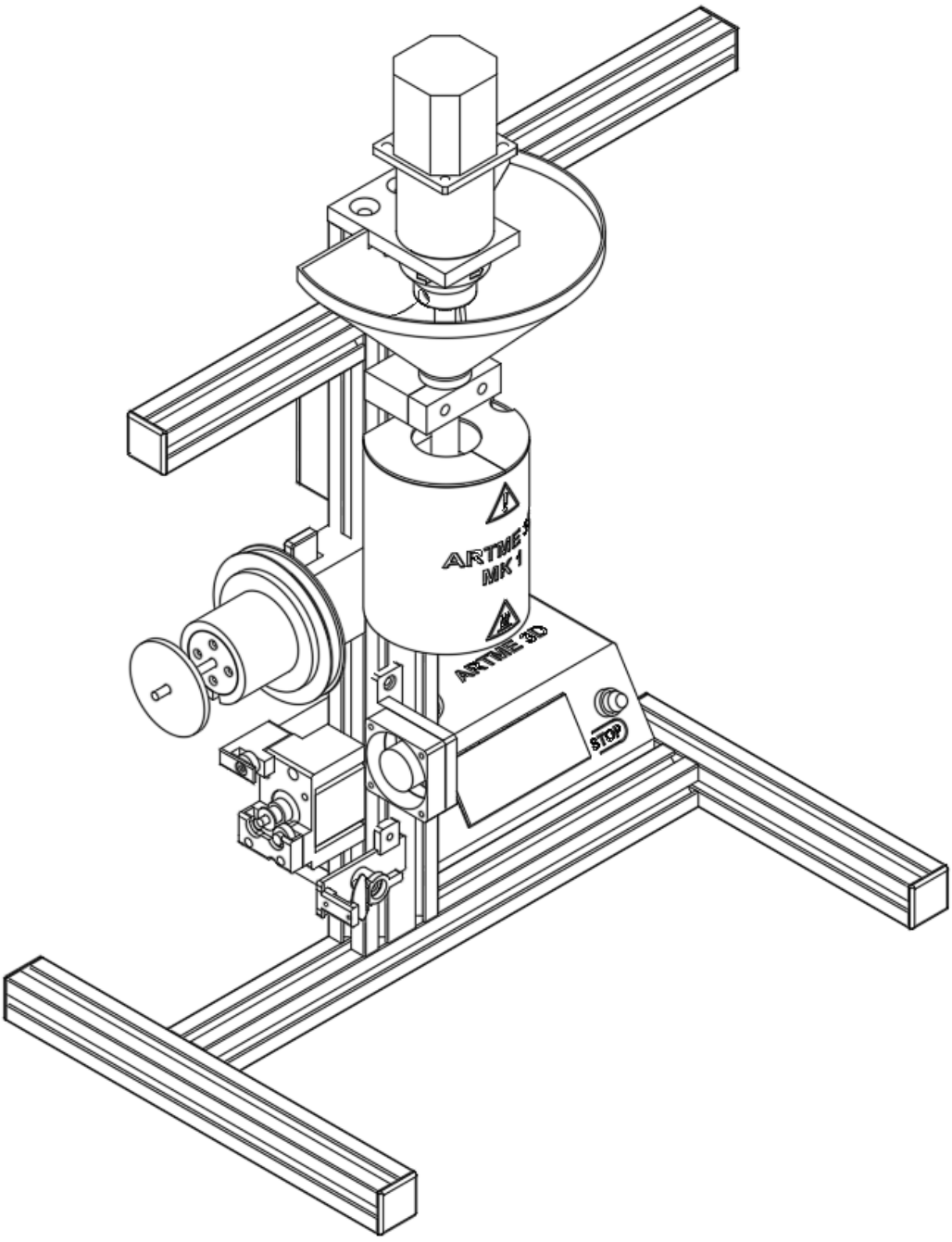
Assembly instructions
05-Spool drive

Original Desktop Filament Extruder MK1 by ARTME 3D

Version 19.06.2022



Additional tools required for this assembly section:

Phillips screwdriver PH1
superglue if necessary
if necessary sandpaper

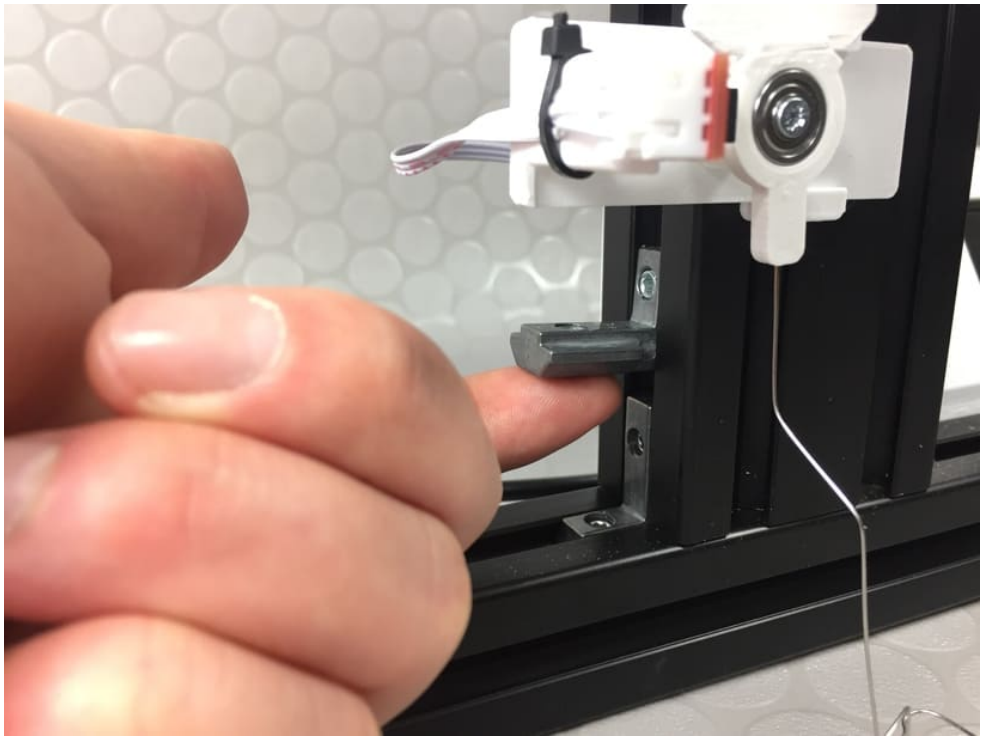
Packages overview

Package 0: Delivered carton
Package 1: Screws (SC)
Package 2: Spare Parts (SP)
Package 3: Custom Metal Parts (CM)
Package 4: Extruder Barrel (EB)
Package 5: Electronics (EL)
Package 6: Tools (TO)

Step 1:

Remove from package 6: Hexagonal wrench 3mm (TO07).

Push the prepared connector upwards in the left groove of the aluminum profile and tighten the fastening screw slightly. The exact positioning will be done later.



Step 2:

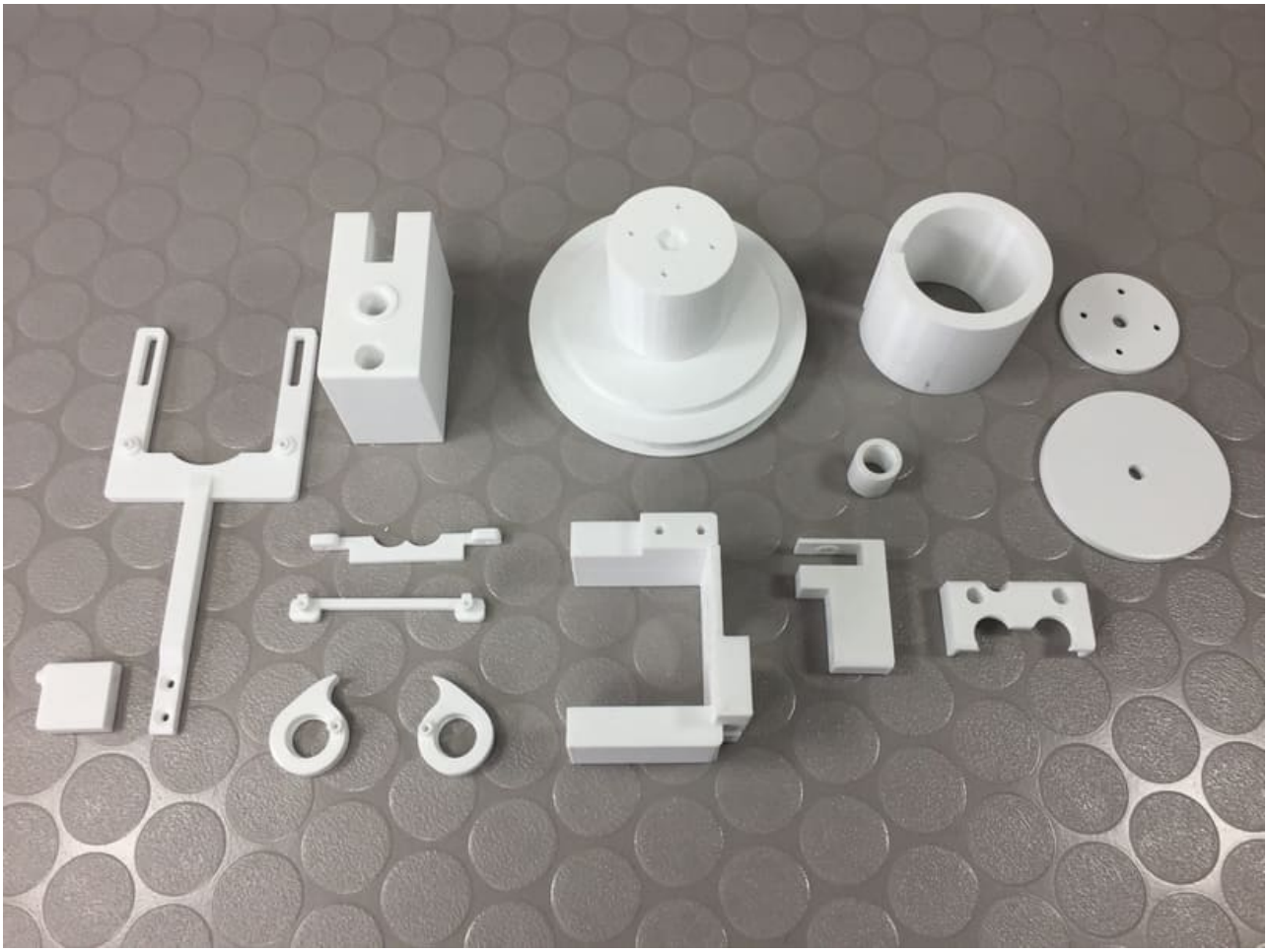
Remove from package 0 (delivered carton):
1x Nema 17 stepper motor (MO03)

Remove from package 1:
16x wood screw 2.5x12 (SC01)
2x wood screw 3x25 (SC02)
4x cheese head screw M3x6 (SC04)
7x cheese head screw M4x10 (SC05)
1x wing nut (SC15)
4x hammer nut (SC16)
1x hexagon head screw M5x70 (SC11)
1x hexagon head screw M10x50 (SC12)

Remove from package 2:
1x toothed belt (SP03)
6x ball bearing 4x13x5 (SP09)
1x Pully GT2, 6mm 20 teeth (SP14)
2x ball bearing 10x26x8 (SP10)

Step 3:

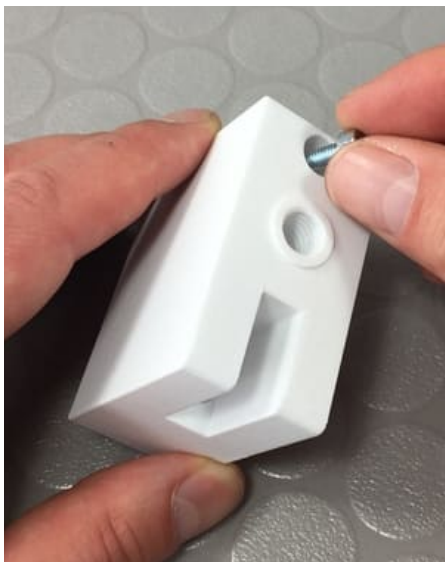
3D printing parts:
1x Spool holder (SD01)
1x Spacer (SD02)
1x Spool holder disk (SD03)
1x Spool holder disc lid 1 (SD04)
1x motor holder (SD05)
1x Motor holder cover (SD06)
1x belt tensioner (SD07)
1x Spool adapter (SD08, select the adapter for the suitable inner diameter of your used spool)
1x Spool holder cover 2 (SD09)
1x hook left (FG01)
1x hook right (FG02)
1x swing arm for 0.7 to 1kg bobbins (FG03.1)
1x crossbrace 1 (FG04)
1x crossbrace 2 (FG05)
1x lifter (FG06)

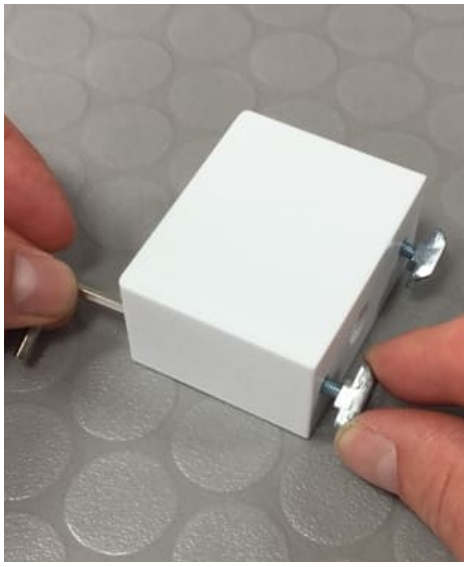


Step 4:

Tool from package 6: Allen wrench size 3 (TO07)

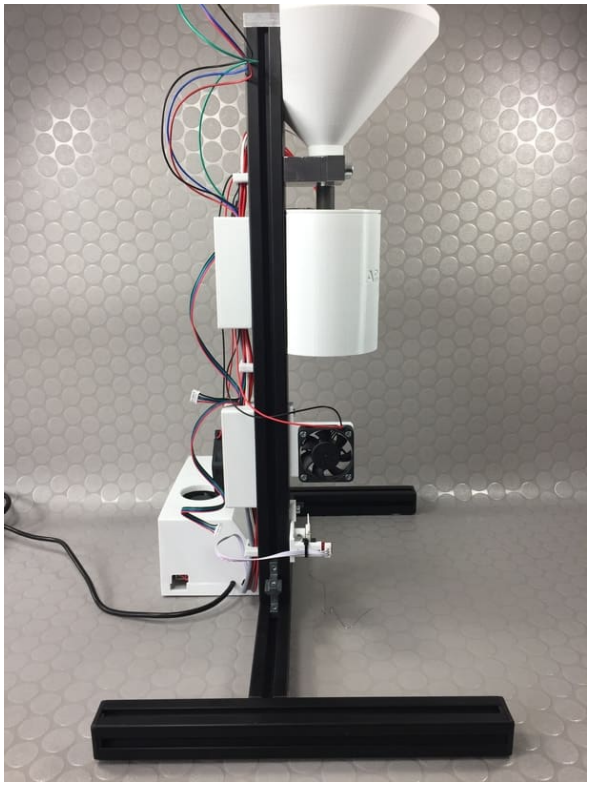
Insert two socket head screws M4x10 into the bores of the coil holder and loosely screw a hammer nut onto each.





Step 5:

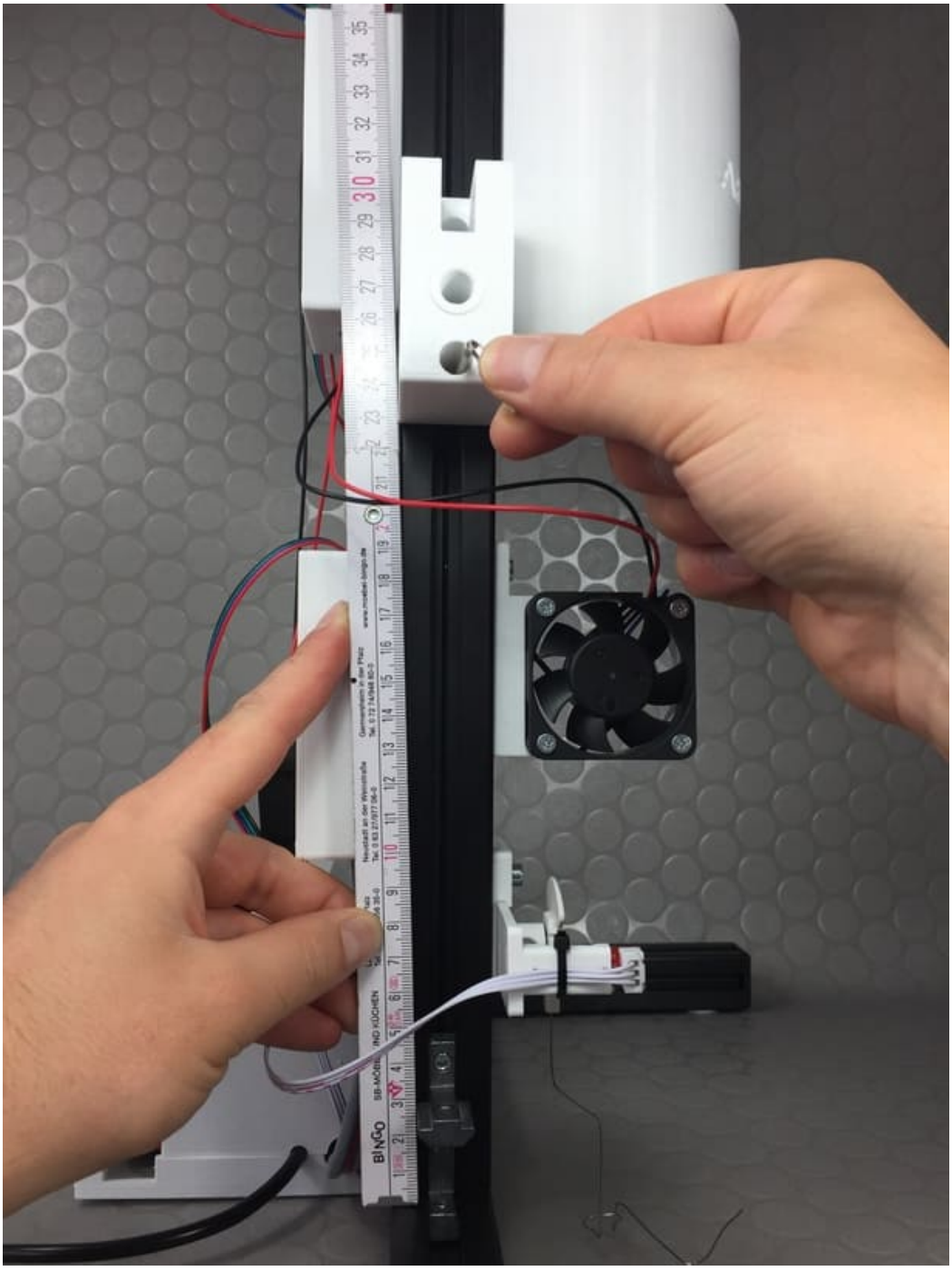
Turn the extruder so that you can easily reach the left side of the aluminum profile.



Step 6:

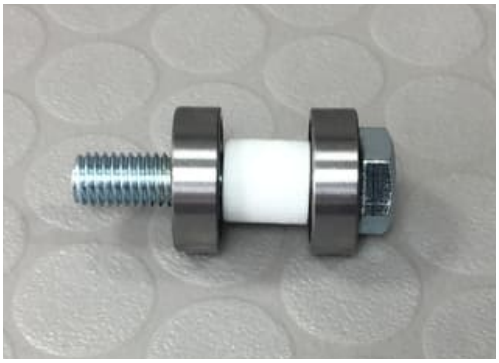
Tool from package 6: Allen wrench size 3.

Mount the coil holder on the aluminum profile of the main frame. The recess points upwards, see picture. The lower edge of the coil holder has a distance of 229mm to the mounting plate. To do this, insert the hammer nuts into the groove on the left side of the aluminum profile, hold the coil holder straight and tighten the cap screws in the holes. Again, make sure that the hammer nuts twist in the groove when tightening the screws.



Step 7:

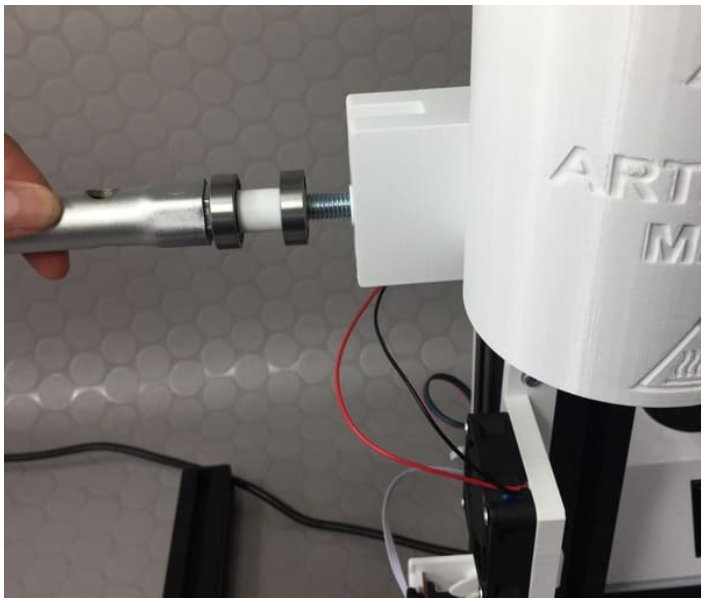
Place the two ball bearings 10x26x8 and the spacer on the hexagon screw M10x50. See picture for sequence.

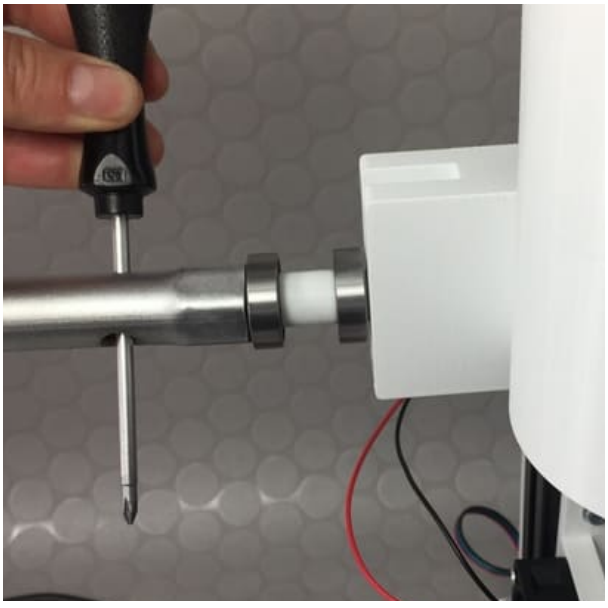


Step 8:

Tool from package 6: Socket wrench size 17 (TO03).

Carefully screw the hexagon head screw into the thread in the coil holder. You can insert the screwdriver or nail through the hole in the socket wrench to apply more force when turning. Do not overtighten the thread in the pressure part.
If the screw goes too hard to turn, check if the screw is inserted correctly into the threads. If it is still too difficult, re-tap the thread with an M10 tap or reprint the coil holder and scale it up by a small factor in x and y direction.

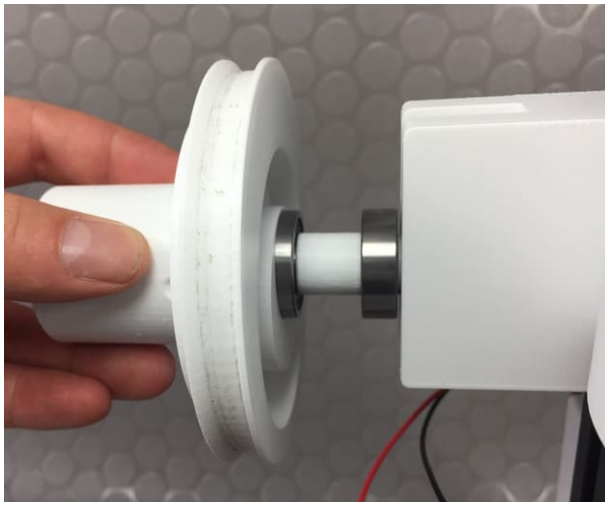
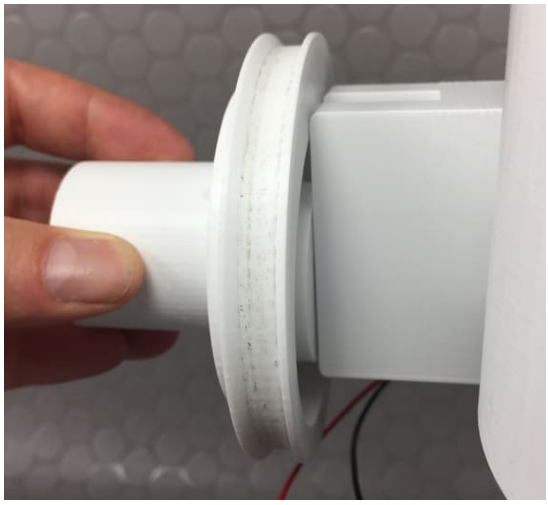




Step 9:

Werkzeug: ggf. Schleifpapier

Place the spool holder disc on the ball bearings as a test. If the print is not dimensionally accurate enough and the coil retaining washer is very difficult to fit, the bore must be reworked. Grind the inner surface of the bore evenly with sandpaper until the bobbin holder disk can be placed on the ball bearings with slight resistance. Then remove the spol holder disk again and set it aside.

Step 10:

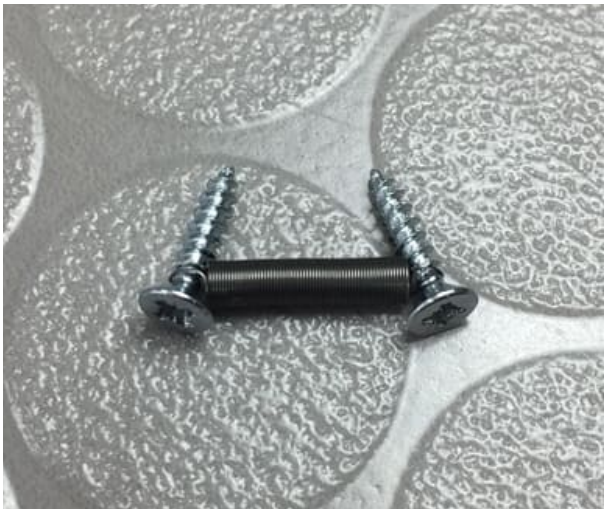
Tool: superglue if necessary

Place the two hooks (FG01+FG02) so that the opening for the ball bearing faces upwards. Now press one ball bearing 4x13x5 (SP14) each into the opening, see picture. If it is very difficult, use light hammer blows or press the ball bearing into the opening with the help of a vice. Be careful not to damage the ball bearing. If the ball bearing fits easily into the opening, you can secure it against slipping with a few drops of superglue.

Step 11:

Remove from package 2:
1x tension spring 3mm (SP23)

Insert/tighten two wood screws 2.5x12 through the eyelets of the tension spring.



Step 12:

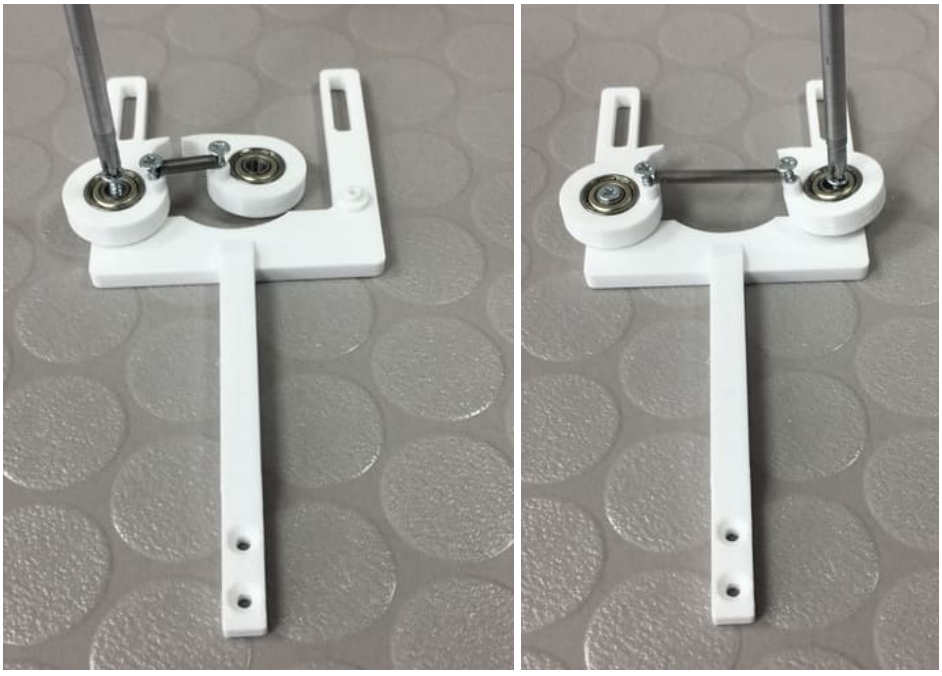
Tool: Phillips screwdriver PH1

Screw the 2.5x12 wood screws into the holes provided for this purpose in the hooks. Align everything as shown in the picture.

Step 13:

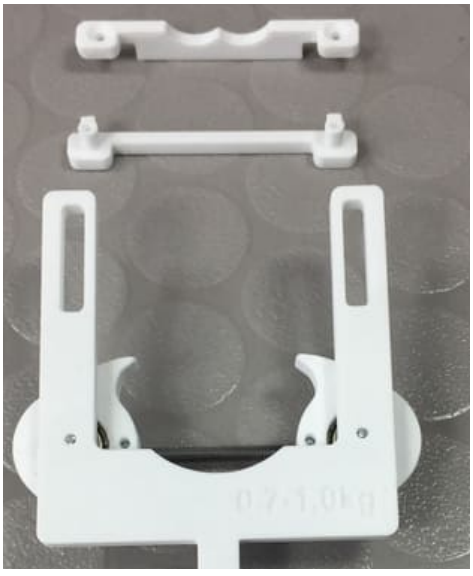
Tool: Phillips screwdriver PH1

Place the hooks on the designated elevations on the swing arm (Use swing arm FG03.1 for coils up to 1kg. For spools with larger diameter up to 2.5kg use the swing arm FG03.2). Make sure that the ball bearing is properly inserted and centered on the elevation. Now screw the ball bearings tight with a wood screw 2.5x12 each. The tension spring tightens a little in the process.



Step 14:

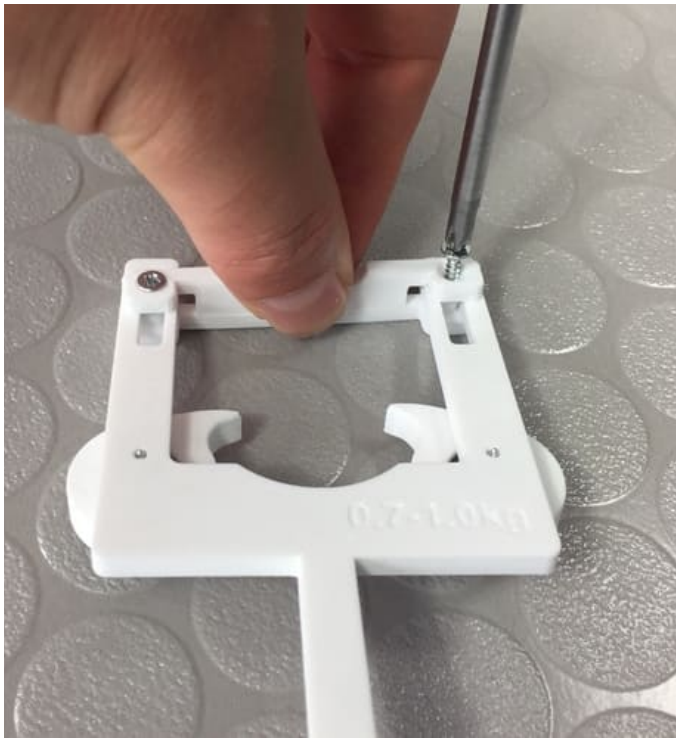
Turn the swing arm over. Place crossbrace 1 and crossbrace 2 over the swing arm and align exactly as shown in the picture.

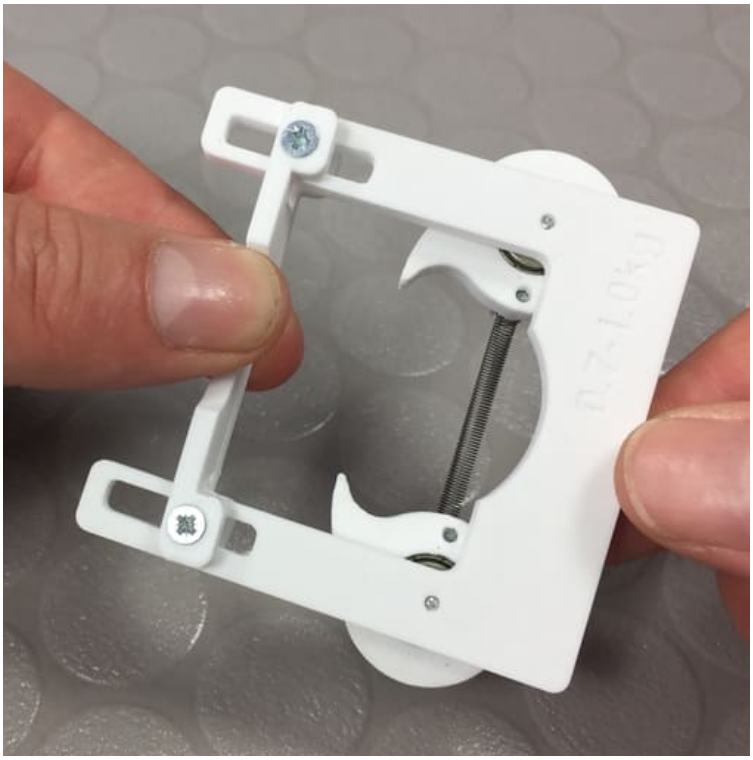


Step 15:

Tool: Phillips screwdriver PH1

Take crossbrace 1 and insert it into the elongated holes of the swing arm, see picture. Then place crossbrace 2 on top and screw a wood screw 2.5x12 into each end, see picture. The crossbrace should slide back and forth quite easily, as well as twist slightly. If resistance is felt here, remove the crossbrace parts again and grind the contact surfaces between the swing arm and crossbrace slightly. Then repeat the process.





Step 16:

Tool: Phillips screwdriver PH1

A ball bearing 4x13x5 is placed on the lifter and screwed tight with the wood screw 2.5x12. Make sure that the ball bearing is centered on the elevation provided.

Step 17:

Tool: Phillips screwdriver PH1

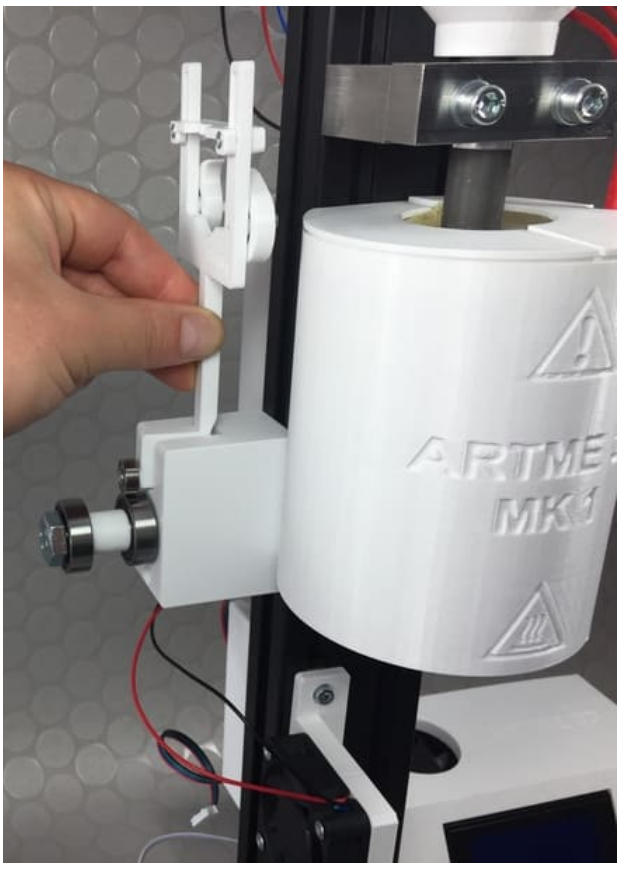
The lifter is screwed to the swing arm with two wood screws 2.5x12. Pay attention to the correct alignment see picture.

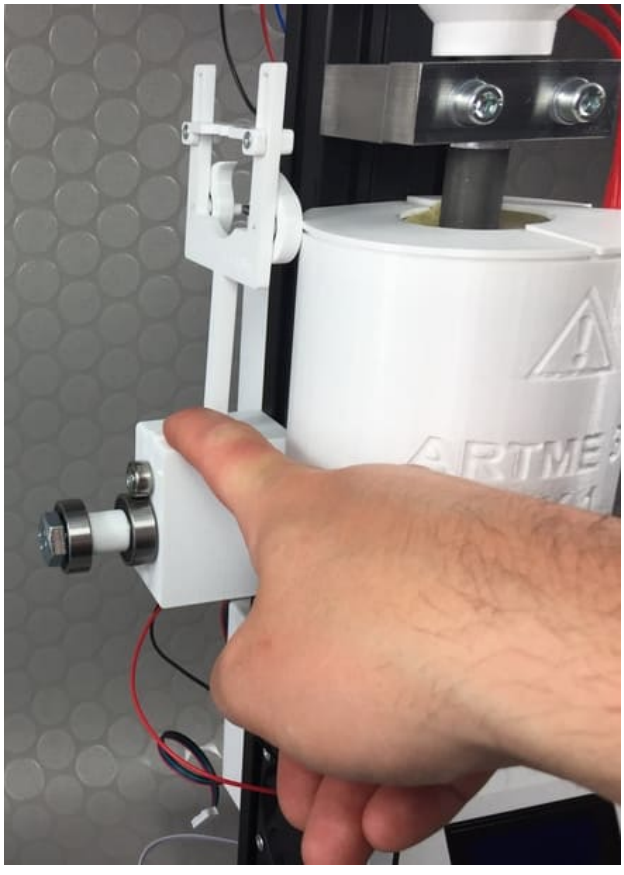
Step 18:

Check again that all parts on the swingarm are correctly aligned. See picture.

Step 19:

Place the swing arm in the recess provided in the already mounted bobbin holder. See picture.

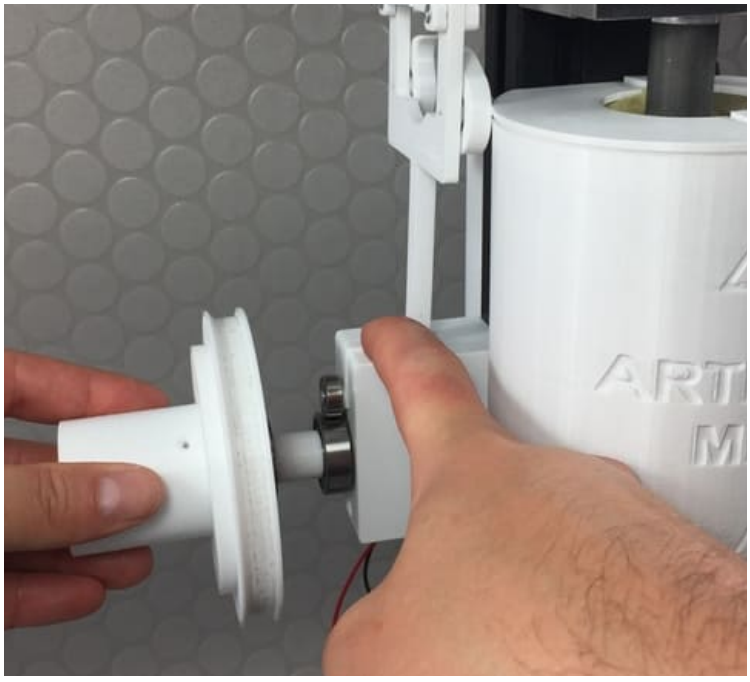


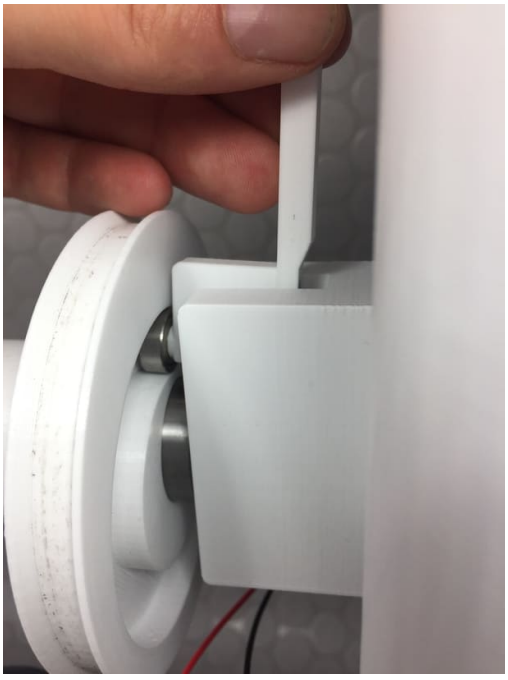


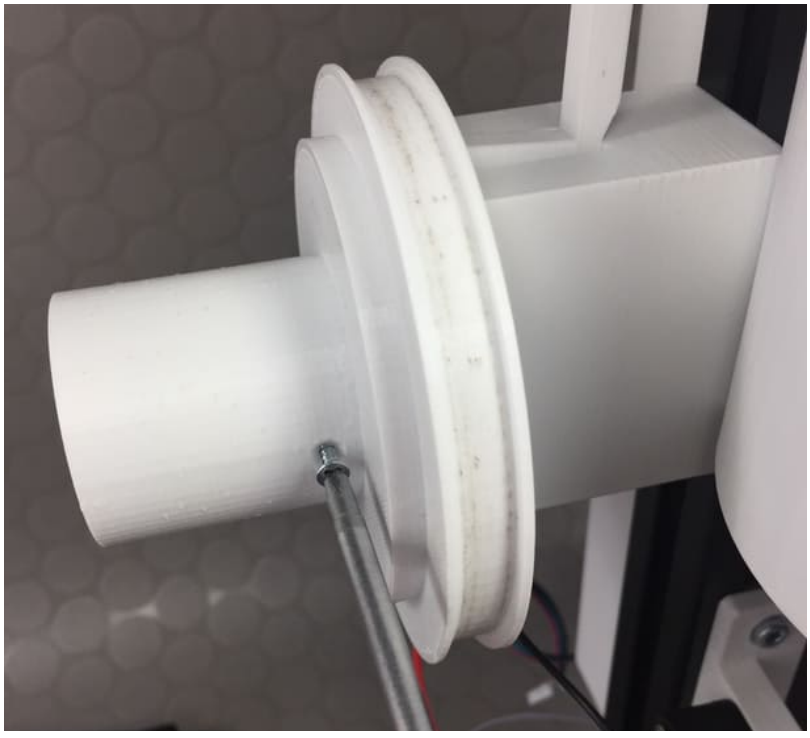
Step 20:

Tool: Phillips screwdriver PH1

The Spool holder disc is placed on the ball bearings. The small ball bearing of the swing arm must hit the oval guide. Slide the Spool holder disc up to the stop. Screw a 2.5x12 wood screw into the hole in the side of the Spool holder disc. This secures the disc and prevents it from moving. Check whether the disc turns smoothly. If it hooks or grinds somewhere, you can rework the printed parts until everything runs well.



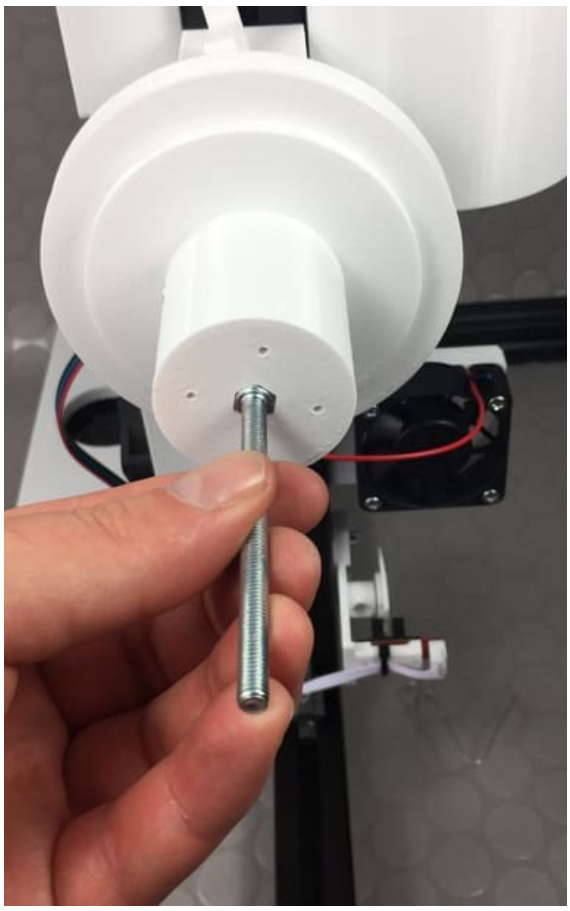


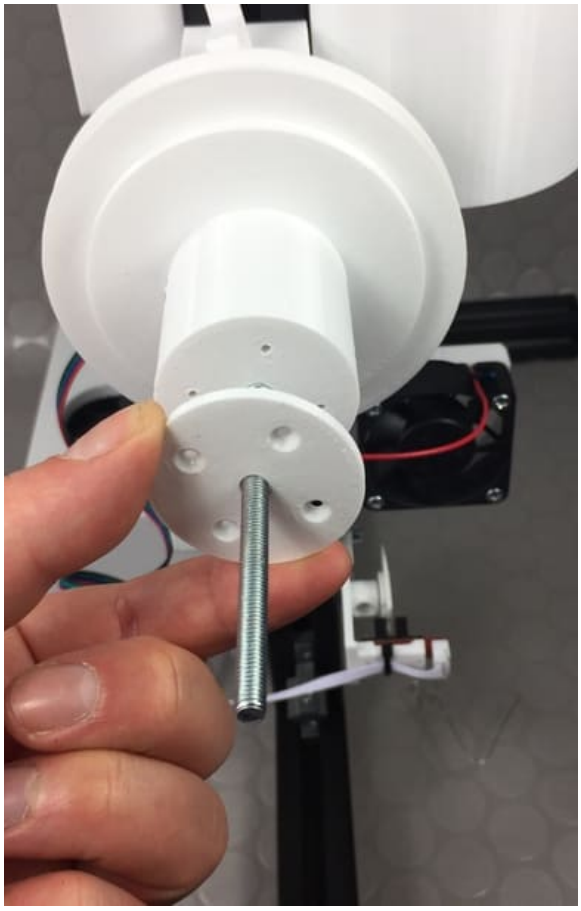


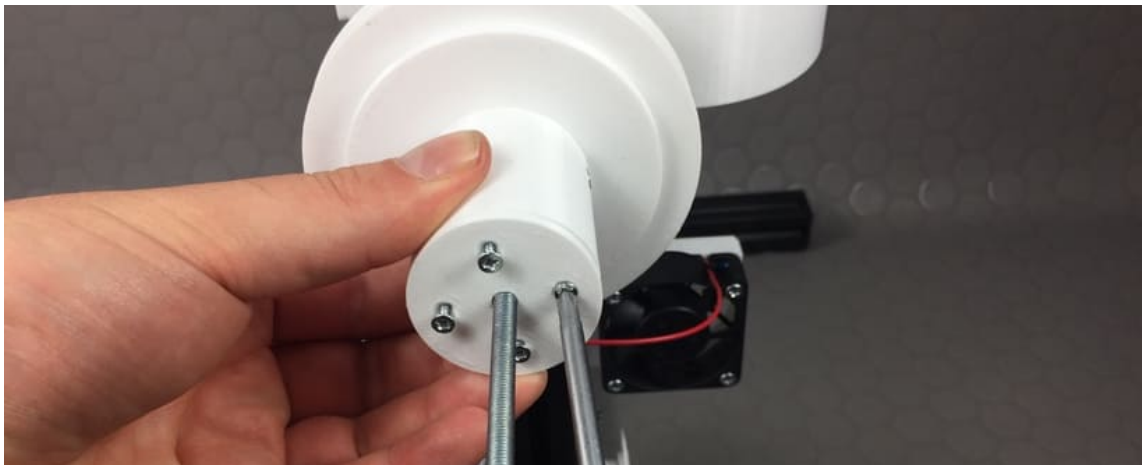
Step 21:

Tool: Phillips screwdriver PH1

Insert the head of the M5x70 hexagon head screw into the opening provided and place the cover Spool holder 1 on top. Align the lid so that you can screw in the four wood screws 2.5x12.

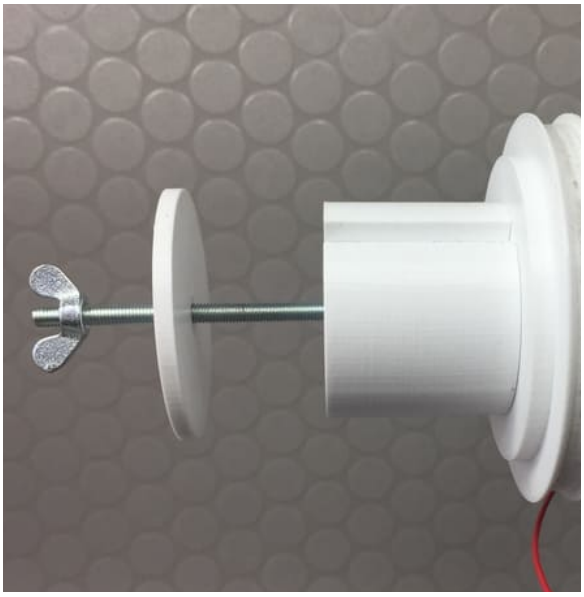






Step 22:

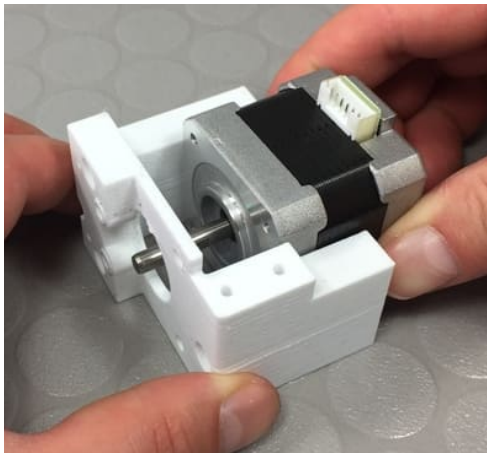
Place the spool adapter (SD08) on the spool holder disc. Print the spool adapter in the size of the inner diameter of the spool you are using. The cover spool holder 2 is put on the hexagon screw M5x70 and the wing nut is loosely screwed on it. The coil is later clamped onto the holder before commissioning. To do this, loosen the wing nut again and remove the cover. If you only use small spools, you can also shorten the screw, then the unscrewing of the wing nut does not take so long.

Step 23:

Tool: Allen key 3mm

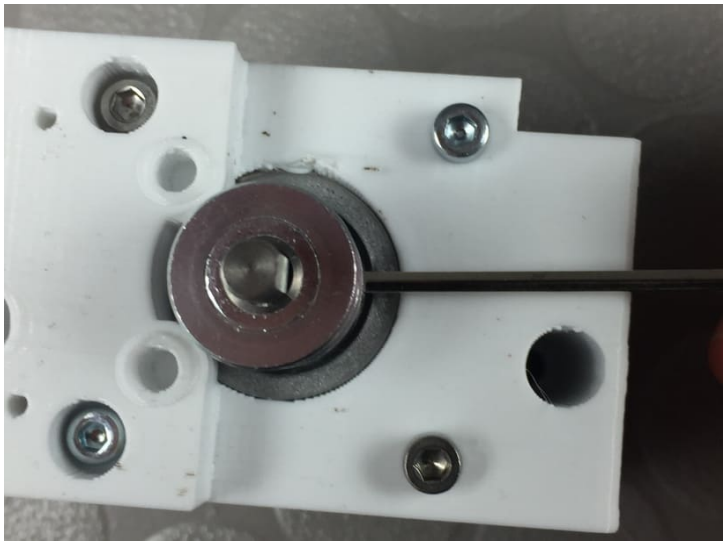
The Nema 17 stepper motor is placed on the motor holder. Alignment See picture. The connection for the cable on the motor points upwards. Screw down the motor with 4x cylinder screw M3x6.

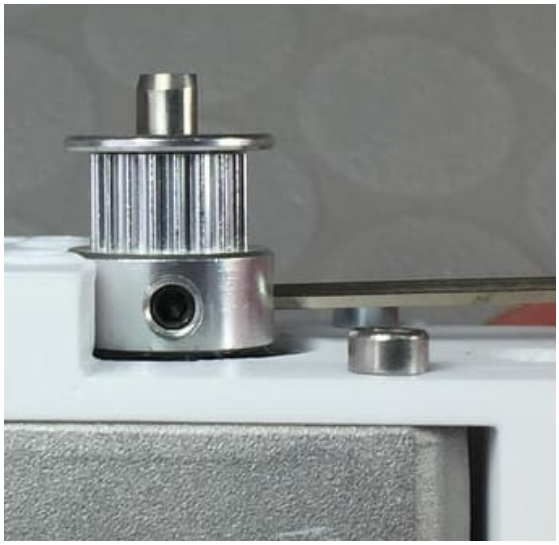


Step 24:

Tool from package 6: Allen wrench size 2.

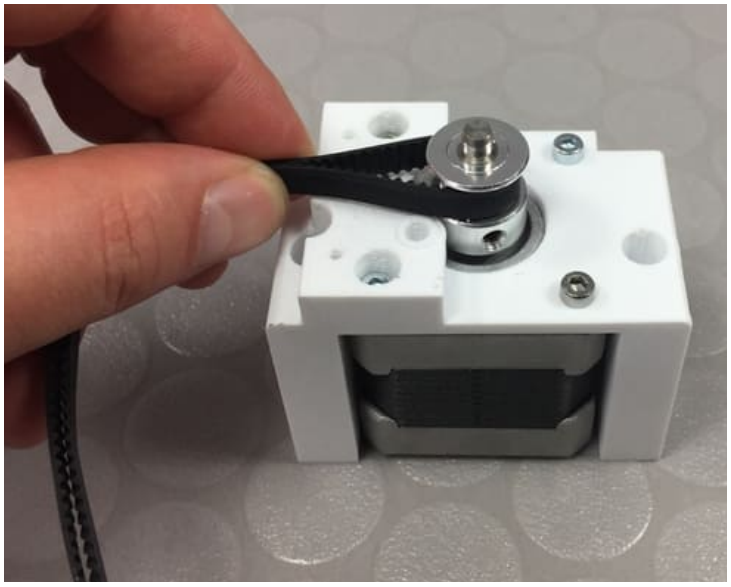
The pully (GT2, 6mm 20 teeth) is put on the motor shaft. Alignment see pictures. Align the grub screws in the pully so that one screw meets the flat surface on the motor shaft. Tighten both grub screws. (do not overtighten)





Step 25:

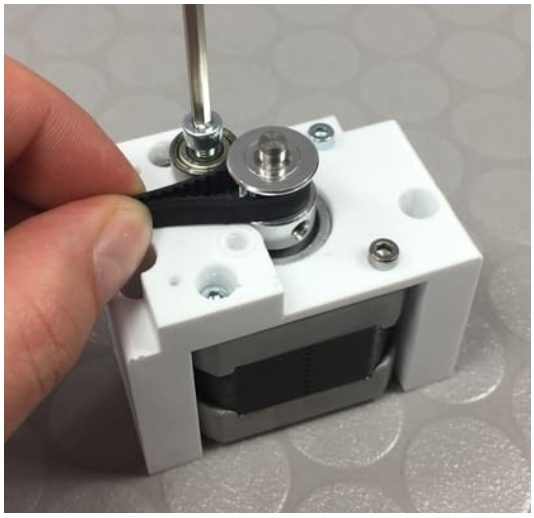
Place the toothed belt around the pully. See picture.



Step 26:

Remove from package 6: Allen wrench size 3

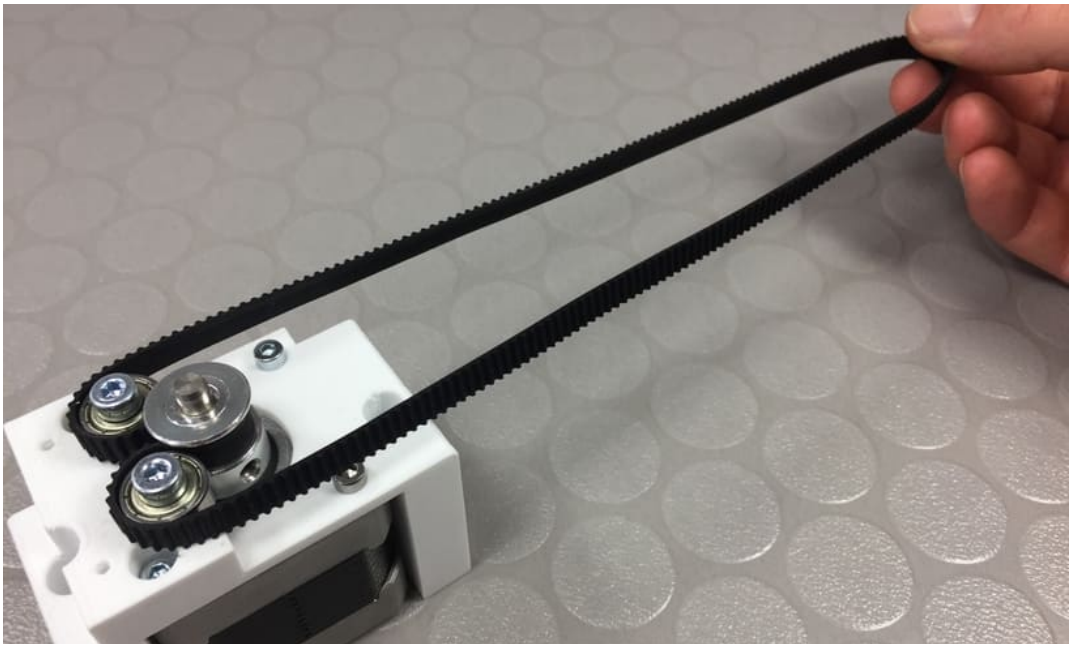
Two ball bearings 4x13x5 are screwed into the hole provided for them, each with a cheese head screw M4x10. Only tighten lightly, do not overtighten. Pay attention to the position of the toothed belt.

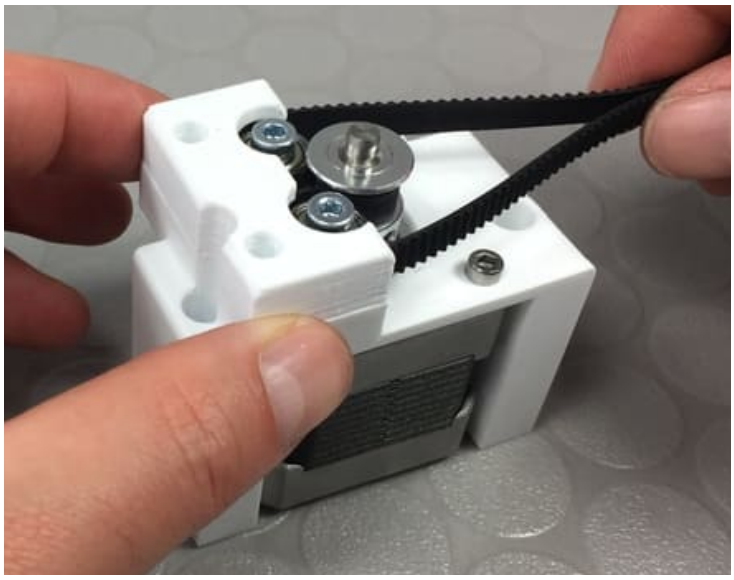
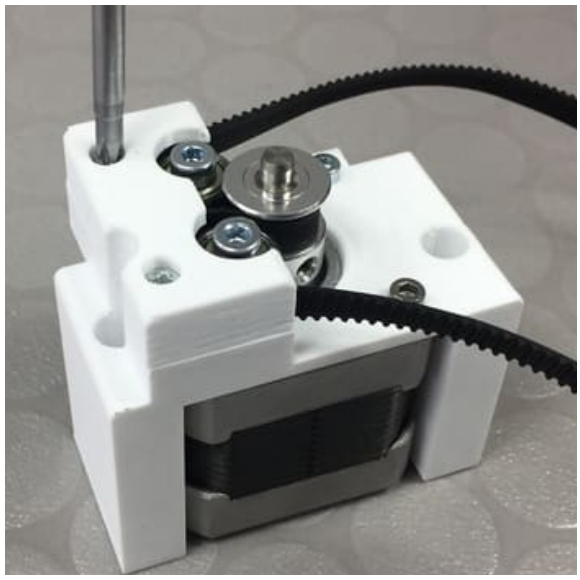


Step 27:

Tool: Phillips screwdriver PH1

Twist the toothed belt so that the teeth point outwards. Then fix the motor holder cover with two wood screws 2,5x12. See also pictures next page.

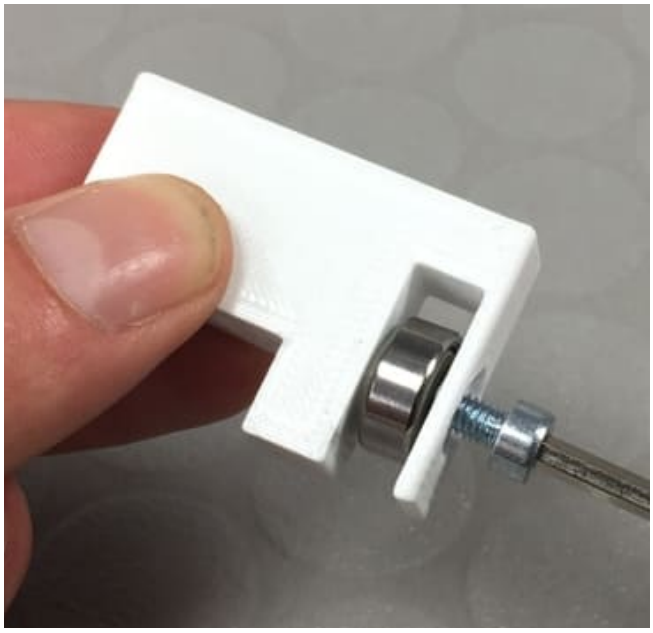


Step 28:

Tool from package 6: Allen wrench size 3.

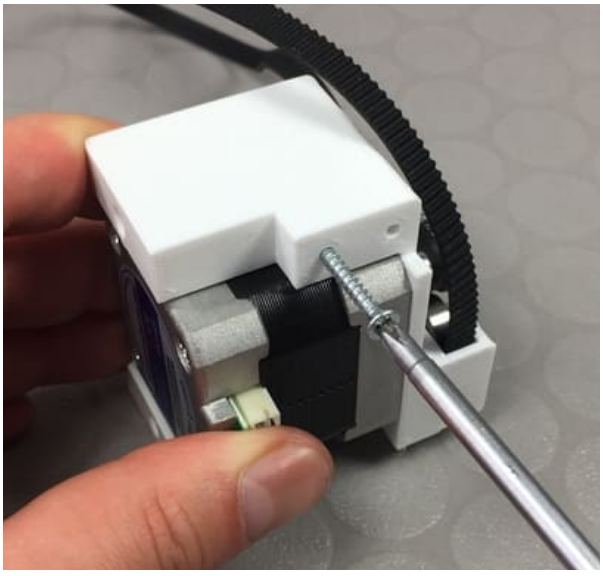
A ball bearing 4x13x5 is inserted into the belt tensioner and fastened with a socket head screw M4x10. Tighten only slightly, do not overtighten.

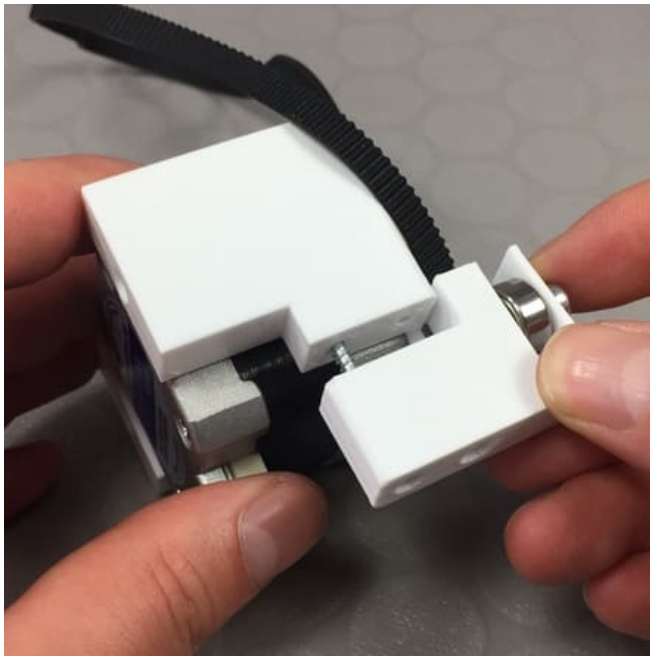



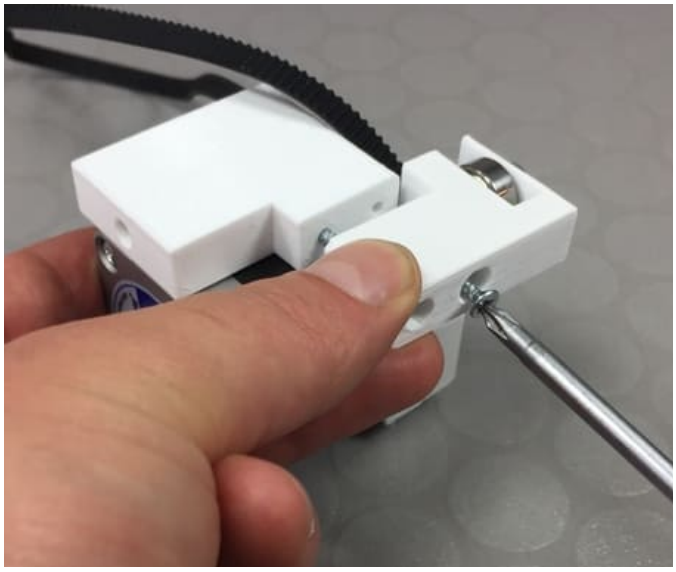
Step 29:

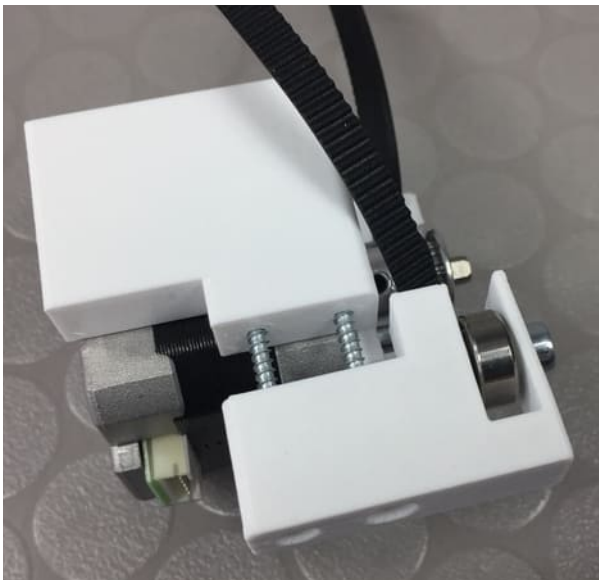
Tool: Phillips screwdriver PH1

Position the motor holder as shown. A 3x25 wood screw is screwed into the left hole in the motor holder. Only a few turns, do not screw it all the way in. Then place the belt tensioner on the screw. A second 3x25 wood screw is screwed in through the right hole. This too only a few turns.





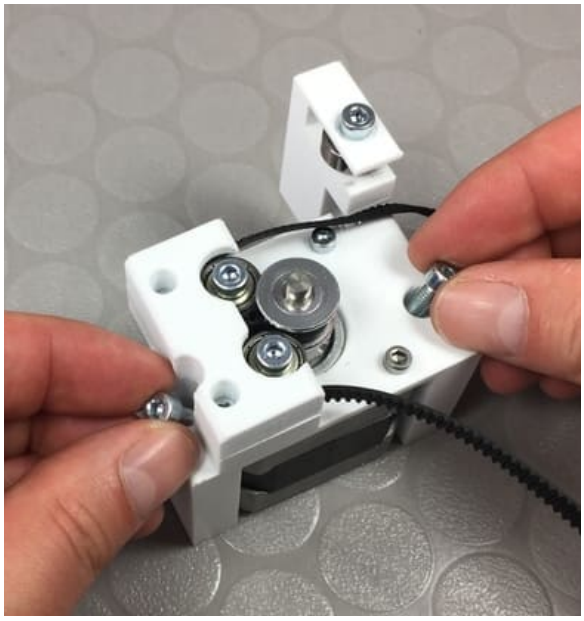


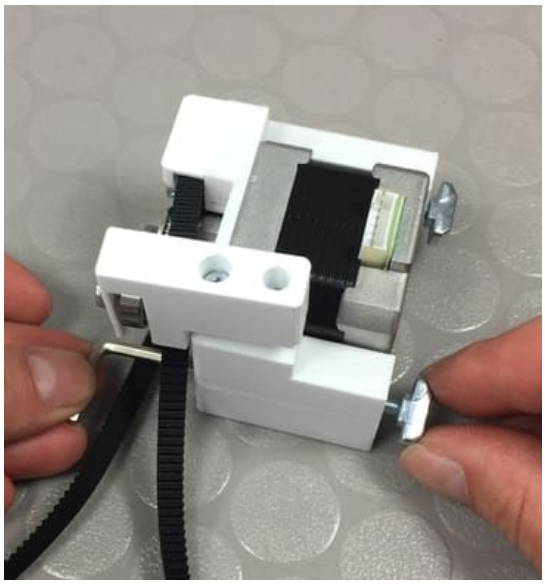


Step 30:

Tool from package 6: Allen wrench size 3

Two socket head cap screws M4x10 are inserted into the hole provided in the motor mount and two hammer nuts are screwed onto them.

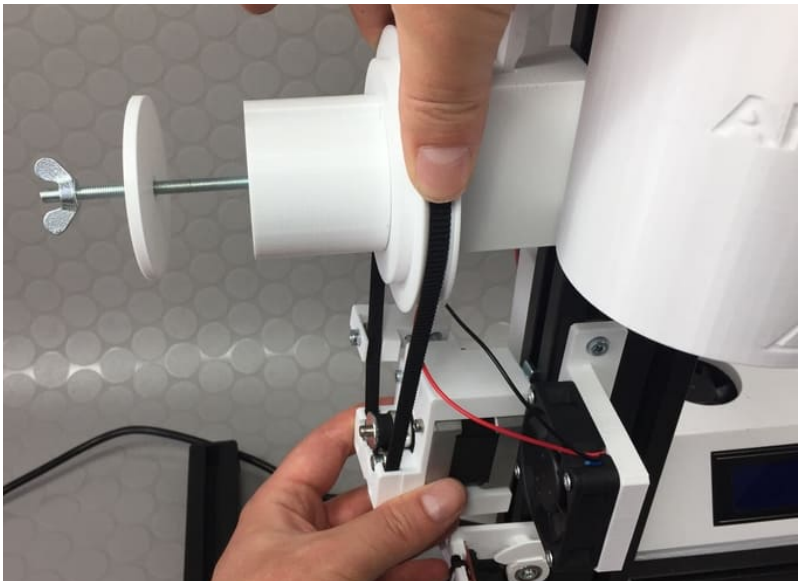


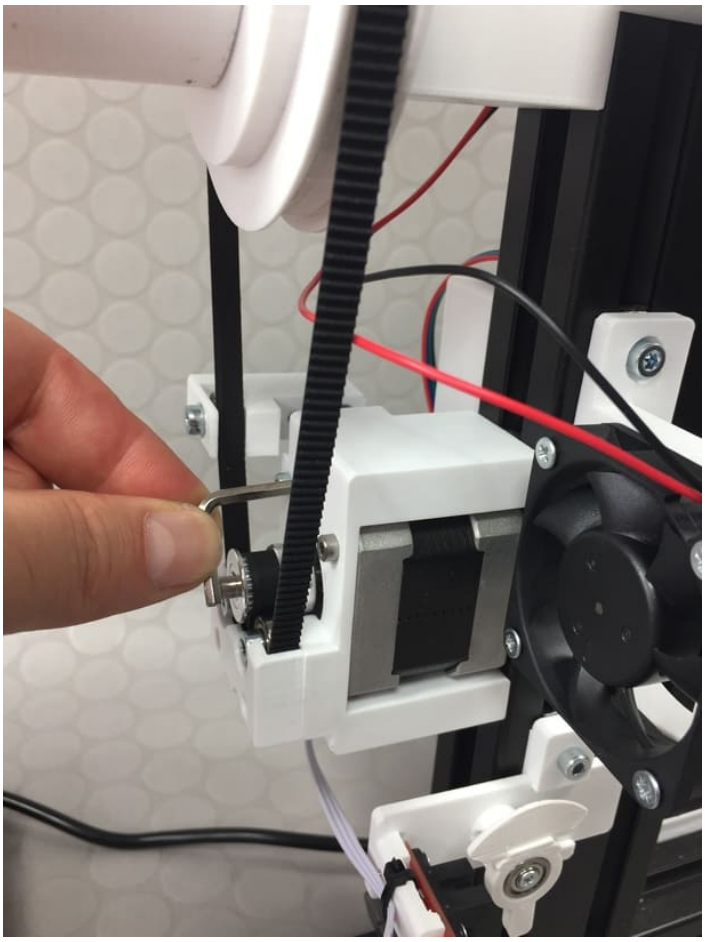


Step 31:

Tool from package 6: Allen wrench size 3.

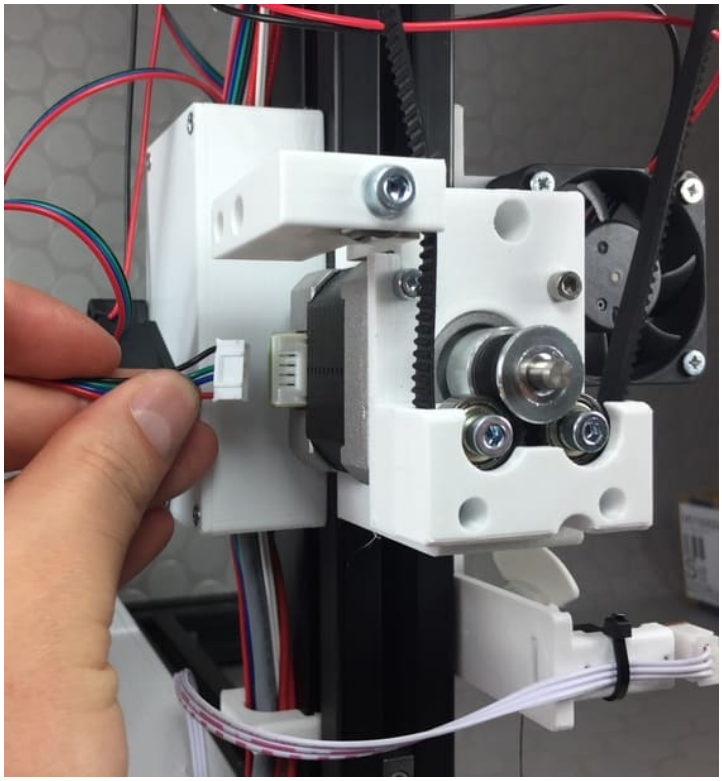
Place the toothed belt on the spool holder pulley and fasten the motor holder to the aluminum profile of the main frame. Alignment see picture, also next page. The cap screws are tightened. Again, make sure that the hammer nuts inside the groove are twisted when tightening. The motor mount should be fastened so that the timing belt has only slight tension. The belt should also not sag. The two wood screws on the belt tensioner should be unscrewed so that the belt tensioner does not yet exert any force on the belt.

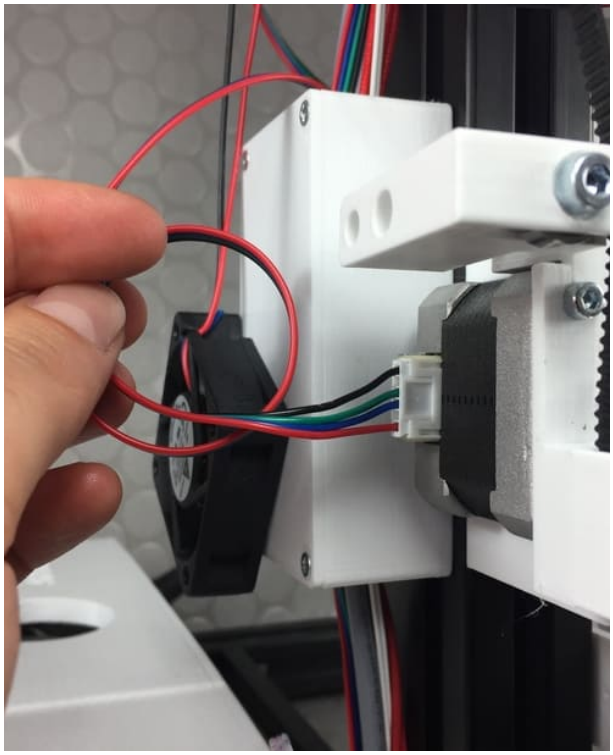




Step 32:

The stepper motor cable, which is led out of the lower connection housing, is connected to the stepper motor. The connector is coded, pay attention to the correct orientation.





Done:

Now continue with assembly instructions "06-Filament guide assembly".