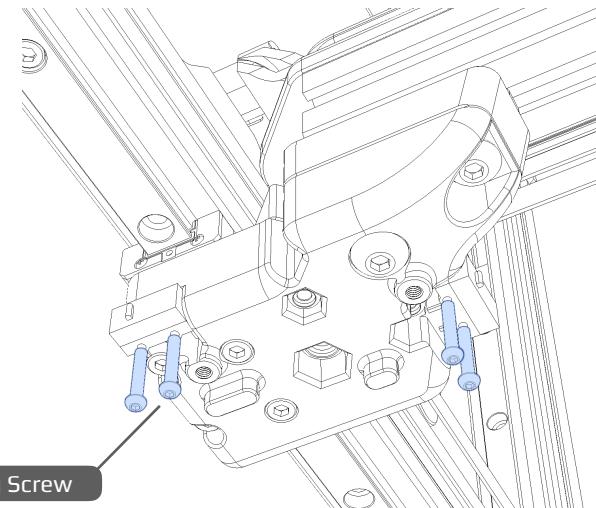
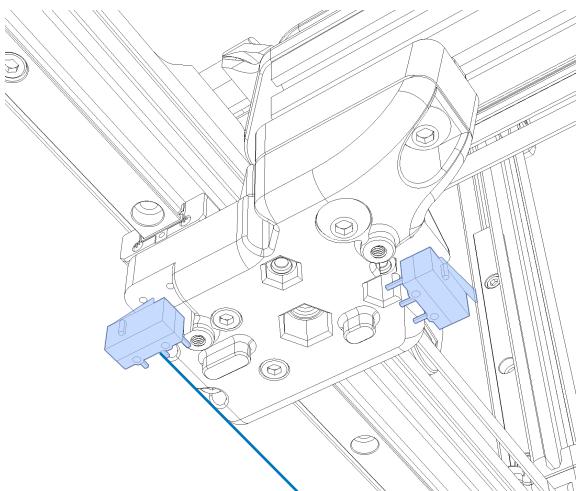
# Z End Stop



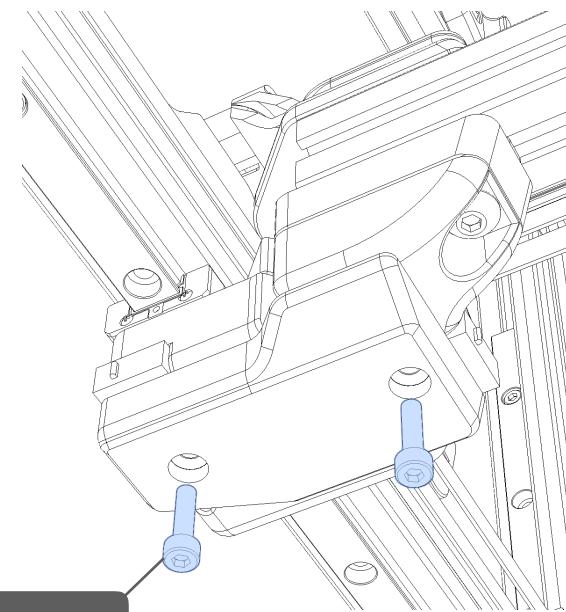
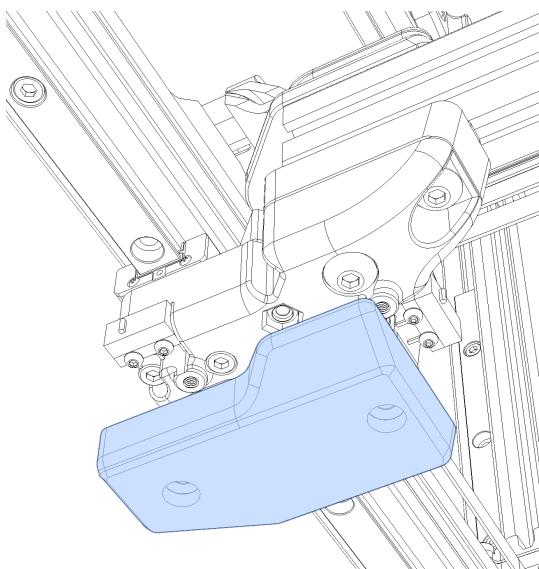
## Z End Stop



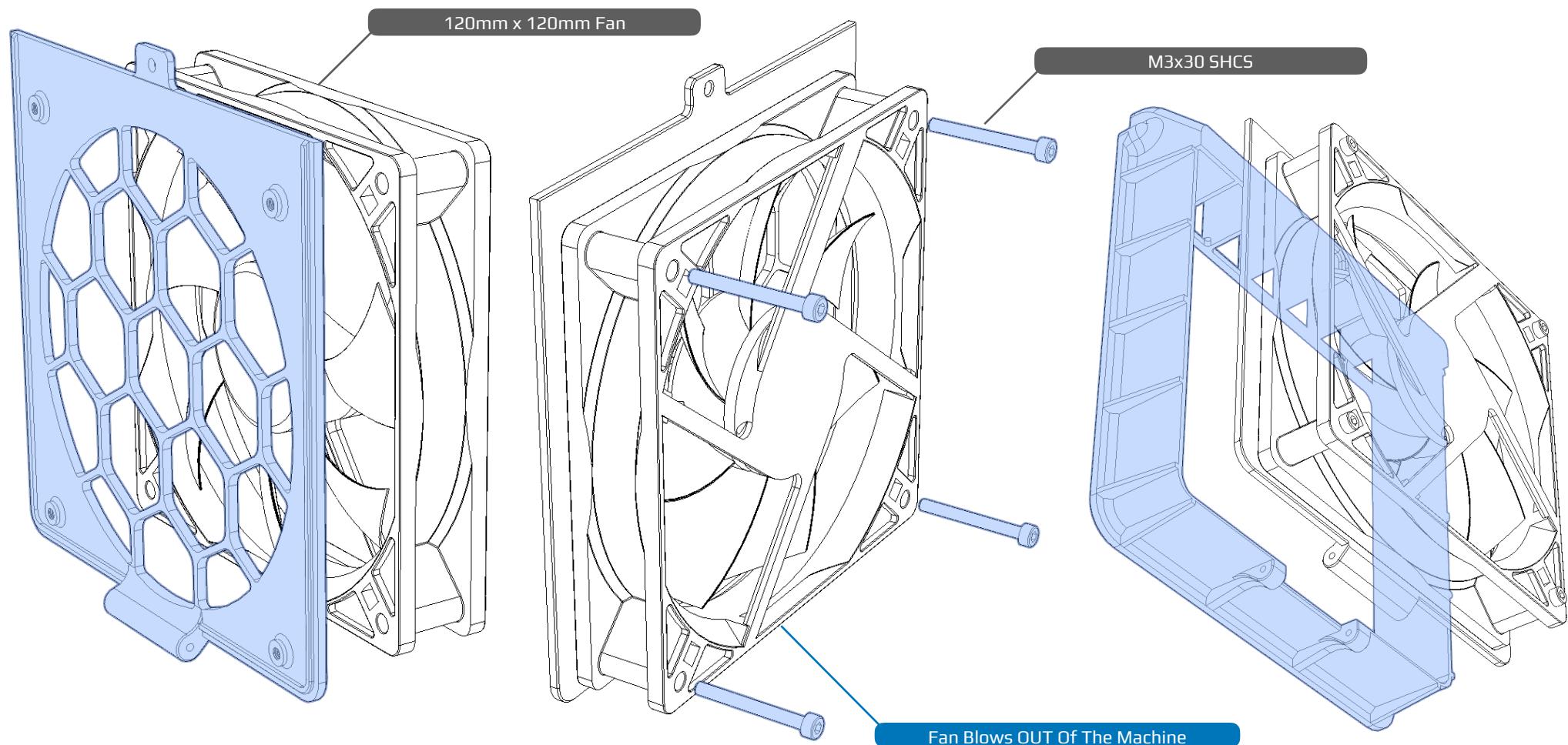
# X/Y End Stops



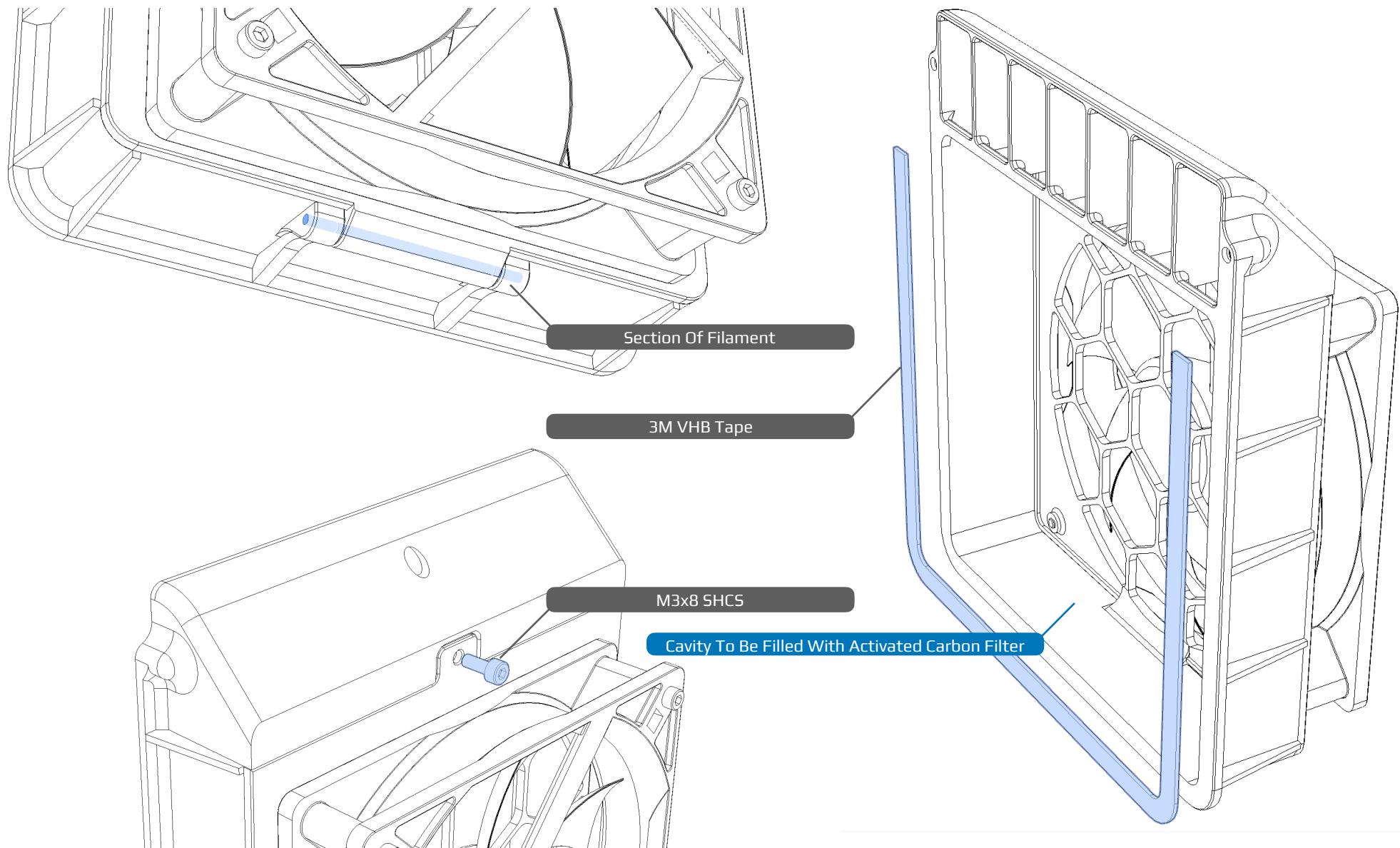
Note: Lever Points Into Machine



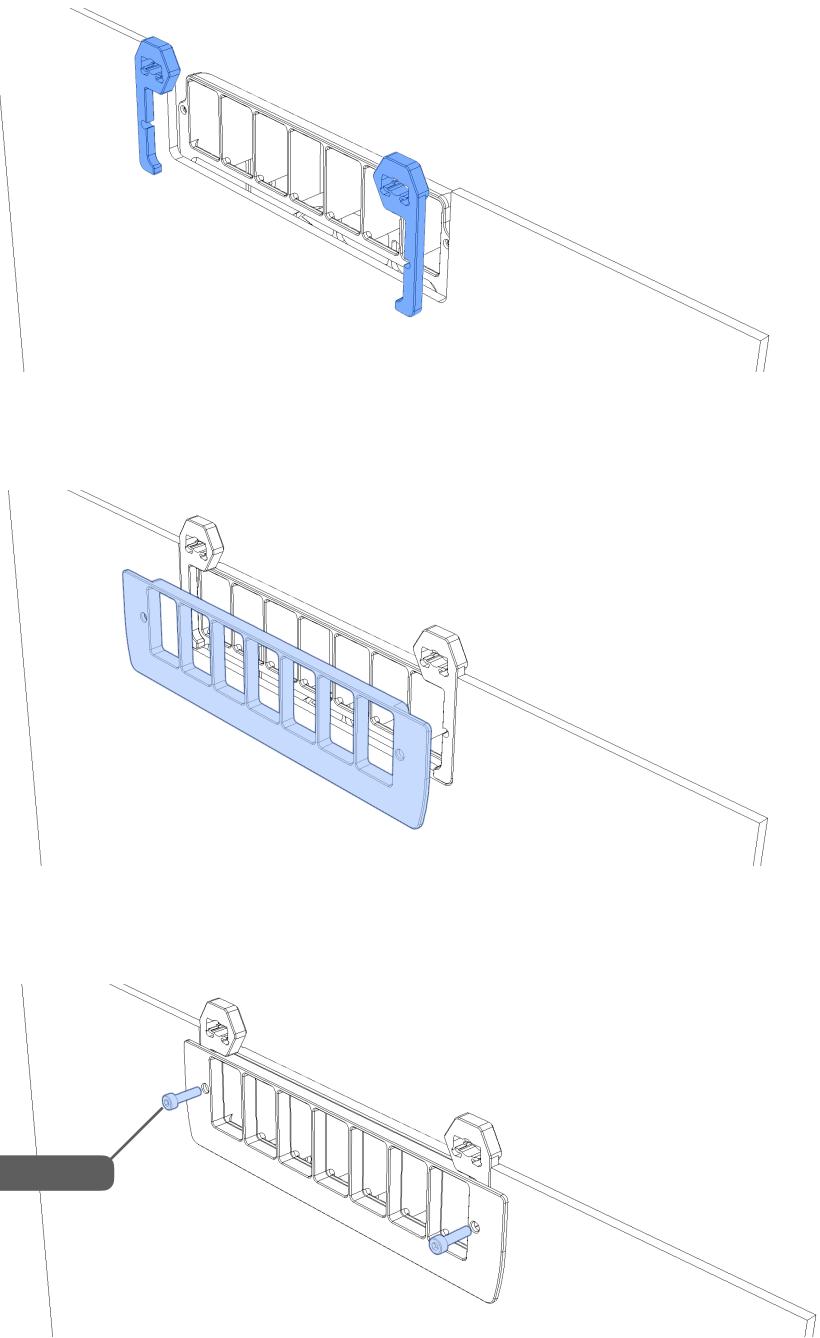
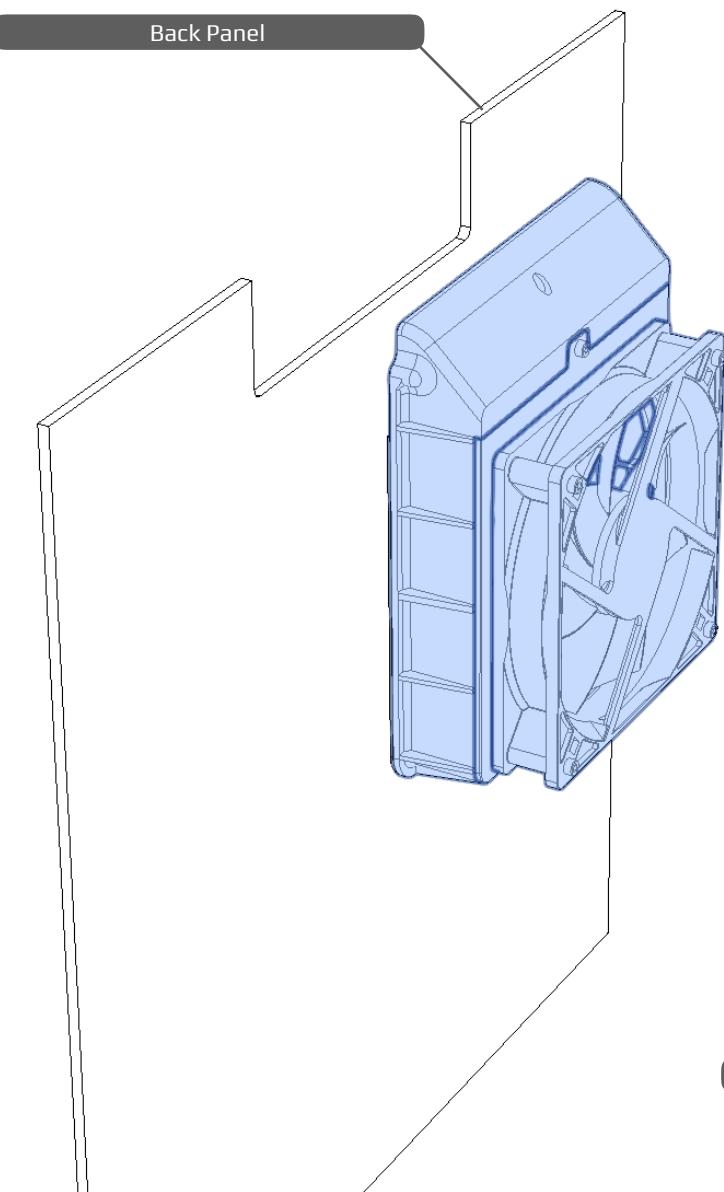
## Exhaust



# Exhaust

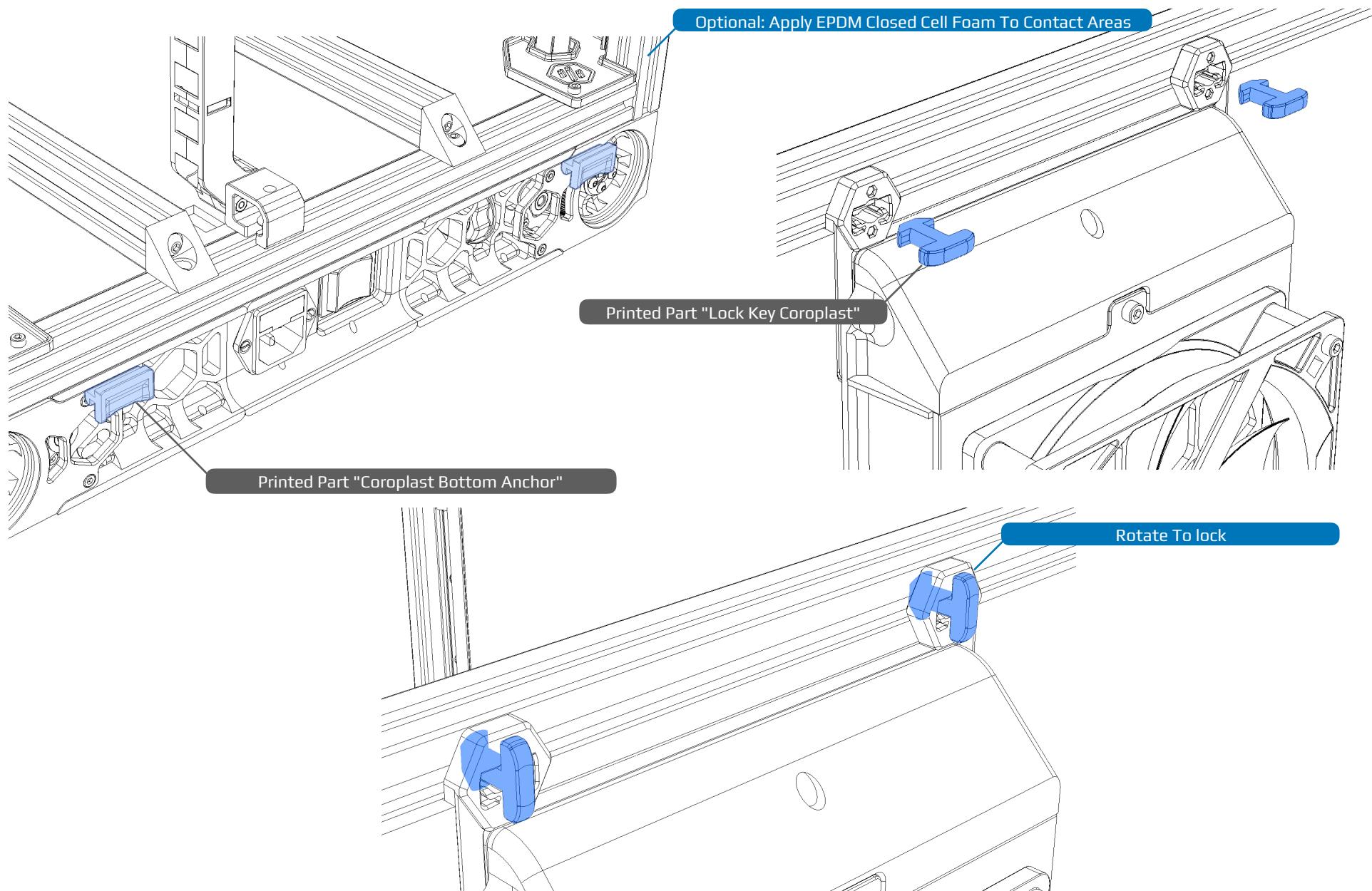


## Rear Panel

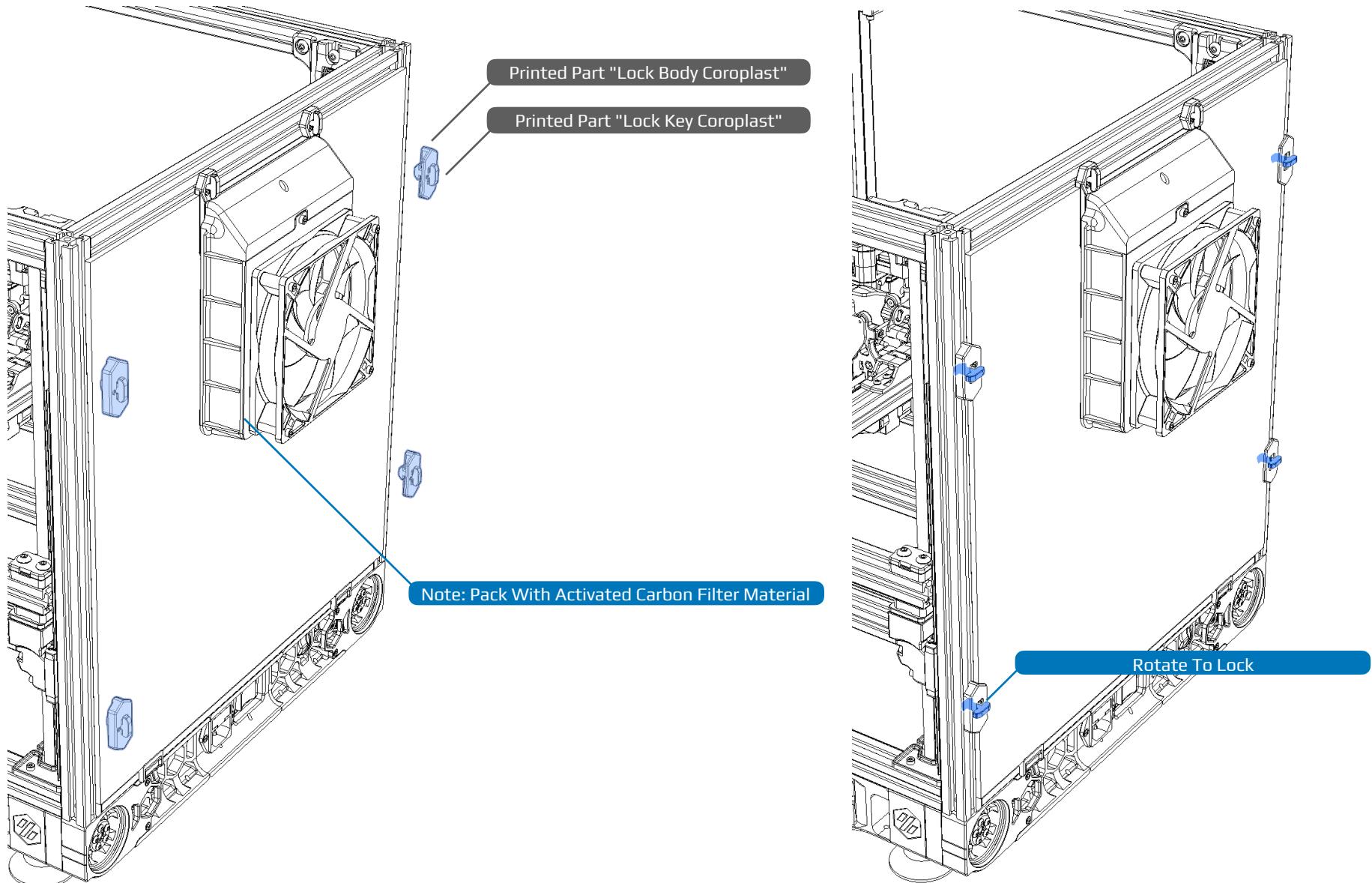


M3x12 SHCS

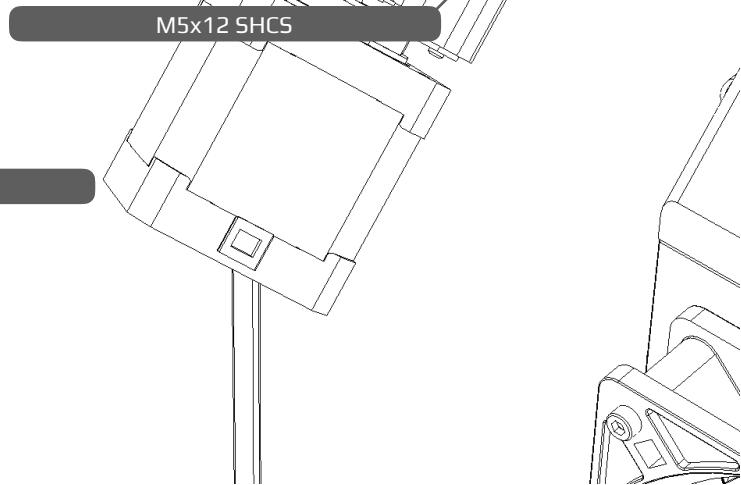
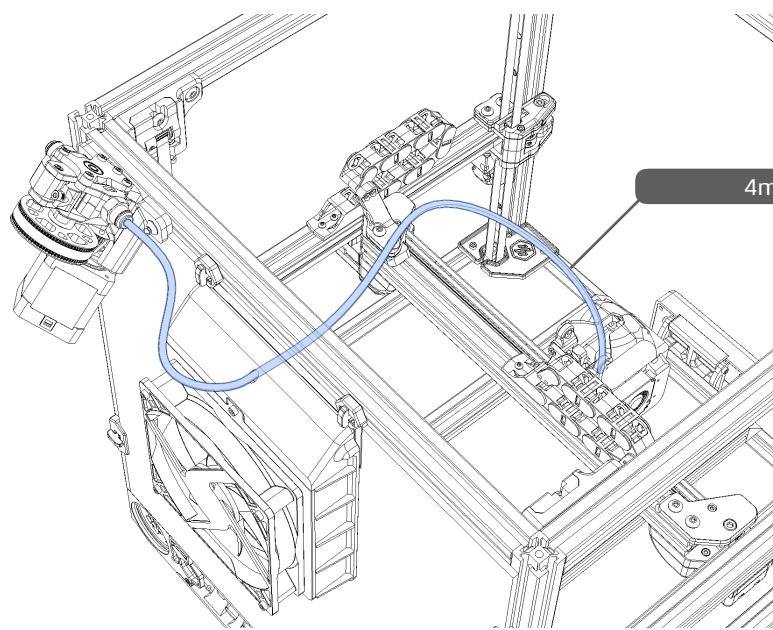
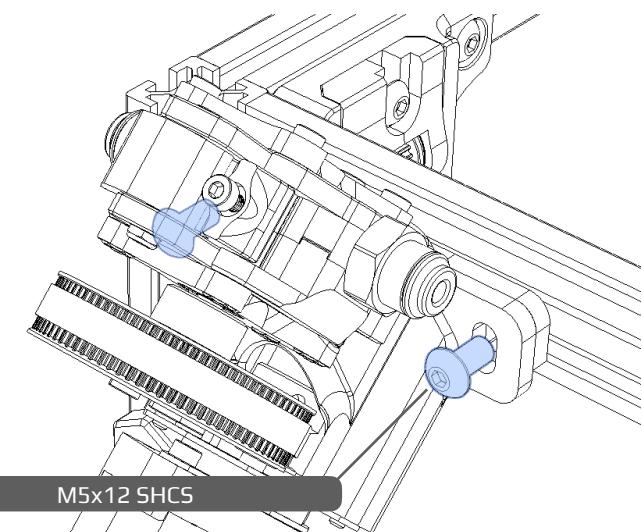
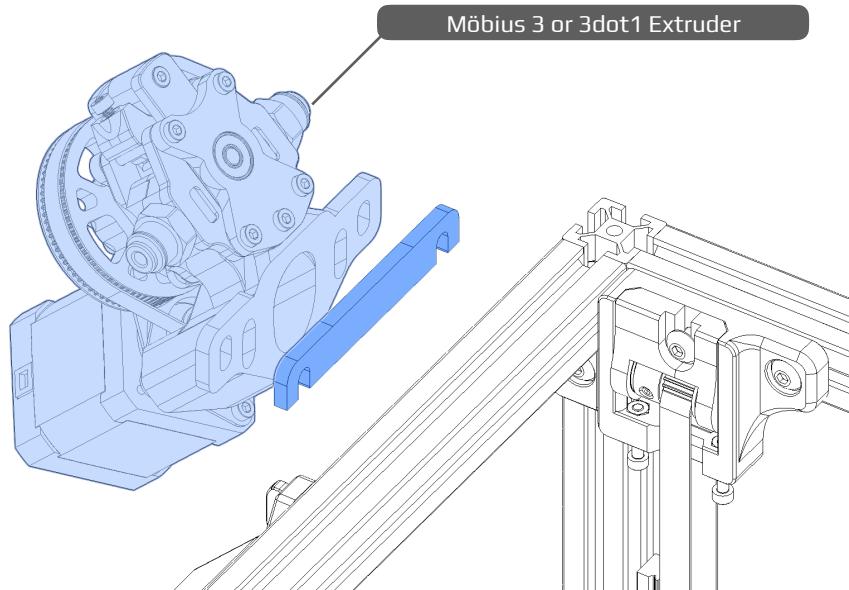
## Rear Panel



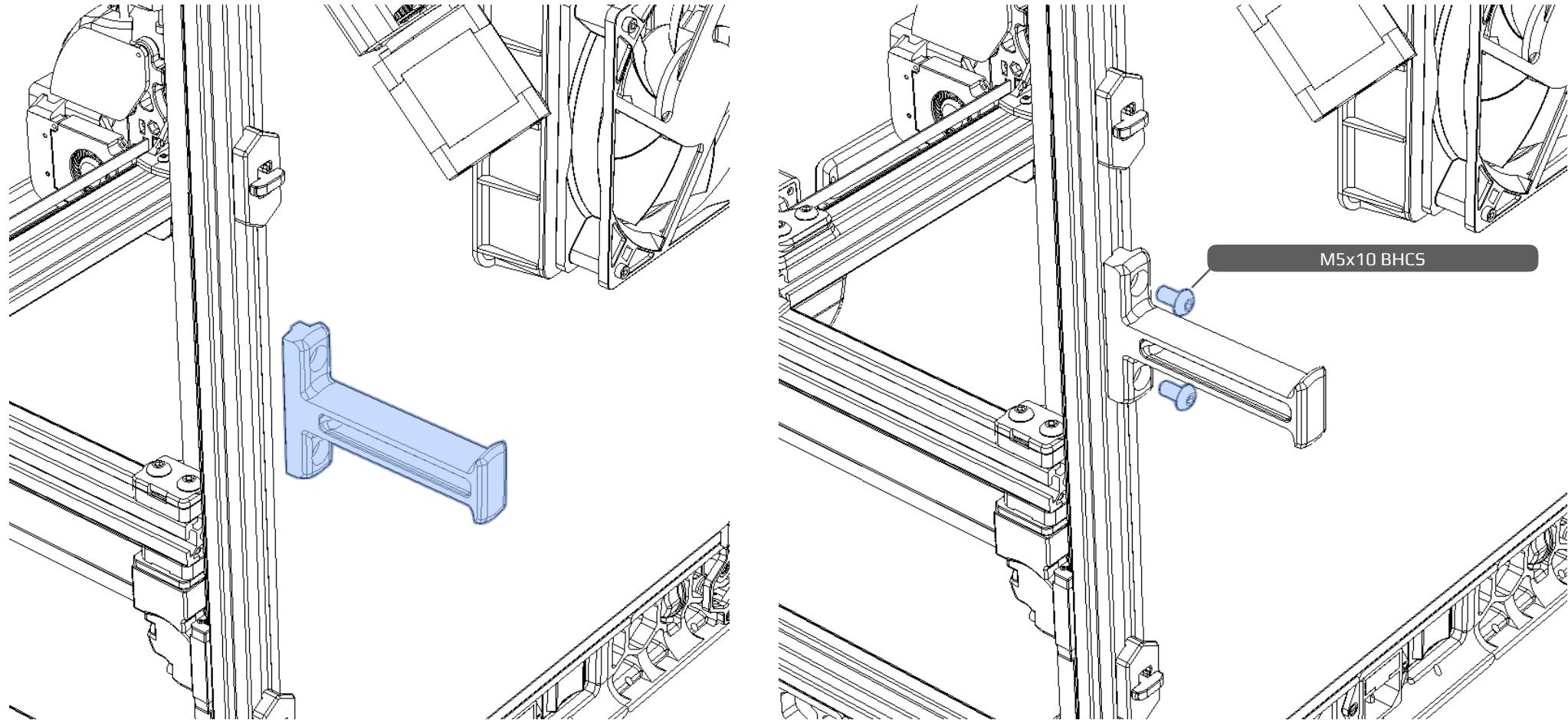
## Rear Panel



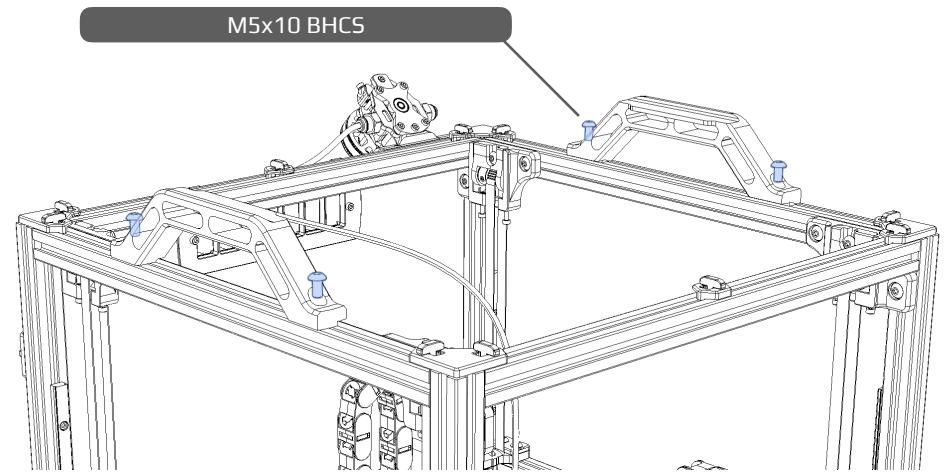
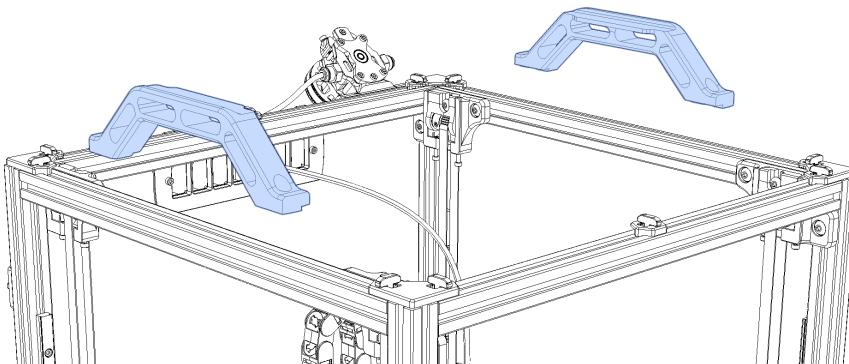
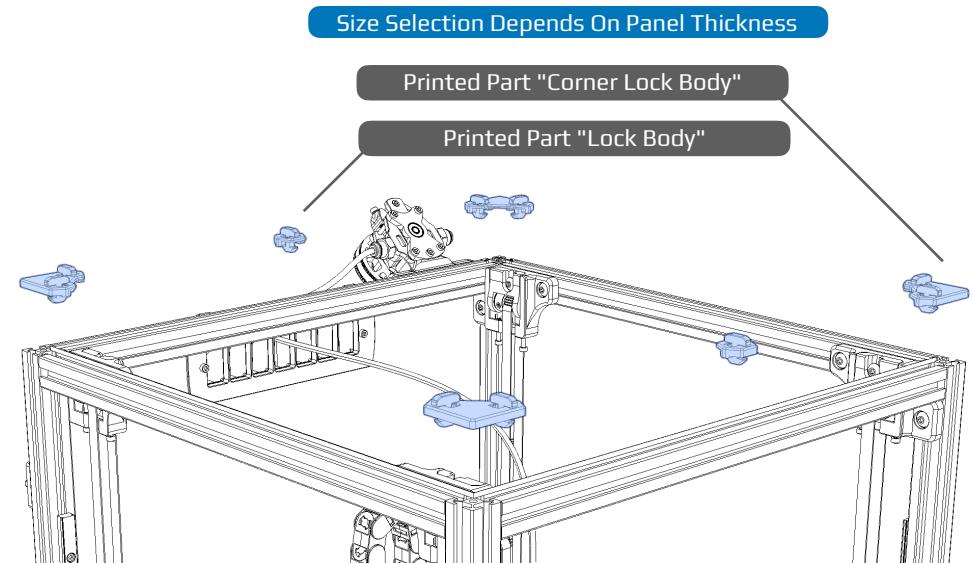
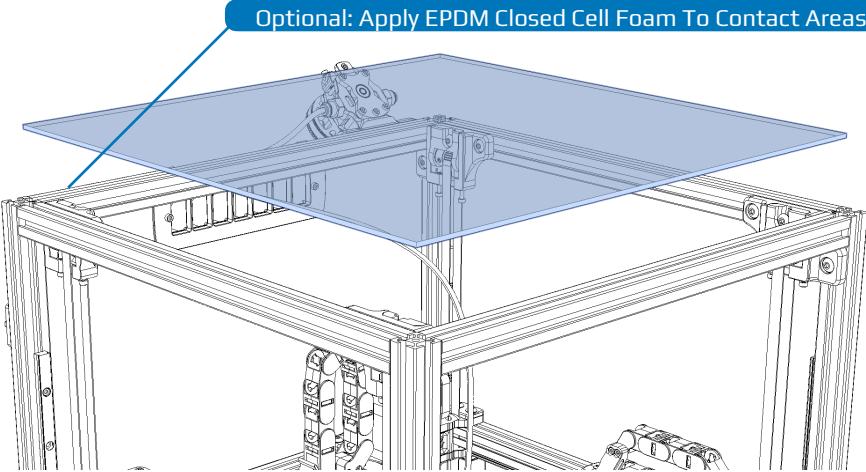
# Extruder Mounting



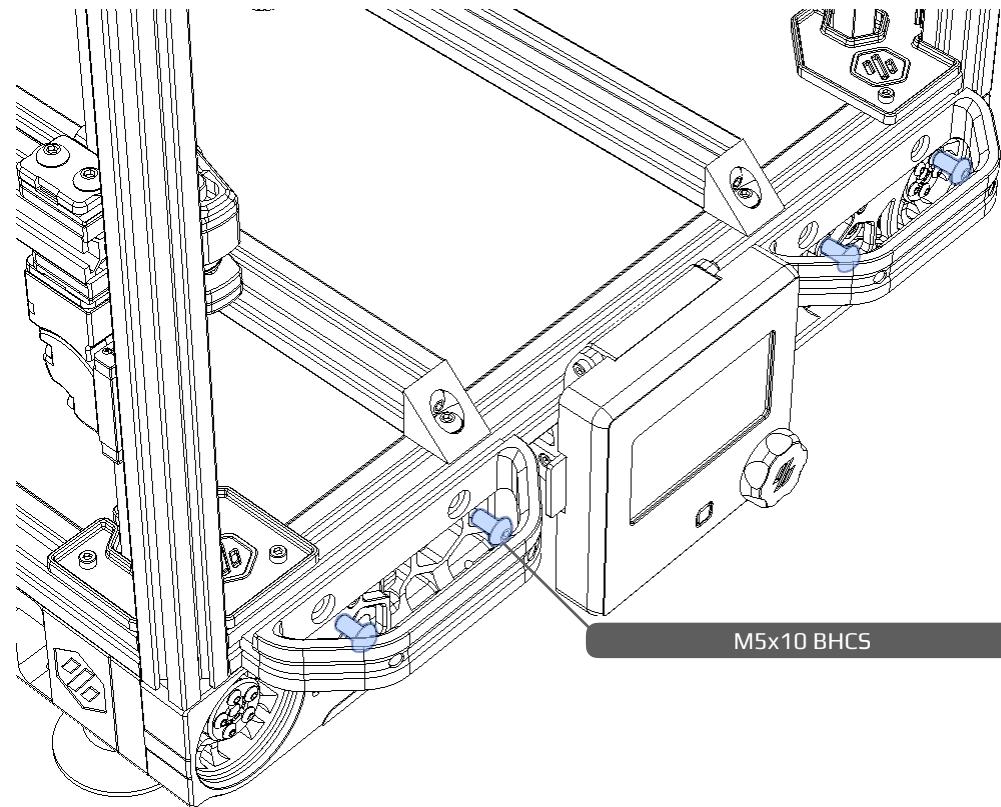
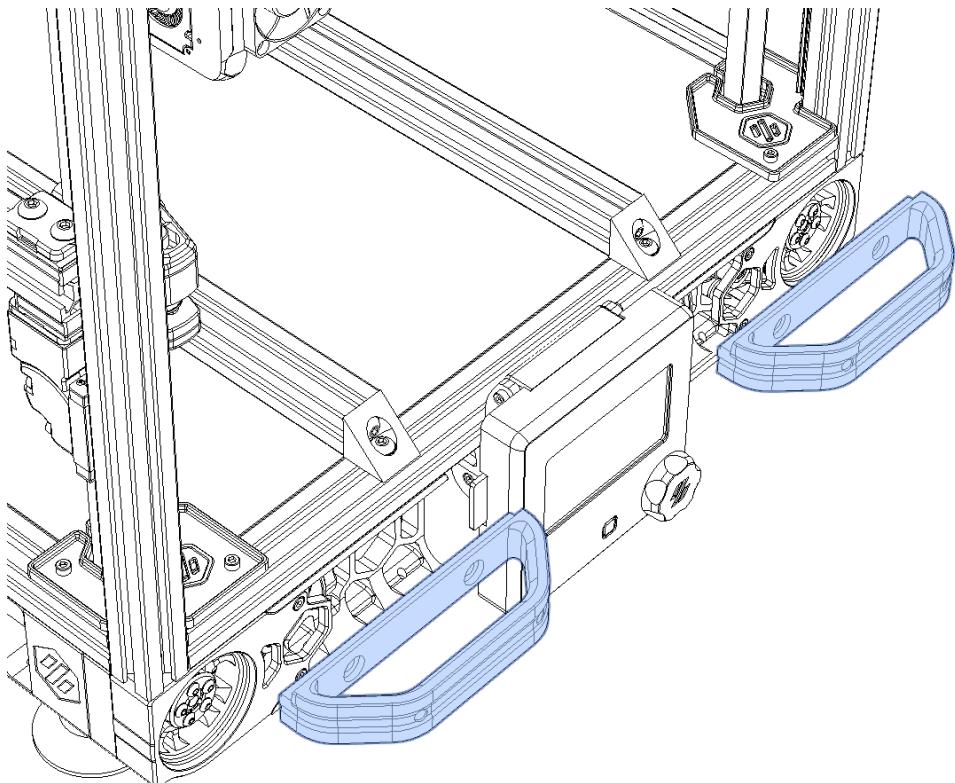
## Spool Holder



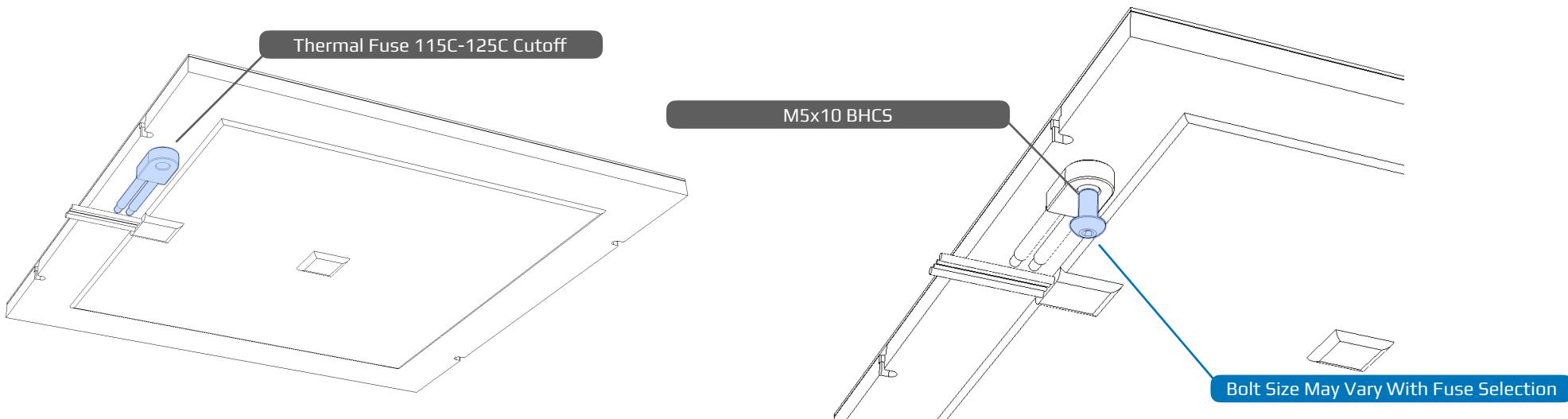
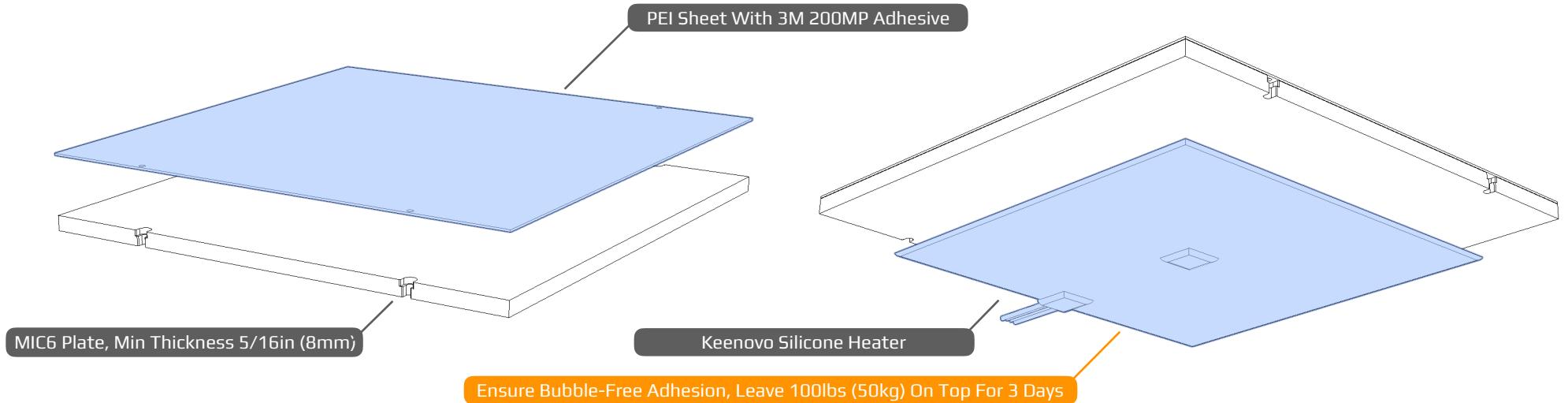
# Top Panel



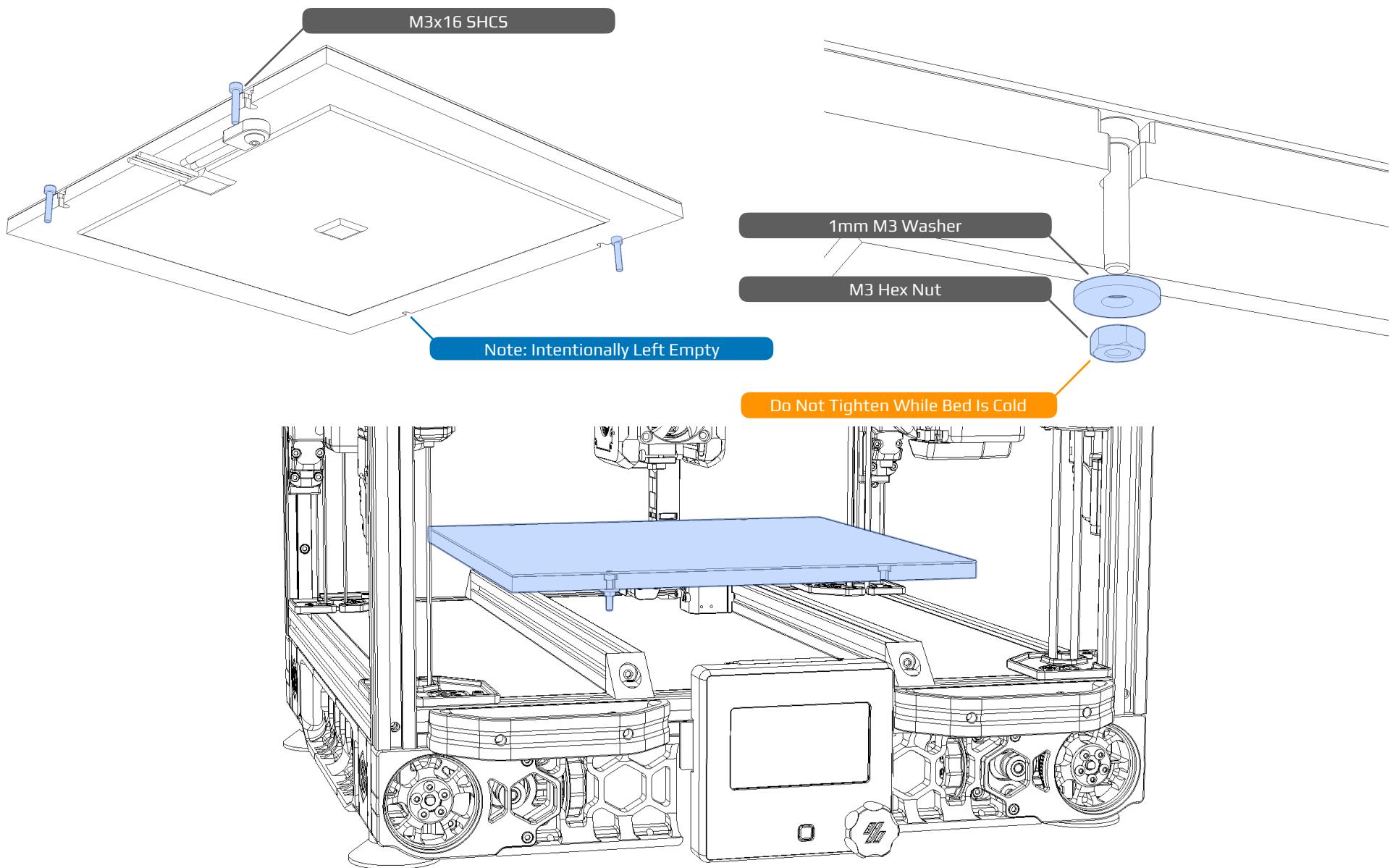
## Front Panel Rest



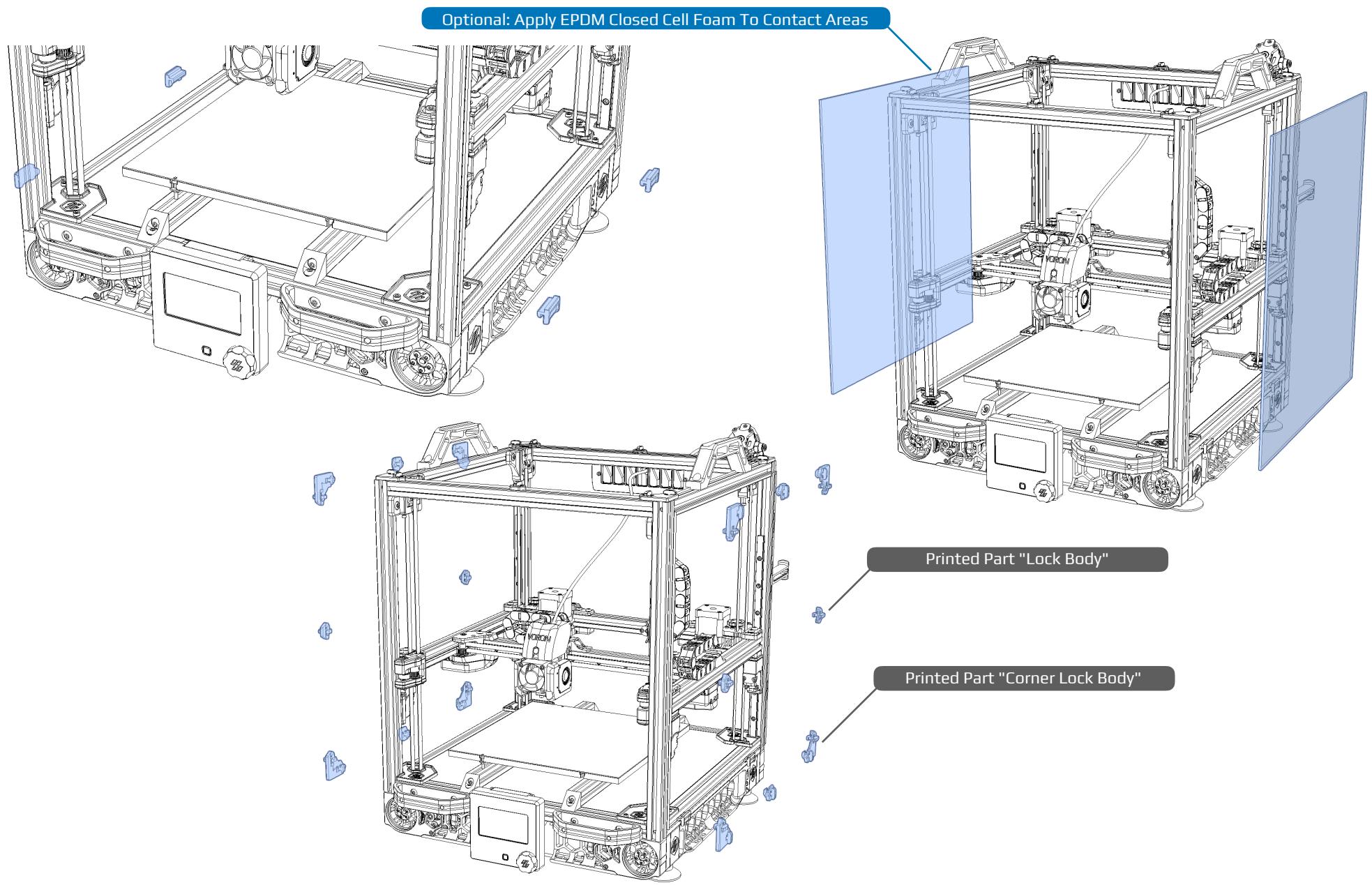
# Print Bed



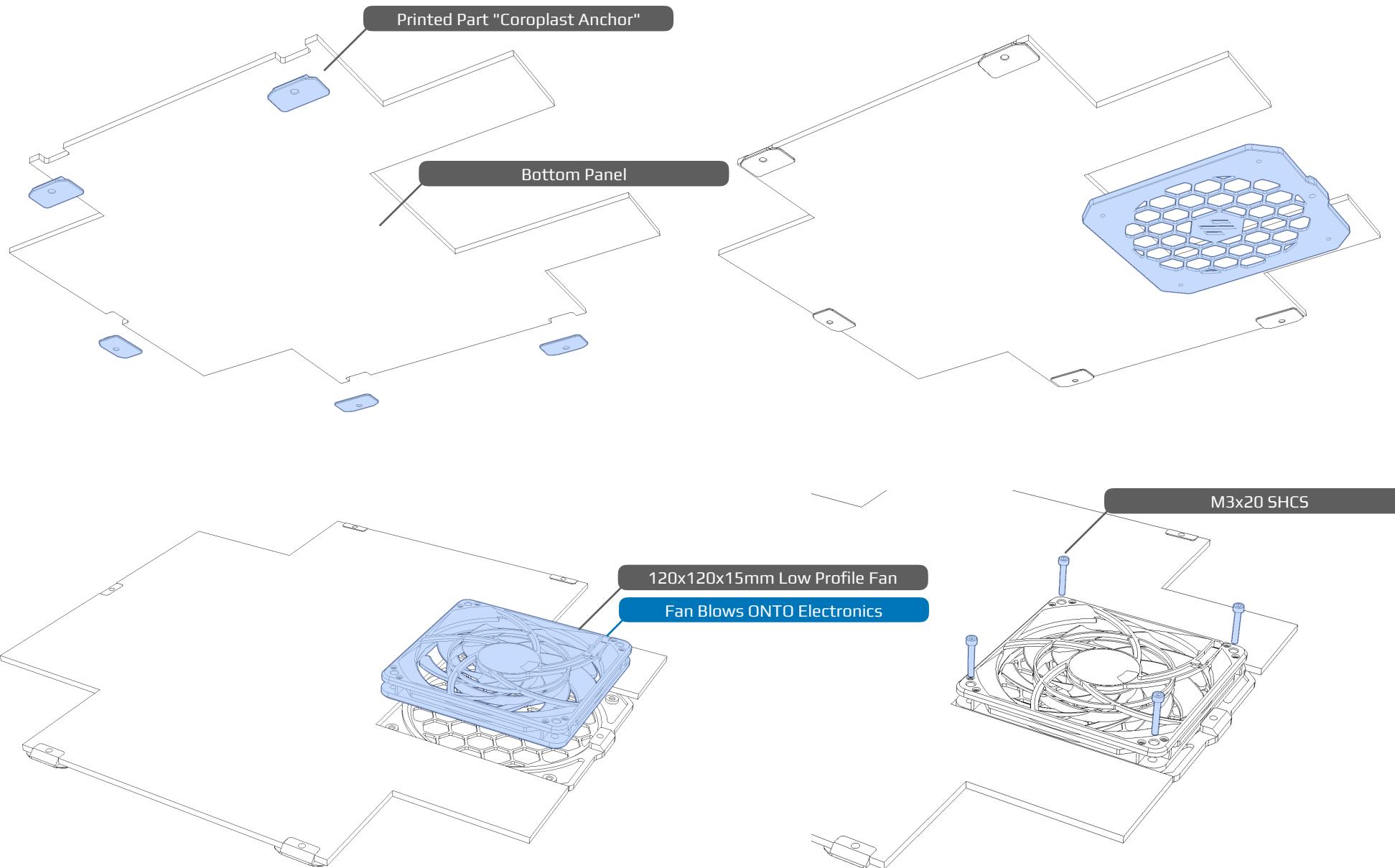
# Print Bed



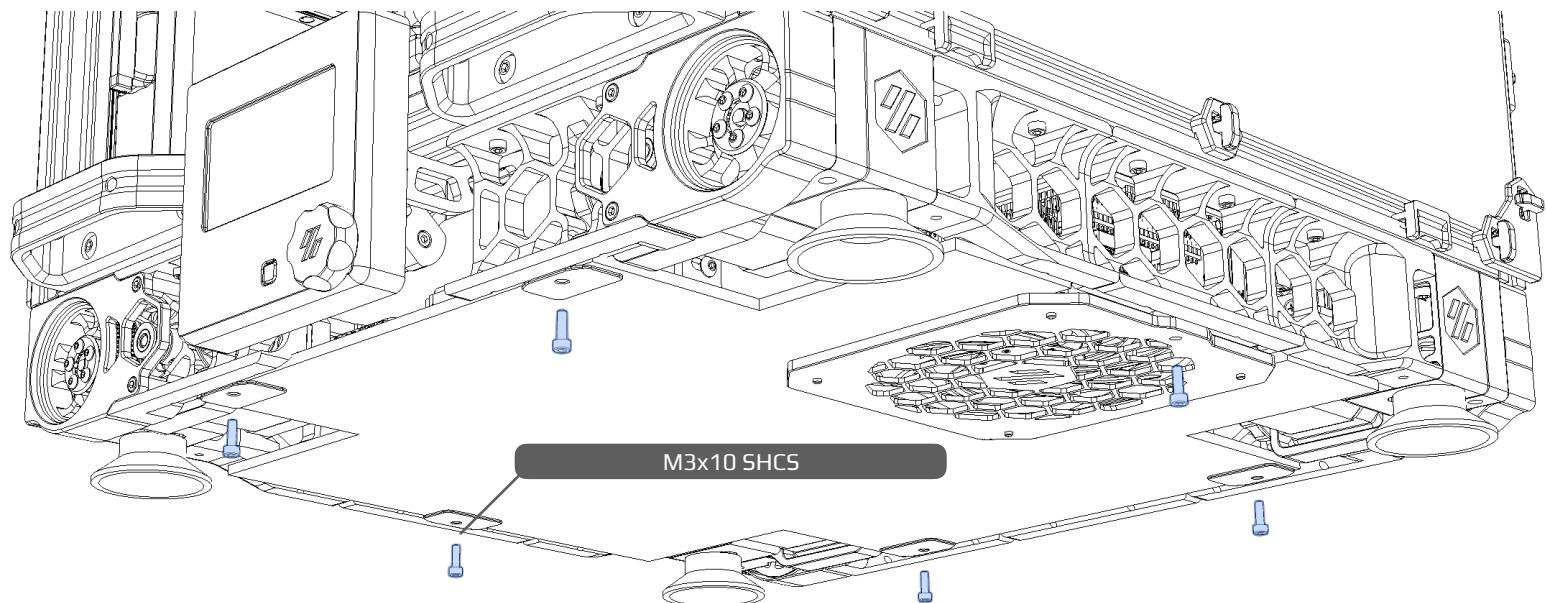
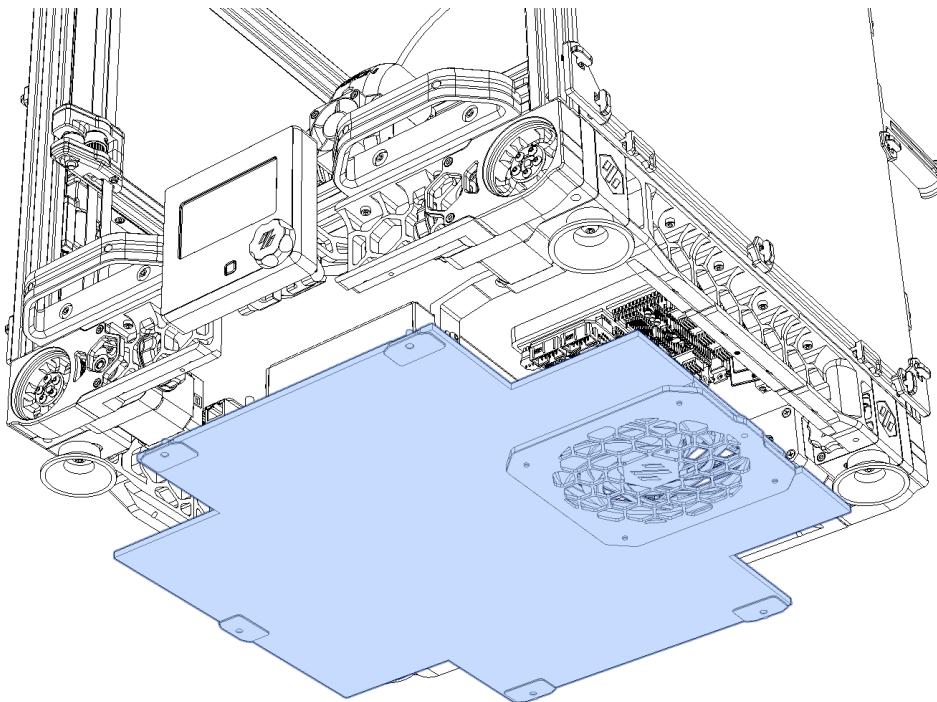
## Side Panels



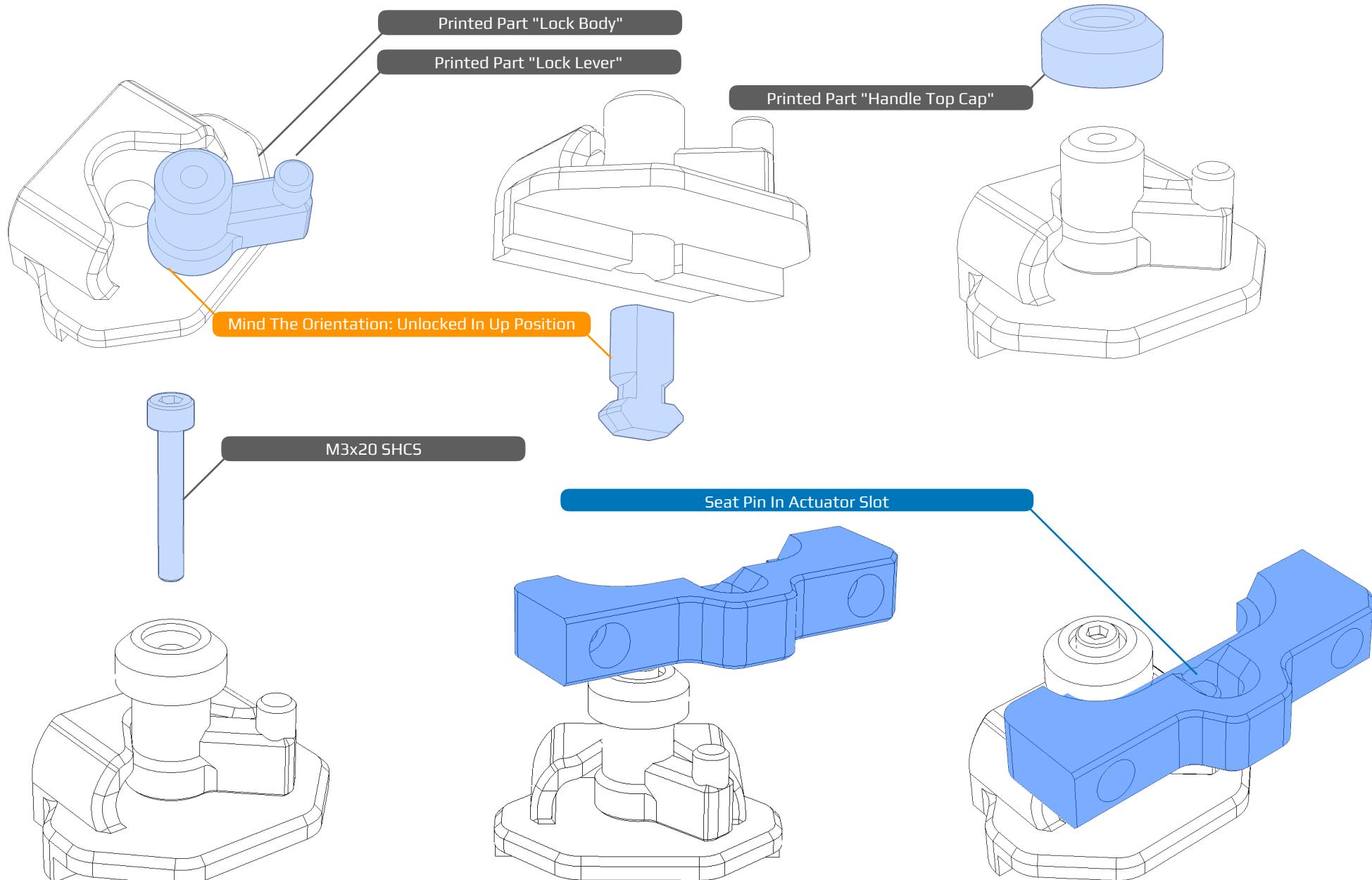
# Electronics Compartment Panel



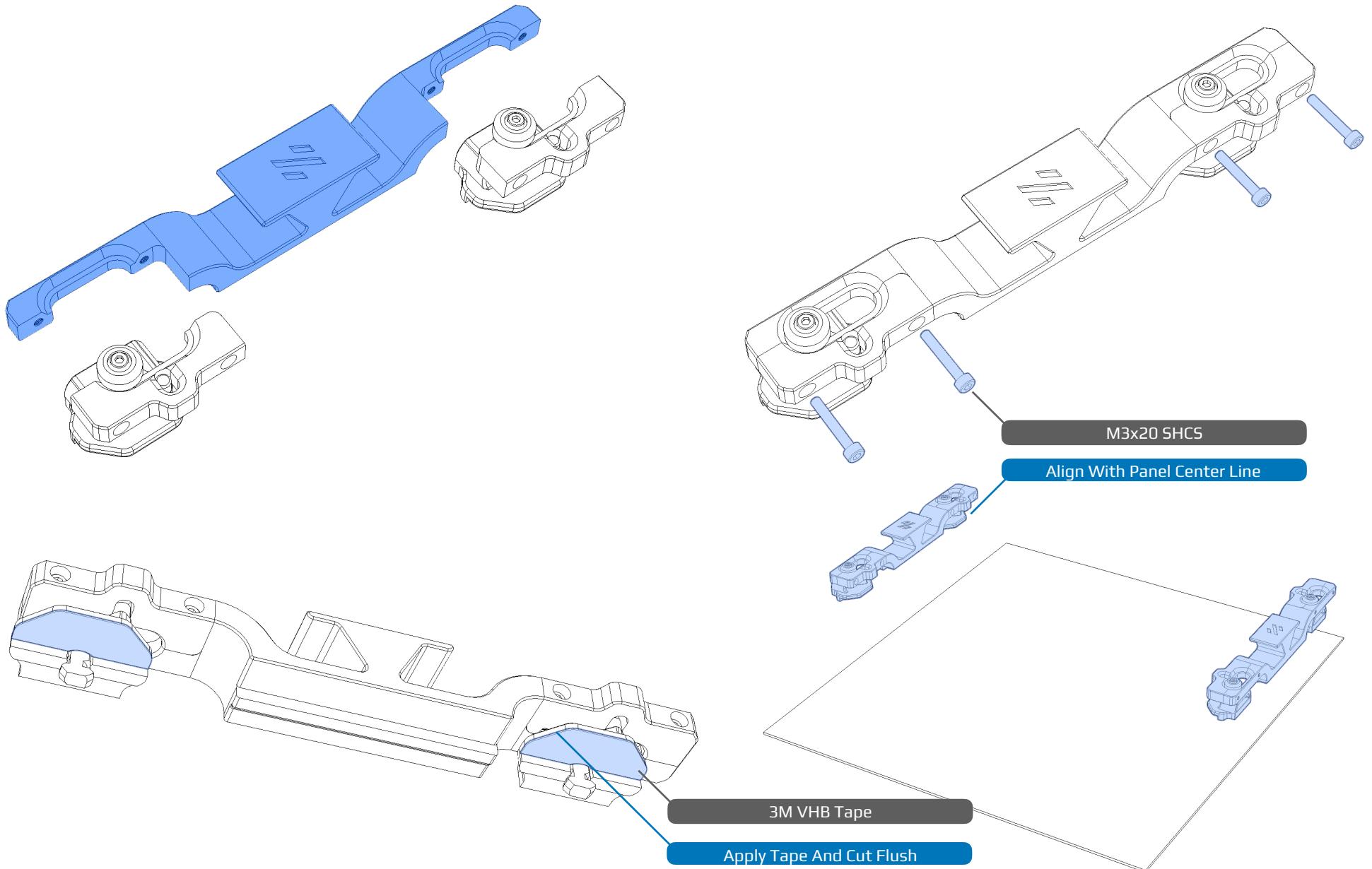
## Electronics Compartment Panel

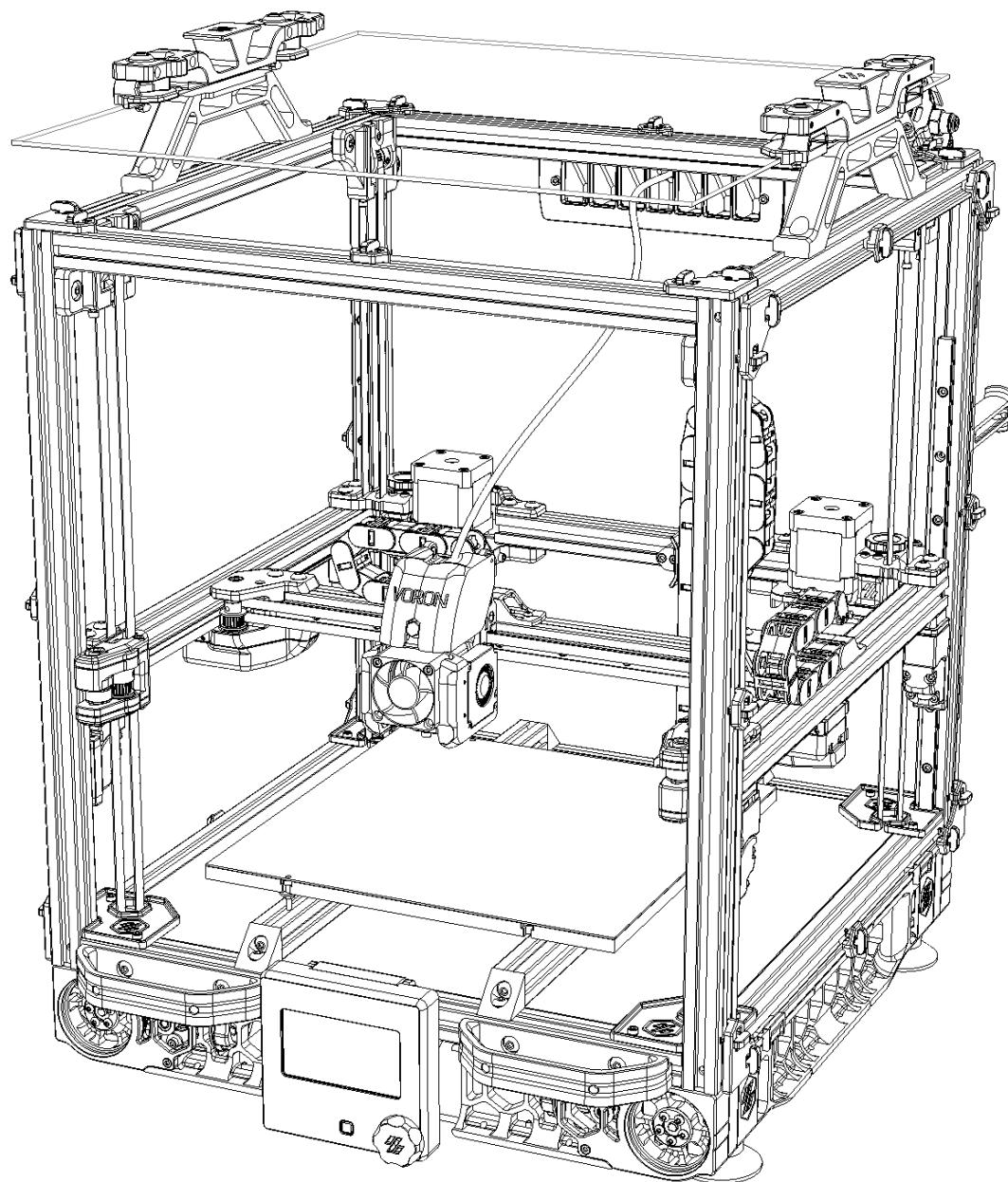


# Front Panel



# Front Panel









*“ Talk about a hot buildplate, I was printing eggs for weeks! ”*  
- Andrea

# FIFTY SHADES OF FILAMENT

BY RUSSIANCATFOOD

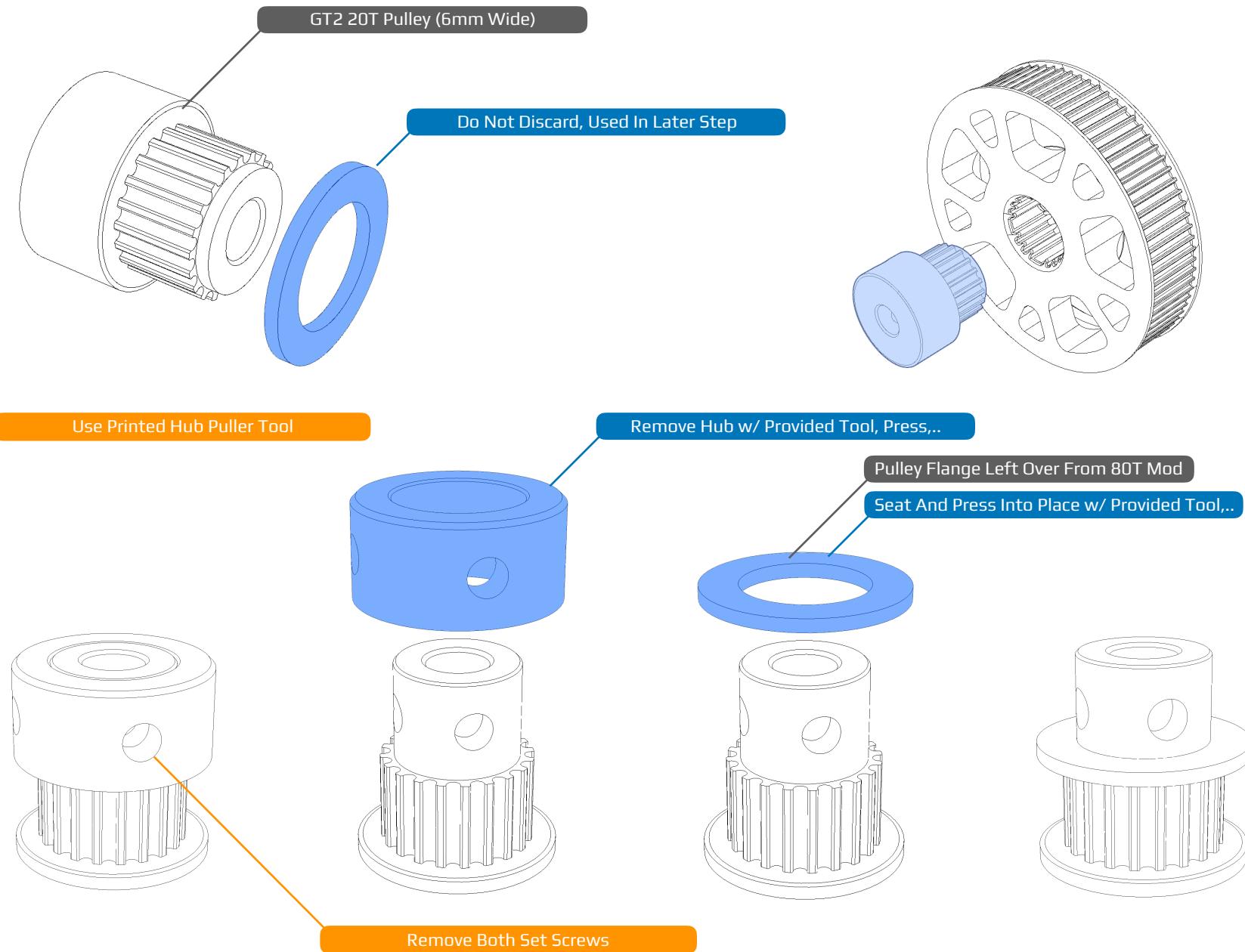
NARRATED BY UBERNERO

Brought To You By; In No Particular Order		
russiancatfood	xanin	wile.e.coyote
volcom	thebrakshow	trunkmonkey
docjeeves	unregistered	tameike
dunar	ampex	synlor
nemgrea	maglin	timmit99
fulg	ubernero	resam
immutef	hackdoggo	railgunner13f
armyag08	fujimonster	pnokel
iakabos	fessyfoo	pnewb
bahahah	stephan	minasokoni
exquyre	johnprime	louielc
etherwalker	drbpgh	lolmodule
strubinator	doowrednu	dgcaste
andylsun	andreq	codexmas
carnufex	brick_sandwich	boff
8bit poro	arksine	daveidmx
<i>our husbands/wives/children/pets/significant others: for putting up with our shit, and dealing with our aliexpress packages</i>		

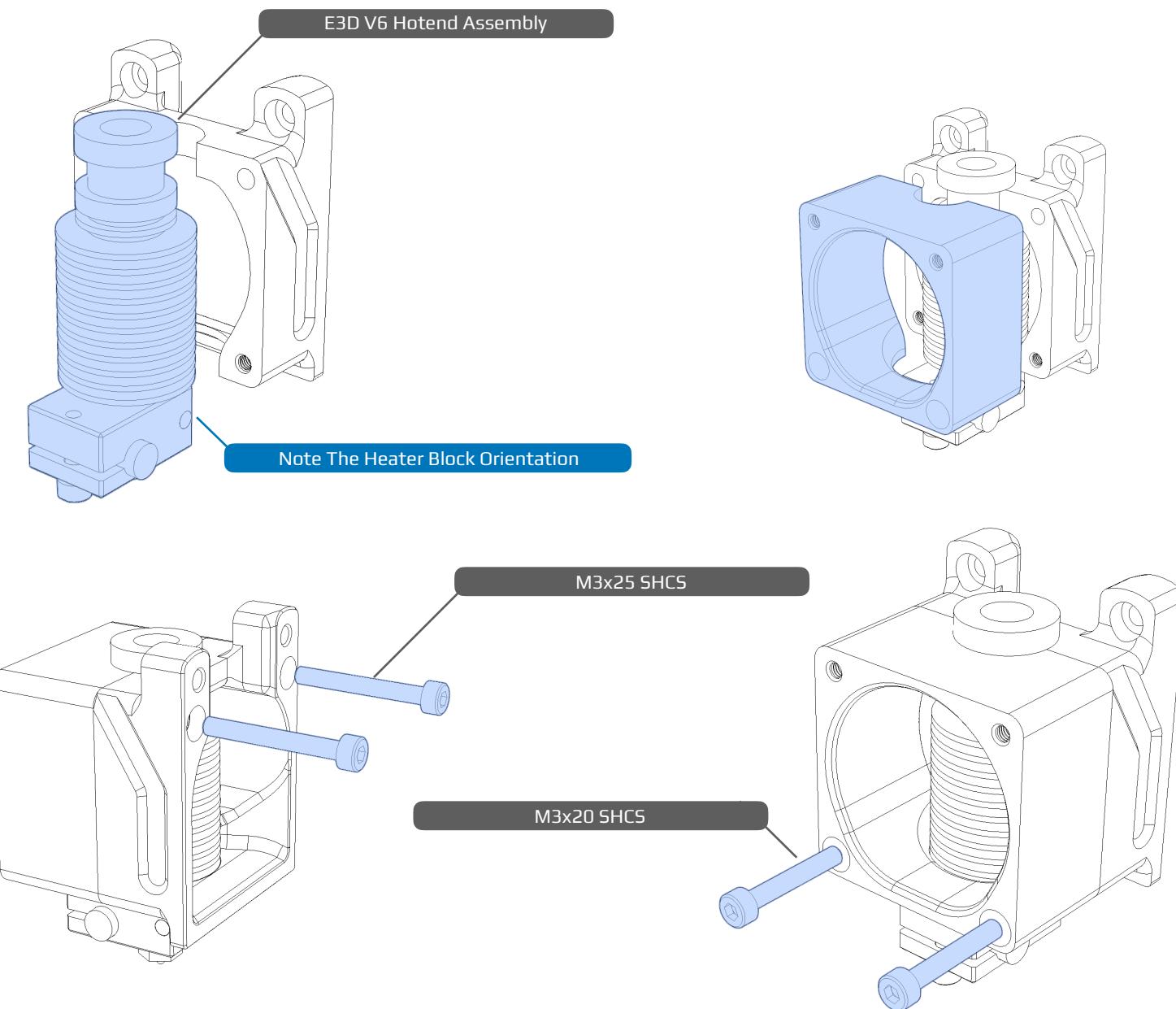
# Appendix A Pulley Modification

Hub for 80 Tooth Gear

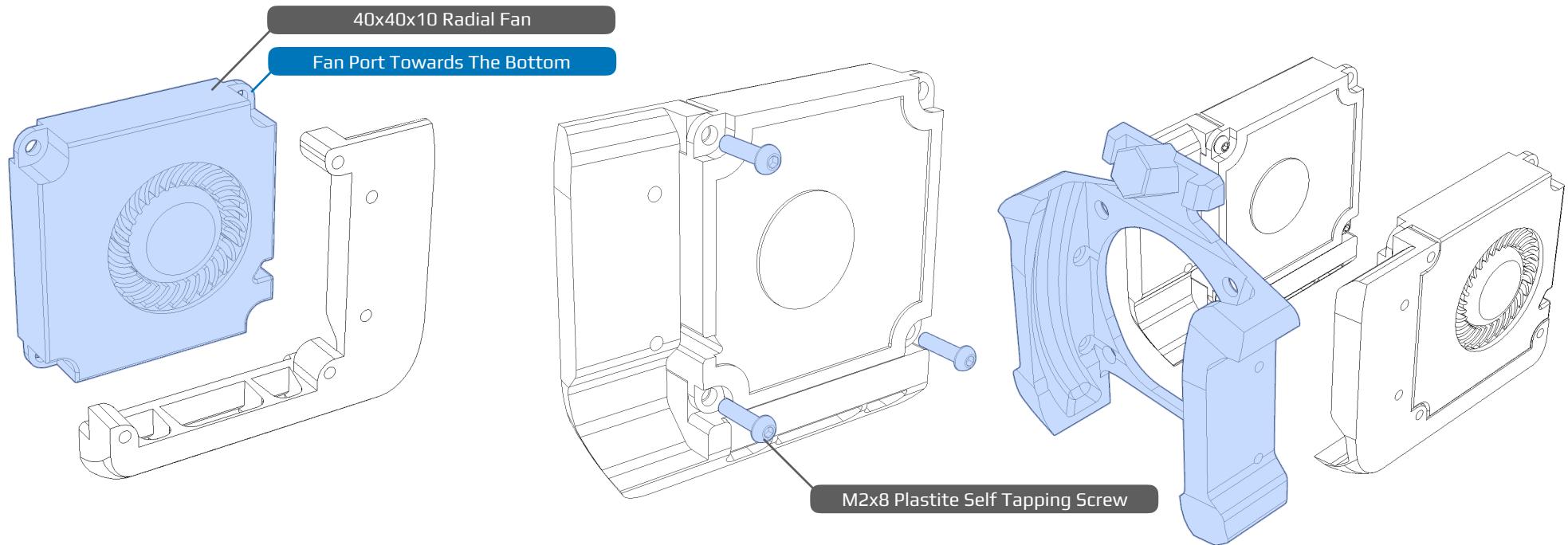
"Dehubbed" GT2 20T Pulley for XYY Joints



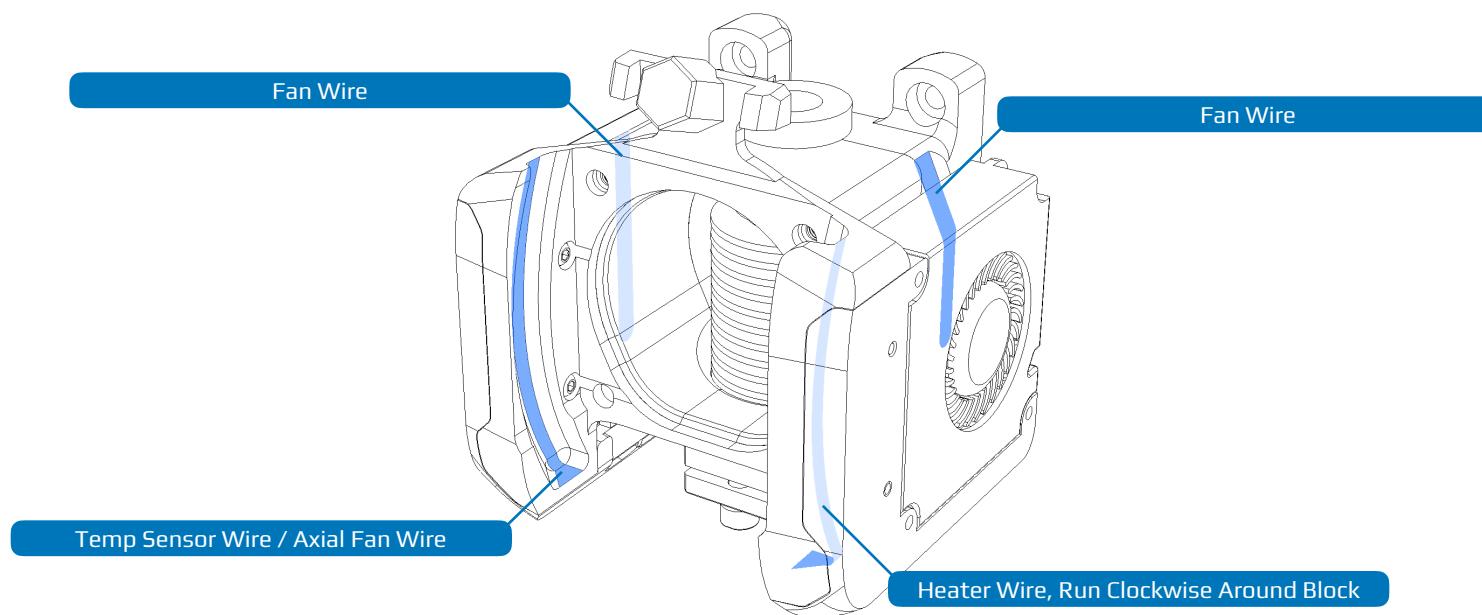
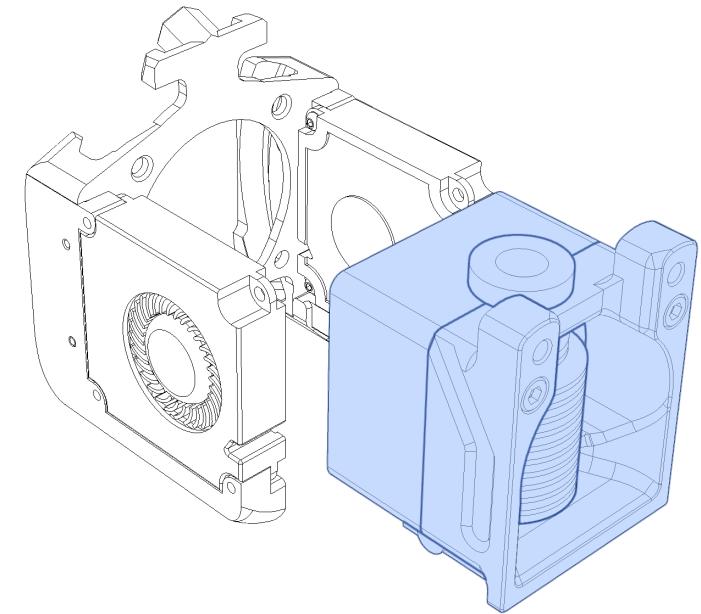
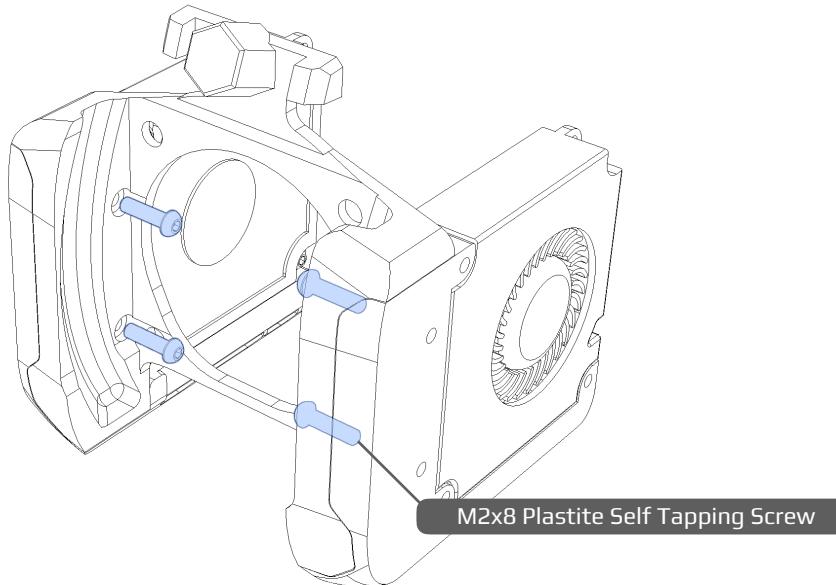
## Appendix B Quick Change Toolhead (E3D V6)



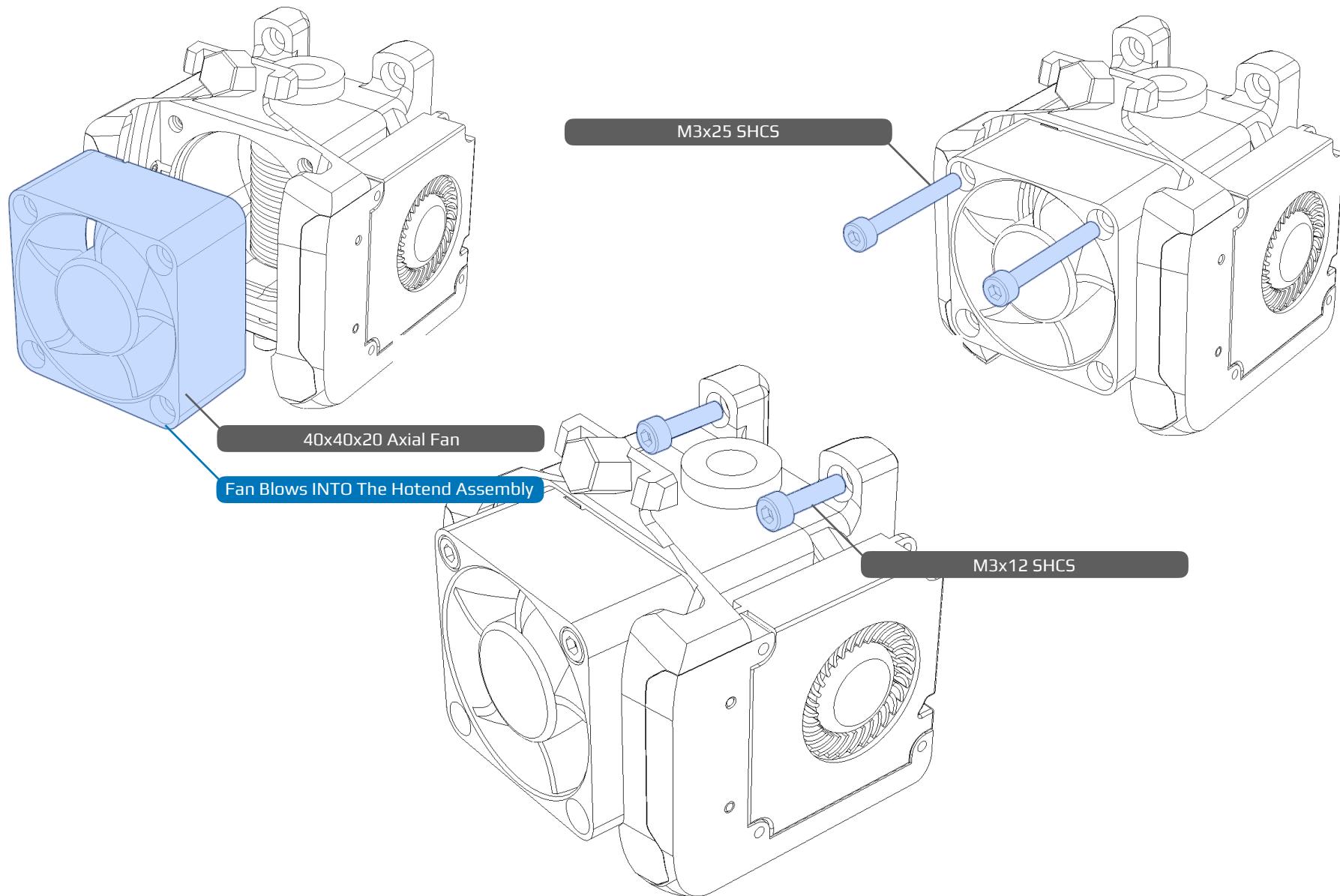
## Appendix B Quick Change Toolhead (E3D V6)



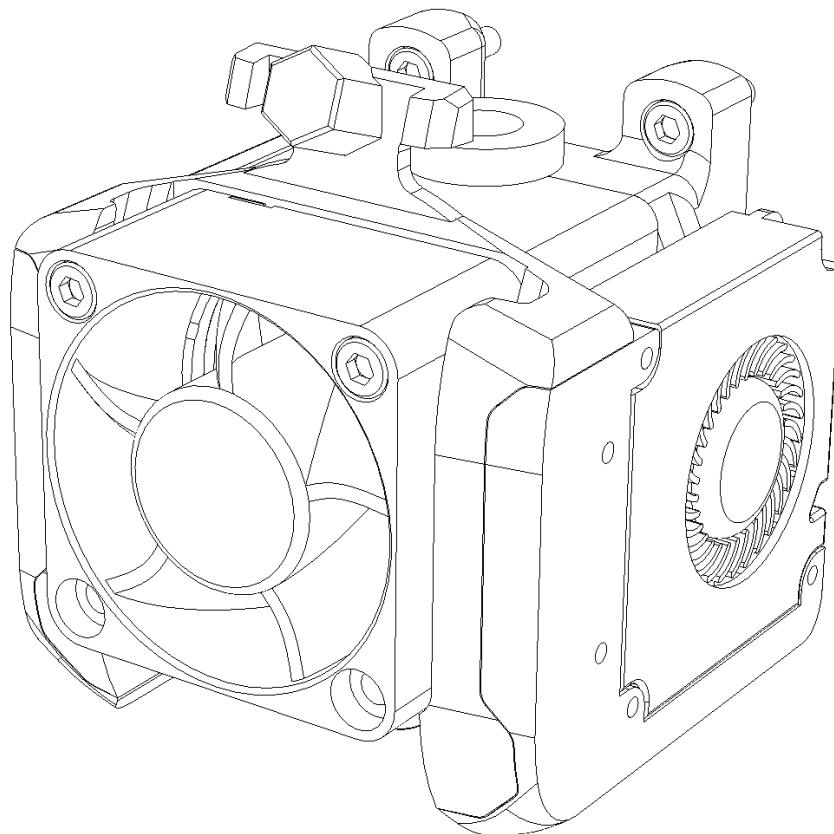
## Appendix B Quick Change Toolhead (E3D V6)



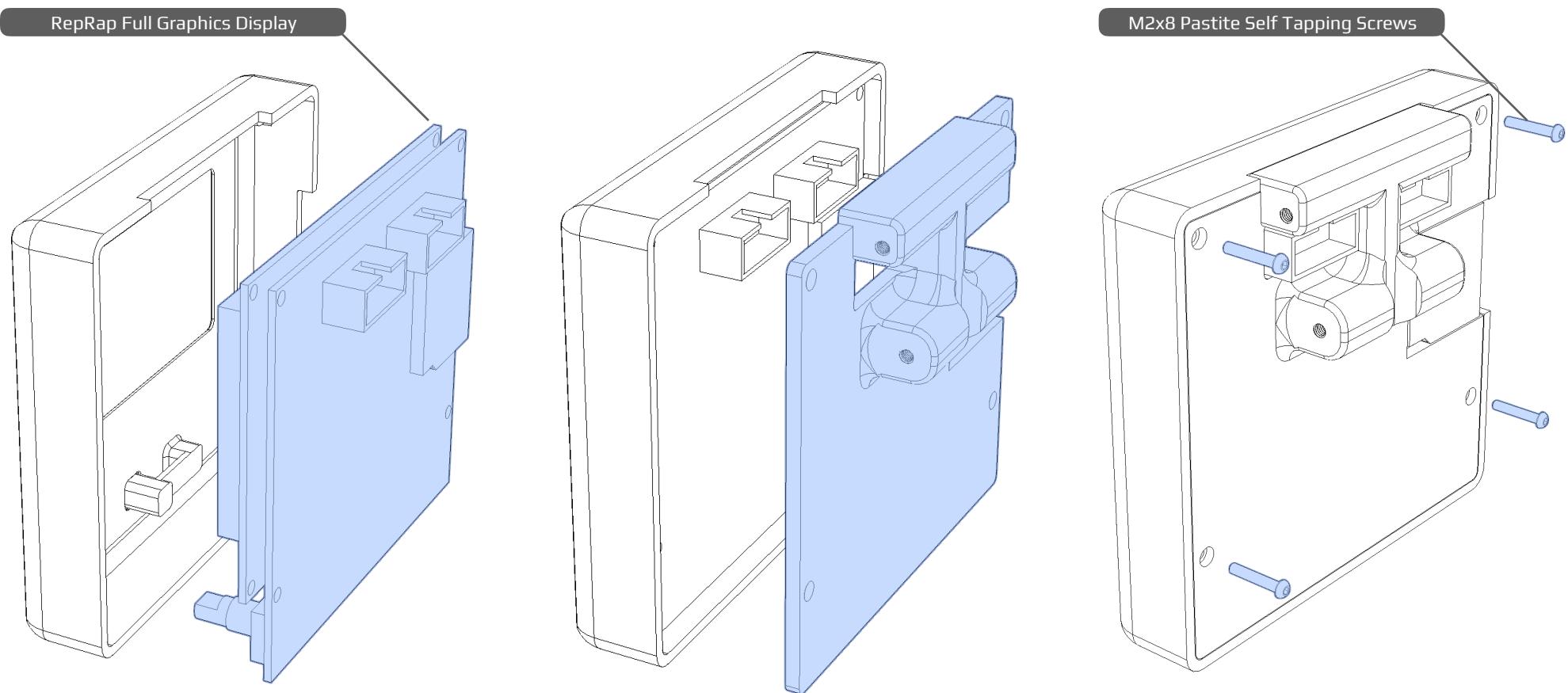
## Appendix B Quick Change Toolhead (E3D V6)



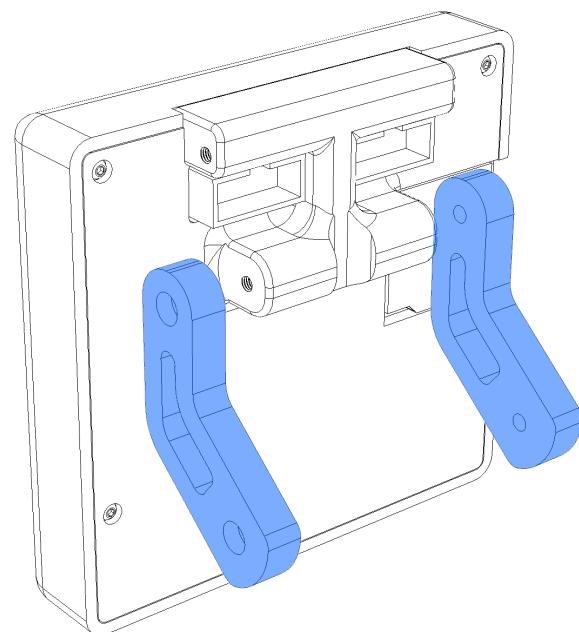
## Appendix B Quick Change Toolhead (E3D V6)



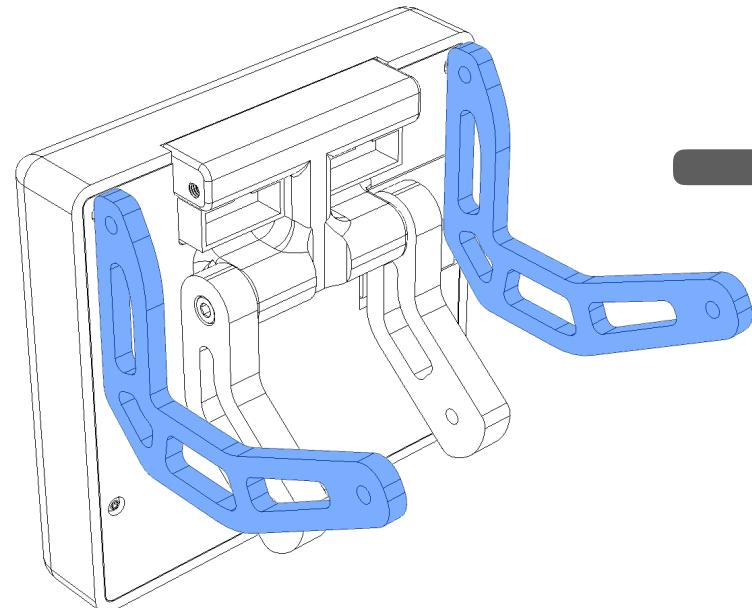
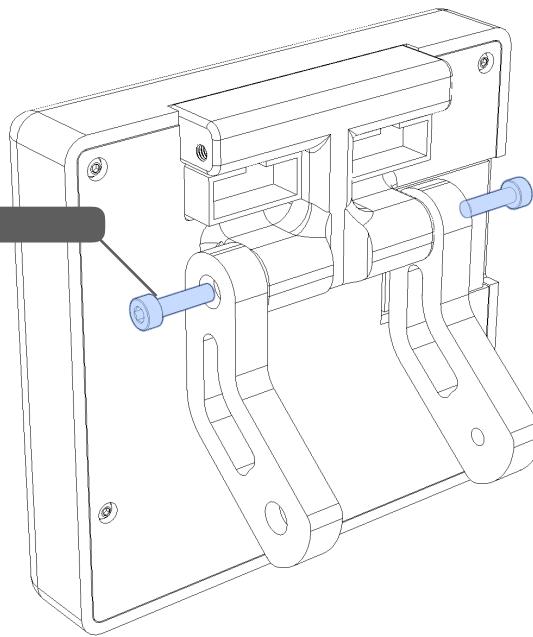
## Appendix C LCD Assembly



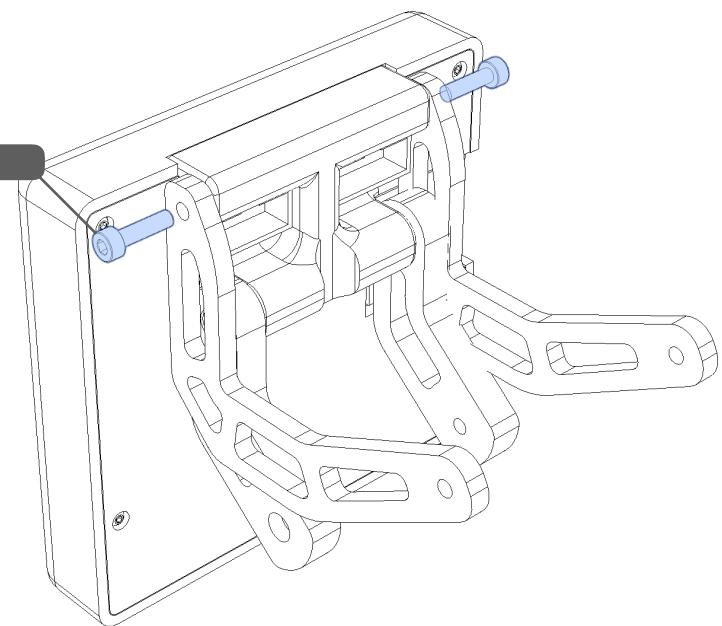
## Appendix C LCD Assembly



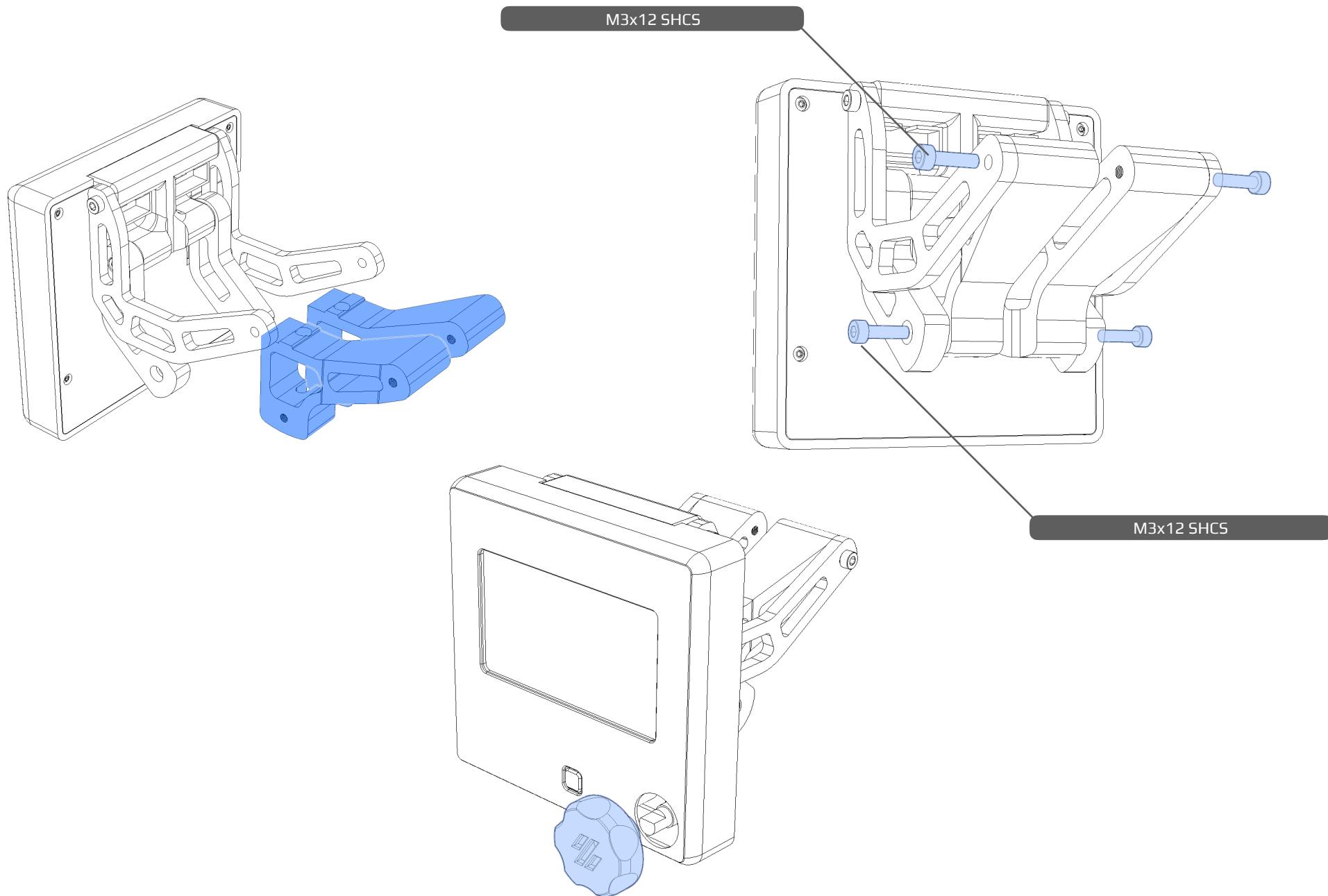
M3x12 SHCS



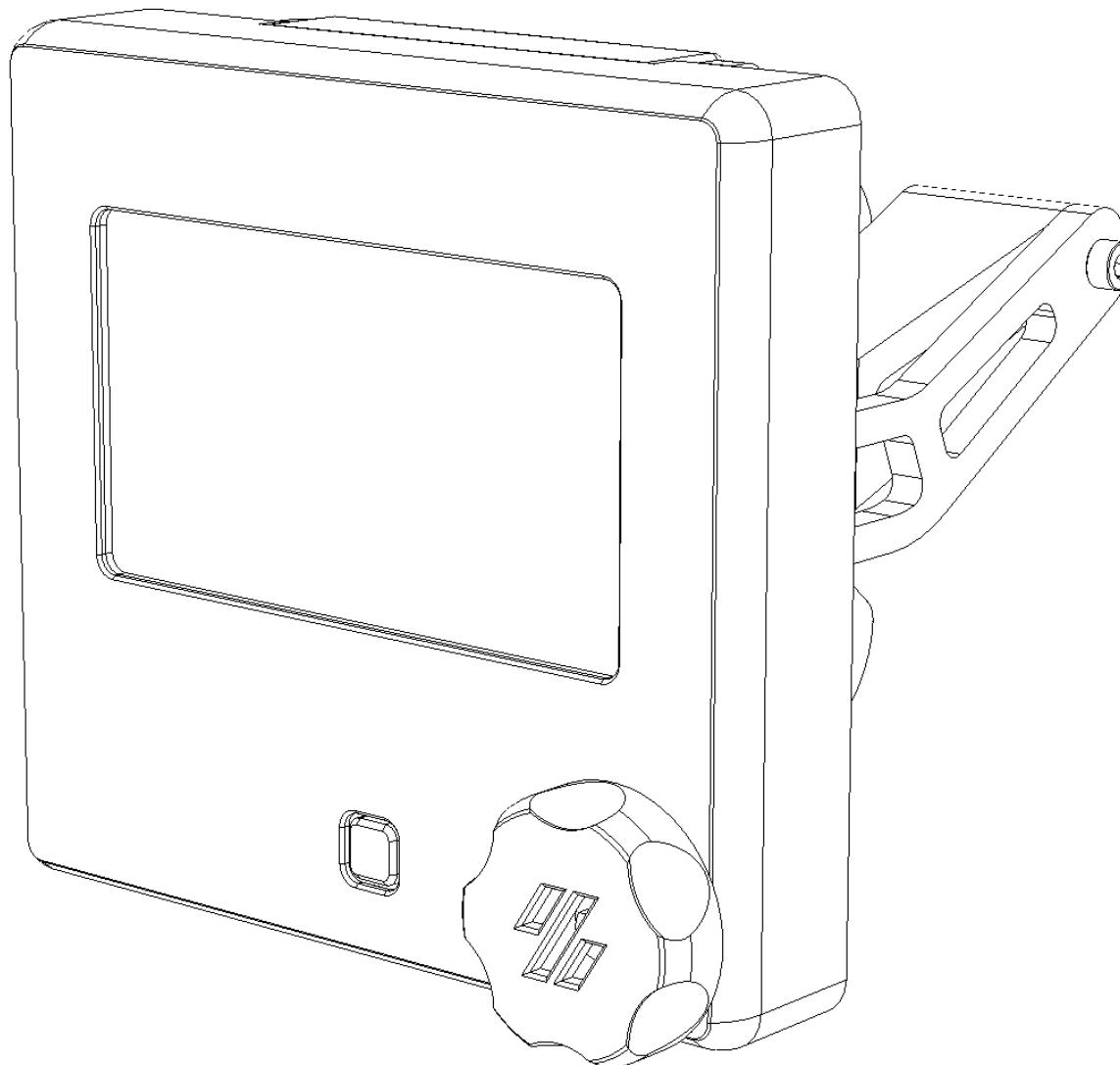
M3x12 SHCS



## Appendix C LCD Assembly



## Appendix C LCD Assembly

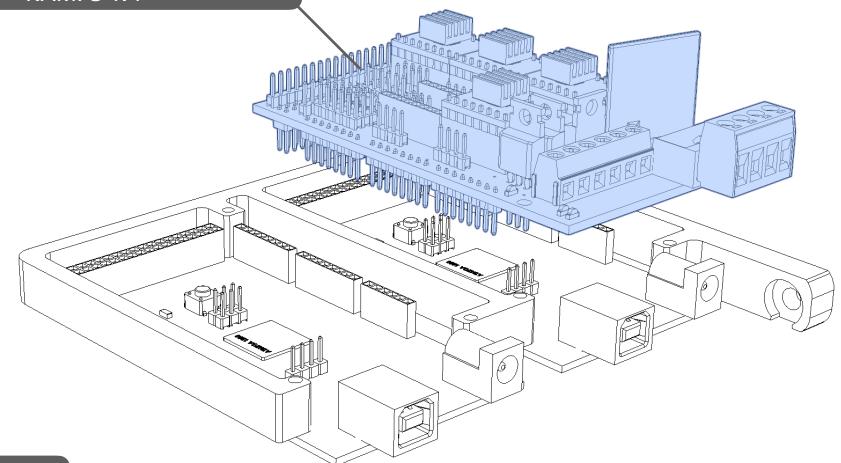


## Appendix D Electronics

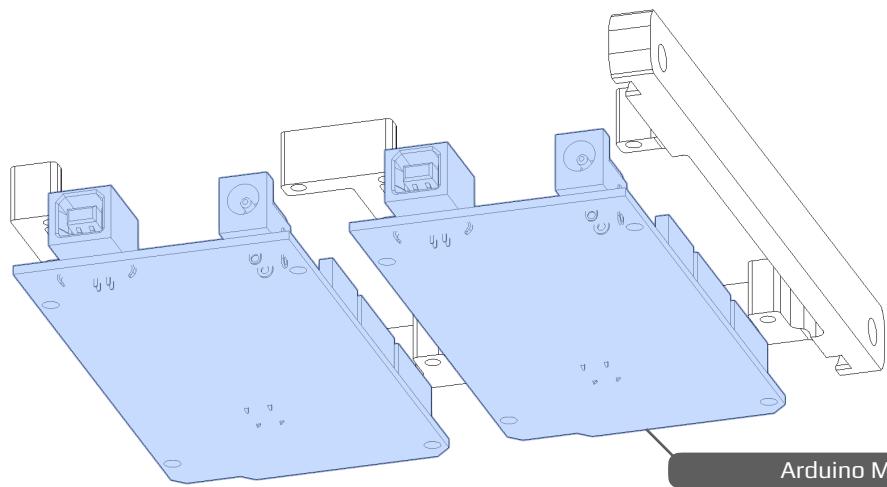
Follow RAMPs 1.4 and StepStick Documentation

Set Drivers to 1/16th Microstepping

RAMPs 1.4

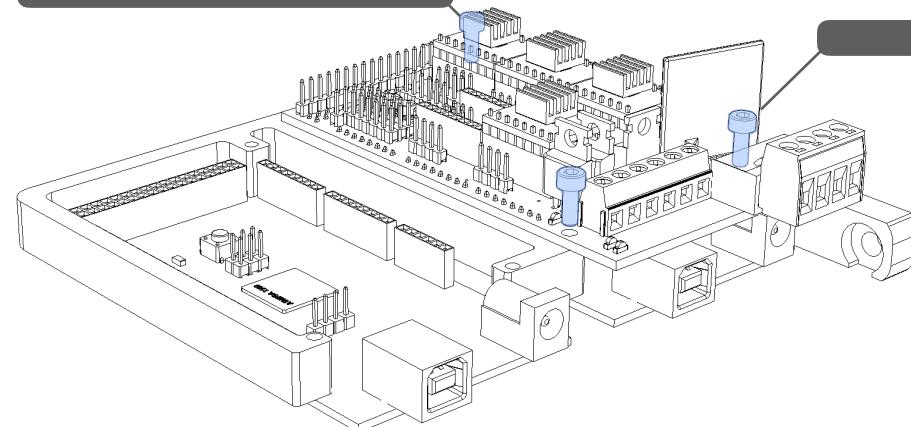


Arduino Mega 2560

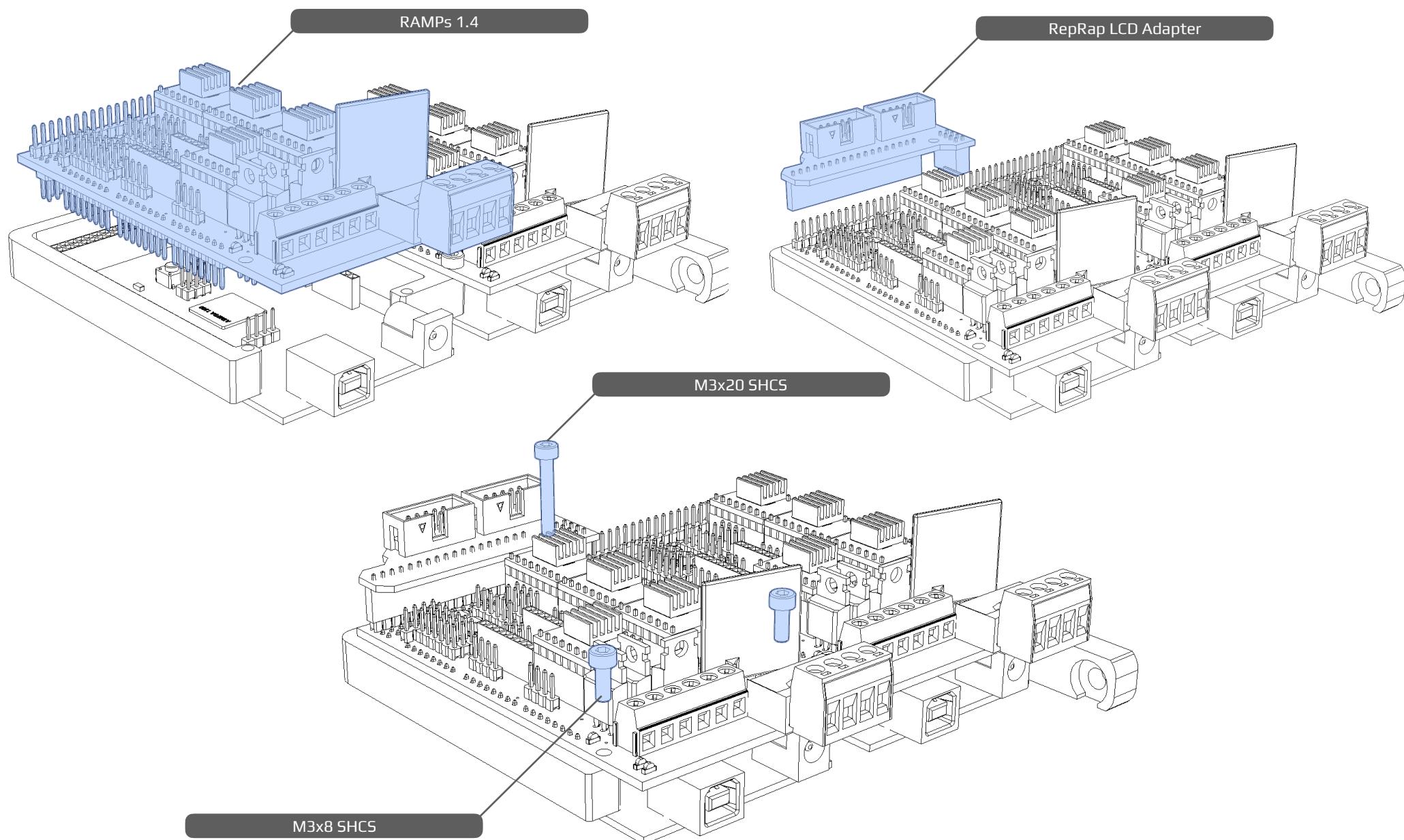


M3x8 SHCS

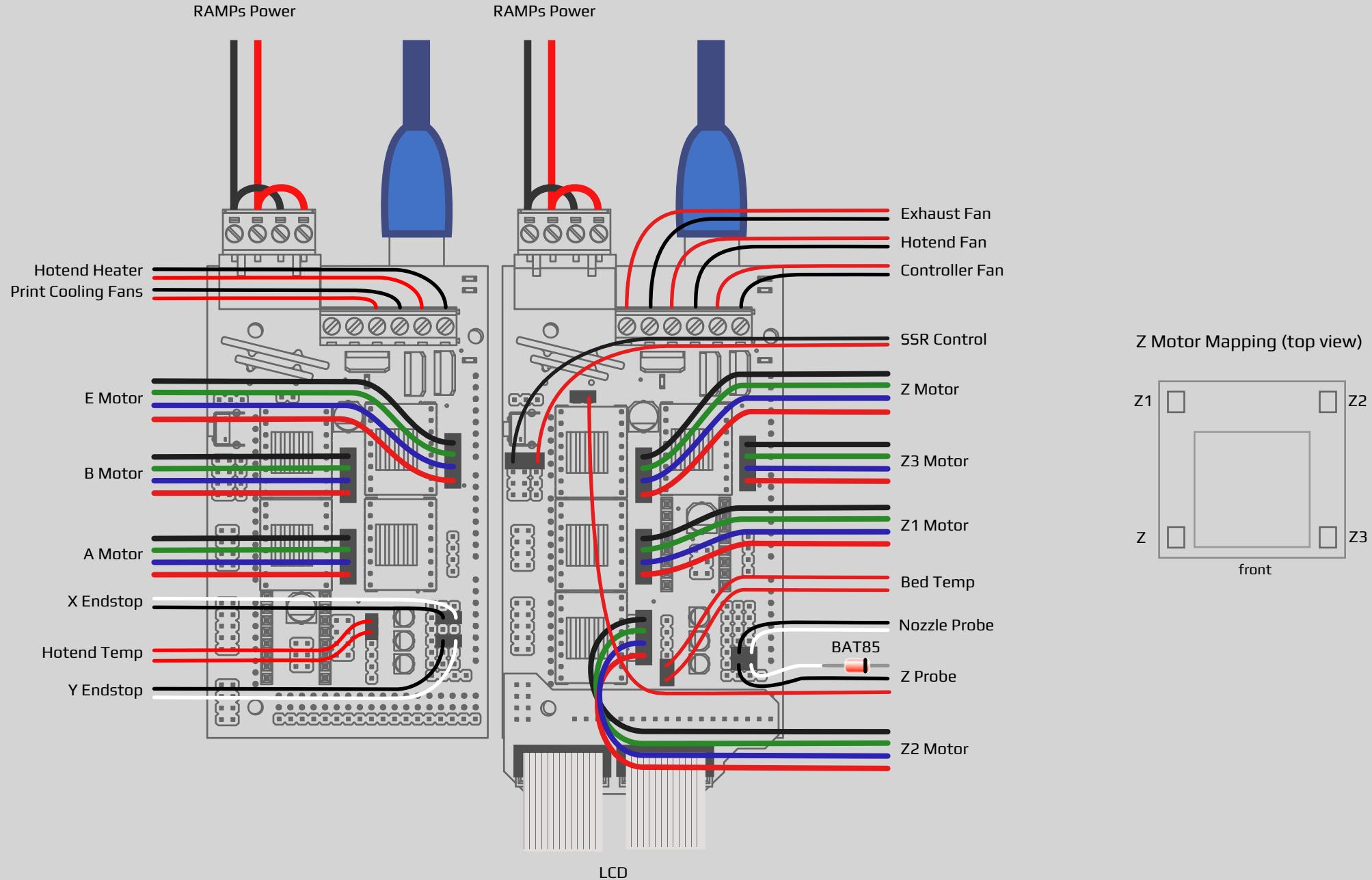
M3x8 SHCS



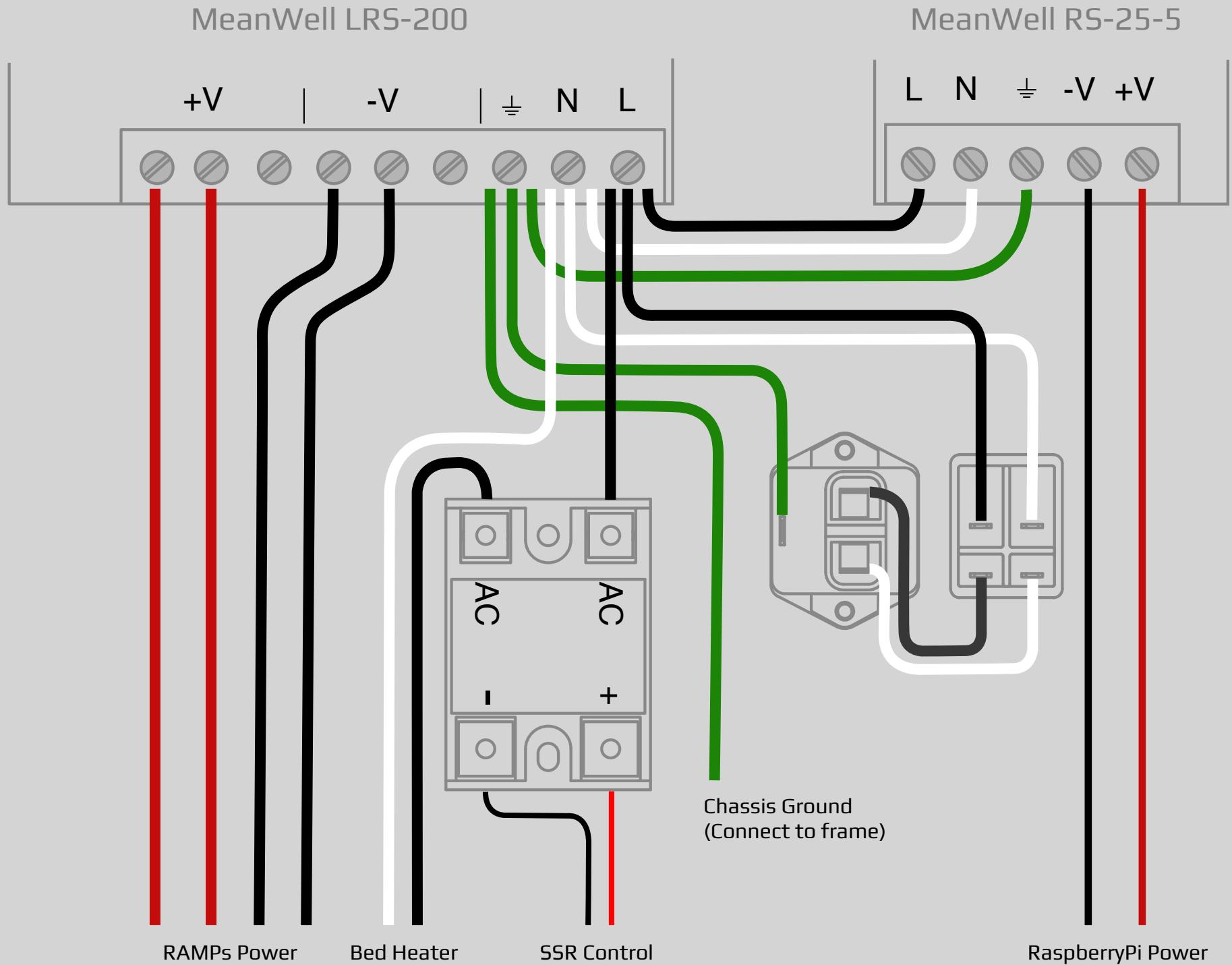
## Appendix D Electronics



# Control MCU Wiring (RAMPs)



# High Voltage Wiring



# Toolhead Wiring

