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

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STEP 1 Introduction

- This guide will take you through the replacement of the **Y-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 the replace bearings on the X-axis, use this guide: How to replace bearings on the X-axis (MINI/MINI+)

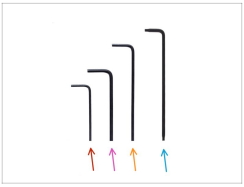
STEP 2 Some tips (optional)

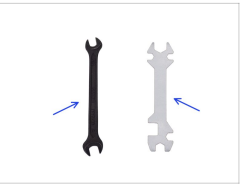


This step is optional. However, we recommend it for easier reassembly of the bearings and their better attachment.

- There are two designs of the Y-axis bearing mounting. Take a closer look at the Y-axis bearing mounting on your printer and chose the appropriate steps:
  - **NEW DESIGN -** each bearing on the Y-axis is secured with a bearing clip (shaped sheet). This method is used on MINI+ printers. If your printer has the new design, please skip to the next step.
  - **OLD DESIGN** - each bearing on the Y-axis is secured with a U-bolt. This method is used on MINI printers. If your printer has the old design, buy an upgrading Bearing Clips pack from our eshop.

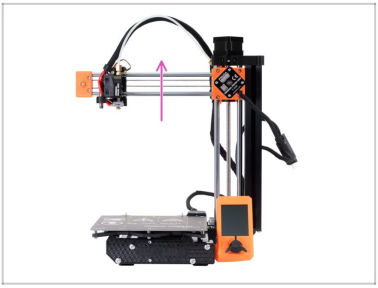
STEP 3 Tools necessary for this guide





- **For this guide, please prepare:**
- 2.0mm Allen key
- 2.5mm Allen key
- 3.0mm Allen key
- Torx TX10 key
- Prusa lubricant applicator set (1x) *for bearing lubrication. Can be purchased on the e-shop*
- Wrench size 5.5 mm or universal wrench received with the MINI+ kit
- Cloth or piece of fabric 15x15cm *to protect your working surface*

STEP 4 Preparing the printer



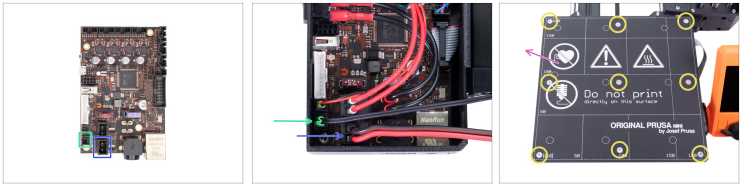
⚠ **Make sure the printer parts - print head and heatbed are cooled down at room temperature.**

- Take off the flexible steel sheet.
- Move the Z-axis to the highest position. 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 Disconnecting the LCD

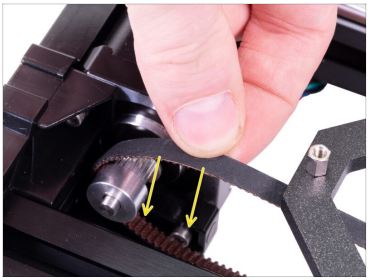
- Disconnect the LCD cable from the back of the display. Insert the cable into the groove in the extrusion. It will not interfere during handling.
- Release and remove the M3x12 screw on the box with the electronics.
- Remove the printed cable cover.
- Lift the second electronics cover slightly. Before you remove it completely, pull it first towards the aluminium extrusion to release both pins from the holes.

STEP 6 Disconnecting the heatbed



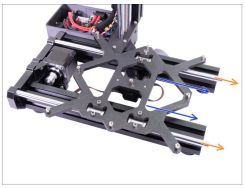
- Disconnect the heatbed cable from the Buddy board.
- Disconnect the heatbed thermistor.
- Use the TX10 Torx key and release all screws on the heatbed.
- Remove the heatbed from the printer.

STEP 7 Removing the Y-axis belt



- Release two screws on the front plate.
- Remove the MINI-y-belt-idler with the belt from the front plate.
- Take off the loose belt from the pulley on the Y-axis motor.

STEP 8 Removing the Y-front-plate



- Release four screws from the MINI-y-plate-front.
- Remove the MINI-y-plate-front with the LCD from the Y-frame.
- Carefully slide out the Y-carriage from the Y-axis smooth rods.
- Carefully pull out both smooth rods from the MINI-y-plate-rear.

STEP 9 New bearings: parts preparation

- **For the following steps, please prepare:**
- Linear bearing LM8UU (3x)
- Prusa lubricant aplicator (1x)
- Prusa lubricant (1x)
- Several paper towels to wipe oil and grease from the bearing surface.

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

STEP 10 Lubricating the bearings



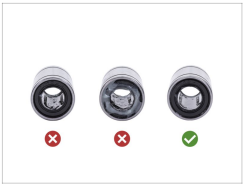
Use any piece of fabric to protect your working surface from grease.

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.

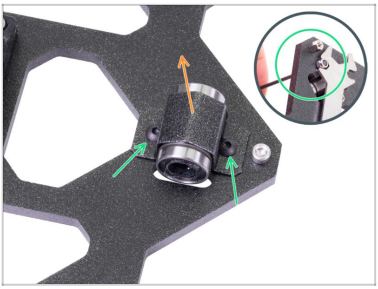
- Wipe off excess grease on the outside of the bearing with a paper towel.
- Use this procedure for all three bearings.

ⓘ Temporarily place all three prepared bearings on a paper towel. We will need them later on.

STEP 12 Bearing mount: new vs old design

- **There are two designs of the bearing mounting.** Take a close look at your version of the mounting and follow the instructions accordingly:
  - **NEW DESIGN -** Bearing is secured with the bearing clip (shaped sheet). This method is used on **MINI+** printers. If your printer has this version of the mounting, please continue with the following step: Removing the bearings (new design).
  - **OLD DESIGN -** Bearing is secured with a U-bolt. This method is used on **MINI** printers. If your printer has this version of the mounting, please go to Removing the bearings (old design)

STEP 13 Removing the bearings (new design)

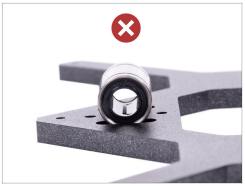


- Remove the two screws from the bearing clip. On the opposite side of the Y-carriage is the nyloc nut on each screw. Hold the nut in a 5.5mm wrench or pliers so that it does not rotate when loosened.
- Remove the bearing clip with the bearing from the Y-carriage.
- Use the same procedure for the remaining bearings.

Place the removed bearings away from you so that they are not confused with new ones in the following steps.

STEP 14 Correct bearing orientation (new design)

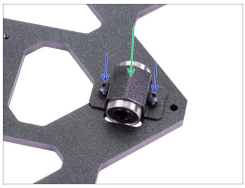
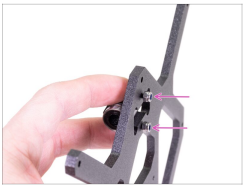
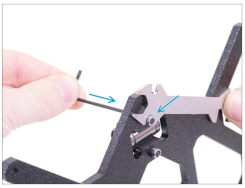




- **The correct orientation**: When placing bearings onto the Y-carriage, **make sure that they are oriented as shown** in both pictures. The tracks (rows of balls) have to be on the sides.

⚠ **The incorrect orientation: Avoid placing the bearing like in the last picture!** This orientation with a single row of balls in the center of the hole will later **increase the wear of the smooth rod**, possibly creating a groove in it.

STEP 15 Installing bearings on the Y-carriage (new design)

- Insert linear bearing in the center of the cutout. It doesn't matter which side. The top side and bottom side are the same. **Pay attention to the correct orientation of the ball rows inside the bearing**.
- Place the bearing clip over the bearing.
- Insert two M3x10r screws into the holes in the bearing clip.
- Using your fingers, hold the heads of both screws and turn the Y-carriage. Place the nyloc nuts on both screws.
- Tighten both nuts by using the 2 mm Allen key and the universal wrench.
- Repeat these steps for the remaining two linear bearings.
- Now, go to Inserting the rods

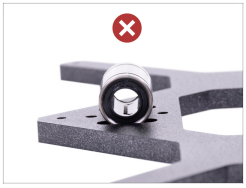
STEP 16 Removing the bearings (old design)

- Release two nyloc nuts on the U-bolts.
- Turn the Y-carriage upside down and pull out the U-bolt from the Y-carriage.
- Remove the bearing from the Y-carriage.
- Use the same procedure for the remaining bearings.

ⓘ Place the removed bearings away from you so that they are not confused with new ones in the following steps.

STEP 17 Correct bearing orientation (old design)





- **The correct orientation:** When placing bearings onto the Y-carriage, **make sure that they are oriented as shown** in both pictures. The tracks (rows of balls) have to be on the sides.

⚠ **The incorrect orientation: Avoid placing the bearing like in the last picture!** This orientation with a single row of balls in the center of the hole will later **increase the wear of the smooth rod**, possibly creating a groove in it.

STEP 18 Installing bearings on the Y-carriage (old design)



ⓘ To replace the U-bolts with the bearing clips, prepare your purchased Bearing Clips pack and go to Installing bearings on the Y-carriage (new design).

⚠ This is a **VERY IMPORTANT** part of the assembly, which can significantly influence the printer's behavior. **PLEASE** read the following lines carefully!

- Place the Y-carriage on a flat surface. Orientation doesn't matter.
- Insert linear bearing in the cutout and secure it by U-bolt. Pay attention to the correct orientation.
- Hold thumb on the U-bolt and turn the carriage. Place M3nN nuts on both ends of the U-bolt.
- Start tightening the nuts, **BUT ENSURE** you are tightening both nuts equally and **AS SOON AS EACH NUT REACHES THE SURFACE OF THE Y-CARRIAGE STOP TIGHTENING!!!** We will finish tightening the nuts in the next step.
- Repeat these steps for the remaining two linear bearings.

ⓘ Over tightening nuts leads to deformation of the bearing and all the issues connected with it. Please follow the instructions.

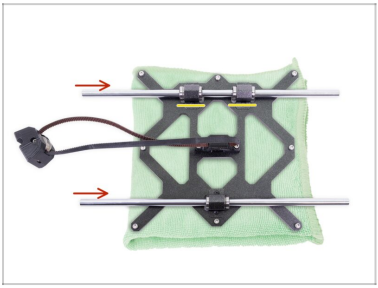
STEP 19 Installing bearings on the Y-carriage (old design)

⚠ Ensure again the nuts are tightened just to the surface and equally.

- Check if the bearing is centered in both directions, if not slightly release the nuts and adjust its position. Then retighten the nuts to the previous state.
- When you are ready, using pliers or a 5.5mm wrench **rotate each nut, but only 90°**. This is enough to fix the bearing without deforming it.

  ⓘ NOTE: This picture is from the MK3S assembly manual. The Y-carriage may look different, but the procedure is the same.
- Repeat these steps for the remaining two linear bearings.

STEP 20 Inserting the rods



- Place the Y-carriage on a piece of fabric or another soft pad that the bearings are facing up. Heatbed spacers could scratch your working surface.

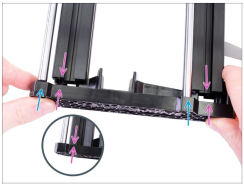
⚠ **NOW, PLEASE BE VERY CAREFUL!** Gently insert the rod straight into the bearings. Do not apply too much force and do not tilt the rod!

- If you can't slide the smooth rod easily, check to make sure that the two bearings are aligned properly.

ⓘ 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.

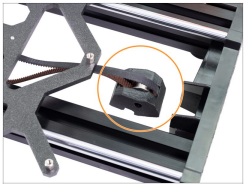
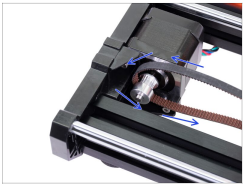
ⓘ The bearings may leave excess grease on the smooth rods after their installation. Wipe off any residue with a paper towel.

STEP 21 Mounting the Y-carriage

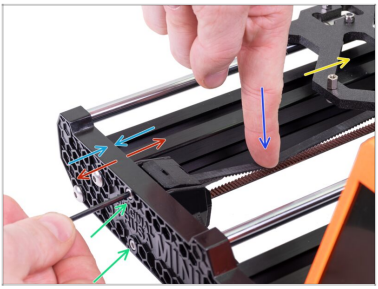

- Gently slide the smooth rods into the holes in the MINI-Y-plate-back. Start with the right rod, then the left one. The side with **one bearing** on the Y-carriage must **face to the right**.
- Place the MINI-Y-plate-front on the smooth rods.
- Push the MINI-Y-plate-front all the way onto both extrusions.
- Secure both parts with four M5x20r screws. When tightening the M5x20r screws, push on the extrusion from above.

STEP 22 Installing the belt

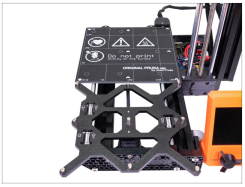

- Place the belt idler near the front plate, like in the picture.
- Guide the loose belt around the pulley of the Y-axis motors.
- Place the idler with the belt on the front plate and secure it with two M3x20 screws. Do not fully tighten the screws. Leave a small gap between both parts. **Do not twist the belt**. Make sure the "upper" and "lower" belts are parallel.

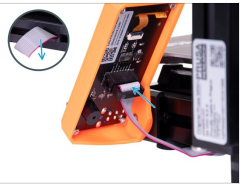
STEP 23 Tensioning the Y-axis belt



- You can change the tension in the belt by adjusting the two screws on the MINI-Y-plate-front:
- Move the Y-carriage all the way from you.
- Using a finger on your left hand push the belt down. Some force should be needed for bending the belt, BUT don't try to overstretch the belt as you might damage the printer.
  - **Tighten the screw**, bring the MINI-Y-belt-idler closer and thus increase the overall tension.
  - **Release the screw**, parts will move apart, the overall tension will decrease.

STEP 24 Mounting the heatbed





- Push the Y-carriage to the front and place the Heatbed behind.
- Align all 9 holes on the heatbed with the heatbed spacers and insert the M3x4b screws in the holes. **DON'T fully tighten the screws**.
- After all screws are in place, use the Torx key to tighten them in the following order:
  - Center screw
  - First four screws (edges)
  - Last four screws (corners)
- Remove the free end of the LCD cable from the extrusion and connect it to the LCD board.

STEP 25 It is done!

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

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