



## 3. X-axis assembly

X axis guide

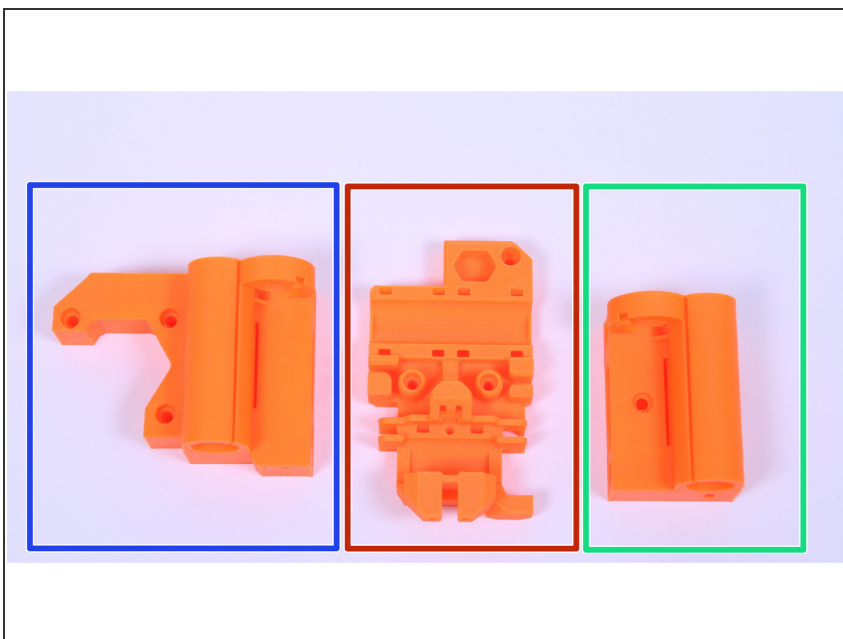
Written By: Josef Prusa

## Step 1 — Getting the necessary tools



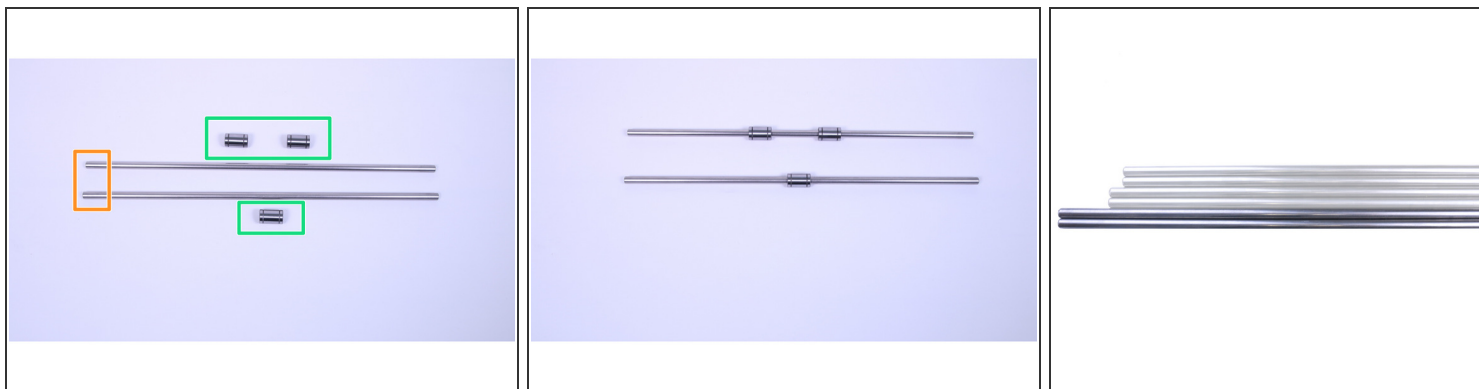
- 2.5mm Allen key
- Needle-nose pliers

## Step 2 — 3D printed parts



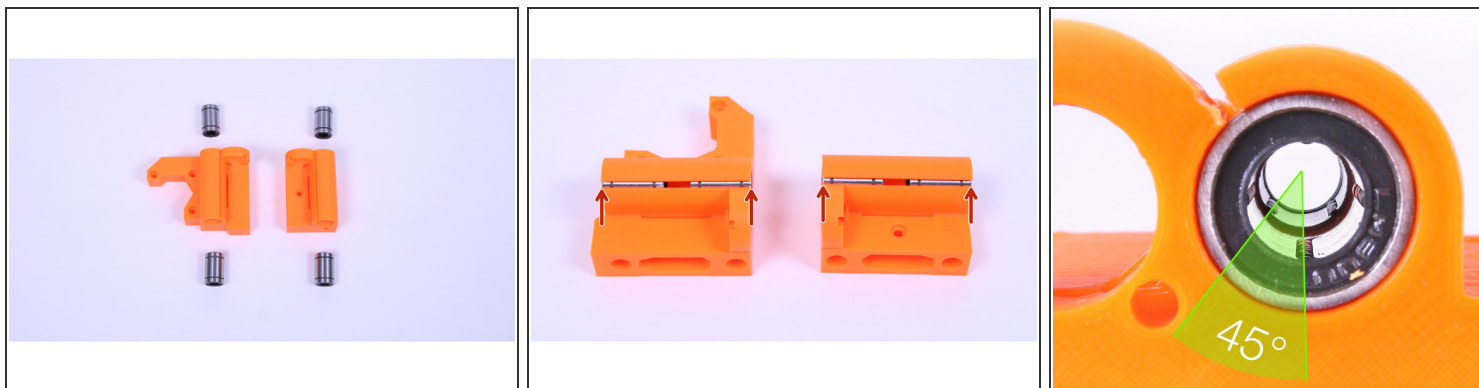
- X-carriage
  - X-end-motor
  - X-end-idler
- ⓘ Some parts can slightly differ from the photos.

### Step 3 — Preparing the rods



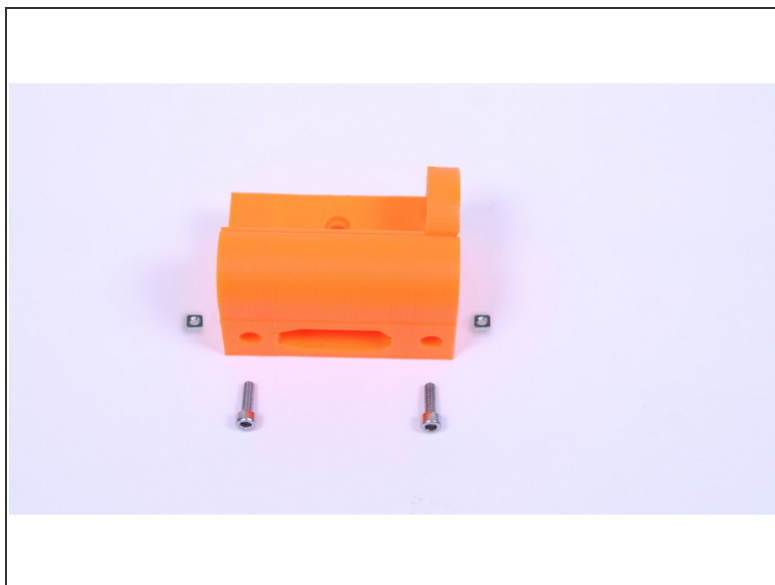
- LM8UU linear bearings
- 8mm smooth rods (the longest ones)
- Carefully slide linear bearings on rods.

### Step 4 — Preparing printed parts



- Insert LM8UU linear bearing into the printed parts (X-end-motor and X-end-idler) as shown in the pictures.
- The bearing should be in line with the X-ends as highlighted in the picture.
- ① You can press on the flat surface for easier insertion.
- ① Place two bearings in a way that the inner balls of the second bearing are rotated 45° compared to the first. This way you will achieve greater contact with the smooth rod. See third picture for more details.

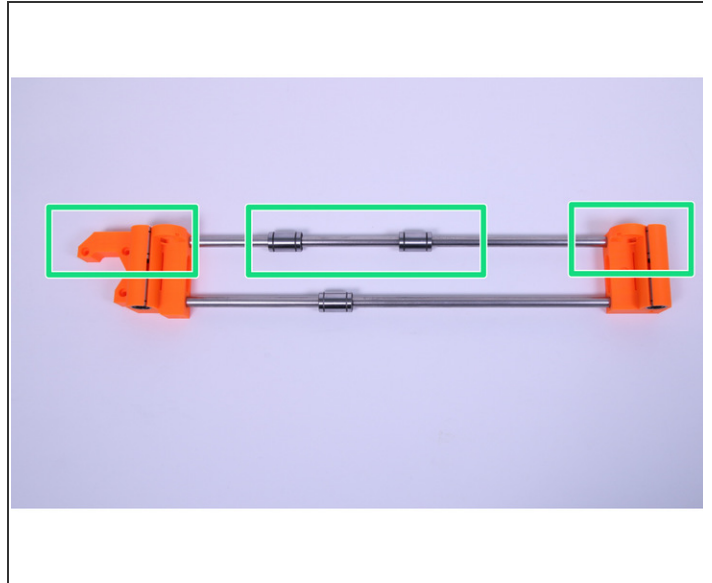
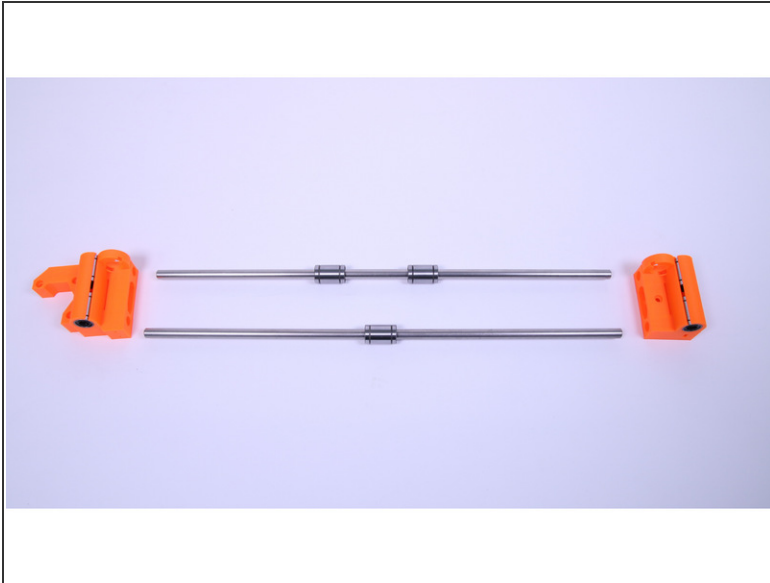
## Step 5 — Preparing tension screws



- Insert M3nS square nuts (2 pcs) and put in place M3x10 screws (2 pcs).

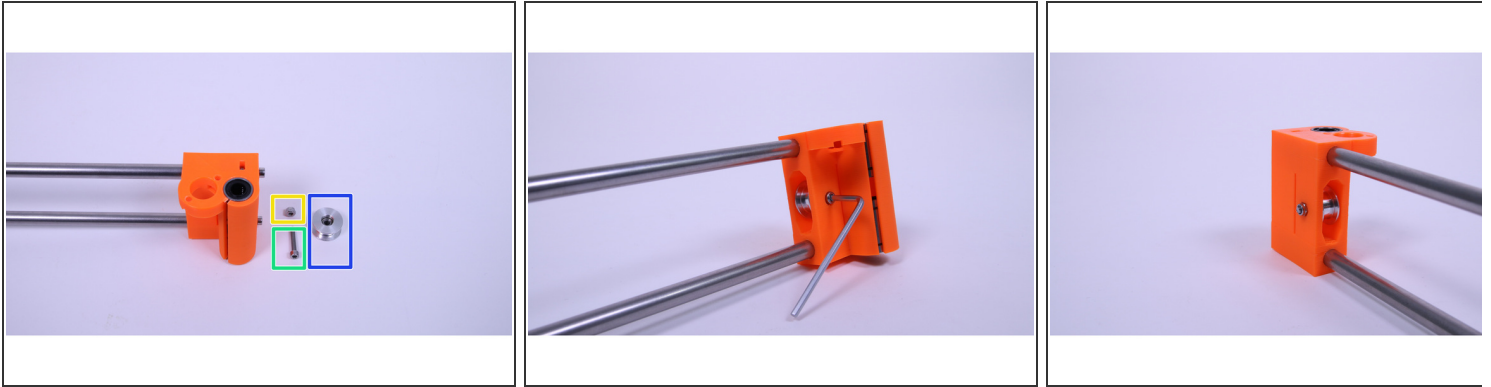
 Avoid overtightening of the screws.

## Step 6 — Assemble the X-axis base



- Insert the rods with bearings fully into the printed parts.
- ⚠ Ensure the correct orientation of the parts and rods (rod with 2 bearings must be on the side with the nut trap).
- ⚠ Insert the rods very carefully. Do not tilt the rods too much.

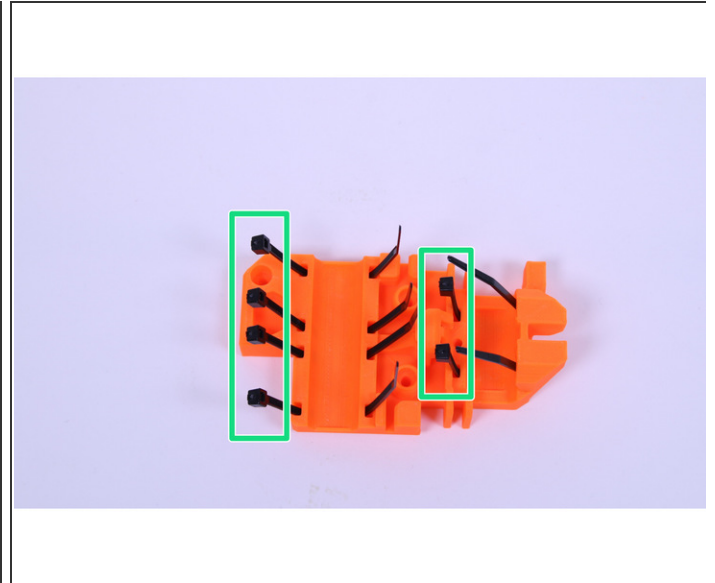
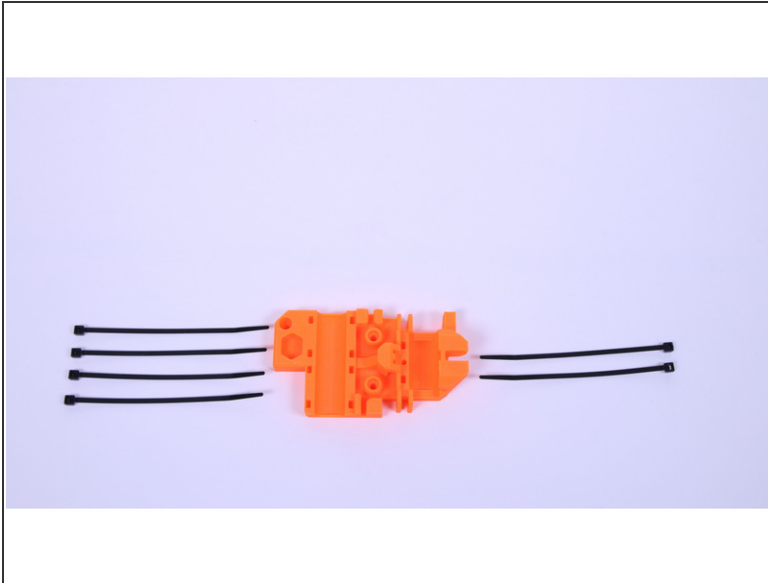
## Step 7 — Preparing the X-end idler



- M3x18 screw (1 pc)
- 623h bearing with housing (1 pc)
- M3nN nylock nut (1 pc)
- Insert the 623h bearing into the X-end idler.
- Secure it in position using M3x18 screw.

⚠ Tighten it with M3 nylock nut, but the idler (wheel) must rotate freely!

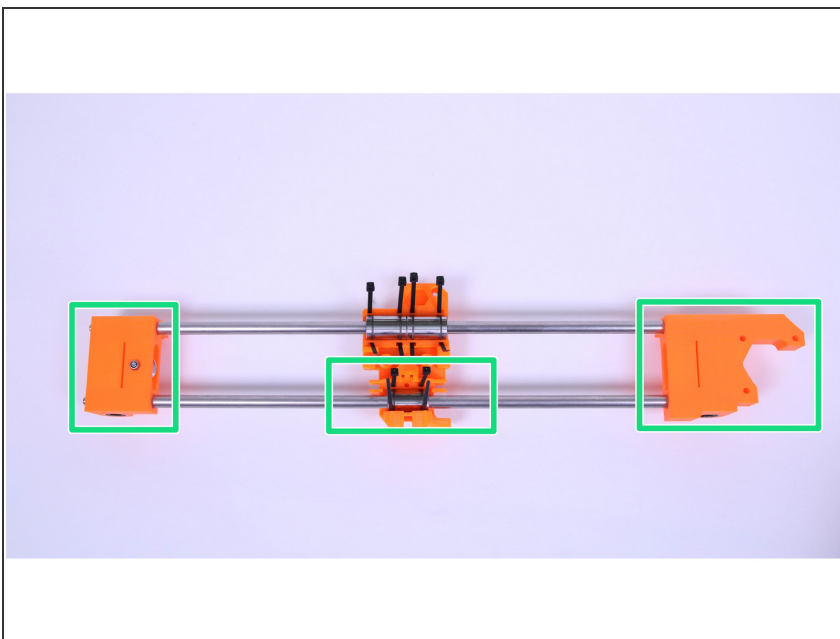
## Step 8 — Prepare the X-carriage



- Insert zipties into the X-carriage as shown in the picture.

⚠ Ensure the correct orientation of zipties.

## Step 9 — Placing the X-carriage

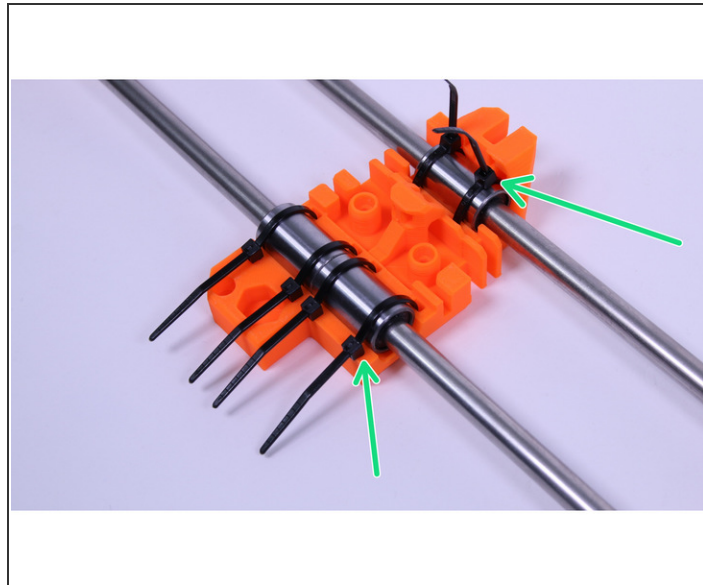
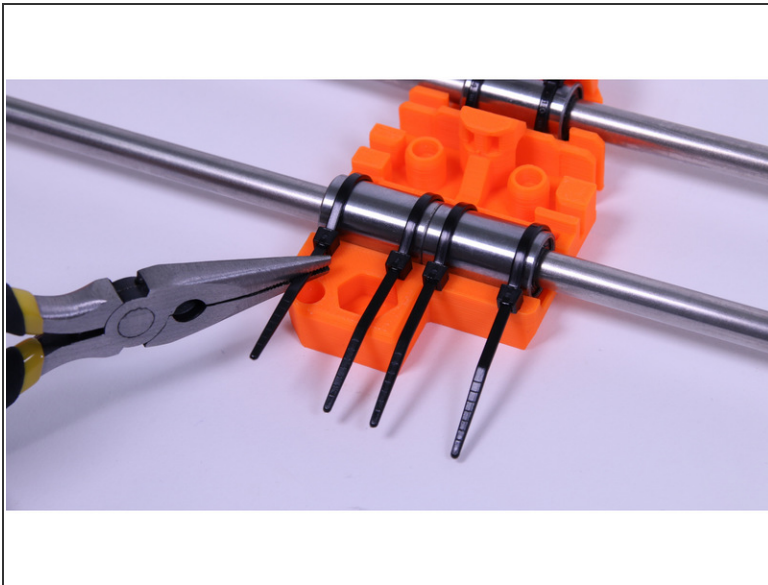


- Place the X-carriage on the X-axis base as shown in the picture.

⚠ Ensure the correct orientation of X-carriage.



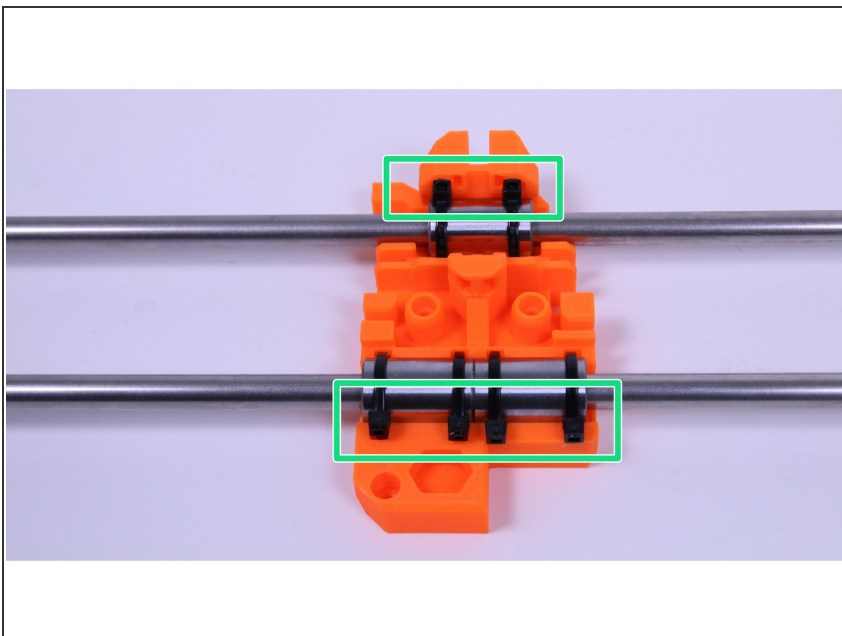
## Step 10 — Tighten the X-carriage



- Use pliers to tighten the zipties.

⚠ Make sure that bearings are in the position as shown in the picture (bearing should be as deep in carriage as possible).

## Step 11 — Cleaning up

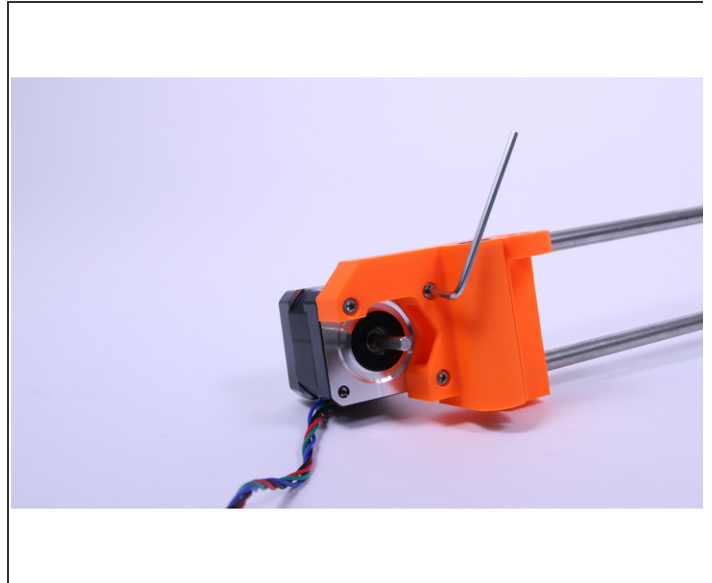
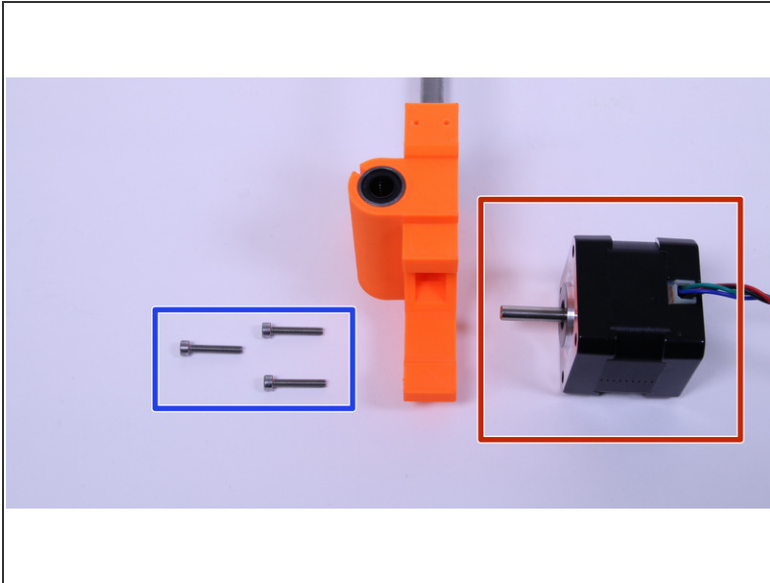


- Use pliers to cut off any excess ziptie.

⚠ Move the ziptie head to the position as shown in the picture.

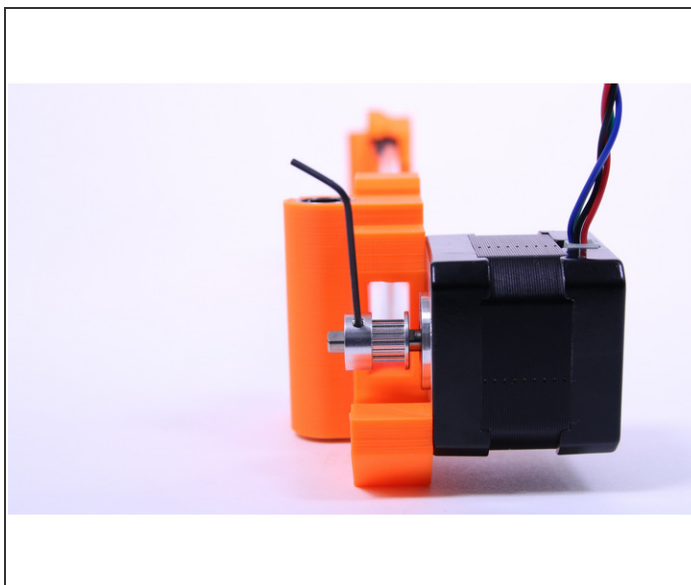
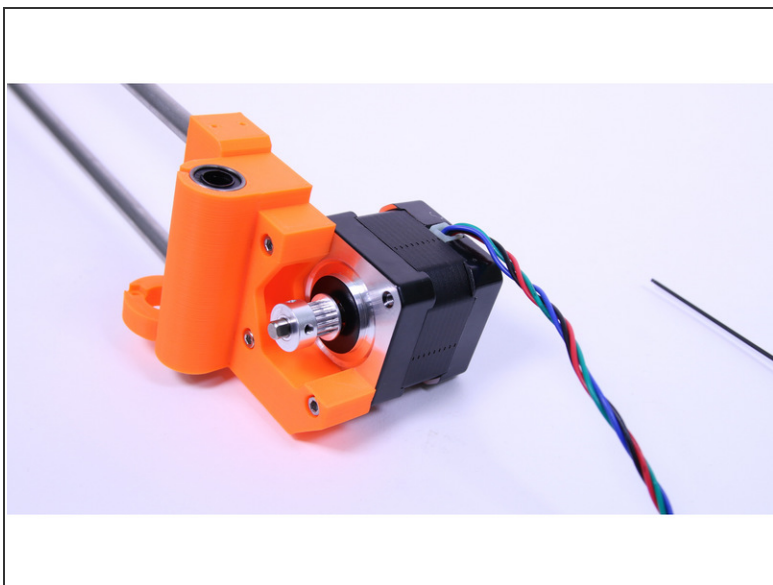


## Step 12 — Assemble the X-motor



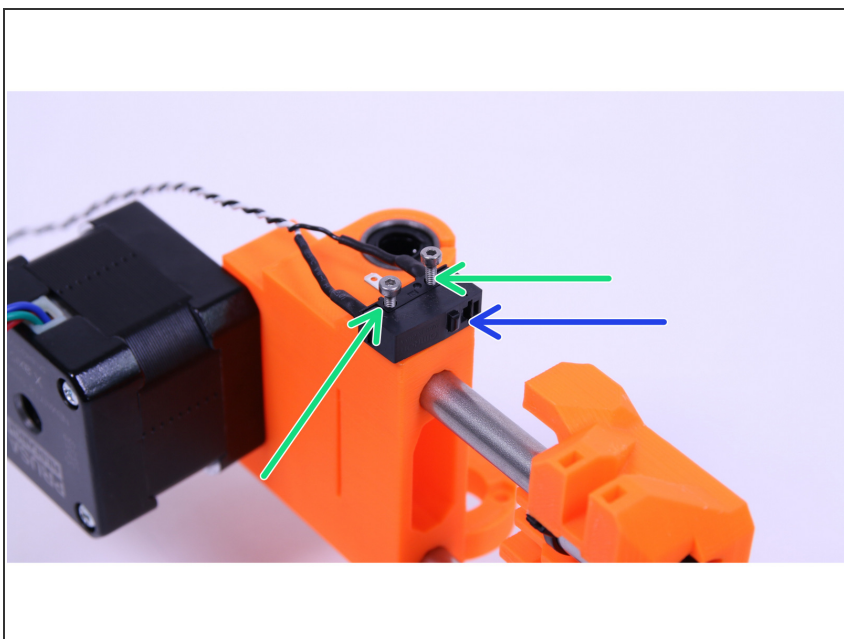
- M3x18 screw (3 pcs)
- X motor (the one labeled with X axis)
- Tighten the motor to the X-end-motor part.
- ☑ Ensure the correct position of cables (Cables should face down).

## Step 13 — Assemble the X-motor pulley



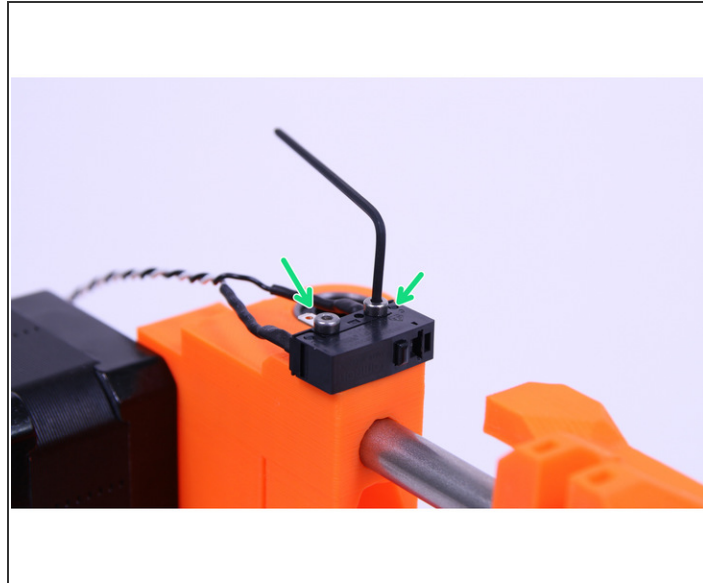
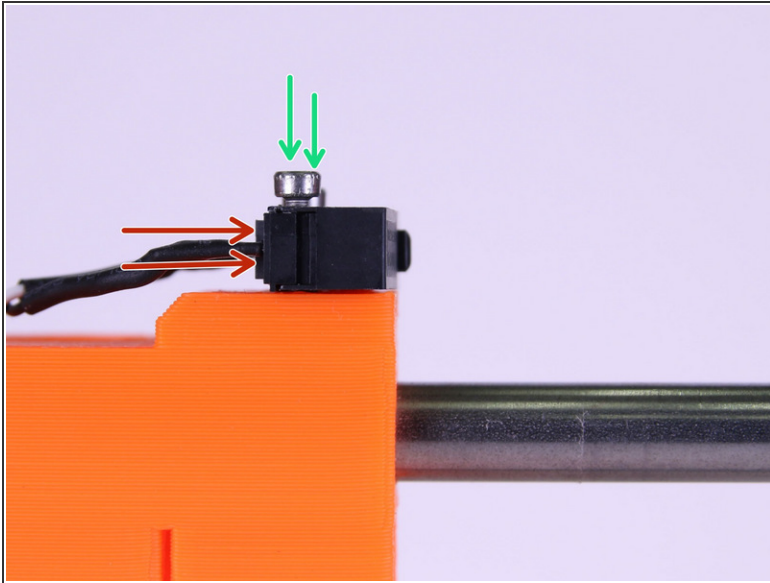
- Place GT2-16 pulley on the X motor shaft.
- Adjust the position as seen in the picture (effective part of the pulley should be in axis with the X-end-motor cutout and one of the screws on pulley should face directly on the pad on shaft).
- Tighten up the pulley.

## Step 14 — Assembling the X-endstop



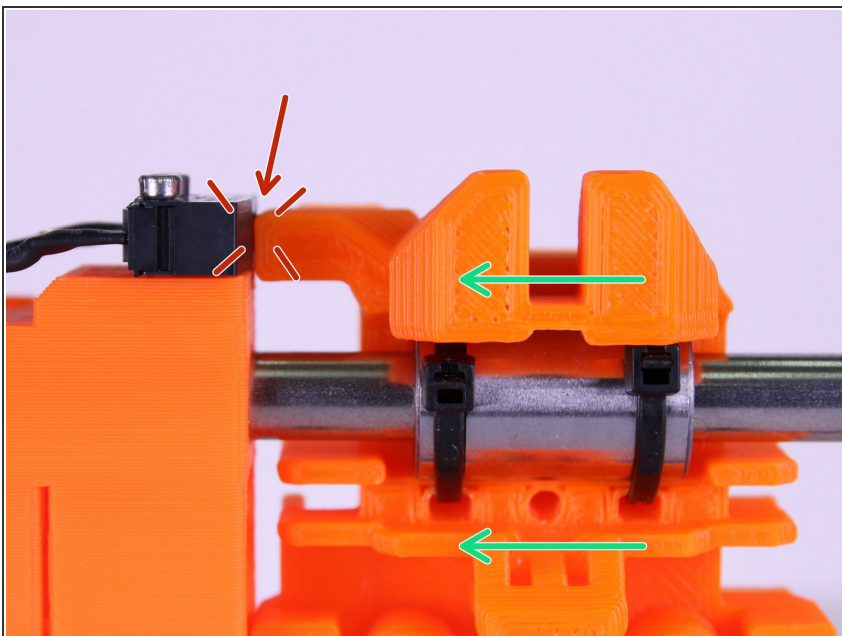
- X-endstop
- M2x12 screws (2 pcs)
- Place the endstop on the printed part and insert M2x12 screws.
- ⚠ Ensure correct position as in the picture (The button on the endstop has to be aligned with the key on the X-end-motor part).
- ⓘ Don't tighten the screws of endstop completely. We will get to that later.

## Step 15 — X-endstop alignment



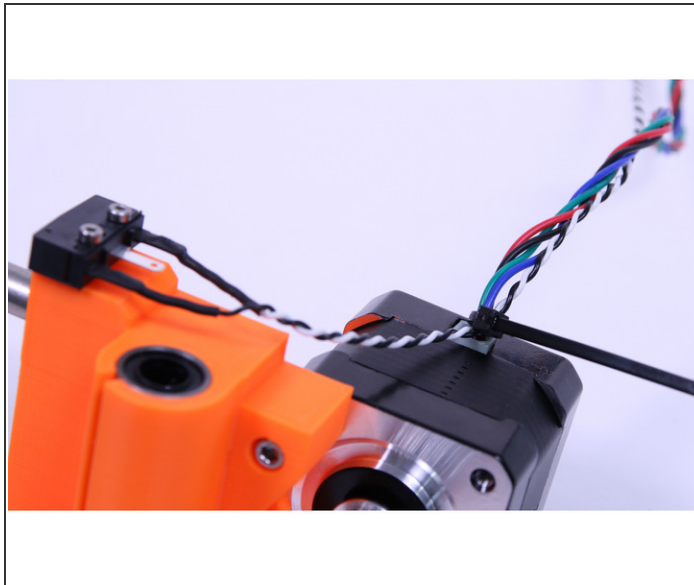
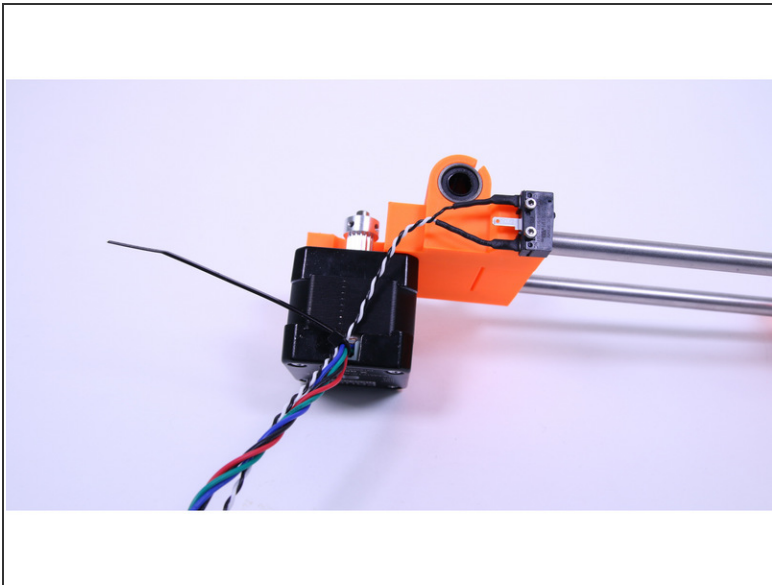
- Before tightening the screws push the endstop all the way towards the X-carriage as shown in the picture.
- Tighten the screws.

## Step 16 — X-Endstop check



- Move the X-carriage as close as possible to the X-end-motor.
- Make sure that you heard "click" sound and the X-endstop is triggered as shown in the picture.

## Step 17 — Cable management

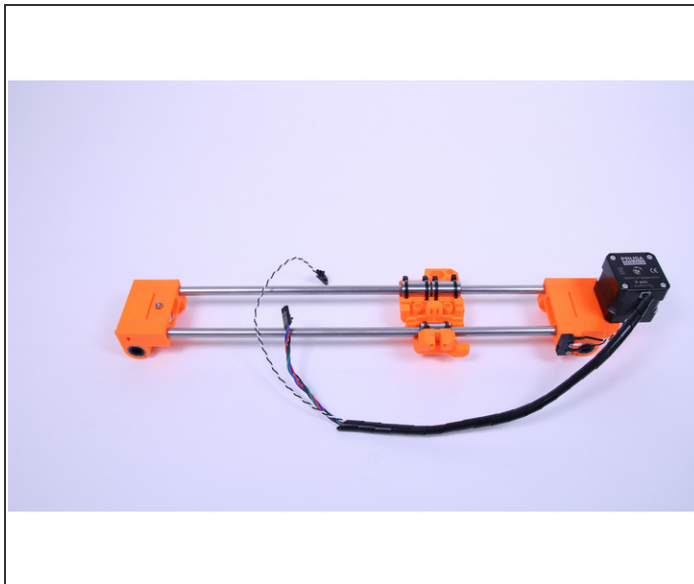


- Use zip tie to secure the X-endstop cable to the X-motor cable as close to the motor as possible.

 Do not overtie the zip tie otherwise you can damage the cables.

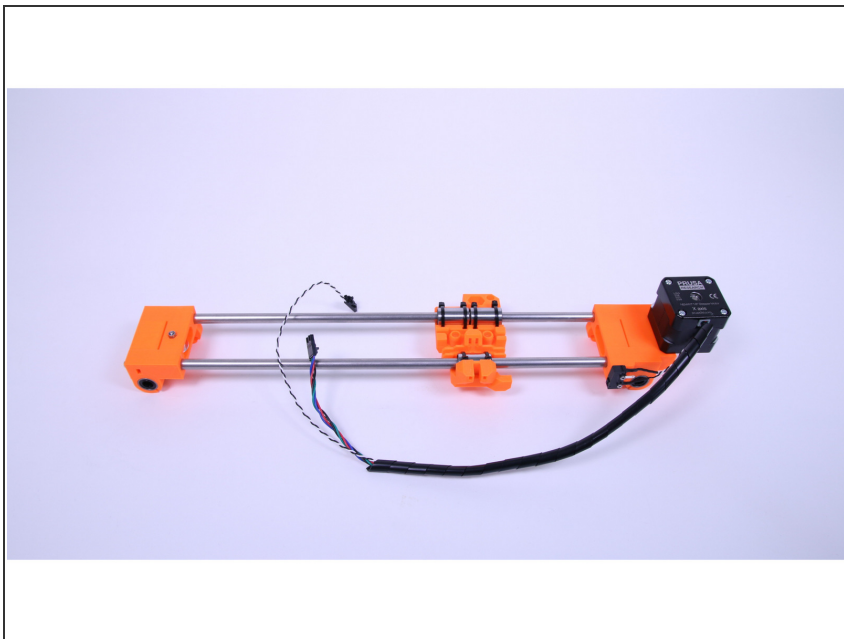
 When done, cut the overhanging part of the zip tie.

## Step 18 — Cable wrapping



- Use the smallest (in diameter) spiral wrap to wrap the cables.

## Step 19 — All done!



- Congratulations! You've just assembled the X-axis.
- Don't be nervous that there isn't a belt, we'll get to that later.
- You can continue by assembling Z-axis in the next chapter - [4. Z-axis assembly](#)

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