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How to replace Nextruder Filament Sensor (CORE One L)

help.prusa3d.com/g944838

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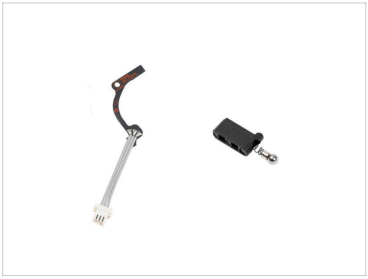
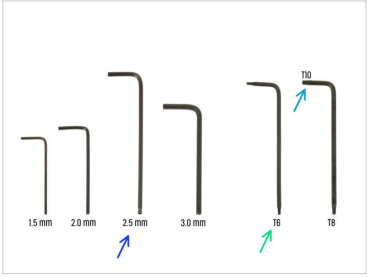
STEP 1 Introduction



- This guide will take you through the **Nextruder Filament Sensor replacement** on your Original Prusa **CORE One L**.
- 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 Required



- **Prepare these tools for this guide:**
  - 2.5mm Allen key
  - T6 Key
  - T10 Key / Screwdriver
  - Prusa lubricant or other compatible grease (can be found in our e-shop)

STEP 3 Printer Preparation



- Close the door.
- Navigate to menu ***Filament -> Unload filament***.
- Pull out the filament.
- Remove the filament spool from the printer.

⚠ Ensure that the printer has cooled down.

- Navigate to ***Preheat -> Cooldown*** and wait for the temperatures to drop. This may take several minutes.

STEP 4 Printer Preparation 2



- Open the menu ***Control -> Move Axis -> Move Z*** and move the heatbed all the way down.
- Wait until the heatbed moves down.
- Turn off the printer using the switch on the back.
- Unplug the mains cable.

STEP 5 Top Cover Removal

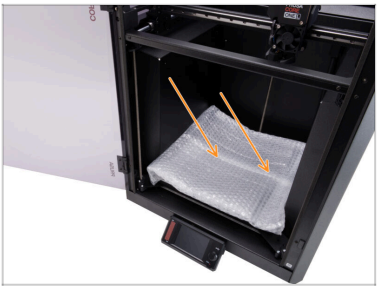


- Open the door and reach in to the bottom side of the top cover.

  The cover is held in place by a set of plastic latches.

- Locate two of the latches at the bottom front. Squeeze them together simultaneously.
- Lift the cover to unhook it. Pull the cover to the front.
- Remove the top cover.

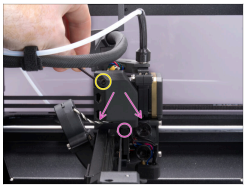
STEP 6 Heatbed Protection

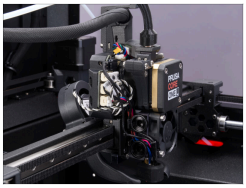


⚠ Before proceeding, it is recommended to protect the heatbed!

- Use a piece of fabric, cardboard, bubble wrap, or another suitable material to cover the heatbed to prevent any damage.

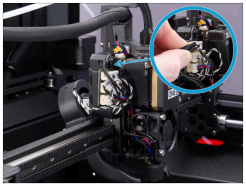
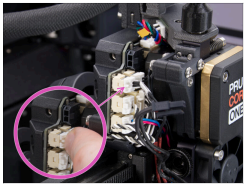
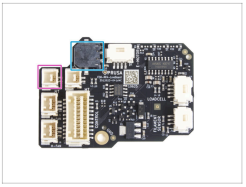
STEP 7 Nextruder Cover Removal





- Adjust the printer so that you can access the Nextruder from all sides easily.
- Using the 2.5mm Allen key, remove the M3x10 screw on top of the Printhead-cover-left (cover).
- Unhook the cover from the bottom and remove it.

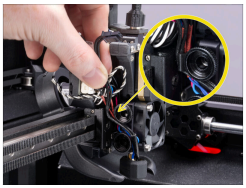
STEP 8 Hotend Disconnecting

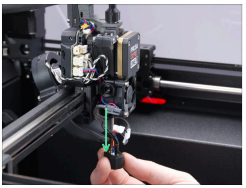




⚠ Each connector has a safety latch; **press the latch to remove the connector**, as pulling without pressing the latch may cause a damage.

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

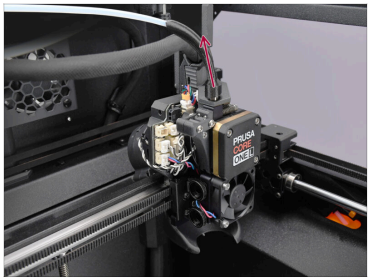
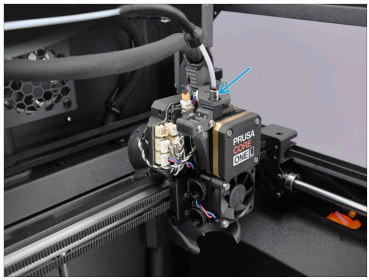
STEP 9 Hotend Assembly Removal





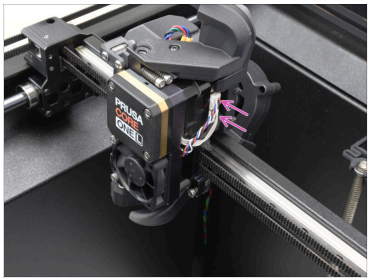
- Unhook the hotend cables from the plastic cable guide behind the two thumb screws.
- Hold the hotend securely with your hand to prevent it from falling.
- Using your other hand, loosen the two thumb screws by a few turns. **Do not remove them completely.**
- Pull the hotend assembly down and out of the heatsink.

STEP 10 PTFE Disconnection

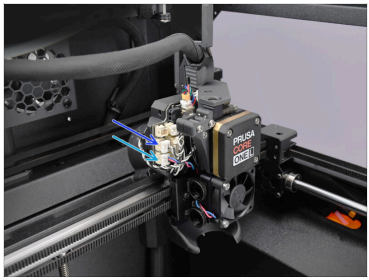
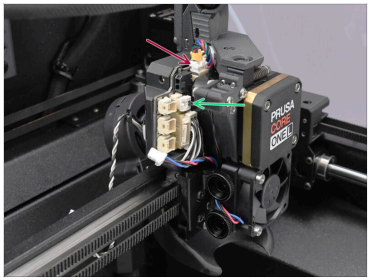
- Pull up the fitting cover on the extruder PTFE tube.
- Unscrew the PTFE fitting from the extruder and set the tube aside.

STEP 11 Cover Right Removal

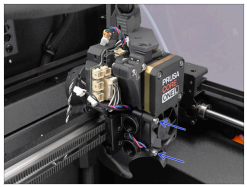
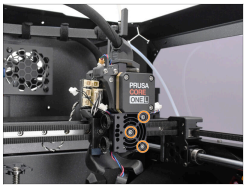
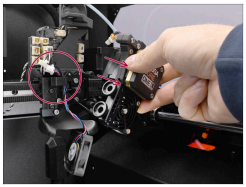
- Loosen the M3x6 screw on the right side of the Nextruder.
- Remove the extruder-side-cover-right.
- Disconnect the Loadcell and Filament Sensor cables.

STEP 12 Extruder Disconnecting

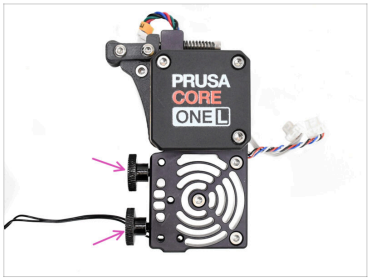
- Disconnect the print fan cable.
- Disconnect the extruder heatsink fan cable.
- Disconnect the Extruder motor cable.
- Disconnect the heatsink thermistor cable.

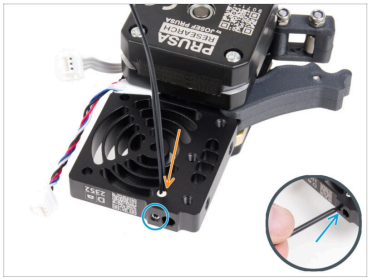
STEP 13 Extruder Removal

- Remove the two M3x18 screws securing the hotend heatsink fan, then remove the fan.
- Remove the three M3x10 screws securing the heatsink, then start removing the extruder **slowly and carefully.**
  - Dislodge the heatsink thermistor cable from the hook behind, then remove the extruder completely.

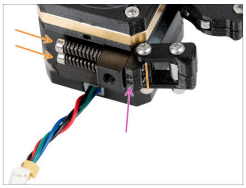
STEP 14 Nextruder Disassembly

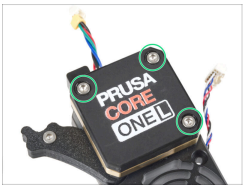




- Remove the two thumb screws on the side.
- Remove the M3x4T grub screw using the short side of the T6 Torx key.
- Remove the NTC heatsink thermistor. Be careful not to damage the cables.

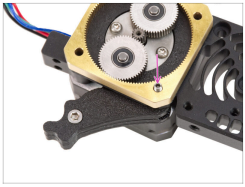
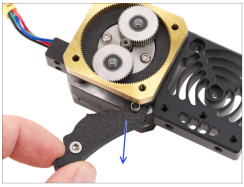
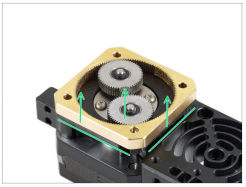
STEP 15 Extruder Disassembly 2





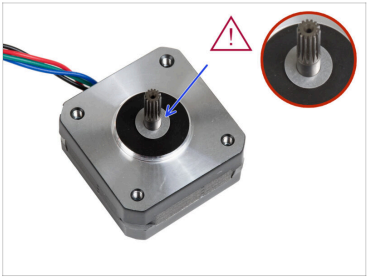
- Remove both the M3x30 screws with the springs.
- Remove the Idler-swivel assembly.
- Remove the M3x25 screws.
- Remove the PG-case, the plastic cover on the front of the gearbox.

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



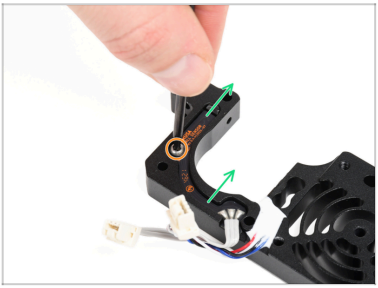
- Locate the **metal washer** that should be between the gearbox and the motor. It might be stuck to the gearbox assembly.

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

  See the last picture for a reference.

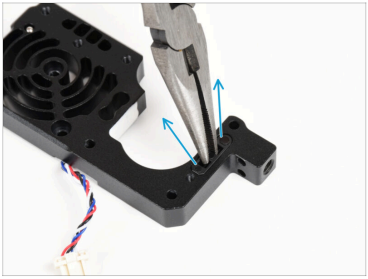
- Remove the extruder motor from the heatsink.

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

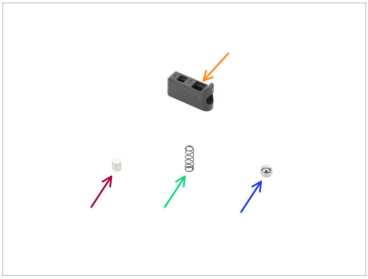


⚠ **BE EXTRA CAREFUL when removing the filament sensor.** The filament sensor contains a tiny parts (spring, magnet, steel ball) that tend to fall out when the sensor is removed.

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

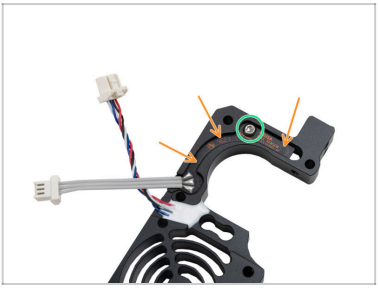
  ⚠ **Don't lose the small parts!** You will need them again later. **Keep them aside in a safe place.**

STEP 20 New Filament Sensor Preparation



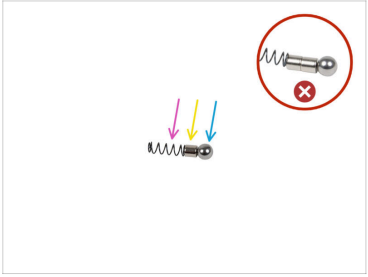
- **For the following steps, prepare:**
- Hall filament sensor (1x)
- Prusa ball holder (1x)
- Magnet 3x3x3 mm (1x)
- Spring 3x9 mm (1x)
- Steel ball 4 mm (1x)

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.

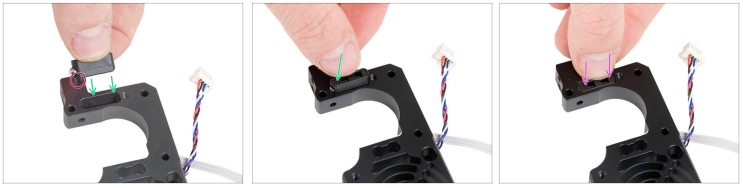
STEP 22 Filament Sensor Assembly



- 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

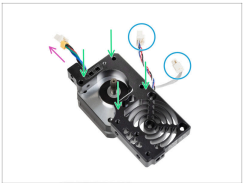


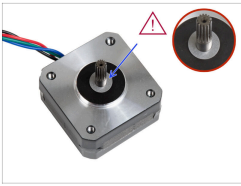
- Insert the filament sensor assembly into the heatsink. Make sure the steel ball part is closer to the side of the heatsink.

  ⚠ 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.**

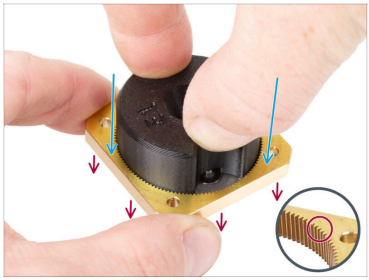
STEP 25 Gearbox Assembly

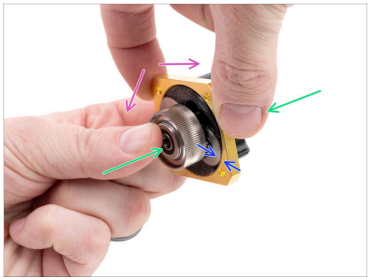
The following instructions need to be done correctly and carefully. Achieve better understanding and successful assembly by watching the video alongside the guide: prusa.io/PG-assembly

- 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

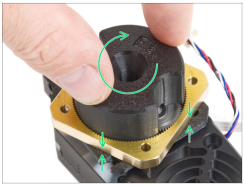




⚠ **Do not assemble the gearbox without the PG-assembly-adapter.** This tool is intended to ensure that the gears are correctly fit together.

- 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.

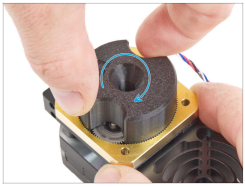
STEP 27 Gearbox Assembly

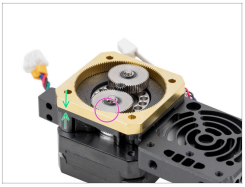




Proceed very carefully in this step.

- 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.

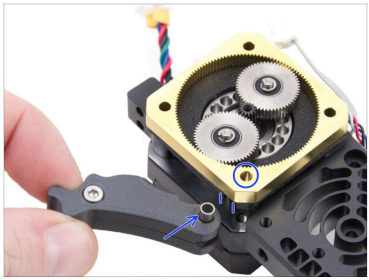
STEP 28 PG-Assembly Check

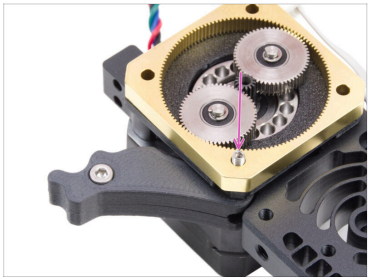




- Attach the PG-assembly-adapter back on the PG-assembly again to verify that all parts are properly seated.
- Rotate with the PG-assembly-adapter. **The PG assembly must be easy to rotate without having to exert much force.**
- Remove the PG-adapter. You will no longer need it during assembly. We recommend 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.

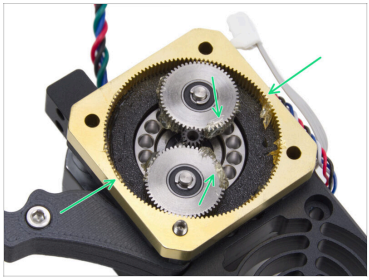
STEP 29 Nextruder Idler Installation





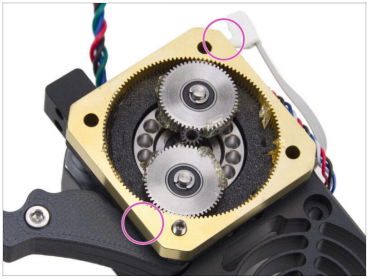
- Insert the idler assembly between the PG-ring and the extruder motor. There is a cutout for the spacer in the main-plate. Line up the idler spacer with the hole in the PG-ring.
- Secure both parts with the socket set screw 3x25. **Do not overtighten the screw! The screw protrudes from the PG-ring after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

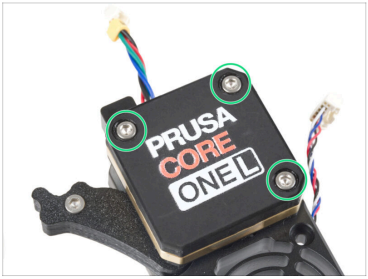
STEP 30 Gear Lubrication



- 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

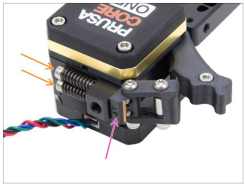




- Using the paper towel, wipe off the lubricant residue from the face surface of the PG-ring.
- Place the front case onto the gearbox and secure it with three M3x25 screws. **Do not tighten them completely** at this moment.

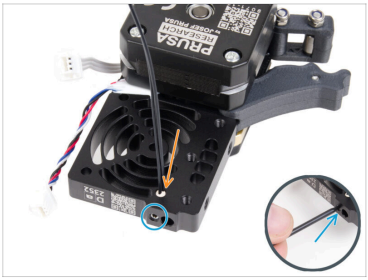
  ⓘ The screws on the front case will be completely tightened during the self-test in the final steps.

STEP 32 Idler Swivel Installation



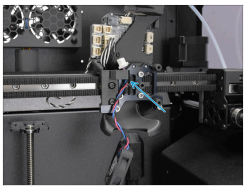
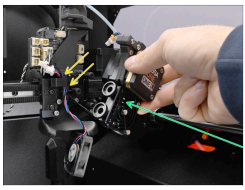
- Attach the spring 15x5 on both M3x30 screws.
- Push the two screws with the springs through the dedicated openings in the heatsink.
- Attach the Idler-swivel assembly onto the screws. Ensure it is oriented correctly, as shown in the reference picture.
- Tighten both screws carefully. **Stop as soon 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 Extruder Installation

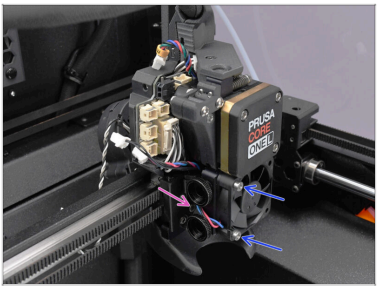




- Before installing the extruder, make sure the hotend heatsink fan cable is held by the right side of the hook on the carriage, as pictured.
- Move the Nextruder to the inside of the printer.
  - Guide the heatsink thermistor cable by the same hook.
- Align the heatsink with the carriage and fix it in place using three M3x10 screws.

  ⚠ Verify none of the cables and connectors behind the extruder is getting pinched.

  ⚠ **Tighten the screws carefully — they thread into plastic, so stop when snug to avoid stripping or otherwise damaging the threads.**

STEP 35 Fan Installation

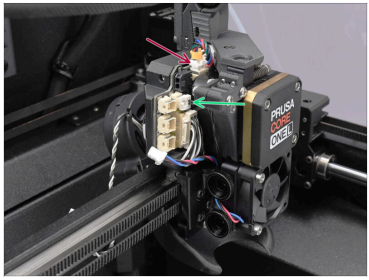


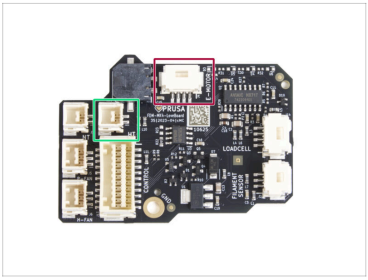
- Guide the hotend heatsink fan cable between the thumb screws.

  ⚠ Make sure the fan is positioned so that the cable is guided toward its left side.

- Attach the fan to the heatsink using two M3x18 screws.

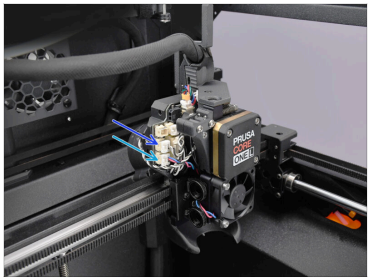
STEP 36 Extruder Connection

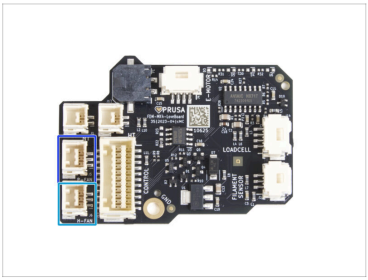




- Connect the extruder motor cable into the top of the LoveBoard.
- Connect the heatsink NTC thermistor into the corresponding plug on the LoveBoard.

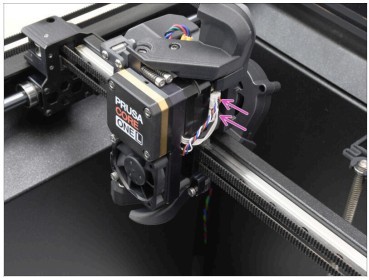
STEP 37 Extruder Connection 2





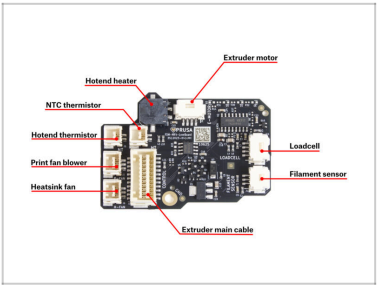
- Connect the Hotend heatsink fan into the bottom left connector on the LoveBoard.
- Guide the print fan cable from the back toward the LoveBoard and plug it into the connector directly above.

STEP 38 Cover Right Installation



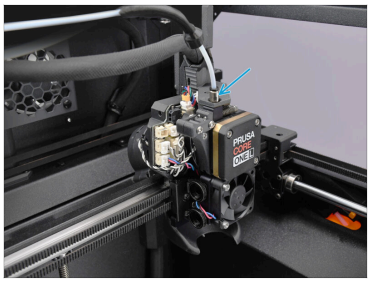
- Move to the right side of the extruder.
- Connect the Loadcell and Hall Filament Sensor cables into the right side of the LoveBoard.
- Cover the cables with the extruder-cover-right, center the cover, and secure it with one M3x6 screw.

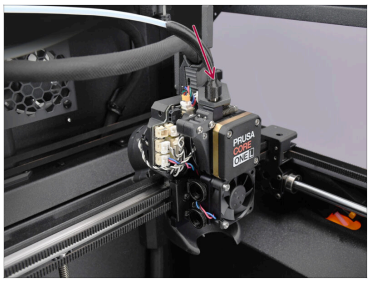
STEP 39 LoveBoard Connection Check



ⓘ Check the connections to the LoveBoard according to the diagram.

STEP 40 PTFE Installation

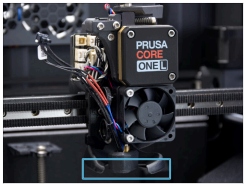




- Screw the PTFE fitting into the top of the extruder and tighten it until snug.
- Slide down the plastic cover to conceal the PTFE joint.

STEP 41 Hotend Assembly Installation



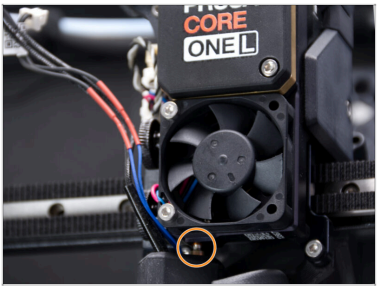


- Locate the hole on the bottom of the heatsink and insert the hotend assembly.

  Position the assembly to maintain a consistent gap between the fan shroud and the hotend.

- Once fully inserted, keep pushing the assembly upward and tighten both thumbscrews.
- Double-check that the hotend is fully inserted into the heatsink and properly aligned with the fan shroud.

STEP 42 Nozzle Check

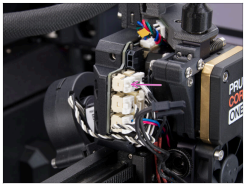
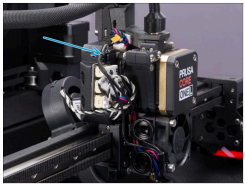
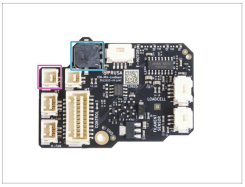


- **Verify that the nozzle is fully inserted** into the heatsink, with the copper ring on the nozzle barely visible.

  ⚠ If not inserted properly, the nozzle may suffer from a poor heat transfer potentially leading to clogs.

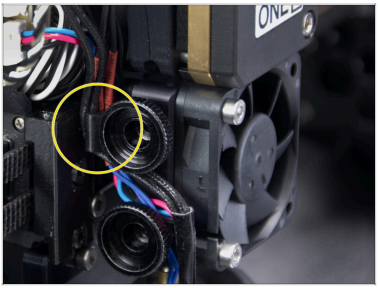
ⓘ To adjust the nozzle position, loosen the thumbscrews, push the hotend assembly upward, and then retighten the thumbscrews.

STEP 43 Hotend Connection

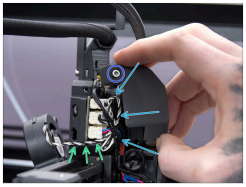
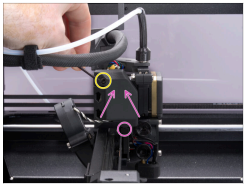
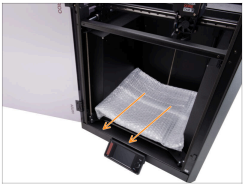
- Plug the hotend thermistor cable to the top left connector on the love board.
- Plug the hotend heater to the black connector on the upper part of the love board.

STEP 44 Hotend Cables Guidance



- Guide the hotend cables between the thumb screws. Hook them behind the plastic notch on the carriage. First, hook up the thinner thermistor cables, followed by the thicker heater cables.

STEP 45 Cover Left Attachment

- Organize the cables so they do not stick out, preventing them from being pinched when attaching the Printhead-cover-left.
- Ensure the print fan cable is routed through the ridge in the Printhead-cover-rear.
- Tip: Prepare the M3x10 screw and set it up in the cover before attaching it.
- Attach the cover to the left side of the nextruder assembly.
  - Insert the bottom of the cover into the slot on the Printhead first.
  - Press the cover towards the nextruder.
- Fix it in place using the M3x10 screw.
- Remove the protective material from the heatbed.

STEP 46 Top Cover Attachment

- Place the back of the cover onto the printer, with the ventillation grille facing you.
- Slide the cover backward until the rear part hooks into place.
- Once the back is secured, lower the front of the cover and gently push it down until the front latches snap into place.

STEP 47 Power Up

Ensure the printer is placed on a stable surface where ambient vibrations, such as those from other printers, are minimized.

- Close the door.
- On the back of the printer, plug in the mains cable.
- Turn the power switch ON.

STEP 48 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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