

# MissChanger Manual

GitHub: <https://github.com/VIN-y/MissChanger>

MissChanger aims to be a tool changer mechanism that is compatible with both Voron Trident and Voron 2.4. While also retaining the MGN9H tapping system of Voron-Tap.

## Support me via:

- |             |   |
|-------------|---|
| Paypal      | <a href="https://ko-fi.com/a_vinny">https://ko-fi.com/a_vinny</a>                       |
| Ko-fi       | <a href="https://paypal.me/NVoChinh">https://paypal.me/NVoChinh</a>                     |
| BuyMeCoffee | <a href="https://www.buymeacoffee.com/a_vinny">https://www.buymeacoffee.com/a_vinny</a> |

# Opening Notes

Although the setting up the config for MissChanger will change some aspects of your printer, it is still recommended that you start the project with a functional printer and add one toolhead at a time.

This document will not guide you through the set up of CAN bus or the physical mounting of the related hardware, please refer to the manufacture's manual for that.

## Print parameters

All parts are designed to be print with the following parameters:

- All parts are pre-orientated in the STLs
- 40% infill
- 4 walls
- ABS or ASA
- No support

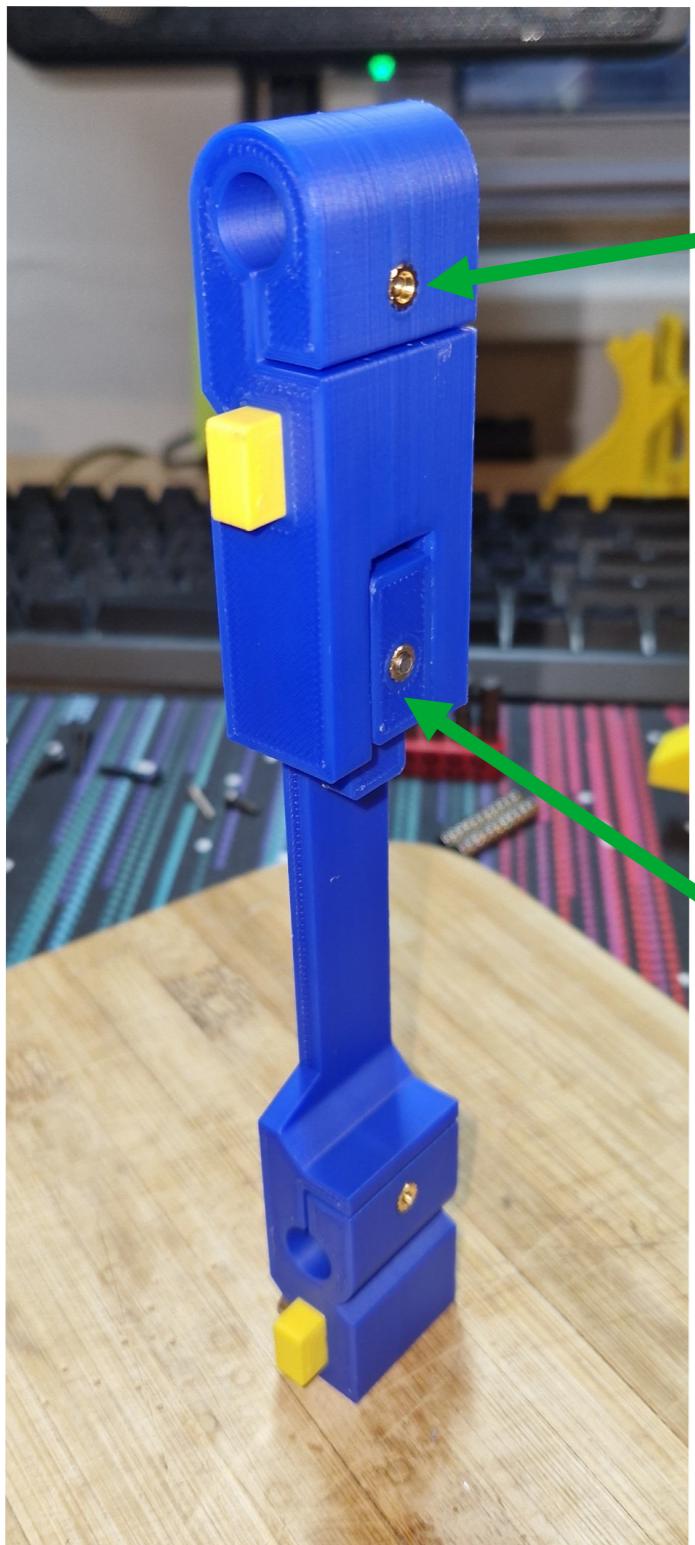
# Dock Assembly

Item	Quantity	Note
Dock-BE_ExAligner_x4	4	
Dock-BE_Holder_A	1	
Dock-BE_Holder_B	1	
Dock-BE_Spacer_x2	2	
Dock-Claw	1	+1 per additional tool-head
Dock-Claw_Mount	1	+1 per additional tool-head
Dock-Claw_Stopper	1	+1 per additional tool-head
Door_Buffer-Door_Buffer_x6	6	
Door_Buffer-Latch_Buffer_x2	2	
Dock-Nozzle_Plug_Template	1	This is a cutting template for the nozzle plug.
Dock-Brush_Dock	1	Optionally, this can be exchanged for another toolhead dock. However, that use case is not supported.
10x467mm solid aluminium rods	2	
Brass brush	1	
Sealing Foam Tape 6mm(W) x 4mm(T)	3m	
0.20mm feeler gauge (10mm wide)	1	
0.20mm Teflon oven liner	1	
0.25mm Silicone Baking Tray	1	
6x3mm magnets	2	+2 per additional tool-head
Rubber band	1	+1 per additional tool-head
Grease	n/a	

# Bar End Assembly

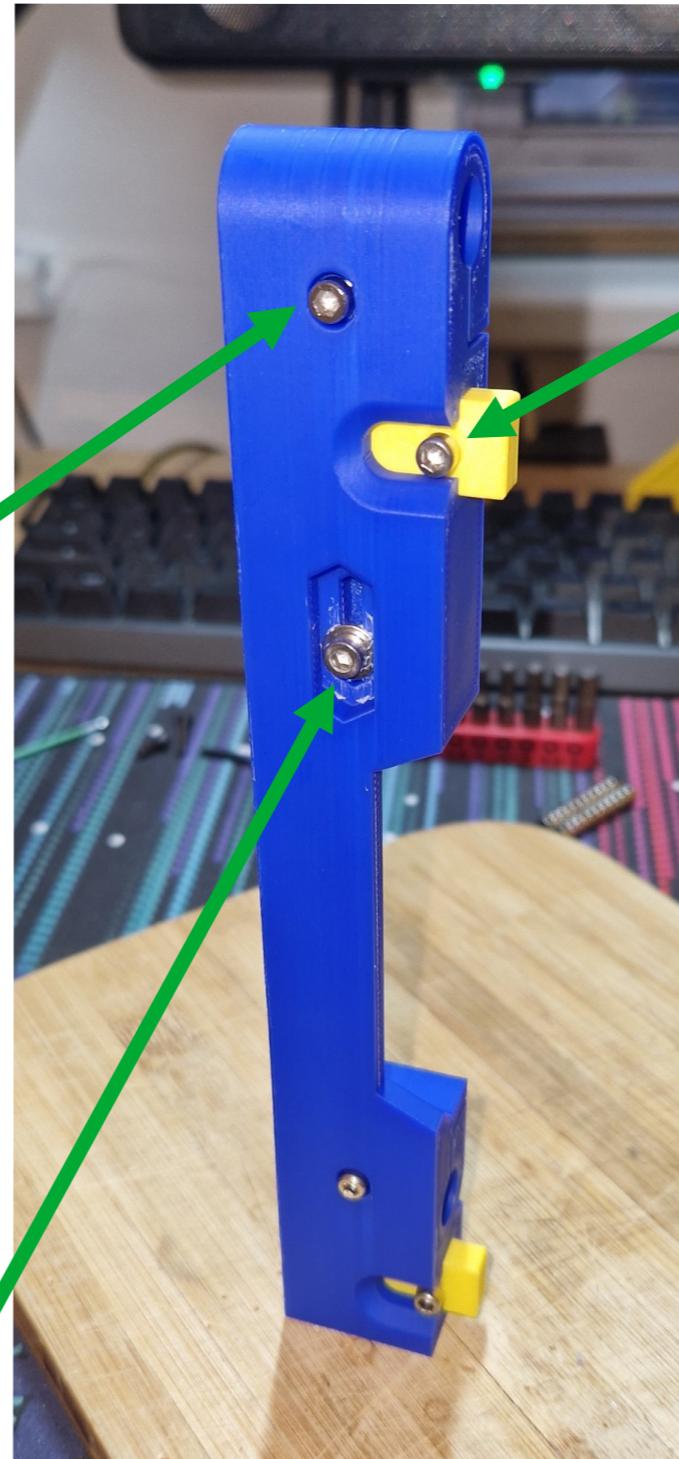
There are 2 mirrored Bar End assembly.

What shown here, will need to be done to the other side as well.



**Bar End (x2)**

Clamp to bars with  
2 off M3x16mm  
socket head +  
threaded insert



**ExAligner (x4)**

Mounted with 1 off  
M3x8mm socket head

**Spacer distance**

This number will change  
depending on your printer.

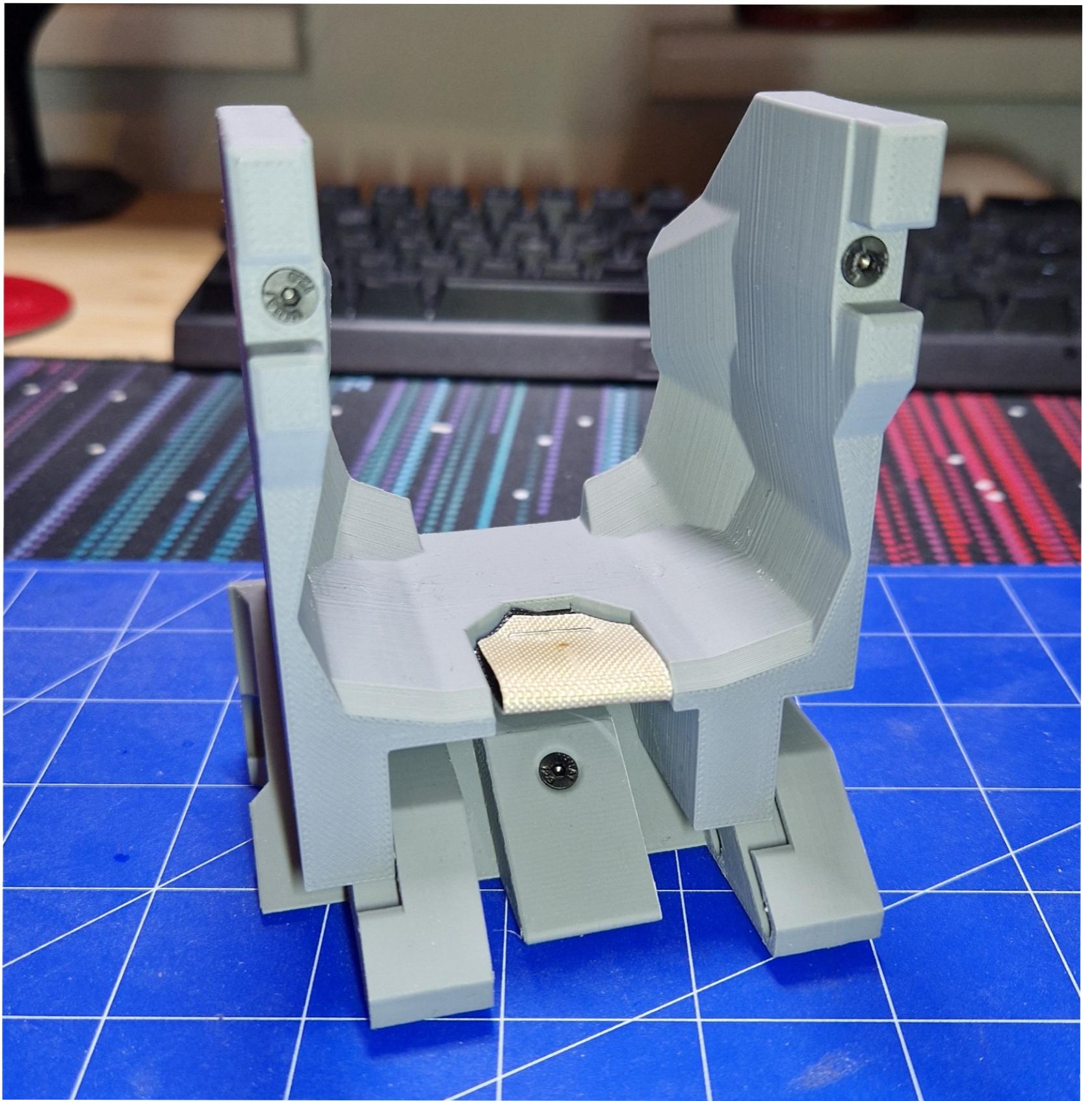


**Spacer (x2)**

Mounted with 1 off  
M3x16mm socket  
head + M3 washer  
+ threaded insert

# Dock Assembly

Alright. Warm up is over.  
Let's make this thing.



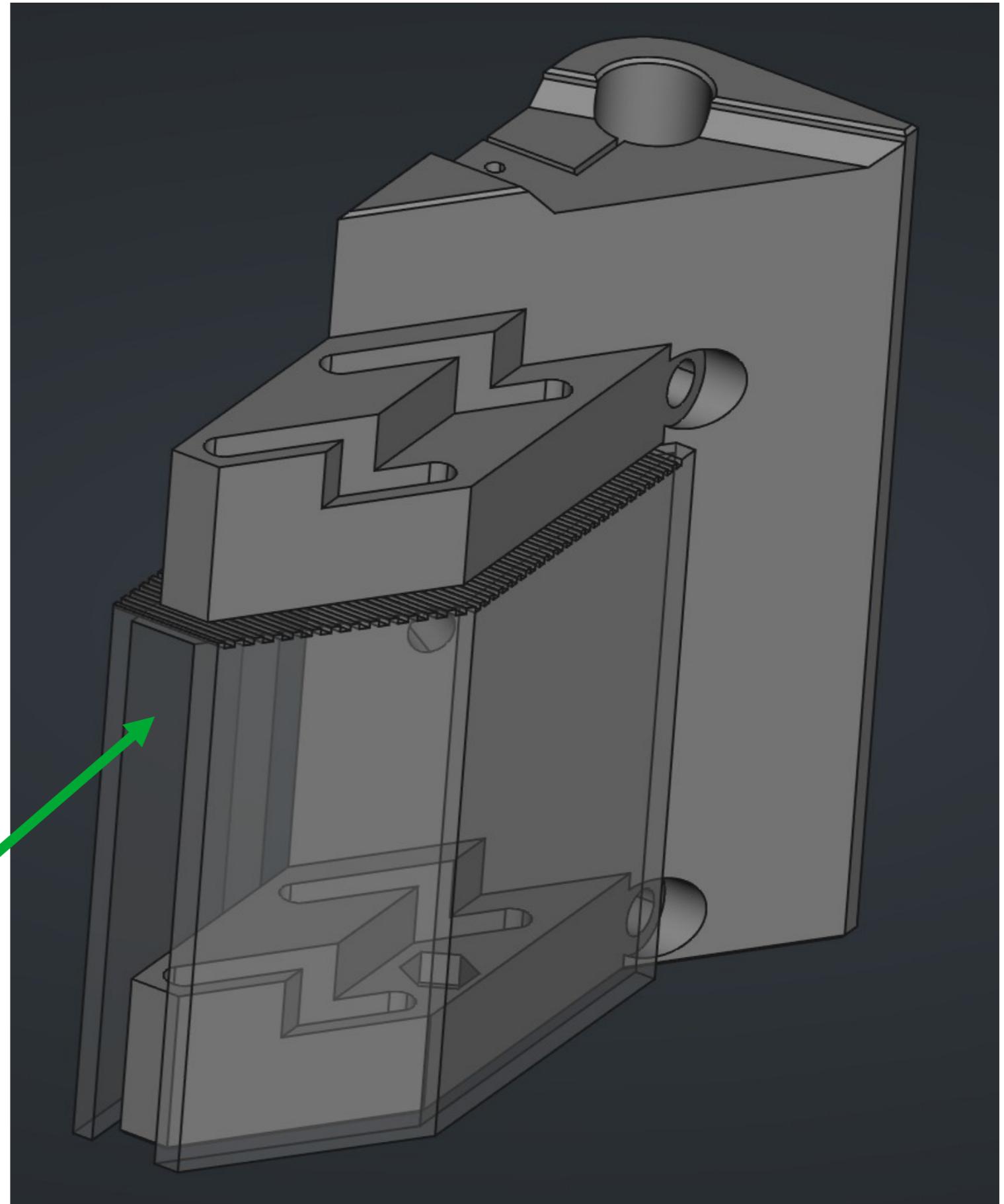
# Dock Assembly

Starting with the base (a.k.a. the Claw Mount)

**This component:**

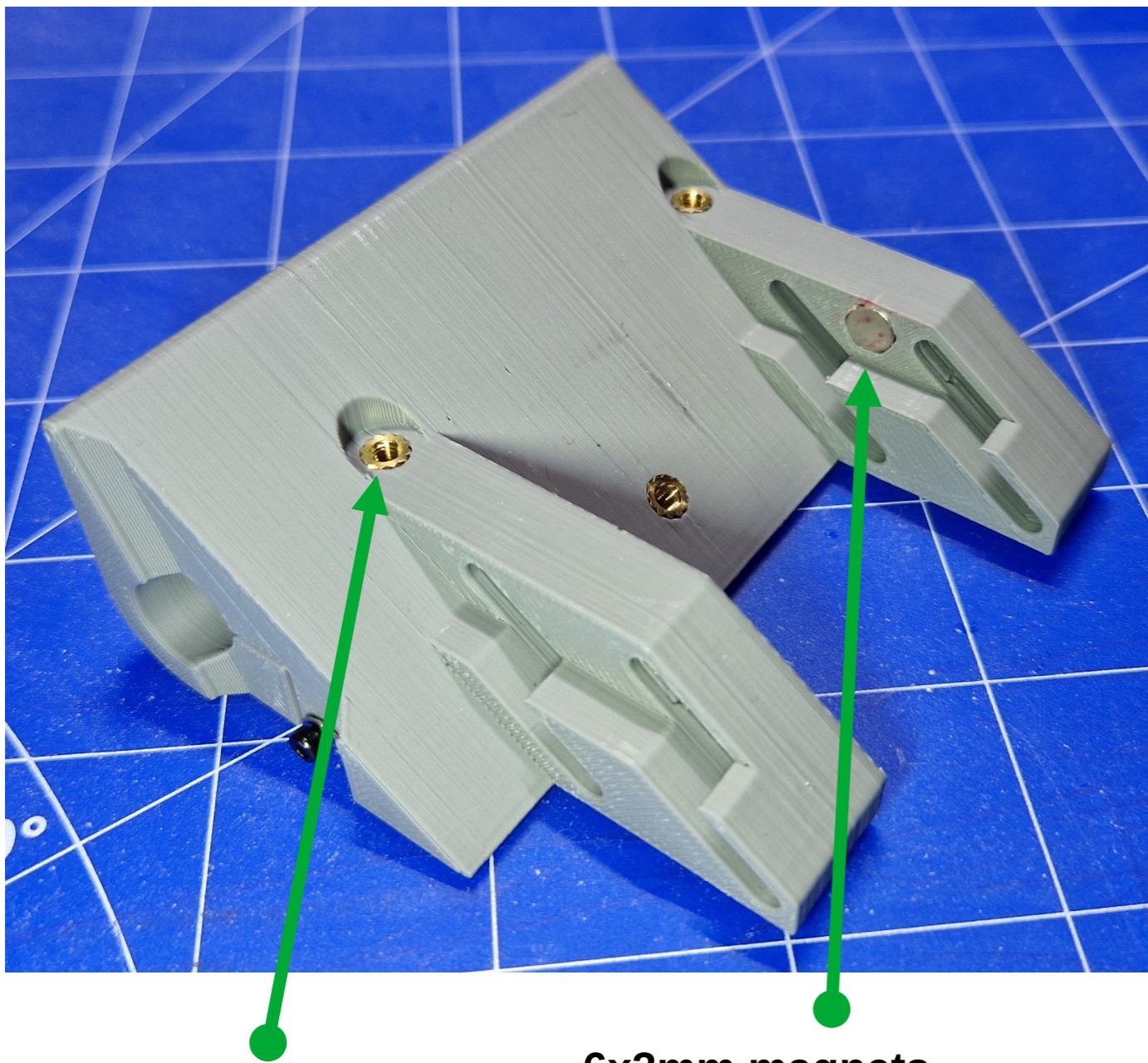
- Comes with built-in support (as shown)
- Needs to has threaded inserts added to it
- Needs to has a magnet glued in place

Built-in Support



# Dock Assembly

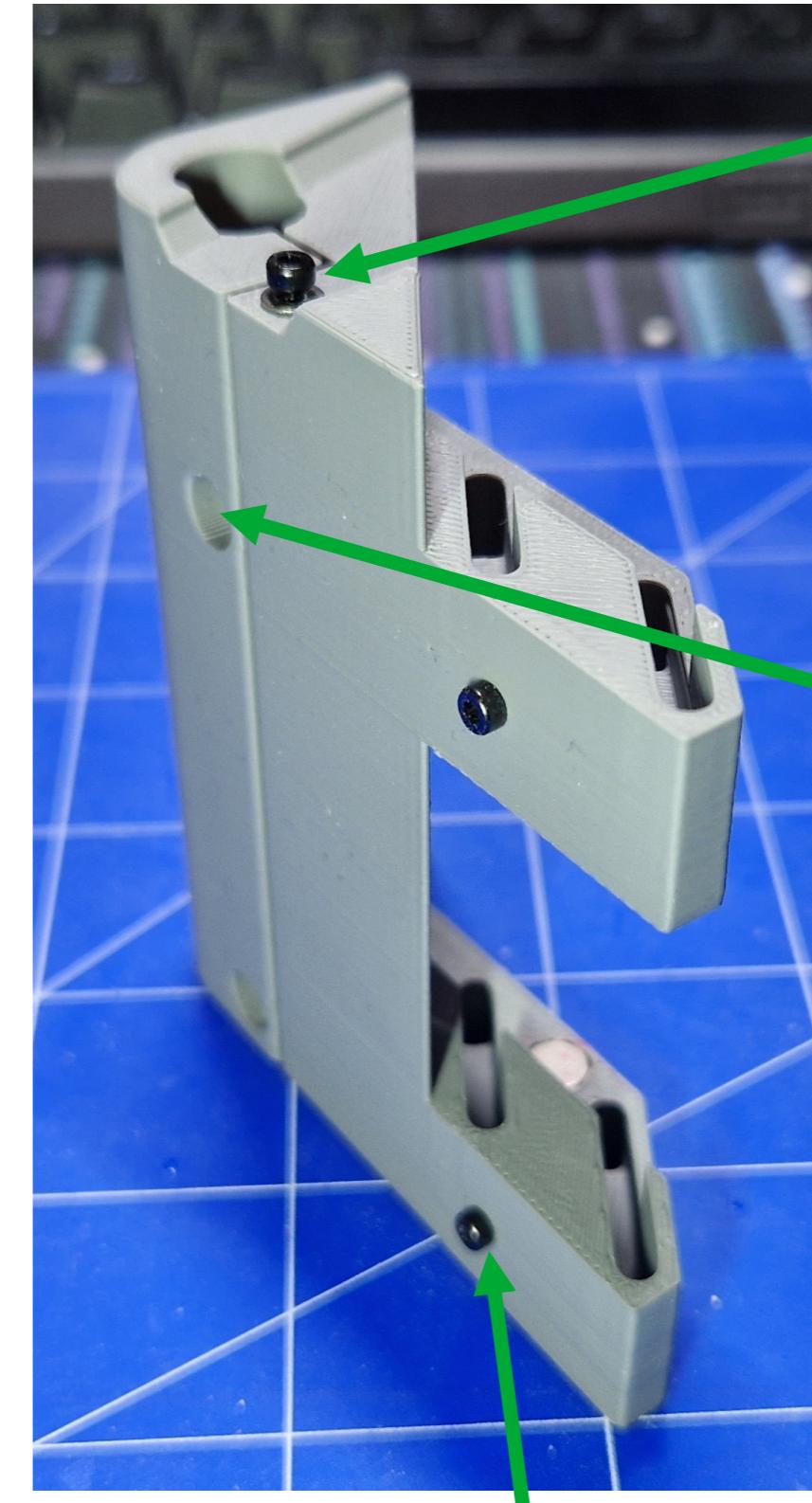
Starting with the base (a.k.a. the Claw Mount)



**Threaded insert 3x**

**6x3mm magnets**

Held in place with super glue.  
Need to attract to that on the Claw



**M2x10mm 2x**

To keep the dock off the bed

**M2x10mm  
+ M2 washer**  
For optional  
rubber band

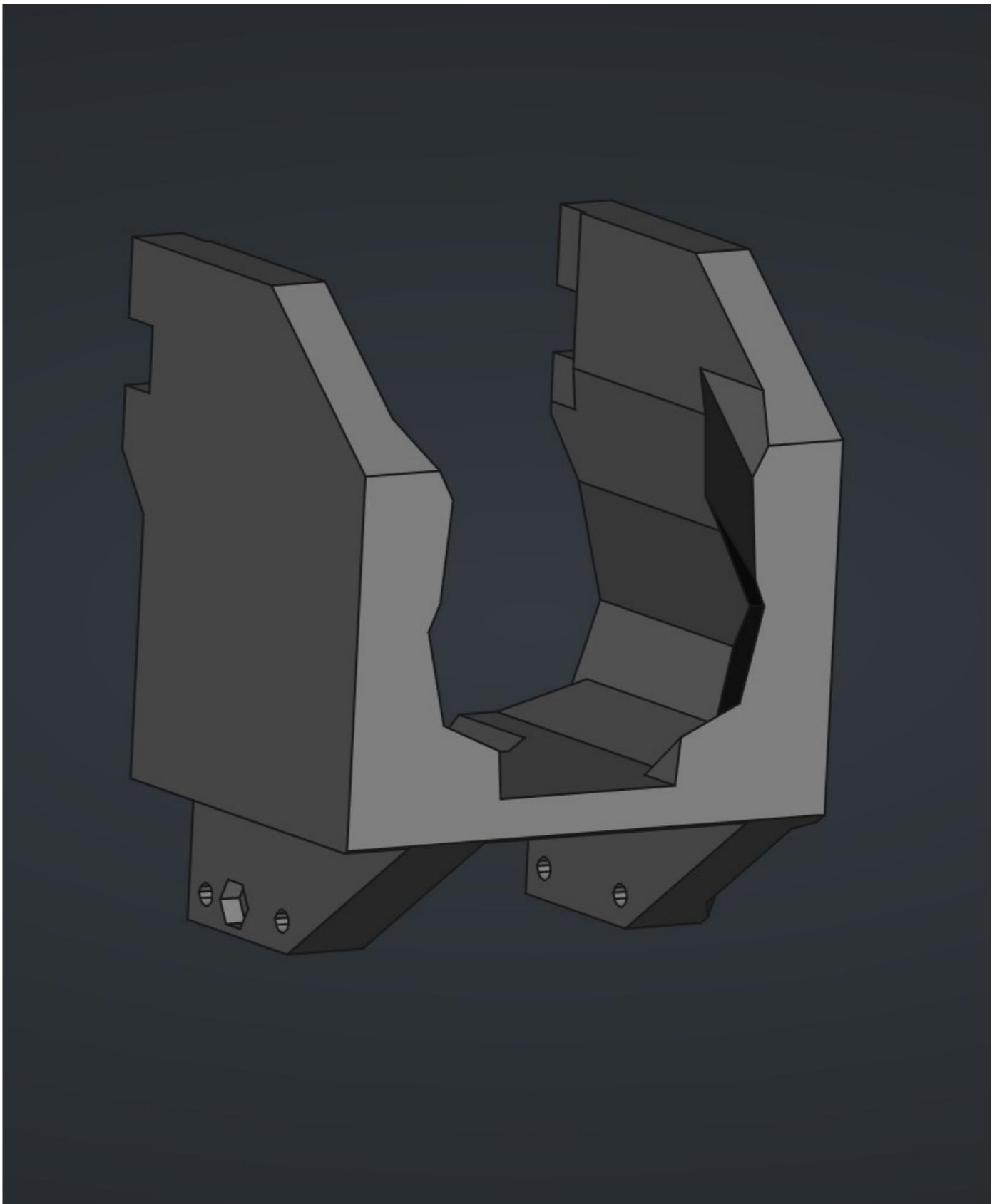
**M3x16mm x2**

# Dock Assembly

Now with the Claw itself

## This component:

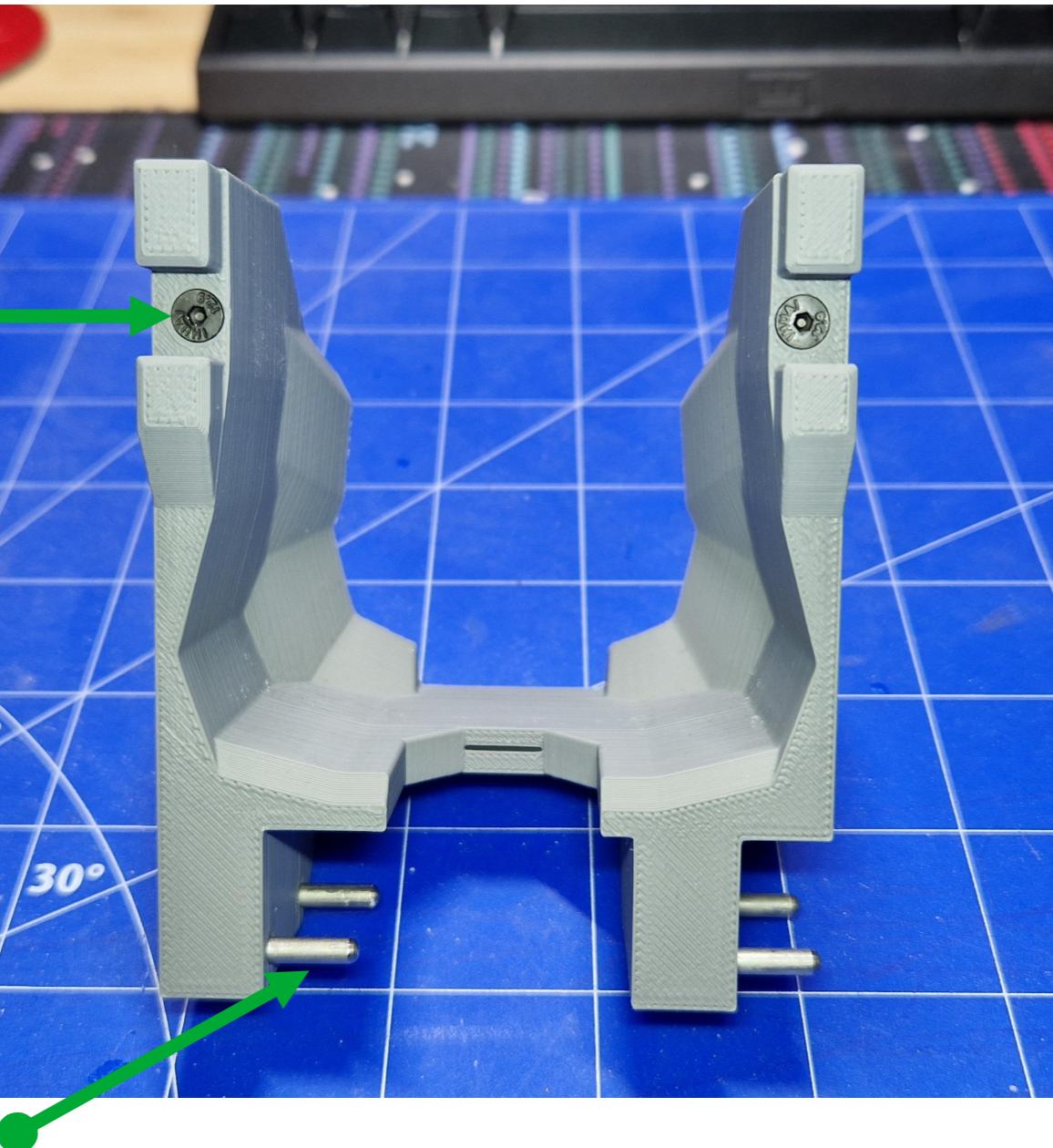
- Needs to has stainless steel pins installed
- Needs to has a magnet glued in place
- Needs to has the nozzle plug installed



# Dock Assembly

Now with the Claw itself

M3x10mm  
countersunk x2

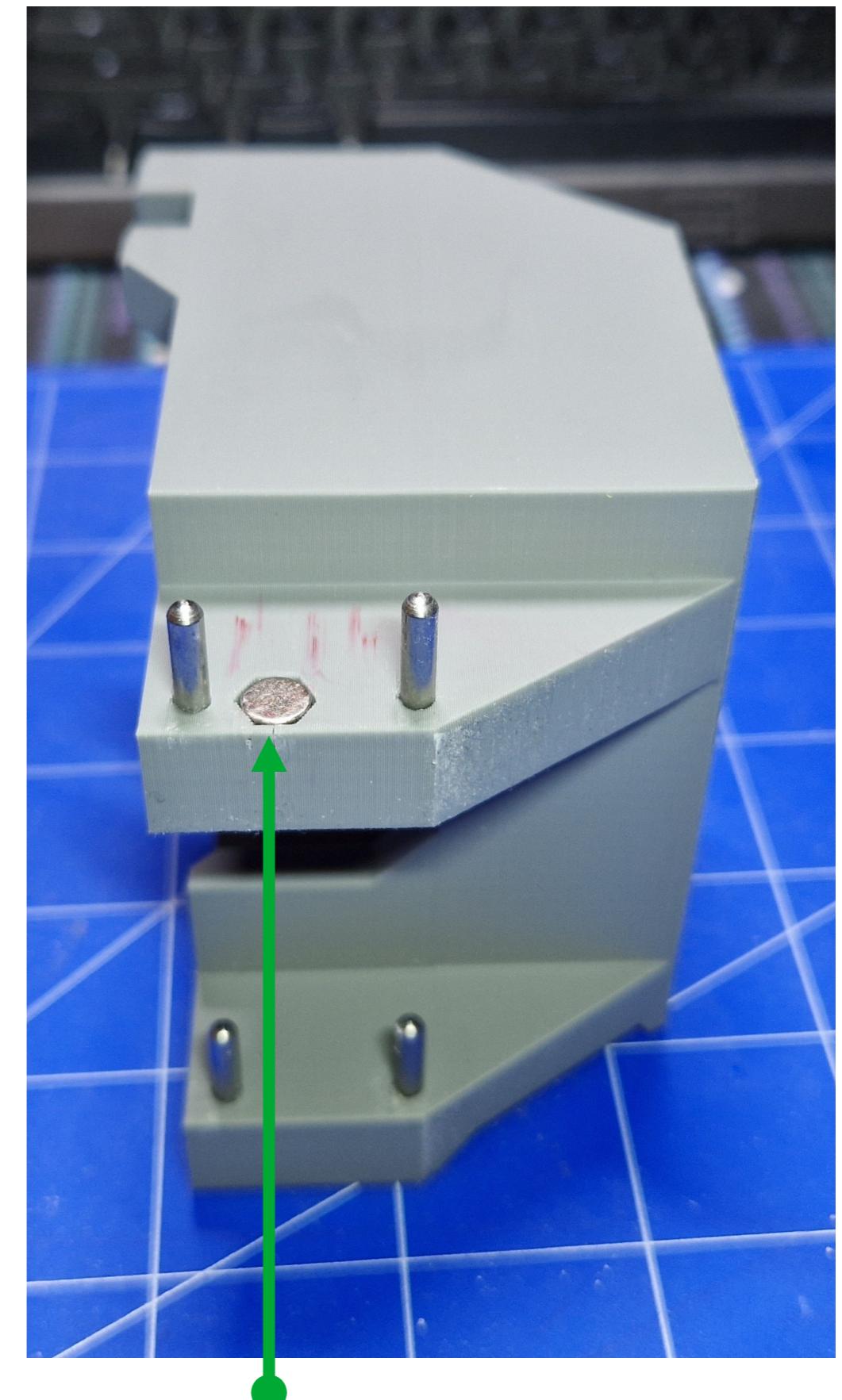


**3x20mm rounded pin x4**

Designed to be press-fitted, but glue can be added into the hole if needed.

**6x3mm magnets**

Held in place with super glue.  
Need to attract to that on the Claw Mount

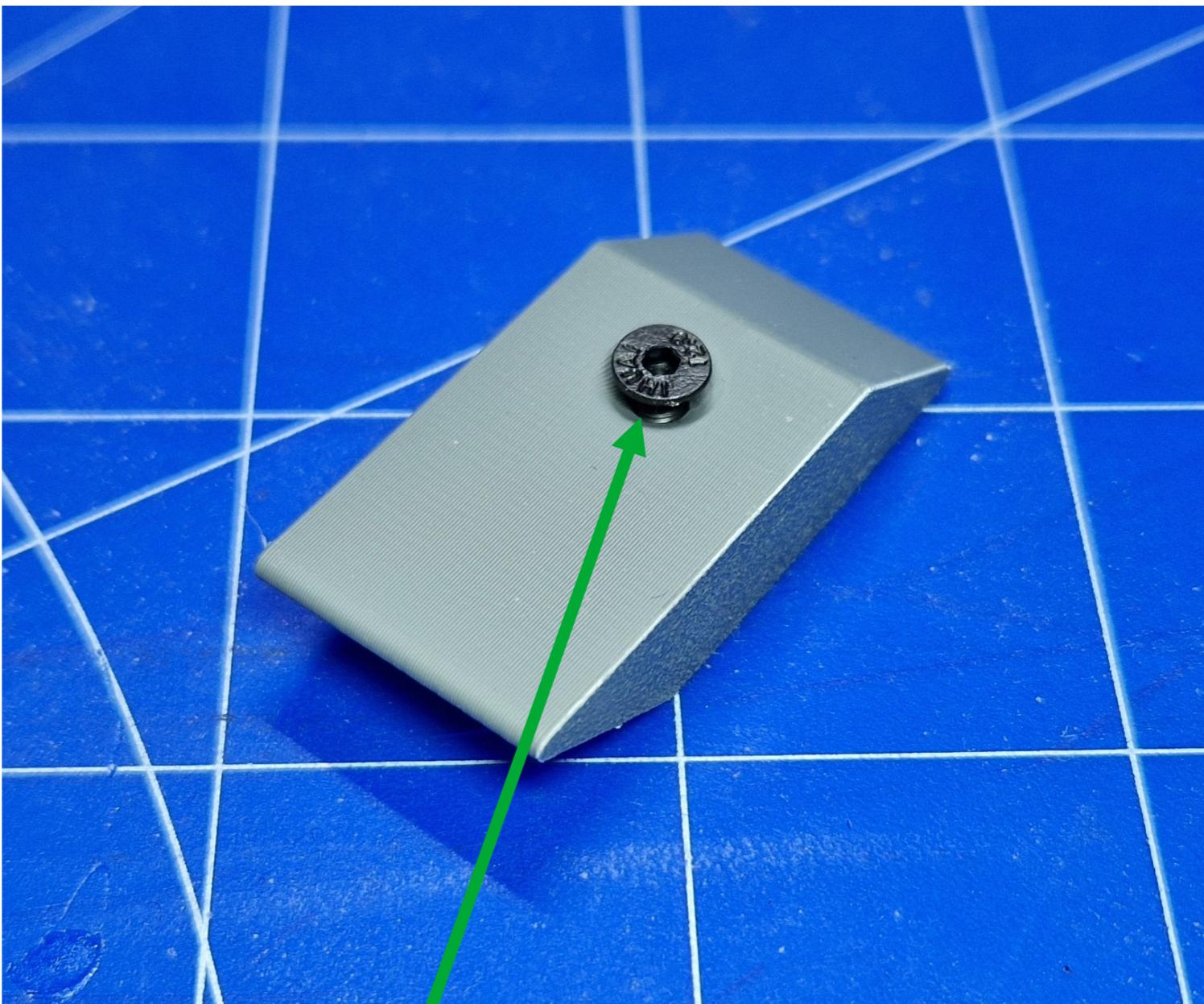


# Dock Assembly

Lastly the Claw Stopper

**This component:**

- Is pretty straight forward



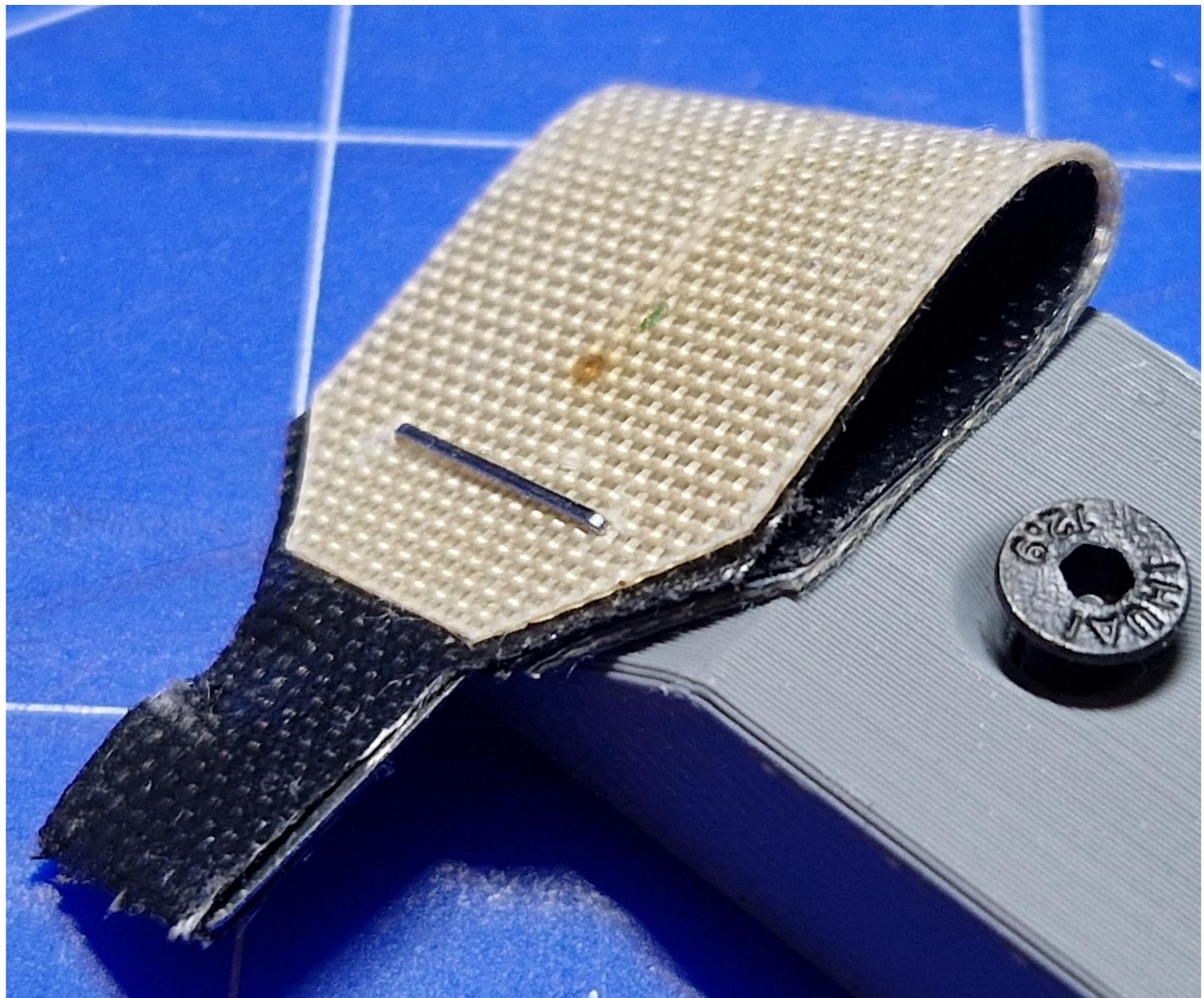
M3x12mm countersunk

# Dock Assembly

Onto the Nozzle Plug

## This component:

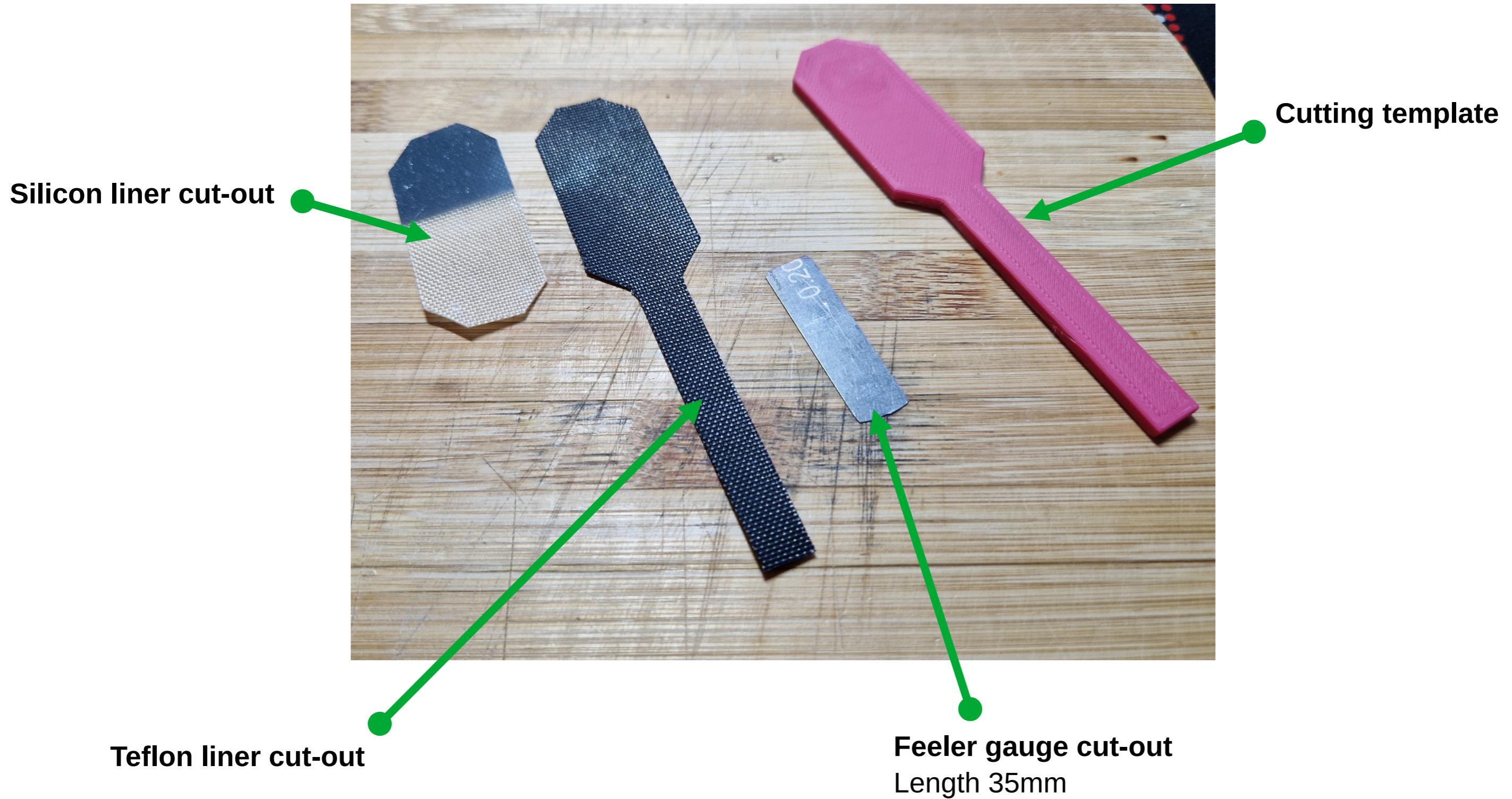
- Is a piece of 0.2mm steel leaf that is wrapped with a layer of 0.2mm teflon oven liner and a layer of 0.25mm silicon oven liner
- The silicon layer cannot be wrapped tightly around the steel leaf; hence, the need to have the teflon layer
- The assembly is held together with a staple
- Check out [this video](#), link is also below, of the old dock to see how everything comes together



Link: <https://youtu.be/jWHPMaVIBcA>

# Dock Assembly

Onto the Nozzle Plug



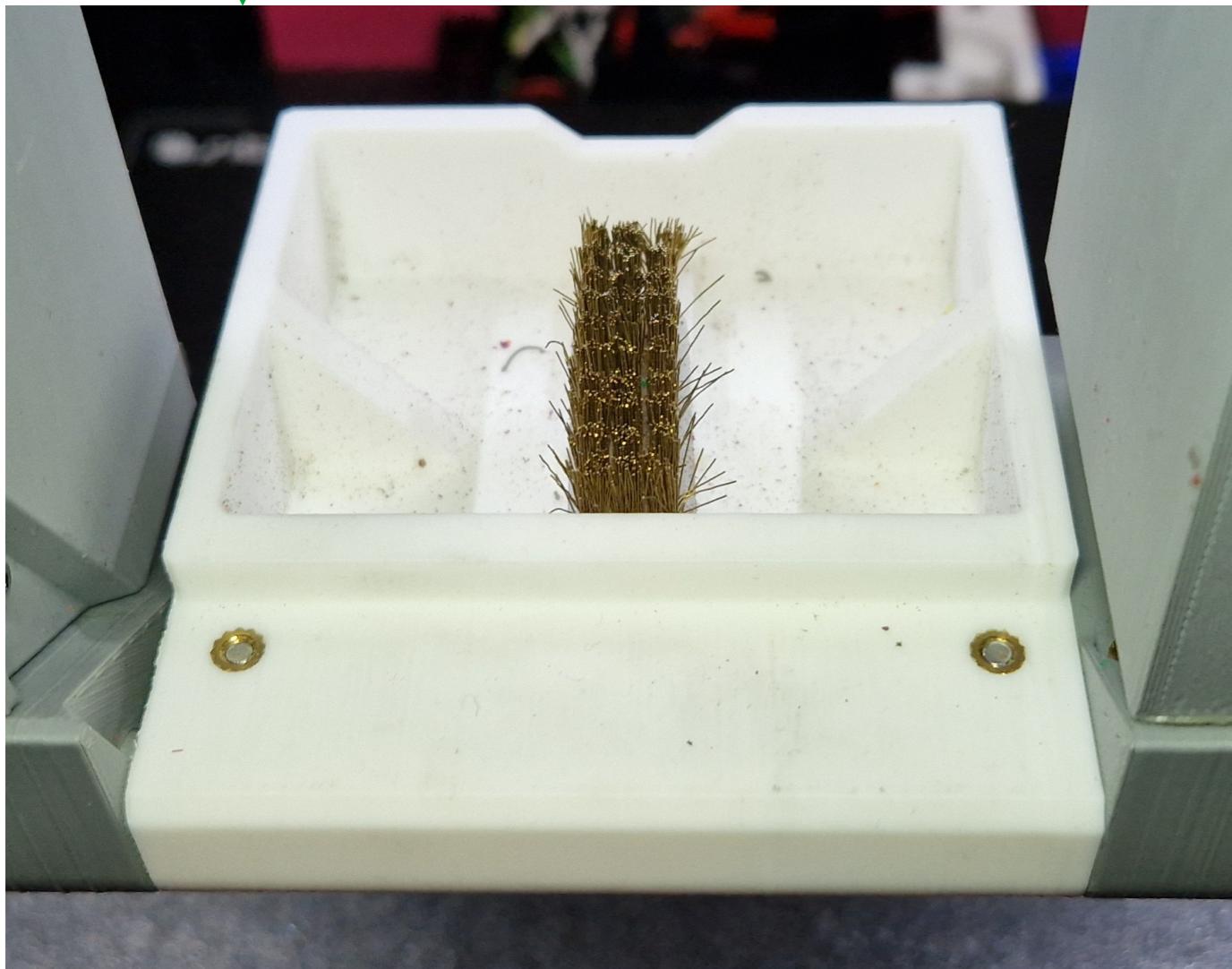
# Dock Assembly

Beside the above assembly, there are also these

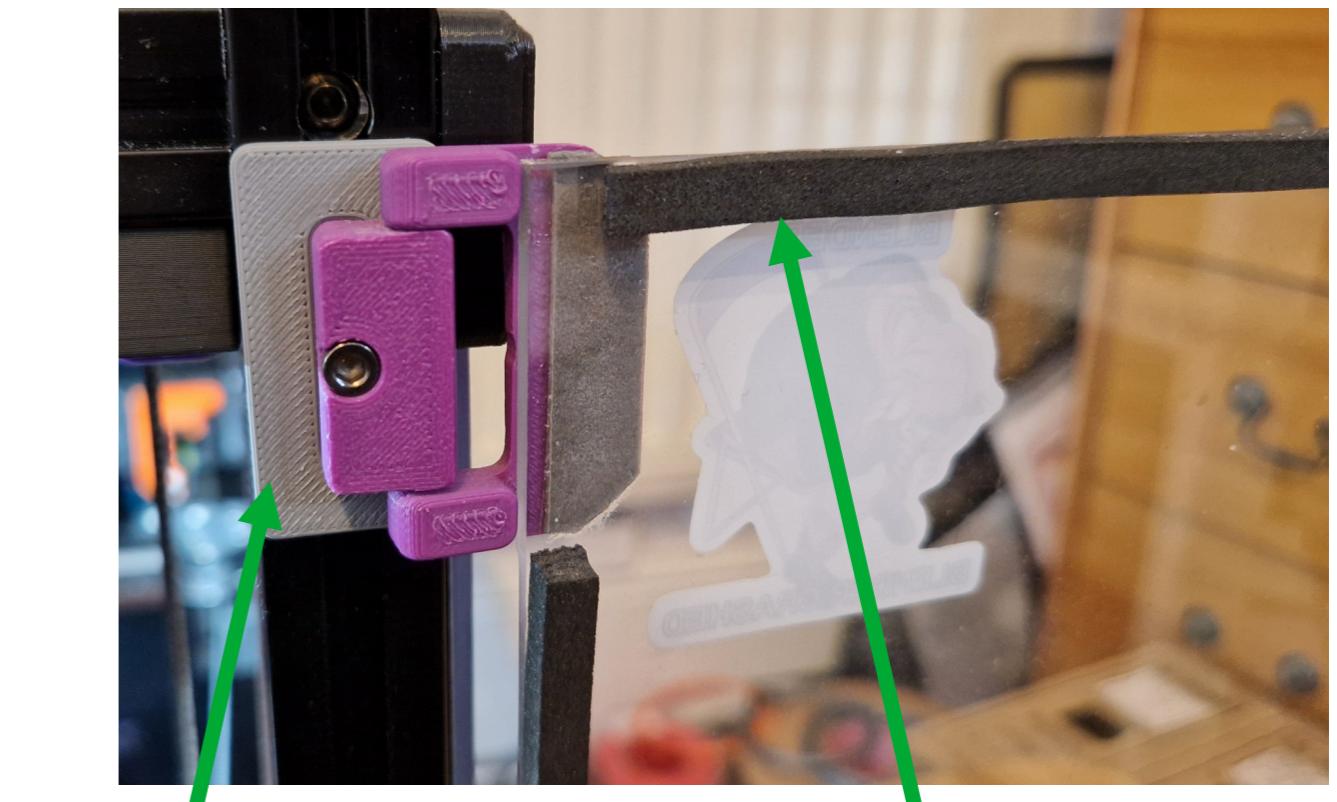
## Brush dock

Brash brush head, attached via double sided mounting tape

Mounted with 2 off M3x16mm + threaded insert



## Door Buffers



## 4mm foam

It looks better on the frame,  
but cleaner on the panel

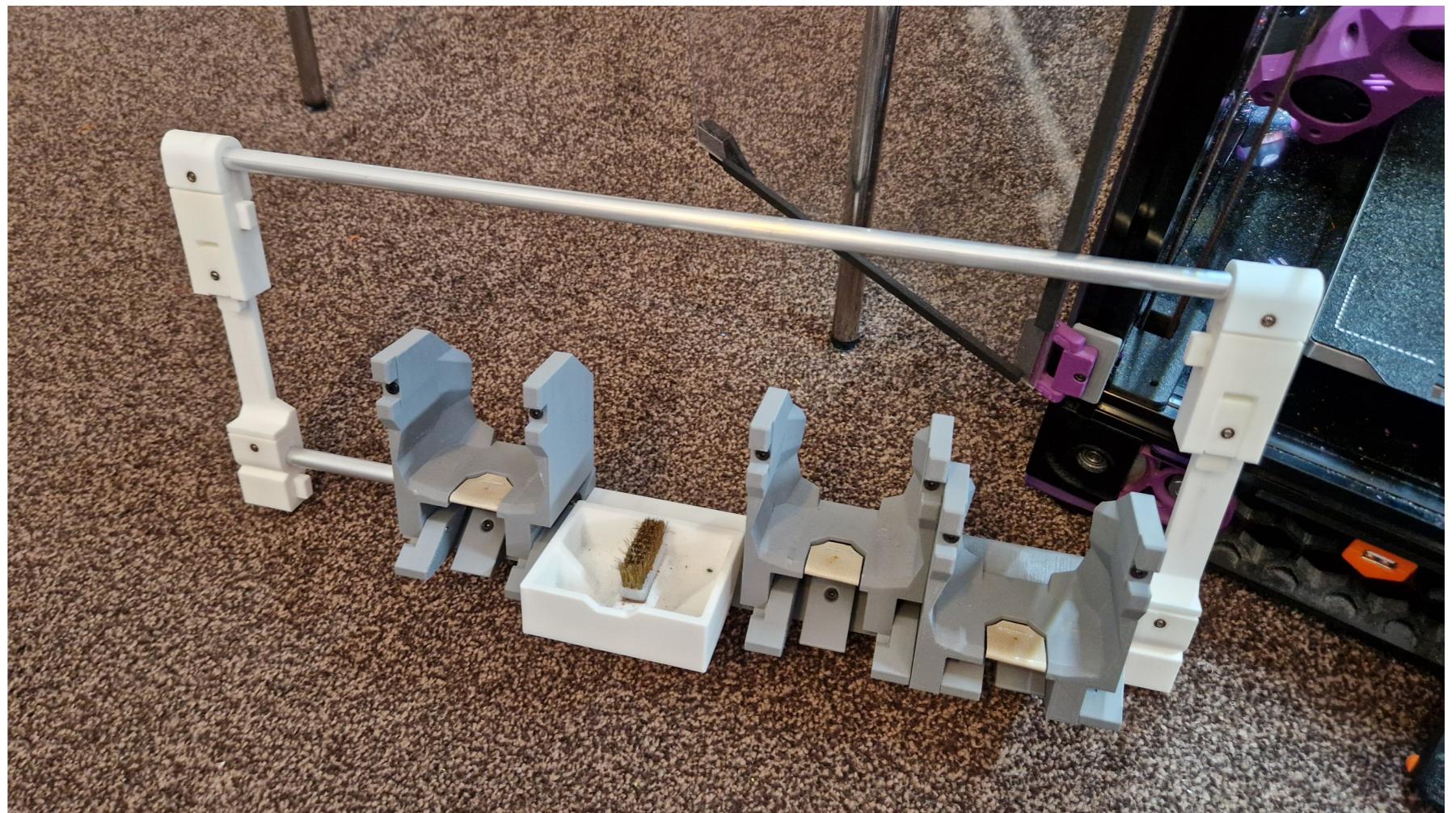


# Dock Assembly

All together

## This assembly:

- Needs to be calibrated later, link is also available bellow
- It is gray now... Because I don't like blue



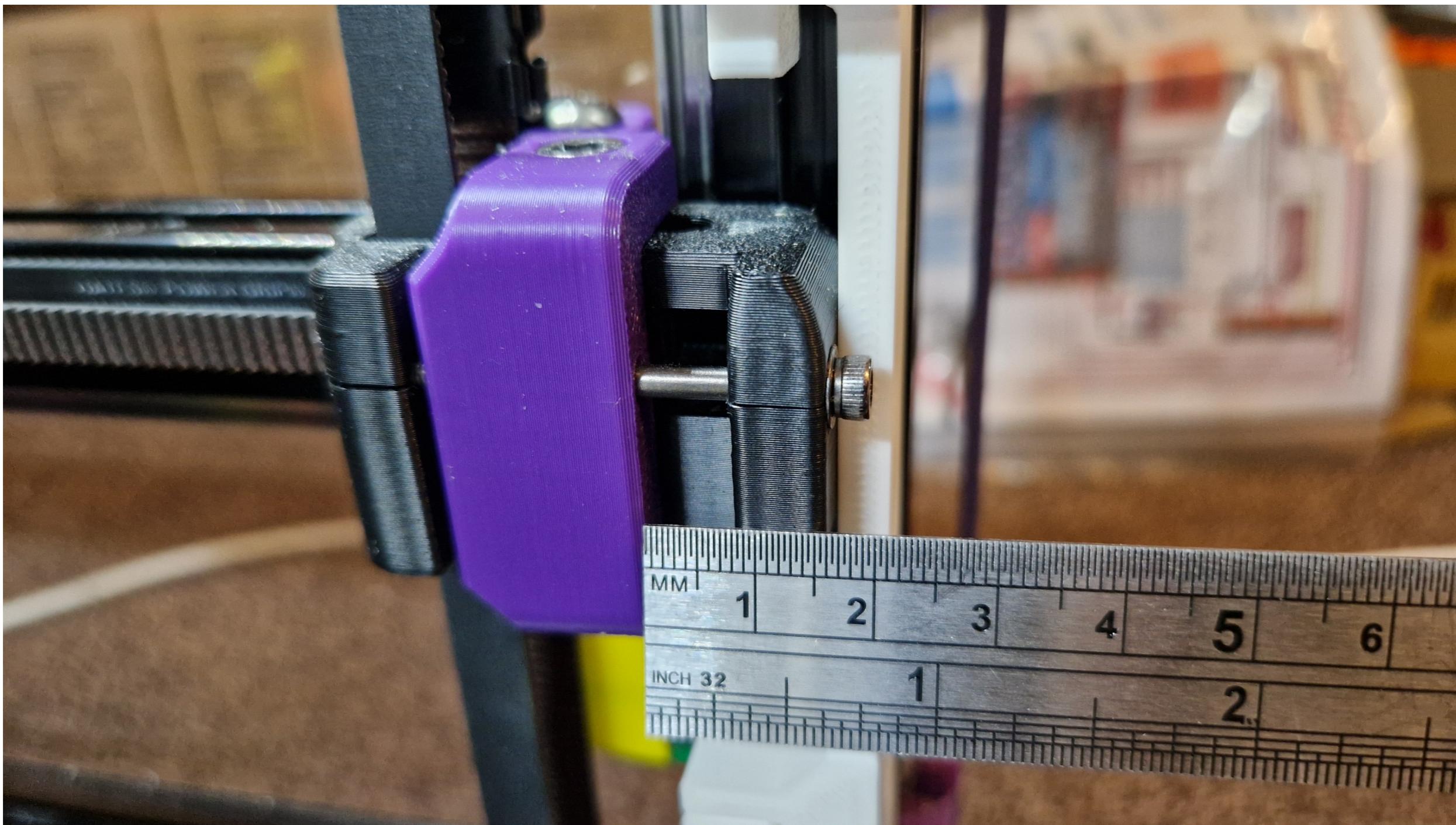
Link: [https://youtu.be/Xxpi4NII\\_MY](https://youtu.be/Xxpi4NII_MY)

# Dock Assembly

P.S.

## A note on belt tension:

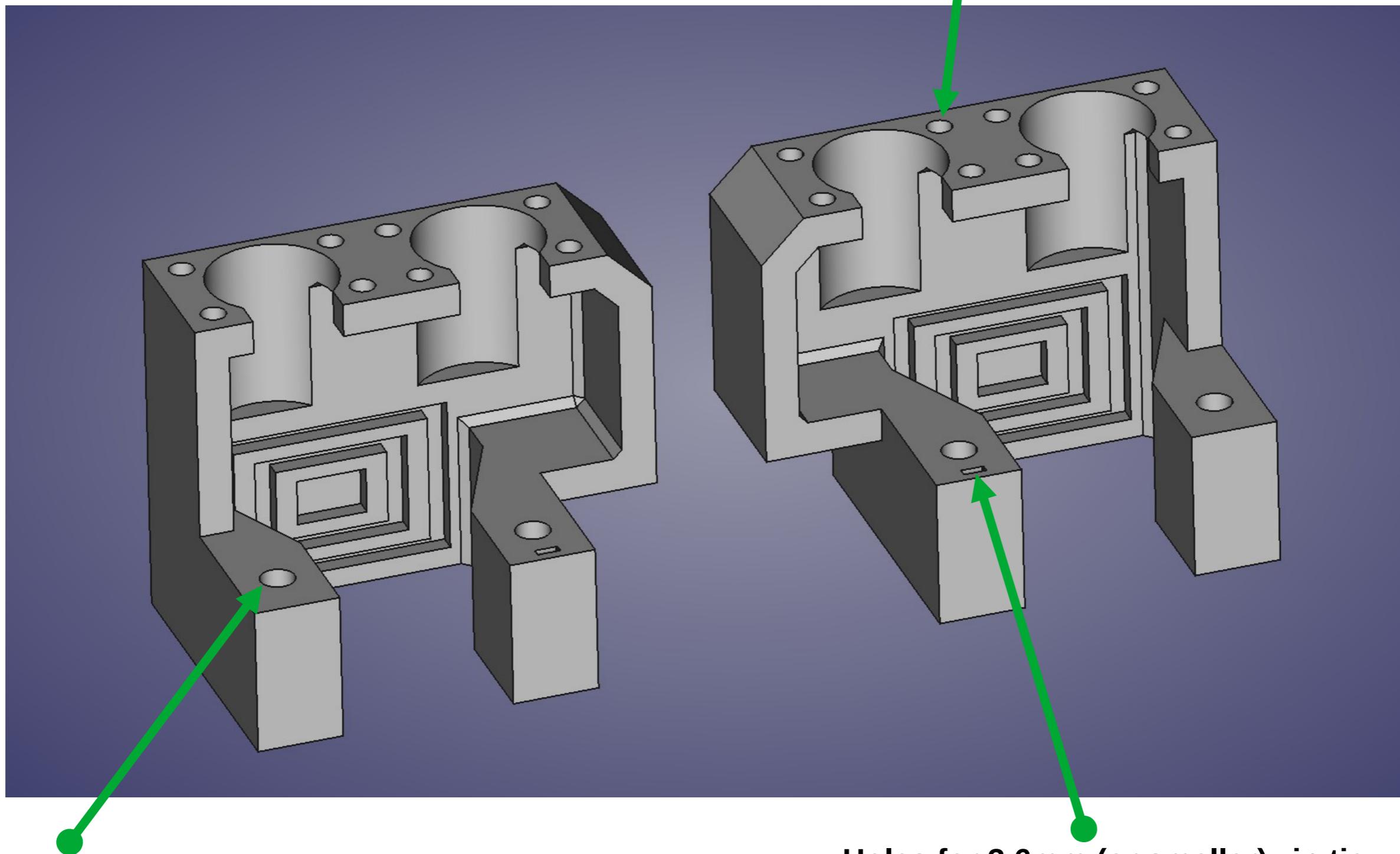
It is advised that you leave at least 15.5mm between the front idler slider and the idler body (see picture below). This is to give the maximum amount of room for the front idler to travel before colliding with the dock's bar-ends.



# XLR Panels

Item	Quantity	Note
XLR_Panel_L	1	
XLR_Panel_R	1	
z_chain_bottom_anchor	1	Not applicable for Voron Trident
z_chain_bottom_anchor_mirror	1	Not applicable for Voron Trident
z_chain_retainer_bracket_x2	2	Not applicable for Voron Trident
4-Pin XLR Female Jack Panel Mount	4	
WAGO Mounting carrier	2	
221 WAGO 3 Port	2	
221 WAGO 5 Port	2	
CAN bus cable	1m	
BIGTREETECH U2C V2.1 Adapter Board	1	This is recommended over MCU CAN bus Bridge

# XLR Panels



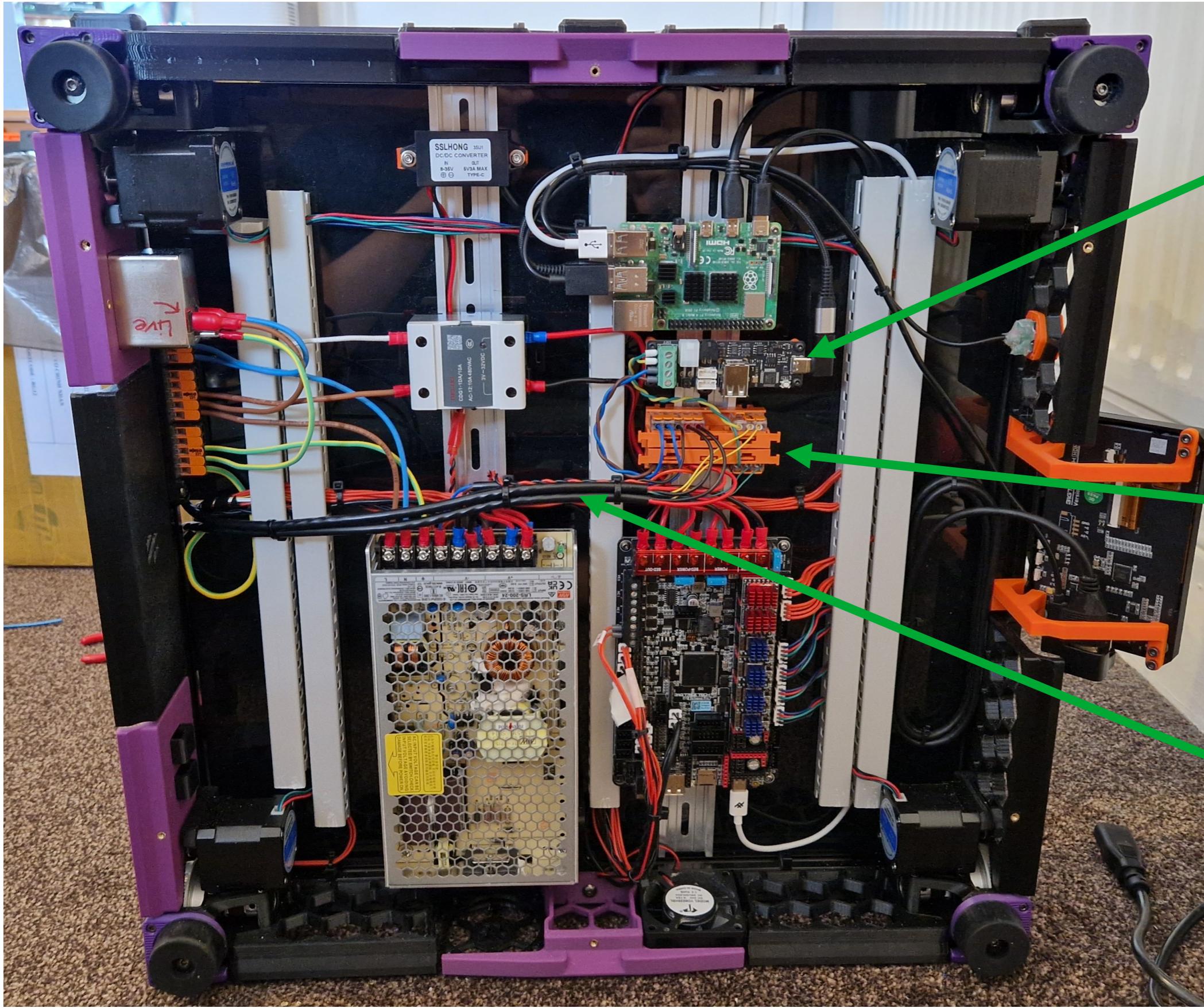
**Holes for M3x10mm bolts and T-nuts**  
For attaching to aluminium extrusion.

**Holes for M3x5x4mm threaded inserts**  
For attaching to 4-Pin XLR Female Jack Panel Mount.  
Note: Only 2 diagonal holes are needed. It depends  
on which panel mount you got.

**Holes for 3.6mm (or smaller) zip tie**  
For cable management

# XLR Panels

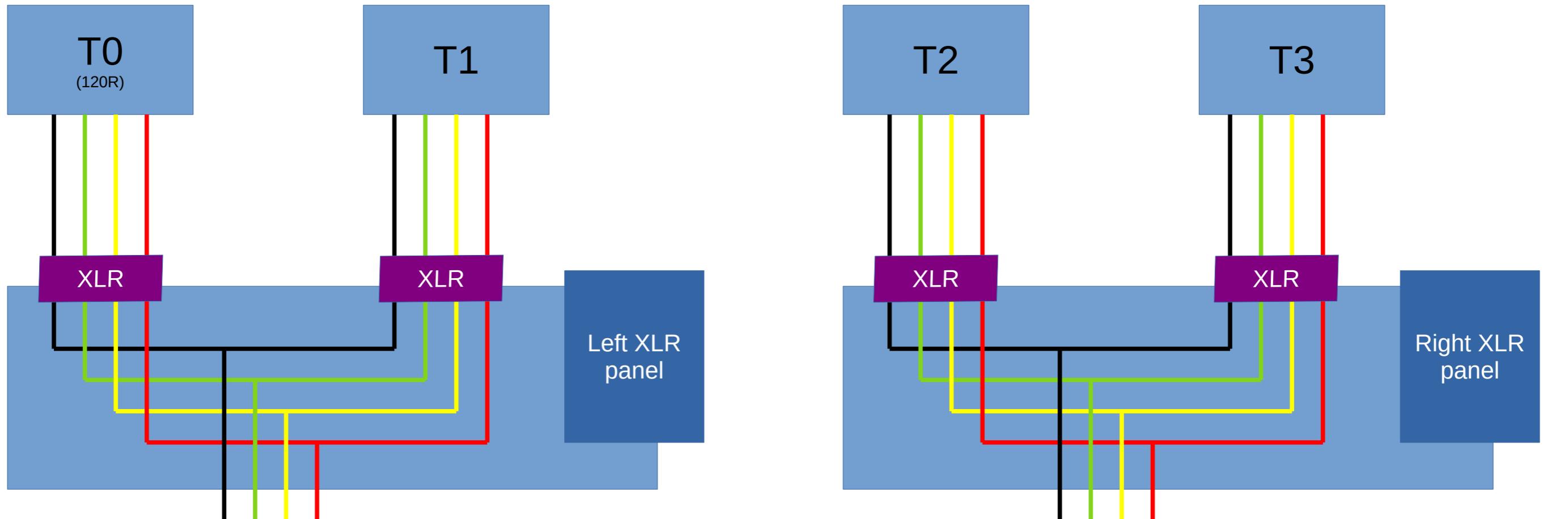
Basement view



**U2C module**

**DIN-mounted WAGO blocks**  
(2 off) WAGO Mounting carrier  
(2 off) 221 WAGO 3 Port  
(2 off) 221 WAGO 5 Port

**CAN bus cable x2**  
One to the XLR panel (right),  
the other to the XLR panel (left)



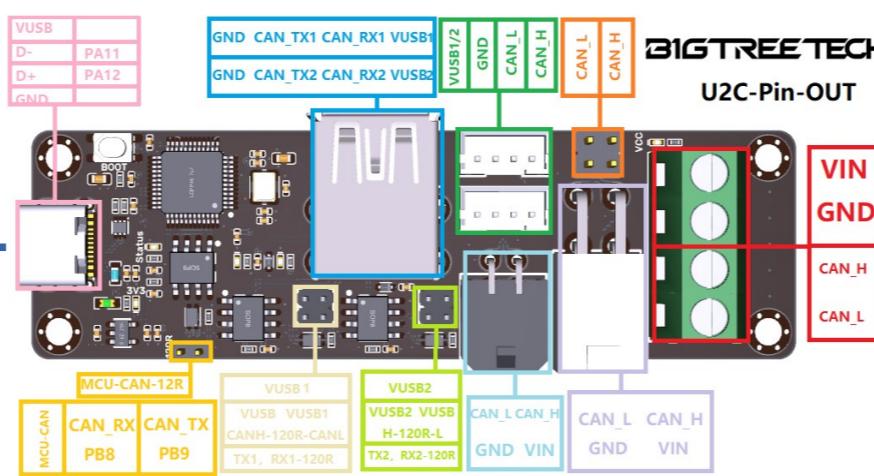
## XLR Panels

Wiring diagram



USB

5V - 3A



+24V

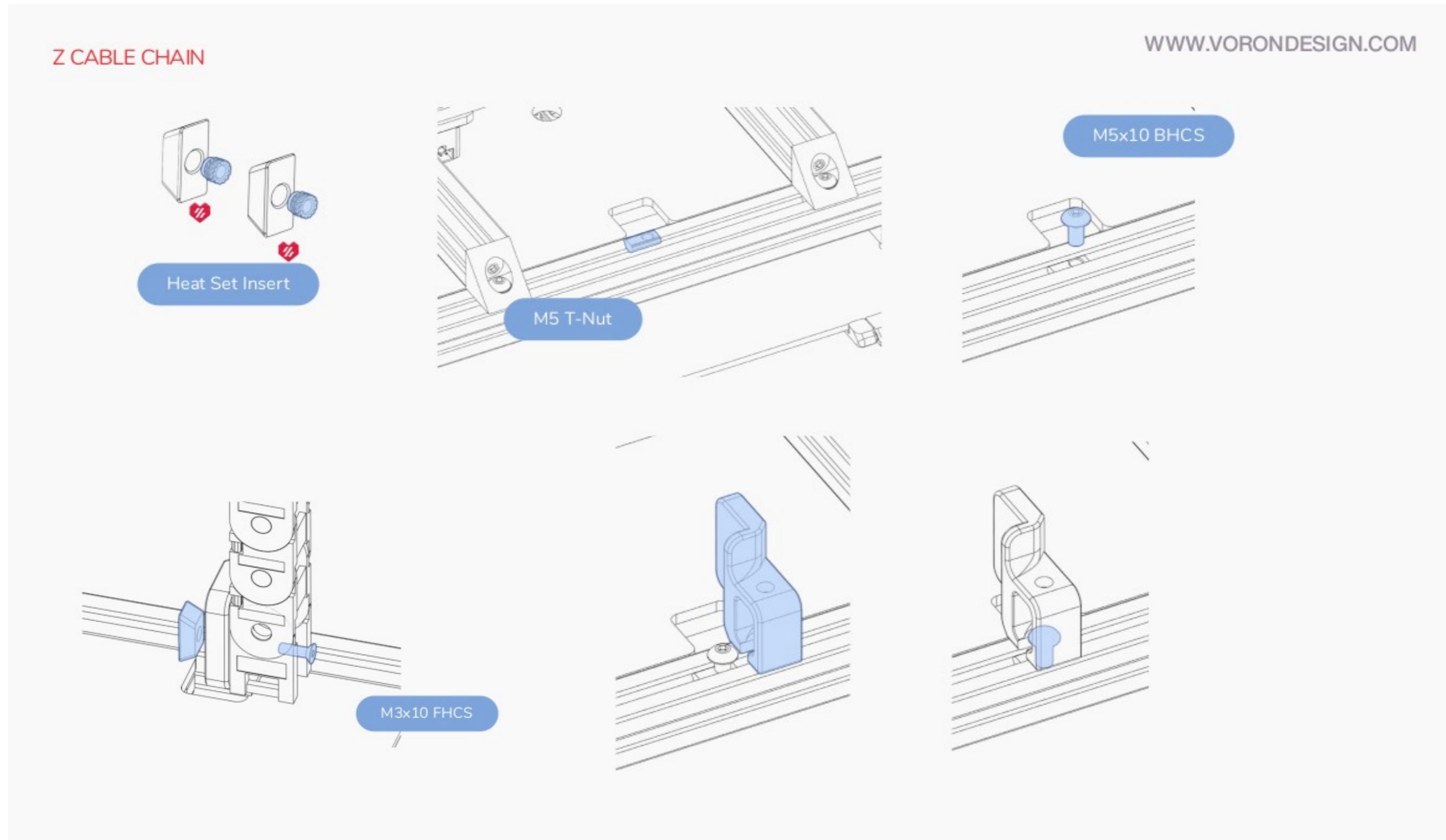
GND

# XLR Panels

Z cable chain relocation, anchor assembly

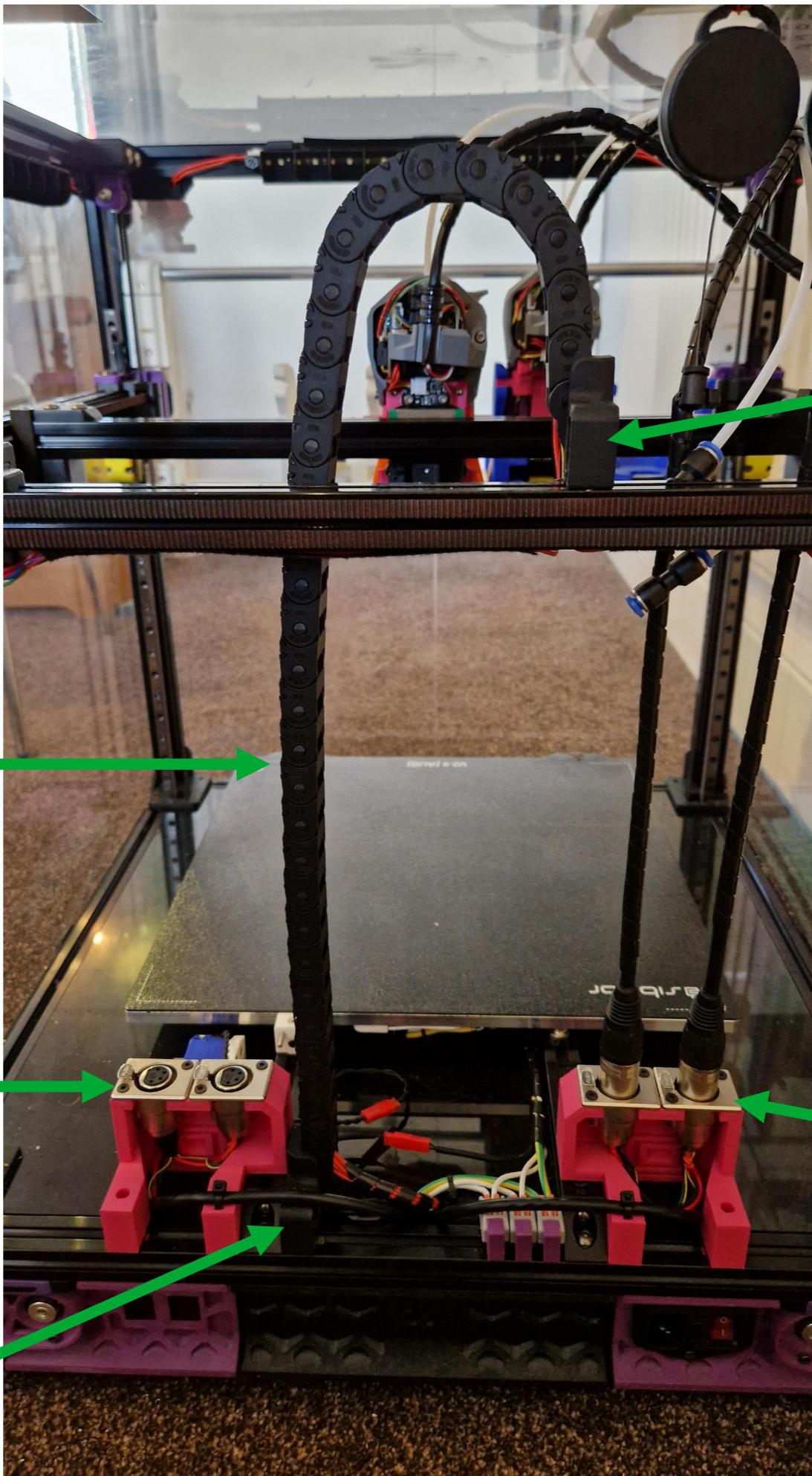
## A note for modularity:

You don't need to re-run the z cable chain to get the left XLR panel and tool-heads up and running.



# XLR Panels

Back View



(Same) Z chain as  
default machine

XLR panel (right)

z chain bottom anchor (mirror)  
... It is there, I swear

z chain bottom anchor

## A note for CAN bus:

CAN bus does not need any electrical components to add more device in parallel.

You can literally just wires more power and signal lines up in parallel.

# Endstops Assembly

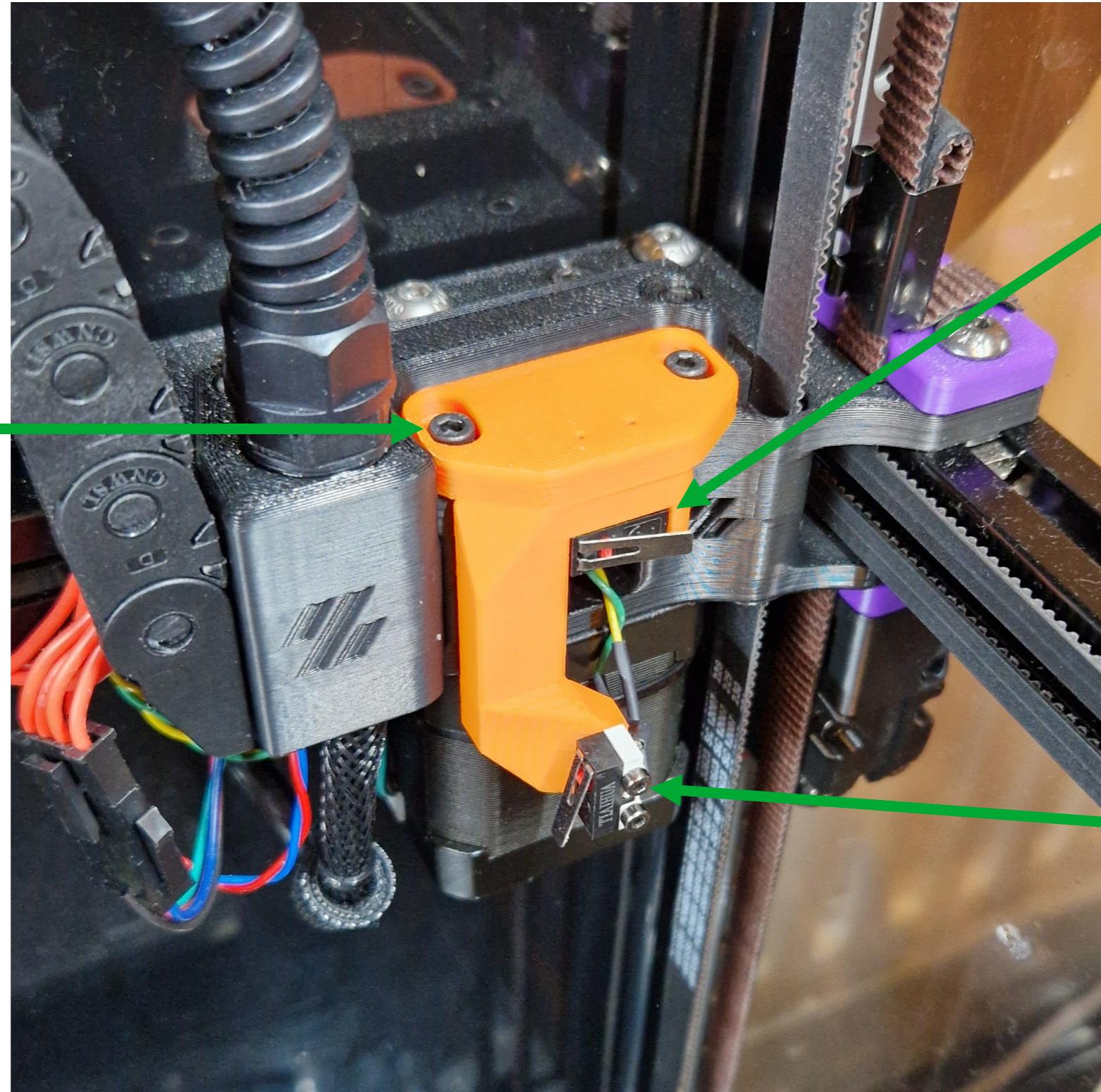
Item	Quantity	Note
Endstops_Mount	1	
Micro switches	2	

Fill space, for the  
purpose of filling  
spaces

# Endstops assembly

Bundling the X and Y endstop to the back right

M3x35mm x2



**Y endstop switch (NC)**

Mounted with 2 off  
M2x10mm self-tapping  
screw

**X endstop switch (NC)**

Mounted with 2 off  
M2x10mm self-tapping  
screw

**Note:**

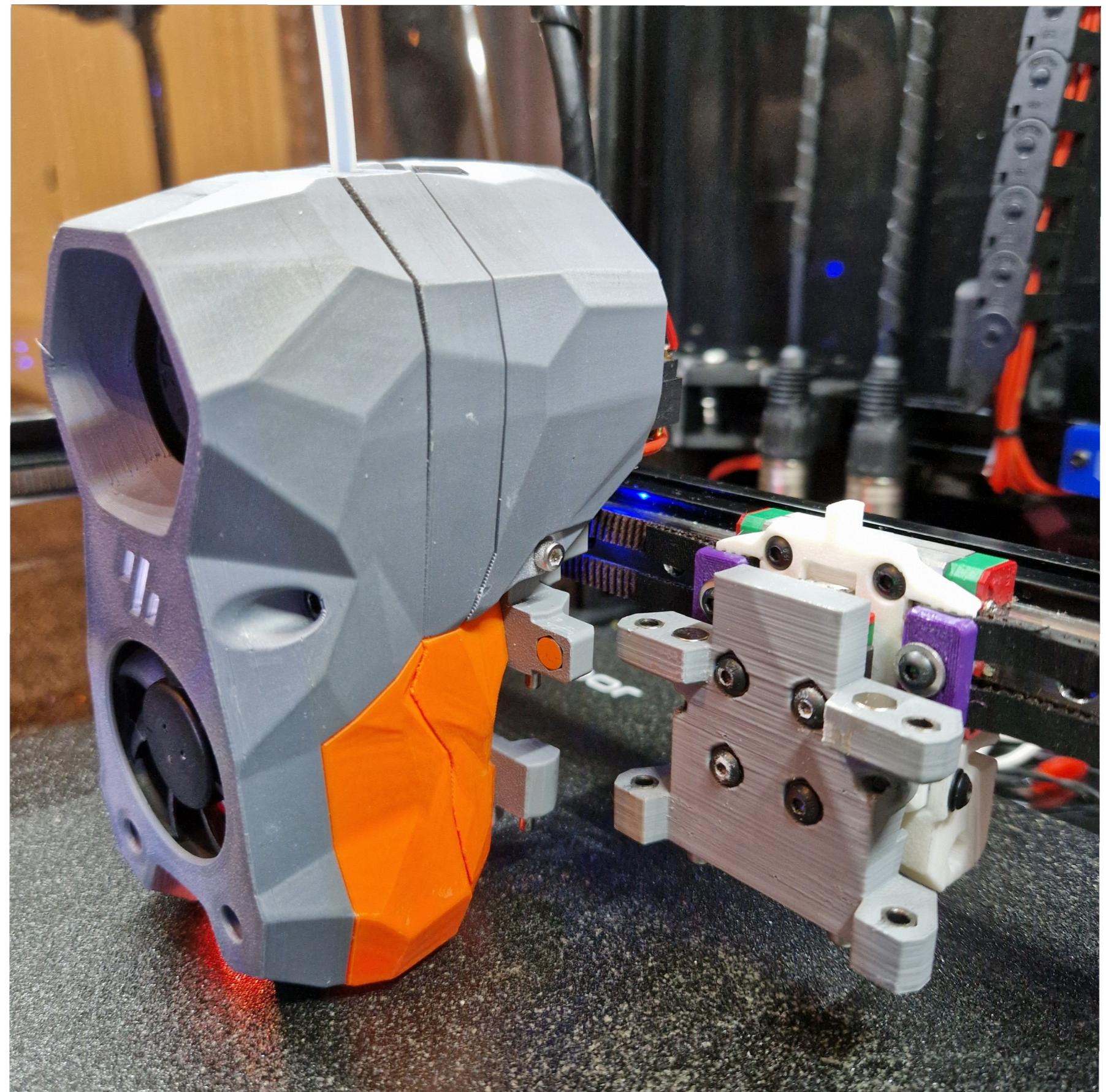
This component also  
comes with built-in  
support

# Tool-head Assembly

Part 1: the easy part

**For this assembly:**

- The steps of putting the Stealthburner together will not be shown
- Although there has been some changes to the design since the making of these video guides, [part 1](#) and [part 2](#),



# Endstops Assembly

Item	Quantity	Note
Voron-Stealthburner toolhead(s)	1	This guide will assumes that the Stealburner parts has been built and ready to go.
MGN9_Assembly_Tool	1	Original Voron Tap part
Tap_Belt_Cover_r8_x2	2	Original Voron Tap part
Tap_Center_left_r8	1	Original Voron Tap part
Tap_Center_r8	1	Original Voron Tap part
Tap_Center_right_r8	1	Original Voron Tap part
Tap&Change-Front_Rail_Side	1	
Tap&Change-Front_TH_Side	1	
Tap&Change-Spacer_x2	2	
Tap&Change-Upper	1	
Tap&Change_X_Trigger	1	
6x3mm magnets	8	+4 per additional tool-head
Sleeve Bearing 3mm Bore x 5mm OD x 5mm Length Plain Bearings	4	
3x15mm, 304 stainless steel round head pins	4	+4 per additional tool-head
MGN9H carriage + rail	1	
M3 nut	4	
M3 washers	8	
M3x3.0 threaded inserts	2	+2 per additional tool-head
M3x5x4mm threaded inserts	8	+5 per additional tool-head
Voron Opto Tap PCB	1	+1 per additional tool-head

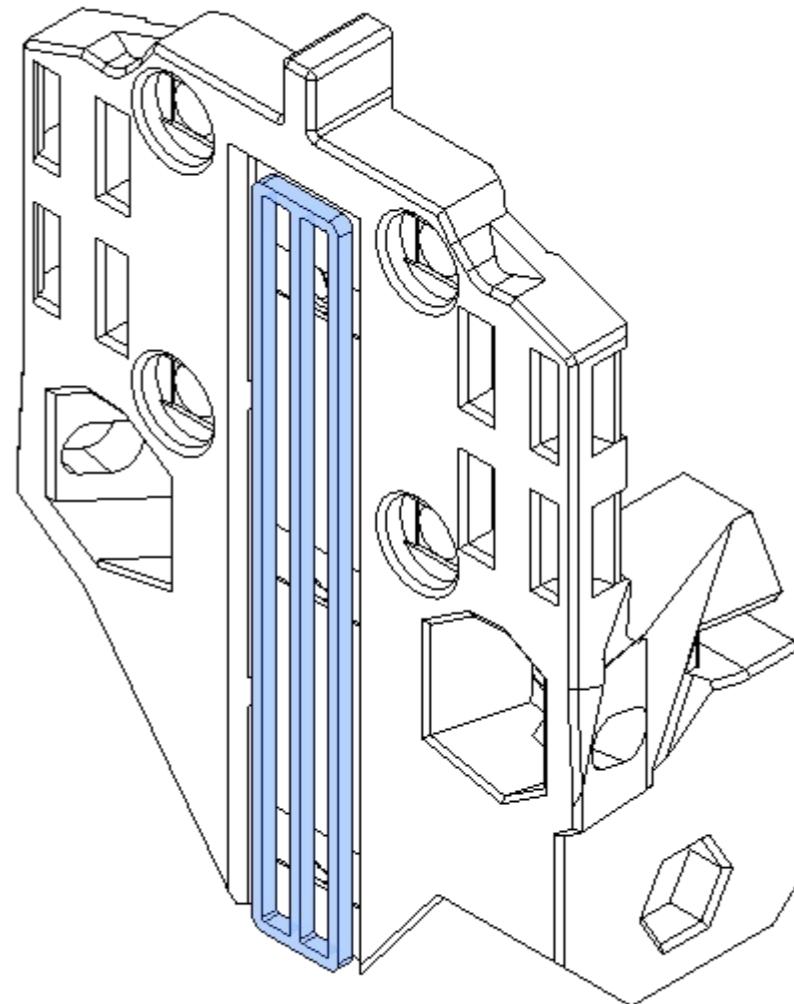
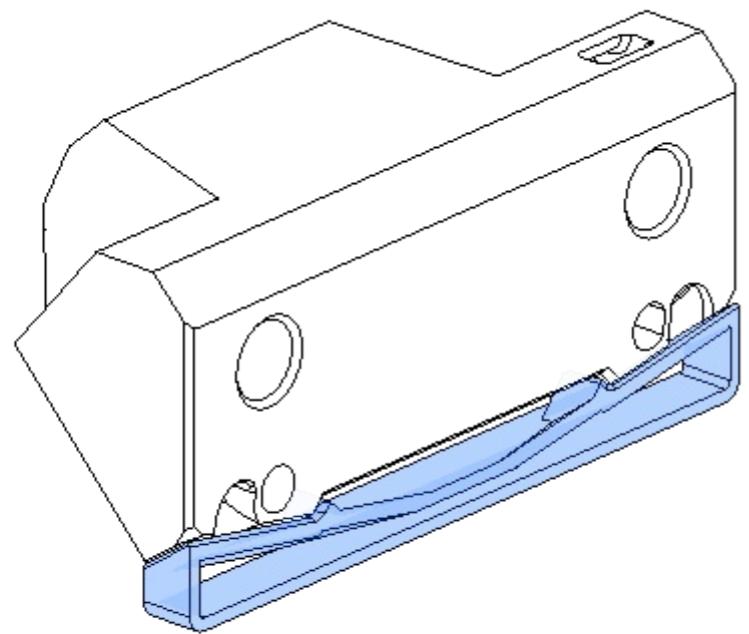
# Endstops Assembly

Item	Quantity	Note
countersunk bolt M3x6mm	2	
socket head bolt M3x16mm	2	+2 per additional tool-head
socket head bolt M3x20mm	2	+2 per additional tool-head
socket head bolt M3x30mm	2	
socket head bolt M3x50mm	2	
button head bolt M3x6mm	6	+2 per additional tool-head
button head bolt M3x20mm	2	+2 per additional tool-head

# Tool-head Assembly

## Built-in Support

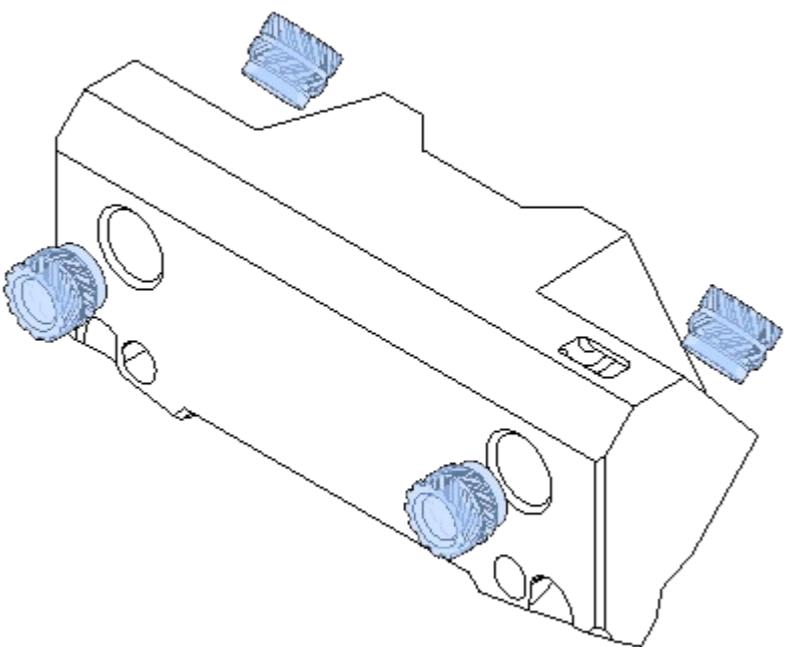
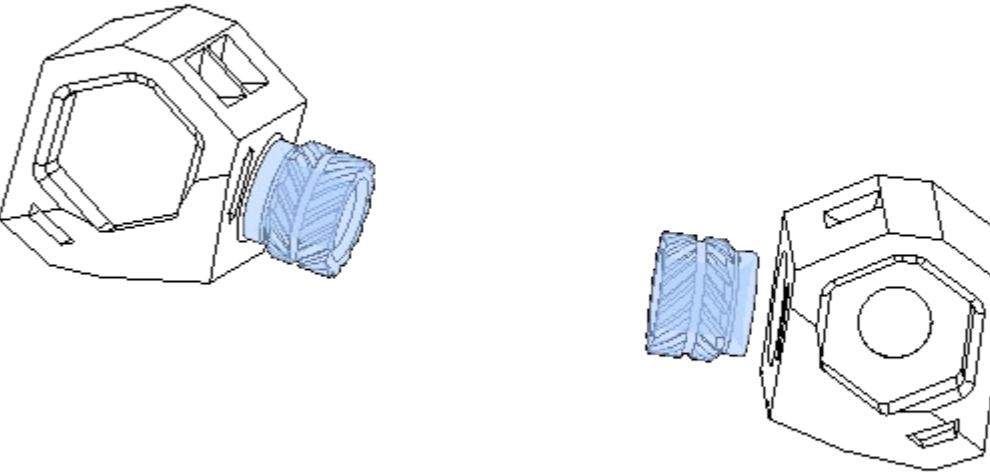
The built-in supports for these parts are the same as Voron-Tap.



# Tool-head Assembly

## Threaded Insert

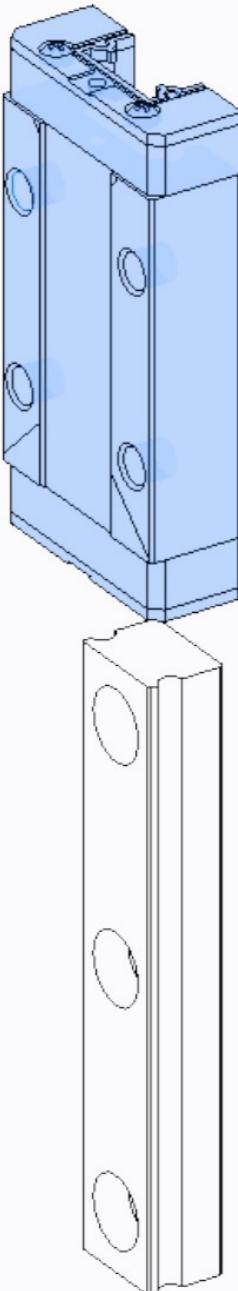
These M3x5x4 threaded inserts are also the same as Voron Tap.



# Tool-head Assembly

Keeping the balls in place

WWW.VORONDESIGN.COM



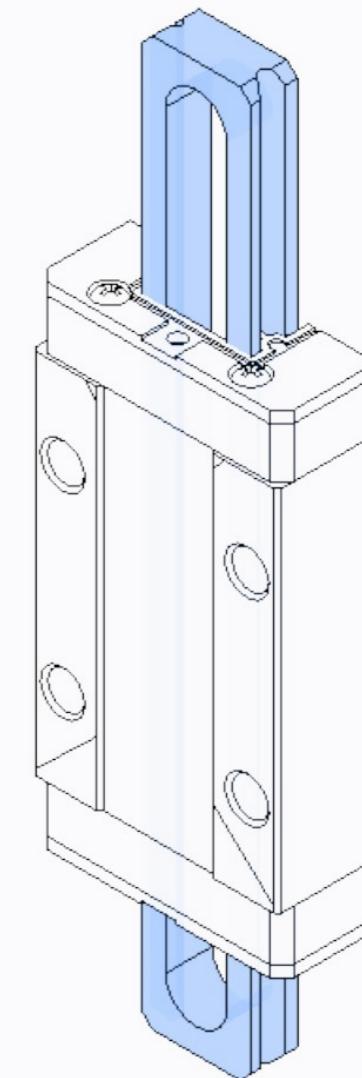
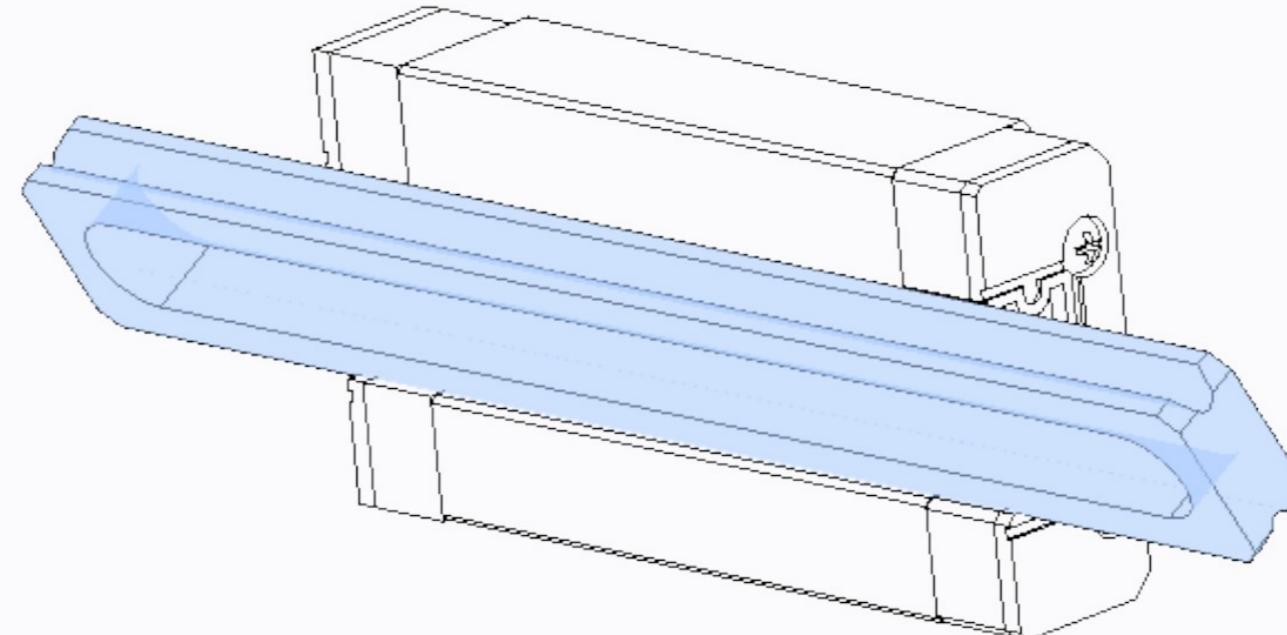
## CAREFULLY REMOVE THE CARRIAGE

Do this over a bowl or other container, just in case a ball drops out. If some do, don't panic! They can be pushed back in, just add the balls back to the middle of the carriage.

## MGN9 ASSEMBLY TOOL

Fit the tool over the bearings on one side. Squeeze the sides of the tool and rotate it to fit it over the other side's bearings, then release pressure.

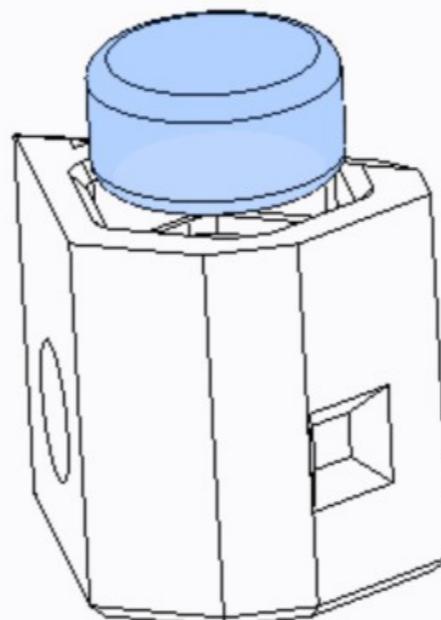
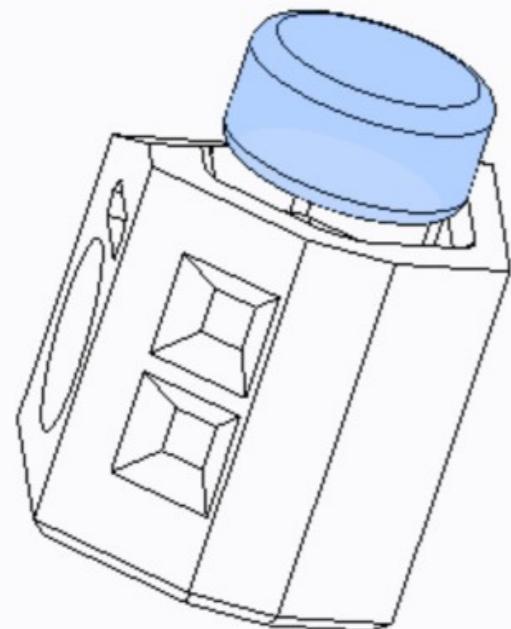
The tool serves to hold the balls in place when not installed on a rail, and will help you reinstall the carriage later. Not bad for a 7 minute print, right?



# Tool-head Assembly

## Magnets

(2) 6x3 magnets  
2 drops RTV or Superglue



### MAGNET PRESS

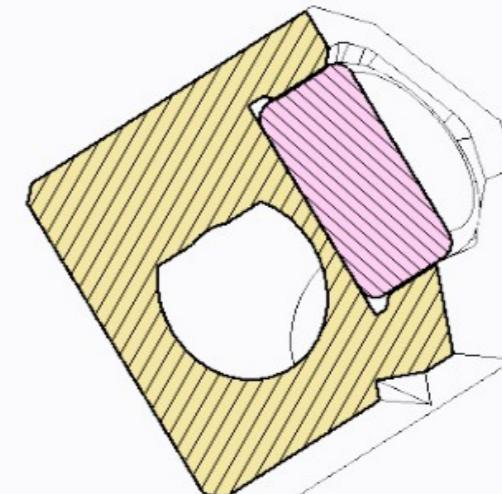
1. Place magnet on a flat surface (polarity doesn't matter)
2. Place a drop of CA glue on top of the magnet
3. Place magnet holder on magnet.
4. Using a strong flat tool, firmly press magnet holder down over magnet.

Do this for both left and right magnet holders.

Alternately you can use channel lock pliers (or a vise) for this,. Whatever tool you use please go slow and don't crush the parts or your fingers!

### ROUND MAGNET, HEX HOLE

The magnet seats here hold much better than a round hole. The seats have been carefully designed and tested to maximize holding power.



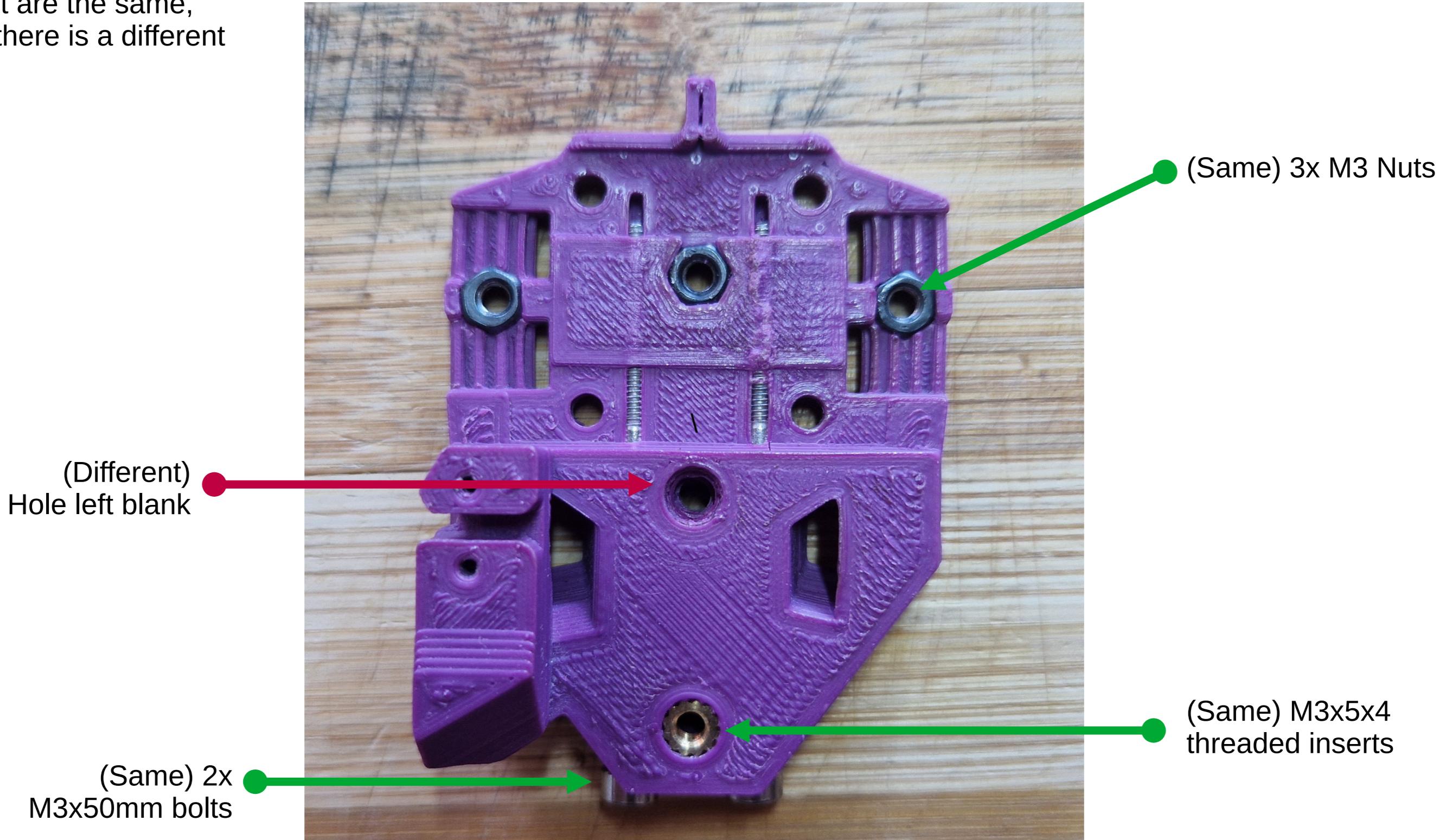
### DO YOU SMELL...GLUE?

Yes, yes you do. Specifically superglue, but you could also use RTV silicone, just a drop. Is all that is needed. Despite our best efforts, the magnets can still come loose without it.

# Tool-head Assembly

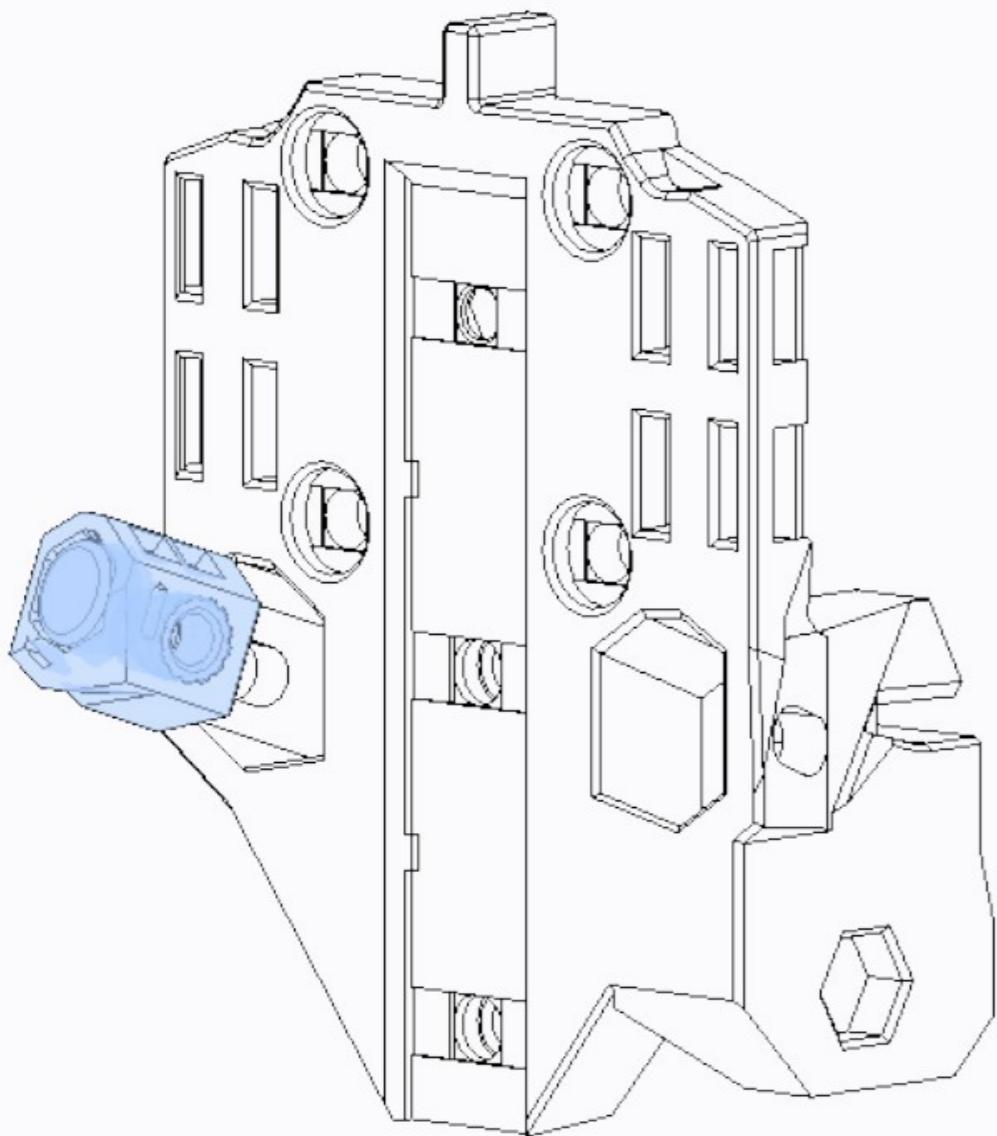
Tap Center

Most are the same,  
but there is a different



# Tool-head Assembly

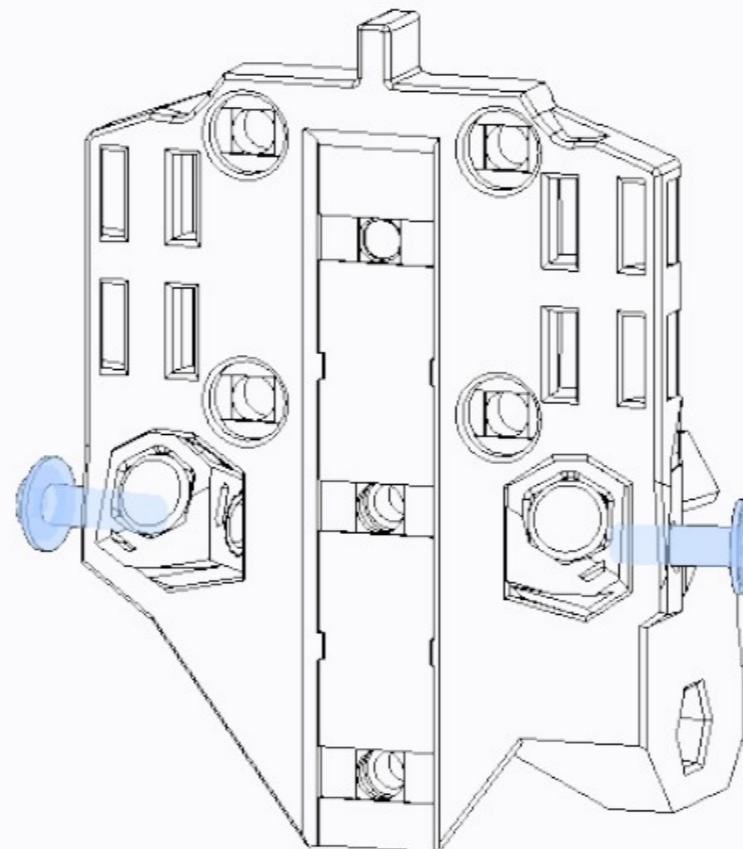
Carriage on



## 2 DOTS LEFT, ONE DOT RIGHT

The magnet holders are marked with dots.  
The left has two dots, the right has one dot.

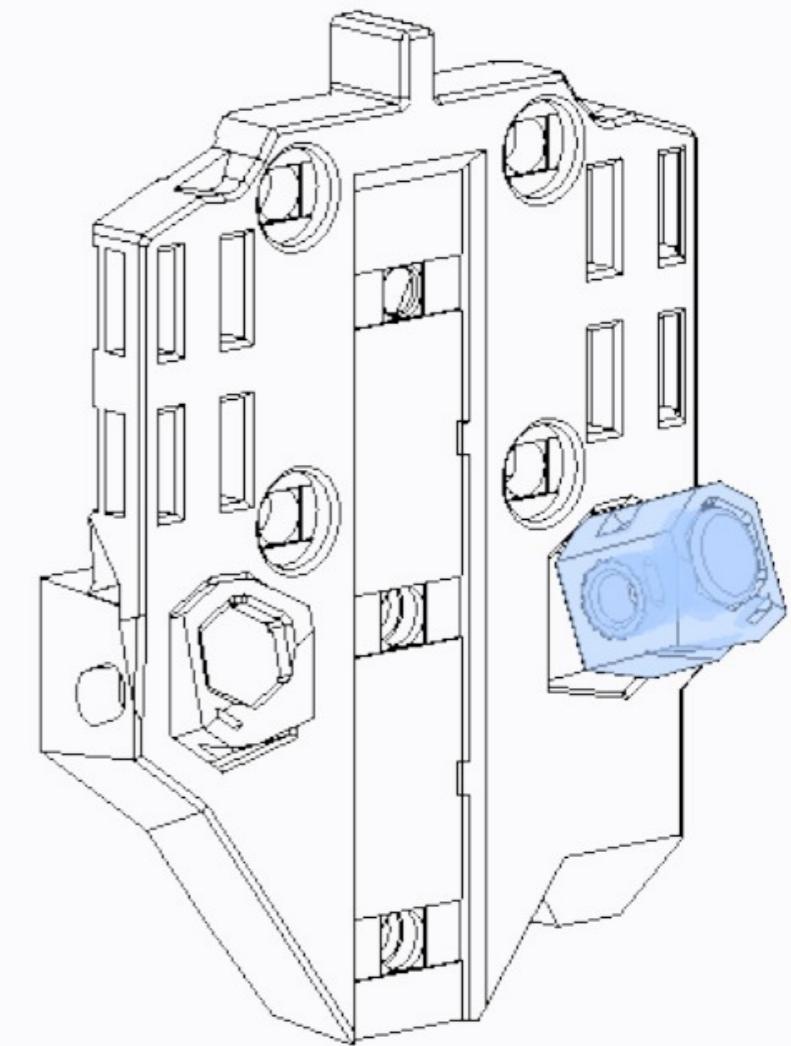
We could say that there is only one way they fit, but we don't want to underestimate you.



## SNUG IN FARTHEST BACK POSITION

These are the magnet adjustment screws. For now, just snug them up with the magnet holders as far back as they will go. We'll adjust them later.

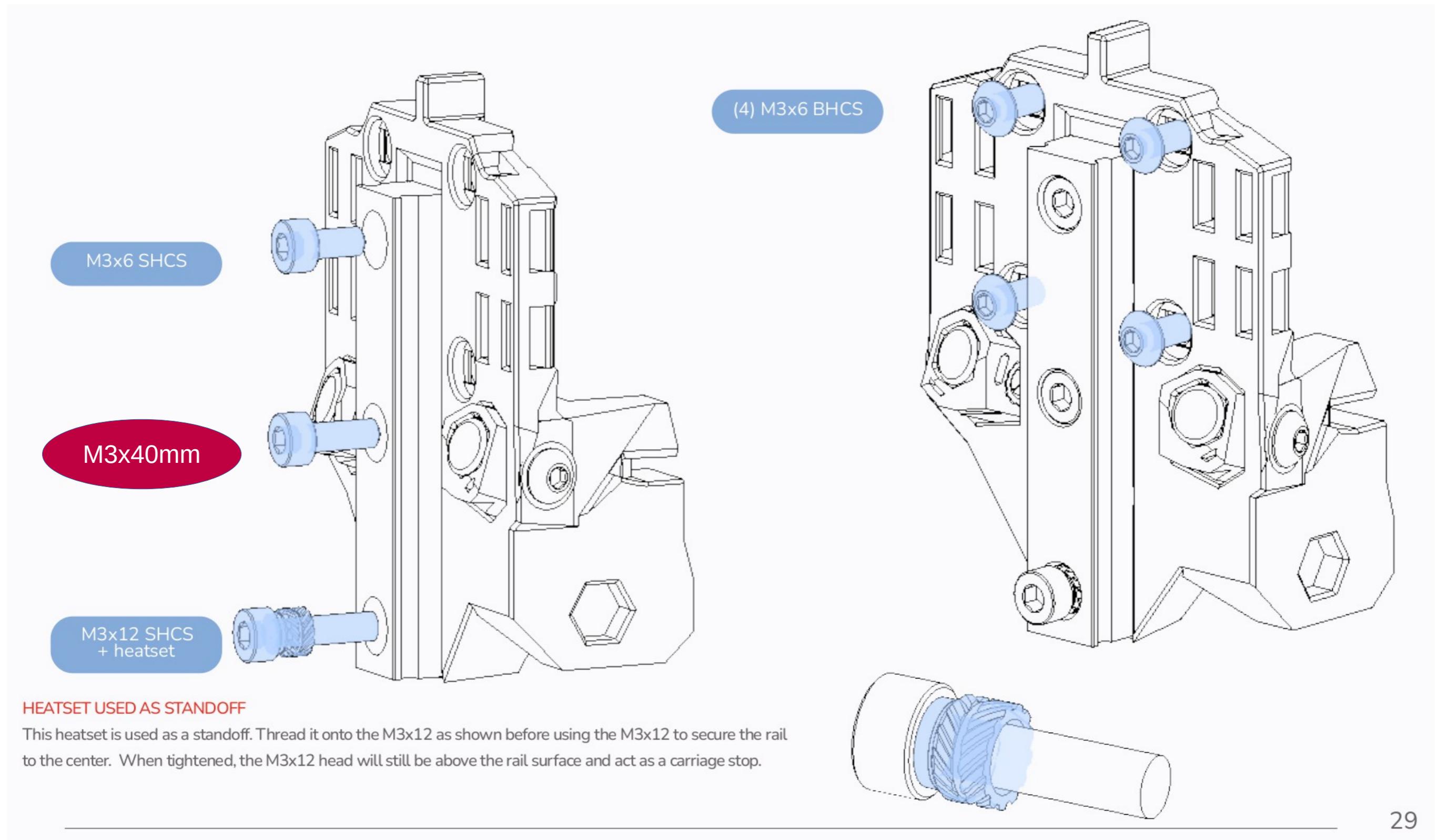
M3x10 BHCS  
+ M3 washer



# Tool-head Assembly

## Tap Center Assembly

Note: the origin Voron Tap documentation (shown here) use an older version of the Voron Tap Center. The actually, included, one is uses 2 extra pieces to hold the belt in place.

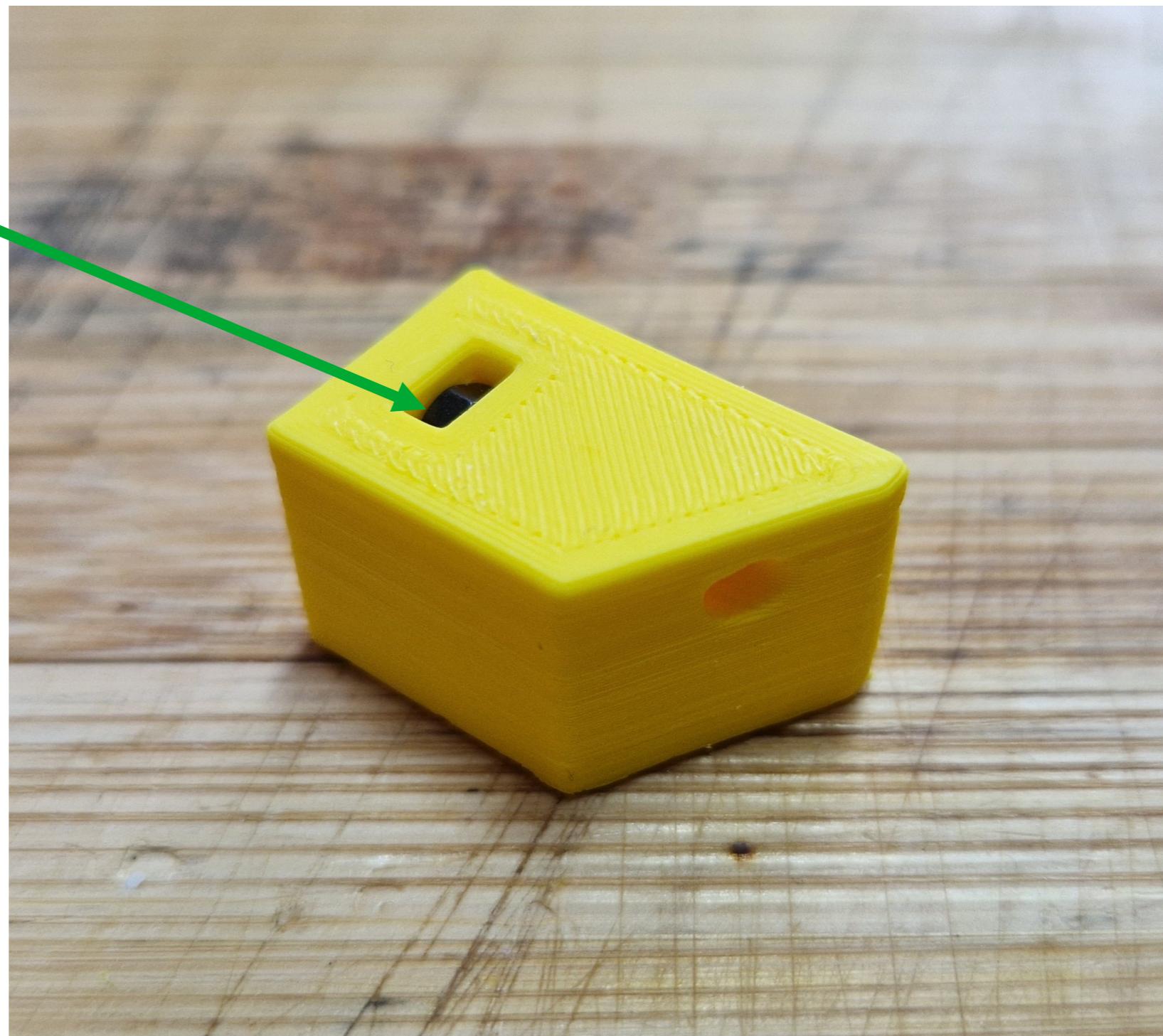


# Tool-head Assembly

X-trigger

M3 nut

**To be connected to the Tap Center**  
Via the M3x40mm bolt through the  
centre hole of the rail.



# Tool-head Assembly

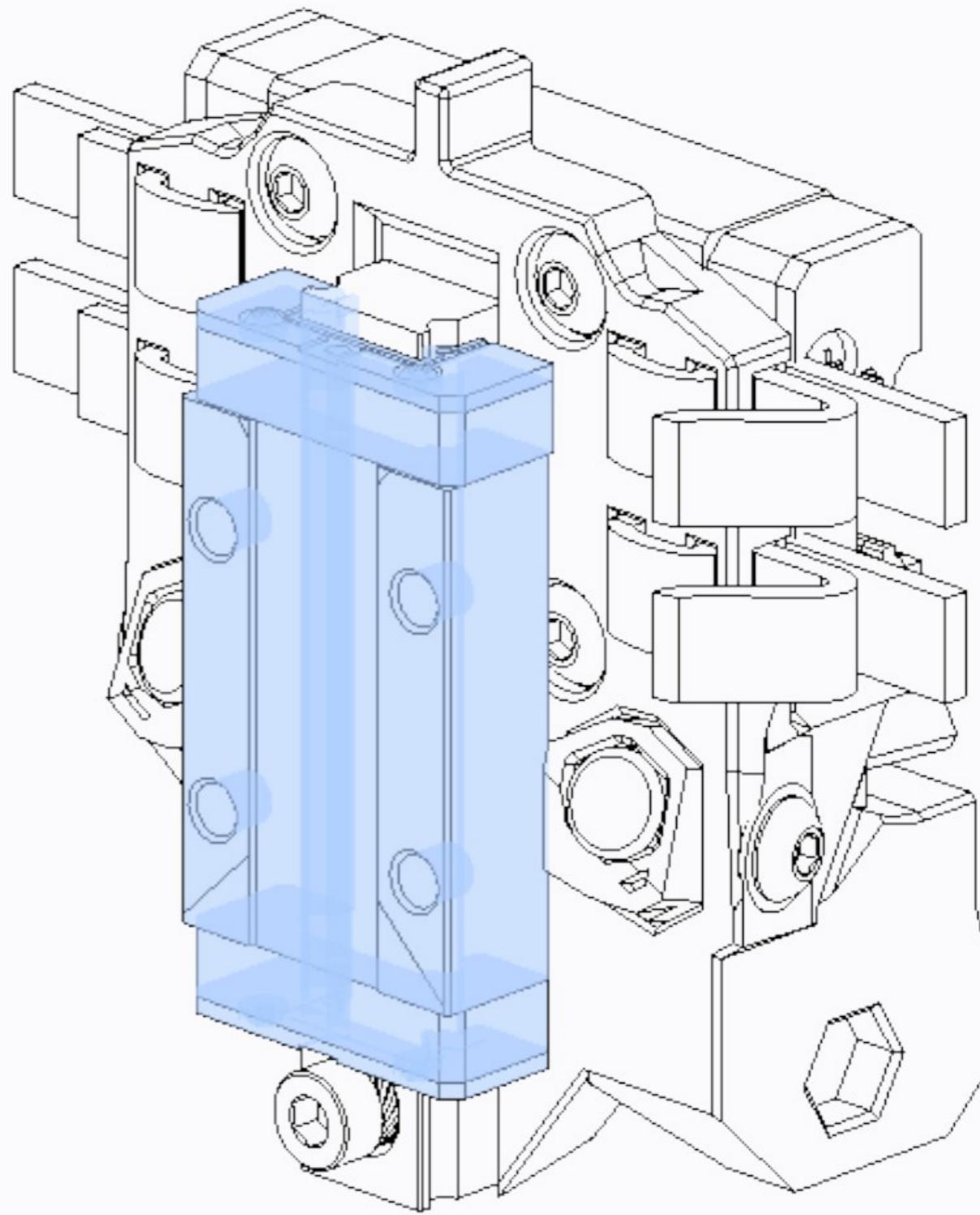
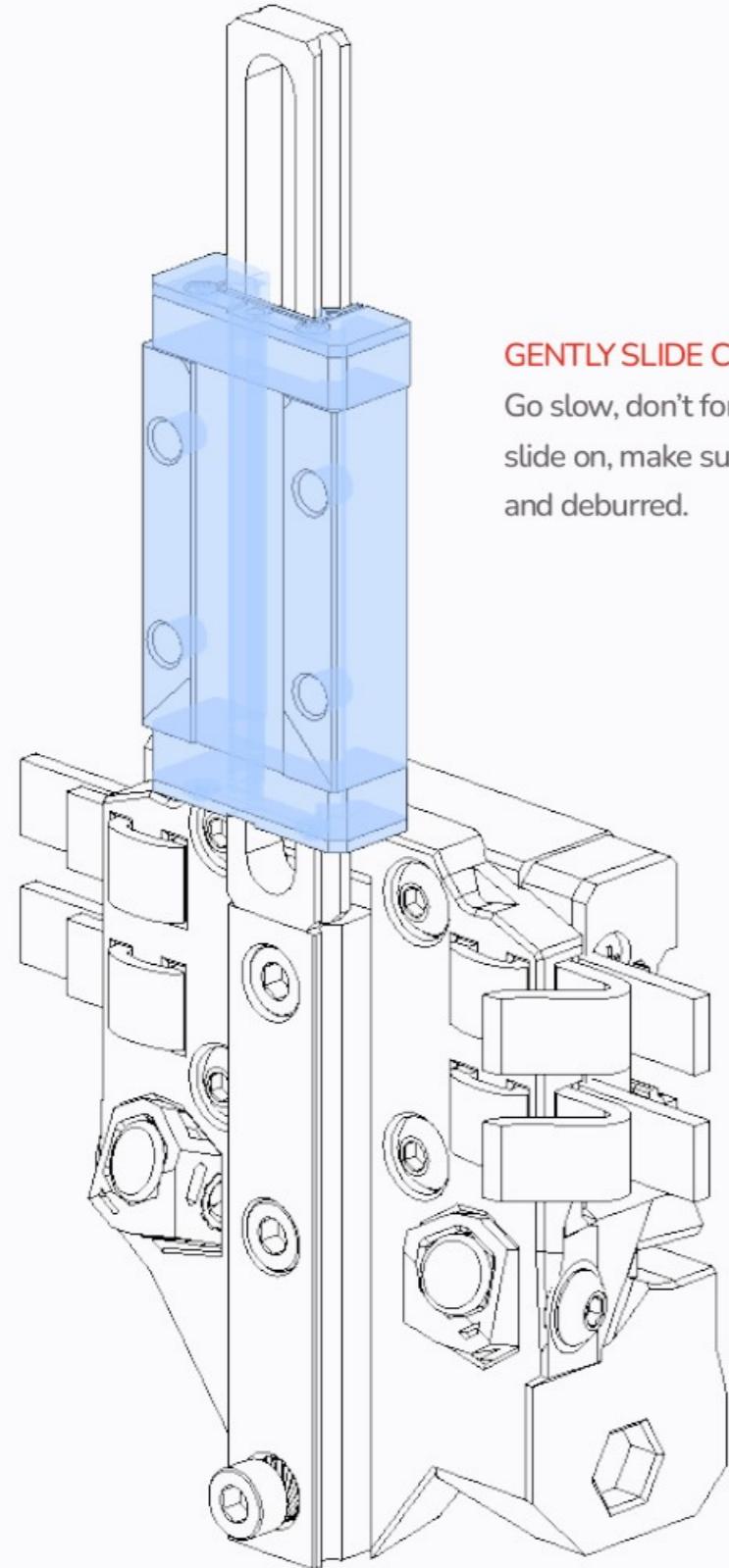
To the gantry, and beyond

The **X-trigger** and **Tap Center** can now be attached to the gantry.



# Tool-head Assembly

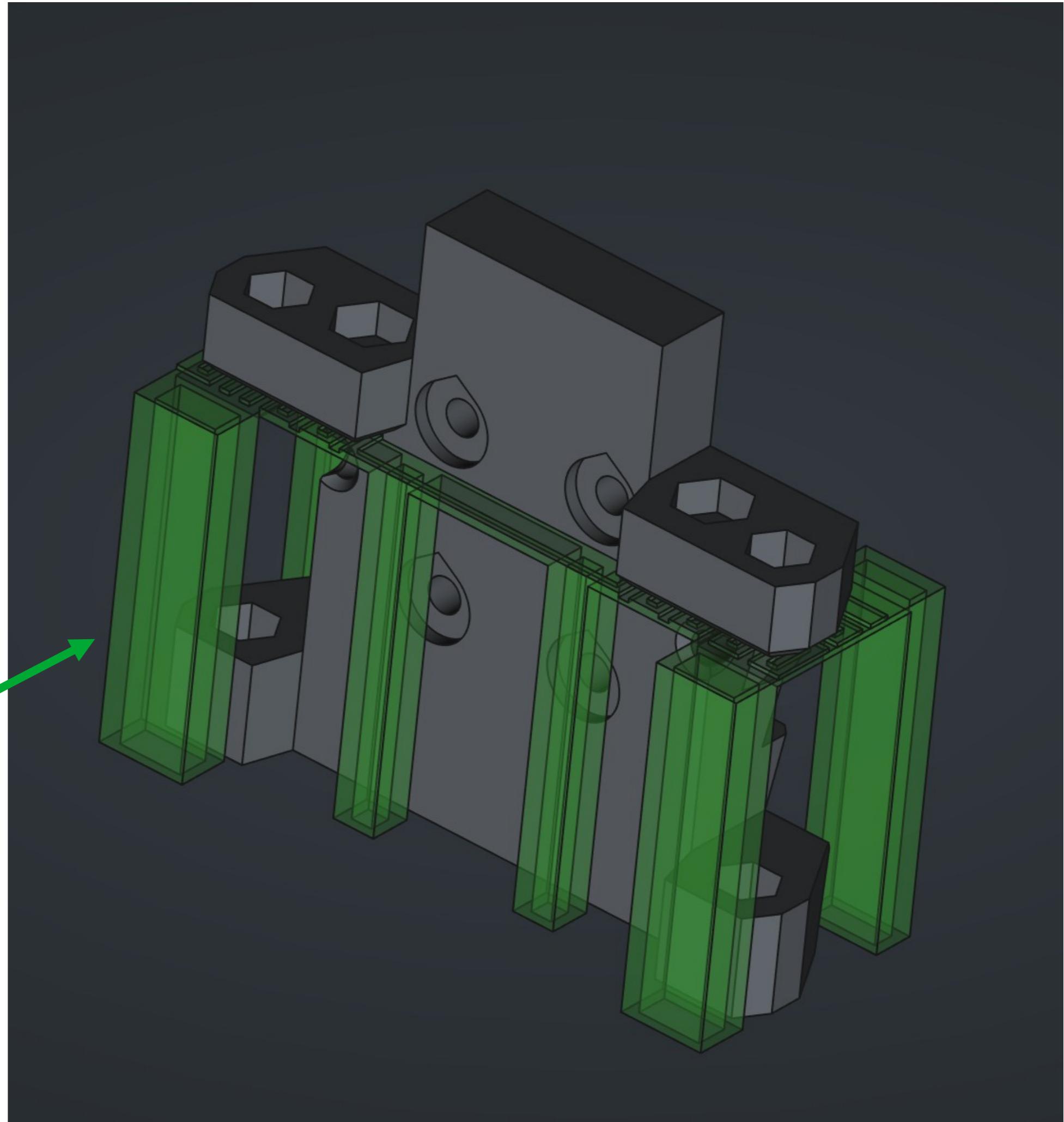
Carriage on



# Tool-head Assembly

Tap&change rail side

Built-in Support



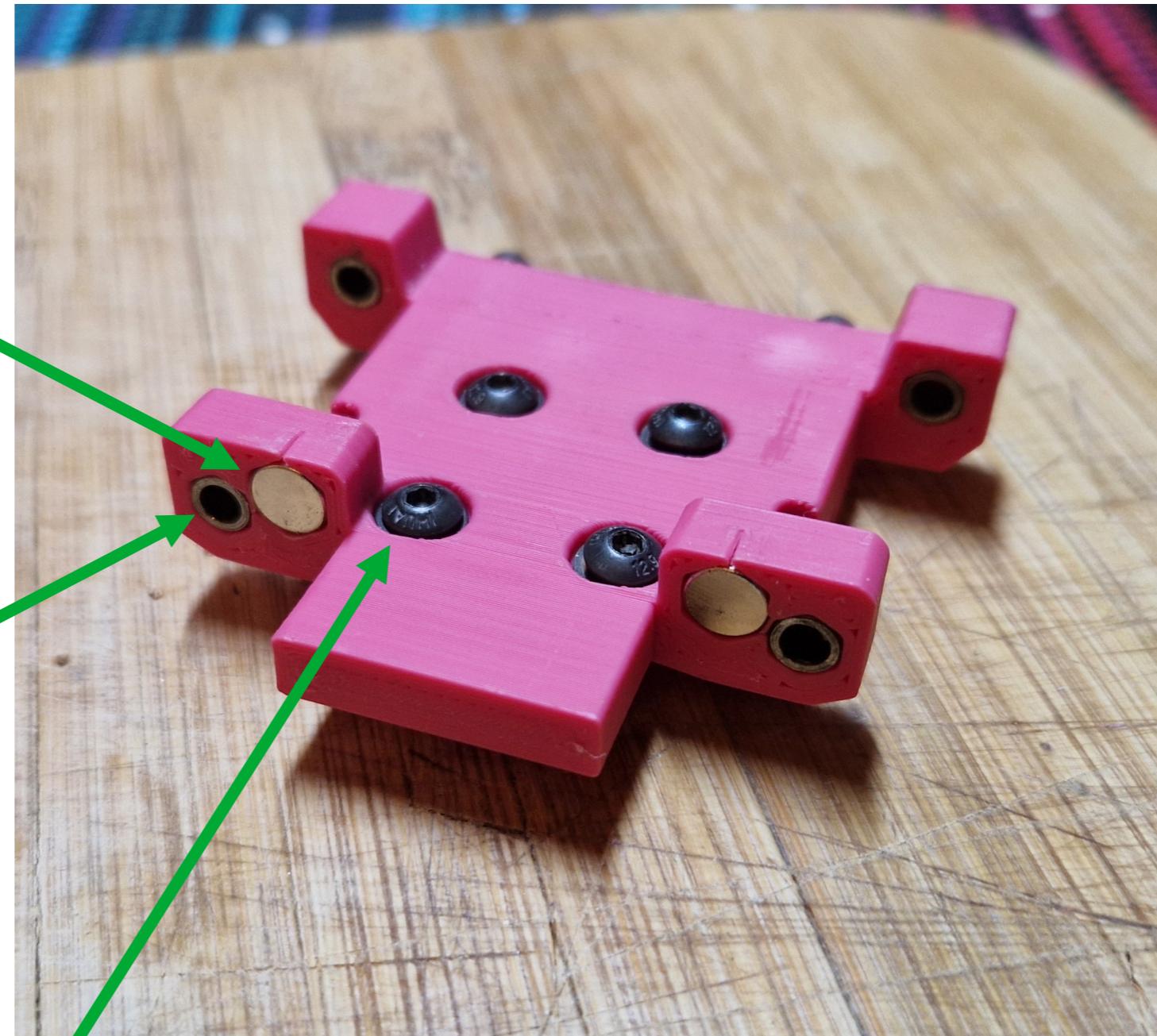
# Tool-head Assembly

Tap&change rail side

**6x3mm magnets glued x2**  
!!! the magnet need to be  
orientated to match that in  
the tool-head side !!!

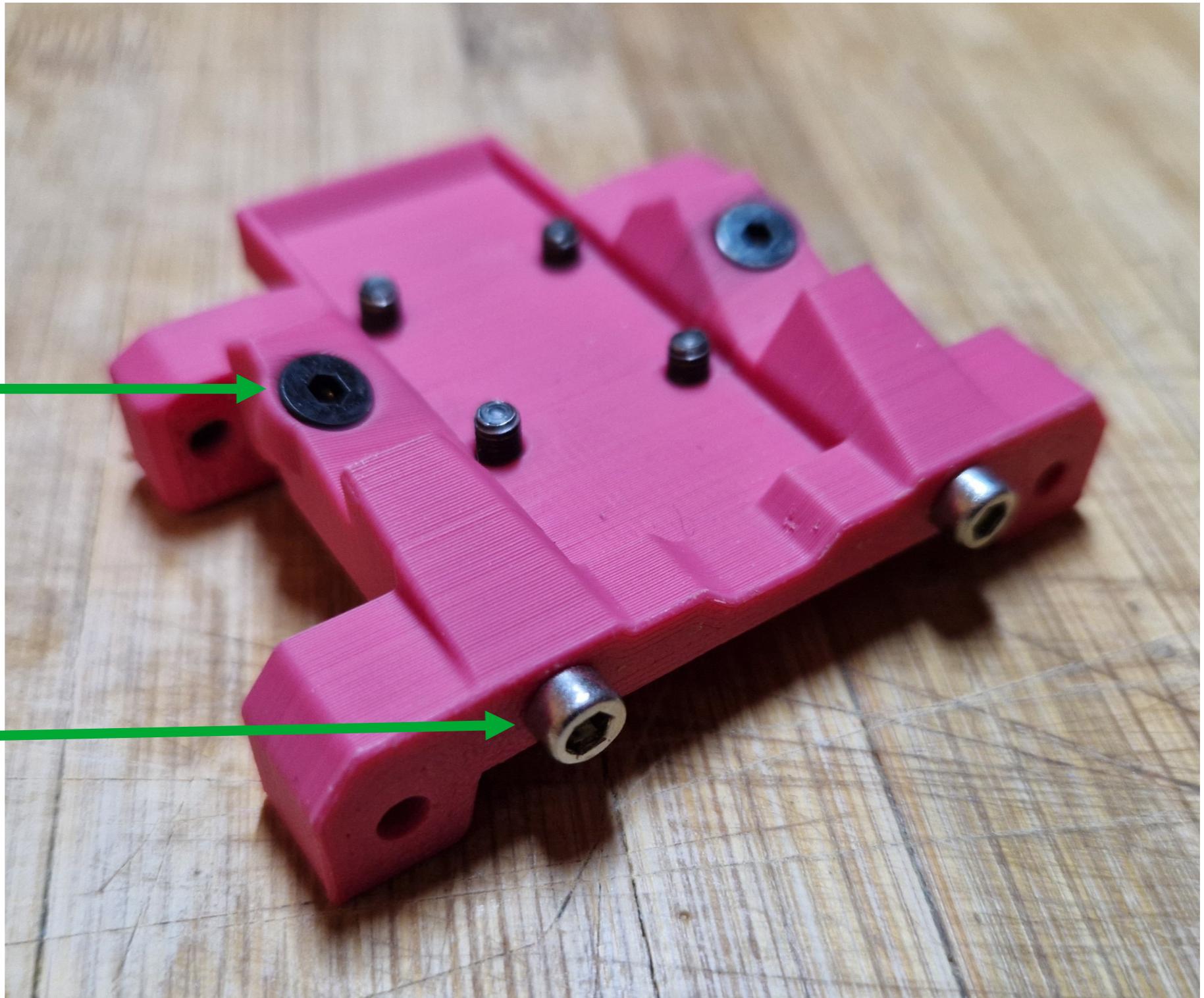
**3mm sleeve bearing x4**

**M3x6mm button head +  
M3 washer x4**



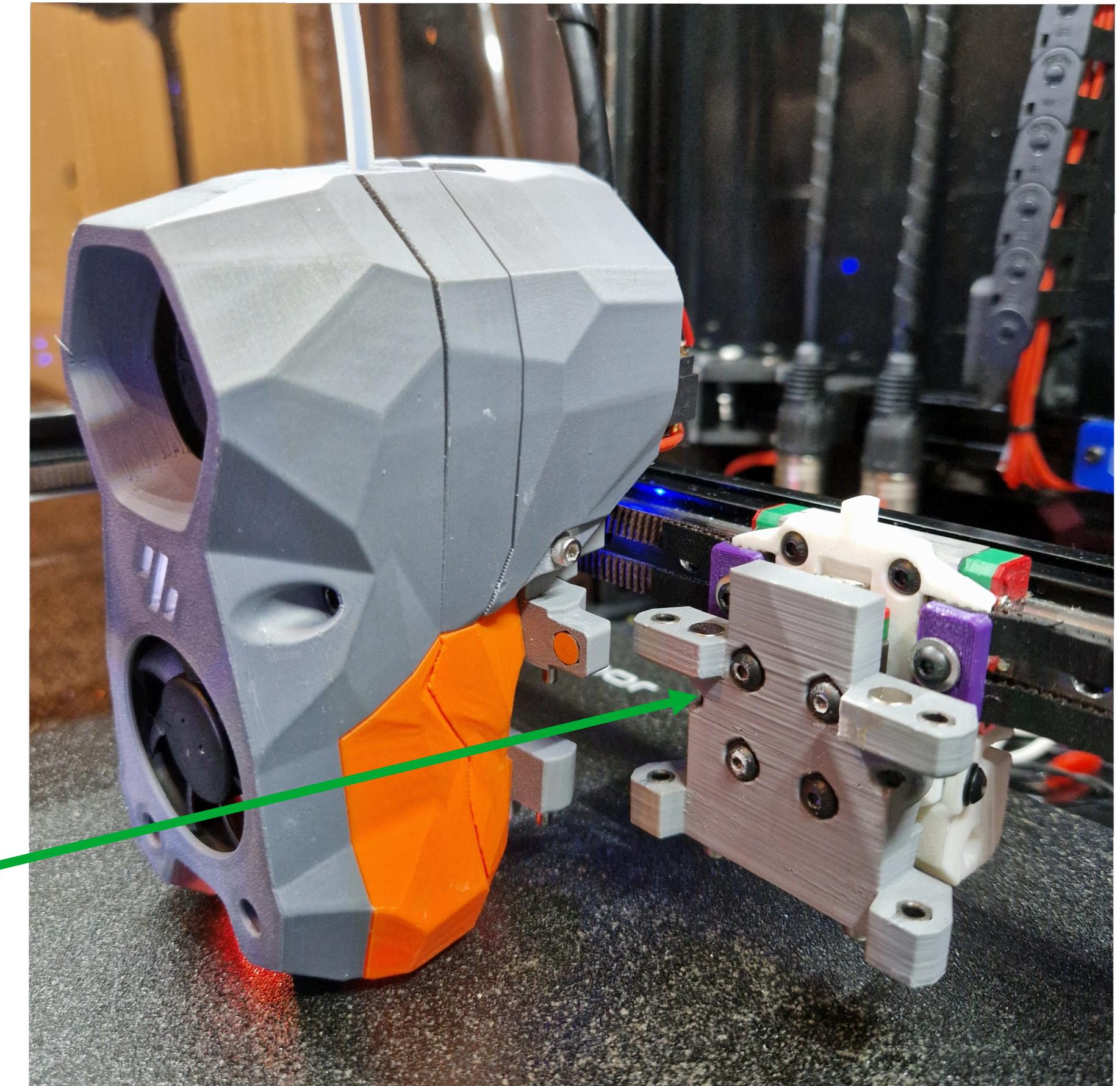
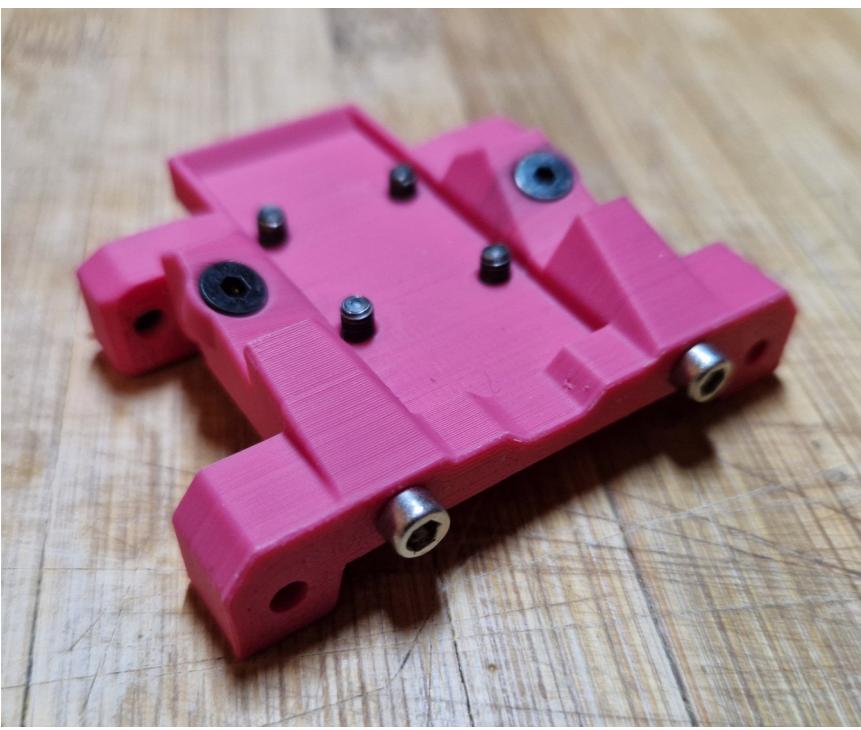
# Tool-head Assembly

Tap&change rail side



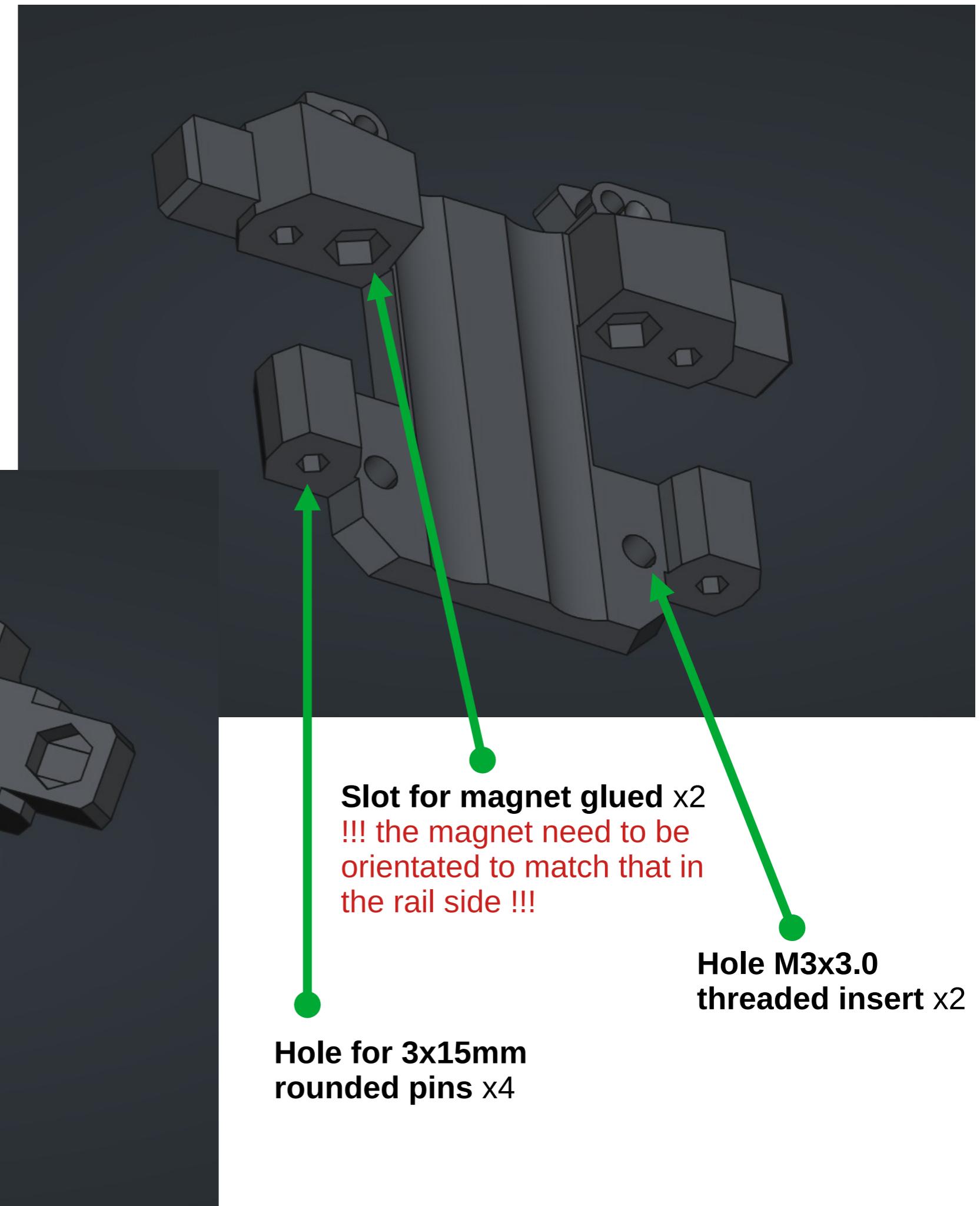
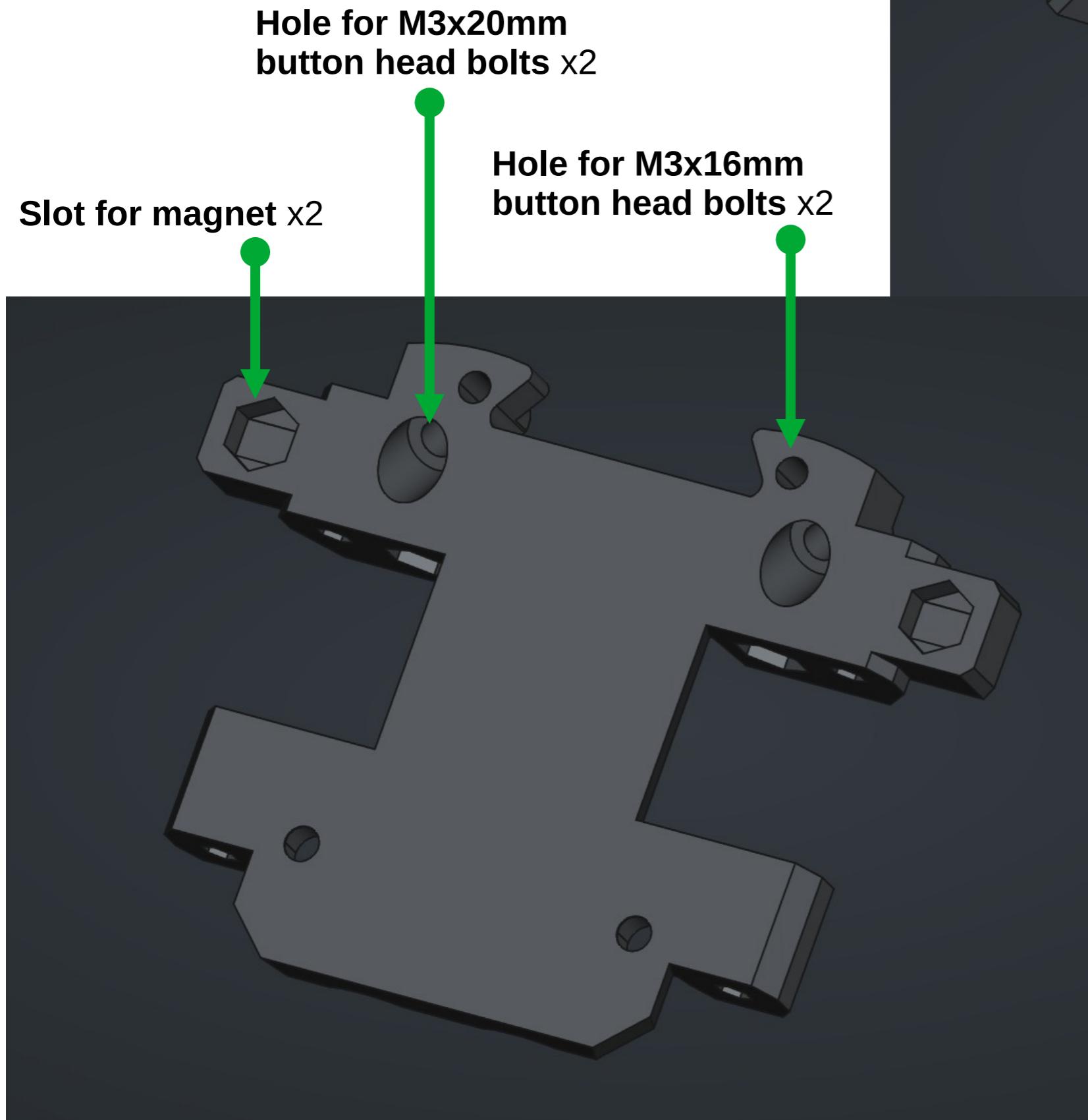
# Tool-head Assembly

Bolt to the carriage



# Tool-head Assembly

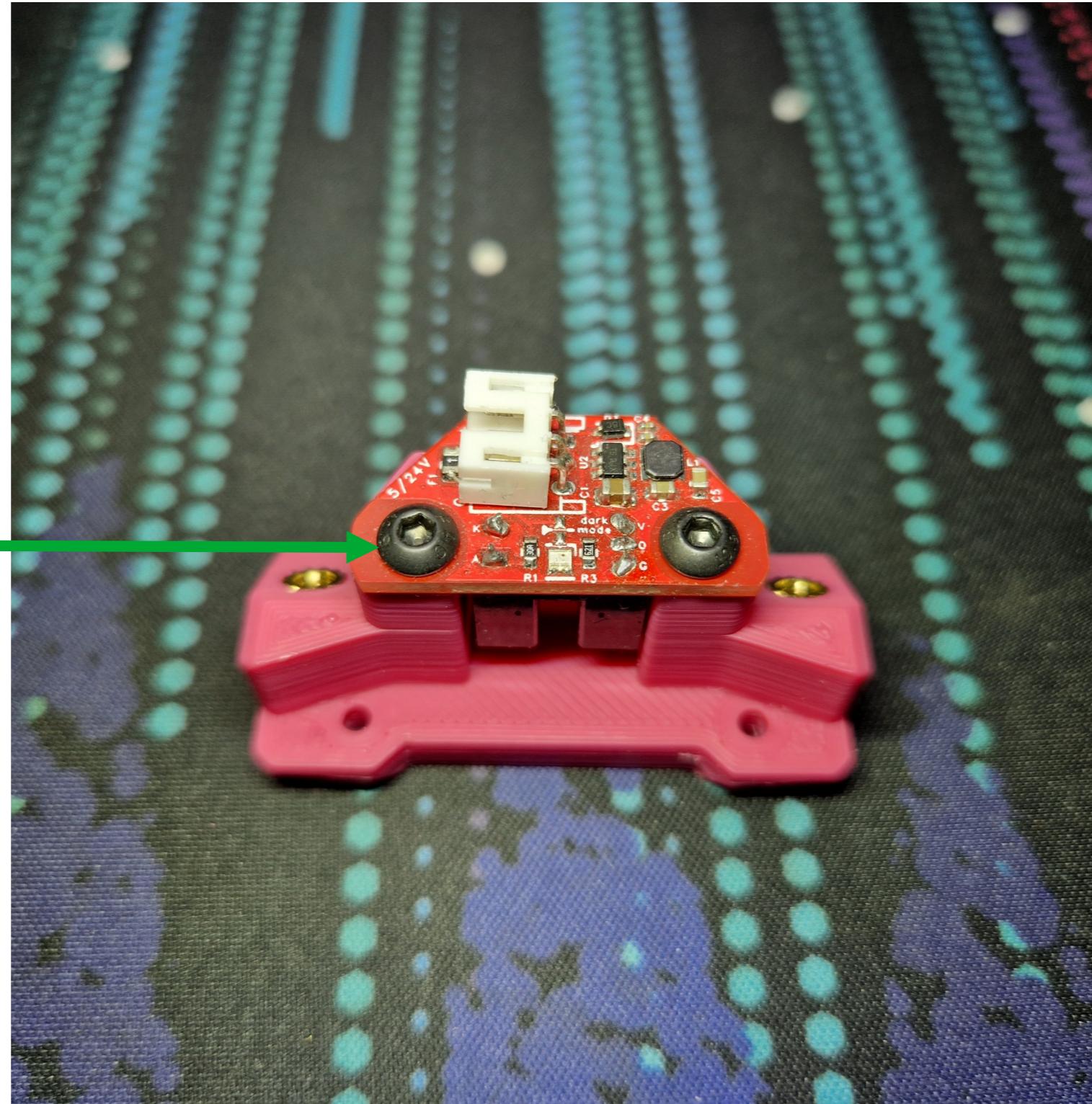
Tap&change tool-head side



# Tool-head Assembly

Tap&change sensor

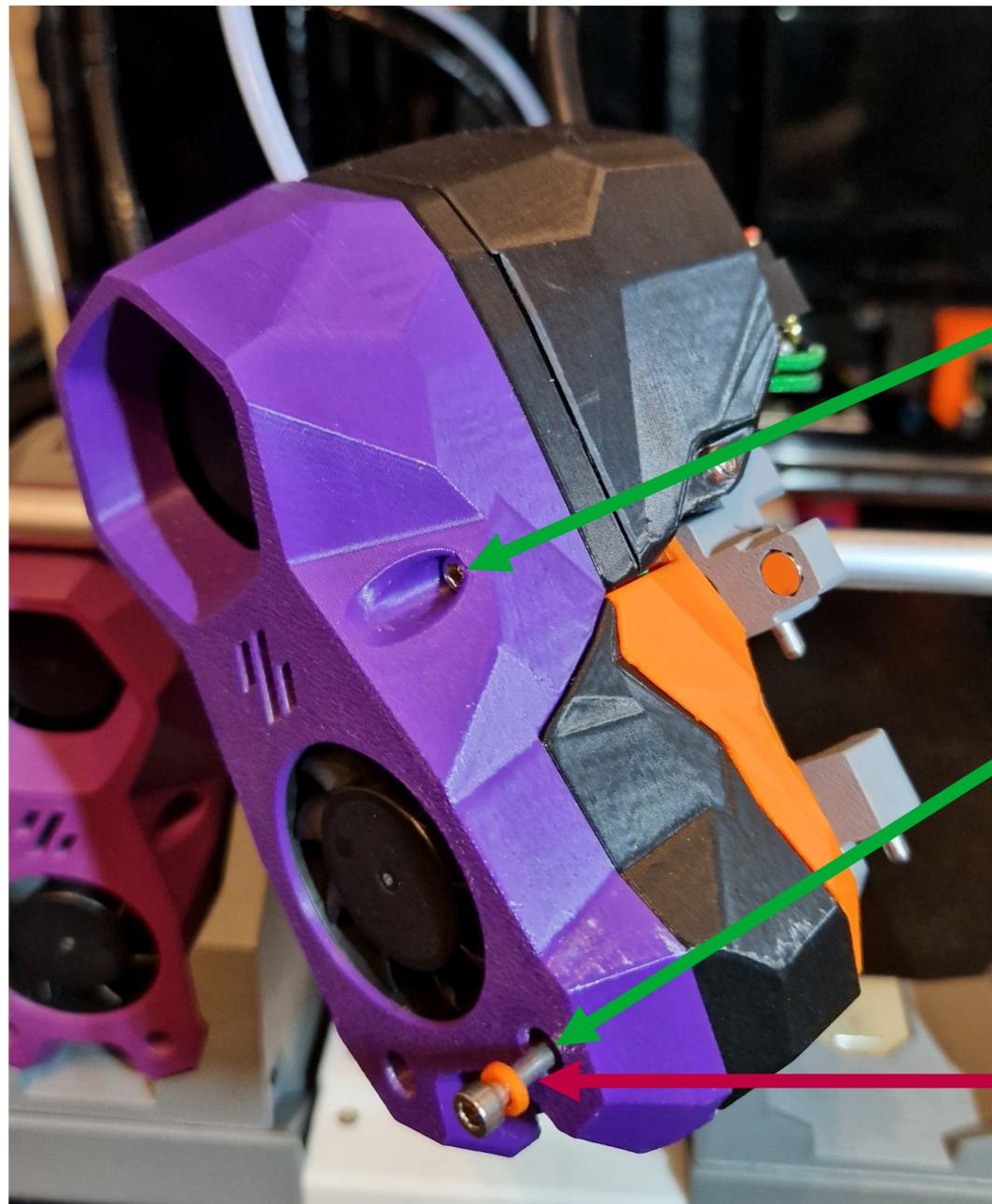
M3x6mm x2



# Tool-head Assembly

All assembled

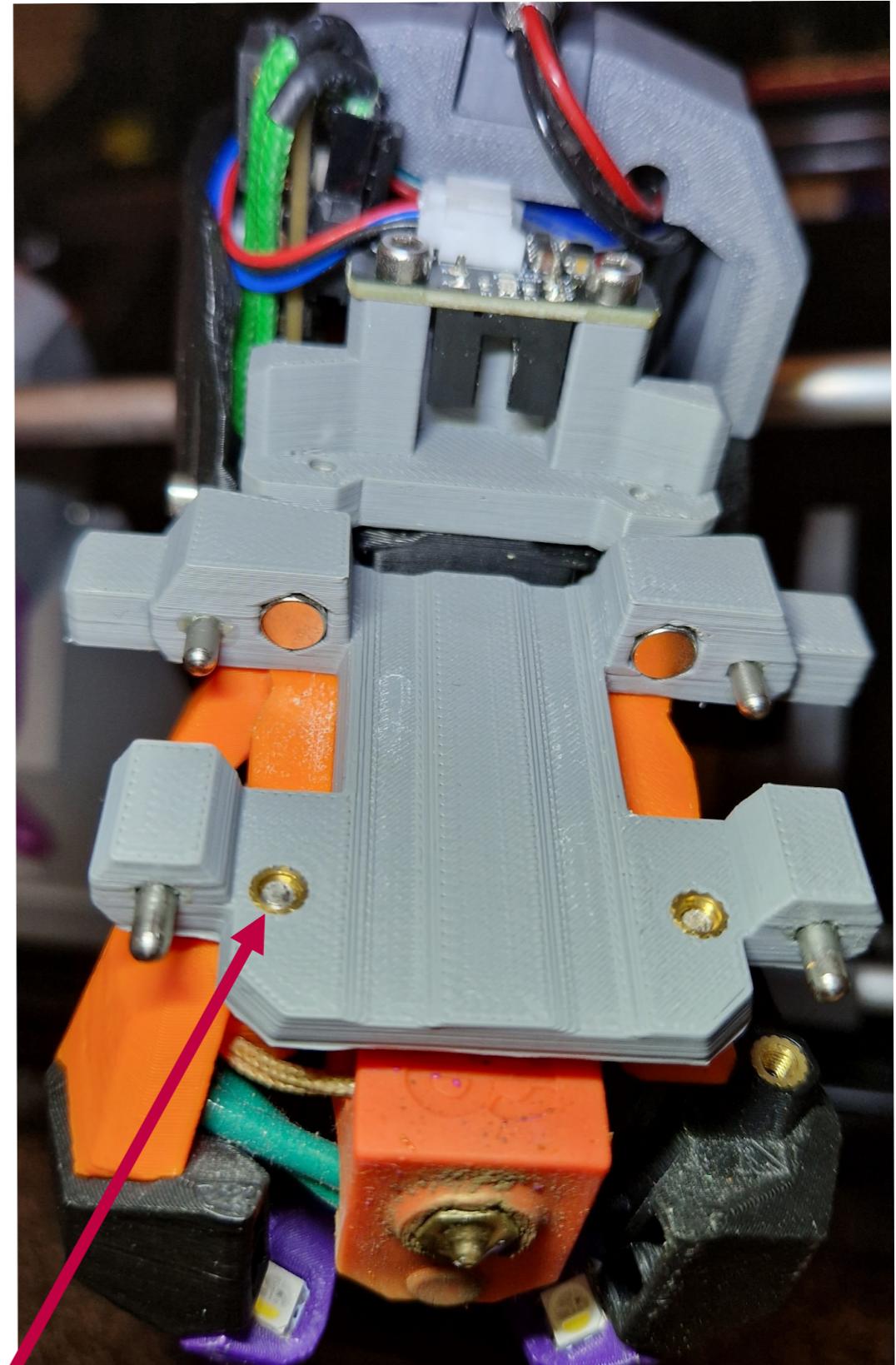
Mostly the same as original Stealthburner,  
except the need for printed space.



M3x20mm  
socket head x2

M3x50mm  
socket head x2

Printed space x2  
Preventing protrusion



# Tool-head Assembly

Now, let's work on that umbilical

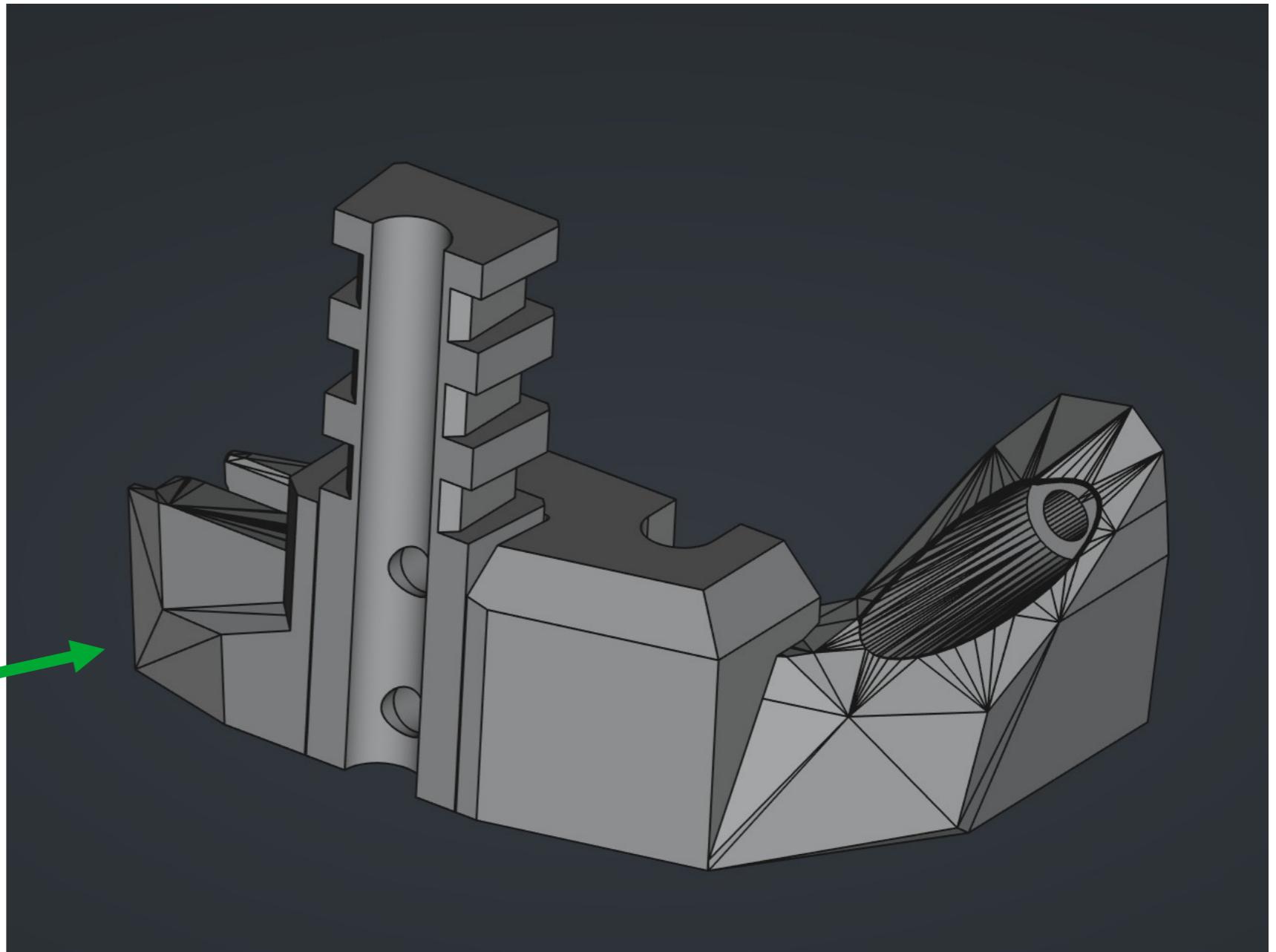
**Or... not.**

It is tricky to capture what need to be done for the umbilical with text and pictures.

For good view of how to make the umbilical, please refer to [this video](#).

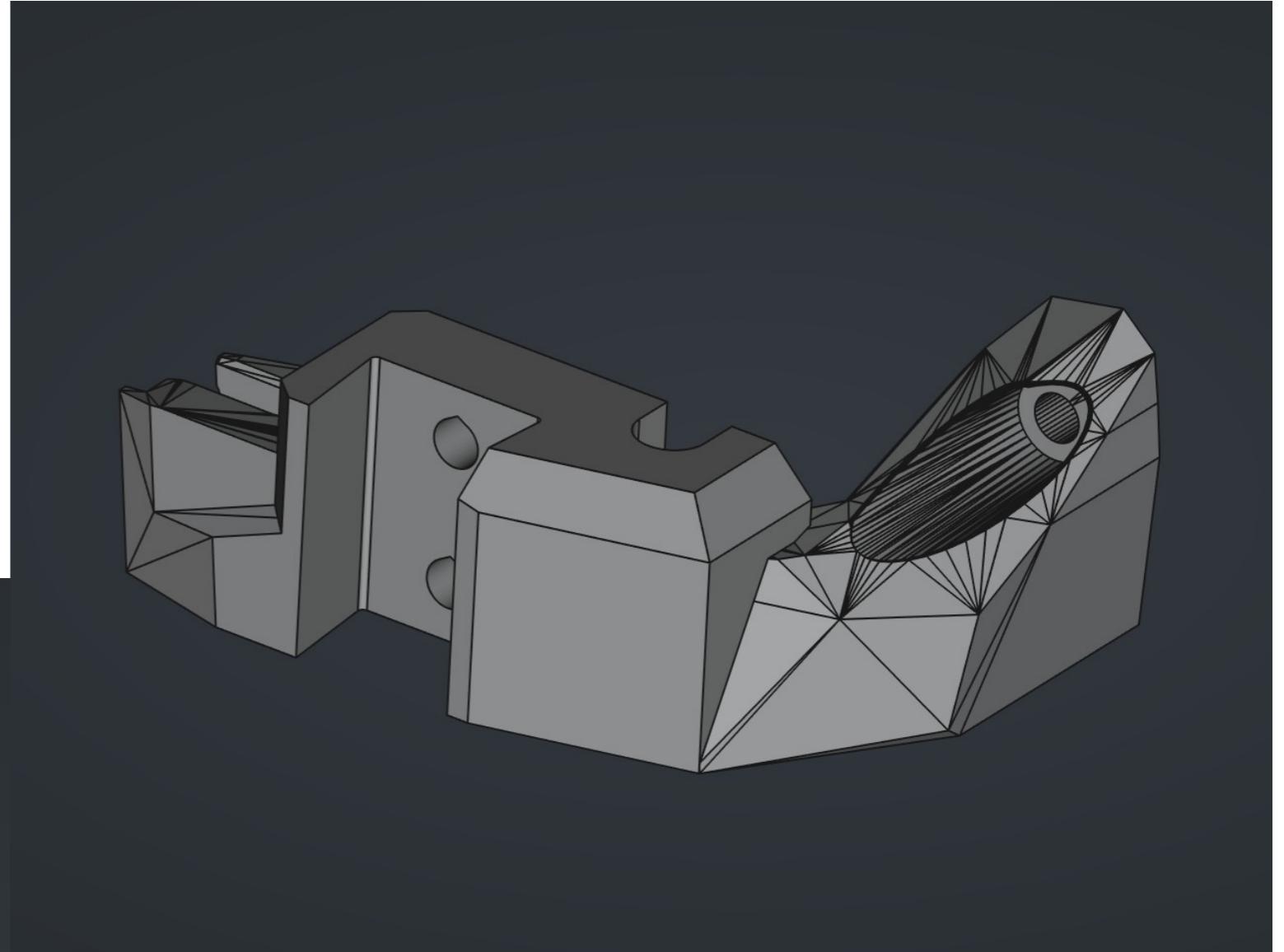
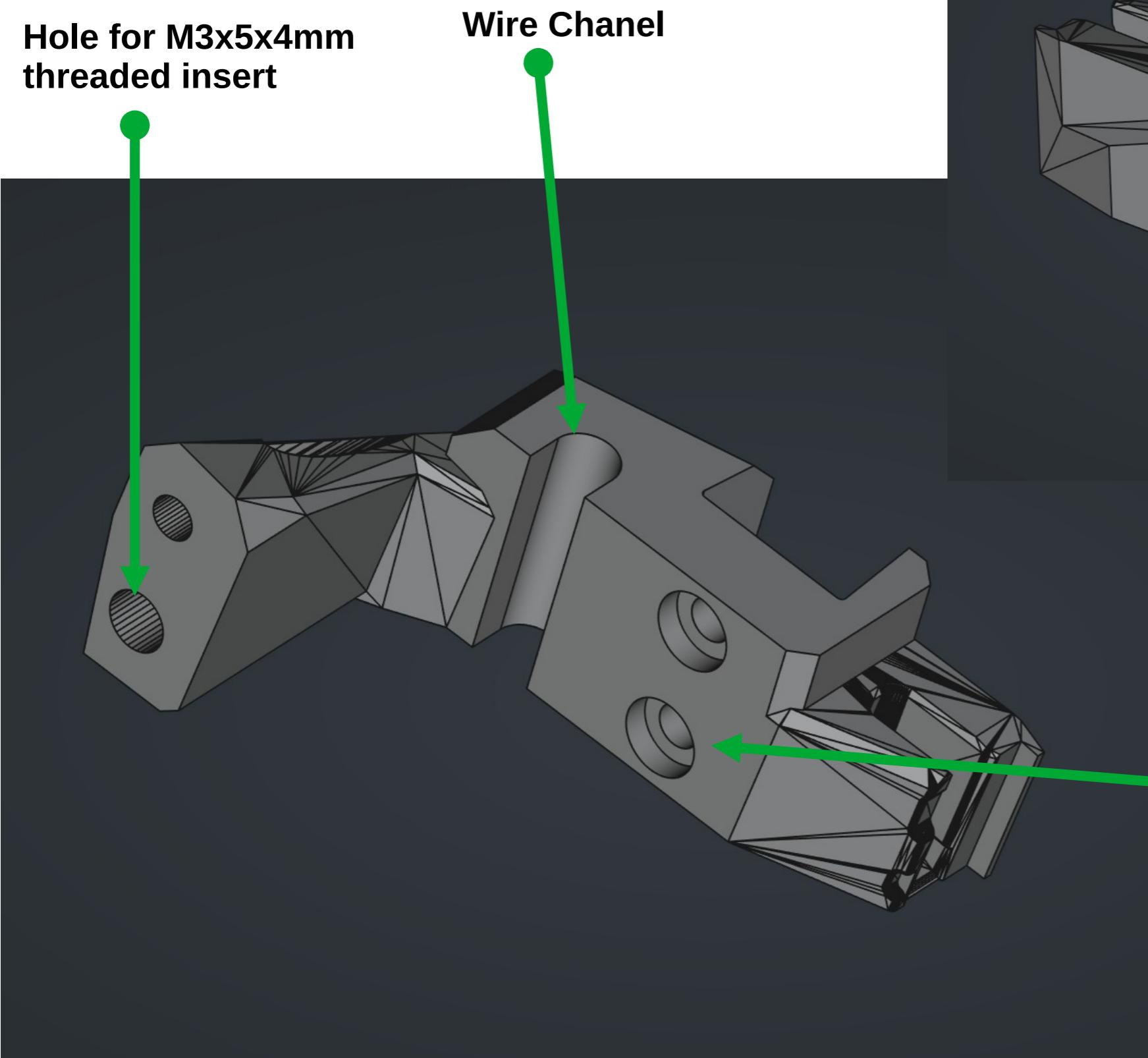
The item shown here only relevant to the SB2209 (or, SB2240) and the Clockwork 2 extruder.

Other CAN bus solutions will all have their own mounting method on the tool-head side.



# Tool-head Assembly

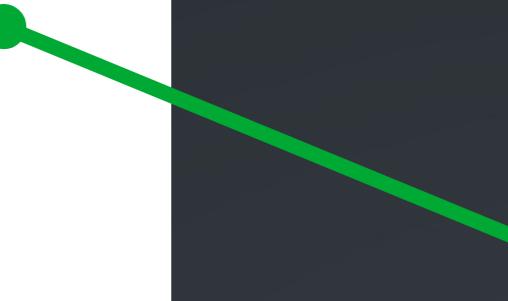
The anchor mount



# Tool-head Assembly

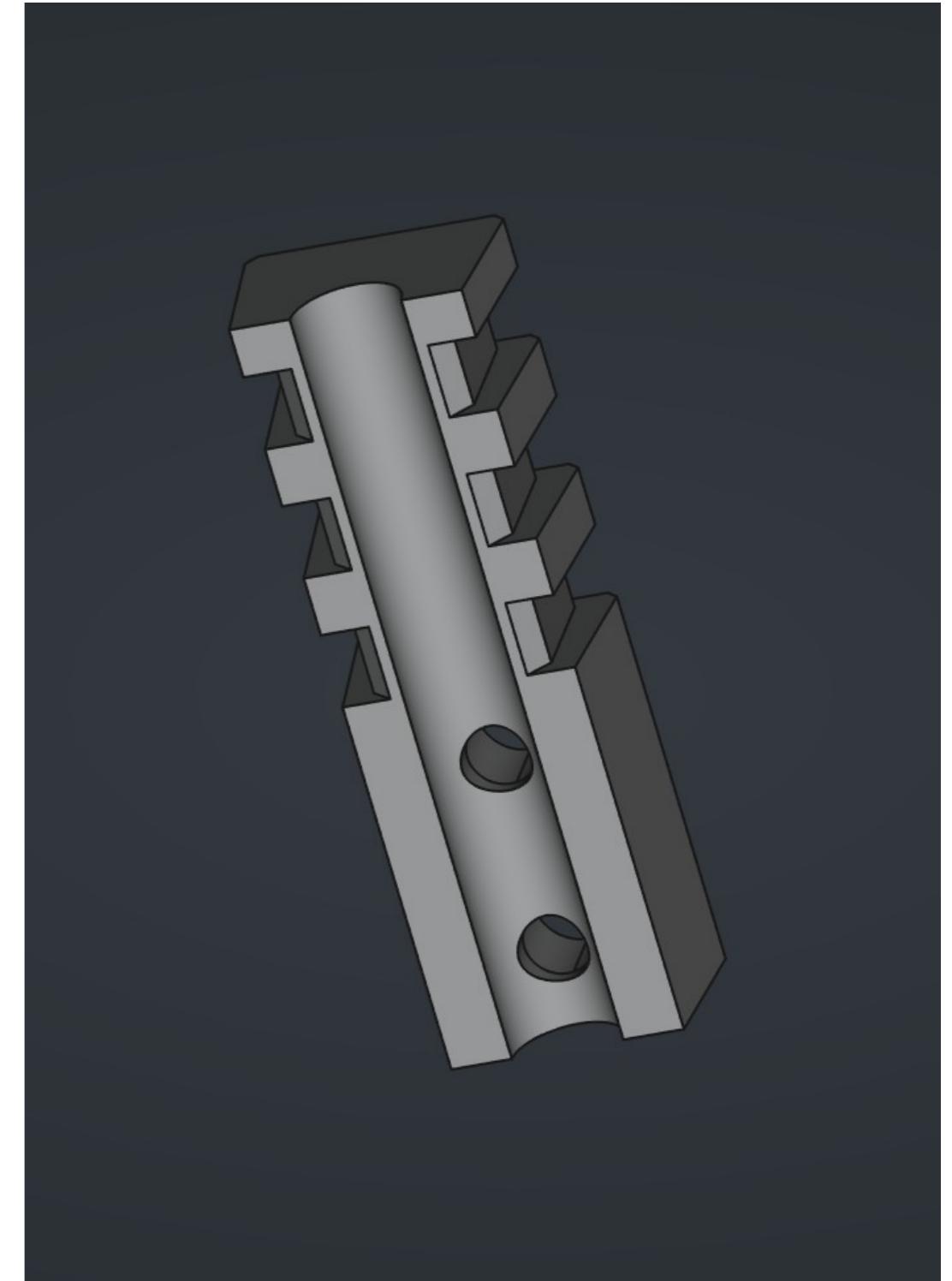
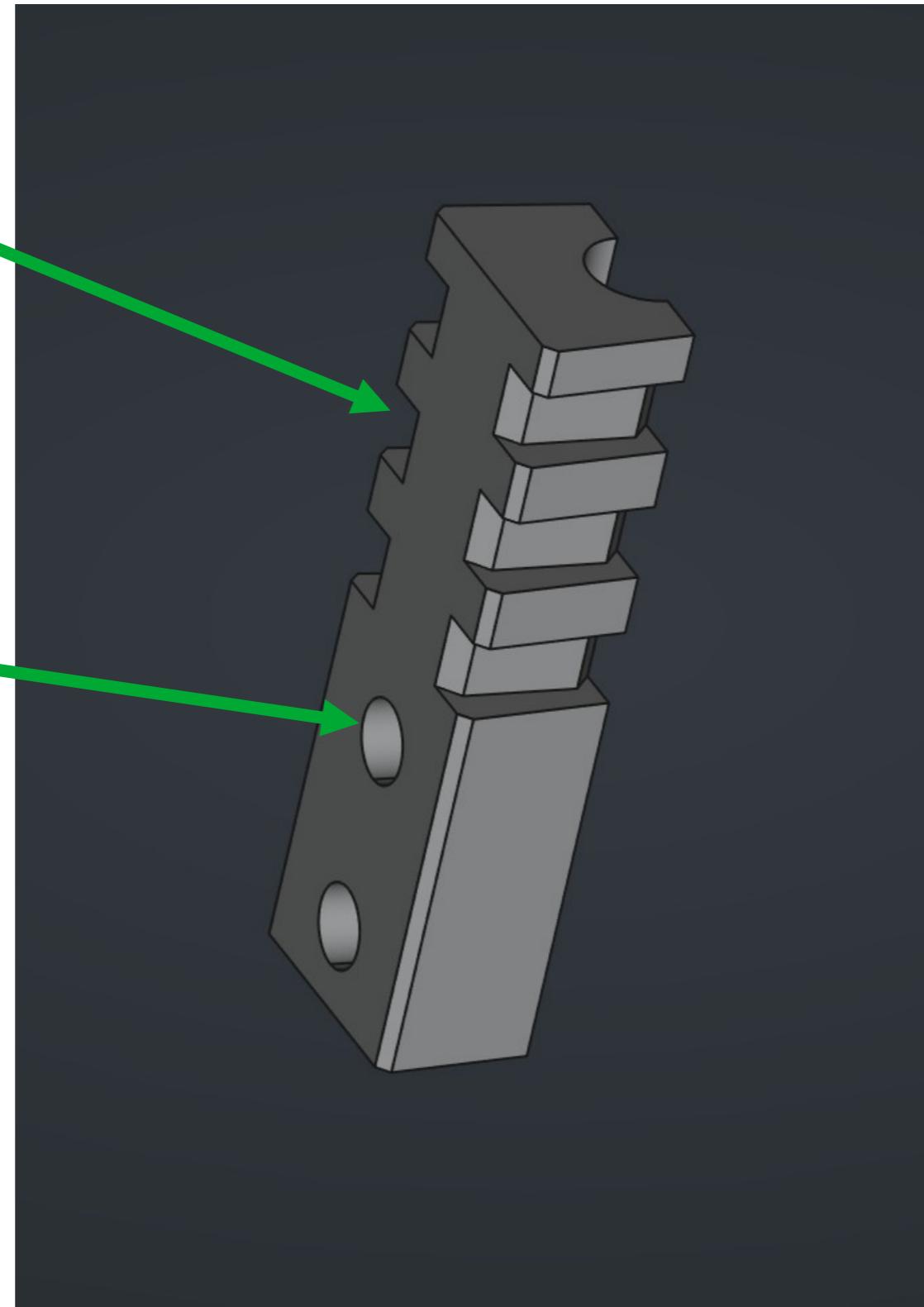
The umbilical anchor

Grove for zip-tie x3



Hole for M3x3.0

threaded insert x2



# Calibration Probe Assembly

Finally

The Nudge probe is not a original creation for MissChanger. It's creator has opted for a video assembly guide. Therefore, it is has been decided that the mounting guide should do the same, for consistency.

Nudge assembly video: [Nudge Probe - Integrated Speedbuild](#)

Probe mount assembly: [MissChanger - Build Guide - Nudge probe mount](#)

## Links:

<https://youtu.be/6eRomxUo7TI>

<https://youtu.be/ucKVRpfPakY>

