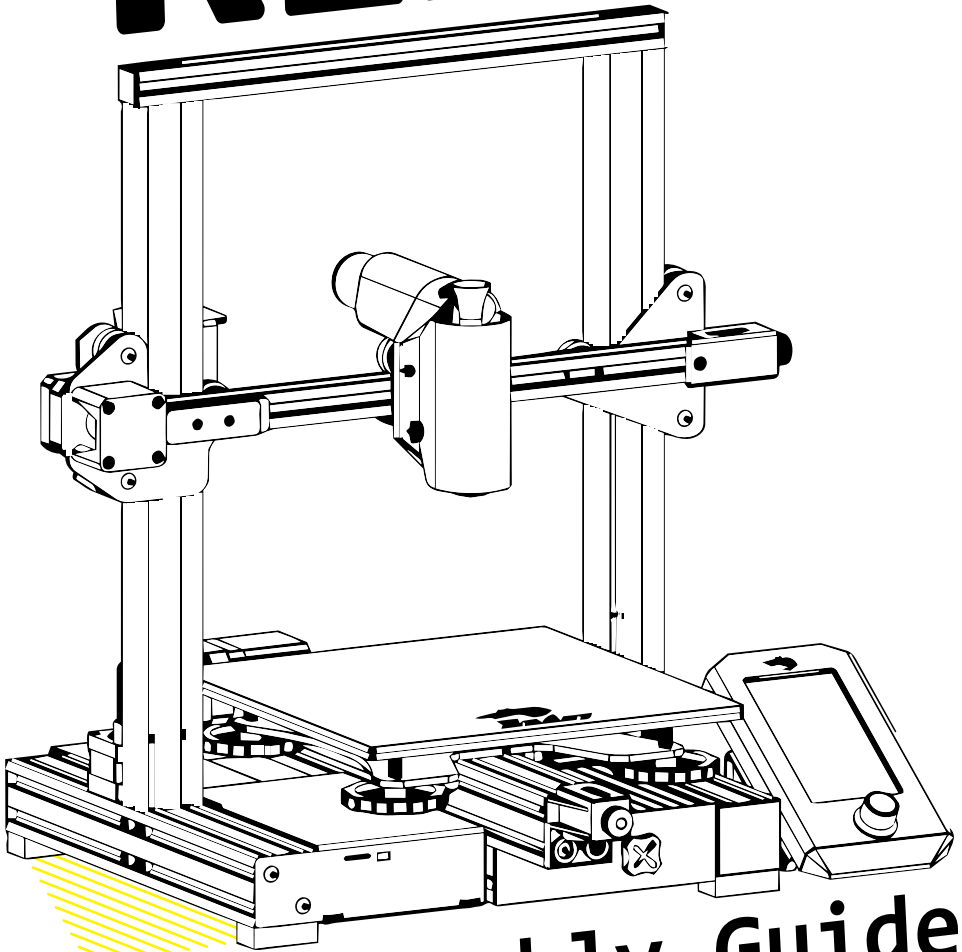


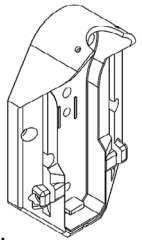
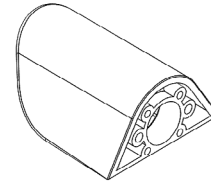
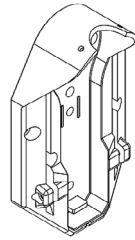
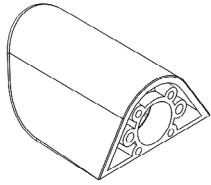
REFIBE



Assembly Guide



Project of: Bart Idsinga
Email: bart@idsinga.net
Study: Industrial Design at TU/e



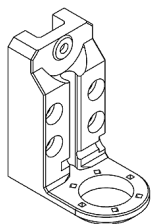
ReFibe is a project of, Bart Idsinga. A student at the Technological University of Eindhoven, in the Department of Industrial Design. This project was inspired by a project of Christien Meindertsma, who made a robot arm that could felt in 3D with otherwise discarded wool. Ever since this project launched, I have been intrigued by it. This project focused on creating a fel ting head that could easily be installed on an off-the-shelf 3D printer, like the Ender 3V2 that I used.

The drive behind the project is the textile waste problem that I want to help solve. In essence, this machine is a new way of looking at how to deal with textile waste, not by making new clothing again, but by exploring what other things you can create with this. As part of this reasoning, I made it open-source. That way, I hope that the progress does not stop, and that other enthusiasts will keep experimenting and improving my machine.

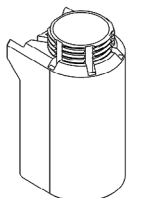
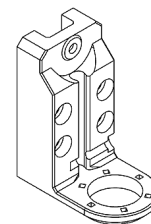
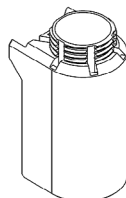
This document is an assembly guide for the 6th iteration of this machine, as it requires quite a few parts. As you will see, there are many parts that you have to 3D print yourself. Besides that, there are some components that you must buy from the internet. These will be linked in the depository (Instructables) that is shared online.

During the design, I focused on the Design for Manufacturing and Assembly methodology (DFMA), creating a design that is easy to assemble and 3D print, requiring near 0 support. In case you have questions, you can always reach out to my email listed above.

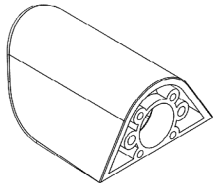
Please be aware that some experience in modifying machines is of the essence with this project, as it can get quite technical. Furthermore, using this machine does not come without any dangers. These needles move at 12 times per second up and down, making this a possible tattoo machine if you are not careful. I advise always wearing safety goggles and installing an extra emergency switch to the power wires of the motherboard. This will make it easier to turn off the machine if that is needed. And of course, do this project at your own risk.



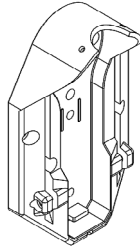
The model of the ender 3V2 was downloaded from Printables, under a public domain license



To 3D print



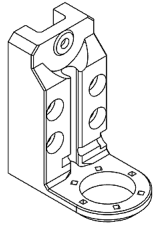
Motor_Cap



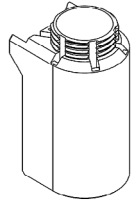
Main_Body



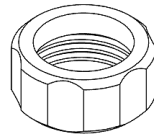
Material_Funnel



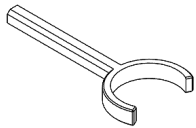
Carriage_Holder



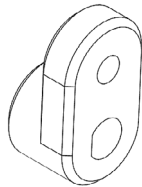
Needle_Holder



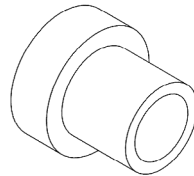
Screw_Cap



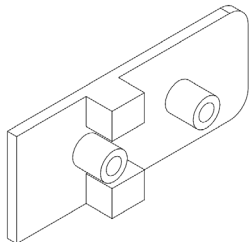
Funnel_Holder



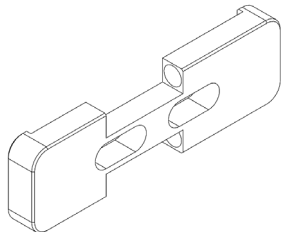
Motor_Coupler



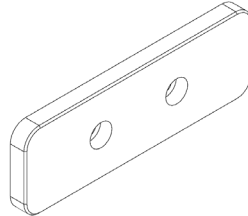
Bearing_Bushing



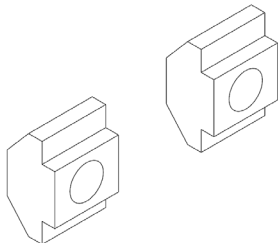
Extrusion_Connector



Slider



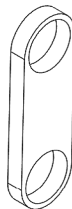
Cover



T_Nut

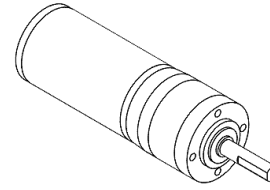


Gearbox_Coupler

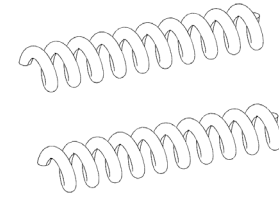


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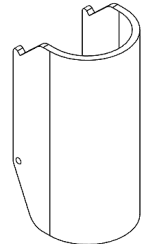
Hardware Parts



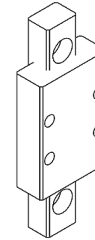
Motor



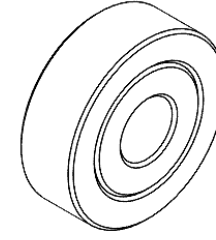
Pen_Springs



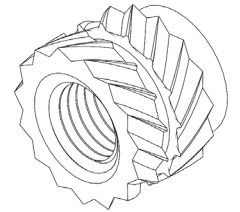
Protective_Screen



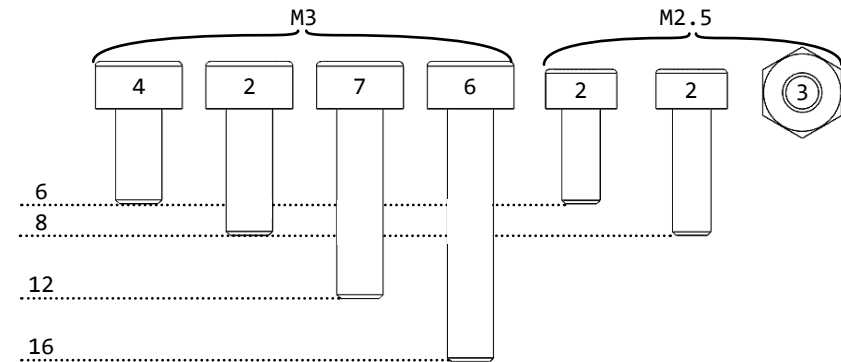
Linear_Rail



4_12_4_Bearing x2



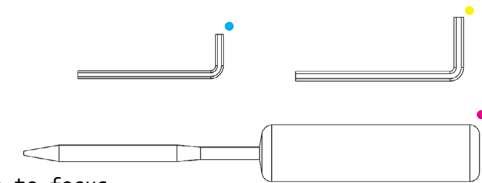
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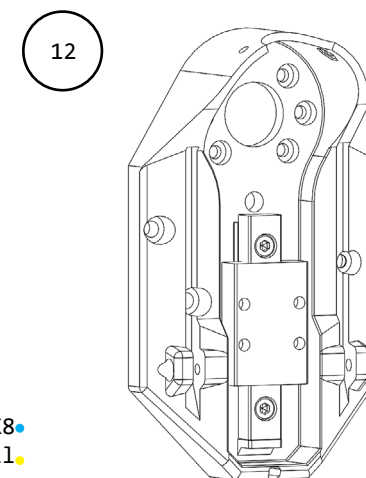
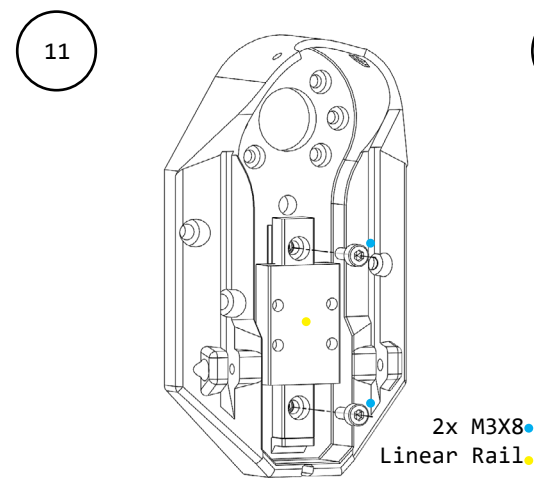
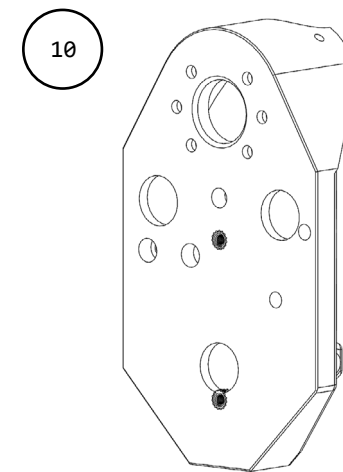
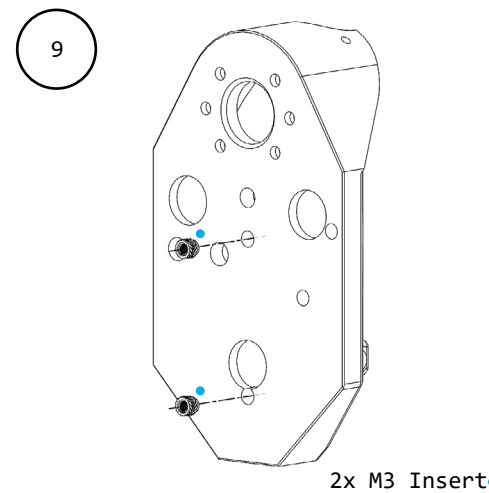
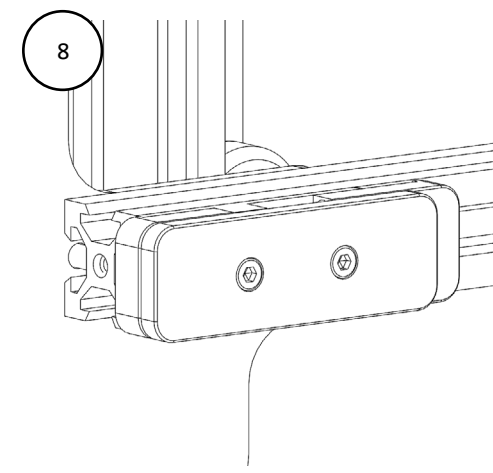
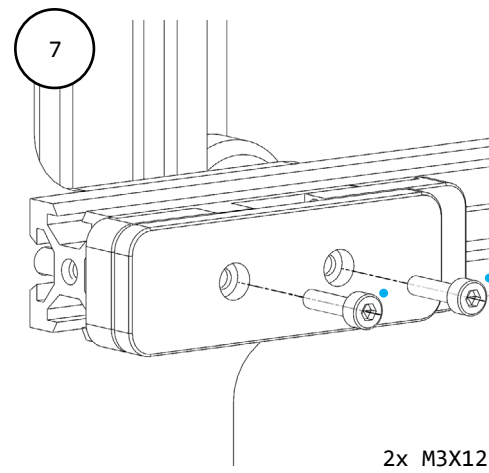
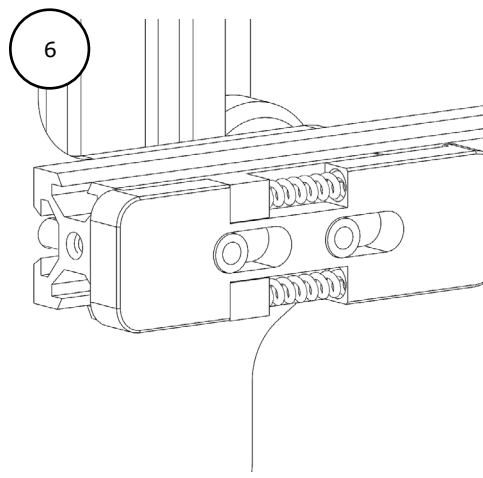
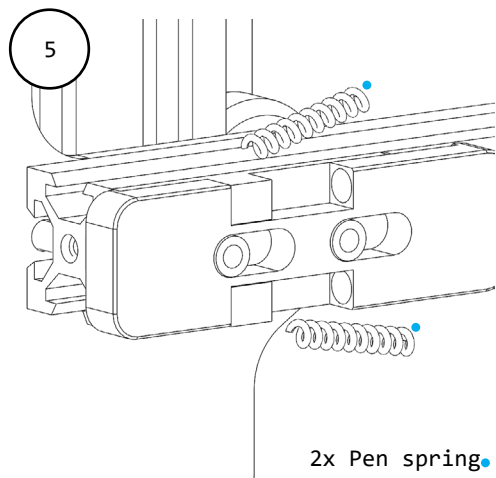
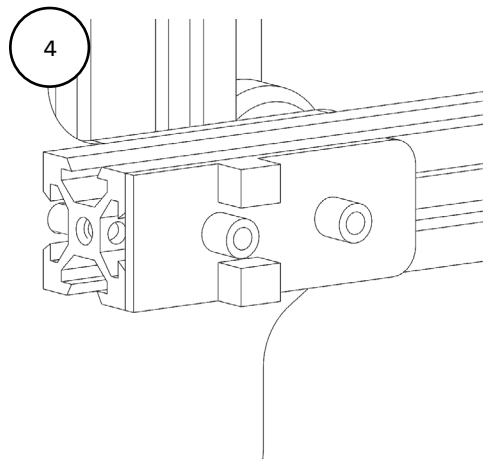
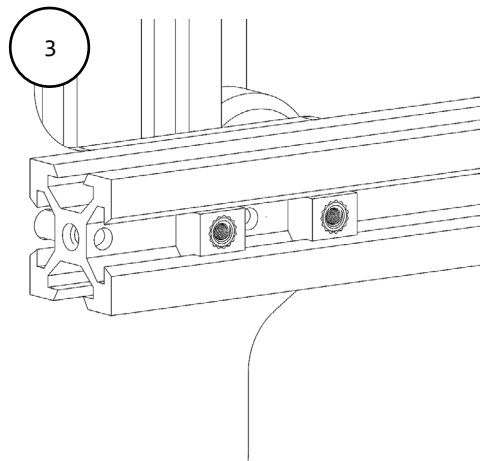
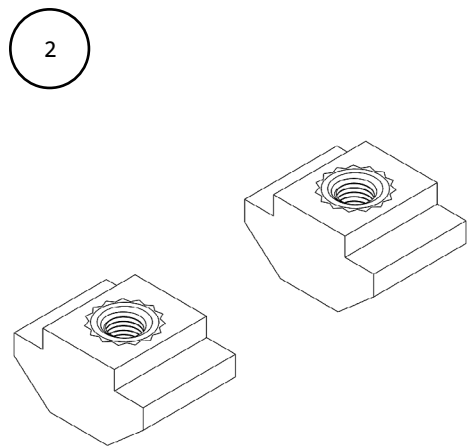
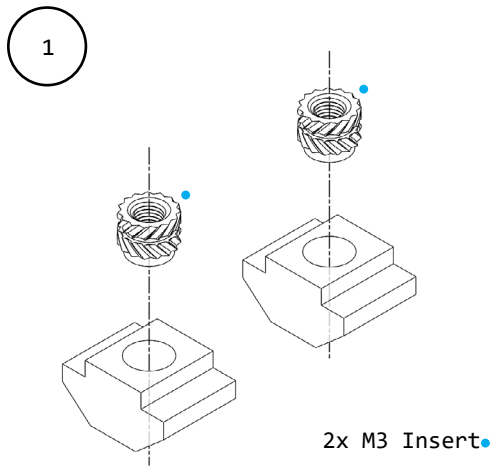


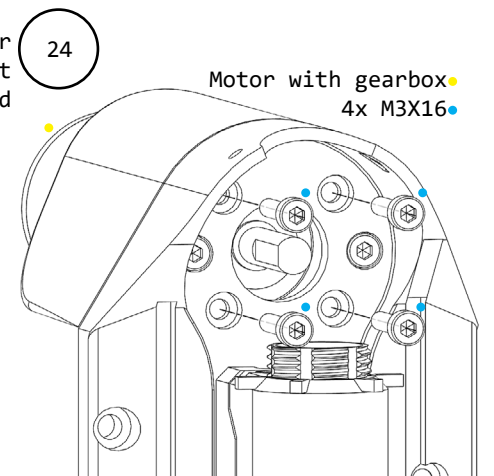
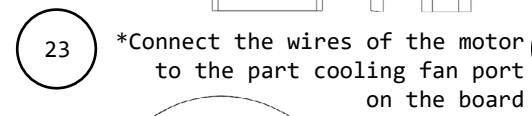
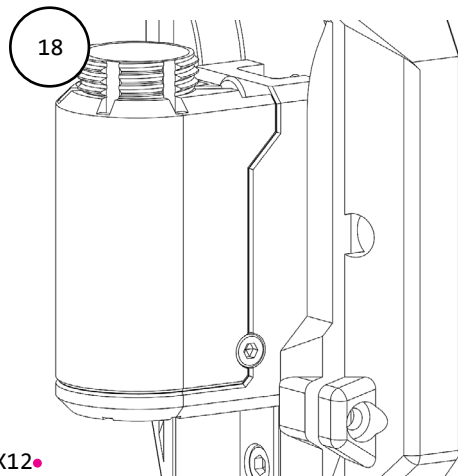
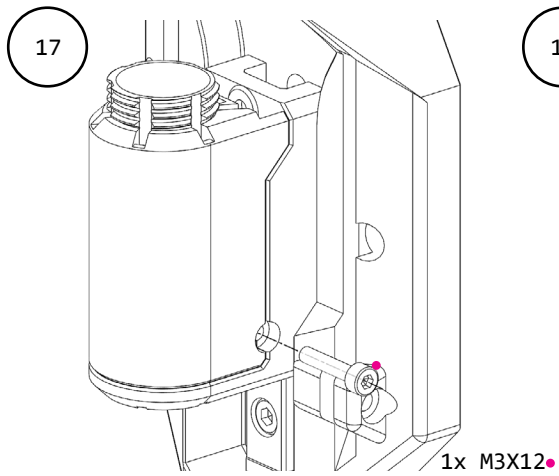
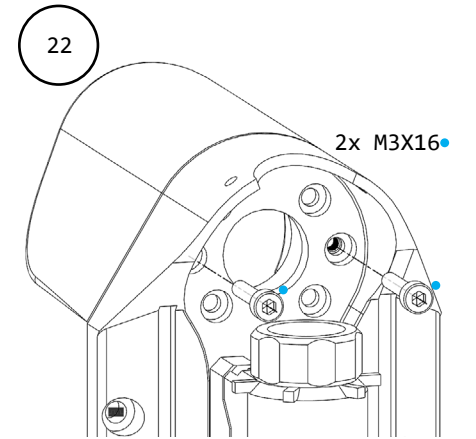
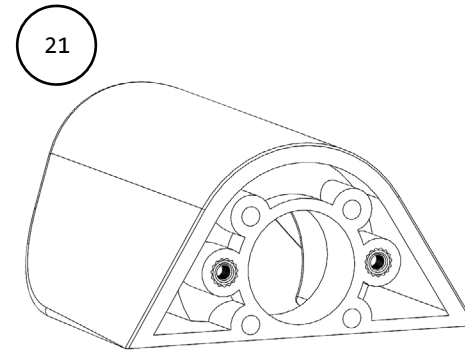
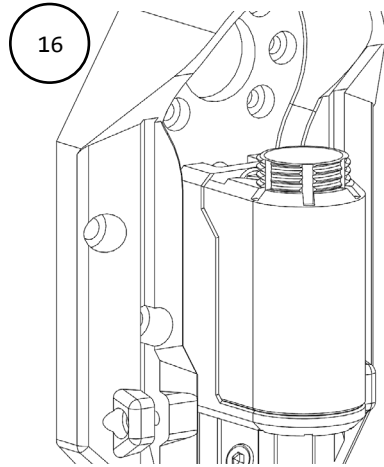
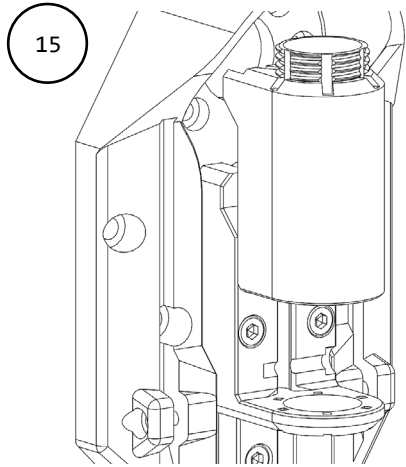
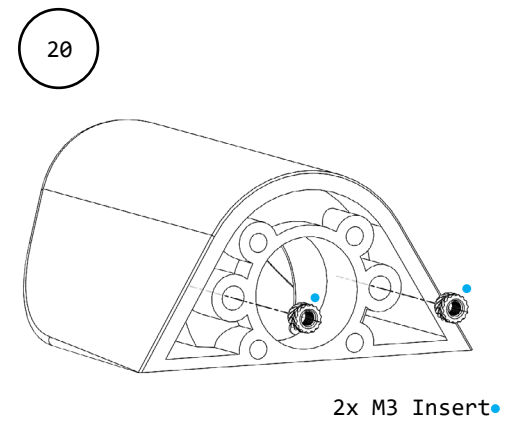
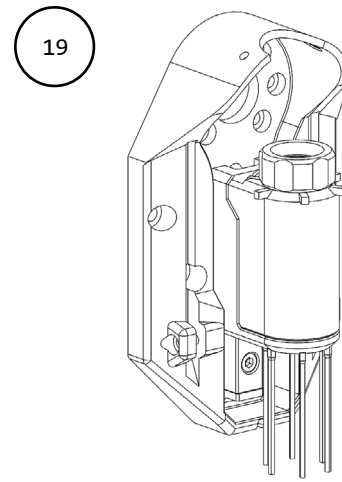
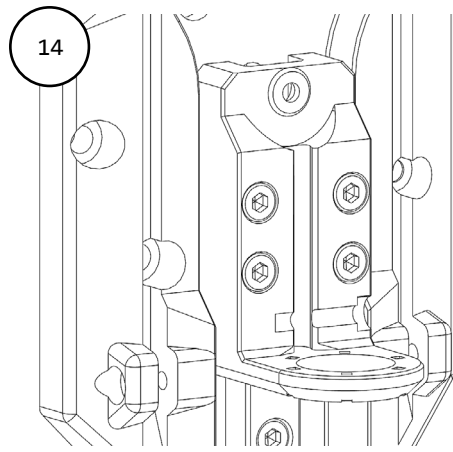
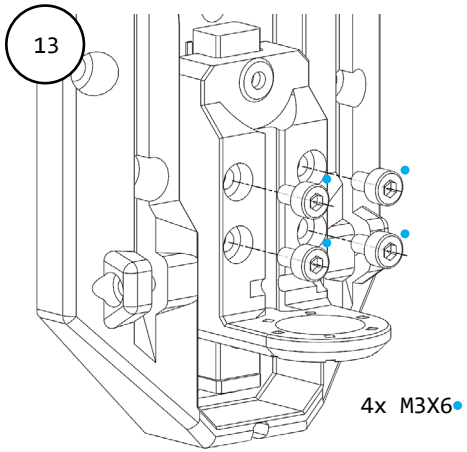
Tools

- Allen key 2mm
- Allen key 2.5mm
- Soldering Iron

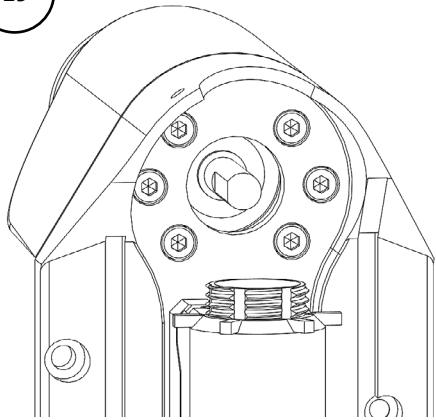
*Coloring shows where to focus



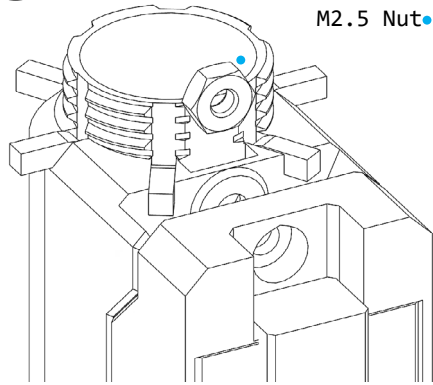




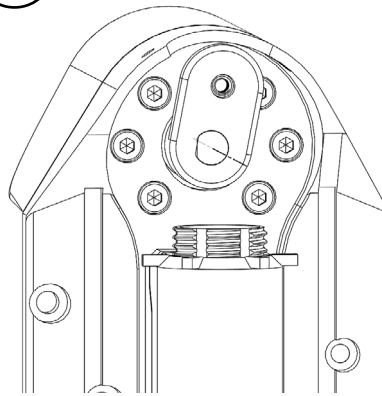
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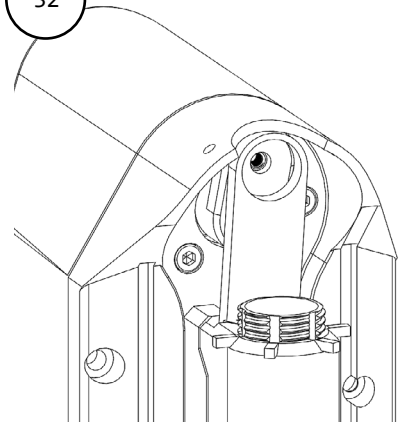
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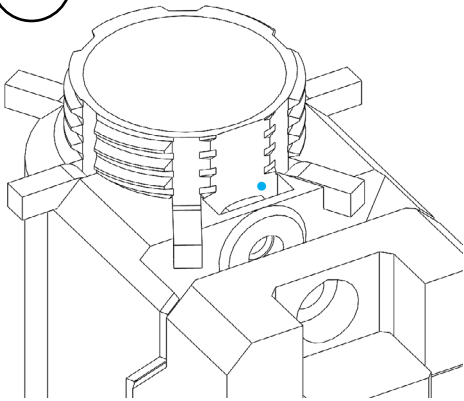
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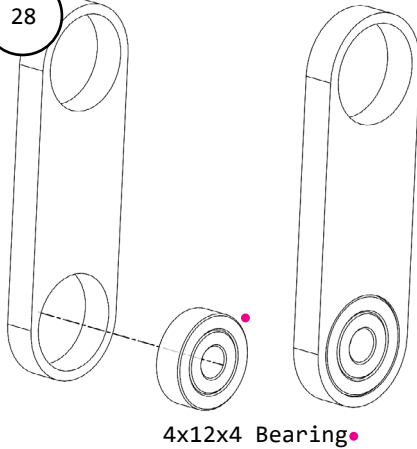
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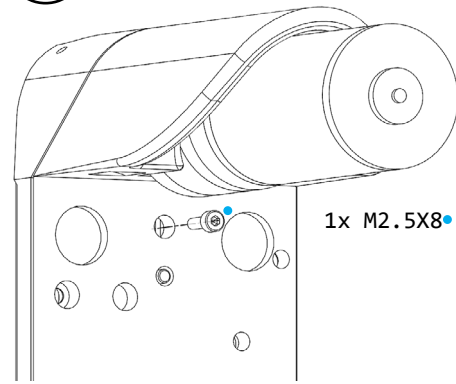
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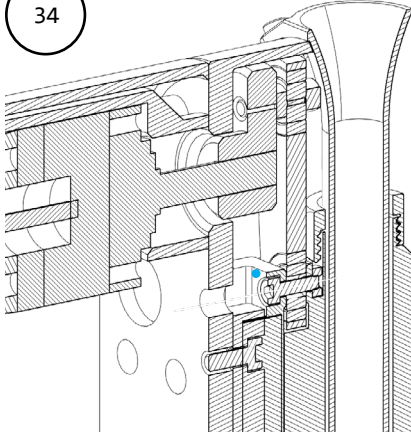
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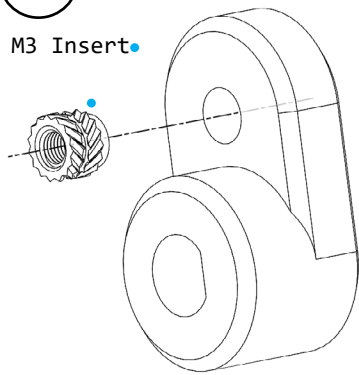
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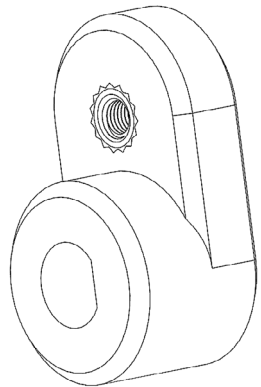
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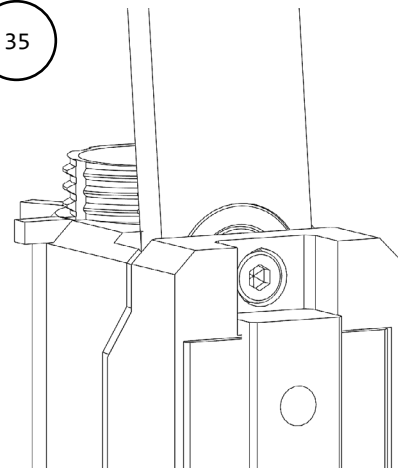
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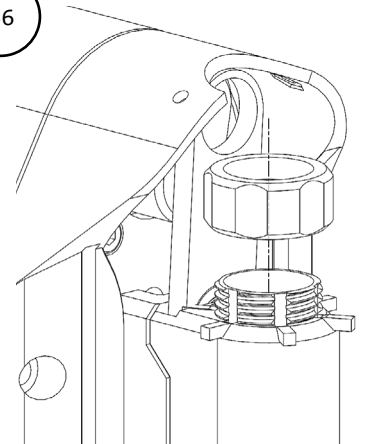
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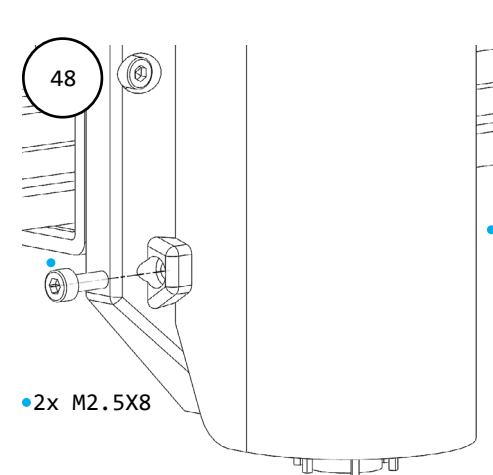
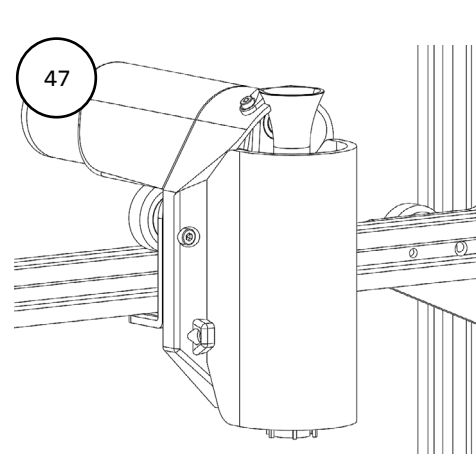
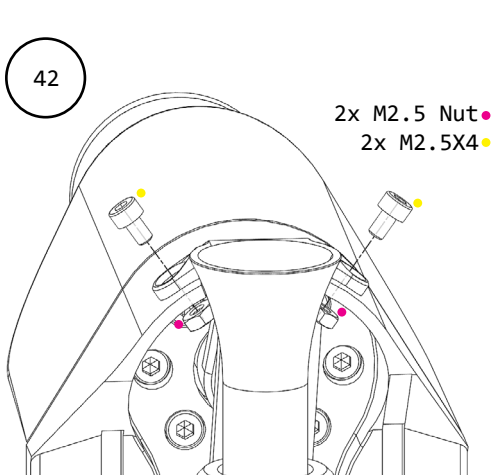
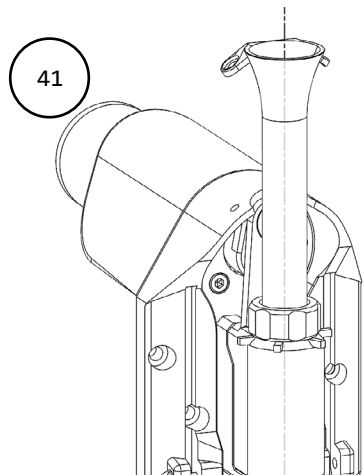
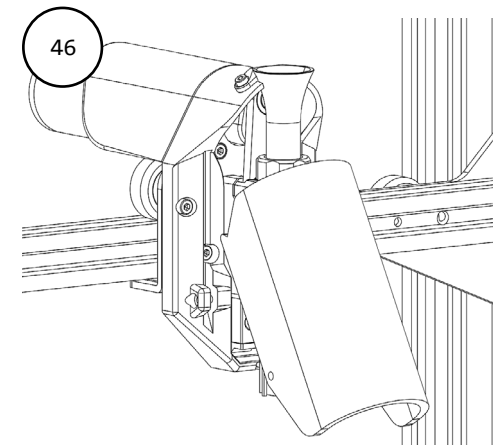
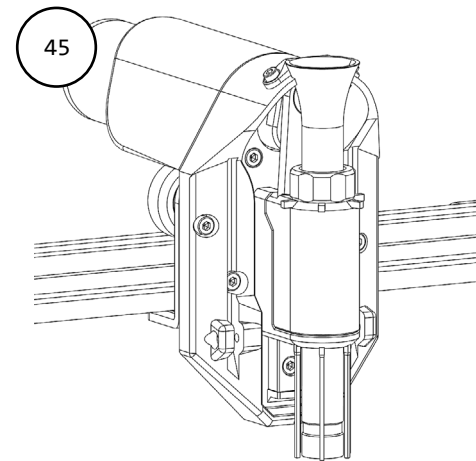
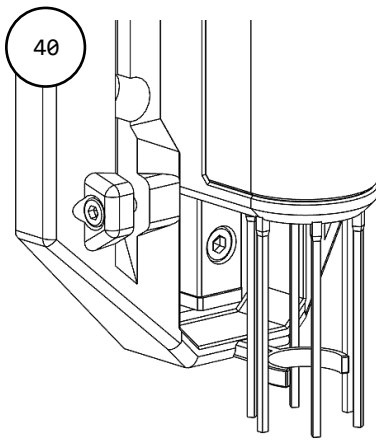
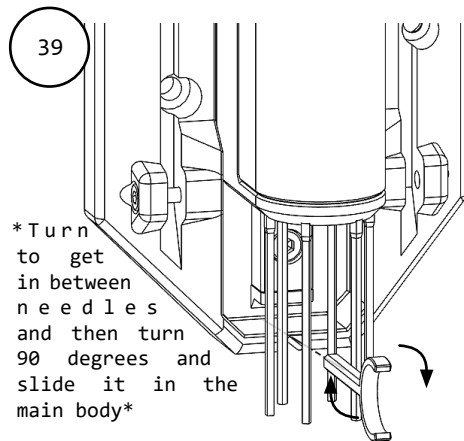
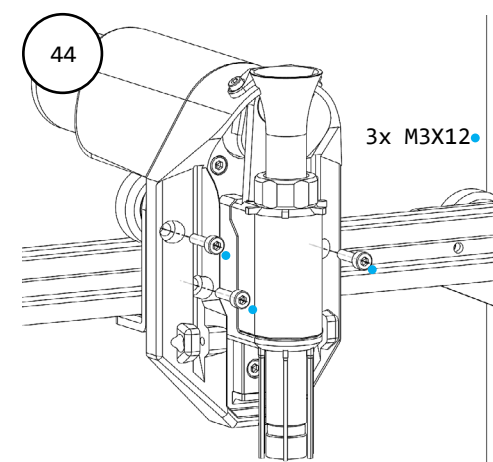
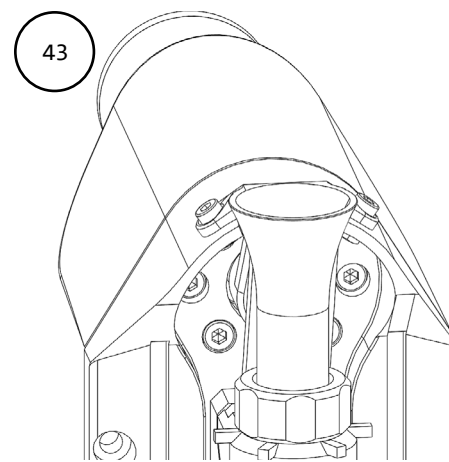
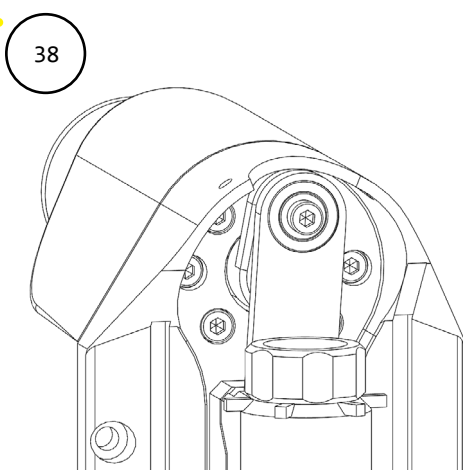
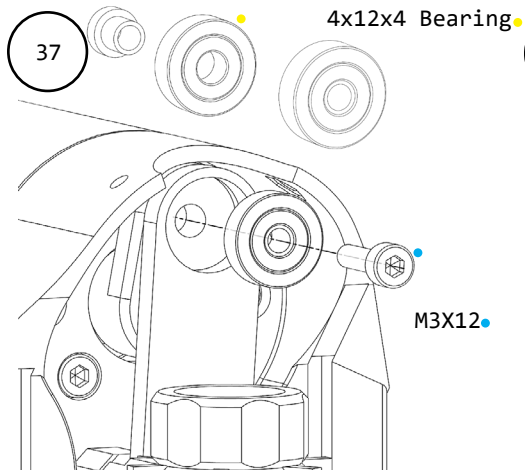
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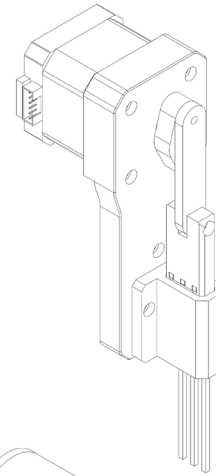
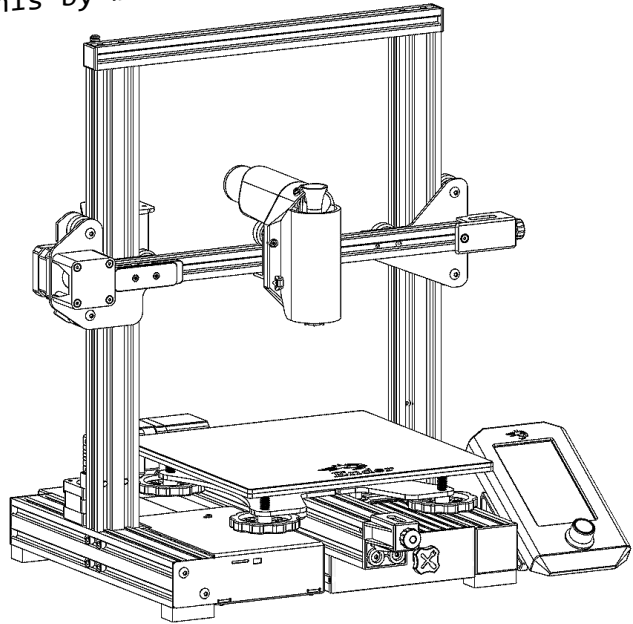


*Cross section for clarification of placement of screw

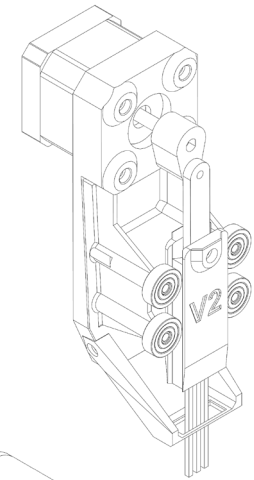


All Iterations

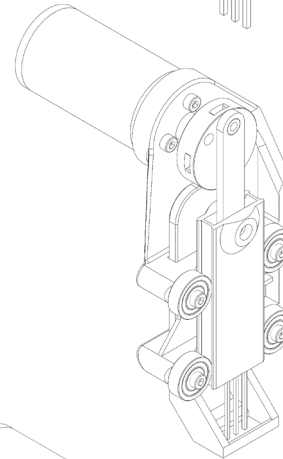
Congratulations! You assembled it! As of now, there is no software specifically for this needle felt printer. Options that you can use are, for example, Grasshopper or Cura. Luckily, this printer is very easy to control with basic G-code. Keep in mind when making the gcode that you want the needles to move a lot between points so it felts all the fibres. I did this by making my lines into a sinus.



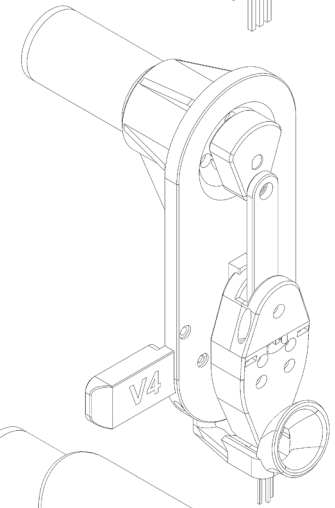
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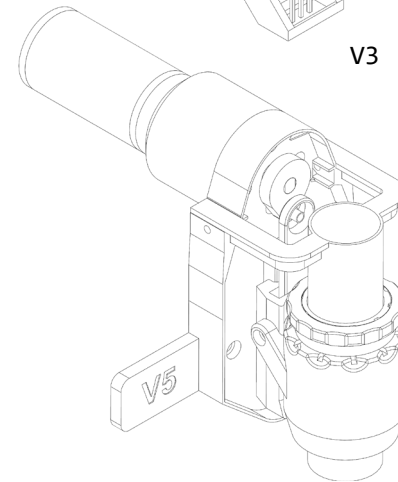
V2



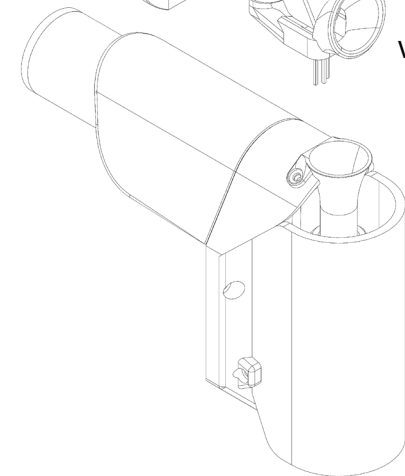
V3



V4



V5



V6

