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How to replace Nextruder Filament Sensor (CORE One)

help.prusa3d.com/g922421

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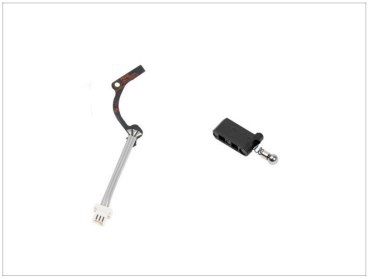
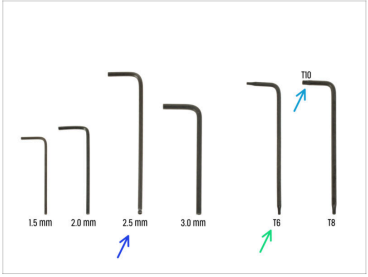
STEP 1 Introduction



- This guide will take you through the **Nextruder Filament Sensor replacement** on the **Prusa CORE One**.
- All necessary parts are available in our eshop 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



- **Please prepare tools for this guide:**
  - 2.5mm Allen key
  - T6 Key
  - T10 Key / Screwdriver
  - Prusa lubricant or another suitable grease (available in e-shop)

STEP 3 Printer Preparation (Part 1)



- Close the printer's door.
- Unload the filament. Visit the menu **Filament** and select **Unload filament.**
- Unload the filament from the printer.
- Remove the filament spool from the printer.

⚠ Ensure the printer has completely cooled down.

- On the printer screen, navigate to *Preheat -> COOLDOWN* and wait for the temperatures to drop to ambient levels. This may take several minutes.

STEP 4 Printer Preparation (Part 2)



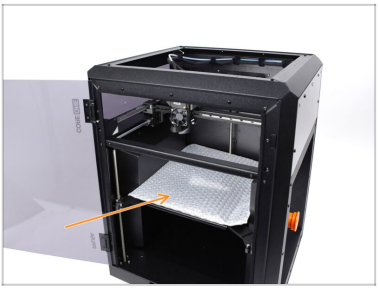
- Open the menu **Control > Move Axis > Move Z** and set it to 100mm or more.
- Wait until the heatbed moves down.
- Turn the printer off using the switch on the back.
- Disconnect the printer from power.

STEP 5 Top Cover Removal



- Open the printer. From the inside, reach for the nylon rivet on the front right of the top cover. Push it out to unlock it.
- Then, remove the rivet from the outside.
- Remove the remaining nylon rivets on the top cover using the same technique.
- Remove the top cover.

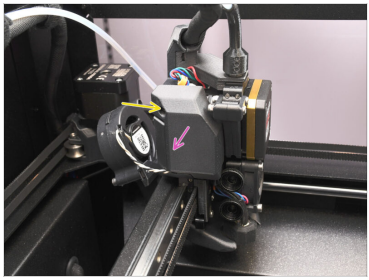
STEP 6 Heatbed Protection

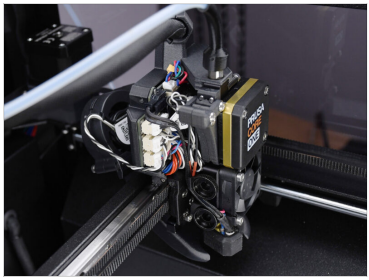


⚠ Before proceeding any further, it is recommended to protect the heatbed first!

- Use a piece of fabric or other material thick enough to cover the heatbed. This will ensure you won't damage (scratch) the surface during the process.

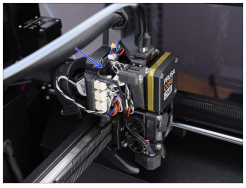
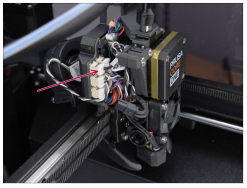
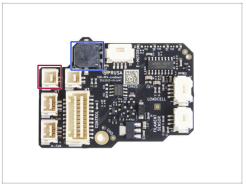
STEP 7 Nextruder Uncovering





- Let's move onto the left side of the Nextruder.
- Using the 2.5mm Allen key, remove the M3x10 screw holding the side cover.
- Remove the cover.

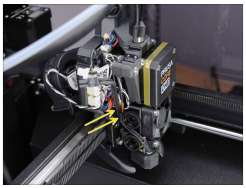
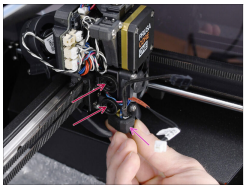
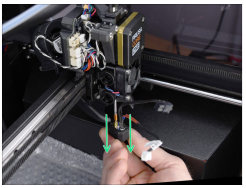
STEP 8 Hotend Disconnecting

⚠ Each connector has a safety latch. **It is necessary to press the latch before disconnecting.** Otherwise, the connector may get damaged.

- Disconnect the hotend heater cable.
- Disconnect the hotend thermistor cable.

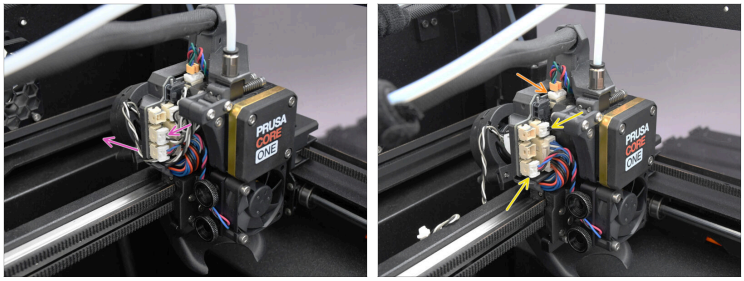
STEP 9 Hotend Assembly Removal

- Remove the hotend cables from the cable guide.
- Grasp the hotend with your hand.
- Use your other hand to loosen the two thumb screws. **There is no need to remove them completely**, a few turns are enough.

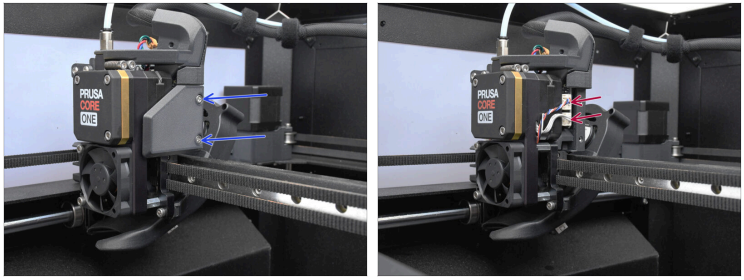
  ⚠ Watch out, the hotend assembly may fall out!
- Slide out the hotend assembly from the heatsink.

STEP 10 Nextruder Disconnecting



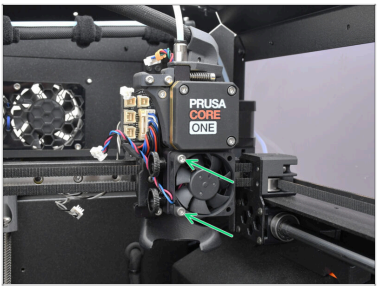
- Disconnect the print fan and move its cable away, to the back.
- Disconnect the Extruder motor on top.
- Disconnect the heatsink thermistor and the heatsink fan cables.

STEP 11 Nextruder Disconnecting 2



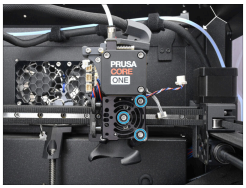
- On the right side, undo the two M3x6 screws and remove the side cover.
- Disconnect the loadcell and the filament sensor cables.

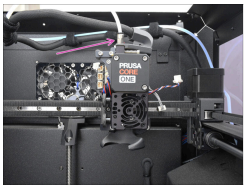
STEP 12 Hotend Fan Removal

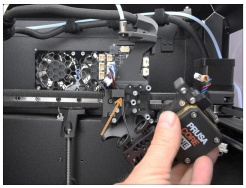


- Remove the two M3x18 screws and the hotend fan from the heatsink.

STEP 13 Nextruder Removal

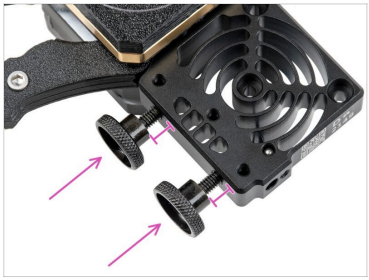


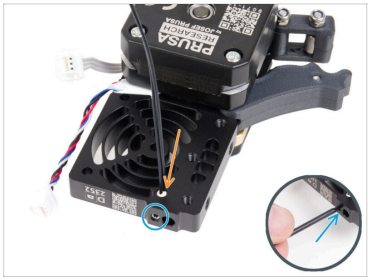




- Remove the three M3x10 screws on the front of the heatsink.
- Unscrew the PTFE fitting on top of the nextruder. The extruder will detach. Start removing it away from the carriage slowly.
  - Watch out for the thermistor cable. Remove it from the hook on the carriage, when removing the Nextruder.

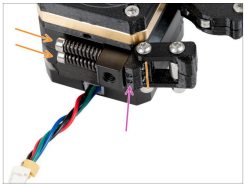
STEP 14 Extruder Disassembly

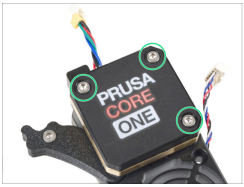


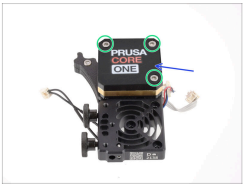


- Remove the two thumb screws on the side.
- Remove the M3x4T grub screw using the short side of the T6 Torx key.
- Remove the NTC heatsink thermistor. Be careful not to damage the cables.

STEP 15 Extruder Disassembly 2

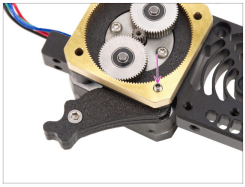
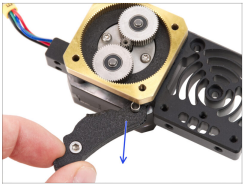
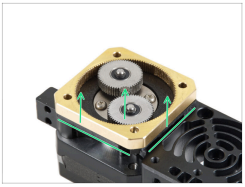






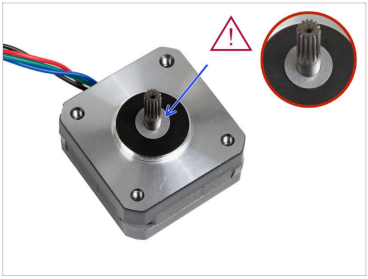
- Remove both the M3x30 screws with the springs.
- Remove the Idler-swivel assembly.
- Remove the M3x25 screws.
- Remove the PG-case, the plastic cover on the front of the gearbox.

STEP 16 Extruder Disassembly 3

- In case you have the "three screw" version of the Nextruder, remove the M3x25 set screw.
- Remove the Idler assembly.
- Remove the whole gearbox assembly: the printed main plate, the brass PG-ring and the gears.
- Clean all the parts of the gearbox from excess grease and dirt.

STEP 17 Extruder Disassembly 4



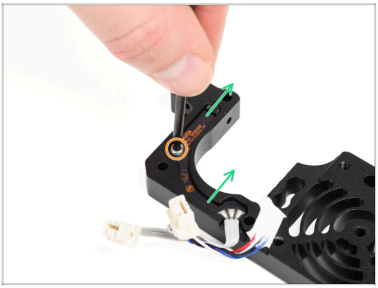
- Locate the **metal washer** that should be between the gearbox and the motor. It might be stuck to the gearbox assembly.

  ⚠ Reseat the washer on the motor shaft, in case it has come off.

  See the last picture for a reference.

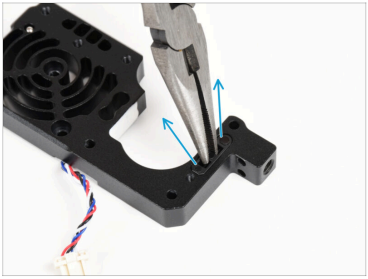
- Remove the extruder motor from the heatsink.

STEP 18 Extruder Disassembly 5



- Unscrew the M2.5x6rT screw to remove the Hall filament sensor.
- Carefully remove the Hall filament sensor.

STEP 19 Extruder Disassembly 6

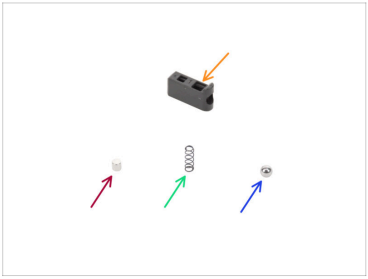


⚠ **BE EXTRA CAREFUL when removing the filament sensor.** The filament sensor contains a tiny parts (spring, magnet, steel ball) that tend to fall out when the sensor is removed.

- Very carefully pull the filament sensor out from the heatsink using the needle-nose pliers.

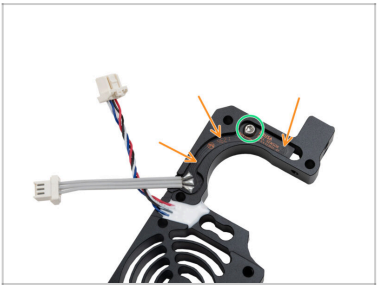
  ⚠ **Don't lose the small parts!** You will need them again later. **Keep them aside in a safe place.**

STEP 20 New Filament Sensor Preparation



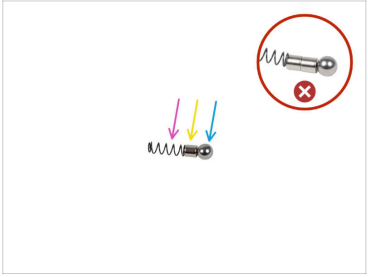
- **For the following steps, prepare:**
- Hall filament sensor (1x)
- Prusa ball holder (1x)
- Magnet 3x3x3 mm (1x)
- Spring 3x9 mm (1x)
- Steel ball 4 mm (1x)

STEP 21 Hall Sensor Installation



- Place the Hall filament sensor into the similarly shaped pocket in the heatsink.
- Fix it with M2.5x6rT screw. Tighten it very carefully, you can crack the electronics board.

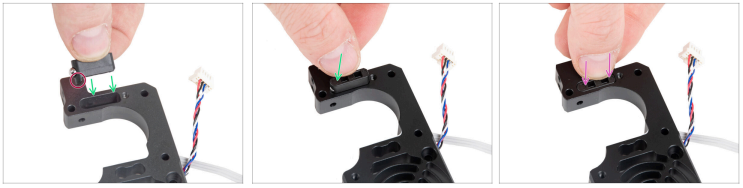
STEP 22 Filament Sensor Assembly



- Assemble the Prusa ball holder in the following order:
  - Steel ball
  - Magnet
  - Spring

  ⚠ Be sure to **insert only one magnet**. One extra magnet is usually included as a spare. The magnets may snap together and appear as one.
- Insert these parts into the Prusa ball holder with the steel ball up.

STEP 23 Filament Sensor Installation

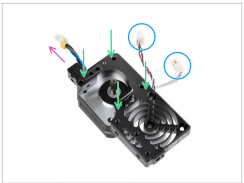


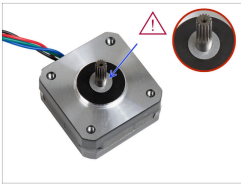
- Insert the filament sensor assembly into the heatsink. Make sure the steel ball part is closer to the side of the heatsink.

  ⚠ Note the **correct orientation of the assembly**. There is a protrusion on the part. The protrusion must be facing down.

- Push the assembly into the heatsink and make sure the filament sensor assembly is flush to the metal heatsink.

STEP 24 Heatsink Assembly





- Place the heatsink on the extruder motor. Note the orientation of both parts.
  - The motor cable must be facing "up".
  - The heatsink cables must be on the right side.
- Place the main-plate on the heatsink. Note the orientation of the part. Use the cutout as a guide.
- **Before proceeding to the next step, make sure that the 5x10x0.1 spacer is placed on the extruder motor.**

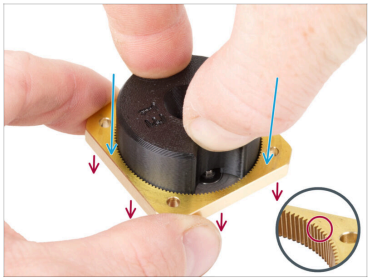
STEP 25 Gearbox Assembly

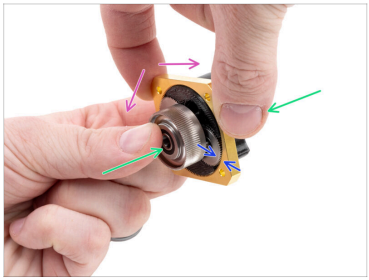
The following instructions need to be done correctly and carefully. Achieve better understanding and successful assembly by watching the video alongside the guide: prusa.io/PG-assembly

- After watching the video, follow the steps in this guide.

- Attach the PG-assembly-adapter on the PG-assembly. Note the pockets for the gears in the adapter.

STEP 26 PG-Ring Assembly

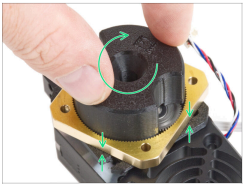




⚠ **Do not assemble the gearbox without the PG-assembly-adapter.** This tool is intended to ensure that the gears are correctly fit together.

- Slide the PG-ring onto the adapter.
  - Note there is a chamfer on one side of the PG-ring teeth. This side must be facing down (to the PG-assembly).
- Grasp the entire assembly in one hand so that it can be rotated with the PG-ring.
- With the other hand, slide the PG-ring onto the PG assembly in a wobbling motion (move the PG-ring left and right repeatedly) - a quarter turn is enough.
- Stop when the surfaces of the gears are approximately flush with the surface of the PG ring.

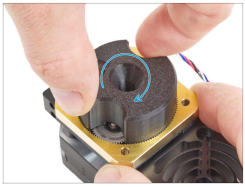
STEP 27 Gearbox Assembly

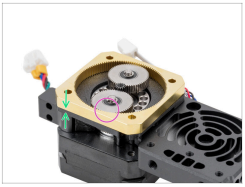




Proceed very carefully in this step.

- Hold the PG assembly in position and carefully attach it onto the extruder motor shaft.
- Very gently rotate the entire PG assembly (PG-assembly-adapter, PG-assembly, and PG-ring) until it naturally drops down, ensuring there is no gap between the assembly and the main plate.
- Remove the PG-assembly-adapter.

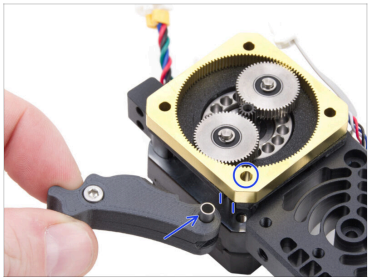
STEP 28 PG-Assembly Check

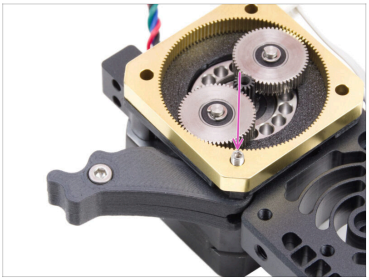




- Attach the PG-assembly-adapter back on the PG-assembly again to verify that all parts are properly seated.
- Rotate with the PG-assembly-adapter. **The PG assembly must be easy to rotate without having to exert much force.**
- Remove the PG-adapter. You will no longer need it during assembly. We recommend keeping it for maintenance.
- Ensure that the PG-assembly is not sticking out above the PG-ring. It should be positioned lower than the level of the PG-ring's surface or at the same level as the ring.
- Ensure that the gap between the PG-ring and the Main-plate is minimal. If a significant gap is observed, disassemble the planetary gear assembly and reposition it.

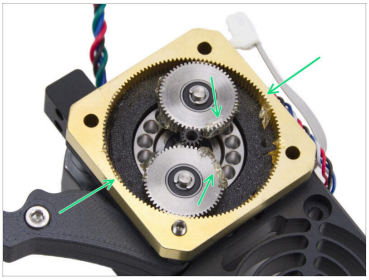
STEP 29 Nextruder Idler Installation





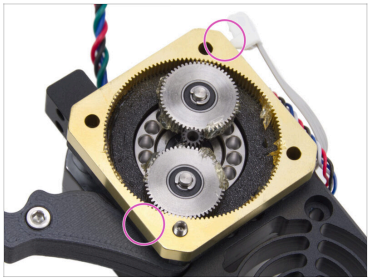
- Insert the idler assembly between the PG-ring and the extruder motor. There is a cutout for the spacer in the main-plate. Line up the idler spacer with the hole in the PG-ring.
- Secure both parts with the socket set screw 3x25. **Do not overtighten the screw! The screw protrudes from the PG-ring after tightening.**

STEP 30 Gear Lubrication



- Apply a small amount of lubricant to the tip of a zip tie (or another suitable applicator).
- Apply a small amount of Prusa Lubricant **all around** the PG-ring and PG-assembly teeth.

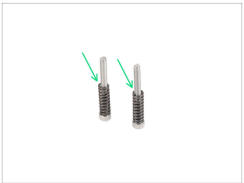
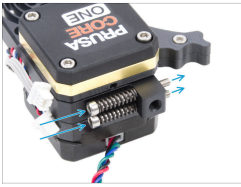
STEP 31 PG-Cover Installation

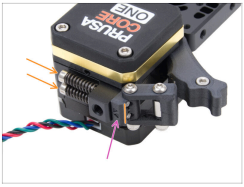


- Using the paper towel, wipe off the lubricant residue from the face surface of the PG-ring.
- Place the front case onto the gearbox and secure it with three M3x25 screws. **Do not tighten them completely** at this moment.

  ⓘ The screws on the front case will be completely tightened during the self-test in the final steps.

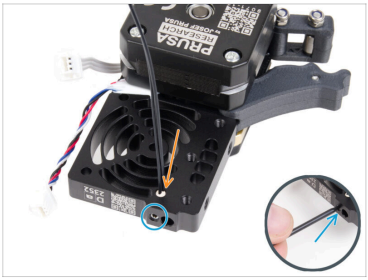
STEP 32 Idler Swivel Installation

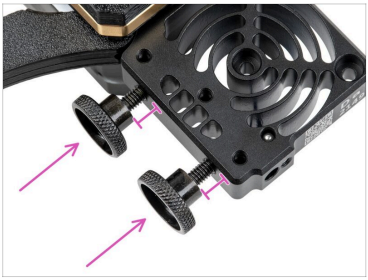





- Attach the spring 15x5 on both M3x30 screws.
- Push the two screws with the springs through the dedicated openings in the heatsink.
- Attach the Idler-swivel assembly onto the screws. Ensure it is oriented correctly, as shown in the reference picture.
- Tighten both screws carefully. **Stop as soon as the screw tips are flush with the front face of the idler nut — do not overtighten.**

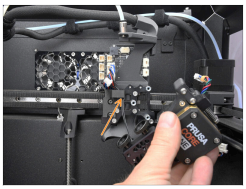
STEP 33 Heatsink Thermistor Installation

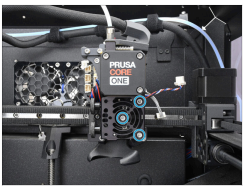




- On the extruder motor side, insert the NTC thermistor into the hole in the heatsink.
- Secure it using the M3x4T grub screw. Tighten it gently but firmly using two fingers on the short side of the T6 Torx key. Do not overtighten to prevent damaging the thermistor and threads.
- Insert two thumb screws into the heatsink. Do not tighten them completely. Two turns are enough for now.

STEP 34 Nextruder Installation

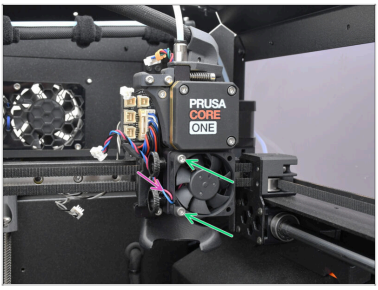




- Move the Nextruder to the inside of the printer.
- Make sure to guide the Heatsink thermistor cable through the hook on the X carriage.

  ⚠ Keep an eye on the cable, while installing the Nextruder. The cable has to be guided freely. Make sure it doesn't get nicked behind the heatsink.
- Align the Nextruder with the carriage and fix it in place by screwing in the PTFE fitting.
- Align the heatsink with the threaded spacers. Fix it in place using the three M3x10 screws.

STEP 35 Hotend Fan Installation

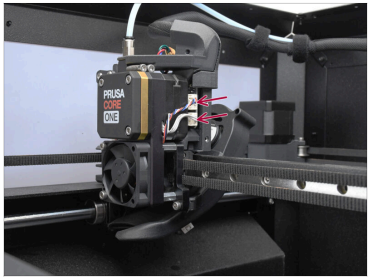


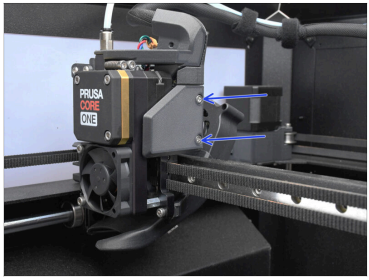
- Attach the fan onto the Heatsink using the two M3x18 screws.

  ⚠ The side of the fan with the silver sticker must face the heatsink.

  - Make sure the cable is oriented to the left.

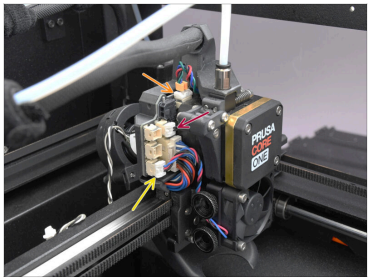
STEP 36 Nextruder Connection

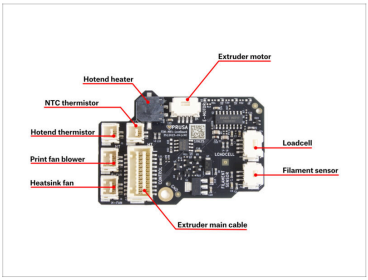




- On the right side of the Nextruder, connect the Loadcell and filament sensor cables.
- Attach the printed cover using the two M3x6 screws.

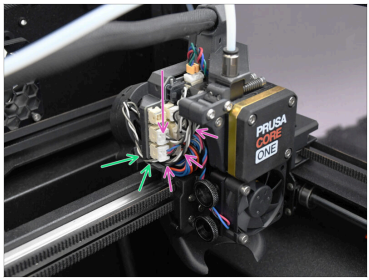
STEP 37 Nextruder Connection 2

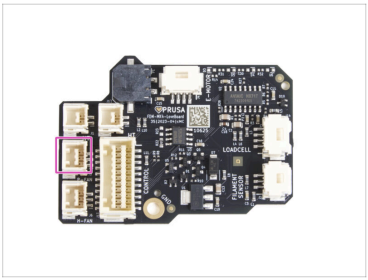




- On top of the Nextruder, connect the Extruder motor cable.
- On the left side, connect the NTC thermistor from the heatsink into the port closer to the inside.
- Connect the front heatsink fan into the lower connector on the left.

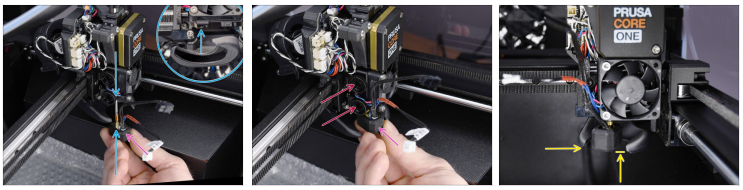
STEP 38 Print Fan Connection





- Guide the print fan cable through the channel in the plastic cover.
  - Create a loop with the print fan cable in the cable area and plug it into the middle connector in the LoveBoard.

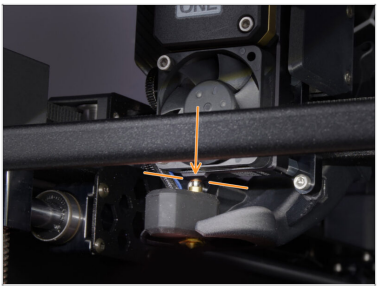
STEP 39 Hotend Insertion



- Locate the corresponding opening on the bottom of the extruder heatsink and fully insert the hotend into the heatsink.
- At the same time, keep the hotend cables pointing to the front, at a slight angle.

  ⓘ The assembly must fit into the recess in the fan shroud with appropriate clearance
- Keep pushing the hotend assembly upward and tighten both thumbscrews to secure it in place.
- Ensure the hotend is fully inserted into the heatsink. It should align as shown in the picture and must not protrude below the fan shroud.

STEP 40 Nozzle Insertion Check

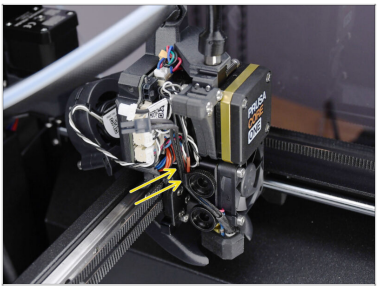


- Verify that the nozzle is **fully inserted** into the heatsink. The copper ring on the nozzle should not be visible if properly seated.

  ⚠ If not fully inserted, it can cause poor heat transfer, potentially leading to nozzle clogs.

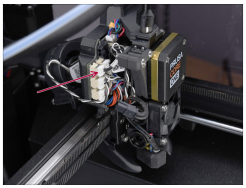
  ⓘ To adjust the nozzle position, loosen the thumbscrews, reposition the nozzle, and then retighten the screws, while pushing the hotend assembly up.

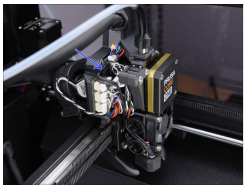
STEP 41 Hotend Cables Guidance

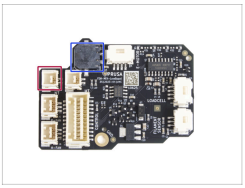


- Locate the cable guide (plastic hook) behind the thumb screws. Guide the thermistor cable through the channel first. Then insert the hotend heater cable.

STEP 42 Hotend Connection

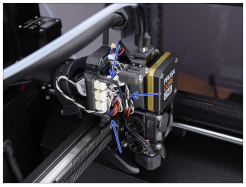
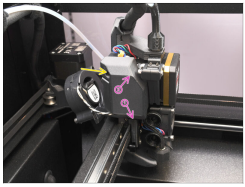
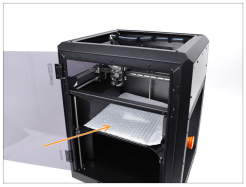






- Connect the hotend thermistor to the top left slot on the LoveBoard.
- Connect the hotend heater to the black slot on the upper part of the LoveBoard.

STEP 43 Nextruder Cover

- Organize the cables to ensure they do not protrude.
- Attach the cover to the left side of the Nextruder assembly.
  - Hook it at the bottom first.
  - Push it towards the Nextruder.
- Fix the cover in place using the M3x10 screw.
- Remove the protective material from the heatbed.

STEP 44 Top Cover

- Now, we can reinstall the top cover.
- Align the cover with the metal frame in the far-right corner.
- Align the cover with the recess in the front part as well
- Secure the cover in place using two nylon rivets in the marked openings.

STEP 45 Turning the Printer On

- Close the door.
- Connect the printer to electricity.
- Turn the printer on.

STEP 46 Nozzle Set Up

⚠ This step is important only if you changed your nozzle diameter or type.

- Visit the **Settings > Hardware > Printhead** menu
- Select the **Nozzle diameter** you are using (e.g. 0.25 / 0.3 / 0.4 / 0.5 / 0.6 / 0.8)

  ⓘ On CORE One, the 0.40 mm nozzle is the stock size.
- Turn on the **Silicone sock** option if you are using one.
- Select a nozzle type.

  ⓘ On CORE One, the High Flow nozzle is a default.

STEP 47 Final check

⚠ Visit the menu **Control > Calibrations & Tests**

and run the Selftest.

- Follow the on-screen instructions, and once all tests pass with a green check mark, you may continue using the printer as usual.

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