PRUSA RESEARCH

3. X-axis assembly

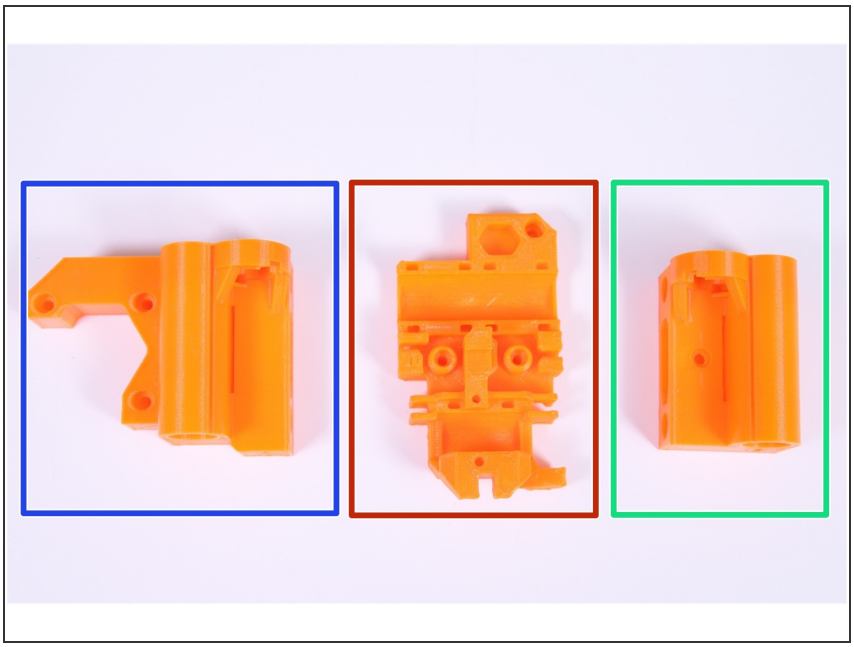
X axis guide

Written By: Josef Prusa

Step 1 — Getting the necessary tools

- 2.5mm Allen key
- Needle-nose pliers

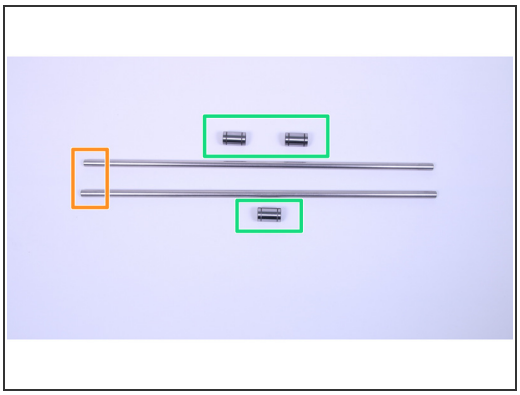
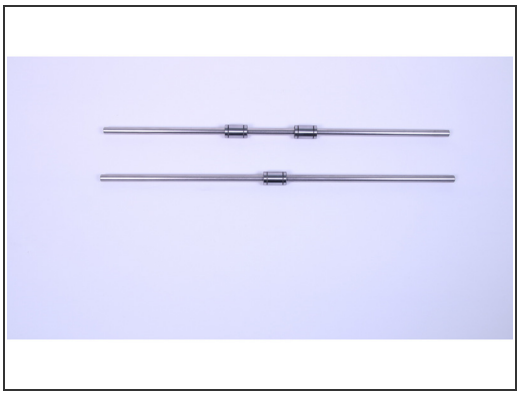
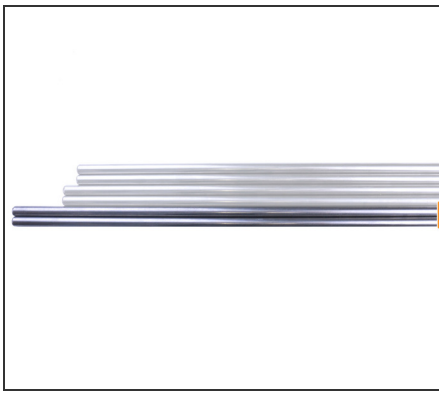
Step 2 — 3D printed parts



- X-carriage
- X-end-motor
- X-end-idler

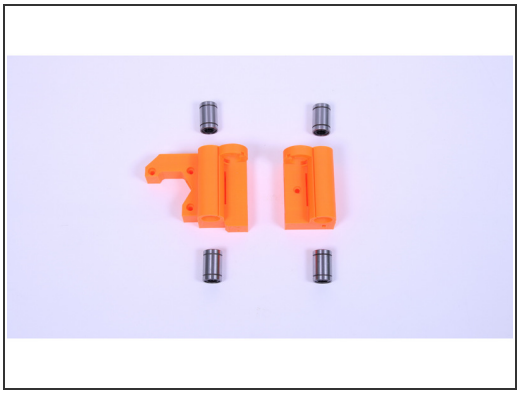
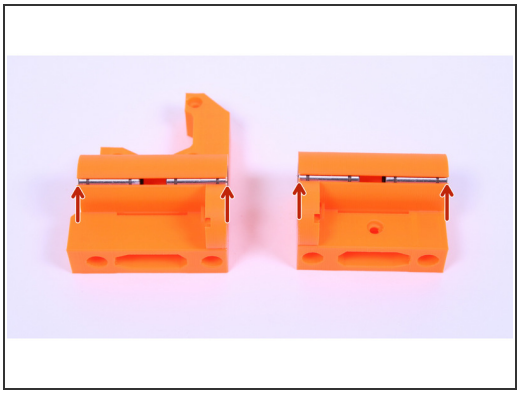
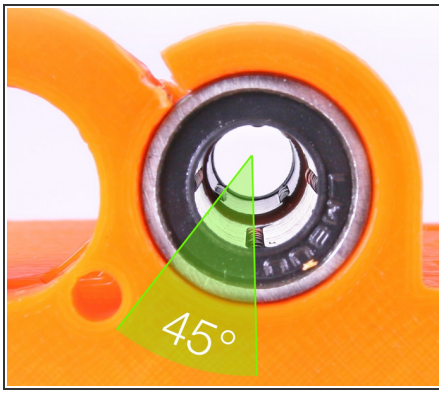
ⓘ Some parts can slightly differ from the photos.

Step 3 — Preparing the rods

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

Step 4 — Preparing the printed parts

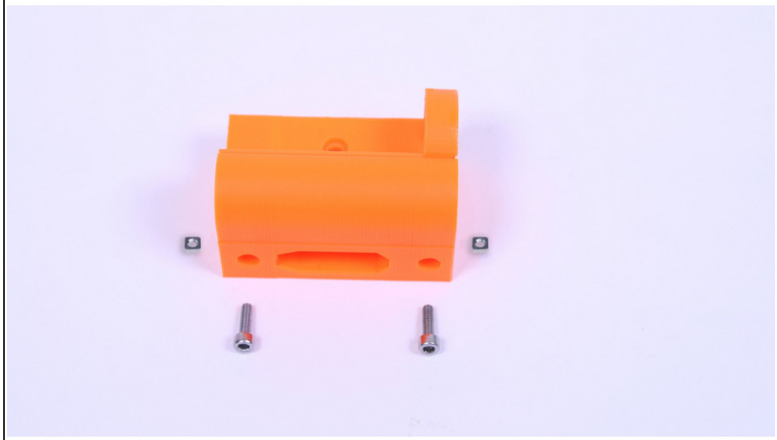




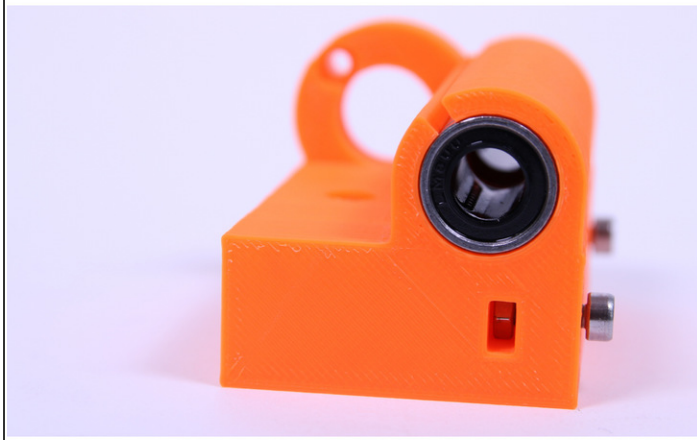
- Insert LM8UU linear bearing into the printed parts (X-end-motor and X-end-idler) as shown in the pictures.
- The bearing should be in line with the X-ends as highlighted in the picture.

ⓘ You can press on the flat surface for easier insertion.

ⓘ 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 the tension screws

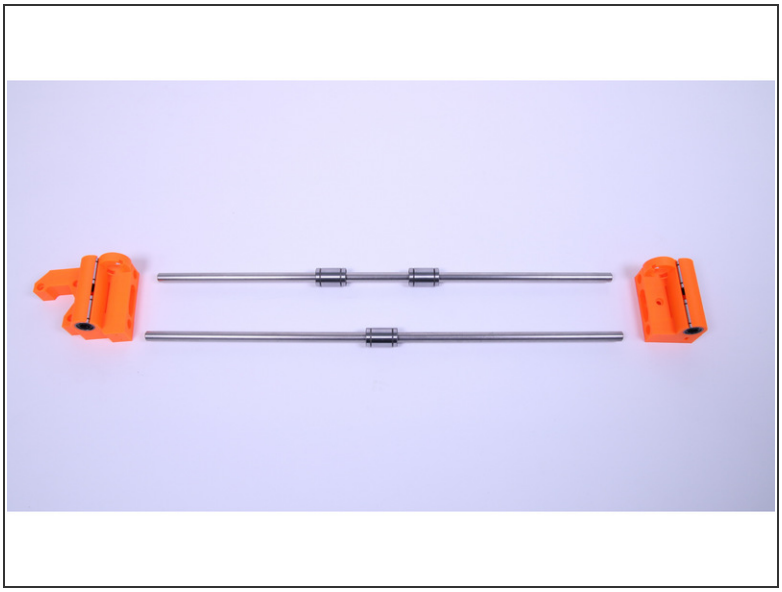


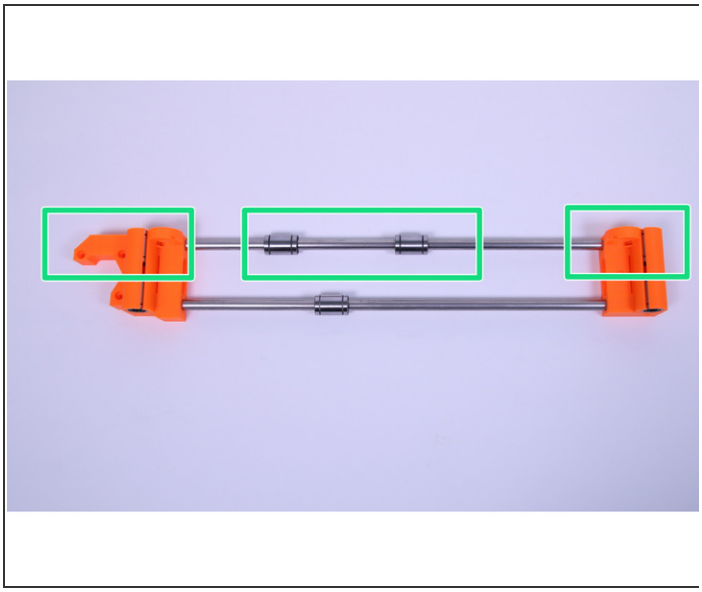


- Insert M3nS square nuts (2 pcs) and put in place M3x10 screws (2 pcs).

⚠ Avoid overtightening of the screws.

Step 6 — Assemble the X-axis base



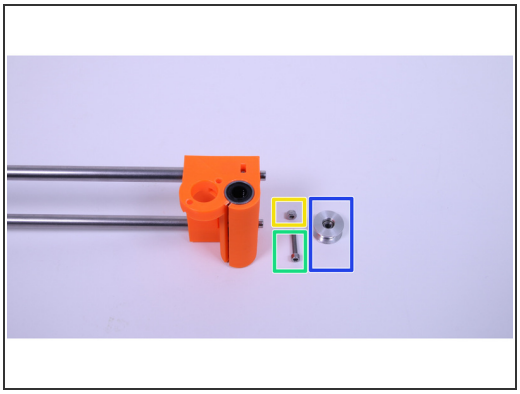


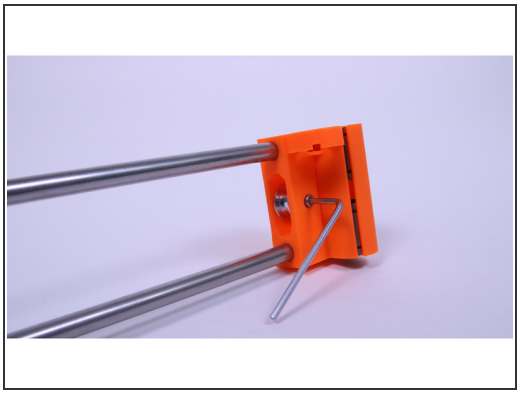
- Insert the rods with bearings fully into the printed parts.

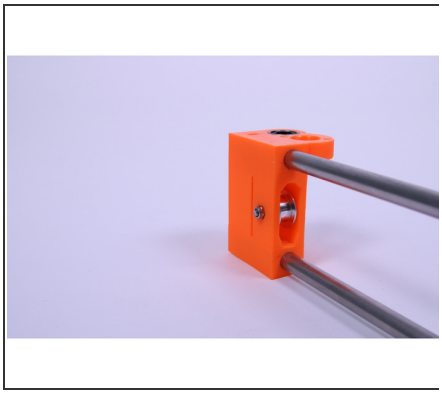
⚠ Ensure the correct orientation of the parts and rods (rod with 2 bearings must be on the side with the nut trap).

⚠ Insert the rods very carefully. Do not tilt the rods too much.

Step 7 — Preparing the X-end idler



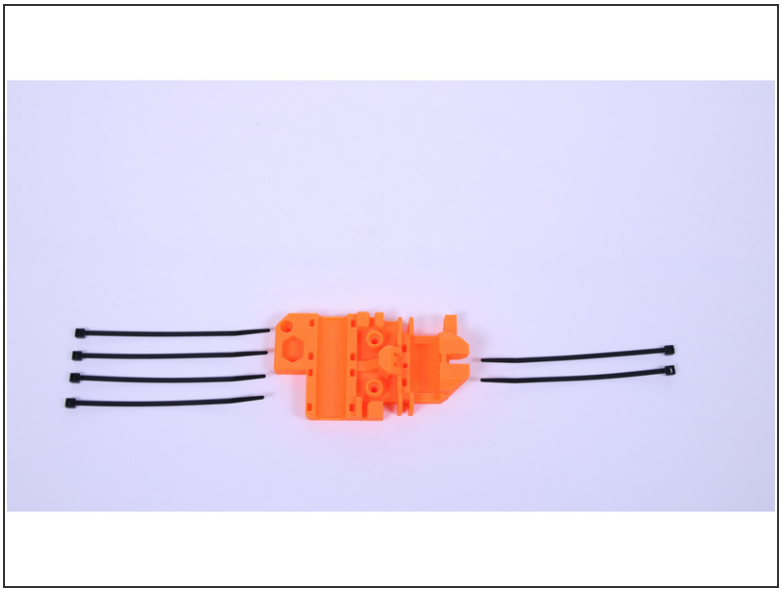


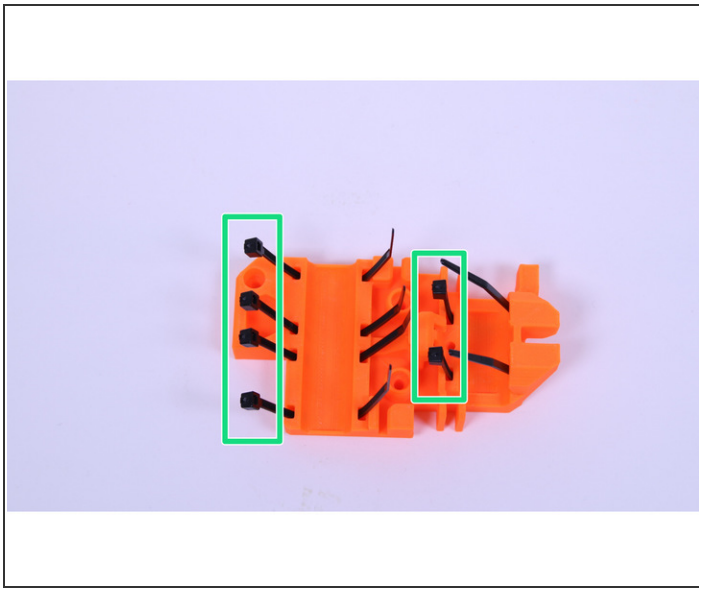


- M3x18 screw (1 pc)
- 623h bearing with housing (1 pc)
- M3nN nylock nut (1 pc)
- Insert the 623h bearing into the X-end idler.
- Secure it in position using a M3x18 screw.

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

Step 8 — Prepare the X-carriage

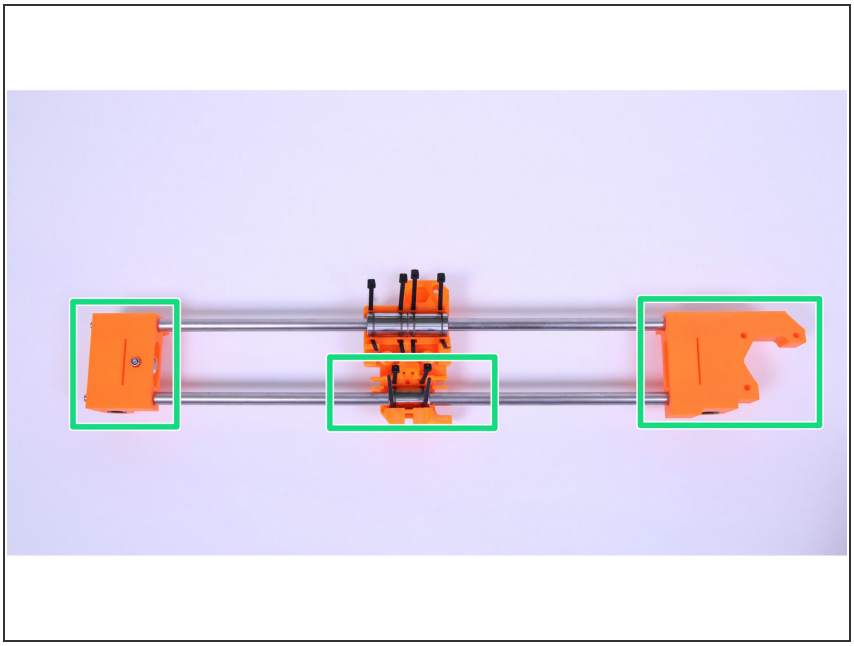




- Insert zipties into the X-carriage as shown in the picture.

⚠ Ensure the correct orientation of zipties.

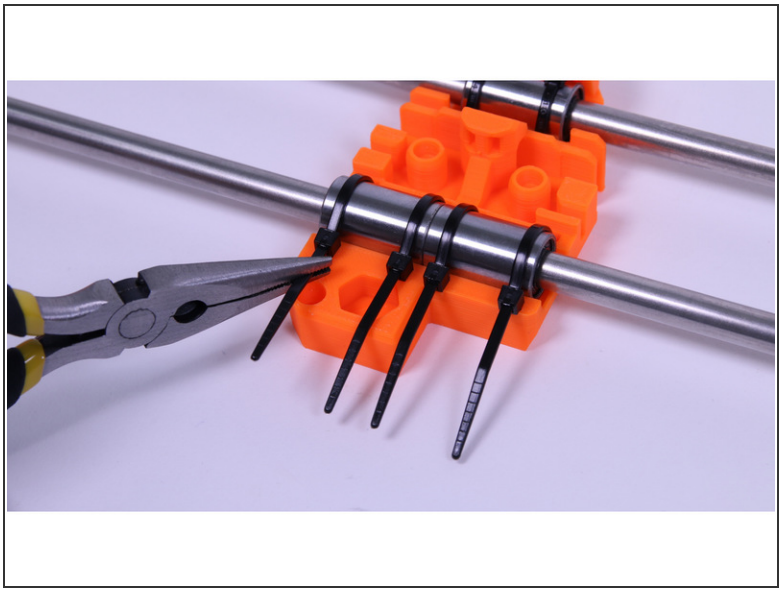
Step 9 — Placing the X-carriage

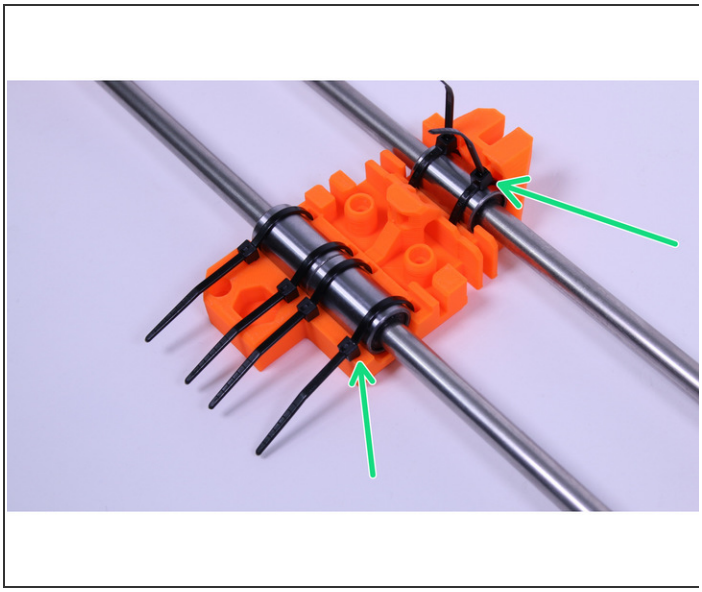


- Place the X-carriage on the X-axis base as shown in the picture.

⚠ Ensure the correct orientation of the X-carriage.

Step 10 — Tighten the X-carriage

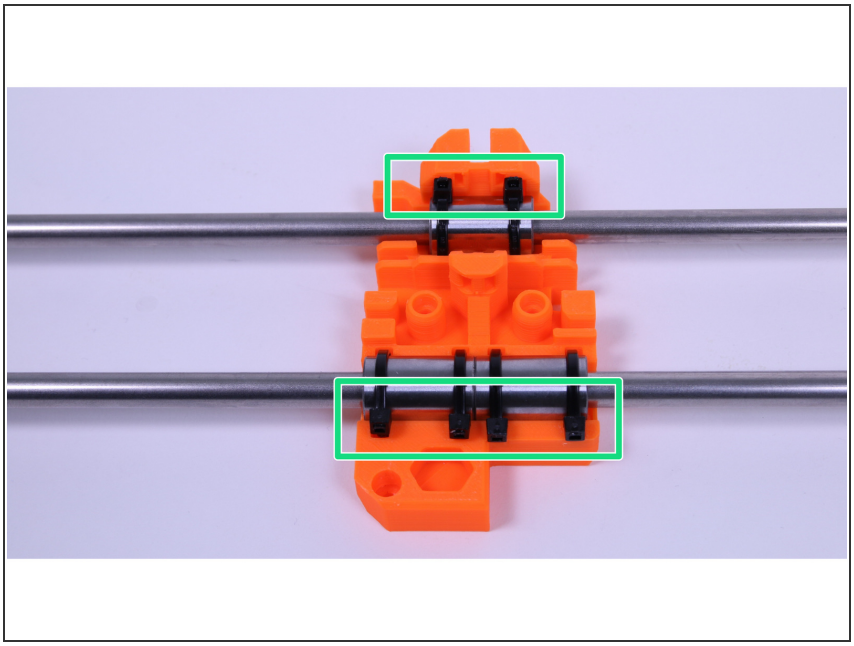




- Use pliers to tighten the zipties.

⚠ Make sure that bearings are in the position as shown in the picture (a bearing should be fully seated and bottomed out in the carriage).

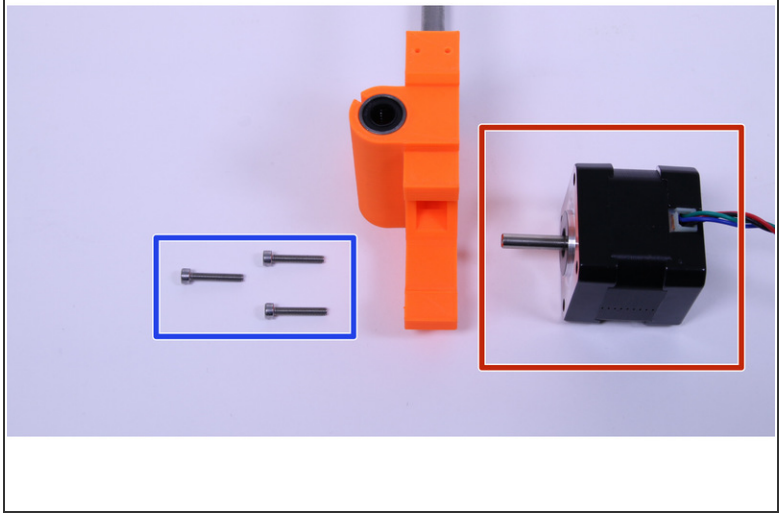
Step 11 — Cleaning up

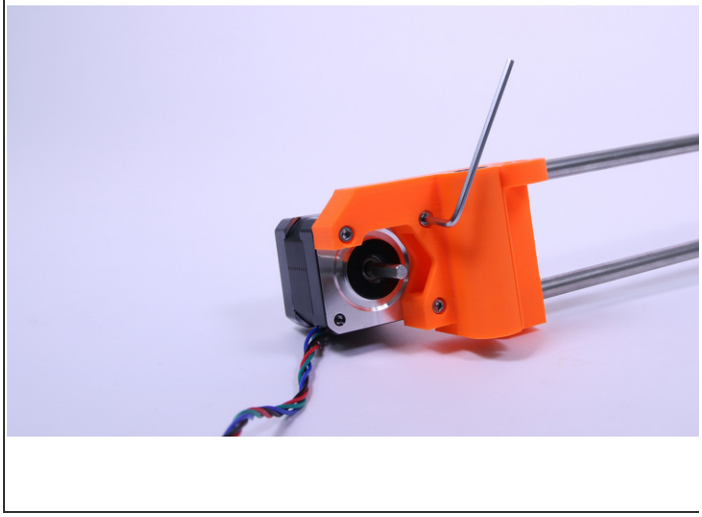


- Use pliers to cut off any excess ziptie.

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

Step 12 — Assemble the X-motor

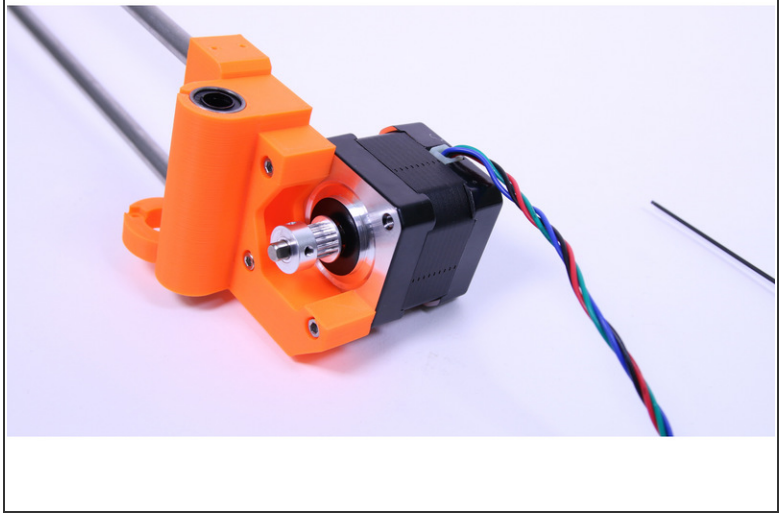


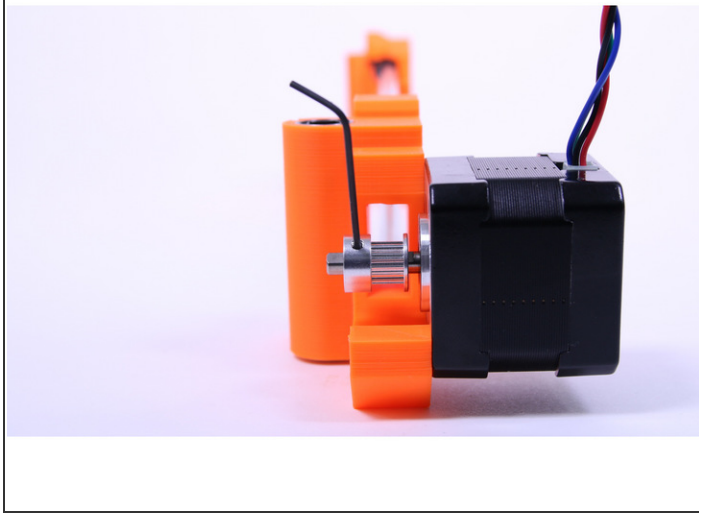


- M3x18 screw (3 pcs)
- X motor (the one labeled as X axis)
- Tighten the motor to the X-end-motor part.

Ensure the correct position of cables (Cables should face down).

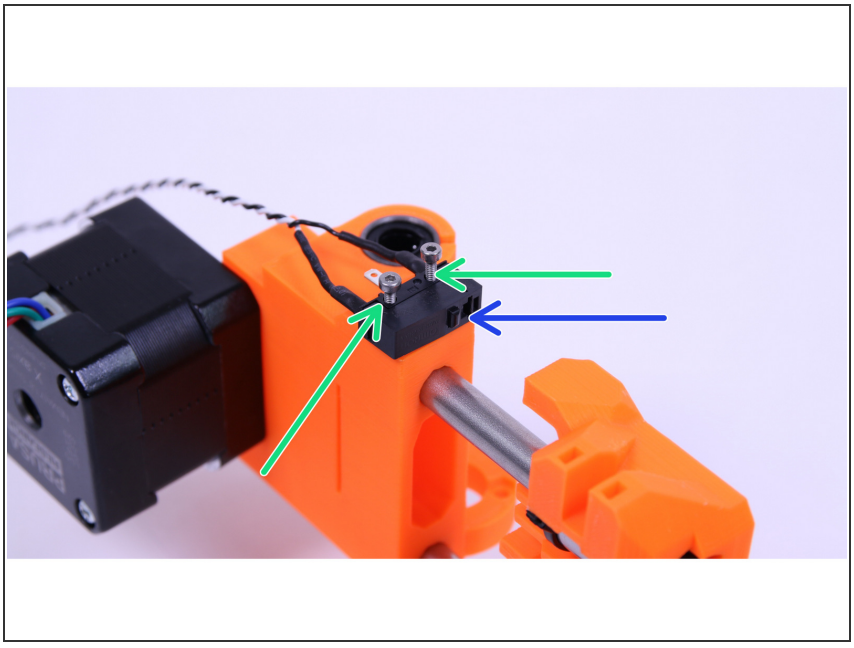
Step 13 — Assemble the X-motor pulley





- 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

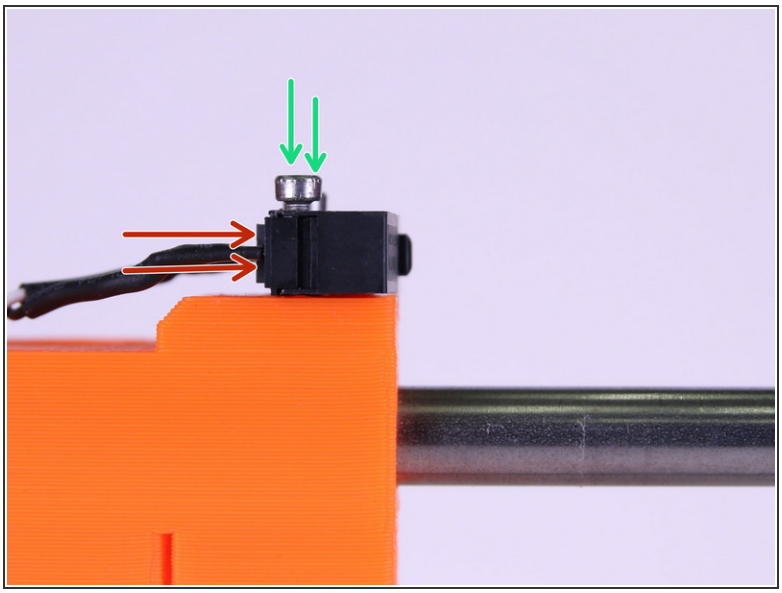


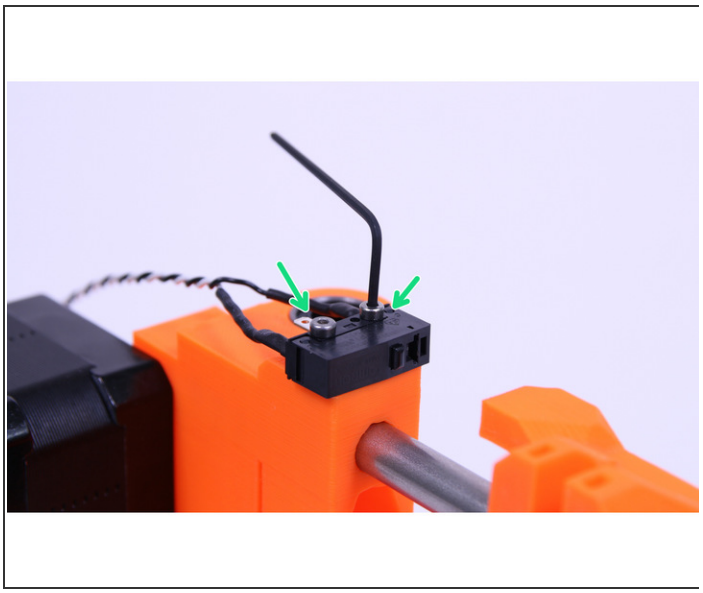
- X-endstop
- M2x12 screws (2 pcs)
- Place the endstop on the printed part and insert M2x12 screws.

⚠ 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.

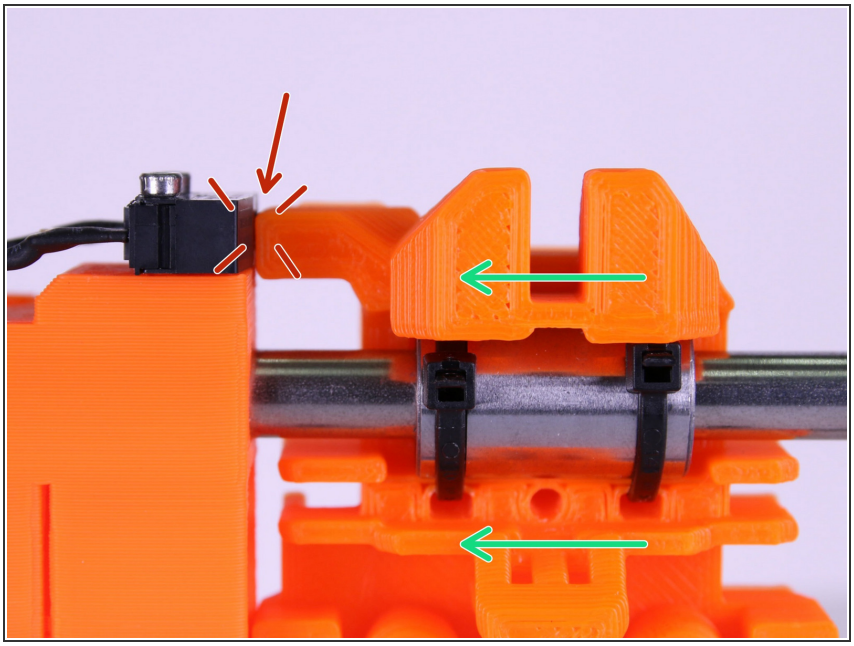
Step 15 — X-endstop alignment





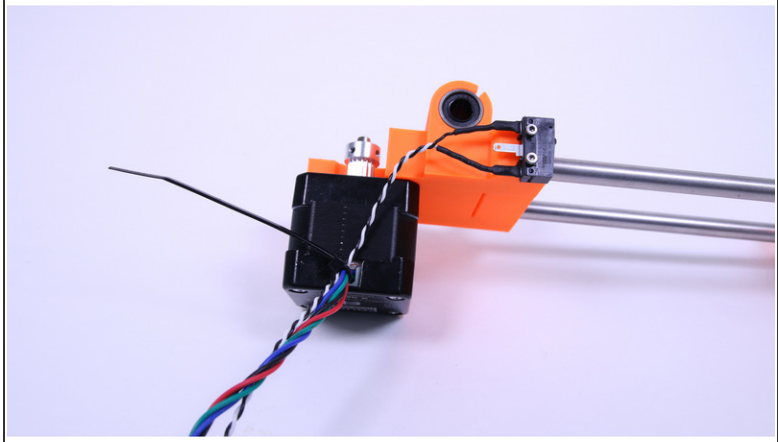
- Before tightening the screws push the endstop all the way towards the X-carriage as shown in the picture.
- Tighten the screws.

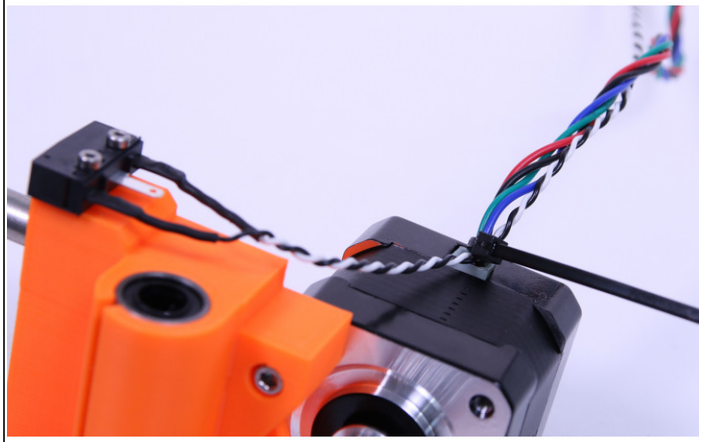
Step 16 — X-Endstop check



- 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



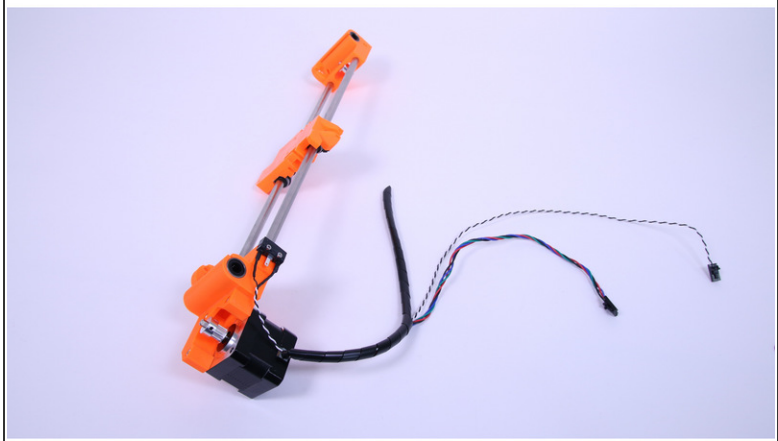


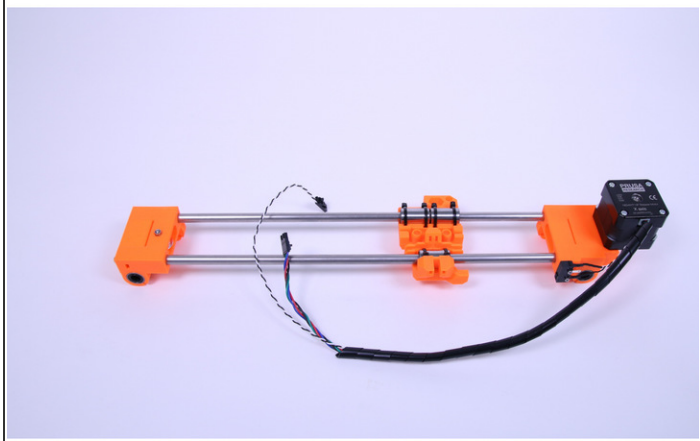
- Use a ziptie to secure the X-endstop cable to the X-motor cable as close to the motor as possible.

⚠ Do not overtie the ziptie otherwise you can damage the cables.

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

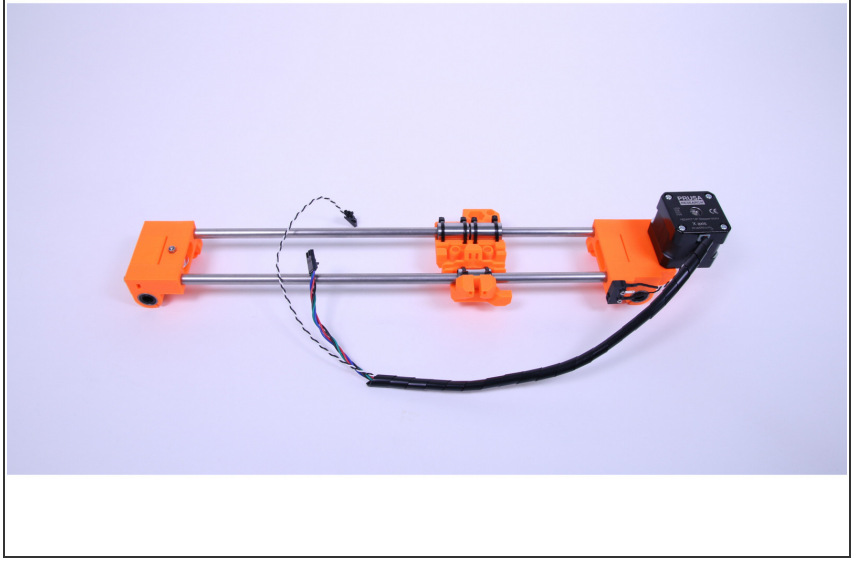
Step 18 — Cable wrapping





- 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 the Z-axis in the next chapter - 4. Z-axis assembly

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