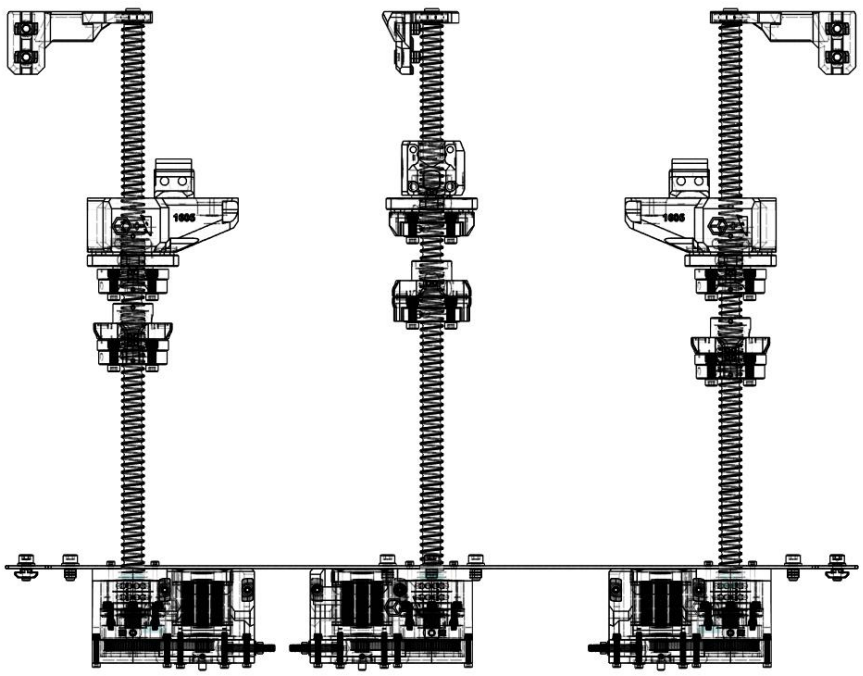
Z-Upgrade 3.2c manual

Suivi des évolutions

Indice	Date	Description de l'évolution	Auteur
0.0	27/10/2024	Création	FBR
0.1	12/11/2024	M3x25mm to full M3x20mm change	FBR
0.2	19/11/2024	3.2b revision / StarLock design	FBR
0.3	20/01/2025	3.2c revision / Belt lenght + Screws changes 25-22mm	FBR
0.4	11/02/2025	Small details additions to the manual for fine tuning	FBR

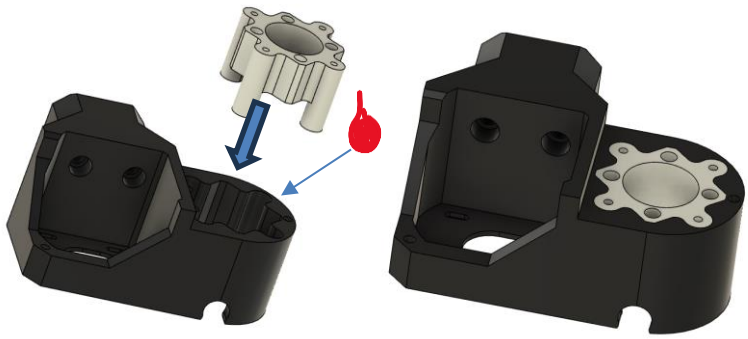


1 Part preparation

Start to prepare the 3 Blocks

You need to pressfit with some Superglue points the Starlock design

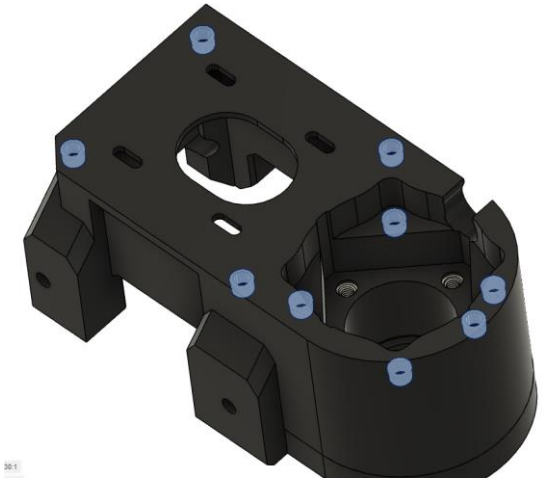
This has been designed to get better surfaces and a more clean printing experience and a stronger join



You will need to place m4 inserts at those places on the 3 pillar base blocks: 1

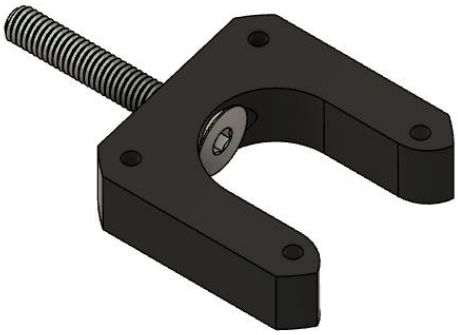
You will need to place m3 inserts at those places on the 3 pillar base blocks: 2

1



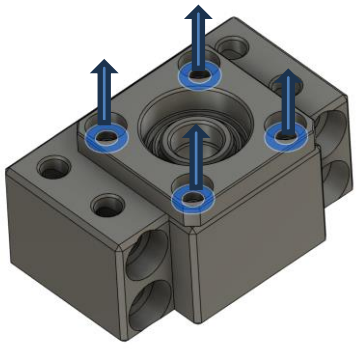
2

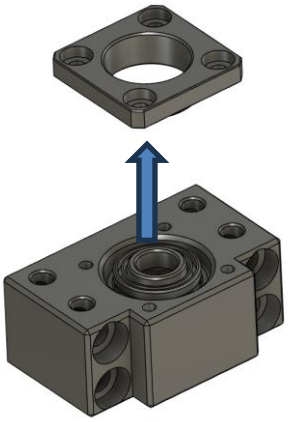
Assemble the tensionner :

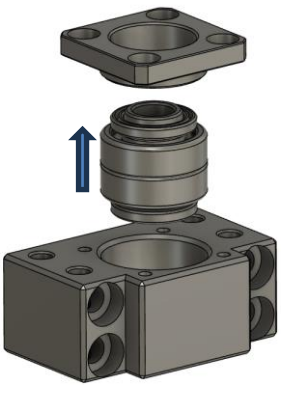


Basically a Nyloc m5 nut with the countersunk M5x40mm, lock it with a drop of Cyanoacrylate glue (Superglue) M5 nut will work too

Dissassemble the BK10:







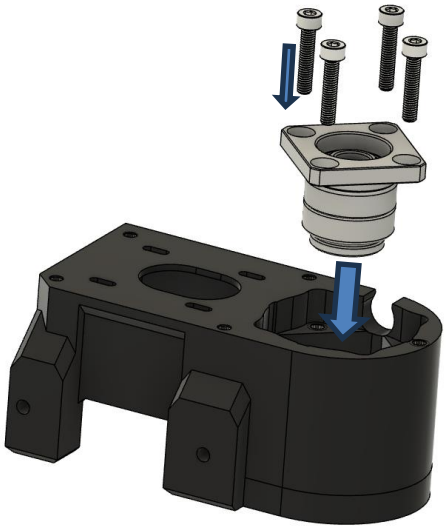
Remove the 4x M4 screws and remove carefully the internal, some force can be needed to remove the 608 bearings

We will keep only that- At this setup you can replace those bearing with angular contact

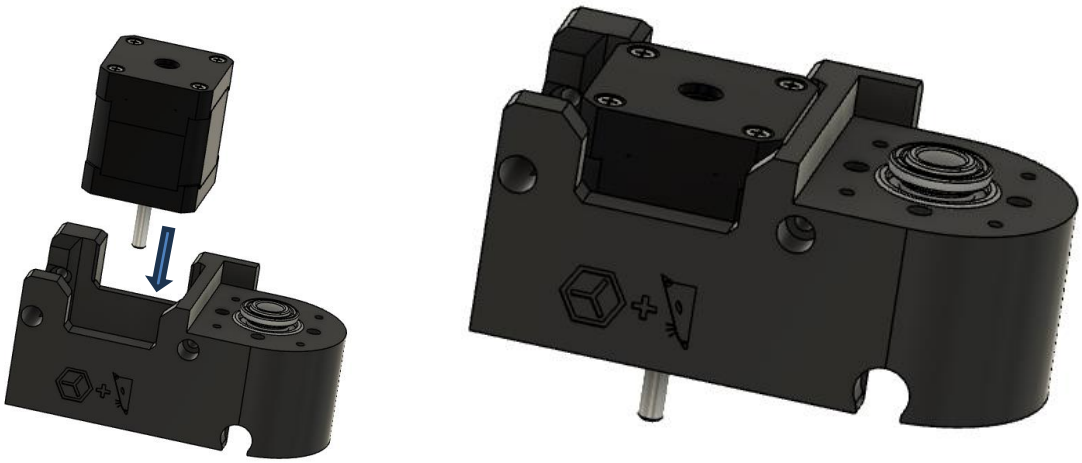
A bit more expensive but better in lifespan for heavy assembly

2 Preassembly

Insert the BK10 internals on in the 3 blocks and secure it with the BK10s M4 short screw

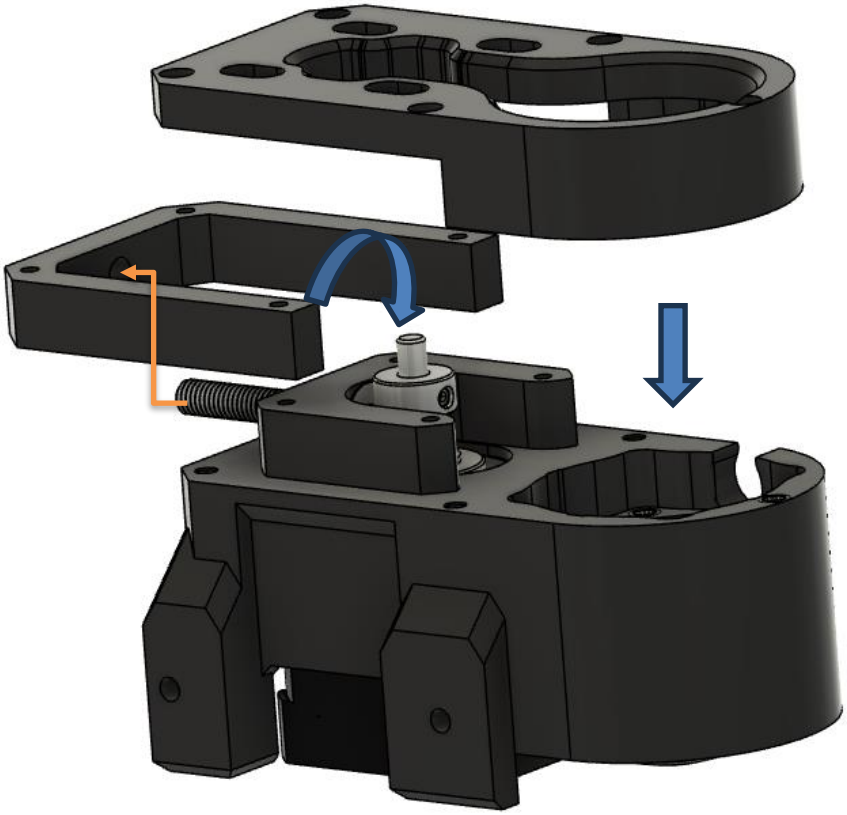


Install the NEMA

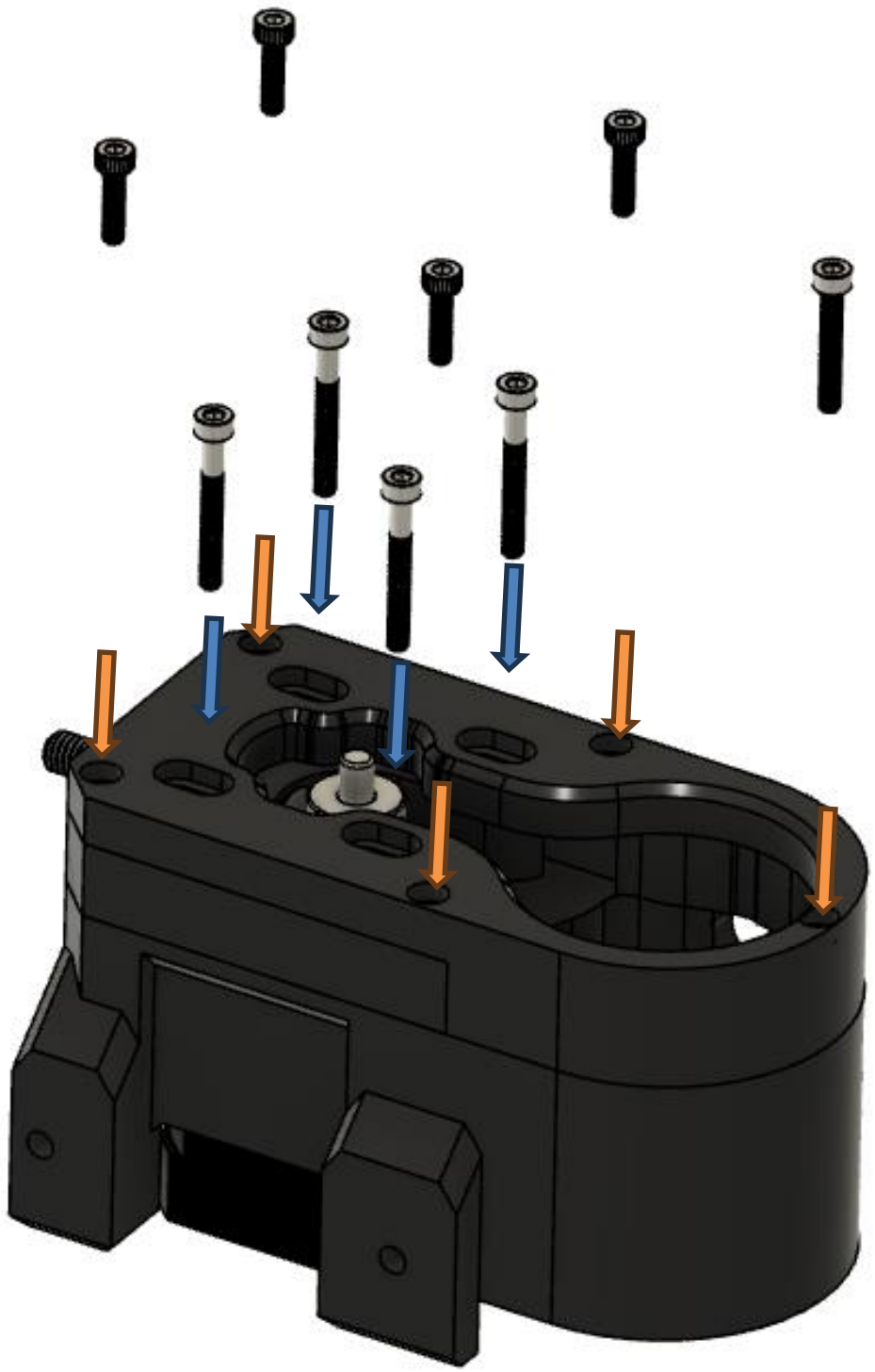


It should be flush

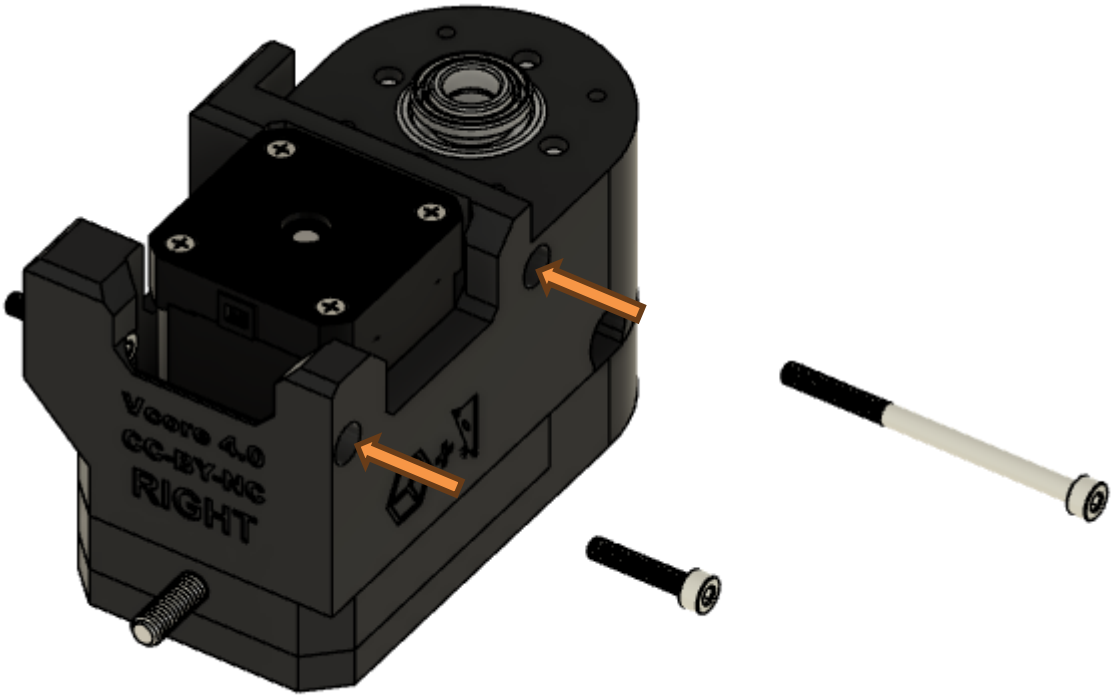
Then we will place the pulley and the rest of the retain parts



Then close it with the M3x22mm screw and then the M3x20mm to close the bottom



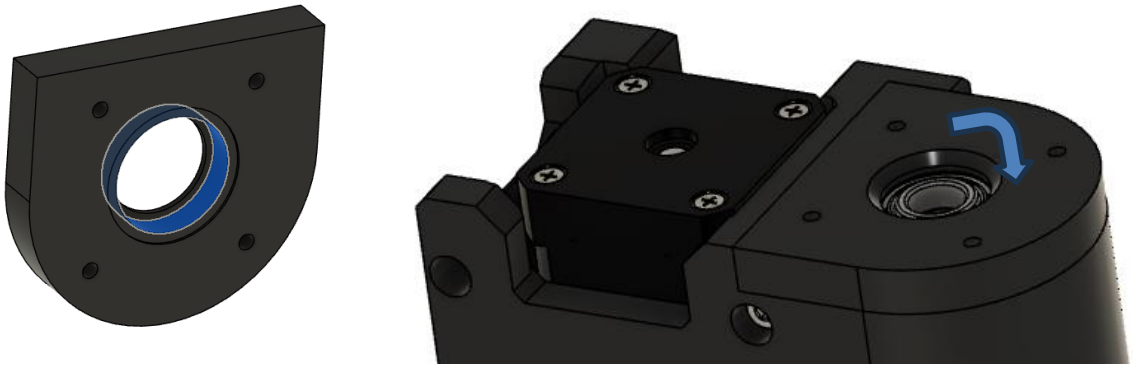
Add the retaining m4x20mm and m4x60mm bolts for the frame anchor. Add a M4 Tnut on each



3 Assembly

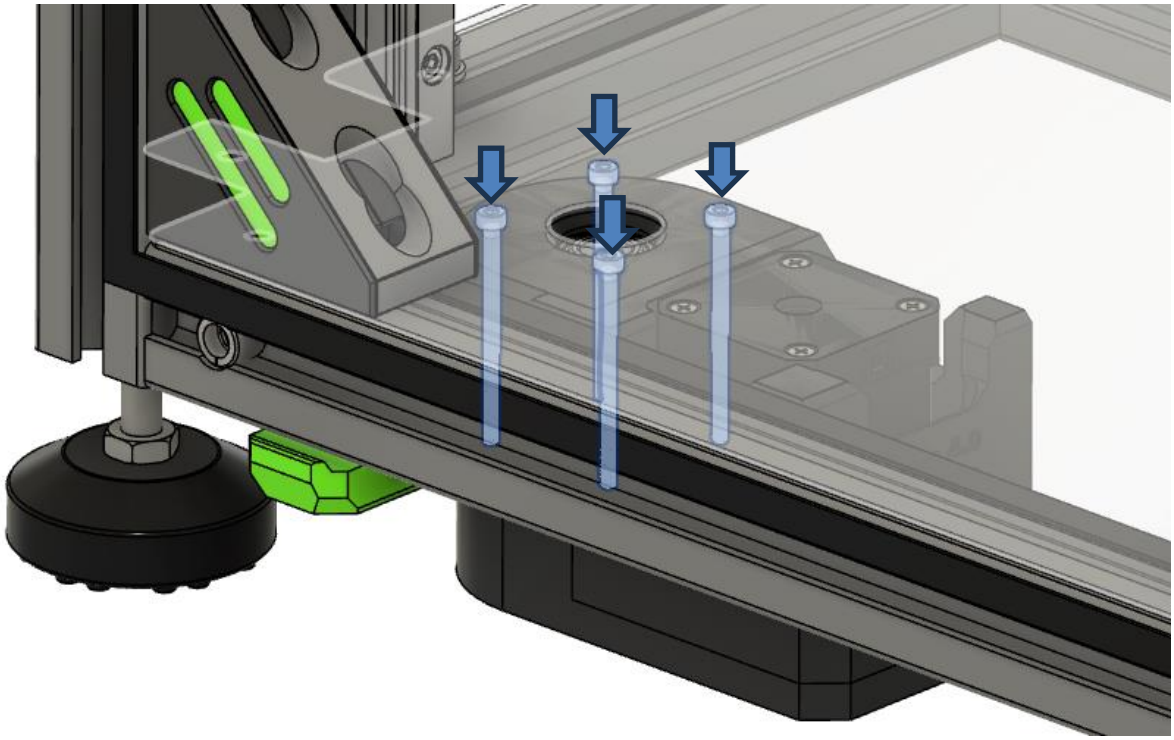
The easier way to do it is to lean the machine on the back or the side, but that is completely up to you depending the status of the machine (Kit or already assembled)

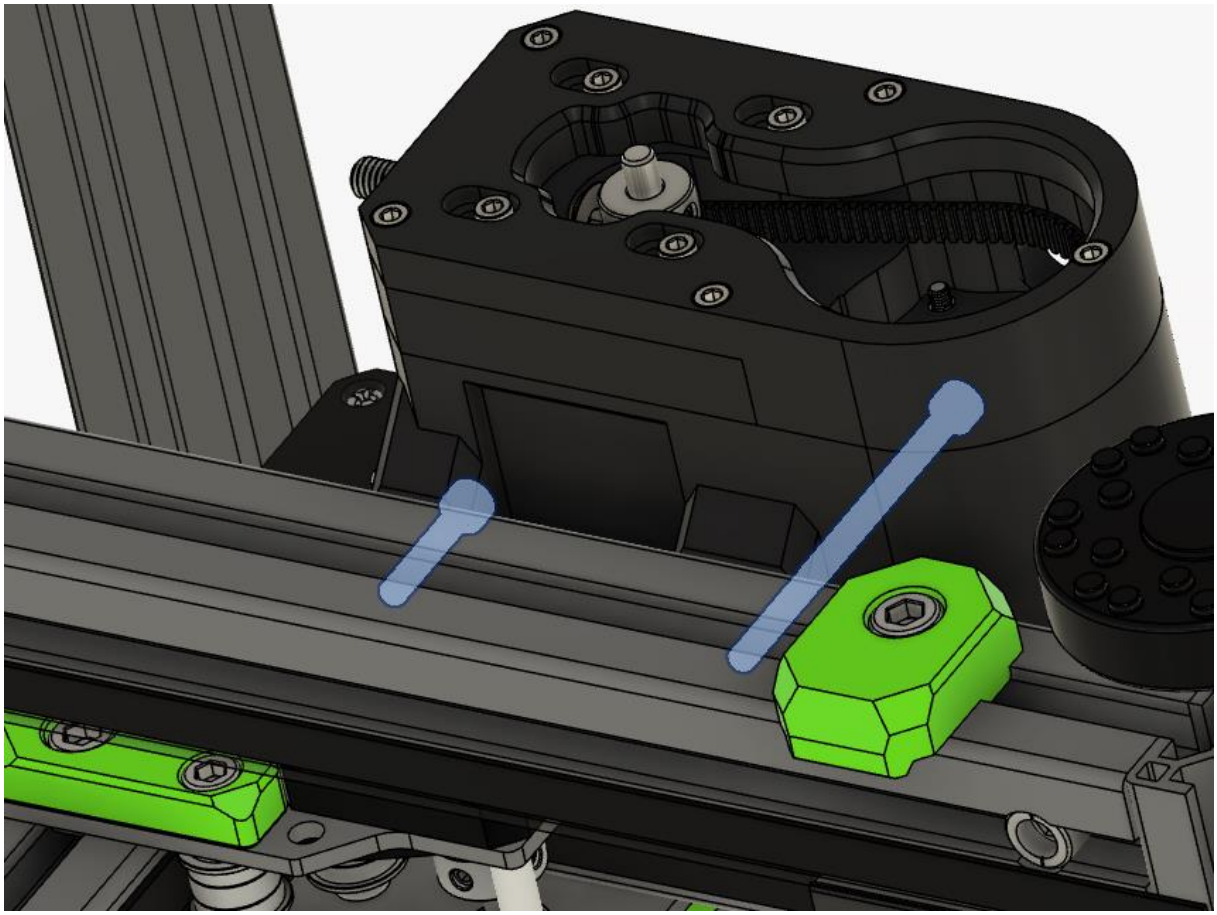
Here the SPI join is not used



You can now place it on the M3 plate hole and add the 4x M3x45mm to retain it

Don't forget to tight the anchors points (2x per blocks)

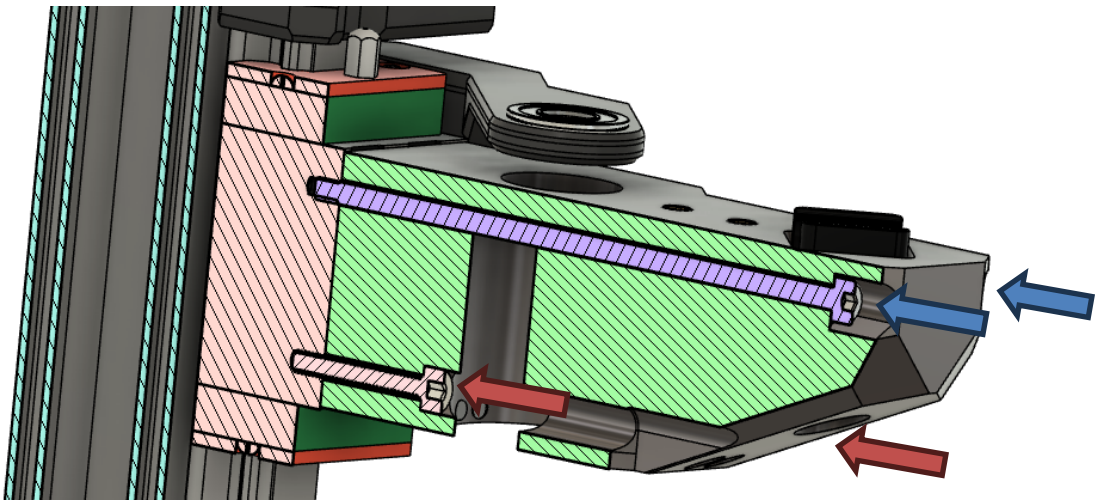


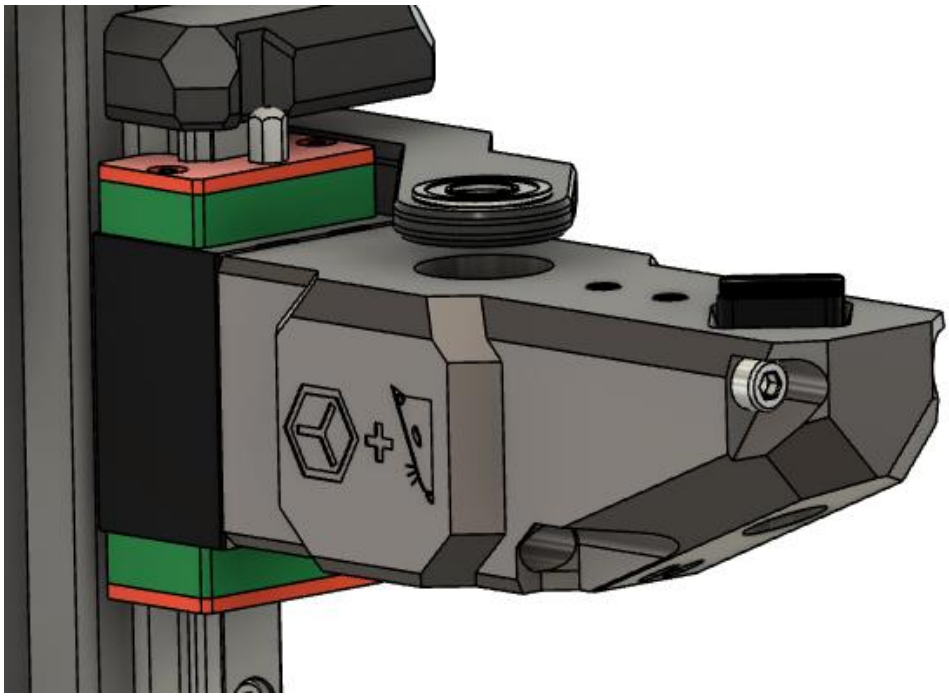


Repeat this process for the 3 blocks

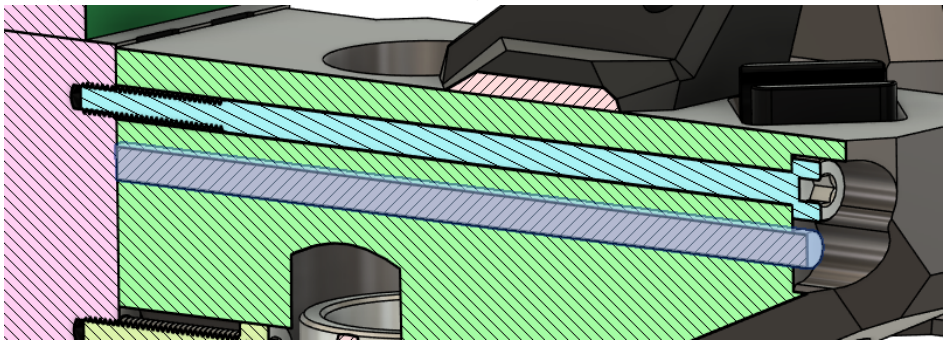
We can now install all the arms

Same logic than the stock ones, but this time we use the 2x m4x100mm and 2x M4x20mm





1605 Reinforced version need some 5x100mm steel rod in the holes

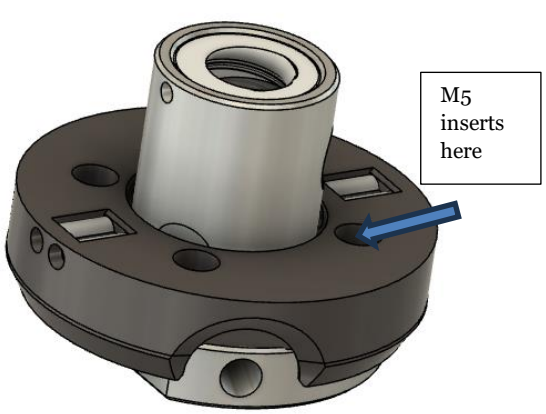


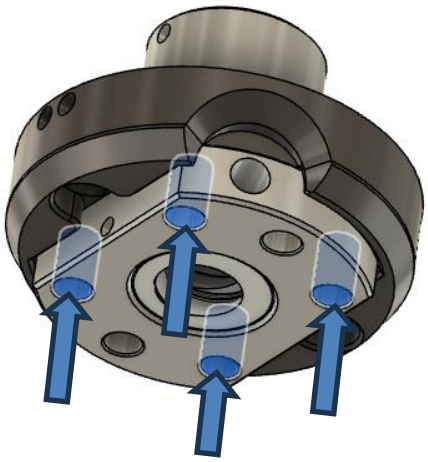
I personally glue then and pressfit them with a hammer

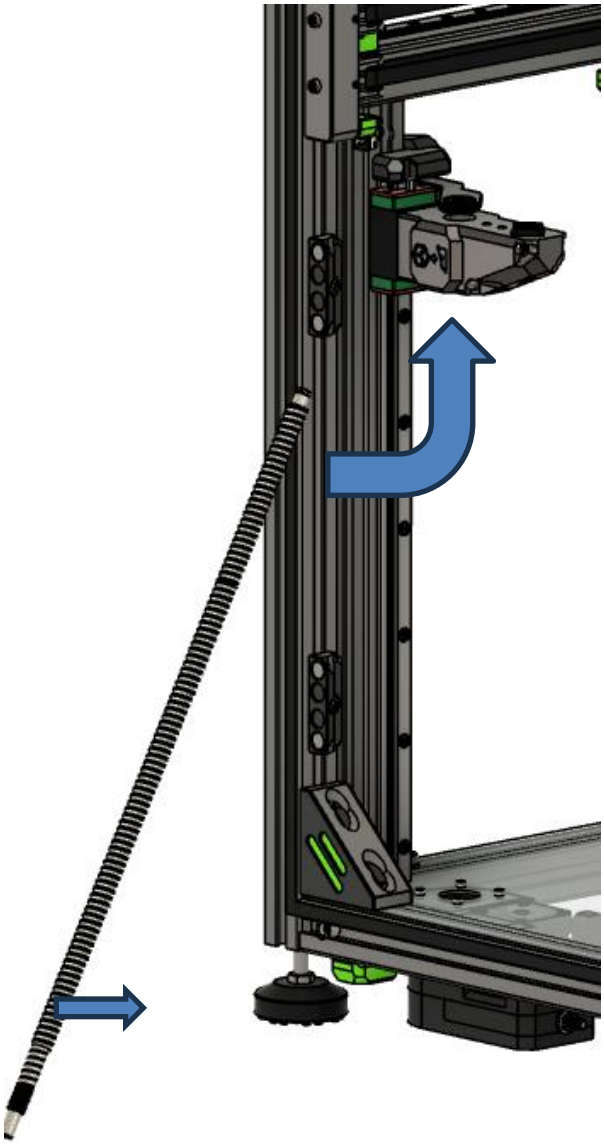
Once done, depending the Oldham / WobbleX choice made, you can prepare the ballscrews

4 BRS-Oldham

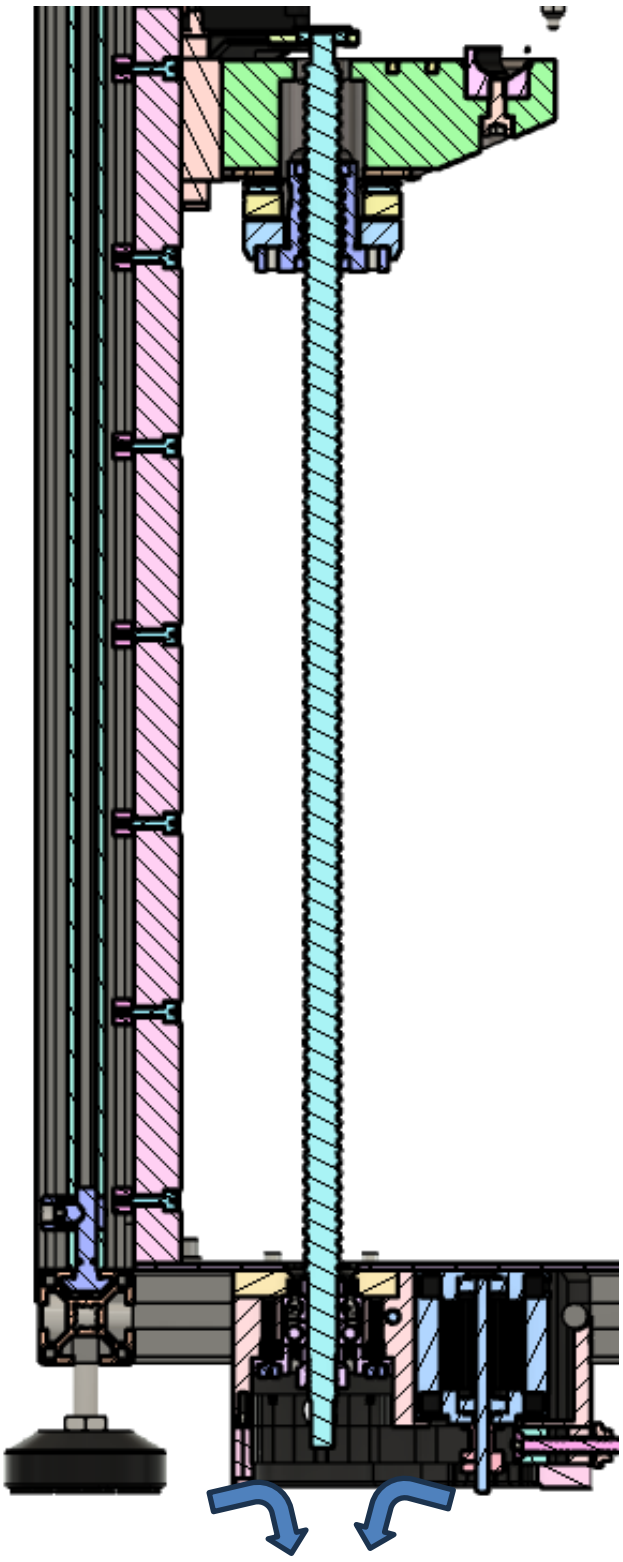
You need to assemble the lower ring on the Ballscrew Nut first







On this picture, the Nut and the Oldham are not represented, but should be positioned on the middle of the ballscrew.



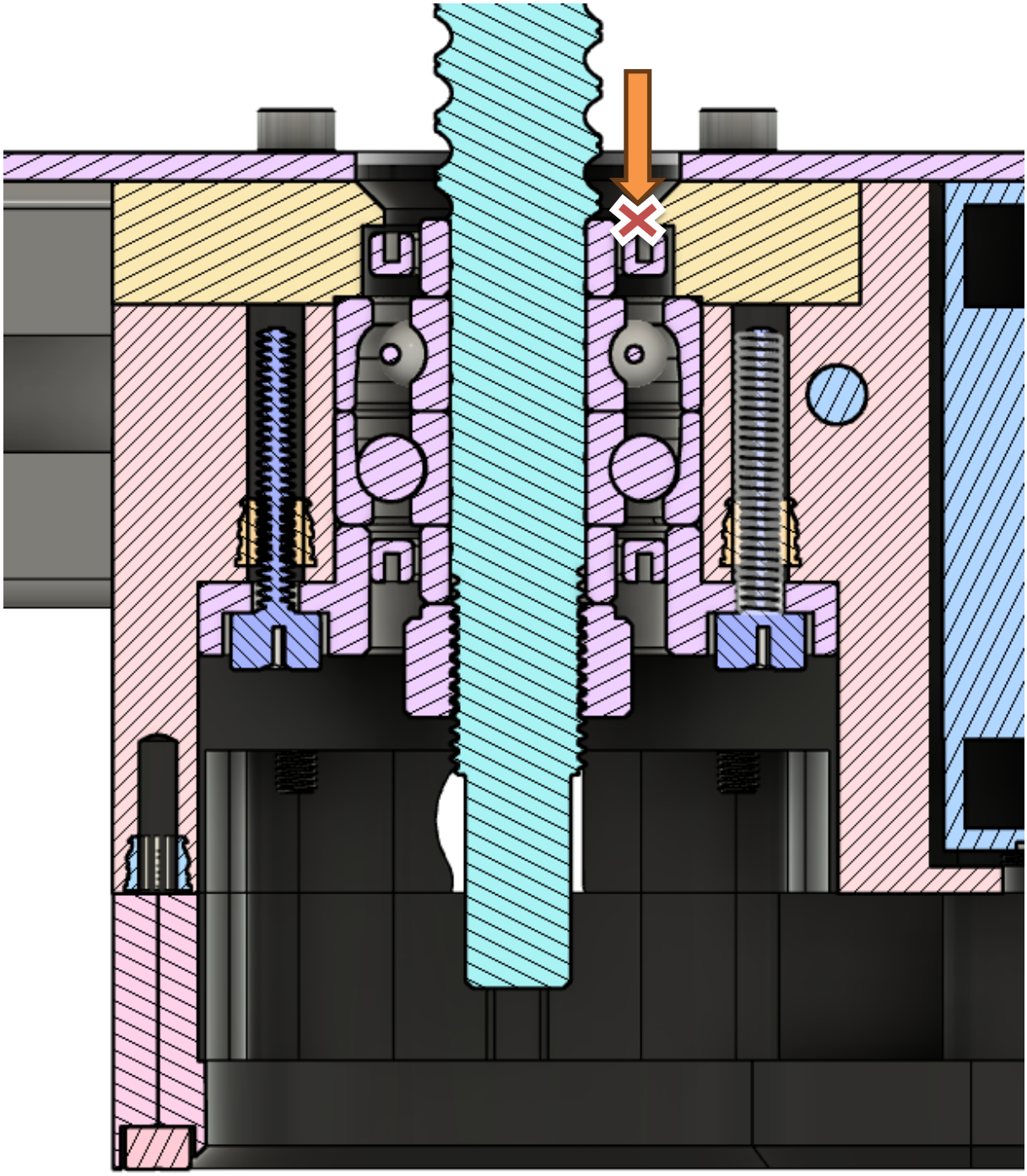


Figure 5

You need to first insert it in the arm hole, you may need to remove the top retainer to give you clearance, and then place the machined end in the lower motor block through the BK10 Internals

When the spindle it inserted in the BK10, be sure it goes against the black spacer, and add the retaining nut (don't overtight it) (Figure 5)

5 WobbleX

For the wobbleX (12/16), same logic: Ad some M5x20 to fix the BS nut to the lower ring, add the WobbleX middle ring and install it the same way with the spindle motion seen above.

Be careful: 1204 and 1605 version got some differences:

-Discs are larger, and use a different layout, 1605 and 1204 are not compatible between each others

-Arms got a different hole layout and dimension as their pins position

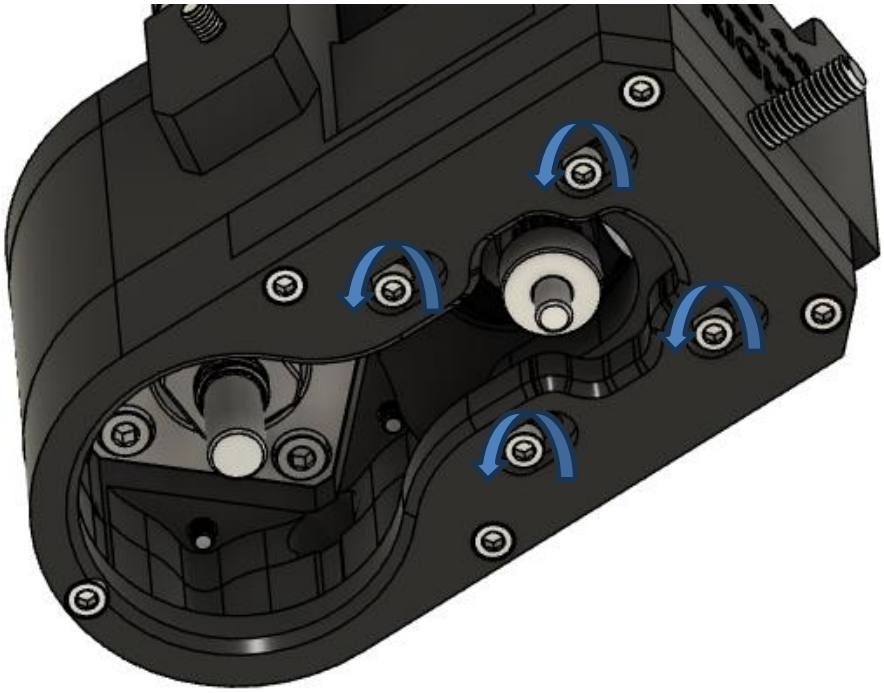
-In some case scenarios, you may need to remove the arm partially to insert the BS spindle

At this point you can change the methods, as few exist to get to the same objective.

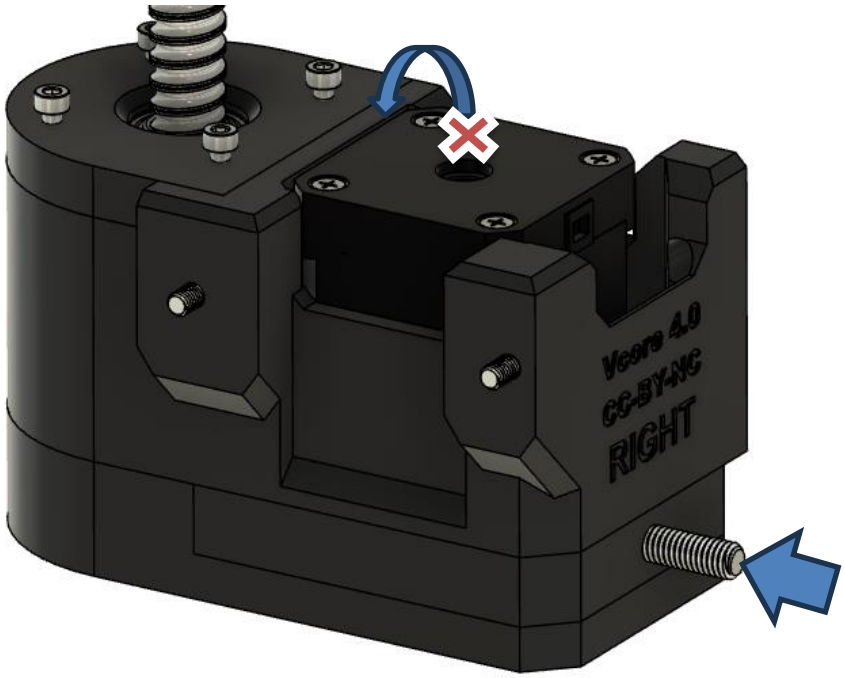
6 Z-Belts

For the purpose of the exemple, let's isolate the next pictures of the full frame.

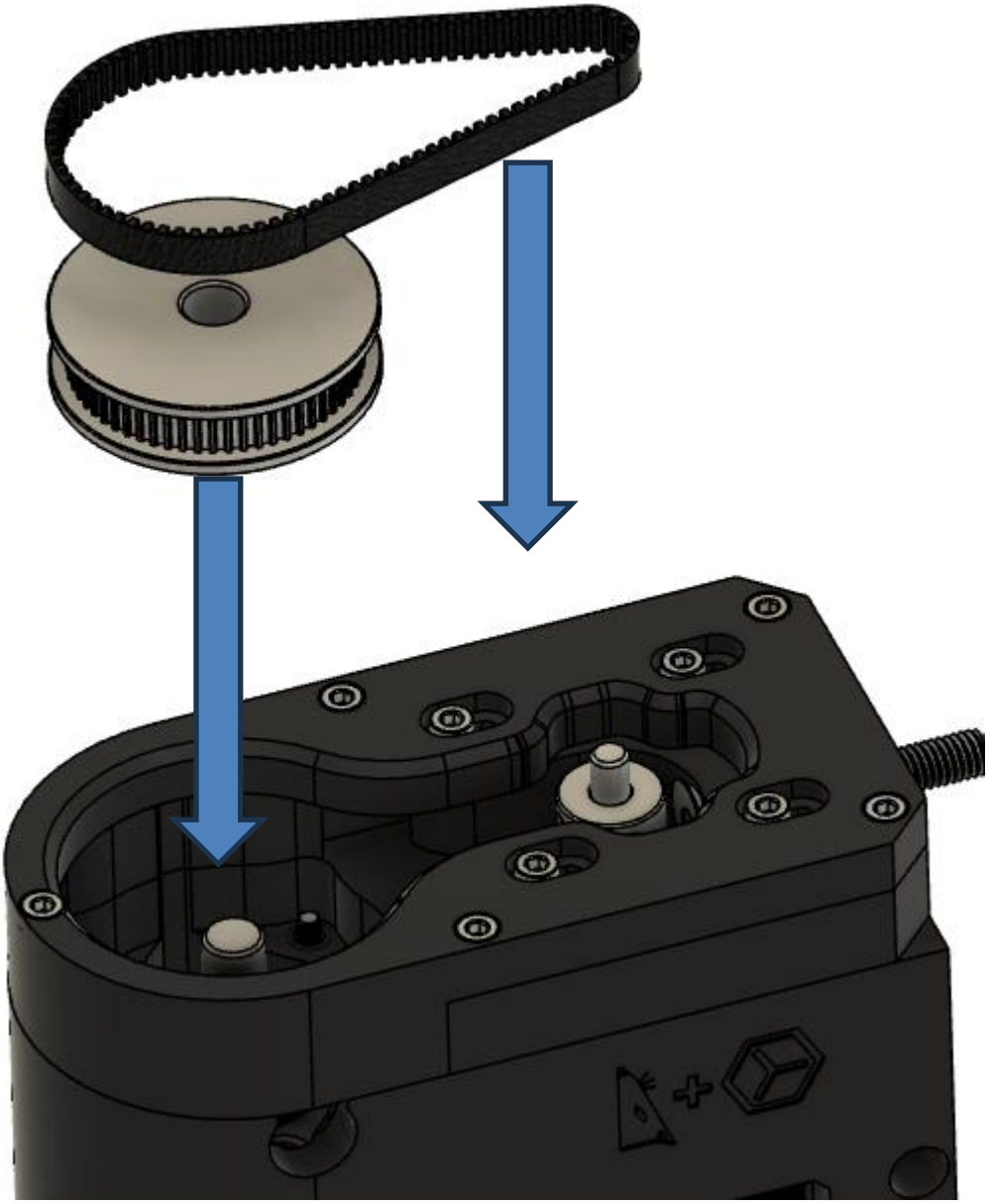
To insert the belt and the 60T pulley, we need the motor the closest possible from the spindle



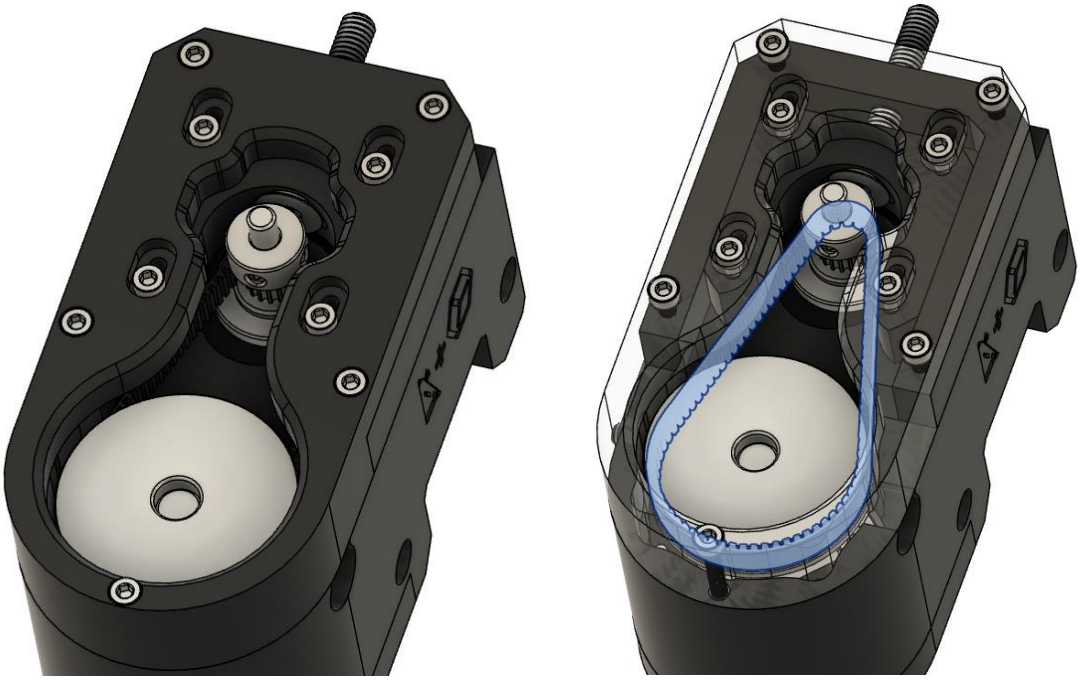
Unscrew a bit the 4 NEMA retainer screws



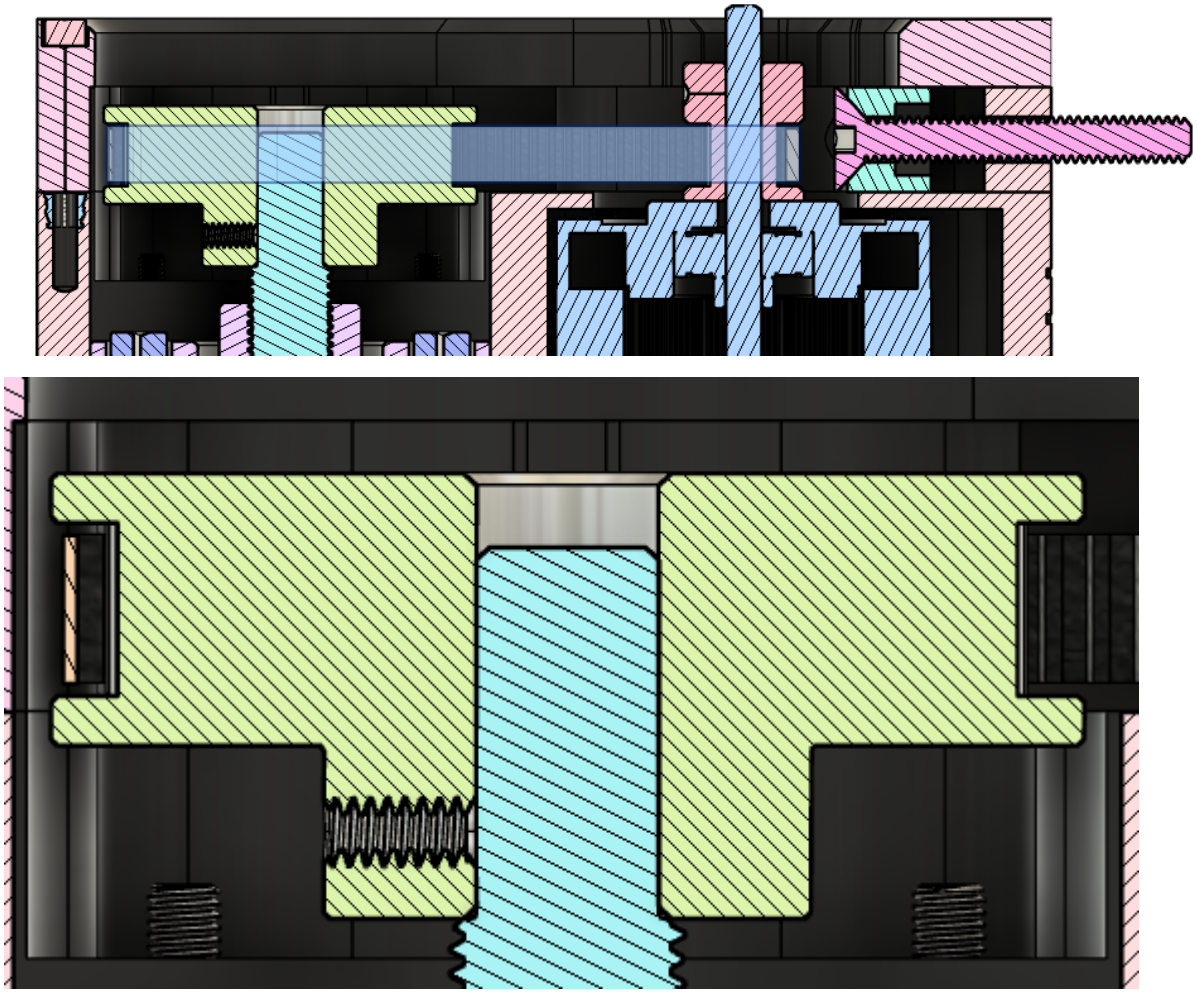
Push the M5 bolt to gain the minimal position.



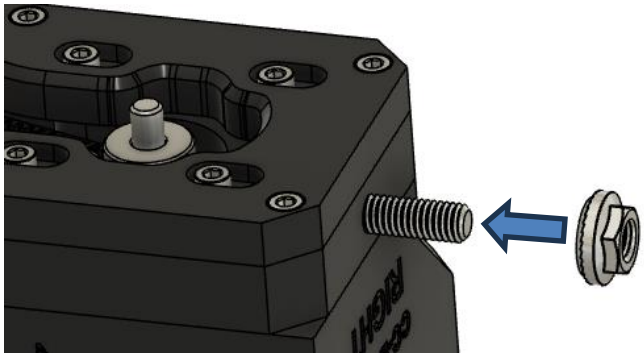
Then install the 190mm Belt and the 60T pulley. Wiggling it a bit to fit the 20T.

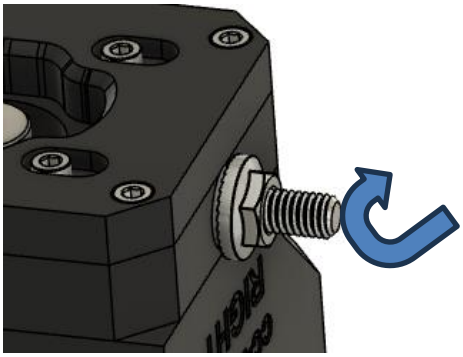


Control the aligment



You can now tighten the 60T screws





Now tune the belt tension through the M6 Nut + washer here

We need it to be tight but do not overtension it either, we want a ferm flex on the belt.

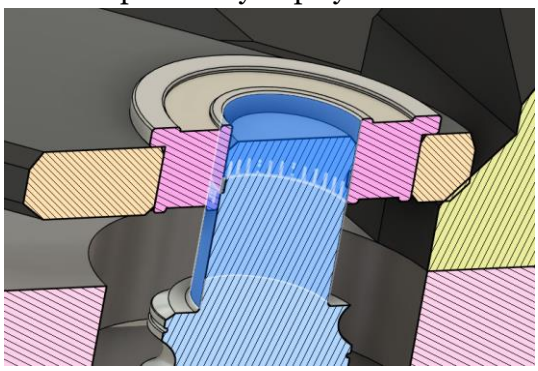
Repeat the process with the 2 other remaining block

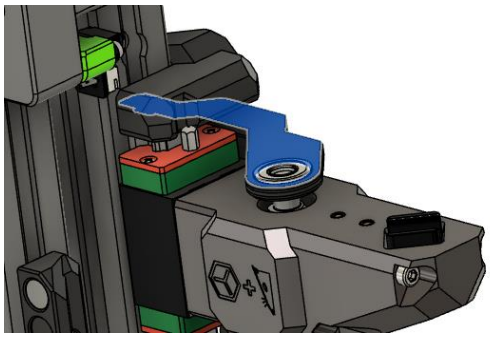
7 Final assembly

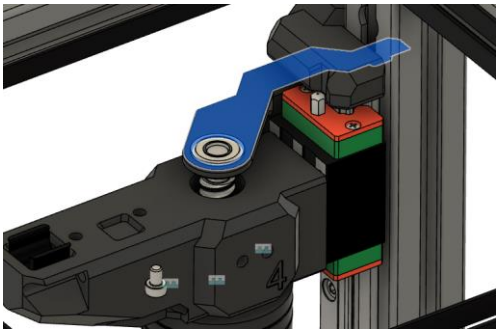
For the 1204 version, simply keep the standard stock LS/BS retainer at the top, we use the same ID 8mm bearing

If you are using the 1605 variant, use the compatible bracket designed for 10mm ID bearings (6000-2RS)

In order to get some safety for potential collision, place the retainer with 2mm margin, you have the possibility to play with the retainer position



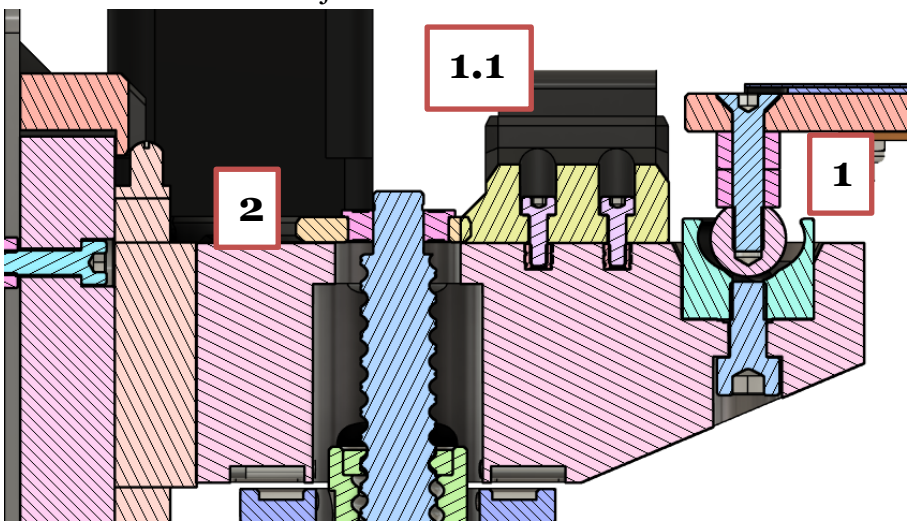




You can adjust a bit the height of them if necessary.

You can at this point add the bearing balls into the OLDHAM/WOBBLEX assembly

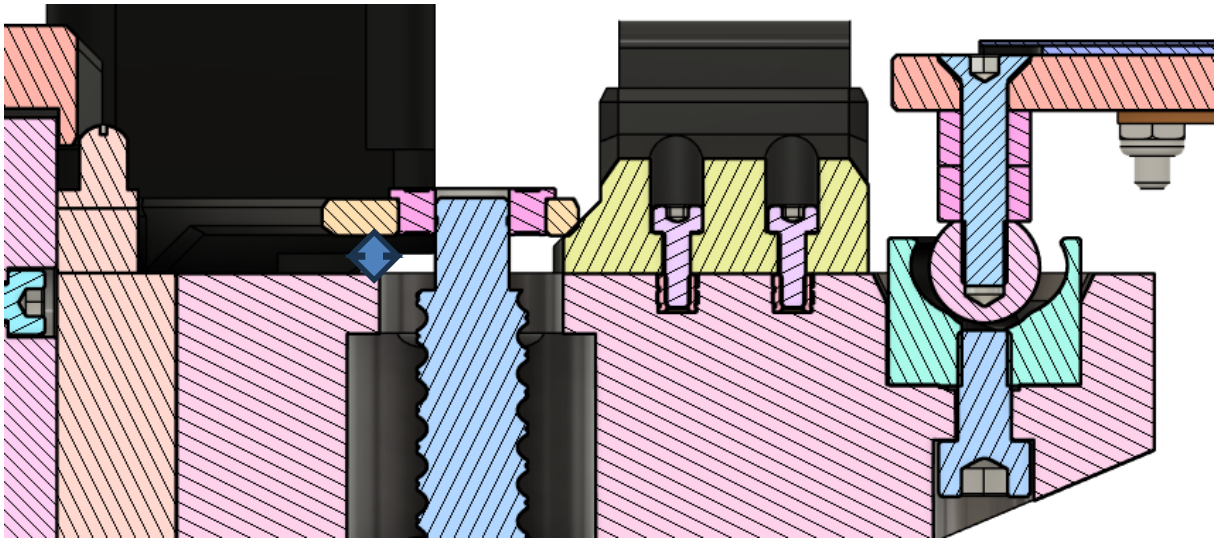
-Depending the Hot end you will use (Rapido, Magnum, Goliath, ...) the max height can be different. There some adjustments that can be done to maximize it



-1/ Add some M5 washers on the bed feet, to add the necessary height missing

-1.1/ Elevate the wiper if necessary

-2/ Tune the height the the retainer: 4mm are available



8 Config cfg

The first thing to do is to correct the ***rotation_distance*** of all Z sections

1204: ***4, transformed with the 1/3 ration to +-1.33***

1605: ***5, transformed with the 1/3 ration to +-1.66***

Then we need to reverse the Z motors since they are inverted (pointing the bottom)

Simply add a "!" in front of the "***dir_pin***" (ex: **dir_pin: !PC12**)