

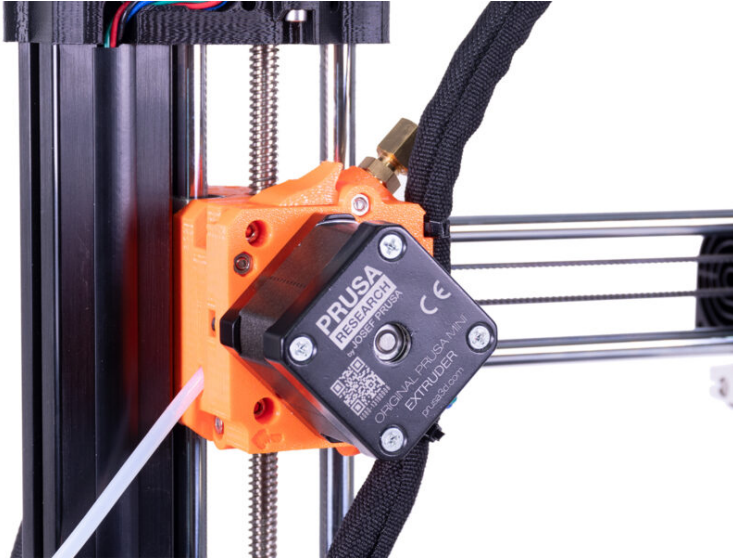
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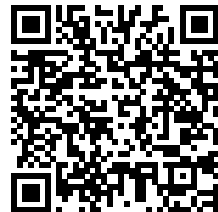


# How to replace an extruder motor (MINI/MINI+)

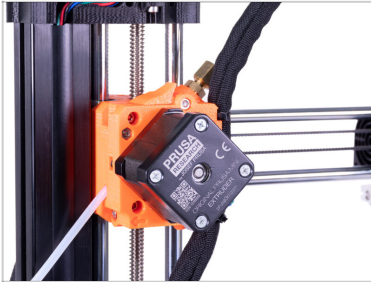


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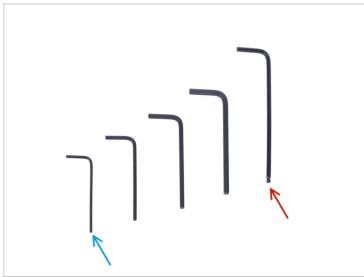


## STEP 1 Introduction



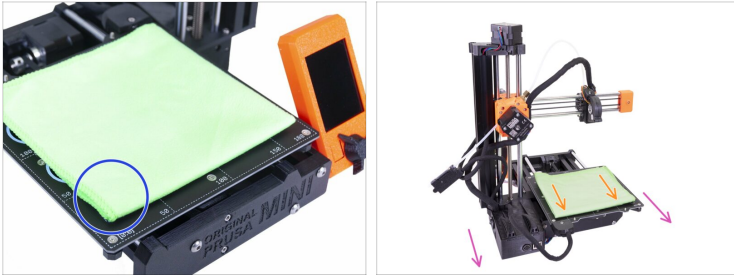
- ◆ This guide will take you through the replacement of the **extruder motor** on the **Original Prusa MINI** and **MINI+**.
- ⓘ Some parts might slightly differ. However, it does not affect the procedure.
- ◆ All necessary parts are available in our eshop [shop.prusa3d.com](http://shop.prusa3d.com).
- ⓘ Note that you have to be logged in to have access to the spare parts section.








## STEP 2 Tools necessary for this guide



- 1.5mm Allen key
- 2.5mm Allen key
- Wrench size 10 mm

## STEP 3 Preparing the printer



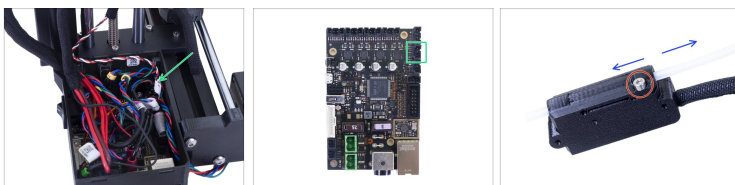
-  **Make sure the printer parts - print head and heated bed are cooled down at room temperature.**
-  **Turn the printer off and unplug it from the socket!**
-  **Before proceeding any further, it is recommended to protect the heated bed first!**
-  Take off the flexible steel sheet.
-  Use any cloth or piece of fabric, which is thick enough and cover the heated bed. This will ensure you won't damage (scratch) the surface during the disassembly.
-  Rotate the back of the printer towards you.
-  Move the heated bed all the way towards you.

## STEP 4 Opening the box with the electronics



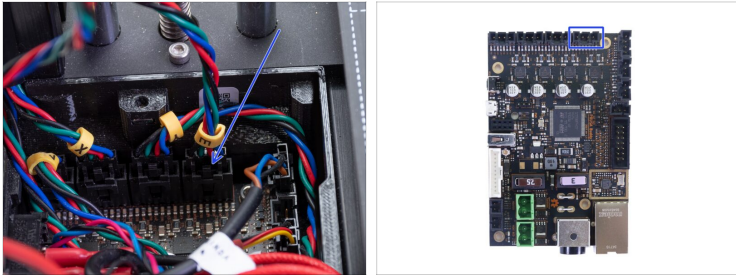
- Release and remove the M3 screw on the box with the electronics.
- Remove the printed cable cover.
- Lift the second electronics cover slightly. Before you remove it completely, pull it first towards the vertical aluminium extrusion to release both pins from the holes.

## STEP 5 Disconnecting the optical sensor (optional)



- ⓘ If your printer does not have the optical sensor, please skip this step.
- Disconnect the IR sensor cable from the Buddy control board.
- Loosen the screw on the optical sensor.
- Remove the optical sensor from the long PTFE tube.

## STEP 6 Disconnecting the extruder motor



- ◆ Disconnect the extruder motor cable (labeled E) from the Buddy control board.

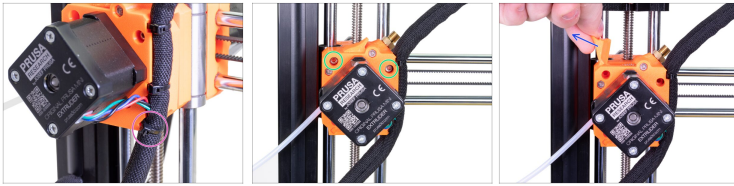
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## STEP 7 Removing the bowden PTFE tube



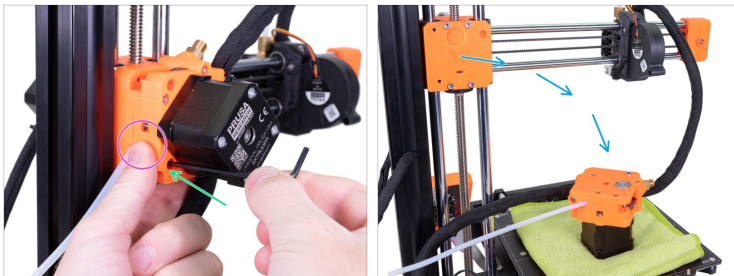
- ◆ Release the upper fitting and remove it together with the long PTFE tube from the extruder.

## STEP 8 Removing the extruder motor



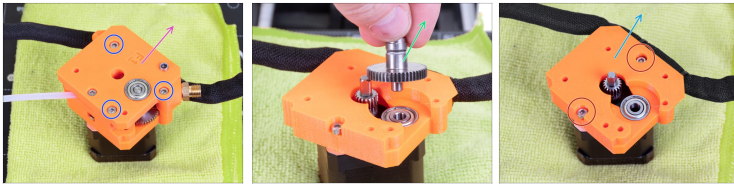
- ✦ Cut the lowest zip tie on the extruder cable bundle mounting.
- ✦ Release and remove two screws from the extruder.
- ✦ Remove the inspection-door.

## STEP 9 Removing the extruder motor



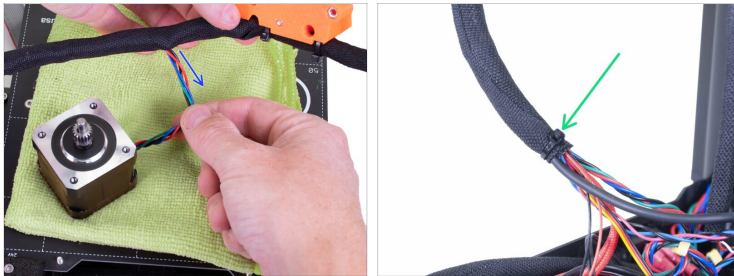
- ✦ Hold the extruder in your hand.
  - ✦ Release and remove the lower screw.
  - ✦ Carefully place the extruder on a piece of cloth on the heatbed so that the motor faces down.
- i** If the extruder does not reach to the heatbed, move the Z-axis down or the X-axis closer. Do it manually, no need to turn the printer on.

## STEP 10 Extruder surgery



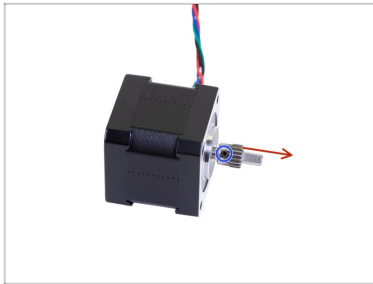
- ◆ Release and remove three screws on the top side of the extruder-rear part.
- ◆ Remove the extruder-rear.
- ◆ Pull out the pulley from the "extruder-front" part.
- ◆ Release two screws.
- ◆ Remove the extruder-front part from the extruder motor.

## STEP 11 Removing the extruder motor cable



- ◆ Pull the motor cable out of the textile sleeve and remove the motor from the printer.
- ◆ Some older units may have a zip tie at the end of the textile sleeve in the electronics. Cut the zip tie.

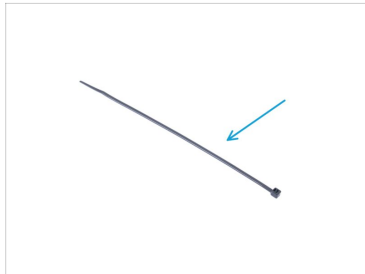
## STEP 12 Removing the pulley



- ◆ Loosen the set screw in the pulley. Do not remove the screw from the pulley.
- ◆ Remove the pulley from the extruder motor.
- ⓘ Keep the pulley for the next steps. Don't throw it away.

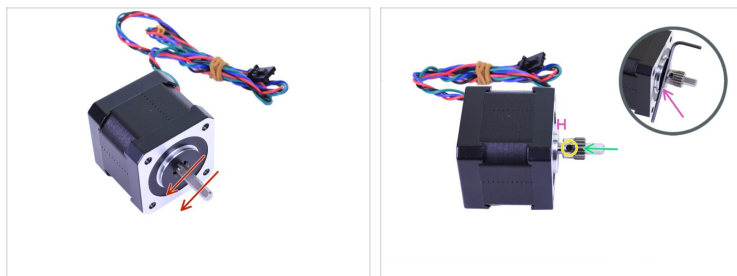
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## STEP 13 New extruder motor - parts preparation



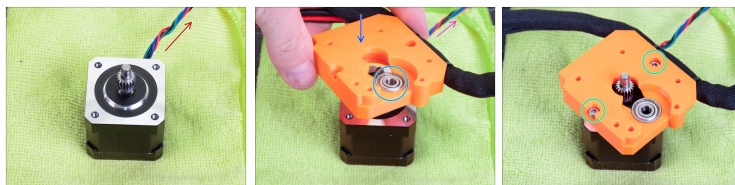
- ◆ **For the following steps, please prepare:**
- ◆ New extruder motor (1x)
- ◆ Zip tie (1x)

## STEP 14 Extruder motor preparation



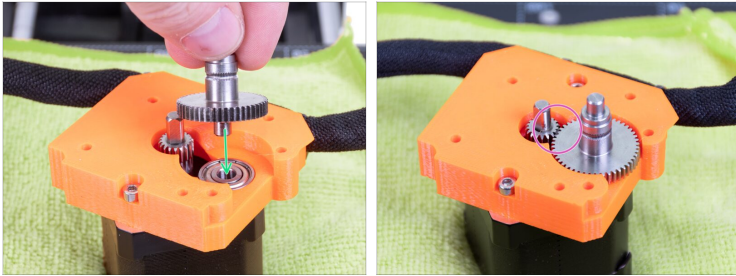
- ◆ There is a flat part on the motor shaft, rotate it similarly to the first picture. See the direction of the arrows.
  - ◆ Place the extruder pulley on the extruder motor shaft as shown in the picture.
  - ◆ Don't press the pulley against the motor. Leave a 2 millimeters gap between both parts. You can use the 2.0mm Allen key to set the gap.
  - ◆ The set screw must be facing directly against the pad (flat part) on the shaft. Slightly tighten the screw.
- ⚠ **Ensure you have the correct orientation of the pulley on the shaft.** It can be placed both ways, but only one is correct.

## STEP 15 Installing the extruder motor



- ◆ Place the extruder motor on the textile cloth on the heatbed like in the picture. See the cable direction.
- ◆ Place the extruder-front part on the extruder motor diagonally, like in the picture.
- ◆ For the correct orientation make sure:
  - ◆ The cable from the motor points away from you, like in the picture.
  - ◆ The bearing in the printed part is closer to you.
- ◆ Secure the extruder-front part with two M3x25 screws.

## STEP 16 Assembling the extruder



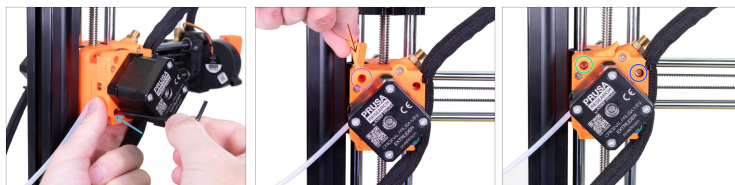
- Place the pulley back into the bearing. The longer part with the jagged groove must face up. See the picture.
- The gears must be aligned properly. Rotate with one pulley to ensure the second is moving as well.

## STEP 17 Assembling the extruder



- Place the extruder-rear on the extruder-front part. Check the correct orientation of the parts as shown in the picture.
- The pulley shaft must fit in the bearing.
- Secure both parts with three M3x25 screws.

## STEP 18 Mounting the extruder



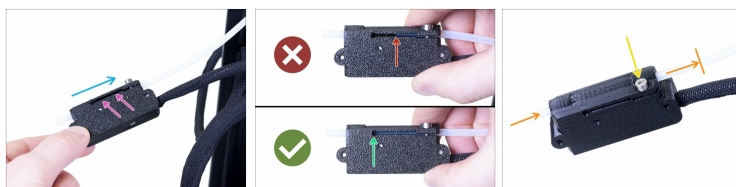
- ◆ Place the extruder on the Z-carriage and secure it with the M3x25 screw in the lower hole.
- ◆ Place the inspection-door to the extruder.
- ◆ Make sure the holes are aligned.
- ◆ Secure it with the M3x25 screw, but don't overtighten. You have to be able to open the door.
- ◆ Insert and slightly tighten the M3x25 screw into the right hole. **Do not overtighten this screw too much**, it could cause problems with the loading of the filament.

## STEP 19 Connecting the motor cable



- ◆ Connect the extruder motor cable (labeled E) into the fourth slot from the left.
- ◆ Insert the extruder motor cable into the cable bundle mounted to the extruder.
- ◆ Mount the bundle to the extruder using a zip tie.

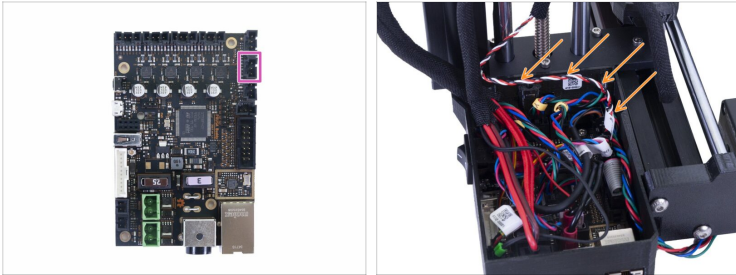
## STEP 20 Installing the filament sensor (optional)



- i** If your printer does not have the optical sensor, please skip to Covering the electronics.
- ◆** Slide the filament sensor onto the PTFE tube. See the picture for the correct orientation of the sensor.
- ◆** Check the position of the PTFE tube through the groove:

  - ◆ Wrong installation.** The filament sensor is not fully pushed onto the PTFE tube. The filament sensor will not work properly.
  - ◆ Correct installation.** The filament sensor is fully pushed onto the PTFE tube.
- ◆** Now, tighten the screw gently to ensure the sensor won't slide from the PTFE tube.
- ◆** Use a piece of filament and slide it through the filament sensor to ensure there is no deformation of the tube. In case of any resistance, release the screw slightly.

## STEP 21 Connecting the filament sensor (optional)



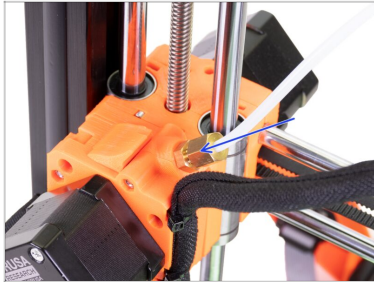
- ◆ Connect the filament sensor cable into the second slot from the top right side of the Buddy board.
- ◆ Arrange the cable according to the picture. Keep in mind that the electronics cover must fit into place.

## STEP 22 Covering the electronics



- ◆ Before covering the electronics, make sure the square nut is correctly positioned in the printed part. **The nut must not fall out!** This can cause fatal damage to the electronics.
- ◆ Insert the cover back in, make sure it is properly seated in the slot. *Note: on an older design, there are holes instead of slots, the assembly procedure is the same.*
- ◆ **Place the second cover on the top and arrange the cables:**
  - ◆ **Extruder bundle**, ensure the textile sleeve is partially in. Also, it must be tilted away from the printer.
  - ◆ **Heatbed bundle**, ensure the textile sleeve is partially inside the box.
  - ◆ **Filament sensor cable** (optional), ensure that the textile sleeve wrapped around the cables is partially inside the box.
- ◆ Now, tighten the second cover. Check that no cable is pinched.

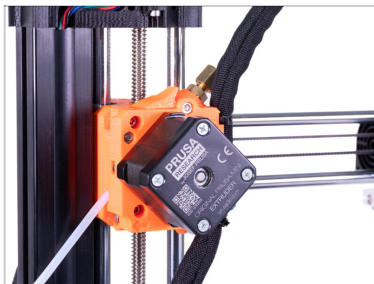
## STEP 23 Mounting the bowden PTFE tube



- ◆ Mount the upper fitting with the PTFE tube and tighten it using the wrench. **Do not over-tighten the fitting, you might deform it!**

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## STEP 24 It's done



- ◆ **Good job!** You successfully replaced the extruder motor.



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