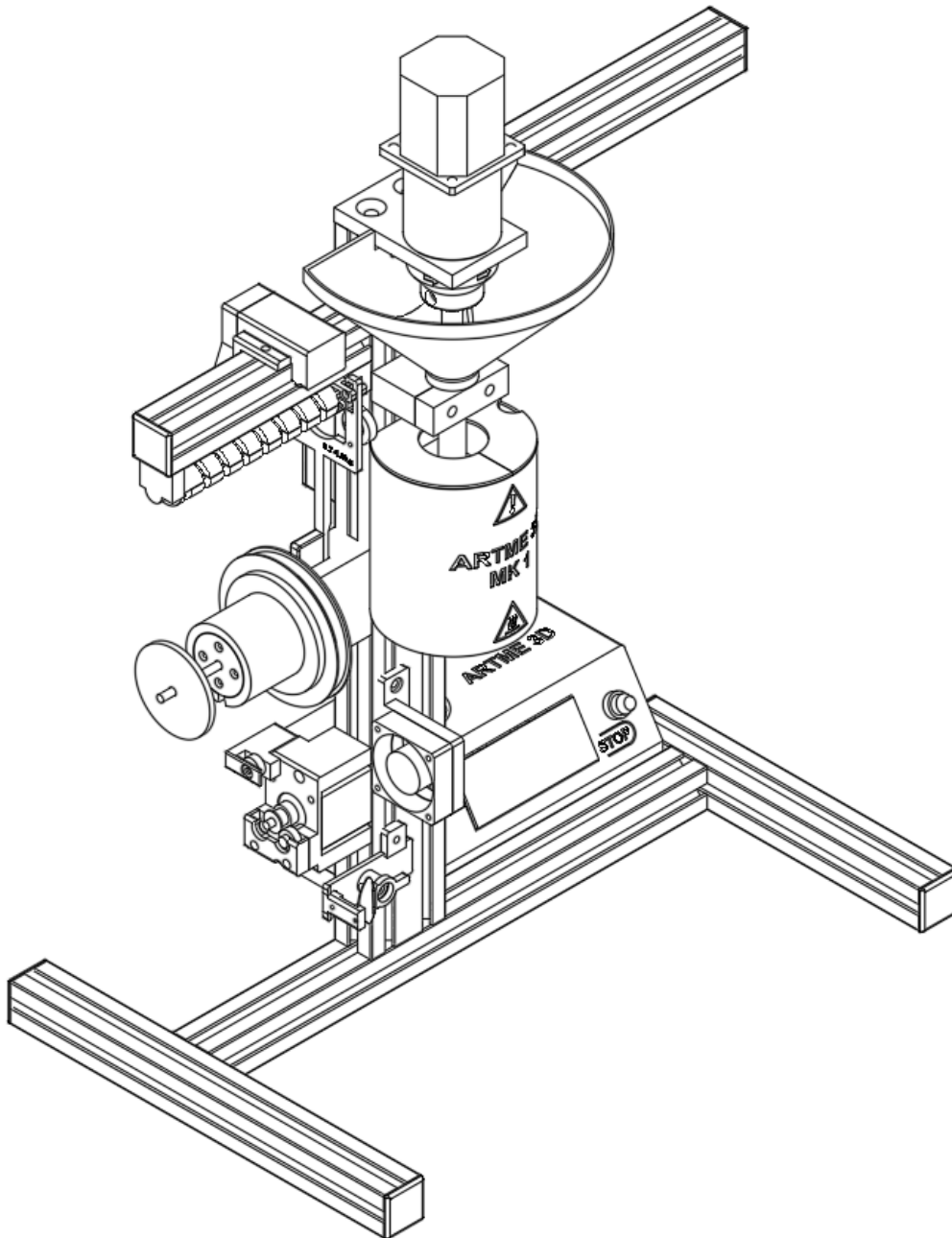


# Assembly instructions

## 06-Filament guide

### Original Desktop Filament Extruder MK1 by ARTME 3D

Version 01.09.2022





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### **Additional tools required for this assembly section:**

Phillips screwdriver PH1

if necessary drill with 3,5mm drill bit

Scissors and paper

### **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:

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3D printing:

2x rails FG07 (on the picture you can see an old representation of 4 short rails)

1x slide part 1 FG08

1x slide part 2 FG09

1x spiral axis for 1,75mm part 1 FG10.1

1x spiral axis for 1,75mm part 2 FG10.2

1x Axis holder right FG11

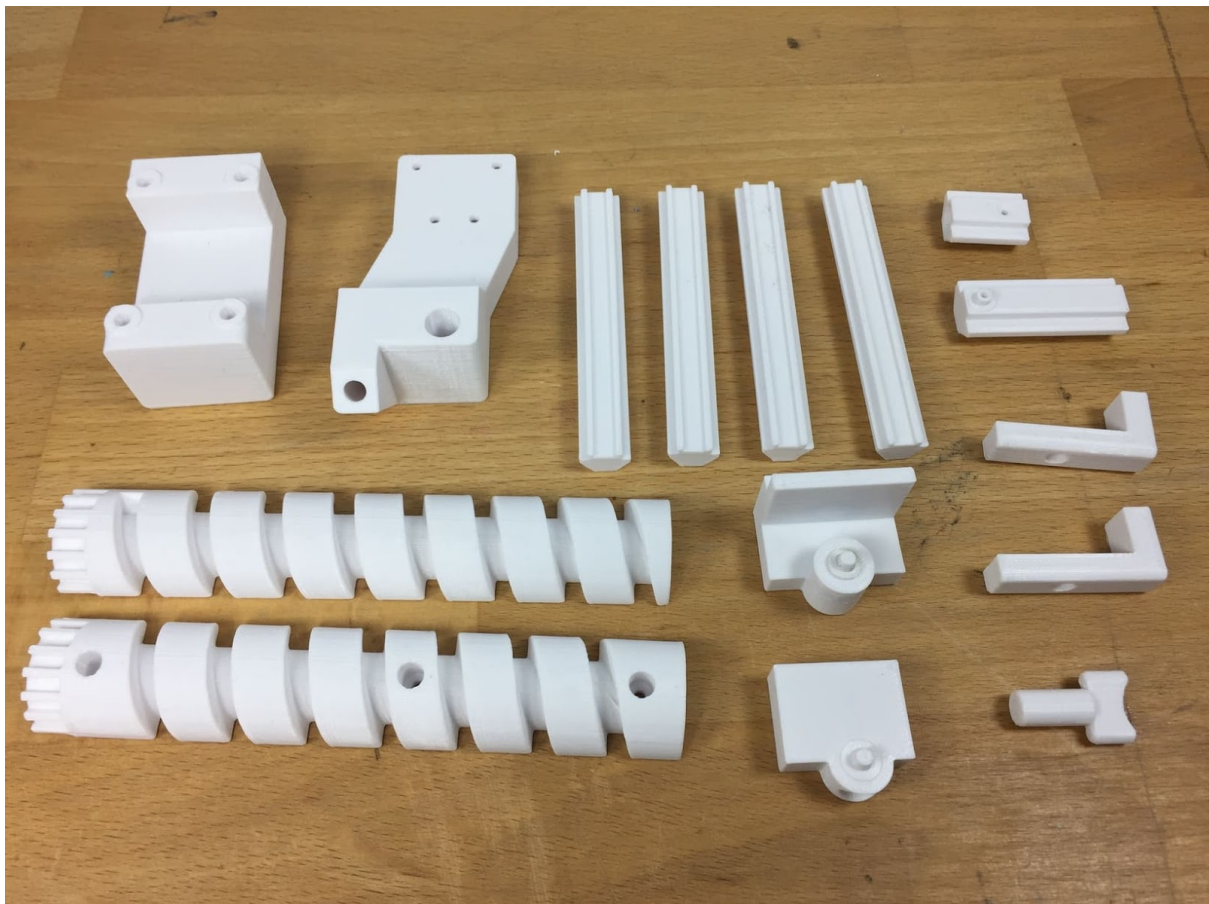
1x snap part 1 FG12

1x snap part 2 FG13

1x Plow FG14

1x Axle holder left FG15

2x Stopper FG16



## Step 2:

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Remove from package 1:

9x wood screw 2.5x12 (SC01)

7x cheese head screw M4x10 (SC05)

1x hammer nut (SC16)

1x slot nut M4 (SC17)

Remove from package 2:

8x ball bearing 4x13x5 (SP09)

1x pressure spring 6mm (SP17)





### Step 3:

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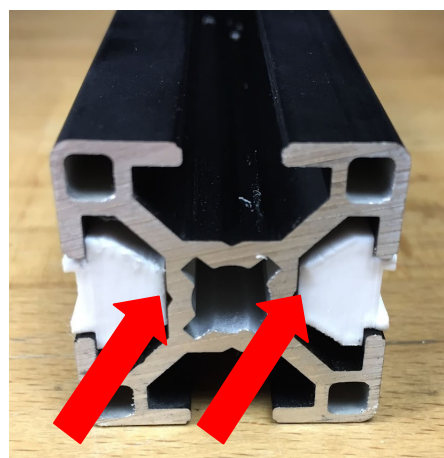
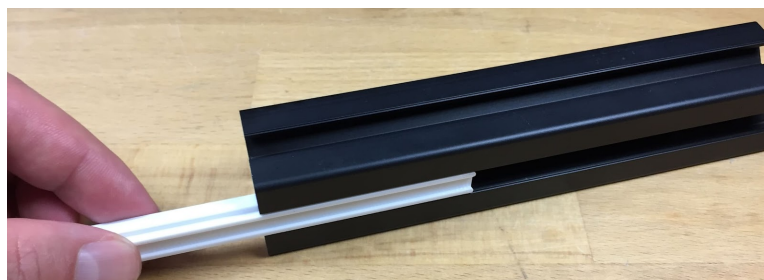
Remove tool from package 0: Aluminum profile 160mm (FR05)



### Step 4:

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Insert the two FG07 rails into the groove of the aluminum profile. Two pieces opposite each other. The aluminum profile has certain tolerances due to its manufacture. Therefore, check whether the rails are firmly seated or whether they have a cavity at the point marked with arrows (see picture) and can therefore be moved. If they are firmly seated, please continue with step 7. If you find a cavity, continue with the next step.

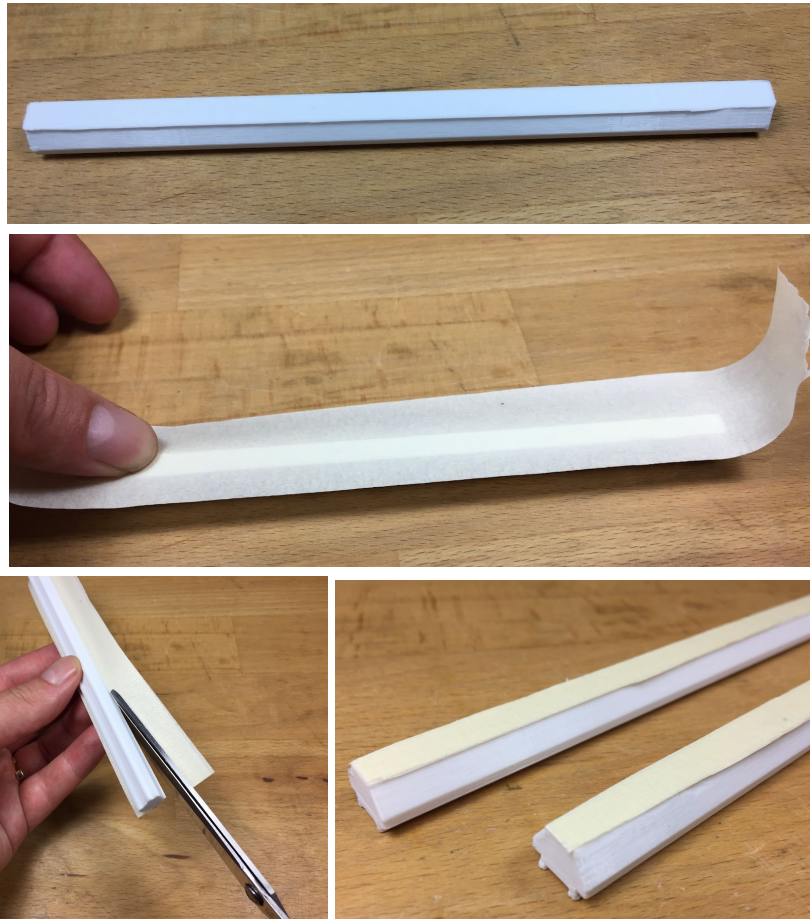


## Step 5:

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Tools: scissors, adhesive tape/tesafilm

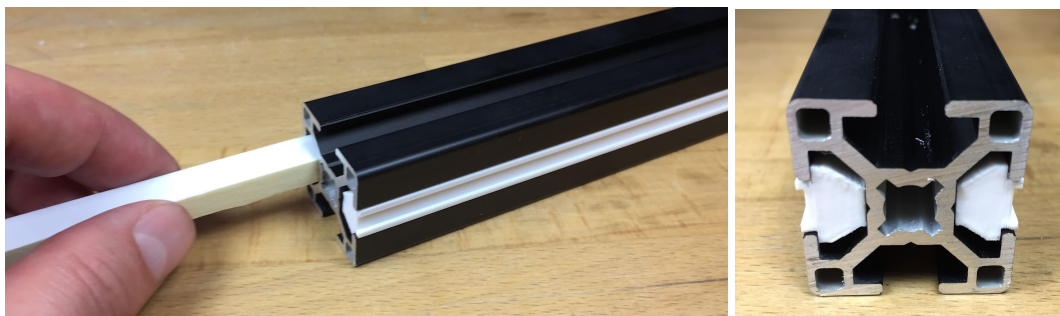
Remove both rails FG07 from the aluminum profile and turn them so that the back side faces upwards. See picture. Then stick a strip of adhesive tape or scotch tape to the back of the rails and cut off any protruding tape with scissors. Depending on how large the air gap in the aluminum profile is, several layers of tape may be necessary.



## Step 6:

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Insert the two FG07 rails back into the groove of the aluminum profile. Two pieces each opposite each other. Check again whether the rails are now firmly seated. If necessary, repeat step 5 if there is still an air gap.

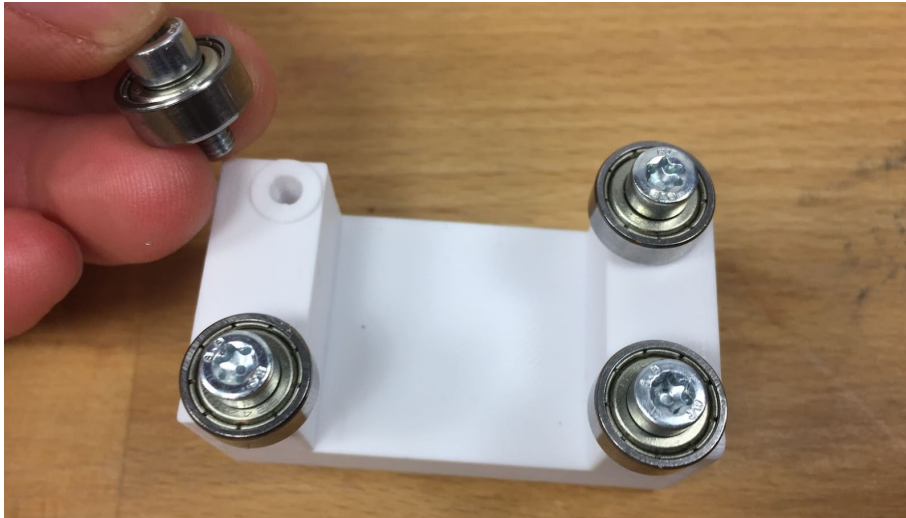


## Step 7:

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Tool from package 6: Allen wrench 3mm (TO07).

Fasten four ball bearings 4x13x5 with a cheese head screw M4x10 each to the carriage part 1. If the holes turn out to be too small, you can drill them out with a 3.5mm drill bit. If the holes are too large, you can additionally secure the screws with a little superglue.

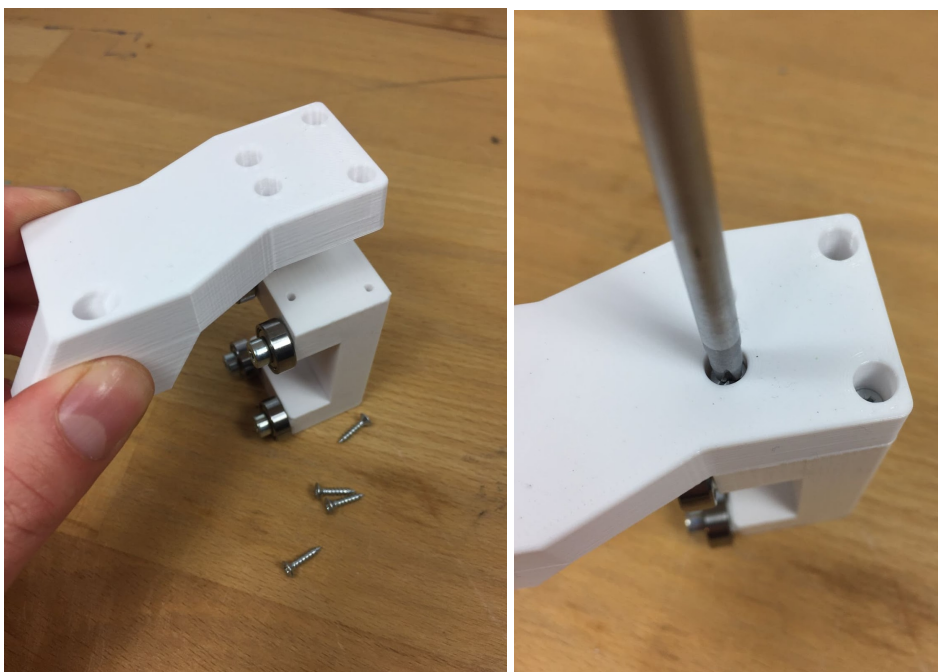


## Step 8:

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Tool: Phillips screwdriver PH1

Fasten the carriage part 2 to the carriage part 1 using the wood screws 2.5x12. Holes are provided in slide part 1 for this purpose. Make sure that the alignment is correct.

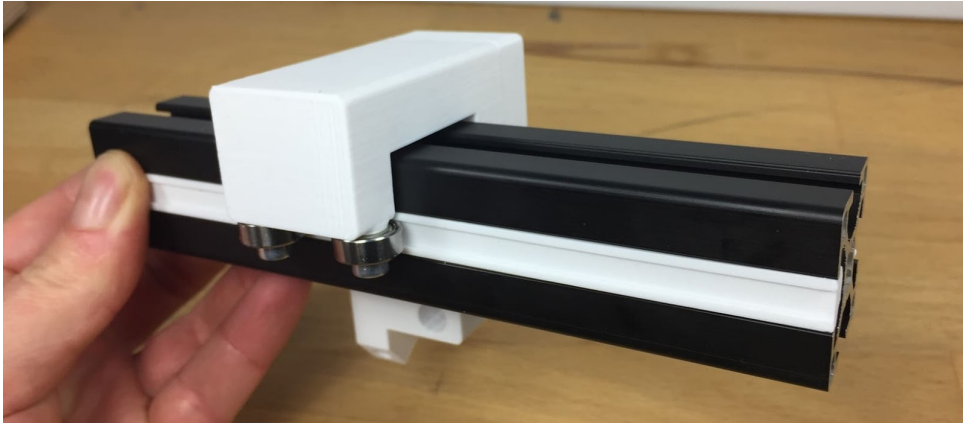




## Step 9:

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Now push the carriage onto the aluminum profile. The ball bearings must run in the guide rails. The carriage should be able to be pushed with slight resistance without hooking. If this is the case, the guide rail can be reworked again with the key file. When the carriage runs easily, it is removed again.

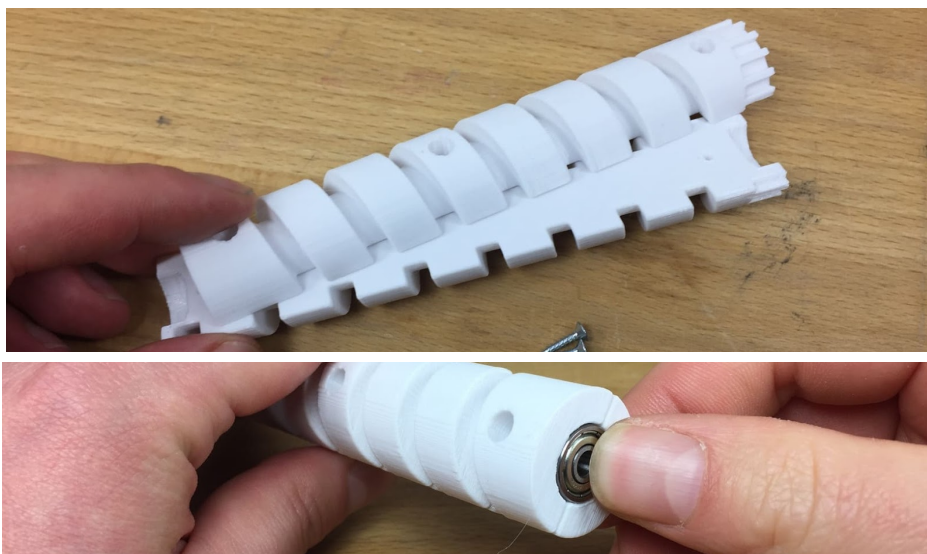


## Step 10:

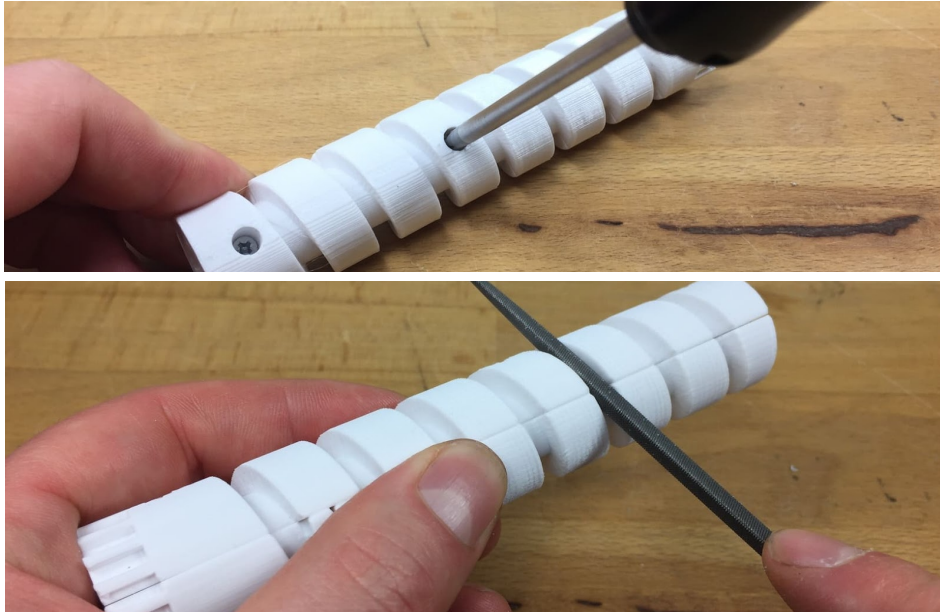
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Tools: Phillips screwdriver PH1, warding file square.

Place the two parts of the spiral axle on top of each other and insert two ball bearings 4x13x5 into the designated places at the ends of the axle. Pay attention to the alignment. The lateral holes for the screws must fit on each other. The two parts of the spiral axle are screwed together with three wood screws 2.5x12. Finish the spiral with the key file so that the edges at the junctions of the two parts are removed and all surfaces are relatively smooth. Be careful not to remove too much material in the process. See also pictures on the next page.



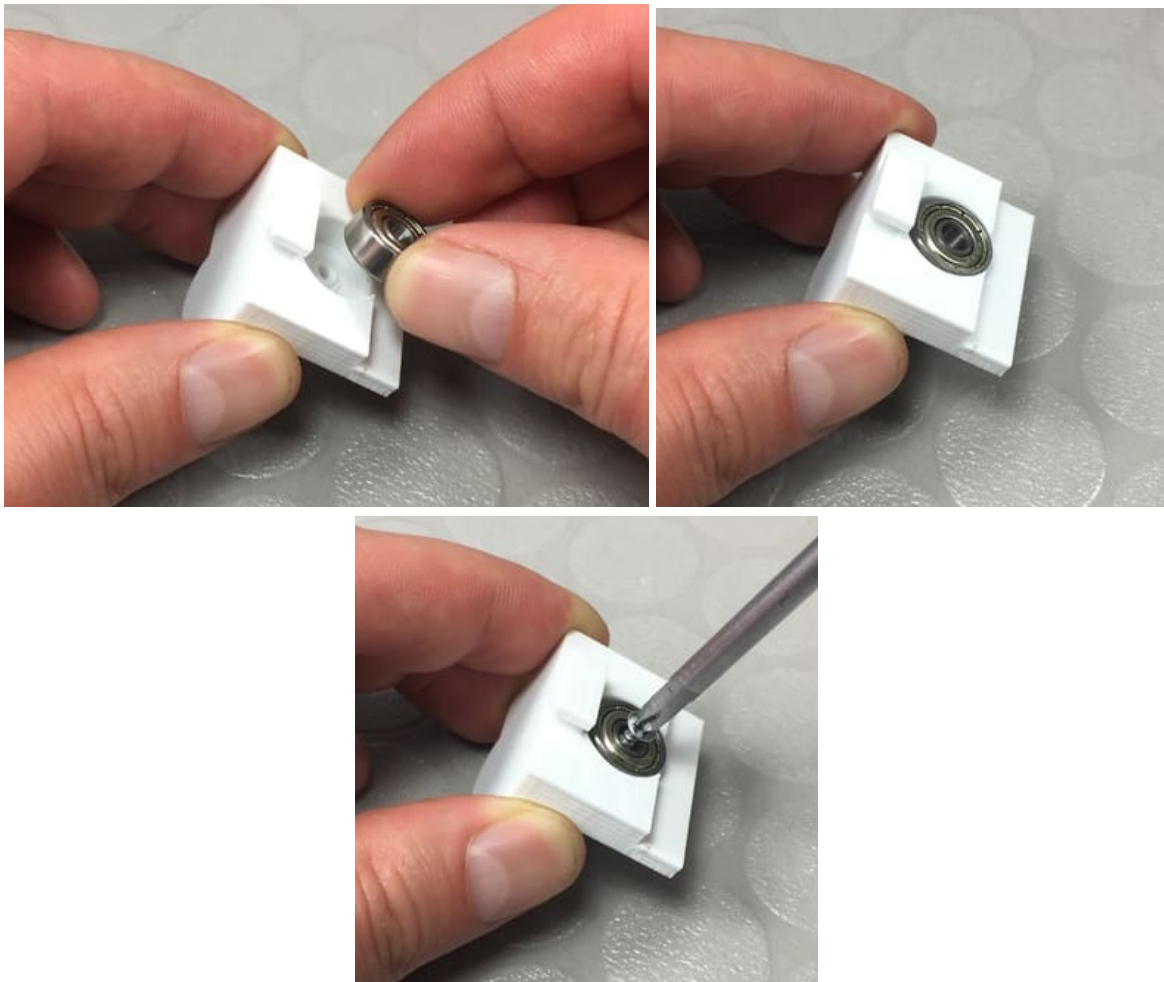




## Step 11:

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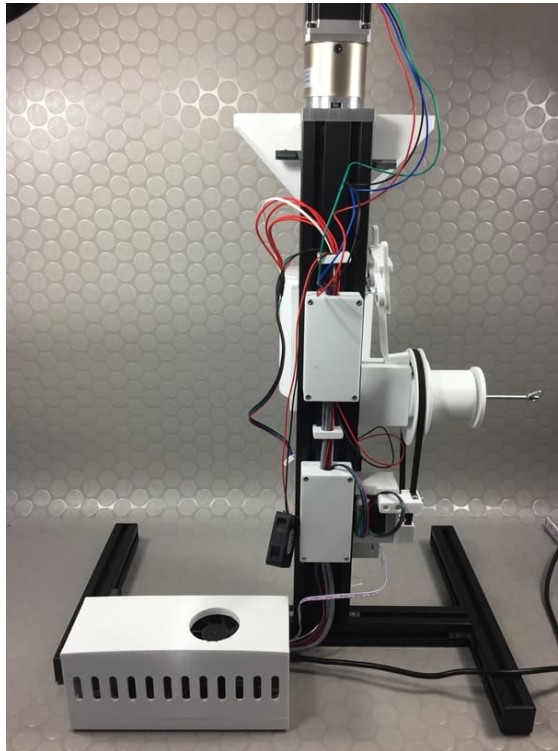
Insert a ball bearing 4x13x5 into the axle holder right (FG11) and screw it tight with a wood screw 2.5x12. To do this, place the ball bearing in the opening provided for it, on the elevation provided for it.



## Step 12:

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Turn the entire extruder so that you are looking at it from behind.

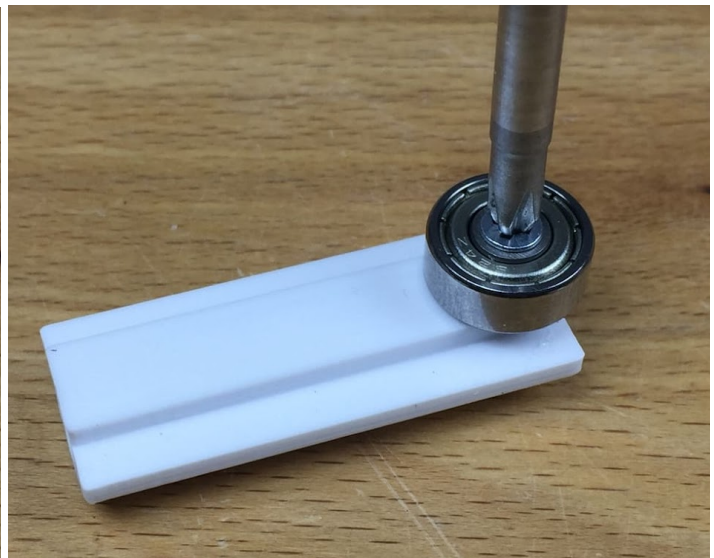


## Step 13:

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Tool: Phillips screwdriver PH1

A ball bearing 4x13x5 is screwed onto the snap part 1 (FG12) with a wood screw 2,5x12. The ball bearing must be centered on the elevation provided for this purpose.

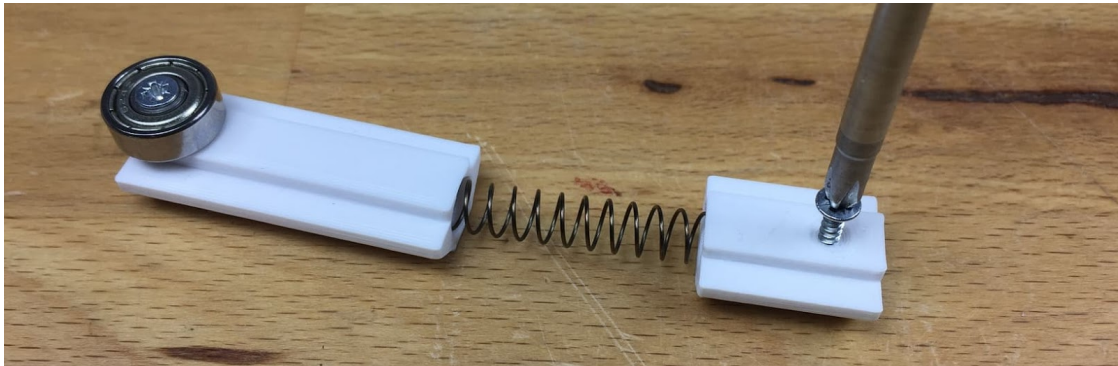


## Step 14:

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Tool: Phillips screwdriver PH1

Screw a wood screw 2.5x12 into the snap part 2 (FG13). Turn the screw in only so far that it does not yet come out on the opposite side. Align the two parts so that the side holes face each other. Then you can place the 6mm pressure spring (SP17) between them and insert the ends of the spring into the holes.



## Step 15:

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Tool: Phillips screwdriver PH1

The now assembled latch mechanism is inserted into the groove of the aluminum profile. See picture. If the parts do not slide freely, the print parts must be reworked by filing or grinding. Tension the spring by pushing the detent part 2 further into the groove. The correct spring tension is achieved when there is approx. 61mm distance to the outer edge of the groove. Then tighten the wood screw so that nothing can move. See also pictures on the next page.

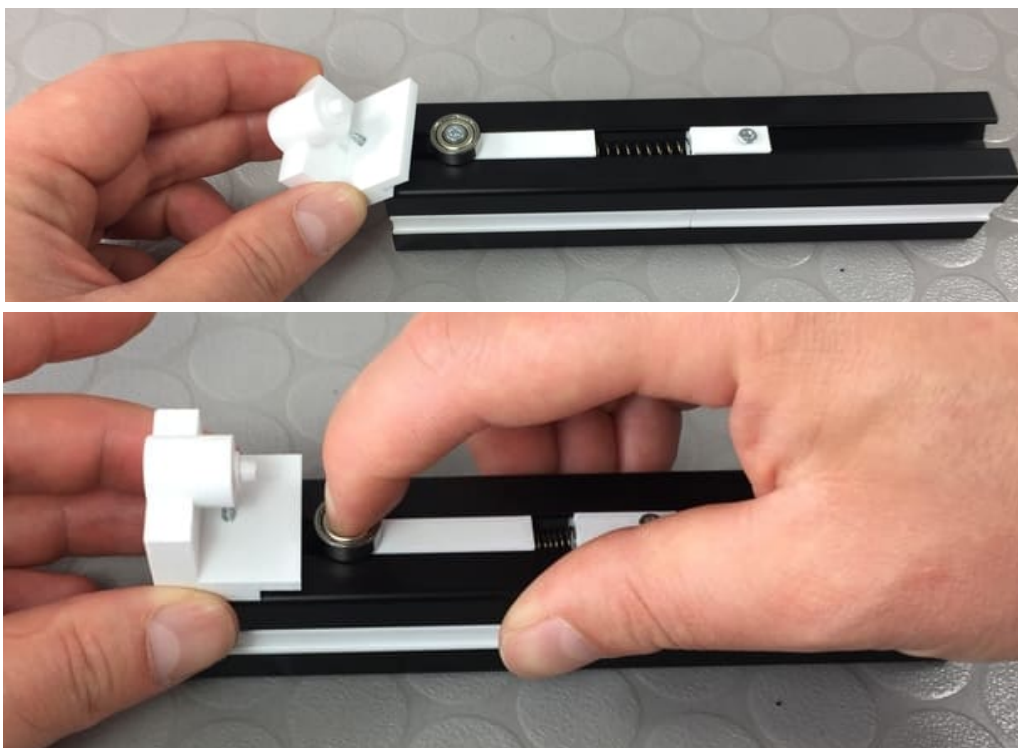




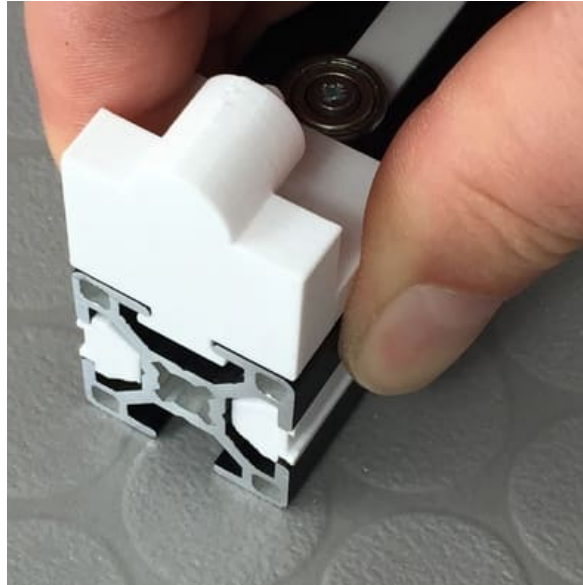


## Step 16:

Slide the prepared right-hand axis holder (FG11) into the groove from the left. The T-shaped part provided for this purpose on the axis holder must fit into the groove. Alignment see picture. The supplied aluminum profiles may be from different manufacturers who have different tolerances in production. Therefore, it may be that the axis holder slides on quite easily or quite heavily. As a result, you may have to push the holder on with some force or hold it in place if it is quite loose. The spring of the latching mechanism will be compressed a little bit. See also picture on the next page.



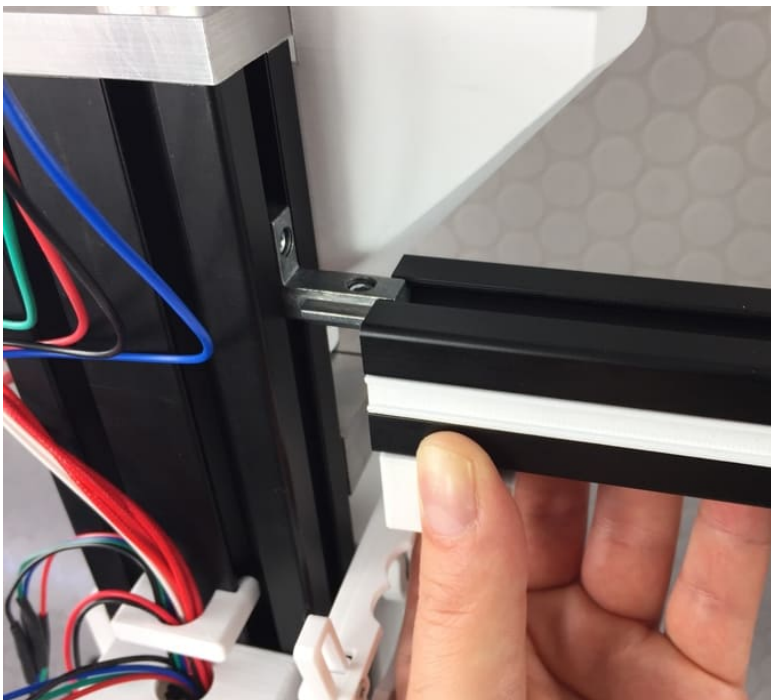




## Step 17:

Tool from package 6: Allen wrench 3mm (TO07).

The aluminum profile can now be mounted on the main frame. The latching mechanism and the axis holder point downwards. The prepared connector on the right side (seen from behind) is inserted into the upper groove of the aluminum profile and the clamping screw is tightened.

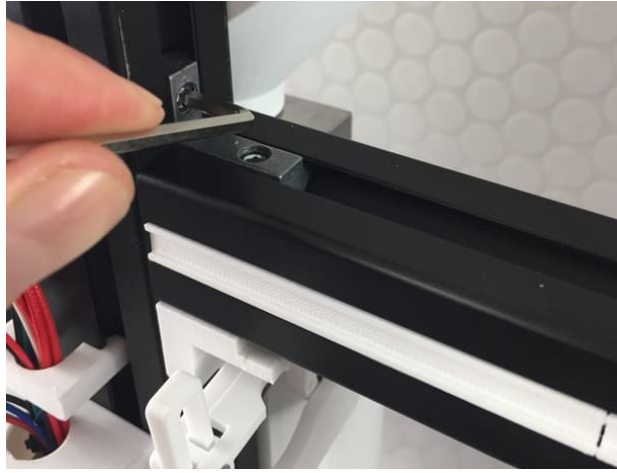


## Step 18:

Tool from package 6: Allen wrench 3mm (TO07).

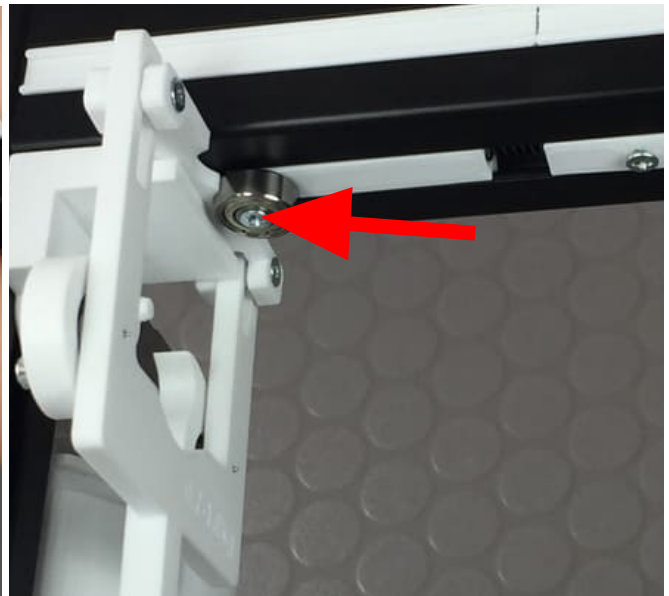
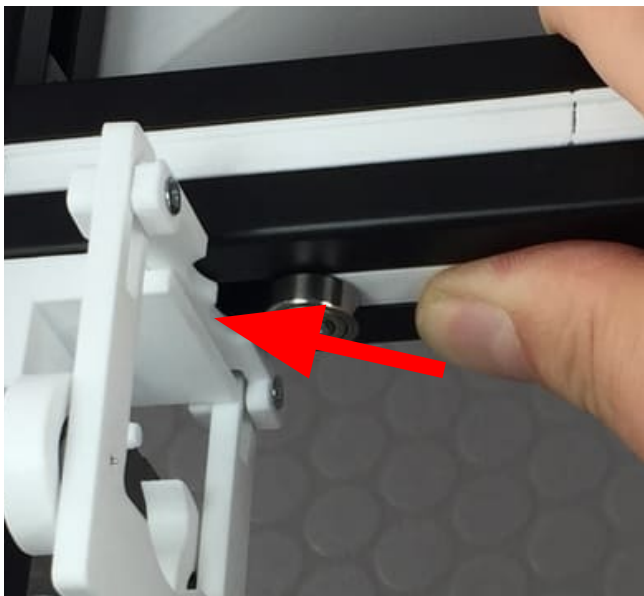
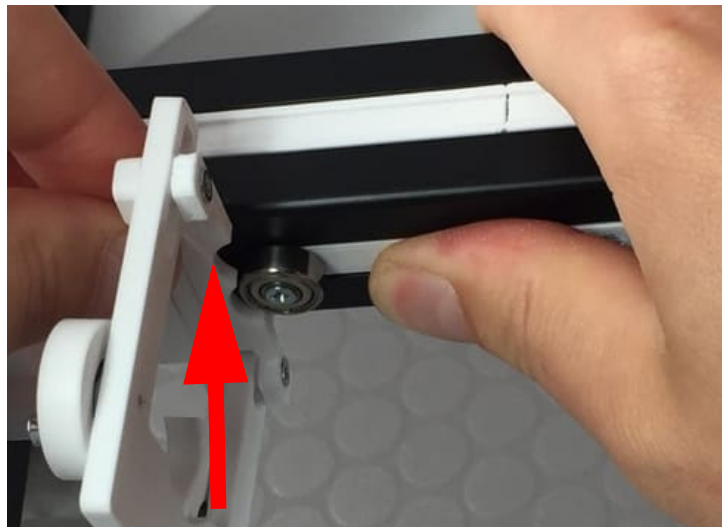
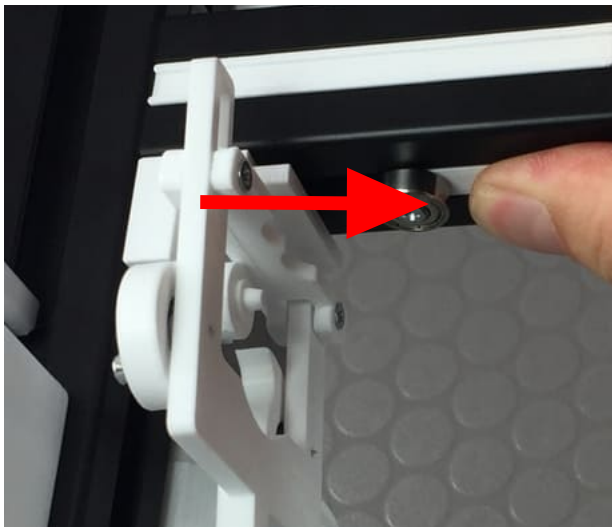
Now the correct height can be set. To do this, loosen the clamping screw of the connector on the main frame once again in order to be able to move the 160mm aluminum profile in height. If the swing arm on the spool drive is in the way, it can be moved by turning the spool holder disc. The distance between the lower 400mm long aluminum profile and the upper 160mm long aluminum profile must be 404mm. Then tighten the clamping screw on the connector again and measure again. Repeat if necessary until the distance is correct.





## Step 19:

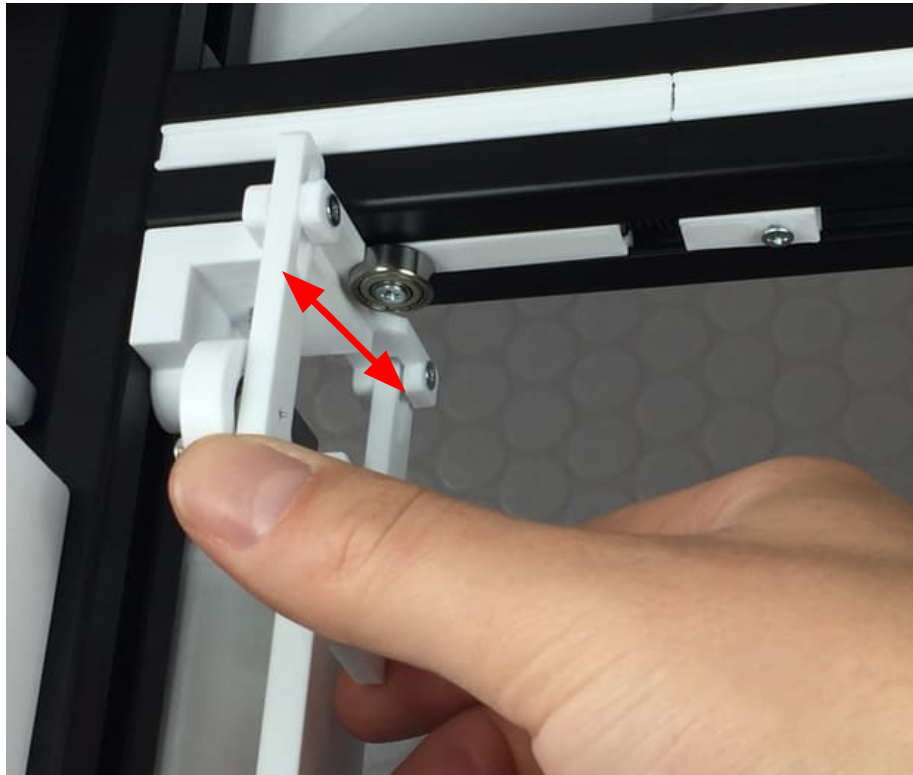
Pull back the ball bearing of the detent mechanism and insert the crossbrace into the recess provided on the axis holder. Then release the ball bearing again. See pictures.



## Step 20:

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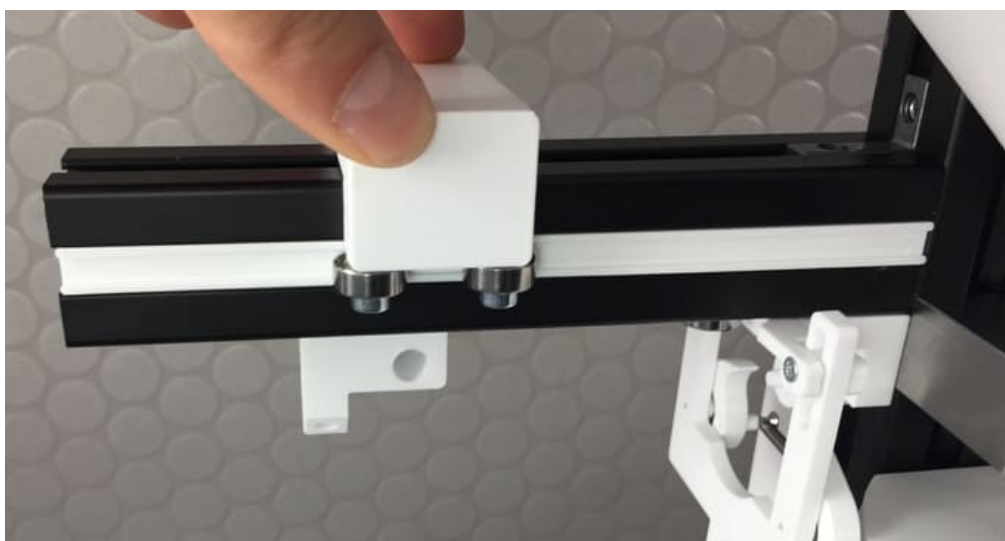
Now check whether the swing arm can be pushed back and forth. The spring tension should allow the swingarm to move with some resistance and engage in the end position. If something hooks or is stiff, the pressure parts may need to be reworked.



## Step 21:

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Then turn the entire extruder again so that you are looking at it from the front. Then push the carriage back onto the rails (FG07). Alignment see picture.



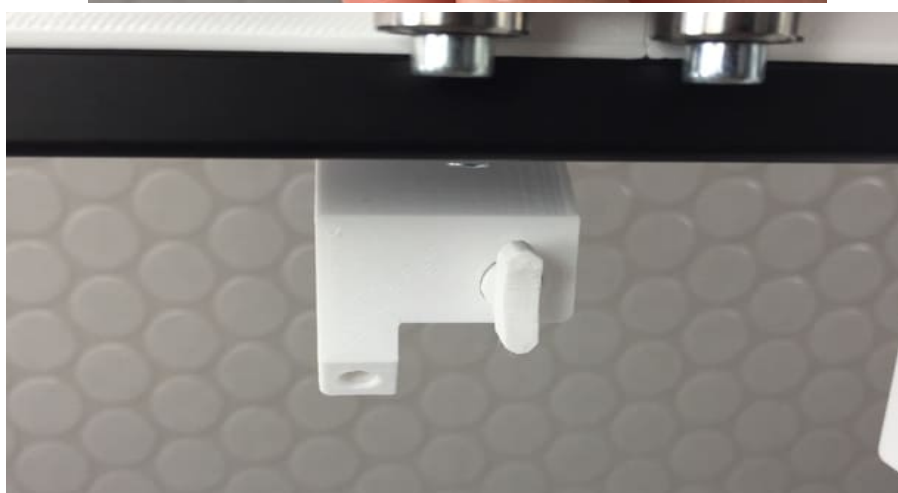
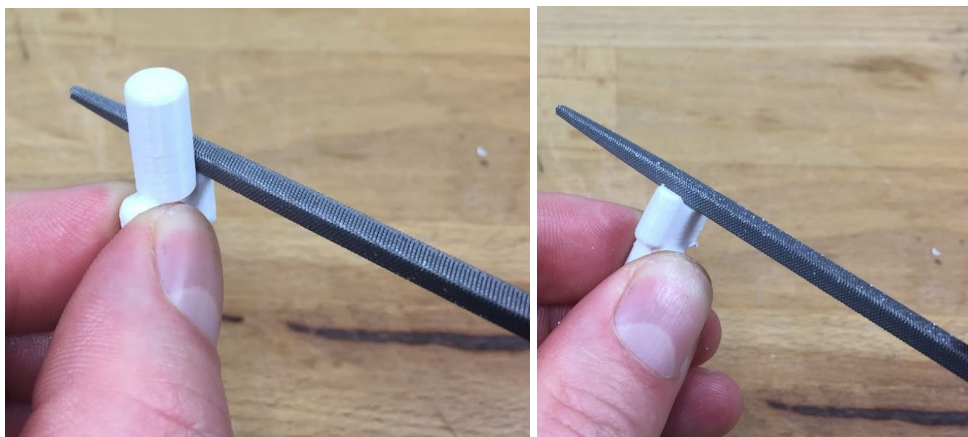


## Step 22:

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Tool: warding file square

Rework the plow (FG14) with the warding file so that all surfaces are smooth. Be careful not to remove too much material. Then insert the plow into the hole provided for it in the carriage.



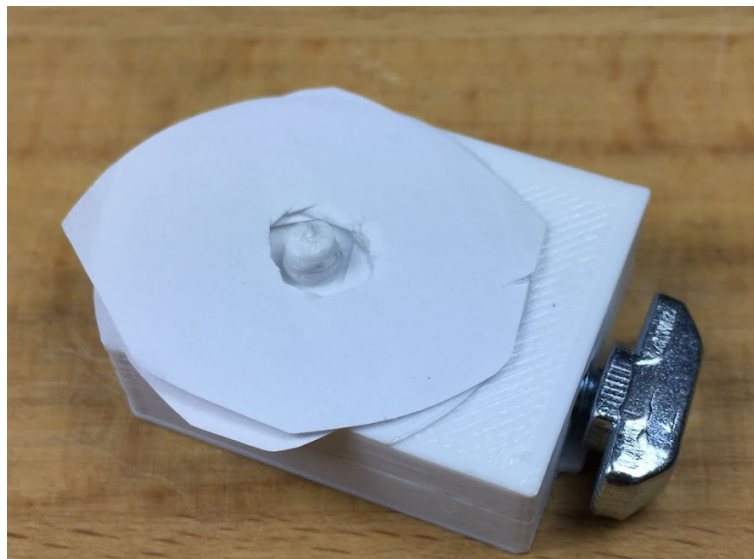
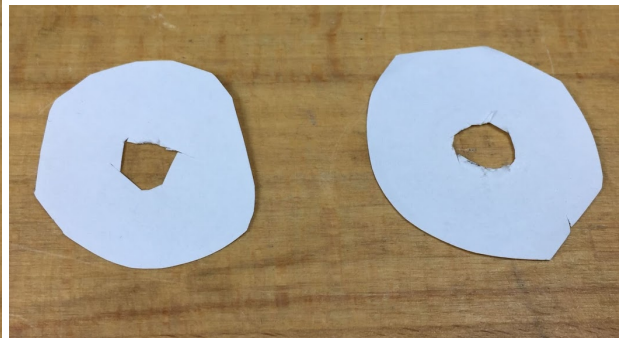
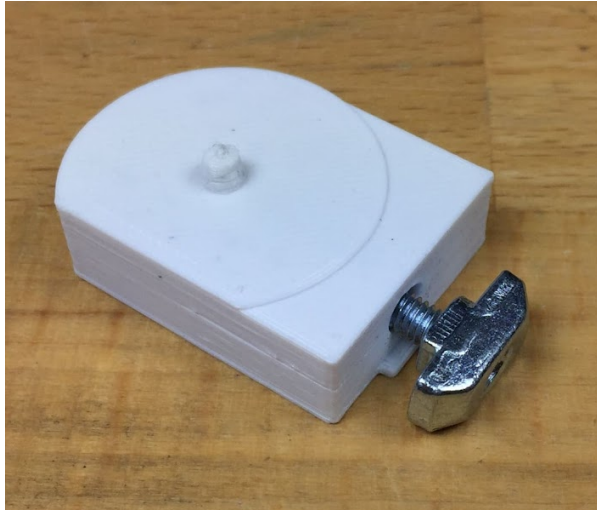
## Step 23:

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Tool: scissors and paper

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

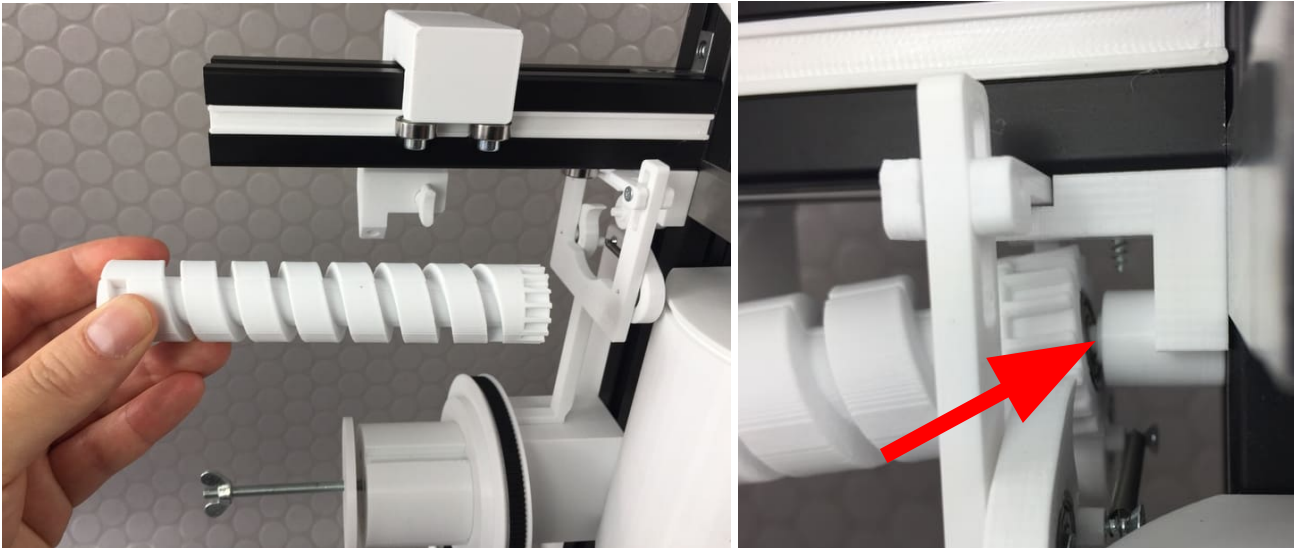
Insert a socket head screw M4x10 into the hole provided in the axis holder on the left (FG15) and screw a hammer nut onto the thread. Cut out two circles with scissors. The circles have an approximate diameter of 25mm and a small hole in the center. Place the circles on the axis holder, see picture.



## Step 24:

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The spiral axle is now inserted in the next steps. To do this, align the axle so that the end with the teeth faces the swing arm. Then put the ball bearing at the end of the axle onto the axle holder on the right. Hold the other end of the axle by hand.



## Step 25:

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Then insert the plow into the spiral. To do this, push the carriage to a position where the plow can engage the spiral. Hold the other end of the spiral axle by hand.

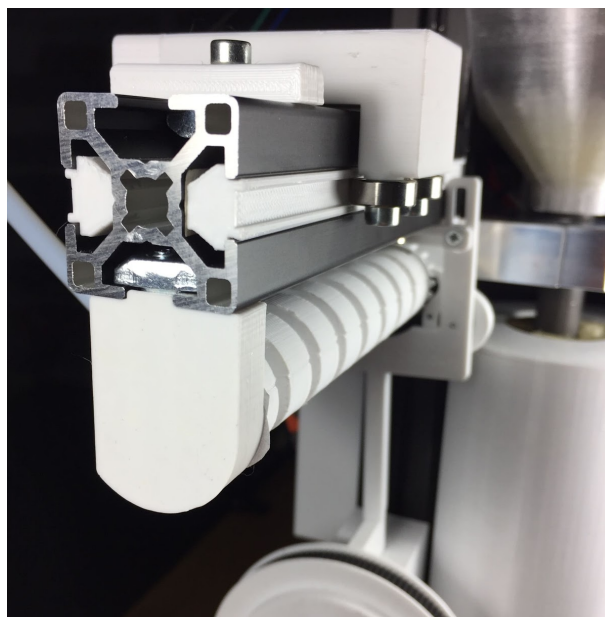
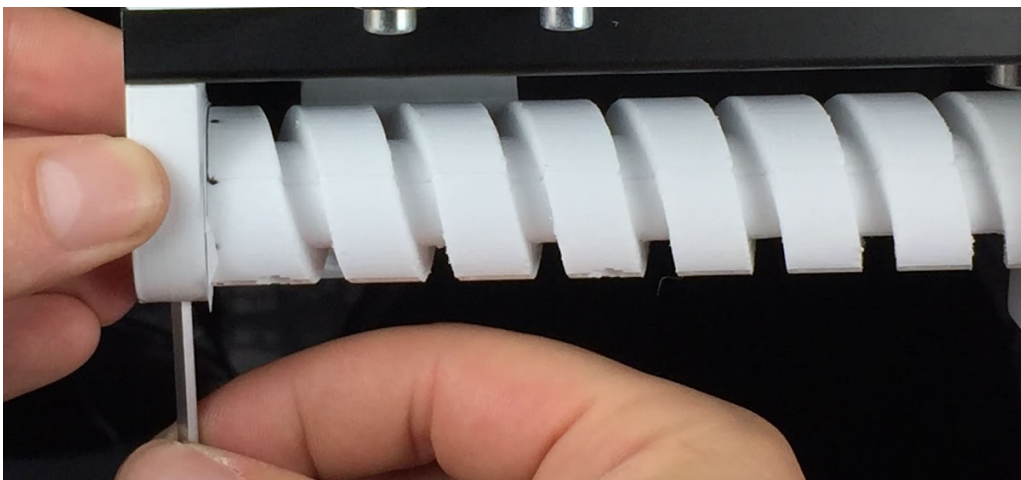
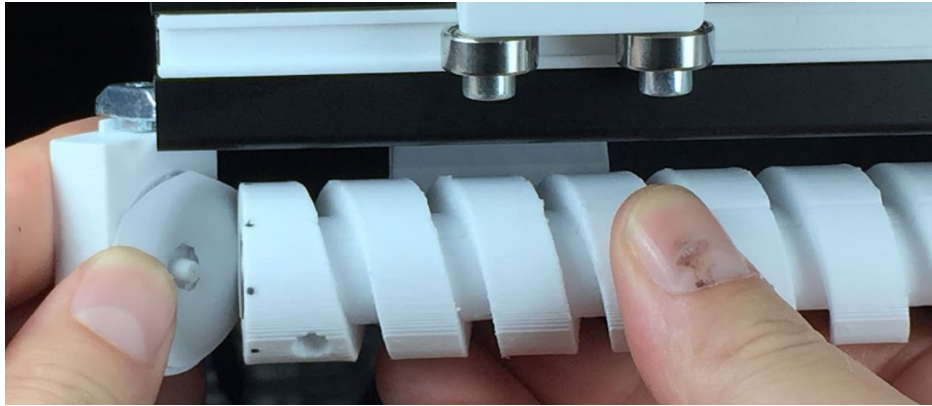


## Step 26:

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Tool from package 6: Allen wrench 3mm

Now the left axle holder is mounted. The hammer nut is inserted into the groove of the aluminum profile. The small pin on the axle holder must hit the ball bearing in the spiral axle. Make sure that the two paper circles remain in position. Tighten the cap screw.





## Step 27:

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Now rotate the spiral axis in both directions. (When you start the rotation, the swing arm may change its position by shifting forward or backward. A little more force is needed at this moment. This is normal). Then check how easy or difficult it is to turn the spiral axis. If the axis can be turned too easily, the position may change unintentionally later when winding filament. Therefore, it should be possible to turn it with very slight resistance and the carriage should move back and forth. To change the resistance when turning, repeat step 26: In doing so, you can press the left axis holder more firmly against the spiral axis while screwing it tight. Or you can place more paper circles between the axis holder and the spiral axis. When the spiral axis can be rotated with very slight resistance and the carriage moves back and forth, continue with the next step.



## Step 28:

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Tool from package 6: Allen wrench 3mm

Insert a socket head screw M4x10 into each of the two stoppers FG16 through the hole provided. Alignment see picture.



## Step 29:

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Tool from package 6: Allen key 3mm

Slide two sliding blocks (SC17) into the upper groove of the aluminum profile. Slide one of the two sliding blocks under the carriage. Then screw one FG16 stopper each to the sliding block using the M4x10 cylinder screws. The angled part of the stopper points to the rear. The stoppers serve as a stop for the carriage and force a change of direction of the carriage. This is necessary to adapt the filament guide later to the bobbin size used.

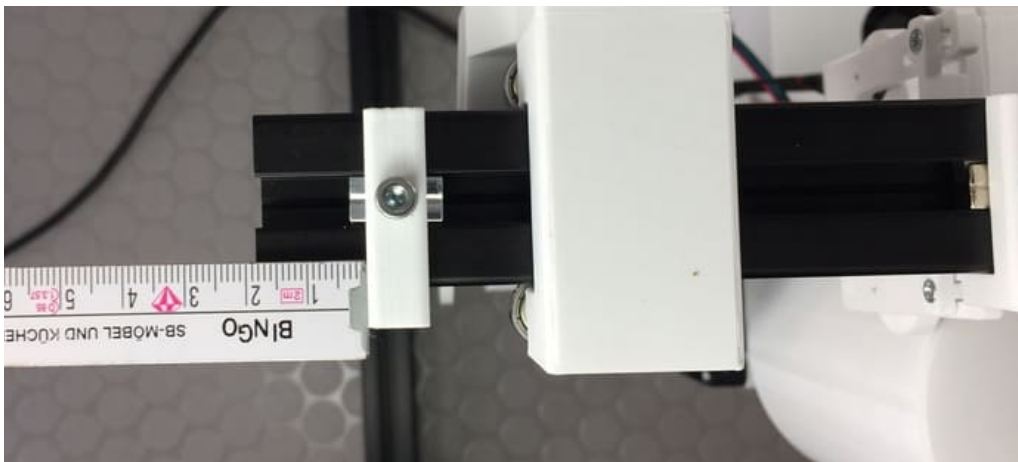
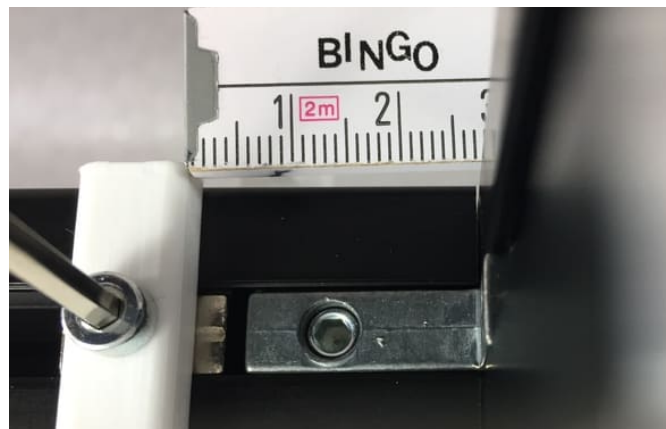


## Step 30:

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Tool from package 6: Allen wrench 3mm.

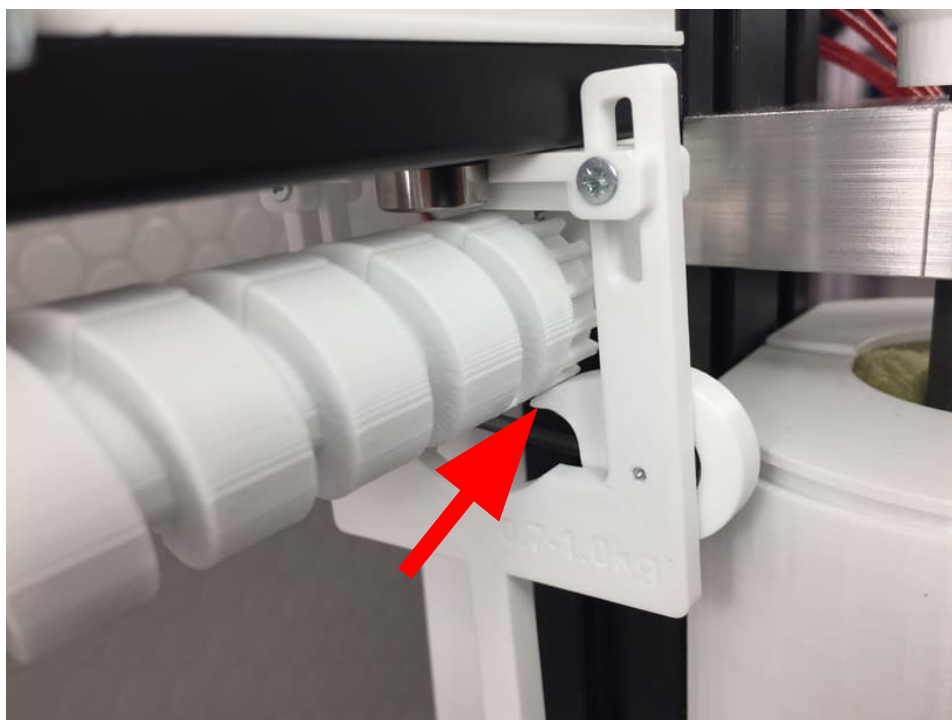
The exact position of the stoppers will be set later during the first winding process and depends on the used spool size and spool type. As a guideline for a 1kg spool, you can set the right stopper with a distance of 27mm to the aluminum profile of the main frame. As a guideline, the left stopper has a distance of 18mm to the outer edge of the aluminum profile. See picture.



## Step 31:

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Now switch the swing arm to the front and rear position so that the hooks straighten up if they have twisted downwards as a result of the spiral axle turning.

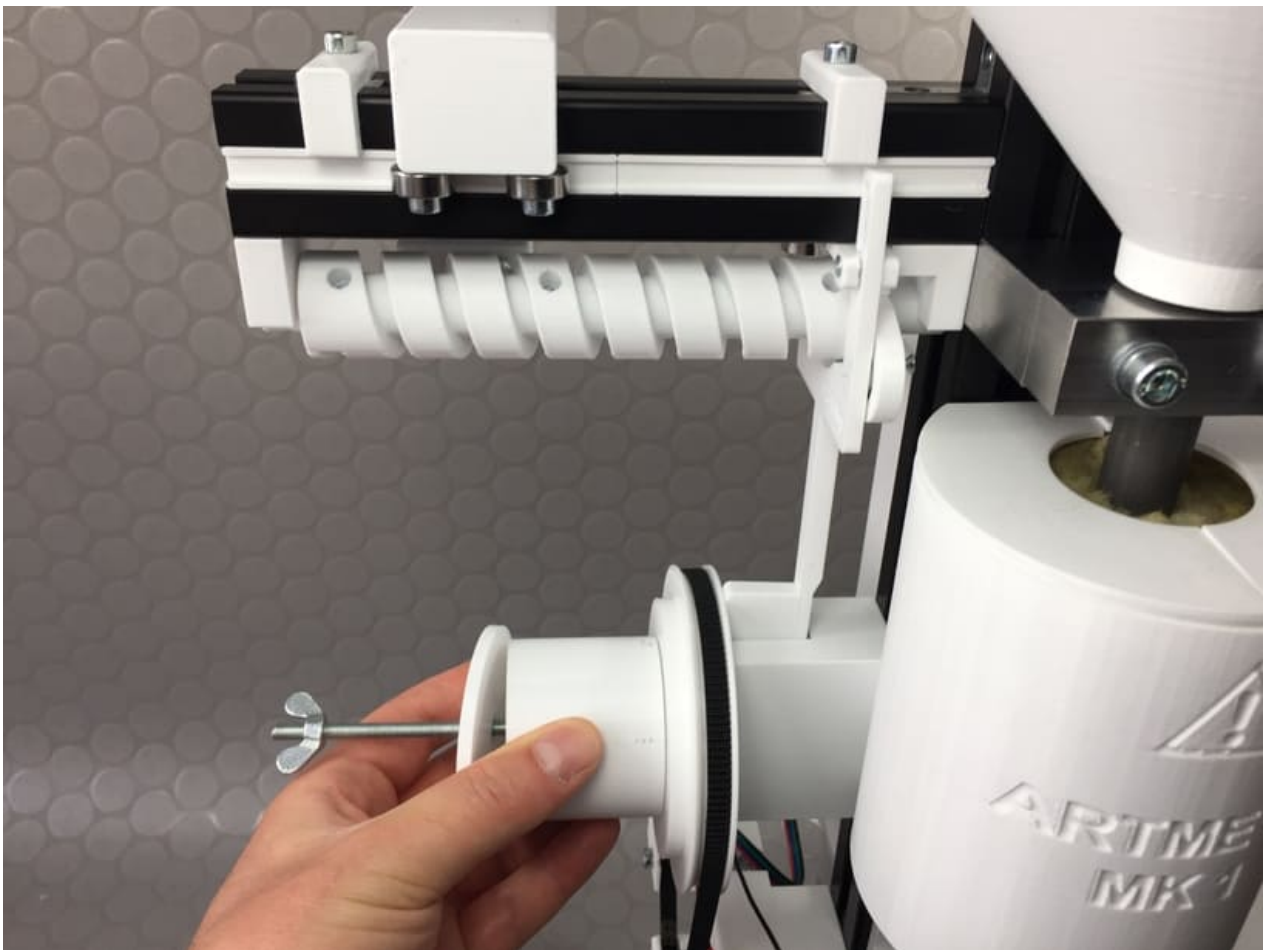




## Step 32:

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Now you can check the correct function of the filament guide. Turn the bobbin holder disk by hand. The toothed belt must be loose for this. If not, adjust the belt tensioner if necessary or loosen the motor bracket of the stepper motor on the toothed belt. When you turn the spool holder disk, the swing arm moves up and down. The serrated drivers rotate the spiral axis a small amount with each upward movement. To do this, the swing arm should move up and down enough to advance the spiral axis by two teeth. The teeth are located on the right side of the spiral axis and are moved by the serrated drivers. This then also moves the carriage. When the carriage arrives at the stopper, the swing arm switches to the other position. This changes the direction of rotation of the axis and thus the direction of the carriage. Do not turn the drive too fast to judge the correct function, take your time to move the carriage back and forth several times. If the direction of rotation changes too early, although the carriage has not even arrived at one of the two stoppers, the spiral axis and the plow may have to be reworked again (step 10) or the spring tension on the detent mechanism increased (step 15).



## Step 33:

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Remove from package 2: Cover cap 30x30 (SP01).

Now you can put the cover cap on the end of the aluminum profile. Some cover caps, depending on the manufacturer, are very tight and may need to be hammered in. Some cover caps sit very loosely and may need to be glued in place.



## Done:

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Now continue with assembly instructions "07-puller motor assembly".

