4. Z-axis assembly

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Step 1 — Tools necessary for this chapter

- Needle-nose pliers for tension check.
- 2.5mm Allen key for M3 screws
Step 2 — Z-axis: assembling motor holders

⚠️ **WARNING:** Printed parts aren't the same! There is a left and right oriented piece. See the pictures. Also note the correct orientation of the frame, the "PRUSA" logo must be facing towards you.

- For the following step, please prepare:
  - Z-axis-bottom-left (1x)
  - Z-axis-bottom-right (1x)
  - M3x10 screw (6x)

⚠️ Place the printed parts next to the frame. See the picture for **CORRECT ORIENTATION** (the small circular openings must be facing out).

- Tighten each printed part with M3x10 screws. **Don't use excessive strength during tightening!** In case of increased resistance, try to place the screws from the other side to "clean up" the hole. Then return to the front side.
Step 3 — Placing the Z-screw covers

- For the following steps, please prepare:
  - Z-axis motor (2x)

  Note each Z-axis motor has different cable length. The shorter one must be on the left side, longer on the right side.

  - Z-screw-cover (2x)

  - Remove the trapezoidal nuts from the motors. **DON'T THROW** them away, you will need them!

  - Screw the Z-screw covers onto both leadscrews.

  **Covers should be screwed fully to the motor, but not too tight! The motor must be able to spin freely!**
Step 4 — Z-axis: assembling the motors

- For the following step, please prepare:
  - Z motor left (labeled Z axis left, shorter cable)
  - Z motor right (labeled Z axis right, longer cable)
  - M3x10 screw (8x)

⚠️ See the second picture. The motor with the shorter cable (red arrow) is on the left, the motor with the longer cable (orange arrow) is on the right!

- **ATTENTION: Motor cables must be oriented towards the frame!** Adjust (rotate) the motor. There is a small cutout in the frame on the lower edge for each cable.

- Secure each motor with four M3x10 screws. Tighten evenly and carefully as you might break the printed parts.
Step 5 — X-axis: trapezoidal nuts (part 1)

For the following step, please prepare:

- Trapezoidal nut (2x)
- M3x18 screw (4x)
- M3n nut (4x)

Turn the X-axis upside down and insert nuts into traps on both X-ends.

In case you can't press the nuts in, don't use excessive force. First, check that there isn't any obstacle in the nut trap.

Note: Design of your X-end printed parts might slightly differ, but the assembly process is the same.
Step 6 — X-axis: trapezoidal nuts (part 2)

- Carefully rotate the X-axis onto its backside.
- Insert the trapezoidal nuts to each X-end.

⚠️ **Note the correct orientation** of the trapezoidal motor nuts!

- Tighten the nuts with M3x18 screws.

ℹ️ You can use any of all four holes on the trapezoidal nuts.

ℹ️ Note: Design of your X-end printed parts might slightly differ, but the assembly process is the same.
Step 7 — Assembling the X-axis and smooth rods

- Aside from the X-axis, please prepare for the following step:
  - Smooth rod 320 mm (2x)

**WARNING:** be very careful while installing the X-axis on the trapezoidal lead screws. The process should be smooth, otherwise you might damage the thread inside the plastic nut. Reseat the axis if necessary.

- Carefully slide the X-axis on the trapezoidal lead screws. By rotating both screws simultaneously let the X-axis slide until both trapezoidal lead screws are visible. If you feel any significant resistance, try to reseat the axis first.

- Make sure the top smooth rod of the X-axis and the lower edge of the frame are parallel.

- **NOW, PLEASE BE VERY CAREFUL!** Gently insert the remaining smooth rods through the bearings on the X-axis all the way down into printed parts, do not apply too much force and do not tilt the rod!

  - In case you manage to push out balls from the bearings, please count them. One or two balls are ok, if there are more of them, please consider ordering new bearings.

  - Note: Design of your X-end printed parts might slightly differ, but the assembly process is the same.
Step 8 — Placing the Z-axis-top parts (part 1)

- For the following steps, please prepare:
  - Z-axis-top-left (1x)
  - Z-axis-top-right (1x)
  - M3x10 screw (4x)
Step 9 — Placing the Z-axis-top parts (part 2)

- Place the Z-axis-top-left part on the rods and align it with the frame.
- Ensure the holes in the printed part are fully aligned with the holes on the frame.
- Use two M3x10 screws to tighten the Z-axis-top-left part.

⚠️ **Don’t use excessive strength during tightening.** In case of increased resistance, try to place the screws from the other side to “clean up” the hole. Then return to the front side.

- Repeat this step on the other side of the frame with Z-axis-top-right printed part.

ℹ️ Note: Design of your X-end printed parts might slightly differ, but the assembly process is the same.
Step 10 — Haribo time!

- Z-axis was easy, have 10% again.

Step 11 — Z-axis is finished!

- Z-axis is done!
- Check the final look, compare it to the picture.
- Checked everything? It's time for: 5. E-axis assembly