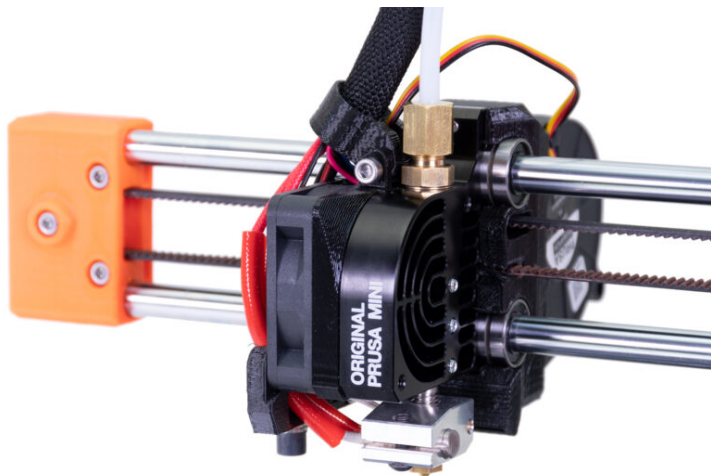


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How to replace bearings on the X-axis (MINI/MINI+)

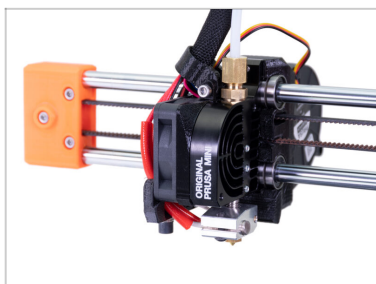


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STEP 1 Introduction



◆ This guide will take you through the replacement of the **X-axis bearings** on the **Original Prusa MINI** and **MINI+**.

ⓘ Some parts may slightly differ. However, it does not affect the procedure.

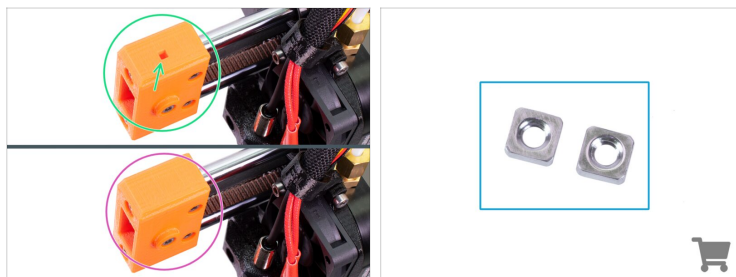
◆ All necessary parts are available in our eshop shop.prusa3d.com

ⓘ Note that you have to be logged in to have access to the spare parts section.

ⓘ For replacing bearings on the Y-axis, use this guide: [How to replace bearings on the Y-axis \(MINI/MINI+\)](#)

STEP 2 Some tips (optional)

How to replace bearings on the X-axis (MINI/MINI+)

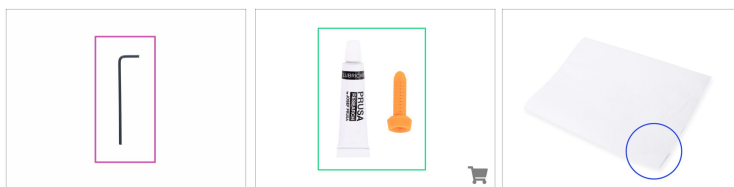


- i** This step is optional. Although we recommend it for easier reassembly of the printer and avoid problems that might arise later.
- There are two designs of the MINI-x-end part. **Before you disassemble the printer** we recommend upgrading to the latest version. Take a closer look at the MINI-x-end on your printer and chose the appropriate steps:

 - NEW design** has an inspection hole on the top and bottom of the part. If your printer has the new design, you can skip this step.
 - OLD design** is without the inspection hole. If your printer has the old design, please follow these steps:

 - Download the latest version of the MINI-x-end from Original Prusa MINI+ Printable parts.
 - Print the MINI-x-end according to the instructions described in this article Printable parts for Original Prusa.
 - Get **two M3nN nuts** at your nearest hardware store. You will need them to assembly the new MINI-x-end.

STEP 3 Tools necessary for this guide



For this guide please prepare:

- 2.5mm Allen key
- Prusa lubricant applicator set (1x) *for bearing lubrication. Can be purchased on the e-shop*
- Several paper towels to wipe oil and grease from the bearing surface.
- Permanent marker

STEP 4 Preparing the printer



- ⚠ **Make sure the printer parts - print head and heatbed are cooled down at room temperature.**
- ⬛ Take off the flexible steel sheet.
- ⚠ **Before these steps, it is recommended to protect the heatbed!**
- ⬢ Use any cloth or piece of fabric, which is thick enough and covers the heatbed. This will ensure you won't damage (scratch) the surface during the disassembly.
- ⬢ Move the Z-axis to half of its height. On the printer screen, using the knob navigate to the *Settings* -> *Move Axis* -> *Move Z*. And turn the knob to move the axis.
- ⬛ Turn the printer OFF and unplug it.

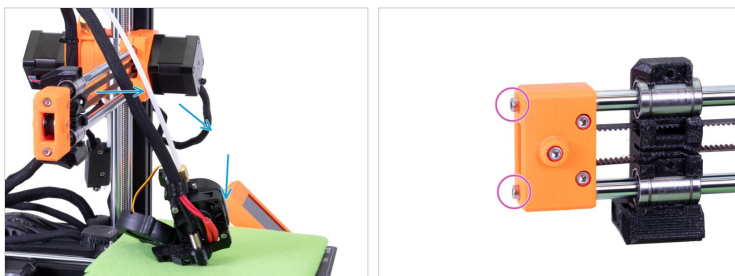
STEP 5 Removing the print fan



- ◆ Release the screw from the minda-holder.
- ◆ Remove the screw from the print fan.
- ◆ Remove the print fan. Leave it hanging freely on the cable.
- ◆ Release the lower screw on the x-carriage.
- ◆ Hold the heatsink with hand.
- ◆ Use your other hand to release the upper screw on the x-carriage and remove the heatsink from the printer.

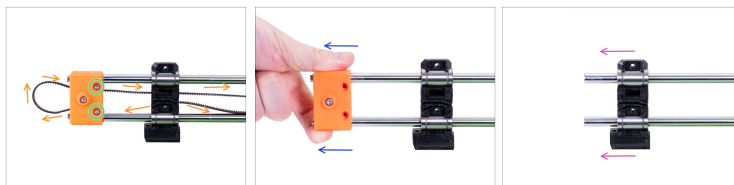
 **CAUTION: Don't drop the heatsink on the heatbed!**

STEP 6 Removing the print head



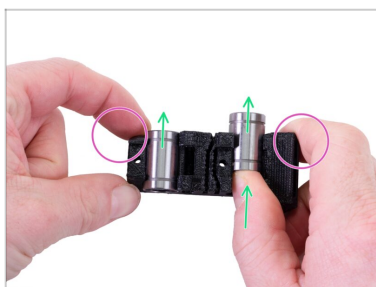
- ◆ Carefully put the print head on the protected heatbed. **Do not place the print head on the print fan.**
- ⓘ If the print head does not reach the heatbed, rotate manually the Z-axis threaded rod to move the axis down.
- ◆ Loosen both screws on the side of the MINI-x-end so that they protrude from the part of half of the screw heads. No need to remove them.

STEP 7 Removing the X-axis belt



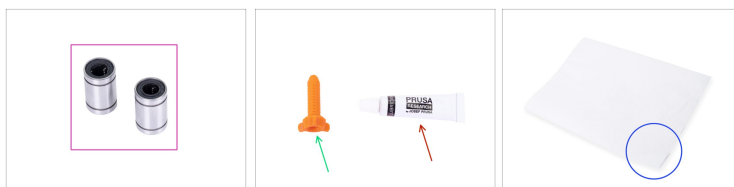
- ◆ Remove both ends of the X-axis belt from the x-carriage and push the belt through the MINI-x-carriage out.
- ◆ Release two screws from the MINI-x-end.
- ◆ Carefully remove the x-end from the X-axis.
- ◆ Slide-out the x-carriage from the X-axis.

STEP 8 Removing the bearings




- ◆ Hold the x-carriage with your hands.
- ◆ Use your thumb and push the bearing out of the MINI-x-carriage.
- ⓘ Don't be afraid to use more force. But **be careful not to get hurt.**
- ◆ Use the same procedure on the second bearing.

STEP 9 New bearings: parts preparation



⬛ **For the following steps, please prepare:**

- ⬜ Linear bearing LM8UU (2x)
- ⬜ Prusa lubricant applicator (1x)
- ⬜ Prusa lubricant (1x)
- ⬜ Several paper towels to wipe oil and grease from the bearing surface.
- ⬛ Permanent marker (1x)

 **Each bearing must be lubricated before mounting on the printer. Follow these instructions carefully.**

STEP 10 Lubricating the bearings



- i** Use any piece of fabric to protect your working surface from grease.
- ⚠** **Make sure the bearing is clean inside.**
- ⬛** Wipe the preservative oil off the bearing surface with a paper towel.
- ⬢** It is necessary to lubricate all 4 rows of balls inside the bearing.
- ⬛** Open the lubricant and pierce the hole in the tube with the tip in the cap.
- ⬢** Screw the tube into the applicator.
- ⬢** Carefully slide the entire bearing onto the applicator.

STEP 11 Lubricating the bearings



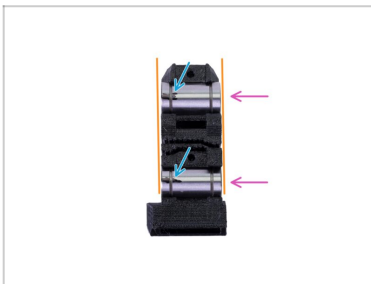
- Turn with the tube and applicator clockwise until you feel a slight resistance. This means that the holes in the applicator are aligned with the ball rows.
- Gently press the tube to push the lubricant into the ball rows of the bearing.
- Look at the front of the bearing. When the applicator pushes the lubricant out (around the black gasket), stop pressing the tube. Hold the bearing with the other hand during the lubricating.
- ⚠ **The grease must be spread evenly over all four ball rows inside the bearing. There must not be too much grease, or too little. Take a closer look at the last picture.**
- Wipe off excess grease on the outside of the bearing with a paper towel.
- Use this procedure for both bearings.

STEP 12 Marking the bearings



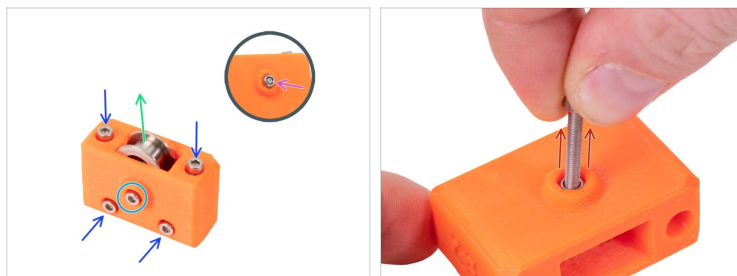
- Position the bearing so that you can see two rows of balls. Like in the picture.
- Make a mark with a permanent marker on the outer surface of the bearing, in the middle above two rows of balls.
- Use the same procedure on the second bearing.

STEP 13 Installing the new bearings



- Push both bearings from the side into the MINI-x-carriage.
- Rotate the bearings that the markings facing you.
- Make sure the bearings are aligned with the printed part.

STEP 14 Disassembling the MINI-x-end (optional)

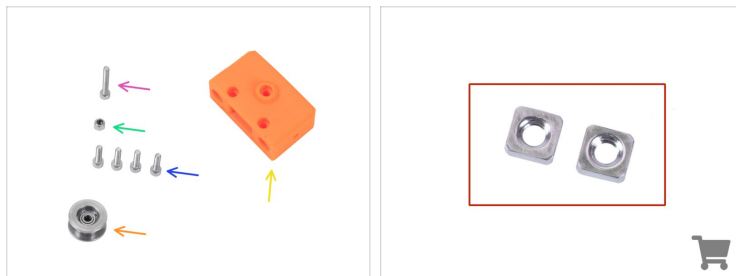


i This step is only for assembling the **new design** of the **MINI-x-end**. If you already have the new design of the part on your printer, skip to Mounting the MINI-x-carriage.

! **Make sure you already have printed the new MINI-x-end before you disassembly the old one.**

- ◆** Remove the M3x20 screw from the printed part.
- ◆** Remove the pulley.
- ◆** Remove four M3x12 screws from the MINI-x-end.
- ◆** Remove the M3nN nut from the opposite side of the part.
 - ◆** Insert the M3x20 screw from the outside into the nut and pull the nut out of the printed part. It's not necessary to insert the entire length of the screw, 3-5 threads are enough. See the last picture.

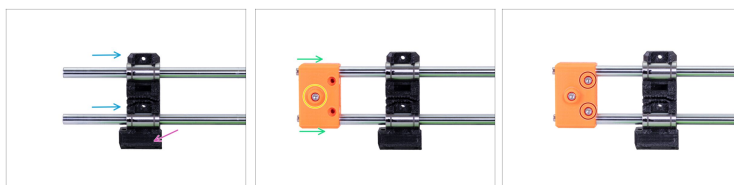
STEP 15 New MINI-x-end: parts preparation (optional)



● **For this step, please prepare:**

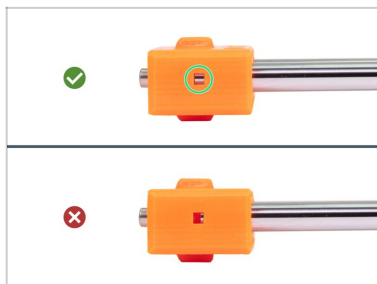
- New MINI-x-end (1x)
 - M3x20 screw (1x) *removed from the old part*
 - M3nN nut (1x) *removed from the old part*
 - M3x12 screw (4x) *removed from the old part*
 - Pulley bearing Idler 623 2Z (1x) *remove from the old part*
 - M3nS nut (2x)
- To assemble the new MINI-x-end, follow steps from the Original Prusa MINI+ kit assembly manual. After assembly the part, come back and continue with this manual.

STEP 16 Mounting the x-carriage



- Carefully slide the x-carriage on the X-axis.
- See the correct orientation. The nozzle of the MINI-x-carriage must be facing downwards.
- Push the MINI-x-end all the way on the smooth rods.
- Check the correct orientation of the part. The screw head in the MINI-x-end must be facing you.
- Insert and slightly tighten two M3x12 screws into the MINI-x-end. We'll completely tighten them later.

STEP 17 Checking the smooth rods



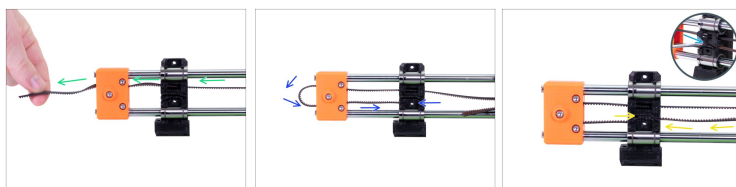
- Look from the top on the MINI-x-end into the inspection hole and **ensure that the upper smooth rod is inserted all the way in the plastic part.**

i MINI and some early MINI+ units may be without inspection holes.

! If the rod is not fully visible in the groove, try using more force to push MINI-x-end on the rod. **Do not use a hammer or similar tools to push the plastic part!**

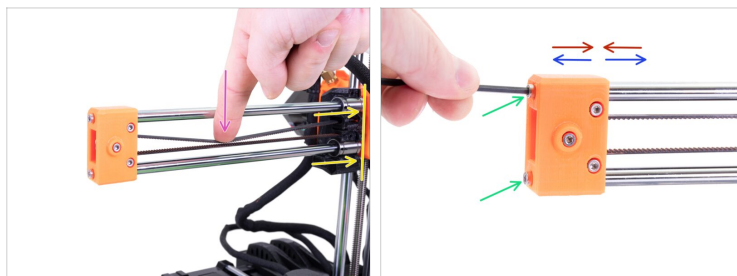
- Look from the bottom and use the same procedure for the lower smooth rod.

STEP 18 Mounting the X-axis belt



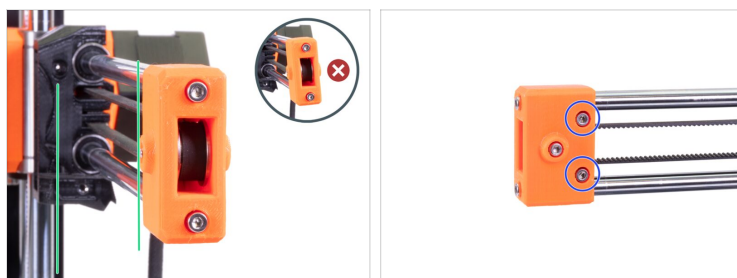
- ◆ Take the X-axis belt and guide it through the channel in the MINI-x-carriage and the MINI-x-end. The teeth of the belt must be facing downwards.
- ◆ Guide the belt around the pulley and insert the end into the lower "jagged" groove in the MINI-x-carriage.
- ◆ Guide the second free end of the belt and insert it into the upper "jagged" groove in the MINI-x-carriage.

STEP 19 X-axis belt tensioning



- Move the MINI-x-carriage all the way to the Z-carriage.
- Using a finger on your left hand push the belt down in the center of the X-axis. Some force should be needed for bending the belt, BUT don't try to overstretch the belt as you might damage the printer.
- Adjust it by releasing or tightening both screws on the MINI-x-end.
 - **Release the screws**, bring the MINI-x-end closer to rods and thus decrease the overall tension.
 - **Tighten the screws**, MINI-x-end will move apart, the overall tension will increase.

STEP 20 Securing the X-end



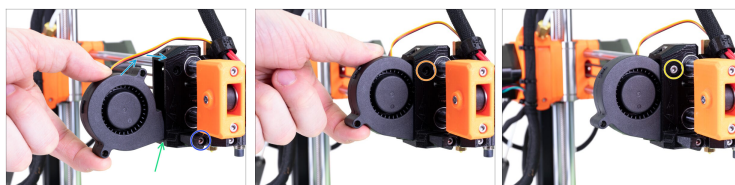
- ◆ Look at the X-axis from the side. Align the MINI-x-end parallel to the Z-axis smooth rods by twisting the plastic part. Do not use too much force to twist, you may damage the X-axis.
 - ◆ Securing the MINI-x-end by tightening both screws on the front side of the plastic part.
- ⚠ After tightening, **check once more the MINI-x-end is parallel** with the Z-axis.

STEP 21 Mounting the print head



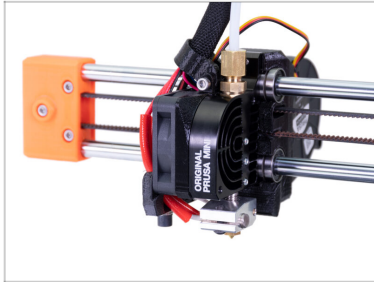
- Place the print head to the MINI-x-carriage. Make sure the print head fits perfectly on the bearings.
- Hold the print head with your hand.
- Insert and tighten the M3x20 screw into the upper hole in the MINI-x-carriage to secure the print head.
- Insert and tighten the M3x20 screw into the lower hole in the MINI-x-carriage.

STEP 22 Mounting the print fan



- Insert and tighten the M3x12 screw to secure the MINI-minda-holder to the MINI-x-carriage.
- Insert the edge of the fan on the bottom edge of the MINI-x-carriage pocket.
- Insert the fan into the MINI-x-carriage.
- Align the screw hole in the fan with the hole in the MINI-x-carriage.
- Insert and tighten the M3x20 screw.

STEP 23 It is done!



- ◆ **Good job!** You successfully replaced the bearings on the X-axis.
- ◆ Heat the printer up and try it out ;)
