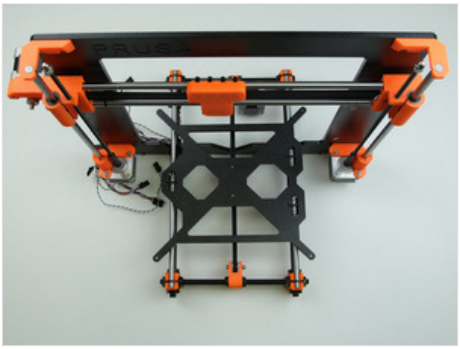
4. Z axis

Z axis guide

Author: Josef Prusa Difficulty: **Moderate**

♡ x 0 x 12 ✔ x 19

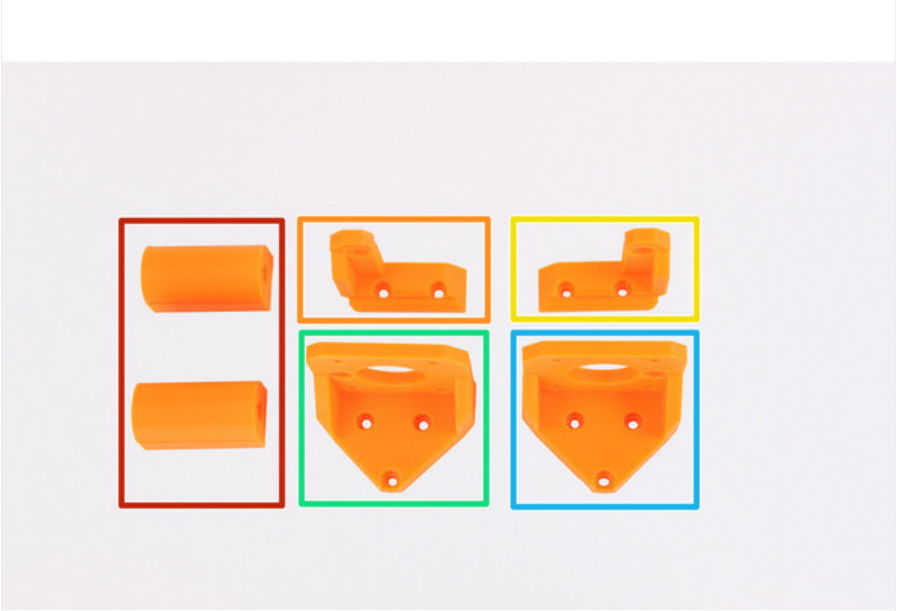


Original Prusa i3 Plus 2.85 mm kit...

All you need to build a Prusa i3 kit. You can buy the original at Shop.Prusa3D.com

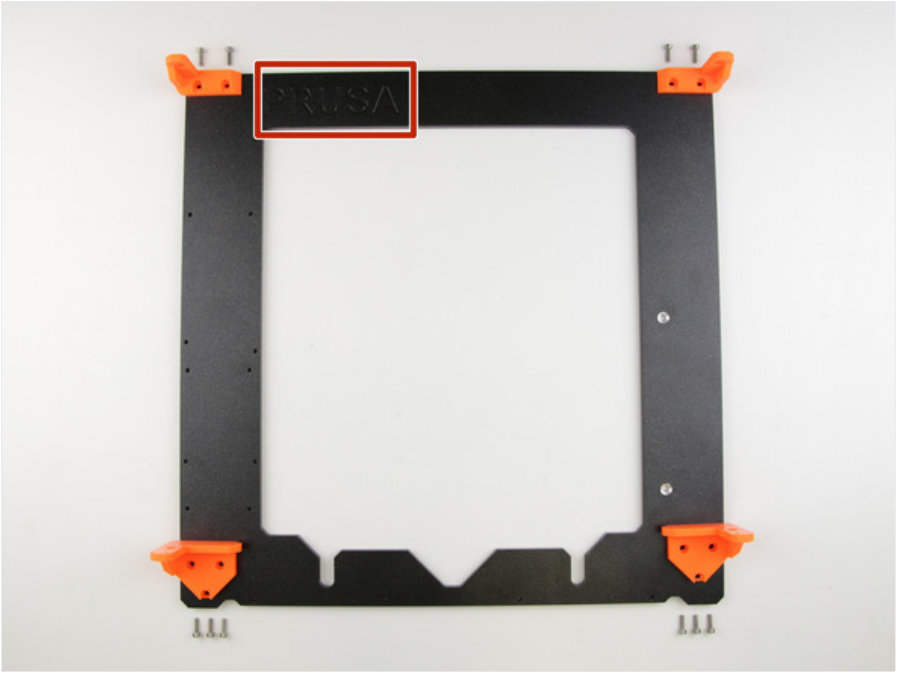
Step 1 — Get the necessary tools

- 13/17mm spanners
- 3.6mm flathead screwdriver
- Needle-nose pliers
- 2.5 and 1.5mm hex spanner



Step 2 — 3D printed parts

- Z-endstop-holder
- Z-axis-top-left
- Z-axis-top-right
- Z-axis-bottom-left
- Z-axis-bottom-right

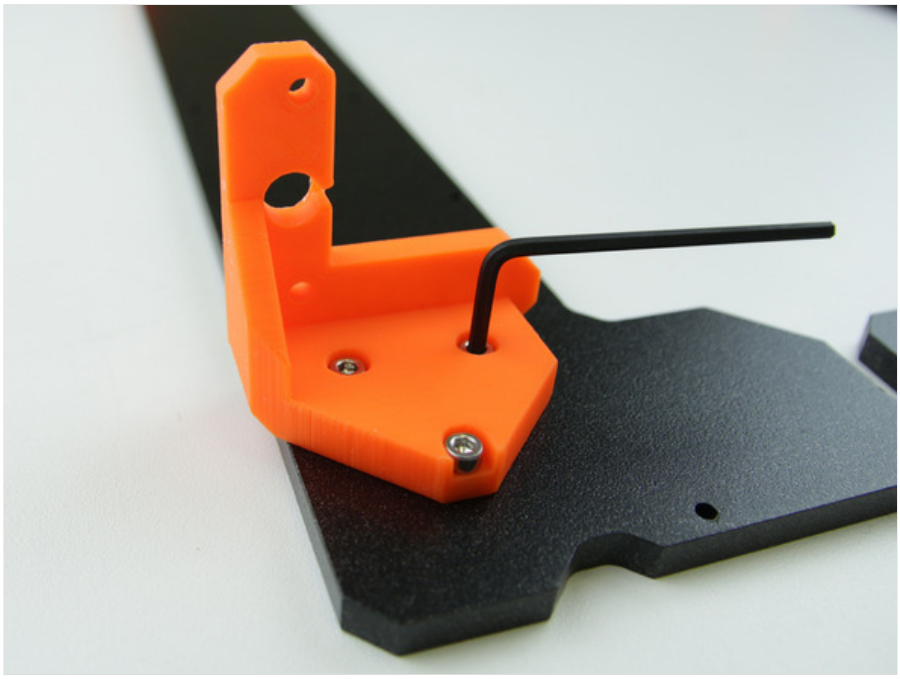


Step 3 — Screw the parts to the frame

- Place parts on the frame as shown in the picture

Note the frame orientation (PRUSA logo has to be visible)

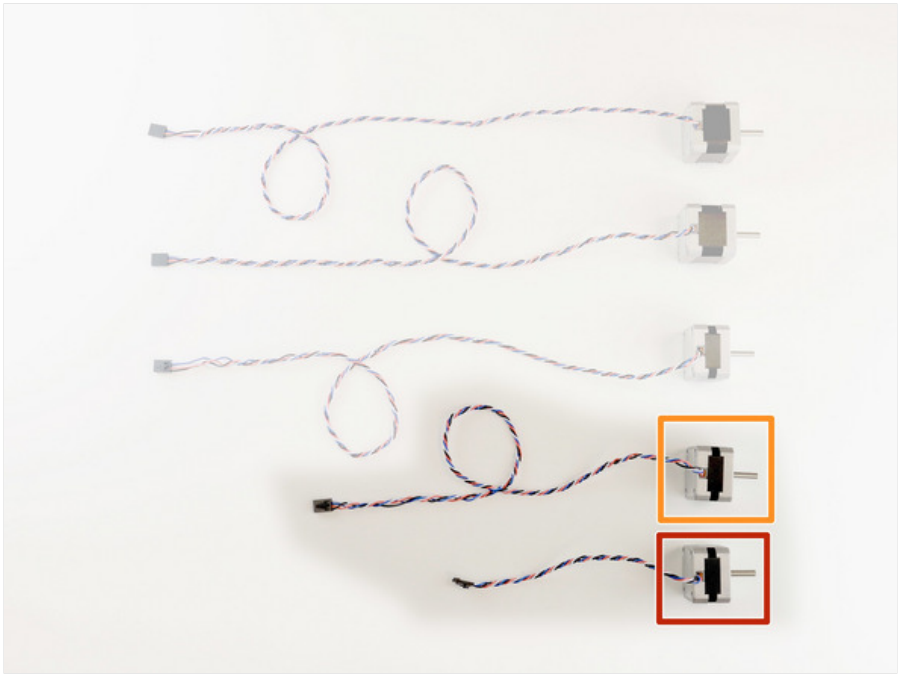
All screws in this step are M3x10



Step 4 — Tighten the parts on frame

- Use 2.5mm hex spanner to tighten the parts to the frame

⚠ Tighten them gently, no superhuman force required

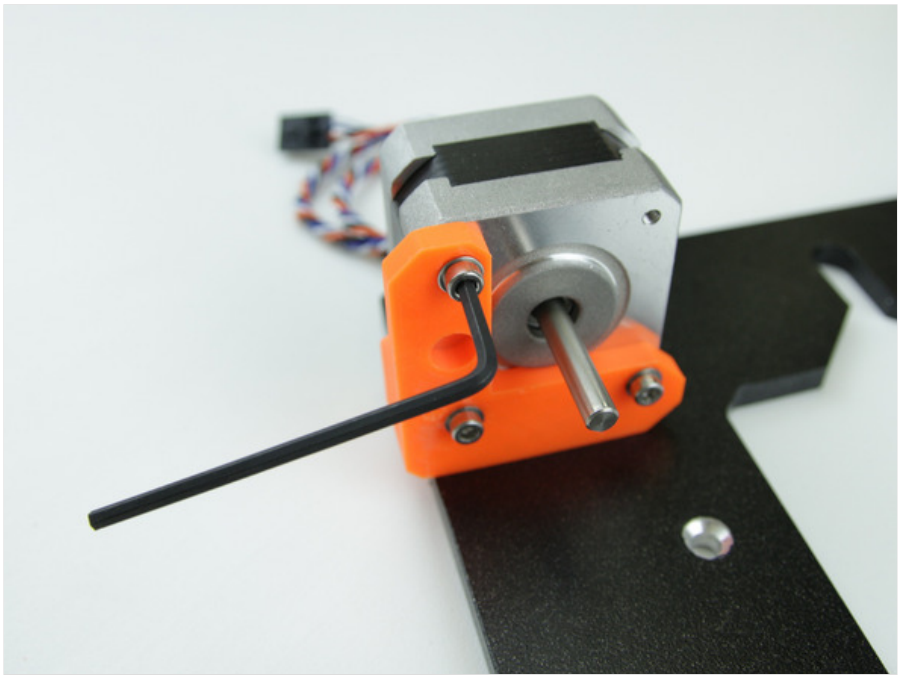


Step 5 — Placing the Z-motors

- Place the Z motors on the frame
- Z-motor 1 (shortest motor with shortest cables)
- Z-motor 2 (shortest motor with second shortest cables)

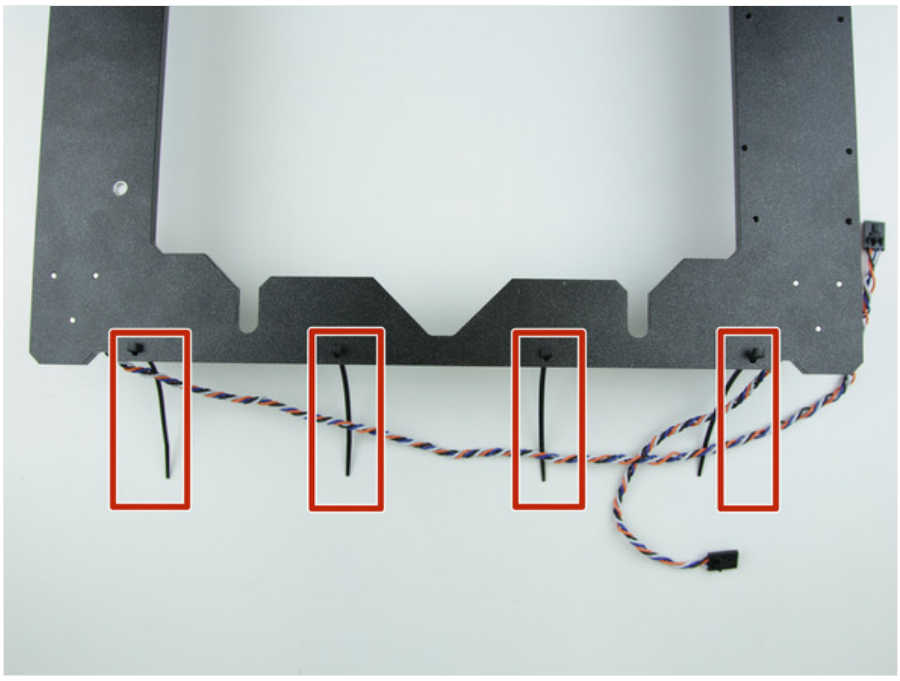
⚠ Ensure the correct position of the motors (Z-motor 1 on the left)

ⓘ Use M3x10 screws and M3w washers



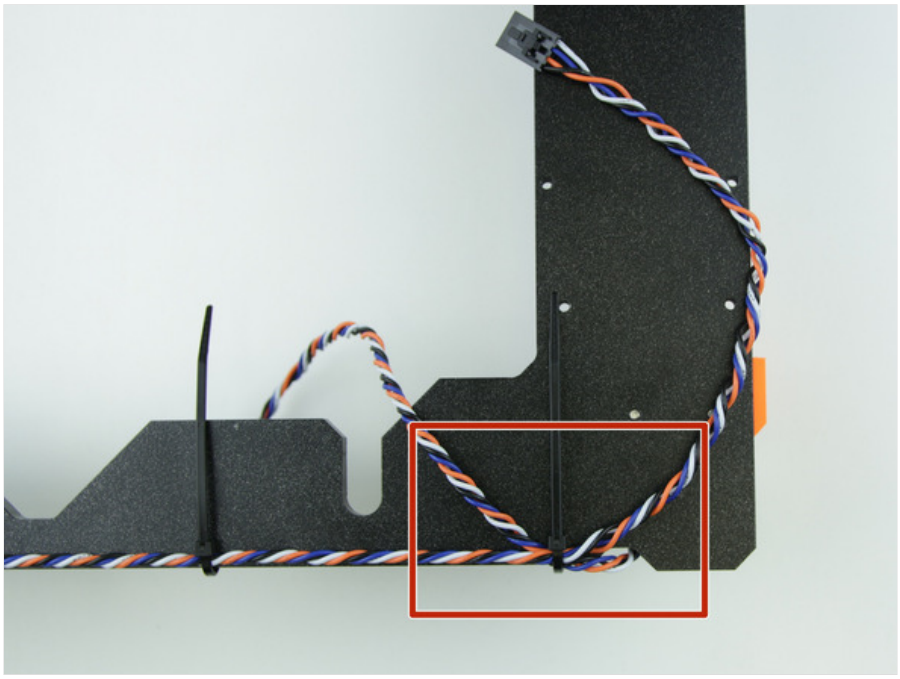
Step 6 — Tighten the Z-motors

- Use 2.5mm hex spanner to tighten the motor to the printed part



Step 7 — Cable management

- Insert the zipties in the holes at the bottom of the frame



Step 8 — Cable management (2)

- Tie the cables to the frame as shown in the picture
- Note that the Z-motor 2 cables aree tied with the last ziptie

Step 9 — Cleaning up

- Use pliers and cut the excess ziptie

⚠ Note the position of connecting ziptie

Step 10 — Assembling the Y-axis

- Grab Y-axis assembly in your hand and slide it into the frame. You should be able lift the construct as a whole
- Tighten the M10n nuts to the frame

⚠ Ensure the there is washer between nut and frame on both sides

⚠ Ensure the correct orientation of the Y-axis assembly and the frame (longer part should be on the side with motors)

Step 11 — Preparing the Z-rods

- Insert Z-rods (shortest ones) inside the Z-endstop holders
- Ensure the correct orientation of parts as shown in the picture

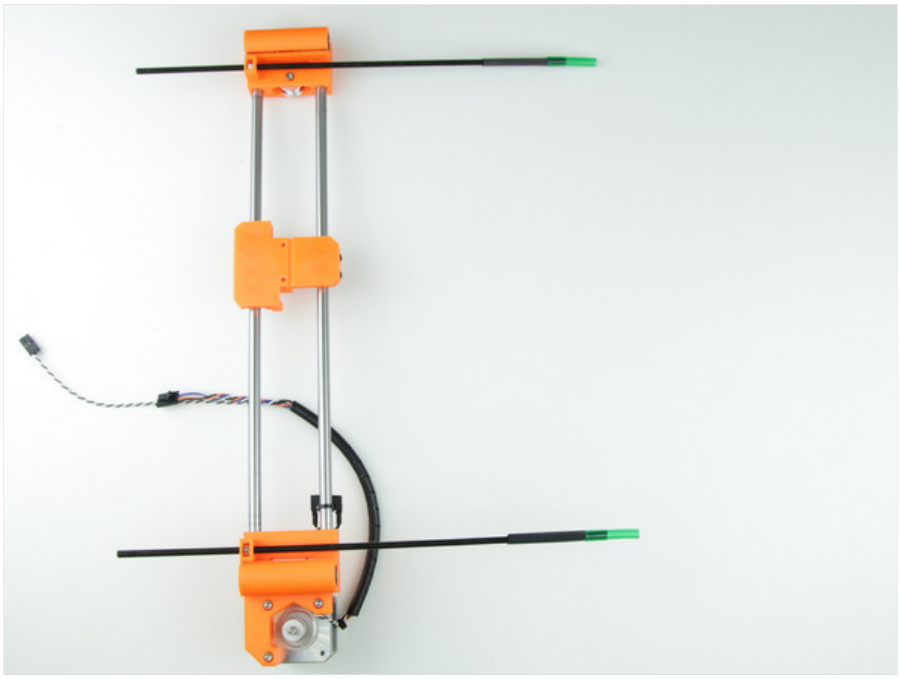
Step 12 — Assembling the Z-endstop

- Z rod with Z-endstop holder
- Z-endstop (the one with shortest cables)
- M2x12 screws

Step 13 — Tighten the Z-endstop

- Using 1.5mm hex spanner tighten the endstop to the holder

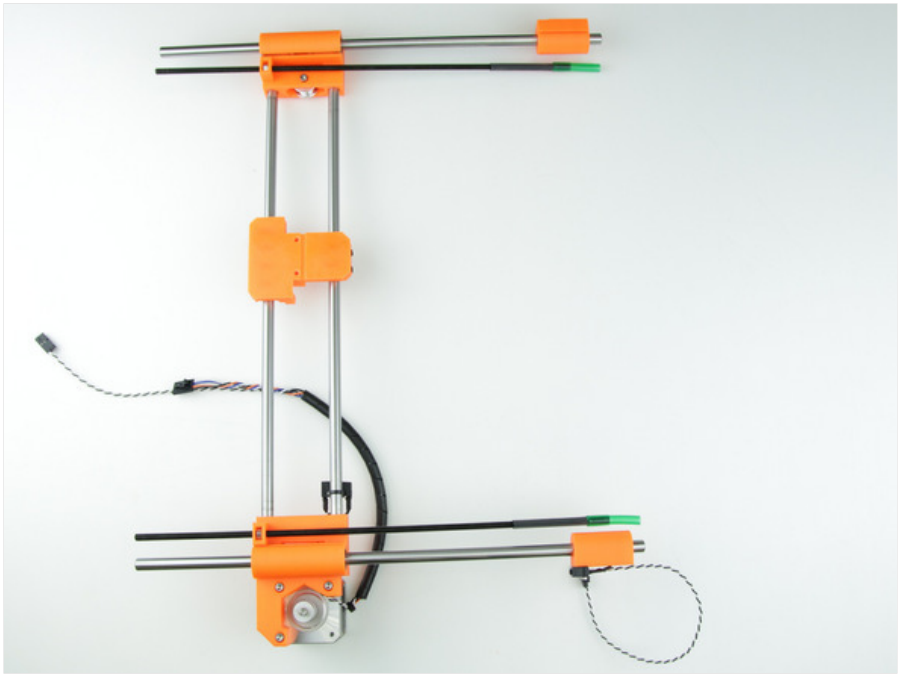
Tighten it gently



Step 14 — Assembling the Z-threaded rods

- M5 threaded rods with preassembled hose coupling
- Screw the threaded rods inside the nuts in X-axis assembly

⚠ Screw until exactly 75mm deep



Step 15 — Assemble smooth Z-rods

- Insert the smooth rods in the X-axis assembly

⚠ Insert them very carefully, perfectly in axis with the bearings and with minimal force

⚠ Rod with attached endstop has to be on the side with motor

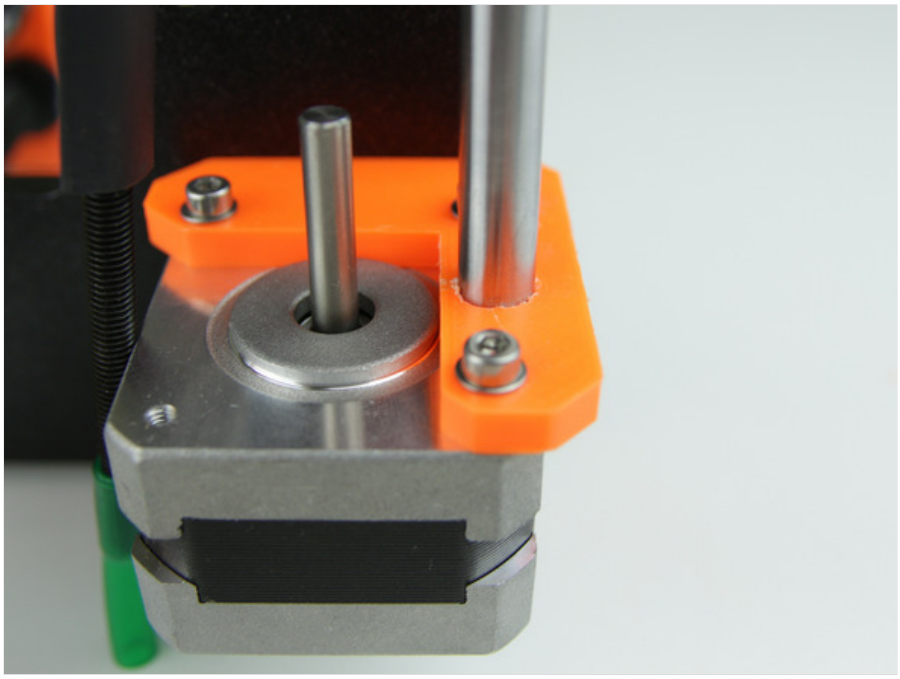
Step 16 — Z-axis assembly preparation

- Insert the Z-axis assembly into the top parts of the frame

⚠ Do not tilt the whole axis too hard. You risk damaging the top parts of the frame

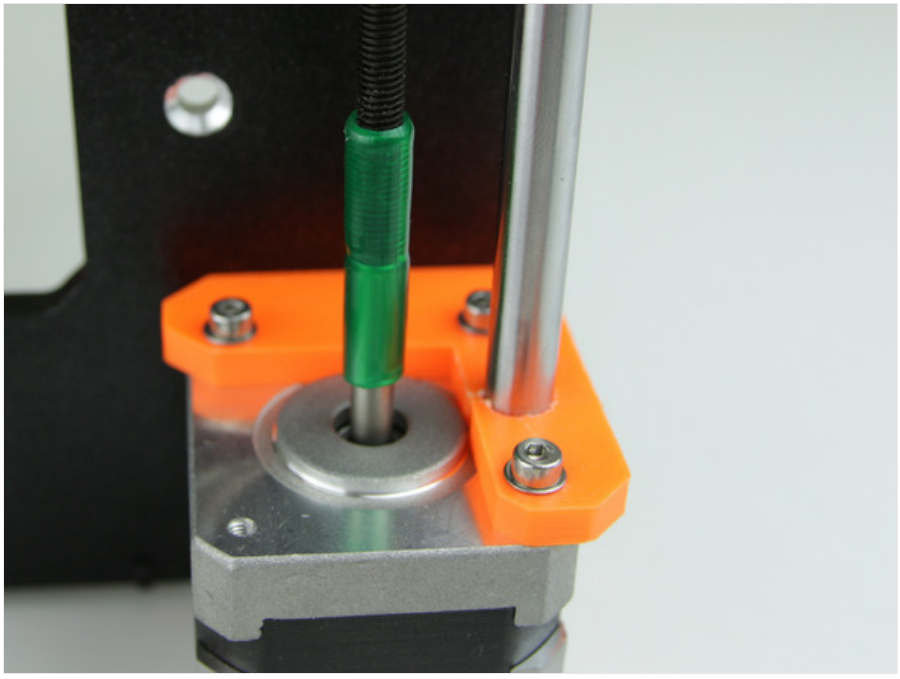
Step 17 — Assembling the left side

- Insert the rod with attached endstop to the bottom left printed part



Step 18 — Assembling the right side

- Slide the rod all the way down
- Make sure that the rod is facing directly to the hole in bottom right printed part (If not, apply some pressure to adjust the pitch between X-ends)
- Press the rod inside the part



Step 19 — Assembling the hose coupling

- Grab the end of the M5 threaded with hose coupling
- Press the hose coupling all the way on the Z-motor shaft

⚠ Keep in mind that you have to do this on both sides simultaneously

Step 20 — Final touches to the bottom side

- Twist the Z-endstop-holder as shown in the picture
- Slide it all the way down
- Slide the heat shrink over the hose coupling
- Repeat the step on the other side

Step 21 — Z-axis threaded rod end assembly

- M5nC Closed nut
- M5n nut

Step 22 — Screwing the nuts

- Screw the M5n nut on the Z-axis threaded rods
- Screw the M5nc closed nuts on the Z-axis threaded rods as far as you can

Step 23 — Tightening up the nuts

- Tie the nuts against each other

Step 24 — Assembling the X-axis belt

- Using flathead screwdriver, insert the X-GT2 belt (longer one) all the way down into the X-carriage

Step 25 — X-axis belt motor guide

- Guide the X-axis belt through the X-end-motor, around GT2-16 pulley and back

Step 26 — X-axis belt idler guide

- Guide the x-axis belt through X-end-idler, around the 623h bearing with the housing and back

Step 27 — Tightening the X-axis belt

- Use pliers to tighten up the X-axis belt

Step 28 — X-axis belt finishing touches

- Use a screwdriver to push the belt all the way down to the X-carriage

Step 29 — All done!

- Congratulations! You've just assembled Z-axis
- You can continue by assembling Extruder by clicking on following link
- 5. Extruder

You're Done!

Give author +30 points!

12 COMMENTS

Add a comment

Step 5
Add comment

The picture and description was a bit misleading for me. The z motors are actually the two medium sized motors. The smallest sized motor is for the extruder.

pgiustino - 06/11/2015

After everything I got different size motors for this part, and one of them has a hole at the end. Maybe the model of the motor should be added to these manuals.

Kite - 07/10/2015

Step 13
Add comment

I was very gentle in placing the screws, but the screw threads do not 'bite' very well into the holder resulting in a loose connection. If this becomes problematic, I'll replace with a similar, but more aggressive screw with better thread bite.

Russ - 08/07/2015

Step 14
Add comment

I did not understand the point of the 75mm deep. I can understand keeping the distance the same.
I screwed both rods much further at a later point for future assembly, then put them back to 75mm.

pgiustino - 06/11/2015

Step 19
Add comment

Required a certain amount of patience and strength for me here.

pgiustino - 06/11/2015

This part required me to take the motor and the M5 threaded rod off of the whole thing. Was a lot easier that way. No strength needed at all. Really easy to put back too. Lucky I had enough of zipties left over.

Kite - 07/10/2015

If you place a rope between the X-axis and the bottom of the frame + a ziptie that connects this rope's endpoints, then it is possible to work on the hoses a bit, tighten the ziptie a bit, work on the hoses a bit and tighten the ziptie a bit and so on... until the hoses are all the way down. This made my day as I tried for ~40 minutes without coming any where without this trick...

Henrik Wistbacka - 09/01/2015

Step 20
Add comment

I see nowhere in the documentation where it says to take a heat source and heat the heat shrinks. I assume this is needed.

JD Caron - 10/04/2015

Step 23
Add comment

It's not just for looks. The ends will make it easier to manually adjust the height of the z axis and make sure both ends are level.

pgiustino - 06/11/2015

Step 24
Add comment

Careful. Picture is oriented upside down. The belt should start facing the motor.

pgiustino - 06/11/2015

> Fixed, all pictures rotated.
>
> Josef Prusa - 06/29/2015

Step 28
Add comment

I would like to see a picture where the full path of the belt is shown.

Miguel Sanchez - 06/07/2015